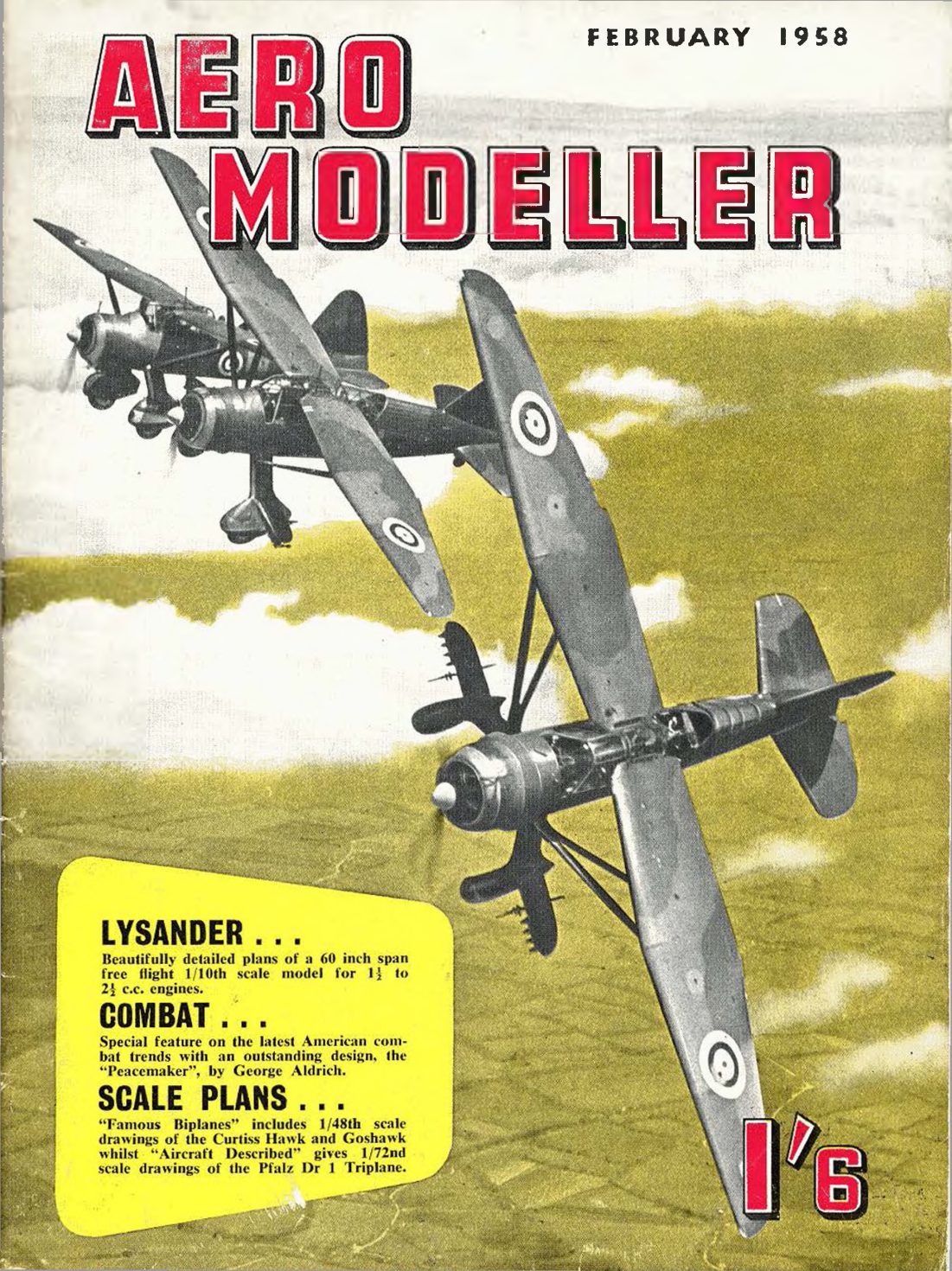
FEBRUARY 1958

AERO MODELLER



LYSANDER . . .

Beautifully detailed plans of a 60 inch span free flight 1/10th scale model for 1½ to 2½ c.c. engines.

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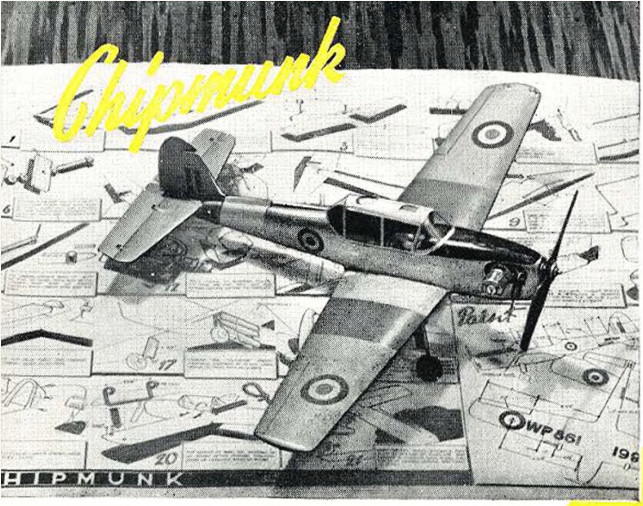
Special feature on the latest American combat trends with an outstanding design, the "Peacemaker", by George Aldrich.

SCALE PLANS . . .

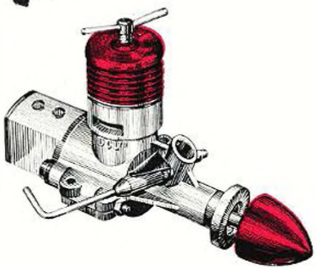
"Famous Biplanes" includes 1/48th scale drawings of the Curtiss Hawk and Goshawk whilst "Aircraft Described" gives 1/72nd scale drawings of the Pfalz Dr 1 Triplane.

1/6



2 SUPER KITS

Both for the SUPER MERLIN



·76 c.c.—·046 cu. ins. Price with tank, spinner, tommy bar & propeller **52/7**

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An accurate replica of the Duke of Edinburgh's own trainer with authentic registration letters and markings supplied on a sheet of first-class transfers. Model features a torsion bar undercarriage and the kit is complete with wheels and special metal tank parts ready to solder. The wing is pre-shaped and all other parts superbly printed on the highest grade balsa. Outstanding feature is the schematic stage by stage instruction sheet, which makes assembly ridiculously simple. Designed by Ron Moulton. Price **15/-**

BALLERINA 38" span Sport Power Model

Fit this model with a Super Merlin and you have the perfect combination for a first power model. Construction is simplicity itself, the kit includes accurate printed parts, shaped trailing edges, etc., all on satin smooth top grade balsa. Big feature of this design by Vic Smeed is its foolproof performance. Even the beginner will find it difficult to prang, yet nifty performance can be achieved up to contest standard if required. Price **16/6**

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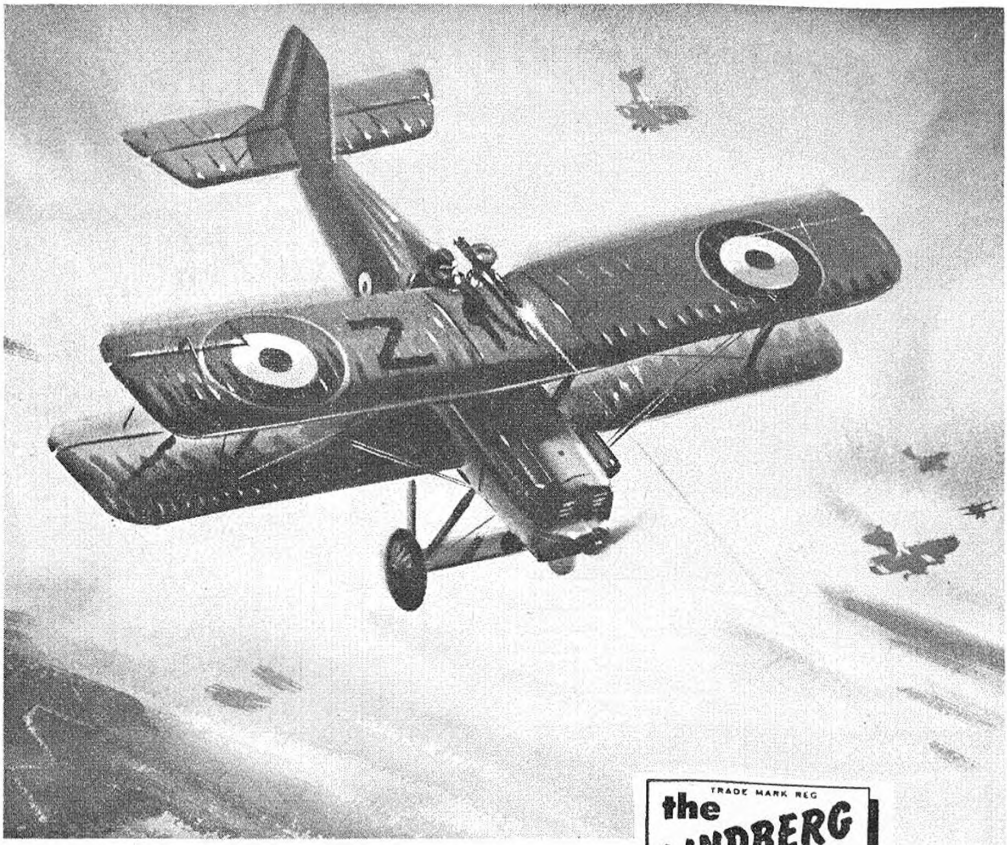

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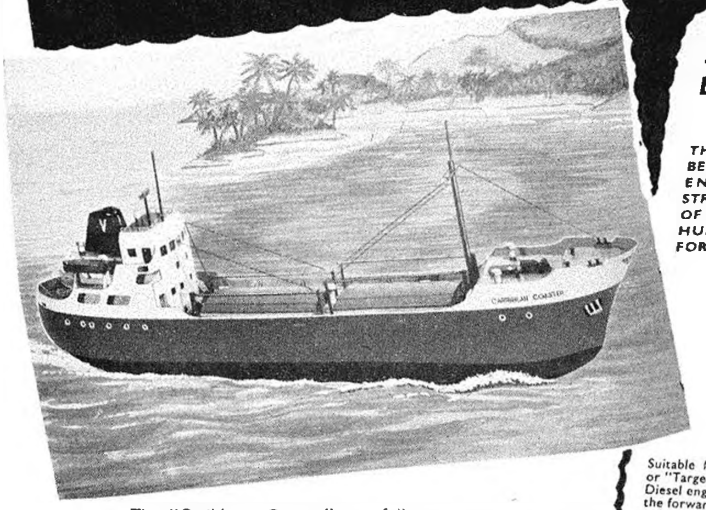

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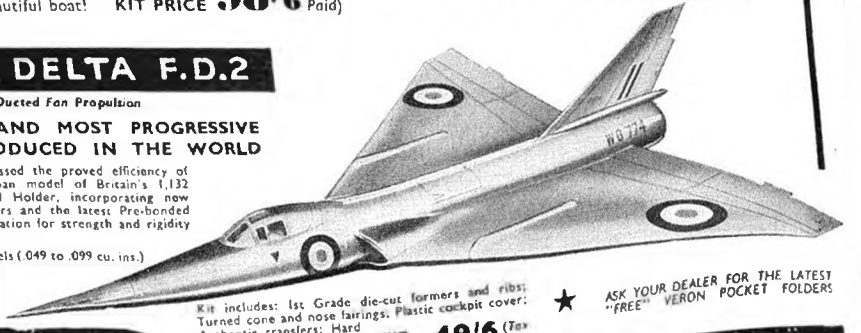

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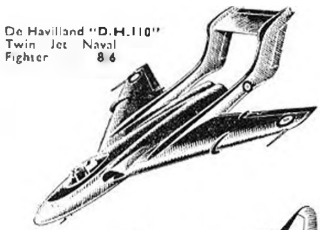
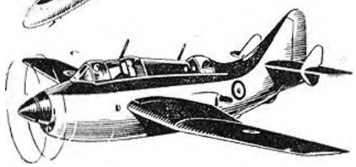


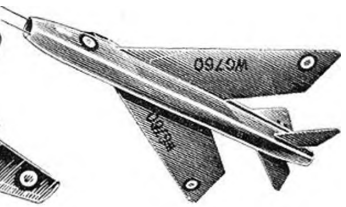
De Havilland "D.H.110" Twin Jet Naval Fighter 8/6



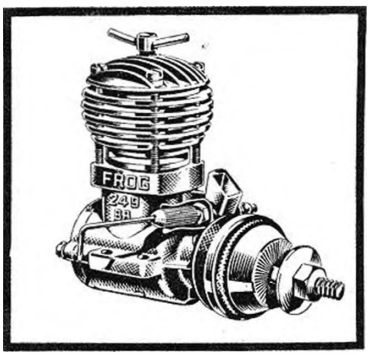
Fairey "Gannet". Three Seat Prop-Jet Naval Submarine Spotter 8/6

1/72nd Scale Models

Vickers Supermarine "Attacker" Single Seat Naval Jet Fighter ... 5/3



English Electric "P.1". Supersonic Twin Jet Interceptor Fighter 6/9



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An open letter

From: Air Marshal Sir John Whitley, K.B.E., C.B., D.S.O., A.F.C.

AIR MINISTRY (AM3a),
ADASTRAL HOUSE,
THEOBALDS ROAD,
LONDON, WC1

Dear Sir,

Suggesting a career is always a big responsibility - not least for parents with a son growing up. In the final analysis, the choice must lie with your son himself. But you can help him in his choice.

Here, therefore, are some facts about one career which is particularly attractive to an ambitious young man. I refer to a flying career in the Royal Air Force, about which there seem to be some misconceptions, at present.

First, let me assure you that flying will continue in the Royal Air Force for as far ahead as can be foreseen. The Royal Air Force has the prime responsibility for the air defence of this country. For young men therefore who are trained to tackle the problems of the air in the air, there will be more - not fewer - opportunities in the missile age. This is especially true of those who qualify now for a permanent or short service commission and come successfully through their Pilot's, Navigator's or Air Electronics Officer's training. In a service as complex and as forward-looking as the Royal Air Force, there is always a constant demand for the right kind of senior officers.

It is a well-paid job. In how many callings can a man of 25 earn £1,500 a year? It is a job of high responsibility. Quite apart from flying and its fascinating skills, there are the manifold duties of an officer; to men under him; in staff, liaison or training jobs; and perhaps, in high command.

You know yourself if your son has the character, intelligence and fitness for this magnificent (but exacting) life. If he is over 17½ and has G.C.E. or equivalent to the required standard, you may be doing him a service if you write to the Air Ministry for fuller information.

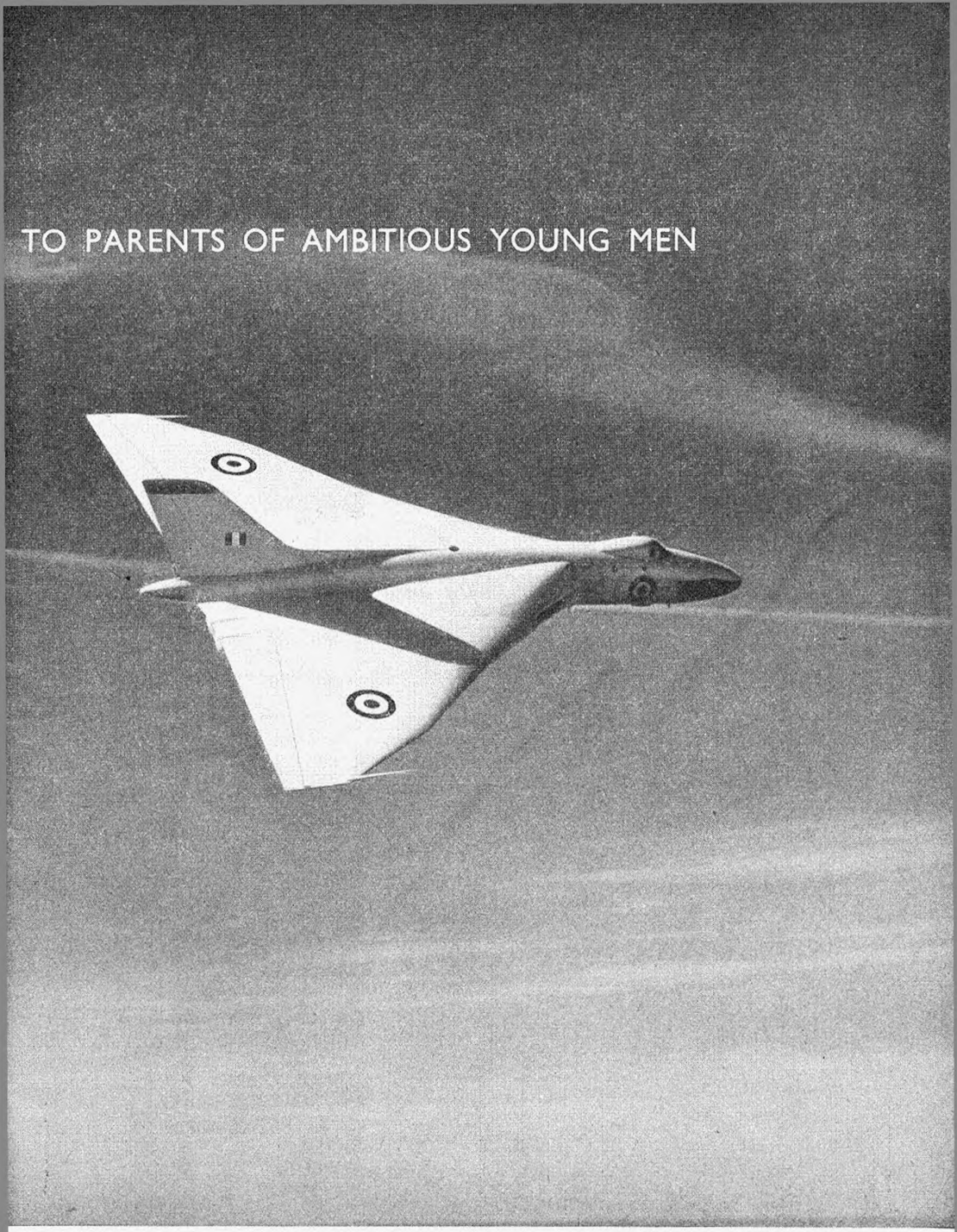
Let me add that the country needs the right kind of young men for this vitally important job, and it needs them now.

Yours faithfully,

Air Member for Personnel

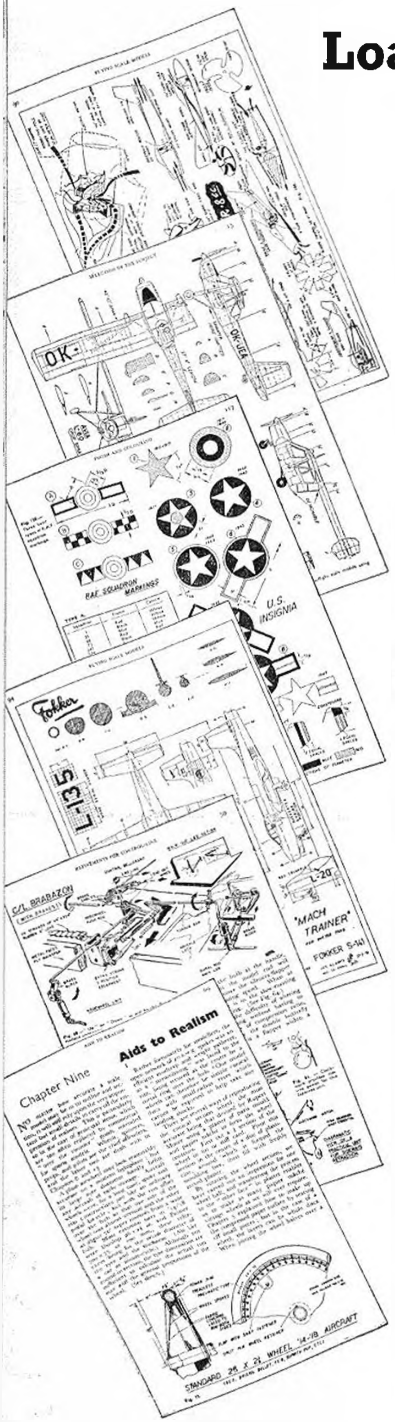
To any young man who wants to fly...

TO PARENTS OF AMBITIOUS YOUNG MEN

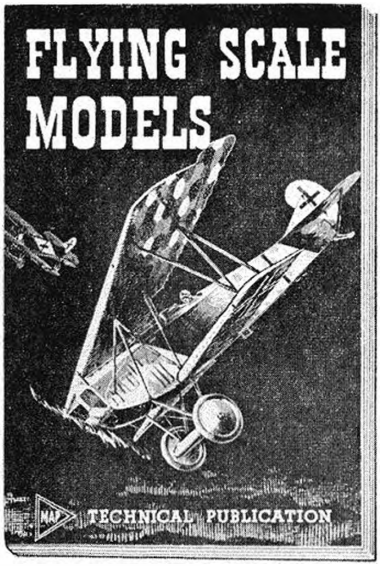


In this letter, it is not possible to give full details about this worthwhile career. For further information write to: Air Ministry (AM3a), Adastral House, London, WC1.

Loaded with "Gen"



A glance at these specimen pages will tell you that this is the reference book of the age for all scale modellers. Packed with facts, useful data and invaluable sketch illustrations, it offers for the very first time a complete guide to the intricacies of flying scale model design, right from the initial selection of the subject to successful flight tests. Many photographs are collector's items, used to show novel colour schemes, interior detail and attractive subjects for your modelling. Check with the contents summary below and you'll find RON MOULTON'S Flying Scale Models to be just the book you are seeking to complete your enjoyment of the hobby.



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J. D. Carrick's fine dust jacket painting in vivid red and black illustrates a Fokker D VII to inspire the scale fans. Fifteen chapters, 45,000 words and 137 carefully selected illustrations in 128 pages explain every point in this comprehensive volume. Selection of the Scale Subject introduces new types, tells how to get plans. Scaling up the Plan covers all forms of enlargement, draughtsmanship, photostats, etc.—how to be accurate, too. Then the design for flight and structural detail is covered in special chapters, followed by specific sections on items that cause most furrows in the designer's brow—the Propeller, Pendulums, the Engine, Rubber and Jetex power, Control-line requirements, Cockpit interiors and furnishings and Ducted Fans. Each is covered in such a comprehensive manner that every chapter is worth the cover price! Add to this the most informative Finish and Colouring charts, detail descriptions and pictures, and then the fine Appendix of Aircraft Manufacturers, and you find this book worthy of a place on your bookshelf. Fully bound in red linson with art gloss paper throughout for finest reproduction. Size 8½ in. × 5½ in.

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AERO MODELLER

VOLUME XXIII
NUMBER 265
FEBRUARY 1958

Managing Editor - - - C. S. RUSHBROOKE
Editor - - - - - H. G. HUNDLEBY
Assistant Editor - - - - R. G. MOULTON

★

Special features

★

Regular features

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AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:

MODEL AERONAUTICAL PRESS LIMITED
SUBSCRIPTION RATE: (Inland) 23/-, (Overseas) 22/- per annum prepaid (including the special Christmas Number.

