

AERO MODELLER

JANUARY 1960

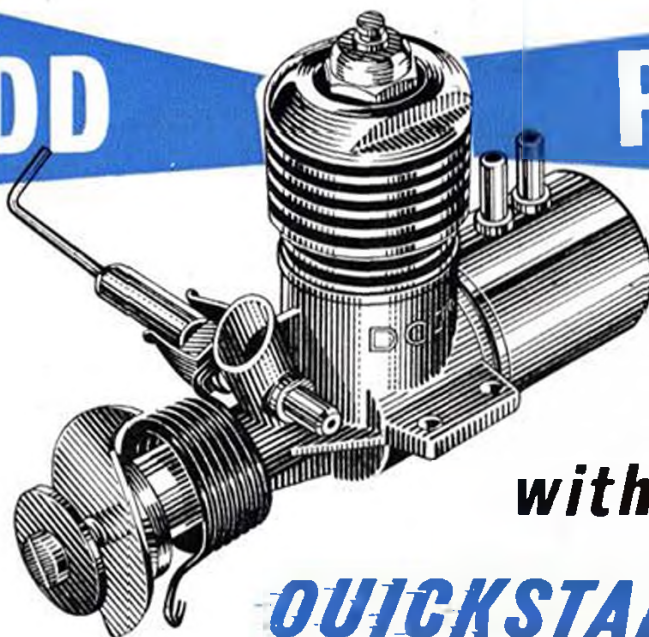


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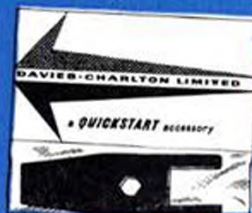
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This unretouched photograph...

proves that these inexpensive kits build up into really beautiful models

The plane shown is a 21" Piper Family Cruiser made from a K K Junior F/S kit

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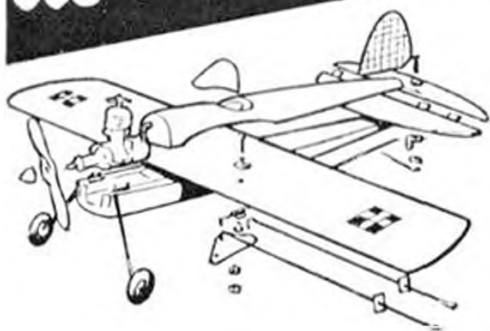




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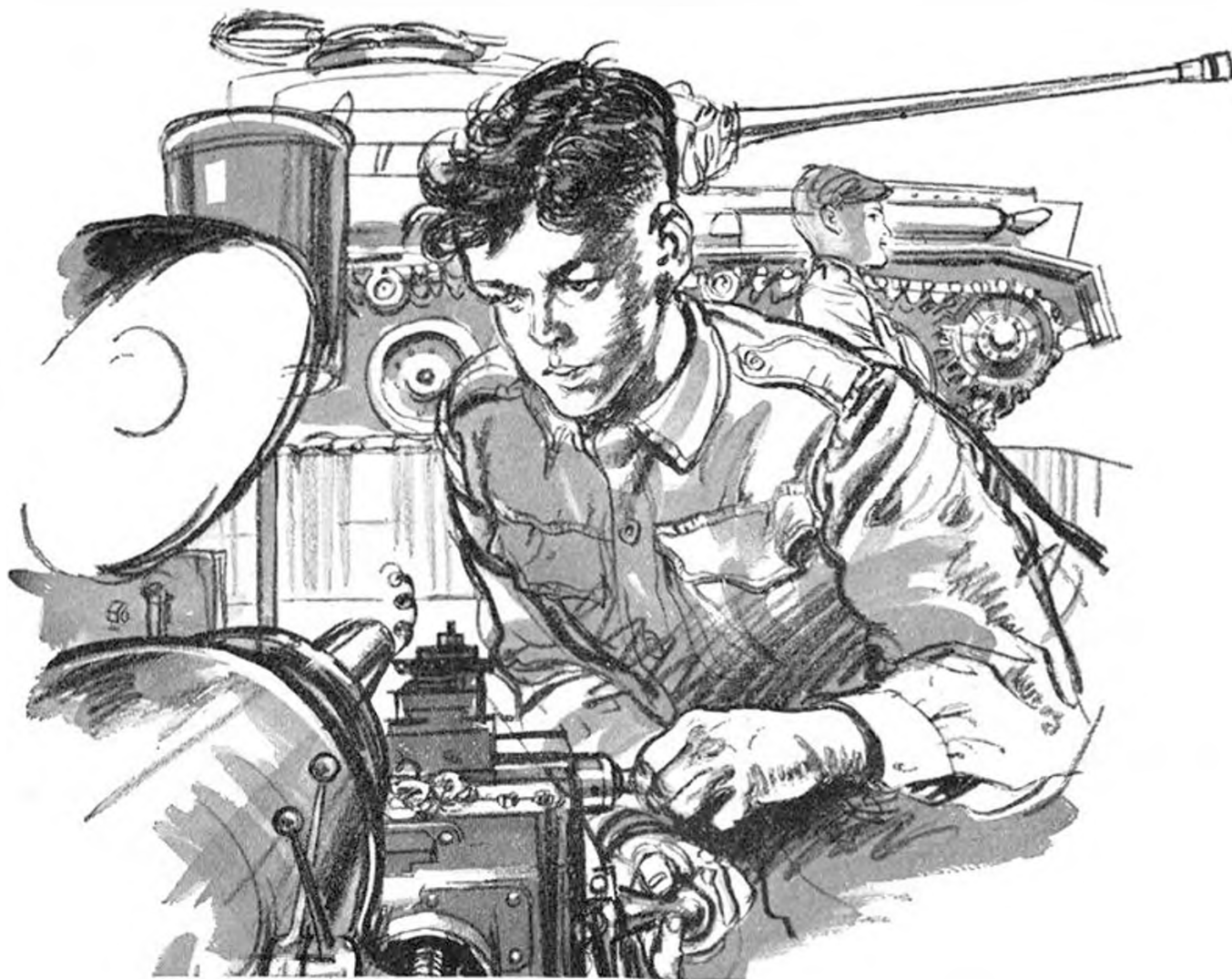


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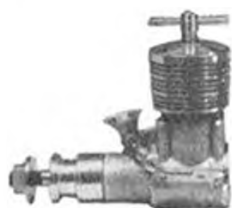
Free-Flight Expert DAVE POSNER — used K.K. RECORD SUPER-NITREX in his Cox Olympic 15-powered model to win the 1959 BRITISH F.A.I. POWER TEAM TRIALS, scoring eight successive maximums!

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January, 1960

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I have had a letter about my Balsa Story, which is a pretty mixture of praise and complaint. It first of all says nice things about how interesting the articles have been, and then ends up by saying that it makes the writer feel that we are much more interested in things like tanks than we are in aeromodellers.

Now that is not true, and in any case the Balsa Story has not been a story of model aircraft but a story about balsa. If I did end up by describing the most difficult work we have ever done in balsa wood it was because I think it is also the most interesting work that has ever been done in balsa wood, and because I hoped that it would give the maximum emphasis on our skill as woodworkers.

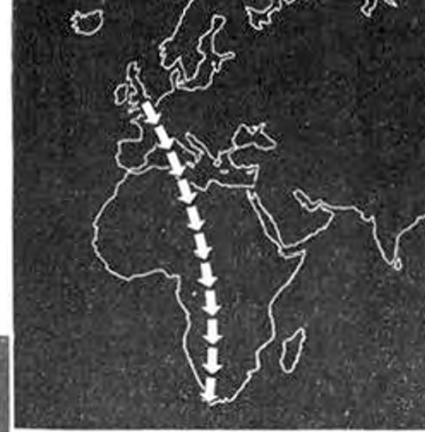
I am quite sure that our skill and accuracy as woodworkers is just as easily seen in all the aeromodelling work we produce. In our sheet, in our strip, and in the parts we produce for so many of the kit manufacturers in this country.

Solarbo IS the Best Balsa, the best selected balsa, the best machined balsa, and the most reliable balsa. That is the basis on which this business has been built — to be far and away the biggest in this country — and aeromodellers are our biggest customers and our most valued.

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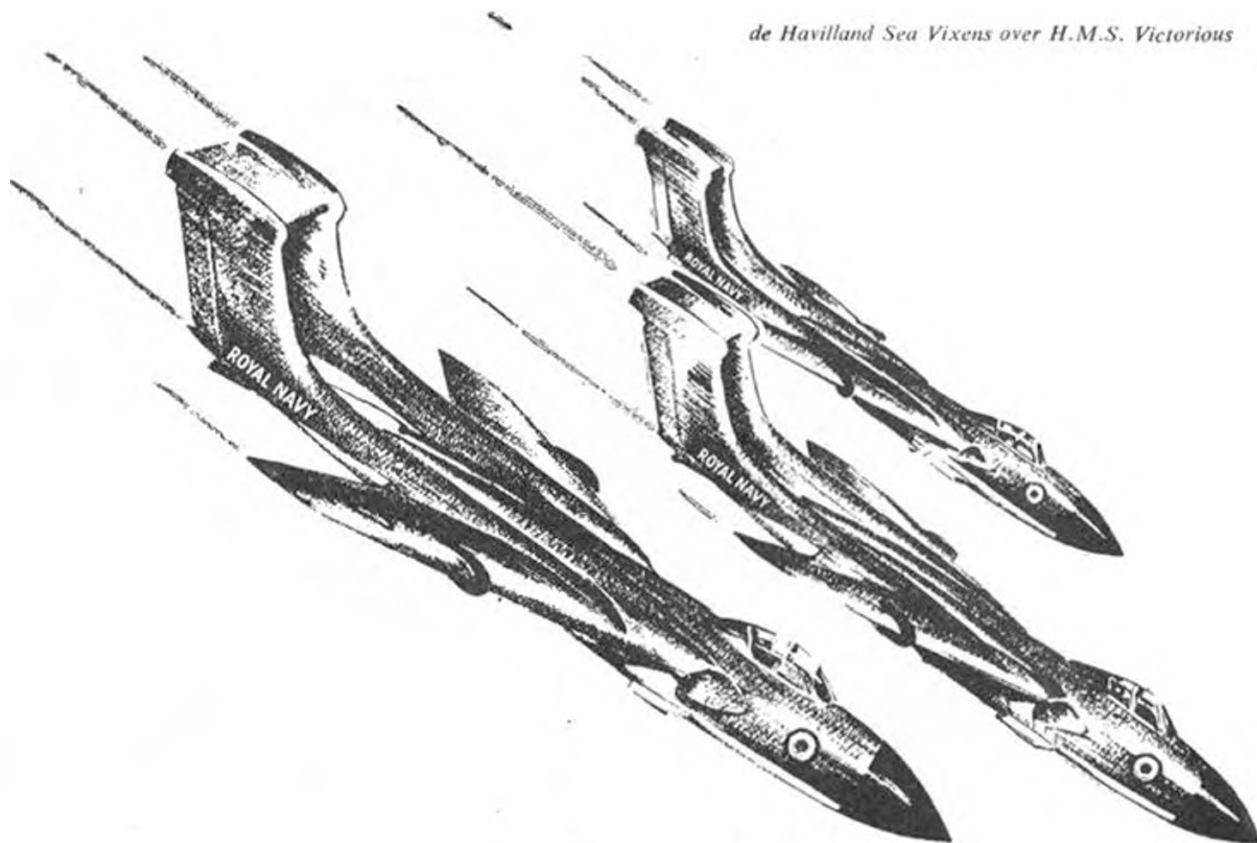
For details of how to apply, of pay, conditions and allowances write to:

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It is an advantage to join the Fleet Air Arm as young as possible, so do not delay—write today for the free illustrated booklet "Aircrew Commissions in the Royal Navy", containing full details.



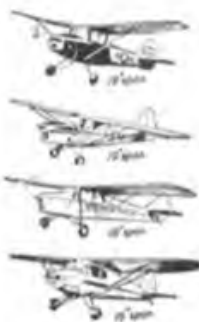
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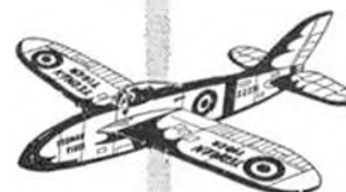


GLIDERS

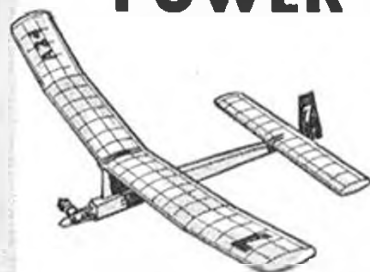


Positively the greatest value in low priced kits! Take your choice from the giant-size all balsa "Tiger" and "Panther" at only 1/11 each—or the 33 in. span "Rambler" at 5/4.

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Heard at the HANGAR DOORS

R.A.F. Station Waterbeach, with its many close associations with aeromodelling through past National contests of fond memory, now hits the headlines by winning the Jolliffe Trophy for the smartest Airman's Mess. The attractive Spanish decor is captured in this "Times" photograph. Who said life in the Service was dull? Waterbeach also has a very active model club with its own permanent headquarters, though we doubt if it bears any resemblance to the neatness of the dining hall!

Keep it quiet

CAN THERE BE a modeller who has not at some time or other heard the admonition of "stop that noise!" when engaged in running a model aero engine? The noise problem has always been with us, and over the years, as engine performance increases, the output in measurable decibels has also increased audibly. Some engines positively make the air ring with a piercing high speed note that is not pleasant, even to the enthusiastic operator.

In the majority of cases, clubs have approached the problem with commendable common-sense, by adopting flying grounds away from habitation for their control-line flying. Councils which have instituted the Home Office Byelaw, and allocated specific flying areas, have in almost every case insisted that the spot to be used is that farthest from housing. But unfortunately there are always those among us who are either so selfish, too lazy to walk an extra quarter mile or so, or downright ignorant enough not to foresee the consequences. These are the people who incur public wrath, and who lose us our flying grounds.

We do not claim that any model engine could rival a low flying Lockheed (any type) or a Boeing 707: but in nuisance value, the continuous wail of a model engine creates indelible discord and demands equal caution.

Why should we reiterate the well known problem at this stage? Well, just wait and see what happens when the "Noise abatement" Bill receives its second reading in the House of Commons on Friday March 4th. Put forward by Mr. Rupert Speir, M.P. the Conservative Member for Hexham, Northumberland, this Bill is likely to have considerable support in Parliament and one can readily surmise the possible restrictions that might apply to operation of miniature two-stroke engines.

Surely, then, the time is opportune for some enterprising manufacturer to anticipate whatever situation might arise by marketing a useful silencer unit? One does not have to look far abroad for a remarkably effective, lightweight and streamlined exhaust restrictor for 360 deg. ported diesels, and the large exhausts of bigger glow-plug engines can be adapted for a silencer just as happily as they now accommodate speed control devices.

The specification should be that the silencer is light, embodies an effectively sealed fit on the engine, can be used to conduct sludge and smoke away from the fuselage, and above all, does not reduce power output by more than a small tolerable margin or harm the engine through back pressure. Given such a unit, modellers could free themselves of constant reference as sources of noise nuisance.

Fixtures for the new season

THE S.M.A.E. Council Meeting on November 22nd announced that the 1960 British national competitions will be held at R.A.F. Scampton at Whitsun, (as last year). However, there will be one important change of policy regarding the Nationals in that the



Editorial
Director
D. J. Laidlaw-Dickson

Advertisement
Director
C. S. Rushbrooke

Editor
R. G. MOULTON

Editorial and Advertisement offices:
38 CLARENDON ROAD, WATFORD, HERTS.
TELEPHONE: WATFORD 32351 (Monday-Friday)

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On the Cover

MIXED BAG—A 1-century of fighter/interceptor development is caught by the Air Ministry camera in this dramatic view of four very famous Royal Air Force aircraft. Gloster Javelin, F.A.W.7, Hawker Hunter Mk. 6, Hawker Hurricane and Vickers Supermarine Spitfire formate over East Anglia. Note how the jet aircraft are obliged to use considerable flap in order to slow their cruising speeds to the high speed range of propeller driven Hurricane and Spitfire.

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

MODEL AERONAUTICAL PRESS LIMITED.
SUBSCRIPTION RATE: (Inland) 28/6, (Over-seas) 27/6 per annum prepaid including the special Christmas Number.

Society can no longer undertake to make arrangements for camping. This is a result of the unfortunate heavy expense in time and money caused by the amount of litter and discarded control line wire left in the camping site adjoining the airfield last Whitsun. In other words the campers spoiled it for themselves. Ray Parker's application for a rubber-driven flying boat record set up at Danson Park, Bexleyheath during September with a duration of 1 minute 16 secs has now been ratified.—Incidentally, as we go to press we have news of another record from the West Coast of America amounting to no less than 118 m.p.h. by a radio/controlled speed model.

Chance for the ambitious

A prize of £5,000 is being offered by Mr. Henry Kremer for the first successful flight of a man-powered aircraft designed, built and flown within the British Commonwealth under conditions to be laid down by the Royal Aeronautical Society. While we are not suggesting that modellers strap an A.P.S. "Leprechaun" or "Goliath" design on their backs and cycle madly down their local hill, but we do feel that there must be many modellers with full-size aviation experience, who welcome this incentive to exercise their knowledge of lightweight model structures.

Manufacturer enterprise

Each year AEROMODELLER Plans Service issues several thousands of scale drawings to modellers whose requests for manufacturer information have been met with a reference to our plans range. However there are many cases in which our Plans Service cannot help and we heartily commend the enterprise of Hunting Aircraft Ltd. who have just issued a magnificent summary of the more famous aircraft produced by that company in earlier days, complete with a photograph and beautifully produced 3-view drawings of each type. They are in fact to 1/72nd scale in the case of Vega Gull I, Gull 6, Proctor I, and Proctor IV. Other types in the brochure which can be obtained from the Publicity Department, Hunting Aircraft Ltd., Luton Airport, Bedfordshire, are the Q.6 and Mew Gull E.3H.

Below: Mrs. Barker referees in a "friendly" betwixt S.M.A.E. General Secretary Major S. D. Taylor (standing, to his advantage) and Competition Secretary Sam Messom (seated, but holding his own) at the S.M.A.E. Dinner. At right: Harry Barker deservedly receives the Arthur Mullett Memorial Trophy for his hard work in connection with the '59 Nats. Mrs. Nash is making the presentation on behalf of the Society

Indoor date

The week-end of February 13th/14th has been provisionally selected for the 1960 Indoor Nationals to be held once more at the Corn Exchange Hall, Hanging Ditch, Manchester. North Western Area announces the dates as early as possible so that intending competitors have ample time to prepare new models.

As before, there are to be three main events. (1) For Chuck Glider, with a maximum weight limit of $\frac{1}{2}$ oz. Best flight out of ten chucks to count. (2) Microfilm free flight, with no restriction on size, best flight to count. (3) Tissue-covered free flight with no restriction on size, but a maximum weight limit of $\frac{1}{2}$ -oz., best flight to count. As many flights as will be possible in the twelve hour session (with intervening chuck glider periods) should permit several flights for each entrant in classes (2) and (3). Cash prizes will be awarded in addition to the S.M.A.E. Badges and Certificates for winners. The 84-ft. high hall will be open for test flying and record attempts from 1.30 p.m. to 10 p.m. on the Saturday, contests taking place from 8 a.m. to 8 p.m. on Sunday.

Indoor flying has a unique fascination and we hope that this two-months' notice will inspire fresh enthusiasm for the super-lightweights.

Calling Radio Control enthusiasts

Those blue questionnaires that have appeared in last two issues of AEROMODELLER and our companion magazine *Model Maker* have been rolling in to good purpose. We have, indeed, been amazed at an interest beyond even our most optimistic hopes and are therefore proceeding with the second stage of our project, the production of Issue No. 1 of *Radio Control Models and Electronics*. This is scheduled to appear on Friday March 11th, dated April, and will thereafter appear monthly on the Friday of the month nearest to the 8th.

We thank all those who took the trouble to complete and return our forms—the information they have given should enable us to start with the right mixture of material. We know you are interested—it is now up to us to provide for you the kind of reading you have envisaged, and, believe us, we shall really do our very best. It is a little early to give more precise particulars at this stage, but next month we hope to tell you of "star" features and of the team who will be responsible for your regular delectation. Meanwhile, your good offices in spreading the word that *Radio Control Models and Electronics* is on the way will lighten our task on "D-day".



F.A.I. :

Important points from the C.I.A.M. meeting in Paris, October 24/25th.

Report we have received of this meeting is the most lucid and detailed that we can recollect reading. For this we must thank our active representation on the committee in the shape of S.M.A.E. Delegate R. F. L. Gosling and Henry Nicholls, as Technical Adviser. Under President Albert Roussel in the Chair, representatives from France, Spain, Switzerland, New Zealand, U.S.A., Gt. Britain, Sweden, U.S.S.R., Czechoslovakia, Hungary, Germany, Belgium, Italy, Finland, Poland and Holland discussed a full agenda which should have a useful effect on international contests in the future.

We shall endeavour to group items according to class of contest discussed, noting matters that have been decided upon. In a later part of this report, as a matter of interest, some of the more revolutionary suggestions made but not passed by the meeting are given.

International Calendar

Offers to run next year's events were considered and agreed as under. New Zealand were also desirous of staging the Power F/F Championship, but on a secret ballot Cranfield was chosen by an overwhelming majority.

Hungary would like a regular Microfilm Championship, and offered to run it in that country every third year if no one else so desired. Offer accepted, 10 for, some abstained (GB for).

Date	Event	Country	Venue
Feb 14 ...	A/2 Wakefield and F/F Power	Finland ...	Helsinki
Mar. 20 ...	Flying Wing (Tailless) ...	Holland	
July 23/25	World Championships Radio Control	Switzerland	Zurich
July 29/Aug. 2	World Championships F/F Power	G.B. ...	Cranfield
Aug. 13/14	Coupe d'Europe	Germany ...	Homburg
Aug. 15 ...	Hydro Cup Unres. ...	Yugoslavia ...	Split
Aug. 21 ...	Compass Controlled slope soaring	Germany ...	Bavaria
Aug. 26/27	Open Glider and Team Racing	Yugoslavia	
Sept. 8/12	World Championships Control Line	Hungary ...	Budaors
Sept. 18	F/F Power Contest	Holland	

World Championship Organisation

Advantages of annual contests advanced by G.B. with support from U.S.A., New Zealand and Germany. Switzerland favoured an Aeromodelling Olympics every 4-5 years, backed by Belgium, U.S.S.R. and Hungary

Have YOU got your copy?

Copies of the 1959 edition, *Sporting Code*, issued by the Federation Aeronautique Internationale (Section 4—Aeromodels), are now available, price 2/9 from the S.M.A.E. Ltd., 19 Park Lane, London, W.1. No contest modeller should be without this concise rule book which contains full information on Contests, Championships and Records.

liked present system. Spain, supported by U.S.A. suggested that question be explored by a sub-committee. This was agreed, and sub-committee appointed G.B. (H.J.N. in the chair), Hungary (R. Beck), Germany (H. Meier), Italy (G. Barthel), U.S.S.R. (to be appointed). First meeting would take place in New Year after national aero clubs had been circulated for their views on a questionnaire.

Canada's criticisms of organisation of recent World Championships in Europe were considered at great length. Difficulty occurred mostly through use of an American Military Aerodrome, where the N.C.O. responsible for giving access to stores arrived late. It was agreed that not too much time should be spent on these criticisms which were largely destructive, and inaccurate as to facts in many respects.

Control-line

To whip or not to whip was the question. To take effect from January 1st, 1960, whipping will only be allowed when coming into land for one lap only after the motor has stopped. Whipping definition suggested as follows:—Whipping is NOT taking place when the axis between the pilot's body, the handle, and the model maintain a straight line. In other words, the handle must not lead the model.

Control line handle design also discussed. Agreed that a sufficient length of arm be allowed top and bottom to permit of line adjustment—a length of only 4 cms. (1½ in.) would be adequate. This suggestion from G.B. agreed unanimously and Para. 4.6.4. will be amended accordingly.

G.B. proposal to adopt the A.M.A. schedule deferred to next meeting. Total flight time in Aerobatics increased to 7 minutes, including starting time, in view of extra manoeuvres now included.

