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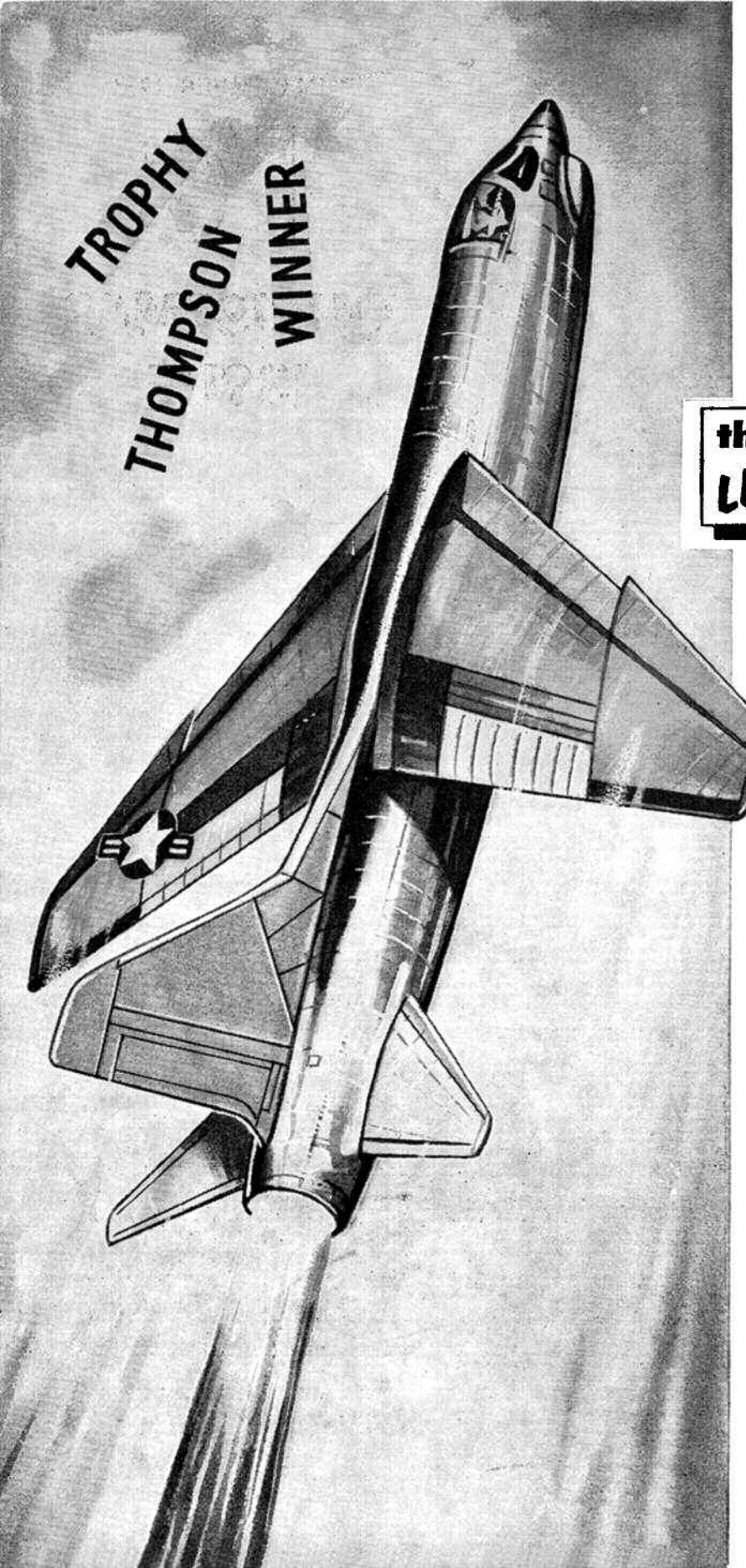

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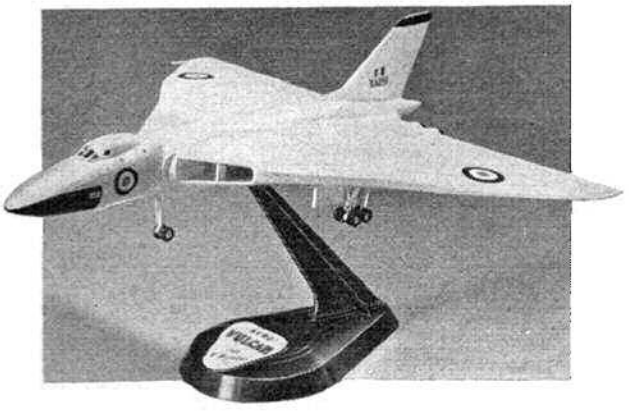

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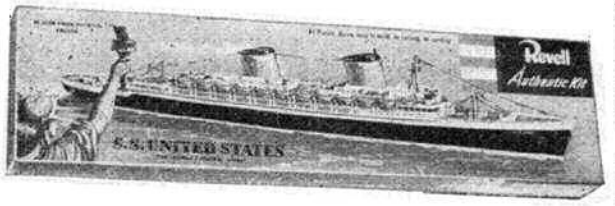

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DECEMBER 1958

Vol. 17 No. 210

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The official Journal of the
SOCIETY OF MODEL AERONAUTICAL ENGINEERS

★

Published on the 20th of each month prior to date of issue by
PERCIVAL MARSHALL & CO. LTD.
19-20 NOEL ST., LONDON, W.1.

Telephone: GERrard 8811

Annual Subscription 22s. post paid. (U.S.A. and Canada $3.)

'EARD AT THE 'ANGAR DOORS

LAST month we took time off to go down to Croydon to inspect the *Super Aero*, the handsome lines of which can be seen in the accompanying photos. This particular machine is the one used as a demonstrator by the firm handling the U.K. sales of this lively Czech twin, and it will be the one featured as our "Plane of the Month" in the January issue. Also we are working on the plans of a C/L version, and if the model handles as well as the full-size job, then it will really be something!

Close-up detail photos, cockpit diagrams, colour schemes—we've got the lot—so if you're a scale fan this is one issue you won't want to miss.

Naturally, while at Croydon we took the opportunity to look around for the odd and the unusual and we were not disappointed. In one hangar we found the Reid & Sigrist trainer receiving the finishing touches to a silver and red paint scheme. The only machine of its type ever built, it has had an unusually varied career, being originally a two-seat primary and intermediate trainer for the R.A.F. Later it was extensively modified for a series of prone-pilot experiments carried out at Farnborough, and now in its civil guise it still retains the extended nose. We understand that prior to its re-paint job, it had been used by a civil operator for photographic survey work.

In the same hangar were some beautifully maintained *Hornet Moths* together with a red *Gypsy Moth.*

The attractive lines of the Super Aero are shown to advantage in the photo below, while left, Norman Butcher and Roy Wesson get down to a close inspection of the engine nacelle. This shot was taken by S. G. Nettle, our "guide" for this interesting visit.

Looking a little out of its natural element—although an amphibian—was a Grumman *Widgeon* from Tanganyika. Next door was an IL-14 of the State-owned Hungarian airline absolutely towering over its stable mates of *Chipmunks*, *Austers* and *Tiger Moths*.

Outside on the tarmac we were able to make a close inspection of an American *Aero Commander*—of particular interest to us after publishing the plans for a C/L version in the July issue. We were rather surprised to find how small an aeroplane it really was.

More models only

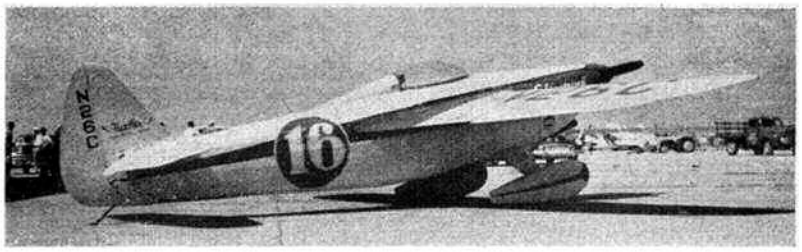
AFTER our paragraph in last month's "Here and There" about flying fields exclusively for models, we were very pleased to see reported in the national Press that some four acres of land on a former golf course at Cannock, Staffs, is to be used as a flying site for model aircraft.

We have no further details, but would assume from the relatively small size of the area that it will be for C/L only. Even this is really something, and we hope that this start will be an incentive for clubs, who have not yet succeeded in securing suitable flying facilities in their own area, to keep plugging.

From the other side of the world, namely, Port Adelaide, South Australia, comes news of similar facilities. Brian Horrocks, who is in this country on a two-year visit, sent us a cutting from his home newspaper, which reports that local clubs have three places which can be used for C/L flying for two hours on one Sunday in each month, and some 200 modellers regularly avail themselves of the sites.

Brian also gives us some dope about his club, the Constellation M.F.C., which was founded 12 years ago and for nine of which Brian was its secretary. It is the largest club in South Australia and its members reign supreme in both R/C and C/L events, but perhaps even more impressive is its tradition for supporting local charities. To quote just one example—the occasion when 12 members with 30 models flew by *Dakota* to a town some 150 miles away to put on a show which raised over £100.

With a record like that, a club deserves some consideration from local councils when they are asked for somewhere to fly!



MODELLING a MIDGET

IT was not until Peter Lewis showed us his collection of photographs of American midget racers that we realised just how many of these types had been built in the States, and incidentally what a fruitful source of prototypes they represented for scale modellers. Peter himself was keen to build a C/L model of one and the result, *Shoestring*, is on page 415 of this issue. Unfortunately, our half-tone illustration above cannot do full justice to the really sparkling colour scheme of *Shoestring*, but we can guarantee that you won't be disappointed with the finished model to look at or fly.

'A' to F.A.I.

AT a recent meeting the S.M.A.E. Council decided to amend the existing class "A" team racer specification to bring it into line with the F.A.I. International Team Race Specification. As there has been some confusion over these requirements, we are listing them below—together with the International Class Speed model specification which has also caused some confusion—in the original metric measurements, with their approximate English equivalent in brackets.

TEAM RACE SPECIFICATION

Maximum cylinder capacity	2.5 cm³ (2.5 c.c.)
Total area (wing plus tail unit)	12 dm² min. (186 sq. in.)
Minimum dimensions of the fuselage at the "pilot's cockpit."	
Height	100 mm. (4 in.)
Width	50 mm. (2 in.)
Maximum total weight	700 gr. (24.6 oz.)
Maximum capacity of fuel container	10 cm³ (10 c.c.)
Line length (C/L handle—C/L model)	15.92 metres (52 ft. 2 in)

SPEED MODEL SPECIFICATION

Maximum cylinder capacity	2.5 cm³ (2.5 c.c.)
Total minimum area	2 dm²/cm³ (31 sq. in. per c.c.)
Wing loading for unit of area	100 gr./dm²max (3.5 oz. per 15½ sq. in.)
Line length (C/L handle—C/L model)	15.92 metres (52 ft. 2 in.)

The class "B" line length has been increased to 60 ft.

New Appointment

MR. C. E. WALLER, formerly managing editor of our companion journals *Model Engineer* and *Home Mechanics*, has been appointed executive editor of all Percival Marshall publications.

Sorting out the snags of A/2 design

by NEVILLE WILLIS—
1956 A/2 Team member

NEXT year the A/2 contest, after a break of a year, returns to the International Calendar, and after the usual eliminating trials, four people will come through the rest of the field to form our team to represent Great Britain in the World Final.

These four will undoubtedly be the best of the bunch, but will they be good enough to win the Final in the face of the usual brilliant foreign opposition? It is regrettable, in view of the average standard of A/2 flying in this country, that we must have very serious doubts in this respect.

Quite often in the past one of our team members has acquitted himself well and placed quite high in the results, but almost always the remaining team members (including the writer!) have been further down the list than they would have liked.

One obvious reason is that our A/2s are not consistent enough. There is another aspect, however. In view of our all-too-apparent shortcomings, 1958 should have been a year when some of the bugs were ironed out. Yet this year only one official A/2 contest appeared in the S.M.A.E. calendar! It is essential that interest is stimulated early so that our A/2's are at peak by the Trials next year, and, of course, the best method of improvement is by competition. This article may, however, also help in some small way.

It does not attempt to deal with all aspects of design and flying, as these have been fully discussed by other writers elsewhere, but the following notes, on points which are most likely to result in an improvement of performance, may assist would-be A/2 designers.

Design Layout

Figs. 1, 2 and 3 show my 1956-7-8 A/2s and all three are still in existence, but the latter is not, as yet, fully trimmed. This uses an asymmetric wing but so far no conclusive opinions to the success of this have been reached.

The first A/2 I built was, as usual, a "quickie" and the 1956 model was evolved from it. This model has been the basis of the succeeding designs and most features are carried by all three models.

Wing and Tail Surfaces

The first consideration is the apportionment of the available total horizontal area between the wing and tailplane relative to the moment arm. With 527 sq. in. available, it is best to use a figure of 520 sq. in. to avoid trouble with processors.

We can use the following well-tried formula:—

$$K = \frac{\text{moment arm } X \text{ tail area}}{\text{wing area } X \text{ mean chord}}$$

(moment arm = distance between wing and tailplane mean chords).

The value for K is usually between 0.75 and 0.8; if this is lowered, insufficient longitudinal dihedral may result. If increased, there is a danger that the tailplane and rear fuselage assembly may become too heavy.

For English weather we must use fairly large tailplanes—80 sq. in. minimum—but an increase of moment arm means that more area can be transferred to the wing where presumably it can be put to better use. However, here again, this may lead to inertia problems if taken too far. A tailplane between 80 and 100 sq. in. will be found to be quite adequate, but if a Clark Y type of tail-plane section is employed, it is necessary to use slightly more area than would be necessary with an "undercambered" section.

Airfoil Sections

The following airfoils are most suitable for A/2 use: Benedek 8358b or Hacklinger type, e.g. MVA 123, NACA 6509, NACA 4406; these are suitable for use with an undercambered tailplane section.

If a Clark Y type tailplane section is used, then the MVA 301, Gottingen 500, Czepa, Isacson 73503, Isacson 73508, or the NACA 6409 is to be preferred.

"Droop" can be used with success on the last three sections listed. Fig. 4 shows droop on an Isacson 73508 which definitely does improve the sinking speed—an increase of 10-15 seconds

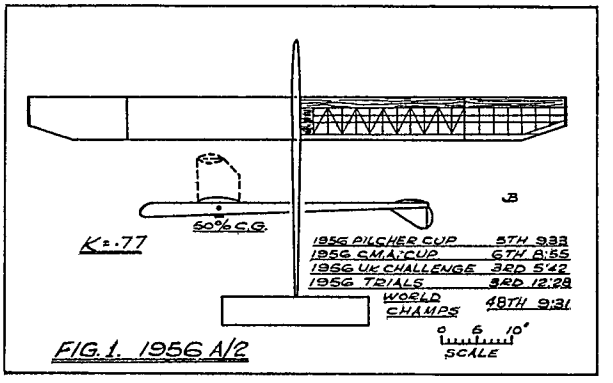
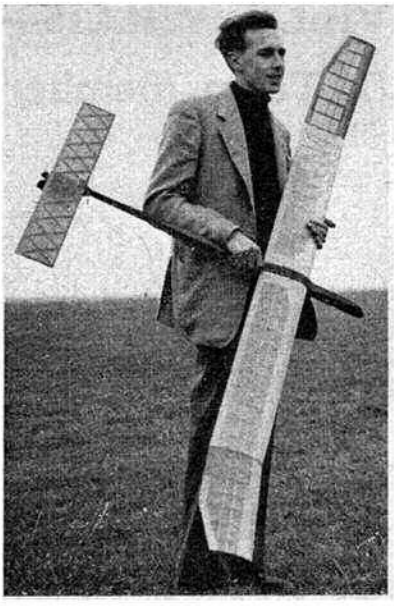


FIG. 1. 1956 A/2



The writer at the 1956 trials, where he gained a place in that year's team.

duration over the normal section has resulted from this alteration. Droop should not exceed 5 per cent. wing chord.

The foregoing list is not complete, it merely contains those sections most frequently used.

C.G. and Neutral Point

The positioning of the c.g. has been a favourite talking point ever since the A/2 formula was evolved, but it is now mostly placed between 50 per cent. and 65 per cent. of the mean wing chord. A lot has been written about the relationship between the c.g. and the neutral point. The neutral point of a model is the point from where the resulting combined lift of wing and tailplane acts when the model is disturbed from its normal flight path. The distance between the c.g. and n.p. is called the static margin. As the static margin increases, so does the correcting moment about the c.g. (see Fig. 5). It is not possible to calculate accurately the position of the n.p. due to inefficiencies of wing and tailplane structures.

It will be seen that it is dangerous to have the c.g. too far back—if moved to beyond 75 per cent. wing chord the static margin will be too small to maintain adequate stability.

Incidentally, do not make the error of reducing nose length to such an extent that it is not possible to insert enough weight to place the c.g. correctly! Alternatively, a long nose may produce a large inertia moment and is also to be avoided.

Spiral Stability

Theoretically, it is possible to trim an A/2 in a hangar or enclosed still-air space to give a time of 2 min. 45 sec. plus. This is probably an increase of 30 sec. or more over its average outdoor time. However, if the model were taken outdoors in its still-air trim it is a certainty that it would be most unstable.

In the hangar the c.g. can be moved rearwards, reducing the static margin without worrying too much about the resulting decrease of stability reserve. The tailplane incidence will be increased and this is able to contribute more to the combined lift. However, this results in decreased longitudinal dihedral.

Taken into the open air, turbulence will sooner or later cause the model to drop a wing, which unless corrected by dihedral, will result in a side-slip. The C.L.A. being behind the c.g. will cause the model to turn into the direction of the side-slip and a spiral dive commences.

This can be counteracted by:
(a) adequate longitudinal dihedral
(b) correct disposition of side areas
(c) low moments of inertia. Thus—
(a) Longitudinal dihedral should not be below 2 deg. This must be a minimum.

(b) As the model rotates about the c.g., side areas above the datum line in front of the c.g. and below the datum line behind the c.g. will both tend to roll the model out of the turn. Therefore sub-fuselage, and reasonably large nose side areas are good for spiral stability.

(c) Too much weight on any outboard panel will tend to worsen the spiral. Keep wing panels and tailplane assemblies as light as possible.

Construction

The main considerations for construction are:
(a) Concentration of weight at the c.g.
(a) Adequate ruggedness
(c) Simplicity of gadgetry.

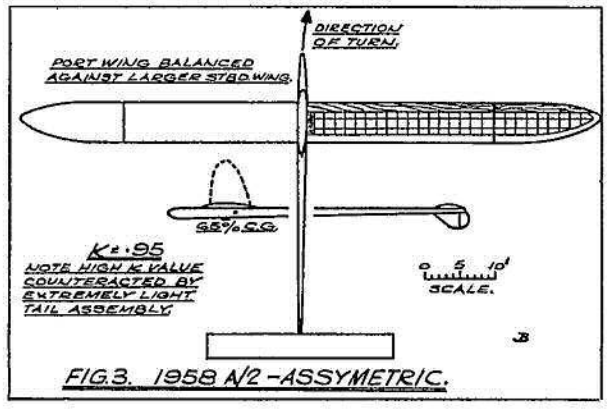


FIG.3. 1958 A/2 - ASSYMETRIC.

Constructional methods have vastly improved since the A/2 was introduced. The first A/2s were very prone to instability problems, mainly due to excess weight caused by the widespread use of spruce in the framework. Spruce can be used to good effect but should be restricted to main spars on inboard wing panels only. Fig. 6 gives a well-tried spar layout combining strength with low weight.

The use of geodetic wing structures for A/2s is not recommended due to the inevitable loss of efficiency of the wing cross-section. However, this is the only method of tailplane construction which will more or less guarantee freedom from warps. For tailplanes 1/32 in. sheet ribs are adequate with one $\frac{1}{8} \times \frac{1}{10}$ in. spar on top of the section.