Editorial and Advertisement Offices:
38 CLARENDON ROAD, WATFORD, HERTS
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Whither the Wakefield?

AN IMPORTANT ISSUE arises from recent F.A.I. deliberations, important that is to the S.M.A.E. and to Wakefield enthusiasts the world over.

It will be remembered that, following the F.A.I. decision to hold bi-annual world championships, the S.M.A.E. informed the F.A.I. with regret that it would be forced to withdraw the trophy as the original rules stipulated that it must be competed for annually. Feelings in this country were, and still are, strongly in favour of annual competition for all world championships, leaving individual nations to decide which, and how many, of the various classes they would support in a particular year. We surmise that this still is the general British attitude, bearing in mind the introduction of even further championship classes as mentioned in our last issue.

Presumably as a result of the S.M.A.E. motion regarding the Wakefield Trophy, Holland proposed at a following meeting of the Models Commission that world championship trophies should be strictly under the jurisdiction of the F.A.I., a motion that was carried at the last meeting, and which in our opinion was a sensible one, as obviously it is unwise for any sporting body to have the conditions of its main awards dictated from an outside source.

This ruling does, however, throw the Wakefield ball well and truly back into the S.M.A.E. court, the Society now being faced with, either withdrawing the trophy from world championship status, or placing it unreservedly in the hands of the F.A.I. for all time.

It would indeed be a great pity if this historic trophy, always looked upon as the premier international award, and which was in fact, the very foundation on which the present world championship structure was built, should be relegated to what would undoubtedly be ordinary international classification.

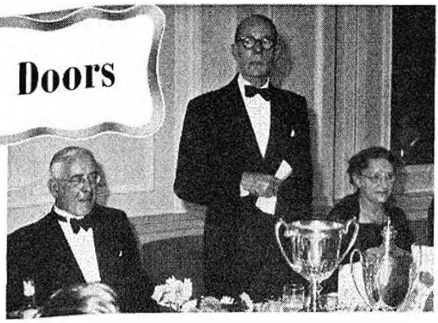
Let us not be deceived into imagining that if the Wakefield was withdrawn and run by the S.M.A.E. it would be supported by other nations as the premier rubber event. With such a crowded international calendar as we shall see in the next few years, most competing nations will be committed with the championship events alone, with precious little time or money to support ancillary contests.

We should therefore swallow an unpalatable decision by handing over the trophy unreservedly, even if we choke slightly in the process, and thus perpetuate one of the classics of competition modelling.

On the cover . . .

THE HIGH ASPECT RATIO cranked wing and large cabin of the Westland Lysander have always made this aeroplane a favourite for aeromodellers. In this issue we present a completely revised and modernised version of our popular 1/40th free-flight scale model and this cover illustration of a formation in "peel-off" position will help considerably to give the correct camouflage pattern for the upper surfaces. Note that the shadow shading pattern is used in two forms, one, the exact mirror image of the other as seen on the first and second aircraft. This 1939 picture by *Flight* photographer shows the earlier, yellow surrounded upper wing roundels, and lack of a fin flash.

Heard at the Hangar Doors



Mr. A. E. Palmer, Warden of the College of Aeronautics Cranfield, during the course of proposing the toast to the Society. Beside him are Mr. and Mrs. Houlberg

Cranfield for August

Highlight of the aeromodelling social season is the S.M.A.E. Annual Prizegiving Dinner and Dance which took place plast year at the Horseshoe Hotel, Tottenham Court Road, London, on Saturday, December 7th, 1957.

Principal guest of the evening was Mr. A. E. Palmer, Warden of the College of Aeronautics, Cranfield, who proposed the toast to the Society. During the course of a most entertaining speech he confirmed that Cranfield Aerodrome and the College facilities will be available for the World Championships in August of this year, and said that the College as hosts welcomed the Society and its guests from overseas. He suggested that aside from the all-important task of administering these important contests, some thought might be given to developing the social side of the meeting, mentioning that the College has quite a reputation in this respect. The S.M.A.E. will, we trust, take heed of this advice with its hint of assistance and possibly appoint a social committee for the occasion.

On the more serious side, Mr. Palmer stressed that British competition modellers would need all their skill and enterprise to meet the fierce competition that other countries, in particular the Eastern European nations would provide, and assured the Society that every co-operation to ensure a successful meeting would be forthcoming from the College of Aeronautics.

Mr. A. F. Houlberg, M.B.E., Chairman of the S.M.A.E., replied on behalf of the Society, and in thanking Mr. Palmer recounted some of his experiences in the Soviet Union last year when he was a guest of the Soviet Aero Club. One of these was a welcome to the Soviet meeting in the form of a large brass band, and on this aspect our Editor, Harry Hundleby, touched in the following speech when he proposed the toast to the guests and ladies. He doubted whether British modellers could produce a brass band for the event at Cranfield, but did know that several clubs sported skiffle groups which he hoped would suffice!

Mrs. R. L. Preston replied on behalf of the ladies and guests, offering apologies for the absence of her husband, Colonel "Mossie" Preston, who had unfortunately only succumbed to Asian 'flu earlier that day. Mentioning at the outset that he was not a model husband by any means, she realised the "double entende" after roars of laughter had punctuated her remarks.

Mrs. Palmer presented the glittering array of trophies, which seem more impressive every year, and the evening passed on to fun and festivity in the traditional manner.

Special congratulations were given to two outstanding prize-winners at the Annual S.M.A.E. Dinner reported above. Seen collecting their hardware at left, from Mrs. Palmer, wife of the Warden of the College of Aeronautics at Cranfield, are Ray Monks (top) and Junior D. Greaves (bottom). Ray had quite a handful of trophies, the "Astral" for Power, "Weston" and "Model Aircraft" for Rubber, and was also 2nd in "Short" Cup for P.Wood. From Leamington. Junior D. Greaves collects the "Heather" Trophy as Junior Champion, he was 3rd in the "Frog" Jr. Cup and placed consistently high in results throughout the year

Plans for this month

Two magnificent subjects for the flying scale fraternity, either free-flight or controline are the

Curtiss Hawk series and Pfalz Dr. 1 Triplane detailed in this issue. AEROMODELLER Plans Service does, of course, include an excellent fully aerobatic controline 36-in. span Curtiss Hawk P.6E by D. Decley, plan number CL/539, price 7s. 6d. for 3·5–5 c.c. engines.

Our Lysander needs no emphasis, it is already an extremely popular subject with scale plan customers, but this new version is thoroughly modernised and has been simplified to a large degree, yet still retains exact scale rib and stringer spacing.

"Star" plan this month and one which is likely to become one of the most popular controline stunt designs of the year is the *Peacemaker*. This was specially designed for AEROMODELLER readers at our request by American stunt ace George Aldrich, who also contributes his first-person account on Combat in the U.S.A., which is of particular interest bearing in mind the teething troubles which exist in combat organisation in this country. To many modellers the new design features introduced in this Peacemaker design may seem very unusual. True, it may appear that its tail is too small and the wings more akin to the shape of a kite, but you may take it from us that this is the *most* aerobatic 2·5 c.c. powered model design yet published in Europe, and readers can have our assurance that it is capable of *all* of the square and triangular manoeuvres included in the new S.M.A.E. stunt schedule. Fast, robust and yet extremely easy to make, the *Peacemaker* will soon become a familiar sight on the controline circuits, and we venture to predict that it will create a new fashion vogue in small tails and swept wingtip shapes.

Belated Noels

Although the season of festivity has long since passed and our empty port bottles relegated to holding spare supplies of engine fuel, we take this opportunity of thanking the many readers and contributors who had the seasonal thought of sending Christmas cards to the Editorial Offices. We cannot, unfortunately, reply to them individually, but hope that this universal thank you, given in all sincerity, will suffice, and take this opportunity of wishing you all a very HAPPY NEW YEAR!

Calling Mr. Kitching

A payment cheque awaits this gentleman for his Gadget Review contribution if he cares to give his correct address, believed to be in the Gt. Ayton District, Yorkshire.

French Aeromodelling re-shuffle

For very many years French aeromodelling and fullsize aviation control has been in the hands of two bodies, who did not always see eye to eye, but now, by a Ministerial decision, we learn from our contemporary, *Le Modele Reduit d'Avion*, that the French Aero Club is to hold all powers, both national and international. We gather that all the interested parties to this new arrangement were signatories to the decision with the sole exception of the Aero Club. This has provoked a typical Gallic flow of indignation, suggesting that this is no decision but a "last will and testament", that being the only normal type of document where the beneficiary's signature does not appear!

It is by no means clear that the Federation which has previously handled aeromodelling affairs internally understood the effect that relinquishing its control may have. The F.N.A. has until now been responsible for inter-club relationships, national contests and championships, distribution of materials to clubs, query and complaint service, arbitration in disputes, in fact all those functions which our own S.M.A.E. handle for us. Responsibility for all this work has now been handed over to a French Aero Club, which so far as we know, has no special department in being to deal with it.

However, gloomy as the picture may appear to French enthusiasts, this is surely a grand opportunity for them to be re-organised with a single central authority, which might well delegate its aeromodelling side, as we have done in this country, and thus produce a properly balanced chain of control, with the proper authority at the top and still retaining the interested and knowledgeable experts on the various tiers that would make for a convenient administration. We know from past experience that France has long been one of the most difficult countries to deal with in securing prompt international entries and advance information regarding team participation. This is their big chance to re-model on an ideal basis.

CURTISS HAWKS

Technical data continued from page 86

SPECIFICATION

P6-E and F11C-2
Fuselage: Welded steel tube.
Wings: Wooden spars and ribs, fabric covered.
Tail surfaces: Metal with fabric covering.
Struts: Streamlined steel tube.
Ailerons: Metal with fabric (P6E) or metal (F11C-2) covering.
Undercart: Curtiss single-strut type with oleo shock absorbers, Bendix brakes and wheel fairings.
Controls: Ailerons operated through push-pull rods in lower wing, rudder and elevators through cables.

P6-E
Power: Curtiss 12-cyl. upright vee "Conqueror" high-compression engine, 600 h.p. Prestone radiator.
Fuel: 50 gallons plus 50 gallons in L.E. tank.
Starter: "Eclipse" hand inertia starter.
Armament: Two Browning m/guns with 1,200 rounds, 240 lb. bombs.
Weight empty: 2,715 lb.
Weight loaded: 3,406 lb.
Maximum speed: 198 m.p.h. at sea level reducing to 182 m.p.h. at 15,000 ft.
Initial rate of climb: 2,400 ft./min.
Range at cruising speed: 285 or 570 miles.
Service Ceiling: 24,700 ft. absolute ceiling 25,800 ft.

XF11C-2
Power: Wright "Cyclone" R-1820-E air cooled radial, 575 h.p.
Fuel: 50 gallons plus 50 gallons
Armament: Two machine guns.
Weight empty: 2,980 lb.
Weight loaded: 4,074 lb.
Maximum speed: 193 m.p.h. at sea level reducing to 180 m.p.h. at 15,000 ft.
Initial rate of climb: 1,820 ft./min.
Range at cruising speed: 285 or 570 miles.
Service ceiling: 25,400 ft. absolute ceiling 26,700 ft.

The above figures are quoted from Jane's "All the World's Aircraft", but the official U.S. Navy report on the F11C-2 gives the maximum speed at critical altitude as 202 m.p.h., range at max. speed 303 miles, and the loaded weight 4,132 lb.

by George Aldrich

Combat . . . in the U.S.A.

"WHEN I WALK into the circle to fly combat, the first thing I do is to seek out my opponent. Our conversation will go something like this: "Hello there, my name is George Aldrich, and I'd like you to know that if you tear up my airplane and engine there will be no hard feelings—for I'll be trying to cut your streamer and the same thing may happen to you". Here is the keynote to having fun when you fly combat. After almost 10 years at the game it is a foregone conclusion that you are going to tear up models, and plenty of them! Every time your author flies combat he plans on total loss of model, engine, tank, lines. If you are not willing to accept this, try flying scale or team racing.

"So much for the mental attitude toward one's own model.

"After many systems over the years we have gone back to what we originally started with down in Texas in 1948, Process of Elimination! This is the only way a contest can be conducted with any degree of fairness.

"The following is a simple set of rules which are the accepted basis for good combat competition in our country."

Basic Rules for Combat

I. Pull Test.
(*a*) One pound of pull for each hundredth of cu. in. displacement. (Example: .15 cu. in. (2.5 c.c.) — 15 lb. pull.)

II. Streamers.
(*a*) A chosen length.
(*b*) 36 ins. of twine attached to the model and to the streamer so as to have no less than 24 ins. between aftmost portion of model and the beginning of streamer.

III. Drawing of Opponents.
(*a*) All names put in a hat and the opponents drawn.
(*b*) Pairings are posted on a board in the manner used in most tennis matches except there is no seeding.
(*c*) With each pairing a flight time is given. When the opponents names are called they will have already had their models pull tested and cleared by the officials. They will then proceed to enter the circle and tie on their streamers of opposite colour. Two minutes are allowed for this.
(*d*) The contestants are then given 3 minutes to get airborne. If one should not get airborne within the 3 minutes time limit, he is eliminated. If both contestants fail to get airborne they are re-scheduled at the end of the list.
(*e*) If one or both contestants are not ready upon the calling of their names they are eliminated. (The tying on of the streamers may be done in the pit area if officials are available.)

IV. Flight.
(*a*) Total flight time 5 minutes.
(*b*) The 5-minute flight time begins when the first contestant becomes airborne.
(*c*) One complete level lap is required with both models in the air before combating may commence. (If a pass is made by either contestant disqualification is made of the contestant making the pass.)
(*d*) Scoring is based on the following:
(1) If only one cut is made by each flyer the contestant with the longest streamer wins.
(2) All other scoring is based on the number of cuts made by the contestants except in the case of a kill.
(3) "Kill" — A "kill" is made by cutting off all of the opponent's streamers *including* the knot where the streamer is attached to the string.
(*e*) More than one level lap at an altitude below 8 ft. shall lead to disqualification
(*f*) More than one level lap while the model is in an inverted position shall lead to disqualification.
(*g*) (1) In the event of a mid-air collision the judges shall decide which flier was at fault and he shall be eliminated.
(2) If the judges decide that neither contestant was at fault they may re-match the flight at a later time.
(*h*) If a contestant at any time releases the handle while his engine is running he shall be disqualified.
(*i*) A contestant may land, refuel, and take off as many times as desired as long as the 5-minute flying time has not expired.
(*j*) A contestant shall do all in his power to keep his model airborne during the 5-minute flying time.

V. General Rules.
(*a*) Any contestant who conducts himself in an unsportsmanlike way shall be disqualified.
(*b*) Officials.
(1) Event director.
(2) At least two judges.
(3) Pull test and safety inspector.
(*c*) Number of Models.
(1) No limit.

VI. Example of a Match:
(*a*) Contestants names are called and they are given 2 minutes to get into the circle and tie on their streamers.
(*b*) Time is called and the 3-minute starting time begins.
(*c*) Models airborne — 5-minute flight time.
(*d*) When the last contestant's engine cuts the next pairing is called immediately.
(*e*) Total elapsed time — 10 minutes or 8 minutes if streamers are attached in the pit area by officials.

A first-person account by America's leading stunt flier on combat procedure, incorporating this specially commissioned Aeromodeller design for 2.5 to 3.5 c.c. — named after the Colt .45 revolver

Whichever way one views the Peace- or Piecemaker, its lines create a new fashion

"As you can easily see, this set of rules is designed to make a contest really move along. Which, with the mass of entrants in combat events is most necessary. It is also advisable to have more than one circle for obvious reasons. Then the winners from each of the circles can vie in a grand finale, which is a great "crowd pleaser".

"Now, we come to my little *Peacemaker*. The pre-requisites for any combat model are as follows: (1) Simplicity; (2) Ruggedness; (3) Manoeuvrability; (4) Speed; (5) Inexpensiveness.

"I have flown my *Peacemaker* with a variety of both diesels and glow plug engines in the 2·5 to 3·5 c.c. class. Speeds ranged from 65 m.p.h. to 80 m.p.h. This is in great contrast to our models over here in the U.S. where we have no noise problem. My own *Flite Streak* design is flown at speeds above the 100 m.p.h. mark with the Fox Combat "35" for power.

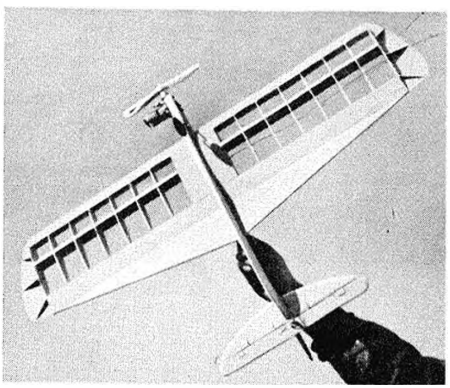
"The construction is very easily seen on the plans, however, there are a few hints which may be of aid.

"Any stunt model be it combat or precision is built around its wing. Therefore, if your *Peacemaker* is to be a top performer, you must have a straight wing. After slipping the wing ribs on to the $\frac{3}{32}$" sheet spar, add the leading edge and then the trailing edge but *do not* cement the ribs to the spar. In this way the wing can be properly aligned. The $\frac{1}{8}$" × $\frac{1}{4}$" spar caps are now added. Now cement the three centre ribs into place, and install the 2-in. bellcrank and leadout wires. The tips are now cemented in place and the $\frac{5}{32}$" o.d. tubing lead-out guides installed on the bottom face of the in-board wing tip. The centre planking of $\frac{1}{16}$ sheet may be installed and *now* the remaining ribs are cemented on all sides to the "I" beam spar. The wing is now ready for sanding.

"After completing the fuselage the wing may be installed and the $\frac{1}{8}$" sheet trailing edge pieces cemented in place. A strip of gauze should be cemented all around the wing where it passes through the fuselage.

"Now install the tail section, double glueing all joints.

"The pushrod is now bent and a 1-in. square of the $\frac{1}{16}$-in. sheet planking is cut out directly over the bellcrank. You must also cut a slot about $\frac{1}{8}$ in. by $\frac{3}{4}$ in. in the $\frac{1}{16}$" planking as shown on the plans. You may now install the pushrod by loosening the bell-



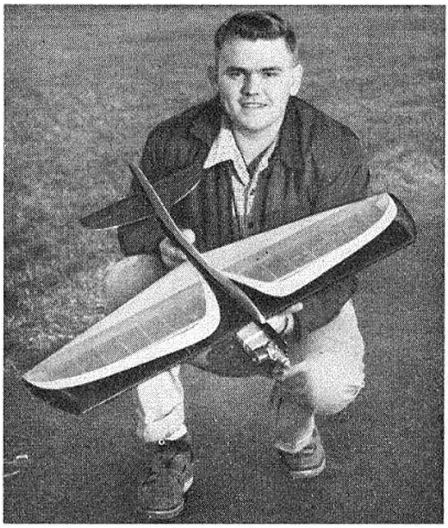
Structure of AEROMODELLER Test Model shows super strength Vee leading edge and full depth I section spar

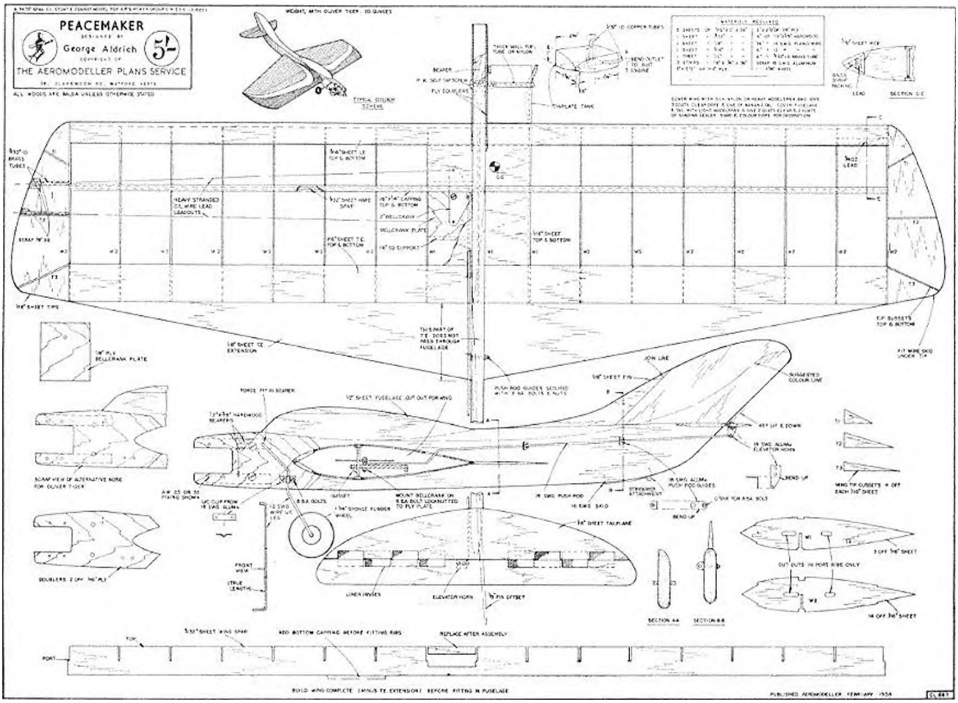
crank bolt slightly and then tightening the bellcrank down again. Do not neglect the push rod braces as they are essential to positive reaction. Also replace the 1-in. square of $\frac{1}{16}$" sheet planking.

"A good procedure for finishing is to apply a heavy coat of clear dope to the entire model and sand well. Next the wing should be covered *wet*, being sure to keep all panels damp until the job is complete. A total of approximately four more coats of heavy clear dope are now applied, sanding between each application. You may also add three or four additional coats to the nose section for protection against oil penetration. Coloured dope may be added if desired, but remember extra dope adds weight and weight cuts flying speed.

"The writer sincerely hopes your *Peacemaker* affords you many enjoyable hours. You may care to know that my personal prototypes have performed square four-leaf clovers, square vertical eights, square horizontal eights, triangular vertical eights, octagons, and many others with ease.

"It is my lingering wish that I someday may visit England and attend one of your rallies. From the stories Bob Palmer has related to me I'm sure there is more for me to learn from you than you so modestly say you have learned from us."—**George Aldrich.** ***(seen at right with his prototype)***





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R.A.F. GEN

Bruce Fergusson explains Service awards

FIRST AND FOREMOST is the Victoria Cross, the highest award for supreme gallantry which Great Britain can bestow. The Royal Air Force has had some 28 winners of this Decoration and the Royal Flying Corps had three, while the R.N.A.S. claim two. Now it can be argued that, during the First World War, the Flying Corps gained 19 awards of the Victoria Cross but, according to Rules and Regulations, where a man was attached (or seconded) to another Unit, his parent unit has been credited with the award! Although women first became eligible to win the award in 1920, so far no woman has won the Cross which was instituted on January 29th, 1856.

The George Cross and the George Medal, both of which were instituted by the late King George VI on September 24th, 1942, may be awarded to members of the R.A.F. or other Services and civilians of either sex. The George Cross ranks next after the Victoria Cross.