Team race fuel tanks may in future be checked at any time throughout the meeting. The same checking equipment will be used throughout the contest.

A Stanzel Monoline handle was submitted by U.S.A. delegate for approval. After long discussion it was approved unanimously (Belgium abstaining) 4.6.4. does not apply to Monolines.

It was agreed that a member of a team can start his own motor and also act as mechanic for one other member of his team only (4.6.11). Spain proposed (4.10.8 sub para 5) each timer in team racing should have a stop watch and lap counting tachometer. Carried nem con.

Swedish amendment to 4.10.2. governing team race circle area, deleted words "minimum", making current radii of centre and flying circles in T/R exactly 3 metres and 19 metres. Carried, 11 against 2 (GB for).

Italy noted that Team Racer maximum weight requirement of 700 grammes (24.69 ozs.) was 58.33 grms./sq.dm², whereas item 1.3.3. permits up to 100 gr./dm² for C/L speed. Carried, that max. loading for C/L models is 100 gm./dm². (32.76 oz. sq. foot).

Italy proposed that mechanic be allowed to enter the T/R circle to retrieve a crashed model under supervision

of the course steward. Motion defeated 11 against, 4 for (GB for).

Free Flight

Three minute starting rule (3.5.1.) to be deleted on a G.B. proposition. Agreed.

Precise functions of team manager regulated by revision to 2.2.4. that:— "The Team Manager may accompany the competitor to take-off area but may not assist in starting or tuning the mechanical motor of the model". (Also applies to C/L and R/C).

Multiple fly-offs produced a spate of counter-propositions. Variations suggested were:—

Early start	Carried unanimously
Fix maximum time on day	Defeated
10 flights	Defeated
7 flights	Defeated
5 flights	Passed

Therefore 5 flights with early start is adopted.

The fly-off itself was subject to proposition by New Zealand and Finland. At the conclusion of five rounds, continue with successive flights with 3 min. max. until only one competitor remains. Carried 12 against 4 (GB in favour).

U.S.S.R. proposed use of binoculars compulsory for timekeepers. Defeated 8 against, 6 for (GB abstained).

Election of Officers

Albert Roussel was re-elected President, with H. J. Meier, Germany Vice-President. M. Bienvenu was elected Secretary.

Agenda items not passed

Some matters were referred back for small group discussion, when conclusions would be circulated. Amongst them was Landing Manoeuvres for Radio Control (5.5.3). Marking was to be reviewed by Dr. Good and Mr. Gilman since opinion was divided on relative importance of 1. Approach; 2. Elegance; 3. Precision. GB believed in zero marking for landing outside the circle, but majority was against it, preferring 1 mark. The following Italian proposals have been deferred to the next meeting as they affect model specifications.

CONTROL-LINE

That the T/R circle be increased to 20 metres diameter. That control-line diameter (item 4.6.4.) be increased to 0.30 mm. minimum for 2 lines and 0.40 mm. for single wire for speed models.

FREE FLIGHT

That maximum flight time be reduced to 2 minutes.

That the sixth, fly-off, flight be made with weight of

"Unaccustomed as I am . . .", this characteristic candid pic of Henry J. in action might well have been taken around the table at Rue Galilee in Paris. In actual fact it shows H.J.N. leading the all-British choral team at Hirsenhain in a stirring rendering of "Allouette"



the model increased by additional ballast. Gliders 600 grams. (24 oz.), Wakefield 280 gr. (10 oz.), Power 1,000 gr. (35½ oz.).

That the proposal to reduce maximum time would involve changes in the characteristics of the models, the following specifications were proposed.

GLIDERS

Total area:	...	25 dm ² max.
Weight:	...	700 grammes min.
Length of wire:	...	60 metres max.

POWERED MODELS

Maximum cylinder capacity	2.5 c.c.
Motor time:	10 sec.
Weight:	350 gr. for each c.c. of cylinder
Wing loading:	28 gr. for each dm ² .

MODELS WITH RUBBER MOTOR

Area:	...	17-19 dm ² .
Minimum total weight:	...	300 gr.
Weight of rubber motor lubricated	...	30 gr.

These items are to be circulated to aero clubs for consideration. U.S.S.R. suggested combining European and World Championships, this matter to be discussed by the Sub-Committee.

"SPOTlanding

did you say?"



Contest Disorganisation

DEAR SIR,

A new and disturbing phenomenon has recently appeared in the Aeromodelling world. This is the "Competitor's Rally"—not only run for the contestants but also, of necessity, by them.

The "East Midland Area and North Midland Association Winter Rally" (Wigsley, November 8th, 1959) was advertised in advance in the Modelling Press—and was well attended by intending competitors from far and wide. It was not, however, attended by any organisers either at the stated starting time, or for some hours afterwards. From interrogation of E. Midland Area and N. Sheffield members, it appeared that all organisation was in the hands of Mrs. Shirt (E. Midland Comp. Sec.) and her husband—and they were missing. The fliers naturally became restive and, about 1½ hours after the events should have begun, they decided that either the competitions would have to be commenced or there would not be time to hold them at all. Three "volunteer" recorders were found for the f/f events, to record scores (as reported by the timers in the absence of flight cards) and flying commenced. Similar arrangements were made by the radio, and presumably by the C/L entrants. (*Radio was judged by Ed Johnson, who travelled 400 miles to compete—and returned home without even a "thank-you"*—Ed.)

Mrs. Shirt (sans husband) eventually arrived, having been delayed four hours by a transport breakdown, and took over some of the f/f recording. Time was then wasted in writing flight cards from the score sheets for no apparent reason. To obtain knowledge of scores became much more difficult. About 13-15 fliers qualified to fly off in either Rubber or Power—and were completely unsatisfactory, as is the statement that "prizes will be sent on" with no attempt to make it a general announcement.

Even this fiasco was surpassed, however, by the "Loughborough College M.A.C. Winter Rally" scheduled for Wymeswold on November 15th, 1959. Arrivals at the drome were met with surprise from the R.A.F. together with a statement of "no permission, and hence no admission." The competitors, acting on a rumour that the contest had been moved to the College Airfield, finally congregated there. Loughborough College members were not in evidence, and impromptu f/f contests were eventually organised by the fliers. In mid-afternoon the L.C.M.A.C. Chairman arrived with the "explanation" that with Wymeswold not available the Club had cancelled the Rally. Notification of this was completely ineffective as shown by the attendance. The obvious step of having an Official at Wymeswold to direct competitors to the alternative and available College Airfield and holding the events there seems straightforward and practical—and yet was not done.

It is high time that it was generally realised that the organisation of contests automatically implies the acceptance of certain responsibilities by those in charge—especially if the Meeting is widely publicised.

Competitors are entitled to expect some organisation and an adequate number of officials to run the events. If this cannot be arranged—and the Wigsley meeting shows the folly of everything being run by one official—then there is little justification for attempting to stage the contest.

It is also the duty of the official(s) to be there before the starting time—and a transport breakdown should not delay arrival for hours. If an Area cannot afford a taxi in an emergency for the sole official in charge of a meeting attracting hundreds of people, then it should not run such events.

Cancelling a contest without notification sounds too ridiculous to be believed. The least an organisation should do is to have an official at the venue to apologise and explain. (The Midland Area overcame this on

READERS' LETTERS

September 27th, 1959 by not announcing a venue for their Rally—so did not have to bother cancelling it publicly).

The arrangements for fly offs and the provision of prizes at the meeting (not later) demand consideration by those in charge. Some means of making the officials (or their cars) more conspicuous and easily found would not come amiss.

In short—competitions should be reasonably organised—or not held at all!
Pendleton J. O'DONNELL
Salford 6

This is one of many letters received on the same subject. At the S.M.A.E. Council Meeting, November 22nd, a Sub-Committee was formed to investigate the sanctioning of future meetings organised by areas and/or clubs operating under S.M.A.E. jurisdiction. Our Contest Calendar for next season will only include sanctioned events.—Ed.

Promised Prop return

DEAR SIR,

I was the one who stole John O'Donnell's propeller unit at Chobham. Every time I think of the incident my conscience pricks me, and if you will publish John's address I will be glad to return the prop and clear my conscience. However, I shall never let my name be known, for my aeromodelling friends would consider me with scorn for evermore.

No address

No name.

Only too pleased to see the effect of our mention in the last issue—John's address is: 2, Park Road, Pendleton, Salford 6.

Success Story

DEAR SIR,

I am writing to express my enthusiasm over the "Galloping Ghost" system of control. I can honestly say that since trying this system in June of this year, I have never enjoyed flying so much.

I have flown R/C models with rudder only for about seven years. This year, I built a "Deacon" for rudder only as usual and equipped it with a "Transitrol" Rx, an Elmic actuator (which is first class), and used a P.C. transmitter. I had endless flights with this, and never a failure, in fact it became rather boring! I had no illusions about the model, and I know it wasn't the ideal for Galloping Ghost, but I "had a go". Incidentally, the pulse box I used was the Ives circuit which was printed in last year's Aeromodeller Annual.

After the first few flights, I became accustomed to the luxury of having two fully proportional controls. I had many flights in the initial stages using dry cells for the actuator (the M.M. motor). However, these needed constant replacement and I brought six 225 Deac cells which have proved a worthwhile investment.

After about 30 or so flights with this combination, I changed over to tone equipment, using the "Unitone" instead of the "Transitrol". This allowed me to carry less weight as it required only a pencil for L.T. and a single B112 for H.T. Originally, the engine was an E.D. Fury, but I find that a P.A.W. 1-49 suits the model better.

Although the "Deacon" may be laughed at, as a choice for the G.G. system, I am convinced that it is the ideal model for the beginner using Galloping Ghost system. I have now logged over 70 flights, each lasting about 10-15 mins. and have only had two failures, when the H.T. lead broke and the actuator shaft became loose.

Ormskirk, Lancs. MAURICE V. RAINFORD.
Our 16-page summary of all published features on Pulse Proportional systems is available as Radio Control Information Booklet RC 735, price 3s. 6d. from Aeromodeller Plans Service.

Leave Combat alone!

DEAR SIR,

Regarding Mrs. Shirt's letter (November issue) it seems to be that the present method of combat organisation is perfectly adequate.

Seldom have I heard complaints about the organisation from the competitors, but I have heard many from the organisers themselves, and even from unknowledgeable observers.

Nobody, who witnessed the smooth running of the event at Halton this year, would call for alteration of the present system. In my opinion Mrs. Shirt's ideas would bring confusion and possibility of bad feeling into the combat circle, at least in the South of England.

I should also like to correct Mrs. Shirt in that, anyone, "browsing around the combat circles" at the Nationals this year would have noticed that the event was being run efficiently and charmingly by a member of the "fair sex", namely Miss Penny Thatcher, to whom we are indebted.

Pinner

R. V. PRATT

Appeal for F.A.I. free-flight

DEAR SIR,

I am glad to see that Mr. Webb in your November issue raised the question of additional contests for F.A.I. power models for which there is a pressing need, as also is the case in respect of Wakefields.

Since the rule changes came into effect in 1958 both these types of models are unfairly handicapped for use in open contests with only the Trials and Eliminations in which to use them, and as a result there has been a natural decline in interest in these categories.

As the present small band of acknowledged experts in these classes dwindle, there will not be the necessary replacement by new blood unless a serious effort is made to make these types of models attractive to the ordinary contest flier. Bearing in mind the stimulus given to international class models in Continental countries by the exclusive use of this type of model in national contests, I feel that the solution is for the S.M.A.E. to give the lead by restricting its appropriate contests to international class models only, leaving the numerous Rallies to cater for the open models.

This proposal may well cause considerable opposition from protagonists of the free for all school, but the S.M.A.E. as the governing body has a duty to keep this country to the forefront in international competitions, which duty should be carried out despite temporary unpopularity.

This club has made suggestions broadly along these lines to the latest S.M.A.E. Contest Questionnaire.

Brighton

I. C. LUCAS.

(Questionnaire results indicate 65 per cent. in favour of no change, i.e., 6 F.A.I. events per year, two for each free flight class—a surprising poll result considering our knowledge of at least two S.M.A.E. Areas requesting 12 per year—Ed.)

Dieselling glow

DEAR SIR,

I have just been reading your article on "Fuel Consumption Tests", in the issue of the Aeromodeller, for June and October 1959 and was particularly interested in your remarks concerning the Enya 15 Glow.

I have one of those engines fitted to the "Stunt Queen" which appears to run equally well on this diesel mixture as it does on a glow fuel.

ETHER —35% CASTOR OIL 32% PARAFFIN—30% AMYL NITRATE 3%

The Enya 15 starts just as easily on diesel fuel as it does with "glow" and appears to develop just as much, if not more, r.p.m. This is on an engine which is only just run in and the needle valve has to be opened about ½ turn more with diesel than with glow. The leads can be disconnected as soon as the engine starts.

Grantham

R. W. FREESTONE.

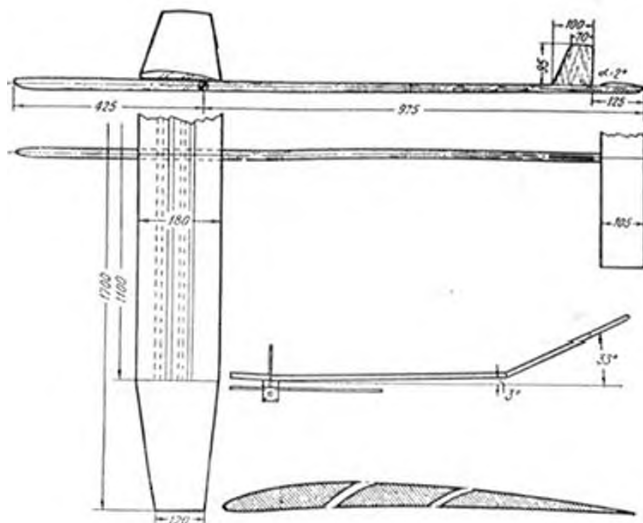
World News

News from "down under" the Wellington, New Zealand, model aeroplane club in fact, gives one some idea of the enthusiasm for the hobby in this part of the world. Ages for members of this particular club range from 10 to 72 years, they have three flying fields, one in the City, for Sunday mornings only, another some 40 miles away with dense bush surrounds to offer recovery hazards and one 20 miles away which is also used by the Upper Hutt aeromodellers. There is enthusiasm for all forms of model and 25 of the members are active in radio control, the latest interest being in slope soaring from a hill at Paraparaumu, 38 miles out of town. Multi channel is just coming into vogue and Les Wright is experimenting with a tone system. During the winter months indoor flying includes rubber driven team racing over 50 laps and indoor chuck glider.

An event which seems to have escaped our notice until now was the American indoor meeting in the Airship hangar at South Weymouth, Massachusetts, U.S.A. where very high times were set up under the 180 ft. ceiling, despite the fact that doors had to be left open to enable the public to come and have a "look-see". Dave Call, who was responsible for the smart little trainer chuck glider published in May 1959 issue, set up times of 29:06 and 30:32, then finally topped this with 31:47 to really qualify him for the "30-minute" club. Dave won the contest which was for 300 sq. in. wing area class "D" microfilm. Indicative of the high standard was Stan Shute's high time of 23:04 with a paper covered 100 sq. in. class "B" model. In Czechoslovakia the Control Line Nationals were held in Prague during October, top time in 2.5 c.c. speed being by Koci at 214 k.p.h. (133 m.p.h.) followed by Sladky and Pastyrik, all of these enthusiasts from Brno. Fastest team race time was 5:08 by Drazek who also won combat, and a clear leader in control line scale was Svoboda's Avro Manchester while last year's Criterium of Europe stunt

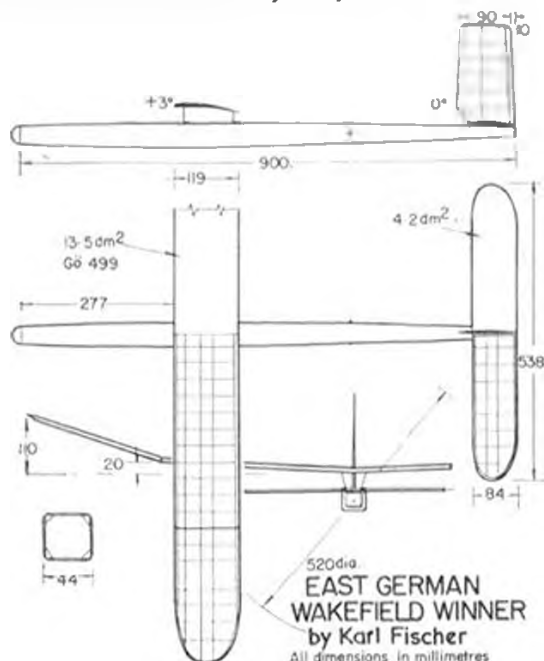
(Continued overleaf)

1/10th scale Swedish SAAB J29 jet by Olle Ericson took two years to build and has drop-out undercarriage, power by Dynajet. Next photo shows Imre Toth's Delta conversion of standard McCoy 60 speed designed for Hungarian Nationals, note that conventional tailplane is still employed for control. Below are the fast Hungarian jets belonging to Benedek and Azor being prepared for flight. Lockheed Lightning is the work of P. Groos of Haarlem, Holland, which won first prize in C/L scale at national contest during September, has two E.D. Racer diesels, span 4-ft., weight 42-oz., speed 60 m.p.h. Below are two interesting Ukrainian glider designs employing slot wings, regret no further information available





Top, attractive scale champion Tri-Traveller by Dan Lutz who made the Chester Jeep featured recently. This particular model has 12 coats of dope, is to 1/12th scale, photo by Bill Dean who was the designer of the "Luscombe-Silvaire" kit model seen on this, built by Mr. Bengt Forsback of Finland. Detailed S.E.5 is by Frank Pulver of Calgary, Canada, veteran flyer of those parts. Drawing below shows winning model in Eastern States International of last year

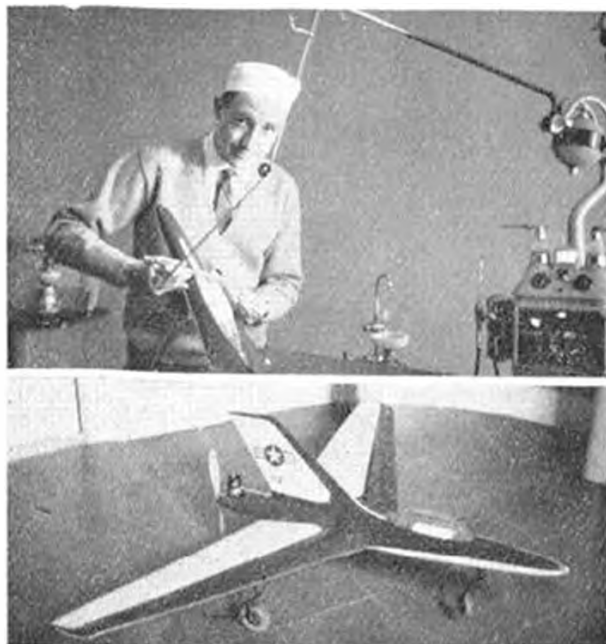


Over in British Guiana, government officials inspect fine model exhibition organised by local trader

champion Josef Gabris was top in aerobatics. Similar championships were also held in Hungary at the same time and once more the familiar names lead speed results with Rudi Beck top in speed, at 136 m.p.h. Highest speed of the meeting was George Benedek's winning flight in jet, 161.5 m.p.h. (see photograph of model). Best heat time in team race Azor's 5:06.

More news has come through of the Hungarian demonstration in China. The total trip involved travelling a matter of almost 18,000 miles mainly by TU-104 jet and IL-18. Observations on the standard of modelling in China that the standard of workmanship is particularly high and there is a very practical approach to flying trim. Standard materials are used but the new Chinese discovery of indigenous Tammo wood might provide a new approach to construction. The Chinese are very keen to establish themselves in the world championships

In Barcelona, dentist Dr. Jorge Prats uses his professional equipment for modelling novel creation for his unique car control





Mediterranean radio controllers M. M. Baridou (Menton), Pouliquen (Antibes), Aubertin (Monaco), Capitto (Menton), and Roy (Nice) enjoying some Sunday flying at Fayence airport near Nice

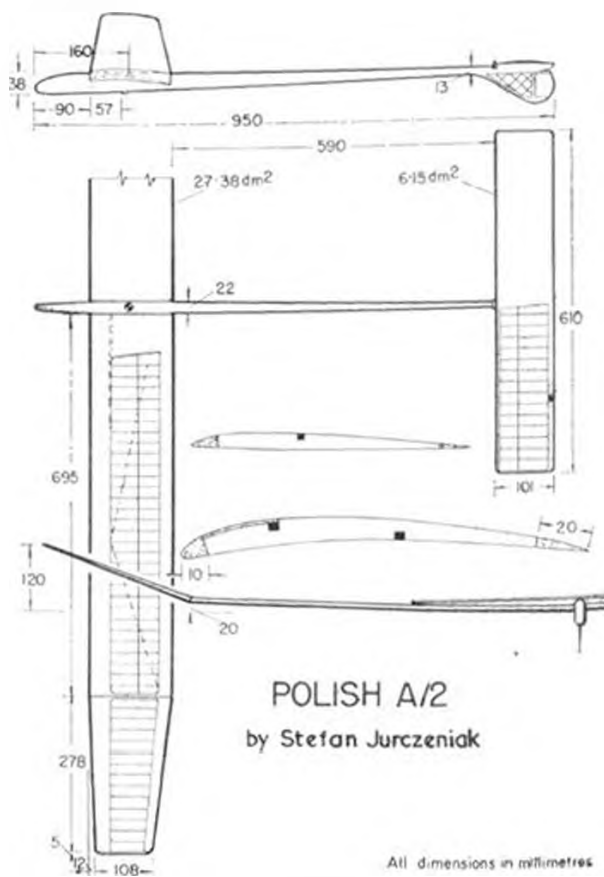
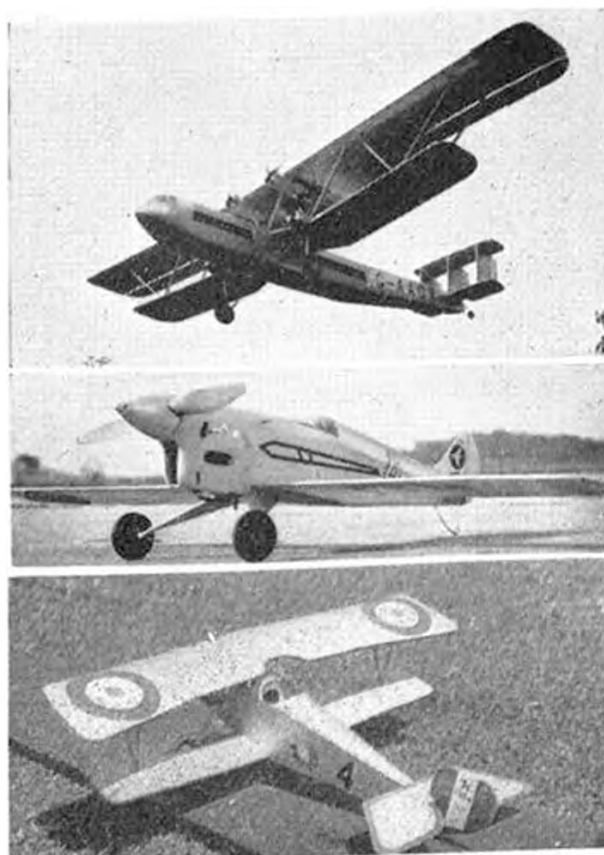
and they very closely follow the design progress in other countries. Photographs of their models indicate that they prefer tubular fuselages for Wakefields and follow the model design pattern established by leading Hungarians such as Erno Fryges. Biggest surprise for the Hungarians during their tour was the fact that the Chinese used rubber motors made in their own country and said to be every bit as good as the best available in Europe. Diesel engines are also made in Peking but there is no evidence of mass production.