Fuselage construction is dictated by the type, shape, etc., but for lightness and strength a $\frac{1}{8}$ in. sheet inverted triangle fuselage section has proved most successful. It is not necessary to use formers behind the wing trailing edge and with a taper to the tailplane this

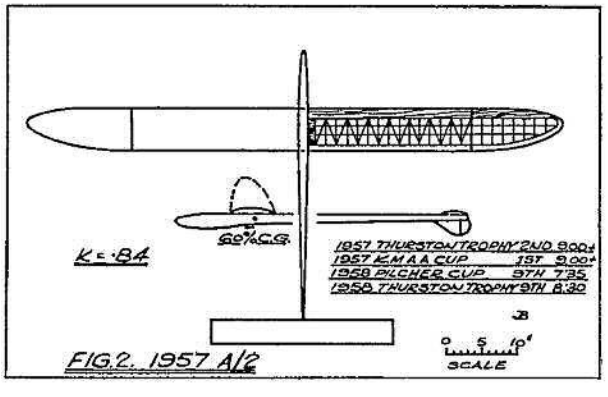
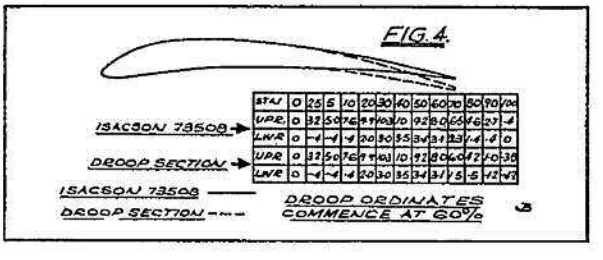


FIG.2. 1957 A/2



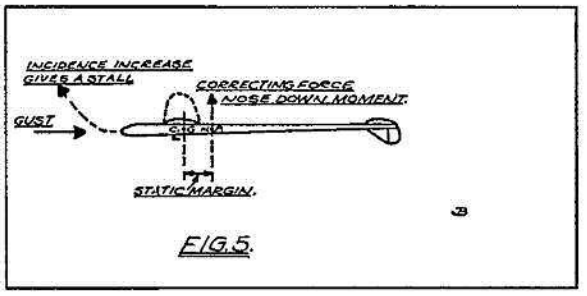


FIG.5.

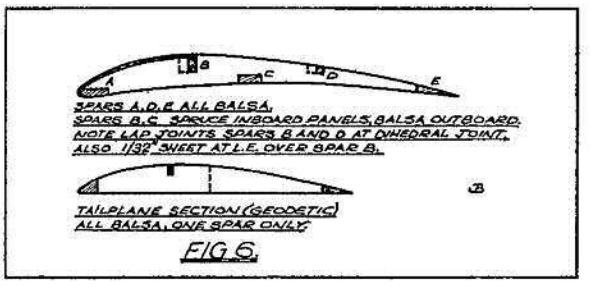


FIG.6.

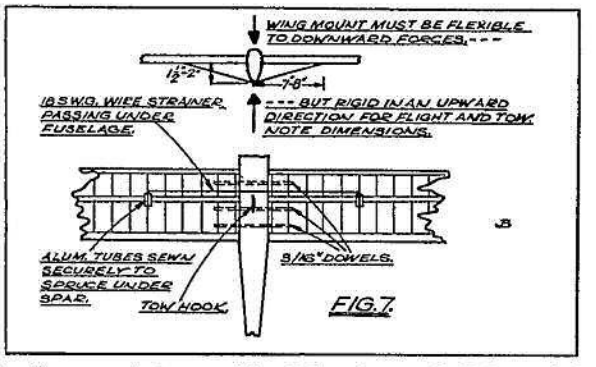


FIG.7.

gives a light whippy rear fuselage. In the event of a heavy landing this type of structure flexes, where a more rigid framework might fracture.

In breezy weather A/2s have a nasty habit of turning over on landing, often removing a wing-tip in the process. To avoid this the wing must be rigid in an upward direction, but flexible when subjected to downward forces received on landing and turning over.

Fig. 7 shows a wing fixing method, well tried in practice, which fills these requirements. The wire strainer provides rigidity for flight and tow, but the expendable dowels flex or fracture on turning over thus preventing damage to the wing tips. The main essential is that the aluminium tubes must be securely bound to the main spar; if not a sad ending will result to the first high speed tow!

A neat auto-rudder assembly is shown in Fig. 8. This ensures a straight tow even if the line slackens temporarily and the rudder does not turn until the ring comes off the tow hook.

Tow Lines and Towing

The tow-line should receive more attention than it usually does. If nylon is used the breaking strain should not be less than 20 lb. Nylon stretches to a remarkable degree and a new line should be "weathered" before being used in a competition, firstly because a new 164 ft. line will probably be 170 ft. plus when checked after having been used a few times and this may penalise you in a competition; secondly, because it is essential to have absolute feel of the model under tow to ensure a good launch.

Weaving on the line—often attributed to bad tow-line stability—may be caused by the nylon line flexing so the points to remember when using a nylon line are:—

(a) at least 20 lb. breaking strain;
(b) "weather" well before using in a contest;
(c) after "weathering" ensure it is still only 164 ft. in length.

Thread lines are preferable to nylon as they flex to a lesser degree, although the drawback is that they are generally heavier and deteriorate far more quickly, but 15 lb. breaking strain is sufficient for thread tow-lines.

Practice towing as much as possible in all weathers. In this respect we are far behind our Continental opponents and more confidence whilst towing might well lead to success at the next World Championships. The real aim in good towing is to place the model in lifting air at the moment of release.

Essentials for good towing are:

1. Always check that you have a clear run—you can then keep your eyes on the model all the time.

2. Do not commence the tow in turbulent air behind buildings or trees.

3. Even if the winch is held in your left hand always take the strain on the line with your right hand to ensure a sensitive feel and control of the model.

4. In rough weather keep sufficient line free with which to ensure an emergency release should this be necessary.

5. Let the model fly up the line. A fast tow aggravates warps, etc.

6. The auto-rudder should not work until the tow ring comes away from the hook.

7. The most important thing is practice and still more practice.

In reasonable conditions it should be possible to hold the model at the top of the line indefinitely. Practice this and thermal searching as much as possible in all weathers. We have no three-minute A/2s in this country as yet, therefore, the model must be thermal assisted to obtain a maximum. This is the most important field for development and improvement of all the foregoing features relating to A/2s.

I hope these notes are of some help to the reader—they have been a good revision course for myself!

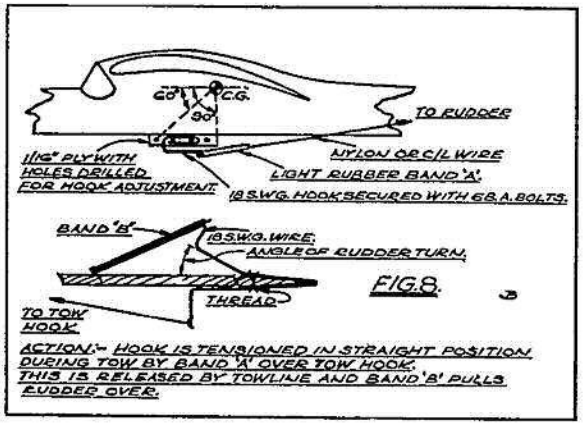
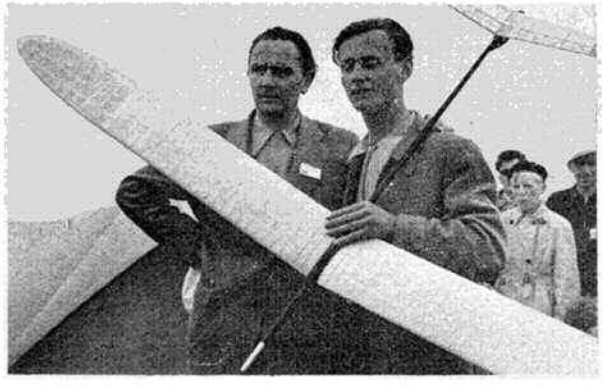


FIG.8.

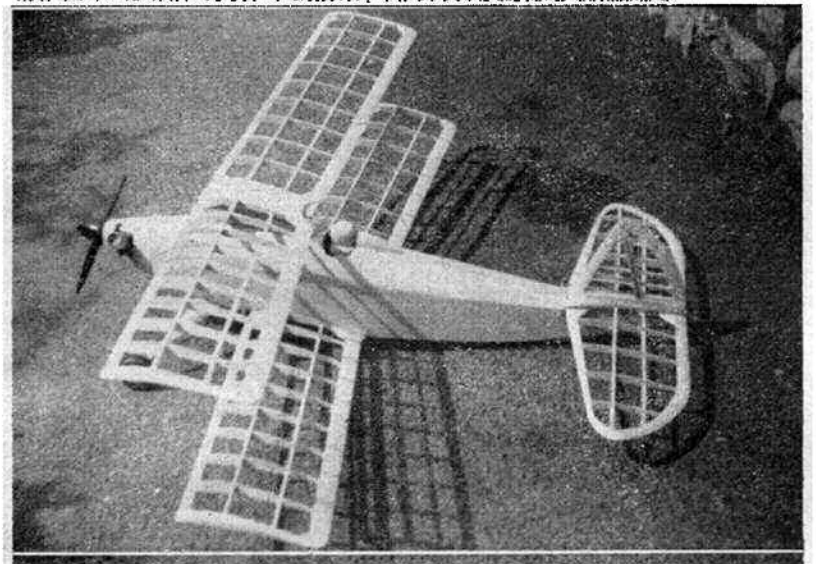
A/2 Champ. Lindner—with one of his highly developed designs.

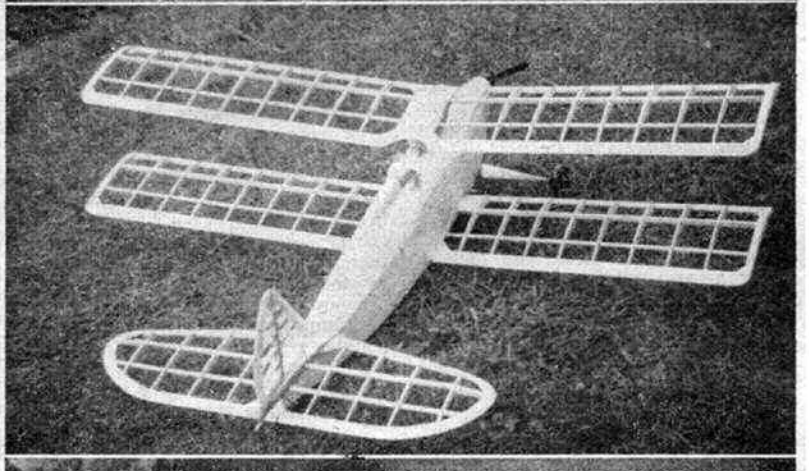


Gadfly

A sports biplane for up to 1.5 c.c. motors and featuring a timer operated rudder

by ——— W. LISTER





THIS model was designed as an easy to build, rugged sportster, to satisfy a desire to have a model that was semi-scale but eye catchingly different. The original has now completed many flights, and never fails to excite attention, both for its looks and also the "out of the rut" performance that the timer-operated rudder gives it.

Trace the formers from the plan onto the appropriate balsa or ply, cut out, then chamfer the edges carefully to allow for the curvature of the sheet sides.

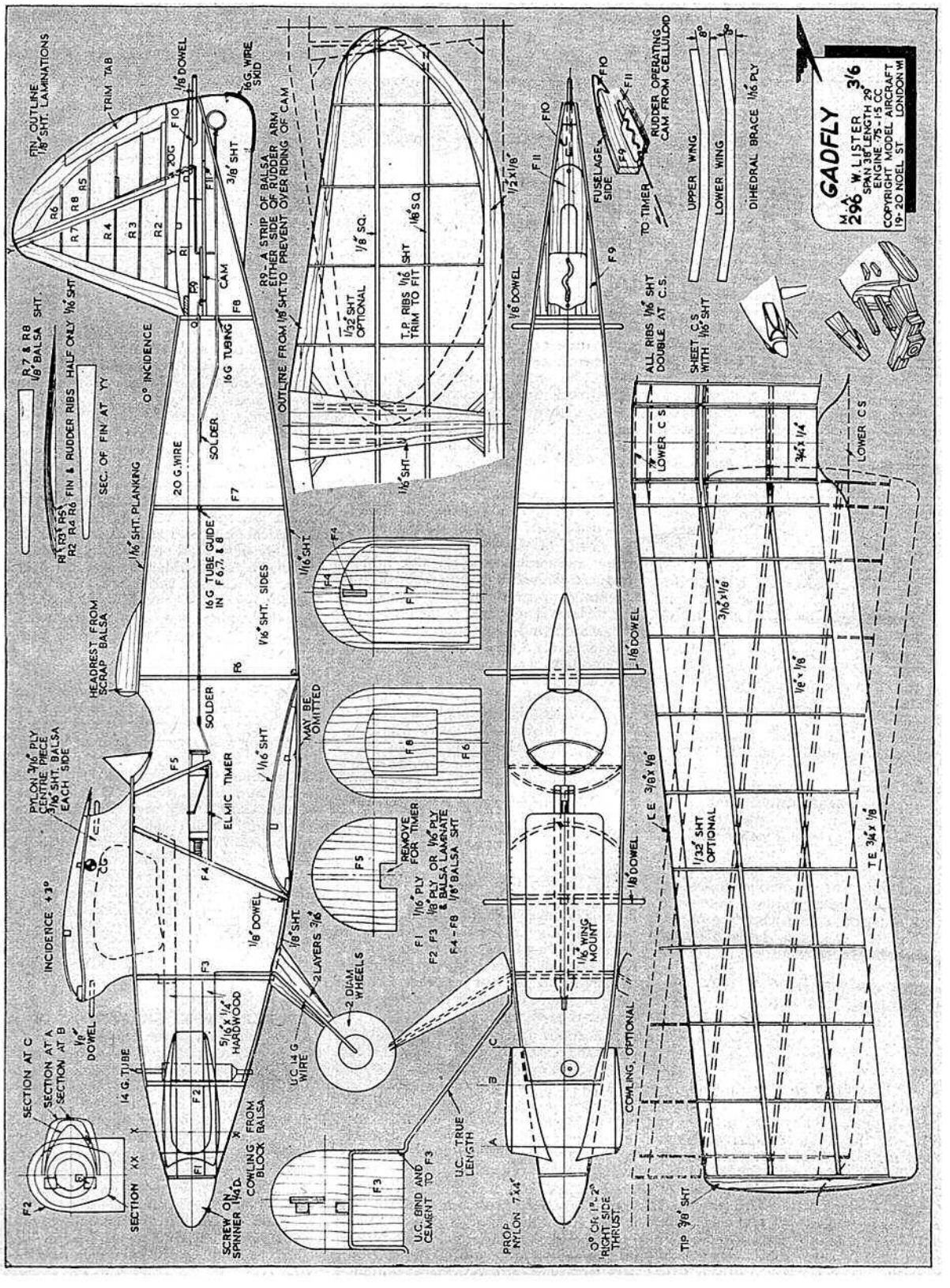
Select some pliable quarter grain $\frac{1}{16}$ in. sheet for the sides, cut to shape, and sand lightly before commencing construction. It is essential that the formers are situated exactly as shown, so mark their positions on the inside face of the sides.

All formers aft of the timer are bushed with metal tubing to accommodate the cam operating wire, so insert these, then bend to shape and bind and cement to its former the undercarriage.

Glue the engine bearers and the wing pylon to the appropriate formers, lining up accurately with a set square, and when dry this will form an accurate jig for the rest of the fuselage construction. The sides are now cemented to the bearers, the cam operating wire bent to shape, formers 6, 7 and 8 threaded over same and then cemented in place.

Now add the timer box and fuel tank and do all the necessary soldering on the cam push rod. This completes the tricky part of the construction, everything else being quite straightforward, the top of the fuselage being planked in the usual way with strips of $\frac{1}{16}$ in. sheet before the bottom sheeting is added.

The wings and tail are entirely orthodox and will present no problems, so all you have to do is press on in the usual way, and finish the model off with a gay colour scheme, perhaps on the lines of the pre-war American military biplanes. One word of warning, though, don't be too lavish with the colour dope—it's heavy—and too much weight will hamper *Gadfly's* lively performance.



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 19-20, NOEL STREET, LONDON, W.1. 3s. 6d., POST FREE

Aviation Bookshelf

CHRISTMAS EDITION

FOR some considerable time now, Putnams have been adding regularly to their already not inconsiderable aviation section, and one of the latest titles is by an author who will need no introduction to MODEL AIRCRAFT readers—John W. R. Taylor. The book is **C.F.S., Birthplace of Air Power,** and it tells how the R.A.F.'s Central Flying School trained the world's first military pilots and gradually became recognised all over the world as the Mecca of flying instruction. It would be too easy to class this book as a "history" and leave it at that, but history is much too dull a word to describe the exploits and skills of the men who pass through its pages. (PUTNAM, 21s.)

ANOTHER aviation book from the same publisher, although a little more expensive, is **British Naval Aircraft, 1912-58,** by Owen Thetford. This forms a companion volume to "Aircraft of the Royal Air Force, 1918-58," and follows the same style of presentation—description, photographs, and considerably detailed three-view drawings with scale (most valuable from the modeller's point of view); these alone make the book a worthwhile investment.

The aircraft are arranged alphabetically under manufacturers and then chronologically in the order of their appearance, all of which makes for very quick reference. A preliminary chapter on the Development of British Naval Aviation since 1912, suitably illustrated, forms the ideal introduction to the wide variety of types in the succeeding pages. Mr. Thetford has also shown us that reference books certainly need not be dull—we spent a pleasant hour or so refreshing our memories on such long-forgotten types as the Blackburn *Skua* and the Miles *Monitor* to mention but two. (PUTNAM, 50s.)

QUITE recently an R.A.F. acquaintance was lecturing a group of A.T.C. cadets. The talk turned to airmen of the 1914-18 war, and the lecturer mentioned the names of Colonel Bishop, Major Mannock, Captain Ball, and others immortal in the annals of the Royal Flying Corps. This provoked little response among his audience, and in fact several blank faces. But when he asked if anyone knew who Baron von Richthofen was, nearly all the class raised their hands to answer. Thus is the extraordinary fascination for the man who was Germany's greatest ace.

So much has been written and said about him. Our pre-war magazines featured many articles, narratives and eye witness accounts concerning his life and death, and two well-known books about him were published in England. "The Red Knight of Germany," by Floyd Gibbons, gave a colourful, but somewhat inaccurate, account of his career; "Richthofen" by "Vigilant," was even less accurate owing to an obvious hero worship by the author, also who presented as facts his own interpretations of unsolved mysteries of the first air war.

Now at last, in 1958, 40 years after the death of the Red Baron, comes a really authentic book on the subject, **Von Richthofen and the Flying Circus,** published by Harborough at 45s. Here is amassed a whole wealth of research and fact finding, which at long last gives a really reliable narrative.

The compilers of this book need no introduction to the enthusiast. Bruce Robertson was, of course, responsible for a previous Harborough publication, "Aircraft Camouflage and Markings, 1907-1954." Heinz J. Nowarra, a recognised authority on German aviation, is well known to all photo collectors for his excellent material. Major Kimbrough S. Brown (U.S.A.F.) has made a study of the Richthofen Circus for many years. He has actually conferred with the present-day Richthofen family, hence this book has benefited from private photographs and personal memories never before published. Major Brown is also an authority on vintage aircraft, having flown most of the 1914-18 types owned by Paul Mantz. This has enabled him to put a great deal of genuine atmosphere into the descriptions of war-time flying.

Just about all the evidence possible is presented concerning the Baron's last flight. Many long-standing mysteries have been given a solution, and where no answer is possible the authors have left an open case for the reader to draw his own conclusions. No attempt has been made to tie up loose ends by hazarding any guesses.

All in all, this is really an excellent book in the first-class Harborough tradition. Obviously it has been an immense undertaking to present thoroughly so big a theme, and the editor and compilers are to be congratulated on a very authentic and intensely absorbing book.

The only real failure lies in the inaccuracy of the six-view aircraft drawings. Whilst they are neatly drawn, they contain many mistakes; e.g. close study of one drawing alone reveals up to 30 errors. One big mistake has been to show most of the propellers as rotating in the wrong direction.

This is a pity because the book is advertised as being invaluable to scale modellers; whereas in fact it is highly misleading. The information on the colouring of individual aircraft is very good indeed. (HARBOROUGH, 45s.)

IT has often been said that gliding is but one step removed from aeromodelling and after reading **Gliding—a Handbook of Soaring Flight,** one is certainly tempted to take that step. Of course, a number of modellers are already gliding enthusiasts and indeed the author of this book is none other than Derek Piggott—a Wakefield flier in the immediate post-war years and a team member of this country's Wakefield team in 1948. This is essentially a practical book and as such is one of the best we have read on the subject, giving comprehensive guidance on every aspect of gliding from the stage where the novice steps into the cockpit to qualifying for the highest international awards. (A. & C. BLACK, 25s.)

WE have read of the early beginnings of aviation many times but never so fascinatingly presented as in **Flying Witness** by Graham Wallace—which is a series of "on the spot" impressions of practically every notable aviation event as seen by Harry Harper ("the world's first aeronautical correspondent") from 1906 to the beginning of World War I. Wilbur Wright, Hubert Latham, Bleriot, Santos Dumont—Harry Harper knew them all and many more. This book is based on his personal recollections and Graham Wallace has successfully collated them in a style that makes history really come alive. (PUTNAM, 25s.)