The Distinguished Service Order may be awarded to R.A.F. officers who have been specially mentioned for meritorious and distinguished services in the field or before the enemy. This Order was instituted on September 6th, 1886.

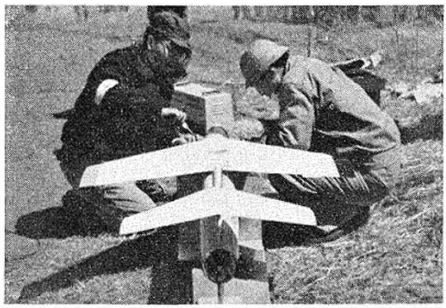
For Good Conduct and Long Service a Special Medal is awarded to Warrant Officers, N.C.O.s and Airmen whose character and conduct for eighteen years has been irreproachable. The Medal is made of Silver and is round with the head of the Sovereign on the front or obverse. On the back, or reverse, are the words "for Long Service and Good Conduct", surrounding an eagle surmounted by the Crown. The ribbon is of dark blue and crimson divided equally, with white edges. The dark blue edge is worn first as it is symbolic of the Royal Navy, the Senior Service, and the crimson represents the Army.

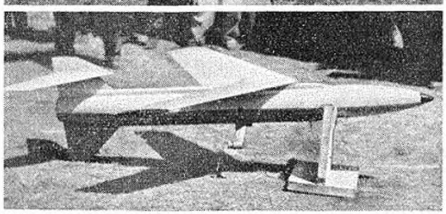
As above, the Royal Air Force Meritorious Service Medal was granted to Warrant Officers, N.C.O.s and men in recognition "of valuable services rendered in the field as distinct from actual flying services" but, since 1928 it is rarely awarded. The obverse bears the effigy of the Sovereign as used upon the coinage, whilst the reverse consists of a wreath with a crown at the apex, within the wreath is the inscription, "For Meritorious Service". Recipients may use the letters "M.S.M." after their names.

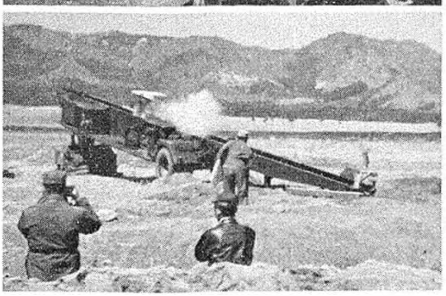
In August, 1942, the Air Efficiency Award was instituted. It consists of an oval in silver with the Sovereign's effigy on the obverse whilst on the reverse are the words, "Air Efficiency Award". The ribbon, which is green, has two central stripes of pale blue one-eighth of an inch in width and the whole ribbon is an inch and a half in width. It may be awarded to Officers and Airmen, men and women, of the Royal Auxiliary Air Force or Volunteer Reserve in Great Britain or the Empire. To become eligible for the Medal a period of ten years' service is necessary.

The last medal is that awarded to members of the Cadet Forces—the Cadet Forces Medal which is eligible to all Officers and Adult Warrant Officers after ten years' unbroken service. Members of the Air Training Corps qualify for this medal but the Cadets themselves are not eligible for it and neither are civilian instructors.

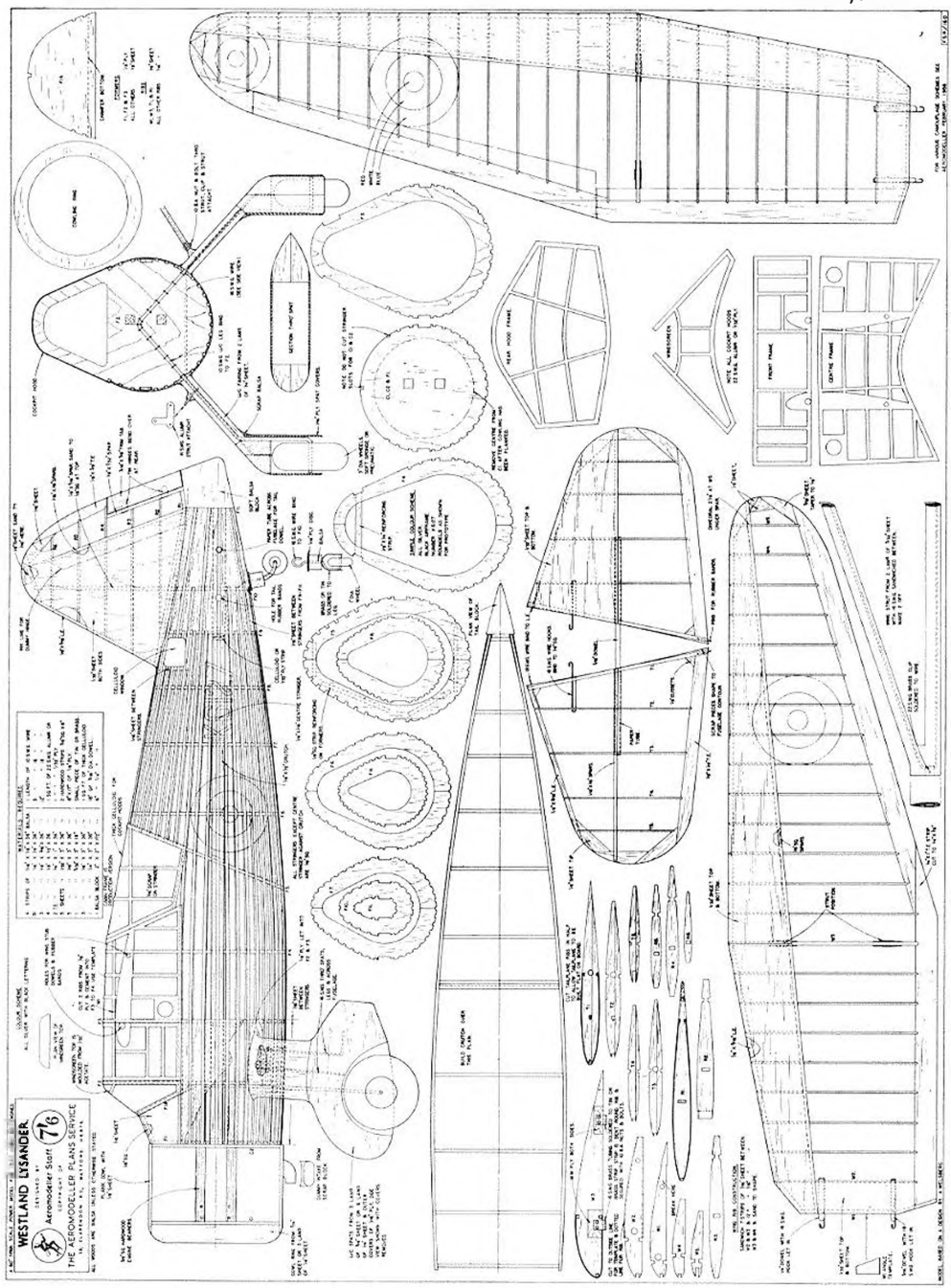
JAPANESE (model size) GUIDED MISSILE







Although unsuccessful, this miniature guided missile tested last year in Japan, will be of interest to modellers. Powered by an unspecified rocket, it very closely conforms to the layout envisaged by most aeromodellers for a high speed free-flight jet (if such were permitted), and we can imagine that the Japanese designers were employing model design experience in this experiment. In the lower view, the missile is seen at the moment of firing from its launcher



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AERO MODELLER

A superb 1/10th free-flight scale model for 1.5-2.5 engines of the famous . . .

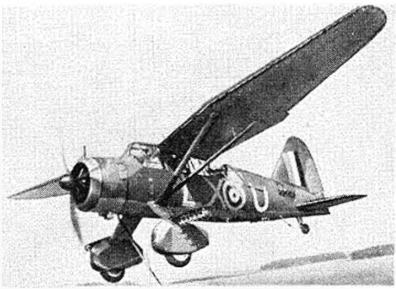
WESTLAND LYSANDER

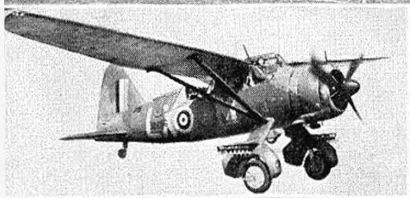
Specially developed by Aeromodeller staff

FOR TWENTY YEARS the high cranked wings and stringered fuselage of the famous Westland Army Co-operation aircraft have made it a modeller's favourite. This version represents a complete structural revision of the well-known A.P.S. design, eliminating all the earlier complication of spark ignition engines, yet still retaining the rib-for-rib, stringer-for-stringer. detail that makes it so accurate in scale appearance Certainly it's no beginner's project, but the crutch-built fuselage and flat-bottomed wings will present no difficulties to the modeller with a little experience.

What a subject for colour schemes! We show seven variations on this page, including the "Cloak and Dagger" variant for partisan activity behind enemy lines. The "Lazzy" served well in Operational Training Units, as a Spy and Supply dropper, or Target Tug, so providing an interesting diversity of markings. Last of the heavy Army Co-op. aeroplanes, it will always be remembered for its wide range of performance.

The model duplicates the same flying characteristics, and we have retained the same unique tail trimming system as employed on the full-size, so eliminating unsightly external rubber bands and still permitting a wide range of trim angles. In anticipation of the inevitable question, "Will it be suitable for r/c conversion", we are sorry to answer an emphatic NO. The small area of the high aspect ratio wings would not permit the payload of radio and batteries.





Top: W/O Hiorn, R.A.F. and his model built from these plans, also K 6127 Lysander prototype, all-silver. At left: Picking up messages, a 1939 type without fin flash, but with number under wing (DK Earth, Dk. Green topsides, Sky undersides), and a later version with Yellow O.T.U. undersides, no number, no roundels under wings and large fin flash

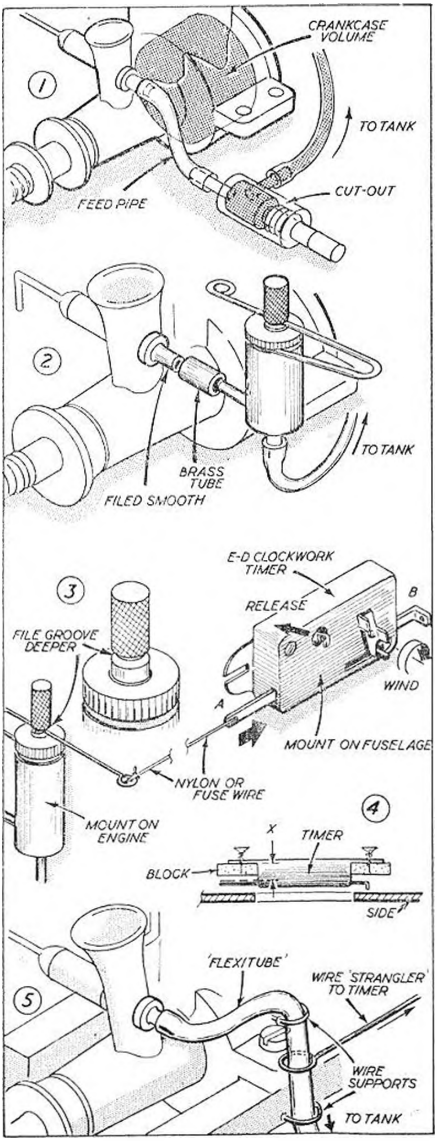
Revised fin flash and no wheel covers on O.T.U. version at left, Yellow under, Green Earth top. All silver Canadian trainer, has numbers and roundels under wings

Partisan version is all black under, 1942 type roundels, has large cylindrical canister under fuselage, seen in N. Italy. LX-P shows yet another fin flash style and roundel size for 54 O.T.U.

(Imperial War Museum Photographs)

AEROMODELLING STEP BY STEP TIMERS

FOR ENGINE AND TAIL SURFACE CONTROL



THE ONLY SATISFACTORY way of stopping a diesel or glow motor at a predetermined instant is by cutting off the fuel supply. (With the spark-ignition, of course, stopping can be achieved by switching off the ignition.) Main factors which determine the cut-off "delay" are the length of feed pipe between the cut-off and engine, and the engine crankcase volume. **(1)** The latter varies with individual designs of engine. With some, cutting off the fuel results in an almost instantaneous stop. With others, running may continue for several seconds on fuel left in the crankcase, making such designs difficult to time accurately.

Principle of nearly all cut-out devices depends on a spring-loaded plunger being tripped to blank off two pipes and so shut off the supply from the tank. In the case of the **Mercury Fuel Control Valve** engine run is determined by the length of the feed pipe (determined by experiment), the cut-out being operated manually at the start of the flight. Conventional cut-outs, however, are normally triggered by a flight timer.

Best position for the cut-out is as near as possible to the spraybar. **Davies-Charlton** make a unit which fits right on the end of the spraybar on their engines. Other cut-outs may be mounted on the end of the spraybar of an engine either by tapping the spraybar end to fit the cut-out barrel (dispensing with one tube), or as shown in **(2)**. Here connection is made with a short length of brass tube soldered in place. Make sure that the cut-out is in a convenient position both for "triggering" by the timer and for attaching the fuel tube from the tank.

Most commercial cut-outs can be made more positive in locking by deepening the groove on the plunger rod with a file **(3)**.

Coupling to a timer, use fuse wire or nylon. A rigid wire connection is usually more awkward. In the case of a clockwork timer it is only necessary to mount the timer the right way round for "pull" from 'A' (or "push" from 'B' in the case of cut-outs which are operated by pushing on the plunger rather than triggering a spring release). The E-D clockwork timer can be mounted neatly flush with the fuselage side by using balsa or hardwood blocks under the mounting lugs **(4)**.

Point to remember is that tripping time on a clockwork timer will be different with the engine running to static performance—the timer usually speeds up due to vibration. So you can only make accurate calibration marks on the timer by tests with the engine running. Re-check by actual flight tests as this may again be slightly different because the engine speeds up in the air.

Very simple type of cut-out, which dispenses with a special unit, is shown in **(5)**. Here a wire "strangler" is operated by a timer to pinch the fuel tube and so close it up. Tubing used must be soft and flexible to be effective, such as "Flexitube", as used with Elmic timers.

Ingenious Elmic timer **(6)** designed for diesels eliminates the cut-out and operates by closing down on the fuel tube. Disadvantage is that the timer must usually be mounted close to the engine (to cut down length of feed pipe to spraybar) and in this position exhaust oil is likely to get on the adjusting screw and valve. Dirt and oil getting in the valve is the chief source of erratic performance with pneumatic timers.

Elmic Universal timer **(7)**, recently introduced, is much improved version using the same tube-squeezing principle for fuel cut-off and also incorporating a snap-action trigger. The latter can be used for operating a mechanical cut-out, instead of using the tube-squeeze method of engine control; or for triggering a separate control system simultaneously. Refinement over earlier designs is the remotely located valve unit (connected to the timer barrel by "Flexitube") which can thus be located in any convenient position well out of the way of oil and dirt.

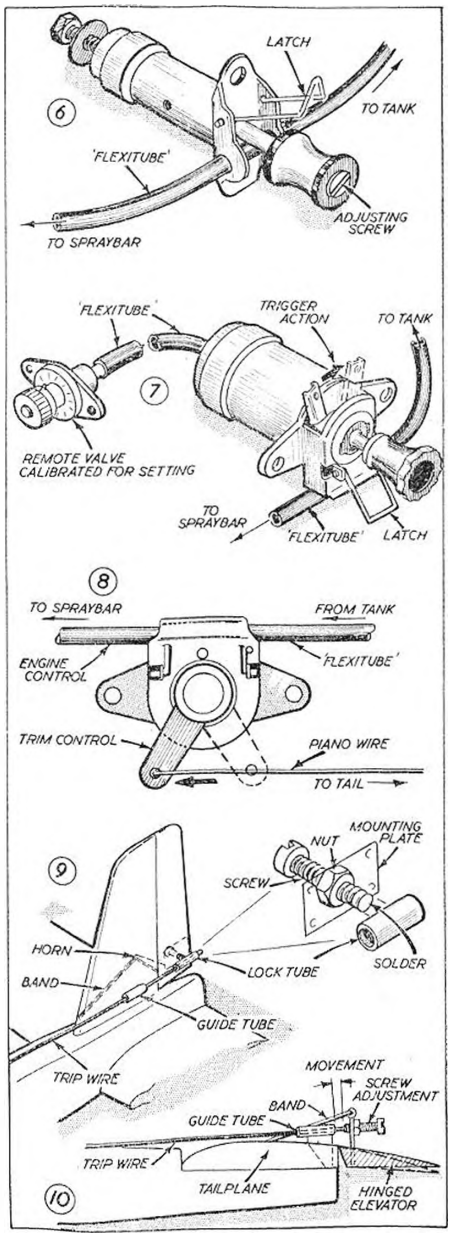
Mounting position for the **Elmic Universal** timer for triggering a tailplane trim control is as shown in **(8)**. The timer should be located near the engine with the shortest practicable feed pipe length. The trigger then provides a forward pull for operating tail trim controls virtually simultaneously with the engine cut-off. Latter controls are normally operated through a rigid length of piano wire acting as a trip wire.

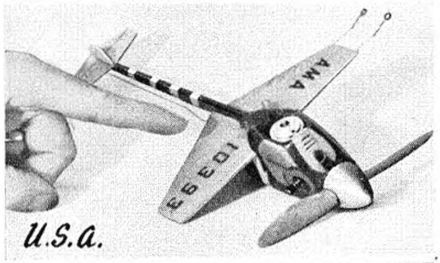
Various tail-trim ideas have been tried out, the idea being that it is safer to fly a power duration model straight (or slightly under-elevated) under power and then change the trim for either a circling or near-stalling glide. A rudder trip **(9)** is the simplest to arrange. The trip wire holds the rudder in the neutral position under power. Withdrawal of the trip wire from the lock tube by the timer allows the rudder to pull over to glide trim setting.

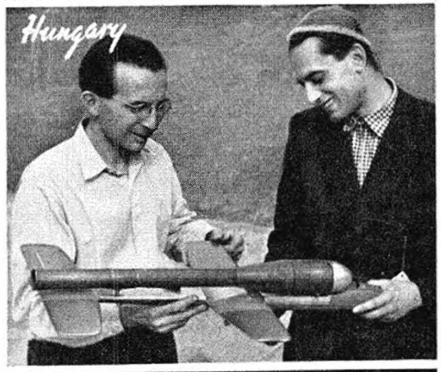
Scheme shown mounts the lock tube on the end of a small screw, permitting adjustment of the neutral position by advancing, or unscrewing, the screw half a turn at a time. An adjustable stop must also be provided to set required glide turn offset. Scheme is simple and practical, although capable of improvement in detail.

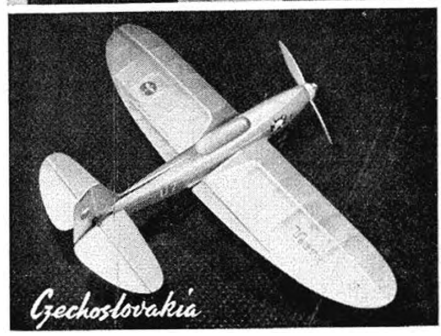
Tailplane trim **(10)** is generally best worked by using a fixed tailplane and hinged elevators. Trip wire holds elevators slightly down, releasing them to pull up to glide position when withdrawn by timer. Scheme shown is simple and allows ready adjustment of elevator down trim. Elevator up trim is given by gap between end of guide tube and adjusting screw. Having set the latter for "power" trim, glide trim must therefore be adjusted by filing end of guide tube. More elaborate schemes, permitting full adjustment and also allowing dethermaliser action, were described in the April, 1956 "AEROMODELLER".

Operation of a tail-trim device must be *positive* and foolproof, otherwise it is not worth considering. That usually means making it as simple as possible, consistent with what you want it to do.









World News

INTERNATIONAL INTEREST is now centering on the 1958 Power and Wakefield rules, with fine prospects for a first class final at Cranfield in August. The power boys have been slower to announce their design approaches than the Wakefield fraternity, but since the **U.S.A.** National teams are already selected and eliminators have been in progress in **Czechoslovakia,** we can but presume that the 300 gr./c.c. power loading is proving no handicap.

Specification of one Czech model may be of interest to those yet to construct their "new ruler". It was designed by Rene Teuber of Prague, placed 7th with 3 max's in an 820 sec. total in one contest and was 2nd in the fly-off after 5 max's in its second contest, model is seen in helper's hands at top left. Span 54-in., chord 8¼-in., NACA 6412 wing and tail section, tailspan 26-in., chord 5⅞-in., total area is 564 sq. ins., weight 27 ounces, and power a Webra Mach 1 diesel, now proving a popular engine with the Czech free flight modellers.

High performance of the top models in the two **U.S.A.** International teams for '58 will be a rebuff for those who cried loudest when the specification changes were first proposed. Teams are: *Wakefield*,

Sal Cannizzo (Staten Island, N.Y.) 900 secs. plus a 28-minute 6th flight.
George Reich (Fairview Park O.), 852 secs.
Herbe Kothe (Arlington, Texas), 837 secs.
Frank Newquist (Santa Monica, California), 818 secs.

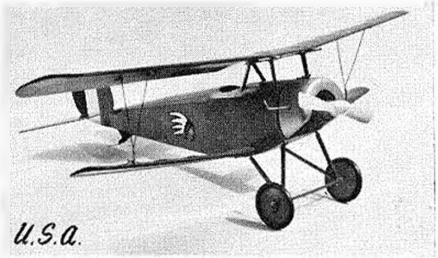
and in the *Power* team:

James Patterson (Granada Hills, California), 900 secs.
Larry Conover (Cedar Rapids, Iowa), 882 secs.
Bill Dean (Winchester, Mass.), 878 secs.
Carl Perkins (Mission, Kansas), 807 secs.

Cannizzo and Newquist are new internationalists, the other six having represented the U.S.A. in previous years. Data on Dean's model is: span 62-in., wing area 490 sq. ins., total area 673 sq. ins., NACA 6409 wing section, weight 31 ounces, power a worked Oliver Tiger with Nylon 9 x 4 Tornado prop.

The Eastern **Canada** Open, held at Gananoque, Ontario, is one of the big events of the year for Canadian modellers. Organised by the Montreal Model Flying Club, it offers generous prizes sponsored by local traders, and is staged in the autumn when thermal activity is expected to be at a low ebb. Highlight of the 1957 event was the fly-off in Open Power. Three models made the triple maximum total to qualify for the fly-off, Al Lashway's Oliver Tiger design, Jerry McGlashan's FAI size lightweight (12½ oz.) with Torp 15 (see plan in June, 1957, issue) and Bill Cooke's *Zeke*.

