JULY 1957

AERO MODELLER

True Arch. Whitehouse action story with detailed SOPWITH SNIPE drawings

1/6

BAMBI

The World's smallest production diesel engine. This has been developed for the experienced Modeller and is ideal for small scale models. Complete with metal propeller blank.

Bore—.218"
Stroke—.250"
Capacity—.15 c.c.
—.009 cu. ins.
Weight—¼ oz.
Propeller—4½" dia.

Price £3. 5. 0
P. Tax 12. 6
Total £3.17. 6

DART

Undisputed champion of the 'point fives', it is built like a watch and has a performance that would not disgrace many larger engines.

Bore—.350"
Stroke—.350"
Capacity—.5 c.c.
—.03 cu. in.
Weight—1½ ozs.
Propeller—C/L 6" x 4"
—F/F 7" x 4"

Price £2.14. 0
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STANDARD MERLIN

For those with a tight budget this is the ideal engine. All the virtues of the Super Merlin, but without the extra fittings. Positive lock needle valve.

Bore—.375"
Stroke—.420"
Capacity—.76 c.c.
—.046 cu. ins.
Weight—1¾ ozs.
Propeller—C/L 6" x 6"
—F/F 7" x 4"

Price £1.16. 9
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SUPER MERLIN

Performance is as good as it looks, and it really is easy to start and operate. Complete with propeller, spinner and tommy bar.

Bore—.375"
Stroke—.420"
Capacity—.76 c.c.
—.046 cu. ins.
Weight—1¾ ozs.
Propeller—C/L 6" x 6"
—F/F 7" x 4"

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SPITFIRE Mk. II

The perfect engine for the beginner. Combines easy starting, flexibility and long life with sparkling performance. A limit stop ensures that the compression setting can be found without difficulty.

Bore—.425"
Stroke—.420"
Capacity—1 c.c.
—.06 cu. ins.
Weight—3 ozs.
Propeller—C/L 7" x 5"
—F/F 8" x 4"

Price £2. 4. 1
P. Tax 8. 6
Total £2.12. 7

SABRE

This powerful motor is ideal for the smaller radio control model as well as free-flight and control line. Complete with propeller, spinner, tommy bar and plastic fuel tank.

Bore—.525"
Stroke—.420"
Capacity—1.49 c.c.
—.09 cu. ins.
Weight—3½ ozs.
Propeller—C/L 7" x 6"
—F/F 8" x 4"

Price £2. 4. 1
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Total £2.12. 7

RAPIER

A high performance engine with twin ball races, downdraught carburettor and rear rotary valve. Provision for a two-speed fitting or choke assembly makes it ideal for contest work and radio control.

Bore—.580"
Stroke—.575"
Capacity—2.49 c.c.
—.15 cu. ins.
Weight—5½ ozs.
Propeller—C/L 9" x 6"
—F/F 9" x 4"

Price £3. 7. 0
P. Tax 12.11
Total £3.19.11

MANXMAN

A powerful, rugged motor suitable for the larger model especially for radio control work. Complete with spinner, tommy bar, and integral plastic tank.

Bore—.687"
Stroke—.562"
Capacity—3.5 c.c.
—.21 cu. ins.
Weight—5½ ozs.
Propeller—C/L 9" x 8"
—F/F 10" x 6"

Price £3. 5. 0
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Total £3.17. 6

Engineered to last a modelling lifetime by DAVIES CHARLTON LTD.
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THE SOLARBO BALSA STORY

by JOHN PATERSON
MANAGING DIRECTOR, SOLARBO LTD.

PART 3 OF A SERIES OF TWELVE

BALSA-METAL SANDWICH

The design of the Balsa Sandwich, as I told you last month, used a light core with strong faces on it. Nevertheless, the Balsa Wood was strong enough to develop the full strength of the thin three-ply faces which were used.

The next stage in Balsa Sandwich construction was developed in America. I think it was Boeing who conceived the idea of making a floor for aircraft using end grain Balsa Wood with aluminium faces. Aircraft floors had been produced here with aluminium faces on longitudinal grain Balsa, but it was a complicated process involving the sticking of aluminium to plywood and then sticking the combined aluminium/plywood to the Balsa Wood.

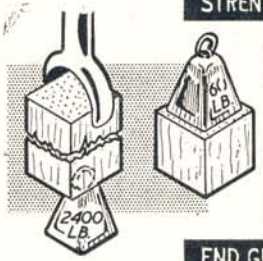
GLUES AND GLUING

At this time there was not available the great range of synthetic resin glues which we know today. The really important thing about the synthetic resin glues, is that they can be set off—that is, made to glue two surfaces together—very rapidly, either by the application of heat or sometimes by adjusting the two chemicals involved, i.e., the resin and the hardener.

Why is this important? The answer is that whatever you make you have to use Jigs, Clamps or a Mould. The quicker you can release these to receive the next pieces, the lower your production costs.

For instance, to make plywood you use a big steam-heated multi-platen press costing, perhaps, £10,000. This press will be capable of giving a pressure up to 200 lb. per sq. in. over the platen area and produce eight sheets of 8 x 4 ft. plywood in a matter of approximately 10 minutes. In our works we have a smaller press capable of a temperature of up to 150 degrees C. It has a platen size of 36 in. x 30 in., which is generally big enough for the type of work we do, and a hydraulic ram capable of exerting a pressure of five tons.

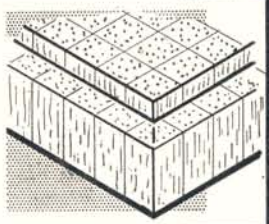
STRENGTH OF END GRAIN BALSA



In general, synthetic resin glues need close contact between the pieces to be glued together, often of the order of 150 lb. per sq. in. Now Balsa Wood is very much stronger with the grain than across the grain. If you take a piece of block Balsa, which will probably be soft, and squeeze it, you will find that your thumb will go right into it. If you bang it on the floor, end on, it will ring like a piece of deal and hardly dent.

Putting this into figures, it will stand, say, 600lb. to the sq.in. on end grain. It takes very little force to pull it apart across the grain, but it will take 2,400 lb. to the sq. in. to pull it apart longitudinally. Herein lies the reason for using end grain Balsa.

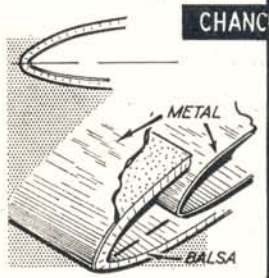
END GRAIN SANDWICH CORE



Because of the low pressure that Balsa Wood will stand, it is difficult to stick a metal, such as aluminium, to the face of a Balsa Wood sheet. But with end grain, Balsa Wood high pressures can be used and so make an effective joint.

If you will look at the sketch alongside, you will see what this end grain core looks like. It is quite a job to make it as you have to glue up a series of small pieces of Balsa Wood into a big block and then slice off a section, say ½ in. thick, but you will see that you get away from the weakness that I mentioned earlier on. The fibres now go the other way and you get a much higher shear strength, to develop the full strength of, say, an aluminium face.

CHANCE-VOUGHT LEADING EDGE



Chance Vought Aircraft went further than this. They applied a sheet of aluminium to one face of this ½ in. thick end grain slab of Balsa Wood and found that you could bend it right round (with the aluminium on the outside) and form the leading edge of a wing. By then gluing an aluminium sheet on the inside they held it rigidly in position and made a very simple, strong and aerodynamically clean section.

You can try this yourself by sticking a piece of cloth (something like an old handkerchief) on to a sheet of, say, ⅛ in. Balsa Wood. The sheet can be bent right back on itself, if you keep the cloth face on the outside and bend across the grain. If you try to bend it the other way—with the grain—you will find it will not work.

Next month I will tell you more about glues and gluing.

MODEL BOAT RADIO CONTROL

NINETEEN CHAPTERS • OVER 150 DIAGRAMS

INTRODUCTION Basic principles. Permitted frequencies. Obtaining licence and conditions of issue. **THE MODEL** Prefabricated kits. Assembly. Hatch security. Earth plates. Stern tubes and shafts. Rudders and rudder control. Kitchin rudder. **PROPULSION** Diesel, steam or electric. Batteries. Rechargeable batteries. Selection of propellers. Estimating required size. Typical commercial motors. **COMPONENTS** Resistors. Ohm's Law. Variable resistors. Chokes. Tuning coils. Switches. Plugs and sockets. Grommets. Valves. Self-tapping screws. Aerials. Symbols. **RELAYS** Method of operation. Types of relay. Equipment for adjusting. Test panel. Relay settings. Adjustment. Pre-adjustment check. **COMMERCIAL EQUIPMENT** Advantages of ready-made equipment. E.D., Triang, Sallis and E.C.C. equipment. E.D. clockwork escapement. Ripmax steering unit and control box. Fenners-Pike steering unit. **SOLDERING** "Practice makes perfect." Value of special radio soldering iron. Cored solder. Heat shunts. Tag and plug connectors. **QUENCH COIL & CHOKE WINDING** Simple methods. Clamp for hand-drill. Spool winder. Geared winder with counter. Bobbin construction. Winding quench coils. **SOFT VALVE RECEIVER (XFG1)** Full-size panel diagram, constructional details and circuit diagram. **THE HARD VALVE RECEIVER** Panel and circuit diagrams, constructional notes. Winding and tuning coils and quench coil. Making bobbins and formers. **HAND TRANSMITTER** Half-size chassis assembly parts. Construction of tuning coil. Assembly of parts. Circuit diagram. Components required. Case. Aerial. **PORTABLE TRANSMITTER** Half-size chassis parts. Details of construction. Winding of coil. Keying choke. Circuit diagram. Aerial mounting. **A LOW POWERED CRYSTAL CONTROLLED TRANSMITTER** Virtues of crystal control. Circuit diagram for transmitter. Screen. Tuning. Case. Aerial. **INSTALLATION OF EQUIPMENT IN THE MODEL** Shock absorbing mounting methods for receivers. Battery fixing. Engine mounting. Accumulator boxes. **INSTALLATION OF EQUIPMENT IN *SEA COMMANDER*** Layout of components in hull. Location of batteries. Indicator light. Switches. Battery mounting. Suitable components and meters on surplus market. **AIDS TO TUNING & TESTING** Field strength meter. Wavemeter. Inexpensive D.C. Testmeter. Large type test unit. Low power crystal oscillator. Domestic radio as signal generator. Pre-sailing routine at home and at place of operations. **TUNING** Checking frequencies. Further adjustments of standing current. Trimmer tool. Capacity effects. Aerial length. Testing loop. Automatic keying unit. **INTERFERENCE & SUPPRESSION** Intermittent interference. Insulation. Smoothing. Ignition wiring. Spark suppressor. **DO'S & DON'TS; FAULT FINDING** Things to watch for. Common troubles and their cure. Positive action. Things to avoid. **APPENDICES** Useful materials. Resistors. Condensers. Batteries. Useful tables. Adapting Govt. surplus switch. Care and storage of equipment. Glossary and abbreviations.

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108 pages, 8½ by 5½ ins., 8 pages art plates; over 150 diagrams, many full-size or dimensioned.

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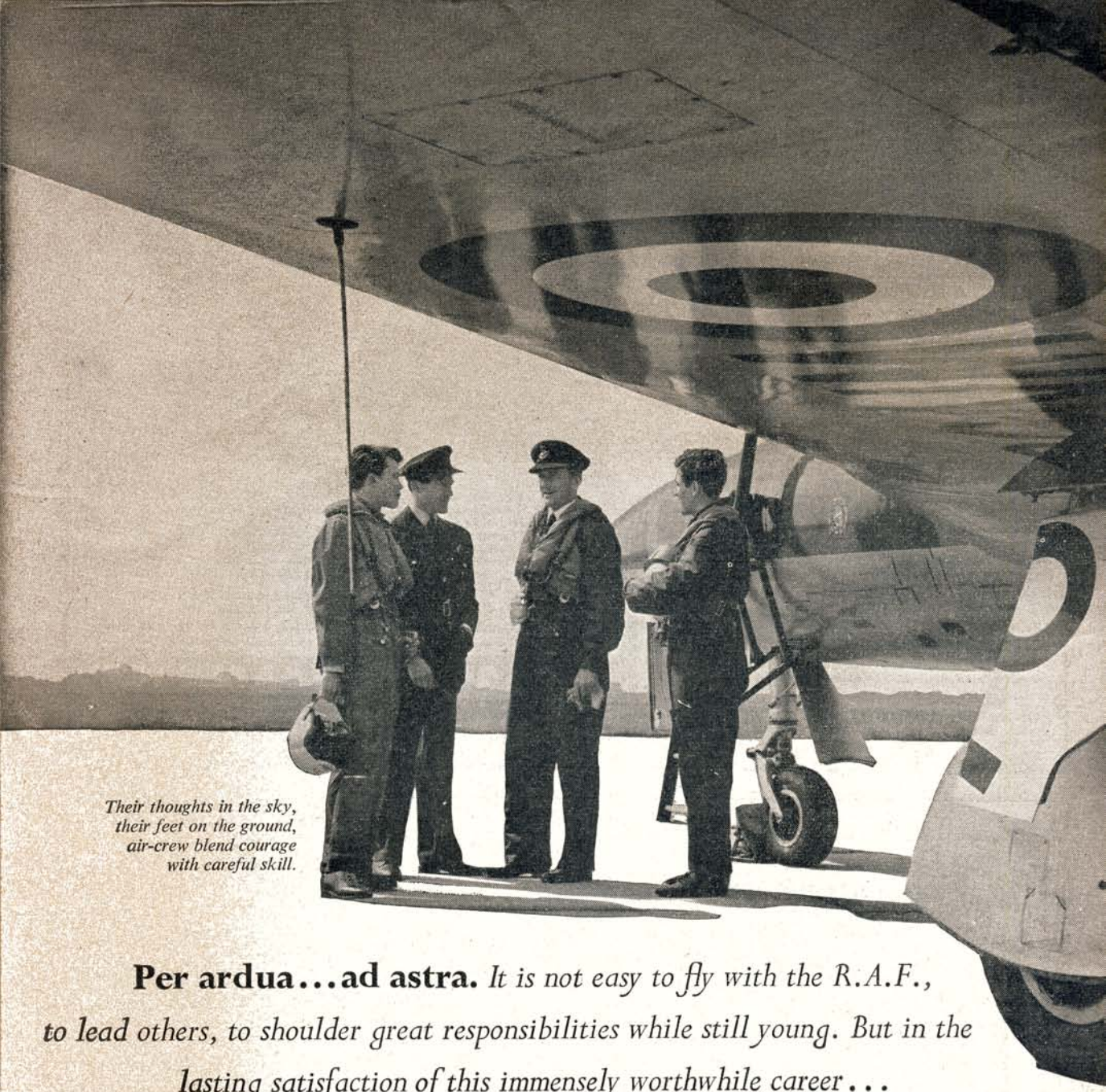

Their thoughts in the sky, their feet on the ground, air-crew blend courage with careful skill.

Per ardua...ad astra. *It is not easy to fly with the R.A.F., to lead others, to shoulder great responsibilities while still young. But in the lasting satisfaction of this immensely worthwhile career...*

great effort finds great reward

A YOUNG MAN'S DREAM may dwell on flying — on the exhilarating challenge in the airy spaces of sky. His common sense tends to call him back to earth—to consider the future and the building of a career.

Feet on the ground

In the Royal Air Force today you can satisfy both these demands — and the new appointment of Air Electronics Officers means more can now fly. These highly skilled men are trained to be responsible for all the electronic devices in the new V-bombers. But aircrew are much more than flyers. They are often seconded for other important work in Britain and abroad. Training others, international liaison, aircraft development — these are but some of the jobs that may come your way. And responsibility grows fast. You can be a Group Captain while in your early forties, responsible for perhaps fifteen hundred men and several squadrons of modern aircraft. Beyond that? There is no limit. Quality counts in the R.A.F. and there will always be room at the top for good men.

A sure future — good pay

You can join the R.A.F. through the Direct Commission Scheme, confident of a permanent career right up to pension age. Or you can choose a twelve year engagement, with the option of leaving after eight. If you leave after 12 years you take back to civilian life a tax-free gratuity of £4,000! Whichever you choose the pay is good. At the new rates, a Flight Lieutenant of 25 for instance, can draw, with full allowances, about £1,500 a year.

Present action — future perfect

Travel, adventure, opportunity, achievement . . . here is a unique chance to blend them all in the satisfaction of a great career. Are you qualified to grasp it?

HOW TO FLY WITH THE R.A.F.

You must be between 17½ and 26 and absolutely fit. You must have General Certificate of Education or Scottish Leaving Certificate or their equivalents. You must be able to lead others, and you must have aptitude as well as enthusiasm for flying. If you feel you have all these qualities, write at once for details of the schemes of entry to the Air Ministry (AM.305d), Adastral House, London, W.C.1. Give date of birth and educational qualifications.