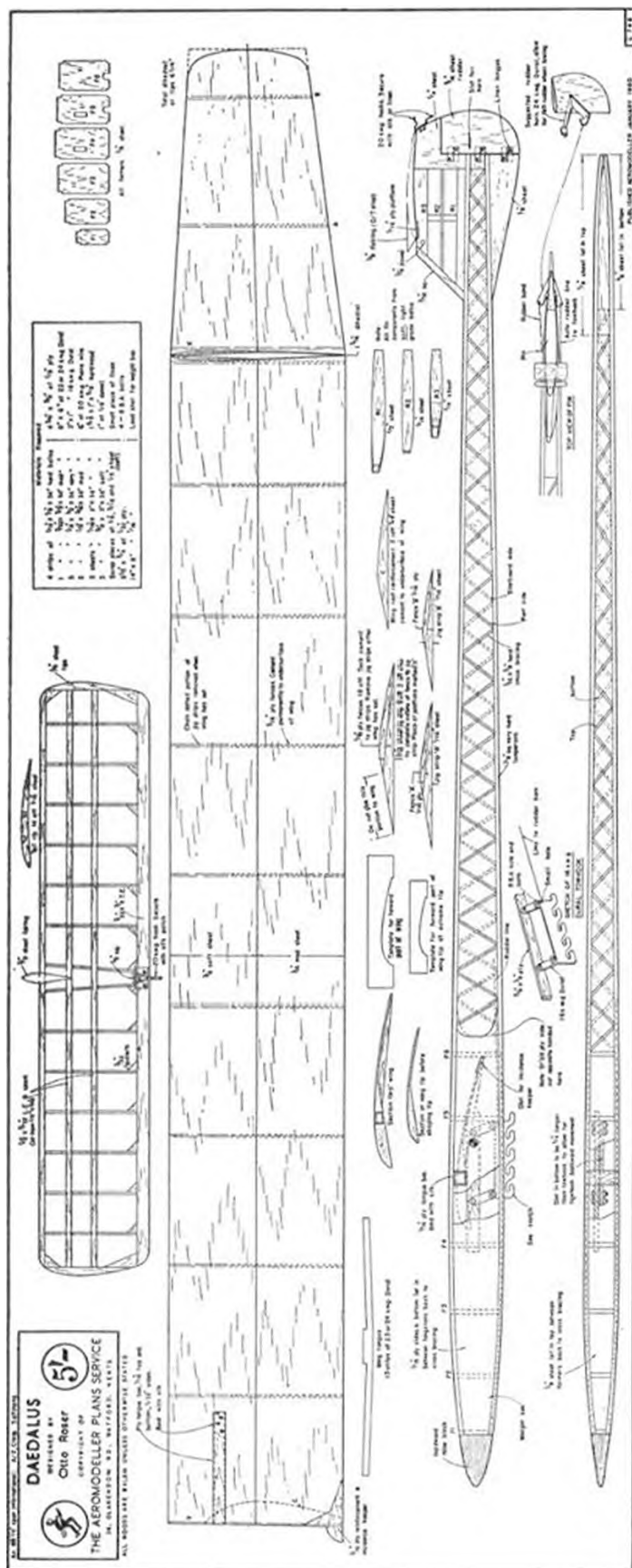
Combat is rapidly gaining popularity and as indicated by the photograph published last month, a number of girls have taken to the hobby and apparently put up a very good show in the circles.

Another country in which recent demonstrations have done much to spread interest in the hobby is that in **British Guiana** in the South American continent. The leading model shop arranged a display both static and flying which was visited by high officials in the government. From the number of models listed in the printed programme it is obvious that the club at Georgetown can put on a better show than many another equivalent community closer to the source of model, kit and accessory supplies.

Newspaper clipping received from Hilversum Holland reads "Model plane sails through double windows", the report reads on, "this is no manner in which to visit anyone on his birthday" or so thought Mr. Gaalenstroem when a fine model aircraft suddenly crashed through his windows, splattering glass around the chair in which Mr. Gaalenstroem was sitting. A few minutes later the owner of the plane, Henk Pfann came to retrieve his model and explain the unfortunate situation. It was actually a case of a radio model getting away from its owner in a rather expensive manner!

Handley Page Hannibal from A.P.S. plans comes from Central Africa at Kampala, Uganda, where G. L. Harter made the model to win local contest. From Brazil comes team racer with O.S. Max 29 which does 55 laps at almost 100 m.p.h. Nicuport Scout is from an American Guillow kit made by Bob Linn of Los Angeles. At right is a leading Polish A/2 design which set up a perfect total of five maxes in the Polish B team during the Eastern States International of last year





ONE OF THE MOST interesting Continental designs to the A/2 glider specification observed at the 1959 World Championships in Belgium was Otto Roser's first-line model. Actually named "Icarus V" (a name we cannot continue as we already have a well-known control line design bearing that title in our plans range), Roser's design embodies one of the simplest wing constructional forms and employs the Jedelsky airfoil.

The forward section of the wing thus forms one solid spar and the rear half is a trailing cambered portion continuing the upper surface in smooth contour and supported by under-surface fences to retain the airfoil camber. In order to preserve a reasonable weight distribution and to avoid weight mass at the wingtips it is essential that the balsa be of light grade and Jedelsky has been quoted as saying that quarter-grain (speckled surface) is essential for rigidity. The weight of the finished wings should in fact not exceed $3\frac{1}{2}$ oz. each half, which is a reasonable enough tolerance allowing almost 50 per cent. of the total weight to be included in the main lifting surfaces.

By popular request!

A solid wing A/2 glider with
high contest performance

DAEDALUS

by Otto Roser of Hungary

The fuselage is built up in order to save weight and care should be taken to see that the tail portion and tail-plane do not come out too heavy.

Reference to AEROMODELLER of June, 1959, pages 278/9, gives further information on the Jedelsky developments of Benedek airfoils together with sketches of his unique wing construction.

Other interesting novelties incorporated in Otto Roser's design are the swing multi hook device which is used to operate the two position auto-rudder. Because the fin is of a cambered section, slight left rudder may be necessary for straight tow trim and a bent dural two-sided horn has been employed for making simple adjustments.

In the actual contest at Bourg-Leopold, Roser's final placing at 39th position was by no means a true indication of the potentialities of the model. On his second and fifth flights the model was caught in severe down-draught, the other flights being two maximums and 2 : 39. One of the great virtues of this type of wing is that provided it is set up on a flat building board during assembly the wing is virtually warp-free. Great care should be taken, however, to see that any tissue protective surface is applied and dope with the wing pinned on a flat base-board and that the same number of dope coats are given to upper and lower surfaces.

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AVAILABLE AS PLAN G748 FROM
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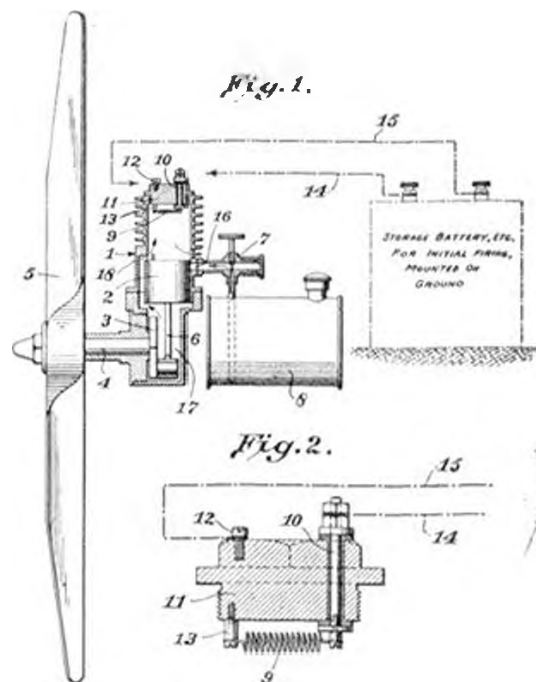


All-red tissue covering and yellow lettering on Otto Roser's prototype at the Bourg-Leopold finals made this high-aspect design impressive in appearance, and the all-sheet wing evoked considerable interest "Model-Avia" photograph

It will be seen on the drawing that wing construction is made more simple by employing jig strips to support the under-surface fences and these are removed after the wing panels are completed.

The fuselage incorporates Warren bracing with alternative diagonal cross pieces to offer a rigid fuselage of light weight and very small cross-section. Sides are built flat over the plan together with the 1/16 in. ply nose panels, then joined by formers F1 to F6 and top and bottom cross bracing and nose reinforcement fitted. Special care should be taken to see that the wing incidence keeper slot, accepting the ply reinforcement at the wing trailing edge, is at an identical position on each fuselage side otherwise wing panels will not line up accurately.

As a model for the expert and also for the enthusiastic comparative novice "Daedalus" is offered as a robust A/2 glider with excellent competition reputation in all weather conditions.



IMPORTANT PATENTS

2138301 K. HOWIE 1937

WITH THE RECENT resurgent popularity of the "glow-plug" this patent specification makes particularly interesting reading. When Howie invented this form of ignition in the miniature internal combustion engine he did in fact introduce a new kind of model aircraft. The post-war popularity of the European diesel obviously stole much of the glory of the glow plug engine but, significantly, it was not until 1948 — ten years after Howies' patent was granted — that the glow plug was introduced to the United Kingdom.

Even more significant has been the latter day tendency, in the U.S.A. at least, to return to the detachable cylinder head and glow element as proposed by Howie in Figure 2 of the specification drawings. It should be noted that the invention is not limited to the embodiment shown in the drawings, that construction is merely one preferred method of carrying it into effect.

The cylinder head includes two terminals marked as 10 and 12 and a smaller pillar 13. A coil 9 extends from the pillar 13 to the extremity of the terminal 10 which is, of course, insulated from the cylinder head. Material for the coil 9 is not specified, but suitable metals were available at that time and were known thirty years before; the fuel is not disclosed, but "dope" fuels were available and could have been used.

Howie claimed that his invention reduced the weight of the conventional power plant by 68 per cent. or 9.777 ounces derived as follows: dry cells 6.09 oz., coil 2.53 oz., spark plug and wires .359 oz., timer (presumably this refers to contact breaker and not flight timer) .242 oz. and condenser .556 oz.

The second sentence of Howies' introduction in describing his invention is worthy of repetition, it is in fact prophetic.

It reads: "Model airplanes at present have a wing spread of from five to thirteen feet, as compared with a desirable spread of two to three feet."

Thank you Mr. Kenneth Howie.

ENGINE ANALYSIS No. 67

by R. H. Warring



A-M-049

SPECIFICATION

Displacement: .83 c.c. (.5065 cu. in.)
 Bore: .421 in.
 Stroke: .364 in.
 Bore/stroke ratio: 1:16
 Bare weight: 1 1/2 ounces
 Max. Power: .052 B.H.P. at 14,000 r.p.m.
 Power rating: .0625 B.H.P. per c.c.
 Power/weight ratio: .03 B.H.P. per ounce
Material specification
 Crankcase casting: light alloy pressure die casting
 Cylinder: leaded mild steel
 Piston: hardened steel
 Connecting rod: hardened steel
 Little end: ball and socket joint
 Bearings: plain
 Crankshaft: hardened steel
 Spraybar: brass
 Cylinder jacket: dural
 Manufacturers: D.J. Allen Engineering

PROPELLER—R.P.M. TEST

Propeller dia. x pitch	r.p.m.
7 x 4 Stant	8,400
6 x 4 Stant	9,200
6 x 4 Trucut	8,600
5 x 3 Trucut	13,600
6 x 4 Frog nylon	12,600
6 x 6 Frog nylon	8,400
5 x 6 Frog nylon	11,800
5 x 6 Frog plastic (styrene)	10,700
6 x 4 Tornado nylon	10,800
6 x 3 Tornado wood	12,400
5 1/2 x 3 O.K. Plastic	13,200
6 x 4 D-C nylon	13,400
5 1/2 x 3 D-C nylon	17,200

Fuel used: equivalent 60-25-15,
 methanol, castor, nitromethane
 blend

THE A-M "049" is basically the American "Wenmac" motor, with certain material modifications consistent with British practice. It incorporates the "Wenmac" patent recoil starter as a standard feature, which represents yet another approach towards "foolproof" starting on baby motors intended for popular sale and gives the front end of the motor a most unusual appearance. The "049" is typically American in layout, with combined beam and radial mounts incorporated on the crankcase casting. Primarily, in fact, the crankcase design is intended for radial mounting. If used with beam mounts it becomes necessary to notch the beams to clear the rear web on the casting. It must be emphasised that there is not enough metal on the crankcase to file the rear flange away.

Allen Engineering only claim that the "049" is an easy-starting sports motor, but its performance on test proved far from sluggish. Maximum B.H.P. developed was, in fact, as high as .052 at 14,000 r.p.m. which gives a specific power output in excess of .06 B.H.P. per c.c. Quite a number of small diesels have not attained this figure. Performance was consistent and smooth throughout the whole of the speed range tested and the "049" was extremely happy running at speeds in excess of 15,000 r.p.m.

Starting is a little strange with the recoil unit. With all the "geometry" hidden it takes a little time to get used to the fact that merely turning the propeller back against the normal direction of rotation engages the small rollers

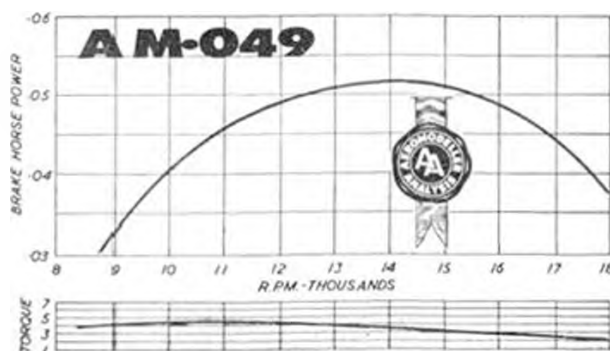
to translate the spring energy into rotation of the crankshaft when the prop is released. The process of engagement and disengagement is fully automatic, the principle of operation being essentially the same as the automatic rewind "pull" starters fitted on modern outboard engines.

Once having got used to the starter, it works like a charm, provided the cylinder and crankcase have not been flooded by excessive finger choking. Light choking to fill the fuel line, followed by a small prime through the exhaust is definitely the best technique, without the needle valve being opened too far. Then first or second try starting is more or less guaranteed, and the virtues of a fully automatic starter with nothing to connect pleasantly underlined. It also seems easier—and more logical—to use the starter rather than flick start. The presence and "feel" of the starter unit seem to mitigate against flick starting, although this is probably psychological. Provided the engine is not flooded, flick starting is quite straightforward on any propeller size.

The manufacturers recommend surprisingly large propeller sizes for the A-M "049"—sizes which on our tests held down r.p.m. to below the 10,000 r.p.m. mark. It is certainly not an engine which turns very sluggish on a high pitch propeller, however, which many baby glow motors do. But apart from the higher power output, we felt that running was more efficient and smooth at higher speeds, which suggests something like a 6 x 4 as a maximum size of propeller. Flight performance, we feel, would be markedly improved.

On static tests, slight power loss was noticeable on warming up, but this would be more than recovered in the air as the load comes off the propeller and a propeller size matched to a static r.p.m. figure of around 13,000 would probably give best results in the air. For free flight, the diameter should be as large as possible, which emphasises that the current range of commercial props, based on diesel requirements, do not really cover the requirements of the new baby glow motors appearing. No doubt this position will soon be rectified.

About the only criticism that could be levelled against the handling qualities of the A-M "049" is that the needle valve is much too near the propeller disc. Needle locking is provided by a short length of fuel tubing, acting as a friction brake which will soon harden under



Three new '8c.c. glowplug engines

the action of fuel and lose its effect. However, when this happens, it is easy enough to replace with another length.

Construction of the A-M "049" presents a number of unusual features for a British production. The crankcase is quite short in length, incorporating relatively massive lugs and a rear flange for the radial mount. The front end is cut off immediately in front of the choke tube although the bearing continues through the recoil spring case to carry the starter cam. The spring case is riveted to the crankcase casting with two screwed plugs.

The "works" of the starter are enclosed in a separate case, the rear cover of which is swaged or similarly locked in position so that this unit, incorporating the hardened rollers, cannot be dismantled. The whole unit, in effect, becomes a large diameter propeller driver when assembled by driving onto the splined length of crankshaft.

The hardened steel crankshaft is 7/32 in. diameter, stepping down to a 5/32 in. Whitworth threaded length. Bearing length is short—only 1 1/16 in. The crank web is fully circular and sharply bevelled. Bearing surfaces are ground to finish but not, it would appear, the 3/32 in. diameter crankpin.

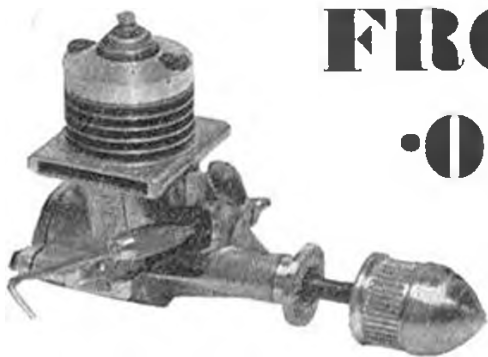
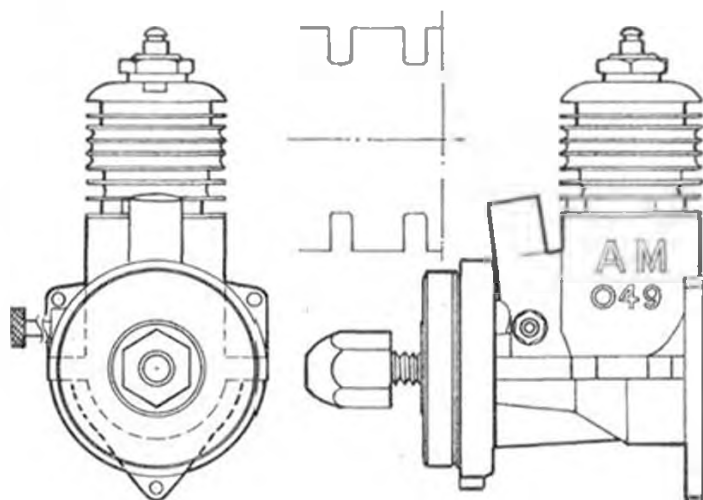
The connecting rod is very thin in section, turned from steel with two "ball" ends and hardened. The piston is also hardened steel and incorporates a socket for ball-and-socket mounting of the little end. The connecting rod is retained by a small circlip, giving a generous amount of play.

The cylinder is of soft leaded steel, screwing into the crankcase casting. Two transfer ports are cut down the sides of the crankcase threads. Three cylinder transfer ports are cut through the cylinder wall immediately below the exhaust flange and three exhaust ports immediately above them. The cylinder is capped by a relatively shallow jacket, screwing in place and sealing on a gasket.

The new A-M 1.5 volt glow plug is fitted as standard

and does, in fact, give a superior performance to other types of glow plug tried. It is specifically recommended for a 1.5 volt starter battery (i.e. a dry cell only, not an accumulator) and cannot take 2 volts without burning out. Main feature of the A.M. glow plug, apart from its attractive small size and appearance, is a relatively large core hole around the platinum wire element.

Here again we have a well engineered and well produced glow motor selling at a remarkably low retail price. The starter unit alone must be an expensive item to produce, but none of the normal standards associated with good British engine production has been lowered to accommodate this "extra". An easy enough engine to start and handle, with plenty of "pep". And if you do happen to like slow running engines, this is one of those glow motors which will swing quite large propellers happily.



FROG •049

LARGEST OF THE current crop of British "049" glow motors, and leading its competitors by 3 months' sales in the model market the .8 c.c. Frog bears a distinct resemblance to the Frog "80" diesel, particularly as it incorporated the same crankcase casting with its characteristic integral stub exhausts. However, the 049 glow is basically a new engine which has undergone extensive development work to arrive at a good "sports" performance with smooth running and easy starting characteristics. Whilst the crankshaft and crankcase remain unaltered, the cylinder is entirely new and the result of

some dozens of individual set-ups to determine the best porting arrangement, compression ratio and combustion chamber shape.

The result is a very easy glow motor to handle, with a performance comparable with that of the diesel version at the higher speeds. Starting characteristics are extremely good, so good, in fact, that the manufacturers have felt that the complication of any starter device was quite unnecessary, even for beginners, which claim would seem to be borne out by practical tests. Having established rough settings for any particular size of propeller, first flick starting can be obtained from hot; or cold after filling the fuel line by finger choking and giving a prime through the exhaust. And the flick does not have to be a very smart one. You can almost—but not quite—start by twisting the propeller nut.

This nut is deliberately made large in size and knurled, the object being that if "assisted" starting is required—useful if the engine is well and truly flooded—a length of cord can be wound round the nut and pulled off to spin the motor. This simple technique works very well and can be applied to the engine mounted in a model since one does not have to grasp both ends of the starter cord but merely aim to pull the cord off the spinner in line with the propeller.

(continued overleaf)

FROG 049 (continued)

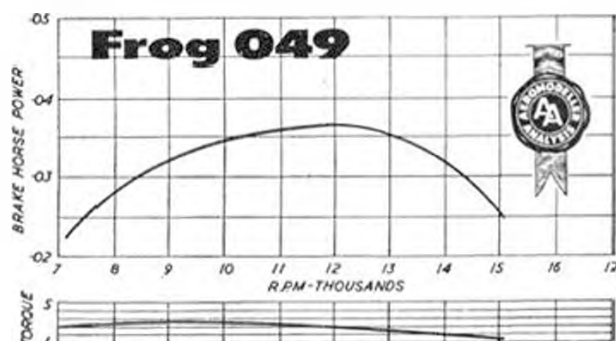
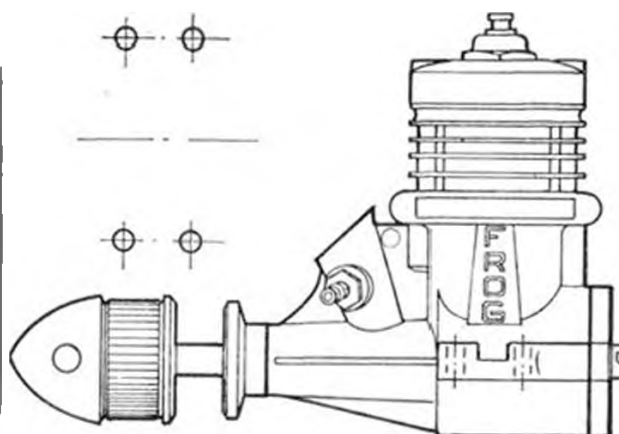
SPECIFICATION

Displacement: .808 c.c. (.04926 cu. in.)
Bore: .400 in.
Stroke: .392 in.
Bare weight: 1.8 ounces.
Max. power: .037 B.H.P. at 12,000 r.p.m.
Power rating: .046 B.H.P. per c.c.
Power/weight ratio: .0205 B.H.P. per ounce.
Material specification
Crankcase: light alloy pressure die casting
Cylinder: leaded steel
Piston: cast iron
Connecting rod: light alloy forging
Crankshaft: hardened steel—3BA propeller shaft thread
Main bearing: plain
Prop. driver: dural
Cylinder head: dural
Spraybar: brass (ratchet spring locking)
Glow plug: KLG Miniglow "X"
Manufacturers: International Model Aircraft Ltd.

PROPELLER—R.P.M. TESTS

Propeller dia x pitch	r.p.m.
7 x 4 Stant	7,400
6 x 4 Stant	8,400
6 x 4 Trucut	7,600
5 x 3 Trucut	11,900
6 x 4 Frog nylon	11,400
6 x 6 Frog nylon	8,400
5 x 6 Frog nylon	10,600
5 x 6 Frog plastic (styrene)	9,700
6 x 4 Tornado nylon	9,600
6 x 3 Tornado wood	10,600
5 1/2 x 3 O.K. plastic	11,500
6 x 4 D-C nylon	12,400
5 1/2 x 3 1/2 D-C nylon	14,400

Fuel used: equivalent 60-25-15, methanol, castor, nitromethane blend



The "049" is fitted with the new Miniglow "X" glow plug and we tried starting on both 1.5 dry and 2 volt wet batteries. Either appear suitable, but the 2 volt supply is better when first handling the engine (i.e. with needle setting not established). Certainly the life of the plug did not appear to be affected by the greater voltage and the hotter element temperature appears to offer an advantage with this motor.

