MODEL AIRCRAFT

1'6
FEBRUARY
1959

In this issue

SAAB-18

Plans for a twin-engined control line model

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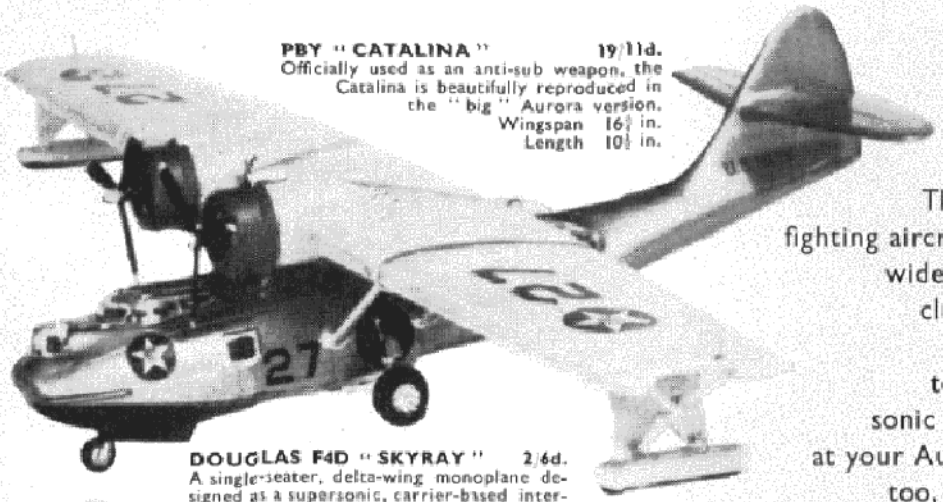

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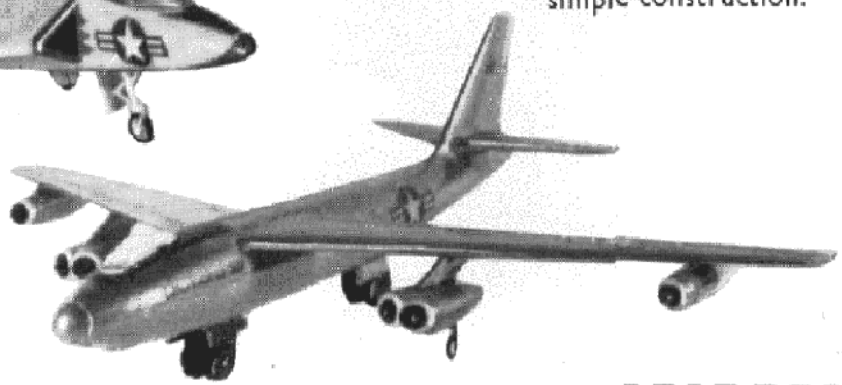

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FEBRUARY 1959

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The official Journal of the
SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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S.M.A.E. Membership Fees Increased

THE S.M.A.E. annual general meeting, held at Blackpool recently, was attended by 26 club delegates, while the total number of people present was 44. This may not seem to be a very large attendance, but it was better support than had been received for some recent meetings in London and, considering the difficulty of transport, which necessitated all except local delegates making an overnight stay, the turnout was not bad.

The main item was the council's proposal for an increase in affiliation fees, but, in fact, this gave rise to very little discussion. After the reasons for the increase had been explained, and considered in conjunction with the treasurer's estimated budget for 1959 expenditure, an assurance was given that all possible economies would be enforced and they were then adopted unanimously. The new fees, which came into force immediately, are:

Country members ...	£1 5s.
Senior club members	£1
Junior club members	7s. 6d.
Associates	5s.

The reasons for the increase are varied, but in addition to the "normal" ones of higher postal charges, telephone and office rentals, rail fares, etc., we were pertubed to see that the block insurance policy taken out by the council will now cost at least £150 more per annum. This is directly attributable to the great increase in the number of claims for damage to cars, windows, etc., that have been made, and is clearly indicative of the careless manner in which many members fly their models. We cannot stress too strongly that everyone should always follow the old N.G.M. motto and "Fly with Care."

An interesting point is that any general increase in fees will automatically augment the coffers of area committees, for they receive a 25 per cent. rebate of fees paid by clubs in their area, to enable them to administer their affairs. It was felt by some members that the present allowance was more than adequate for normal area working, so following a recommendation of the meeting the council are to consider the amount of this payment in the light of the new fees.

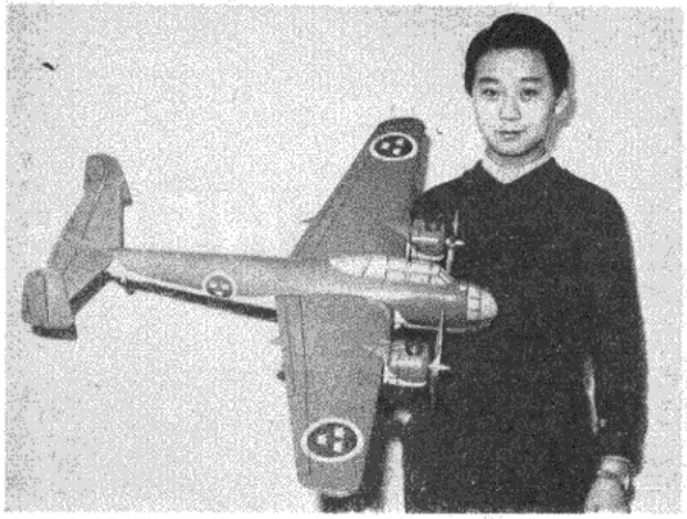
For they are jolly good Fellows!

BY unanimous vote at the annual meeting, Henry Nicholls and Harry Hundleby were elected Fellows of the S.M.A.E. This award is made for long and outstanding service to the Society, a qualification that both more than fulfil.

Incidentally, Harry, who has for many years been editor of our contemporary journal *Aeromodeller*, is leaving them to become sales director of Davies Charlton Ltd.—manufacturers of the Allbon range of engines—in the Isle of Man. We wish him every success in his new appointment.

TWINS ARE TOPS

WHEN we published the plans of the Bristol *Beaufighter* (M.A. Plan 275) in the March 1958



Hoh Fang-Chiun with his Saab 18A.

issue of MODEL AIRCRAFT, we little dreamed that a comparatively expensive to build, and power, twin would become one of our top selling designs—yet it has. So following our policy of always trying to supply what readers want, this month we are pleased to feature Hoh Fang-Chiun's design for the SAAB-18A—a design that is, perhaps, rather reminiscent of the *Beaufighter* in appearance—although from the model viewpoint totally different.

The SAAB is designed round two 1.5 c.c. motors—the *Beaufighter* was for two 2.5s—so a pair, matched or otherwise, of any of the popular 1.5s that are now readily obtainable will be quite suitable, while from the constructional aspect there is nothing to deter anyone who has progressed from the elementary beginner's stage.

We have published other of Hoh Fang-Chiun's designs in the past, (M.K. *Sportster*, M.A. Plan 239 and *Acrobator*, M.A. Plan 279) but we must confess to having been more than a little intrigued at receiving plans from a Chinaman, living in Sweden, and accompanied by letters, written in English that would put many of our native born correspondents to shame.

Mr. Chiun was asked for some details of his interests and this is his reply:

"I am Chinese and 21 years old, studying at a technical college in southern Sweden, from which I shall graduate next spring.

"I have been actively engaged in aeromodelling since 1952, and since then I have built some 100 model airplanes (of which about half were powered by mechanical engines). My main interests are radio control and free flight duration, but I am also keen on all types of control-line models, with the exception of speed.

"Last summer I worked at the German model airplane factory of Johannes Graupner at Kirchheim-Teck in West Germany, and thought that you might be interested in a photo (see below) which was taken there, showing me in front of the office main entrance with my models. The model at the left is a test model of the R/C *Sattelite* (de Bolt *Live-Wire Trainer*) powered by a Taifun Hurrikan, using Mikroton receiver and Telematic-Alpha rudder servo. The plane at the right is a control-line combat design of my own. The model spans 37 in. and is designed for 2.5 c.c. engines. My original has a Taifun Tornado for power.

"By the way, when I graduate next spring I will have a degree known as machine engineer, and after graduation I would very much like to work in the aircraft industry. I wondered, therefore, if there is any possibility of finding employment in some British commercial aircraft factory?" *(Any suggestions will be passed on—Ed.)*

An Amalgamation

NEXT to London, which is a law unto itself anyway, it seems that of the bigger cities in Britain, Bristol has the largest number of affiliated model aircraft clubs, with five at present active.

It is heartening, therefore, to hear that rather than each going its own way, they have got together and formed an association to deal as a single body with such items as flying fields, inter-club competitions, exhibitions, etc.

Named the United Bristol Model Aircraft Association, the first undertaking has been to organise a show of all types of aircraft at a local model clubs' exhibition held recently at a Bristol store. A booklet was given away containing a short history of each club and this should attract some new members.

We wish them every success, particularly in any dealings with local authorities when the opinion of five groups, presented as one, should carry particular weight.

S.M.A.E. Notes

After 16 years of service to the F.A.I., A. F. Houlberg, M.B.E., has announced his retirement as president of the Models Commission due to increasing business commitments. Fortunately he will still continue as chairman of the S.M.A.E.

* * *

Due to his refusal to give an explanation for his non-arrival at Darmstadt for the King of the Belgiums Cup, after he had agreed to be a member of the British Team, D. Pierpoint has been debarred from all S.M.A.E. contests for two years.

* * *

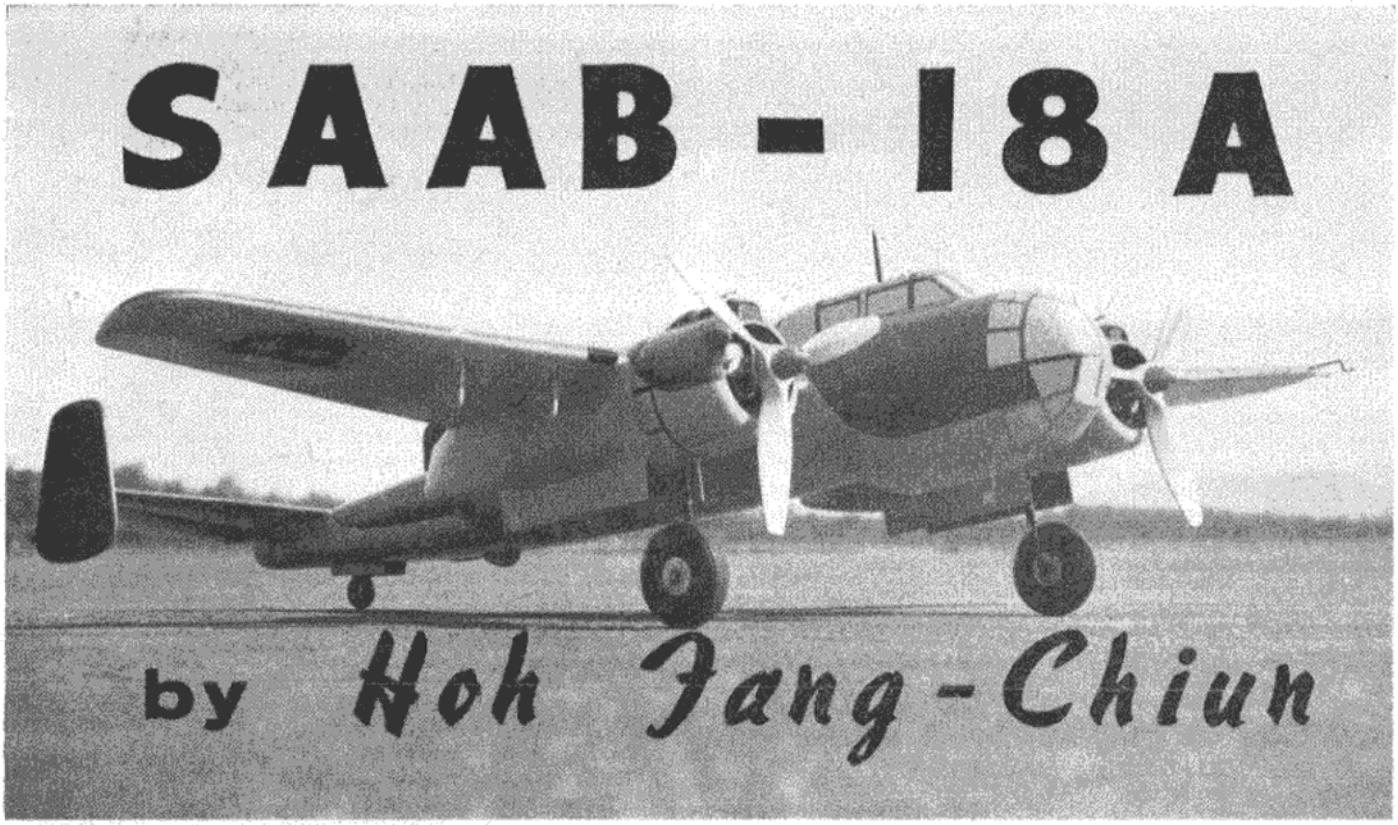
A R/C hand launched glider record claim for a flight of 3 hr. 50 min. 35 sec. by the Northern Heights team of Copland/Young/Warwick has been ratified.

Editor's Illness

ALTHOUGH his name has remained in its accustomed place in the "credits," Roy Wesson, Editor of MODEL AIRCRAFT, has been missing from the office for some weeks. He fell victim to the very unpleasant virus pneumonia, having returned to work too soon after a bout of flu. He has withstood the ordeal with typical fortitude but, for all that, has been pretty ill.

When these words were written he had not yet returned to duty but, by the time they are in print he should be back in harness. It may be that in a small number of cases correspondence has been held up because of Mr. Wesson's illness. For that, the usual apologies and assurances that the leeway will be made up as soon as possible.

SAAB - 18 A



by Hoh Jang-Chiun

A scale twin control-line model of a Swedish Bomber, suitable for two 1-2 c.c. motors

ALTHOUGH twin-engined control-line scale models have gained an ever increasing popularity in recent years, to consider building a model of this type may still give rise to misgivings for the average modeller. This may be due to a number of factors. The design of the model is perhaps unnecessarily intricate; the chosen subject may not be very suitable; or the designer endeavours to copy the full-size machine right down to the last rivet, with complete disregard for practicable construction.

With these points in mind, I have tried to make the construction of this scale model of Sweden's *Saab*-18A medium bomber, so simple that every modeller with a little experience should be able to build it. The construction is of balsa, which gives a good weight/strength ratio. The sheet covering should not offer any difficulty, as the wing is planked entirely separately, with the fuselage and nacelles then built on to it. To further simplify the building, soft balsa blocks, carved to scale shape and finished in scale outlines, were used for canopies instead of moulded ones, though you may, of course, make these latter up if you prefer.

The model spans 40 in. and my prototype *Saab*-18A, with two Taifun Hurrikan 1.5 c.c. motors for power, weighs about 48 oz. and has an air speed of around 55 m.p.h. A pair of 1.5 c.c. engines are recommended, but any pair of motors up to 2.5 c.c. can be used. Even good 1.0 c.c. diesel engines would be suitable if the model is kept light during building.

Construction

Start with the wing. First, join the spars with their respective $\frac{1}{16}$ in. plywood dihedral braces, and cut all the ribs, except for the centre one, from $\frac{1}{8}$ in. sheet. Don't forget to cut the slots for the lead-out wires in the port ribs. Next, slide and cement the ribs onto the spars from the centre outward, and frequently check over the plan that they line up correctly. Note that the hardwood bellcrank mount has to be cemented in place before ribs WC, etc., are added. Cement the leading edge in place and install the complete bellcrank assembly.

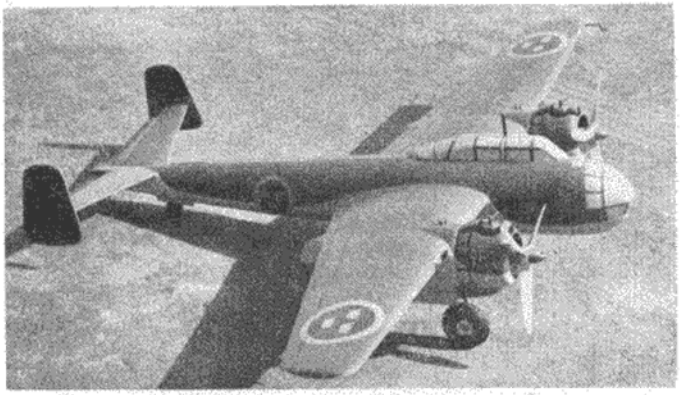
Before sheet covering the wing—preferably with hard $\frac{1}{16}$ in. sheet—securely cement a piece of lead, weighing about $1\frac{1}{2}$ oz., in the starboard tip, between the mainspar and leading edge. Add block tips and sand entire wing.

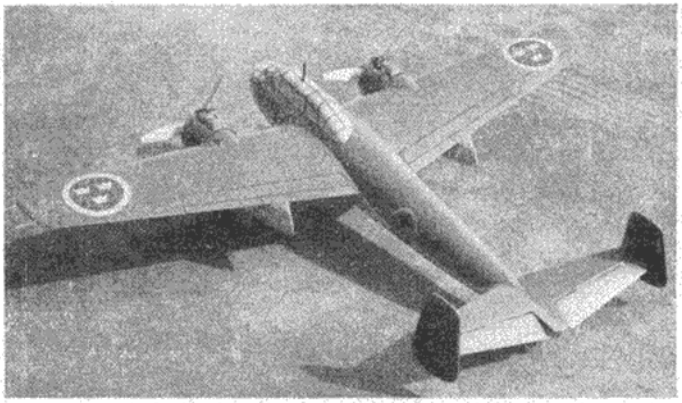
Start the fuselage by cementing the $\frac{1}{8}$ in. sheet keel onto the centre of the wing. Be sure that the wing slot in the keel is just big enough so that it fits tightly onto the wing centre, and check carefully that the keel is absolutely straight in relation to the wing. Cut out all the formers and cement them in place. Note that the lower part of the keel is cut off about 3/64 in. in front of former F1's position, and rejoined after the former (F1) is cemented in place as shown on the plan. The entire fuselage can be planked now with $\frac{1}{8}$ in. sheet strips, but leave an opening in the rear for the stabiliser.

The tailplane is made from $\frac{3}{8}$ in. sheet tapered to $\frac{1}{4}$ in. thick at the tips. Sand the tailplane to a symmetrical section before cutting off the elevators. Cut and bend the tailplane to the correct dihedral, and cement the $\frac{1}{8}$ in. sheet brace in place. Insert the wire elevator horns into the elevators using plenty of cement, and join them with linen hinges to the tailplane. Cement the assembly onto the fuselage, and be sure that the elevators take the neutral position simultaneously.

Form the fuselage rear with a soft block, as indicated, and sand the entire fuselage with coarse sandpaper. Cut the fins from $\frac{3}{16}$ in. sheet and cement them to the tailplane, at right angles, with plenty of cement.

Start the nacelles by cutting out all the parts. Assemble these by first cementing NB and NC to the engine bearers; note that the U/C components must be bound to the formers before the latter are cemented to the bearers.





Two more views of the original model.

Next, cement the fuel tank in place, then join the nacelle nose assembly to the wing, by marking out its position on the underside of the wing, and cutting a slot in the sheeting for the tank.

Cement the nose assembly in place with the bearers at neutral and when dry, add the two $\frac{1}{8} \times \frac{3}{16}$ in. crutches and the remaining formers. After the nacelle is planked with $\frac{1}{8}$ in. strips, add former NA and the block at the rear.

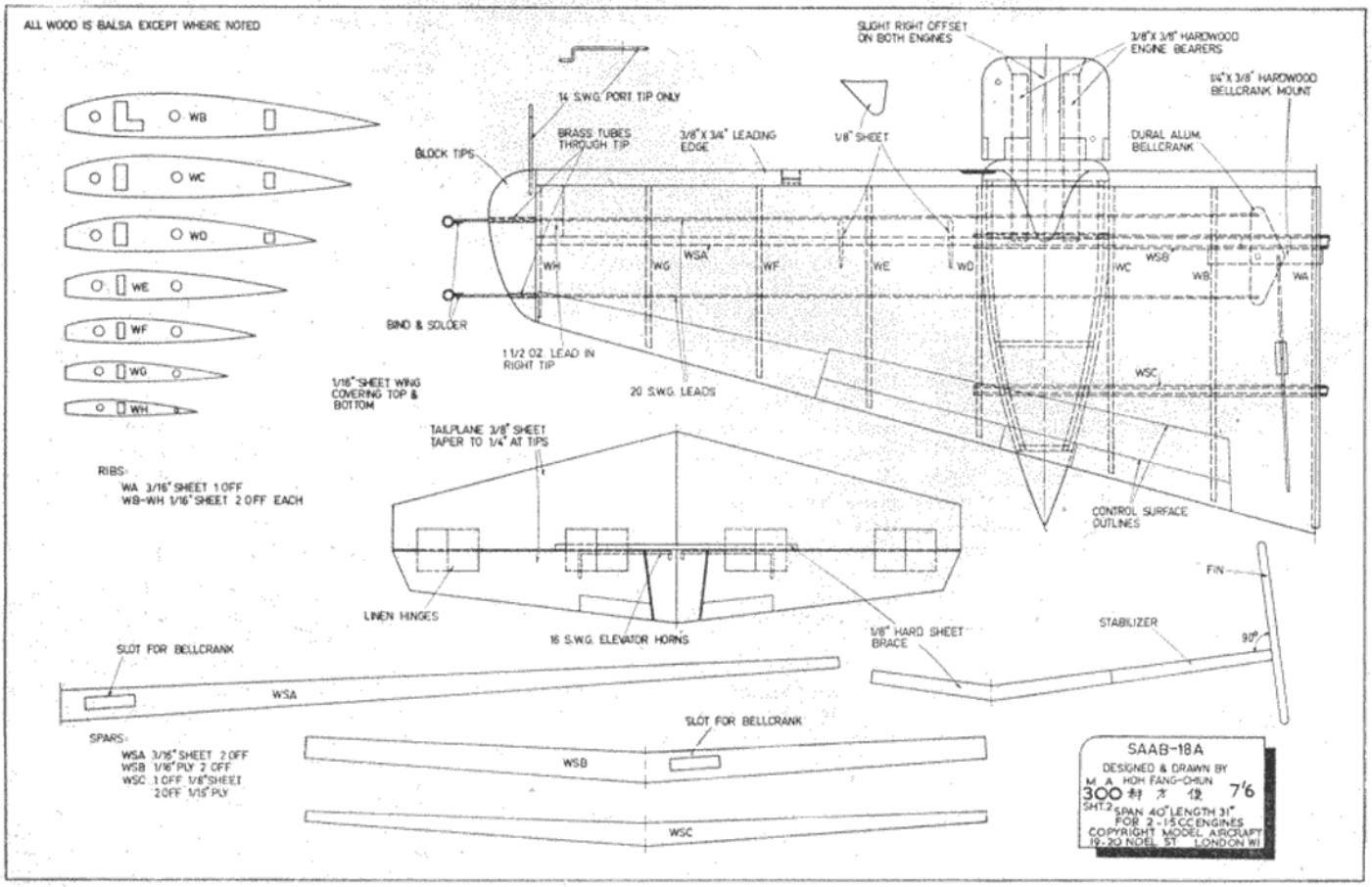
The engine cowling is carved from block and then divided into two halves. The lower half is cemented permanently to the bearers and former NA, while the upper half is detachable. To hold it in place, you can either spot-cement or use two dress-snaps placed diagonally, and, to prevent movement, two $\frac{1}{8}$ in. hardwood dowels, cemented to the upper half, are inserted into holes in the lower.