OPERATION GRASSHOPPER is the story of the Grasshoppers and of the growth of the Aviation Section of the 8th U.S. Army in Korea. Dario Politella, as a journalist and a pilot, has set down a fine, first-hand account of this branch of aviation and the book is especially recommended to modellers for the well-selected photographs showing the finishes and markings of the various types of aircraft—many of which are ideal model flying subjects—and for the outstanding set of beautifully-drawn and highly-detailed plans of the Cessna *Bird Dog*. (Obtainable from specialist aviation bookshops at 35s.)

J. W. R. Taylor's

The Americans certainly know how to show off an aeroplane—even a trainer. Top surfaces are white with the lower surfaces in grey on this North American T2J-1.

AVIATION NEWSPAGE

CUT-PRICE CLASSROOM above is North American's new T2J-1 jet trainer, which beat all comers in a U.S. Navy design competition in 1956 by its promise of exceptional performance and economy.

To keep down development costs and speed production, it has been built around the basic wing structure of the original straightwing FJ-1 *Fury* fighter and utilises the control system of the T-28C *Trojan* piston-engined trainer, with added hydraulic power boosters. The engine is a well-proven Westinghouse J34-WE-36 of 3,400 lb. thrust, which was put back into production nearly 10 years after the first J34s entered service.

Designed for one-plane training from the pupil's first day in the air through to carrier indoctrination, the T2J-1 was ordered into big-scale production off the drawing board. No prototype was built, and No. 1 production machine flew for the first time on January 31st this year. It has an arrester hook and provision for carrying packaged installations of guns, target-towing gear, 100 lb. practice bombs, air-to-ground rockets or pods of 2.75 in. Mighty Mouse unguided air-to-air rockets.

The T2J-1 spans 36 ft., is 38 ft. 4 in. long and weighs 9,507 lb. at take-off, with two 100-gallon wing-tip tanks. Top speed is 495 m.p.h.

* * *

Trainer of **SLIGHTLY EARLIER VINTAGE** from North American is the T-28A (below), illustrated for the first time in civil colours. Registered N7495C and painted sky blue with white trim, it is one of many of these handy little tandem two-seaters which have been sold by the U.S.A.F. at an average price of £530 and converted for private flying. At the time this particular T-28A was photographed at Santa Ana Airport, California, the C.A.A. had not licensed the type for civil use, even with a restricted licence, but certification was hoped for at any moment.

With an 800 h.p. Wright R-1300, the T-28A is much less powerful than the U.S. Navy's B and C models, with 1,425 h.p. Wright R-1820; but its max. speed of 285 m.p.h. makes it quite a toy for part-time pilots.

* * *

STILL FLYING as part of the NACA high-speed research flight at Edwards Air Force Base, California, is the second of the two original Bell X-1s. Sister-ship of the aircraft in which "Chuck" Yeager made the first supersonic flight on October 14th, 1947, it has been extensively modified, as can be seen in the picture (below). Gone is the old flush windscreen that enabled the pilot to look upward, but little else, and the wings are also new, with a 4 per cent. thickness/chord ratio. Power plant is a Reaction Motors XLR-11 of about 8,000 lb. thrust.

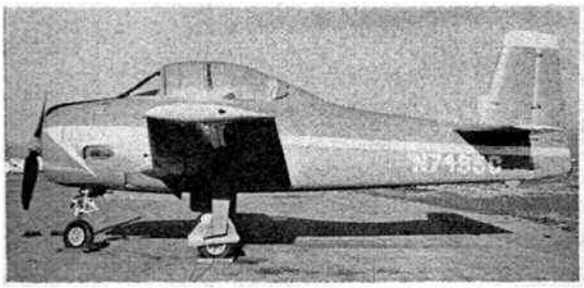
The second Bell X-1 rocket ship, with modifications, is still doing its stuff in the upper reaches of the earth's atmosphere.

Now painted white, with the name "Little Joe" on its nose, and designated X-1E, this diminutive rocket-plane has acquired a pair of fixed ventral fins to increase stability. It is being used to flight test the ballistic control rocket jets that will ensure adequate control of the North American X-15 research aircraft during hypersonic flight at extreme altitudes.

* * *

PHOTOGRAPHED FOR THE FIRST TIME in natural metal finish, with Indian Air Force markings, the Folland *Gnat* XN122 (below) is the machine used for R.A.F. tactical fighter trials at Aden this summer. It was flown out in a *Beverley*, for evaluation in competition with a *Jet Provost* and *Hunter*, with a probable large contract awaiting the winner.

Based at R.A.F. Khormaksar, the *Gnat* flew 32½ hours during the trials.



Builders of Monogram's plastic kit of the T-28 now have the option of a civilian colour scheme as exemplified by this T-28A seen at Santa Ana in California.

THE SUPERMARINE SPITFIRE XII

AVIATION NEWSPAGE
Plane of the month

UP to mid-1941 no fighter in the sky could match the overall fighting efficiency of the *Spitfire*. Then, in July and August of that year, formations of *Spitfire* Vs sweeping over the Channel coast of France began to encounter the first Focke-Wulf FW190As of Adolf Galland's Jagdgeschwader 26; and it was soon clear that the British fighter was outclassed. Its ability to pull a very tight turn prevented a massacre, but it needed more power to offset the enemy's higher performance.

Some respite was given by the *Spitfire* IX, with a two-stage Merlin engine giving considerably more power than the single-stage Merlin fitted in the *Mark V*; but the real answer lay in an entirely new family of Griffon-engined "Spits," which had their prototype in the solitary Mark IV (Supermarine Type 337).

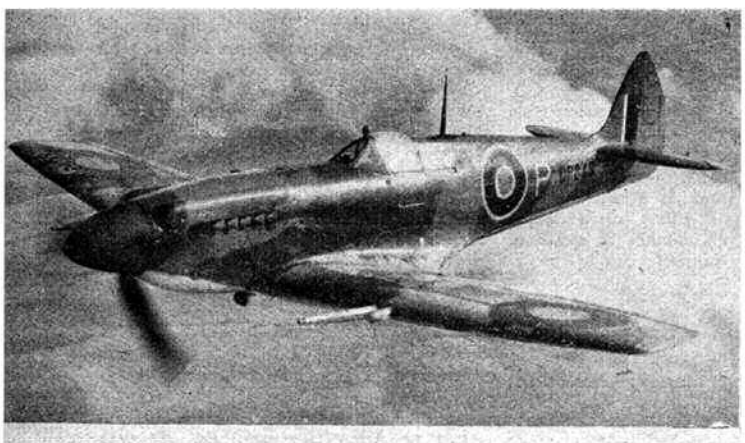
This aircraft (DP 845) had started life as a Mark III with a 1,390 h.p. Merlin XX, but was re-engined when the first 1,730 h.p. single-stage Griffon IIB became available in 1941. This engine owed much to the Rolls-Royce R used in the Supermarine S.6 and S.6B Schneider Trophy seaplanes, with similar dimensions and capacity of 36.7 litres, as compared with the 27 litres of the Merlin. Despite this much greater capacity, an essential feature of its design was that it could be installed in existing Merlin-engined fighters to ensure a steady improvement in performance until fighters of a later generation, like the *Typhoon*, with 24-cylinder engines, were ready for service.

MB 882 before being delivered to 41 Squadron —see formation photo on opposite page. *Charles E. Brown photo.*

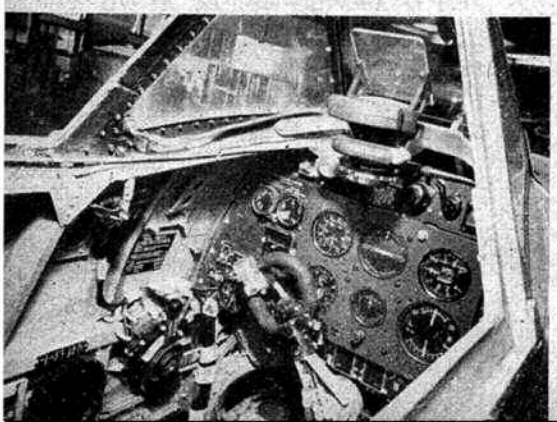
Many airframe improvements were planned for the *Spitfire* IV, to take full advantage of the extra power, and it flew for a time with a special wing carrying a mock-up installation of no fewer than six 20 mm. cannon, and experimental flaps.

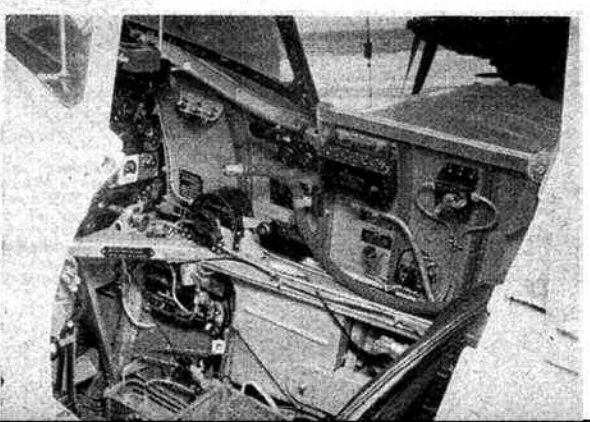
To avoid confusion with the Merlin-powered P.R.IV, first production photo-reconnaissance version of the *Spitfire*, DP 845 was re-designated Mk.XX. An order for 750 was placed in August, 1941, but none of these flew as Mk.XXs, and DP 845 remained the only "Spit" of this mark.

Remained i perhaps the wrong word, because when the Germans began to



Compare this photo of DP 845 with the photo of the same machine on the opposite page. Here the aircraft is in its final Mk. XII prototype form, complete with clipped wings and pointed fin and rudder. Also note the yellow P for prototype on the fuselage side, the dark spinner and the absence of yellow bands on the leading edges of the wing. *Vickers-Armstrongs photo.*

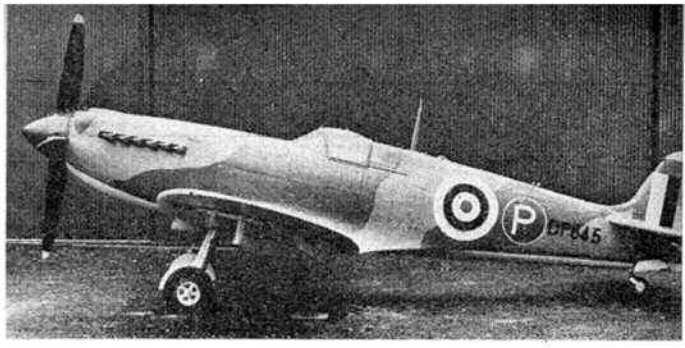




Left: Port and starboard views of the Spitfire XII's cockpit. *Vickers-Armstrongs photos.*

use the Fw 190 as a low-level fighter-bomber for tip-and-run raids on the U.K., the wings of DP 845 were clipped to a span of 32 ft. 7 in., instead of the 36 ft. 10 in. of the usual, famous, elliptical planform, to find out if the combination of Griffon and reduced span would give a high enough performance at low altitude to cope with the 190.

The results were promising, so Vickers and Rolls-Royce were asked to produce 100 production aircraft of this kind as quickly as possible. Within a few weeks, Rolls had ready for service 100 Griffon IIIs and IVs, rated to give a max. output of 1,735 h.p. at 1,000 ft. and these were fitted into specially-strengthened *Spitfire* VC airframes. The result was the Mk. XII (Supermarine Type 366) first production Griffon-engined version of the "Spit," which entered service in the spring of 1943.

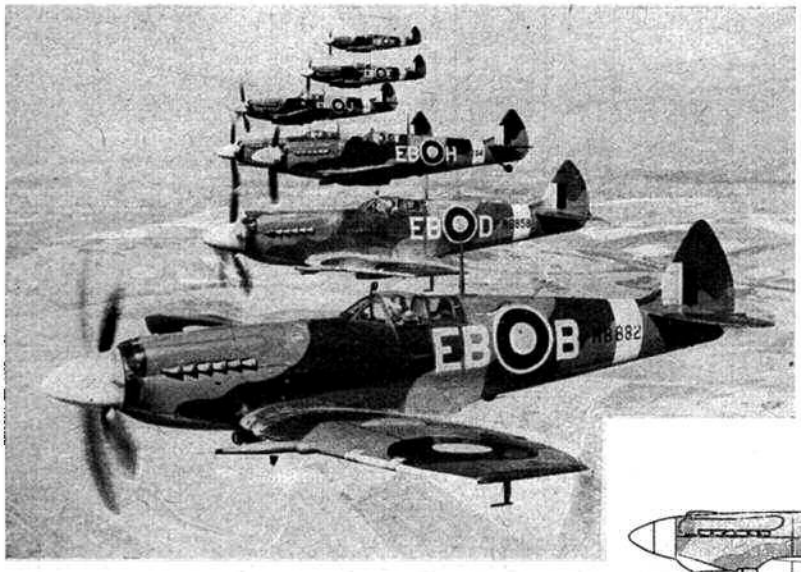


DP 845, Griffon powered, but before the other modifications were carried out to turn it into the Mk. XII prototype. *Vickers-Armstrong photo.*

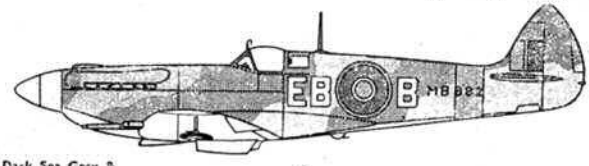
Apart from its engine, the Mk. XII differed little from its predecessors, being of conventional all-metal construction, with two-spar wing and semi-monocoque fuselage. A few machines, like HB 794, of No. 41 Squadron, had fixed tail-wheels, but the majority had a retractable tail-wheel. Armament consisted of two 20 mm. Hispano cannon and four 0.303 in. machine-guns, and a rack for a 500 lb. bomb could be fitted under the fuselage.

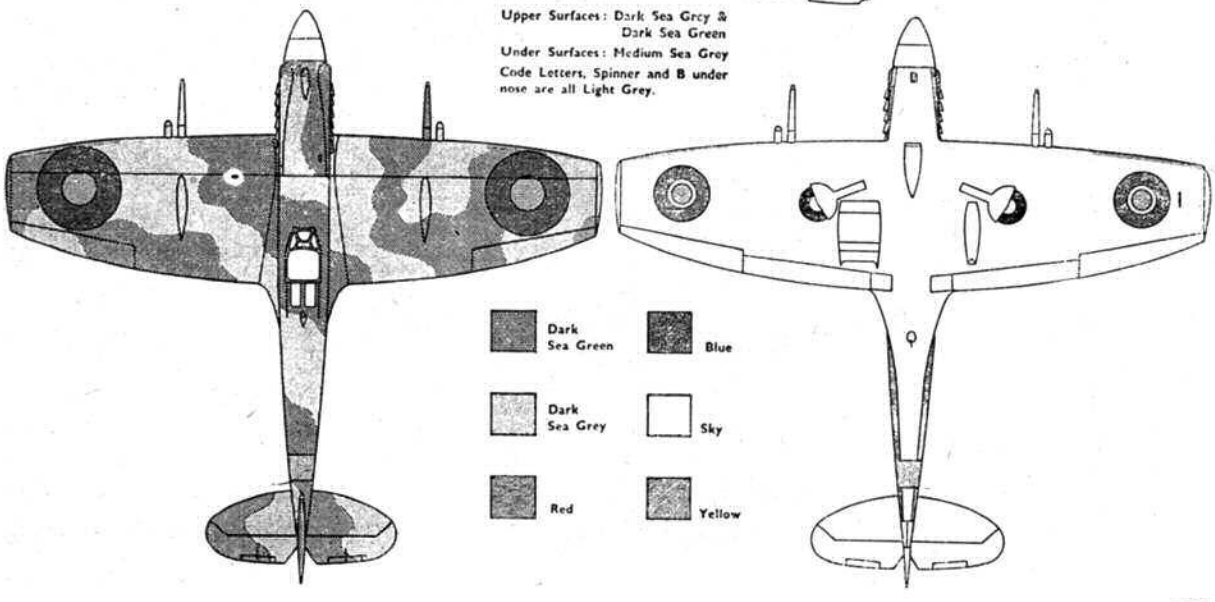
Only squadrons to fly the Mk. XII were Nos. 41 and 91, based at Hawkinge, and it remained in service only until the end of 1944. But by that time, together with the *Typhoon*, it had helped to restore the R.A.F.'s superiority over the *Luftwaffe* and led to development of the later Griffon-powered *Spitfire* Mks. XIV, XVIII, XXI, XXII and XXIV.

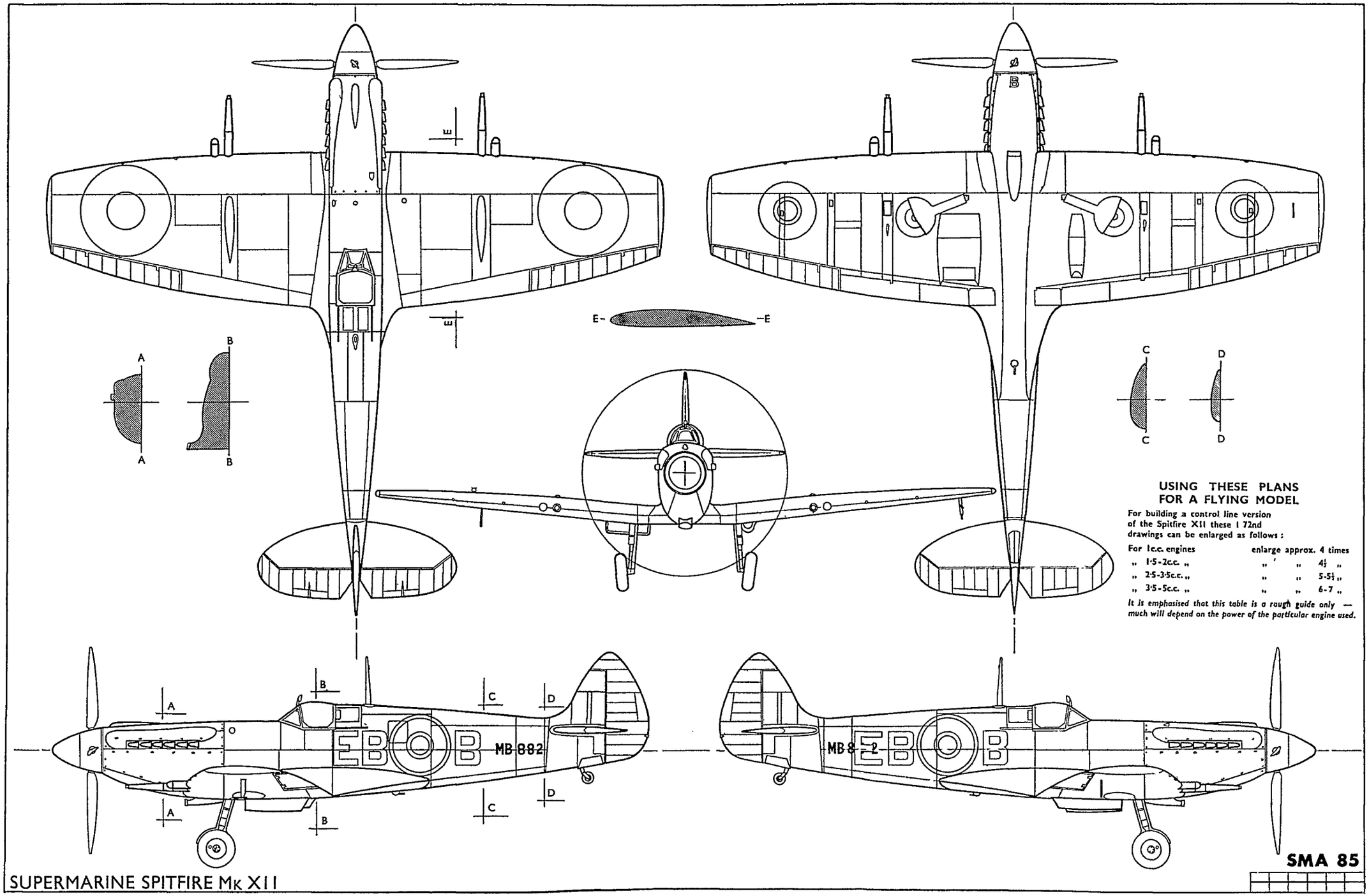
Colour scheme of the 100 Mk. XIIs was the then-standard dark sea grey and dark sea green top surfaces, with medium sea grey undersurface. The airscrew spinner and an 18 in. band around the rear fuselage were light grey, as were the three-letter unit code markings, which started with EB for 41 Squadron and DL for 91 Squadron.



Left: Spitfire XII's of 41 Squadron with MB 882—the particular Spit featured in the plans—nearest the camera. *Imp. War Museum photo.*







USING THESE PLANS FOR A FLYING MODEL

For building a control line version of the Spitfire XII these 1 72nd drawings can be enlarged as follows :

For 1c.c. engines	enlarge approx. 4 times
„ 1·5-2c.c. „	„ „ 4½ „
„ 2·5-3·5c.c. „	„ „ 5-5½ „
„ 3·5-5c.c. „	„ „ 6-7 „

It is emphasised that this table is a rough guide only — much will depend on the power of the particular engine used.

