MODEL AIRCRAFT

Supermarine N.113

Illustrated Feature Inside

1'6

JANUARY
1957

Skyleada

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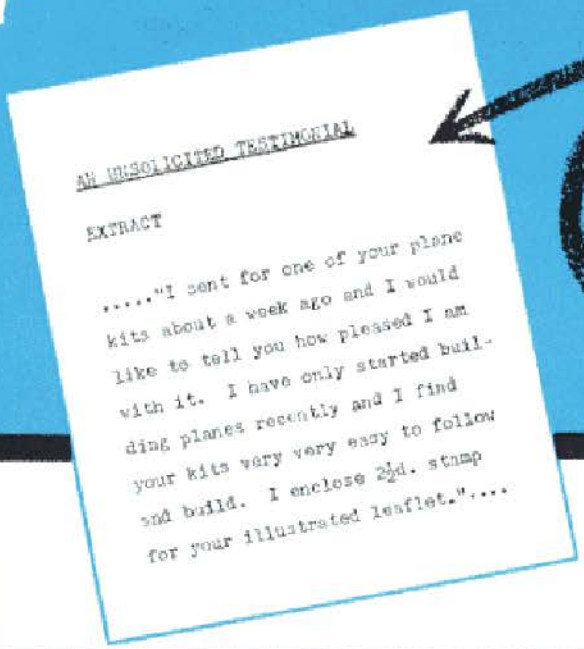

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Cover Story

Chief interest at Farnborough last September was centred on the Supermarine N.113, it being the only relatively new aircraft in the 1956 S.B.A.C. Show, and in the hands of test pilot Mike Lithgow it did not disappoint.

Our fine cover photo, taken by a *Flight* photographer, shows the N.113 (WT854) coming in to land on the Farnborough runway.

Flight photo.

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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Letters TO THE EDITOR

Camera Capers

DEAR SIR,—With reference to J. W. Law's letter in the December MODEL AIRCRAFT, I think it should be pointed out to would-be aerial photographers that aerial photography is rather beyond the scope of these small cheap cameras. They are really meant for normal snapshots at approx. 10 ft. and even then the results leave a lot to be desired, but they are not bad value for 12s. 9d. I suggest budding photographers should get in touch with their local camera club when planning a project like this.

The lens needs to be of high definition to obtain reasonable results, while the shutter speed depends on the height at which you intend to make the exposure, i.e. at approx. 500 ft. 1/25th would be sufficient, but a speed of around 1/200th sec. is to be desired.

I hope in the near future to mount a camera in an 11 ft. span × 3 ft. 3 in. chord flying wing sailplane, which was designed by Tim Turner and myself. It started construction as a combined effort, but due to my becoming more interested in photography it was almost entirely built by friend Tim. In this model I am using the lens and shutter borrowed from my ¼ plate camera, so I hope for some excellent results.

Yours faithfully,

Hextable, Kent. S. ROBINSON.

Glow for Ever !

DEAR SIR,—A remark in the recent article " Mainly Motors " has prompted me to write to you.

Commenting about the fact that there were no glow 35's made in Britain, Peter Chinn tells us that there may be a rectification of this as a Miles Special of 5.7 c.c. is in being.

A friend of mine once commented that the Miles Special filled him with a desire to make a scale model of a steam roller ! These, of course, are strong words and the Miles may be a very good motor for some purposes; but to enlarge it to 5.7 c.c. and offer it as a 35 appears to me to be defeating the objects of the 35, i.e. light weight, compact dimensions and the power of the early 60's.

I myself think there are too many bread and butter beginner's motors made in Britain and too few competition motors. Many people are willing to pay for performance and both Oliver's and Eta's seem to have little trouble selling their products.

(Continued on page 20)

F.A.I. SURPRISE

Power and Rubber Champs OUT for '57

AT the meeting of the F.A.I. Model Commission held in Paris at the end of November, delegates from France, Switzerland, Holland, Czechoslovakia, Germany, Italy, Spain, Yugoslavia, Belgium and Great Britain decided upon the future of the World Championships.