RESPONSIBILITY. To fly with the R.A.F. is to work with the most dependable men in the world, confident and well qualified for each of the many calls on their skill and initiative.

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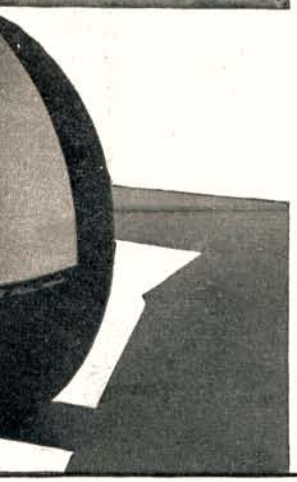
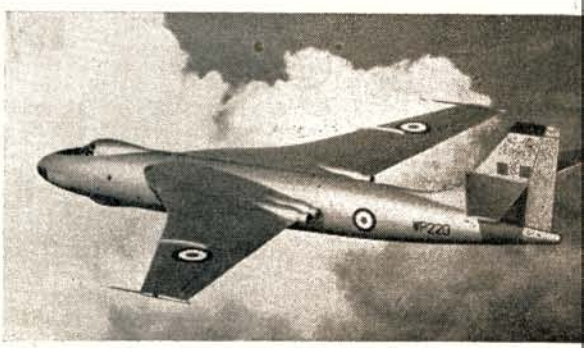


The Royal Air Force

Flying . . . and a career



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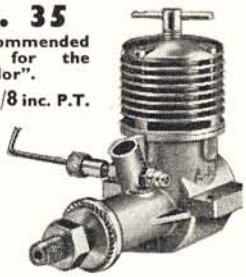
A.M. 35
The recommended engine for the "Toreador". Price 71/8 inc. P.T.

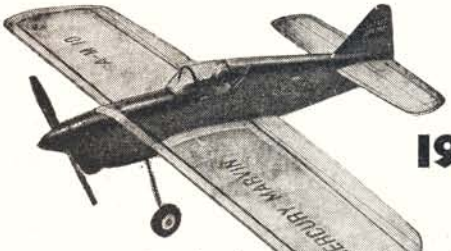


"The TOREADOR is a rugged, fast fully aerobatic flying wing for combat and stunt flying that has been designed especially to stand up to the roughest treatment. I thoroughly recommend it to those modellers who want a combat model of proven performance that is easy to build and as stable as any conventional stunt job in the air."

Henry J. Nicholls

MERCURY— THE RANGE THAT ALWAYS HAS SOMETHING *NEW*

MERCURY MARVIN



19/6

This up-to-the-minute design for a 1 c.c. powered stunt model that will go "right through the book" is what many C/L fliers have been waiting for.
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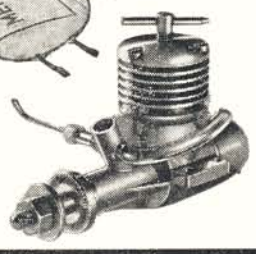

A.M. 10
The recommended engine for the "Mercury Marvin". Price 58/6 inc. P.T.

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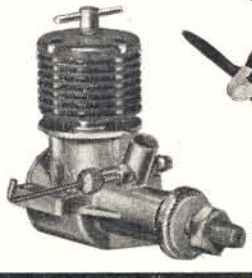
A wonderful model of the greatest fighter aircraft of all time—the fabulous Spitfire.
With the exclusive Mercury MASTERBILD pre-cut Balsa parts. The elliptical wings are shaped to a true airfoils section and need only slight sanding to finish.

37/6



A.M. 25
The recommended engine for the "Spitfire V". Price 68/6 inc. P.T.

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AERO MODELLER

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

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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:

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38 CLARENDON ROAD, WATFORD HERTS
TELEPHONE: GADEBROOK 2351 (Monday-Friday)

Wearing our best Bonnet!

WE IMAGINE THAT quite a number of our readers will do a "double-take" when looking at the front cover of their favourite magazine this month. We know they will admire the fine painting of Billy Barker's Sopwith Snipe by aviation artist and aeromodeller Laurie Bagley. They will undoubtedly wonder at such a radical change of cover style and may wish to know the reasons why our style of bonnet changes so drastically from month to month. And make no mistake, it will continue to change. Varying from dynamic paintings such as the Snipe, to colourful photographic covers such as the Cougar on our May issue and the "Spirit of St. Louis" on our June number. We have, for instance, a particularly fine cover featuring the D.H. Rapide for August, and an unusual shot of a model Ju 87 Stuka for September. After that . . . well that would be telling! Although we can assure you that there are some very fine Bagley paintings on their way.

AEROMODELLER has never stood still in its endeavour to set the standard in world model aviation literature, a standard that we strive to maintain and improve with each successive issue. We make no secret that we set our bonnet at new readers, principally through our cover, whilst zealously providing for our regular readers, who know that whatever surprise the cover has in store, they will find within the contents a balanced aeromodelling diet of first-rate material, both in quality and quantity.

Continued rising sales permit us to say in all modesty that our policy is a successful one, and from the readers' viewpoint as well as our own it is comforting to know that the more people who read AEROMODELLER the better the diet we are able to provide, particularly in these days of rising production costs in the publishing industry.

AEROMODELLER will always be a one hundred per cent. model aviation journal which does not prevent us from including authentic stories of the men who flew historic machines such as the Snipe, or even the men flying our modern jets. The human story is invariably the most interesting one, and followers of "Aircraft Described", indeed all readers, will be intrigued by Arch Whitehouse's graphic account of Major Billy Barker, V.C., whose courage and ability are oft passed by when World War I aces are under discussion. They will be equally intrigued by Peter Grey's accurate three-view 1/72nd scale drawings of Barker's Sopwith Snipe which represent many hours of painstaking research.

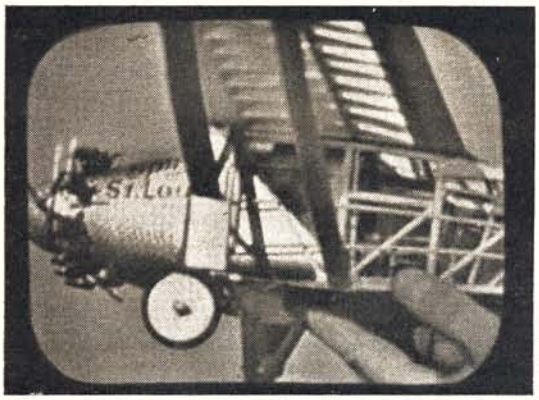
This is but one facet of our content. For flying scale fans there is a superb scale model of the Cessna 172 equally adaptable for free flight or radio control. Mentioning this latter subject reminds us that we have something special for the radio boys this month. None other than the "Galloping Ghost".

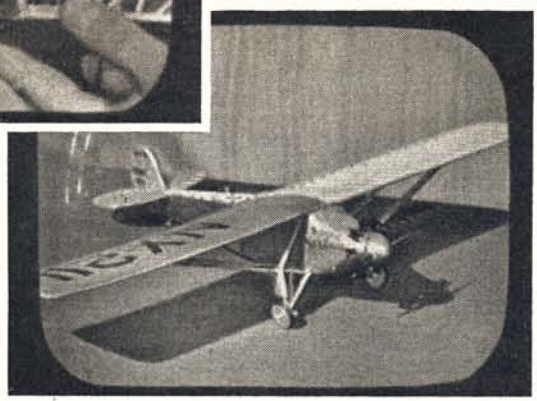
"Who, or what, is the 'Galloping Ghost'?" Well, turn to page 375 and find out!

"How about me?" says the contest modeller. What better than an account of the South African Nationals by celebrated modeller "Doc" Allen. A report that includes the first stage of the adventures of those two Californian globe trotters, Howard Bonner and Bob Palmer.

Journeying from the U.S.A. to South Africa, where they demonstrated throughout the Union, they came via Brussels to this country. Here as our guests, they showed thousands of British modellers their technical skill when they flew at Woburn Park, home of the Duke of Bedford. There is no doubt that they set a standard of modelling perfection that we have yet to achieve, and in doing so inspired many modellers to greater efforts in control-line and radio control flying.

Heard at the HANGAR DOORS





AEROMODELLER display in Warner Theatre foyer during premier of Spirit of St. Louis film was very beautifully decorated for the occasion! Shots above are from T V screen when A|M model was used for B.B.C. programme

"Spirit" model on T.V.

Those readers who managed to get their eye to the upper two photographs will be interested to know that they were taken from a T.V. screen during the B.B.C. Television showing of a programme commemorating Lindbergh's crossing, viewed on the thirtieth anniversary of the flight.

Model was built specially for the programme by Assistant Editor Ron Moulton and photographer Doug McHard, and involved some 45 hours of precision work. Structure is to scale apart from the use of square balsa where original fuselage was tubular steel; "engine turned" cowling was effected by utilising a miniature electric motor with small piece of eraser rubber held in neoprene tubing to produce actual turning marks.

The other model was "found" by AEROMODELLER photographer, "Mac", when doing his stuff at the Warner Theatre Premier of the film "Spirit of St. Louis". AEROMODELLER has a display in the foyer where interested readers can see three examples of the ½ c.c. flying scale model, including the sectionalised version mentioned earlier. Unfortunately Miss Barbara Roscoe has now left the scene, but we would mention that her "formula" is not subject to F.A.I. ruling and is therefore completely practical "39-24-38"! When asked to comment on his evening's experiences, photographer Mac gave an expressive "Cor!!!".

Sound radio is now showing a new series of programmes which start on June 15th between 6.45-7 p.m. entitled "Hobby Time". First in the series deals with aeromodelling, and recordings were taken during the recent Woburn Park meeting of Raymond Baxter interviewing various modellers; including Vic Breeze on radio control, Betty Moulton on the woman's angle, and a running commentary on the Combat event.

Unexpected comeback!

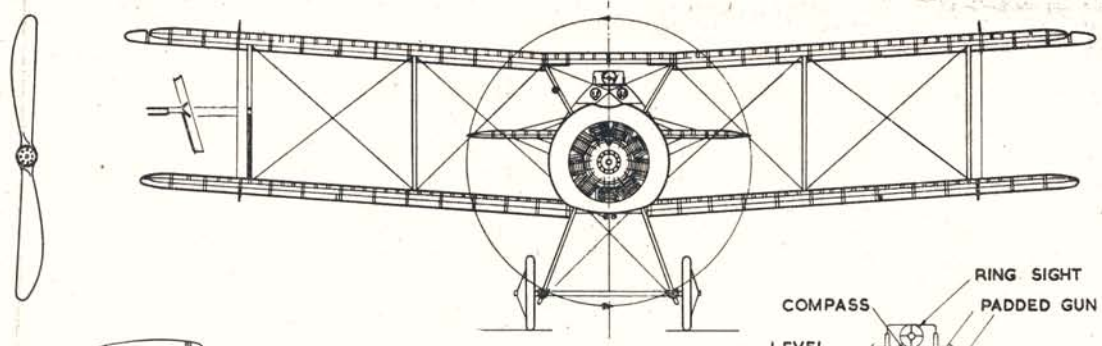
We have received a letter from Messrs. E. Law & Son (Timber) Ltd., following publication of Messrs. Solarbo's advertisement in our May, 1957, issue which contained working drawings of a balsa boomerang. Messrs. E. Law point that they hold a Patent Specification No. 718215 which covers all the points described in the advertisement, and that anyone manufacturing or constructing one of these boomerangs is infringing the patent.

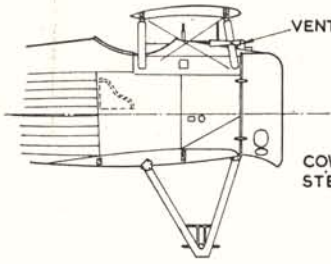
Messrs. Solarbo Ltd., and ourselves as publishers, offer apologies to Messrs. E. Law & Sons for this infringement of which, at the time, we were obviously unaware. We only hope our Australian readers take note of this point and restrict their manufacture to local hardwoods!

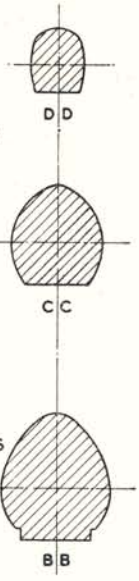
Subtle Danes

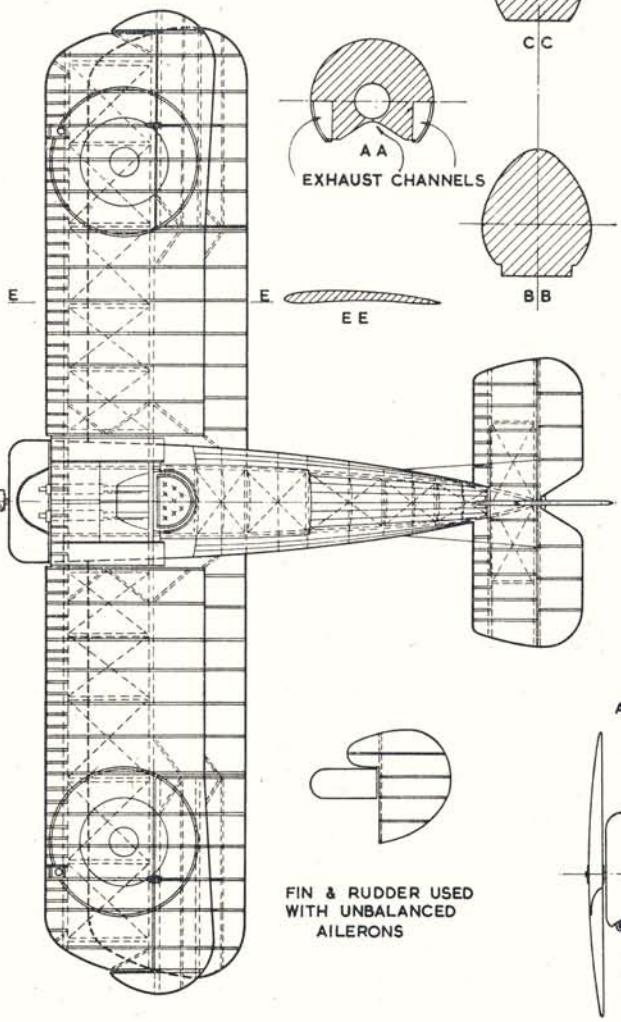
In an effort to induce more youngsters to join model clubs, the Danish Aero Club has organised a contest with a lightweight motor-cycle as first prize. Being of the opinion that most boys are more interested in motoring than aeromodelling, they are, so to speak, attacking the enemy with his own weapons.

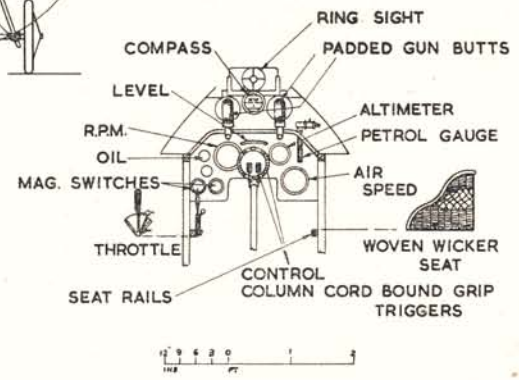
A new beginners model has been designed, and is available in kit form. A builder is required to perform three flights of one minute, and forward a coupon to the Aero Club. From the coupons re-











DATA (Production aircraft):

Span, Upper 31 ft. 1 in.
Lower 30 ft. 0 in.
Chord 5 ft. 0 in.
Length 19 ft. 10 in.
Incidence 1 deg. 50 min.
Weight loaded 2,020 lbs.
Weight empty 1,312 lbs.
Endurance: 3 hours at 15,000 ft.
Variable tailplane incidence: Min. + 1 deg. 20 ′, Max. + 5 deg. 50 ′.
Armament: Two fixed synchronised Vickers machine-guns

Performance: Speed 121 m.p.h. at 10,000 ft.
113 m.p.h. at 15,000 ft.
Climb 6,500 ft. in 5.2 min
10,000 ft. in 9·4 min
15,000 ft. in 18·8 min
Service ceiling 19,500 ft.

Serial number allocation of production batches

400 Boulton and Paul	E6137-6536	150 Coventry Ord. Wks.	E6537-6686
150 Napier	E6787-6936	100 Ruston Proctor	E6937-7036
500 Ruston Proctor	E7337-7836	300 Sopwith Av. Co.	E7987-8286
100 Portholme	E8307-8406	200 Sopwith Av. Co.	F2333-2532

Obviously many of these contracts were wholely, or in part, cancelled after the armistice. 497 aircraft had been built up to December 31st, 1918, 264 were "on charge" at the date of the armistice of which some 90 were in France.