SUPERMARINE SPITFIRE MK XII

SMA 85

COPIES OF THIS 1/72nd SCALE DRAWING ARE OBTAINABLE FROM "MODEL AIRCRAFT" PLANS DEPARTMENT, 19-20, NOEL STREET, LONDON, W.1, PRICE 9d., POST FREE.

Our heading photo shows a fine model of an unusual subject: this Polish scale model PZL P.63 is powered by a 2.5 c.c. Zeiss diesel.

Roving Report

Brings you up to date on the latest world model news

"QUARTER-A"—i.e. 0.02 cu. in. powered—R/C models are appearing in increasing numbers in the United States, following the advent of the Cox Pee-Wee engine and tiny, all-transistorised receivers like C.G. RX-1 and Deltron. Wing areas of around 100 sq. in., with spans of 24 in., for a total, ready-to-fly weight of 8-9 oz. are the rule.

Obviously, with wing-loadings of 12 oz./sq. ft. and more, these tiny models are not calculated to give the slow, leisurely flight best recommended to beginners, but, for the R/C enthusiast with a little experience, who wants a quickly-built model that can be flown in a small space, they can obviously be great fun.

Will some kind British manufacturer please give us a (reliable) 2 oz. receiver/relay/actuator unit that will run on an ounce of batteries?

* * *

If a year-by-year popularity poll of diesel *v.* glow could be plotted in the form of a graph—like the "state-of-the-parties" charts featured by some of the national newspapers—we would see that only once, around 1949, did the glow engine show any sign of challenging the popularity of the diesel in Great Britain. In another year or so, however, there may be a different story to tell.

Aided by recent American and Japanese imports, the popularity of glow engines is definitely on the increase again. While it is mainly the contest-minded and C/L enthusiasts who are responsible for the present upswing of interest in glow engines, the fact that two model firms in this country are currently investigating the possibility of marketing small, glowplug-engined, plastic models on the American pattern could very well result in a tremendous boost for the popularity of the glowplug engine.

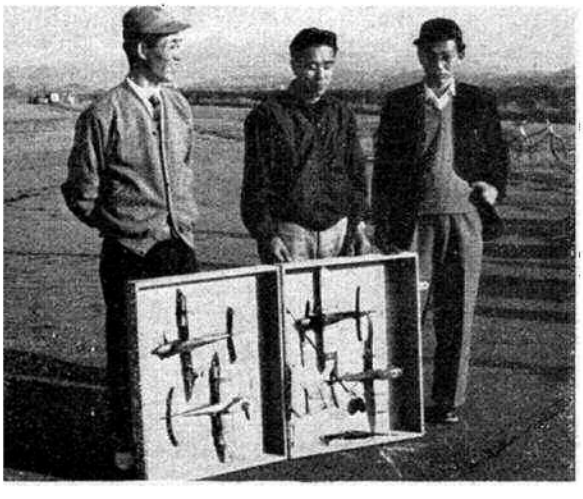
At present, 99.9 per cent. of beginners start with a diesel (they have little or no choice anyway) and thereafter stick to diesels. Once the glow engine has got its foot in the door with the beginners, we believe that it will be well on the way towards achieving equal popularity with the diesel in Great Britain.

* * *

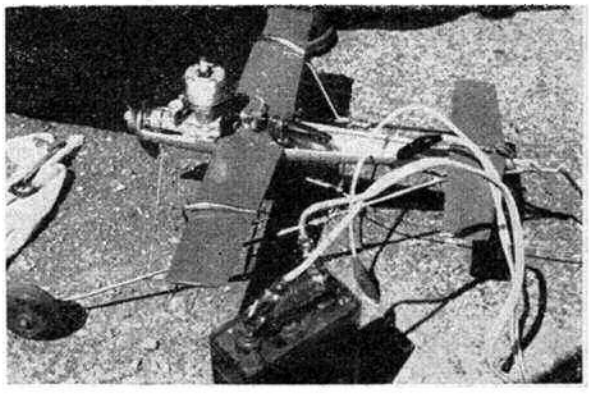
We had heard a lot about the Japanese made KSB clockwork timers, so we decided to get ourselves one or two and see what made them tick. They certainly seem to confirm all the reports about their being the answer to the free-flight contestant's prayer.

Covering a range of 0-25 sec., the latest Mk. II version incorporates a scale accurately calibrated in seconds from 10 to 22, so that any desired engine run is instantly obtainable without readjustment and timing of valves, etc. The timer incorporates a neat, integral fuel shut-off valve, with nipples for connection to tank and engine and there is a stop/start switch to enable the engine run to be pre-set, with the shut-off valve held open while the engine is started and warmed up. A flick of the starting switch, when the model is launched, then sets the mechanism in motion.

The mechanism is mounted on the back of a neat panel and is enclosed



Left—seen at a contest at the Yao Airport, Osaka: three Japanese enthusiasts with their neat box of O.S. Max powered speed models. Below—competing against O.S. and Enya engined models in the 2.5 c.c. speed event at Yao Airport was this metal pan job powered by an Italian Super-Tigre G.20 with pen bladder tank.



with an aluminium cover, while the timer controls and cut-off valve are mounted on the front. The panel is intended for flush mounting so that the mechanism is protectively enclosed in the fuselage, while giving ready access to the controls and fuel lines. The complete unit weighs 0.7 oz. and the panel size is 40 × 30 mm. (1-19/32 in. × $1\frac{3}{16}$ in.).

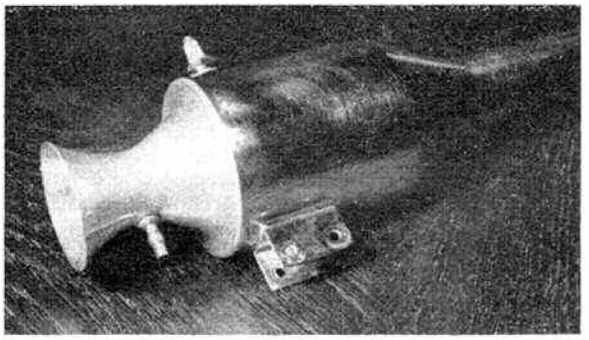
* * *

Cox's wonderful little Pee-Wee engine (see this month's Engine Test report) is not the first American 0.02 cu. in. glowplug engine, nor is it likely to be the last. Older readers will remember that, many years ago, the K. & B. Manufacturing Company (i.e. before its amalgamation with the Allyn concern to become the K. & B. Allyn Company) marketed a 0.02 cu. in. engine called the "Infant."

Now, there is news from the Testor Corporation that their Duro-Matic Products Division, manufacturers of the McCoy engines, are working on a 0.02 and we shall not be in the least surprised if other manufacturers follow suit as well.

* * *

In Australia, the range of available model products has increased tremendously during the past couple of years. In addition to domestic products, British, American, German and Japanese kits, engines and R/C equipment are being imported. Most of the kits come from the U.K. (mainly Mercury, Veron and Contest) and most of the engines from Japan (mainly O.S. and Enya). Prices, in Australian pounds, seem to be fairly evenly balanced between imported and domestic items. A Max 29 or 35 engine, for example, sells at £7 19s., or £9 10s. 9d. with throttle control, the Enya 19 at £5 8s. 9d. and the Enya 60 at £12 12s. 6d. The O.S. pulse-jet is priced at £14 7s. 6d. The most popular R/C outfit, the O.S. Minitron, sells for £22 19s. for transmitter and receiver and a full range of accessories is available, including clockwork timers at 29s. 6d. and 3 in. treaded airwheels with alloy hubs at 23s. 6d. Good quality fuels, including Australian-made Keogh's 30 per cent. nitromethane racing glowplug mixture, are readily obtainable.



The new Swiss-made Fuehrer pulse-jet. It has a ten port valve head and a claimed s.t. of 3 lb.

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We hear that the famous Zeiss works At Jena, East Germany, may enter the R/C market. Already known for their "Pionier" and "Aktivist" model engines, Zeiss are also reported to have secured the services of Willi Otto, the "Wilo" engine maker, to design model diesels for them. First on the list is a 1 c.c. diesel.

* * *

The East German magazine *der Modellbauer* has ceased publication and its place taken by a new journal called *Modellbau und Basteln* (Modelling and Hobby).

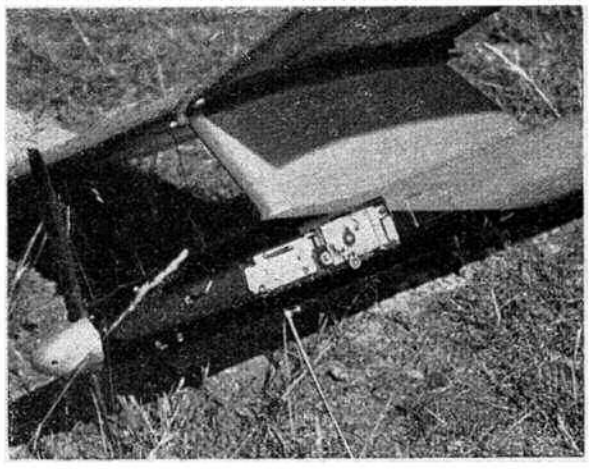
* * *

There is a new pulse-jet being manufactured in Switzerland which in size, comes between the standard American Dyna-Jet and the most successful of "small" pulse - jets, the Japanese Tiger M-1 and M-2. Named the *Fuehrer* ("Leader"), but nothing to do with a late and unlamented character who laid claim to the same title, this Swiss jet has a length of $18\frac{1}{2}$ in. and weighs a little under 9 oz. Maximum dia. is $2\frac{1}{4}$ in. and the claimed static thrust is 3 lb.

Jean Mouttet, of Marseilles, has been using one of these motors and comments favourably on it. He reports that it is as easy to start as the average diesel, and (not easily accomplished with a pulse-jet) he has managed to get the engine performing satisfactorily in a stunt model.

* * *

M. Mouttet also tells us that he has one of the Polish "Sokol" (Falcon) 5 c.c. diesels, of which, we believe, some examples have been exported to Germany and Switzerland. This is a shaft-valve, radially-ported engine of conventional layout. It was designed by Stanislaw Gorski, designer of the popular



A close-up of Liu Min Tao's model, which was powered by a West German Webra Mach-I diesel.

"Jaskolka" (Swallow) 2.5 c.c. engine, and is apparently made in a department of the PZL aircraft works. The "Sokol" has a bore and stroke of 19 × 17.5 mm., giving an actual capacity of 4.956 c.c. and weighs a little under 7 oz. Output is said to be 0.35 b.h.p. at around 12,500 r.p.m. This is the standard version and there is also a "special" equipped with ball-bearing shaft and rear induction.

* * *

Bill Winter, editor of *Model Airplane News*, replying to suggestions that pre-contest team training and organisation on East European lines is necessary if the U.S. is to regain the ascendancy in World Championship events, says: "It seems to me that Bond Baker struck a mighty blow for the individual approach. . . . As you know, Alan King took the Wakefield here in '54 and his gassie was terrific. . . . I thought then that he might have won both power and rubber. . . . Suppose Baker had done it!" Yes, indeed, Baker came pretty close to doing so (1st and 3rd), as did his fellow Australian in 1954 (1st and 5th).

Liu Min Tao, a member of the Chinese team which did so well at the 1958 MMS International Championships in Budapest. He took 2nd place in the power event with a time of 14:47, which included four maximums.

"I Tried Tailless"

Looking round for a design to fly in a club contest for up to 120 sq. in. rubber models, **JOHN POOL** hit on the idea of using a tailless design. The details of its development will be of interest to modellers who would like a model to fly in restricted areas, while the reduced scale plans are adequate to enable any competent builder to duplicate the design, or to use it as a basis for development of his own ideas.

THIS model was designed—on the lines laid out in Josh Marshall's excellent article in the March issue of MODEL AIRCRAFT—to fly in the 120 sq. in. model contest held by the Halifax M.A.C. The aim of this contest is to produce models capable of being flown in a small park near the town centre. Rules state that wing and tail area together must be less than 120 sq. in. and to encourage beginners, all must use the Keilkraft 7¼ in. plastic prop.

Typical entries had 20 × 4 in. wings, 10 × 2½ in. tailplanes, and 22 in. all sheet fuselages. With four strands of $\frac{3}{16}$ in. rubber, between 24-30 in. long, their performance was over 60 sec. (when trimmed).

My tailless model was unfortunately untrimmed for the first contest—and had flown away by the second, a month later. It has recorded a best time of 1 min. 20 sec. with many flights between 1 min. 10 sec. and 1 min. 15 sec.—and two untimed fly aways.

The performance has been so good—after ironing out the bugs—that I have seriously considered giving up orthodox light-weights and concentrating on an "Open Wakefield" area model this winter, for the layout seems at least the equal of the conventional models. Incidentally, the first contest winner's best flight was 1 : 33—achieved with four strands of $\frac{3}{16}$ × 33 in.—an amount of rubber which I have not yet managed to fit into *Never Forget's* 15 in. fuselage.

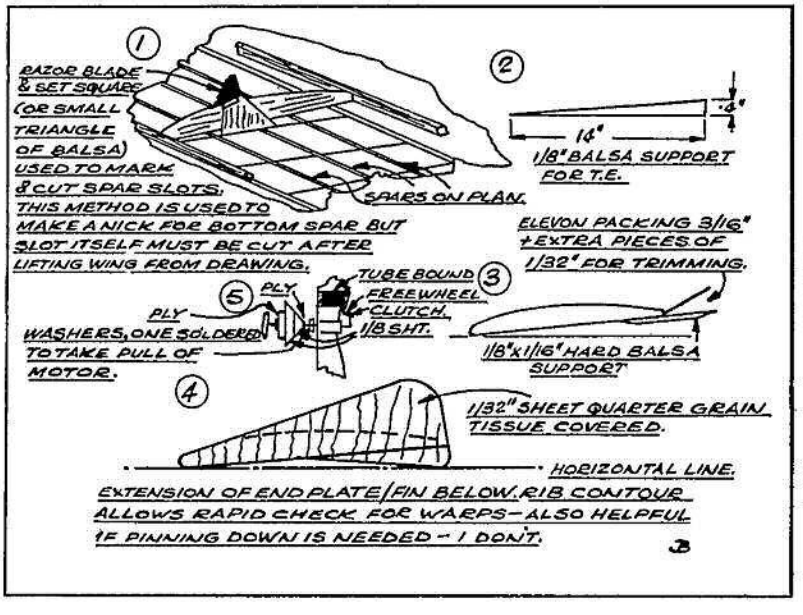
On the design side, sweepback is 30 deg., the wing section is an o/d—flat bottom, quite thin, with the maximum thickness well back, washout is 5 deg. and the elevons are set on the flying field. The wing loading is quite low, for even if the wing is considered to be only 60 per cent. efficient, it is still only 3 oz./sq. ft. I suspect, after studying plans of all the tailless rubber models I could lay my hands on, that much of the reputed inefficiency of the tailless model is due to over-cautious construction, leading to excess weight—leading also to the need for more rubber—and more weight.

How much of *Never Forget's* performance is due to arranging the propeller as a pusher I do not know—but it certainly climbs very well, even though I use a considerable amount of downthrust.

Trimming this model is simple if you know how—but if you don't know, don't go out night after night trying, and have the C/L bods sneering. Go early morning—it smells better anyway!

Hand-glide with the c.g. just in front of the apex formed by the trailing edge. The model will dive into the ground. Pack up the elevons 1/32 in. at a time until a reasonably flat glide is obtained. You can trim the model to glide well with the c.g. further forward, but more elevon angle will be needed to keep the nose up.

Having settled for the glide, add about $\frac{1}{16}$ in. downthrust and 1/32 in. sidethrust and try a low power flight (200 turns). With this power the model will not climb very fast—and should turn right—if not, add sidethrust until it does.



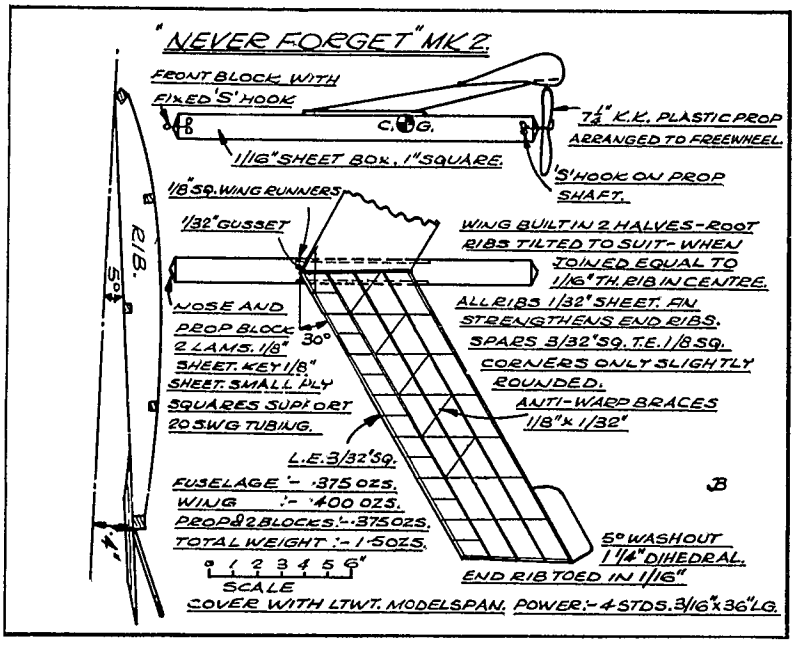
Round-about half turns (500) you will find that the model will start to loop (using the recommended power and prop). This is because the propeller is rather small—and gives quite a surge on full power. The effect of the elevons under this surge is to roll the model over into a loop. With a forward c.g. and a large elevon angle this effect will be magnified.

The cure is a combination of excessive sidethrust, which will spin the model in, but stop the loop, and an increase in angle on the port elevon. This will hold the wing on the outside of the turn down and correct the spin.

The effect of this adjustment on the glide is rather gratifying. The left elevon drags more, and brings the model round in a nice left-hand circle.

The best trim results in a partial loop with the model rolling out at the top and this is attained by reducing sidethrust until the model loops again, then adding a bus ticket sidethrust. I found even a postcard was too thick on the 1 in. square fuselage when this stage of trimming was reached. Incidentally, the model will start turning left before the power runs out.

I found out by bitter experience that "S" hooks or bobbins are necessary with the 26 in. motor. If an ordinary propeller is used then the motor must be wound backwards. If it is, then the "S" hooks must be bent backwards. It also helps to wind on the pre-tension turns backwards. I wind from the front—but there is no reason why the model shouldn't be wound from the rear.



Washout is built into the wing—the trailing edge being supported on a wedge of ⅛ in. balsa during building.

I hope the diagram will help to show how a set square, with the 90 deg. corner set on the spar on the plan, is used to mark and cut spar slots. This ensures that the spars are not twisted in the wing, and so helps to hold the washout. The slight extension of the end plates beneath the rib contour, in this case 0.4 in., is because the washout also totals 0.4 in. under the trailing edge at the tip, and thus is a ready check that the washout is accurate.

The elevons are attached by tissue well doped on the underside; they tend to pull flat because of this, and so press against the packing without recourse to rubber bands.

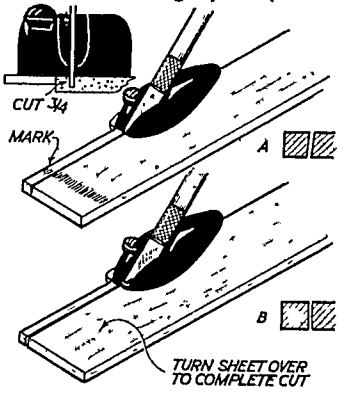
I am aware that these notes specifically refer to one very small model, but I have built three of them and they all behaved the same. However, the knowledge gained will also apply, in some degree, to all tailless rubber models.

CUT YOUR OWN STRIP

MATCHED strip is essential to build true slabsided fuselages, which is why longeron lengths should be chosen carefully for similarity in weight, strength and grain. Most experienced modellers prefer to cut their own strip lengths from sheet to get as close as possible to matched lengths and also select the right grade of sheet initially for the job.