Top, Czech new-rule F.A.I. Power design by Rene Teuber of Prague with charming helper (see text). From U.S.A., Capt. McGuin's experimental Holland Hornet .8 c.c.-powered speedster has been checked by hanging out of a car window at 45 m.p.h. for take-off speed. Hungarian modellers George Benedek and George Horvath with the former's new World Speed record holding jet. (Plan last month.) At bottom, an attractive efl stunter for the Super Tigre G.31 1.5 c.c. by Kamil Brauner

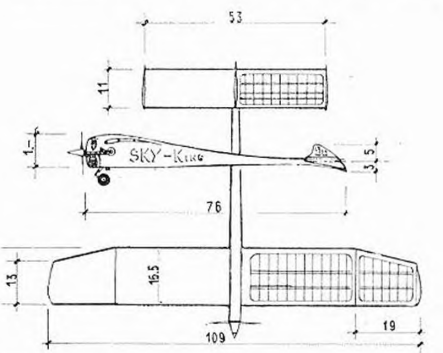


Bert C. Streigler of Houston, Texas, built this "simplified" Nieuport 17C Scout for the Allbon Bambi. All-up weight is 3 ounces. At right, a Finnish flying boat by T. Forsback of Ekenas

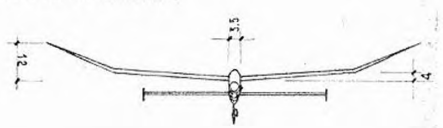
with a ¼A Holland Hornet (·8 c.c.). All three models landed in a 100-yd. circle from their simultaneous fly-off and it was the little 'un that came out top by a 13 secs. margin, quite a thought-provoking performance. We glean this information from the post-contest illustrated and press-printed report sent to all contestants, sponsors and officials as part of the Montreal MFC service. In the regular MMFC Bulletin, the model design for November, 1957, was Mike Segrave's open rubber model with 45-in. span 2·15 ounce airframe (including an all-sheet fuselage) featuring 1/40th sheet for wing ribs which sounds like a nice new handy thickness and probably accounts for the remarkable light weight. The bulletin is supplied to associate members in all parts of the world, and we would be pleased to forward enquiries to the Club Secretary.

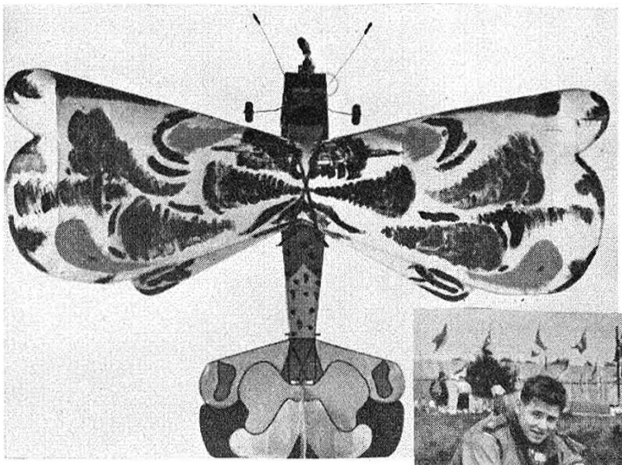
WIPMAC, the Western Province MAC Newsheet from Cape Town, **S. Africa,** announces inauguration of the "Howard T. Bonner" Radio Control trophy for contest at the coming Nationals, donated by Howard, who has fond memories of his African journey last May. A fund-raising display of controline is planned for January 25th at Belleville Stadium to bring in more working capital for running the Easter National contests.

Below, Herman Broukink of Enschede in Holland was a top performer at last year's Criterium of Europe, now has a twin 3.5 c.c. model to do the F.A.I. schedule (two 4M 35s). At extreme right, Roberto Zappata of Bologna has been using this 1.5 c.c. Super Tigre G.31 design throughout the 1957 season, will adapt to the new rules with ballast details in drawing

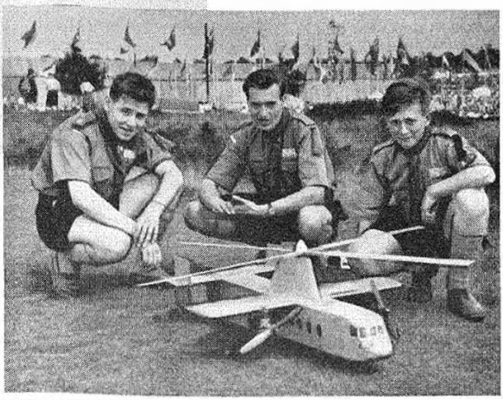


DIMENSIONS IN CENTIMETRES





model news



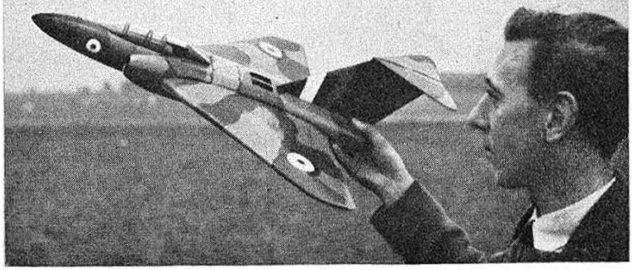
ENTERPRISE IS THE keynote this month. Rarely are we able to reproduce such a set of outstanding models as we have on these two pages and none published in the past have been more "revolutionary" than John Coatsworthy's remarkable twin engined ducted fan (centrifugal) Gloster Javelin. Span is 23½ in. and weight 16 ounces, the only diversion from true scale being slight increase in fin area and dihedral. The jet intakes are dummies, as the fans suck air through the rear cockpit and upper fuselage, and as the rear engine stops first the model lands in a nose-high attitude with the front engine still going. John is now planning to fit a pair of Webra Piccolos.

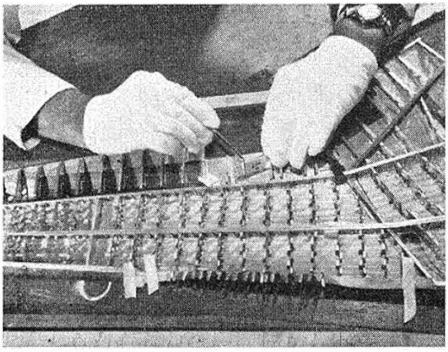
Weird butterfly shape is an amusing diversion built by S. F. Bryant, stationed in Germany with the R.A.F. Powered by a 1 c.c. Taifun Hobby, "Flutterby" is an extremely docile free-flight model and capable of some interesting low speed performances at 10 m.p.h. Span is 49 in.

The Fairey Rotodyne is much in the news these days and the Air Scouts seen with the twin DC. Manxman version, are to be congratulated for their efforts. The model turned out a little too heavy for the two diesels and a pair of 5 c.c. engines are now being fitted. Lads belong to the 8th Walthamstow Air Scouts, who have several other interesting designs, notably a scale Hustler with 4 Jetex 50's. G. K. Mutch of Wirral, sent along the photo of his controline Fokker D.23, with an E.D. 2·46 in front and an Ameo 3·5 P.B. pushing. The model will fly on the front engine alone and was scaled up from the AEROMODELLER feature in our May, 1956 issue, span is 52 in. In the corner another remarkable model, as may be detected by the size comparison with the Ford Anglia roof. This F.D.2 is 6ft. 7 in. long with a pushing A.M.35, span 51 in. and fuselage diameter no less than 8 in. A. P. Hugh-Vincent of Bristol is responsible and tells us that the flights have been quite satisfactory, although more engine power appears to be needed for the all-up weight amounts to 3¼ lbs. ready to fly.

Photographs of unusual models made by our readers

Model of the Month

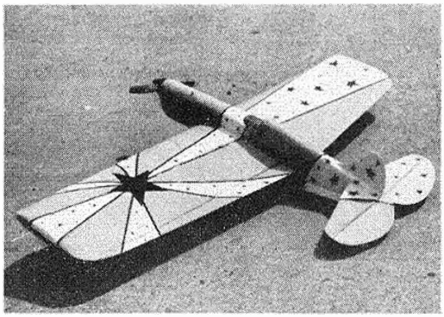


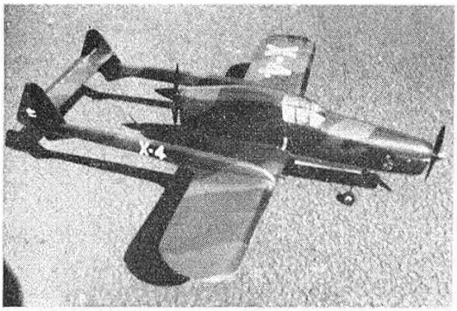


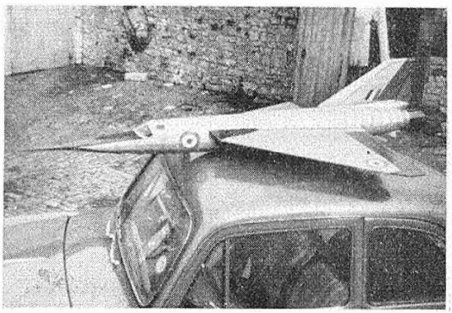
The colour schemes we published last year, certainly had their effect on modellers and the Mercury Monarch, with brilliant star scheme is taken direct from one pattern we published, by D. Moates of Torquay. Decoration like this makes a very pleasant change from the usual commonplace red fuselage, yellow wings, etc.

At top right, we see model making in the most advanced stage. Gene Mayfield, a model maker with Convair, is seen fitting ribs and spars to a Convair 880 Jetliner, 1/20th scale model to be used for flutter tests. Gloves are essential for this precision work, as perspiration and skin oils must be kept off all model parts. An electronic circuit through the model is connected to strain gauges for flutter tests. Altogether, more than 2,000 parts are fitted in this 72½ span model, which is scaled right down to the ·005 in. magnesium skin thickness. The magnesium had to be specially acid etched to obtain the correct thickness. Many modellers are concerned with this masterpiece, which took more than 6,000 man-hours to design and 13,000 man-hours to make. It is a classic example of how a model can eventually save tremendous expense in full size aircraft design subjects.

There isn't a single aircraft flying today that has not at some time or other been the subject of model research, and of the designs currently occupying the drawing offices of all the aircraft manufacturers we do not know of a single instance where the go-ahead signal has been given prior to acceptance of model test reports. This is particularly evident with the VTOL types, and expensive projects like the Convair 880.







DECOR DETAIL

Continuing our new feature with a mixed bag of vintage and modern details

Douglas A-26 Invaders on a mission in WW II have individual identity letters on rudders

FOLLOWING OUR THREE PART series by Peter Gray on World War I German Aircraft colour schemes, we present a miscellany this month to introduce some more recent details. Among the many queries received at the AEROMODELLER Offices we have a number of regular requests and one of these is for a colour scheme to suit the twin engined Douglas A.26 Invader.

The heading picture provides a little variety for those making the solid nose gun sprouting variant and as far as we are aware, the identification lettering is in black. Decoratively, the Invader was, and still is, a singularly plain aeroplane, usually appearing in straight metal finish with national markings, olive drab nose anti-dazzle patch, red prop-line strips on fuselage and black "buzz" number across the fin.

Another regular request is for squadron letters applicable to the more famous World War II types serving in the R.A.F.

The following should provide enough variety to suit most tastes, and suits a number of the more popular subjects chosen for control-line scale models.

Hawker Typhoon 1a and 1b

JX	...	1 Sqdn
QO	...	3 Sqdn
US	...	56 Sqdn
DP	...	193 Sqdn
DT	...	257 Sqdn
ZY	...	247 Sqdn
SA	...	486 Sqdn
PR	...	609 Sqdn

Hawker Hurricane

LK	...	87 Sqdn
VV (N.F.)	...	534 Sqdn
NW	...	286 Sqdn
KC (Mk. IIc)		238 Sqdn

Vickers Wellington III

AA	...	75 (NZ) Sqdn
DX	...	57 Sqdn
KA	...	9 Sqdn

Supermarine Spitfire

XR (Mk. Vb, c)		71 Sqdn
JU	...	111 Sqdn
AV	...	121 Sqdn
MD	...	133 Sqdn
TM	...	504 Sqdn
YQ (Mk. VI)		616 Sqdn
SH (Mk. IX)		64 Sqdn
FL	...	603 Sqdn

N.A. Mustang

RM (Mk. I)	...	26 Sqdn

Curtiss Tomahawk

KH	...	47 Sqdn

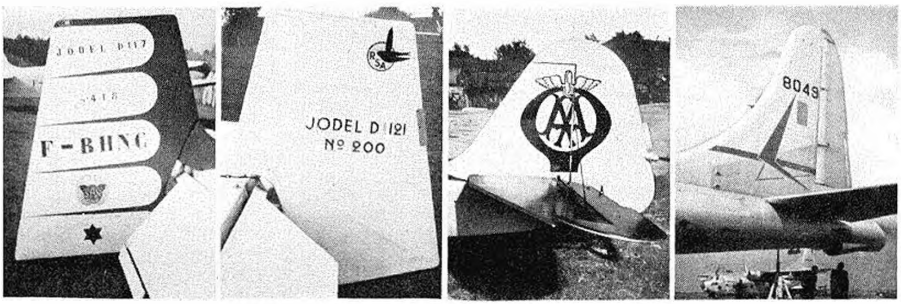
Curtiss Kittyhawk

HB	...	260 Sqdn

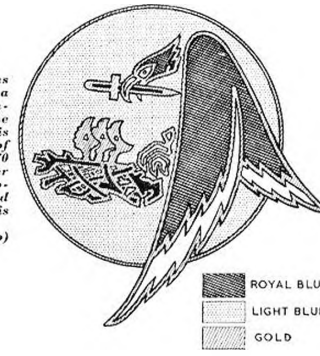
Avro Lancaster

OF	...	97 Sqdn
OL	...	83 Sqdn
VN	...	50 Sddn

Tail variety: Left to right, a Jodel D 117 No. 018. Six-pointed green star at base signifies it has been built with Govt. grant aid. Colours are red and white. Other badge is for Societe Aeronautique Normandy. Jodel 121, altered from D 11. No. 200, is all cream with red registration F-PEVM. RSA badge with Swallow insigne shows approval of construction by Reseau de Sport de l'Air. Auster Alpine operated by the Automobile Association is vivid black and yellow and the attractive emblem on the folding fin of a KB-50 tanker is in bright red



French squadrons and units have a fine series of emblems. That of the Ecole de L'Air is seen on the nose of a jet CM-170 Magister trainer at Salon-de-Provence. Detailed emblem at right is for port side. (BR/ SPB photo)



Short Stirling

MG	7 Sqdn
OJ	149 Sqdn
LS	228 Sqdn

H.P. Halifax

EY	78 Sqdn
LQ	405 Sqdn
ZL	427 Sqdn

D.H. Mosquito

GB (Mk. I) ...	105 Sqdn
ZK (Mk. FII)	25 Sqdn
EW	307 Sqdn
HS	109 Sqdn
XD (Mk. IV)	139 Sqdn

Westland Whirlwind

HE	263 Sqdn
SF	137 Sqdn

Douglas Boston III

OM	107 Sqdn

Bristol Beaufighter

ZJ (Mks. I & VI) ...	96 Sqdn
AJ	256 Sqdn
LA	235 Sqdn

Westland Lysander and B.P. Defiant

PV (A.S.R.)...	275 Sqdn
BA	277 Sqdn
NW	286 Sqdn

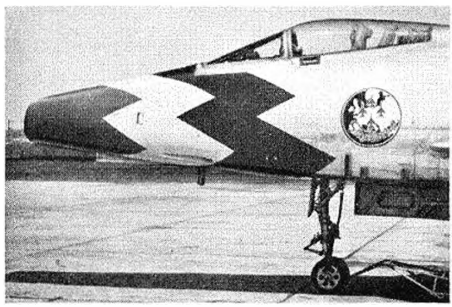
These letters were painted in matt finish "Sky" (more commonly described as Duck Egg Blue) during the early period of the war, and were later painted in the same colour as the underside, *i.e.* either light Sea Grey or Sea Grey medium, in the case of all day operations aircraft. Night fighters and bombers with black undersides had red letters. It was usual to have the Squadron letters in front of the fuselage roundel on the port side and aft on the starboard side; but in many cases, *e.g.* the Mosquito, the situation was reversed. The individual aircraft letter appeared on the other side of the roundel, one exception being the Mitchell, which carried the single letter on the fuselage nose.

This shot of Austrian Naval Lohner flying-boat illustrates the crimson-white-crimson flashes painted on the wings of Austro-Hungarian Naval and Marine aircraft. The asymmetric cross painted on the nose was a feature of all A-H flying boats, and when viewed exactly "nose on" appeared perfectly regular. The rudder was in three chordwise divisions of crimson-white-crimson

Exceedingly rare print of an all-black Albatros D III of Lt. von Bertrab referred to in earlier Decor Detail. Note the use of white crosses. Photo by courtesy of W. R. Puglisi

Another rare view of a Fokker D VII. Rib tapes show in a different tone over standard printed camouflage on original picture. Rear fuselage, tail surfaces and "snake" between crosses on top wing appear to be white. Photo by courtesy of W. R. Puglisi

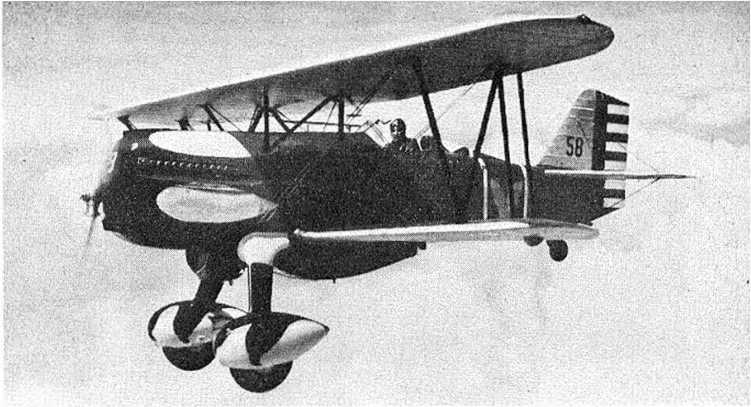
Slight change in the F.100 Skyblazers in Europe red/white/blue scheme uses straight edges to replace earlier curves, as seen at the Paris Aero Show (SPB photo)



FAMOUS BIPLANES
Number 13

The Curtiss Hawks

By G. A. G. COX



Heading and side view below show the famous 17th Pursuit Squadron decor (based at Selfridge Field) with "Great Snow Owl" insignia. (Photos from Paul C. Matt collection)

ALTHOUGH IT HAS NOW ceased to exist as an aircraft manufacturing concern, the Curtiss firm was one of the pioneers of aviation and through its products established for itself a reputation which will never diminish in the light of subsequent achievement. The first two heavier-than-air craft purchased by the U.S. Signal Corps were built by the Wright Brothers, and the next was a Curtiss model "D" pusher supplied in 1911; it is fitting, therefore, that the two names should be linked later on in a great engineering enterprise. The name soon became internationally famous when the JN4 trainer was produced (the "Jennie"), the only really successful U.S. designed aircraft of the First World War: more than five thousand of these sturdy machines were built—more even than the licence-built D.H.4.

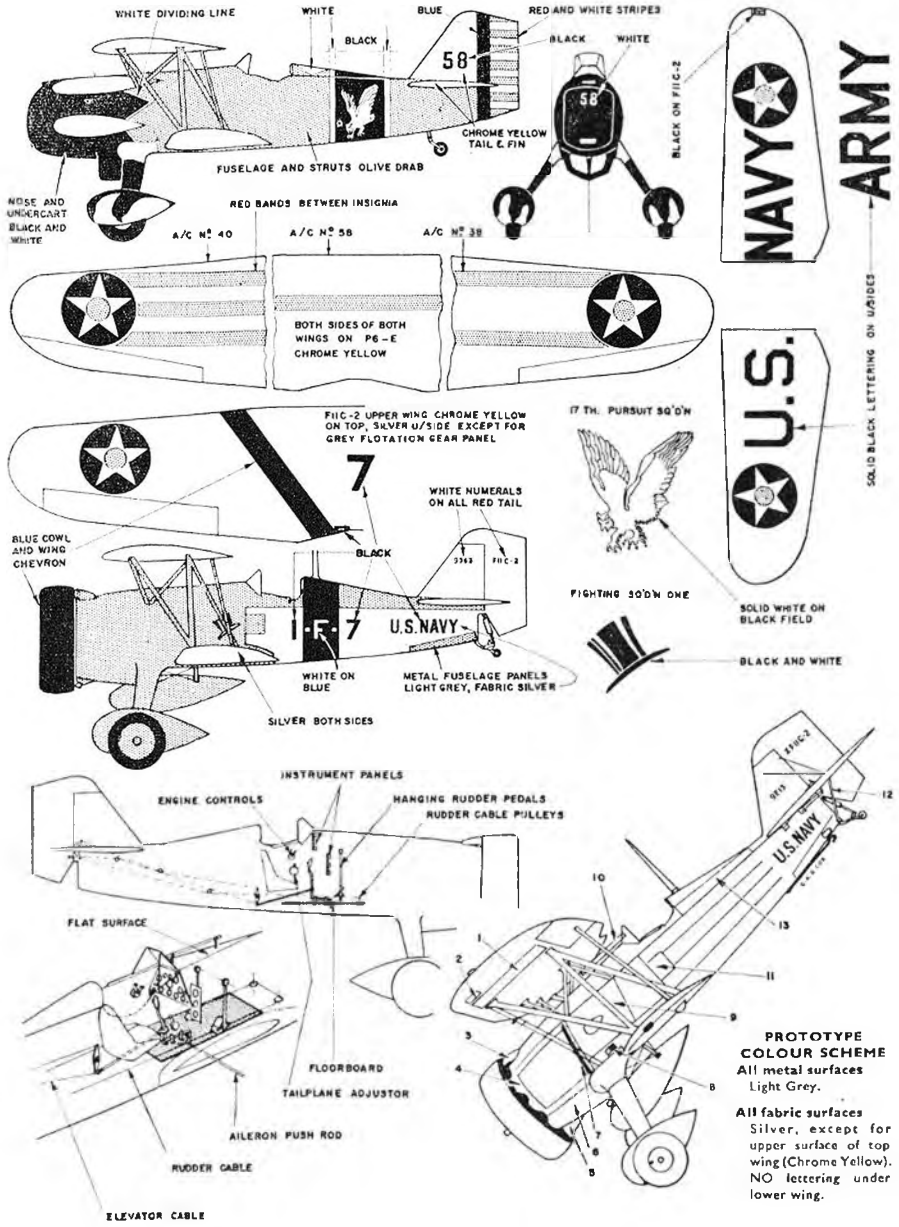
During the difficult post-war period, Curtiss produced the R-6 racer, powered by the new Curtiss D-12 engine of 400 h.p. This tiny machine (span 19 feet) appeared in 1922 and so successful was it that a military adaptation was put in hand and was accepted by the Air Service with the designation PW-8 (pursuit, water-cooled, No. 8). Apart from the Fokker PW-5, the PW-8 was the first pursuit aircraft to be ordered in quantity after the war. In 1925 another fighter emerged from the Curtiss factory, and given under the new designation system adopted by the Army Air Corps, the title P-1. The P-1 "Hawk", still powered by the D-12 engine, but now boosted to 435 h.p., was the real ancestor of the P6-E, in fact the later Hawks still retained the same wing, tail and basic fuselage structure of the original P-1. The engine of the P-1, listed by the U.S.A.A.C. as the V-1150, was confined within a remarkably sleek cowling which terminated in a pointed spinner, and the undercarriage was of the split-axle type. Minor changes, mostly engine modifications, resulted in successive re-designations up to P-1F, and thence to P-2, P-3, P-5 and P-6, the last of which was ordered in small number by the Army. Development continued until 1931, when the YP-20 appeared. This, the first Curtiss Army pursuit with a radial engine, had a Wright "Cyclone" and spatted wheels and still retained the split-axle undercart and basic airframe of earlier marks. The XP-21 followed, with a Pratt and Whitney engine, while the XP-22 returned to the inline engine, but this time the new Curtiss "Conqueror". When they combined the virtues of their last two aircraft, *i.e.*, the airframe of the YP-20 and the engine and single-strut undercart of the XP-22, Curtiss produced a fighter which fulfilled Army requirements and a contract was awarded in 1932 for 46 machines. This "Hawk" was designated YIP-22 during service trials, but was later changed to P6-E in view of its origin.