Running was smooth and consistent, with a tendency to increase r.p.m. slightly on warming up. Needle valve setting was very non critical and could be opened up a turn or more before over-rich running became apparent. Starting and running was just as consistent on straight glow fuel as on doped fuel, although r.p.m. figures for any given propeller load were improved by some 5 per cent., using the latter.

Basically the Frog "049" appears to have been proportioned around the Frog nylon 6 x 4 as a matching size of propeller, with no particular attempt made to develop higher speed performance. Peak power on test was, in fact, measured at 12,000 r.p.m. with a marked fall off in performance past this point. In this respect, of course, high speed demand would be beyond the requirements of an engine designed specifically for sports use. At low speeds performance remained consistent and the Frog "049" was still reasonably happy driving an 8 x 6 nylon propeller with which, incidentally, it has proved capable of flying a model. Within this lower speed range, of course, performance is inferior to its diesel counterpart.

The entirely new "049" cylinder incorporating integral finning has upward-angled drilled transfer ports (a pair each side), overlapping the two exhaust ports (actually emerging in the substantial pillars between the

exhaust ports). The cylinder is secured by two screws through the head, the bottom flange resting on the crankcase casting and sealing with a gasket. The two large transfer passages are formed in the crankcase casting and the fact that the hold-down screws pass through the cylinder fins ensures that the cylinder ports line up, irrespective of which way round the cylinder is replaced.

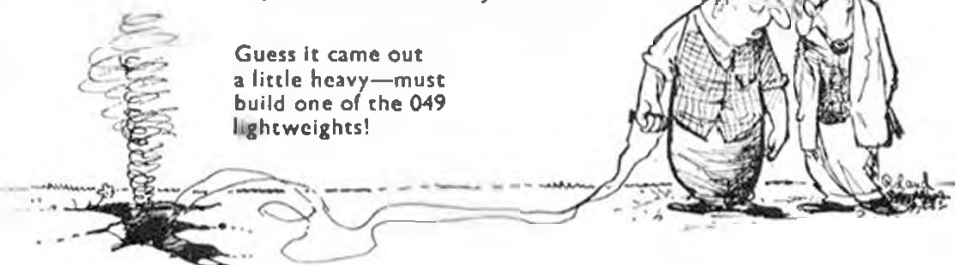
The head is turned from dural, with an appreciable spigot plugging into the open top of the cylinder. This has been shaped to give a hemispherical combustion chamber, found to give the smoothest running and flexibility of operation, particularly with doped fuels. The head also seals with a gasket with the KLG plug screwing into the centre of the head.

The piston is of cast iron, flat topped with a bevelled edge. Cylinder wall thickness is quite light, no doubt contributing to the low level of vibration experienced whilst running. Workmanship and finish is generally of a high order throughout.

The balance of the construction is as for the Frog "80" diesel, with the exception of the large spinner nut already mentioned. This is turned from dural, giving a knurled section of approximately 9/16 in. diameter and ankle length for cord winding with a spinner entry, the latter with the usual tommy bar hole for tightening.

Manufacturing tolerances appear to be held almost to "diesel" standards, with a close fitting piston giving a definite compression feel, and also marked crankcase compression. Crankcase volume, too, is relatively large which means that if the motor is accidentally flooded there is a lot of raw fuel to blow out in order to give the plug a chance! A point, too, with regard to the use of a battery connecting clip. The blued finish on the cylinder can act as an insulator and thus not give a proper earth connection, if the clip is only lightly positioned. It is not likely that this will happen every time, but is a point worth checking if the engine does not start. The Frog "049" is an engine that should—and does normally—start first flick every time, after a prime. And provided the needle valve is somewhere near the right setting, it will keep running as many modellers have already discovered.

Guess it came out a little heavy—must build one of the 049 lightweights!





SPECIFICATION

Displacement: .762 c.c. (.0465 cu. in.)
 Bore: .410 in.
 Stroke: .352 in.
 Bore/stroke ratio: 1.17
 Bare weight: 1.3 ounces
 1.5 ounces (with tank)
 Max. power: .053 H.P. at 15,000 r.p.m.
 Max. Torque: 4.5 inch-ounces at 10,500 r.p.m.
 Power rating: .07 B.H.P. per c.c.
 Power/weight ratio: .035 B.H.P. per ounce

Material specification

Crankcase: light alloy pressure die casting
 Cylinder: leaded steel
 Cylinder jacket and head: turned dural
 Piston: hardened steel
 Crankshaft: hardened steel, 6BA propeller shaft (bolt)
 Connecting rod: light alloy forging
 Bearings: all plain
 Plug: KLG Miniglow X, short reach, 1.5 volt
 Spraybar assembly: light alloy
 Propeller driver: dural
 Manufacturers: Davies-Charlton, Ltd., Hills Meadows, Douglas, Isle of Man

D-C Bantam

SMALLEST in overall size, and lightest of the current spate of British "049" glow engines, the "Bantam" offers exceptional value for money and a remarkably high specific power output of .07 B.H.P. per c.c. Handling characteristics, too, particular starting, are very good and the matching range of accessories include two sizes of moulded propellers in a soft grade of nylon, the "Quickclip" for easy attachment of the starting battery, a matching spanner, and "Quickstart" glow fuel specifically blended to give top performance with the "Bantam"—a complete outfit for less than the price one has become accustomed to paying for a baby diesel.

The Bantam is, of course, "tailored" around the Davies-Charlton coil spring and cam starter—a simple and effective device which is easy to use. The manufacturers recommend a set starting technique, using the "Quickstart" which is just about as foolproof as can be and really does produce instant results, if followed faithfully. Once familiar with the setting for any particular propeller size, however, flick starting is just as easy. Needle valve adjustment is not critical and allows considerable latitude in arriving at an optimum setting.

Whilst the "Bantam" will run quite happily down to 9,000 r.p.m. on the larger propellers it is definitely sweetest and happiest running really fast, achieving nearly 18,000 r.p.m. on the $5\frac{1}{2} \times 3\frac{1}{2}$ D-C nylon propeller, for example. Peak power appears to be developed around

15,000 r.p.m. and so with this propeller size the Bantam is probably over-speeding, but the power fall-off is not abrupt past the peak. Some slight loss of power was experienced on warming up at all load speeds, but this was not significant.

In appearance the "Bantam" follows the familiar "Dart" layout. The original "Dart" crankcase die has been reworked to give a large crankcase diameter, but otherwise is identical. A finer thread is, however, used for holding the bottom of the cylinder (40 t.p.i.) and transfer passages are milled down each side of the crankcase unit.

The cylinder itself is turned from leaded steel, unhardened and seals on a copper gasket when screwed in place. Three transfer ports of relatively shallow depth are cut in the cylinder walls immediately below the exhaust flange and three exhaust ports in the flange itself. The pillars of the exhaust ports come over the centre of the transfer openings. The upper cylinder is completed by a turned dural jacket screwing in place, giving a flat head into which the KLG plug screws. Check that both head and cylinder are screwed up tight if running is erratic, or starting difficult.

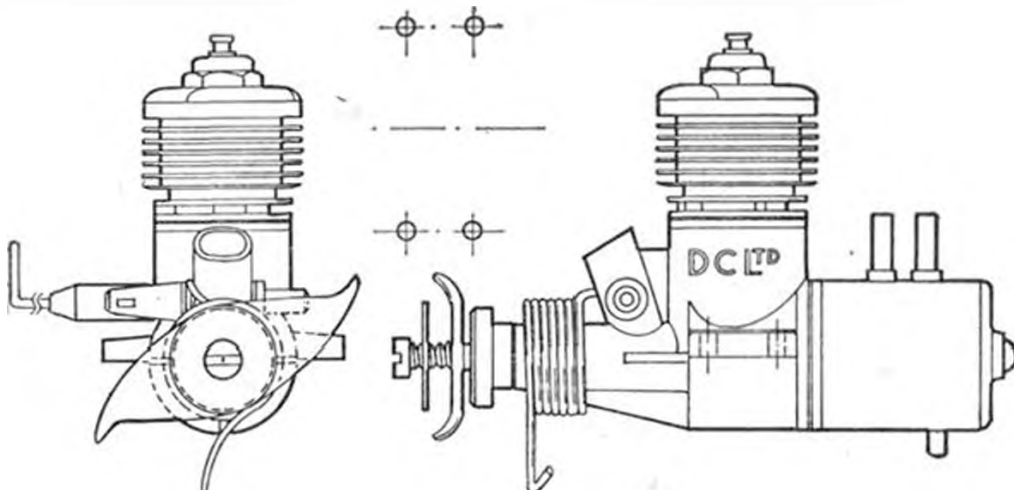
The piston is of hardened steel, of substantial wall thickness and rather nearer "diesel" standards for fit

(concluded on page 27)

PROPELLER—R.P.M.—TESTS

Propeller dia x pitch		r.p.m.
6 x 4	Stant	9,200
6 x 4	Trucut	9,000
5 x 3	Trucut	13,600
6 x 4	Frog nylon	12,400
5 x 6	Frog nylon	10,600
5 x 6	Frog plastic (styrene)	11,700
6 x 4	Tornado nylon	10,800
6 x 3	Tornado wood	12,200
$5\frac{1}{2} \times 3$	O.K. plastic	12,900
6 x 4	D-C nylon	14,200
$5\frac{1}{2} \times 3\frac{1}{2}$	D-C nylon	17,600

Fuel used: Davies-Charlton
 "Quickstart"





NEARLY seventeen thousand square feet of factory space on one floor, with packing, despatch, tool room etc. on a mezzanine above part of it, built to the company's precise needs, surrounded by flowering shrubs and adjacent to the capital is a good enough reason for anyone to move to the Isle of Man, or so Hefin Davies, Managing Director of Davies-Charlton Ltd. believes. Low income tax, beautiful scenery, and golf without queueing are purely incidental extras.

It is a big change from the humble beginnings of the firm in 1946, when young Davies, whose wartime years had been spent with Rolls Royce, on, amongst other things, the original jet developments, decided, to the horror of his closest relatives, to give up his good job and start on his own. First of all, as older readers will remember, his original Barnoldswick venture was a design office offering drawings for the early Wildcat diesel, hot air engine, and the like. Castings and machined kits for these drawings soon followed, made by sub-contractors. In 1947 he bought his first lathe and started direct manufacture. This produced an almost immediate demand from his neighbours for an injunction to stop engine testing. "I won't grant an injunction now", said the Judge, "but if you go on testing engines, I will". This Irish judgment forced an expansion to nearby factory the "Crows Nest," and again to Station Sawmills in 1948. Some of these early premises are still used by D-C (U.K.) Ltd., and will come into their own again shortly when the new Quickstart glow and diesel fuel is being manufactured.

Steadily the firm grew bigger and bigger—limited company was formed in 1950—until need for modern premises was desperate, but the government could do

AEROMODELLER PAYS A VISIT TO THE ISLAND HOME OF DAVIES-CHARLTON ENGINES

nothing immediately since although Barnoldswick was a scheduled area there was no building policy for that area. Only the I.O.M. offered exactly what was wanted, and in 1955 the main unit moved over, and the company was reconstituted to obtain the benefits of that move.

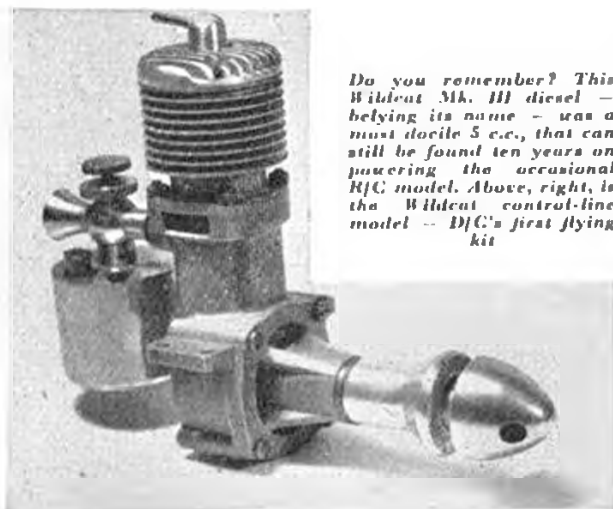
Meanwhile, the Korean war had flared up, and, naturally, the Rolls Royce trained Hefin Davies, who, incidentally holds a B.Sc. degree in engineering, offered his special facilities to their Barnoldswick branch for sub-contract work. Work that was gladly offered, and has continued from that day to this, though mainly precision short runs on development projects, requiring highly skilled work involving a wide range of operations. At one time or another a large proportion of the machine operators have handled Rolls Royce jobs as part of their everyday work—a happy little thought in assessing the kind of skill that goes into every D-C engine!

Our own editor for many years, Harry Hundleby joined Davies-Charlton nearly a year ago to strengthen the "aeromodelling" viewpoint of the company, and we flew over in October to attend the official release day of the company's first major release since he joined them—the Quickstart Bantam glowplug motor. The Quickstart spring system of starting had already been adapted for their existing diesel range, but this was the first glow motor to come off the lines.



It makes power flying possible and practical for the most improbable people. An early test was to hand the office junior an instruction leaflet and an engine and tell her to start it by the "book". It fired first time and frightened the life out of her! Since then she has become a keen enthusiast, and now tests the company's Quicklips—another simplicity aid that has followed the Bantam. During these months of development, D-C have also streamlined their whole selling plans, with new "house colours" of cerise and grey, triangular easy stack and display boxing, Quickstart display stands, and a regular model trade News Letter. Where will it lead? Will the emphasis on the Quickstart Bantam tend to kill sales of their other diesel engines? Frankly, it doesn't matter. If it does, then concentration on one main line could only benefit the aeromodeller by making for a better product at an even lower price!

But no such future is envisaged. Already the promised D-C glow twin to be named Tornado is piling up to its pre-release stock, and will create a striking new note in styling and performance of special interest to radio and



Do you remember? This Wildcat Mk. III diesel—belying its name—was a most docile 5 c.c., that can still be found ten years on powering the occasional R/C model. Above, right, is the Wildcat control-line model—D/C's first flying kit

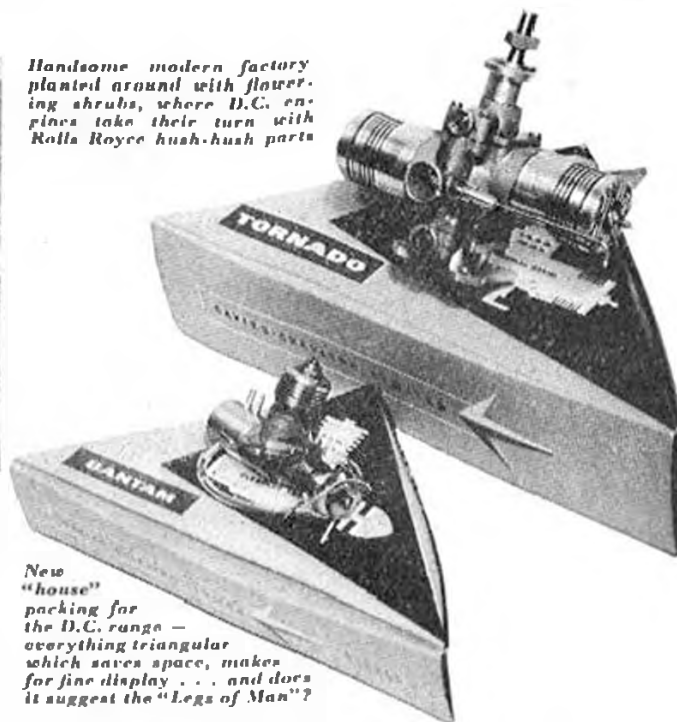


Handsome modern factory planted around with flowering shrubs, where D.C. engines take their turn with Rolla Royce hush-hush parts

control line enthusiasts. Another project will be a 2½ c.c. glowmotor for competition power flyers aimed at beating the best American products. Hefin Davies can speak with authority on American production methods, for, before embarking on the glow programme, he spent many friendly weeks with American manufacturers who gave him a wealth of information on their procedures. His North American trip must already have paid handsome dividends.

Throughout their existence, D-C have concentrated on making engines for the ordinary aeromodeller. For that reason extensive contest use has not been encouraged by sponsoring individual experts or producing special engines. That however, is likely to change in the near future, when any engine in the range will be available at a small premium in a hand-finished specially tuned version, to be individually ordered through dealers... in fact, a hand built precision job made personally for you!

The engine manufacturer's life—even in the Isle of Man—is not all boating and TT races, the background to every item is a story in itself. Glow motors demanded



New "house" packing for the D.C. range — everything triangular which saves space, makes for fine display... and does it suggest the "Legs of Man"?

easy starting—the Quickstart; good glow plugs—K.L.G. spent infinite trouble developing them; adequate starting batteries—Ever Ready selected their most suitable product; handling accessories—the Quickclip snap on lead and the combined spanner tool were produced; glow fuel—Quickstart glowfuel was developed in conjunction with I.C.I. to give better performance to their engines than any other on the market. Instruction sheets, boxing, press releases, special propellers, dealer services, distribution—there are still lots of problems that have been solved, before you—the aeromodeller—could take an engine off the model shop shelf.

D. C. BANTAM (continued from page 25)

than glow motors. The floating gudgeon pin is 3/32 in. diameter and the big end bearing ¼ in. diameter. Connecting rod is a light alloy forging.

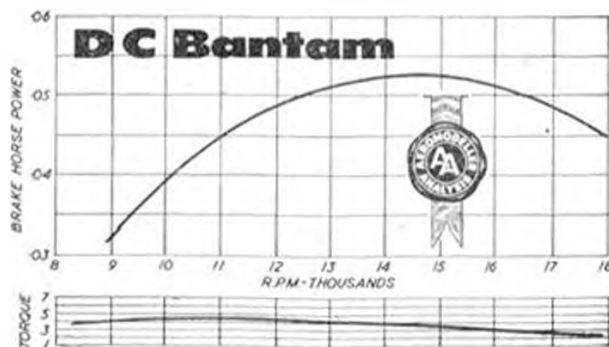
The hardened steel crankshaft is 13/64 in. diameter, terminating at the propeller driver. The latter is turned from dural and driven on. The centre of the shaft is drilled and tapped to take a 6 BA screw which forms the propeller shaft. Thus the clearance hole called for in the propeller hub is only ¼ in. diameter. The "Quickstart" cam and front washer also assemble on the shaft screw and give sufficient clearance to accommodate a 3 in. minimum pitch hub thickness.

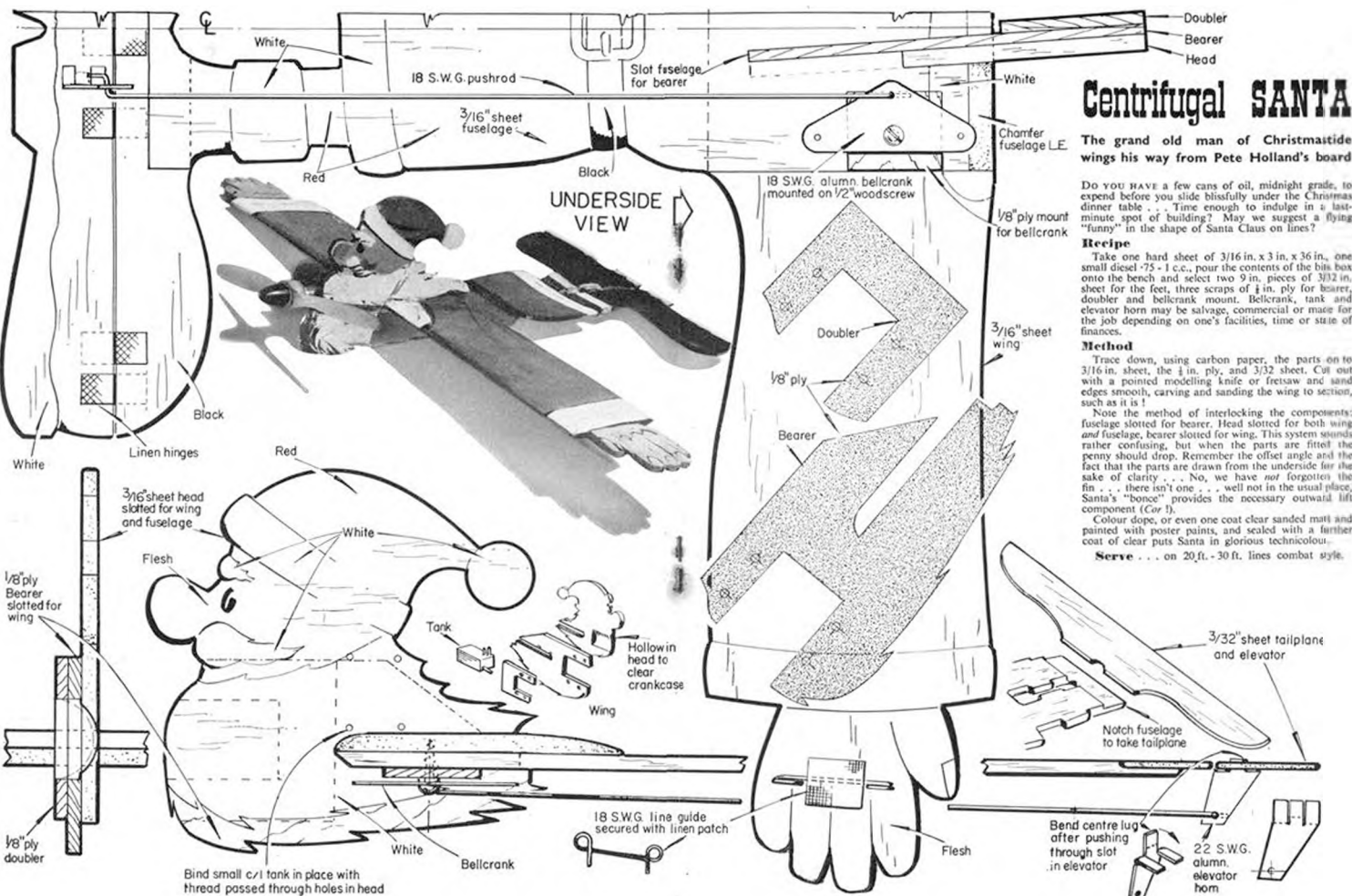
The integral fuel tank is turned from solid stock, mounted by a central fixing screw. Vents and feed pipe are angled to give satisfactory flow in a variety of positions—e.g. sidewinder mounting—and, in fact, the standard tank proved quite satisfactory on a small control line model for consecutive loops and bunts. Davies-Charlton are also producing a radial mount adaptor for the "Bantam" in line with current American practice where radial mounting of small engines is almost universally preferred.

Effective suction is quite good, the fuel line readily filling on finger choking. An additional moderate prime through the exhaust is, however, also called for as excessive finger choking will invariably result in flooding. The KLG plug is specifically recommended for use with 1.5 volts, i.e. a dry battery—the Ever Ready A.D.4

being particularly suitable and matching the two-pin plug on the "Quickclip" lead.

Besides being compact and light, the "Bantam" is also extremely rugged for a baby glow motor. Costs must have been cut to the bone and yet there is nothing at all that suggests a cheap production. Throughout, it is a quality job—the only criticism we would think of offering being that the end of the "Quickstart" spring would be better ground smooth rather than cropped off. As it is, the sharp end can at times be painful when locating the end of the spring on the cam. The "Bantam", too, should convince even the most "diesel minded" fan that baby glow motors are easy to start—and can give diesels a run in the matter of performance!







Adrian Hundleby launches a Darlex Charlton Hallerina for first air tests of the D-C Hunter .049 glowplug engine, analysed on pages 25/27 of this issue. New D-C moulded nylon props complete the design combination from the Isle of Man

ARRIVING IN THE SHOPS just in time for Christmas, and what a superb present to receive on the day, is the 1/72nd, 19-in. span, 160-part Airfix Sunderland III. The movable control surfaces, extendable bomb racks, retractable nose-turret, and

is also faithfully reproduced and introduces a new easy assembly method for turrets. If one seals the join lines of the white plastic hull with thick paint, the Sunderland will float with a near-scale waterline. Markings on our Sunderland are modified from



Typical of Graupner kits is the Dornier Do 27. This one flies fine now with E.D.246 (Control-line) though designed for the Taifun Hurricane

detachable beaching-gear together with the rest of the kit, require about 35 hours to assemble and finish properly. Guns elevate and all crew members are included. The unusual off-set dorsal turret of the Sunderland

kit, being RB-N of 10 Squadron R.A.A.F., famous for their work in the Battle of the Atlantic.