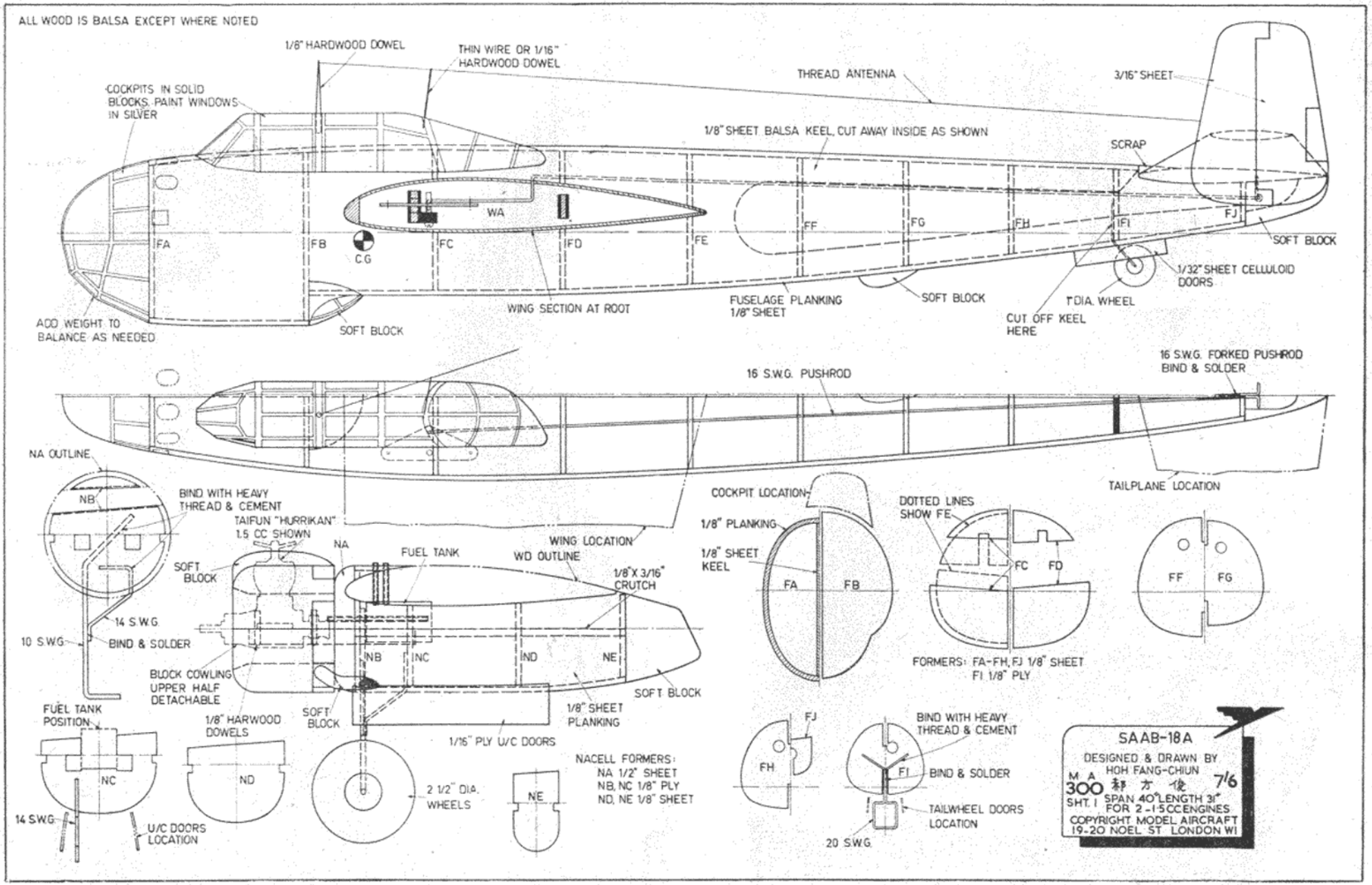
Install the engines, don't forget to offset both slightly outward (right), and make an initial balance check. The model should balance on the leading edge at this stage, but if it doesn't, add lead weight in the fuselage nose block. When this c.g. position is correct, cement the nose block, and the remaining cockpit blocks, in place and give the whole model a final sanding.

Finish the model by first giving all the surfaces several coats of sanding sealer to fill the grain, sanding down the sealer carefully after each coat. When you have a smooth surface, cover the entire model with lightweight tissue and apply another coat of sanding sealer. After a final sanding, the wheel doors and other scale details can be added, and the model is then given several coats of clear dope before colouring.

The colour scheme is blue-grey on the lower surfaces and olive-green on the upper surfaces and fins. Dope the whole model first with the light colour, and then the upper surfaces and fins in dark colour. The cockpit windows and control surface outlines are then masked off by tape and painted with one thick coat of their respective colour. Finally the Swedish national markings, in blue and yellow, are painted directly onto the model with compasses and a fine brush.

Before you go out to fly, be sure that the c.g. is located as shown on the plan, and that the controls move freely. Choose calm weather for the first flight and don't use too long a line length—40 ft. of heavy Laystrate wire is about right for 1.5 c.c. engines, while 50 ft. or so can be used if there are 2.5 c.c. engines in the nacelles.





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ROVING REPORT

Brings you up to date on the latest world model news

Place winners at the European F/F Championships, Bucharest. They are (left to right): Babic of Yugoslavia (3rd), Verbitki of Russia (1st) and Hints, Rumania (2nd).

OUR "Inside Information" department tells us that British made, ready-to-fly C/L models are definitely going to burst upon the British market in the not too far distant future. These look like being very much on the American pattern (one of the plastics manufacturers at present making scale plastic kits is planning to use American dies) and the engines will also be U.S. type glow 049s.

The diehards are not going to jump for joy at this news. We can only reply: "Let's be philosophical and wait and see." We do not believe that the popularity of the "genuine built-up" model will decline when these "toy" models become available: rather, we hope that they will encourage more potential young modellers to our ranks. In the United States, plastic "ready-mades" sell by the million annually and they haven't killed the model movement yet. On the contrary, they have served a useful purpose in acquainting vast numbers of youngsters with miniature i.c. engines.

Plastic ready-made power models are, of course, practically unknown in this country. Last year, however, M.A. featured an illustrated description of the Cox Pitts Special biplane, powered by a Cox Pee-Wee motor and, recently, a limited number of Comet models were imported for the Christmas store trade. Now, it has been our good fortune to sample another interesting American plastic, the attractive Wen-Mac *Turbo-jet*, which is fitted with the Wen-Mac Mk. II 0.8 c.c. engine described elsewhere in this issue.

This model spans 15½ in. and is 13 in. long. It is moulded in a flexible plastic called "Dura-flex," which is both tough and resilient and will withstand a great deal of the mishandling to which a beginner's model is inevitably subjected. Everything has been done, in fact, to make the model as near foolproof as possible: the provision of an excellent recoil starter being another case in point.

Basically, the model consists of five main components: upper and lower fuselage halves, wing, tailplane and elevator. These are interlocked and two screws, through the bottom of the fuselage, fore and aft, serve to hold everything together. A tricycle undercarriage, with rubber-tyred plastic wheels, is used, the two components being locked between the fuselage halves. The bellcrank is mounted on the centre section of the wing, enclosed in the fuselage, and the pushrod and elevator horn are also entirely enclosed. The beam-mount engine sits on four lugs moulded in the bottom fuselage shell and is held down by three flat-head Phillips screws threaded into brass inserts moulded in the plastic, so that the need for nuts is eliminated. Adding to a "turboprop" appearance, the model is equipped with a three-bladed, square-tipped prop (4½ in. dia., 3 in. pitch, nylon) and a neat "air-intake" spinner.

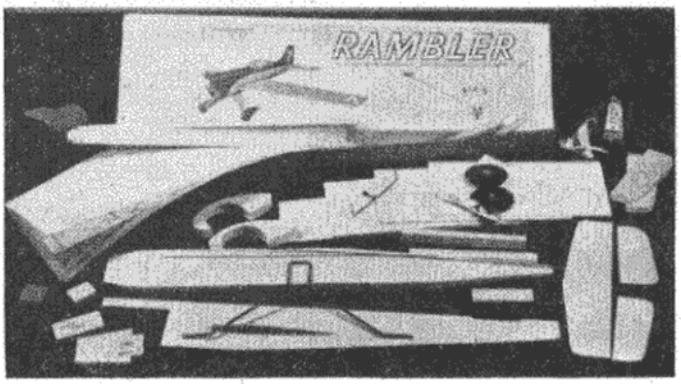
The bare model weighs a little over 4 oz., which, with engine, prop and spinner, is brought up to a total of slightly more than 6 oz., for a gross wing area of about 36 sq. in. The wing-loading, therefore, is quite high at around 24 oz./sq. ft., but this is compensated, in some measure, by the fact that the wing is single surfaced and deeply undercambered.

Several other types of plastic, power-driven models are manufactured by the Wen-Mac Corporation. They include two scale model aircraft: a Vought *Cutlass* pusher and a Beechcraft *Bonanza*, inboard and outboard speedboats, an Indianapolis type racing car and, most unique of all, a ducted-fan Hiller flying-platform.

* * *

In an interesting article in *Model Airplane News*, recently, Larry Conover, noted American F/F exponent, analysed Clipper Cargo model trends and also provided a data sheet tracing the development of these models over the past eight seasons.

From this, we observe the following facts. Firstly, as one might expect, cargo weights have gone steadily upwards —from 14 oz. in 1951 to no less than 54 oz. (by Don Gurnett) in 1958. Wing areas have also increased tremendously: 300 sq. in. in 1951, 400 in '52, then



One of three Australian-made "Aero-Flyte" kits recently inspected: the "Rambler" team racer for 5 c.c. class engines.

remaining at 500-600 during 1953-56 and, now, during the past year or so, a sudden spurt to areas of up to over 1,000 sq. in. Bare model weights, of course, have also gone up appreciably. In 1952, helicopter expert Parnell Schoenky's weighed only 6.3 oz. In 1955-56, Wright, Lang and Blanchard had added 5-6 oz. to this, but had tripled the payload. Last year, the 1,000 sq. in. models soared to 20 oz.

Actual loaded flying weights have gone up from 20.3 oz. in 1952 to a staggering 74 oz. (yes, 4 lb. 10 oz.!) in 1958. Remember, all these models are using only 0.049 (0.8 c.c.) engines! The Cox Thermal-Hopper is, of course, the "stock" engine for this event. A little surprisingly, perhaps, standard size 6/3 props are used on these 7 ft. (and larger) models. Evidently, nothing is to be gained by increasing diameter, even slightly, and either tolerating a reduction in r.p.m. or reducing pitch. Engine speeds, 12,500 r.p.m. in 1951 and 14,500 r.p.m. in 1954, are now topping the 18,000 mark—right on, or, perhaps, a little over, the peak of the power curve.

One is left wondering how the cargo experts can possibly improve on the remarkable performances they have now achieved. We cannot reasonably expect much more power than the Thermal-Hopper gives. Is the solution to be found in a geared engine?

The last important international event of 1958 was the European F/F Championships event held this time in Rumania. Here are three members of the successful Russian team. Centre is Abramov, who was second in last year's contest in Moscow.

Up and coming Czech Wakefield flier is Eduard Chlubrny of Brno, seen below with his finely constructed model at the Czech Nationals.

* * *

Until recently, Japanese R/C modellers laboured under the difficulty of not having an examination-free frequency—a problem that has beset modellers in most countries at some time. This is said to have retarded the development of R/C in Japan—at least, from the popularity standpoint: actual production of R/C gear has progressed quite favourably, aided by exports to the U.S. and elsewhere.

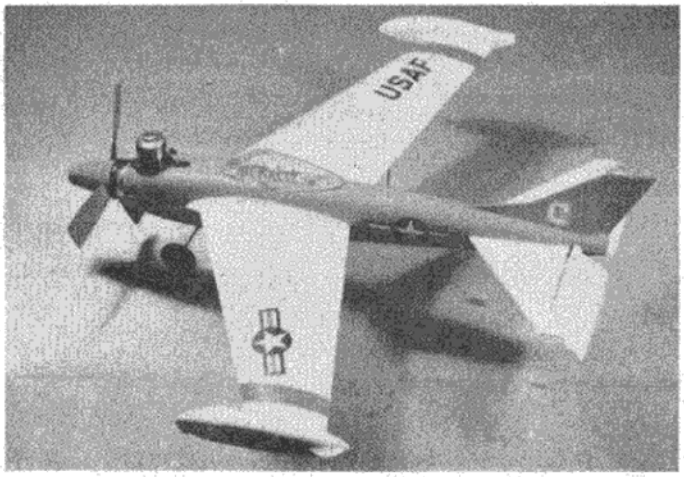
Now, however, Japan has three "free" frequencies for model R/C use: 13.56, 27.12 and 40.48 Mc/s, and it is expected that this branch of model flying will expand considerably in the future, particularly so because there are very few suitable large open spaces available for serious F/F work in Japan.

* * *

Despite the fact that large quantities of imported model goods are sold in Australia, the range of Australian made kits, accessories, etc., is steadily expanding. Recently, Southern Model Supplies Ltd. of Springbank, South Australia, sent us three kits from their range of "Aero-Flyte" models. Named *Nimbus*, *Vulcan* and *Rambler*, there are, respectively, a simple 30 in. glider, a 30 in. stunt/combat model for 2.5 c.c. power, and a Class B team racer.

These kits are, in most respects, comparable in quality with similar English kits. Printed sheets are used in all three, but there is a certain amount of prefabrication. In the *Vulcan* kit, fuselage sides, horizontal tail surfaces and ply formers are ready cut out and ribs are bandsawn in a block. The *Rambler* kit includes a moulded sheet plastic cowl. Both these kits have ready formed undercarriage struts and all three are very complete, containing rubber-tyred, dural hub "Aero-Flyte" wheels and all hardware, including nuts and bolts.

The American Wen-Mac "Turbojet" plastic C/L model. Similar ready-to-fly models are expected on the British market this year.



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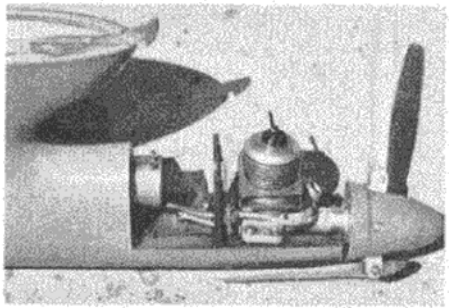
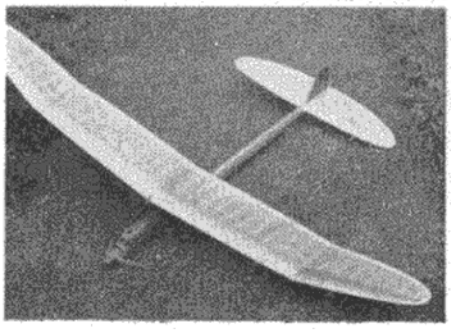
We often wonder whether contest prizes (as distinct from cups, etc.) are really necessary. There was, admittedly, quite a rush, at first, for those very generously donated P.A.A. gold watches, but we believe that it would be true to say that the majority of modellers fly in contests in the hope of achieving the satisfaction of being top dog and the prize, if there is one, is of secondary importance.

However, we are not so sure that this would be the case if prizes were on the lavish scale of those sometimes awarded in contests abroad. Motorcycles, refrigerators, TV sets, cameras and radios have lately been awarded in Russian-sponsored contests, while, in America, cars and even light planes, as prizes, are not unknown. Would some philanthropic soul care to try the effect of offering a Jaguar XK.150 as a first prize at the '59 Nationals?





Right: East German Hans Neelmeijer's variable incidence International class power model, which, in many respects, recalls earlier trends. Elliptical surfaces, cowled engines, retractable undercarriages and folding props have all been used before, but abandoned by leading contest fliers in favour of simplicity. Variable incidence wing is unique, however; low angle for climb; high angle for glide.

L. DUTTON tells you how to run –

THOSE GARDEN FETE DISPLAYS!

One often reads in Club News that so and so M.A.C. recently gave a flying display at the local church fête, but are they displays or just another afternoon's club flying ? After two years of display work, involving a dozen events, I can assure any organiser that a slipshod pile of models and flyers is a waste of spectators' time and your fuel, but if you want to put on a proper show which will benefit your club and really hold the interest of the spectators, then the following notes should help.

NEARLY every church holds a garden fête, and the first step towards staging a display there is to get in touch with the fête organising committee early, so as to get the show booked weeks ahead of the date. This will give you free advertisement on the posters and in the local Press.

Before the booking is made final, make sure that you have enough space to perform, remember that 50 ft. lines need a 50 yd. circle, to allow a good safety margin between spectators and models.

With the initial arrangements in hand, a letter to one or two trade distributors and manufacturers will bring posters and leaflets of their respective products, and please don't forget to enclose the return postage. A little courtesy goes a long way and doesn't cost a lot.

As the great day approaches, work out the flying programme and the time at which you will perform, also organise pit crews and make sure that everybody knows, and will adhere strictly to, the programme.

Now to the day. Before and after the actual flying display all models taking part, and any others that you can get together, should be on exhibition for the public to see and admire. A model standing on its actual plan is a very useful fill in, or if it is a kit design, an opened kit box, showing what the machine was built from, will excite attention. Two trestle tables covered with trade posters or corrugated cardboard will probably be required.

You *must* cover the tables. Besides looking better, the covering will keep the inevitable oil spots off—and they may be required as a dining table later ! A few sheets of crêpe paper round the front and sides fill in the gaps, add a professional air to the whole layout, and leave somewhere for the pit crew to put their lines, fuel bottles and all other oddments, away from inquisitive fingers.

As the flying time draws near, the pit crews must get to work, laying out *one* set of lines for each pilot, with his favourite handle attached. A pilot can only fly one model at a time, so why have lines lying about all over the place ?

Put the models that are to be first and second away on the lines and on the word go, get the first model away smartly. This should be an impressive, slow, large tanked model, that will keep the spectators happy for five minutes. The second model is now got ready and is flown immediately the first one lands, and so on to the third, this way the display continues smoothly and efficiently. Don't panic at all costs, if a model gives any trouble, put another up straightaway.

" It's the same the whole world over," a good model will always attract a crowd, as our heading photo, taken in Czechoslovakia, shows. Even at a C/L display it is not necessary to restrict the static show to C/L models, any well-built machine is an attraction.

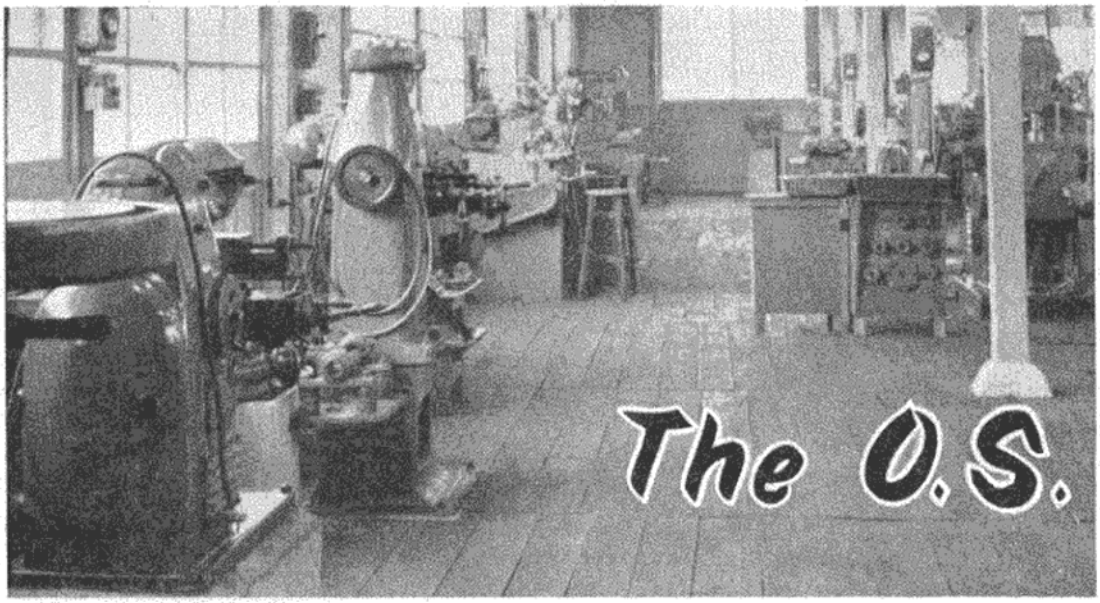
At many of the events I have organised, three keen modellers have kept the crowd on their toes and four appear to be the maximum necessary. Mix up the flights as much as possible, stunt, semi-scale and fast sports models will give plenty of variety, and then bring on the largest model you have. Most of the spectators are waiting for this, and while it is performing, put two combat models on the lines ready with streamers and squeeze bottles full.

A useful tip is to have all squeeze bottles with the same spout, and tank fillers on the models identical; this pays off time and again. The first combat model to start goes up, and while the spectators are wondering what the streamer is for, get the other up, they'll soon catch on. Near misses look better than cuts and if you match a good little model against a large noisy job, let the small chap win, any crowd will support a good littl'un.

After one or two jousts the crowd will gradually drift away and now you must finish. The hour's entertainment is over, and you'll probably find it has stretched into 90 min. Surprised ?—you try it.

Clean the models, get them back on the stand, and leave two people behind to reel up the lines and collect

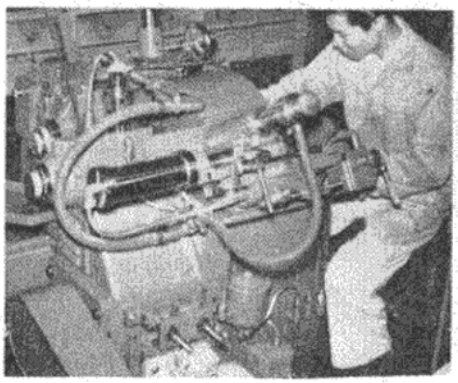
Continued on page 66



The O.S. story

The history of one of the leading model engine manufacturers is told by Peter Chinn in . . .

SIX years ago in M.A. we described a Japanese engine, called the O.S. 29, loaned to us by a R.A.F. modeller who had obtained it from a U.S.A.F. friend in Japan. At about the same time, Bill Atwood, the noted American model engine pioneer, who has secured the U.S. concession for the O.S. 29 from the makers, the Ogawa Model Manufacturing Company, began advertising this motor in the American model magazines.



Production of O.S. model engines is now at the rate of many hundreds per week, aided by modern machinery such as this centreless grinder.

So did the name of O.S. first become known to modellers in the western hemisphere. But it was not until the Max series of O.S. engines started to appear in contests from 1955 onwards and, in particular, Ron Draper's World Championship win with an O.S. Max 15 in 1956, that the majority of modellers began to sit up and take stock of this "new" make. In actual fact, the O.S. story starts some 20 years earlier.

"O.S.," reversed, are the initials of Shigeo Ogawa, founder, designer and present owner of the firm that bears his name. Ogawa has been a model enthusiast since his childhood days and first started by making rubber-driven models back in 1931. Even in these early days, however, the idea of using a small internal combustion engine to power model aircraft was much in his thoughts, and, during this period, he was shown an English model engineering book which described, among other things, a flash steam plant and a petrol engine suitable for boats. "For me, then, to make similar items was too expensive," says Ogawa, "and, besides, it seemed too hard, technically." He was about 15 at the time.

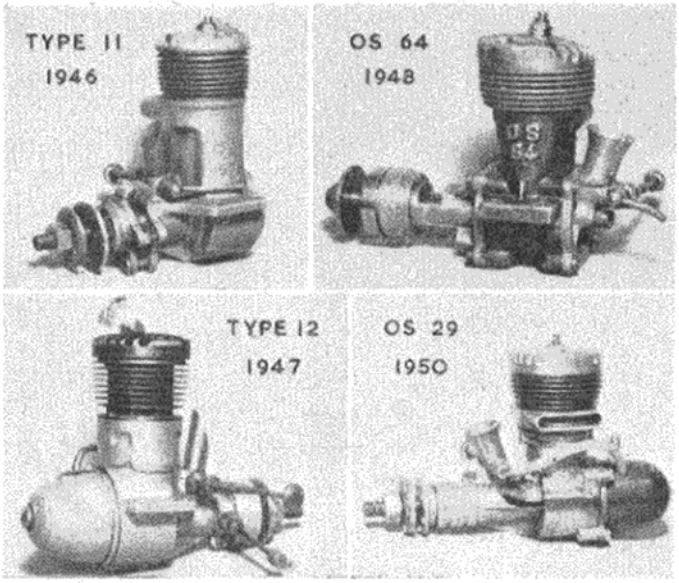
In 1935, Shigeo Ogawa finished a technical school education in Osaka and started work as a furniture designer. Early in the following year he set up an American lathe and drill press in a corner of a warehouse. With this equipment he quickly realised some of his earlier ambitions and built a number of model steam engines, locomotives and model railway equipment. He also made a high quality miniature pressure gauge and, soon afterwards, he commenced selling his products in modest quantities to modellers and shops in Japan.

About this time, Ogawa learned of the existence of the Brown Junior engine on the American market and he began to think again of petrol-engined model aeroplanes. Unable to obtain an American engine, he studied photographs and descriptions of the Brown and other early U.S. motors then beginning to appear and, eventually, embarked on the construction of an experimental shaft-rotary-valve engine.

First efforts with this engine were not very encouraging. Ogawa could not get it to start with a propeller and so resorted to a flywheel and, on this, it overheated quickly. But these were but minor inconveniences when viewed against the fact that the motor actually worked! He therefore converted it to water cooling and installed it in a model launch. This caused quite a sensation among the model boating fraternity in Japan, for, although the engine's maximum r.p.m. were only a modest 3,500, it was considerably faster than the steam-engined boats then being used.