While this development work was in progress for the Army, the Curtiss concern devoted themselves with equal energy to the production of naval aircraft, and by 1932 the list of basic fighter types had progressed from FC-1 to F11C-1, although it should be remembered that for a time the Navy grouped fighters and dive-bombers in the same "F" category, hence the Curtiss F8C-1 "Helldiver". Several types were conversions from existing Army designs to naval specifications or *vice-versa* and the differences were often simply a matter of engine and fuselage strength to withstand the strain of deck landings. The similarity between Army and Navy equivalents was often striking, as it was with our own Hawker "Fury" and "Nimrod".

The differences between P6-E and XF11C-1 were manifold. The low pressure tyres were exchanged for larger, high-pressure ones with ungainly spats. The two-bladed propeller necessitated a longer undercarriage (which gave the XF11C-2 a distinguished appearance) and the gap was increased to give better forward visibility. The forward fuselage had to be reshaped to suit the radial engine, while behind the cockpit the headrest was widened to accommodate baggage and a life raft. The wings were substantially the same as those of the P6-E, except that "Flotation gear" was

Key to Diagram opposite

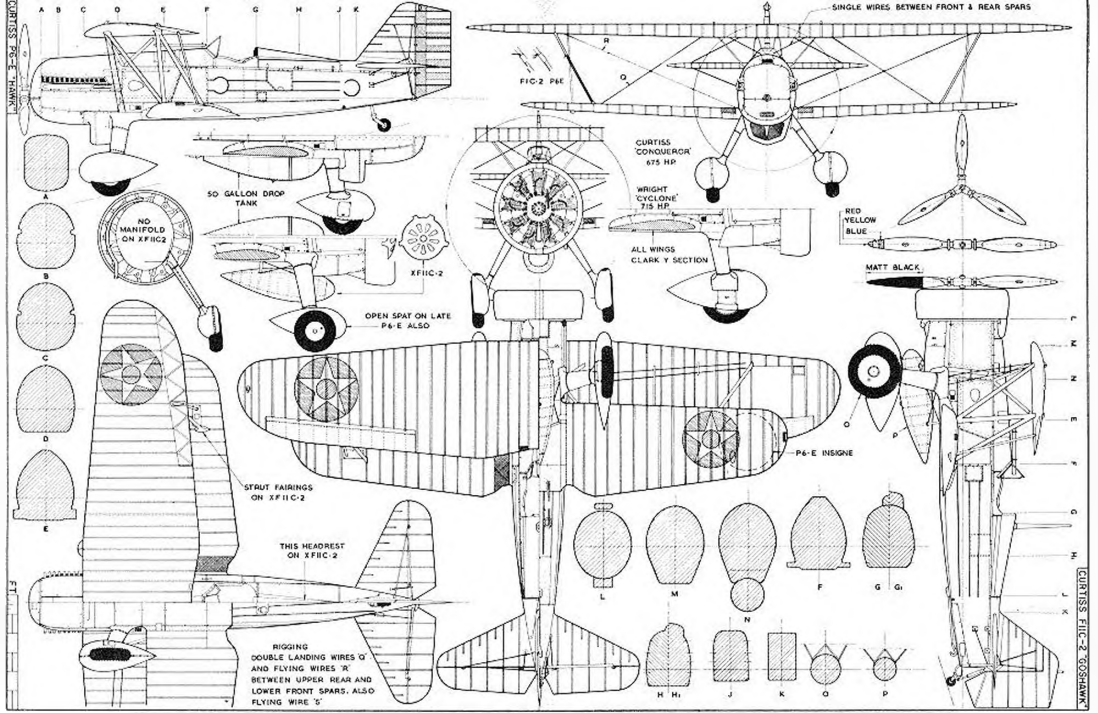
1. Flotation gear panel.
2. Inspection window.
3. Carburettor air intake.
4. Sidepanels cut away around inlet pipes.
5. Adjustable air scoop for oil cooler.
6. Lower nose panels form tunnel for oil cooling.
7. Air outlet louvre.
8. Cartridge case chute.
9. Panel hinged along upper edge for gun access.
10. Dive-bombing sight. (M/gunsight alongside.)
11. Access panel replaces circular zip flap on P6-E (Access to oxygen stowage on starboard side).
12. Strut on F11C-2, twin wires on P6-E.
13. Life raft and baggage stowage.



PROTOTYPE COLOUR SCHEME

All metal surfaces Light Grey.

All fabric surfaces Silver, except for upper surface of top wing (Chrome Yellow). NO lettering under lower wing.



engine designer, to meet this request, and the simplest answer boiled down to the modifications described. This version of the 249 was then produced as an "export" model only in limited quantities and designated the "249 BB Modified" at the request of the American customer.

It became obvious that there was an equal, or even larger demand in this country for an "improved performance" version and production has been stepped up to a larger scale to make this model freely available on the home market. The cost is proportionately higher—largely on account of the extra work involved in machining and finishing the liner—and the two models will continue in production, the hotted-up version retaining its original (American) designation of "249 BB (Modified)", not the "Mark II" or "Special".

All the good starting and running characteristics of the standard 249 BB have been retained—if not enhanced. Its peak performance now puts it in the "racing" class—and certainly in the top line for team racing or combat work. It also retains the extreme flexibility of operation of the standard 249.

We found, for instance, that at the lower end of the speed range it swung a 14 x 6 propeller quite easily and consistently at 3,800 r.p.m. (although the mixture had to be richened up so much that the needle valve was almost completely unscrewed); whilst at the other end it was even more happy at 22,000 r.p.m. plus on a 6 x 4 Frog nylon prop. The speed, in this instance, was not perfectly consistent—but that was the propeller, not the engine. The blades were actually stretching and changing slightly in diameter and pitch under the centrifugal force generated!

Up to about 12-13,000 r.p.m. running characteristics were excellent on standard "Powamix" diesel fuel. At higher speeds, however, settings tended to become rather more critical with a "straight" mixture. A nitrated fuel restores flexibility and generally tends to make for smoother running from 12-13,000 r.p.m. on. The cylinder gets really hot and the least one has to adjust the compression screw the better, to save burnt fingers.

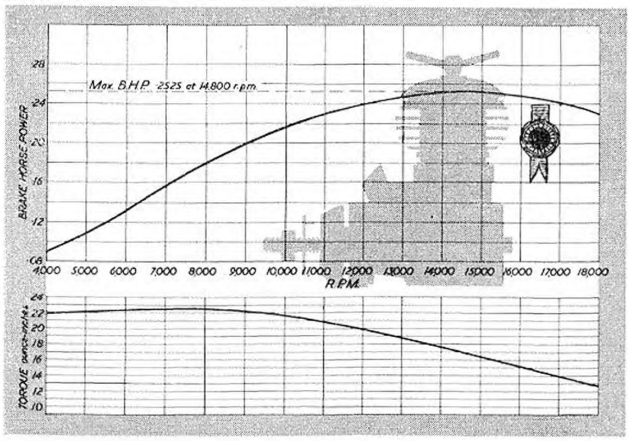
Propeller—R.P.M. Tests

Propeller dia. x pitch	*r.p.m.*	*Propeller dia. x pitch*	*r.p.m.*
9 x 4 (Stant)	11,000	8 x 6 (Trucut)	10,200
8 x 4 (Stant)	13,900	8 x 4 (Trucut)	13,700
7 x 4 (Stant)	15,500	8 x 3 (Trucut)	14,300
7 x 9 (Stant TR)	10,900	7 x 9 (Trucut)	10,400
8 x 5 (Stant)	12,500	7 x 6 (Trucut)	12,000
9 x 6 (Stant)	10,000	7 x 5 (Trucut)	13,400
9 x 3 (Tiger)	12,200	7 x 3 (Trucut)	18,600
8 x 4 (Tiger)	14,400	6 x 10 (Trucut)	13,400
8 x 3½ (Tiger)	15,500	6 x 8 (Trucut)	14,100
6 x 9 (Tiger)	14,500	6 x 6 (Trucut)	16,000
14 x 6 (Trucut)	3,800	6 x 4 (Trucut)	17,500
9 x 4 (Trucut)	11,200	Fuel: Frog "Powamix".	

Somewhat more care is required in tightening down the cylinder screws on the 249 "Modified" than with the standard model to avoid the possibility of distortion, because of the reduced flange thickness. Another difference is that if the 249 "Modified" gets a knock on the front of the shaft the shaft can only knock back a matter of about $\frac{1}{32}$ inch because the driver is then stopped by the brass sleeve bearing against the inner ring of the front ball race. A sharp tug and the shaft is brought back into place. With conventional practice the shaft of a ball race engine can often be knocked back so far that the crankpin hits the rear cover.

Material specification on the 249 "Modified" is substantially unaltered. The contra-piston is of mild steel as this has been found better than cast iron since it has a tendency to "stick" and thus hold a setting without having to be quite tight initially. Heat treatment of the shaft is also amended slightly, the shaft being toughened overall rather than locally hardened. (Also the hole down the shaft is slightly smaller in diameter to give greater strength.)

These changes also apply to the standard 249 BB.



SPECIFICATION

Displacement: 2·467 c.c. (·1505 cu. in.).
Bore: ·5807 in.
Stroke: ·5685 in.
Bore/Stroke ratio: 1·02.
Bare weight: 6 ounces.
Max. B.H.P.: ·2525 B.H.P. at 14 800 r.p.m.
Power rating: ·102 B.H.P. per c.c.
Power/weight ratio: ·042 B.H.P. per ounce.

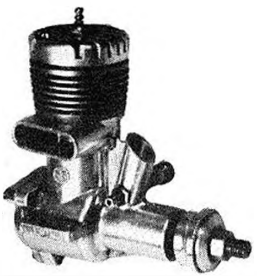
Material Specification:

Cylinder liner: heat-treated fine grain mild steel, ground internally and externally, wet honed bore.
Piston: "Brico" cast iron (ground).
Contra-piston: mild steel (ground and lapped).
Gudgeon pin: silver steel.
Connecting rod: RR56 light alloy forging.
Crankcase unit: LAC 112A light alloy, pressure die casting.
Cylinder head: LAC 112A light alloy, pressure die casting.
Crankshaft: 3 per cent. nickel steel (toughened by heat treatment, ground finish).

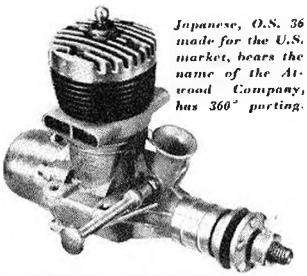
Manufacturers:

International Model Aircraft, Ltd., Morden Road, Merton.
Retail price: £4 14s. 9d. (including tax).

MOTOR MART



Johnson, 35 at left, has high shine crankcase finish and outstanding piston/cylinder fit.



Japanese, O.S. 36 made for the U.S. market, bears the name of the Atwood Company, has 360° porting.

ONE OF OUR MORE pleasant tasks in the AEROMODELLER Reader's Query Service, is to identify rare engines and it is quite surprising how many unique prototypes and short series production motors are in general circulation. P. C. Walker bought a Japanese engine whilst stationed in the R.A.F. in Malta and from his initial description, we were rather baffled as to its identity. Fortunately, a home posting enabled him to send the engine along and it turned out to be an **O.S.** 36 bearing the name of the American Atwood Company on the crankcase, which was manufactured at Osaka during 1953 for distribution in America. This O.S. is a very interesting motor in that it was probably the largest mass production glowplug unit to employ 360 degrees porting. For this reason it is a unique motor and on our check figures it delivered 11,400 r.p.m. on a Topflite 10 x 6. The engine appears in the photo, top right. Another serviceman, Sergeant Woods of the R.A.F., called in at the office to show us his latest acquisition, one of the **Johnson** 35's, illustrated *top left*. Johnson engines have established a name for themselves in the Western U.S.A. as engines of very high quality and to judge by the piston/cylinder fit, the 35 is a particularly fine example of their standards.

Conforming to the general exterior pattern of most engines of this capacity, its most outstanding features, apart from the finish, are the massive square section connecting rod and relieved piston. Bore and stroke are square at .750 and weight is 6·7 ozs. Unique instruction on the engine information leaflet is, that the carburettor spray bar hole position is indicated at 45 degrees pointing forwards and down towards the shaft port and it is said that the engine will not function properly unless the valve is so fitted. To our knowledge, this is the first time a manufacturer has committed himself on the position of the said valve hole.

International Model Aircraft have two new engines on the stocks. First one likely to be out is a 1 c.c. based largely on the **Frog** 150 layout, with reduced bore but retaining the same stroke—giving a bore/stroke ratio of about 0·9. Of the other new Frog engines, plenty of people have seen the prototype 3·5 being tried out in control line stunt and combat models. This design is unusual in featuring rotary drum induction and has also been obviously laid out with a view to sleeving down to 2·5 c.c. and with this background in mind, it may not be too far off the beam to guess that the idea of sleeving down the successful Frog 80 to a smaller capacity has not escaped attention.

We understand from Messrs. Auto Vaporisers of New Road, Lymm, Cheshire, that they have taken over, in conjunction with Mr. F. Ellis, the Aerol Engineering Co. of Henry Street, Liverpool manufacturers of **Elfin** engines.

We have received quite a number of complaints regarding servicing for these engines during the past twelve months and have, in all cases, endeavoured to obtain satisfaction for the readers concerned. Every effort is being made by the new owners of the Aerol Engineering Co., to satisfactorily complete any outstanding repair or servicing items.

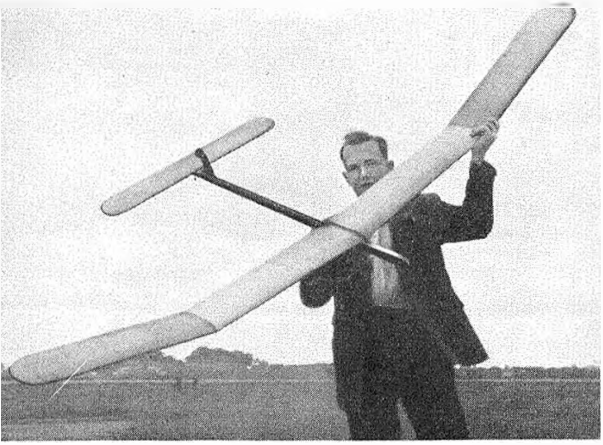
Will any readers who have sent engines for servicing or repair and been unable to obtain satisfaction, please write immediately to Messrs. Auto-Vaporisers, New Road, Lymm, Cheshire, giving full details. Every effort will be made to give satisfaction, but it is pointed out that clearing up a large amount of outstanding repair and service work may take several months, and that this must be completed before the well-known Elfin engines go into production once more.

Errata.—Prop/r.p.m. figures for the Webra 2·5R quoted last month, were somewhat optimistic for that mysterious series of 9 in. pitch propellers. They should, of course, have been 4 in. pitch, making the figures much more realistic.

Technical Terms Illustrated

Left "Running Rich"

Right "Running Lean"



MEANDERER

A contest winning 8 ft. span glider by J. Baguley

THERE'S A WELL-WORN theory amongst contest fliers that the bigger the glider, the greater its chance of collecting a thermal and winning a contest. Popularity of the A/2 specification has tended in recent seasons to outshine the "open" type of glider and many of our readers will not even be aware of the now rather old series of ultra-lightweight designs that prevailed in the immediate post-war years.

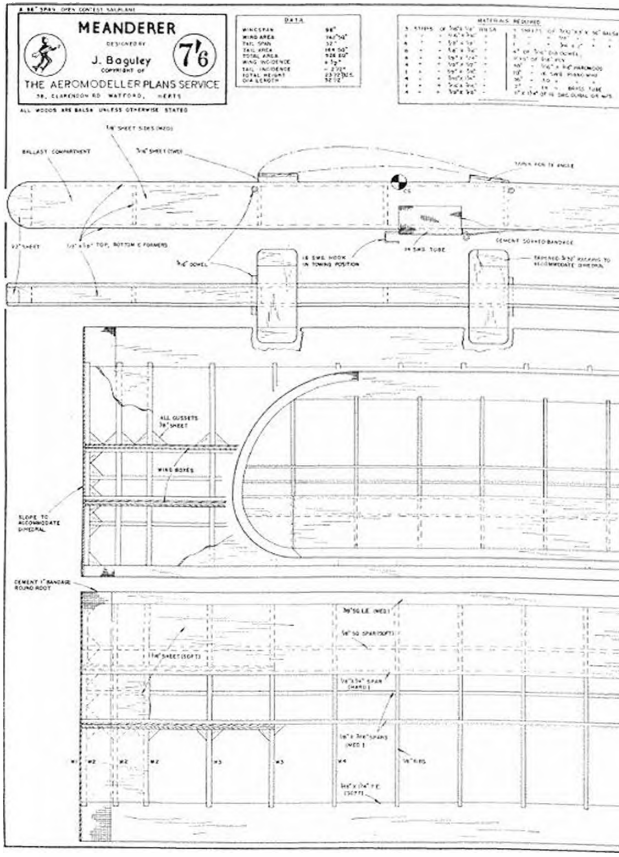
MEANDERER comes in the big, lightweight classification. It already possesses a fine contest record and as a cheap-to-build, easy-to-fly glider, it forms the ideal subject for entry into National "open" glider events.

It was based on Jim Baguley's standard A/2 design which is well known in the West London district, Jim belonging to the Hayes and District Club. The object was to try to retain the A/2 wing loading (it comes out at about 4½ ounces per sq. ft. with a total weight of 23½ ounces) and use the increased area to obtain extra performance. During early tests it had the ability to hold lift even at 9 p.m. It was subsequently flown in competitions, with the result that during the 1956/57 seasons its time average was 77 per cent. of the maximum possible total. Actual figures were 43 : 31 out of a possible 58 mins.

All structural problems and items which gave trouble in earlier versions have been modified in this latest Mk. XIII version, including special attention to the thick section fin and the very simple auto rudder operating direct from the movable towhook. Incidentally, as the name indicates, Meanderer is not intended to fly straight, even with the auto rudder set in line with the rudder. This might be thought to offer handicap in slope soaring, but its flying time in the 1956 hand launch slope soaring event held at Chobham Common was no less than 4 : 07.

Construction

The construction is simple and conventional, thus a detailed building description is not necessary but the following should not



come amiss. The fuselage should be covered and doped before adding wing and tail mounts, auto rudder, fin, etc., but the fin should be covered and attached to the fuselage before doping. When building the wings, it is best to use the procedure of building a centre panel, packing this to the dihedral angle (4½ in. as panels are of equal length) and then building the tip *panel on to it*, thus obtaining good dihedral joint.

Trimming

Start with auto-rudder offset as given on the plan (this is safe if you have no excessive warps). Test glide in the usual manner, adjusting the tailplane incidence if necessary to obtain a rough trim. Then tow using a 50-ft. line and make any adjustment necessary. Next use a full line, and decrease tail incidence until a slight stall is apparent, then remove 1/32-in. of packing.

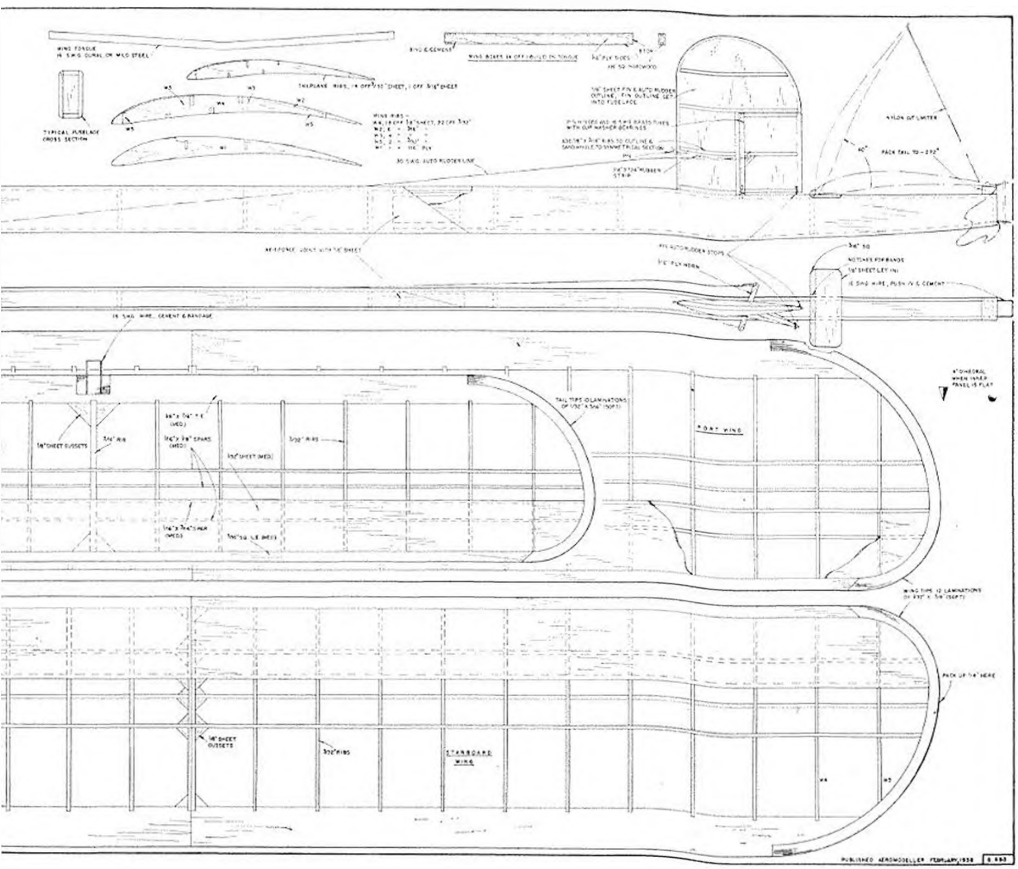
The model should then be roughly trimmed, and any further trimming will be the result of personal preference and further flying.

Use a 200-ft. ÷ dia. circle on glide, which will tighten up in certain lift conditions.

In calm evening air, flight times should be between 2 : 15 and 3 : 15 from a full 164-ft. line, the usual being 2 : 50 unless the D/T is needed. The still air performance is thought to be around 2 : 30.

In a wind it is best to leave half the line on the drum and pay out, using a strong nylon line; Jim Baguley uses 35-lb. nylon, and always use a D/T (this design has caught model losing type thermals at 9 p.m.).