The grouping of the four events at one meeting had been proposed by a number of countries, but a compromise proposal was finally adopted which divides the four championships into groups of two, each group to be held in alternate years. This arrangement was facilitated by the fact that Czechoslovakia had applied for permission to run the Glider and Speed Championships, and Sweden had withdrawn from the option to run the Wakefield Rubber event in 1957.

Thus, in 1957, there will only be one World Championship meeting and this will take place in Czechoslovakia between August 15th-21st, when the Glider and Speed events will be held. There will be no Power or Rubber Championships in 1957, but these have been offered to Great Britain for 1958.

The following proposals which affect model specifications are, in accordance with the instruction from the F.A.I. General Council, subject to a postal ballot of national aero clubs with a view to their adoption in 1958:—

Power

Maximum cylinder capacity	2.5 c.c.
For each 1 c.c. of cubic capacity	300 grams minimum
Minimum wing loading per dm²	20 grams
Maximum wing loading per dm²	50 grams

Rubber

Maximum weight of rubber	50 grams

Among other matters decided upon was the question of hand launching and its adoption was carried by a large majority; radio controlled models must, however, r.o.g. These rules will come into operation on January 1st, 1957.

It was also decided to limit the number of competitors in a team race circle to three, for reasons of safety. The proposed amendments to the team race model formulae are to increase the wing area to 12 dm² minimum; to limit the maximum weight to 700 grams; to increase the fuselage cross-sectional dimensions to 100 × 50 mm. These proposed amendments are to be submitted to the national aero clubs with a view to their introduction in 1958. No satisfactory conclusion was reached regarding the question of whipping.

The schedule of manoeuvres for 1957 aerobatic contests will be modified to eliminate the less useful figures. The "climb" and "dive" manoeuvres have, therefore, been dropped and the "double wing-over," with a scoring co-efficient of 8, added. It was also agreed that the aggregate scores of two flights would count for classification purposes.

With regard to records, it was decided that when a model is built by a team, the record shall be held jointly by all the team members.

The definition in the Code Sportif has been amplified to include: "A helicopter must be capable of safe descent by auto-rotation."

In the case of the Flying Wing Contest, it was agreed to apply the A/2 formulae with a loading of 12 grams per dm².

OBITUARY

IT is with great regret that we have to record the death of Harry York. All older modellers will remember his many years of practical interest in modelling and service to the S.M.A.E.

He started modelling in 1913 and built a radio controlled model in 1921. Ten years later he was elected to the S.M.A.E. Council and acted as Press Secretary from 1932-42, when he was made a Fellow. After demob in 1946 he was again elected Press Secretary, which position he held until pressure of business forced him to retire in 1948.

Harry opened his well known model business at 171, New Kent Road, in 1930, and claimed that he was the first shop to introduce balsa wood, Jap tissue, lightweight dopes, banana oil, micro-film, indoor balsa and American kits and engines to the British market, thus it was probably the oldest established "pukka" model shop in this country.

A member of the Blackheath, Northern Heights, Hayes and P.M.A.L. clubs, he will be sadly missed and we tender our sincere condolences to his relatives and friends in their bereavement.

The decision to drop the World Power and Rubber Championships is bound to be received by British model flyers with mixed feelings—to say the least! MODEL AIRCRAFT has very definite views on this action, but at the time of going to press we have not received a full report of the meeting of the F.A.I. Model Commission; further comment is, therefore, reserved until next month.