Both engine and boat (called "Kamone," or *Seagull*) can still be

Shigeo Ogawa (left) and a group of his employees during early R/C testing. Many of the O.S. staff are keen modellers.



Early post-war O.S. engines: 1946-50. The 29 was subsequently sold in large quantities in America by the Atwood company.

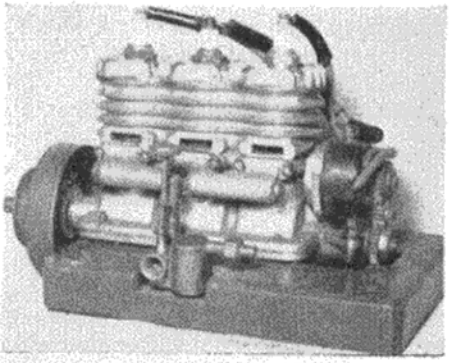
seen at the Ogawa factory in Osaka. The company must, in fact, be almost unique, among present day model engine manufacturers, in that examples of practically every different design built are still preserved.

The very first O.S. model i.c. engine to be marketed was the outcome of a meeting between Shigeo Ogawa and a Mr. Houton, an American living in Japan. Houton gave Ogawa two American engines for study and suggested that a new small engine should be designed and built, for which he would find a market in the U.S. Subsequently, Ogawa produced the " Pixie " engine, designated O.S. Type 1. This was a three-port engine with bore and stroke of 12.75 × 13.0 mm. and was certainly one of the smallest (1.66 c.c.) model engines produced at that date (1937-38). It has a bronze bearing, a compression ratio of 4.5 : 1, weighed 4 oz. and turned up a modest 4,000 r.p.m. on the standard prop. It was handled by International Models Inc. of New York and was sold with a Nathan Smith ignition coil and Champion ¼ in. sparking plug. Twenty or 30 of these engines were made per month. Production of steam engines continued.

In 1938, the enterprise, now known as " Ogawa Seisakusho," or " Ogawa Manufacturing Works," grew to a staff of three—Shigeo Ogawa and two employees—and a second engine was introduced. This, the O.S. Type 2, was a much larger unit, 6.92 c.c., with a bore and stroke of 21 × 20 mm. It was named " Buick " —presumably after the well-known American car. This was a shaft induction motor and was fitted with a German Bosch plug. Only 50 of these engines were made, about 30 of them going to the U.S., the design then being succeeded by the 7½ c.c. Type 3 with a bore and stroke of 20.8 × 21.8 mm. This reverted to piston controlled induction, but had various refinements and monthly production now rose to between 50 and 80 units, aided by an increasing domestic demand. This was now sufficient to allow attention to be concentrated on model i.c. engines exclusively and steam engine production was dropped.

Over the next three years (1939 to 1941-2) many other types of engines were made. Type 4 was, in effect, a scaled down version of the Type 3, having a bore and stroke of 18 × 18 mm. and a capacity of 4.58 c.c. Type 5 was a radial-mount, water-cooled engine of 5.4 c.c. Types 6, 7 and 8 were all large engines of 23 mm. bore and with displacements of 9.35, 9.35 and 9.50 c.c., respectively. They were all three-port type engines with well-shaped, close-finned cylinders, short, bolted-on streamlined exhaust stacks and having a neat bell-mouthed carburettor body cast in one piece with the fuel tank top, *a la* Ohlsson Custom-60 of the period.

World War II brought to a temporary halt, the Ogawa works' model activities. Shigeo Ogawa was called up and saw service in Malaya and Thailand. During his absence, his father took care of their small factory, which, between 1943 and 1945, produced radio aerials for aircraft.

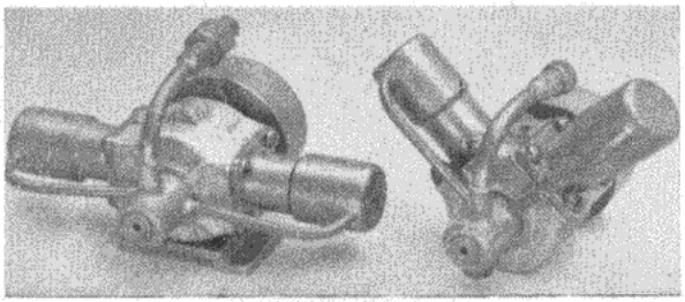


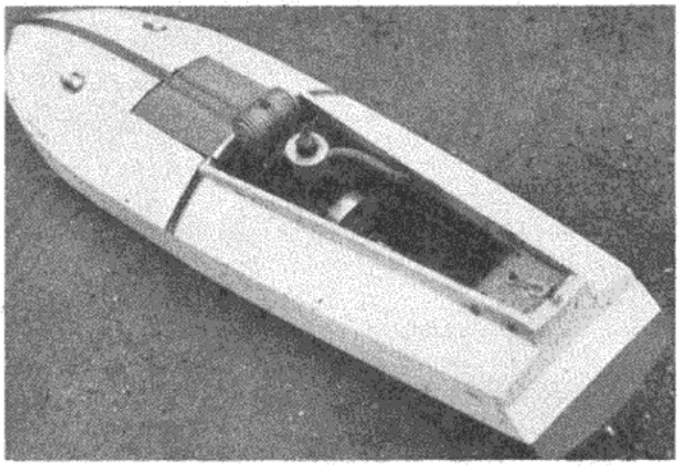
Among many unusual O.S. experimental engines was this monobloc three-cylinder two-stroke marine motor made in 1940.

Shigeo returned to Japan in June, 1946, to find his home destroyed, but the factory still intact. He immediately set about designing a new engine and recruiting employees.

The first post-war engine was the O.S. Type 10. It had a bore and stroke of 23 × 23.5 mm., a swept

Left are some of the trophies won by O.S. employees, members of the " Telmic " Club, during 1955. Right: The Ogawa Model Manufacturing Company Ltd. factory at Osaka as it is today.

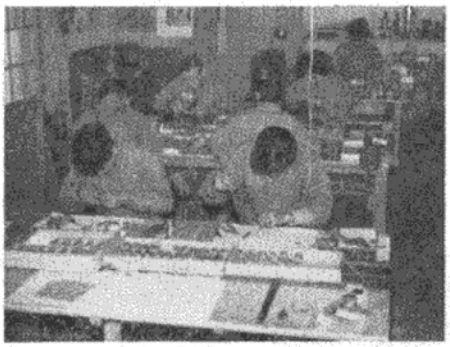




Above: Early Ogawa products included these twin-cylinder steam engines.
Right: Ogawa's first model i.c. engine, made in 1936, was used in this model boat, "Kamone." Both engine and hull are still in existence.

volume of 9.7 c.c., shaft induction and circumferential porting. It was certainly one of the very first large engines to use 360 degree porting : Ogawa had, in fact, used this even earlier in the experimental Type 9, on which he had also tried disc and reed induction.

With American Service personnel stationed in Japan and many of them model aircraft enthusiasts, interest in power-driven models received fresh impetus. Ogawa, too, was very much impressed by the high-speed performance of the new post-war American engines and was moved to



A corner of the R/C assembly department.

design two new engines, peaking in the region of 10-12,000 r.p.m. and utilising diecast parts. One of these, the Type 11, or O.S. "57," was a 9.3 c.c. loop-scavenged engine with shaft induction, big ports and a heavy duty contact-breaker. The second, the Type 12, was a 9.85 c.c. unit with shaft induction and circumferential porting.

These were followed, in 1948, by a pukka racing "Sixty," the O.S. "64" of 10.4 c.c. It had a bore and stroke of 25.3 × 20.6 mm., twin ball-bearing shaft, disc valve induction from a large inclined carburettor and all the usual structural features of the typical racing model two-stroke.

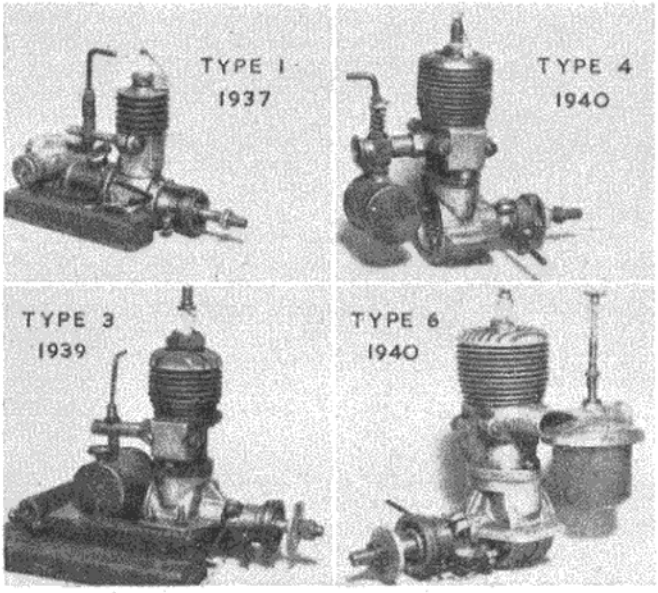
The real turning point came, however, with the introduction of the O.S. 29. This shaft-valve, radially-ported glowplug engine first saw the light of day in 1950. Good looking, powerful and easy starting, it found a ready sale among both Japanese modellers and the U.S. forces. Soon, five to 700 of these engines were being turned out monthly and employees increased to 15. Bill Atwood, who had entered the Half-A Class market with his Wasp engine, although still then making his C and D Class Triumph engines, was quick to appreciate the 29's possibilities for the American B Class market and began importing them in considerable numbers. The engine was improved in minor detail and finish and was joined, in 1951, by the little 1.6 c.c. "099" and by the "36" of 5.9 c.c. in 1953. During this period, production reached 1,300 units per month, up to 600 of which were exported to the U.S.

In 1954, the first of the Max series was put on the market. These engines, made in three sizes : "15" (2.5 c.c.) "29" (4.9 c.c.) and "35" (5.8 c.c.) and in both standard and "Multi-speed" versions, are too well-known to need further description here. They have been steadily developed and improved each year and are now rated among the world's best in their respective class. Demand for O.S. engines is such, that, even with a production rate now closely approaching 1,000 a week, importers frequently cannot get enough of them.

There are appointed O.S. agents in the U.S.A., Canada, Australia, South Africa, Germany, Italy, Switzerland and Brazil. Engines are also sold to many other countries via various export firms and a limited number of O.S. motors will come onto the U.K. market, this year, through one of our biggest model firms. Two years ago the Ogawa Model Manufacturing Co. Ltd., as it is now called, moved to new premises. On a 21,000 sq. ft. site, the main building has a floor space of 7,300 sq. ft. and over 30 people are now employed.

Since 1955, the company has also been producing many types of model R/C equipment. During 1958, four different transmitters and four receivers were in production, ranging

Continued on page 47



Pre-war O.S production engines included these four petrol motors, ranging from 1.66 c.c. to 9.35 c.c.

Topical Twists

by PYLONIUS

Olde Tyme Flying

Those people who suspect aeromodellers of being slightly touched become completely convinced of it upon reading in the popular Press that the premier modelling award is competed for by models powered with elastic bands. Such denizens of the jet age can be excused for thinking this form of primitive toy power went out with crinolines, or whatever it was that enabled big sister to keep small brother in good supply of the stretchy stuff. No doubt they happily thought of us playing contentedly with our model sputniks and miniature *Comets*, and it must come as a shock to them to learn that we are still deeply entrenched in the bow and arrow scheme of things.

But the bow and arrow modeller might not be so daft as they might think. The fate of the modernistic power modeller is only too well known. He has only to approach to within flicking distance of an open space to have the vigilantes out in force. Park-keepers, local councils, ratepayers and other public-spirited citizens fight for the privilege of being the first to kick him off. But who's going to take exception to the presence of some harmless nitwit with an elastic powered toy? People generally show great tolerance towards dogs and children, and the elastic band model fits unobtrusively into the general playground picture of scampering bow-wows and hula-hooping kiddies. So, if the rubber modeller is regarded as a rather old fashioned child he's better off than his power counterpart. After all it's not much good being a space age flyer if you've only got plenty of age but no space.

Then there are other advantages in being a rubber modeller. If, for example, you and Joe Bloggs are flying models with similar engines, you haven't much of a face saving excuse if the Bloggs model out-performs yours by umpteen minutes, but if his rubber job knocks spots off your deck loving effort you can always plead rubber fatigue, or threaten to take proceedings against the local model shop for selling coloured string as rubber strip.

And if Joe Bloggs happens to be an expert, so much the worse for him. Instead of just going green with envy at the sight of him collecting the hardware you can accuse him of using that super special brand of rubber available only to experts. Waving your "Unfair to Beginners" banner under his nose you can ask him how he'd like to buy his rubber over the counter. He'd probably reply that he'd very much like to, but as this contest-going keeps him short of ready, he'll just have to keep going with his three-year-old stock.

Carnival Capers

Being an urbanised sort of character I'm apt to be a bit shaky on my folklore. For one thing I'm completely boggled by all those annual frolics they go in for out in the hayrick territory, whether it's the ceremony of rolling a stale muffin from the Red Lion to the parish pump, or roasting the Squire on the village green. So, you must excuse my ignorance in not knowing what a Feast Week is, apart from it being some yearly caper they cut down Cowley way. At first I thought there might be some connection between the Cowley Feast Week and the jolly old custom of feeding our bovine friends with chewy model fodder. But as this latter practice is peculiar to far away Wigan I can only presume that the Cowley Feast Week is some annual picknicking jaunt in vintage cars.

Anyway, whatever it might be the local model club didn't allow themselves to be overwhelmed by all the feasting and flap-doodle. They made a stand. Such a good one, in fact, that it won a first prize. Just goes to show how people are taking to eating good nourishing balsa.

The Give Away

There's been a lot of talk about experts lately, and from all accounts the pot lifting profession is not one to be envied. Perhaps because of the abuse so freely bestowed upon his size 8 head the expert prefers to go about his prize-winning business with the minimum of fuss and publicity. Often the only way you can tell the expert from the rawest beginner is that he's the one who comes away from the model rally with a 3s. 6d. beginner's kit tucked under his arm.

In that more prodigious country, America, the expert enjoys a more sumptuous way of life, cashing in on the big-time prizes. Not that the prizes are quite on a par with the yacht and aircraft rake-off of the quiz winners, but you could hardly expect the same reward for chucking a model into the air as for brilliantly knowing that Washington is the capital of the U.S.A. Nevertheless, a brand new car is not to be sneezed at, and that's the sort of hand-out they give the experts across the pond.

Perhaps this might give our own contest organisers something to think about. Perhaps in the future our comp winners will not be insulted by having to leave the field with nothing better than a model glider kit, but be given a plastic car kit instead.

Wide Closed Spaces

I don't know very much about Australia, except that it's full of sheep and Wakefield winners, and that if my power job pranged in hard enough, some unfortunate lamb in that inverted country might gambol a little more vigorously than its mates. However, I've always believed, in my own little innocent way, that it was a sort of modelling paradise. All you had to do, I thought, was to hop on your horse, gallop off into the outback, clear a space in the sheep, and you'd be all set for a spacious day's flying.

What a far cry this would be from our own tight little island, where conditions are so cramped that there's hardly room to swing a 6 × 4 prop—and heaven help you if you try! But I quickly changed my fairy tale ideas about the land of the kangaroo when I heard about that letter from an Australian modeller, in which he almost wept with gratitude at being given the use of a C/L site for two hours on one Sunday per month. This seems to put the "down under" modeller in much the same boat as ourselves, but we, at least, have the consolation of not being able to fly on the other three Sundays anyway—too wet.

SKETCHES BY—ALI

AVIATION NEWSPAGE
Plane of the month

The SAAB - 18

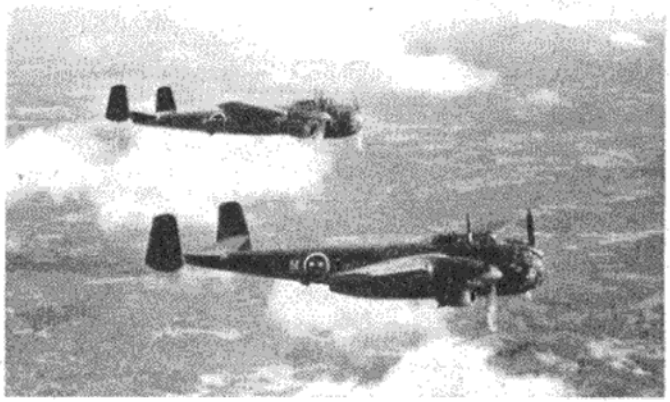
WHEN Saab undertook the development of a dual-purpose dive-bomber and long-range reconnaissance aircraft for the Royal Swedish Air Force, in 1939, the result, the first twin-engined aeroplane designed in Sweden for more than 20 years. Designated Saab-18, it bore a superficial likeness to the German Dornier Do 17, but was somewhat smaller; and when the prototype flew for the first time in 1942 it proved considerably faster, with a top speed of 290 m.p.h. To this performance was allied such load-carrying capacity and versatility that the Saab-18 remained in first-line service for 15 years.

The prototype was a conventional mid-wing monoplane, powered by two 1,065 h.p. Swedish-built Pratt & Whitney R-1830-SIC3G Twin Wasp radial engines and with a slotted dive-brake under each wing, outboard of the nacelle. Pilot and radio operator/rear-gunner sat in tandem under a continuous canopy offset to the port side of the fuselage, with a glazed nose position for the bomb-aimer. Armament comprised one fixed forward-firing machine-gun in the starboard side of the nose and upper and lower manually-operated guns at the rear of the cabin. Bombs were stowed internally in a weapons bay in the centre fuselage.

Like most Saab designs, the bomber seems to have been a success from the start. It went into immediate production, and the first of 60 Saab-18As was delivered in 1943, to replace the R.S.A.F.'s Ju 86Ks, some of which had been bought in Germany and others built by Saab. The bomber version was given the service designation of B18A, with the reconnaissance version known as the S18A.

It was decided within a few months to step up the aircraft's performance by re-designing it to take two 1,475 h.p. Daimler Benz DB 605B liquid-cooled engines, and the R.S.A.F. ordered 120 of this version under the designation of B 18B. Top speed went up to 355 m.p.h., which made it one of the fastest all-metal light attack bombers in the world when deliveries began in the summer of 1945.

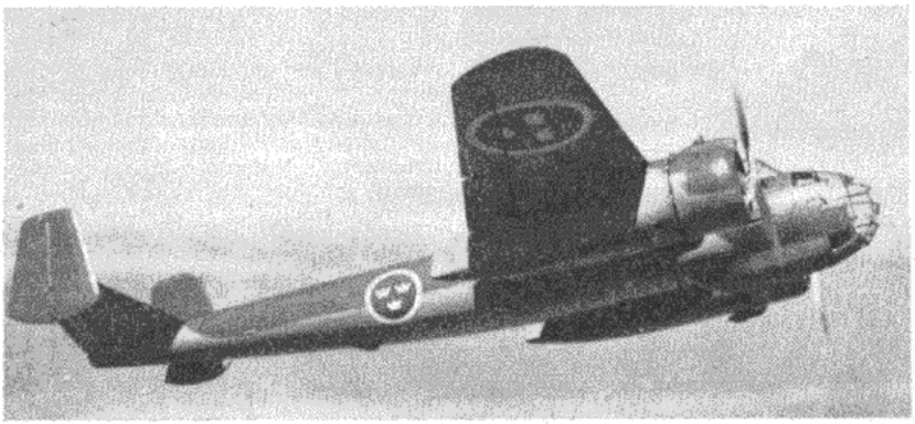
A second major modification of the basic airframe produced in this same year the prototype of a new version, designated T 18B, with considerably heavier armament. Externally, it could be identified by the more bulged under side of the fuselage nose, which housed a 57 mm. Bofors cannon in addition to the normal 20 mm. cannon and bombs or a torpedo for anti-shipping strikes.



The heading photo and that above show the Saab 18-B, while below left is the 18-A version featured in our C/L plan on page 35.

Sixty T 18Bs were built before production of the Saab-18 ended in 1948, and even after that the design underwent further development. In January, 1949, it was announced that all B 18B and T 18B aircraft were being converted into two-seaters for attack duties only, and that ejector seats were to be provided for the pilot and navigator/gunner. The A also continued in service in the reconnaissance role, with an undernose radar container, and, in fact, survived the later models as the last squadron did not begin to re-equip with Saab-32 *Lansen* jet aircraft until a few months ago.

The following data apply to the S 18A: Span: 55 ft. 9 in. Length: 43 ft. 5 in. Height: 14 ft. 3 in. Wing area: 471.28 sq. ft. Weights empty: 13,450 lb.; loaded: 17,960 lb. Max. speed: 289 m.p.h. Cruising speed: 258 m.p.h.



J. W. R. Taylor's

AVIATION NEWSPAGE

POPSIE-PLAYBOY PARTNERSHIP above is one of the prettiest sights in the skies around Long Beach, according to photo sleuth Bob Archer, who snapped it recently from the back seat of a T-6 (*Harvard*). The pilot is Joan Trefethan of Lomita who, like more than 200 other enthusiasts, built her single-seat *Playboy* from plans supplied by Stits Aircraft. Finished in high-gloss white and orange with fine black trim, it has several non-standard refinements, including a one-piece plexiglas sliding hood.

The standard *Playboy* has an 85 h.p. Continental flat-four engine, spans 22 ft. 2 in. and weighs 902 lb. fully-loaded. Top speed is 150 m.p.h., cruising speed 135 m.p.h. and take-off run under 100 yds. in a 10 m.p.h. wind.

* * *

NEW TREND in paint schemes for U.S. executive transports is illustrated by one of Douglas Aircraft's *Aero Commander* 560 light twins. To make it more visible in crowded air spaces, the wing-tips, fuselage nose, fin and tail-plane are finished in Da-glo fluorescent red.

The idea originated with the decision to paint all U.S.A.F. non-combatant and experimental aircraft in this way. Seen on machines the size of the huge Douglas C-133 transport, the effect was so startling that civil operators began to follow suit. Already New York Airways' Vertol 44B tandem-rotor helicopters are sprayed liberally with fluorescent rocket red, and as the paint-scheme is said to need renewing every two months or so, Da-glo shares should be a good investment.

* * *

BUILT IN SIX WEEKS, the Hindustan *Pushpak* gives further proof of the growing capabilities of India's aircraft industry. Wisely, its designers chose a traditional high-wing monoplane configuration, and the result looks inevitably Auster-like; but it is claimed to be entirely home-produced and will even be re-engined shortly with the first Indian-built aero-engine.

Few details of the two-seat *Pushpak* are available; except that it cruises at 90 m.p.h. for just over three hours. It flew for the first time on September 24th last year and is intended for both civil and military use.

* * *

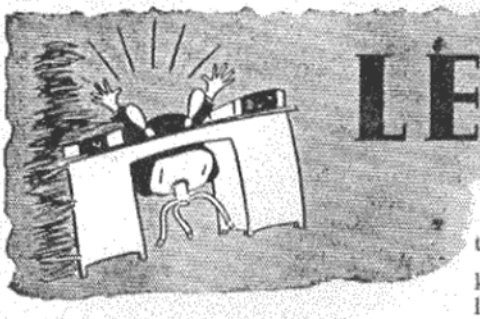
SURPRISING NEWS from Hindustan is that the company is developing a fighter aircraft, powered by an advanced version of the Bristol *Orpheus* turbojet. The design team is largely German, headed by Dr. Kurt Tank, who was responsible for the wartime Focke-Wulf Fw 190; but more than 70 Indians are being trained for aircraft and aero-engine design.

In this supersonic era, it is extremely ambitious to set out to produce a first-line fighter, and the aerodynamic shape is reported to be undergoing initial tests now in the form of a glider towed by a powered aircraft. The genuine prototype is scheduled to fly in 1961.

* * *

HAYES AIRCRAFT of Birmingham, Alabama, is the company responsible for converting B-50 *Superfortress* bombers into KB-50J and K refuelling tankers of the kind illustrated below. Major changes include the addition of two General Electric J47 turbojets in underwing pods, and containers for probe-and-drogue type hose-reel units at each wing-tip and in the extended tail-cone. Almost complete internal re-design was necessary to enable the KB-50 to carry nearly 25 short tons of fuel. This is often transferred in a shallow dive, to enable the *Superforts* to reach a forward speed at which fighters like the F-101 *Voodoo* and F-104 *Starfighter* can maintain controllability during refuelling.

Left we have the Da-glo trimmed Aero Commander, lower left Hindustan's Pushpak, and right the B-50 refuelling tanker.