(*Serials given with kind permission of Bruce Robertson, Esq.*)

COLOUR DETAILS:

All fabric top and side surfaces were finished to the standard Khaki-Green (approximately Olive-Green), and under surfaces clear doped and varnished, resulting in a creamy buff shade.

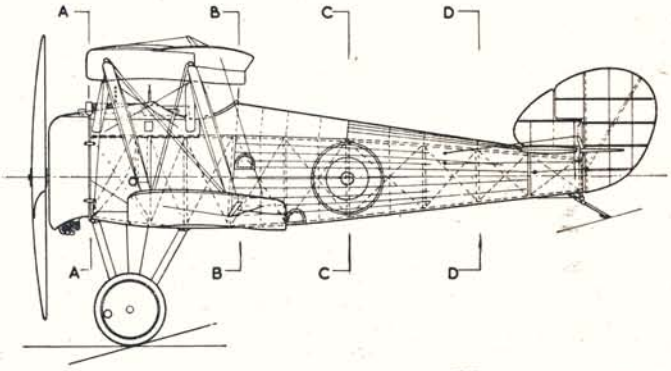
Ply panelling was finished a medium Grey, with struts either varnished natural spruce, or fabric covered and doped Khaki-Green.

August, 1918, saw the introduction of serial numbers on the rudder and rear fuselage. Ex-works machines carried the fuselage serials in black letters on an oblong white background, whilst the rudder serials were written fraction fashion, i.e., letter above the numerals, superimposed upon the rudder stripes and outlined in white.

Variations occurred on operational aircraft due to the addition of squadron markings, and red, white, and blue roundels were carried on all four wing panels, those on the dark surfaces being narrowly outlined in white.

Post-war Snipes were eventually finished in aluminium dope, with black serial numbers carried under the wings. The prefix letter was half the height of the numerals.

The aircraft illustrated is in 4 Australian F.C. Squadron markings, stationed at Bickendorf shortly after the armistice.



SOPWITH SNIPE 7F1 PROD'N.

FT.

R/C & COMBAT at Woburn Park.

AFTER SUNDAY, May 5th, the World seems a very small place to us at AEROMODELLER. This was the day arranged for the first-ever model rally to be held at His Grace the Duke of Bedford's estate, Woburn Park. Trees surrounds prohibit free-flight: but for radio and controline the venue is perfect, and the facilities offered for family activity whilst Pop and Son get on with their flying, are ideal.

It was a rally in the broadest sense, organised by the South Midland Area, and contests were entirely impromptu. Nevertheless, of the many hundreds that turned up, 37 out of an all-time record attendance entered an R/C event and 36 in Combat—this in spite of a harsh cold wind that swept the area throughout the day.

Without doubt, the main draw of the meeting was the demonstration of advanced radio and controline stunt flying by American experts Howard Bonner and Bob Palmer. When the gates were officially opened at 11 a.m., the car queue was a mile long, and we are sure that the majority were there to see the Los Angeles fliers perform. For that reason, we are also certain that readers will want to know more about them.

Only the Sunday previous they had left Johannesburg, South Africa, after a successful demonstration tour arranged and sponsored by **Jix** model shop in conjunction with the S.A. Nats. Flying by **Sabena,** they arrived in Brussels in little more than 24 hours, where we arranged for them to be met by leading Belgian modellers, and a couple of hours later, AEROMODELLER was entertaining them in London!

For a week the boys were our guests. They saw the British model shops, visited manufacturers (they'd never seen so much balsa as could be viewed at Solarbo) and met modellers in all phases of the hobby. Two more unassuming yet so expert ambassadors of our hobby could hardly be found. They held no secrets, answered the same questions over and over, and apart from our English summer (?), enjoyed every moment of the inquisition.

When they demonstrated their famous "Thunderbird" and "Smog Hog" Veco 35 powered models, it would be true to say that onlookers were spellbound, and that includes two Gold Trophy winners and the victors of most R/C events over the past three seasons. Bob was the first man off, and he was soon into the routine of wringing out the stunt pattern, only with a difference. No doubting why they call him "Smoothie"—up to twelve of any manoeuvres and all identical and no wandering, no jerks and no mistakes. His square bunts and square horizontal eights were a revelation. Inverted at nought inches, the fin barely scraping grass contours; square vertical eights; inverted pull-outs and spot landings were executed so nonchalently that the crowd cried for more.

Here was the man who has won 82 first places in 118 events, 1955 U.S. National Stunt Champ, three times a close 2nd in this supreme event, and tutor of other famous controliners Davy Slagle and Madman J. C. Yates. Bob taught himself to fly a Jim Walker model bought through mail order in 1941, and recounted a fascinating story of the race to be first to fly upside down, to loop, eight, etc. It paralleled the British story

His Grace the Duke of Bedford meets Howard Bonner of Los Angeles. Howard is explaining the motor control system and the unique plastic bottle tank. Centre: Combat finalists, G. Cornell (Croydon, and winner) with Raybould of West Bromwich, each showing evidence of close battle in their tailplanes! At Right: George Honnest-Redlich with Miles 5 c.c. powered model with which he won the r/c event. Wings are strut braced

of pioneer stunt flying by West Essex during '48.

Bob is by profession a skilled modelmaker for Lockheeds, where he has worked for 12 years—hence the beautiful tricolour decor of his Thunderbird. In spare time he designs kits and we look forward immensely to seeing his next, which will be based upon the elegant lines of the supermarine Spitfire.

The name of Howard Bonner is synonymous with radio control servos, and in his eight-channel equipped Smog Hog, Howard has a set of control servos that would fulfil any modeller's dream. Four small alloy boxes enclosed a self-centering printed circuit mechanism that operated ailerons (measuring 2 × 18 in.), elevators, and rudder through 60° ranges plus full motor throttle control. To obtain this highly desirable set of controls, Howard employs eight channel Orbit equipment with its impressive bank of eight Jaico lightweight relays. For the demonstrations at Woburn the ailerons were taped at neutral as the bellcrank mechanism had worn through constant use in South Africa to the extent of developing aileron flutter.

Take-off into the usual British contest wind was neat and snappy. An obvious touch of "up" and full power were held for the initial climb, and Smog Hog was on its own, battling with Woburn turbulence. Rate of ascent, with elevator controlling the up-the-stairs flight pattern was merely a prelude to what followed. Vertical dive and three beautiful consecutive loops followed soon after by two perfect barrel rolls. Then more climb and a horrifying 7 turn vertical dive with the wings rotating about the fuselage—a feat that no one had ever seen in Europe before. More climb, then an outside loop, followed by motor idling and finally a long descent almost back to base. Announcing these items as part of a test flight, we were anticipating inverted flight and a true flat spin in the next demonstration, but, unfortunately, after hundreds of outings, without so much as a range or meter check, the Tx batteries failed and Smog collected a tree top soon after take-off. Nevertheless the British modellers had seen enough to convince them.

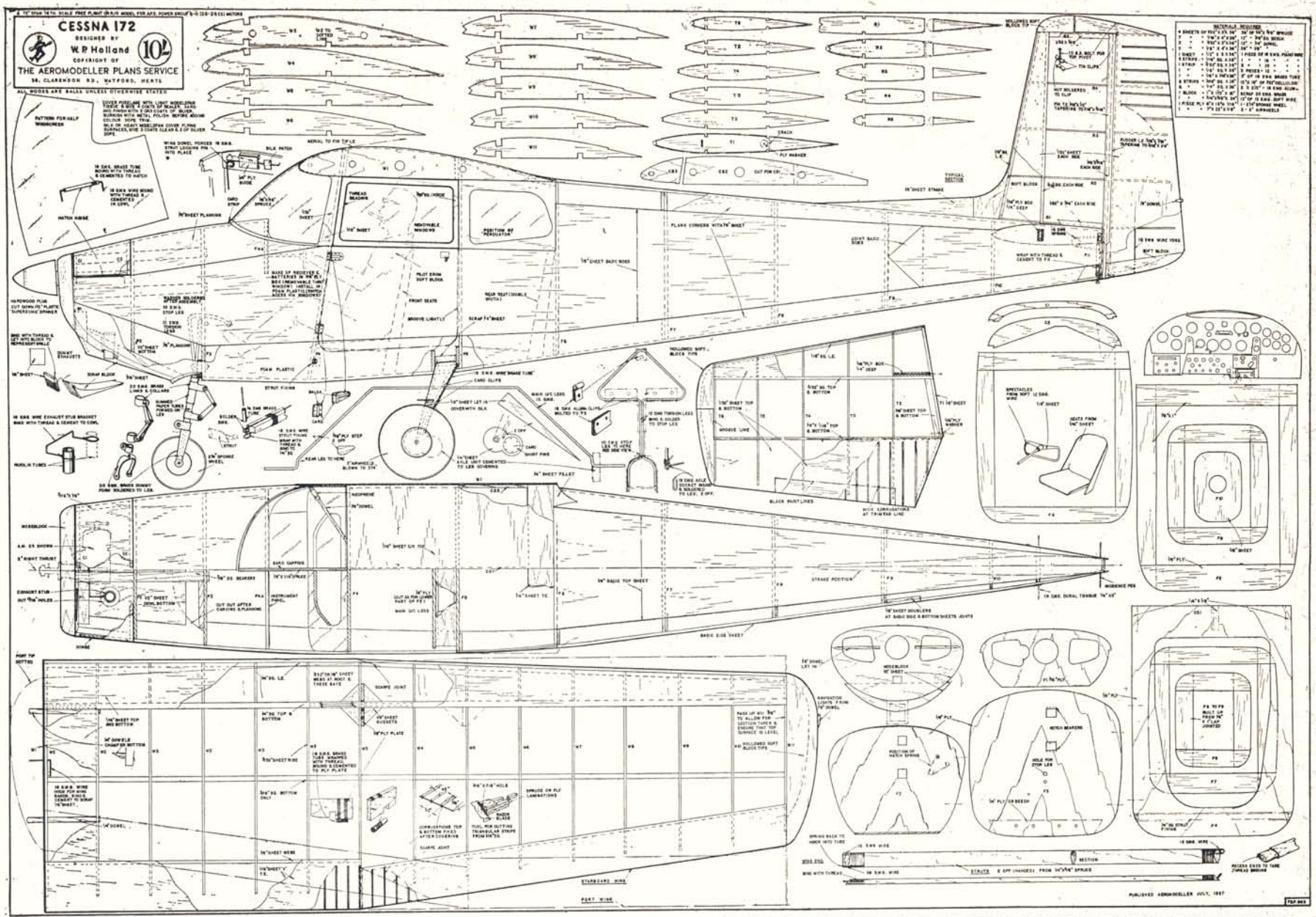
Some said that these two fliers showed us the equivalent of a two-year peep into the future of our Contest flying standards. Time will tell. And speaking of time and this very small world, Bob and Howard were whisked off to London Airport from Woburn at 5.30, flew to Brussels, and thence to New York via Sabena, across the vast U.S.A. to home at Los Angeles and were back at work on Tuesday morning. Phew!

Back at work in Lockheeds on Tuesday after flying at Woburn on Sunday, Bob Palmer checks a mahogany wind tunnel model of the Electra which he spray painted in blue and grey.

Pictures on these pages show the winners of the rally, G. Cornell of Croydon in Combat, and G. Honnest-Redlich in radio. George showed that Howard was not the only one that could loop.

Top: Smog Hog airborne for the first time in England. Right: 6lb. Berkely Cessna 170 kit model by Vic Breeze was most impressive, launch-by Ted Hemsley. Unique Dunne type tailless bipe with nose vane bounced out of a tree—undamaged!

Bob Palmer fuels up his T'bird before a faultless display of square manoeuvres. At right, Howard Bonner "plays the console" with four miniature joysticks controlling his multiple servos. Hand held set is varied in attitude for max. range effect



FULL SIZE COPIES OF THIS 1/6TH SCALE REPRODUCTION ARE AVAILABLE FROM AEROMODELLER PLANS SERVICE PRICE 10/- POST FREE. PLEASE QUOTE NUMBER FSP/666 WHEN PLACING YOUR ORDER.

AT LAST! A MODEL FOR "BIG" SCALE ENTHUSIASTS AND RADIO CONTROL. W. P. HOLLAND'S DESIGN FOR A 72" VERSION OF THE . . .

Cessna 172

BIG SCALE MODELS are always impressive, and when the subject is a perfectly proportioned Cessna 172, with traditionally bright American colour scheme, trike undercarriage and a fuselage capacious enough for any radio gear, one can readily appreciate how Peter Holland's design has joined AEROMODELLER Plans Service.

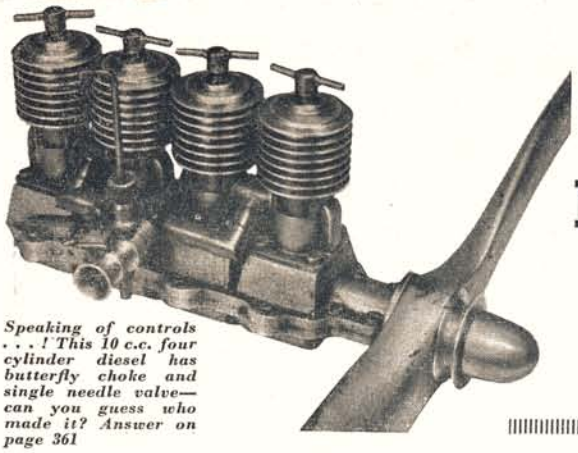
The model is 1/6th full size—just 6 ft. wing span and construction has been kept as simple as possible. Initially it was tested as pure free-flight, then it was equipped with radio, and Peter's own speciality—a "pendulator". This ingenious device takes over in the event of over-control and prevents a button happy operator from spiral diving such a fine inherently stable model. Further details of the "pendulator" are included on the full-size plan.

Light weight (less than 3 lbs.) is one of the contributing factors to the stability virtues of the design (it climbs at a steady angle with the AM25 revving moderately on a 10 x 6 nylon prop) and whether required for sport flying or precision radio work, it is a most attractive aircraft to see around the flying field. Much credit for the inspiration to build the plane should go to Swiss A/2 and Wakefield expert Bruno Bachli, now with Swissair, who flies the full size HB-CPD regularly from Kloten and personally demonstrated its airworthy charms to our Asst. Ed. last July. Swiss markings for this "first 172 in Europe" help to embellish the bright decorative scheme and the aluminium finish is easily reproduced by metal polishing a coat of silver dope.

Construction, though *not* for beginners, is quite simple. Wing and tail halves detach for transportation and the fuselage presents the only carrying problem. Built-up formers are cemented to the basic $\frac{1}{8}$ in. sheet sides, top and bottom, making assembly very simple, planking being required for the radiused corners and cowling. Window sections on the doors open to give interior access should R/C be fitted. Point to watch on the wing is that spars have to be lifted off the board to allow for letting into ribs, and the outer sections are raised when building for incorporated dihedral. Being a tricycle U/C, the front unit employs a sensible torsion bar springing with a stop to prevent a complete fold-back.

Has this whetted your appetite for big-stuff? The full-size plan is packed with constructional and colour detail gen to enable one to make a perfect replica of this fine modelling subject.

Large size, lightweight and perfect proportions of the Cessna 172 make it an ideal model for those who are able to transport the rather bulky fuselage. Peter Holland is seen here with the prototype in these two photos. The model has already been subjected to stringent flight tests under free-flight and radio controlled conditions.



Speaking of controls . . . ! This 10 c.c. four cylinder diesel has butterfly choke and single needle valve—can you guess who made it? Answer on page 361

KNOW YOUR ENGINE

PART ELEVEN CONCLUDED

ENGINE SPEED CONTROL

Continuing with 2-speed control for radio, provision can also be made to incorporate an air bleed in the switching system so that two engine speeds and "stop" are available as controls. A typical method of achieving this is shown in *Fig.* 6 which utilises a Bonner (American) escapement type valving switch, designed for radio control work.

In the Bonner motor control unit both spray bars are connected to the tank, but each has in it a "T"

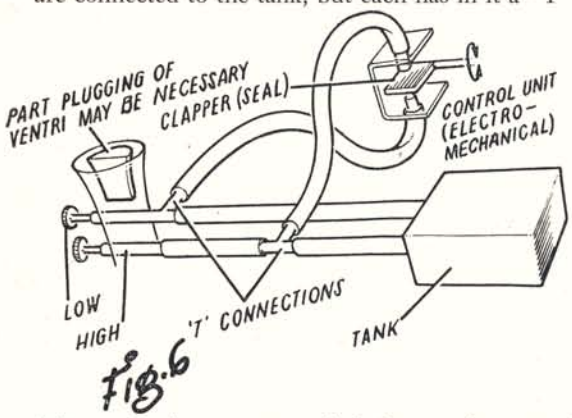


Fig. 6

joint connecting to open-ended pipes on the control unit. The escapement controls the position of a sealing pad which blanks off one or other of the bleed tubes. Whichever line is thus sealing off is therefore operative at its respective spray bar. If the sealing pad is caused to float between the two bleed pipes, both lines are vented and so the engine will continue to run only as long as given by the amount of fuel between the T joint and the spray hole. This line length thus determines the time interval between signalling "engine off" and the engine actually stopping.