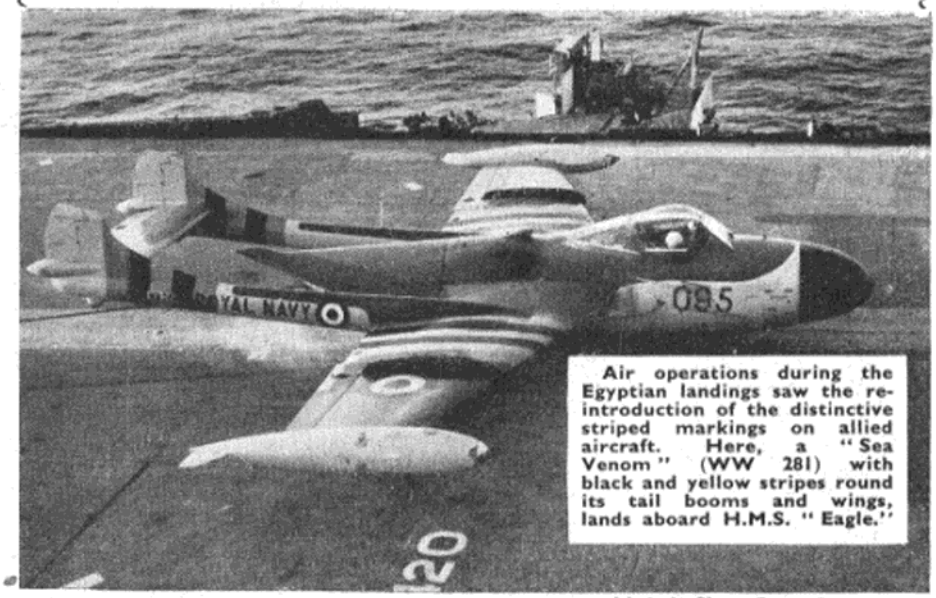
Quiz Results

THE response to our Christmas Quiz page in the December MODEL AIRCRAFT was greater than ever before, and total entries were up on last year by 50 per cent. The Engine Quiz was by far the most popular, and winner in the lucky draw was K. Proctor, of Sunderland. Checking through all the entries afterwards we found that no less than six more had an "all correct line," so to A. Young, of Streatham, I. Williamson of Carlisle, L. Carley of Manchester, W. Hall of Coventry, E. Smales of Hull and J. Jaaskelainen of Finland, goes a consolation prize of six months' free subscription.

No one submitted an "all correct" for the Model Quiz, but E. Smales had only one answer wrong so he will get the year's free sub. As Mr. Smales already has a prize from the Engine Quiz, he can now read the next 18 issues of M.A. for nothing!

The number of entries in these competitions shows that quiz popularity is not limited to ITV, so for future MODEL AIRCRAFT quizzes a CASH prize of two guineas will be awarded to the first correct solution opened. The first quiz is on page 27 of this issue—so get weaving.

STRIPEY STRIKER



Air operations during the Egyptian landings saw the re-introduction of the distinctive striped markings on allied aircraft. Here, a "Sea Venom" (WW 281) with black and yellow stripes round its tail booms and wings, lands aboard H.M.S. "Eagle."

Admiralty Photo, Crown Copyright Res.

For those who want to see where they went wrong in the Christmas quizes here are the results:—

Engine Quiz

1—K. & B. Allyn Sky-Fury Twin. 2—K. & B. Torpedo .15. 3—Frog 149 Glo. 4—E.D. Bee Series I. 5—Allbon Bambi. 6—Amco .87 Mk.II. 7—K. & B. Infant. 8—McCoy Diesel .049. 9—Webra Mach.I. 10—Gee Bee Sabre Mk.II. 11—Allbon Javelin. 12—Elfin 2.49 B.R.

Model Quiz

1—Club Conquest. 2—(c) 41¾ oz. 3—(a) Ch./Tech. Edwards, (b) Lee-Richards Annular Aeroplane. 4—(a) (iv) U.S.S.R., (b) (iv) 275 km.hr. 5—(a) (i) 4.86 c.c., (b) (i) .740 in. 6—F/F man Gaster, the others are stunt exponents. 7—(a) Jasco Trojan. 8—(a) "Vertig-O," (b) Elfin 1.49.