LETTERS

A.2 Comments

DEAR SIR,—I was very interested to see the article on A.2 design, by Neville Willis, in the Christmas issue of MODEL AIRCRAFT as his gliders are consistently good performers, and much of his advice is invaluable. Mr. Willis mentioned a number of technical topics about which much may be written, so may I be permitted to note one or two significant points?

The static margin is a very real guide to longitudinal stability and is, in fact, proportional to the value of "K" referred to in the article. There is another important factor, however, and this is the rate of change of downwash at the tail, with change of wing incidence, $\frac{d\epsilon}{d\alpha}$. The longitudinal stability is proportional to $\left(1-\frac{d\epsilon}{d\alpha}\right)$, so that $\frac{d\epsilon}{d\alpha}$ must be kept small. This can be achieved by a long tail moment arm, which may be undesirable for other reasons, or an alternative is to use high aspect ratio, which keeps the tip vortices away from the tailplane.

Having encountered a disturbance, the time taken to recover equilibrium is proportional to the inertia, but beware, for the less the inertia the more severe will the disturbance be, and may possibly result in a greater loss of height.

Now may I turn to spiral stability? Mr. Willis tells us that in circling flight, the aircraft rotating about its c.g., a sub-fin will tend to roll the machine out of its turn. Very well, but we are also told that initially the banked aircraft will sideslip, turn into its sideslip, and possibly spiral dive. At the same time as turning the model into its sideslip, the sub-fin will roll the model into the spiral dive.

The pit-fall here I think, is to suppose that the fin, either above or below the fuselage, can provide a significant rolling moment. The function of the fin is to provide yawing moments, and the dihedralled wing must be relied on to provide rolling moments. It is only by having these latter two present, to a sufficient degree and in the right ratio, that spiral stability can be ensured.

Yours faithfully,

London, N.W.2. M. S. PRESSNELL.

. . . and Some Corrections

DEAR SIR,—I would like to compliment you on the presentation of my article on A/2's, however there are three errors which should be corrected.

P. 389, col. 2, for "insufficient longitudinal dihedral" read "insufficient longitudinal stability."

P. 389, col. 3, delete "e.g." from list of air foils.

P. 390, col. 3, for "sub-fuselage" read "sub-fins."

Yours faithfully,

Chelmsford. NEVILLE WILLIS.

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.

The O.S. Story

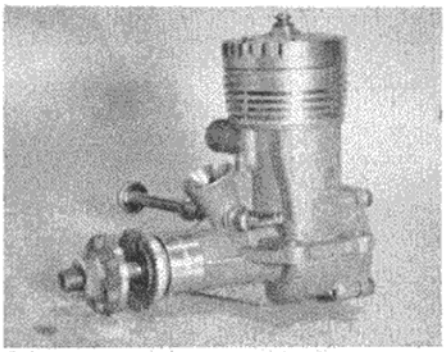
Continued from page 43

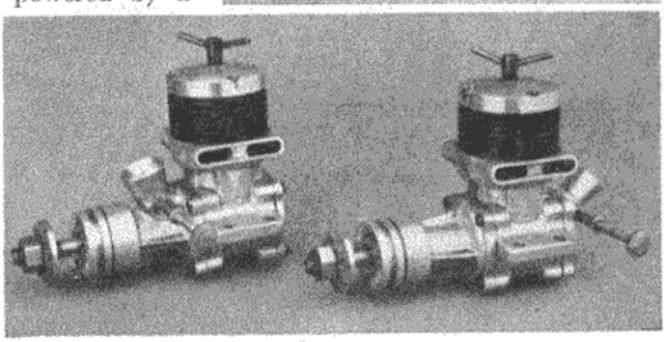
from the simple, single-valve, carrier-wave Minitron outfit, to the three-channel audio-tone outfit with three-valve crystal-controlled transmitter and six-valve receiver. Now going into production are a single-valve-plus-three-transistor single-channel tone receiver and a six-channel outfit. A staff of eight is at present employed on the radio side.

Apart from work on piston engines, O.S. have for many years made model pulse jets, starting with the original O.S. Jet Type 1 which set a Japanese national record of 132 m.p.h. in 1951. This was subsequently replaced with the present Type II that raised the record to 144 m.p.h. and has recorded speeds of up to 155 m.p.h. In addition, O.S. also make a variety of model accessories, etc. These include glowplugs in nine different types, propellers, spinners, boat flywheel, prop and drive assemblies, escapements and relays and three types of glow fuel.

Before the demand for their model products reached its present urgency, they also undertook certain sub-contract work, ranging from bicycle pumps during the immediate post-war struggles, to ice-cream freezing equipment for the Matsushite Electric Company, in 1955.

Despite the present commercial success of his enterprise, Shigeo Ogawa is still a model enthusiast at heart. When compiling the facts for this article, we received over 100 photographs and, from these, we were able to piece together records of Ogawa's model work from the earliest times to the present day: wonderfully detailed steam locomotives; a model racing car powered by a Type I engine; a remarkable semi-scale monoplane, very much on *Stinson Reliant* lines, powered by a 7½ c.c. Type 3 engine and with an intricate *all-metal* airframe; a massive R/C model *Queen Mary* and, of course, several recent R/C aircraft. Many Ogawa employees, too, are serious contest modellers and others are given every encouragement to take an interest in the hobby.





Above right: One of the forerunners of the present O.S. Max range of engines was this experimental 35 with separate alloy cooling barrel.

Right: Two experimental 2.5 c.c. O.S. diesels, one with shaft rotary valve induction and the other with reed valve.

plans and constructional drawings for the D.H. 108

FIRST British aircraft to exceed Mach 1, the D.H.108 was developed under Ministry of Supply contract to explore the control and stability characteristics of sweptback wings over the widest possible speed range.

Design began in October, 1945, at a time when de Havilland still favoured a tailless configuration for the D.H.106 (*Comet*) jet airliner on which they were working. By the end of that year the airliner project had grown a tail, but it retained its swept wings, so the research programme remained of great potential value and the first D.H.108 (TG283) was flown by the late Geoffrey de Havilland from an emergency airstrip at Woodbridge, Suffolk, on May 15th, 1946.

To save time and money, it was built around a standard *Vampire* fuselage, the wings attached to the same pick-up points as those of the fighter. Made of wood, like the rest of the airframe, they had a leading-edge sweep of 43 deg., a symmetrical aerofoil of 10 per cent. thickness/chord ratio and no dihedral or incidence. Controls consisted of the now-familiar elevons and rudder; and, as TG283 was intended for work at low speeds, it was fitted with fixed leading-edge slots, as well as trailing-edge flaps. Power plant was the normal 3,000 lb. s.t. Goblin 2 turbojet of the *Vampire*.

Early flight tests went surprisingly well for so unorthodox an aircraft, and at the end of May, 1946, de Havilland were able to announce that more than 2,500 miles of flying had been logged in two weeks. They added that "the first flights of a machine such as the 108, having control problems of which little or no experience is available, calls for a high degree of skill, combined with care and judgment"; but Geoffrey de Havilland had these qualities in abundance and it was soon decided to press on with tests at higher speeds.

For this purpose, the second D.H.108 (TG306) was fitted with retractable slots and a more powerful Goblin 4 turbojet, giving 3,500 lb. s.t. In this form, its performance was so impressive that an attempt was planned on the world speed record of 615.781 m.p.h., held by Group Capt. Donaldson in a *Meteor* IV. Unfortunately, before this could take place, TG306 broke up in the air over the Thames estuary and Geoffrey de Havilland was killed. It was stated later that his speed immediately before the accident was higher than that achieved by any other pilot up to that time.

His death, added to those of many pilots who had ventured too close to Mach 1, helped to produce a ban on attempted supersonic flight by piloted aircraft in Britain; but swept wing research continued with a third D.H.108 (VW120). Externally, it differed from its predecessors mainly in having a longer, more pointed nose, a less bulbous, armoured canopy, and automatic slots; but there were important internal structural changes. The pilot was given an ejector seat and power-assisted controls, and the engine was changed to a 3,600 lb. s.t. Goblin 5.

On April 12th, 1948, John Derry set up an international 100-km. speed record of 605.23 m.p.h. in VW120. Five months later, on September 6th, he ensured the D.H.108 an enduring place in the history of British flight by attaining Mach 1.02 during a dive from 40,000 to 30,000 ft. It was almost the end of the story, for the two remaining 108s were lost in flying accidents, VW120 on February 15th and TG283 on May 1st, 1950.

Flight summed up their careers with the comment that: "In a long series of very remarkable flights, the D.H.108s certainly established their predicted aerodynamic efficiency, but the controllability factor proved to be marginal at very high speed, and it was found, moreover, that the landing weight for a given landing speed would have been uneconomical (in a transport)." The price paid for such knowledge was high, but so have been the rewards, for data gained with the D.H.108 influenced the design of all subsequent British swept-wing aircraft.

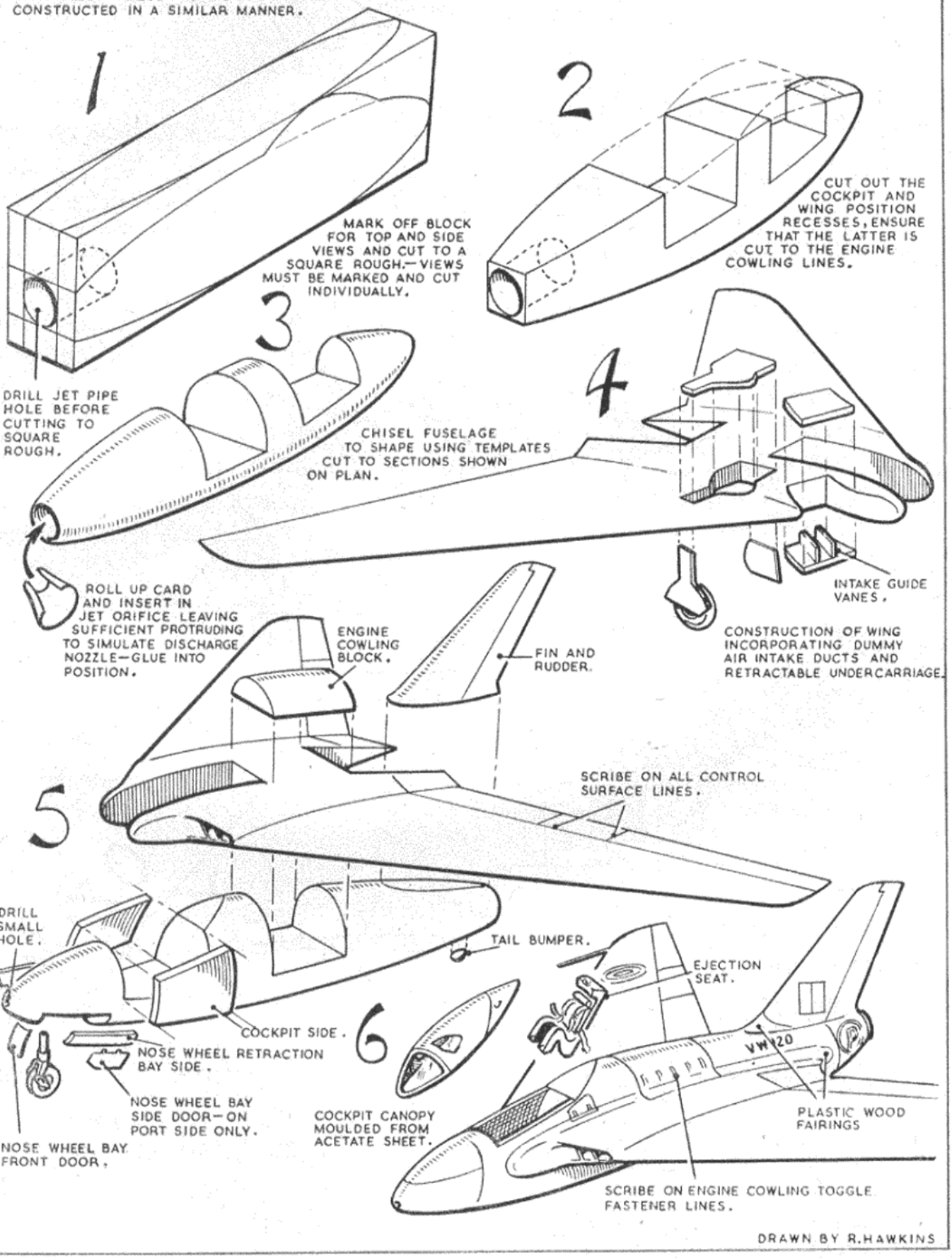
Span: 39 ft. Length (TG283): 24 ft. 6 in., (VW120): 26 ft. 9½ in. Height 10 ft. Weights empty : approx. 7,000 lb., loaded : 9,180 lb.

Building a Model

From the model angle, the constructional diagrams opposite, used in conjunction with the plans on pages 50 and 51, are self explanatory, and should need no further amplification. However, reference to Peter Lewis's article "Achieve that Life-size Look" in the March and April, 1958, issues of MODEL AIRCRAFT, will be of help if you want to build a really super-detailed model.

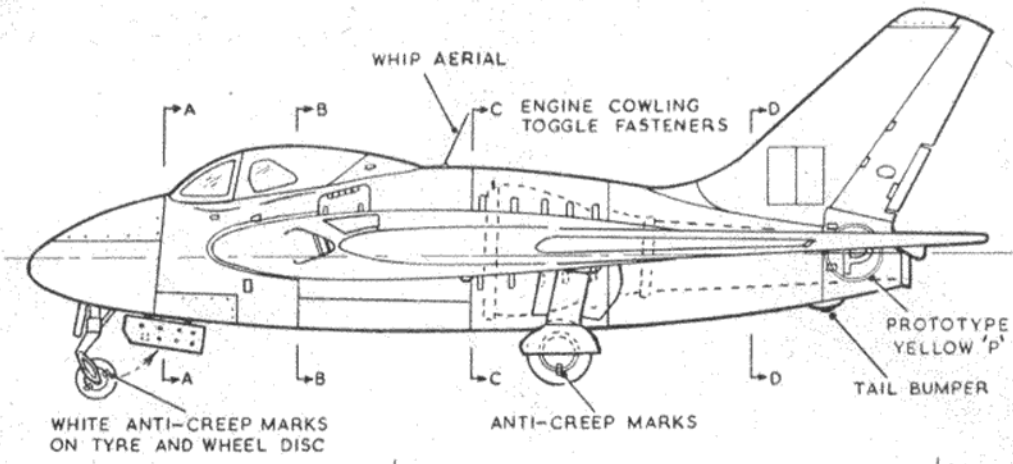
BUILD THE DH 108

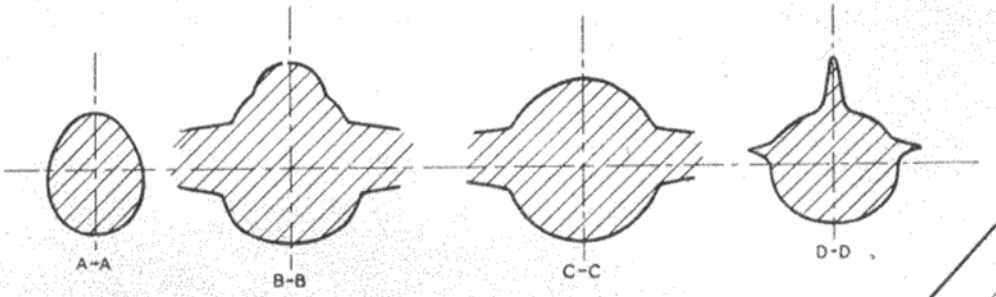
THESE ILLUSTRATIONS SHOW THE BUILDING OF VW 120—TG 283 AND TG 306 MAY BE CONSTRUCTED IN A SIMILAR MANNER.

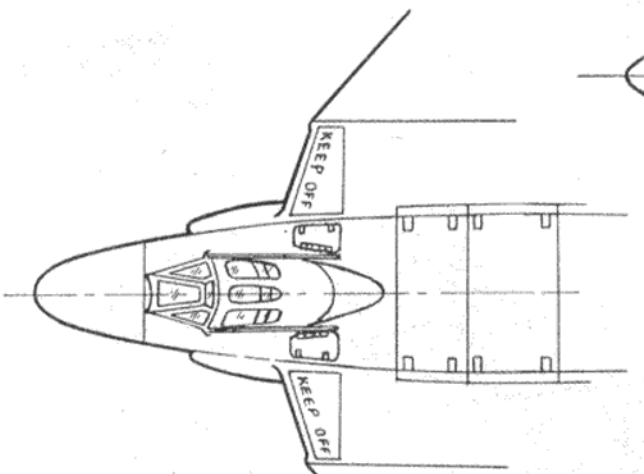


DRAWN BY R. HAWKINS

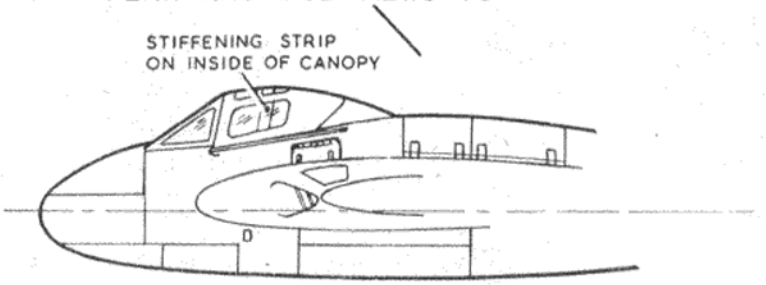
DETAILED 1/72nd SCALE PLANS OVERLEAF

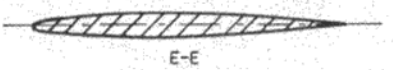




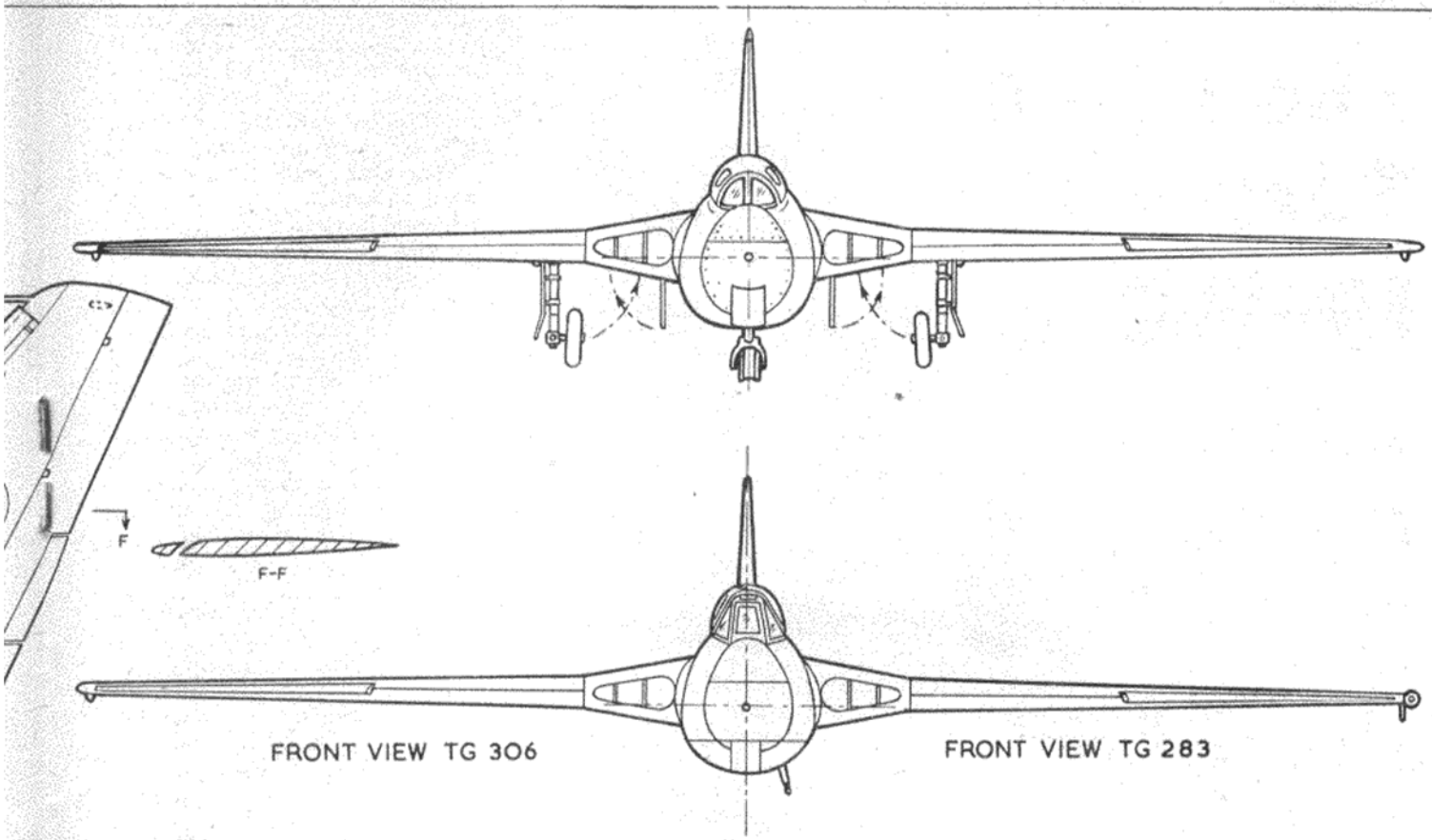


PLAN AND SIDE VIEWS TG 306





DE HAVILLAND D.H. 108

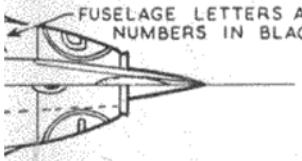


FRONT VIEW TG 306

FRONT VIEW TG 283

DE HAVILLAND GOBLIN ENGINE

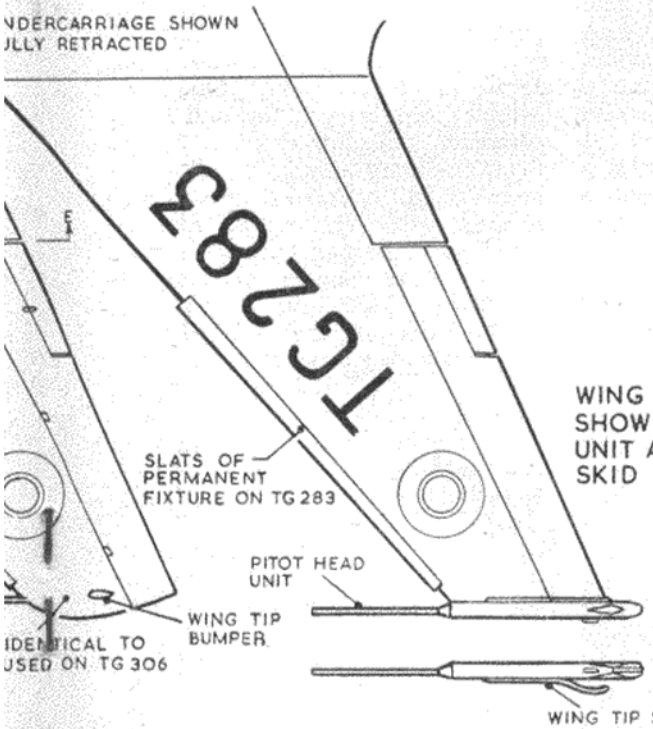
FUSELAGE LETTERS AND NUMBERS IN BLACK



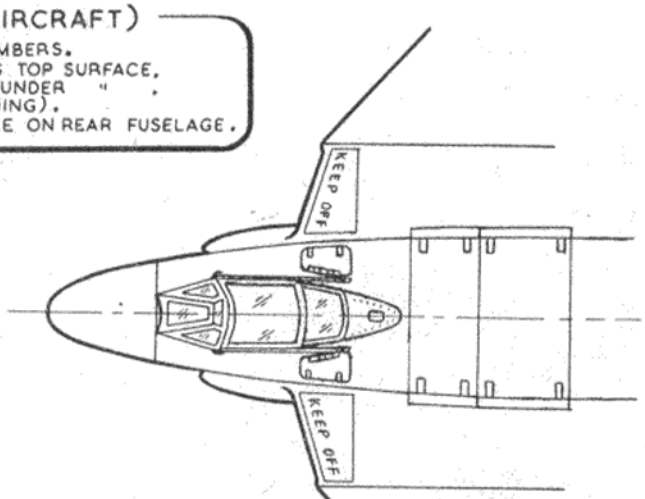
COLOUR SCHEME (ALL AIRCRAFT)

SILVER ALL OVER WITH BLACK SERIAL NUMBERS.
RED, WHITE AND BLUE ROUNDELS ON WING TOP SURFACE,
" " " " " " " UNDER " .
RED AND BLUE FLASH ON FIN (RED LEADING).
YELLOW PROTOTYPE 'P' IN YELLOW CIRCLE ON REAR FUSELAGE.