An advantage of this system is that it allows "low speed" and "high speed" running to be adjusted completely by the individual needle valve settings. Starting would normally be done on the "low" speed setting (rich mixture). To get maximum speed difference, with consistent running at both speeds, it may, however, be necessary to experiment with different fuels and different glow plugs for individual engines. Generally low nitrate fuels are best.

Although widely used for glow motor speed control, the twin-needle valve system has never found great favour with diesels. It does, however, work reasonably well on most diesels. Similarly, glow motors will normally respond to the "clapper" method of choking to produce a rich mixture for slow speed running, but this method is less used with glow engines than the twin needle valve set-up.

An objection with diesels to running on an over-rich mixture is the danger of getting too much solid fuel in the cylinder head leading to over compression. Some diesels can tolerate running with the head very wet. Others cannot. In the latter case, speed control may be produced more effectively by blanking off the exhaust. This is easiest to do on engines which are fitted with exhaust stacks and has the advantage of being far less messy than slow running on an excessively rich mixture.

Blanking off the exhaust has the effect of reducing the efficiency of the engine by reducing the amount of scavenging which can take place. As a result the fresh charge drawn in for firing is adulterated with exhaust gases which have not escaped from the previous cycle. Consequently, there will be less power gathered on the firing stroke. Again, too, this will lead to a similar build-up of unburnt (solid) fuel in the head, but not normally to the same degree as that given by running on an excessively rich mixture.

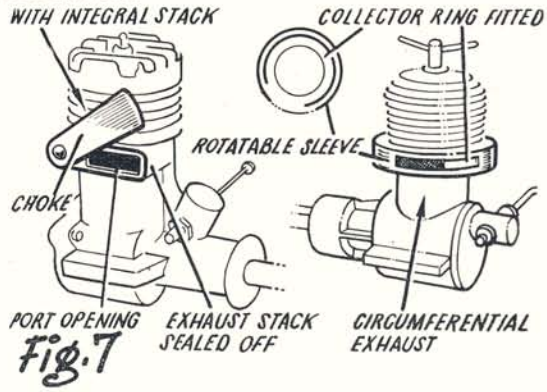


Fig. 7

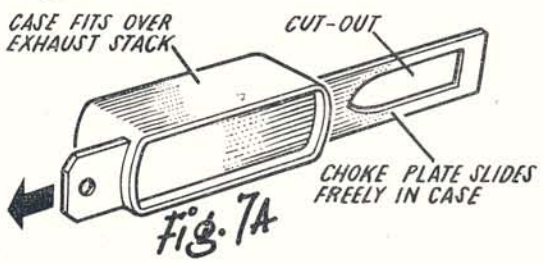


Fig. 7A

The degree to which the exhaust area must be blanked off to achieve any appreciable drop in speed may be surprisingly high. Most exhaust areas on model engines are larger than necessary for complete scavengng to start with, in any case. Blanking off half the port area (*e.g.*, sealing off one of a pair of exhaust stacks) will normally produce no appreciable difference in running speed. The exhaust area may have to be cut almost completely off before a marked loss of speed is produced—*Fig.* 7. Also a good seal may be necessary on such a device. Depending on individual engine designs, however, this method can be effective for variable speed control, variable on the degree of blanking off. *Fig.* 7*A* shows an ideal unit for all American 35's.

A method of speed control which has become popular on the larger diesels (mainly for radio control work) is the use of a butterfly valve in the intake tube. A scheme developed by G. Honest-Redlich and Electronic Developments in this country utilises twin butterfly valves, one on either side of the spray bar, and linked to have parallel

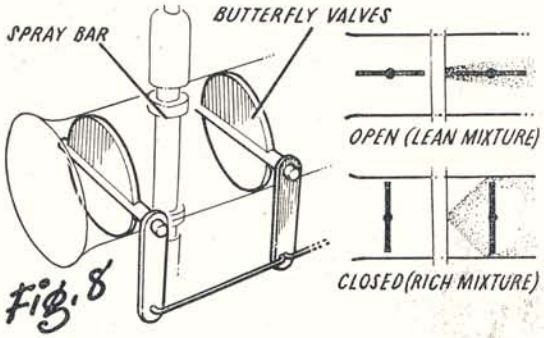


Fig. 8

movement. These butterflies control airflow entering and leaving the spray bar. Closing them results in a richening of the mixture, and *vice versa*. The butterflies must be quite snug fitting for maximum effect in the "closed" position and represent a certain difficulty in assembly within the intake tube, but the external linkage necessary to operate them in simple, and power to move them low.

Much the same effect can be achieved with a single butterfly valve with a single "T"-shaped spray bar mounted on it—*Fig.* 9. Here the spray bar is rotated with the butterfly from fully closed (maximum rich) to fully open (maximum lean), the actual mixture being determined by the setting of the needle valve proper as controlling the fuel supply to the bar of the "T".

A valve of this type with the greatest possibilities is the barrel valve, although representing more of an "engineering" job in the matter of manufacture. In general, however, it is rather easier to make and fit a barrel-type valve than single- or double-butterfly units.

A true barrel valve is shown in *Fig.* 10. The barrel fits the choke tube and is rotatable, the relatively large hole drilled through it normal to its axis of mounting thus providing an adjustable air opening. The fuel jet opening terminates in the

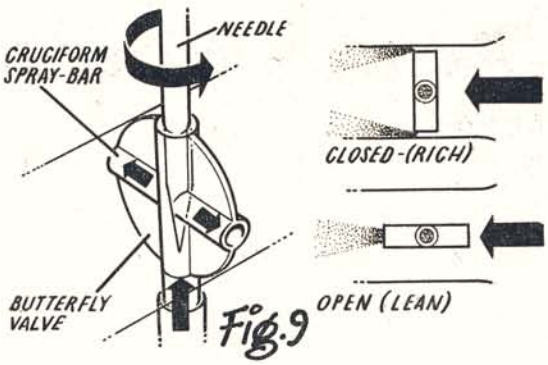


Fig. 9

throat of the barrel opening, the mixture setting being controlled by a normal needle valve arrangement.

Quite accurate adjustment of the mixture can then be obtained by trimming the edges of the barrel. In the closed (slow running) position, removing metal from edge "A" weakens the mixture, whilst removing metal from edge "B" richens it. It is thus possible to arrive at an optimum mixture for slow running for a required needle valve setting (*i.e.*, for optimum "high speed" running mixture).

The proprietary Mills and Bramco type throttles—*Fig.* 11—work on a similar principle, the needle valve being surrounded with a rotatable sleeve. Actually, needle valve assembly and sleeve rotate as one unit, for convenience. The sleeve is then bored through with a large diameter hole (the same as the diameter of the venturi throat) to line up with the intake for normal running; but when rotated 90 degrees blanks off the intake except for a small bleed hole. In this position the air supply

Continued on page 361

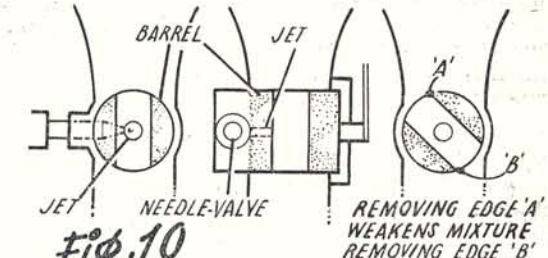


Fig. 10

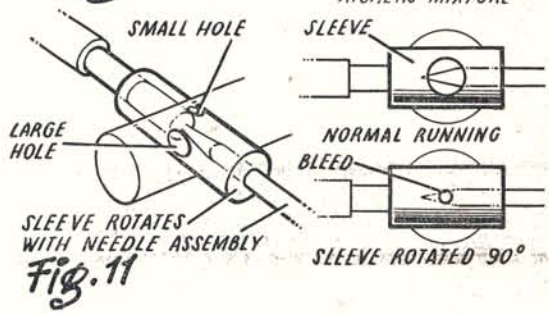
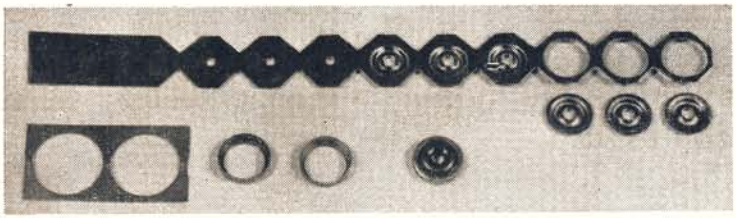


Fig. 11

TRADE NOTES



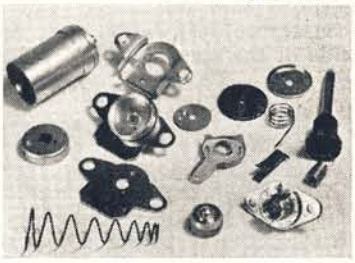
Stage by stage manufacture of Elmic Atom Ball-Race makes a "Mystery" picture above, at right are the Universal Timer and its complex parts. Note remote valve.

PUZZLE CORNER MIGHT be an alternative title for the picture above, and if we tell you that the mysterious parts are shown actual size—we wonder how many of you can guess the subject. Have a try before reading further. Got it?

Scorpion Precision Co., who are more familiarly known to us as manufacturers of Elmic Timers are introducing two quality items to the model trade that should be met with wide acclaim. First is the Atom ball-race. Yes, that's it in various stages of production from flat strip to caged race, above. Eighty of these Atom races weigh one ounce. They need no extra washers, cannot fall apart, are free running on up to 16 s.w.g. wire and packaged at 1s. each, will be a cheap way to friction-free prop running for all rubber models. And why not above and below a controline bellcrank too? Other, and much awaited item is the new and revolutionary *Universal Timer*. We announced prospects of this timer with the remote valve difference some time ago: but production snags and the constant will to provide only the very best by designer/maker Dennis Elmes has resulted in delay. This timer does everything. It has the advantages of the Elmic diesel with its snap action cocking arm, with tube nipping shut-off, it is accurate for up to five minute settings for dethermaliser work, and its remote valve allows mounting in an oil secluded fuselage section. Add to these three important features the calibration system on the valve, and we have in the Universal timer, Dennis Elmes answer to our appeal in the A/M Annual 1954. A glance at the components will show the extensive tooling and skilful design that has gone into the job. Each timer comes with a calibration chart which is filled in by the operator. For example, number 8 might be exactly 15 secs., number 9, 15·8, etc. Once calibrated, the dial can be altered, then returned to set back to say, No. 8, and it will be 15 secs. every time. In exhaustive tests, the Universal recorded a maximum fluctuation of only 2½ secs. over eight widely time-spaced operations at the 60 secs. setting. In 15 secs. that represents ⅜ sec. *possibility* of error—reducing the delay factor to about the same as that of the time-keeper and man releasing the model. Price is 15/-, weight only half an ounce.

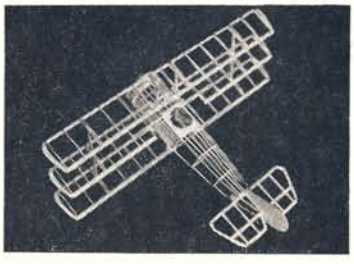
C. P. Dixon, who makes the **Compass** series of 1/72nd scale solids announces the addition of the Vickers Wellington and Heinkel III to his range, which now totals 23 World War II types. Details of the range can be had from him at King Street, Southport. For solid and particularly plastic model decoration, the new range of **Scope** colours, including some 12 tones, all authoritative and with true camouflage greys, etc., are to be recommended. Easy spreading, fair coverage and quick drying are the three main assets. Scope Labs, 466 London Road, Croydon, are the manufacturers. Colours come in small ½ ounce tins, with large tops for easy brushwork.

Red silk, in a really glorious hue

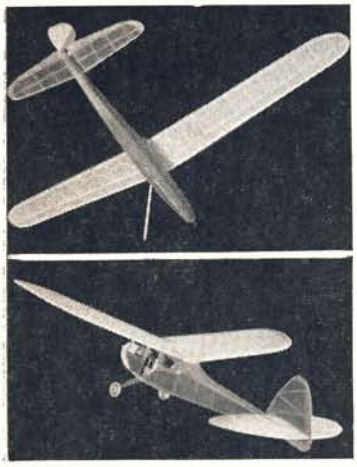


Transfer sheets by Veron are fine for flying scale, include extra large roundels and full markings for U.S.A.F. interceptor

Veron kit for the Sopwith Triplane in their 3s. 7d. series is a fine flier and most realistic in authentic olive drab and buff colours



New kits for 36-inch span glider and power designs by Hobbies Ltd. of Dereham have new features



is now available from **Henry J. Nicholls,** for personal callers, please note (no mail order). With sunlight shining through clear doped surfaces, the red silk offers increased visibility as well as enhancing the structural appearance of any model. Henry also announces, that following appeals by the scalex addicts, all **Mercury** kits for the Spitfire V (37s. 6d., for AM 25) are to have an additional transfer sheet. This provides a pair of plain identification red and blue roundels for the wing upper surface, the correct type for the Spitfire after March, '39, although the other four colour roundel is quite right for early Spits.

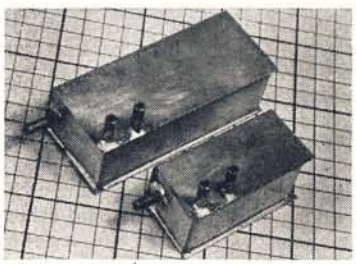
Dealers who are constantly asked for odd screw, bolt and washer sizes will be interested in the "Pip-Pack" shop dispenser unit with its neat array of transparent tubes, retailing at 1s. each. Finished in blue, the dispenser unit is ideal for counter sales, enquiries to **Precision Industrial Products,** Quadrant Rd., Thornton Heath.

New kits from an old established firm are the trio, Skysail, Ascender and Champion by **Hobbies Ltd.** Each is a practical model, as photos opposite show, and several novel features are incorporated in the designs. Champion, the power model, is for under 1 c.c. engines and has interior cabin detail, selling at 18s. 6d.

In our visit to Veron last month we implied that **Model Aircraft (Bournemouth) Ltd.** held a very strong light under their bushel—and that the Fairey Delta 2 kit was going to be really outstanding. Now that the F.D.2 is widely distributed, dealers and modellers alike have had time to form their own opinion, and in general it seems to be accepted that this is the kit of the year. It tends to overshadow a much less ambitious, but equally meritorious, kit in the 3s. 7d. range for the Sopwith Triplane. Not only did we find this model a delight to build, but it gave us quite a surprise with its fine flying performance. Three wings measuring 18 ins. span each and a tough little fuselage make up to very good value for only 43 coppers. Only point on which one might quibble is the size of the wheels.

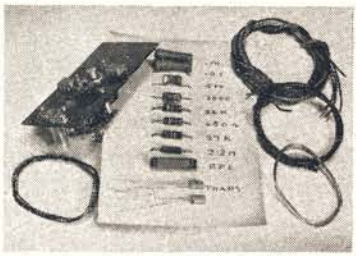
First of another line of plastic kits, the "*Merit*" 1/48th scale Sopwith Camel by **J. & L. Randall Ltd.** has appeared in company with an Albatros DV misnomered DIII. The kits are packed in a colourful box conforming in design with those of the veteran car kits by the same firm.

The models set no new standard of accuracy of detail, in fact they resemble most strikingly the "Aurora" models of the same machines, but a few noticeable differences will be found on examination. To simplify, the makers have joined the upper ends of the interplane struts and made a corresponding groove in the underside of the wings. This reduces the assembly time, excluding painting and applying transfers, to 11 minutes, and although the wing undersurface is marred to a minor degree, it does take the judgement and skill out of the final assembly stage. Another difference between the two models is the embossing of the makers' name on the wheels. This is a small point, however, and the letters may easily be removed with a sharp knife.



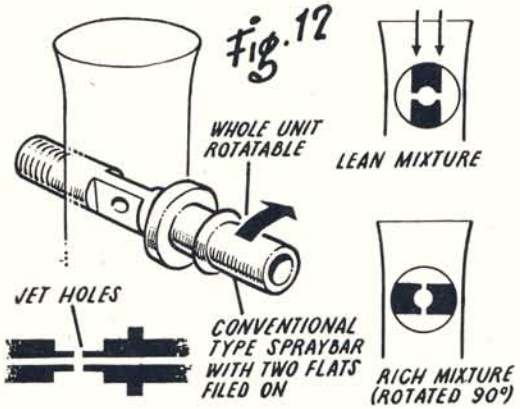
Team race tanks for Class A or B from Davies Charlton checked at 27 and 13 c.c.s respectively, allow for capacity of vents and feed pipe to come within regulation 30 and 15 c.c.