BASIC PROBLEMS

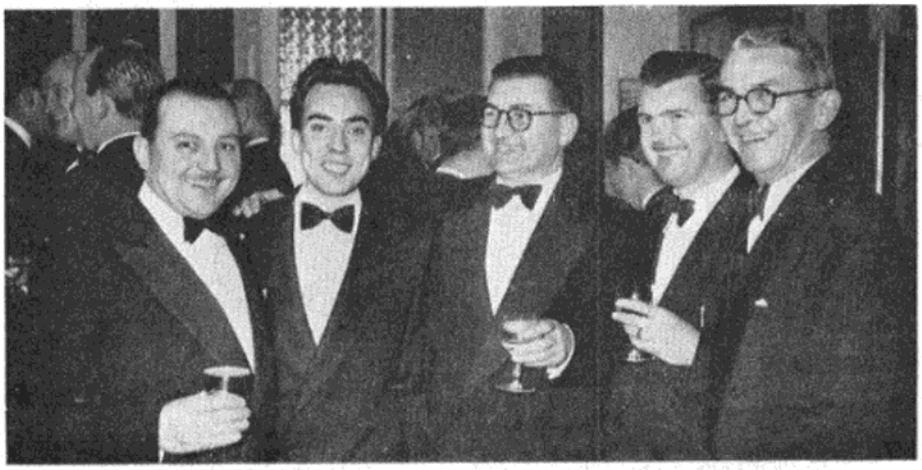
RETURN to wartime standards of petrol rationing reminds us that model flyers were probably even more active on the contest field then, despite travel difficulties. One modeller we know even applied for, and got, a basic ration for his stock of engines (spark-ignition in those days, so petrol-oil fuel was the standard). We also remember one of the early Nationals at Northampton at a time when there was no petrol allowance for private motoring at all—and the number of modellers who attended by car on some business pretext. We never realised before, the ramifications of the model trade.