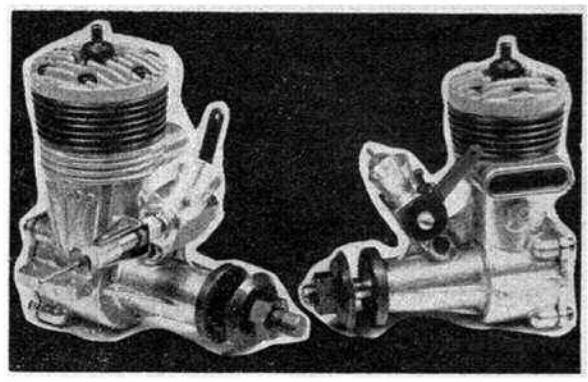
Cutting off lengths of any section with a stripper requires a little practice before you can be sure of cutting a true section each time. It is important that the sheet should be rested on a flat, rather soft and *grain free* surface. If the knife point picks up grain on a surface under the sheet it will tend to follow this and produce an uneven cut.

Even a man used to handling a balsa stripper will often find it difficult to cut dead true square section in hard sheet. Nearly always there is a tendency for the knife blade to run off slightly and produce a diagonal edge, as in "A." The trick in getting dead square edges is only to cut about three quarters the way through the sheet on the first cut, then turn the sheet over and reverse it end for end and complete the cut from the other side. You should then end up with a true section as in "B."



To be sure that your strip lengths remain properly graded, make a crayon mark across the end of the sheet before starting stripping. Then you can match the strips up properly when cut. Balsa is one of those natural materials which vary enormously over quite small lengths or sections and so the density at one end of an apparently consistent sheet may be quite different to that at the other. If you mark one end to start with, and that mark is retained on the strips, you will, at least, be the nearest you can get to a number of matched lengths of strip.

Peter Chinn's Latest Engine News



Developed by John Brodbeck of the K. & B. Allyn Company at the request of various noted Californian R/C enthusiasts. The 5.8 c.c. Torpedo 35RC and 3.27 c.c. Torpedo 19RC engines with their special Multi-Speed barrel type throttle units.

FOR years, modellers wanted to know why engine manufacturers did not provide a throttle control on their engines. Then the idea seemed to grow up that it was impracticable to throttle a modern, high-speed miniature two-stroke of the diesel or glowplug type. In truth, there were probably several makers who would have been prepared to fit throttles to their engines, had there been any real demand for such a refinement. Actually, until the advent of multi-channel R/C, the ability to control the engine speed in actual flight had been desirable in only a very limited number of applications—such as the U.S. Navy Carrier event for C/L scale models. From time to time, separate throttle units for fitting to existing engines were, in fact, offered—among them the British Mills throttle unit for the Mills 1.3—but hardly anyone used them.

The change came, as we have said, with multi-channel R/C. Since that time, throttling equipment (mainly applied to glowplug engines in the 0.19 to 0.35 cu. in. capacity groups) has developed along two paths: intake restriction (either by means of a rotating barrel or butterfly valve in the carburettor), or exhaust restriction (by means of a rotating, sliding or swivelling bar or gate in the exhaust stack).

One of the best, if not the best, examples of the former approach is that now seen in the K. & B. Allyn "Multi-Speed" carburettor, which is available as an accessory (at $5.95 or 42s. 6d.) and is standard equipment on the K. & B. Torpedo 19RC and35RC engines.

As fitted with this unit, the 35RC differs slightly from the standard Torpedo 35 model. The modifications are confined to the crankshaft and crankcase. The shaft now has its web flanks cut away on the crankpin side, thus augmenting the degree of counterbalance already obtained with the standard machined-in crescent counterweight. Presumably this has been found beneficial over the r.p.m. range used for R/C work.

The Torpedo was one of the first engines to have a rectangular shaft-valve port, but, in the RC type, a reversion to the circular port is made. This is drilled at an angle corresponding to the slope of the carburettor intake and, therefore, appears as an oval shape in the shaft, but is of smaller area and reduces the induction period from 180 deg. to approximately 160 deg. (55 deg. ABDC to 35 deg. ATDC).

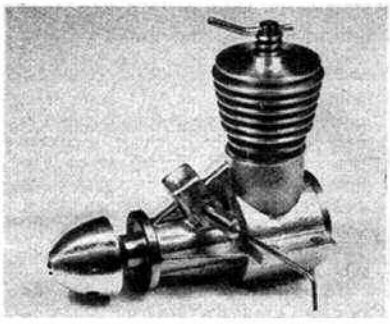
The 19RC has a carburettor of slightly smaller bore than that of the 35RC and retains a full disc counterbalanced crankweb, but otherwise has similar modifications. Both engines are fitted with the new K. & B. "idlebar" glowplug, made under licence from Irwin G. Ohlsson, who originated this type of plug for engines using two-speed needles or intake throttles. The engines weigh 8.3 oz. (35RC) and 6.5 oz. (19RC).

* * *

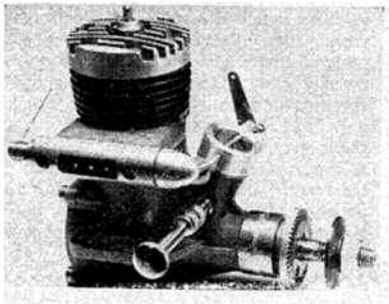
Australia's best-known domestically-produced engines have been, for many years, those built by Gordon Burford and Company of South Australia.

Originally, Burford engines were made under the label "Gee-Bee," which later gave place to "Gee-Bee Sabre," then "Sabre," and, as regular readers will know, we have featured a number of these models in MODEL AIRCRAFT from time to time, including the 1.5 and 2.5 diesels and the 0.19, 0.35 and 0.49 glowplug ignition types.

Nowadays, the glowplug Burford engines go under the title of "Glo-Chief," while "Taipan" is the name

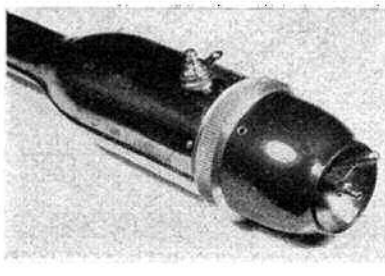


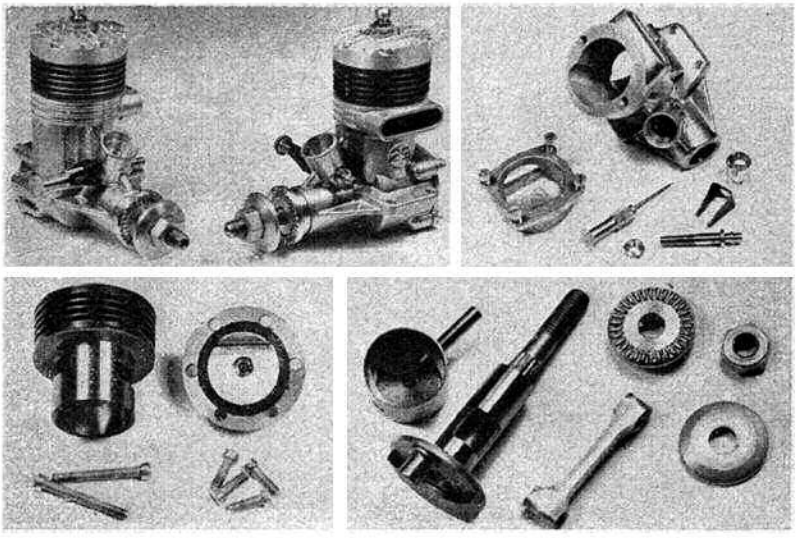
Left—one of two prototypes of an as yet unnamed Swiss 2.5 c.c. diesel which is being tested for the makers by M.A.



Lower left—on the O.S. Max Multispeed 35 and 29 engines, coupled intake and exhaust throttling is used to give an excellent degree of speed control. This is the latest version with an extra, adjustable lever on the carburettor for direct coupling to a push-pull od.

Below we have the new small-size Tiger M-2 pulse-jet from Japan, which weighs less than 7 oz. and has a special 4-volt glowplug starting system. It will be described in further detail in our next issue.





The new 1958-59 versions of the Gordon Burford Glo-Chief 35 and 29 engines from Australia. These have bigger intakes, larger transfer passages, heavier cylinders and lighter pistons than the previous Glo-Chief and Sabre models.

given to the diesel models. Recently we have been able to examine three of the latest models, the Taipan 1.5 c.c. (which will be featured in a future issue) and the Glo-Chief 29 and 35.

The Glo-Chief models are, of course, loop-scavenged, shaft-valve motors and, like many earlier Burford glow engines, are typically "American" in conception, with the emphasis on the very successful K. & B. Torpedo layout. In October 1955 we published an "Engine Test" report on the Sabre 35. The present improved Glo-Chief 35, just introduced (and its companion 29 model) is very similar to this engine and, clearly, has been developed from it. Almost every part, however, has, in some way, been altered, so that practically none of the parts is interchangeable between the two motors.

Most of the modifications have obviously been aimed at improving rigidity and breathing. The new crankcase, for example (very cleanly cast, as is always the case with the products of Burford and Company—themselves diecasters), has a bigger transfer passage, larger intake and thicker main bearing housing, with more generous webbing.

The crankshaft journal has been increased from 0.426 to 0.439 in. dia. and the rectangular valve port has been slightly enlarged. This latter, combined with an appreciably bigger induction aperture in the bearing, extends the induction period from 180 deg. (approx. 50 deg. ABDC to 50 deg. ATDC) to no less than 210 deg. (approx. 30 deg. ABDC to 60 deg. ATDC). The shaft now has a splined end for the prop driver (now alloy instead of steel), and a blued finish on the non-working surfaces is no longer used. Incidentally, the very considerable main bearing clearance that was deliberately used on the earlier 35 now appears to have been abandoned, the present 35 and 29 bearings being quite closely fitted and with appreciably less clearance than is usual with American equivalents.

The same cylinder design and similar porting are retained, but the base flange thickness has been increased, one less cooling fin is used and the wall thickness has been substantially increased from 0.037 to 0.054 in. The piston no longer has the skirt relieved and the fence type baffle now dispenses with root filleting. The skirt portion now has a thinner wall. Boring of the piston is rather cleverly carried out to provide extra wall stiffening while keeping weight at a minimum. A rectangular sectioned machined alloy connecting rod, instead of a turned component, is now used. Plain, unbushed eyes are retained in conjunction with a 7/32 in. dia. solid crankpin and a 5/32 in. dia. solid, full-floating gudgeon-pin.

The bore and stroke of the Glo-Chief 35 (nominally 0.800 × 0.700 and the same as the Fox 35) remains unchanged, giving a swept volume of 0.352 cu. in., or 5.77 c.c. Weight, at 7.5 oz., is about 1/10th oz. up.

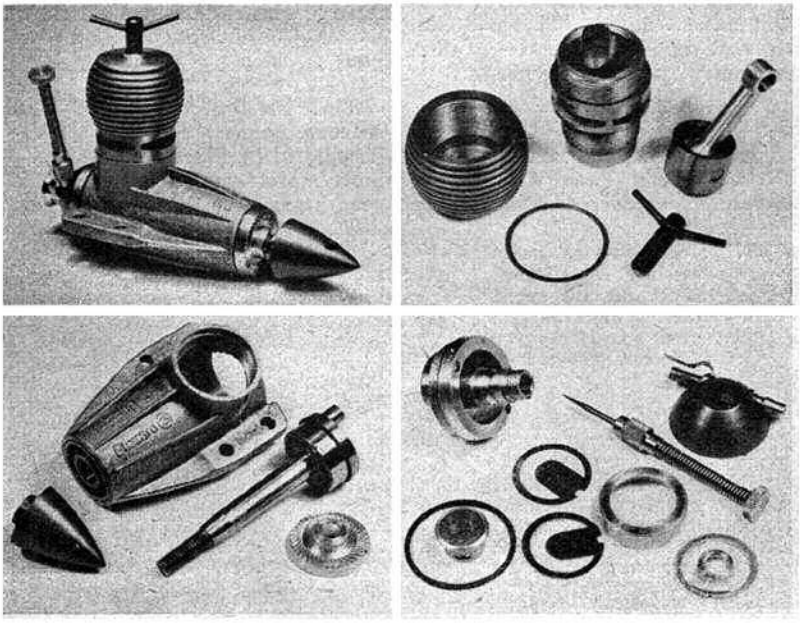
* * *

An engine which has been claiming considerable attention in Germany and elsewhere on the Continent, recently, is the newly introduced Taifun Blizzard. Made by a subsidiary of the large Johannes Graupner concern, it is Graupner's latest effort to produce a "world class" 2.5 c.c. diesel and one that can compete commercially with the well-established Webra Mach-1, Germany's most successful contest diesel to date.

Like the Mach-1, it is a reverse-flow scavenged motor with the crankshaft carried in two ball journal bearings. Again, like the Mach-1, it has a screw-in cylinder with internal transfer flutes and a screw-on cylinder barrel. But here the similarity ends. The Blizzard is a good deal bigger than the Mach-1 and appreciably heavier (over 6 oz.) and it features reed-valve induction instead of a rotary disc.

As can be seen from the photographs, the Blizzard adopts the bullet-shaped crankcase that various designers have had a fancy for, from time to time

Continued on page 408



The Taifun Blizzard 2.5 c.c. diesel from West Germany has a Cox type reed valve basically identical with that used on the 1.5 c.c. Taifun Hurrikan. The streamlined crankcase has a mottled grey enamel finish.

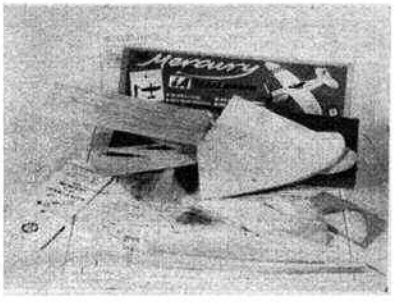
Over the Counter

Regular rally-goers in the south of England will hardly need telling that the mobile model shop shown in our heading photograph is the week-end "offspring" of **Sheen Models**, 263, Upper Richmond Road West, East Sheen, S.W.14. The photograph was taken at the recent Croydon Gala, and the Volkswagen under the command of "Bill" Davies has been welcomed at all the major meetings by many modellers who have forgotten some essential item or other of their equipment.

Of especial interest to clubs who are preparing plans for their next year's rally is the news that the van has now been equipped with a public address system, which will be available for use—free of charge—at any meetings that the van is attending. Also Sheen Models will loan this equipment to clubs who would like to use it for their winter meetings, etc., and delivery can be arranged within reasonable distances of S.W.14.

Interested clubs should write to Sheen Models at the foregoing address.

* * *



The **Mercury** ½A Team Racer, which we have mentioned previously, will definitely be available for Christmas, so being well up to the usual Mercury standard and very reasonably priced at 15s. 6d., it would, we have no doubt, be the solution to many "present" problems.

* * *

"Very nice" was the general comment, when the box containing the new **Frog** *Victor* was opened, and after considered reflection we still think it's "very nice," in fact one of the best kits of this type that we have seen. Even after careful study of all the parts we could find no criticism of the finish—which is in white, with a black stand, a most effective contrast—nor of the fit of the components. The *Victor*, which costs 12s. 6d., is to 1/96th scale, and will be followed by the *Vulcan* and *Valiant* to the same scale, and also a *Boeing* 707 to 1/144th.

* * *

The first non-military aircraft produced by **Revell** is a Douglas DC-7C. This is a replica of Swissair's "Seven Seas," has a wingspan of 12 7/16 in., costs 8s. 11d., and the kit includes authentic Swissair transfers, which allows for a finished model pleasingly different from the usual British or American liveried machines.

* * *

Biplanes always excite interest and you should be assured of a good crowd if you turn up at the flying field with the latest **Performance Kits** design the *Lynx*. This is a 26 in. span back-staggered stunt biplane for up to 3.5 c.c. motors, and it is claimed that suitably powered it will fly the full A.M.A. schedule. In fact, contest-going readers will probably have seen the designer flying his scaled-up version in numerous events this year. The kit, which is very complete and features may ready cut parts, sells at 25s. 4d.

For beginners, Performance Kits have added the *Asteroid* to their range. This is a 25-in. span rubber model of orthodox conception which costs 7s. 6d.

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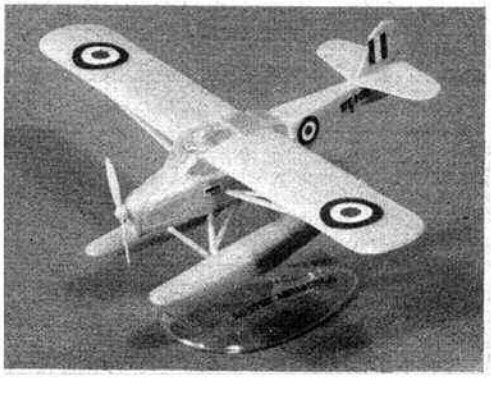
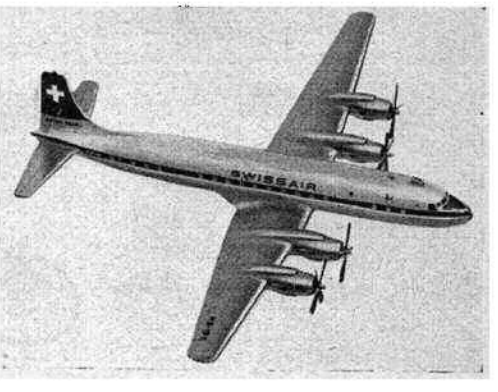
There are several additions to the **Aurora** range of plastic kits—distributed by Playcraft Toys Ltd.—most impressive of which is a 16¾ in. span version of the *Catalina* which

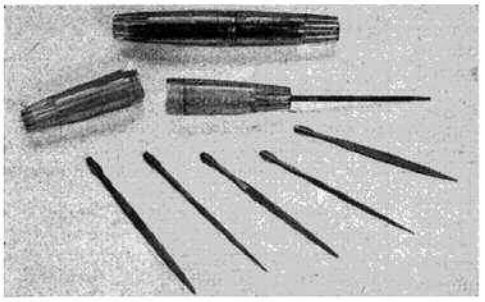


Top, left—the new Mercury ½A Team Racer Kit, the contents of which are to the usual high Mercury standard.

Left—an Auster with a difference—the Airfix Auster Antarctica.



Right—Revells DC-7C in Swissair livery.



Many visitors to the International Do-It-Yourself Exhibition at Olympia were impressed by the attractive stand of the Humber Oil Co. (left), who manufacture the Britfix cements, etc. Of particular interest were the practical demonstrations, where the correct way to obtain an exhibition finish was shown. Below is the useful "6 in One" file set made by J. Stead & Co. Ltd.

sells at 19s. 11d. Two other additions to their "large" range are the Curtiss P-40, at 5s. 11d., and the Piasecki *Army Mule* at 6s. 11d.

In the smaller range there are two new bombers at 4s. 11d., the *Convair* B-36 and the B-52 *Stratofortress*, while the Grumman F9F6 *Cougar* is added to the 2s. 6d. series.

* * *

We owe an apology to **Airfix** for stating, in the October issue of MODEL AIRCRAFT, that their *Lancaster* would cost 3s. Many would wish that it did, but even at its correct price of 7s. 6d. it offers really remarkable value, produced as it is to the usual 1/72nd scale.

An original addition to their range is an Airfield Control Tower. Based on the type of tower used on wartime aerodromes, it is scaled for use with "HO" or "OO" gauge model railways, which makes it approximately 1/80th scale, so if you are not too fussy about complete scale realism, then at 3s. 6d. it would make an interesting "centrepiece" for your model collection.

On the model side, we have received samples of the Fairy *Swordfish*, which costs 3s. and is a most attractive prototype, while for those seeking something a little more out of the rut, there is the float-equipped Auster *Antarctic* at 2s.

* * *

A most useful item of field equipment is the new "6 in One" combination file set manufactured by **J. Stead & Co. Ltd.** It consists of an amber coloured plastic handle containing six files of assorted section. The handle, which screws in half, has a brass socket in which the file selected is inserted for use. Retail price is 10s. 6d.

* * *

Of particular interest to manufacturers, and thus directly to all modellers, is the newly formed **Balsa Imports Ltd.** Although a new company it is certainly not lacking in knowledge of trade requirements, for the directors have many years' experience behind them in this sphere.

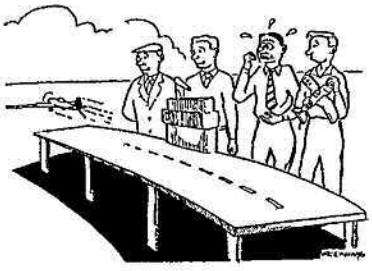
The company is unique in having its own import and covered storage facilities and is thus able to offer a first class service to manufacturers in the importation, selection, and delivery of first quality balsa wood.

Peter Donavour-Hickie has resumed production of his 1/12th scale N.A.T.O. Pilots. These are now injection moulded in nylon, and are much lighter than the originals. Trade distributor is Henry J. Nicholls, and the retail price is 2s. 4d. each.