Merit plastic kits to 1 48th scale have a common box, illustrating full range on ace and around edge



Radio and Electronic Products produce the above kit of parts for the "Aeromodeller Transistor Receiver", at 62s., which includes drilled and pre-assembled panel, valve and two transistors. We would also mention for the benefit of constructors that the aerial grid condenser on this set should be 30 pf. rather than 50 pf.

Know Your Engine *continued from page 359*



is considerably restricted and so the mixture is much riched for the same needle valve setting.

An adaption of the barrel valve principle, using in effect an ordinary spray bar, slightly modified and made rotatable, is sketched in *Fig.* 12. Here the centre portion of the spray bar is formed into two files to serve the same function as the hole through the barrel valve (except that the spray bar may not completely fill the intake tube and so some air passage is left on each side of it). Rotating the spray bar both "throttles" the air supply and also slightly affects the mixture due to the displacement of the jet holes relative to the intake axis giving, in effect, a variable mixture control between "open" and "shut" from fast (optimum lean mixture) to "slow" (maximum rich mixture). Like the barrel valve the final mixture for slow running can be finely adjusted by trimming the edges of the flats.

report on the

South African Nationals

by 'Doc' E. ALLEN *Seen putting pressure on a timekeeper's head at left.*

Top is Author Doc Allen, Pres. of S.A.M.A.A. with AM10 powered Calypso. Same engine is used by Jeff Lindon for APS Y-Bar in next view. AM10 was an eye-opener at the meet. Above, U.S. experts on the highveldt, Bob Palmer releases Bonner's Smog Hog for a demonstration. Below: Jeff Birdon (Pretoria) receives highpoint trophy as Nat. Champ. from Lt.-Col. Mills, U.S.A.F.

SOUTH AFRICA is a country that is probably seldom in the thoughts of English or American modellers in relation to Model Aeroplanes, maybe now and then on seeing a movie of animal life a vague thought of our distant country may flash through their minds. Let me reassure you, however, that aeromodelling in S.A. is here to stay and is a baby that is growing rapidly and strongly.

So keen and eager to learn are the modellers here that the S.A.M.A.A. (South African Model Aeronautical Association) with the very necessary aid and foresight of a Model Shop, Messrs. Jix Pty. of Pretoria, whose wide-awake managing director, Monte Malherbe, is also Hon. Secretary of the S.A.M.A.A. brought out from U.S.A. two Maestros to show us how: namely Bob "Smoothie" Palmer and Howard "Smog Hog" Bonner. These two friendly and instructive characters spent a month with us, demonstrating flying technique, equipment and generally "yakking" on modelling. I don't think anyone who had the pleasure of meeting them can honestly say that they did not learn something new. (Same goes for England too.—*Ed.*)

Flying demonstrations were given in front of vast crowds at Palmietfontein Airport at Johannesburg, Kingsmead in Durban, Springs, Rustenburg, and, of course, at Pretoria during our Nationals.

The boys were shown a few of our sights—went down a goldmine—visited Kruger National Park, and Bob at least rode in a rickshaw in Durban.

I wish we could persuade some of our, and other countries, large concerns to sponsor the regular interchange of modellers. I am sure that we aeromodellers could achieve a great deal in establishing friendlier International relationships (U.N. please note).

The S.A. Nationals took place over Easter weekend in Pretoria, Transvaal, and the Pretoria Aeromodellers Club were really lucky, being blessed with four perfect days.

The rather drab but extremely good flying ground of P.A.C. at Koedoespoort took on a colourful aspect as refreshment tents sprang up and at 9 a.m. Good Friday, the long list of competitions was under way.

"A" Rubber (less than 150 sq. ins.) and "A" Glider (less than 300 sq. ins.) soon provided the large crowd with some good flights and A.P.S. *Aiglets* were myriad, the Waverley thermals were well in evidence. The Cape Town boys, Rob Rowe and Pete Visser, were impressive in the handling of their rubber jobs, as was John Jones of Johannesburg. Mid-morning heard screaming ·049's as ¼A power got under way and many flyaways were seen.

By Nathan H. Rambo III

First mention of this system came from John Worth some four to five years ago in the U.S.A. It has recently been taken up and further developed by R/C fliers in Hampton, Virginia, and the author wishes to credit Donald Brown and William Gilkey in this respect. The system offers scope for further development and improvement which we trust our readers will take up; meantime it provides a far greater control range from single channel equipment than anything yet offered.

THE "GALLOPING GHOST" radio control system offers the modeller simultaneous proportional rudder and proportional elevator control. The name for the system came from the observer's natural response to the control action since the rudder and elevator surfaces flap continuously during operation. The system is intriguingly simple and amazingly inexpensive. Both ground and airborne components are merely additions to basic R/C equipment. Neither the simplicity nor the low cost of the system, however, seem to detract from its performance in the air.

Ground equipment requires a pulse box (see photographs of box) in place of the normal keying switch on any single channel transmitter. The box is able to provide variable mark-space pulse ratios according to stick lateral motion, and also provide variable pulse frequency according to stick fore and aft motion. Thus rudder control with this system, as with any rudder-only proportional system, is determined by the mark-space pulse method. The additional elevator control is a function of pulse rate.

The airborne portion of the "Galloping Ghost" is shown in the sketch. The reader undoubtedly recognises how the mark-space ratio (ratio of relay energised to relay de-energised time) determines effective rudder position. The important thing to note from the sketch is the effect that pulsing frequency has on amplitude of crank oscillation thereby conveying elevator intelligence. At a very slow pulse frequency (2 c.p.s.) the crank oscillates through maximum swing (about 270 degrees) dwelling on its limits to give effective up-elevator. The extreme opposite or fast pulse frequency (8 c.p.s.) dithers the motor crank through a small arc (about 10 degrees) giving down-elevator. Any proportion of pulse rate between these limits produces an appropriate elevator position.

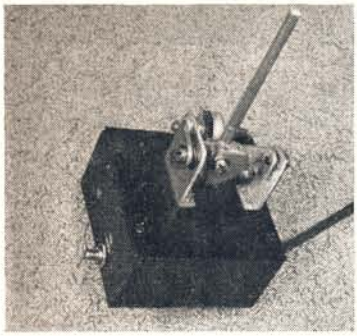
Most difficult to overcome in understanding the "Galloping Ghost" are the mental blocks the escapement and multi-reed modellers conjure before trying the system. Of particular example is the feeling that applied rudder will reflect up-elevator position. This is negligible except at very extreme limits of rudder control normally not used if rudder area is large. Furthermore, any other mentally contrived interactions due to crank geometry or fancy theory just don't show up when making a pylon turn, inverted flight, or a true spin . . . so relax.

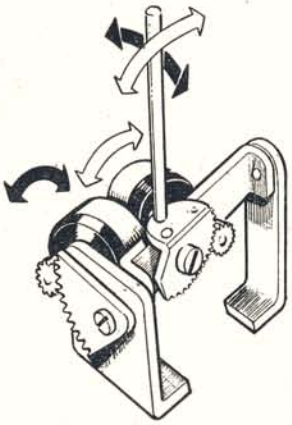
Box Construction

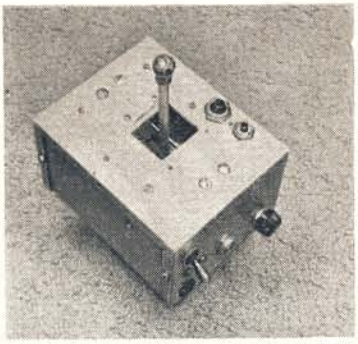
The heart of the G.G. system is the control box which varies the mark-space and pulse rate as discussed. Although any sloppy makeshift arrangement can be made to serve the purpose of the box, it is felt that a neat, self-contained electronic control box fabricated with extra care will reward the modeller with years of hard service on the flying field.

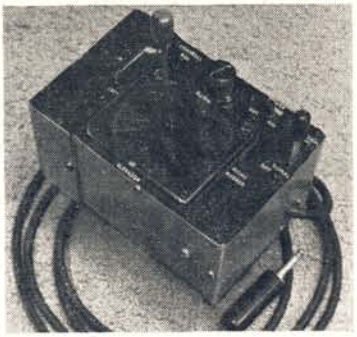
A double-pivoted yoke system must be made to facilitate rotation of the rudder and elevator potentiometers with one control stick. The control box mechanism photograph and sketch show a good approach in building this mechanism. Note that gears of about 4 : 1 ratio will give adequate potentiometer arc-of-rotation without excessive stick movement. Rather than present exacting and complex diagrams, the mechanism is left to the builder's discretion.

The electronic design is shown in diagram form with values for the 3V4 valves. The circuit should

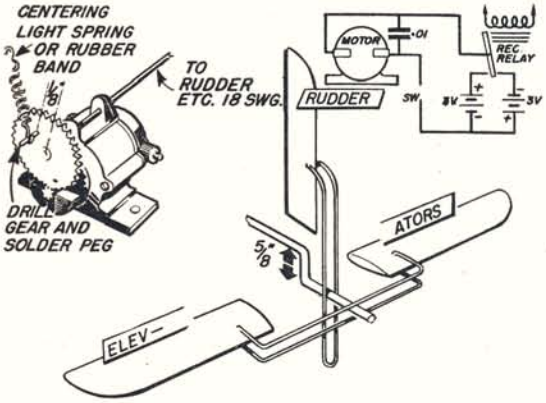


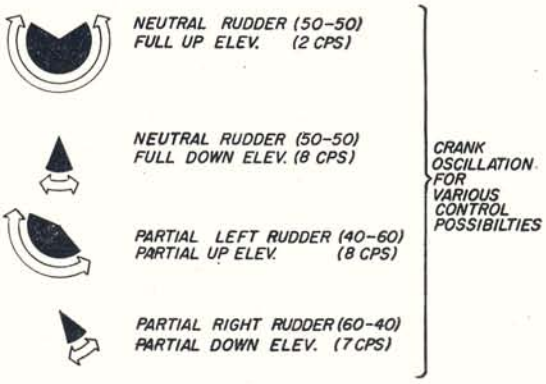


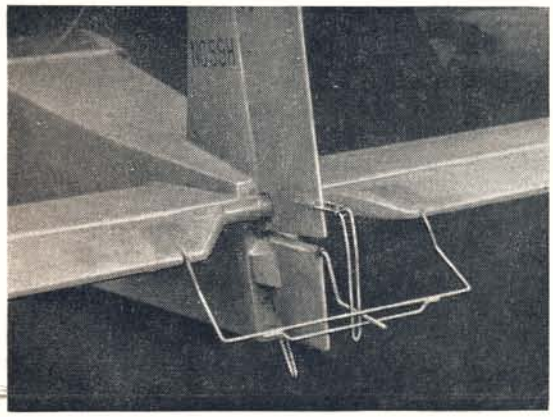


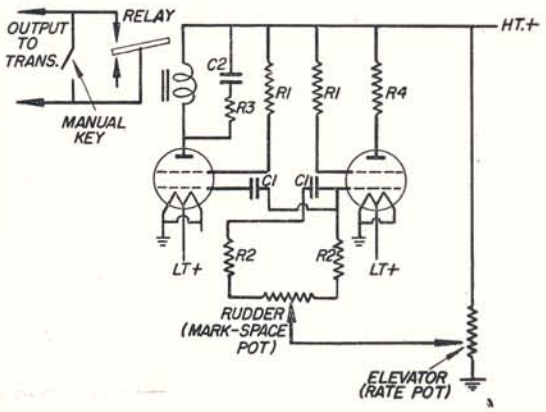


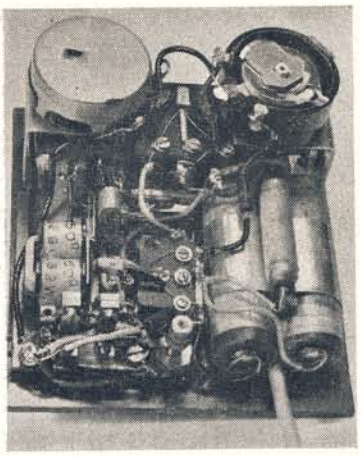
Miniaturised box, top left, uses 1AG4 valves and deaf aid batteries. Bottom left is pulse box with external pot. and gear system, see drawing above. All these control boxes have been built by clubmates of the author and connect to the transmitter by means of extension cable as shown bottom right. Stick mechanics necessitate a somewhat large hole in the box lid and it is a good idea to make a flexible cover as in the one example











Pulse box utilising transistor circuit built by Tommy Ives. Note Siemens high speed relay of 500 ohms and two Hivac T.M.1 transistors. Interconnected pots are used but without gears. Full details will be given at a later date

work unless wrong connections are made. First, adjust the relay by feel for positive operation. Connect an ohmmeter across the output points. Using the meter needle as a guide to rudder intelligence, check for neutral rudder (50 per cent. on—50 per cent. off) and hard-over rudders (about 20-80 and 80-20). In neither hard rudder stick position should pulsing stop because elevator intelligence is then lost. Also, pulse rate should be fairly constant as long as the stick is moved only left and right.

Now try moving the control stick back and forth with no side travel. The ohmmeter needle should not vary in mean position but pulse rate should vary between about 2 and 8 pulses per second. A stop watch and some mental counting will determine if the rate is right. If troubles with circuit symmetry are encountered, try switching valves. If pulse rates are too high, increase the sizes of the ·35 MFD capacitors (or vice versa if too low).

Mount the electronics in any convenient box. Most people feel that a $4 \times 5 \times 6$ steel or aluminium box is about nominal. Include a pulser on-off switch, a manual keying switch, and a six foot long cord with transmitter plug fitting.

Airborne Installation

The sketch of equipment in the airplane speaks for itself. Crank dimensions are not critical and may be adjusted in necessary after first flights. Slightly larger rudder area and throw than used on escapement models is suggested. Small chorded elevators (10 per cent. area) with about 20 degrees throw in each direction are also recommended. Note that the crank arm and torque rod are all one piece of 18 s.w.g. wire which replaces the upper shaft of the Mighty Midget motor and extends rearward and out the aft end of the fuselage. The centring rubber should be a light rubber band stretched tightly from a small radius. Be positive that all linkage fits loosely with lots of slop in the control yokes to avoid friction and binding (see photograph of model).

A few words should be said about the electric motor. The Mighty Midget motor and its stock 7 : 1 gear-reduction should not be replaced by any other. When installed, its brushes should be bonded or blocked in place so they cannot fall out. If mounted on a wood platform, and sponge suspended in the model, the plastic bearings of the motor will hold up much longer than if the motor is rigidly fastened to the airframe. Nominal voltage on the motor is three volts with battery supplies ranging from four pencells to four medium cells depending on model size.

As far as receiver and relay are concerned, reliability is of utmost importance. Also to be mentioned is that certain receivers do not take fast pulsing. Beware of any receiver using diode rectifiers in the relay stage, for these usually won't pulse rapidly. A single tube receiver is acceptable but the user should use as high a current change as permissible with the unit. If the receiver relay points are not spark suppressed, it is wise to add a 100 ohm resistor and a ·005 MFD capacitor in series from each relay point to relay frame. The Lorenze type receiver with two soft valves or a soft valve and transistor is recommended for good reliability, also the "Aeromodeller Transistor Receiver".