FULL SIZE COPIES OF THIS 1/5TH SCALE REPRODUCTION ARE AVAILABLE PRICE 7/6 PLUS 6d. POST AS PLAN G. 683 FROM AEROMODELLER PLANS SERVICE

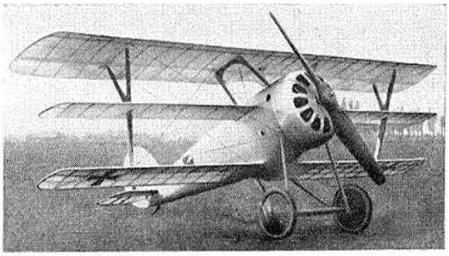


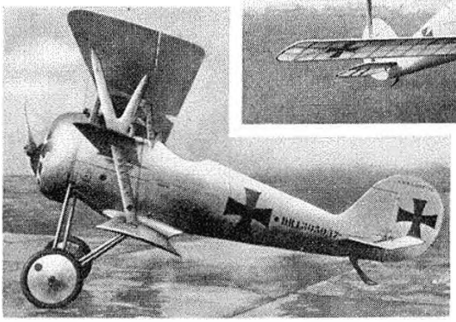
AIRCRAFT DESCRIBED

NUMBER 89

By P. L. Gray

Pfalz Dr. 1





DURING THE WINTER of 1916/17 the German authorities decided to investigate the possibilities of the triplane layout and the majority of manufacturers submitted prototypes for assessment. Many and varied were the designs which emanated from the workshops of AEG, Albatros, DFW, Euler, Friedrichshafen, Naglo, Pfalz and Shutte-Lanz: even the Austro-Hungarian factories of O-Aviatik, Hansa-Brandenburg and W.K.F. built prototypes. Few machines were entirely original though, the majority being triplane versions of existing D type single-seat fighters.

As may be recalled from an earlier article in the series, the Fokker Dr I was the only machine of triplane format to go into anything like series production, and certainly the only one to see any widespread operational activity. However, one other triplane proved promising enough to merit a small production order and this was given to the Pfalz Flugzeug g.m.b.H., Speyer-on-Rhine.

The factory, under the auspices of the brothers Eversbusch, was inaugurated to fulfill the requirements of the Bavarian flying units and its first aircraft were copies of French Morane Saulnier parasols. Later, LFG Roland D I and D II types were built under licence and known as Pfalz LFG D I and D II; then came the Pfalz D III—their first successful original design. This machine was superficially similar to the Albatros D III and D Va types, but distinguished by its more angular wing-tips and trapezoidal tailplane. There followed D IV, D VI and D VII, which were prototypes only; the latter, a stubby rotary-engined biplane, came during the later part of 1917 and it was from this aircraft that the Dr I was evolved.

The Sh. III engine, with its eleven cylinders (against the more usual nine), was a considerable mechanical achievement for its day, and was distinguished from the standard rotary motors by being a "geared" rotary. Instead of the propeller being bolted to the crankcase it was fitted to the crankshaft, which, through the gearing, enabled the airscrew to rotate at only 900 r.p.m. and the engine itself rotated in the opposite direction at 900 r.p.m. Advantages of this arrangement were two-fold: lower airscrew speed making for more efficient use of propeller and lower engine speed giving less torque and gyroscopic effect. The somewhat hefty proportions of the propeller may be noted; it was of Axial manufacture and had a rather coarse pitch of some 10 ft. 3½ in. to take advantage of the low r.p.m. The official designation of the motor was Siemens Halske Sh III (there was also IIIa which was the same engine with higher compression ratio) 160 h.p.: the rating was somewhat optimistic—usually German h.p. ratings erred on the conservative side—the actual power eventually produced being more in the nature of 135 h.p., which figure considerably reduced the power/weight ratio. However, no less than 547 of these engines were ultimately built, the majority being used by Siemens themselves in their D III and D IV interceptors.

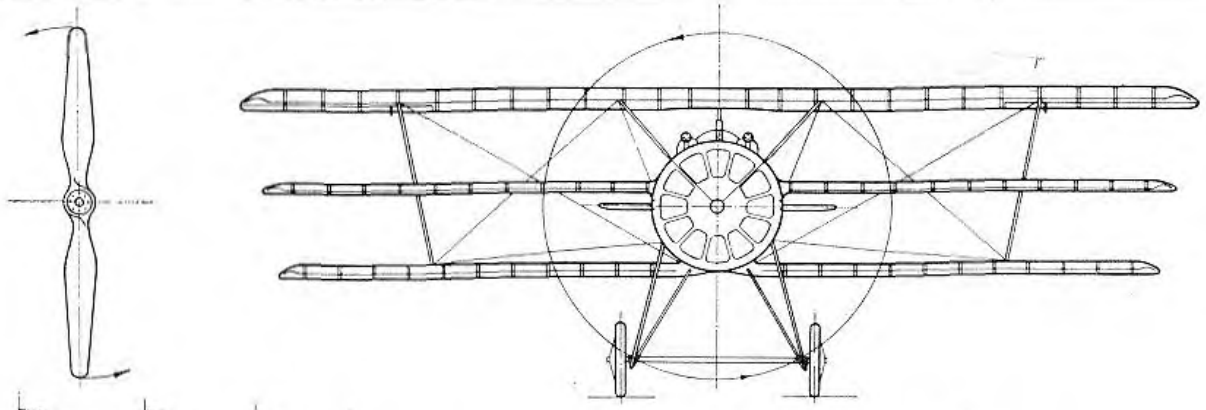
The airframe of the Pfalz Dr I was practically a completely wooden structure. The fuselage was a stocky plywood shell built up on light laminated formers additionally reinforced with ply gussets at the stringer stations: it tapered from the circular engine plate to a vertical knife-edge at the rudder post. Neat fairings for the centre and lower wing roots were incorporated into the structure and the ply-covered fin was built integral with the rear fuselage. The tailplane was also a ply-covered—but separate—structure and was of inverted airfoil section to assist dive recovery.

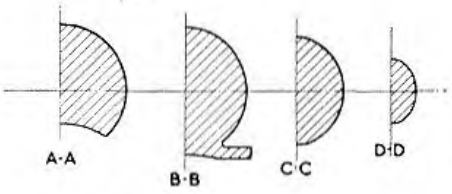
The wings, although unusual in layout, had nothing particularly unorthodox about their construction, being simply plywood ribs mounted on hollow box spars; all were fabric covered.

The cowling was somewhat unorthodox for a rotary housing, the face being fretted with some twelve vents to provide adequate cooling. The upper quarter was detachable to facilitate removing the complete cowling without having to take off the propeller. The exhaust passed under the belly between the undercarriage legs in similar manner to the Sopwith Snipe.

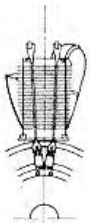
The Pfalz Dr I did not completely fulfill operational requirements and the projected Dr II and Dr IIa developments were not proceeded with.

Top: Probably the first Pfalz Dr. I (Navarro photo) this unpainted a/c is not armed and does not show the aileron gap as on adjacent side view. (Chas. Donald photo.) At left: unique revised cowl with lower quarter cut away. Photo by courtesy of W. R. Paglisi

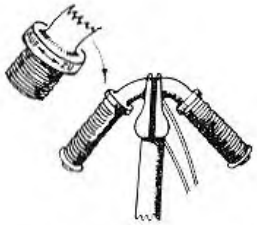




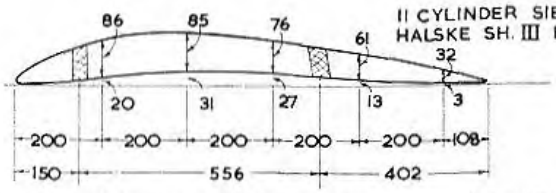
II CYLINDER SIEMENS-HALSKE SH. III ENGINE



ENLARGED CYLINDER DETAIL



CONTROL COLUMN HEAD WITH TRIGGERS AND AUX. THROTTLE TWIST GRIP



ENLARGED AEROFOIL WITH ORIGINAL MM. DIMENSIONS.

PFALZ Dr I

Colour Details.—In accordance with the regulations for aircraft not going to the Front. Pfalz Dr Is were unpainted. The natural linen fabric covering of the wings and control surfaces was clear doped; the fuselage shell of spruce ply, the centre-section and interplane struts were clear varnished, resulting in a straw shade. Cowling: polished aluminium. Black patee cross insignia painted above and below the wings on fuselage sides and rudder. The style of serial painting is shown of 3050/17 and on this aircraft the serial also appeared in reduced size across the top of the rudder, along each elevator adjacent to the hinge line, and down the lower part of the interplane struts.

DATA

(For aircraft 3050/17 on test October, 1917)

Span:	Upper	8550 mm. (28 ft. 0¼ in.)	Chord:	Upper	1108 mm. (3 ft. 7⅝ in.)
	Centre	8100 mm. (26 ft. 7 in.)		Centre	500 mm. (1 ft. 7⅝ in.)
	Lower	7820 mm. (25 ft. 7⅞ in.)		Lower	705 mm. (2 ft. 3¾ in.)
Length:		5500 mm. (18 ft. 0½ in.)	Height:		2760 mm. (9 ft. 0½ in.)

(*metric conversions are approximate*)

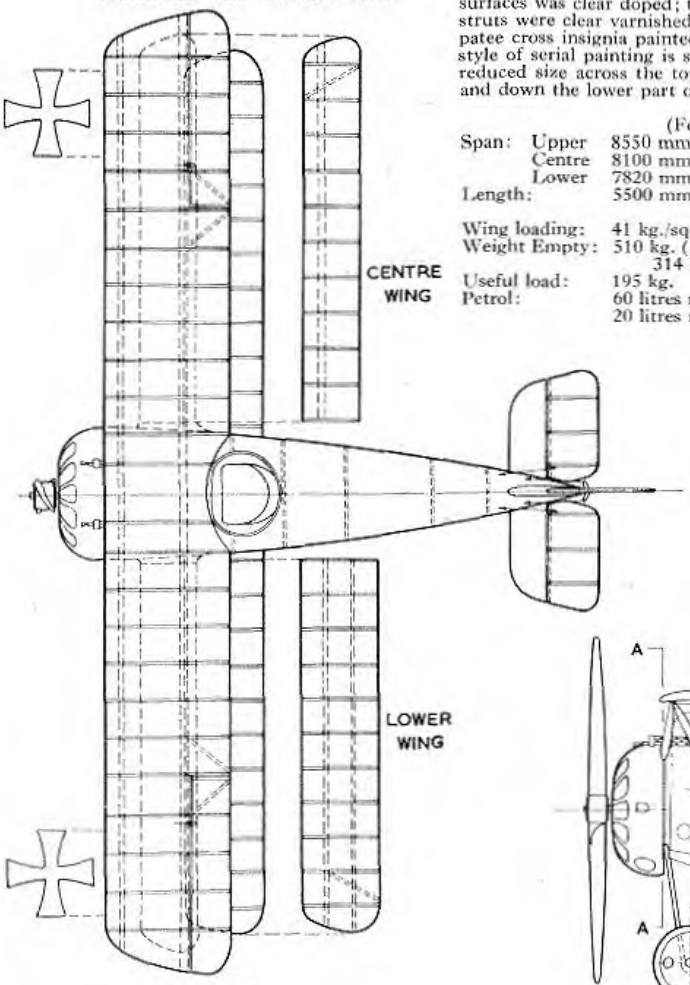
Wing loading:	41 kg./sq. m².	Power loading:	5·2 kg/h.p.
Weight Empty:	510 kg. (196 kg. engine, 314 kg. airframe)		
Useful load:	195 kg.	Duration:	1½ hours
Petrol:	60 litres main 20 litres reserve	Oil:	22 litres

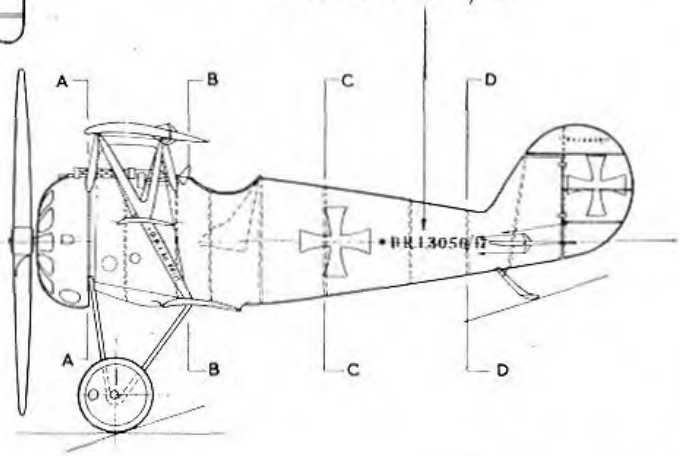
Performance

Climb: 0—1,000 m.	1·7 min.		
1—2,000 m.	2·0 min.	=	2,000 m. in 3·7 min.
2—3,000 m.	2·5 min.	=	3,000 m. in 6·2 min.
3—4,000 m.	3·1 min.	=	4,000 m. in 9·3 min.
4—5,000 m.	4·2 min.	=	5,000 m. in 13·5 min.
5—6,000 m.	6·5 min.	=	6,000 m. in 20 min.

Speed: 190 km. per hour level flight at 4,000 m.
Take-off and landing, both within 100 m.
Engine:
Siemens Halske Sh III 160 h.p. geared rotary

• D.R.1. 3050/17





PFALZ Dr. I

FT.

GADGET REVIEW

TIRED OF FUEL SEEPAGE? We have seen many a good model spoiled for the sake of a coat of shellac around the engine bearers (Painters' "knotting" is a good shellac solution) and in many cases the model outlives its bearer/bulkhead installation. This is particularly so in the case of team racers, where 5 and 10 minute sessions are the order of the day and the engine bay has to put up with a very mess-making exhaust. B. M. Cole of Bedford has found aluminium faced plywood at his local handicraft stores, and as seen in **A**, uses it for complete insulation of the bulkhead immediately behind his engine, but be sure to finish the job properly and shellac those bearers!

Ever had difficulty getting at the carburettor to choke-start in a cowled model? The A.P.S. Cessna Bird Dog was giving Carl Bates of Leeds a few problems with an Allbon Dart installed. Then he found that the neat plastic paste spreader found in those alloy "Gripfix" tubs was just the right fit for a carb. extension as in **B**. Cut across the spreader at an angle to suit the cowl line and you'll find it not only easy to start and choke the engine, but also the longer intake tube makes needle valve setting even more positive due to improved suction.

Now for an idea that all contest modellers should adopt. Simply a plate of celluloid stuck on three of its sides to the model fuselage and a replaceable "lost and found" notice slipped in place. A. A. Weston of Coulsdon suggests the idea **C**, and points out that this enables a modeller to change the 'phone number on the notice according to the flying venue. At least this would help with earlier model recovery at the Nats.

Widespread introduction of Poly/Diothene for packaging has been accepted by modellers in many ways. Large (wardrobe) size bags make excellent emergency covers for a model cut in the middle of the field in a rainstorm and form part of the recovery equipment carried by many contest modellers. Reader A. Heasman of Dorking has another use, he makes full tanks out of thicker plastic by the simple method shown in **D**. Same applies to special bag shapes for wings, tails, fuselages, etc. Remember to be quick in rubbing the hot soldering iron over the proposed seam area, and be sure to use a metal rule as a guide, and metal base to take away excess heat.

Soft wire hinges are simple enough to fit, but the wire often develops the nasty habit of working loose. Pete Holland finds laundry shirt stiffeners perfect for the job of adjustable trim tab hinges, and if your local laundry doesn't offer the same service, Pete suggests home-made stiffeners as in **E**. The paper is easily stuck to model parts, and the hinge becomes permanent.

D. S. George of Liskeard in Cornwall sends **F** which is a neat Hamilton Standard or De Havilland "spinner" representation in the form of a brass curtain rod bracket! Mr. George was making an A.P.S. Douglas Invader when this idea cropped up and the final effect is most realistic. All one has to make, apart from shaping the curtain rod bracket, is the wooden dome cap and the whole unit effectively hides the prop nut.

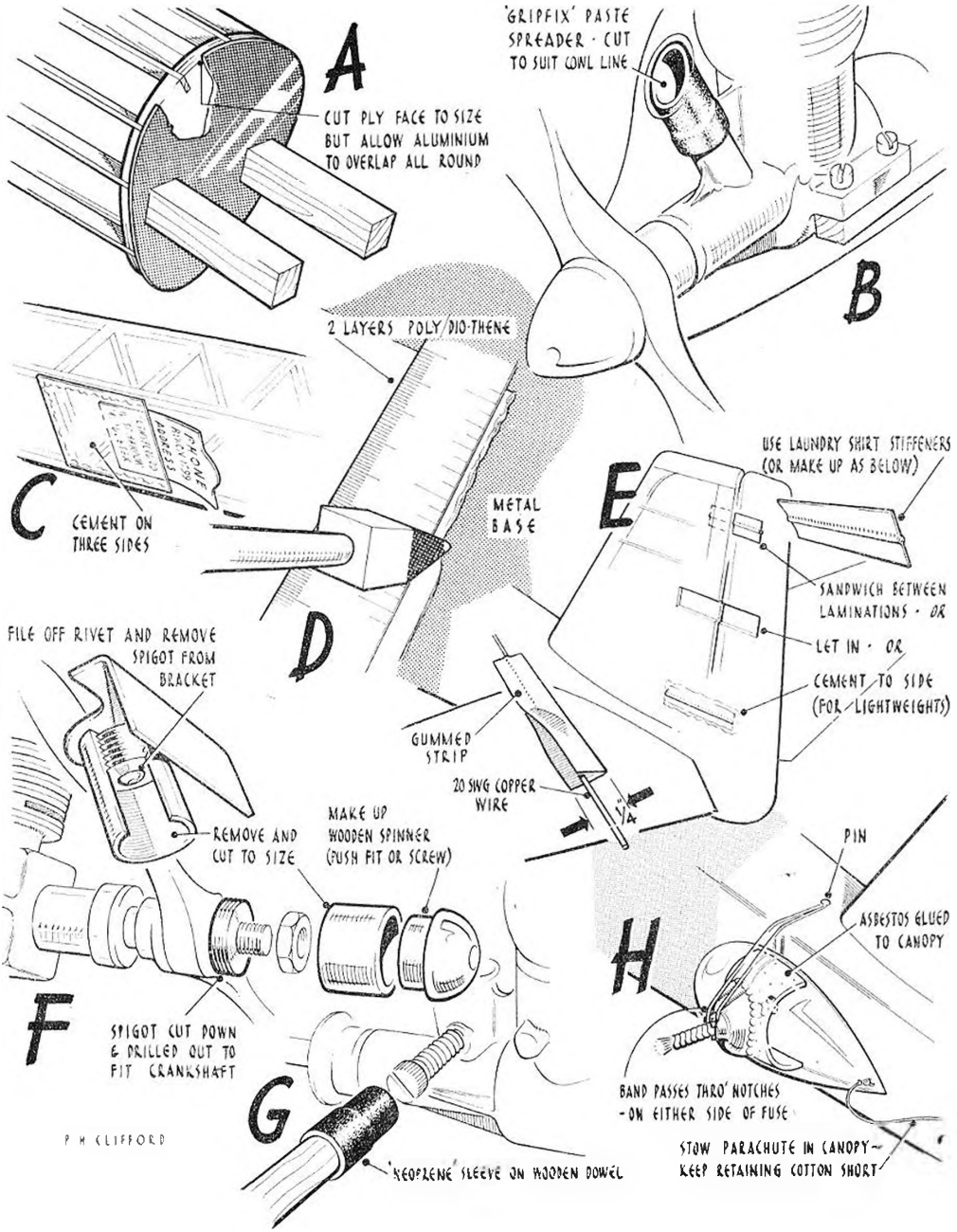
"When I alter the setting on my motor," says Master Peter Spurrier of Riselet, Lancs, "I get my knuckles in the propeller"—which is a bit hard on the digits, and not saying a lot for the needle valve position on the small U.S.A. engine he operates. However, his suggestion, **G**, will be a boon for fellow sufferers and it is a length of dowel with large bore Neoprene tube on one end to fit the needle valve. If the dowel is longer than the prop radius, one can operate without fear of a knuckle rap.

Now for one which suits all builders of model designs that either do not cater for a dethermaliser or which call for a parachute d/t but do not give much idea as to how to install the device. **H** shows the system as employed by J. R. Crosby of Leicester and we commend it for special study. Take one commercial cockpit canopy of suitable size to take the folded parachute and to fit on the rear fuselage side of the model. Cement a square inch of Jetex-type asbestos sheet on the outside, and take the top of a *large* tube (cement, toothpaste, etc.) and shape to fit over the asbestos. File or cut two notches in the tube end, make sure that the tube will take your fuse size and cement the tube to the asbestos.

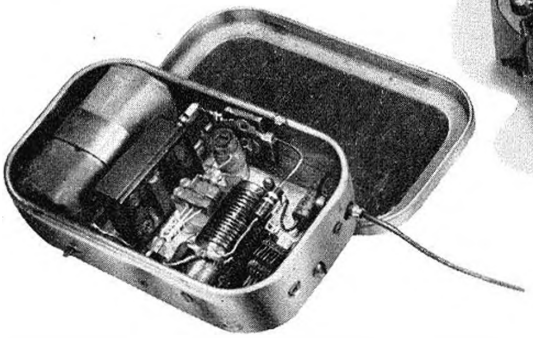
Now fit two pins on the fuselage, attach the rear end of the canopy with a short length of thread to the fuselage and also fit the parachute with its retaining thread. Fold the 'chute in the canopy, and hold the unit on the fuselage with an elastic band as sketched. Fuse should be fitted, and when this burns through the band the canopy falls away to dangle from the fuselage and the 'chute deploys to dethermalising action stations.

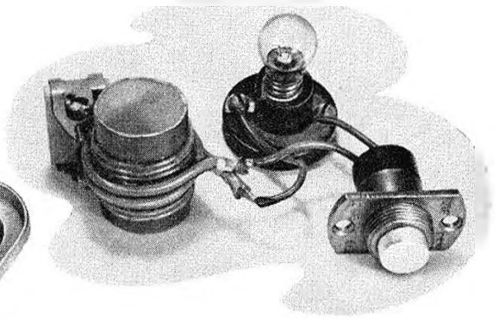
Did you save those balloon decorations from Christmas? T. M. Unsworth of Stockton-on-Tees suggests clipping off the narrow neck and using the balloon as a dust jacket for your engine.

Here's a tip for team racer design that saves the tip weight. Make the inboard wing of Clark Y section and the outer panel symmetrical, says Tony Rooney of Dublin.