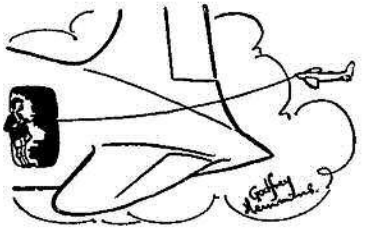
CRAZY COLUMN

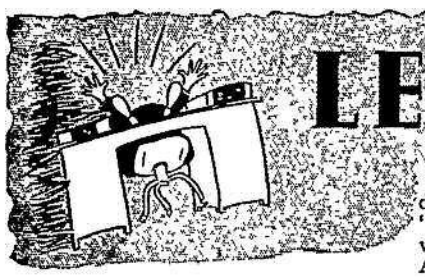
"I didn't think this was what you meant when you said you were going to fly your plane round the pole!"

"This latest kit cuts building time to a minimum!"



"I feel seasick!"





LETTERS

Theory saves time

DEAR SIR,—I am sorry that the "well-known contest flier" finds it necessary to remain anonymous, because I thought his article ("Getting it on the Card," M.A. July) was an interesting one. One point, though, I cannot agree with. He may have found that it makes no difference whether his rubber model does 3 or 6 min. on the average, as there are enough thermals to go round at any contest, but that has definitely not been my experience. A model that you know will only hit around the 3 min. mark in, say, a calm evening, cannot be relied on for, or even coerced into, three maximums all the time (this is from bitter experience). Maybe once a season, maybe twice, but no more. I think the majority of contest types will agree with me here.

This being my experience, it strikes me not as abstruse mathematical reasoning but plain common sense that a model which will do 4 min. is a better and more consistent bet than one which will touch down in three. Since you are doing this by developing an existing design (that was the basis of my article, "Developing Rubber Lightweights" which appear in the May issue of MODEL AIRCRAFT) it will possess the same practical characteristics as the 3 min. model it previously was. By using the Palmgren formula I had a look at in my article a great deal of time wasting and depressing "developments" can be eliminated by a half-hour with a pencil and paper.

For instance, it is well enough known that if you add extra power your performance will go up until such time as the rubber weighs twice as much as the frame of the model. So the obvious way to increase performance sounds like adding an extra couple of strands, or else putting an extra 6 in. on the motor. A quick calculation with the Palmgren will show whether the increase is worthwhile or not. If you have already a lot of rubber in your model, you will be wasting your time adding some more for the sake of 2 or 3 sec. on the flight time. That time will be probably more than swallowed up by the decreased efficiency of the prop. working with more power. However, if you have only a moderate amount of rubber it will probably be worth your while to increase it. As I see it, the only real alternative to Palmgren is trial and error, and what a trial those errors can be.

Practical experience and practical theory are not antagonistic; they are complementary; and together add up to the pleasurable activity of improving our contest models.

Yours faithfully,

Aberdeen. C. M. CHRISTIE.

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

Give us the tools . . .

DEAR SIR,—I have read with great interest the very informative articles and letters in your journal upon high performance rubber models. It would appear, however, that the most important piece of advice for the beginner and those not in the know has been omitted. A fundamental of a rubber model is, naturally, the motor and none of your correspondents state from whence can be obtained a rubber of reasonable quality. To the best of my knowledge none of the top ranking rubber experts use that strip which can be obtained directly from a model shop.

Even the most abstruse mathematics will never put a rubber model into the top flight if not backed by a good motor and the would-be aspirant in this branch is likely to find himself with a beautifully constructed model but having to use rubber which is quite likely to fracture without warning at 50 per cent. turns. This, of course, would be most heart breaking to the newcomer who, from the start, does not even stand a chance of obtaining consistently high results.

The same comments apply in part to the question of covering material. It is generally admitted by many that Jap covered flying surfaces cannot be bettered for this class of model. Here again, the tyro is off to a bad start since he cannot obtain coloured Jap and white is useless from the visibility point of view. Lightweight Modelspan can be used on the wings, but it increases the weight of the average rubber model by at least a tenth of an ounce, which could make all the difference in a fly-off.

It would, perhaps, be opportune at this stage to take up the cudgels on the behalf of the power fliers. I have yet to see the timer which is equivalent in performance to the engine which it is called upon to control. Those generally available upon the home market are lacking in the consistency which is needed on the contest field. I would have thought it possible for some manufacturer to make an escapement controlled timer, with all the spindles running in brass and a sealed escapement bearing to prevent the ingress of oil, for the equivalent cost of a cheap clock. A timing accuracy of 95 per cent. would be considered by all to be adequate.

Yours faithfully,

Cannock, Staffs. D. ILLSLEY.

LATEST ENGINE NEWS

(*Continued from page 405*)

(examples: the American Synchro-Ace of 1937 and the Italian Atomatic designs of 1947) complete with pointed spinner-nut and domed backplate cover.

Basically, the engine is fairly conventional. The cylinder porting consists of four radial exhaust ports, spaced alternately with the transfer flutes, but these latter are contoured rather neatly to smooth the gas flow into the combustion chamber. The exhaust ports present a slightly unusual appearance externally and give the impression of a much larger port area than is evident on closer inspection. The shaft is solid, with a disc web, non-counterbalanced, and runs in two 7 mm. × 19 mm. SKF ball journal bearings. The piston is fairly heavy, with a coned head, pressed-in gudgeon pin and machined alloy conrod.

Large diesels are now comparatively rare. This modern exception to the rule is the Polish Sokol engine of 5 c.c. It is made at the PZL aircraft works. (See Roving Report page 401.)

The most interesting part of the engine is the backplate assembly. This is basically similar to that used in the 1.48 c.c. Taifan Hurrikan diesel and, therefore, is closely modelled on the original Cox 049 design which began the present generation of model reed valve designs and which, we feel, has yet to be bettered. As on the Hurrikan, the two reeds are of 0.003 and 0.005 in. thickness and a screened intake and four-jet venturi are featured.

The photographs show the various components quite clearly and for a detailed description of the induction unit, we refer readers to the "Engine Test" report on the Hurrikan in our issue of September 1956.

Topical Twists

by PYLONIUS

Organised Chaos

Some of you who are not so old in the modelling tooth might be amazed to learn that, in the dim but not so distant past, serious attempts were made to organise our model contests. Although it may sound a bit far fetched now, even a friendly club comp called for a maximum organising effort, with the full technical works, including miles of rope barrier, enough tents to house the armies of Genghis Khan, public address systems, and official armbands for all and sundry.

This, you might think, is a far cry from the present state of affairs, when you diligently scour Chobham Common in search of the contest area. Not a roped barrier, tent or address system in sight, and after you've hopefully followed a chap with an armband for half an hour, you find out he's only the Common Keeper. Eventually you track down the comp control area, which you find consists of two blokes working from a motor-bike pannier with one stop watch and the back of a fag packet.

This makes you wonder what happened to all these good organising intentions. History tells us they were brutally trampled underfoot by the restless hooves of a too-curious public. At the first hint of a model comp the hordes would gather for a full-scale onslaught on the take-off area. Nothing infuriates them more than the sight of a roped barrier, which is regarded as a challenge of the first order. Before any contest can go two rounds the take-off area becomes a shambles with the spectating hordes in full possession.

To counter this menace the modeller of today has abandoned any idea of holding an organised contest, and has gone to ground. Any contest now is held in the most casual and off-hand manner possible; the fewer the models the better, and, for real success, no models at all. To keep the public on the run, field mobility becomes the watchword. The take-off area is switched from one place to another, and, in fact, it is not unknown for dummy take-off areas to be established while the two blokes with the motor-bike pannier get to work under a distant and sheltering bush.

I was reminded of all this on visiting the World Champs at Cranfield, to witness at first hand that modern curiosity—the organised contest. It was clear to see that much careful thought had gone into the problem of keeping the take-off area clear of unwanted bodies. Quite cleverly, it was decided to eliminate the spectator menace by making everyone an official. Only one point was overlooked, however, the provision of officials to control the officials. At times the take-off area became so officially crowded that the flyers had to resort to vertical launching. Had it not been for this athletic prowess on the part of the flyers I wouldn't have seen a thing. And, as the only unofficial spectator at the event, I thought it only right that I should. Let me say, however, in all fairness, that they would have made me an official had there been any room for me in the take-off area.

* * *

Just one more point about the Cranfield do. I was particularly struck by the classy workmanship of the many precision built models. Only goes to show what can be done with a few sticks of balsa, some sheets of tissue, a watchmaker's lathe, fibre glass moulds, vacuum formed polystyrene, panel beating equipment and a few hundred quid. Gives you such encouragement when you face up to the kitchen table with an old razor blade and a packet of pins.

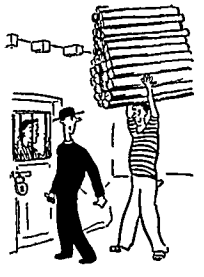
Homegrown

Other countries have climates, we just have weather, and it's pleasant at times to turn our thoughts away from our rain-drenched, wind-swept airfields to sunnier, kinder-to-model, climes.

Let us, then, take a trip to sunny Bolivia (to the capital, Blaurence), which is so high above sea level that it takes six men and a donkey to launch a chuck glider; and where the air is so thin that it can't be seen if the wind is blowing sideways. But in spite of the rarefied atmosphere, thermals abound, and it is quite a common sight to see a model vanish into thin air. If only Shakespeare could have seen that.

Bolivia (next door to Ecuador) is a land of balsa, and it is encouraging to learn that missionaries are being sent into the jungles to teach the natives how to make model planes out of their home produce. This brings us to the story of the first missionary to those priceless jungles, and how balsa got its name.

It is a little known fact that the natives of Gocharaza used balsawood as a form of currency. Quite how they worked out their strange monetary system is not known, possibly by the use of logs, but you needed a heck of a lot of the stuff to buy very little. Six logs at least were required even to purchase a wife, and this is where one of our native friends got himself into trouble. Instead of throwing his favourite wife to the sacred crocodile at the full moon, as is the custom, he threw his unfavourite mother-in-law. There was a bit of an uproar about this, and our native friend soon found himself in the jungle dock.



Our missionary now enters upon the scene, and we find him sitting outside the lock-up, idly plucking a few poison darts out of his shirt front. To his amazement he sees a native approaching, carrying the largest bundle of logs you ever saw. Of course, he doesn't know that it's the prisoner's brother-in-law, so he points to the huge bundle of logs, and asks the native what it is.

"Bail, sah," replies the informative jungle dweller.

Current Conversational Convolution

In these verbose days, when dustmen prefer to be called Refuse Disposal Operatives, and floorsweepers are known as Debris Conservation Experts, we Model Aeronautical Engineers should insist upon being referred to as such, and not as Model Builders, Modellers, Balsa Butchers, Cement Squeezers, and the undignified like.

Some years ago, when spades were called spades and not Manual Excavating Instruments, and we and the Model Society were young, we wore our S.M.A.E. lapel identification emblems, I mean badges, with immense pride, but suffered some embarrassing moments as a consequence. For instance, after launching a 20 in. rubber job into a glorious nose dive, a curious bystander would ask what the initials on the badge stood for. When given the full mouthful, the gentleman who only asked, would take it as a joke in poor taste, and go off muttering something like: "Some Mothers 'Ave 'Em."

But, in these technological times, Model Flyer isn't much of a prestige handle to attach to the operating of a 12 channel radio job—in fact, it can often be a downright untruth. We should, therefore, stand on our dignity, with us Model Aeronautical Engineers always referring to our machines as Miniature Functional Aircraft, even if, like mine, they are only fit for the services of the Refuse Disposal Operative.

Control line CARGO CARRYING

W. I. BARRATT describes an amusing but instructive control-line "weight lifting" competition organised by his club, so if you also would like to try something a little out of the ordinary, then the gen in these pages will help you

SOME months ago, several club members were discussing ways and means of organising an entertaining competition which would not involve too much preparation. As most of the club's F/F enthusiasts could fly a C/L model, we decided that a pay-load competition for C/L models should provide amusement.

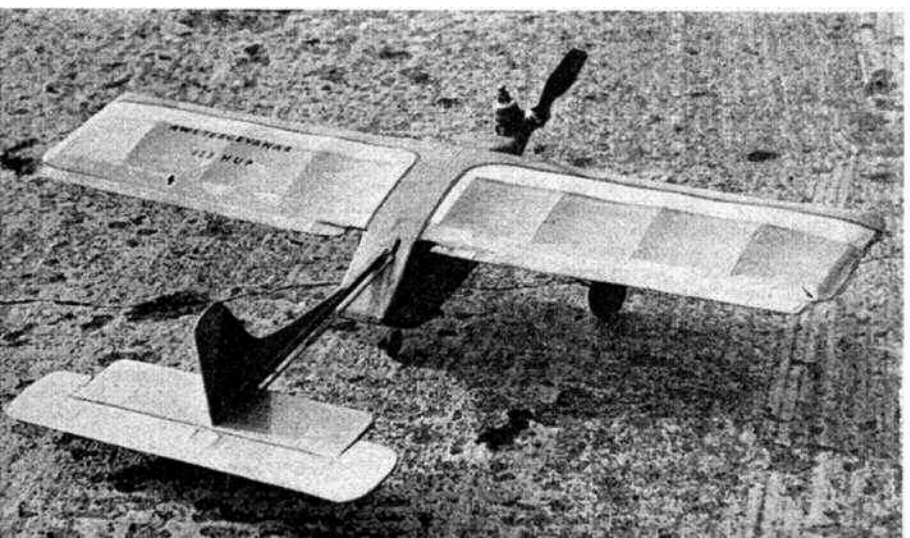
The rules were kept as simple as possible, and were formulated with the local flying field in mind. On the field was a concrete strip approximately 20 yards long and 5 yards wide. This was to serve as the take-off area, and models had to be airborne within its length. Line length was to be a minimum of 20 ft., in order to prevent the models being "helped" off the ground by the pilot. Each model was to make two qualifying flights, one fully loaded, and one empty. A normal take-off and landing was to be made in both cases. The biggest load carried per c.c. of engine capacity was to be declared the winner.

After the rules were announced, many wierd and wonderful projects were suggested. More than one model was going to be forced into the air with a battery of rockets, until it was pointed out that it was highly illegal, not to mention the expense of getting the contraption into orbit!

Of course, when the competition eventually took place, very few of these wonder models made their appearance, the majority being converted stunt models.

Preliminary flights had shown that the rule concerning flight, in both the loaded and unloaded condition, was well founded. Some of the specially built models had drooped trailing edges to the wings, and generated so much lift, that when taking-off unloaded, the model was half way round a loop before the pilot realised it was off the ground. The eventual winning model overcame this difficulty by the fitting of adjustable flaps, which could be lifted to act as lift spoilers when the model was unloaded. When in this condition the model would achieve landings that would make even a Prestwick *Pioneer* look sick!

After all the models had made

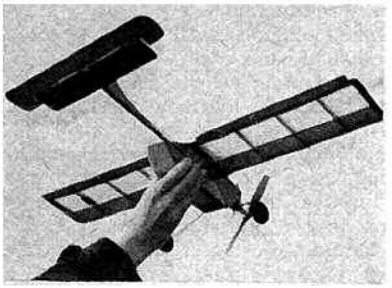


The three photographs on these pages show the layout and ample storage space of the winning model.

their preliminary unloaded flights, the ballast was placed in the holds. This ballast consisted of small bags of air gun slugs, each bag weighing one ounce. Nearly every competitor had underestimated the bulk of the ballast, with the result that most models could have carried more weight than they could hold. The necessity of good strong hatches was also demonstrated when one model shed its load in the air, causing the motor-cycling fraternity to hastily don their crash helmets. The resultant wing-over by the model was a joy to see.

The take-off run was the limiting factor for the top placing models. A good deal of skill was required to allow the model to reach flying speed within the length allowed, and once the model was in the air, to keep it there. A steep climb after take-off was fatal, as the model immediately stalled into the ground.

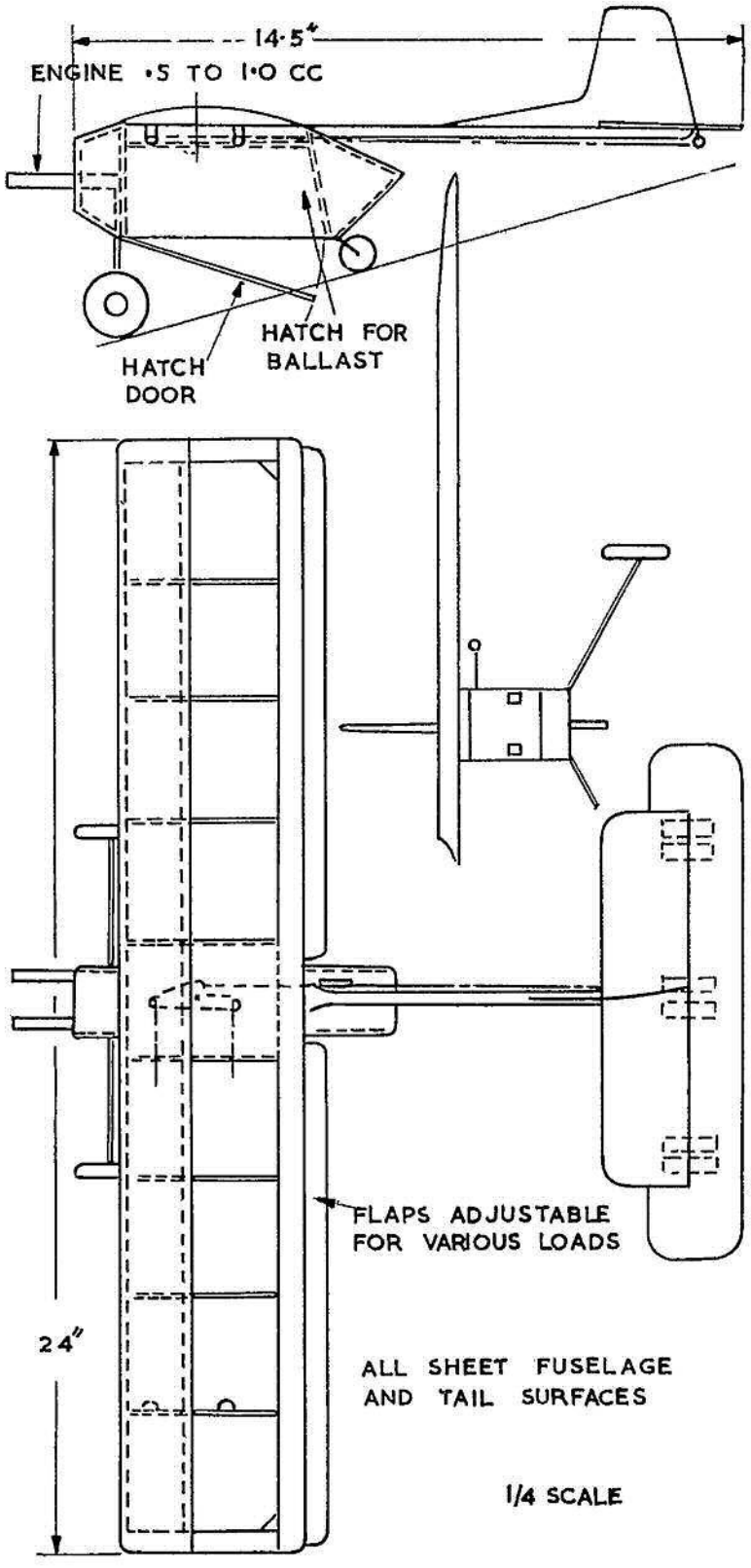
When the results were calculated the winner proved to be a special job powered by an Attwood Wasp, which

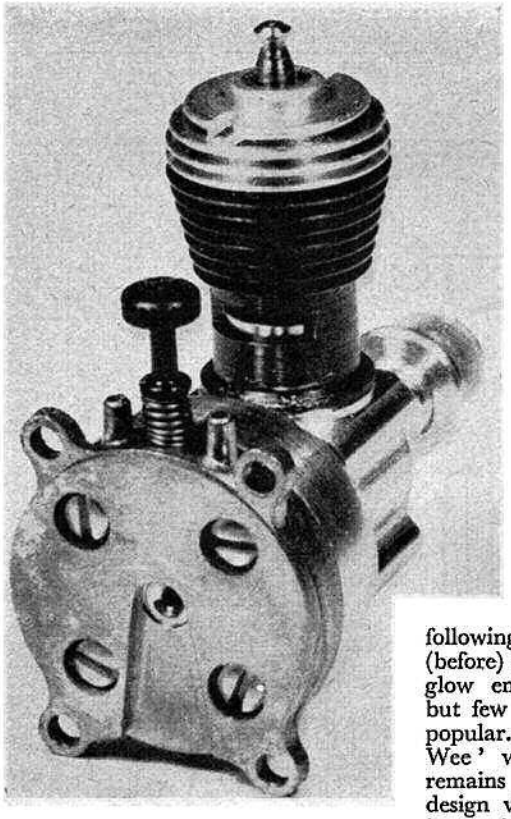


lifted a total of 10 oz., i.e. 12.75 oz./c.c. It would seem that models with small engines have an advantage over larger jobs. The largest model flown was a mighty twin boomed, twin-engined layout with a total engine capacity of 4 c.c. After a two lap take-off through tall grass and weeds, it bounced into the air carrying a cargo of 8 oz. ! Perhaps that was because the normal weight of model was over 4 lb.