This kit, one of the largest obtainable in Britain, is the best and most ambitious yet from Airfix and begins

a new Series 6 priced at 10/6.

Available this month is the Lindberg 1/48th Hawker Hunter. As can be seen from the photos, the 1960 plastics trend will be towards more movable and detachable parts. Control surfaces on the Hunter are movable (even the very thin section elevators); undercarriage is fully retractable; rear section of model is removable as on full-size to show engine detail, the engine and Avon jet pipe being also removable from this section. Perhaps the most novel part about the kit is the operating ejector seat which realistically fires pilot and canopy from cockpit, the interior of which is highly detailed. Included with the kit is a fine transfer sheet giving markings for the Air Forces of three nations. Drop tanks and rockets are also included, together with a detailed towing tractor and driver. Other new Lindberg kits for 1960 are Me-262, Ju 88 and Caravelle, the latter to have a transparent fuselage side.

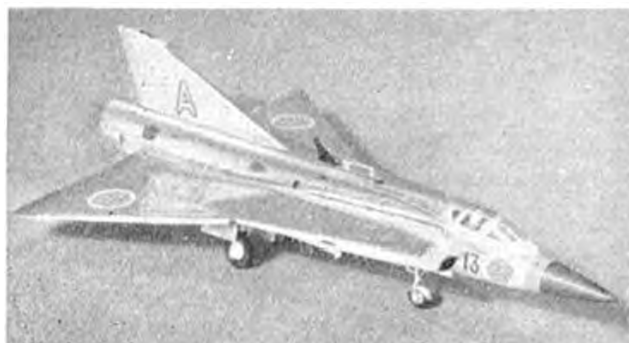
Most significant price reductions are in Aurora's series B kits of 1/48th scale W.W. I fighters, the Nieuport II, SE-5A, Camel, Albatros DIII Fokker Triplane and DVII. Until recently these kits were boxed imports at 8s., now they come from Playcraft in polythene bags at 3s.

From Revell we have the "707", which, according to the kit box is manufactured by B.O.A.C., Boeing being given no credit whatsoever! The general outline of the model is accurate, but exaggerated rivet detail spoils the finish.

According to the transfer sheet, yet another model of a B.O.A.C. air liner is registered "G-BOAC"—why not be authentic and provide any from G-APFB to G-APFP inclusive for the 707?

1960 Gamages' Catalogue is now available and lists most of plastics to be bought in Britain, both home-produced and imports, as well as usual model railways, cars and boats, and is still only 1s. for 130 pages.

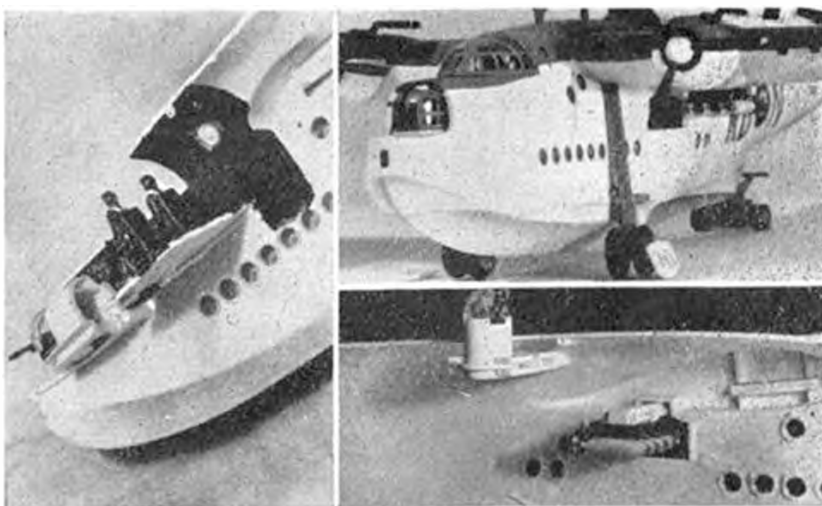
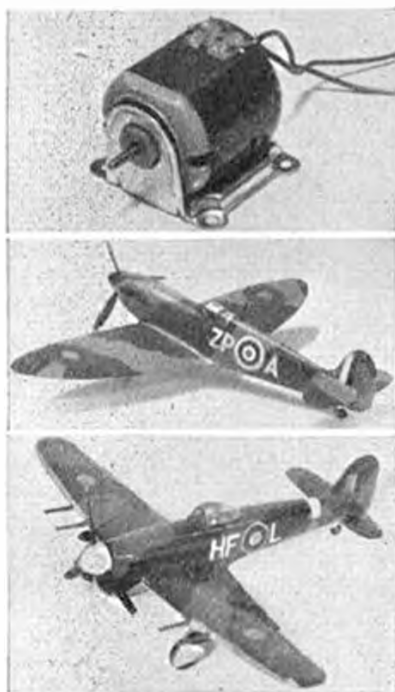
Something to interest younger readers is an air-race game presented



Detail of Airfix's Sunderland shows movable turrets, beaching gear, bomb racks which slide out under wings and separate portholes, a fine model

free by Jetex. Details are to be found in Jetex advertisements now being published in the daily papers.

Very impressive 2s. 6d. catalogue from A. T. Sallis, 93 North Road, Brighton, is invaluable for radio enthusiasts who get their Catalogue money back on first order of £2 or over. 92 pages are full of government surplus gems including vast range of relays, meters, switches, contacts, etc. Newest kit from Performance is the 32-in. Cirrus C/L.



became famous for his prolific model design output so had Bert gained an admirable reputation for being a number one salesman. His place will be taken by P. J. Champion, author of the "Rockets" feature, December issue (not Chapman, as printed). Howbell Models of Solihull tell us that it was *their* service offered at the I.R.C.M.S. meeting when tools and equipment were made available for modellers to use on the field. We commend this admirable service to all other enterprising retailers.

Left, top to bottom. The Japanese AP 35 electric motor which is now readily available and has been used for many flying experiments. Frog's new plastic series includes a fine 1/72nd scale Spitfire: but be careful to get markings right way round with ZP for 74 Sqdn. together on both sides of fuselage, not as provided on transfers. Bottom is the Airfix Typhoon, also to 1/72nd scale

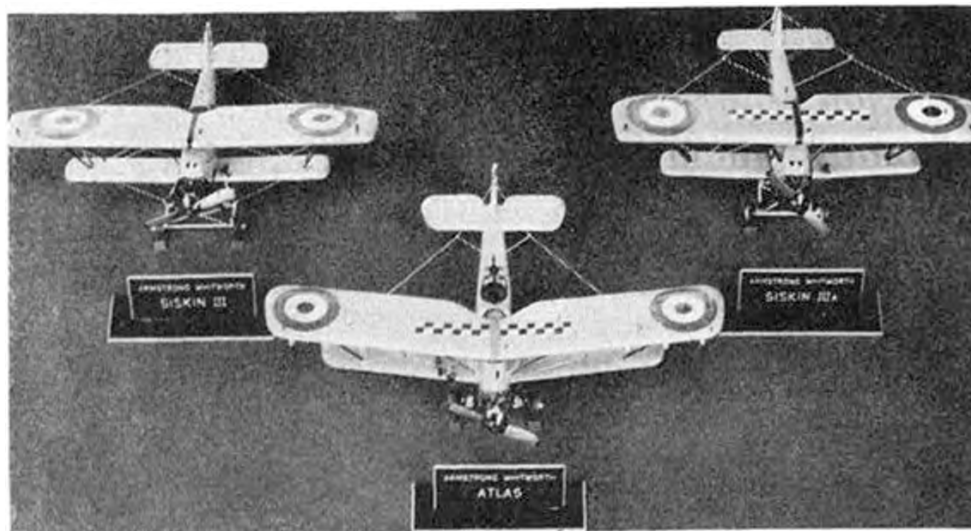
Good Year "Pliobond" changes its blue and yellow tube styling for a new colour scheme and title. Tubes are now black and white with a printed CA for contact adhesive on the tube which retails at 1s. Especially useful for joining hardwoods and applying fabric hinges, "Pliobond" has to be coated on both surfaces, allowed to evaporate till tacky, and then the join made by pressing components together. Another introduction in the adhesives line is Britfix 77 polystyrene cement tube in 1-oz. sizes selling at 1s. complete with polythene fine flow applicator. This is a push fit over the nozzle and certainly enables one to position the adhesive carefully, a most useful feature for plastic modelling. Half-ounce tubes are also to be available at 6d. each, but without the applicator.

Stunt for 1 - 1½ c.c. retailing at 21s. 6d. and we must say that the general lines of the model are most appealing, all-ply parts are very accurately die cut as well as major balsa components and the design has been well proven in the air by designer O. W. F. Fisher, who incidentally is now marketing the famous Australian Gorrie Mi-T propellers in several sizes, example being 7x8 and 9 retailing at 2s. 11d. A familiar face in southern England will be very much missed in the future now that A. F. (Bert) Dean has retired after 13 years on the road for KeilKraft. Just as his son Bill

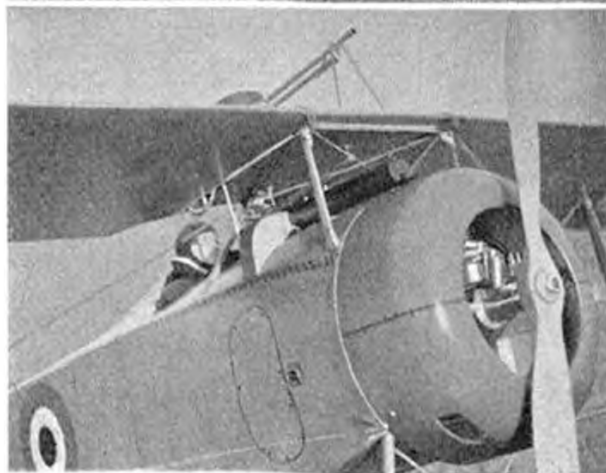
Opposite, left, Revell's Draken with metal foil covering, and Lindberg's Hunter showing dismantled parts. At right is the complete model, in all-black 111 Sqdn. decor, below the completed Airfix Sunderland in 10 Sqdn. R.A.A.F. markings. Note the beaching gear for authentic land-based parking!



Model News



THREE MAGNIFICENT 1/72nd scale models of famous Armstrong Whitworth biplanes are seen in the top picture. They are the result of several weeks' work by the skilled model makers of the A. W. model making department which we mentioned last month in our feature on professionally made models. Beautifully finished down to



the last tiny detail, they are now on exhibition in the R.A.F. Cranwell College Museum. A point we omitted to mention last month was that the very high standard of model making at the A.W. wind tunnel is due to the skilled guidance of foreman Bert Cross and the Chief Wind Tunnel Engineer George Beech, who carried out the bulk of the research model work on the "Argosy" and was responsible for the ingenious motorised model featured in December issue. Incidentally one of the most ambitious radio controlled free flight projects in our knowledge is now approaching completion at Whitley and we hope to give you more news on this when the wraps are off the secret subject.

Another point arising from our professionally made models feature concerns the A. V. Roe's 748 model (also fitted with working motors, but for display purposes only) which we illustrated in partly made and finished form. This model was actually completed by Westway Models of Acton and the photograph above, showing the whole aircraft displays the amount of internal detail in the cabin. Those unusual engine nacelles will be a solution for simple engine mounting on twin engined control line models, leaving the wing structure unhindered with the engine bearers superimposed on the top surface. Westway Models have also been responsible for the magnificent Vickers VC 10's used for display purposes, in connection with the recent technical releases on this new four-jet airliner.

One of the finest Nieuport 17 Scout models we have seen (at bottom left) was made by C. La Mar Kemp of Dallas, to 1/6th scale with 54 in. span. Due to an all-up weight of 4½ lbs. a Johnson 29 glow plug engine is used and Deltron transmitter and receiver gear applied for



single Radio/Control. Also radio controlled is P. E. Norman's second ducted fan r/c model seen above.

This larger version of his original "Javahawk" conversion is for 2.5 c.c. and can take a Frog 249 or E.D. Racer. Another is currently fitted with a Fox 15. The radio is fully transistorised for 6 volt operation triggering a Rising actuator for rudder control only. All-up weight of the 36 in. span 350 sq. in. model is only 39-oz. and the climb is something terrific.

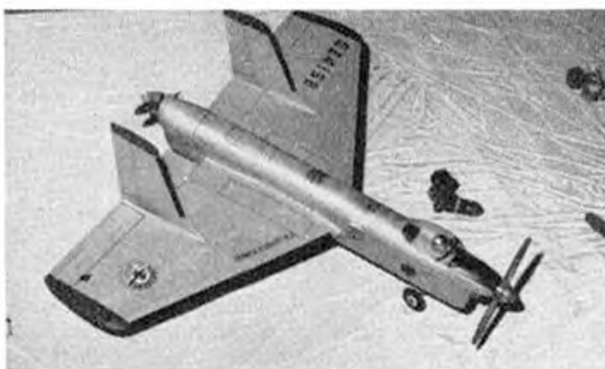
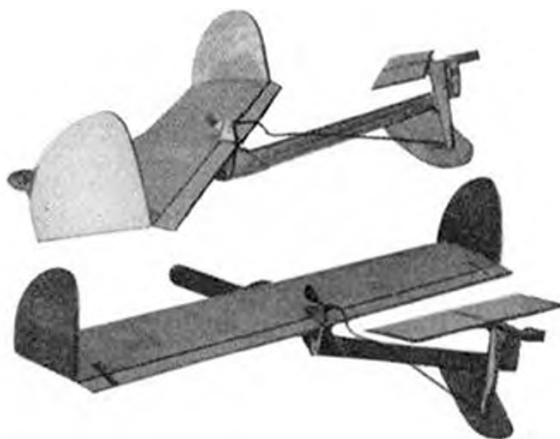
The Fox version is actually only 31-oz. and has a slightly smaller span. Congratulations to "P.E." for this terrific achievement in perfecting ducted fan radiocontrol.

Another ardent enthusiast for models out of the ordinary is Charles McCutchen. Checking through his feature on the "Patient Pierodactyl" (November issue, pictures on current experiment, top right) Charles finds that in the course of typing his original manuscript a number of important formulae went adrift. Those who are following his fascinating system of servo stability control which deserves the attention of all who like to experiment, can obtain the corrections on application to AEROMODELLER offices. Remembering the international success of Charles "Charybdis" single blade helicopter, we can quite foresee this servo stability idea appearing as "original" material in foreign publications in a few years' time.

John Howard of Foresters (Nottingham) made the twin engined control line model at right for two Oliver Tigers and it was originally designed for Class "B" team racing! Presumably, the starting problem of two instead of one conventional motor arrangement proved to be a disadvantage, although the heavier fuel consumption and range with good speed might have made the project worthwhile.

The Canadian R/C Nationals in September provided a victory for two Toronto R/C model club fliers, each with the same design and actually beating many well known and established multi-channel designs in the process. Ron Chapman, the winner is seen with his model in the upper photograph, weight 7½-lbs. span about 69 in., K. & B 45 engine, tapered wings, and all radio equipment made by Ron himself to work on 53 Mc/s. Ron is a licensed amateur broadcaster (call sign VE3CPV for those who want to make contact). Visiting the Canadian Nationals up from Michigan U.S.A. was Bill Bertrand who placed fourth with his modified "Astro Hog" seen bottom right. This also operated on 53 Mc/s with C.G. gear and the cockpit canopy and tail revision on the "Astro Hogg" are reminiscent of the Spitfire.

Among other designs flown on this Canadian contest was the first overseas "Uproar" to come to our attention, flown with a Max 35 by L. Pepino of London, Ontario. It was the only model at the meeting not powered by the popular K. & B. 45 in multi channel.





Special packing for a completely wired up boat unit includes verrox, batteries, etc., for multi, being packed in far left photo. Right is the multi-channel assembly line with Triton coming through

Radio control gear
being produced en
masse at the Radio
& Electrical Pro-
ducts' establishment

'REP'TONE

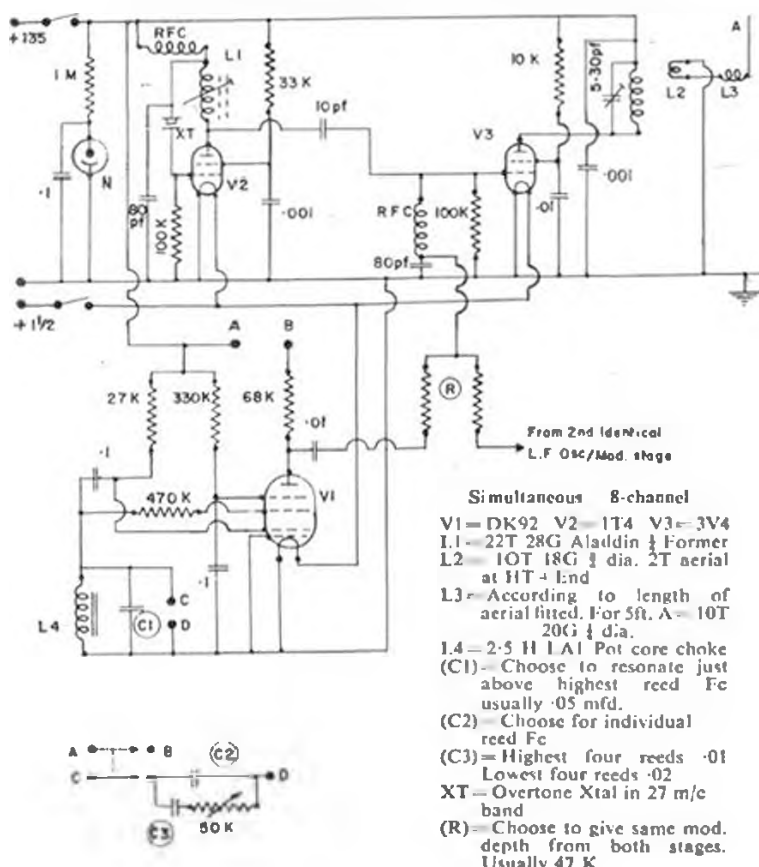
The name of George Homest-Redlich is synonymous with radio control. A pioneer of the reed system as employed for model control, with many "firsts" to his credit, George's expansion with extensive production of a range of Tune outfits impressed us during the course of a recent visit. Tritone, Sextone and Octone outfits have been well received in all parts of the world, and are coming through the assembly stages in rapid succession, at the R.E.P. shop in Sheen. Always ready to help the enthusiast, George makes no secret of his circuits, and provides Octone Tx circuit as below. Results of our tests with Unitone follow:

UNITONE is in keeping with the standard of all the R/C goods produced by R.E.P. Ltd. Both transmitter and receiver are well made and neat in appearance and it is obvious that a great deal of thought has been put into design and production. The result is reliable single-channel equipment at a reasonable price.

The TRANSMITTER is housed in an attractive aluminium case with a mottled grey finish. Size is 9½ in. x 6 in. x 3 in. and at a weight of 4½ lb. complete with aerial and batteries it is ideal as a hand-held unit.

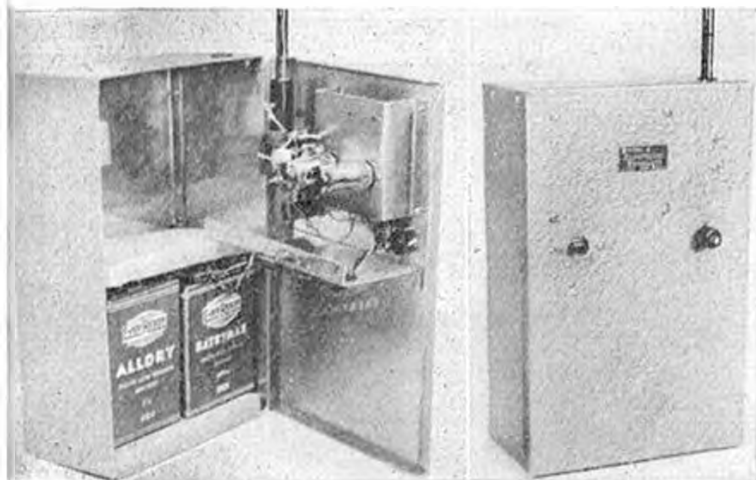
Circuit includes a single valve RF oscillator using a 3V4. This is coupled to the aerial inductively and although there is no provision to load the oscillator fully there appears to be ample RF output to meet all requirements. The RF oscillator is modulated by a DK-96 in a Dynatron circuit in which a sub-miniature choke is included in the second grid circuit. This method is standard in all tone transmitters produced by R.E.P. and has been found to be extremely stable for reed work. Its inclusion in the single-channel version is merely to conform with the standard circuit and provides a reliable source of modulation.

Input power is approximately 1.5 watts and the output is ample for all needs.



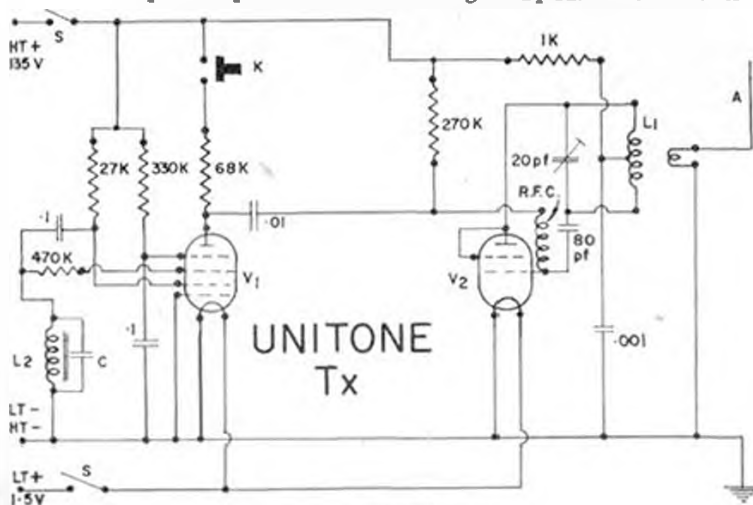
George H.-Redlich checks an Octone on the 'scope



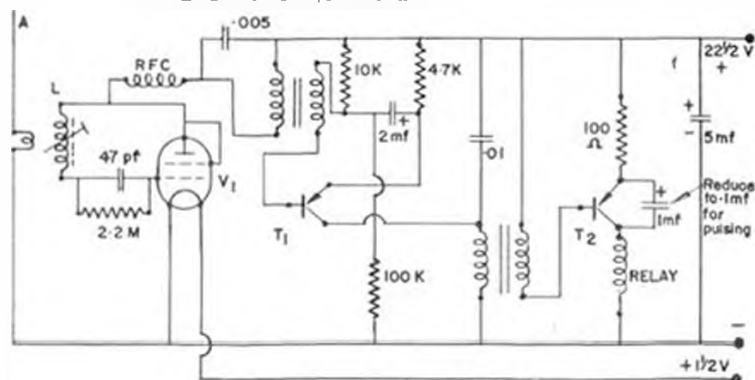


Unitone Transmitter a neat, hand-held unit, with telescopic aerial. Octona has several refinements including a neon flasher indicating battery state

RECEIVER is housed in a shockproof red plastic case and the wiring both neat and compact. Size is $3\frac{1}{2}$ in. x $1\frac{1}{2}$ in. x 1 in. and weight $2\frac{1}{2}$ oz. The unit is



UNITONE Tx
 $V_1 = \text{DK96 (or DK 92)}$ $V_2 = 3V4$
 $L_1 = 10 \text{ turns } \frac{1}{8}\text{-in. dia.; Aerial coil } \frac{1}{2} \text{ turns}$
 $\text{RFC} = \text{RF Choke}$ $L_2 = 4H$
 $C = \text{To tune to 400 c. approx. } .01$
 $S = \text{Double pole on/off switch}$ $K = \text{Operating switch}$



R.E.P. UNITONE
 $L = \frac{1}{2}\text{-in. Aladdin } 33 \text{ turns } 28 \text{ s.w.g. Aerial } 2\frac{1}{2} \text{ turns}$
 $V_1 = \text{XFY34}$ $T_1 = \text{HIGH GAIN}$
 $T_2 = \text{LOW OR MED. GAIN}$ $\text{Relay} = 5K$
 $\text{Relay current off signal, } 0 \text{ M/A, on signal, } 4 \text{ M/A}$

supplied with switch and plug ready wired and all that is necessary to operate is to connect the H.T. and L.T. batteries together with the actuator and battery. The size and weight make it suitable for any size model, the cross-section adapting itself to small fuselages.