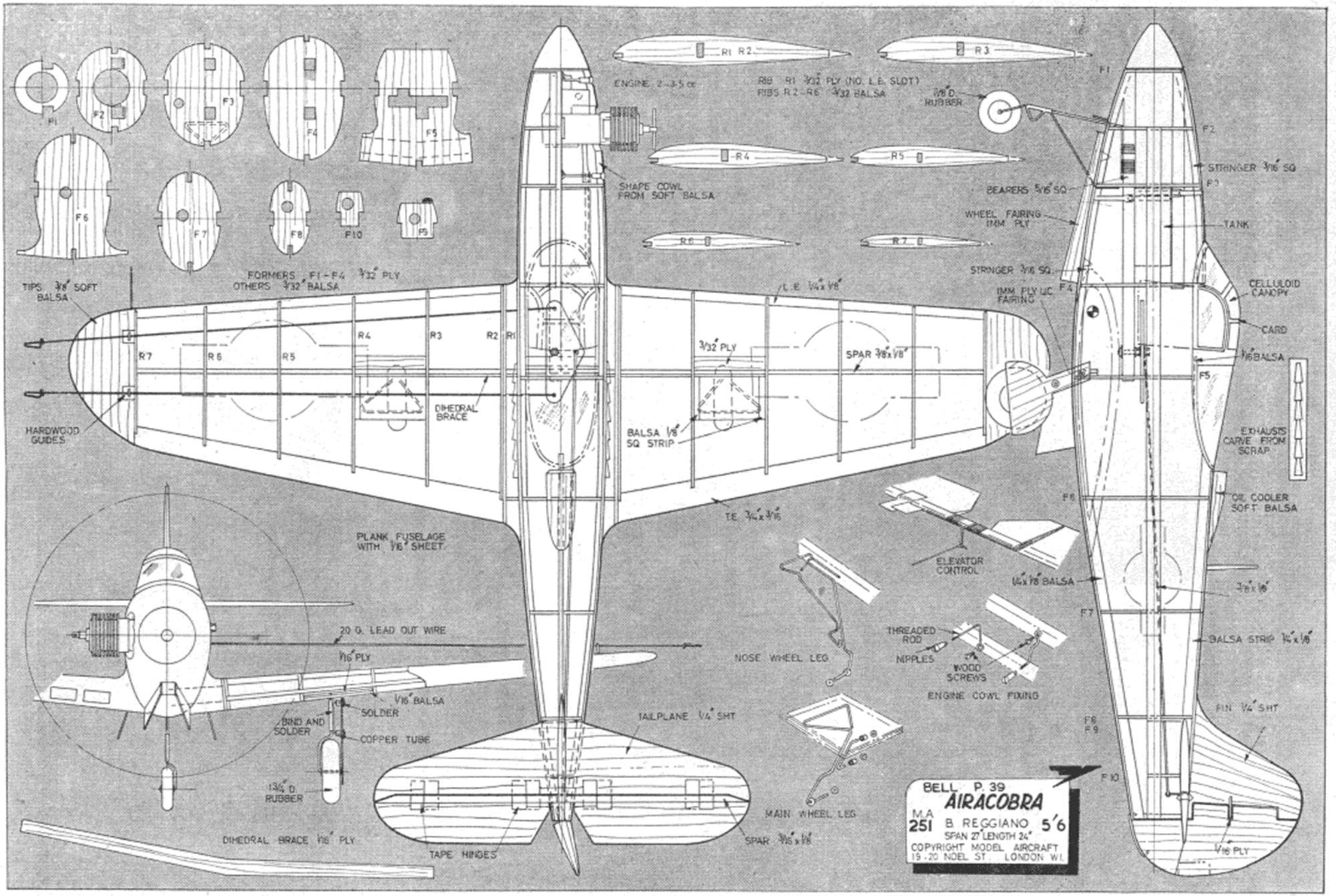
Dinner for Two

RON DRAPER and Ray Gibbs, champion modellers both, were among the guests of honour at a recent dinner given by the Royal Aero Club to mark their achievements in model flying. The other guests of honour included Commander H. C. N. Goodhart and Mr. Frank Foster, winners of the Two-Seater World Gliding Championships, and Mr. E. C. Bowyer, C.B.E., Mr. L. L. Bridgeman, Mr. P. B. Mayne and Wing Commander W. R. Parkhouse, M.B.E.

Col. R. L. Preston, C.B.E., secretary-general of the R.A.C., addressed the distinguished gathering and paid tribute to the guests of honour.

Eddie Cosh, Ray Gibbs, C. S. Rushbrooke, Harry Hundleby and Doug Gordon share a joke at the Royal Aero Club dinner.




F1
F2
F3
F4
F5
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F7
F8
F10
F9
R1 R2
R3
R4
R5
R6
R7
ENGINE 2-3.5 cc
RIB R1 3/32" PLY (NO L.E. SLOT)
RIBS R2-R6 3/32 BALSA
1/8"D RUBBER
SHAPE COWL FROM SOFT BALSA
BEARERS 5/16 SQ
WHEEL FAIRING 1MM PLY
STRINGER 3/16 SQ
TANK
CELLULOID CANOPY
CARD
1/16 BALSA
EXHAUSTS CARVE FROM SCRAP
OIL COOLER SOFT BALSA
1MM PLY U/C FAIRING
TIPS 3/8" SOFT BALSA
FORMERS F1-F4 3/32" PLY
OTHERS 3/32" BALSA
L.E. 1/4"x 1/8"
3/32" PLY
SPAR 3/8"x 1/8"
DIHEDRAL BRACE
BALSA 1/8" SQ STRIP
HARDWOOD GUIDES
T.E. 3/4"x 3/16"
PLANK FUSELAGE WITH 1/16" SHEET
ELEVATOR CONTROL
1/4"x 1/8" BALSA
3/8"x 1/8"
BALSA STRIP 1/4"x 1/8"
20 G. LEAD OUT WIRE
1/16" PLY
1/16" BALSA
SOLDER
BIND AND SOLDER
COPPER TUBE
13/4" D RUBBER
NOSE WHEEL LEG
THREADED ROD
NIPPLES
WOOD SCREWS
ENGINE COWL FIXING
TAILPLANE 1/4" SHT
FIN 1/4" SHT
MAIN WHEEL LEG
SPAR 3/16 x 1/8
DIHEDRAL BRACE 1/16" PLY
TAPE HINGES
1/16 PLY
BELL P. 39
AIRACOBRA
M.A. 251
B. REGGIANO 5'6
SPAN 27" LENGTH 24"
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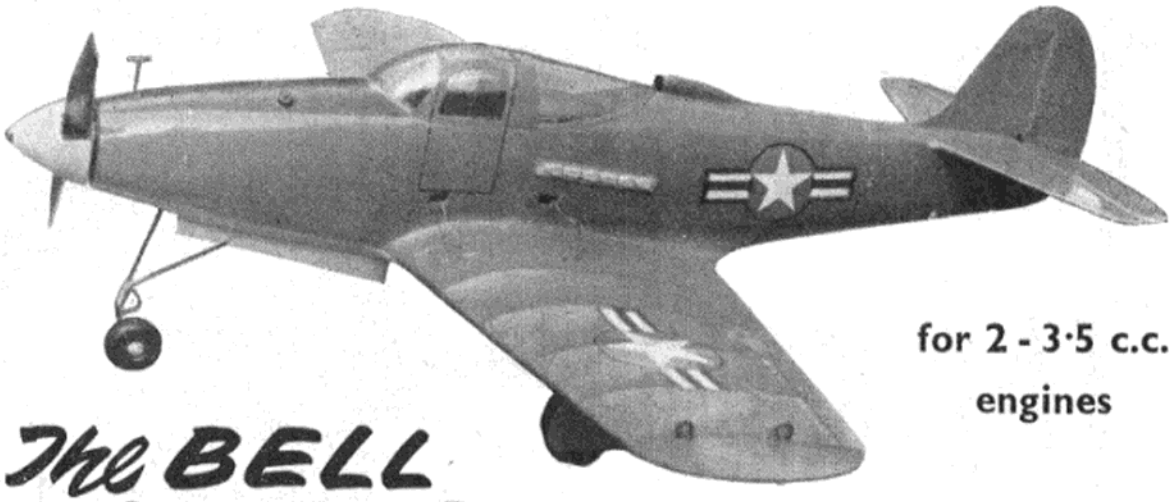
A SLEEK C/L SCALE MODEL OF