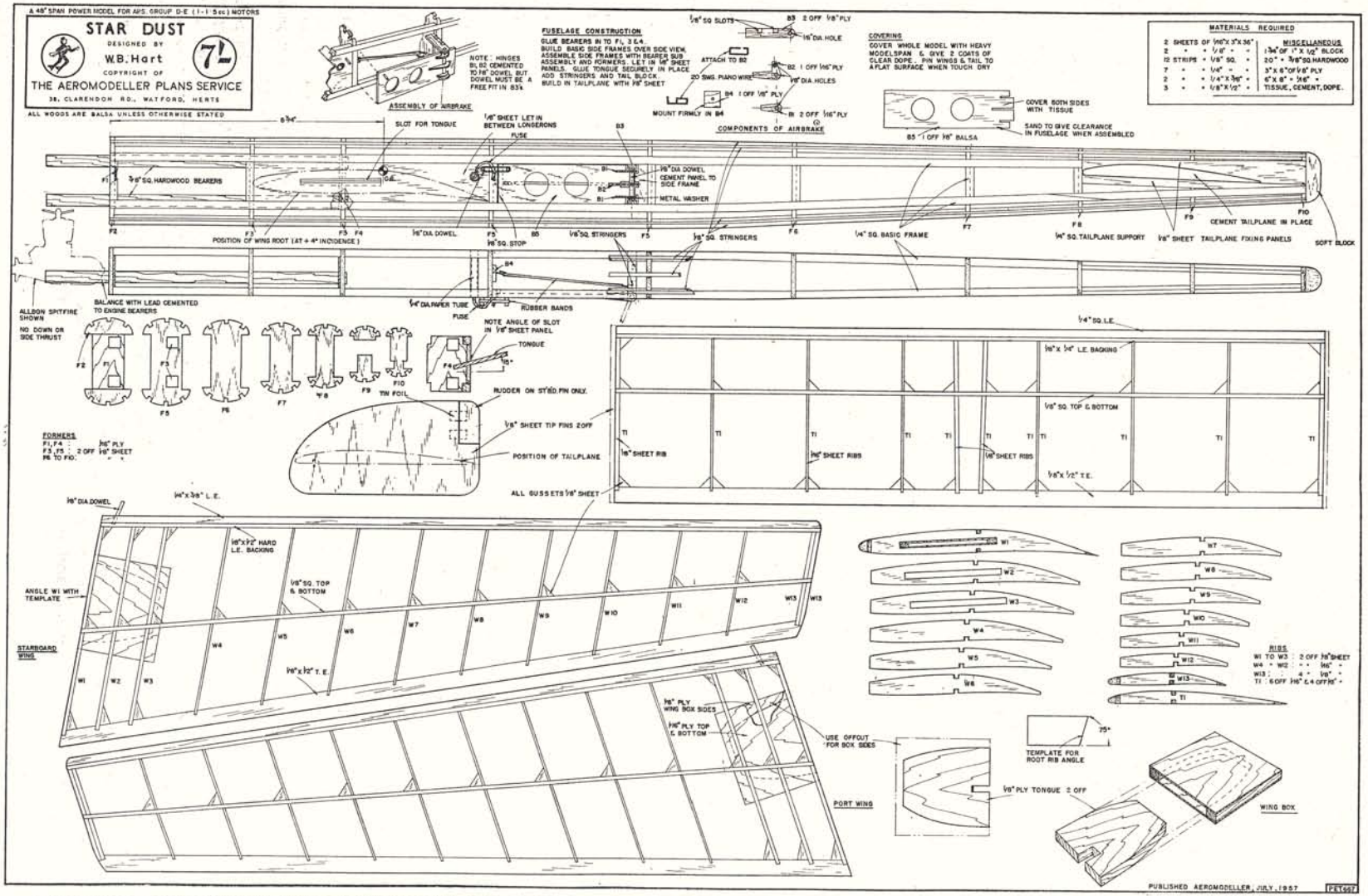
Flying

When the model and pulse box are finished the entire "Galloping Ghost" system should be checked out carefully before flying. With a shrewd eye and some good imagination, one may readily ascertain if the effective control position on the model duplicates the control stick attitude. In some cases, it may be necessary to restrict stick motion if excessive mixing occurs in extreme control positions.

Once on the flying field, begin with test glides with the radio system operating and a pilot on the stick. Trim the model for normal glide with the stick in neutral. This trim should be accomplished by slight shim under wing or by weight shift but never with excessive decalage (wing-tail angular difference) since this makes elevator control ineffective. Now fire up the engine and make the first flight. Use your proportional stick to compensate for any minor trim problems on this flight, making changes later.

Piloting ability with any dual proportional control system increases with practice. The flyer will find that his general flight procedures are entirely different than when flying rudder-only ships. For instance, flight altitude rarely exceeds two hundred feet, and instead of an occasional tap of rudder control, the model is constantly guided by the pilot who never takes his eyes from the model.

The pylon turn is the first manoeuvre the pilot learns once past the first flight. Inverted flight, however, is probably the most spectacular and advanced manoeuvre performed with this system. The manoeuvre is entered from a half loop. It is important to enter the manoeuvre from a near-vertical dive so that air speed is still high at the top of the half loop where top elevator is applied by full down stick. Be sure to hold exactly neutral rudder here or the model will roll.



FULL SIZE COPIES OF THIS 1/5TH SCALE REPRODUCTION ARE AVAILABLE PRICE 7/– POST FREE FROM AEROMODELLER PLANS SERVICE. PLEASE QUOTE NUMBER PET/667 WHEN ORDERING.

Star Dust

A swept-forward wing design for 1 to 1.5 c.c. motors, sport or contest flying by W. B. HART

FOR THOSE WHO like something with a difference here is an experimental design used to test an unorthodox wing planform and an unusual airfoil section. The distinguishing swept forward wing feature of the aeroplane was intended to increase longitudinal stability in three ways:—

(1) By increasing the moment arm of the tailplane about the C.G. of model for a given length of fuselage.
(2) By utilising the stabilising effect of a large wing area behind the C.P. of the wing.
(3) By harnessing wing twist.

If the model should dive the airspeed would automatically increase and so would the lift. This would increase the twisting moment of the lift (acting at C.P.) about the twisting axis resulting in a slight increase in incidence and the C.P. moving forward in consequence. This exerts a stabilising effect on the model. The reverse (in theory) would happen if the model should climb.

Sweep forward has its disadvantages though, among them being a tendency to go into a spin following a turn. This is successfully counteracted on this model by using a large fin area and moment arm and giving the wings a large amount of dihedral. Airfoil section, L.D.C.2, is used because of its reputably high efficiency at low model speeds.

No undercarriage was fitted as it was not considered necessary on a model with such a low landing and flying speed.

Construction

Build two fuselage side profiles from $\frac{1}{4}$-in. square balsa and join them with formers. Cement engine bearers to ply formers only, using plenty of cement where bad landing stresses may be high. Attach $\frac{1}{8}$-in. square stringers to top and bottom of fuselage making joints in stringers where shown. The two sheets of balsa retaining the tailplane should be cut undersize at first and then opened up to make a good fit with the tailplane ribs. Wing tongues should not be cemented in place until the fuselage sides have been sheeted where shown, and then using plenty of cement, attached to ply former and slot in fuselage sheeting. It is essential that the wing dihedral and incidence angles are accurate and this can only be obtained by accurate assembly of the wing tongues. Complete the fuselage structure with other small details shown on the plan.

Cover with heavyweight tissue and give two coats of clear dope and one of fuel proofer. Engine bearers should now be drilled to receive the engine.

Cement all wing ribs except the root ribs to the slotted trailing edge ensuring that they are attached at the correct angle and are all aprallel. Add top and bottom spars and the deep leading edge spar which is cut from $\frac{1}{8}$-in. thick balsa sheet. Cement $\frac{3}{8}$ in. $\times$ $\frac{1}{4}$ in. balsa leading edge in place and attach root rib at correct dihedral angle (using template shown on drawing). The wing tongue box is completed before assembling into the wing.

Cover the wings with tissue and apply two coats of clear dope. It is advisable to pin the wings to a flat surface while the dope is drying to avoid warps.

Tailplane is straightforward and may be built in any method desired but care must be taken that no warps develop because of its low rigidity when not covered with tissue. It should be covered with tissue and one coat of clear dope applied.

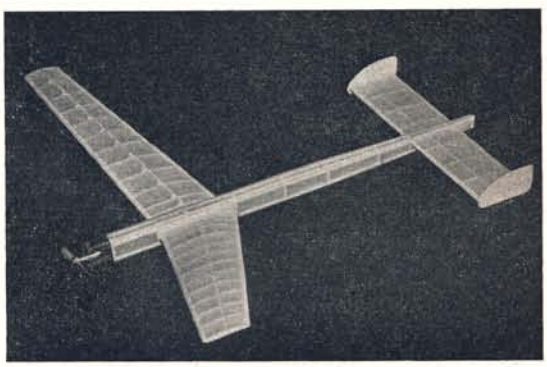
Fins should be cut from $\frac{1}{8}$-in. thick balsa sheet and sanded to a flat plate airfoil section. They should be covered with rag tissue and doped and then cemented to the tailplane. (Do not cement fins to tailplane before tailplane is cemented into fuselage.)

Flying

The prototype flew straight from the drawing board, no trimming whatsoever being needed, but, due to inaccuracy in building, this may not be the case with every model.

"Star Dust" should be glide tested in long grass and trimmed for a long flat glide by adding weight to engine bearers or tailplane block if this should be necessary. When the glide is satisfactory the model may be safely flown under power.

From testing done so far on the prototype the characteristic flight pattern is a developing gradual increase in climbing angle from the hand launch to a maximum of about 70° to 80°.



Long tail moment and large tail arm counteract all the disadvantages of swept forward wing designs in Star Dust a most attractive and inexpensive novelty which will surprise all, by its rate of climb

RADIO CONTROL NOTES

By HOWARD BOYS

THE WRITER recently helped an old friend with his first radio control model which was an A.P.S. "Black Magic" with a re-designed tail unit to accommodate flapping rudder, proportional control. The model is also similar to the author's well-known design particularly in relation to the C.G. position and wing incidence.

Flight testing was carried out by running along with the model, releasing it, and catching it again, without the motor running, of course. This glide test being satisfactory a powered flight was then attempted, the model running along the ground and hopping into the air, but showing signs of under elevation. The wing incidence was increased by one degree before attempting any further flights. Next time the model made a perfect take-off and except for insufficient right turn flew extremely well.

The principle of making the first flights of an untried model R.O.G. is a good one, for if anything is wrong with the control system the model is unlikely to take-off. This applies only to mark/space control and not necessarily to normal click clack rudder control.

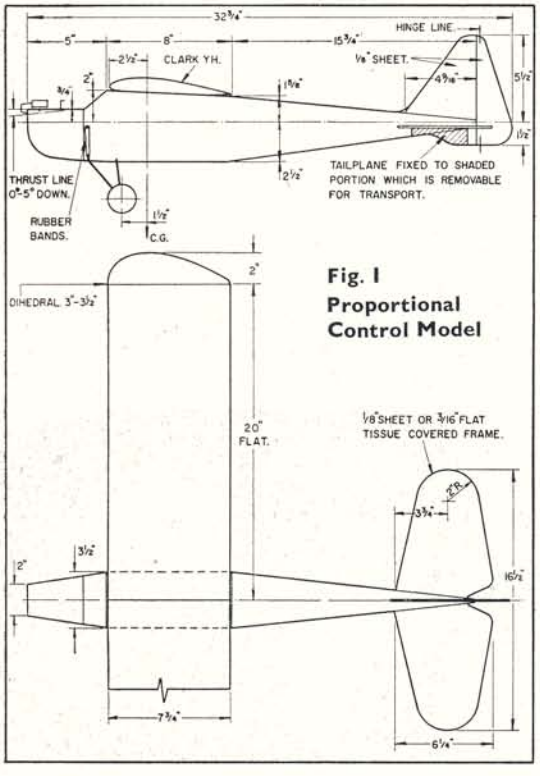


Fig. 1
Proportional Control Model

Well designed Japanese radio model uses O.S. radio equipment and a Max 15 glo-motor

The radio equipment used an AEROMODELLER Transmitter built into the model box in a similar manner to the writer's glider equipment. The receiver was the "Ivy" circuit using 22½ volts H.T. followed by a transistor, giving a current change of nearly 3 m/a. dropping to ·5 m/a. Range was checked at a quarter of a mile, no attempt being made to find the limit.

It is some time since the writer published his ideas on the layout for a proportional control model, so an outline drawing is given in *Fig.* 1. The dimensions given are for the writer's Mills 1·3 c.c.-powered model which has been used for most of the flying during the last seven years. No attempt has been made to publish the full design because it does not lend itself to ordinary escapement-operated control. This layout has been scaled up, and down, with equally good results. The glider "Ann Twerp" was 1½ times and has since been fitted with an E.D. Hunter, pylon mounted on the wing, over the C.G. This flies very well. A nose wheel is fitted in this case due to the high thrust line. The control does not appear to suffer any disadvantage such as that experienced by a reader with a single fin and rudder on an R6B. This may be due to the greater distance between prop and rudder.

Actuators are reliable says Stillings!

Our old friend Harry Stillings has blown a couple of fuses over some of the unkind remarks made recently about the ordinary self-neutralising magnetic actuator. Although we do not fully agree with his comments on motor driven actuators we do feel he gives most valuable advice on how to avoid trouble with actuators. Over then to Harry whom to quote verbatim:

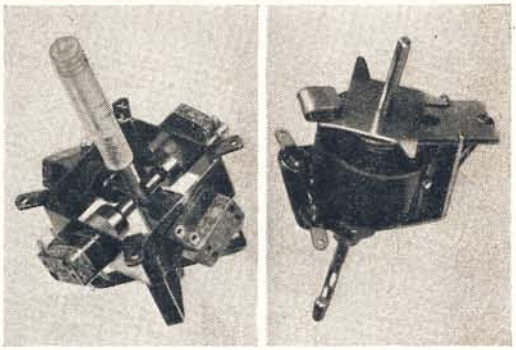
"I would like to come forward to champion the much-maligned standard electro-magnetic self-neutralising actuator, against scurrilous attacks which seem to be constantly made upon it nowadays. In this month's AEROMODELLER (February), for example, in Radio Control Notes, Laurie Ellis gives the impression that they do little but skip, spin, chatter, or stick; in the *Aeromodeller Annual* 1956/7 the electro-magnetic actuator is even more severely slated, claiming that it is far from fool-proof, unreliable, plus all the faults Laurie Ellis mentions. These statements are pure unadulterated rubbish, and are put forward merely to bolster the claims for the writer's weird, wonderful, and far more complicated and heavy electric-motor actuators,

with their multiple gears, pulleys, wiper contacts, etc., etc.

"I have used the standard E.D. self-neutralising actuator (with current-saving coil) ever since I took up R/C over four years ago, and the only time it has ever let me down has been when *I* have boobed, through carelessness or ignorance. The unit itself will ALWAYS (I repeat ALWAYS) respond perfectly provided a modicum of care and maintenance is used. I am now flying a radio controlled stunt model on single-channel rudder-only control, which has a normal flying speed (in still air) of 30 m.p.h. rising to 50-60 in dives and I confidently stunt to within a few feet of the ground at these speeds—the actuator has never once failed me, although I *have* had crashes caused by RX faults. Response of the actuator has always been immediate and accurate—it has to be when controlling a model flying at 50 m.p.h. only a few feet off the deck. Numerous fellow modellers and members of the public can confirm my statements, as they have seen the model in action on many occasions.

"This complete and constant reliability of the actuator has been achieved by the very simple method of using intelligence and care in installing and maintaining it. If the following points are observed I guarantee that anyone else would enjoy the same reliability.

(1) Use a 6 v. battery to ensure a strong, healthy pull. Keep it fresh.
(2) Make the rubber motor 20 per cent. longer than the distance between hooks, and keep it well lubricated. Replace as soon as deterioration appears.
(3) Install with care, so that drive right through motor, actuator spindle, and crank is dead straight. This is not difficult!
(4) Make bearings very slightly 'sloppy' to avoid possibility of binding.
(5) Bend crank to angle of 100!, not 90!, so that it follows angle of rudder loop as it moves to left and right.
(6) Examine faces of cross-arm and claws from time to time to ensure that these are flat and square, with no 'bevelling' at edges.



This 4 way double pole control stick unit is ideal for multi reed work and available commercially complete with cover plate for 37s. 6d. Right, is the new R.M.A. "Mactuator", a really small self-centering escapement of 9 ohms resistance for 3 to 6 volts that retails at 23s. 10d.

(7) Check return-spring tension very occasionally.
(8) Clean the points of contact between the phosphor-bronze contact strip and the cross-arm—a sort of 'metallic grease' tends to build up here after considerable use, and may affect perfect contact.
(9) See that the phosphor-bronze strip makes light but *positive* contact.
(10) Check that cross-arm just clears claws in turn (this only needs to be done if faces have been filed in accordance with (6).
(11) To prevent any possibility of sticking through residual magnetism, insert slip of sellotape *face downward* between magnet pole and lower pawl.
(12) Keep spindle lightly lubricated with a tiny spot of contact oil.

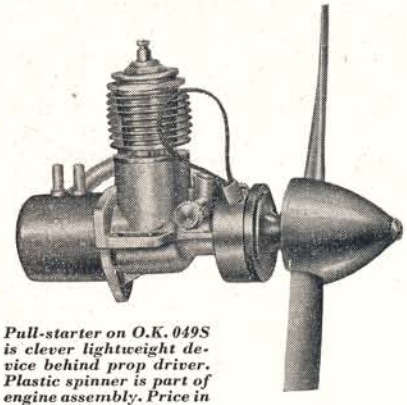
"In short, although the above list seems at first sight rather formidable, in practice it amounts only to reasonable care and periodic checking and maintenance. I am not saying that electric-motor servos are useless, but for heaven's sake, let's stop this completely unjustified slander campaign against the good old straightforward and reliable actuator!"