Although small in size, however, nothing has been sacrificed and performance is excellent.

The circuit is a hybrid using a valve super-regenerative detector followed by two transformer-coupled transistor stages. The new R.E.P. 1-oz. relay is in the final circuit and is set to make contact at 2.8 m/A.

This is a tone system, which means that the receiver will only respond to a carrier modulated by a tone. No sensitivity control is needed and tuning is very simple by means of a single control. Once tuned it should remain stable for long periods provided reasonable precautions are taken in wiring up the batteries, etc., and in maintenance. A measure of temperature stability is incorporated in the circuit and on test no trouble was detected at extremes of temperature.

A range test was made on a day when the temperature was at freezing point along a road lined with trees. Full current change was observed up to 500 yards, and beyond that the reduction was only .2 m/A. The equipment can, therefore, be recommended with every confidence. This distance being greater than normal flying range with good visibility.

Minor criticisms are as follows. The absence of transmitter switch markings which is being corrected by the inclusion of an engraved escutcheon. The flexible leads are not anchored at the point of connection. In the sample tested one had fractured. Relay adjustment is a little coarse and in view of the change of 3 m/A care in setting up is desirable, should this ever be considered necessary.

Those who intend to use Unitone for pulse systems are advised to specify the intention when placing their order so that the manufacturers can make special adjustments.

SPECIFICATION

Transmitter.

Single valve RF oscillator (3V4) modulated by a Dynatron L.F. oscillator (DK96)

H.T. Voltage 135 (2 Ever Ready B101 batteries).

L.T. Voltage 1.5 (Ever Ready AD4).

Total L.T. Current 125 ma.

Total H.T. Current 10 ma.

Total H.T. current (no modulation) 12 ma.

Price £8,17/6.

Receiver

Valve super-regenerative detector followed by 2 transistor A.C. coupled amplifier.

H.T. voltage 22½ (B122).

L.T. voltage 1.5 (pencil).

Total standing current (no signal) 1.2 ma.

(signal on) 4.2 ma.

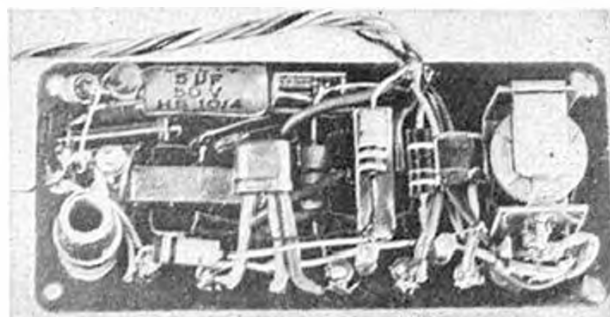
Standing current (final stage) (no signal) .3 ma.

(signal on) 3.4 ma.

Relay opens at 1.8 ma. closes at 2.8 ma.

Weight 2½ oz. Battery weight 1½ oz.

Price £7,2/-



Unitone Receiver tested is not far off actual size. Standard of soldering and assembly is high, and latest production units have newest type transistors

**Most successful
F.A.I. specification
speed design
in Europe.
Champion of
Italy, fastest
at the Criterium
of Aces**

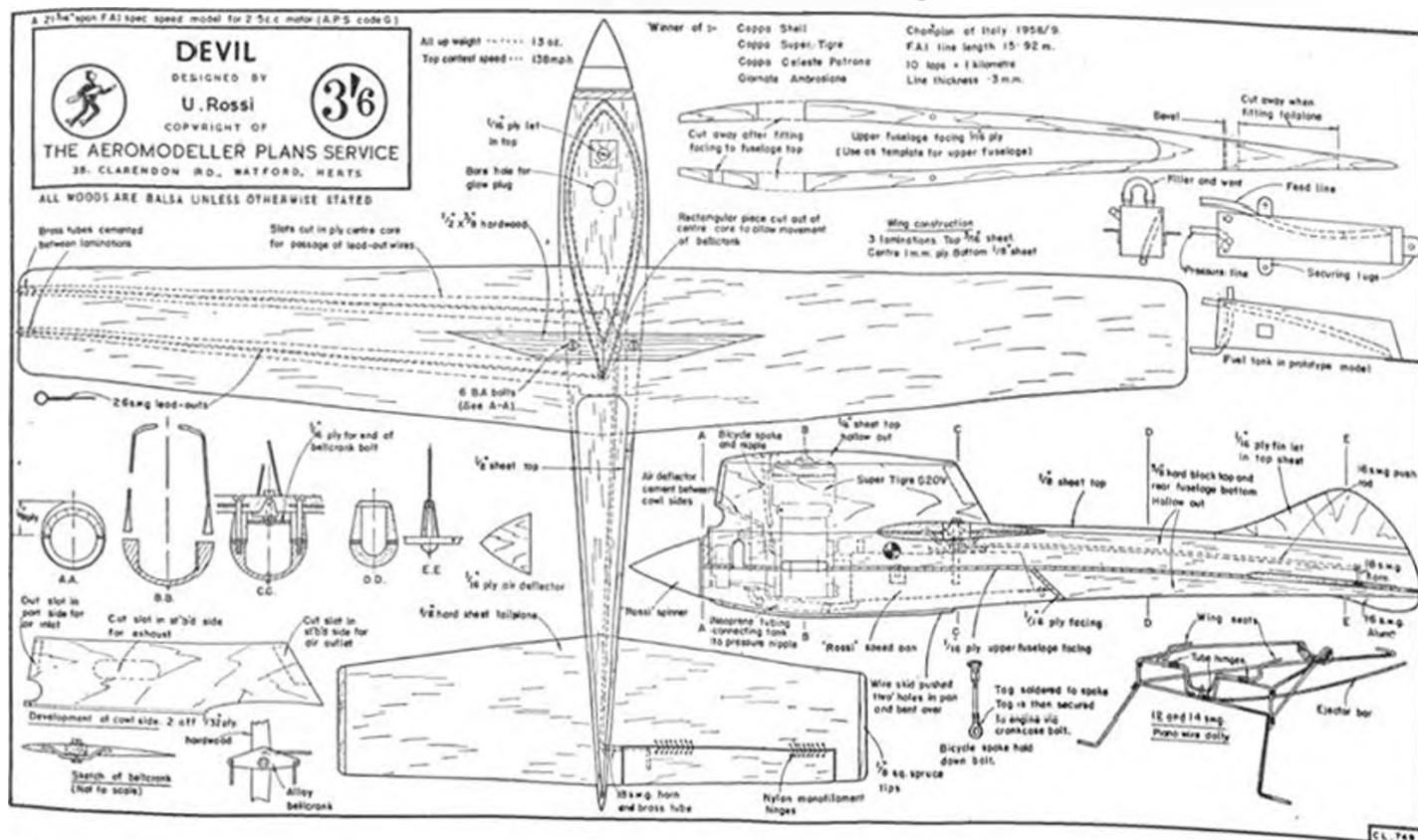


DEVIL

by Ugo Rossi

THOSE WHO FOLLOW the Italian competition results (which include more speed events than held in any other European country) cannot fail to be aware of the famous Rossi brothers, Ugo and Cesare, who conduct their model business in Brescia. During the week they make "Vulcan" glow plugs which are fitted to the majority of Italian competition engines, and they also cast their special speed pans and turn spinners for speed models all to a very high standard of engineering. In addition to this they run a formidable stable of speed models and offer re-worked Super Tigre G 20V 2.5 c.c. glow-plug engines for sale to fellow-enthusiasts. In the past two seasons they have eclipsed the opposition in practically every speed contest and these include well-supported

FULL COPIES OF THIS 1/4TH SCALE REPRODUCTION ARE AVAILABLE AS PLAN CL 749 FROM AEROMODELLER PLANS
SERVICE PRICE 3s. 6d. PLUS 6d. POSTAGE





Ready for action, the Devil sits in its wire dolly. Photo opposite shows the ejector bar which trails on the ground and forces dolly from model at take-off

events with large entries, notably the Shell, Super Tigre, Celeste Patrona, Giornate Ambrosiane Trophies, and also the Italian speed championships both in 1958 and 1959.

In this year's national championships the Rossis won 2.5 c.c., 5 c.c., 10 c.c., and jet speed! It was no surprise,

therefore, when Ugo Rossi collected first place at the Criterium of Aces in Brussels during September with a magnificent highest speed of 138 m.p.h. Cesare Rossi placed third with 130.5 m.p.h. Both models employed the new version of the Super Tigre with its flat top piston.

"Devil" is quite a simple model to construct, and although based on the Super Tigre with the Rossi speed pan there is no reason why the main airframe cannot be adapted to take any other equipment, motor and mounting unit. The construction is typical of that used by all the leading Italian speed experts with a ply sandwich wing, balsa fuselage, ply cowl sides and separate intake for the front rotary valve on the Super Tigre. A pressure feed tank is employed, taking air feed from the positive pressure side of the crankshaft valve for which the Super Tigre has a special tapping plug under the crankshaft bearing. One of the most impressive features of the Rossi brothers' flying in Belgium was the way in which they soon work their engines up to peak speed after take-off by "yo-yoing" the model, pulling it back rather than attempting to whip it up to speed. Needle valve setting for pressure tank systems has been said to be critical and certainly this demands a considerable amount of practice to obtain the optimum setting.

The Rossi brothers took every opportunity to check their models during practice periods at the Brussels competition and no attempt was made to preserve the motor for any particular maximum effort.

For anyone aspiring to a world championship team place for the international contest at Budaors, Hungary, next September we recommend the "Devil" as a fine airframe in which to mount the best of motors.

BRITISH CIVIL AIRCRAFT 1919 - 1959 Volume 1 by A. J. Jackson, published by Putnam. 63s.

This book covers manufacturers from the A.B.C. to Dudley Watt section of the alphabet and runs to 571 pages in doing so; from which fact one may gauge the staggering degree of comprehensiveness. Uniform in format with O. G. Thetford's Naval and R.A.F. Aircraft books, there are some 110 G.A. drawings and over 500 photographs. This works out at roughly ten illustrations for a shilling and certainly represents "value for money". Added to which are the immensely informative and unique narratives, the compilation of which must have entailed years of research.

Many are the interesting anecdotes. For instance, that of the enthusiastic private owner acquiring a Blackburn Velos torpedo plane for £15 in 1933, and using some 63 gallons of petrol flying it down from Hooton to Brooklands! Or that of civil Catalinas being operated in 1943 non-stop from Ceylon to Perth, Australia, with durations of 25 hours upwards, and passengers being presented with a certificate admitting them to the "Rare and Secret Order of the Double Sunrise".

The quality of the photographs is excellent and there are many rarities; the number of military aircraft (including both World Wars) that flew in civil markings is astonishing. The reviewer was agreeably surprised to find a photograph of the actual machine in which he first flew in 1929, i.e., Sir Alan Cobham's D.H.61 Giant Moth G-AAEV. Modellers will find some useful references to individual colour schemes and also House liveries, such as the de Havilland School of Flying machines being initially battleship grey with red struts and silver flying surfaces, and latterly resplendent in red fuselages and struts, with gold flying surfaces. Now there is scope indeed for a colourful model!

The three view drawings are useful, but, due to the shortness of the scale provided (and no standardisation of scale), modellers will find enlarging them accurately to be a rather tricky business, especially on the larger aircraft. The centre-section struts in

Book Review

the slide view of the Avro Baby on pp. 86 have "gone missing", but one knows only too well how easily these things occur and in such a magnitude of work such is small criticism indeed.

Certainly this is a book to put on one's Christmas "wants" list — I'm putting it on mine!

P. L. G.

THE HURRICANE STORY by Paul Gullico. Michael Joseph Ltd., 144 pages, illustrated 5 in. x 7½ in. price 12s. 6d.

When a novelist, no matter how successful his established works, attempts a subject dealing with technical development, and military achievement, he must tread warily with his facts and curb his words to realistic terms rather than extend himself to flowery phrase. Unfortunately Mr. Gullico reveals his lack of contact with the Hurricane, or any contemporary aircraft for that matter.

Starter batteries do not whirr; the electrical system was 24V, not 14; for Gloucester, reader Gloster; the Gladiator had no room for passengers; pictures showing tail damage on "two" Hurricanes, are in fact of the same aircraft and the air-frame (sic) described as of totally different structure was no more than a logical monoplane extension of Hart and Fury assembly methods.

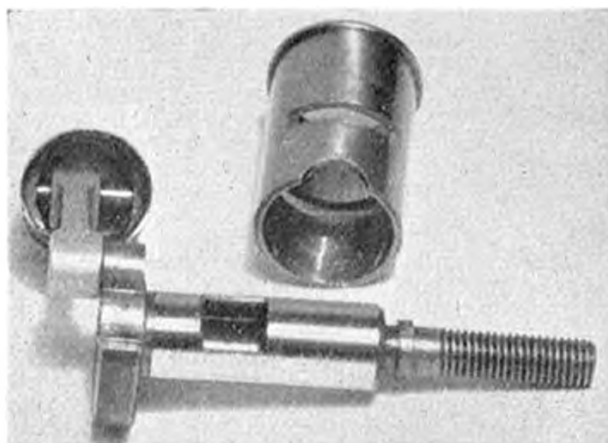
It is a pity that the author did not seek technical opinion on his manuscript, for this is a story that can do with re-telling many times over. F. H. M. Lloyd's excellent work on the very same subject published 14 years ago is now a collectors' item, and one which certainly ought to have come to Mr. Gullico's attention when attempting so worthy a task.

MODEL RADIO CONTROL by Edward L. Safford Jr., Gernsback Library Book No. 74, New York 11, N.Y. 192 pages, 210 illustrations 5½ in. x 8½ in. price \$2.65.

Published recently in the U.S.A. this manual of model radio control covers the subject from basic "wireless" to Superhets and servos. Many are the circuits and ideas

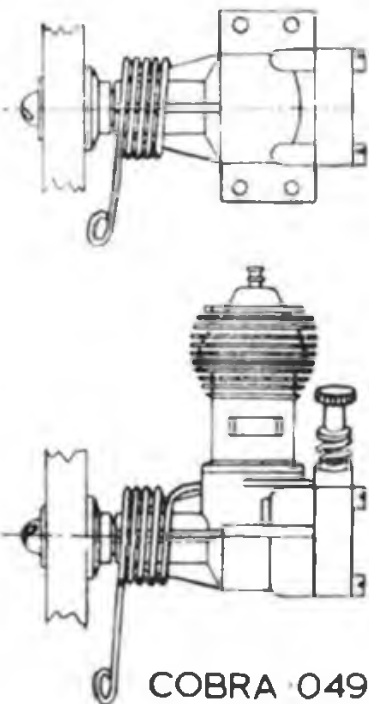


for decoding, all described in lucid style, rendering the subject easy to follow for the uninformed amateur. Pulsers, reeds, filters, transistors, hard valves, simultaneous proportional, beep boxes and super compounds are all detailed. A book to be recommended and well worth its cover price of practically £1.—for a start it is ½ in. thick, and with thin card covers at that! Although the only commercial gear reviewed is of American origin, Mr. Safford limits the items described to specific examples of various approaches to equipment design. Thus he provides a fine internationally understandable survey.



Internals and the complete Fox 201, a comparatively rare bird in Europe. This example sent us for review by C. Lambert of Weston-super-Mare. Note how 19 marking is milled off and overstamped with 201

Revealed for the first time, on Keilkraft's new 20 in. span control-line stunt model design, the "Firefly", is the Cobra 049 which we reprint from the plan, below. Although not yet ready for distribution at the time

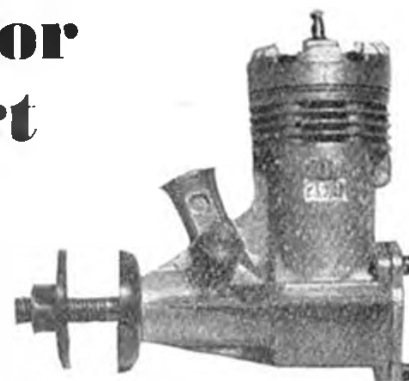


COBRA 049

of writing, this new addition to the rapidly growing range of small engines should be in the shops during the new year. Among several obvious innovations are the integral glowplug, remote needle assembly and screw stud propshaft. Enquiries as to the actual manufacturers have drawn a blank: but they are London based and are not without modelling experience. Another new engine is the Hill 3.4 c.c. diesel which will also appear in glowplug version, and reed instead of rotary disc induction should the purchaser prefer reed advantage of omnidirectional running. On the standard engine, a Tufnol disc is used, the shaft is supported by two Hoffman ball-races, and great attention has been paid to selection of materials. External finish is equal to the highest standards, with a vapour blasted crankcase casting and very highly polished machined surfaces. One striking feature is the early exhaust port opening and depth of these ports. The prototype indicates handsome performance to be expected from production versions.

Research into manufacturing process and wire selection for glow plugs is now rewarded by the success of the A-M series of plugs. Spot welding the small coil to the two parts of the main plug body is no easy task.

Motor Mart

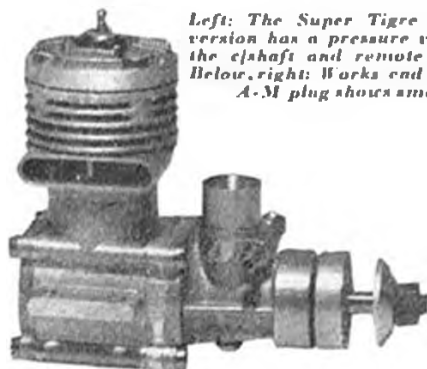


Performance-wise the A-M "A", "B" and "C" have already established themselves with London modellers as being good for an increase in r.p.m. from practically any engine. One example from our more recent tests involved a 1.5 c.c. glow engine which would settle down to a figure some 800 r.p.m. less than its initial starting revs. Changing the plug to an A-M type "A" not only increased the peak figure; but also enabled the engine to hold speed indefinitely. The 1.5v. plug is not of course, recommended for larger than .065 engines: but this one certainly withstood several long runs and has not burned out. Economic price of 4/1 makes the risk worthwhile if top speeds are wanted.

Almost hidden among the small print in some U.S.A. model supply house catalogues is an engine rarely seen this side of New York. We refer to the Fox 201. Externally identical with the "19", the 201 was checked to find what differences applied to make the increase, and according to our measurement, both bore and stroke are *still* the same as always announced for the 19 at 0.65 in. and 0.6 in. respectively. These figures give a swept volume of .199 cubic inches, so the mystery thickens! Checking on the bench we did find one major difference betwixt this and other Fox engines—it needs a lengthy running in period to loosen up.

Left: The Super Tigre G 20V, standard version has a pressure valve point under the c/c shaft and remote needle position. Below, right: Works end view of the new A-M plug shows small coil

The Hill 3.4 c.c. diesel prototype shows sturdy construction and excellent external finish



January, 1960

AIRCRAFT DESCRIBED No. 99

Nieuport 17c

described & drawn by P. L. GRAY

WITHOUT DOUBT the Nieuport 17 was a delightful aeroplane. Introduced mid 1916 and in use for about a year, until replaced by later models and S.E.5s; it was pleasing to the eye, the sweep of the wings bestowing an élan that distinguished it from its straightforward contemporaries. It was pleasing to fly; light and agile, which enabled it to out-manoeuvre its heavier, stationary engined, adversaries. In fact the Germans thought so well of it as to produce an almost exact copy in the Siemens-Schuckert D 11.

Developed from the earlier Nieuport 11 which was powered by an 80 h.p. Gnome Monosoupape engine, the 17c was slightly larger, a little more robust and certainly more powerful with its excellent 110 h.p. Le Rhone motor which endowed it with improved performance. It was the hands of Capt. Albert Ball V.C. that first proved the metal of this machine to the R.F.C., with his fiery attacks regardless of the odds. Later it was flown, also with devastating effect, by Mannock and McElroy of 40 Squadron, Bishop of 60 Squadron who scored many of his 73 victories on this type of aircraft.

Basically it was a simple aeroplane but with considerable refinement of structure. The fuselage was a plain box girder based on four spruce longerons which terminated in a vertical knife-edge of steel tube: the lower pair of longerons were set closer together than the upper pair which gave the fuselage sides a distinct taper, a fact which does not appear to have been brought out in earlier drawings. Forward the longerons were reinforced with ash as far aft as the cockpit; spacers were of spruce routed to a "T" section, except at the second station where steel tube was used and incorporated the lower wing attachment sockets. The tail-skid fairing was a neat streamlined structure and not a flat fin as photographs tend to make it appear. Hereabouts the fuselage was additionally strengthened by mm. ply sheet fastened to the inside of the side members. Forward a near circular fairing with large access panels, tapered from the cowl to the cockpit—this appeared asymmetric in plan view due to the drum which retained the used ammunition belt being mounted outside the basic framework on the port side. Aft of the cockpit extended a slightly curved decking built up of light stringers.

Variety of markings in these views of the famous fighter offer good opportunities for the ardent scale enthusiast. Drawings are first ever to show correct construction, were taken from manufacturing prints

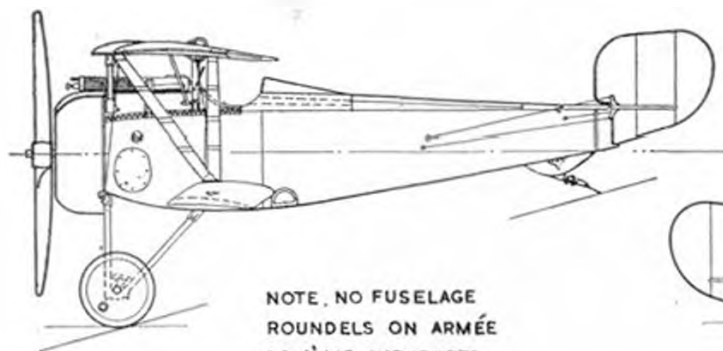


Wings were a normal braced structure based on two (upper) and one (lower) box spars, ribs in the upper wing halves being of beefed up section to act as compression members where necessary. Ailerons were of light gauge steel tube and of inverse taper which, with the angular rake of the tips gave an elegant and distinctive profile to the wings. Operation of the ailerons was through a torque tube actuated by bellcranks in the centre-section. On many Nieuport 17s the centre section panel was covered with celluloid to improve upward vision for the pilot, but invariably—as this deteriorated with use—it was replaced with normal linen fabric.

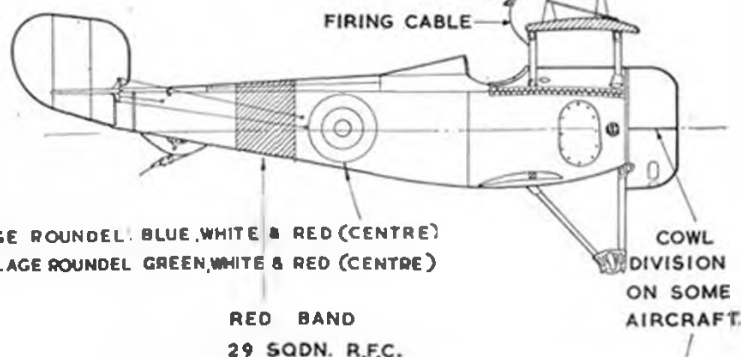
Complete tail assembly was of light gauge steel tube with the tailplane braced to the fuselage by light streamline section tubes. The tailplane was attached to the fuselage by clips at the centre of the leading-edge and a spring lock on the main spar which could be "quick-released" by a length of chain with a ring on the end, running through the fuselage sterntube, thereby facilitating speedy removal and servicing. (There is no truth in the rumour that some Hun pilots took to hunting with a boathook specially adapted to pulling Nieuport chains!). The normal Vee type undercarriage was fitted with dual spreader bars and sprung with elastic shock cord; wheels had tyres of 650 x 80 mm. section.