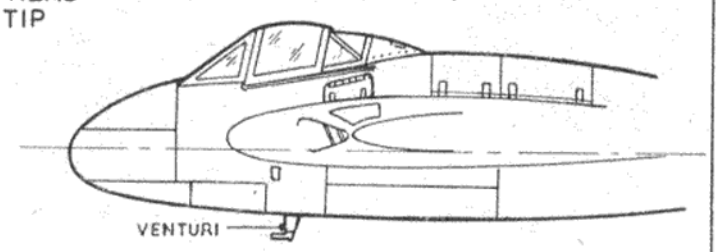
NDERCARRIAGE SHOWN
ULLY RETRACTED



WING OF TG 283 SHOWING PITOT HEAD UNIT AND WING TIP SKID



PLAN AND SIDE VIEWS TG 283



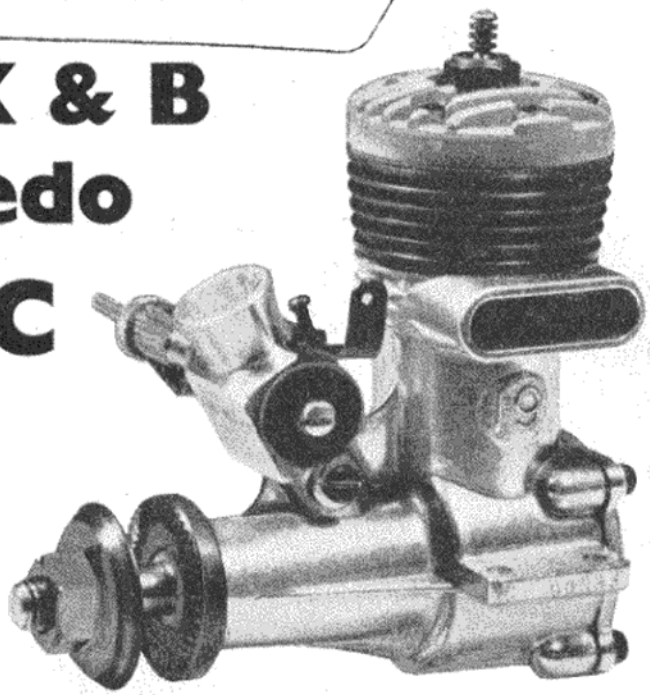
SMA 87

DRAWN BY R.A.HAWKINS

FT.

The K & B Torpedo 19-RC

3.27 c.c. glowplug motor



IN the course of 120 tests featured in this series, we have encountered, perhaps, 10 engines of such all-round merit as to place them in a class of their own, and, very near the top in this group, comes the American K & B Torpedo 19, tested in 1953.

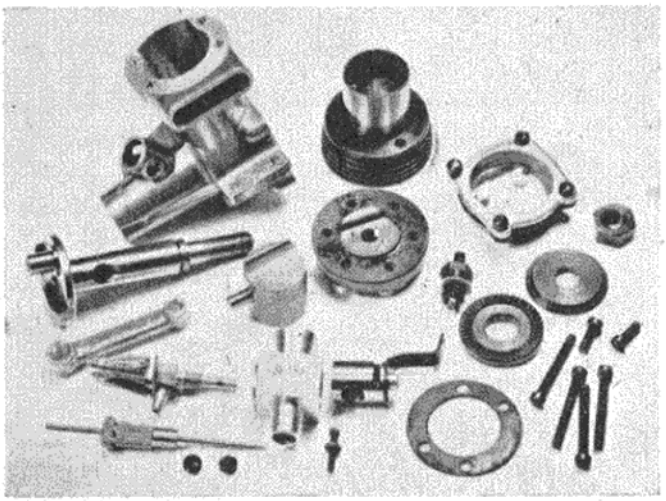
The most powerful of all engines in the 0.19 cu. in. and 3.5 c.c. classes, the Torpedo 19's performances in American Class A speed contests, alone, have been quite outstanding, speeds in excess of 150 m.p.h. having been achieved with specially prepared examples.

The Torpedo 19RC model, which is the subject of this month's report, is a de-tuned, throttle-equipped version of the 19, especially intended for radio-controlled models. The main differences between the 19 and the 19RC are as follows:

Crankshaft. This has a smaller valve port of circular section (drilled at an angle) instead of the normal rectangular port. This reduces the ultimate performance somewhat, but has been found desirable in the interests of flexibility, even low-speed running and improved throttle response.

Crankcase. This has the intake cut off just above the normal spraybar installation. The "Multi-Speed" carburettor unit plugs into the shortened intake, the standard spraybar holes being tapped and utilised for two set-screws, which lock the new carburettor in position.

K & B Allyn Multi-speed carburettor. This is a smaller bore version of the original unit introduced for the Torpedo 35RC. It consists of a machined alloy body, containing a barrel type throttle, with a lever, on the left-hand side of the engine, which operates quite independently of the needle-valve. The needle-valve assembly is a self-contained unit which screws into the right-hand side of the carburettor.



The Torp 19 in pieces.

Glow-plug. This is a special type, fitted with "idle-bar" to provide more positive ignition under slow-running conditions. It is similar to the Ohlsson FR ("Full Range") glowplug and is made under licence by arrangement with Irwin Ohlsson.

All other parts are identical and interchangeable with those of the standard 19 model.

In general layout and construction, the 19 and 19RC are similar to the other current Torpedo models. In contrast to the newer Torpedo designs of the past five or six years, however, it retains four cylinder holding down screws, instead of a fore and aft two-screw fitting. One or two slight changes are apparent on comparing the engine with the early 19s, such as radiused, instead of square-cut, exhaust and transfer ports and a green enamelled head.

Specicfiation

Type: Single-cylinder, air-cooled, loop-scavenged two-stroke cycle, glow-plug ignition. Crankshaft type rotary-valve induction. No sub-piston supplementary air induction. Baffle piston. Central ignition plug.

Bore: 0.640 in. Stroke: 0.620 in.

Swept Volume: 0.1994 cu. in. = 3.27 c.c.

Stroke/Bore Ratio: 0.969 : 1.

Weight: 6.5 oz.

General Structural Data

Pressure diecast aluminium alloy crankcase unit, tumble finished, with bronze main bearing. Non-hardened crankshaft with disc-web and crescent counterbalance, having ⅜ in. dia. journal and 7/32 in. dia. hollow crankpin. Blued-steel drive-washer, keyed to flat on shaft. One-piece cylinder with integral fins and blued corrosion resistant external finish. Pressure diecast aluminium-alloy cylinder head, enamelled green and secured with six screws, four of which pass through cylinder fins to tie complete cylinder assembly to crankcase. Meehanite piston, with filleted baffle and skirt relieved 0.001 in. below gudgeon-pin centres. Fully-floating 5/32 in. dia. gudgeon pin with alloy end-pads. Forged aluminium-alloy connecting-rod with plain eyes and oil hole at lower end. Detachable crankcase back cover secured with four screws. Barrel-throttle type variable speed carburettor with aluminium alloy body and barrel and brass spraybar assembly.

Test Engine Data

Running time prior to test: 3 hr.

Fuel used: (1) 70 per cent. Blending Methanol and 30 per cent.

Duckham's Racing Castor Oil, for running-in. (2) Shell Red Glow Plus for performance tests.

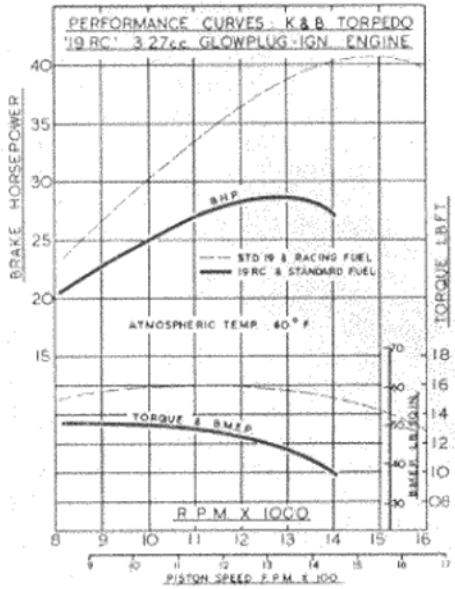
Ignition plug used: K & B Long-reach 1½-volt with "idle-bar" as fitted.

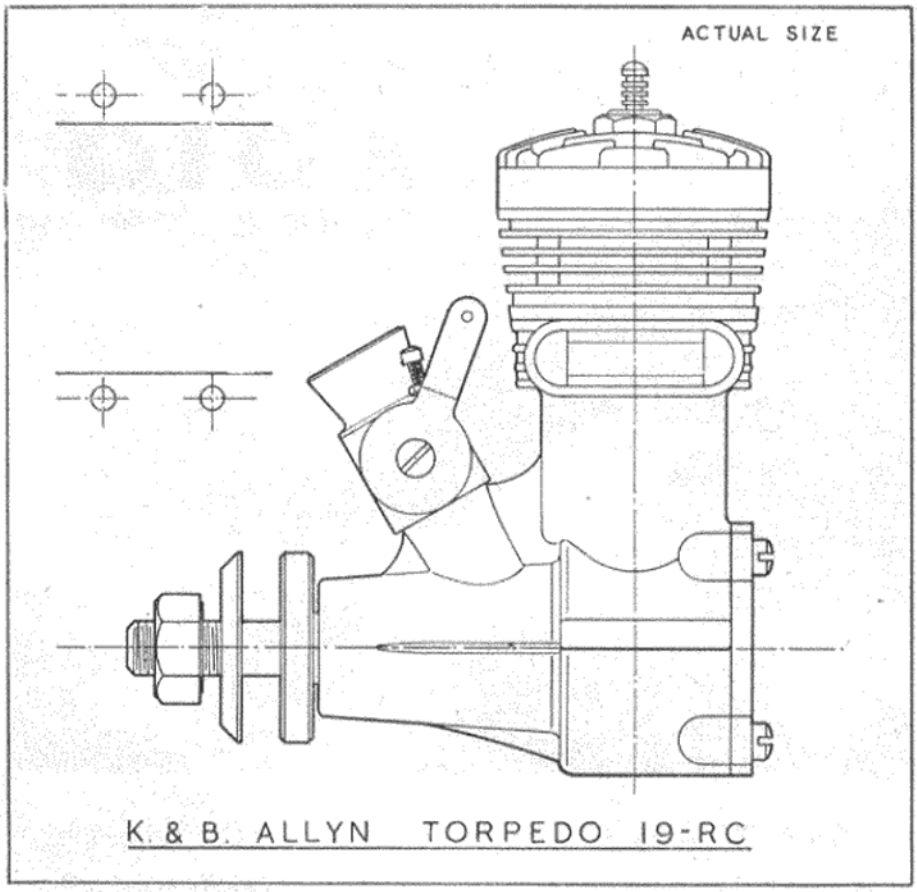
Performance

All engines of this type usually require at least one hour of rich-mixture running (i.e., "four-stroking") before the needle-valve may be turned down for maximum revolutions on any given load. The 19RC proved to be no exception to this rule. We ran the engine for an initial 1½ hr. on a 10/4 prop under these conditions, using the "cool" mixture noted above. At the end of this period, the engine would maintain an even "two-cycle," but appeared to be giving a little below the expected power output. A further 1½ hr. were, therefore, given before any test readings were taken...

While the possibility that our single test sample may have been a little below average cannot be dismissed, it does appear that the power of the 19RC is quite appreciably below that of the standard 19 model.

However, the performance curves achieved with our earlier 19 model, as indicated by the broken lines on the graph, are not directly relative, since they were achieved with a highly nitrated racing fuel, such as might be used for speed work, whereas the tests on the 19RC were conducted with a good standard commercial glow fuel. In any case, the performance of the 19 is so good that even quite a drastic cut in power is easily tolerated for the type of duty (i.e., R/C work) for which the engine is primarily intended and for



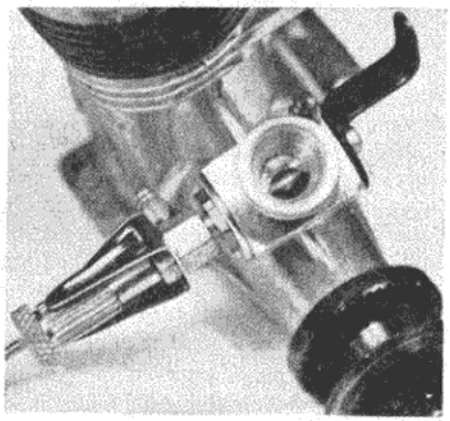


which, moreover, high output at ultra-high peaking speeds is seldom required.

General handling characteristics of the 19RC were all that could be desired. The engine ran with exceptional smoothness over the entire speed range and starting was excellent, irrespective of prop size. Response to the needle-valve was very satisfactory, the control having just the right degree of sensitivity without being critical.

The throttle control worked admirably and, in our experience, the K & B Multispeed carburettor is probably the best intake-only throttle system currently available on engines of this type. There is a screw adjustment for setting the "idling" speed. This prevents the barrel from rotating too far and cutting off air completely; normally the adjustment is set so that the barrel remains open a little over 1/16 in.—varying very slightly according to prop, fuel and condition. It gives, aided by the special plug, a true "idle"—not quite a "tick-over," perhaps—but enough to reduce actual power by something like 90 per cent. from the full-throttle position, with no risk of stopping the engine when opening or closing the throttle abruptly. It is, of course, a true variable-speed unit, so that, in such advanced R/C installation as may demand it, the engine can be operated over a whole range of "cruising speeds" between the full throttle and idling positions.

Over the past few years Torpedo engines have achieved an enviable record of contest successes, with



Close up of the throttle unit.

more wins in U.S. Nationals events than any other make. The 19RC should have no difficulty in living up to the reputation of its forebears.

Power/Weight Ratio (as tested): 0.70 b.h.p./lb.

Specific Output (as tested): 87 b.h.p./litre.

PART II — in which HARRY STILLINGS describes the beginner's R/C model he has designed especially for this series.

THIS month I introduce *Radio Railcar*, an out-of-the-rut R/C model, designed especially for this series. Steady and stable in flight, it embodies many unusual features as follows:—

(1) High-mounted motor giving virtual immunity from damage, and extra stability under power.

(2) Pod-and-boom layout for "keel" effect to retard tendency to spiral-dive and for quick recovery to level flight after turns.

(3) Unique uncrushable and almost unbreakable motor mount.

(4) Sorbo-rubber nose to reduce effects of impact with obstructions.

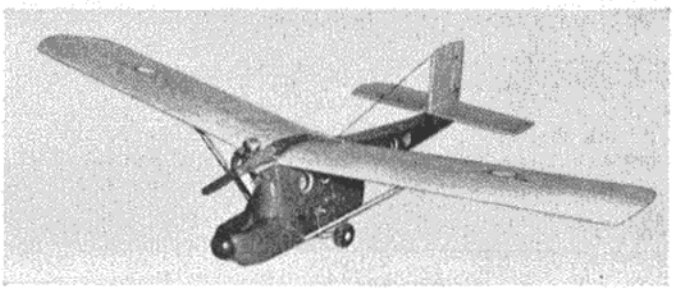
(5) Low-slung tricycle undercart for good r.o.g. characteristics, and for reasonable landings even on rough ground, thick grass, heather, etc.

(6) Knock-off two-piece wings for easy transportation and prevention of damage, with unbreakable alloy tube struts.

(7) Spacious cabin for ease of radio installation and maintenance.

(8) Special cargo compartment for release of parachutes, etc.

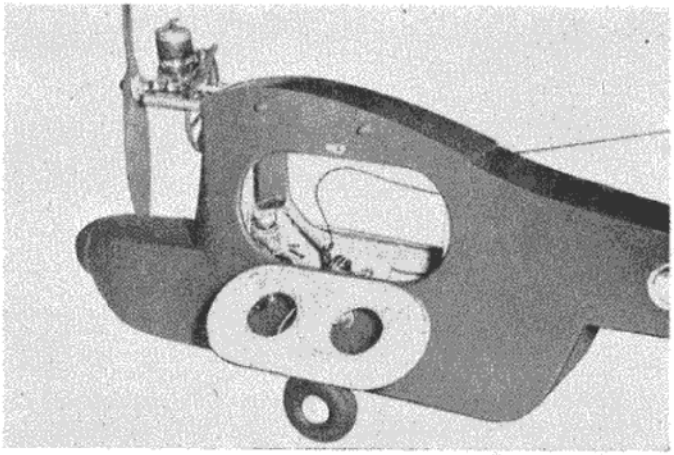
The model has been thoroughly flight-tested, and can be confidently recommended as an ideal first R/C venture. Being fairly slow-flying, utterly stable and entirely without vices, it gives the radio novice plenty of time to think whilst gaining experience in the use of the button. It is easy to get airborne—if level tarmac is available it will r.o.g. after a 50-60 ft. run; if you have no suitable take-off surface it is simplicity itself to launch, no running or hurling being needed; just a vigorous push into wind (the right hand doing the pushing at the tail while the left holds the model straight and level at the cabin) will do the trick, unless there is only a very light breeze or dead calm, when two or three running steps may be needed. To assist launch and climb in a *flat calm only*, it may also be found useful to pack up the trailing edge of the tailplane *not more* than 1/32 in. Once airborne the model will fly straight and level until the button is pressed, when it goes into a safe turn which can be held on for 2 or 3 sec. without beginning a spiral dive.



Radio Railcar, the model designed for this series.

Much thought and effort have gone into the design of the prototype, and the plan should be followed in every detail for success—modifications (except possible adjustment of motor thrust) are not only unnecessary, but will almost certainly adversely affect the flying performance. For example, the degree of throw on the crank (and thus rudder movement) has been very carefully worked out to give adequate control without excessive turn, and spot landings will soon be relatively easy to achieve. *Radio Railcar* is also the perfect model for carefree, relaxed flying on a pleasant day, as it will fly on happily without the need for constant control. If a little added excitement is desired the cargo compartment can be brought into use to drop a parachute or balsa-wood "bomb"; a suggested method of release, using a timer, is shown on the plan; this should be set for 3-4 min., to give ample time for a good height to be reached. Note that cargo must be light enough to avoid upsetting fore-and-aft trim; if necessary a little ballast must be taped to the nose to keep the c.g. in the right place; when the cargo is released, this may result in a very slight nose-down attitude, but that is preferable to any tendency to stall. (SPECIAL NOTE. It will be seen that the usual plan view of fuselage has been omitted—this has been done deliberately, as, owing to the sloping fuselage sides and varying contours of tail-boom, it would only be confusing. Provided the basic cabin assembly is accurate, and the sides are cut exactly to plan, the fuselage *must* "come right" when the tail ends are drawn together. All necessary guidance is given in elevation and detail drawings.)

Construction is quite straightforward, but all joints must be precemented throughout, as this adds greatly to the inherent strength.



This view shows the spaciousness of the cabin. At the time the photo was taken, the timer release had not been fitted to the cargo compartment door, and a temporary fuel tank was being used for flight tests.

Start by building the cabin framework—floor, ceiling, and formers A and B (note especially that the chamfer of the floor sides is *added* to the 4 in. wide sheet, by cementing a strip of $\frac{1}{16} \times \frac{1}{2}$ in. each side, and chamfering when thoroughly set; the $\frac{1}{16}$ in. strip serves as an accurate guide when chamfering to the correct angle, although this is not, of course, its main purpose). Make sure the formers are perfectly vertical by testing with a set-square, and then pin and rubber band the framework assembly and put aside to set really hard, as it is the basis for all other construction. Meanwhile, cut out two sides from $\frac{3}{16}$ in. medium sheet, butting together 4 in. wide stock as necessary to achieve the required depth at the cabin; cut out the tail-boom portholes, but do not cut out the cabin doors and portholes yet—this is done later. Securely cement the two sides to the main framework, and again pin, etc., and set aside to harden. In these intervals of waiting for the cement to set, cut out the wing and tail ribs to save time later.

When satisfied that the assembly so far is quite set, draw the tail ends together with the sternpost sandwiched between, cement, pin, and band in place. Now carefully bend (with the hands only to avoid pinching) a suitable length of 16 g. alloy tubing ($\frac{1}{4}$ in. inside diameter) into a long " U " shape as per plan. Tap a length of $\frac{1}{4}$ in. dowel right down into each leg of the " U," and trim the whole component to the required length. Slide into position on top of the cabin ceiling (and levelling wedge) and between overhanging tops of sides, then bed in firmly with $\frac{3}{8}$ in. sheet, plastic wood and cement. Fit centre-section dowels and cross-pieces then fill in with sheet or block above the engine mount, trimming flush with tops of sides. Finally, sheet over with $\frac{1}{8}$ in. sheet.

Cut out the doors with a bevel cut, using a really sharp and pointed balsa knife; mark and cut out the portholes and cement acetate sheet inside—also do this now for the rear portholes to avoid forgetting it. Next sheet in the bottom only of the tail-boom, and add the $\frac{1}{2} \times \frac{3}{16}$ in. cross-member at the top front of the tail-bay. Fit the tail-plane dowels, and then carefully install the entire actuator assembly (hook, motor, actuator, crank, tinplate bearing), ensuring a dead-straight drive right through from the front hook to the crank bearing at the tail. Remember to drill the crank bearing slightly oversize to prevent binding. Take special care to reproduce exactly the bend in the crank, as this determines the amount of rudder movement. Solder two 24 in. lengths of PVC-covered wire to the actuator contacts and fit these neatly along inside of the tail boom, taking them through into the cabin for connecting up later.

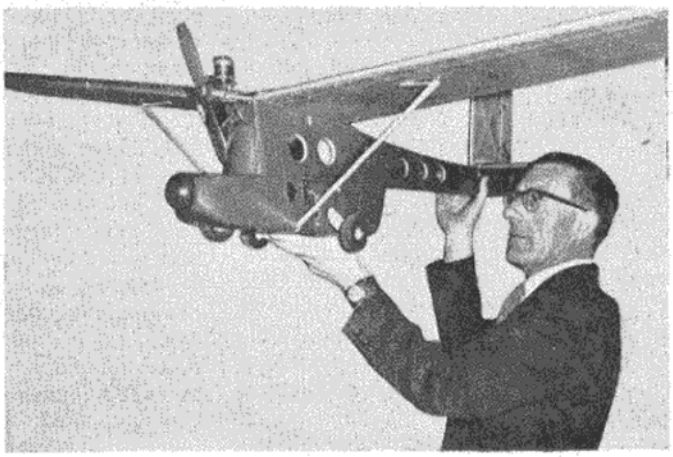
Now cover the top with $\frac{1}{16}$ in. sheet (grain crosswise), fitting the actuator hatch (note slot for cross-arm which protrudes slightly) and saddle-catch for same. Ordinary white tape is used for hinges throughout. Next fit the $\frac{1}{2} \times \frac{3}{16}$ in. cabin strengtheners/door stops, but do not fit doors yet. Fit the $\frac{1}{4}$ in. stub dowels, angled as shown, for strut location (protrude $\frac{1}{4}$ in. from sides) and the tin-plate reinforcement. Make the rear undercarriage assembly and bolt to cabin floor, using metal plates on the inside, then make the cargo compartment and door. Solder up the fuel tank from tinplate and fit as shown, and add the receiver-suspension hooks and battery-pack hooks. Details of radio installation will vary according to the equipment chosen, but all necessary switches, sockets, potentiometer, etc., should now be installed. When all the work inside the cabin has been completed, fit doors and turn-buttons.

This completes the major portion of the fuselage construction, and the front wheel can now be installed as per plan; then cover the top of the wheel-bay with $\frac{1}{2}$ in. sheet and add the $\frac{1}{2}$ in. sheet front pieces. Shape (from 1 in. sheet) and cement in place the front cabin fairing. The nose-cone assembly is made up from two laminations of 2×3 in. block, with $\frac{1}{2}$ in. sheet sandwiched between; a small extra wedge of block being added to the underside to make up the necessary depth. Final shaping and sanding of the fuselage can now be done, rounding-off all edges. The rubber nose is merely half of an unburstable ball, purchased from Woolworth's at about 1s. 2d.—cut very carefully in half at the seam, using a razor saw—use plenty of cement and pin in position until set. Drill the motor mounting holes generously oversize to allow for possible thrust adjustments—2 to 4 deg. right thrust will be needed.