A
CUT PLY FACE TO SIZE BUT ALLOW ALUMINIUM TO OVERLAP ALL ROUND
'GRIPFIX' PASTE SPREADER - CUT TO SUIT COWL LINE
B
2 LAYERS POLY-DIO-THENE
C
CEMENT ON THREE SIDES
METAL BASE
D
E
USE LAUNDRY SHIRT STIFFENERS (OR MAKE UP AS BELOW)
SANDWICH BETWEEN LAMINATIONS - OR
LET IN - OR
CEMENT TO SIDE (FOR LIGHTWEIGHTS)
FILE OFF RIVET AND REMOVE SPIGOT FROM BRACKET
GUMMED STRIP
20 SWG COPPER WIRE
1/4"
REMOVE AND CUT TO SIZE
MAKE UP WOODEN SPINNER (PUSH FIT OR SCREW)
F
SPIGOT CUT DOWN & DRILLED OUT TO FIT CRANKSHAFT
G
NEOPRENE SLEEVE ON WOODEN DOWEL
PIN
ASBESTOS GLUED TO CANOPY
H
BAND PASSES THRO' NOTCHES - ON EITHER SIDE OF FUSE
STOW PARACHUTE IN CANOPY - KEEP RETAINING COTTON SHORT
P H CLIFFORD

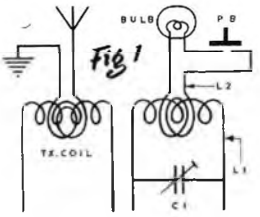
Below is Dave McQue's crystal oscillator built in a tobacco tin. Right, Howard Boys' simple absorption wavemeter prior to assembly in transmitter case





RADIO CONTROL NOTES

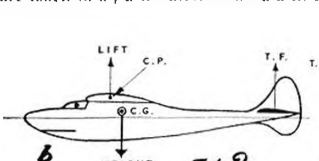
Readers building the wavemeter described below may have it calibrated by sending the completed components as shown above, securely packed, direct to Howard Boys at 89 Catesby Road, Rugby, together with postal order for 1/6 which covers calibration fee and return postage.

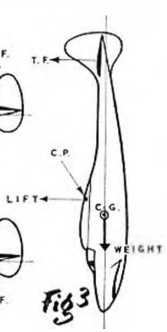


By Howard Boys

REQUESTS HAVE BEEN received for details of an absorption type frequency meter that can be built into a transmitter in the manner of that used in the Tri-ang transmitters, and giving an indication by the glow of a bulb. There are two different schemes used by Tri-ang of which one indicates the tuning for maximum output, the frequency being controlled by a crystal. The other is a frequency meter, or as it is often called, wavemeter. Some low power transmitters may be too weak to make the bulb glow, and yet still give sufficient power to operate a sensitive receiver. These are, however, very rare.

The wavemeter is quite a simple device, shown in the photo with the circuit arrangement in Fig. 1. L1 is a coil of 10 turns of 18 S.W.G. wire wound on a paxolin or similar tube about $\frac{1}{4}$-in. diameter, the turns being spaced to a length of $\frac{1}{2}$-in. L2 is two turns of similar wire in insulating sleeving wound round the middle of L1. The leads from L2 are best as short as possible and are taken to a push button and bulb in series. The P.B. should be of the spring off type so that the circuit is open unless the button is held down. The bulb is 6 volts 0·04 amps. as used for the rear lamp of cycle dynamo sets. The tuning condenser C1 is a 50 pf. compression type trimmer. The coil is mounted close to, and in line with the tuning coil, or output coil of the transmitter. It is necessary to have this meter tuned to a crystal controlled transmitter at 27·12 mc/s before it can be used. It is not sufficiently accurate to tune it to some other frequency within the model control band. How near the transmitter coil the wavemeter coil is fixed depends on the power output of the transmitter. If too close, a powerful transmitter could burn out the bulb. When adjusting the position, the glow brightens very rapidly as the distance decreases. The bulb is best sunk well down below the surface of the transmitter or the glow will not be seen in daylight. A peephole can be arranged, covered with celluloid or something similar. Note that whilst the bulb is glowing, it is absorbing power from the transmitter, and the spring-off push button is advised so that the bulb is not easily left on. Note also that when the location has been found for the wavemeter coil it must be fixed rigidly in position. It is no use trying to hold it there by hand for instance, nor even on a bracket that is easily bent, or it can be pushed out of place and give a wrong indication of the working. Not that it would give the wrong frequency, but the glowing bulb also gives an indication of the power, and this might be misleading.





"Divenamics"!

At the last I.R.C.M.S. contest the writer saw G.H-R's Radio Queen dive a little past the vertical. George said that as soon as it was given down elevator it liked to dive, and it was very soon necessary to give up again. Models have been known to crash through not pulling out of a dive. One cause of this is aerodynamic,

and does not usually seem to be understood.

The forces acting on the model in this case are the lift and weight as shown in Fig. 2. In "a" the centre of gravity is shown in front of the centre of pressure or lift, and in "b", the C.G. is behind the C.P. The model is considered as pivoting about the C.G. so it is necessary in "a" to have the tailplane at negative incidence to provide a downward force to prevent the lift rotating the model in a nose down direction. In "b" the tailplane force T.F. is in an upward direction to prevent rotation the other way. The C.G. stays in the same place but the centre of lift varies fore and aft with change in angle of attack. The amount of variation depends on the wing section used, a symmetrical section giving little change while an undercambered section may have the C.P. right behind the wing at small angles. Wing sections with a reflex trailing edge, such as R.A.F. 34 in particular have a very stable centre of pressure, and are likely to give far less trouble this way, but they give less lift.

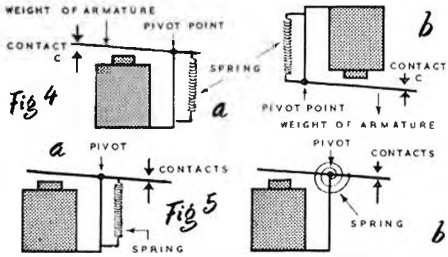
The trim of Fig. 2a was popular years ago because it is stable, but later 2b became more popular because it makes more efficient use of the lifting surfaces of wing and tailplane. The snag is that 2b can, under certain conditions get into a dive from which it will not pull out. Fig. 3 shows such conditions. Due to the wing section used the C.P. has gone back behind the C.G. as a result of decreasing the angle of attack for a dive. It will now need a large force from the elevator to pull the nose round. The writer once saw a model dive to the ground from a hundred feet or more without showing any sign of pulling out. It was learnt later that it was not the first time the model had done that. The radio could have failed on "up elevator" but it could also be the nose down moment produced by the dive.

A C.G. position of 50 per cent. wing chord is often used these days and sometimes people have difficulty in getting models to fly well. In many cases a model will fly better with the C.G. between 25 and 30 per cent. chord, with the tailplane incidence adjusted to suit. This is something that can be tried, because it is always safe to put the C.G. forward a bit. With no other alteration to the trim it merely means a slighter higher flying speed. The further forward the C.G. the more stable is the model.

Relay Design

A new relay has appeared on the market, having an unbalanced armature. This may be all right for boats or conditions where it is immoveably mounted, but the writer would not even look at it from less than ten feet, let alone touch it for model aircraft. Readers will have gathered that the writer is rather particular regarding relays so perhaps the reasons will prove interesting.

Fig. 4 shows the popular type of relay the writer loathes. In "a" it is shown the normal way up, and if kept in that position a well made one can be adjusted to operate in a sensitive manner with a small current change. Note that the weight of the armature is acting against the spring. Suppose now the relay is inverted as in "b" the weight of the armature is acting with the spring. The force now required to close the contact C will be much greater. With one such relay tested the operating point was set to 1·7 ma. to close, and 1·4 ma. to open in the normal position. When inverted the operating points became 2·3 ma. and 1·9 ma. respectively. An independent test with larger current flow gave 2.4 ma. to close and 2·4 ma. to open in normal position, and 2·6 ma. and 2·25 ma. respectively inverted. Another disadvantage of this type of relay is that if it is subjected to vibration at right-angles to the armature, the out of balance weight of the armature will cause it to lag

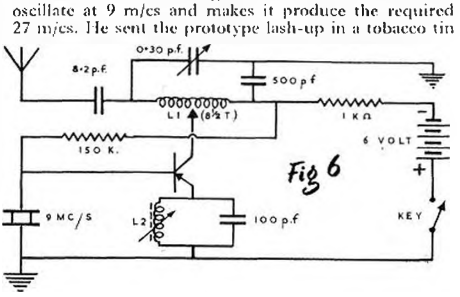


behind, and not much vibration is needed to falsely operate the contacts. Although the previously mentioned relay could be adjusted to open and close with a current change of 0·2 ma. it was stated after the independent tests, to be quite reliable under the normal working conditions of 1 ma. in excess of the operating point. In effect this meant a current rising from 0·5 ma. up to 2·5 ma. for safe operation.

In Fig. 5 is shown a relay with the armature balanced about the pivot point. The spring in "b" gives slightly better balance than "a" but with the spring close to the pivot, "a" is perfectly satisfactory in practice. Since there is no out of balance weight, inverting the relay does not alter the operating point. Moreover any vibration is transmitted through the pivot point which being at the centre of gravity of the armature moves it as a whole, and there is therefore no tendency for it to lag behind and falsely operate a contact. The only movement that could cause faulty operation would be a rotational force centred near to the pivot, and this would be very difficult to obtain. Relays of this type have been used by the writer ever since he started in radio control, and the only troubles experienced have been due to dirt in the contacts or magnet gap. The relay normally used is as small as any commercial type and the current change is from 1·5 ma. down to 0·5 ma. and has often been 1·4 ma. to 0·7 ma. The type of pivot favoured is a shaft pointed at both ends and running in adjusting screws like the balance wheel of a clock. This type of relay cannot be produced as cheaply as the unbalanced type, but is worth far more because it will operate reliably on less current.

Transistor Crystal Oscillator

We have another interesting item from David McQue, this time a crystal-controlled oscillator using only a transistor. The writer has known people in a favourable position to look out for transistors that could be made to oscillate at 27 m/cs for this purpose without success, and then David comes along with a transistor that will oscillate at 9 m/cs and makes it produce the required 27 m/cs. He sent the prototype lash-up in a tobacco tin



with circuit, and "please could he have it back as soon as possible". Details were quickly taken and another transistor checked for satisfactory operation, and later the new oscillator built up as shown in the photo, the circuit being given in Fig. 6.

The tuning coil L1 consists of 16 turns of 22 S.W.G. wire spaced to a length of $\frac{5}{8}$-in. on a $\frac{1}{4}$-in. diameter paxolin tube former. The tap on the coil at $8\frac{1}{2}$ turns may need adjusting a bit one way or the other for best matching to give maximum output. The 0-30 pf. tuning condenser should be of the airspaced variety. The one shown in the photo is actually 0-20 pf. according to the marking and is about the smallest design of this capacity. Coil L2 is 20 turns of 30 S.W.G. double silk covered wire close wound on a $\frac{1}{4}$-in. former with iron dust core. A purple ended core was satisfactory, and so was an unmarked ex-Government type, but a yellow-ended core did not work with this coil. However, the yellow core worked with a coil of 20 turns of 38 S.W.G. double silk covered wire. The base resistor should be adjusted to give minimum base current with reliable keying, the 150 k. shown being near enough to start with. Since the current flow is only about 1$\frac{1}{2}$ m/a the 6-volt battery can be made up from very small cells if desired. Those used in the picture were U16, and were wrapped in paper for protection from the metal clamp. The switch was made from a small piece of springy brass, bolted to the case at one end. A knob on the other end, projecting through the case enabled the strip to be pressed on to the battery positive end cap. The crystal holder was made from a scrap octal valveholder, one socket being soldered direct to the case, and the other soldered to a tag insulated from the case. The aerial is about a foot of solid wire or flex.

For the initial tuning of this oscillator the aerial was put very close to a super-regen receiver which was already in tune to the main transmitter. The oscillator coil was then tuned to give a current drop in the receiver. The oscillator was moved away so that the receiver current rose, and the crystal and the crystal coil tuned with the oscillator switched on to give a current drop in the receiver again. The oscillator coil was finally tuned at a greater distance.

The crystal is the one used in the normal transmitter so that the receiver can be tuned and checked at no more than a foot or two range. It needs to be one-third of the output frequency.

The transistor used by David McQue was a Pye type, and that used by the writer a B.T.H. GT13. This latter is easily obtainable through radio dealers though may not be in stock. The price has recently been reduced to about 25s. or 30s. A holder is used for the transistor to avoid the necessity of soldering with its risk of damaging the transistor. This holder is packed up from the bottom of the box to facilitate assembly.

The tin used by David McQue had a hinged lid, and it was interesting to see how he had put a small blob of solder, drawn up to a point, on the opposite side from the hinge, to make sure the lid was properly earthed to the box by a good rubbing contact.

MULTI-VIBRATOR CIRCUITS

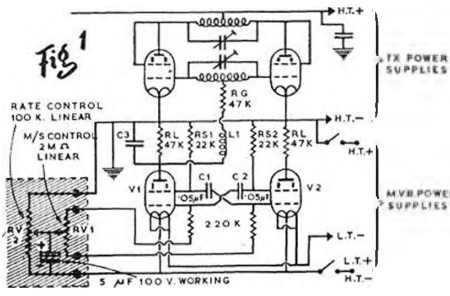
BY J. BLACKBURN

THE USE OF the multi-vibrator circuit to obtain mark-space modulation of transmitters for proportional control systems is well known. This circuit is used, for instance, in the "Galloping Ghost" systems as described in the July, 1957, AEROMODELLER.

The system as generally used is not completely satisfactory, however, as it is usual to use a relay to switch the transmitter on and off. This is noisy and, strictly speaking, crude. In the circuit about to be described it will be shown how the relay can be dispensed with giving the following advantages:

(1) The rate of pulsing does not necessarily have to be low enough for the average relay to be able to follow it.

(2) It dispenses with a relay that the impecunious modeller probably feels could be better employed in a receiver.



(3) The transmitter is completely silent, which mystifies the uninitiated.

Circuit

The multi-vibrator circuit now becomes an integral part of the transmitter circuit. It will be seen in *Fig.* 1 that the earth line of the transmitter is the H.T. line of the multi-vibrator, which requires a separate battery pack. At the anodes of the multi-vibrator valves, square waves are generated; each valve cuts off and conducts in turn, causing the voltage at the anodes to rise and fall. The anode load RL for V1 is also the grid leak for the TX; when V1 is cut off, this valve is effectively removed; RL then acts only as the grid leak for the TX, and oscillations are produced. When V1 is conducting, however, a large voltage is developed across RL; this voltage is sufficient to cut off both TX valves, and the TX will stop oscillating. Thus our TX is switched on and off completely electronically.

The multi-vibrator valves are of the usual type, *e.g.*, DL92,3S4, DL96, etc. In practice about 1m/A flows through an RL of 47K giving us by Ohm's Law about 50V, more than enough to cut off the valves.

The TX circuit shown is of the TATG type, with a single grid leak, and is the most suitable type of oscillator for this purpose. The circuit could be modified for use with the simpler type of cross-coupled oscillator, but the component values are much more critical (*Fig.* 2). RL should still be 47K. In all circuits a certain amount of fiddling with Rg may be necessary to keep the TX H.T. current at the right value. Rg may be as large as required but should not be less than 10K or it will cause excessive damping of the tuned circuit. In the case of the cross-coupled oscillator, the Cg's may have to be reduced in value—they can even be made by twisting two pieces of insulated wire together if necessary (this

should be done with the aerial connected). If the cross-coupled circuit will not work satisfactorily, the circuit could be modified as in *Fig.* 2*a*. This would most certainly work, but requires an extra valve, increasing the drain on the batteries. It would be better to change the TX to the TATG type, which is rather more efficient anyway.

L1 and C3 form a filter which stops the 27 Mc/s getting to the M.V.B. L1 is a normal 27 Mc/s R.F. choke, and on no account should it be omitted. Some experiment is possible with C3; it is not critical, but if large, the modulation square wave will be distorted. Try reducing it to 100pF.

The circuit could also be applied to the McQue TX. This is most simply done with the circuit shown in *Fig.* 3. The P/A valve only is modulated; RL and RB form a bleeder which gives a certain amount of bias even when the TX is oscillating; RB should be adjusted so that when the M.V.B. is switched off and the oscillator put out of action by removing the crystal, the current through the P/A valve is approximately 2Ma.

The writer has had some correspondence with Mr. McQue on this matter, and he suggests that this is not the best way to modulate the TX, since at very short range direct radiation from the oscillator causes a full mark to be transmitted. Mr. McQue is of the opinion that this is best overcome by modulating the oscillator as shown in *Fig.* 3*a*. In this case the bleeder RL and RB for bias on the P/A valve would still be used.

The writer feels, however, that it is better to modulate the P/A, as crystals do not react kindly to being switched on and off rapidly. It would be better to do that and mount the oscillator section in a metal screening can.

Layout

It is essential that the M.V.B. is mounted in the same box as the TX, as if it is mounted separately you would have 27 Mc/s travelling along about six feet of lead, which would be troublesome.

Since the M.V.B. has the normal earth-line as its H.T. line, care will have to be taken when wiring up. It is recommended that the unit be built on a paxolin sub-chassis. This can be very small; about 2 in. x 3 in. is big enough as there are very few components to be mounted on it. These may be soldered directly between the valve-pins provided that lengths of Systoflex are used to prevent any possibility of short circuits. Try and obtain matched C1 and C2 and RS1 and RS2. It would be advisable to fix a short tag-strip along one edge of the sub-chassis for external connections. A four-pin polarised socket should be fitted on one side of the TX case, to plug in the lead to the control box. A separate on/off switch for the M.V.B. will be required—in the H.T. line as well as in the L.T. line—since the pulse-rate potentiometer in the control box constitutes a bleeder across the H.T., which will become run down if the user forgets to unplug the box.

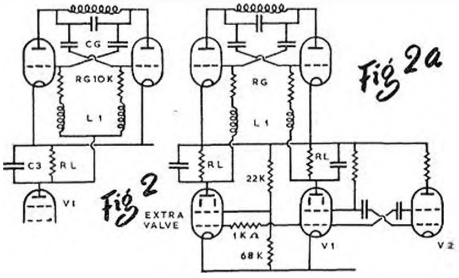


Fig 2a

Fig 2

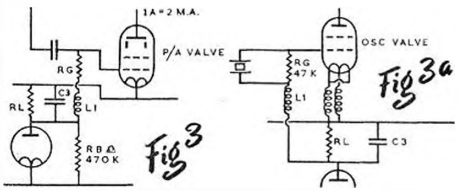


Fig 3

Fig 3a

The M.V.B. is very economical as regards battery consumption. In the original an Ever Ready B114 67½/1½V was used; this battery is quite compact being only 4 in. x 5 in. x 2 in.

Testing

Switch on the M.V.B., and check that it is working by touching just one lead of a pair of head-phones to one of the anodes. A clicking noise should be heard. With the M.V.B. switched off, the TX should still have the same anode current as before; if not, alter Rg as explained earlier. With the M.V.B. on, altering RV1 should alter the average H.T. current of the transmitter from nearly zero to almost maximum. Altering RV2 should have negligible effect. If it is not satisfactory, remove V2 from the M.V.B. which should then stop oscillating. Enough bias should now be developed across RL to reduce the TX H.T. current to zero. If it isn't try increasing RL to 68K. If this doesn't work, increase the M.V.B. H.T. to 90V. If it still doesn't work properly, check the valves and all wiring.

Multi-Vibrators

Finally, some hints on multi-vibrator design. A simple circuit for mark-space control is shown in *Fig.* 4. V1 and V2 are alternately cut off and conducting; the length of time that V1 remains cut off, and therefore the width of square wave produced, is controlled by the produce C2R2; this is the time taken for C2 to discharge through R2, and increasing the size of either of these components will keep V1 cut off for a longer period of time. Similarly for V2; its time constant is C1R1. The time taken for one complete cycle is therefore the sum of these time constants. Moving the slider along the potentiometer A will increase one time constant and reduce the other; the mark-space ratio will be altered but the frequency will remain substantially constant. Raising the potential at P by moving the slider up the potentiometer B will make both C1 and C2 discharge more quickly. The pulse-rate will therefore rise without affecting the mark-space ratio; the 5μF condenser will help here (its working voltage must be at least equal to the H.T. supply to the M.V.B.).

The "squareness" of the square wave is governed by the time constants C1R1.1 and C2RL2, which should be as small as possible. RL1 RL2 cannot be reduced too much or the valves will not amplify, so C1 and C2 must be kept small. To keep the frequency low enough for model use, R1 and R2 must be large. A 2 Meg potentiometer is the largest easily obtainable; this is about right. The potential at P has quite a large effect on the frequency.

The system works perfectly satisfactorily in practice.

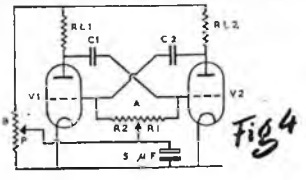
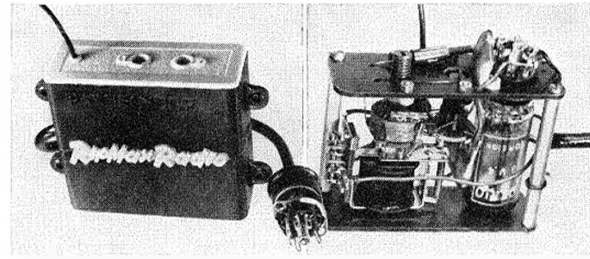


Fig 4

TRADE NOTES

FIRSTLY WE MUST correct a price error that appeared in our last issue relative to the *Hog* X-3 which is distributed in this country by **Messrs. Ripmax.** It was given in "Engine Analysis" as £3 15s. *plus* Purchase Tax, whereas the figure is, of course, inclusive of tax. Our apologies to Messrs. Ripmax who send this month a sample of their new radio control receiver, the *Pathfinder*. As can be seen from the photo the unit, including valve and relay, is totally enclosed in a very well designed case moulded in unbreakable plastic, and comes complete with 7-pin B7G plug and socket for £5 19s. 6d., including tax. By the time this is read a companion "Pathfinder" hand transmitter will be on sale retailing at £4 19s. 6d., which again includes tax.

The receiver is the single valve super-regenerative type giving a standing current of approximately 4·0 to 4·5 m/A. at 90 volts dropping to between 0·5 and 1·0 m/A. on signal. The case measures 3 x 2¼ x 1¼ ins., weighs 3¼ ounces and features two tuning controls which are clearly marked. It is furthermore sealed, as all servicing is carried out by the manufacturers under a special dealer scheme of which more anon. The hand transmitter, which we will be illustrating at a later date, measures 5 x 4 x 2½ ins., utilises a 3-ft. 14 gauge piano wire aerial, and is of the normal single channel carrier wave type.



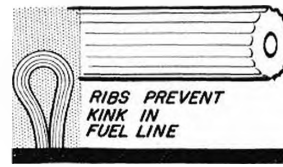
Ripmax Receiver is totally enclosed in neat plastic case as left. Right, view of the "works" not normally seen by customer as case is sealed

The recommended escapement for use with this equipment is, of course, the Ripmax "Mactuator" which we previously illustrated in our July, 1957, issue.

Messrs. Ripmax emphasise that all the above equipment is fully guaranteed and advise readers that a special servicing scheme is being arranged with appointed dealers who undertake to carry a minimum stock. These dealers will be supplied with a special test unit which enables them to check each set as it is sold and demonstrate it working to the satisfaction of the customer.

Comprehensive and well illustrated operating and installation instructions complete a radio control outfit that should prove extremely popular.

Also from Messrs. Ripmax comes a completely new line in fuel tubing, one of those simple, yet so far overlooked innovations, that improve beyond measure an already utilitarian product. As can be seen from our sketch the outer wall of the tubing is ribbed which completely overcomes the problem of kinking. Winding one of the samples into the tightest possible coils failed to close up the tube in any way. It is available in three bores: ⅛ in. at 3d. per foot; ¼ in. at 4d. per foot; and ⅜ in. at 5d. per foot.