Varying armament was installed in Nieuport 17s, but the evolution of a reliable interrupter gear saw the almost universal installation of a single Vickers gun; usually this was mounted on the fuselage centre-line but occasionally it was offset to starboard. Prior to the introduction of synchronised Vickers, Lewis guns were mounted on top of the centre-section but mountings were far from standardised. The mounting used by Capt. Ball enabled him to slide the gun back and thereby fire upwards. Occasionally Le Prieur rockets were fitted for balloon straffing; they were attached four to each Vee strut and fired by a push-button switch on the instrument panel, the struts being protected by a metal sheath. On at least one occasion a load was accidentally fired inside a Bessoneau hanger after which an isolating two-pin plug was fitted!





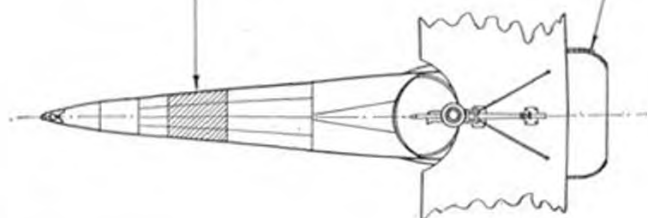
NOTE, NO FUSELAGE
ROUNDELS ON ARMÉE
DE L'AIR NIEUPOINTS



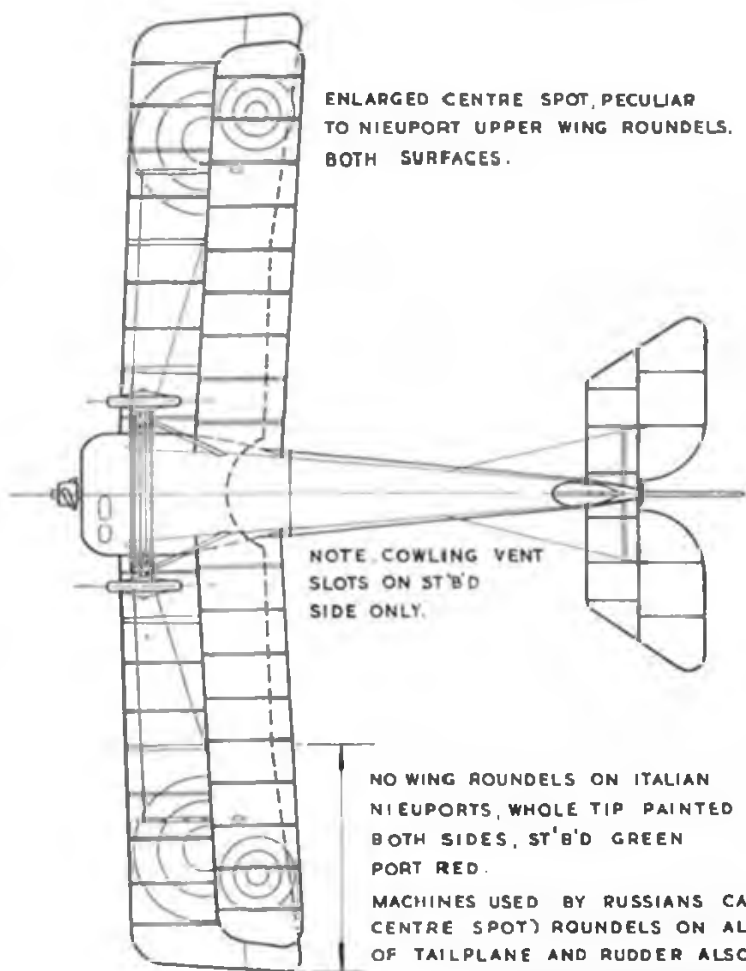
POSITION OF LEWIS GUN
WHEN FITTED, MOUNTINGS
DIFFERED WIDELY.

RFC FUSELAGE ROUND: BLUE, WHITE & RED (CENTRE)
ITALIAN FUSELAGE ROUND: GREEN, WHITE & RED (CENTRE)

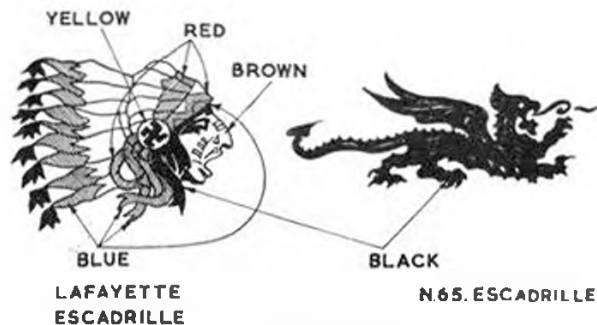
RED BAND
29 SQDN. R.F.C.



ENLARGED CENTRE SPOT, PECULIAR
TO NIEUPOINT UPPER WING ROUNDELS,
BOTH SURFACES.



NOTE, COWLING VENT
SLOTS ON ST'B'D
SIDE ONLY.



LAFAYETTE
ESCADRILLE

N.65. ESCADRILLE

APPROX. TO SAME
SCALE AS SERIAL NOS.

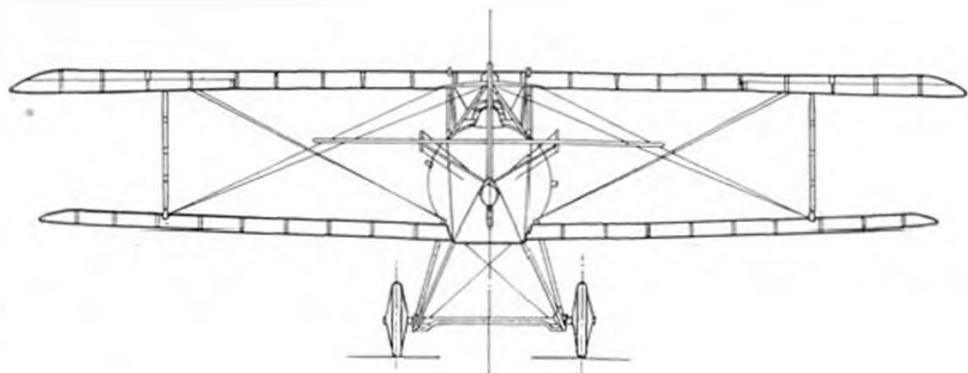
NO WING ROUNDELS ON ITALIAN
NIEUPOINTS, WHOLE TIP PAINTED
BOTH SIDES, ST'B'D GREEN
PORT RED.

THESE FRENCH UNIT INSIGNIAS
WERE PAINTED ON FUSELAGE
SIDES IN LIEU OF ROUNDELS

MACHINES USED BY RUSSIANS CARRIED RED, BLUE & WHITE (ENLARGED
CENTRE SPOT) ROUNDELS ON ALL WING TIPS, SOMETIMES ON BOTH SURFACES
OF TAILPLANE AND RUDDER ALSO.

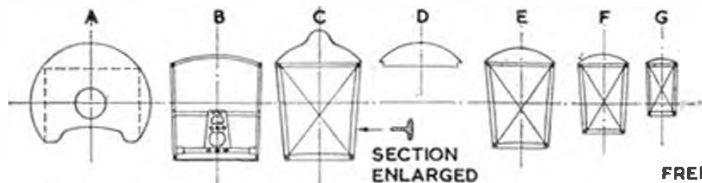
DATA

Span: 8240 mm. (27 ft. 0 7/16 in.)
top 7,800 mm. (25 ft. 7 1/4 in.)
lower.
Length: 6,000 mm. (19 ft. 8 1/2 in.)
Incidence: 1 deg. 50 min. top.
4 deg. lower (5 deg. at port tip
to compensate torque).
Chord: 1,230 mm. (4 ft. 0 7/16 in.)
top. 720 mm. 2 ft. 4 5/16 in.)
lower.
Track: 1,600 mm. (5 ft. 3 in.).
Weights: Loaded 1,233 lb.
Empty 825 lb.
Performance: Max Speed 107
m.p.h. at 6,500 ft. Climb to
6,500 ft. in 5 min. 30 sec.



NIEUPOINT 17

1/72ND SCALE REPRINTS OF THIS "L" TYPE PLAN AND 1/48TH SCALE "B" TYPE DYE-LINE PRINTS ARE AVAILABLE PRICE 1s. AND



NO DASHBOARD FITTED. INSTRUMENTS WERE FASTENED DIRECT TO CONVENIENT STRUCTURAL MEMBERS.

FRENCH SERIAL

N
2474

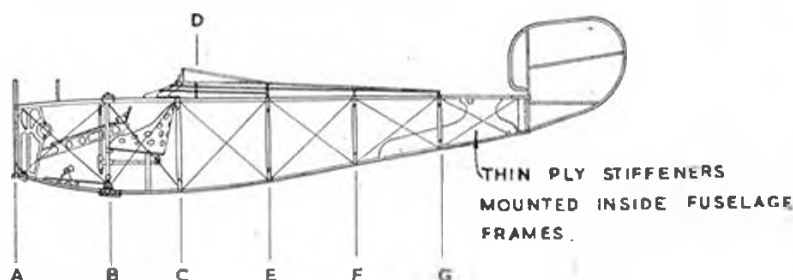
R.F.C. SERIAL
29 SQDN.

A'6684

SCALE

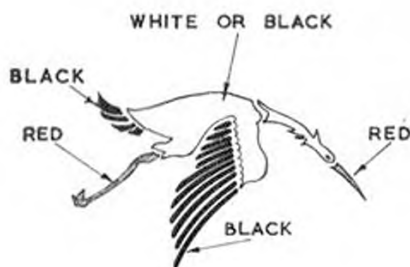
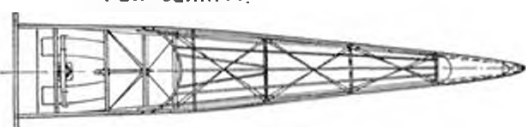
Note on the aircraft flown by "Capt. W. A. Bishop, V.C., kindly contributed by Mr. Chas. B. Simpkin who was his mechanic at the time.

Nieuports A 306 and A 6769:—"Camouflage was predominantly green with irregular brown areas. Wheel discs were blue, undercarriage and centre-section struts also blue (believed paint or enamel as it was softened by the castor oil splashed by the engine). The 2-inch wide strip along the lacing at the base of the centre-section struts was also blue. I cannot recollect clearly if the cowling was blue but am inclined to the opinion that it was. A Maple leaf about 1 ft. high was painted in autumn tints on part side of the fuselage near the cockpit, which I regarded as a work of art in those days. At one time, after a leave period, Capt. Bishop brought back a blonde-haired doll inscribed as being presented by Miss Beatrice Lillie. I had to attach this doll to the bottom of the port interplane struts."



BASIC FUSELAGE STRUCTURE

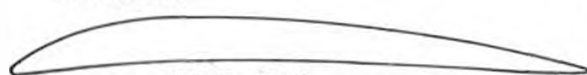
SEAT OMITTED FOR CLARITY.



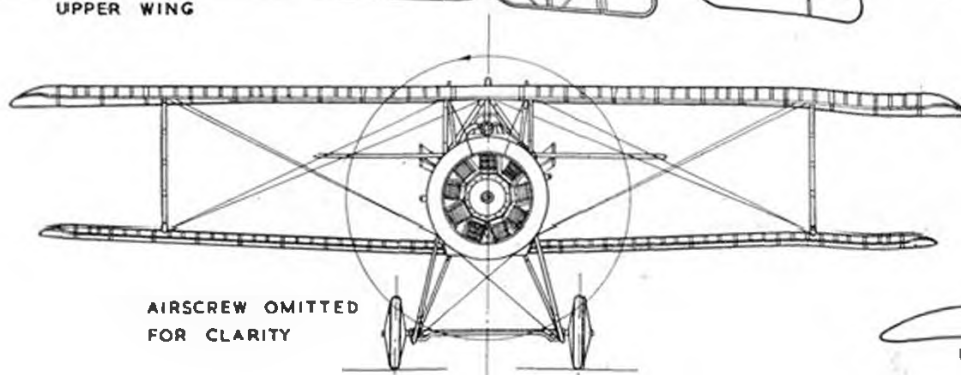
CIGOGNES N.3

APPROX. TO SAME SCALE AS SERIAL NOS.

OTHER CIGOGNES UNITS WERE NOS. 26.73.103 AND 167 WHICH ALSO CARRIED STORK INSIGNIA IN DIFFERING ATTITUDES.



UPPER WING



AIRSCREW OMITTED FOR CLARITY

COLOUR DETAILS

Main output of Nieuport 17 scouts were doped with an overall aluminium finish. Some R.F.C. machines were camouflaged in irregular patches of dark green and khaki: likewise

French aircraft were sometimes camouflaged and sometimes left in natural linen fabric finish. Cowlings when not painted over by units, were natural aluminium. Interplane Vee struts were varnished natural spruce and were cord bound at intervals, such bindings often being additionally protected by a coat of coloured dope, usually red or blue.

Rudders were equally divided into red, white and blue divisions, the blue being foremost. Serial numbers were stenciled in black: on R.F.C. machines numerals which were imposed on the coloured portions of the rudder stripes were sometimes outlined in white.



LOWER WING

FT. 1 2 3 4 5 6 7 8 9 10

Over the Waves

NEW EQUIPMENT & IDEAS FOR R/C FANS

THE MOST POPULAR home construction receiver in the United States today appears to be the design by Phil Kraft published in our contemporary, *Model Airplane News*. So successful is this receiver the it was chosen as a fine example for printed circuit construction to be used in the *AEROMODELLER Annual 1959/60*, where readers will find not only the etching-board pattern, but also the physical layout of components full size, together with circuit diagram and list of American components.

Rodney Pask made one of these tone receivers and it is operating perfectly, using British equivalent components, and for those who would like to construct this receiver from the *Annual* he offers the following equivalents.

Valve: XFY 34

R.F.C.: As per AEROMODELLER Transistor Receiver.

Coil L: 30 turns 26 swg. enamelled copper on "standard" coil former.

Transistors: Mullard OC71

Transformer: Ardence 5-1

Relay: 8,000 Ohm, but almost any in range 3-10K would do.

Condenser C8: 5 mfd. will work, but use 1-0 or 0-75 mfd., 23 or 50V. for pulse work.

Rest of components not critical.

Cobb system

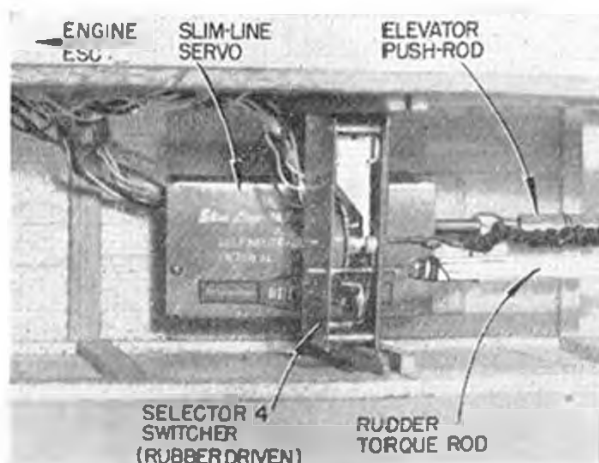
This is a combination of compound escapement and motorised servo which gives to the single channel receiver many of the advantages of multi control.

As with all compound escapements, signals of fixed number and duration are necessary. Whilst this may be achieved manually it needs plenty of practice. In the present case a "Pilot box" is available and by the movement of a control lever the correct signals can be given.

There are three units, which can be purchased separately and also used individually with a variety of combinations.

- (1) "Selector" 4. A rubber-driven compound escapement giving four positions. Control is achieved with signal on and return to neutral operates with signal off. Intermediate positions are given by pulses of fixed number and duration (e.g., signal gives right rudder; one pulse and signal on gives left rudder).
- (2) A motorised servo (*Slim-line*) operated from a switch plate at certain positions of the escapement, for elevator control.
- (3) A Pilot control consisting of a clockwork mechanism driving a switch to the Tx. The inclusion of a

Cobb gear installed in a model for test and demonstration



Claude McCullough of Iowa has this 6-lb. 64-in. Turbulent flying with a Min-A Rx for proportional rudder and trimmable motor, scaled from *Aeromodeller* plans for an Atwood .49

"treadle plate" and stops on the control stick provides the means of sending the correct signals.

The rudder control is effected by means of a cam using the first two positions of the escapement. The remaining positions are switch positions which can be used for any purpose. In the present case they operate the motorised escapement for two elevator positions.

The escapement passes over the switch positions on returning to neutral from the rudder positions but due to the low transit time of the Slimline servo no movement of the elevator occurs. The motor only drives to position when the appropriate signal is held on (e.g., three pulses and signal gives up elevator). By an ingenious use of the delay also present in the compound escapement the effect of simultaneous control can be obtained. For example, if the control lever is moved to up or down elevator and, when required, quickly moved to left or right rudder they remain in position. The result could be a spin, either upright or inverted, or in some cases a roll.

On returning the control stick to neutral, both surfaces follow suit. This is a safety measure in case the pilot becomes confused.

There is an additional control operated by means of a quick blip of a button on the pilot box. This trips a non-self-neutralising servo or escapement and can be used for motor control, etc.

Full instructions for installing and use are given with each unit and trouble shooting hints are included. With care and practice, the user could enjoy most of the thrills of multi.

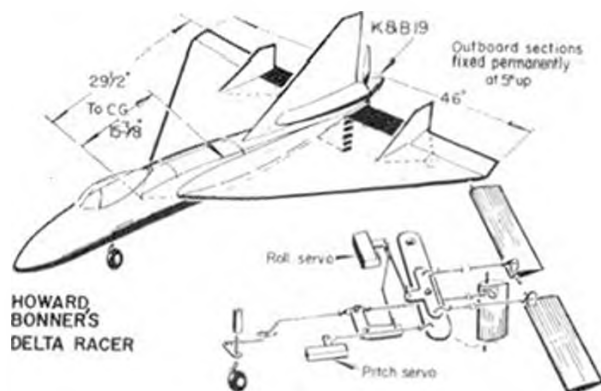
It is suggested, however, that operation should be carried out in steps so that the operator can familiarise himself with one control before proceeding to the next, should he be using the manual button instead of the efficient Pilot box (which did not fail to select desired control during our tests).

Manual signals should be:

Press and Hold	...	...	Right Rudder
Press Press and Hold	...	...	Left Rudder
Press Press Press and Hold	...	...	Up Elevator
Press Press Press Press and Hold	...	...	Down Elevator
Quick Blip	...	...	Engine Speed

Microdyne receiver

This is an *all* transistor receiver, carrier-operated and representing a new "first" on the British market by eliminating the relay. It is compact due to the fact that the output stage is fitted to a separate deck. Physical size is only 2 in. x 1½ in. x 1½ in. and the weight of 1 oz. should make it suitable for the smallest of models. The relay normally used in this type of receiver is replaced by an intermediate power transistor, and vibration effects will not disturb its working. The Microdyne therefore does not need special shock-proof packing.



Unique control application on Bonner's delta uses four of his six channels

A further advantage is the low battery weight. Two batteries only are required for complete radio control installation and for receiver operation, due to the moderate current drain, a miniature 9 v. battery is sufficient. The actuator battery is determined by the needs of the coil resistance, 4.5 v. being typical for the standard 8 - 10 ohm unit.

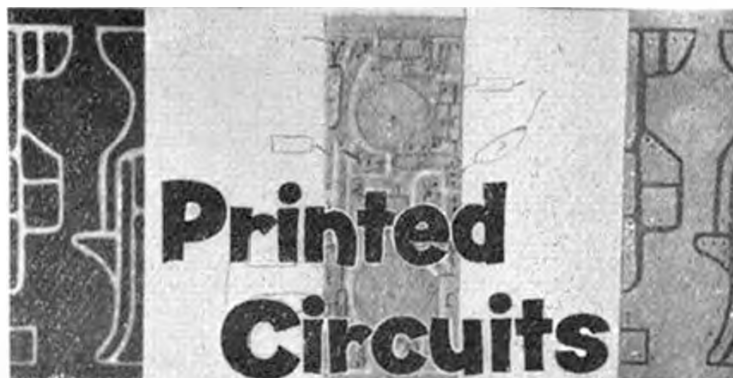
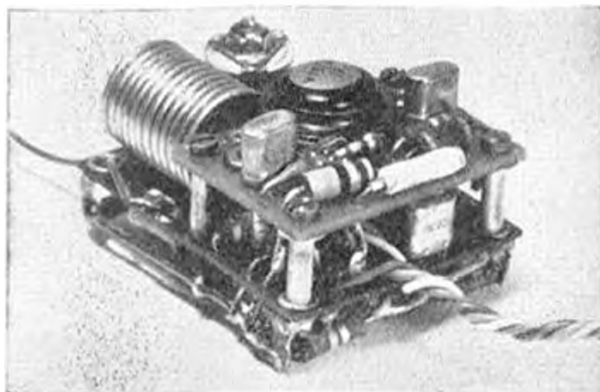
Current consumption for the Receiver is approximately 3 m/A. The output stage into actuator (no signal) is 5 m/A. With signal "on" it rises to 150 - 300 m/A, depending upon the actuator used. The battery voltage in the output stage should not exceed 15 v. — an unlikely requirement, but a point which should be observed.

Carrier-operated receivers usually need some adjustment for maximum sensitivity and this Rx is no exception, the manufacturers have, however, arranged for adequate sensitivity in the receiver design and a separate control is unnecessary. There is some effect from capacity to earth and the standing current is affected by the tuning at one end of the frequency band.

In spite of this, sensitivity is adequate and provided that due care is exercised in wiring and ensuring that the Tx is on frequency (this is required by law anyway) no trouble on the score of range will be experienced. Ground range in excess of 2,000 yards has been obtained with a Tx power of 36 milliwatts. Tuning calls for a 0 - 1 amp meter (makes a change from 0 - 10 m/A !) in series with the actuator, or alternatively a flashlight bulb can be wired in across the actuator and used to tune.

The receiver can be recommended with full confidence to the newcomer to R/C provided the simple precautions mentioned are observed. Installed weight with F. Rising or Conquest actuator, and Ever Ready PP3, three D.14 cells and a switch is only 5 1/2 oz.

Very small, very light, yet the Microlyne has 11 capacitors, 14 resistors, 6 transistors, a transformer, and a diode. Functions down to 7 volts



A "DO-IT-YOURSELF" METHOD

Described by Sqdn. Ldr. S. W. Sarll, A.M. (Brit.), I.R.E.

(Condensed from *The Radio Constructor*, Nov. 1959)

A PRINTED CIRCUIT differs from a conventional wired radio or electronic circuit in that all the electrical interconnections and the component termination is done by copper sheet conductors bonded to an insulating baseboard. Such circuits can be mass produced to a consistent standard more cheaply than conventional wiring, and are used extensively in commercial transmitters and receivers. For the aeromodeller who makes printed circuit equipment there are the advantages of reduction in size, ruggedness, simplicity of construction, besides the long life stability. It is now possible to construct a "one off" circuit at home with no special tools or equipment. Besides radio chassis, printed circuits may be used for rotary or slide switch for actuators, mechanical pulsers and other similar devices.

Basically the system built around copper-clad laminate board consists of:—

- (a) Painting the required pattern on the copper surface.
- (b) Etching away the uncovered copper.
- (c) Removing the protective paint and cleaning the copper.
- (d) Drilling the connection holes.
- (e) Soldering the components to the copper conductors.

Anyone capable of handling a paint brush, drill and soldering iron can produce results.

Assuming that the required pattern is a radio circuit and that a theoretical diagram is available, the first job is to make an exact full-size drawing on paper of the components and interconnections in their correct place. All components will be anchored by passing their connecting wires through small holes drilled in the baseboard. All interconnections will be by the copper laminate remaining after the surplus is etched away. Positioning of components is critical with some R.F. circuits and must be catered for in the layout drawing. Leave room between fixing holes for a length of lead sufficient to prevent the heat, when soldering the ends, from reaching the components.

Once a satisfactory layout has been drawn, shade in with pencil the areas where the final copper connection is required. Large unconnected areas can often be made "earthy" by suitable bridges or linking wires.