New Radio Club

Photo, right, was taken at the first flying meeting of the newly-formed Aircraft Radio Control Club at Benson Aerodrome in April. Vic Breeze prepares to swing the prop on his 5 c.c. Miles diesel. The model is fitted with six Reed equipment and unfortunately came to grief through a faulty reed on down elevator. Resultant vertical dive broke the Miles engine clean in half! This was, however, the exception rather than the rule, as in general a really good day's flying was enjoyed by some twenty odd members who attended.

Standing in background with his verbal pipe is George Honnest-Redlich, Secretary of the club and winner of the day's contest. On his left, looking at model is F. J. Franklin, the Treasurer of High Street, Benson, Oxon, who will be pleased to hear from would-be new members. Club is not a local one, and at the moment includes most of the active radio fliers in London and the Home Counties.

MOTOR MART



Pull-starter on O.K. 049S is clever lightweight device behind prop driver. Plastic spinner is part of engine assembly. Price in U.S.A. $6.95 (£2 8s.)

Latest news of model engines from USA and Europe

PLANS FOR AN onslaught on the European export market (for Austria, Norway, Sweden, Finland and Greece) have been announced by Polish State manufacturers of the **Jaskolka** (Swallow) 2·5 c.c. diesel. Outwardly similar to the already established Hungarian **Alag × 3** from Hungary, distributed in this country by Messrs. Ripmax, the Jaskolka is to be made in quantities up to 11,000 in 1957. The JR-7 illustrated below is of similar type, having front rotary valve. The Jaskolka-1 is a plain bearing variant with disc valve and Jaskolka 2 a ball-bearing alternative for which ·28 B.H.P. at 17,000 is claimed. A prototype 5 c.c. diesel of ultra short stroke (20×15·5 mm.) claims ·35 B.H.P.

East Germany, the source of the **Schlosser** 2·5 c.c. which set the standard for the new flush of East European diesels is now leading the miniature jet field with the **Victoria M-D1.** Made by the famous Victoria typewriter firm, this compact unit is after the Swiss Furrer jet design, having 12 separate flutter valves and narrow jet pipe. With incorporated nose tank, also serving to streamline, the overall length is 31¾ in., weight 11½ ozs. and thrust in the region of 3 lb.

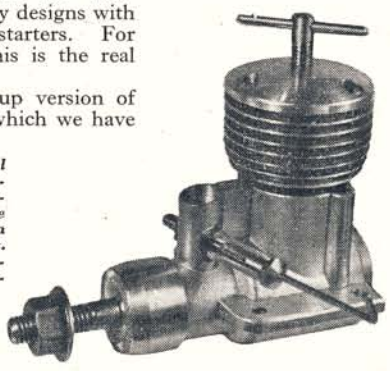
Walter Fritsch from **WAF** 1 c.c. fame in Germany has just marketed a unique diesel, with a contraprop shaft. Two 6×4 in. props are said to give absolutely torque-free thrust.

In Czechoslovakia accent is on the World Speed Championships as far as motors are concerned, and the **Vltavan** Ball-Race 2·5 based on the very impressive prototypes used by Josef Sladky is now in full scale production. Claimed B.H.P. is 0·25 at 16,000. Its bigger brother in 5 c.c. claims a modest 0·4 H.P. at 12,000 r.p.m.

From the U.S.A. good news is that token imports of engines will allow British enthusiasts to obtain a limited supply of the **Veco 19,** one of the nicest glowplug engines it has been our pleasure to handle. With TCC (Temperature Controlled Clearances) the Veco has been imported by H. J. Nicholls, selling at £6 6s. Latest and quite different version of the Veco 35 was used by Bob Palmer and Howard Bonner in their demonstrations throughout South Africa and at Woburn Park.

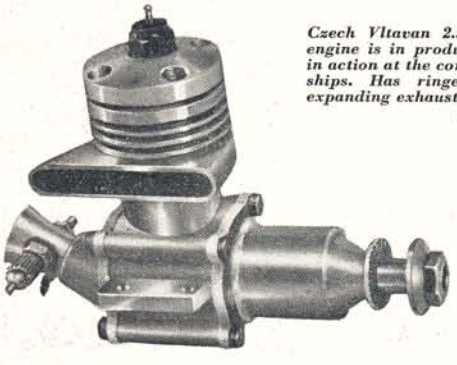
Outstanding modelling development is the "Pull Start" for **OK** engines. Fitted to the **·049S** for airscrew or flywheel, the starter merely requires a tug and the engine is pulled over at about 500 r.p.m. but for three turns only. Repeated tugs at the nylon cord result in very easy starts. Cord flicks back by spring tension, and the unit offers no retarding action on the engine. Its weight is negligible. Altogether a great achievement, though not the first in the field (**Movo** were first), certainly the OK "S" Series of engines will be forerunners of many designs with incorporated starters. For ducted fans, this is the real answer.

The hotted up version of the **Frog 249** which we have mentioned previously is to go into production alongside the standard model shortly and will sell in this country at about ten shillings more than the standard model. Performance has been improved by modifications to the internal shape of the cylinder liner and altered porting. The Mark II engine will readily be identified by the cylinder jacket being anodised red.

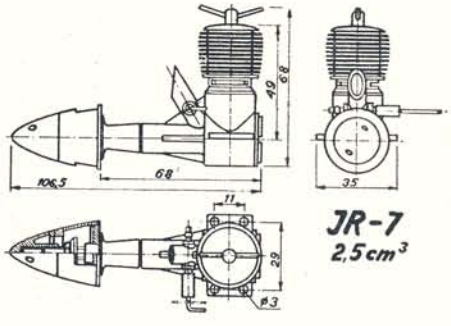


Eifflaender Special is the engine designed by experience. Has single ballrace, large area ports and bearers. Is individually produced for top performance

First checks on a test **Eifflaender** 2·5 show it to be remarkably docile for its potent output (14,800 on an 8×3½). With their fine reputation for good workmanship, the Macclesfield firm are making their 2·5 Special in limited numbers to sell at £6 10s.



Czech Vltavan 2.5 c.c. glowplug racing engine is in production and will be seen in action at the coming World Championships. Has ringed light alloy piston, expanding exhaust stack and twin bearing shaft



Polish JR-7 is typical of the flush of new engines from East European countries. Dimensions are in millimetres

Joining the R.A.F.

Life in the Air Force Today *by* GROUP CAPTAIN E. C. KIDD (Cassell), 10s. 6d. 238 pages. Illustrated.

Surprising as it may seem, this is the first book of its kind to appear, dealing with life and careers in the post-war R.A.F. Such books were popular before 1939, but in recent years the prospective entrant to the R.A.F. has had no such independent guide to consult and has been wholly dependent on official recruiting brochures. No matter how well official leaflets have been studied a young man planning a R.A.F. career will find much to interest him in Group Capt. Kidd's book, which in seventeen chapters ranges from a description of recruit indoctrination at Cardington to the opportunities for National Servicemen with a gift for languages to study Chinese (Mandarin) or Japanese at Hong Kong University! Between Cardington and Hong Kong, as it were, the author takes in such matters as trade training, apprenticeships, cadetships, aircrew duties, discipline, travel, promotion, sport and educational facilities. There is also a section on the W.R.A.F.

To these essential facts about conditions of entry and service, Group Capt. Kidd has had the happy idea of adding chapters on the organisational structure of the Air Ministry, the R.A.F. at home and overseas, and the N.A.T.O. set-up. A brief account of some outstanding flights follows, but this is none too accurate. Bleriot crossed the English Channel in 1909, not 1910, and the author falls into the popular error of crediting the Alcock and Brown flight across the Atlantic in 1919 to the R.A.F. In fact, the Vimy belonged to Vickers and both airmen had left the Service. Misleading also is the remark that Sqn. Ldr. Swain's Height Record of 49,967 ft. in 1936 "lasted until 1939". It was exceeded by Italy in May, 1937, and regained by Fl. Lt. Adam of the R.A.F. who reached 53,937 ft. in June, 1937.

Historical slips are not to be taken too seriously in a book which, after all, deals chiefly with careers. More regrettable is the impression one gains that insufficient care has been taken to bring the book completely up-to-date before publication. Illustrations are badly dated by old-pattern W.R.A.F. uniforms, the absence of aircraft more recent than the prototype Provost, Chipmunks, a Swift F.4 and Venom F.B.1s. There are odd references in the text to Vampires in Fighter Command (and no mention of Hunters, which entered service in July, 1954), to Mosquitoes in the Far East (withdrawn in December, 1955) and Lancasters with Coastal Command (withdrawn in October, 1956). Aircrew categories such as air signaller and air gunner, though listed, have not been recruited from civil life for some time. Radio observers are not even mentioned, and there is no description of the vital new role of air electronics officers in V-bombers, though the category is listed.

To these lapses a more serious objection must be added. This is the complete absence of information on rates of pay for officers, airmen and airwomen, or any examples of how actual careers may progress in terms of promotion with age. Surely these are important questions in any prospective recruit's mind? The blurb on the dust-jacket would lead one to believe that these facts are included. One can only conclude that this refers to training pay received by cadets and apprentices which is, in fact, detailed.

Despite these not inconsiderable drawbacks, this is a book well worth acquiring, for it has good things to offer. But how much better it would have been with truly contemporary photographs and—dare one say it?—with an index!—O.G.T.

The World's Air Centre

London Airport (H.M. Stationery Office) 4s. 64 pages. Illustrated.

Featuring one of the most striking covers we have seen for many a day this lavish production includes text by John Chandos, drawings by Felix Topolski and architectural drawings by Gordon Cullen.

We found the behind the scenes story of the planning, development, construction and daily operation of this colossal aeronautical enterprise a truly fascinating story, and noted of modelling interest the reproduction of the various airline badges for the solid building enthusiast.—H.G.H.

True to Life

Time of Departure *by* W. D. PEREIRA (Robert Hale Ltd.) 10s. 6d. 192 pages.

This "human interest" story has the British aircraft industry for background, and is very readable in its apparent authenticity of the drill and personalities involved in the production of an ambitious private venture airliner of the future. For those of us intimately concerned in aviation matters it becomes an interesting pursuit matching the book characters with real-life individuals in "the trade".

Pity that some very careless proof reading should have allowed three glaring errors to appear within the story, and one within the opening "blurb". We are particularly tickled by the fact that ". . . the machine looked like silver 'wafter' lying on the other side of the airfield".—C.S.R.

Textbook for Theory

Aerodynamik der Flugmodells—Tragfluegelmessungen I *by* (*late*) ING. F. W. SCHMITZ (*first published* 1942) edited by CARL LANGE VERLAG, 2-4 Kuhstrasse, Duisburg, Germany, 3rd revised and amended printing; cloth bound, price DM 13—(West), 160 pages, 92 illustrations, 5 sheets of diagrams.

This is the complete model aerodynamicists' manual. As early as 1940, the original book was compiled by F. W. Schmitz, to win the coveted £300 Prandtl Prize.

Present, third, revised and improved printing has undergone major improvement through careful proof-reading and amendments by such noted experts as Dr. Richard Eppler (genius behind successes of Lindner, Hacklinger and Co) and Ing. Nils Hiorth. Some of early, rather unhappy conclusions by Schmitz (low, blunt tip aspect ratio wings, for instance) have been eliminated, making way for more accurate data.

As far as we are aware, no authentic English translations have become available, except a "Farnborough" translation (not available for the average modeller), but a brief, informative coverage was published in U.S. three years ago, in *Model Airplane News*, written by the well-known Lippisch-Conover team. For one who *does* know his way about in German *and* aerodynamics, *plus* metric conversions, the book holds a treasure of model data, unsurpassed as yet.

Schmitz must be credited for being the first ever to test model wing sections at true *model-speeds* in a *wind-tunnel of very low turbulence factor*. He took great trouble, and could rely on full help and unique advice from expert aerodynamicists to achieve unsurpassed perfection. His test wings were precision carved and honed to spotless perfection from plastic material. There can be no question about accuracy of results and findings.

Benefits that stem from use of turbulators in front of wing leading-edge are clearly and unquestionably demonstrated and tabulated.

Schmitz's book (though still labelled as "wing-test-series I" with no hope of a volume No. 2 ever appearing), is still adorned with reference to antique, outdated and unobtainable Nazi literature "Luftfahrt und Schule" (Aviation and Schools). No one can ever hope to get hold of these books today, even in Germany! A minor criticism which could, however, just as well have been eliminated through more careful proof reading.

Many a succeeding Prandtl-Prize winner has been inspired by this book. Last year's winner (an AEROMODELLER reader) Hel Bruss (of Bad Pyrmont and his Mittelschule class) wrote for example on: "Affin Abbildungen des Profils MVA 123". (Slimming for MVA 123 wing section, and consequent influence on flight characteristics.).

Schmitz's finds have been largely explored in many a country to develop new (modern) wing sections for model use. One of the first to glean from Schmitz (without verification by wind-tunnel testing incidentally), was Sigurd Isacson in Sweden. Others to follow were Dr. George Benedek of Hungary, who did some testing (to our knowledge). Of late Kupfer, a Soviet expert modeller and researcher, further explored along Schmitz's lines. He tunnel-tested lightweight cigarette-paper covered, non-doped wings. He verified an MVA 123 type wing section as ideal. However, there is no mention whatever, and no data has been forthcoming, on the turbulence coefficient of his wind-tunnel. If Kupfer did not establish this, one must regard his work with some suspicion.

In East Zone of Germany, a recent small manual was published for a specific model glider design in the A/2 class. It is Schmitz-based, and scientific right through. Publishers are Communist H.Q.'s "Verlag Fur Sport und Technik", East Berlin by Horst Schulze. 1st Edition, 1956, 38 pages, price DM 3.15 (East) 18 line-illustrations and diagrams, including one reduced-scale plan of proposed model, which was built and flown, and proved calculations.

This little book is complete, mathematical exploration of a high-performance model glider (A/2) with actual reduced-scale plan. (*See* drawing in World News.)

Some of the data given is in strong contradiction to current established design practice for high performance models. In particular, Schulze advised a small area, non-lifting section tailplane. *But* for those foreign readers, who know their way about German and in maths with equal perfection, it is a find as regards studies, and illustrates the worth of *Aerodynamic de Flugmodells* as the prime move of so many other works.

SAGITTARIUS

CLUB NEWS

IF I AM NOT MISTAKEN, 1957 is going to be recorded as a boom year for the Club movement. It is very nice to see new names coming up in the results sheets, although the "oldies" keep popping out at the very top, the influx of new blood will undoubtedly show itself at the British Nationals. All I hope is that we do not get hooliganism along with the newcomers, particularly in the Combat and Team Race classes.

London

The **ST. ALBANS** club mag., "Thermal", tells me that some clubs in the London area seem to think they are superior to others and do not co-operate in running competitions at Chobham. Whilst this is a domestic affair for the area concerned, I do feel that it is about time that the London area took a leaf out of other area record books and instituted a system which ensures that all competing clubs play their part at every organised event . . . and that includes the Nationals. Dave Tipper has managed 4 mins. 2 secs. with his tailless model and Charlie Christie has got himself involved with an excursion into fin area theory which makes interesting reading. If you would like to have the "Thermal" regularly, the charge is 2s. for six copies, from 59 Howlands, Welwyn Garden City, Herts.

Keen modellers in the Walthamsow area are urged to contact the **WALTHAMSTOW M.C.** at 4 Rensbury Villas, Rensbury Road, Walthamstow. Meetings are held at 7.15 each Friday at George Gascoigne Secondary School, Queens Road, E.17.

Following their Class "B" win at the first London Area T/R Champs, D. Walker-Tuthill, **ENFIELD AND D.M.A.C.** also won the 2nd and 3rd meetings at Heston and won the High Wycombe Rally as well, with the fast time of 7 : 33 using their hybrid Eta and novel two-cell tank. M. Pinnock gained 2nd in Combat making it a field day for Enfield. Josh Marshall of **HAYES M.A.C.** collected the tailless trophy this year with his big geared model and J. Baguley has done very well in the area A/2 Eliminators. Some fast Class B and ½A T/R designs are on their way. There is talk of a film show for the London Area including a talk by J. Patterson of Solarbo following his recent trip to Equador. Added to this Howard Bonner left his film of the U.S. Nationals and Los Angeles radio control activities with us for showing, so the evening's filming will be worth a long journey.

Southern

No club entries from **SOUTHERN CROSS A.C.** for the Lady Shelley? ? ? What *is* happening to this home of the tailless models? I hope they will be attending the Nationals with just a few of their wings to show that they have not lost interest. A new club room for **FARNBOROUGH M.A.C.** has been opened and during the club's April meeting at Birbright, D. Menzies Oliver powered *Dream Weaver* showed great promise until extra power was added and the wings gave up their unequal struggle at great height, leaving the fuselage with a screeching Oliver to plumet, earthwards, fortunately without damage to the engine. This sounds rather unusual for *Dream Weaver*—I suggest he attends to the wing braces in future.