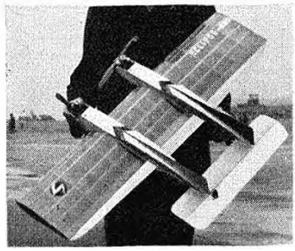
To conclude the news from Messrs. Ripmax, we hear that their new *V-Max* jet fuel will be on the market in the Spring. Already selling in vast quantities in the U.S.A., it reduces flying costs for this type of power unit to a mere "penny per flight" basis, and can be used in standard Jetex units.

All kinds of modellers will be interested in **Messrs. Gamage's** latest 128-page catalogue selling at 1s., which includes Trains, Boats, Cars, Aircraft, etc., and in particular a special feature on plastic kit modelling based on the recent AEROMODELLER articles on the subject. Well known for their extensive model department, which contains one of the finest collection of plastic kits in the country, Messrs Gamages enjoy the reputation of being probably the oldest model shop still actively trading.

The well known **Elmic "Limitank"** combination fuel tank and timer has been revised and improved and a Mk. II version is available at 7s. 9d. including tax. It is now only necessary to push down the knob to open the valve for filling, and a flick of the finger closes the valve for flight by means of an extended operating arm. This is much more simple in operation than the earlier engaging of a thread, etc.

Messrs. Bondaglass of 55 South End, Croydon, Surrey, have recently produced a most useful booklet by G. M. Lewis entitled "The Bondaglass Handbook". Fibre glass has a thousand and one uses in aeromodelling and modellers will find this handy reference work a really first class guide on the subject. All the technical facts relating to mixing are available with essential information on moulding and laminating given in detail. We thoroughly recommend this highly useful reference work and remind aeromodellers that for the engine and fuel tank compartments on power models where fuel seepage as the model ages

Two new style eft kits are the 22s. 6d. Contest Kits "Combat King" for 2.5-3.5 c.c. One shown at top is slightly modified, having an AM 35 and was built by D. Brunt of Cheadle. Bottom view is latest from Performance Kits of Coventry, a fully aerobatic stunter for any pair of engines totalling more than 3 c.c. It has flaps and is 42 in. span



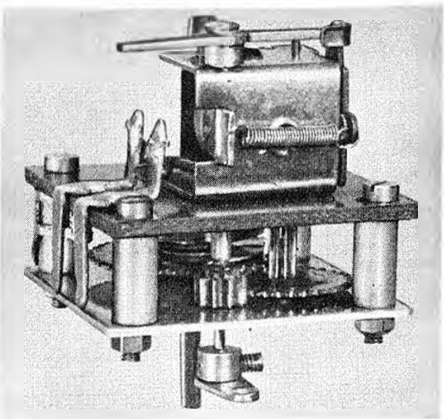
becomes a real problem, then "Bondaglass" is the answer. Applied to the inside of the structure when the model is new not only prevents the fuel problem but also gives tremendous strength at the expense of very little weight.

Balsa has many uses as we aeromodellers know too well, but there is one man who spends a great deal of time and money exploring every possible use that balsa can be put to in order to prevent wastage through offcuts. We are, of course, referring to John Paterson of **Solarbo Ltd.**, well known to AEROMODELLER readers through his interesting series of advertisements which tell the fascinating story of balsa from start to finish.

Latest, and most practical use that he has found for balsa offcuts comes in a sample parquet flooring block we have received which enables the do-it-yourself enthusiast to lay a magnificent floor in either sapele, oak or beech, according to taste. Measuring 8 x 2 inches the block consists of a $\frac{1}{4}$-in. layer of balsa sandwiched between a $\frac{3}{32}$-in. veneer of the facing wood with a $\frac{1}{32}$-in. sheet of obeche on the underside. Besides producing a very light wood tile we can also confirm that balsa wood included in a floor produces a remarkable effect acoustically in that it deadens sound to a pronounced degree. One half of the Solarbo works canteen is floored with balsa, the other with normal wood blocks. Passing from one side to the other we detected a most noticeable change in noise level which had nothing to do with the digestive tracts of the people eating there! Solarbo accredited dealers will be agents for this flooring with sales direct to the public.

Messrs. Harleyford Publications Ltd. ask us to point out that a revised reprint of their title "*Aircraft Camouflage and Markings* 1907-1954" is now available. Containing some 212 pages and profusely illustrated, in many cases with colour plates, this most voluminous reference work by Bruce Robertson costs 45s.

Fred Rising of Whissendine, whose throttle units for E.D. engines we described in our November, 1957, issue, has come up with another beautifully made radio control accessory, a clockwork escapement. Primarily designed for engine speed control it weighs only 1¼ ounces, occupies only 1¼ cubic inches and when fully wound gives over 100 revolutions, *i.e.* over 200 speed changes. Operating voltage is 4·5 volts and current drawn when held on is 270 milliamps. A key and



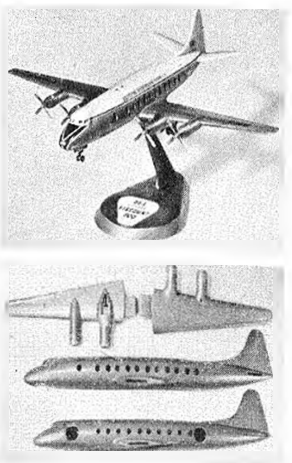
Rising Actuator on right, is shown approximately 1½ times actual size. Pawl is brass and coil chassis copper plated. Winding key shaft and actuating lever are on underside in this view

Below, latest from I.M.A. is the plastic Viscount 800, a faultless queen among the vast selection now available, with separate windows, super accurate detail and fine transfers. In lower picture we show how it forms a perfect mate for the earlier Hawk Viscount 700 in identical scale of 1/96

mounting brackets which permit vertical or horizontal mounting are provided, and the price is 32s. 6d. We can visualise many uses for this unit, which is a real precision job and trust that Fred will produce a variant less gearbox as lightweight rubber driven escapement.

Messrs. International Model Aircraft have produced what we consider to be one of the finest plastic kits yet in their "*Viscount* 800". Scale is 1/96th and refinements such as cut-out cabin windows with moulded "glass" for cementing on the inside, plus a most accurate and comprehensive transfer sheet in the correct BEA colour scheme, enable the builder to produce an outstanding model. We were impressed, too, with the comprehensive assembly instructions including a special set for the transfer sheet which give useful tips such as sliding the long fuselage strips off the backing paper *sideways* in order to prevent stretch. Having watched Junior struggle with these in the past we know this is sound advice and says much for the careful preparation that has gone into this kit. Undercarriage parts, propellers, spinners, fronts of nacelles, and crew cabin windows, etc., are all separate parts, with a handsome stand including swivel joint and transfer nameplate all included. Cement and a small bottle of white paint complete a real "value for money" kit at the modest price of 14s. 6d.

Plastic kit enthusiasts, particularly those who live in out of the way places should note that two specialist Mail Order firms are now catering for their needs. **Messrs. Redgates** of Sheffield and **Lerner Brothers** of Finchley offer first-class service to the plastic kit modeller be he interested in aircraft, boats, cars, or plastic knights, etc. Remember when ordering, and this applies to any reader who wishes to buy mail order, PRINT your name and address in BLOCK CAPITALS; list your requirements clearly; send the correct amount of money by crossed cheque or postal order; and do not forget to include the correct amount of postage. The number of orders we receive for *Aeromodeller Plans* and *M.A.P. Books* from apparently mythical characters with no roof over their heads is quite remarkable.



CLUB NEWS

Now is the time of Winter Social Activity in the Club movement—has your group arranged a social get-together?

This happy collection of NOVOCASTRIA members and friends was taken on the occasion of the club's social evening and prize-giving held at club H.Q. last season. In centre of group (uniform) is Club President, S/Ldr. James Rush, A.F.C.

MODEL TALK at the S.M.A.E. Dinner was quite naturally based on experiences with the new 1958 power rules and there seems to be a keen interest in the new heavyweights in the Northern and London areas. Talk of 2 : 40 from 7 secs. engine run was, of course, greeted with the usual raspberry, but from the number of witnesses of this performance, it seems there's a grain of truth in it and we expect some interesting new models in the first power eliminator.

London

ENFIELD AND D.M.A.C. have found things somewhat quieter after their busy summer contest season and have once more inaugurated their winter film show programme. They use the services of the local gas board, who provide the equipment. The only string being one of the films must be their's. One recent novel item was an experiment using one of those large polythene clothes bags, full of gas, the idea being to have an aerial firework display on November 5th. Unfortunately, it broke its mooring "cable" and owner Brian Downham now wishes to claim an unofficial "free flight polythene bag record" of 4 : 25 o.o.s. vertically upwards. 1958 C.L. Rally is not yet fixed, but will probably be July 8th or 13th, again with all classes as before, and may be stunt as well—Good show, if more rallies would take this up we would soon raise our standard to the International level.

ST. ALBANS M.A.C. recently had a film show consisting almost entirely of model films. Highlight of the evening was the showing of the S.M.A.E. film of the Nationals with Henry Nicholls to introduce it. They recommend it highly to other clubs. In the club's winter rubber and glider contests, D. Tipper placed top in Glider with 7 : 46 and Charlie Christy top in Rubber with 10 : 05. There's a great deal of interest in the new rule Wakefield and several prototypes are already airborne.

HAYES M.A.C. have their hopes raised for the future by acquisition of two new Enya 29's which are expected to bring interesting developments in Class B racing and open power. J. Banguley now has a 12-ft. span lightweight glider (see *Meanderer* in this issue) which unfortunately wandered away in the direction of the local gravel pit and had to be fished out. In spite of the large span, the model packs up into a relatively small box for transporting on the back of a bicycle. The Christmas competition for **FARNBOROUGH M.A.C.** was held in calm cold weather, and once again D. Sibbick came first with his Oliver Tiger *Helicanth II* which must have been some consolation for the loss of *Helicanth I* due to timer failure. Junior Beech played safe and used a graduated tank to come second. Following the discovery that an 8 x 4 for 2·5 c.c. and 7 x 4 for 1·5 c.c. provides a high rate of climb, the Farnborough lads are getting upstairs much quicker these days.

Mr. Sumner, head of the Aeronautical Section of the Science Museum, gave an interesting talk on the progress of aviation to the **NORTHWOOD M.A.C.**, whose main interest is in controline. A recent club contest consisted of an invitation to build models from one piece of 36 x 3 x $\frac{1}{4}$ balsa, the only extra timber allowed being hardwood and the range of entries varied from speed models to flying wings. **EPSOM AND D.M.A.C.** tell me that they are making preparations for the Bill White contest, but unfortunately no one has told me which day this will be held, so I cannot advise anyone when they should go to Epsom. Radio Control is showing a considerable upswing. Vic Rigby having a new small size model with an E.D. 2·46 which flew fast, furious and terminated in a spot of crankshaft bending. Vic's next model is to be a *Breathless* with Babcock compound escapement. Another advanced American design, the *Triple Threat*, is coming along with multi-channel so that Epsom hope to be up with the LARKS in 1958.

Southern

Over in the Isle of Wight, the **SHANKLIN A.M.** Club has been formed, and although they cannot boast of great model achievements, have refreshments available in their club room. Distance flying seems to be their main interest, in spite of the water-bound situation and the record appears to be held by a Super Merlin powered Keil Kraft *Pirate*, which flew for three miles.

Midland

The weather was kind for the **LOUGHBOROUGH COLLEGE** winter rally on November 17th. Mist reduced visibility but luckily the wind was light. There were very good entries in all events and the high standard of flying showed up when, by three o'clock there were five in the power fly-off and three in the rubber. All contests were for open models with four flights of three minutes maximum each flight. For the fly-off it was decided most fair that the models go off nearly together and the timekeepers walk under them to get results in the mist and light wind. In the glider event nobody obtained four maximums but the first three places were very close. The combat proved very interesting and the final was fought out in failing light conditions. Thanks are due to the members of **FORESTERS M.F.C.** for handling the combat and team race events.

Open Power (fly-off times)

		Mins.
1. J. O'Donnell (Whitefield)	...	6 : 29
2. R. Gray (Wakefield)	...	4 : 36
3. M. Gaster (Surbiton)	...	4 : 14
4. A. Young (Surbiton)	...	4 : 05
5. Muller (Surbiton)	...	3 : 06

Open Rubber (Fly off times)

1. J. O'Donnell (Whitefield)	...	6 : 21
2. P. Read (Birmingham)	...	5 : 27
3. R. Lennox (Birmingham)	...	4 : 23

Open Glider (Total times for four flights)

1. Watson (Whitefield)	...	11 : 17
2. A. Farrar (Wakefield)	...	11 : 11
3. Wisher (Surbiton)	...	11 : 03

Combat

1. Keeling (Rangdipoids).
2. Lomas (Rugby).

Team Race

1. First (Heath).
2. Geeson (Long Eaton).

LEICESTER M.A.C. have a full winter programme with talks on engines, radio control, and winter competition, film shows and indoor flying to occupy the fortnightly meetings. **RUGBY M.E.S.** have had their A.G.M. and prize-giving with Roger Dowdeswell collecting the rudder trophy, John Bickerstaffe, power, and Ken Sansom, glider. The best all-rounder was voted to be J. Andrews, and Ian Lomas took the controline shield for his recent combat successes. Because the club have lost the use of Church Lawford flying ground, they are now flying in co-operation with the neighbouring **COVENTRY** club.

Northern

Final contests for the 1957 season were held at Halton Moor, Leeds, for the **BAILDON M.F.C.** and the only people who managed to keep warm were the muscular types entering the chuck glider event. This was won once more by Frank McNulty and for the third year running Les Hey secured the A.1 trophy. A new event was run for the first time. This was a precision contest for a trophy recently donated to the club on the understanding that any member should be eligible to win it, and consisted of making three flights as

Contest Calendar

February 2nd

N.W. Area Winter Rally, Stretton, Nr. Warrington. All F.F. class, C.L. Rat Racing, R.C. See under N.W. Area News.

February 22nd/23rd

Indoor Nationals, Corn Exchange, Manchester. Chuck Glider, Microfilm, Tissue Covered classes.

near as possible to a pre-determined time for each round; it provoked great hilarity and excitement and was eventually won by Silvio (flying a glider, believe it or not) with a lead of one point over his nearest rival, competition secretary Gerry Tideswell.

South Midland

NORTHAMPTON M.A.C. is showing an interest in radio control slope soaring following a visit to the St. Albans meeting at Ivinghoe Beacon and there's mention of a 15-ft. giant power-assisted glider in their newsheet. Any unattached modellers wanting to join in the winter activities would be welcome at the Boys' Brigade Hall. But when?

North Western

At the A.G.M. of the North Western Area, the chairman reviewed the 1957 season and noted that the area was maintaining its position as one of the leading areas in the country, although there was a decrease in entries largely due to the distances in travelling to area centralised contests. Mr. Neild has presented a trophy for radio control to the area and the date for the winter rally is announced as February 2nd at Stretton Aerodrome, near Warrington, with all free-flight events, plus radio control and a controline "Rat Race" (any type of model eligible) for Class A up to 3·5 c.c. and Class B over 3·5 c.c. Novel event after the Annual Dinner came when the four top glider experts in the area, Stan Hinds, John O'Donnell, Joe Chadwick and John Hannay, who were blindfolded and given paper gliders for a small contest. It seems needless to relate that the first prize went to John O'Donnell. The Indoor Meeting to be recognised as the British Indoor Nationals will be held at the Corn Exchange, Manchester, on February 22nd/23rd, with classes for Chuck Glider, Microfilm and tissue free-flight. Further details can be obtained from R. Musgrove, 81 Moorbey Street, Oldham, Lanes., or R. Chadwick, 129 Mottram Road, Stalybridge, Cheshire.

A point about the winter rally on February 2nd is that all controline entrants must display their own S.M.A.E. number on the top surface of the port wing with minimum size ¾-in. figures. Send to R. Chadwick as above for pre-entry. **ASHTON M.A.C.** celebrate their coming of age in 1958 with twenty-one years of activity and hope to promote an open rally and model exhibition to celebrate. Congratulations are due to Junior Pete Grimshaw flying in his first contest, who surprised everyone including himself by beating Charlie Jackson in the finals. **SOUTHPORT M.F.C.** attended an inter-club competition at Blackburn where Doug Barber launched his new powered model in the verge of dusk and a stuck cut-out resulted in a 35-seconds engine run. The model had an Mag engine, red wings, black fuselage, and anyone hearing of the lost model can notify me, when I will be pleased to pass on the necessary information.

SHARSTON D.M.S. have been very busy of late designing and building an 8-ft. span Avro Lancaster powered by four Eta 29's, which they hope will be ready for the 1958 Nationals. Indoor Team Racing record stands at 90 secs. over 30 laps including winding up the rubber motor. Top men in the **WIGAN M.A.C.** for 1957 were B. Talbot in power and rubber, and S. Wood in glider. Mike Hosker was the leading junior, and I am told that we must look out for this name in future contests. Two large silver cups have been presented by the local model shops, one to be known as the J. J. Bradburn and the other one to be known as the Jack Carrington Trophy.

Scotland

MONTROSE M.A.C. announce that they are out of debt at last after being in the new place more than a year and a half. They have been able to revive some of its cosy social activities. They held a Halloween night especially for Martin Dilly of Croydon, and had the traditional Donking and Scone-licking contests and other activities in which even some of the courageous young ladies who attend took part. It was the first party they had ever had that required a microphone to control it. The local Rock/Skiffle band played to beyond the point of exhaustion and is the first (and possibly the last) to include a Wakefield fuselagist in some of the numbers. At the **ANGUS AND D.A.L. A.G.M.** a strong element was in favour of having six A/2 events again in 1958 as it had brought record entries in 1957, however, half the meeting was against so many in the same class, so a compromise was reached which plans 15 events, namely five classes, A/1, A/2, open rubber, open power, and F.A.I. power, there being three competitions on different days for each of the above. There will be six contest days altogether, every month, April-September inclusive. The scale contest has been held over till 1959 and there appeared to be no demand for an unrestricted glider competition. A new trophy "The Grampian Cup" will now go annually to the league's best F.F junior member. In the club champion-ship list for 1957 the order was: 1st Montrose, 11,296 pts.; 2nd Bucksburn 7,108 pts.; 3rd Arbroath, 4,917 pts.; 4th Kinriemuir, 3,957 pts.; and Dundee 1,505 pts.

Pen Pals

A pen pal is requested by A. E. Walker of 3 Driffold Cottages, Church Road, Maney, Sutton Coldfield, from East Germany with the intention of improving Mr. Walker's knowledge of the German language. He is not keen on controline, but has an interest in A/2 and Contest Power. Pen Pal is also requested for Gerard Maisel, Netherby, Abingdon Road, Kenilworth, Cape Town, South Africa, who is mainly interested in controline and gliders.

J. N. Bowyer of 70 St. Andrew's Road, Bebington, Cheshire, wants to contact an American modeller with special interests in the new three-line Flight Control.

G. Wyhacik, of Ceske Budijovice, J.S. Baara 13, Czechoslovakia, wishes to correspond with a British aeromodeller, and from the photos he has sent, he has a keen interest in F.A.I. power and Radio Control.

B. van Dijk, Ruijsdaelstraat 5, Leeuwarden (Fr.), Holland, is 25 years old, is interested in free-flight power, gliders and controline, and would like to correspond with any English-speaking pen pal.

The CLUBMAN.

NEW CLUBS

DUFFIELD D.M.A. and E.C.
J. M. Orme, 13 Wirksworth Road, Duffield, Derby.

RAMSGATE M.A.C.
F. Nottingham, 56 Chatham Street, Ramsgate, Kent.

BEXHILL & DISTRICT A.C.
E. L. Wilson, 16 Springfield Road, Bexhill-on-Sea, Sussex.

BEMBRIDGE M.F.C.
A. Robinson, "Dawn", Margate Road, Bembridge, Isle of Wight.

GATESHEAD M.F.C.
K. Eustace, 257 Coatsworth Road, Gateshead 8, Co. Durham.

LEATHERHEAD & D.M.F.C.
M. G. Dias, 21 Orchard Close, Fetcham, Nr. Leatherhead.

SECRETARIAL CHANGES

DUNMOW M.F.C.
D. H. Gardner, 10 Highfields, Gt. Dunmow, Essex.

HARLOW M.A.C.
E. B. Vincent, 111 Ladyshot, Harlow New Town, Essex.

HULL PEGASUS
G. A. Gooding, 112 James Reckitt Ave., Garden Village, Hull, E. Yorks.

WORTHING M.A.C.
J. Bashford, 15 Beeches Avenue, Worthing, Sussex.

CHESTERFIELD SKYLINERS M.A.C.
A. Shapcland, 55 Keswick Drive, Newbold, Chesterfield.

GLASGOW M.A.C.
A. Finch, 595 Paisley Road West, Ibrox, Glasgow, S.W.1.

GLEVUM (GLOUCESTER) M.C.
R. P. Roles, 53 Park Avenue, Longlevens, Glos.

YORK M.A.S.
D. Gilchrist, 21 Melwood Grove, Acomb, York.

URMSTON & D.M.A.C.
K. W. Holme, 3 Wycliffe Road, Urmston, Manchester, Lanes.

WANSTEAD A.C.
D. Howell, 49 Monmouth Road, East Ham, London, E.6.

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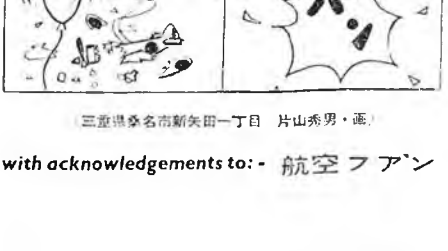

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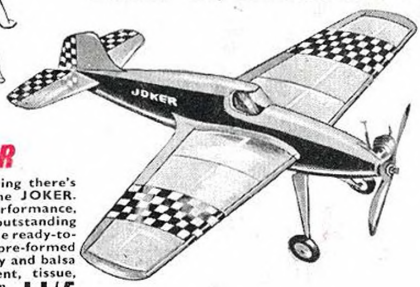

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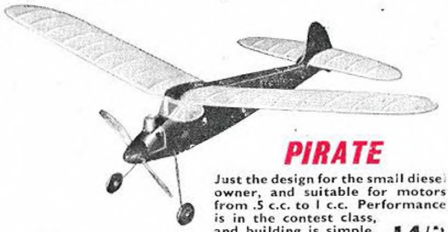

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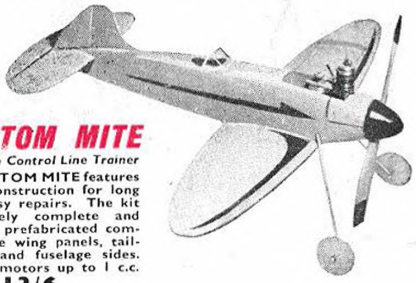

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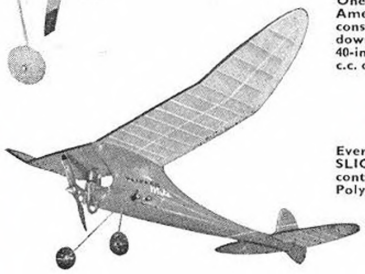

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