Coming now to the copper faced laminate board, successful results have been achieved using "Formica" Copper Clad Material Engraved DCC.20—.0028 ins. copper. Unless considerable heat is applied the 2.8 thou. copper will resist all normal attempts to peel off, but it may be removed quite easily by etching or even by cutting away with a razor blade or modelling knife.

(continued overleaf)

The first job is to cut and sand the board to size, cleaning the cut edge of the copper with a file or sandpaper. Lay the paper pattern exactly over the board and mark the positions of fixing holes and any other significant reference points in the copper surface. Emphasize these points in the copper with a punch—do not drill yet.

Anything can be used to protect the wanted copper that will resist the etching agent. Success has been achieved with:— (a) Cellulose enamel. (b) Humbrol enamel. (c) Cellotape. (d) Self adhesive plastic insulating tape.

Assuming that enamel will be used, it can be applied by a fine paint brush. Shaded areas of the paper pattern are copied free hand on the copper using the hole positions as a guide. It is not necessary to make a good paint finish, merely cover the areas with sufficient thickness of paint. A mistake can be quickly removed and the area repainted.

Satisfactory etching has been achieved using ordinary or strong solution of Ferric Chloride obtained from any chemists. The solution at the strength supplied or slightly diluted with water (up to 20 per cent.) is poured into a shallow glazed earthenware dish, such as a plate. Place the panel in the liquid and allow time for the unprotected copper to be removed. Keep the liquid in motion with a piece of wood to prevent localised saturation by copper, but take care not to splash the liquid as it is corrosive. About half an hour will be required to remove the spare copper from a small panel and the liquid may need replacing if it becomes saturated, but don't be impatient. After the first slight change of tone of the copper, success will only be observed by the disappearance of the copper from the edges first. Confirmation that all the spare copper has been removed is obtained by lifting the panel and looking through it at a strong light, when the full translucence of the base-board will be apparent. Don't leave in the etch beyond this point. Pour the waste liquid away carefully, on waste ground, avoiding other metalwork.

Both the dish and the board are washed under running water. Paint can now be removed with thinners, dope, or nail varnish remover; it comes off easier if it has not had time to dry really hard. The board is now thoroughly scrubbed under running water, using a mild household abrasive, such as Vim, to produce a bright clean surface. Unless it is intended to proceed at once with drilling and assembling, the areas to be soldered should be protected from oxidation by painting with flux.

All the holes can now be drilled, using a size for

component wires that just gives a clearance—too large a hole produces a poor soldered joint. Larger holes for valve bases and parts etc. can be drilled and cleaned out.

To remove any oxidation the copper should again be cleaned and scrubbed and then the areas immediately around the holes lightly painted with a very thin film of paste Fluxite.

Before use, all component wires should be well tinned, dirty or dry wires will not solder easily and excess heat damages the copper bond.

Remember that a heat shunt is *always* required at the component end of wires when heating. If pliers are not used, ordinary small croc. clips or spring Dinkie pin curlers (available from Woolworths) with heavy copper wire soldered to the ends, may be clipped to the wires.

Bend the component wires carefully with pliers forming small open loops with the ends spaced to allow them to fit easily into the respective fixing holes. If vibration is expected, unequal lengths of wires will reduce resonance effects. Components may be mounted either side of the board, but it is preferable for accessibility to have components on the plain side and solder on the copper side. More rigid construction is achieved by fixing components close up to the board, but better heat insulation when soldering is achieved by having the components well "stood off" if space and vibration are not critical. All components can be fitted to the panel the ends turned along the copper and the layout "proved" before soldering.

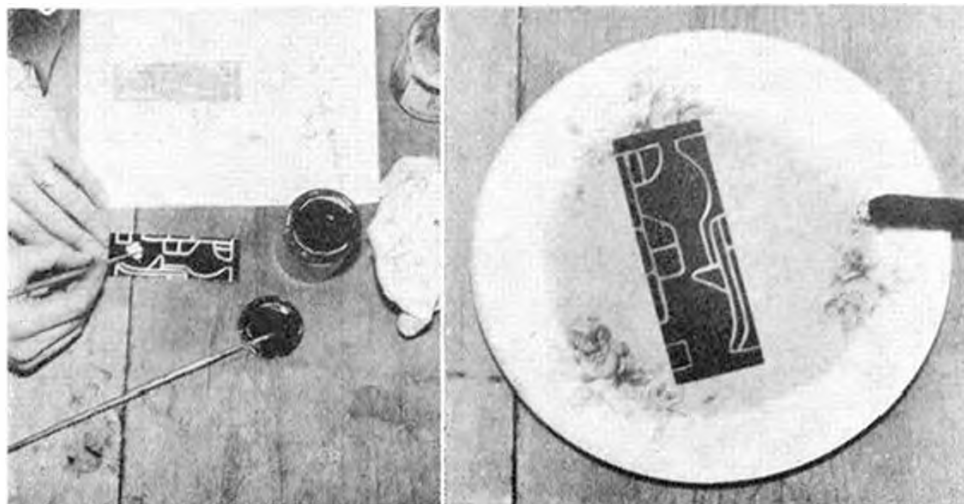
To solder, use a low wattage iron with a small clean hot bit. The thin (22 S.W.G.) Ersin Savbit Multicore solder is better than the larger size for printed circuit soldering as the quantity per joint can be more carefully controlled.

Apply the soldering iron tinned surface to the copper adjacent to the wire and apply the resin cored solder at the same time to both copper and wire. If maximum heat is applied to the copper and less to the wire, the solder will quickly run to form a small bright blob around the wire. Both iron and solder should be removed as soon as the wire has been completely encircled since excess heat and solder do no good at all.

Inspect all joints for faulty or inadequate bonds, then snip off the excess wires and the job is done.

If sufficient copper has been left on the board, a circuit change can be subsequently effected by isolating a piece of copper with a razor blade, drilling new holes and linking the areas with a piece of tinned wire as if it were a component.

Heading opposite illustrates a panel painted ready for etching, and the etched panel at right with layout sketched centre. Squared paper is an advantage for this. At right, use of cellulose as a resist, here being painted on Furnica Copper Clad, available from R.E.P. Ltd., and at far right, the panel immersed in etching fluid, using a deep plate



Did I mention last month that clubs are still wrangling over the 1960 Contest Programme? Well, stop worrying (or start doing just that!) for the new schedule presented to the S.M.A.E. Council at its November meeting was accepted almost in its entirety, though a suggestion that the Nats. be divided into free-flight and control-line affairs on different dates was shot down in no uncertain manner. The general opinion is that this annual meeting should be maintained as a real get-together of all classes of aeromodellers, and even if the exponents of both types of flying do not exactly see eye to eye, at least they can publicly ignore each other on the same airfield!

One thing is certain, most keen modellers want more practice in the International class of event, and even though there will not be World Championships for Wakefield or A 2 in 1960, there will be Practice Trials in addition to Area organised qualifiers. Note that word . . . *not* eliminators as previously understood, but to qualify for the Trials a modeller must take part in at least one of the qualifying contests. Only in this way will practice be acquired, and I foresee a general improvement as this system gets under way.

Just before getting down to the brass tacks of your individual reports, I have news of two models for which the rightful owners have doubtless spent much bootleather and time in looking for. D. W. Gladwin of 18 Pitcairn Road, Pennywell, Sunderland, knows the whereabouts of a red-and-yellow A 2, found at Blaydon after the Novocastria Gala at Newcastle. Applicant(s) must give full description etc., when claiming.

The second job is an A.M.15 powered model, found near Debdon, and full details can be obtained from S. L. Dr. Drinkell, R.A.F. M.A.A., Air Ministry, Whitehall Gardens, London, S.W.1.

Speaking of the R.A.F. brings to mind their recent 10th A.G.M. when it was decided that entry to the Services Championships will from now on be unlimited, and two new events, a .9 c.c. maximum Team Race and a Scramble have been introduced. We hope that much benefit will derive from a new approach to liaison with local Areas, particularly regarding flying space.

Northern

S. Broadey of Thornaby Pathfinders put in a set of very consistent flights on October 11th to win the Muxlow Memorial Trophy for Wakefield models, his total of 13:29 being the odd second ahead of Lou Roberts of Lincoln and "Pop" Miller of Baildon. Near-perfect weather blessed this contest, also the Inter-Club knock-out event held on the same day, when Sheffield A beat Tees-side A 25:51 to 23:48. The Area reminds that their annual Winter Rally will take place at Rufforth on the 17th January, when Open Rubber, Power, Glider, Chuck Glider, Paaload, {A, A and B Team Race, Single-channel Radio and Concours will be held.

The TEES-SIDE M.F.G. organise a very interesting type of event for their Autumn Shield. Both F.A.I. and open class models compete, and the results are computed as a percentage of a possible 3-flight maximum (F.A.I. 9 mins., Open 12 mins). This works well and gives everyone a chance. Tom Chambers flying a Wakefield for a total of 6:05 made a percentage of 67 per cent., A. M. Robson (open rubber) 7:35 got 63 per cent., and S. Broadey (just transferred to Tees-side, but no fee stated!) again flying a Wakefield got 5:20 for a 59 per cent. score.

Two members of the WHARFEDALE M.A.C. set out for Brussels and the 10th Criterium taking with them 3 models, 7 Olivers and a gallon of fuel, but not to much purpose. Their first flight was disappointing, but the second was much faster . . . until disqualified for high flying! A word of warning to all home-brew makers (including beer). Amyl Nitrate is a highly volatile substance, as Ken Long will agree, for whilst handling a bottle of the stuff it ejected the cork, and the gases given off temporarily blinded him.

CLUB NEWS

COVENTRY M.A.C. have produced a very fine club magazine, with some very good sketches by Ron Draper, and a number of readable articles. Birmingham just pipped the Lady Godiva's to the Model Planes Trophy event, scoring a total of 67:01 for their top six men, to Coventry's 65:29 and Leamington's 62:59.

North Western

An amalgamation of the old Blackpool & Fylde and Poulton-le-Fylde clubs has resulted in a new group named POULTON, BLACKPOOL & FYLDE M.A.S. as from August 1959. With a flying field as large as any in the North West, plus the use of a large gymnasium for indoor flying and a good room for meetings, this club seems to have everything in its favour. Interested modellers should contact N. E. Porteus at 29 Chester Ave., Poulton-le-Fylde.

Despite a good year elubwise, the CHESTERFIELD SKYLINERS have certainly had their little troubles. One member had his Fita 29 powered scale Boeing 14B go up in flames following a backfire; Brian Fearnie smashed two crankshafts in consecutive weeks; and an O.S. Pet "Diviclander" was last seen disappearing in heavy rain and thick clouds on a ten minute engine run! Oh well, and some grumble at thermal activity.

Midland

Plenty of team racing has been the theme of NUNEATON A.M., and a fair amount of success has resulted, except when at Cranfield Hector Rey's "A" job surprised everyone by doing 87 m.p.h. with a re-worked E.D. 2.46. Unfortunately, when well in the lead, the motor went the same way that the majority of the T-R engines do . . . into the tarmac HARD. This club is coming to the view that buckshee displays at fetes and barbecues should incur a charge in future, as theirs is a major attraction drawing crowds three or four deep around the arena to watch a half-hour non stop four-up combat joust.

In order to maintain winter interest, the WEST BROMWICH M.A.C. is organising various contests, with indoor work priority. Several members are building indoor team-racers for motors up to .8 c.c., and the result should be quite interesting! A number of class B jobs are under way for the new season, and one bod has acquired a "Tiger" jet, so it seems that the club members are in hourly peril of their lives.

WALSALL M.A.C. got a shock recently when secretary I. James (in office for the past 10 years) handed in his resignation. However, he was persuaded to continue in office, so all the other members breath again that one of them has not had to step into the breach.

LOUGHBOROUGH COLLEGE will long remember that rally-that-wasn't, but the lads got together and staged an impromptu affair on the torn-up college airfield. In murky fog, timekeepers were permitted to follow the models to the far fence, presenting a fine spectacle as owners and timers charged across the field with heads up! Eric Barnacle of Leamington placed top with a fly-off time of 5:23 in the rubber class, but we have yet to learn the results of the glider boys. Probably still lost in the fog.

One of the oldest, yet least heard of clubs must surely be LEICESTER M.A.C., who, in spite of continuing as a virtual "closed shop" still manage to run a good set-up. The winter building competition does much to keep interest alive during the indoor season, and their new set of contest rules are well worth studying by other groups.

I gather from reading between the lines of the MACCLESFIELD M.A.S. report that they are yet another group to have fallen foul of local residents over the noise question. At the expense of a certain amount of inconvenience to members, who have to walk a little further, the position has been shifted farther from the noise-conscious public, so off they go again. Macclesfield has been well represented at recent meetings held at Siretton, Gig Eifflander in particular showing his old skill by placing top in both rubber and power events, and second in chuck glider.

Western

Permission has been granted to the WESTON CONTROL-LINERS for a rally to be held on Boxing Day on Weston Aerodrome. Events will be for all C.L. classes, and secretaries are asked to contact R. Burgess of 6 Selworthy Rd., Weston-super-Mare for further details. The club has had use of R.A.F. Locking, and invited the Bristol lads along. Mr. Evans brought out his twin-jet Blackburn N.A.39, but appeared to be having tank troubles, the model only flying a couple of laps. He did not attempt to use both pipes, though he has a device for starting the second jet in the air.

It just goes to show! GLEVUM M.A.C. have a good airfield at their disposal, yet find it hard to get more than a handful of their members along to fly. What wouldn't the Chobhamites give for such facilities! In an effort to whip up some enthusiasm, special meetings will be organised once a month to supplement the indoor programme held monthly at Longlevens Village Hall.

Members of the EXMOUTH & D.M.A.C. went along to R.A.F. Blake Hill Farm for the Area events recently, the most successful being Alan Parker who made best Area time with a "Eureka" powered with a 12-years-old Arden. In the club presentation of "pots", Parker took honours in the power section, D. G. Baudet in Glider, and "Pop" Baudet the rubber class. Parker also won the "White Cup" as 1959 club champ.

South Eastern

In spite of blustery conditions, BRIGHTON D.M.A.C. had a fair entry in the C.M.A. and Frog Senior events. Reg Boxall scored 6:28 in glider and Ian Lucas 8:34 in power. On November 1st when flying for the "Arthur Mullett Rose Bowl" brother Fred Boxall was the eventual winner in a three-men flyoff with a 3:44 in fading light. This was some consolation, for he had two rubber models partly devoured by cows during the day!

Another of these "Areas within an Area" is the UNITED SOUTHERN AERO-MODELLING CLUB, which held a meeting on Goodwood racing circuit in fine conditions. Four member clubs, Chichester, East Grinstead, Horsham and Worthing, were joined by Lee Bees and Portsmouth, the results being:—Combat, K. Hall (Worthing); {A T R R. Boxall (Chichester) and Stunt, R. Brown (Lee Bees); Power A. Puzey (Chichester) 6:14; Rubber Johnson (Portsmouth) 9:00; and Glider G. Richardson (Horsham) 6:00.

Fine conditions prevailed at the Area C.L. Championships, where Clive Weller of the ASHFORD M.A.C. easily won the A T R event with a "Tigress". Junior Jeff Playford won combat with his "Razorblade", thus retaining the event for the club for second year running.

London

The Cooper/Allen equippe of the MILL HILL M.A.C. have been racing their "Fredwall" at most of the rallies last season and racked up a useful score of successes in class A events.

DARTEFORD M.F.C. have been very inactive over the past year, but now that membership is slowly rising, they hope to attend most of the forthcoming rallies. Members in the district are invited to join

CLUB NEWS (Cont'd)

this reorganised club, meetings every Friday 7.30 to 10 p.m. at the Rose & Crown, West Hill.

The WEST MIDDLESEX M.F.C. finds indoor flying not so easy as it sounds, though Dave Allen has been quite successful flying a modified Ranger 20 design. Recently Bob Axall scored an outdoor flight with his 9 ft. "Powhattan" glider of 25 minutes.

(That's all from London! What is wrong with the clubs from the Big Smoke? Surely not declining in their activities or vociferousness!)

South Midland

ABINGDON & D.M.F.C. has at last received some definite promises about airfield space, and is undergoing quite a revival as a result. Neil Webb is currently engaged on the construction of a Comet IV, span 84 inches, root chord 23 inches, and powered by two Dynajets. May the Good Lord bless them and keep them (whole!)

Mice have apparently got at the NORTHAMPTON M.A.C. duplicator, or has someone whipped the alignment gears for a new Wakefield! After much consultation with a magnifying glass and the Rose Stone, we decipher that Ron Draper of Coventry gave a very interesting talk to the members recently; and that Mick Evatt won a recent power event with a time of (undecipherable); the glider class with 6:34; and Prof. Payne the "Open Ribber" event with 6:38. I wonder if the club members were lucky enough *not* to be able to read instructions re that not-to-be-mentioned Wymeswold Rally-that-wasn't?

East Anglia

The newly formed ESSEX M.F.C. won the 1959 Area inter-club Championship, and in addition P. McLean turned out National Junior Champ. Martin Presnell was Area Champ, with L. Sayer (Glider) and Neville

Willis (Power) the other individual honours. The boys are now working hard for 1960, the accent being on F.A.I. class models.

IPSWICH M.A.C. are once more strongly under way in local contests, and D. Parker obtained a speed recently of 130 m.p.h. with a Dooling-powered speed job to set up a new club record. The annual contests held at Ipswich Airport was poorly supported, and now Ipswich have the all too common shortage of flying space.

Interest in the ANGLIA M.F.C. is now centred on r.t.p. flying, a number of members experimenting with electrically driven scale jobs. These look very realistic on take off, due to engine control made possible by using a variable resistance from the mains. A scale C.L. Corsair, complete with engine control and full scale markings, is on the stocks, and the designer claims it will cause quite a stir at exhibitions it is hoped to stage next season.

Wales

CARDIFF M.A.C. was thoroughly beaten at home on November 15th by visitors from Port Talbot, who carried off both individual and team honours in the open glider event. Results were:—

Team Glider	Port Talbot	1006 secs
	Cardiff B	643
	do. A	520
Open Glider	do. C	519
	P. T. Waters (P. Talbot)	6:00
	B. R. Jones (Cardiff)	5:37
A/I Glider	K. Williams (P. Talbot)	5:24
	R. Flaherty (Cardiff)	4:58
	S. Morgan do.	2:43

Scotland

After a fairly successful season, the ECURIE CADZOW seem to be concentrating

on F.A.I. material, which is to be commended. A little more attention to International classes would not come amiss with many clubs, for the hit-and-miss of general modelling just cannot produce the skill needed in the formulae class of model. One snag with the Cadzow lads at present is line failure, usually when well placed in Class A.T.R. but undoubtedly continued practice will disclose the causes with benefit to all.

Ireland

CORK M.A.C. has suffered a great loss recently, when their chief stunt flier was whipped into the R.A.F., but, who knows, we shall perhaps see him doing as well in Service events! The club placed well in last years Irish Nats. with three firsts and one second out of four events entered.

At the 14th A.G.M. of the BELFAST M.F.C. it was agreed that the club championship will in future be held in separate f and c/l sections in order to give the specialists more chance, and it is hoped to give rise to an improvement in flying standards. A precision flying contest will be staged on Boxing Day, probably at Newtownards aerodrome. Members of the LARNE M.F.C. had a good time at the fA event staged by the Belfast lads, though the rather stormy conditions gave the pilots of light models a somewhat hectic time. The team of McGalliard Blain won the 200 lap final at an average speed of 45.5 m.p.h., including eight pit stops. A recent combined meeting of the Larne and Belfast clubs decided that Ulster Nats. shall be held in 1960, details to follow.

Well, with the exception of one request for a pen pal from Frank W. Perry, 5755 28th Avenue N.E. Seattle 5, Washington, U.S.A. (age 33, active in R.C.) that is the lot for this month. So my merry men, get down to those new models in good time for the coming season, and may it be as good as the last.

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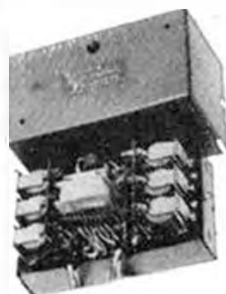
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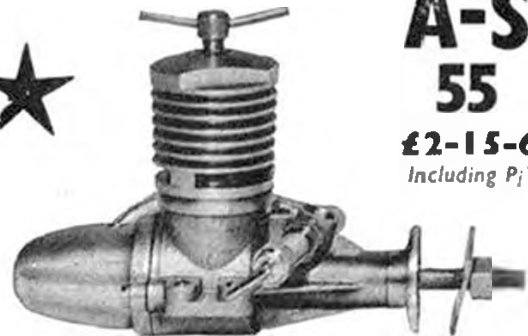
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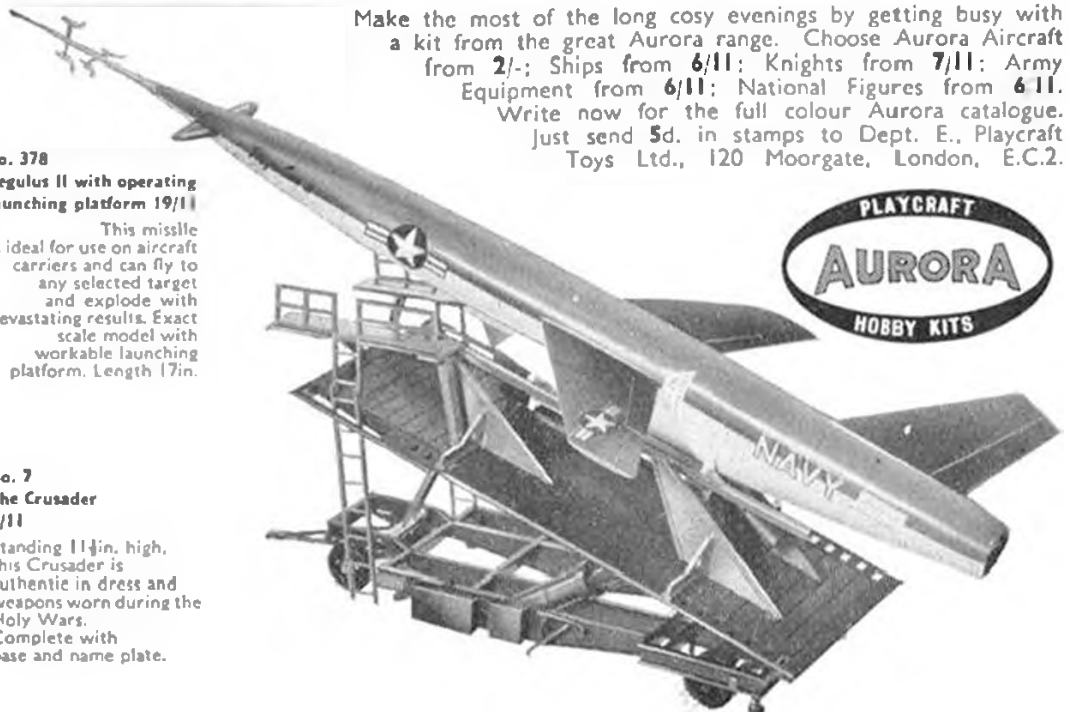


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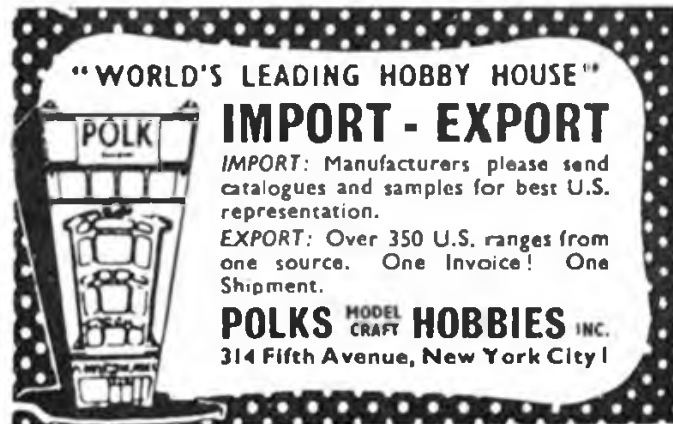
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Continued on page 55

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Continued on page 56

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