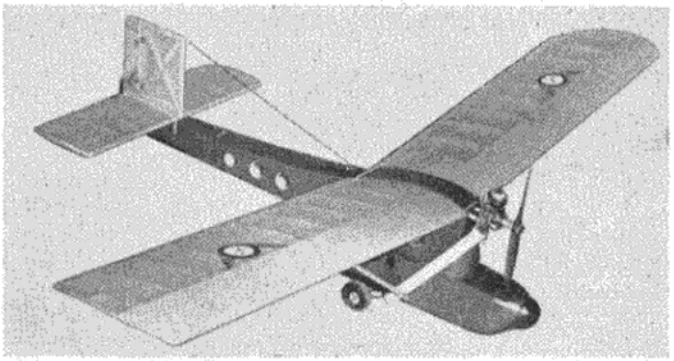
Now proceed with the wings, tailplane and fin—construction of these is clear from the plan, the only points needing special mention being:

(1) Make sure that the rudder loop is made exactly as shown on the plan, as this affects amount of rudder movement and thus flight characteristics.

(2) Use hard, strong balsa for wing and tail spars—soft or spongy strip will result in a weak, warp-prone component.



The correct launching position—right hand grasping the forward tail-dowels giving a firm grip for " push," while the left hand, under the cabin, holds the model straight and level.



This view shows the writer's pet system of keeping the model clean, exhaust "pipe" being pram-handle rubber sleeving, flat section.

(3) See that the strut hooks are fixed really securely and packed in with plastic wood, so that they cannot possibly pull out.

(4) The 16 g. alloy tubing used for struts and motor mount is obtainable from most good ironmongers, but if any reader is in difficulties over this I will be glad to let him have the name and address of my own supplier, upon receipt of a stamped addressed envelope sent c/o MODEL AIRCRAFT.

When all the construction work is completed, the fuselage should be given a good coat of sanding sealer, lightly rubbed down, then two good coats of colour dope. The colour scheme for the original was red dope for the fuselage and yellow heavy-weight Modelspan for the wings, tailplane and fin—silk or nylon covering for the wings would, of course, give greater strength if the extra work is not objected to, but will raise the total weight appreciably. Four or five coats of clear dope will be needed to ensure a fuel-proof finish, so be careful to pin or weight down the wings, tailplane and fin (the latter being cemented on to tail AFTER doping), while the dope is drying, to avoid warps. If any should develop, warm carefully while gently twisting against the direction of the warp, and hold until cool—this usually corrects anything except really bad warps, which with ordinary care should not arise.

[*The following notes on the radio installation and testing of the equipment are included here for continuity; they will be amplified and explained much more thoroughly in later parts of this series.—Ed.*]

The radio receiver and batteries can now be installed, and wiring-up completed. If the receiver used is not already provided with a five or six-pin plug I strongly advise that you fit one, so that the receiver can be taken out of the model for inspection at any time merely by removing this main plug. The battery leads are then, of course, taken through the switch(es), etc., to the socket, which is fitted inside the cabin. Use a D.18 battery for low-tension, as this has a two-pin socket for easy replacement, and as weight is not important I recommend that you use heavy-duty deaf aid batteries for H.T. (B.105 for 30 v., B.110 for 22½ v.). The equipment should be carefully bench-tested with the transmitter, and again with the motor running. When satisfied that all is well, the model can be taken to the flying field for first tests, having made sure that the c.g. is exactly right.

First check that you have adequate range—this test is most important, and will be omitted only at your peril. Get a friend to operate the transmitter, and check the tuning at intervals of 200 yards over as long a distance as you can manage—up to half a mile if possible. If the receiver is still responding adequately at this distance, you can rest assured that you will have ample range in the air, provided, of course, you remember to keep the model upwind of the transmitter so that it will drift back *towards* you if it should get out of range, and so come back into range again.

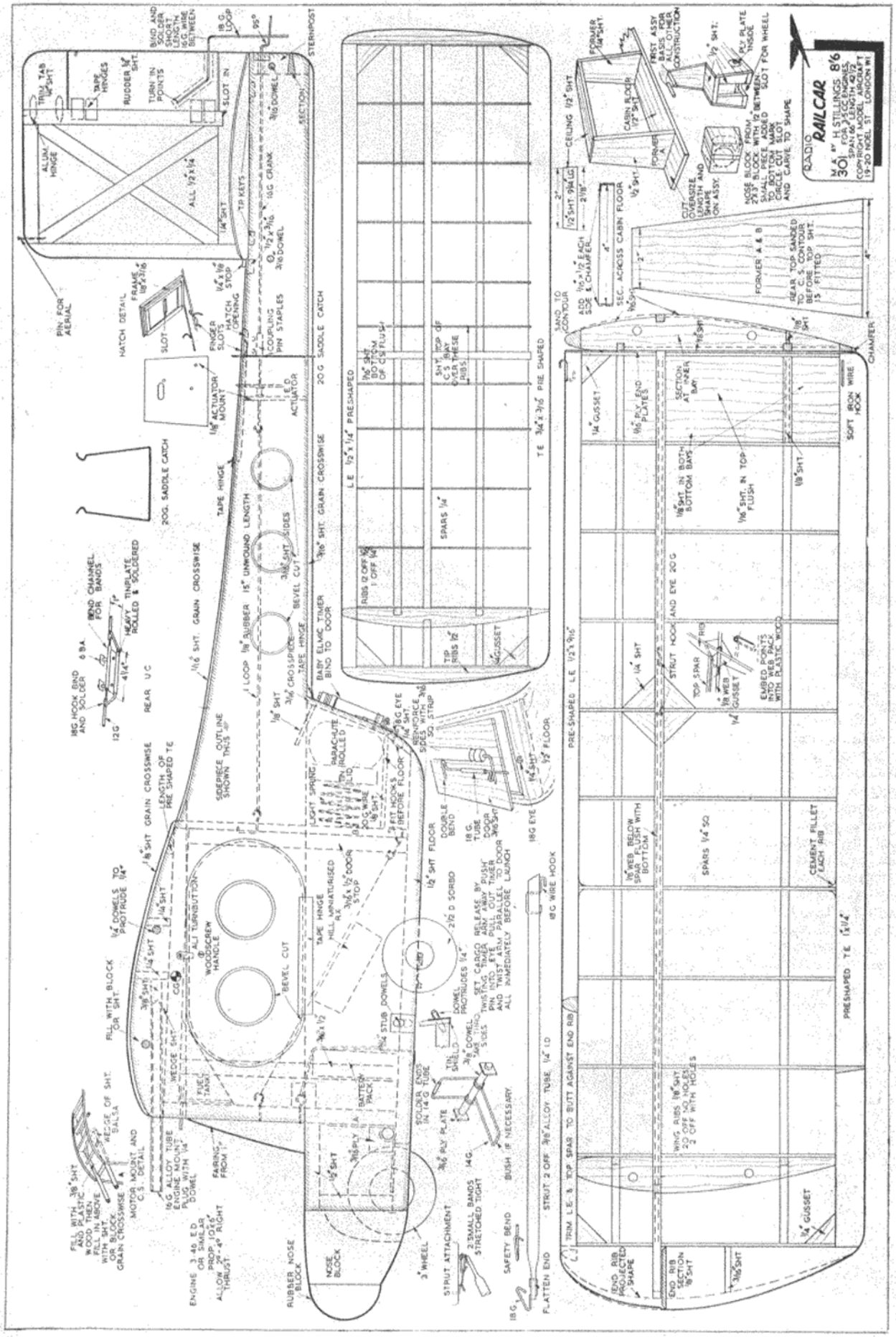
When satisfied that this test has been completely successful (you will have tuned the receiver accurately in carrying it out, of course), measure out enough fuel for not more than 2 min. engine run, start the motor and adjust for reduced revs. Test the radio response once more, and if O.K., launch the model into wind in the manner previously described—a strong push with the right hand at the forward tail-plane dowel (this gives a firm "anchorage" for the fingers) while the left hand under the cabin keeps the model steady and level. Make sure you do not induce a stall by launching nose-up; if anything, a slightly nose-down attitude is preferable. With its generous wing area *Radio Railcar* should become airborne almost immediately, but if the revs are too low it may fail to gain height or may even sink to the ground. This will not matter, as the landing will be quite gentle in these circumstances, and you can then try again with increased power.

Assuming that it gradually gains height, the thing to do is to concentrate on keeping it into wind, only attempting a turn when it is at least 30-40 ft. up; even then you must be careful not to hold on the button too long—come around in a series of quarter-turns, pausing to allow the inner wing to rise, then blipping through the unwanted rudder position and holding down for another quarter-turn. In this way you will eventually have completed a full circle and be facing back into wind again. With the short motor-run the engine may now cut, but do not worry about trying to get back for a spot-landing. This will come later when these first flight-tests have been successfully concluded. Concentrate on keeping the model into wind; watch the glide carefully, noting if it is straight on neutral and fairly flat, and, if not, make a mental note of the deviations for correction later.

When you've got the model safely down again, make any necessary adjustments *a little at a time*! It's better to have a dozen short test flights, gradually getting the trim exactly right, than to bang on a load of trim-tab or a great wad of packing, only to see the model completely out of control. If the power-on neutral flight path is more than a *very little* off straight (a tendency to bear very slightly left on neutral, for instance, can often be an advantage), correct this by adjustment of thrust only—do not use the trim tab, otherwise you will throw out the glide path. This is why the bolt-holes in the motor mount are drilled generously over-size, to allow for such adjustments, as different motors and props will affect the degree of torque reaction.

Having successfully surmounted these initial flight tests (always the most crucial and perilous phase in the life of any model) you can use full power and increase the motor-run to, say, 5 min. which will give enough time for the model to gain a good height and so permit longer and more detailed study of flight performance both under power and on the glide: final optimum adjustments can then be made, when the model should continue to perform reliably for an indefinite period, provided no changes are made in motor, prop,

Continued on page 67



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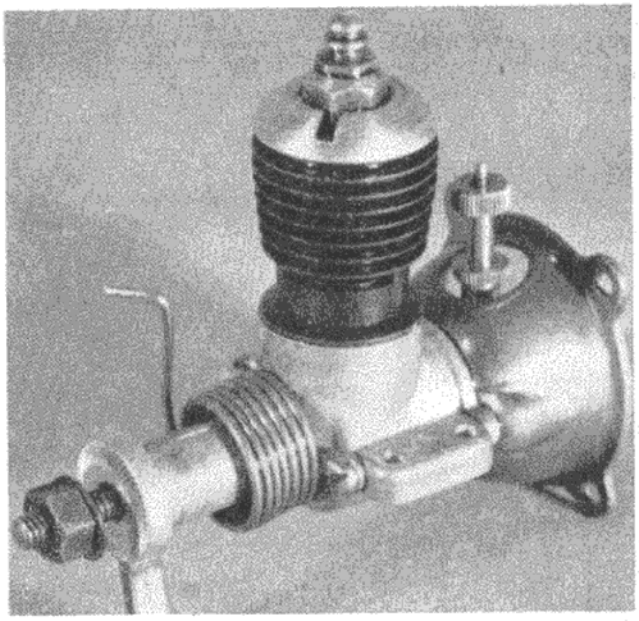
Peter Chinn's Latest Engine News



The latest Enya is this new 0.06 (1 c.c.) model, designed primarily for the home market.

SOME years ago, the Wen-Mac Corporation of Los Angeles began manufacturing small i.c. engined plastic models, using, first, an engine by Atwood Motors and, later, their own engine specially designed for them by Bill Atwood.

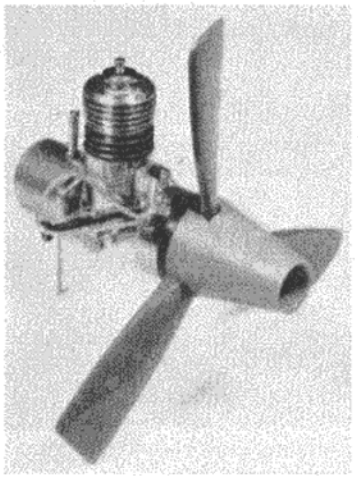
The company was primarily concerned with a large and relatively untapped toy market. For this, obviously, the first requirement was an engine that was easy to operate and one that shop and store assistants, with no previous experience of model i.c. motors, could be relied upon to demonstrate convincingly.

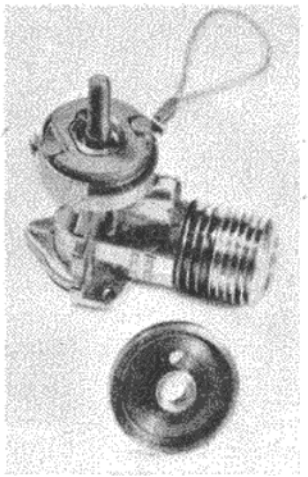
Clearly, this was no easy problem. An engine could be made that was as easy to start as can be reasonably expected of any model motor, and toy department assistants could be shown how to operate them by factory repretatives, but this was not enough. In actual practice, the old story of "we don't seem to be able to start it" occurred with painful regularity.

At this point, the McRoskey brothers, owners of Wen-Mac, decided to investigate the possibility of equipping their engines with an integral starter unit of the type commonly fitted to modern outboard engines: i.e., a cable and pulley with rewind spring and clutch mechanism. This, in itself, was not without difficulties. No such starter unit had previously been fitted to so small an engine and there was a number of problems to be overcome before a unit that would work, and would go on working reliably, could be evolved.

The final solution was the Wen-Mac "Automatic Recoil Starter," now a standard fitting on the Wen-Mac Mk II motor, and the first integral starter unit to be seen on a production model engine. It was subsequently patented.

This ingenious little device weighs but four-tenths of an ounce, including the steel drive disc which replaces the normal prop drive hub. Contained in a drum of $\frac{7}{8}$ in. dia. and a little over $\frac{1}{4}$ in. deep, the complete mechanism fits inconspicuously on the nose of the crankcase.





The world's first starter - equipped model engine, the 0.8 c.c. American Wen-Mac Mk.II. A self-rewinding cable starter, similar to that fitted to some outboard motors, is employed. Also shown are the maker's three-bladed nylon prop and plastic spinner.

The great thing about the Wen-Mac starter is the ease and speed with which the engine can be turned over. Each pull of the starter cord spins the engine over three compressions and, since the cord rewinds itself instantly on release, it is possible to spin the engine almost continuously by keeping the finger in the loop provided and giving a series of short, brisk pulls on the starter cord. In this way, the engine can easily be turned over 40 or 50 times in the space of five seconds. Not only does this ensure that compression is rapid enough for initial firing; it also appreciably reduces the nominal starting time under a given set of conditions. If, for example, it takes an operator half a minute, after priming, to reach the point where the mixture is just right for starting, use of the starter will probably cut this to five or six seconds. To the customer, this makes all the difference between what appears to be difficult and easy starting.

Some idea of the design of the Wen-Mac starter can be gained from the accompanying photographs. Firstly, there is the machined alloy housing (A) which slips over the crankcase nose and contains the flat, clock type return spring (B). The outer end of this spring is anchored to the housing and the inner end to the boss of the alloy pulley (C) on which the braided nylon cord (D) is thereby rewound. Keyed onto the front of the pulley is a flat steel plate (E) and in the specially shaped sections cut away on the periphery of this plate, two small steel discs (F) are placed. These components are assembled on the crankcase, as shown, the unit being secured against rotational movement by a pin below the main bearing which engages a hole in the housing.

Assembly is now completed by pressing the mild steel driving disc (G) onto the

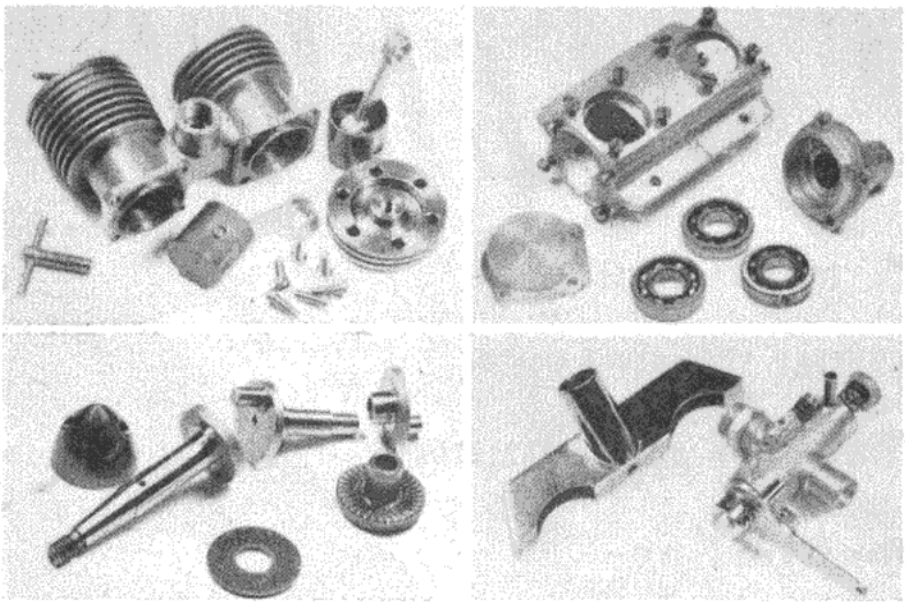
splines on the hardened crankshaft. This disc, it will be noted, is recessed on the inside to form a rim which encloses the plate E and the small discs F, the whole forming the clutch system.

Operation is simple and effective. Pulling the starter cord causes the pulley and plate E to rotate (anti-clockwise when viewed from the front). This causes the small discs F to move outwards and lock plate E against the driving disc. When, however, the pulley direction is reversed (as when the cord is released) or, alternatively, when the engine starts and the drive disc is rotated by the crankshaft, the small discs F shift to the opposite end of their travel and remain free-floating, causing the system to disengage.

The whole thing works smoothly, with no tendency to lock or slip. There are no ratchets to wear and we would imagine the incidence of return spring and cord breakage to be very low. The spring is of ample length and works well within its limits, while the cord, being of nylon filaments, is practically unbreakable and highly resistant to wear.

The Wen-Mac engine itself, is an orthodox radial-port, shaft-valve design. Its general layout and construction owe much to the original Atwood 049, the most noticeable departure being in the crankcase design, which is a combined beam/radial mount type, and in the use of a somewhat longer conrod, making the engine about $\frac{1}{8}$ in. taller. The same type of chamfered disc-web crankshaft, with circular induction port, is used, also an almost identical cylinder and piston design.

The shaft, which runs in a bushed main bearing, has a 7/32 in. journal, with a 9/64 in. dia. port and passage and a substantial threaded end. A 3/32 in. crankpin is used in conjunction with a steel conrod and a ball-joint small end. The cylinder screws into the crankcase, which has the threaded section omitted for 7/32 in. each side to form transfer passages These feed the three radial transfer ports via an annular space at the top. The one-piece cylinder barrel and head, with Wen-Mac short-reach glowplug, screws over the top of the cylinder.



Parts of the Taplin Twin. The engine uses E.D. 3.46 cylinder and piston assemblies, with smaller exhaust ports and modified two cylinder induction. The main crankshaft unit is carried in two ball bearings, the drive shaft being supported in one ball bearing and a bronze bush. Although heavy, the engine is very sturdy.

The entire engine is well made and nicely finished. It is very easy to handle, both with and without the starter (it can, of course, be flicked over by hand, but the prop cannot be turned backwards) and has a useful performance, especially above the 12-13,000 r.p.m. mark. The weight of the motor, complete with tank and starter, but less prop and spinner, is just over $1\frac{3}{4}$ oz. It has a bore and stroke of 0.420 × 0.360 in. giving a swept volume of 0.0499 cu. in., or 0.817 c.c.

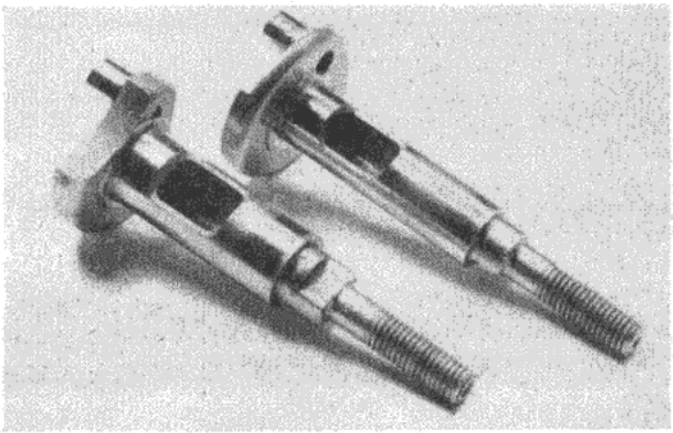
* * *

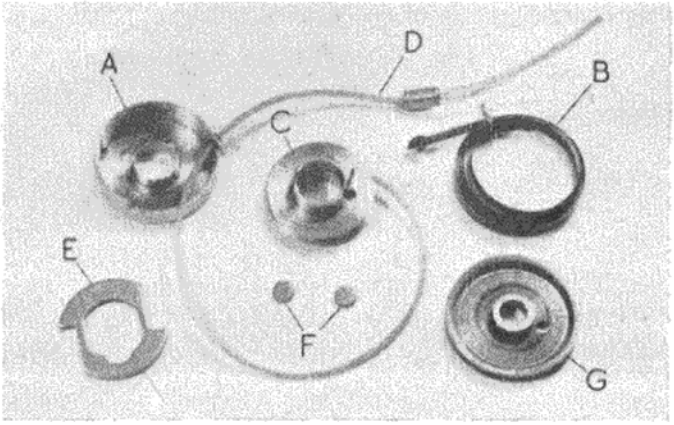
The Taplin Twin 6.9 c.c. diesel, which we described in last month's issue, is now in full production and we include some photographs showing the production model air-cooled engine. Two small modifications are evident, as compared with the pre-production model originally sampled. Firstly, the exhaust manifold (chromium plated, incidentally) has a central outlet, instead of a straight-through one at the rear. Secondly, the barrel throttle carburettor has an air-bleed screw adjustment for low speed running.

We have made some runs with one of the production engines and there is no doubt that this engine is, in many respects, unique. The throttling is superior to anything we have previously encountered with a diesel. When the engine is thoroughly warmed up, the throttle can be slammed fully open from the tick-over position, and vice versa, with no risk of stalling the engine. It is also exceptionally smooth running for a big diesel. This, of course, is due to the alternate-firing arrangement which reduces cyclic fluctuations of torque, and

Continued on page 65

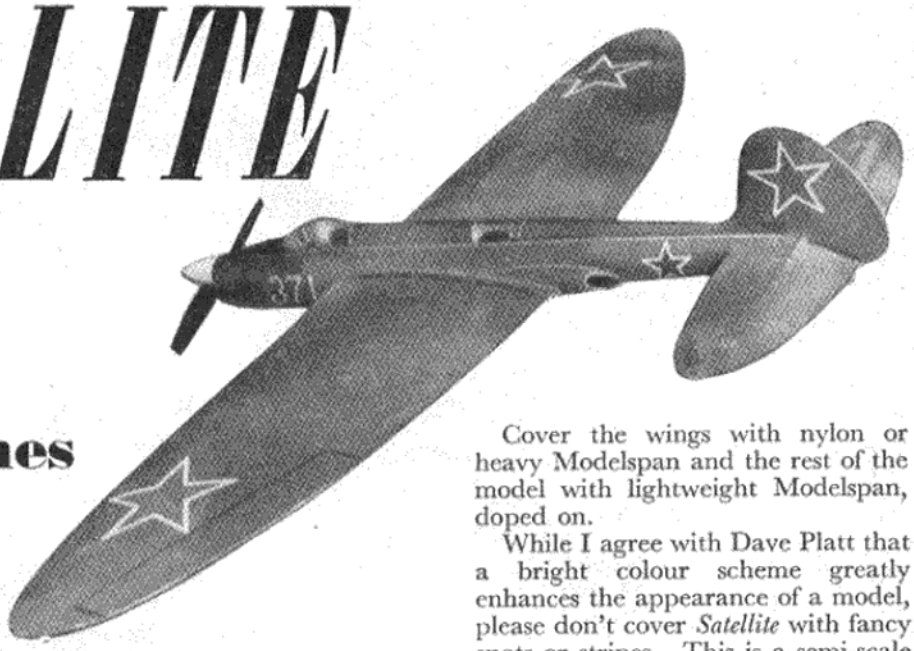
Below: with a journal diameter of 13 mm., the new 1959 O.S. Max crankshaft is the largest of any 29/35 class engine. Shown for comparison is the shaft of the 1958 model. Right: parts of the Wen-Mac patented model engine starter. A full description of how it works is included in the text.





SATELLITE

A semi-scale stunt model for 2.5-3.5 c.c. engines



Designed by—
M. F. HAWKINS

A STUNTER with real semi-scale appearance, the *Satellite* will orbit its way through any of the "awkward" manoeuvres in the new S.M.A.E. schedule. I have used both an ancient D.C.350 and an Oliver Tiger as power plants, so anything from an A.M. 2.5 to a Veco 0.19 would provide all the urge necessary to "do the book."