Although the weight lifted by the winning model does not approach the loads carried by similarly powered American F/F PAA-load models, we feel that under the conditions laid down, the weights we achieved were reasonable.

However, the competition will be remembered more for its entertainment value than its technical attainments, and we can heartily recommend it to any club with an unfilled contest calender and a yen for the unusual.





ENGINE TESTS

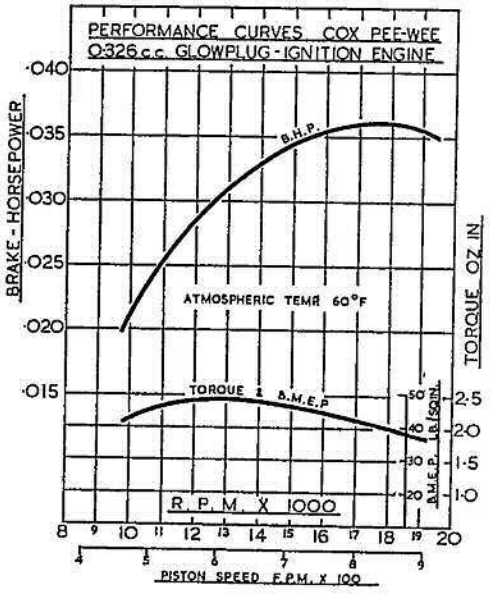
COX "PEE WEE"

.032 c.c. Glowplug engine

"... captured the imagination of even the most seriously minded model builders"

THE Cox "Pee-Wee" 0.020 cu. in. glowplug motor is the smallest American engine in current production. It was introduced in 1957 and its design and constructional features were dealt with exactly a year ago in MODEL AIRCRAFT. At that time, we concluded with the following remarks: "There has (before) been a number of American glow engines below the 049 size, but few of them have become very popular. Whether or not the 'Pee-Wee' will catch on more widely remains to be seen, but, from the design viewpoint, it is certainly an interesting achievement and, production-wise, a remarkable example of the fruits of automation in the model industry."

Today there can be no doubt that the "Pee-Wee" has, in fact, captured the imagination of even the most seriously minded model builders. It has even invaded the R/C field, where its low weight and astonishing power has, in conjunction with tiny transistor receivers, led to the development of half-pound models no bigger than a small control-liner.



In many respects, the model engines produced by the L. M. Cox Manufacturing Company Inc., of Santa Ana, California, are unique. Extremely competitively priced, they are, nevertheless, relatively complicated designs of very high quality construction. That high quality and low cost can be combined, is, in this instance, due to extremely large sales and clever production techniques—i.e., the adoption of the most modern rapid production methods involving the use of much special automatic machinery, some of which has, in fact, been designed and constructed by the Cox Company. Very close manufacturing tolerances are maintained throughout and, in the case of the piston and cylinder, are to such fine limits as to eliminate the need for matched assemblies and to reduce the effective running-in period to a matter of a few minutes.

An illustrated description of the "Pee-Wee" was contained in our issue of December, 1957. To restate its basic specifications, it is a reed induction, reverse-flow scavenged engine with twin opposed exhausts and twin transfer flutes, a description which, however, gives no clue to its ingenious construction. At the rear of the engine, and embodying a four-point radial mounting, is a combined fuel-tank, carburettor and reed-valve assembly of highly individual design. To examine the latter and appreciate its ingenuity one needs to use a magnifying glass and to fully appreciate the amount of talent that has gone into the production of this motor, one needs to have more than a passing acquaintance with model engine design and manufacture.

In the past, many well-known American model engine designs have been unashamedly copied, with varying degrees of success, by manufacturers in other countries. Sometimes, by virtue of lower labour costs, they have even managed to undercut American prices. But in the "Pee-Wee," the copyists have surely met their match. We doubt whether the Cox Company had any such notions when the "Pee-Wee" was designed, but if they had set out to build an engine specifically to frighten would-be imitators into immobility, they could scarcely have succeeded more decisively.

Specification

Type: Single-cylinder, air-cooled, reverse-flow scavenged two-stroke

cycle, glowplug ignition. Reed-valve induction and sub-piston supplementary air induction. Flat top piston.

Bore: 0.300 in. Stroke: 0.282 in.

Swept Volume: 0.01993 cu. in. (0.3258 c.c.).

Stroke/Bore Ratio: 0.94 : 1.

Weight: 0.75 oz. complete.

General Structural Data

Machined aluminium alloy crankcase and main bearing (unbushed). Case-hardened crankshaft with machined-in crescent counterbalance, two 5/32-in. dia. journals and 5/64-in. dia. crankpin. One-piece blued steel cylinder with integral cooling fins, screwed into crankcase. Screw-in alloy hemispherical pattern cylinder head with integral glow filament and seating on confined copper gasket. Hardened steel piston with swaged socket for ball jointed steel connecting rod. Machined alloy fuel tank with central intake tube and reed-valve housing. Single 0.001-in. copper reed retained by wire circlip. Die-cast alloy tank backplate with integral needle valve assembly. Complete assembly secured to crankcase with four screws through tank from backplate. Four-point bulkhead mounting.

Test Engine Data

Running time prior to test: 10-15 min. each engine (three engines tested).

Fuels used: Record Methanex (initial running). Record Super-Nitrex (dynamometer test).

Performance

There is no doubt that the " Pee-Wee " would have found ready purchasers even if its performance had been quite modest. In fact, however, the power available from this tiny engine is quite phenomenal for its size and completely disproves earlier theories regarding the unfavourable specific outputs of small glowplug engines as compared with diesels and larger glow motors.

Another disadvantage of very small engines—baby diesels perhaps being the worst offenders—has been a tendency towards tricky starting. Here again, the " Pee-Wee " scores heavily, for it is exceptionally easy to start and is equally easy to adjust, added to which, of course, its small size makes it a very docile motor for the youngest modeller to handle.

It is seldom, however, that motors tested in this series escape criticism entirely and, in connection with the " Pee-Wee " tests, we have to report an unexpected weak point that was revealed in all three engines used. This concerns the combined cylinder-head glowplug unit and in each case the insulation sealing the terminal in the head was rendered unserviceable after considerably less than 30 min. running time. This caused the terminal post to loosen, resulting, first, in a slight loss of compression—evident in reduced power and difficult starting—followed by shorting of the post against the plug body. At first we wondered whether we had been careless with the plug connector and therefore took the precaution of lightly connecting a thin flexible lead to a point on the test mount, but the same trouble was experienced with both the other two heads. We afterwards cut one of the defunct heads in half and discovered the insulation to be of a thin plastic like film, which appeared to have softened under heat. There being insufficient time to get in touch with the makers in the U.S.A., we contacted Messrs. Henry J. Nichols Ltd., the United Kingdom distributors, who confirmed that similar troubles had been encountered, but stated that this fault was found mainly in the earlier engines imported and that the makers had now effected an almost 100 per cent. cure.

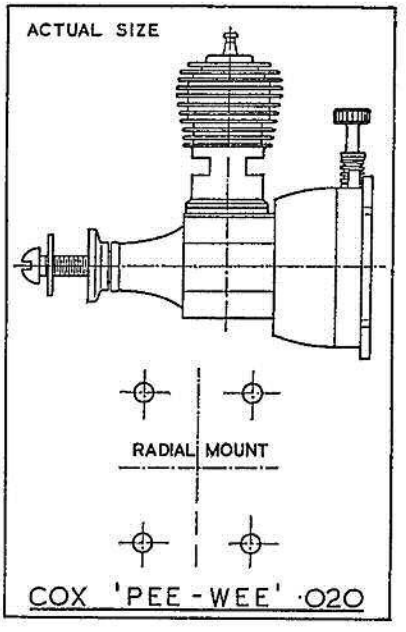
Most of the under 1 c.c. American glowplug engines respond to fuels containing a relatively heavy proportion of nitromethane and for the " Pee-Wee," Thimble-Drome Racing Fuel is recommended. Since American fuels are not available in the U.K., the nearest British equivalent, the newly introduced KK Record Super-Nitrex blend, containing 30 per cent. nitromethane and 5 per cent. nitrobenzene, was chosen for our torque tests.

Under these conditions, a maximum torque of 2.4 oz. in. at 13,000 r.p.m. was determined. This, equal to a b.m.e.p. of 40 lb./sq. in., is fantastically good for a baby glow-plug motor and exceeds formerly accepted levels by at least 30-40 per cent. As one might expect, the " Pee-Wee " peaks at very high revolutions—just on 18,000 r.p.m. on our test, where the output was approximately 0.036 b.h.p. Unfortunately, due to the plug failure mentioned, it was not possible to double check the top end figures, but it will be observed that, equal to a specific output of no less than 110 b.h.p./litre, this performance is far in excess of standard small glow engine power. It gives support to views expressed in the American model Press to the effect that the " Pee-Wee " falls not very far short of normal 0.049 class engine performance and demands almost similar sized F/F models.

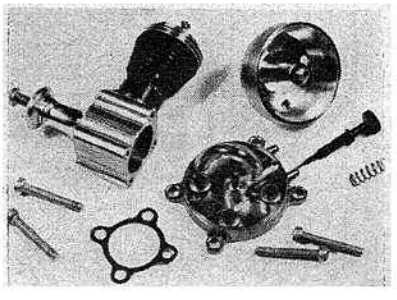
Running characteristics of the " Pee-Wee " were all that could be desired. It runs with great smoothness and consistency from 12,000 r.p.m. upwards. There is little point in running this motor any slower and it is obviously happier at the high speeds. Recommended prop for F/F is 4½ in. dia. and 2 to 2½ in. pitch. For C/L the diameter can be reduced to 4 in. with a 2½-in. pitch.

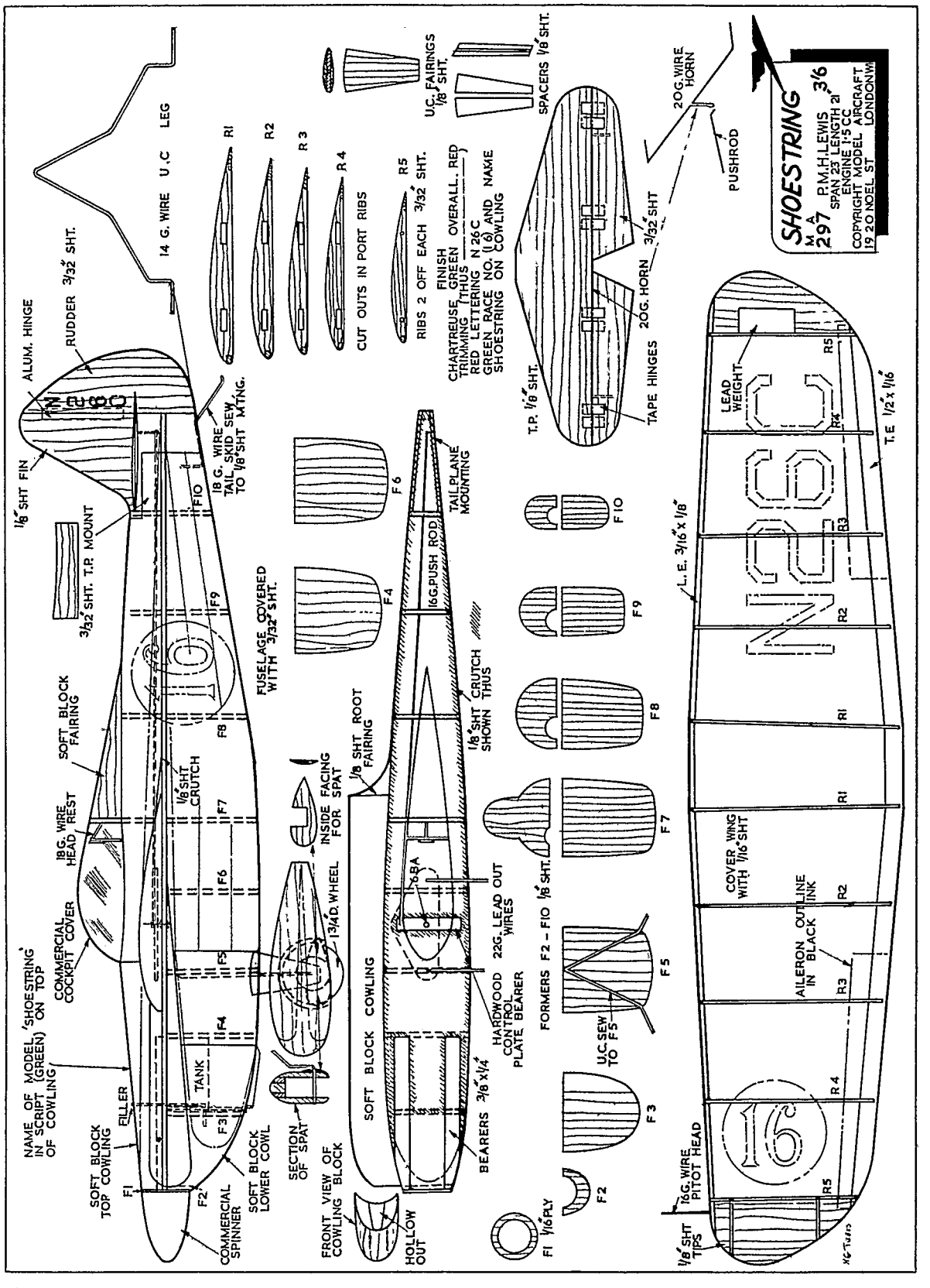
Power/Weight Ratio (as tested): 0.432 b.h.p./lb.

Specific Output (as tested): 110 b.h.p./litre.



Some of the " inside " story of the Pee-Wee is revealed in this photo.





FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 19-20, NOEL STREET, LONDON, W.1, 3s. 6d., POST FREE

SHOE STRING

A scale control-line replica of a snappy American Midget Racer

by PETER LEWIS

HERE'S an eye-catching model of one of the neatest little racers ever to take to the air. Encouraged by the American Goodyear Trophy contest rules, home-builders produced an exciting crop of original racing designs, with Mercury Air's *Shoestring* possessing the most elegant and refined lines of all, adequately matched by the tiny machine's contest successes. These included the winning of the Continental Motors' Trophy at Detroit in 1951, when John Paul Jones flew the midget around the course at 197.2 m.p.h. The design was by Rodney Kreimendahl and the brothers Carl and Vincent Ast. The wings spanned 19 ft., and the nose of the 17 ft. 5 in. fuselage mounted a Continental C-85. The model uses a 1.5 c.c. motor, and features simple, strong construction so that you can have *Shoestring* in the air in a very short while indeed.

The fuselage is the first item for attention, built up on the $\frac{1}{8}$ in. sheet crutch which is shaped to the outline shown on the plan. Hardwood engine bearers of $\frac{3}{8}$ in. × $\frac{1}{4}$ in. section are cut to length, tapered at the front and cemented firmly into the crutch slots. The hardwood control-plate bearer is made from similar section wood and slotted into place. The engine bearers are flush with the lower surface of the sheeting. The crutch is marked with the positions of the formers F2 to F10 and these are now cut from $\frac{1}{8}$ in. sheet and mounted in place, excepting the upper half of F7, which is added after the wings are fixed. Former F5 carries the 14 gauge wire undercarriage, sewn and glued to it. Installation of the tank between F3 and F4 is the next step, followed by the 18 gauge wire tailskid and the 3/32 in. sheet tailplane mounts.

Single pieces of 3/32 in. sheet form the sides and underneath of the fuselage. Six B.A. bolts, soldered to strips of drilled brass or tinplate, are fastened in place on the engine bearers, together with the front ring F1 of $\frac{1}{16}$ in. plywood, and the whole upper nose cowling is finished by filling in with soft block carved to shape. A 6 B.A. bolt fastens the control-plate to its bearer, accompanied by the fittings of the 16 gauge wire pushrod and 22 gauge leadout wires; $\frac{1}{8}$ in. sheet is used for the tailplane and the fin, both cemented in place at this stage. The fuselage unit must now be put on one side, as work cannot proceed on it until the wings are mounted on the crutch.

To start the wings, pin down the $\frac{1}{8}$ in. × $\frac{3}{16}$ in. leading edge and the $\frac{1}{16}$ in. × $\frac{1}{2}$ in. trailing edge. Trace ribs R1 to R5 on to 3/32 in. sheet and cut them out, noting that leadout-wire slots are necessary only in the port set. Cement the ribs in their respective positions and add the $\frac{1}{8}$ in. sheet wing tips.

The undersurfaces of both wings are next covered with $\frac{1}{16}$ in. sheet, leaving the centre-section open. The leading and trailing edges are now steamed at the four centre-section points so that the upper surface of the wing lies in a straight line, in effect giving a small amount of dihedral on the lower surface. Guide the leadout wires through their slots and tubes and slide the wings into a snug fit in the front cowling block cut-out, finally gluing them firmly to the crutch.

The upper surface of the wings can now be sheeted over, including the centre-section. The upper half of F7 is added, together with the rear fuselage decking and the head-rest block. Soft block is also used for the engine cowlings on the sides of the nose, and another piece is hollowed out to cover the engine to be fitted to the model.

The undercarriage strut fairings consist of two layers of 3/32 in. sheet, glued one on each side of the wire legs, with the gaps filled in with similar pieces. The whole leg is then sanded to streamline section.

Wheel spats are laminated from $\frac{1}{4}$ in. and $\frac{1}{8}$ in. sheet and cemented in place on to the legs, after the wheels have been fitted and retained with washers soldered to the axles. The outer $\frac{1}{8}$ in. sheet laminations—which have been split away to ease assembly—are then cemented on again to complete the spats, which finally receive $\frac{1}{4}$ in. sheet inner facings to bond them firmly to the leg fairings. Ensure that the wheels revolve freely within the covers.

To complete the tail unit, the 3/32 in. sheet rudder joins the fin through a thin aluminium strip pressed and cemented into each surface. The pair of elevators are glued to their 20 gauge wire axle and subsequently hinged to the tailplane.

The four stub exhausts consist of neoprene tubing cemented into holes on the undersides of the side cowling blocks. The cockpit is completed with a piece of leather glued to the wire headrest, followed by the celluloid canopy which may be a trimmed commercial one, or pressed specially for the model.

The final work of finishing the model is started by sand-papering the surfaces until they are smooth, followed by successive applications of sanding sealer, comprising clear dope mixed with french chalk, accompanied by further sanding. The entire model is then covered with tissue doped on and given several coats of chartreuse green. Trimming is in red, with registration N26C on the rudder and above starboard and below port wings. Green *Shoestring* is in script on each side of the cowling bulges, with racing number 16 in the same colour on red discs on the fuselage sides and above and below the opposite wingtips to the registration.

CLUB NEWS

HORNCHURCH M.A.C.

The club has not been in the news for some time now and we thought it was about time we let it be known that we are still in existence. In fact a rumour has been going round the district that the club had disbanded.

This, however, is very far from the truth as the club is still "quietly" active, but new members are, of course, always welcome and don't forget, we still have a whole aerodrome to fly on. Anyone interested should contact the secretary—see under Change of Secretary.

OUTLAWS (CANNOCK) M.A.C.

At the Leicester C/L rally, one stunt and no fewer than eight combat entries were made; seven of these won through the first round and Derek Gater, who three months ago had flown nothing more elaborate than a *Phantom Mite*, reached the quarter-finals in this, his first ever comp, with a P.A.W.-powered *Peacemaker*.

The 1957 Nats film finally found its way to this area and a very enjoyable social evening was held to which members of the Walsall and Norton Canes clubs were invited.

PETERSFIELD M.A.C.

At the recent Southern Area rally at Beaulieu, Ken Wallers' high speed Veco 19-powered combat job gained 3rd place in that event, arousing much interest in the process; only a damaged needle valve lost him a possible first. Arthur Crocker's A.M. 35-powered *Toreador*, with Arthur's imperturbable hand at the controls, got through to the semi-finals but a control horn coming adrift robbed him of further success.

New members are sought and any interested locals should contact club secretary: Frank Buckland, Buriton House, Petersfield.

WEST BROMWICH M.A.C.

The last combat meeting of the season at Leicester was quite well run for a change. We had quite a good day's outing, and several of the "Keen Types" brought home prizes including "Tubby" Day's first place in the stunt comp and Dave Wilkes' and Mike Kendrick's equal third in combat. Mike Kendrick had the misfortune to be flying in the torrential thunderstorm, which, marred the day, when he received quite a powerful electric shock through the C/L handle. He has now made a vow never to fly in a thunderstorm again.

OXFORD METEOR M.C.