It is with some regret that I learn that "Rip" has recently resigned his post as Chairman of the **CHRISTCHURCH AND NEW FOREST M.A.C.** He has done this, not through failing interest in the club, but because he feels that he is unable to devote sufficient time to Chairman's duties. There is no need to enlarge on the support "Rip" has given to the movement in general and the Christchurch Club in recent years, and we all look forward to seeing him back on the flying field again . . . with a new model? **READING D.M.A.C.** have been flying at Booker, near High Wycombe, and are planning a general contest with the Farnborough Club on 7th July. The only flying field available between the two clubs being Chobham . . . shame! Reading members have already been advised to cover their models with sheet tin!

WEST HANTS A.A. originally announced their Open Rally as being fixed for September 8th, but when I pointed out that this clashed with the Public Day at Farnborough, which so many modellers like to attend, they put the date forward to September 1st. At the moment no particular venue has been fixed, although Southern Cross is a certain reserve should no better venue be located. **BRISTOL ACES M.A.C.** have the use of R.A.F. Filton on Wednesday evenings, and with light evenings coming on, there has been frantic activity in free-flight power. Latest craze among the controliners is for World War I profile Combat models, already including a Bristol Fighter and Fokker DVII.

South Midland

On their Easter Sunday Open Duration event, **OXFORD METEORS** report that M. Reeves topped the bill using his 480-sq. in. *Miss Dream* (cross between *Swiss Miss* and *Dream Weaver*) doing 8 : 46 on three flights at Port Meadow. John Harding had a long over-run when his model D/T'd under power at approximately 1,000 ft. altitude, and resultant aerobatics has to be seen to be believed. Wednesday evening activities at 7 p.m. on the local racecourse are fixed by **NORTHAMPTON M.A.C.,** and it is hoped that they will help to stimulate and rebirth interest particularly in rubber power. Three Rally trips are planned for the coming season, and the club is hoping to give a display for the town Carnival. I gather that the recent Howard Bonner and Bob Palmer demonstrations at Woburn Park influenced this club among many others, and know that quite a number of modellers travelled especially to see these famous experts, considering every inch of their journey worthwhile. **WAYFARERS** club has been reformed in the Watford district,-being strictly a competitive group as of old and has already shown itself in the Area eliminators and semi-centralised events.

Midland

BIRMINGHAM M.A.C. returned from the Manchester Indoor Meeting after a good club effort with two firsts and several places. All-rounder Ray Monks kept the Weston Cup in the club for the second year with three max's and 5½-minute fly-off. Another branch of aeromodelling has emerged in the club with Derek Illsley and friend Freddie Vale of Burton getting the British R/C glider record with a flight of two hours 23 minutes (to be confirmed). **RUGBY M.E.S.** were hosts to the **COVENTRY** and **LEAMINGTON** clubs for a wet and windy first round of the inter-club contests on Sunday, May 5th. Out of a total entry of 14, gliders proved to be the most popular models with nine stalwarts braving the elements for a keenly fought contest from which L. Watts Coventry emerged the winner with a three flight total of 5·25. Power had only three entrants, and losing arguments with hangar buildings by two contestants left J. Andrews of Rugby an easy win with a two flight total of 2·15. Having only two entrants in rubber, both from the home club, a truce was called after the first round, with R. Dowdeswell, Rugby, winner with one flight total of 3·00. In view of the very bad flying conditions the turnout of all three clubs was commendable, and an enjoyable afternoon was had by all, excepting, perhaps, the two unfortunates, Watts and Roberts of Coventry, who left their models in the loving care of the well between the hangar roof spars. A very good start has been made to the outdoor season, with the **COVENTRY** team winning the Keil Trophy. This was also another triumph for Ron Draper's *Crescendo*, for three of the team flew this design, all O.S. Max 15 powered, and the fourth member flew a Criterion 62 (Enya 16GP) which is the predecessor to the Crescendo. Sunday, April 14th, saw the clubs Junior Trophy run off in excellent conditions, with the juniors putting up some good flights. The event was won by J. Summer's APS *Aiglet*, with a total time of 4 : 21. On Easter Sunday the club held a Trans-Atlantic Contest with the Alamo Aeromodellers of Texas, mentioned in the last report. Again, excellent weather prevailed, and club members put up a very good show totalling 33 : 53 in Power and 27 : 03 in Glider with 3-man teams. Rearsby Aerodrome continues to be the centre of activity for **LEICESTER M.A.C.,** and a wide diversity of types is in evidence. The club had been demonstrating controline at local garden parties and have probably been influenced by their recent visit to the Duke of Bedford's Estate at Woburn Abbey. They are going to make a personal appearance in the ground of Lord Lanesborough's House, Swithland Hall!

East Midland

The **FORESTERS M.F.C.** seems to have awoken from their winter hibernation, although I note that they are still using models from two or three seasons ago, and the Team Race crew collected first and fourth places at High Wycombe, leaving the place with the prize for the best prang of the day, which followed a line break. Foresters have four of their men going to the Criterium d'Europe at Brussels, and I hope that they give their models a fresh lick of paint or alternatively make a new set before they meet pristine creations from Spain, Belgium and Holland.

East Anglia

In **NORWICH** recently, the club has been denied a flying field, since Bertram Mills Circus has paid the city a visit. Model of the month is R. Howard-Alpe's *Cessna* 310, with a fine finish, and it flies well. **DUNMOW M.F.C.** in Essex paid a visit to the Keil Kraft factory at Wickham, and were shown around the factory to see how kits are produced and various complicated balsa parts cut to shape. Local exhibitions and displays have helped to increase the club's strength, where the main interest is controline stunt, particularly for display work.

North Western

R. Rhead of **WIGAN** is to be congratulated for topping the area combined Eliminators with a total of 26 : 20. Surprise in the area is that J. O'Donnell is so far down in the results that I doubt whether he will be able to qualify for the Trials. John did, of course, surprise everyone with his fine performance in the Indoor Meeting at the Corn Exchange, Manchester and P. Criddle also of **WHITEFIELD** won the area stunt competition with opposition from Urmston members, to keep the good name in the news.

Date for the *Stockport Express Rally* at Woodford is now definitely fixed for June 16th and it promises to be a very fine affair with all the usual events, plus Combat. **WIGAN M.A.C.'s** report tells me that two of their models persisted in going upwards o.o.s. in spite of D/T tailless, and when queried they informed all and sundry that it was just a natural glide. One model was found about a mile away, and the other must be still natural gliding. This was at R.A.F. Turnhill, where there was a fairly strong drift in clear blue thermally skies.

Some multi-channel radio models by **KEASAL R.C.F.C.** were going at the same time, and B. Askew's new design wi h two-channel elevator control, hopes for inverted flights at an early date. It was said that thermals were so strong for the gliders that twelve models were lost, one carrying a towing winch up to 50 ft. before it fell off, and after seeing the tailless glider circling at 900 ft., everyone dashed to tie their model boxes down!

A member of the **OLDHAM AND D.M.A.C.** is said to have a 8½ lb. A.P.S. *Vulcan*, which has been round to fourteen rallies and flown twice. The wheels are made from the Firestone advertisement Ashtrays! Perhaps contest interest is on the upgrade, for this club has a number of E.D. Racers which are being re-worked by the Pete Buskell system as described in AERO-MODELLER. **CHORLTON M.A.C.** have a fine field near the Stretford High School, and welcome new members. Principal interest is in gliders, and attendance is planned at the Woodford and Hyde Rallies. Incidentally, I have a note from **HYDE M.A.C.** telling me that no entries whatsoever can be taken after July 6th, and all information can be obtained from 21 Harding Street, Hyde. There will be no T/R at this Rally, which starts at 10.30, and this will be held on their new field with refreshments and model recovery warranted. Another Rally, in the North Western Area is at Clwyd for the Slope Soaring for Open Glider, A/2, R/C and Tailless. No fuse type D/T's are to be allowed. For those who do not know how to get to Clwyd, they can be located near to "Loggerhead". The second Rally in on August Monday, C/L on on August Monday, C/L Rodeo at Chester on the Roodee Racecourse for Class "A" and "B". plus Combat and stunt if there are sufficient entries. Pre-entry is required for all classes, and information is available from C. R. Filtness, 26 Raymond Street, Chester.

Scotland

The Scottish Gala will take place at West Freugh Aerodrome, Stranraer, on July 14th, having the Caton Trophy for Glider and Taplin Trophy for Radio. The Aerodrome is easily available from Glasgow, Belfast and Carlisle, so there is no excuse for poor attendance. Camping facilities are to be provided. Up at **PRESTWICK M.A.C.** *Tiger Terror*, which set the Southerners back a bit at last year's Nationals, has been put up for another session in the Davies Trophy, and we look forward to a Scottish contingent at Waterbeach. **ANGUS D.Ae.L.** had its first two 1957 events at Montrose Aerodrome on Sunday, April 28th, where R. Robertson won rubber with a *Borderline* and Les Dempster was 3rd in A/2 and rubber. Top in A/2 event was D. L. Petrie of Montrose flying his A.P.S. *Lucifer*. The Strathmore points are tallied on a team of three basis and worked out at 1,881 for **MONTROSE** and 1,836 for **BUCKSBURN** over the two events. Arbroath has 939 and Kirriemuir 676.

In the **ARBROATH M.A.C.** D. Porteous, aged 15, won the Junior Annual Club Exhibition by gaining top points with his *Sky Skooter*. He also happened to be the winner last year.

Wales

There is more flying activity in the **CARDIFF M.A.C.**, I understand, including 15 mins. o.o.s. flying by E. Taylor, with his own designed A/2. The area rally at Llandow was well supported with Ebbw Vale having an edge in team racing and Swansea's Frank Holland was once more unassailable in rubber.

B.A.O.R.

After rather discouraging news a few months ago, I gather there is an increasing interest in activity in the 2nd T.A.F. and a three-cornered competition between R.A.F' Ahlhorn, Buckeburg and Wunstorf was held at Wunstorf on April 21st in very high and thermally conditions. Class "A" Team Racing was won by F/O Crawford (Ahlhorn) using an Oliver Tiger, and 2nd was S. A. C. Barry (Buckeburg) using an O.S. Max 15. This is one of the few occasions which we have heard of Glowplug entries in Class "A". Winner in the other events were as follows:—

F-F Power: 1. S. A. C. Mason (Buckeburg), 2 mins. 44 secs. (Creep/Mach 1).

Glider: 1. S. A. C. May (Buckeburg), 4 mins. 16 secs. (Inchworm); 2. L.A.C. Collinson (Ahlhorn), 3 mins. 25·5 secs. (Snark); 3. S.A.C. Bray (Buckeburg), 3 mins. 20 secs. (Southern Sue).

The Stunt schedule was a modified A.M.A., one as shown in the A/M Annual and scored on the American system. The only manoeuvres left out were the square figures and triangular loops.

1. S.A.C. Mason (Buckeburg), 197 pts. Own Design/E.D. 2·46; 2. S.A.C. Finch (Wunstorf), 131 pts., Foxstunter/OS.35.

The 2nd Champs will be held some time in June at R.A.F. Gutersloh, and a team has been invited to attend the U.S.A.F.E. Champs at Weisbaden.

North Eastern

TEES-SIDE Newsheet No. 3 continues in its fine form with detailed drawings of T. Chamber's *Easyrider* Wakefield size lightweight which was 3rd in the 1956 Gamage and 4th in the 1957 Gamage event, and placed 1st at the Northern Gala last year. I think that of all the club sheets I receive, this one certainly is the most enterprising and factual. **DARLINGTON M.A.C.** have a most novel claim to fame in that they have designed and built for £7 a set of portable "conveniences" which will ensure that there can be no complaints from visitors or farmers, etc., etc. Plans are obtainable from the club secretary. Their Easter Gala at Croft was unfortunately blessed with high winds, results being as follows:

Power

1. S. Lanfranchi	...	Baildon	8·40
2. — Broomfield	...	Middlesbrough	8·04
3. B. Eggleston	...	Baildon	6·50

Glider

1. K. Harrison	...	Darlington	7·40
2. A. Farrar	...	Wakefield	4·30
3. B. Stoker	...	Tynemouth	3·04

Rubber

1. T. Chambers	...	Stockton	9·00
2. C. T. Miller	...	Baildon	6·51
3. I. Osborne	...	Darlington	3·11

Sunday, April 28th was the day for the **TYNEMOUTH M.A.C.** for their Open Rally at Town Moor, Newcastle, and they had fine weather with light winds, and those attending were from Darlington, Jarrow, Novocastria, Sunderland, etc. Thanks are due to the *Model Shop, Newcastle*, and *Hamilton Model Supplies* for the generous donations of prizes. Results are as follows:

F-F Power (3 min. max.)

1. T. Stoker	...	Tynemouth	6·54
2. R. Colling	...	Darlington	5·20
3. G. Oswell	...	Tynemouth	3·34

Glider (3 min. max.)

1. R. Swinden	...	Darlington	8·05
2. R. Nichols	...	Tynemouth	7·07
3. P. Ward	...	Darlington	6·38

Rubber (3 min. max.)

1. R. Pollard	...	Tynemouth	3·00

Chuck Glider

1. G. Carr	...	Tynemouth	2·07
2. R. Pollard	...	Tynemouth	1·33
3. R. Pollard	...	Tynemouth	1·31

Combat

1. G. Oswell / P. Jackson	...	Tynemouth / Tynemouth	

Pen Pal

Mr. R. Allen, of P.O. Box 132, Pietermaritzburg, Natal, South Africa, would like a pen pal who is interested in Contest F/F Power and C/L Stunt.

THE CLUBMAN.

For Your Diary

June 16th
Rush Trophy Gala (Novocastria Open Rally)—All Classes f/f, Combat, Concours —Newcastle Town Moor.

June 16th
Stockport Express Rally, f/f all classes, Jetex, T/RA and B. Flying scale, combat, R/C, Ladies' Challenge Trophy. A. V. Roe Aerodrome, Woodford, Manchester.

June 23rd
Northern Heights Gala—All Classes—R.A.F. Halton.
Clywd Slope Soaring—All Glider Classes —No fuse D/T's allowed.

July 7th
Enfield Controline Rally—T/R, Combat and Speed.
Hyde Rally—F/F, All Classes—R/C, Combat—Hyde, Cheshire.

July 14th
Scottish Gala—All F/F Classes, Radio—T/R, Speed—West Freugh Aerodrome, Stranraer.

July 28th
Slope Soaring Rally, Epsom D.M.FC.—Box Hill—Albatross Trophy.

August 5th
Chester C/L Rodeo—T/R Combat—Stunt—Chester Roodee Racecourse.

August 4th
Northern Gala—Linton on Ouse, nr. York. (Includes U.K. Challenge Match.)

August 24th/25th
P.A.A. Festival—Abbotsinch, Paisley.

August 25th
South Midland Rally—All Classes—Cranfield.

September 1st
Huddersfield Rally—Open F/F All Classes—Combat.
Wes: Hants Rally—T/R—Stunt Combat —F/F All Classes.

September 22nd
All Britain Rally—Radlett—All Classes.

September 29th
South Eastern Rally, Ashdown Forest—Open Event, F/F only, All Classes.

S.M.A.E. Contests

June 30th:
International A/2 Glider Trials.
Proposed: R.A.F. Hemswell.

July 7th:
Pilcher Cup ... U/R Glider
Women's Cup U/R Rubber/Glider D/C
Jetex Cup ... Jetex.

July 14th:
S.M.A.E. Scottish Gala—West Freugh, Stranraer.

S.M.A.E. Contest Results

WESTON CUP

April 28th, 1957

(Rubber—3 flts.—4 minute max's—70 Competitors)

1. Monks, R.	Birmingham	12·00 *plus* 5·23
2. Callinan, J.	Surbiton	11·30
3 Burwood, R.	Surbiton	11·25
4. Miller, K. J.	Croydon	11·17
5. Moore, L. E.	Leamington	10·45
6. Rutter, K. F. P. / Dennison, W.	Baildon / Wakefield	10·40 / 10·40
8. Wiggins, E. E.	Leamington	10·31
9. Palmer, J. D.	Croydon	10.30
10. Wood, D.	Luton	10·25
11. Sharp, F.	Blackheath	10·15
12. Clay, C. G.	York	10·06

LADY SHELLEY CUP

April 28th, 1957

Open Tailless (3 ft.—4 minute max's, 17 competitors)

1. Marshall, J.	Hayes	8·39
2. Grant, K.	Halifax	6·25
3. Neath, P. G.	Coventry	5·53
4. Nicholls, A.	D.H. (Hatfield)	5·07
5. Hardman, R.	Bolton	4·57
6. Wassall, J.	Hayes	4·29

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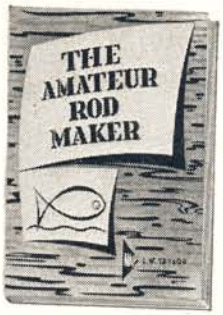

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