Satellite's vital statistics are—wing area 370 sq. in. and weight 22 oz., giving a wing loading well below 10 oz. per sq. ft. If you prefer to build the model heavier, then add flaps, but they have not been necessary on the original, and the model is quite strong enough to withstand all except vertical prangs onto tarmac.

To get down to construction, the wing, which is built first, is quite straightforward, and for real strength all the ribs are capped, while the leading edge sheeting extends as far as rib 2. The inner wing is 1 in. longer than the outer.

For the fuselage, first build the ply and hard wood assembly of F1, F2, engine bearers, undercarriage, tank and fuselage doublers, and cement this firmly to the wing. Then add planking strips for the top and bottom of the fuselage, insert the remaining formers and complete the fuselage planking in the usual way. Remember to stitch the tail wheel strut to F8 before covering the fin and rudder with $\frac{1}{16}$ in. sheet.

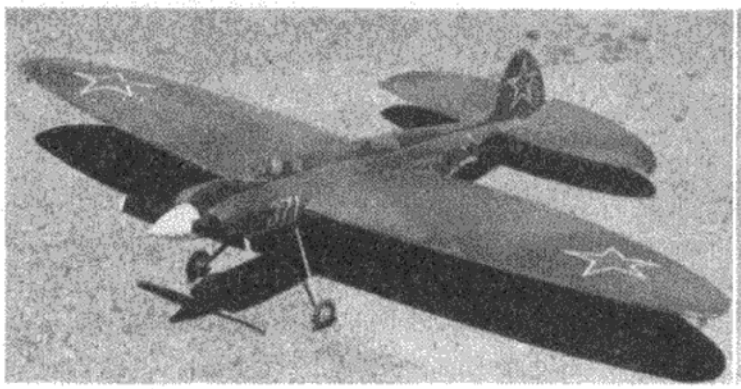
Lightly cement C4 to F1 and build the cowling in one piece, bringing the fuel tubes out through C3. Cut away the detachable half of the cowl and cut to fit snugly around your motor.

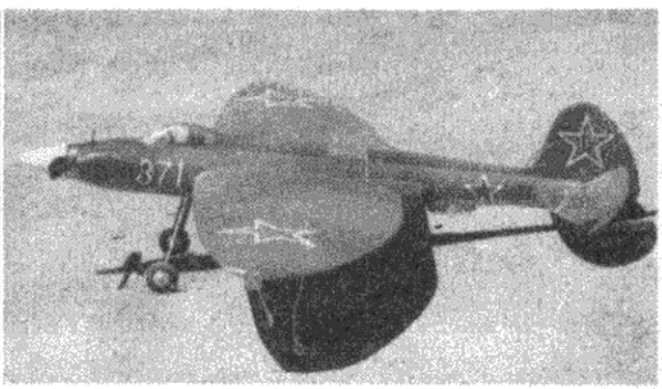
If you decide to use the elevator hinges as shown on the plan, slide the ply hinges down the dowel and firmly cement them into the sawcuts in the stabiliser; add the elevators only after cementing the tailplane to the fuselage and attaching the push rod. This makes it easier to adjust the controls for neutral.

Cover the wings with nylon or heavy Modelspan and the rest of the model with lightweight Modelspan, doped on.

While I agree with Dave Platt that a bright colour scheme greatly enhances the appearance of a model, please don't cover *Satellite* with fancy spots or stripes. This is a semi-scale model, so why not use a scale or semi-scale colour scheme, e.g. U.S. Navy, grey and white? I used dark grey and green sprayed camouflage finish on top and silver underneath; with Soviet Air Force markings painted on, this result looked very smart—as the photographs show.

If you can fly a stunt model at all you won't need telling how to fly this one, but if this is your first then take it easy until you get the "feel." Line lengths of up to 60 ft., depending on the wind, are recommended.





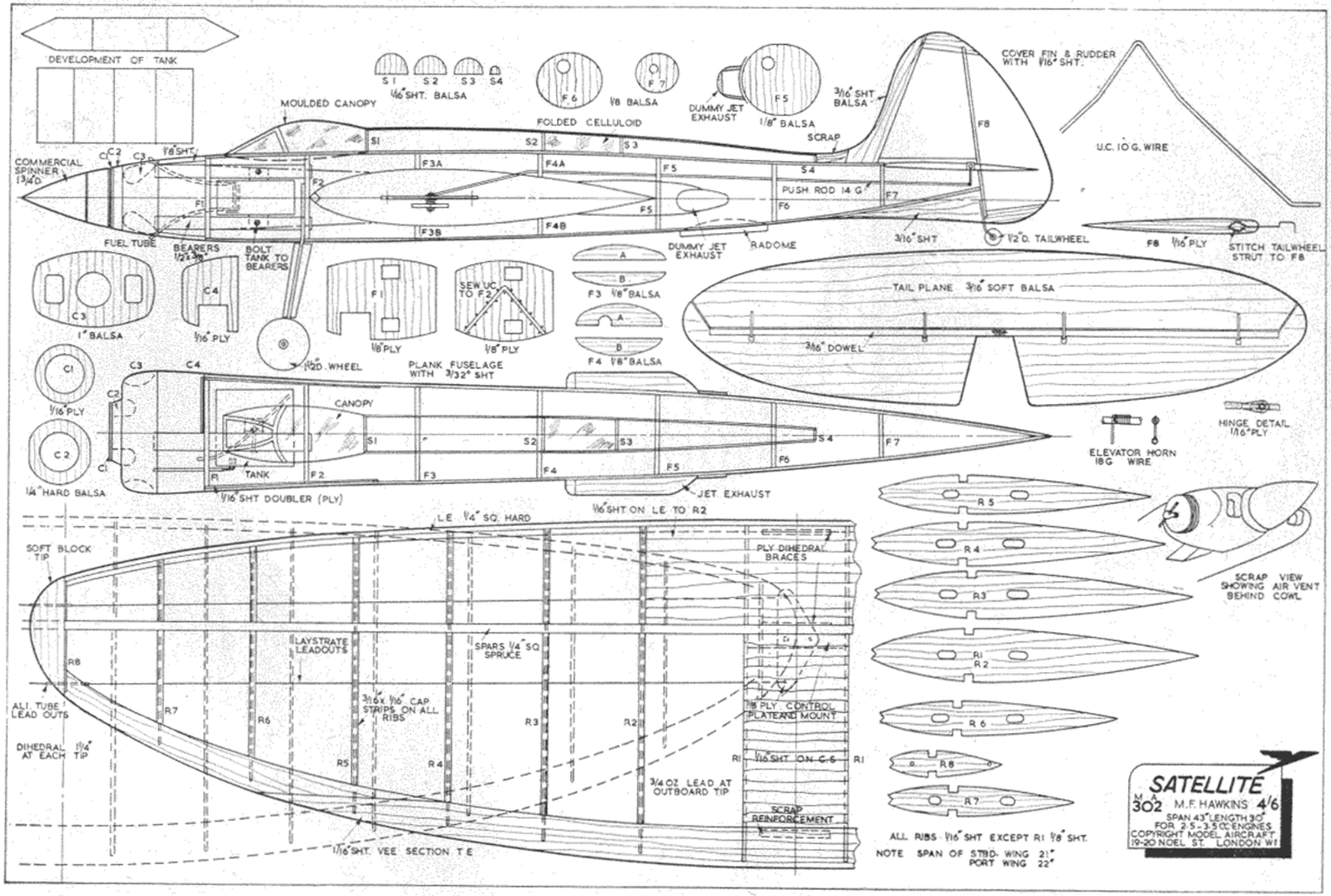


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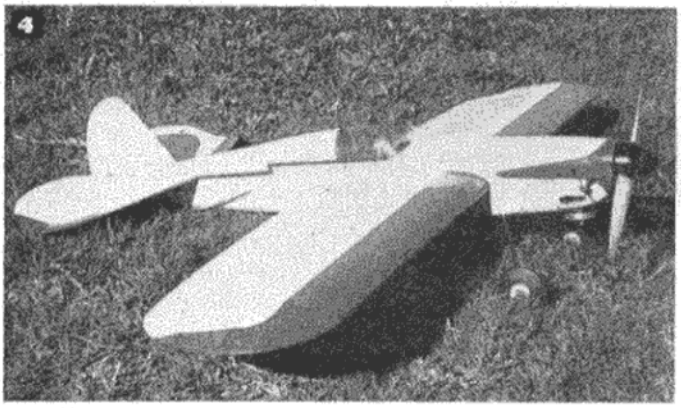
PHOTO NEWS

IF there sometimes appears to be a preponderance of scale models in Photonews, it is because we receive more photographs of this type than any other, so no accusations of bias, please! All this apart, Photo **No. 1** would have earned its place anyway on its photographic merit alone, or rather the imagination used by the Solent Heights M.F.C.'s photographer. This *Gypsy Moth* in the rural surroundings was built by John Hitchman and spans 6 ft. An E.D. 3.46 carries the model—complete with single channel R/C equipment—aloft for a very satisfactory flight performance. Peter Caseley, Hon. Sec. of the club, was kind enough to send us this and other interesting photos from the club photo album.

Another D.H. job—although of later vintage—is shown in Photo **No. 2.** Norman Lees has ably demonstrated what a fine model can be made from Mercury's kit, although, with due modesty, we mention that Norman gives us credit for the *Tiger Moth* feature in our March, 1957, issue, which he says was a great help when it came to the "super-detailing." It seems superfluous to add that the model won the first prize in its class at last year's Northern Models Exhibition. Incidentally power is an E.D. Bee.

Smart stunt model in Photo **No. 3** is the work of Jaroslav Rybak, of Svitavy in Czechoslovakia, and if you haven't read the wing legend—the engine is an O.S.-Max 35. Jaroslav gives the maximum speed as 150 k.p.h. and he says it "does the book" at this speed. He uses a Tornado 10 × 6 prop and the brew consists of 60 per cent. methanol, 10 per cent. nitro, and 30 per cent. castor oil; sorry chaps, we have no information on the other model.

The stunter in Photo **No. 4** is also from abroad—Australia. Designed and built by Roger Lloyd, of the Model Flying Club of Australia, it is powered by an old 5 c.c. twin port reverse flow engine, and the long crankshaft of this particular motor makes possible the *Spitfire*-type cowling. Fuselage is planked top and bottom and



the colour scheme is dark blue and bright yellow.

The model in Photo **No. 5** would appear to have more than its share of unorthodoxy, what with gull wings *and* floats. However, Ron Crammer, of Durban, South Africa, says he and his friend have plenty of fun flying it on the Durban yacht pond. Needless to say it's a control-liner, but was scaled up from F/F plans that originally appeared in *Air Trails*. Span is 54 in. and with a 10 c.c. Hornet up front, the total weight comes out at around 4 lb. On 60 ft. lines it rises off water in just under half the circle and on a full tank flies for 12 min. The builder says it has been clocked at 70 m.p.h. on the 60 ft. lines—must be quite a sight!

Vive la France!—we say that because friend Jean Mouttet of Marseilles was thoughtful enough to write to us in English. He enclosed the photo of himself with team racer that you see as photo **No. 6.** Jean has named his model *Diable Rouge* and for those readers who do not parlez-vous it means *Red Devil* (all right, we admit we had to look it up). As if the colour (red) was not enough to match the name, even the engine is a McCoy Red Head 5 c.c., which has a throttle worked by a third line. Speed is about 85-90 m.p.h.

"Every picture tells a story"—so goes the old saying—but the two photos, **Nos. 7 and 8**, are only half of it. Here, in his own words, is what H. J. Fox, of Chingford, had to say of them:—

"H. Fox energetically hurls into the air a much rebuilt and many times patched Keilkraft *Gypsy*—a 40 in. span rubber powered duration model—while H. Lee looks on approvingly.

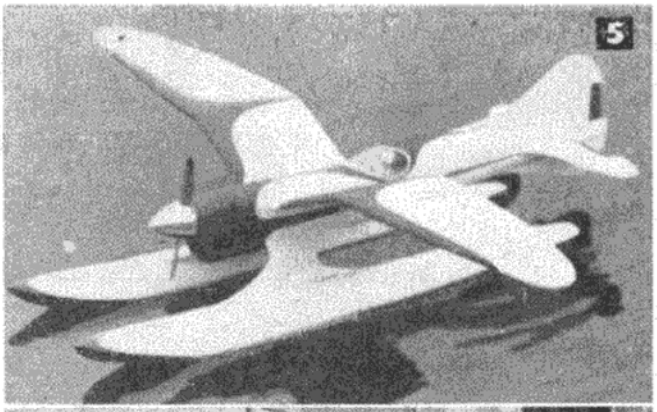
"We have only recently become interested in the hobby, and this was our first serious attempt at building something that would stay airborne longer than a few seconds. At first the model was pretty consistent at around 2 min., but as the patches got bigger and bigger the model got heavier and heavier, the flights shorter and shorter and the time between flights longer and longer.

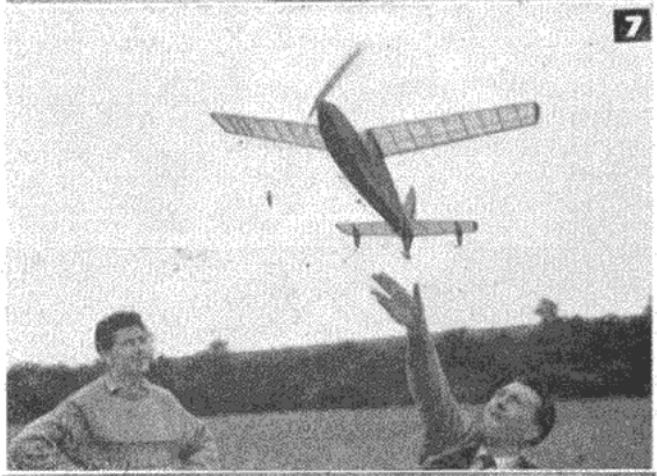
"The second photo **(8)** shows the surprising result after a hand launch on maximum winds, straight into a straw bale—the motor completely severed in two.

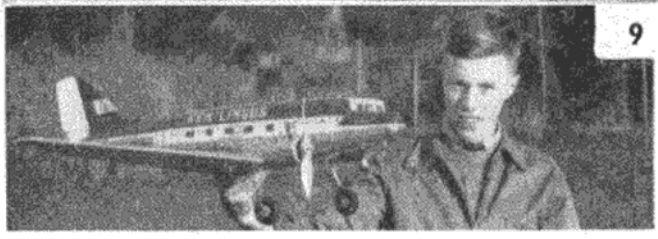
"Maybe we'll go back to fishing; we never caught anything at that game but life wasn't quite so uncertain.

"P.S.—Photo by mate J. Cutteridge, who also helps patch things up at the end of the day."

Sixteen-year-old R. Cooper, of Dorking, has done a creditable job of turning out a 46 in. span D.C. 3 from scaled-up silhouettes, and the result is in Photo **No. 9.** All up weight is 18 oz. and two Mills 0.75s provide the power. On 54 ft. terylene lines the model takes off in about four yards, and will fly on one engine. Colour scheme is that of Aer Lingus, the Irish airline.







OVER THE COUNTER

An apology to **Bradshaw Model Products** for a misprint in their advertisement in our January issue, which stated that Dooling 29s were available at £5 10s. 9d. No doubt many readers wish that they were, but the correct price is £15 10s. 9d.

Also in our editorial write up we made a £10 error in the price of the Deltron 109 receiver—the correct price being £19 8s. 6d.

* * *

We like the leaflet issued by **Mills Bros.,** manufacturers of the famous Mills engines. This gives a complete list of kits—aircraft, boat and car—for which their engines are suitable, together with prices and illustrations of most of the models. In addition, there are the overall and mounting dimensions of their motors, and recommended propeller or flywheel sizes—a most useful little hand-out.

* * *

While on the subject of price lists, etc., we were very impressed by the **Ripmax** catalogue, which is one of the most complete and easily referred to that we have seen, and well worth the nominal charge of 4d. made for it.

* * *

The American "bubble pack" idea is certainly catching on, and in future the **Mercury** range of accessories will be packaged in this way. As our photo shows, the packs are triangular in shape with the item clearly visible, and, from a shopkeeper's point of view, most useful of all, the price clearly displayed. A wire counter display stand cum dispenser for these packs will be provided free of charge to retailers who place a certain minimum order for accessories.

* * *

World War I fans will be pleased with the **Revell** Fokker Dr. 1 *Triplane* The first of a series of large scale W.W.I fighters, it has a span of 10 5/16 in., costs 17s. 6d., and has several very interesting features, including a cowling which lifts to disclose the detailed rotary engine.

The kit of the Lockheed *Hercules*, which we mentioned last month, is shown on the next page while two other interesting designs due for early release are the Chance Vought *Crusader*, and the Martin B.57B—the American built version, and development of, the *Canberra*.

* * *

We have just examined the kit of the **Frog** *Condor* 1.5 c.c. stunt model. We commented some time ago on the excellent flight performance of this model, and we can only say of the kit, that it lives up to the capabilities of the design. The quality of the materials is first class, while the die cutting is some of the best we've seen; included in the kit are streamlined rubber wheels, plastic spinner, etc., and it costs 30s.

* * *

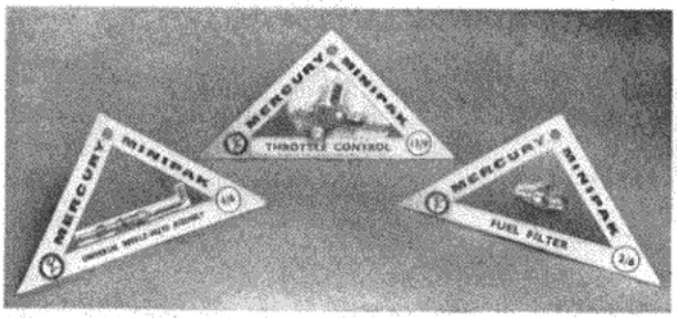
New from **Keilkraft** are a range of pneumatic airwheels in five sizes—2 in. (14s. 5d.), 2½ in. (21s. 7d.), 3 in. (26s.), 3½ in. (28s.), and 4 in. (30s.). The wheels look very attractive with the tyres in shiny black rubber, and a plastic hub with aluminium bush. They are boxed in pairs complete with cycle pump adapter.

* * *

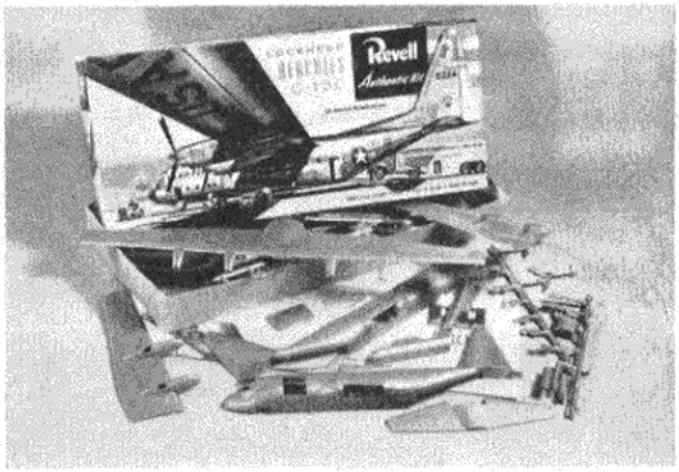
Now available from model shops is **Airfix's** most ambitious kit to date—their 1/72nd scale *Lancaster*. For the cost of 7s. 6d., this makes up into a most impressive model, while in its attractive coloured box—a departure from their usual polythene bag packaging—it will make an interesting addition to the present range of plastics, which is all too lacking in models of this type.

* * *

First marketed last Easter, **Keilkraft** Nitrated Diesel Fuel, in its familiar green and yellow printed can, has now become very popular with modellers throughout the country. An economically priced fuel, selling at 3s. for 10 fl. oz., it is based on the same formula and high-quality ingredients as KK Record



Left we show the new Mercury accessories pack, lower left the Mercury and Keilkraft fuels, and right, the Airfix Avro Lancaster kit.



Above is the Revell kit for the Lockheed Hercules, and right the Frog Condor stunt model.

competition fuel (3s. 6d.) but contains 1 per cent., instead of 3 per cent. nitrate and has the proportions of burning oil and ether revised accordingly. In addition, although remaining, basically, a castor lubricated mixture, it also contains a proportion of special inhibited petroleum oil to resist cold gumming tendencies.

We have tested this Keilkraft fuel in a number of popular diesels and have found it entirely satisfactory. It runs on a moderate compression setting and is well up to the best standards in respect of startability, power and flexibility. It is clean running and should also be quite suitable for running in new engines. The fuel, which goes through a modern filter system before being tinned, is very clean and was found to have no tendency to form coagulated deposits during a six-month storage period. The conveniently shaped half-pint can is equipped with a reversible filler-spout type screw-cap.

* * *

More recently **Mercury** have responded to the current demand for a "tinned" fuel with their new "Super-6" mixture. Hitherto, all Mercury fuels (and there have been at least a dozen different grades and variations since Mercury began marketing fuels in 1948) have been in 8-oz. bottles. Super-6, which replaces the earlier No. 6, comes in a red and yellow labelled 10-oz. tin with a long spout. Like the old No. 6, it it is a mineral-oil based "economy" mixture, intended for the chap who requires a cheaper fuel than the castor-oil based Mercury No. 8.

Tested against three top quality castor-base mixtures containing varying proportions of amyl-nitrate, Super-6 was seen to require a somewhat harder compression setting, but ran on a slightly lower needle adjustment, suggesting that its claims to economy may be partially found in lower consumption figures. One other characteristic came to light which was interesting. This concerned three engines (two prototypes and a foreign import) in which a high-speed misfire had proved very difficult to eliminate. Despite the fact that the higher compression ratio necessary with Super-6 suggests that its cetane value is relatively low, this fuel was, in fact, more successful than any other in eliminating the misfire in two of these three engines.

LATEST ENGINE NEWS

Continued from page 59

to better balancing as opposed to a single-cylinder engine. George Honnest-Redlich has now tried one of these engines in a *Smog Hog*, with, we are informed, promising results.

* * *

The Enya Company of Tokyo have lately introduced a new engine to the Japanese home market. This motor, intended mainly for beginners, was designed by the youngest of the three Enya brothers, Yoshiro, and is not yet being exported. It is known as the Enya 06 (0.06 cu. in. or 1 c.c.) and, as will be seen from the photograph, is of quite different design from any of the current Enyas now available in the U.K. A description of the engine will be included in these columns shortly.

* * *

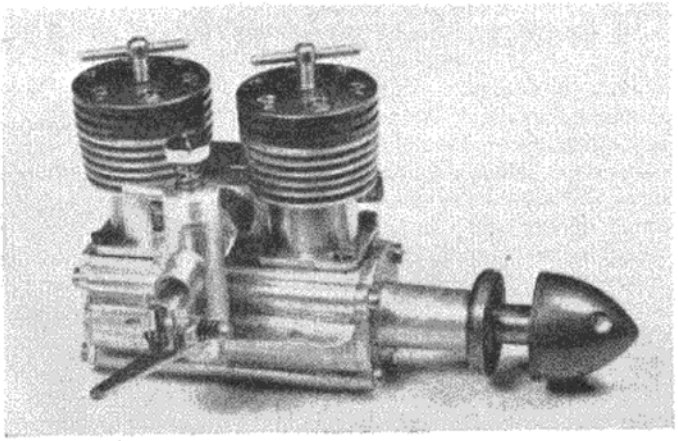
Following the recent introduction of the new 1959 Max-35 with new crankcase, extra large shaft (over ½ in.) and revised timing and balancing, O.S. are now making the new improved model Max-29, having these same features.

* * *

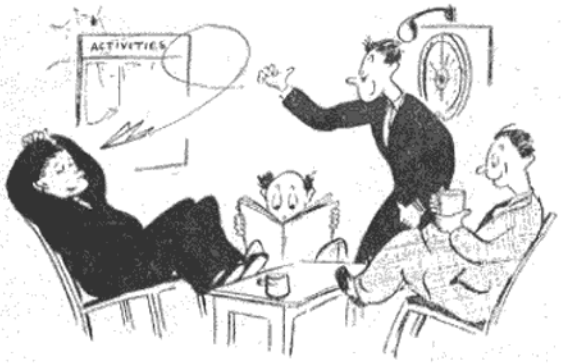
American engine designer-manufacturer Duke Fox has been working on a modified model Fox 29x. It is being made available as a "custom-built" item, direct from the factory, at $25.00 (approx. £9).

* * *

Latest imports include the Dooling 29 racing engine and Ohlsson glowplugs from America, and the Australian Burford Glo-Chief engines.



The current production version of the 7 c.c. Taplin Twin diesel. A throttle type carburettor is standard and provides excellent speed control.