The main event over the past month was our contemporary style stand of models at the annual "Cowley Feast Week Exhibition," which got us two write-ups and a photo of the club-room in the local paper. One write-up said that our stand was by far the most attractive which, considering it cost us only £2 18s. 4d. to build, was fairly good. It seems to prove something about the ingenuity and thoughtful improvisation needed for successful aeromodelling. This was definitely our best local publicity for some years.

KENTON M.A.C.

We visited the last rally of the combat season at Ashford. The rally was not very well attended and the rain no doubt dampened enthusiasm, but L. Burbridge and D. Wilson finished 1st and 2nd.

With the latest British powerful 1-1.5 c.c. engines available, the club would like to see "½A" combat at the Nationals and other large rallies. This ought to open a new field of interest in combat events to the usual Oliver Tiger flying wing.

NORTHWOOD M.A.C.

Our combat flyers, especially P. Tribe, are making themselves known; at Wanstead he took second place, and a week later at Dagenham he took first place with his team mate, P. Perry, coming second, while at Beaulieu, Tribe again came first.

The club, which is about forty strong, held a parents' evening on October 24th, where we demonstrated the various club activities.

ENGLISH ELECTRIC M.A.C.

Bad visibility at the Northern Gala kept the flight times down, and although T. W. Smith was punching holes in the clouds as usual, he gained very little due to the visibility and was

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This year's Croydon Gala

This year's Croydon Gala was held at Chobham on September 14th in what must surely have been the best contest day of 1958, both from the point of view of smooth and gripe-free running, and also the superb weather, which produced 122 maximums.

A number of people were flying F.A.I. power models in the open power event and the weight penalty seemed to make surprisingly little difference compared with the average open model; this was particularly so in the case of Dave Posner's latest *Dream Weaver*, which was ½ oz. under F.A.I. weight, but with a Mk. III Tiger certainly had the fastest and most logical climb at Chobham, a 70 deg. straight path with no height wasting rolling on the way up. He eventually placed third to George Fuller's Alag powered open model. At the end of the day seven people turned up for the power fly-off with five Oliver Tigers between them.

In open rubber, the story was much the same, a fair sprinkling of Wakefields with increased rubber, and several 300s, for which the calm weather was ideal. Four people returned triple 4-min. maximums, and Eric Barnacle was doing some hectic searching through his stock of reserve models before his model was returned about a quarter of an hour before the fly-off, which was eventually won by K. Horry of Bristol and West, with a free-wheeling prop lightweight.

The glider contest, with three in the fly-off, was won by country member D. Partridge flying Roy Yeabsley's four-year-old *Nebula* design; he subsequently joined Croydon, presumably out of gratitude.

Left: Ray Monks gets a good launch in the rubber event. Lower left: Two young flyers from Epsom check their motor run. Right: A scene from the top of the "clump" during the popular slope soaring event.

Young of Surbiton won the chuck glider event with a resounding 4 : 29, and in the highly popular slope soaring contest, J. Baguley of Hayes, eventually turned out the winner in spite of completely unsoarable conditions; even Phil Read was seen casting a lightweight rubber model stuffed with plasticine off the hill with a grim expression on his face.

In the end, George Fuller turned out to be gala champion after spending the whole day hurling assorted models into the Chobham air and disappearing into the bush in pursuit.

Croydon members are anxious to make it known that the prison camp that has recently appeared on the Common is not a new scheme for eliminating the opposition, but actually a film-set by British Lion!

RESULTS

Open rubber (48 entries)

1. K. Horry ..	Bristol & West	12 : 00	+ 4 : 50
2. D. Poole ..	Birmingham	12 : 00	+ 4 : 39
3. E. Barnacle	Leamington ..	12 : 00	+ 4 : 38

Open glider (76 entries)

1. D. Partridge	C.M.	12 : 00	+ 2 : 58
2. D. Howell	D.H. Hatfield	12 : 00	+ 2 : 11
3. M. Dickson	Leamington ..	12 : 00	+ 1 : 29

Open power (57 entries)

1. G. Fuller ..	St. Albans ..	12 : 00	+ 4 : 19
2. K. Glynn ..	Surbiton ..	12 : 00	+ 4 : 10
3. D. Posner	Surbiton ..	12 : 00	+ 3 : 54

Chuck Glider (19 entries)

1. A. Young ..	Surbiton	4 : 29
2. J. Lawson	St. Albans	2 : 06
3. J. Barker ..	Surbiton	1 : 29

Slope soaring (34 entries)

1. J. Baguley	Hayes ..	..	3 : 46
2. J. Simeons	St. Albans ..	..	3 : 45
3. B. Cox ..	St. Albans ..	..	3 : 03

Gala Champion—G. Fuller, St. Albans.

finally placed 4th in power. After breaking a 16 strand motor Tom decided not to fly in rubber.

We topped the area with a total time of 33 : 22 in the Farrow Shield. Flying conditions were good with a little mist at times and again T. W. Smith topped the area in individual, which now gives him the distinction of being placed 1st in the area for the three-team events this year. (Keil Trophy, M.E. Cup and Farrow Shield.) C. A. Kimber, B. Smith and I. Ellison, the other members of the team also placed in the first six within the area.

The four-cornered final for the English Electric Trophy will be between Wigan, Accrington, Blackpool and ourselves.

FARNBOROUGH M.A.C.

Four members entered power at the Croydon gala, and M. Beech managed two max's but fell short on his third flight, the Amco-B.B. cutting prematurely.

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

We went to the R.A.F. " at home " at Gaydon, Warks., where we met the very active members of the Gaydon M.A.C. and together we put on a display of C/L flying which was slightly marred by high winds. The two clubs also staged a static exhibition which included the raffling of a A/2 glider.

Following these activities, we have been invited to visit the well-equipped club rooms at this V-bomber base, on the first Monday of every month. At our last visit, we arranged an open contest for gliders which was held at Wellesbourne on November 2nd. Future plans include night-flying under flood lights and possibly some r.t.p. and microfilm work.

WALLASEY M.A.C.

J. Done had a mixed day at Stretton in the Halfax when he finished top in the area with 10 : 49, but unfortunately lost his best power job; however, the club finished third in the area in the M.E. cup with a total of 21 : 27.

WIGAN M.A.C.

Our juniors showed the gen boys of the club how to fly power in the Halfax Trophy when G. Ayles flew his model to a well deserved third place with 9 : 41, his team mate junior Hosker gaining fourth place with 9 : 21. Our other junior entry didn't place but managed to lose a leg of his jeans to a faster moving farm dog when out recovering a model.

B. Picker temporarily lost his glider in the middle of the smelliest dung heap seen this season. No wonder the model stuck its nose down on its next flight, spun in and wrecked itself. While to finish off in the same vein, B. Talbot heard about his lost model from Lynton on Ouse, but on arriving to get it he found it was completely wrecked. He was told that it had landed in a field of cattle which had trampled and chewed it to pieces before it could be rescued.

The club is thinking of sending a donation to the R.S.P.C.A.

LEICESTER M.A.C.

As can be seen from the results West Brom had a field day at our rally at Stapleford Park. We had a little trouble getting the combat started, but after that things went quite well. This was our first big " do " and we would welcome criticism of our faults but also would like to know if we had any good points.

There were 66 entries for the combat, and 14 in the stunt, the winners being as follows.

Combat

1. B. Kirkman .. Derby
2. J. Vaughan .. Chesterfield
3. D. Wilkes .. West Brom
   M. Kendrick .. West Brom

Stunt

1. D. J. Day .. West Brom
2. R. Crofts .. Burton on Trent
3. M. Grimmett .. West Brom

DEBDENAIRS M.F.C.

Just about the grandest flying day of the year to date saw our first effort at a " rally." This was an " invite " event to celebrate our second anniversary and will, we hope, blossom into a full rally for next year.

We were supported by several clubs in the area including Bishops Stortford, Harlow, Dagenham and Northwood, to all of whom many thanks for an enjoyable day.

Owing to the restricted facilities at our venue, Grange Farm Centre, Chigwell Lane, combat was the chief event, which saw a close win by " our man " Doug Galpin over his opponent, Hobbs of Dagenham, in the final.

Meanwhile, in a separate field the glider boys got together, resulting in a win for another of " our men "—Mike Pointing.

We still feel there are many unattached modellers in the area, and we welcome *all* classes of modellers who should contact P. Oliver, 23, Covert Road, Chigwell, Essex.

BAILDON M.F.C.

In the Halfax Trophy our two best men were Eckersley (10 : 14) and Pannett (10 : 01); these times gave us 4th and 5th placings in the area and also counted for a club power contest held in conjunction with the S.M.A.E. event. We also came third in the area for the M.E. Cup with a team aggregate of 22 : 04, highest-placed man being Arthur Collinson with 6 : 04; but our sole representative in the E. C. Muxlow Memorial Trophy for Wakefield models, Henry Tubbs, seems to have been right off form and only scored 3 : 16.

On our last visit to Rufforth, the weather-man produced a beautiful still day marred only by early-morning mist, and C. P. Miller scored a faultless 12 : 00 in the Farrow, Henry Tubbs coming a good second with 10 : 29; Gerry Tideswell also placed top in the area in the A/2 contest with 12 : 15, but we regret to announce that our " C " team failed miserably in the final of the knock-out and lost to Tees-side by about 4 min. Inquest to be opened later !

BRISTOL R/C M.A.C.

The last round of our six months' competition for the chairman's trophy was held, as usual, in a steady gale. The winner of the trophy, the member gaining most points in the whole series, was Pete Hubner, with 317 points against the runner-up's 295 (John Mardon).

Your model recovery service is much appreciated. In your October edition we mentioned the loss of one of our models . . . lost some weeks before. Our summer had completely obliterated the owner's name and address but the model came into the hands of an aeromodeller in another town, a diligent reader of club notes, and as a result, by a devious route, the model came back home to its owner, somewhat wet. However, it has been dried out and has taken the air since. Thank you !

DERBY M.A.C.

Our Model Engineer cup team placed unofficially 3rd in our area with 24 min. 17 sec. total. The same day the combat section (alias " Rangdipoids ") visited Leicester rally and Brian Kirkman smashed one Oliver and two models to win. With so many rallies to attend we are hard pressed to find time to fly off our club events, the last attempt ending in a deluge.

BLETCHLEY & D.M.C.

We propose to hold a slope-soaring contest at Ivinghoe Beacon on Boxing Day, December 26th, 1958, from 10 a.m. to 4 p.m. There will be contests for radio controlled models and F/F.

We should also like to hear from any keen modellers in the area interested in joining us. (For address see under New Clubs.)

GOATSHEAD KNIGHTS M.F.C.

During the past nine months the club membership has risen to 30, there being an almost equal number of seniors and juniors. We recently approached the local education authorities and were fortunate in securing a room at the Alexandra Road Schools, where meetings are held every Monday at 7 p.m.

All classes of flying are catered for and anyone interested in details of the club should come along to the meetings on Mondays or contact the secretary, A. Dempsey, 88, Claremont Street, Gateshead.

CROYDON & D.M.A.C.

At Beaulieu, a gaggle of Croydon " ½A " team racers joined the fray and after a rather messy and expensive tangle it transpired that George Fletcher had come second, at the cost of one re-styled folding, two-piece, Frog 150, and Pete Fraser fourth with a Frog 149 model. As a consolation Gordon Cornell placed third in stunt with one of his 150 powered *Princess* models. A couple of weeks earlier, he had steamed off to Brussels at the last moment for the world C/L championships, laden with stunt models, and returned still laden with models but, alas, no trophies.

With the onset of the long winter evenings the club has organised a programme of Tuesday evening contests, talks and slide shows. On the list, and causing a few double takes, are a Wakefield symposium (!) and R.T.P. Jetex speed (Oh ! the shame of it . . .). Visitors would be welcome at these and other meetings, at Woodside School, Morland Road (on the 197 bus route).

ENFIELD & D.M.A.C.

The club put on an exhibition and flying display at the Enfield Town Show. Although the display lacked most of the contest models (due to " prangs " at recent rallies) it was still received extremely well; highlight was two *Mosquitoes* flying in formation.

At the Southern gala, junior Roy Salter placed third in the class " A " race, and the Don Walker/Ray Tuthill class " B " team were just beaten (by half a lap) by McNess of West Essex. The model was doing 118 m.p.h. but could only manage 25 laps.

WANSTEAD A.C.

Fine weather graced our rally, at which all events were concluded well before dark, including combat, in which B. Austin of the Dope Pedlars placed first in the final against Tribe of Northwood.

Several hours of mowing and flattening the grass were necessary before the surface was suitable for the team racing. In the " ½A," Bell of Godalming, took first place and Oswell of Ashford won the class " B " in the time of 8 min. 37 sec., while in the class " A " the order was Dew/Bassett, followed by Williams of Wimbledon, and Hartwell of Enfield.

Dave Platt ran the stunt event, which attracted 11 entries, to the new S.M.A.E. schedule, and Brown of Lee Bees took first place with 480 points, closely followed by Cornell and Blundell with 463 and 459 points respectively.

We joined forces with the Dope Pedlars to put on a display for the Dr. Barnardo's home at Woodford. All types of C/L flying were demonstrated including balloon bursting and using a mammoth size streamer, Jack Wilkinson managed to score a cut of his own streamer.

At the Dagenham rally, which several of our members attended, Len Soanes won the first place in the class " A " team race.

BLACKHEATH M.F.C.

The Blackheath gala, which had to be cancelled because of bad weather, will now be flown off on December 7th at Chobham Common.

Competitions will be for the Bill White Memorial Cup : open rubber—plus a glider and a power event.

Entry fees will be 1s. 6d. per event. For further details contact P. Crossley, 11, Broadfield Road, Catford, S.E.6.

ASHFORD M.A.C.

We ran our first C/L rally on October 5th and must have chosen the worst Sunday possible. Hats off to the gallant flyers who came to support us, of whom the winners were:—

Combat

1. J. Burbridge } Kenton
2. B. Wilson }

Stunt

1. G. Cornell, Croydon

At the Wanstead rally, G. Oswell won the " B " team race (Mike Basset on the handle). using a Barclay-Eta Mk. IV in the *Thin Man.*

We hired a coach to Sevenoaks for the S.M.A.E. C/L rally on September 28th and almost cleared the prizes. Ernie Goodall (a junior) showed the seniors how to win the combat event ! Clive Weller placed 2nd in the " A " race, and Gordon Oswell carried off the " B " race.

NEW CLUBS

BLETCHLEY & D.M.C. D. McQue, 6, Laburnham Grove, Bletchley, Bucks.

NEWBURY & D.M.A.C. J. Evans, 55, West Street, Newbury, Berks.

BILSTON SKYRANGERS M.A.C. Malcolm Scotto, 58, George Street, Ettingshall, Nr. Wolverhampton, Staffs.

SOUTHGATE & D.M.A.C. L. Teff, 23, Arlington Road, Southgate, London, N.14.

MANCUNIANS M.A.C. W. Bell, 17, Radclyffe Street, Middleton.

CHANGE OF SECRETARY

LEIGH M.A.C. P. Eckersley, 6, Winmanleigh Gardens, Leigh, Lancs.

HORNCHURCH M.A.C. A. R. Wells, 167, Ardleigh Green Road, Hornchurch, Essex.

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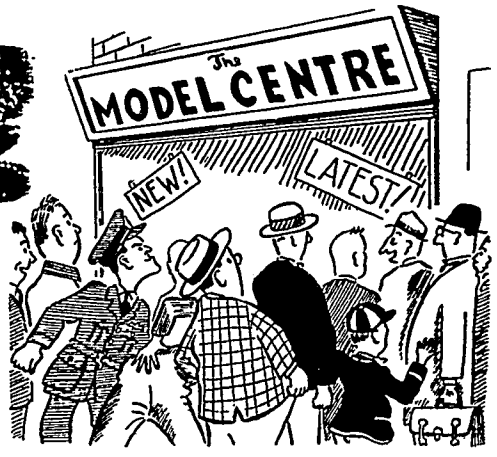

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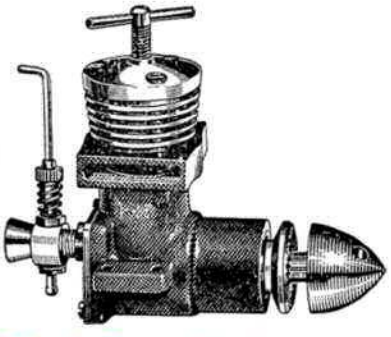

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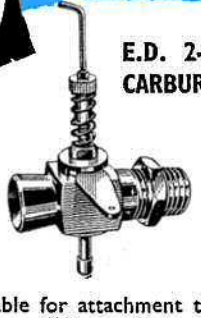

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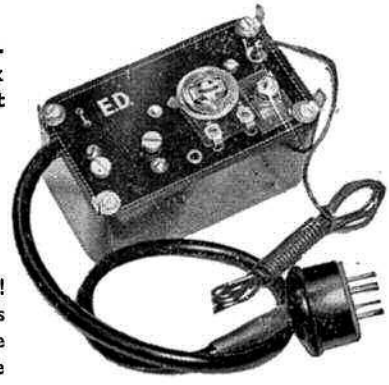

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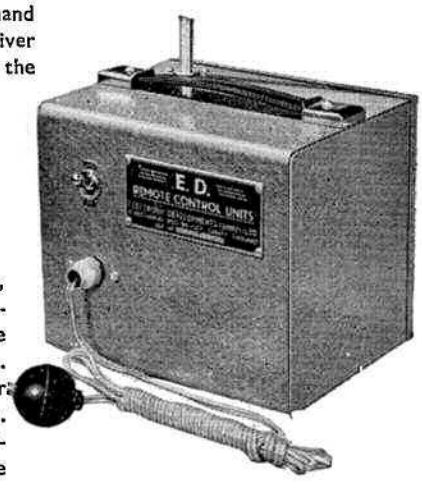

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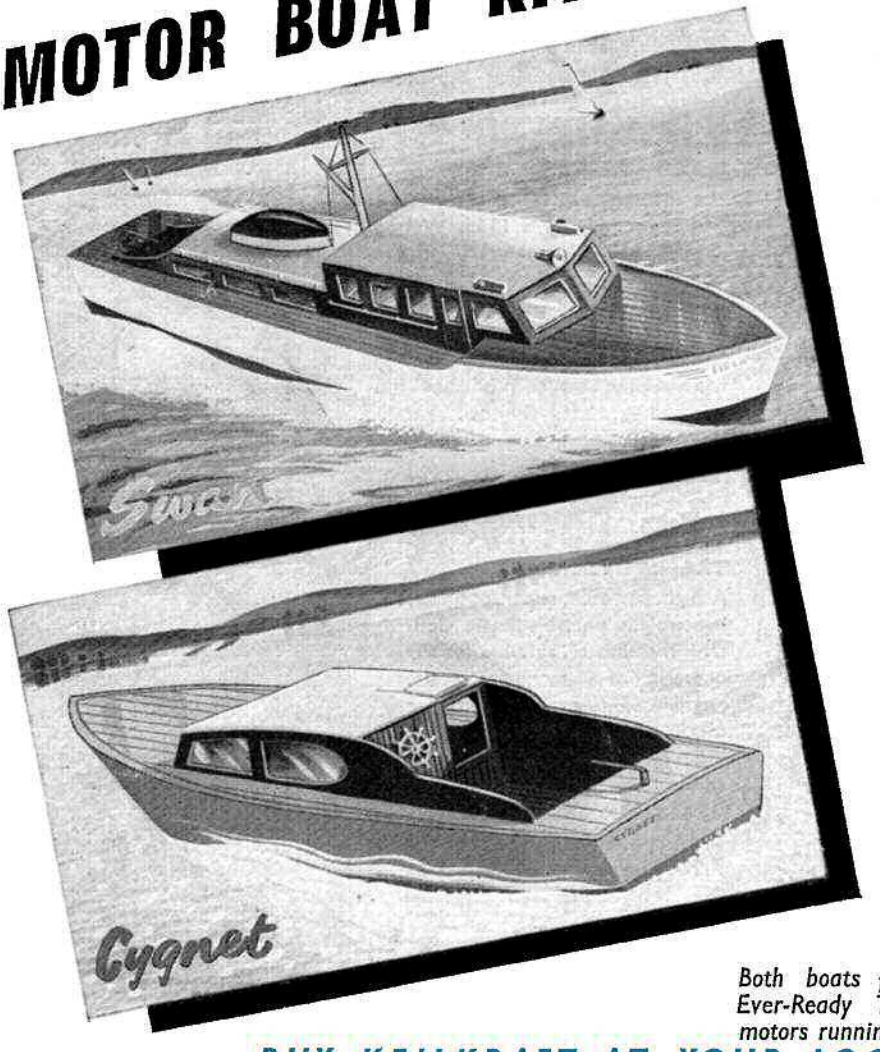

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