Club News

BLACKHEATH M.F.C.

The following are the results of our Gala held on Chobham Common on Sunday, Dec. 7th, 1958.

Bill White Cup (25 entries)

		m.	s.
1. D. Greaves	.. Leamington ..	5	38
2. J. Knight	.. Croydon	5	22
3. R. Boxall	.. Brighton & Dist.	5	18

Glider Contest (27 entries)

1. D. Partridge	.. Croydon ..	6	00
2. Brookes	.. Surbiton ..	5	22
3. Tofield	.. Watford ..	5	14

Power Contest

1. A. J. Crisp	.. Martyrs ..	4	29
2. D. Wain	.. Martyrs ..	4	25
3. A. J. Strakee	.. Springfield Park	3	56

Weather conditions were foggy, no wind and visibility about ¼ mile, but we had quite a good entry in spite of the weather.

DAGENHAM M.A.C.

Bill Morley came down to give us a very interesting two-hour talk on stunt models, starting with the general history of stunt, right through to the modern machine. So if our new stunt models crash, it should only be lack of practice. Bill tells us that speechmaking is not his usual line, but even so, he held his audience the whole time.

Looking back on the year, we find we ran our first C/L Rally most successfully. We visited all of the major rallies, and most of the smaller ones. Combat has taken a hold on most of the club members, but there is still a keen interest in many other branches. We have also held inter club comps with the local clubs, and intend to do so more frequently in the future. Lately there has been an influx of senior members which could well continue if all local unattached modellers were to come along to Hut 3, The Old Fire Station, Becontree Heath, on Thursday evenings at 7.30.

MILFORD HAVEN D.M.A.C.

We have just formed the above new club which is not an A.T.C. club as was the previous one in this district, but is open to anyone. New members are invited to the Marble Hall Field any Saturday afternoon where members will be found flying, mostly C/L.

SOUTHAMPTON M.A.C.

The contest season finished up with the annual contest for the "Hobart Trophy" which is flown for each year between the Southampton and Portsmouth clubs. The rules call for a six-man team from each club to fly in each class, two flights 3 min. max. Again the Southampton club were victorious for the fourth year running with a total of 24 : 32, against Portsmouth's 11 : 39.

All praise must go to Tom Colclough, a new junior to the Southampton club, who put up a double max. in the Power comp. and this being only his second contest.

COSMO A.M.C.

An inter club combat "do" between the Sidcup, Dartford and Cosmo clubs resulted in our taking the first two places.

For garden fetes, etc., B. Southern and S. Robinson have worked out a good demonstration routine, guaranteed to keep the crowd on their toes, as both are capable of flying two models at once, usually a *Toreador* and *Zephyr*.

Club meetings are held on Fridays at 8 p.m. at Hurst Community Centre in Hurst Road, Bexley. Building is carried out under the expert supervision of Mr. Crick and Mr. Andrews in our large and well-equipped clubroom, and any lone hands in the area will be made welcome. We also fly at Danson Park up till 1 p.m. on Sundays.

URMSTON & D.M.A.C.

The latest competition held by the club was a F/F scramble, and it was quite a surprise to see so many C/L types having a go! Winner was a power model flown by I. Bescoby, while second place was taken by W. I. Barrett flying his reserve glider, after his Kalper powered canard had bit the dust. R. Puddephat was banished to an adjoining field when his midget all sheet Mills 0.75 job adopted dive bomber tactics. The power glide ratio of the model was about 2 to 1!

In the team race circle, junior J. Brady has been putting up some fast times with his class "B" racer, using an Eta Mk. 6. The noise is working up the local seagull clan into a frenzy—a pity they don't carry streamers.

SOUTH WEST R/C M.F.S.

The club held its a.g.m. at Paignton, by kind invitation of Courtenay and Mary Gill. A representative attendance made several important decisions, as follows: (1) Club monthly rallies next season will be held at Woodbury Common and Salcombe alternately; this is to cater for the eastern and western sections of the area, membership now stretching from Somerset to Cornwall. There will also be a big "Open Rally" once a season at Winkleigh Airfield. (2) Subscriptions for 1959 have been reduced to a nominal 2s. 6d., to be reviewed at the next a.g.m.; our healthy financial position makes this possible and removes any "excuse" for R/C flyers in the area not joining! Already this has brought in six new members. (3) Building emphasis this winter will be on models designed for penetration in windy conditions, this being our usual lot in this country. The first rally is fixed for Easter Sunday at Woodbury Common. New members welcome—write to Hon. Secretary: H. A. Stillings, 5, Woolsery Grove, Whipton, Exeter. Phone 66183.

NORTHWOOD M.A.C.

We recently held a combined parents' evening and exhibition which was a great success. The local Press came along and took notes and photographs and a week later a group picture centred around Mr. Sen Becket's huge glider succeeded in untidying the front page of the local paper.

The club has now affiliated to the Middlesex Youth Council, from whom we can borrow film projectors, camping equipment and money, also they have approached the council on our behalf requesting that we be allowed to flatten a piece of Ruislip Common and make two C/L circuits on it.

CONTEST CALENDAR

Feb.	1st	N.W. Area Winter Rally, R.N.A.S. Stretton. Open R/G/P. Combat, T/R, A & B. R/C. multi and single. (See N.W. Area report for full details.)
May	3rd.	Stockport Express Rally, Woodford Aerodrome, Cheshire.

CLUBS: If you want details of your gala to appear here, then just send us a postcard with the date, venue and events at least six weeks in advance.

NORTH WESTERN AREA

We are holding our winter Rally at R.N.A.S., Stretton, nr. Warrington, on February 1st, the events being as follows: F/F, Rubber, Power & Glider, all events unrestricted. C/L, Combat, Team Race "A" & "B." R/C Multi and Single Channel.

Rules

Pre-entry to J. Chadwick, 129, Mottram Road, Stalybridge, Cheshire. Seniors, 1s. 6d; juniors, 6d. Double entry fee on this day. The class "A" T/R will be to the new S.M.A.E./F.A.I. rules, while class "B" will use 60 ft. lines. R/C multi to full S.M.A.E. stunt schedule and single to Taplin schedule.

DEBDENAIRS M.F.C.

We have recently paid a visit to the Harlow club where a Combat event was held. Bernie Steelgoe, one of our youngest members, flying in his first-ever competition, took first place flying a model built by our comp. secretary, Doug. Galpin, who was second.

New members who are active modellers and in the area of Loughton/Buckhurst Hill should "hop on a bus" one Friday and see us at Loughton Hall, or, preferably, contact P. Oliver, 23, Covert Road, Chigwell, Essex.

CROYDON & D.M.A.C.

The club series of winter contests is well under way now, with an Open Rubber, Glider, Power or Wakefield event every Sunday till Gamage day; thus the lads should have plenty of opportunity for developing models in contest flying as opposed to sometimes less conclusive trimming sessions on Sunday afternoons.

After winning the Croydon Gala (as a country member) and the club A/2 contest, Dennis Partridge managed to score two threes, to return the only perfect score and win the Blackheath open gala event at Chobham; he flew his *Nebula* in appalling conditions the mist closing visibility down to 50 yd. at times—he must have chosen the other times to fly.

Johnny Knight took second place in open rubber at the same "do," scoring 5 : 22 with

Those Garden Fete Displays!

Continued from page 40

all the oddments. By now the aeromodelling movement will have a few converts, answer all their questions, show them how things are done, and don't forget the leaflets, they are there to be given away but I don't mean a dozen to every clutching hand in sight, they will only drop them for you to pick up again.

If you are charging a fee to cover your expenses, fuel, etc., collect it from the treasurer before the fête closes and give him a receipt. If the committee want two flying displays, chop the programme in half, stunt, etc., first and all combat second.

By now you will have given an exhibition of model aircraft flying and the local Press is there to get the details, but who are you? If you haven't got an attractive name for your display, start thinking of one ready for next time and make sure that it is featured prominently.

his large and quite elderly featherer, again a matter of deciding when the fog was at its thinnest, winding, and heaving into the murk.

In between flying *Beverleys* to Aden and Cyprus, John Blount has found time to finish a Fox 35 powered "T-Boid"; all that's needed now is for him to be in Britain instead of Africa when the Nationals come around.

A flame-proof dope for Wakefields would be a welcome New Year present from manufacturers, particularly after the sudden appearance of Martin Dilly's scorched, tailless, Wake at a recent club contest; in any case the appearance of snuffer-tubes is forecast.

On the social side Keith Miller showed us some films he'd taken during 1958, including some impressive shots of V-bombers doing loops and rolls off the top at Farnborough, and also a hair-raising sequence of a Sky sailplane doing a most dodgy approach at Lasham after losing 14 ft. off its port wing in a mid-air collision.

FARNBOROUGH M.A.C.

The club has obtained provisional permission to use a hut at the R.A.E. Apprentices' hostel for evening meetings, and this will substantially relieve a financial strain on the club's resources.

OUTLAWS (CANNOCK) M.A.C.

The club's first annual dinner and social evening was a great success, and 50-odd members, guests and friends from five neighbouring clubs made short work of an excellent chicken dinner. Dancing, party games and general frivolities followed, whilst an extension to the bar kept the less energetic types sublimely happy.

The first of our monthly practice combat comps was almost an Eifflaender Benefit Day as 75 per cent. of the entries used P.A.W.s. First place went to new boy, Derek Gater with a *Peacemaker*, and second was Brian Millington flying an O/D wing. How's this for scrupulous fairness? (or is it just bad management)—the secretary, chairman and treasurer were all eliminated in the first round!

Flying wings with Gloster *Javelin*-type tailplanes are arousing interest, and one fiendish derivation, known as the *Lck'sperimental* has arisen with plotted eliptical surfaces, slotted elevators and an area akin to that of an F.A.I. team racer! The first flight is awaited with an an air of acute trepidation and an abundant supply of blind faith.

CAMBRIDGE M.A.C.

"Dusty" Miller, one of the club's top power fliers and who, until recently, never thought of as being anything else, has just received the E. Anglian Scale Cup and has been flying R/C for several weeks. However, his radio model pranged beautifully on a runway and apart from the receiver, etc., and a few square inches of wood, is no more. "Dusty" has gone back to power but is threatening to fit radio in a *Magna*

After much searching the club has, at last, found a substitute for its rapidly-deteriorating club room; and only just in time, too. When we arrived for the last meeting there was a gaping hole in the ceiling. Fear of further falls of plaster put paid to R.T.P. flying for the evening. Chief attraction of the new room is probably the fire, an unheard of thing in the old club room where some members used to sit round a can of "Anti-Freeze" to keep warm. For anyone interested the new room is Trinity Hall, Trinity Place, King Street, Cambridge.

BRISTOL ACES M.F.C.

Foggy, dank air greeted our F/F contingent when they arrived at Sodbury Common for the Bulldogs U/R rubber and power contests. They had an extremely successful time, however, since D. Cummins and H. W. G. Bunney were first and second respectively with times of 7 : 26 and 6 : 27 in rubber. J. R. Shaw, with his Torp 19 powered *Eureka*; D. Cummins, with O/D special, and Gordon Bunney with his P.A.W. O/D model, came first, second and third in power with times of 6 : 23, 5 : 36, 4 : 57 respectively.

Only black spot on the day was the fact that Gordon Bunney, flying for his B certificate had a 37 sec. motor run and lost his P.A.W. model. He said the tank would run out before 20 sec. and didn't use the timer!

WIGAN M.A.C.

The end of the competition season saw a prophecy well and truly fulfilled, that this was to be Mike Hosker's year. He did, in fact, win the N.W. Area and National Junior Championship's, a double that we in Wigan are as proud of, as Mike himself might well be. This is a very popular, and a well deserved win, and a challenge to our other juniors, who will, I have no doubt, be very keen to follow in Mike's footsteps. Add this to the fact that Brian Talbot was N.W. Area power champ, and was placed second in the placings for the overall F/F champs, as well as the win through to third place in the C/L champs in the N.W.A. by Dave Morgan, and you will know why we are proud of last season.

BRISTOL R/C M.A.C.

Since "summer" ended we have enjoyed a couple of months good flying weather, with few prangs. We had a most enjoyable club dinner to round off the summer season and then promptly started a series of winter contests—one a month, each one different—for a cup donated by a member, Tom Carroll.

The first two heats attracted keen competition from eight competitors—next heat is for the largest number of circuits and spot loadings an entrant can cram into 10 min. Hard on the starting finger if the weather is cold!

Mike Barnett's 6-reed ⅛ scale *Smog Hog* has taken the air—the inevitable teething troubles, but it has made some good flights. He has simultaneous control on the elevators and rudder.

ST. ALBANS M.A.C.

We have succeeded in winning the L.D.I.C.C. Trophy for the second year running, again beating Surbiton in the final. The usual team of G. Fuller (rubber), B. Cox (power), and J. Simeons (glider) are the ones to be congratulated for this success.

WEST ESSEX AEROMODELLERS

There is a great increase in activity recently in the club, with all branches of aeromodelling showing a marked expansion.

Interest is centred largely around R/C, but a drive by the club to increase membership has resulted in the nucleus of a contest F/F section, with Arne Ross and Don Reece as the current leading lights. The recruiting campaign, apart from bringing in new members, has brought back old hands who haven't flown a model since the Fairlop days. One such member even has his Fairlop models still in excellent flying condition, and airs them regularly on Sundays at North Weald!

Den Allan, Sid Sutherland and Ken Marsh have all announced their intention of going in for multi-channel R/C in a big way next season and backed this up by ordering eight reed simultaneous equipment for their models, the latter being *Smog Hogs*.

C/L interest is by now means neglected. Mac McNess in turning in 118-120 m.p.h. with his latest Class B racer on the new line length—this coupled with a lappage in the 40 region. Brew is a closely guarded secret which nobody has yet succeeded in discovering.

Club room activities include lectures, film shows, etc., and new members are made welcome at the meeting, which are held each Wednesday at 8 p.m. at Markhouse Road School, Walthamstow.

PEN PAL WANTED

Zdenek Tesinsky, Zelizy, 61, okr. Melnik, Czechoslovakia, would like to exchange copies of their magazine "Letecky Modelar" for similar English publications. Anyone interested should get in touch direct.

NEW CLUBS

VICKERS ARMSTRONG (SOUTH MARSTON). D. Howard, 80, Bourne Road, Moredon, Swindon, Wilts.

COSMO A.M.C. Mr. Crick, 423, Hurst Road, Bexley, Kent.

ROTHERHAM & D.M.A.C. J. Roderick, 14, Winifred Street, Rotherham, Yorks.

MILFORD HAVEN & D.M.A.C. C. Claxton, 4, Concrete Houses, Pill, Milford Haven, Pembrokeshire.

CHANGE OF SECRETARY

LONG EATON & D.M.A.C. M. G. Foster, 16, Wilsthorpe Road, Long Eaton, Notts.

DAGENHAM M.A.C. B. J. Whitcombe, 682, Becontree Avenue, Dagenham.

CHEADLE & D.M.A.C. J. Wingate, 62, Ogden Road, Bramhall, Cheshire.

CRYSTAL PALACE M.A.C. M. Ballentyne, 70, Hurstbourne Road, Forest Hill.

and so to . . .

RADIO

Continued from page 56

c.g., etc., and flying surfaces are maintained true and free from warps.

Experience in control can now be built up, but remember to make haste slowly and fly with care and common-sense. For instance, do not jeopardise the model (and risk injury or damage) by trying to make spot-landings under impossible conditions, such as when the final approach would take it directly towards obstructions such as trees, cars, or spectators. In such circumstances, be content to get it down *safely* in a safe place, even if it means a walk of several hundred yards to retrieve it. Similarly, don't try to weave intricate patterns in the sky until you have become thoroughly familiar with the model's characteristics, so that you know exactly when to press and (more important!) when to let go of the button. Every model has its own peculiarities, even when ostensibly identical in every respect with another, and the way to a long and honourable model life is to get to know your *own* aircraft inside-out, so that eventually you have the feeling that you are actually up there in it, and know precisely what effect the next signal will have, and exactly *when* to give the command.

Radio Railcar is not a stunt model and was never intended as such, so don't try hair-raising spiral dives to within inches of the ground, or similar manoeuvres. When you feel you are ready for such goings-on, build another model designed for that purpose (such as my aerobatic design *Zoom*, M.A. Plan No. 252) which will give you all the thrills you want. *Radio Railcar* will not only help you safely and painlessly through your R/C apprenticeship, it is also a model to which you will be glad to return again and again for relaxed, restful flying, especially after a period of frantic button-bashing with some misguided missile of more flashy performance!

If you start building *Radio Railcar* now you will have partially completed it in readiness for the next article in this series, which will deal with bench-testing of your radio equipment and familiarising yourself with the various functions *before* installing it in the model.

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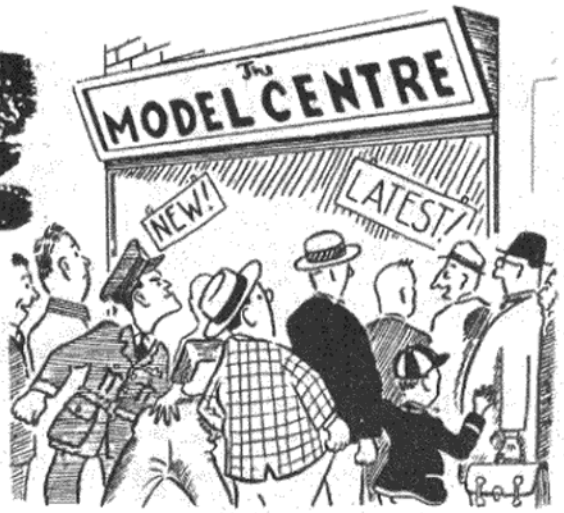

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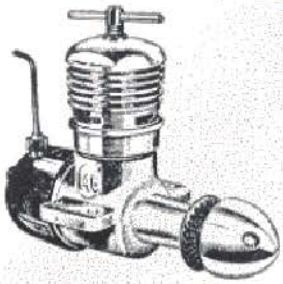

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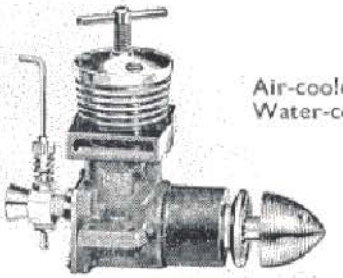

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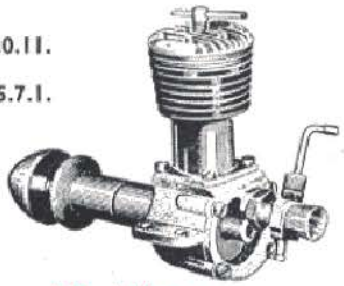

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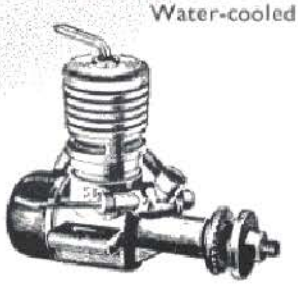

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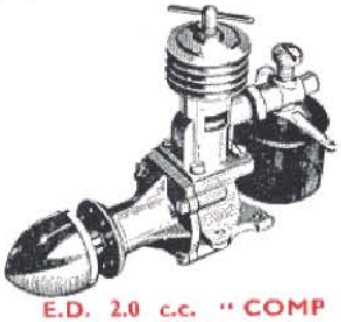

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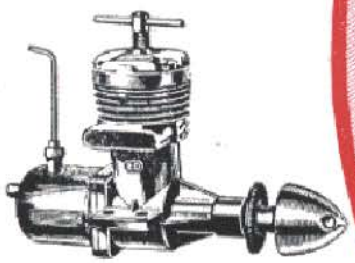

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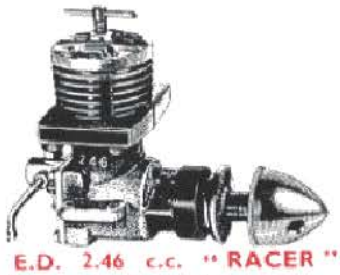

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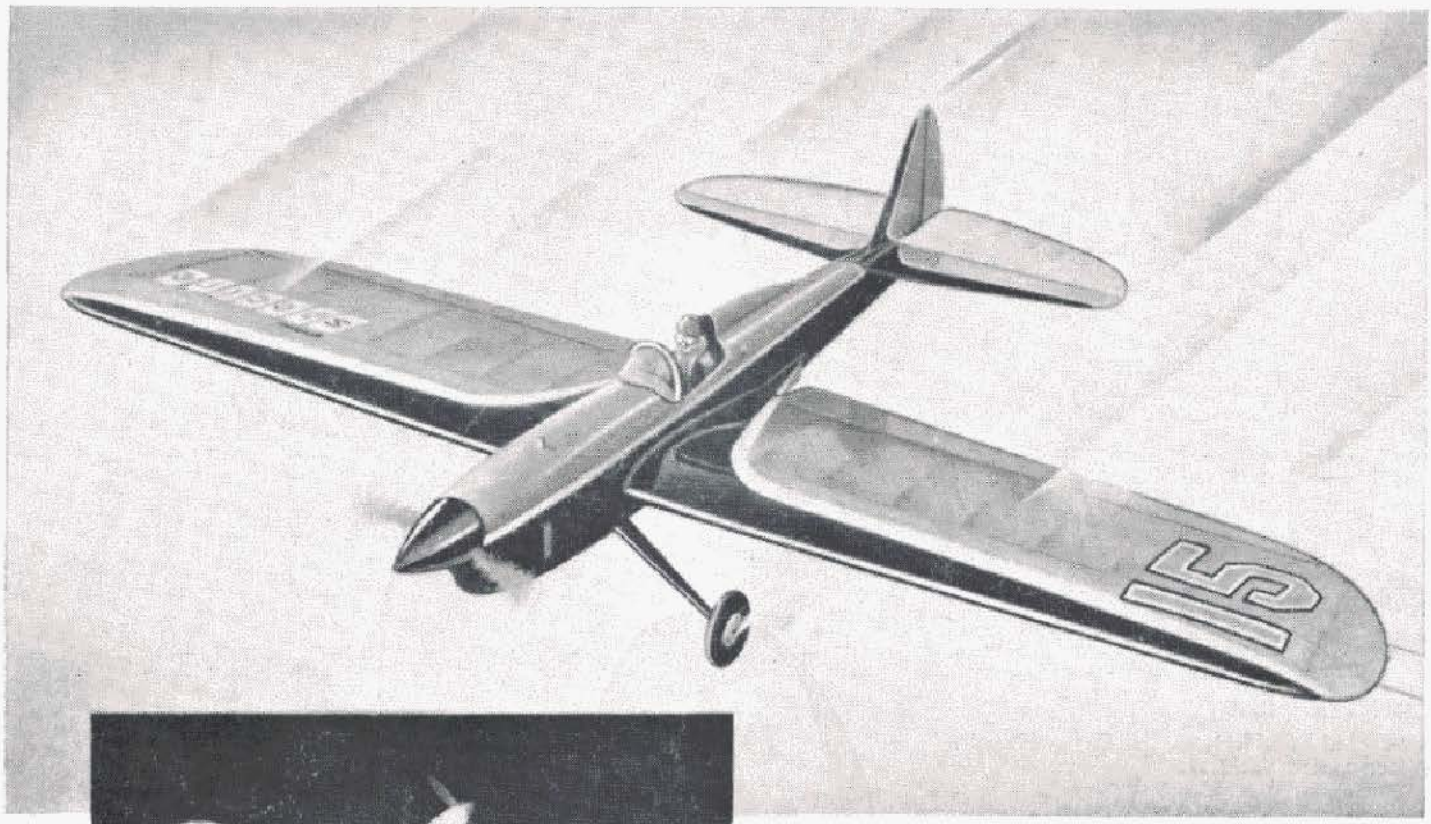

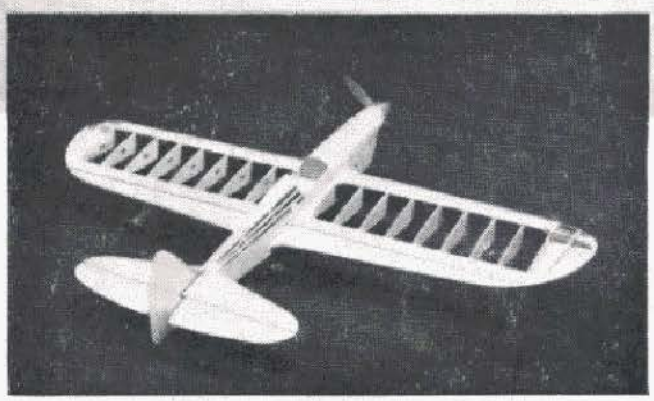

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