for 2 - 3·5 c.c. engines

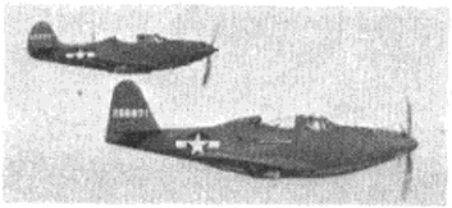
★ The BELL AIRACOBRA

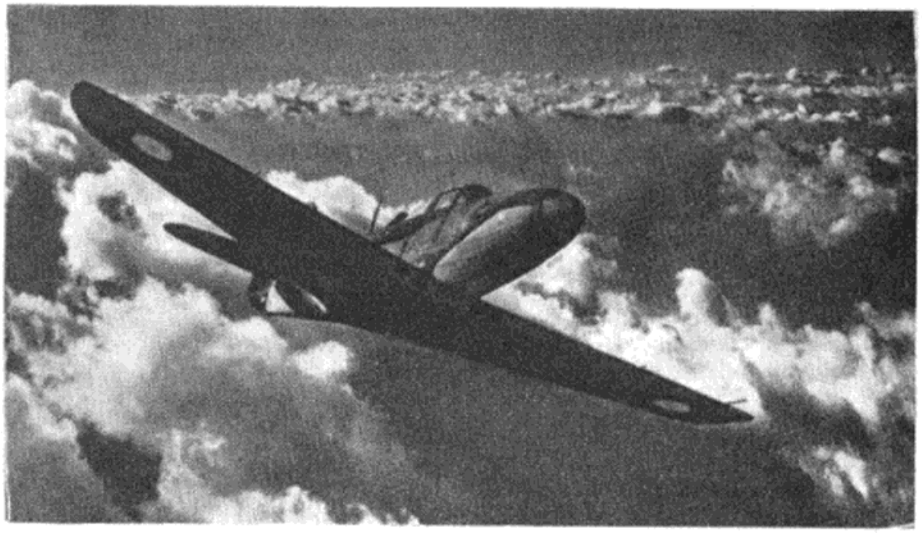
designed by B. Reggiano

ALTHOUGH the Bell *Airacobra* was, in its time, considered to be a most unorthodox aeroplane, there is nothing unorthodox about the construction of its model counterpart. In fact, so straightforward is this latest addition to the M.A. plans range that we decided to forego the usual building notes and instead give some useful "visual" gen on the scale appearance side of things.

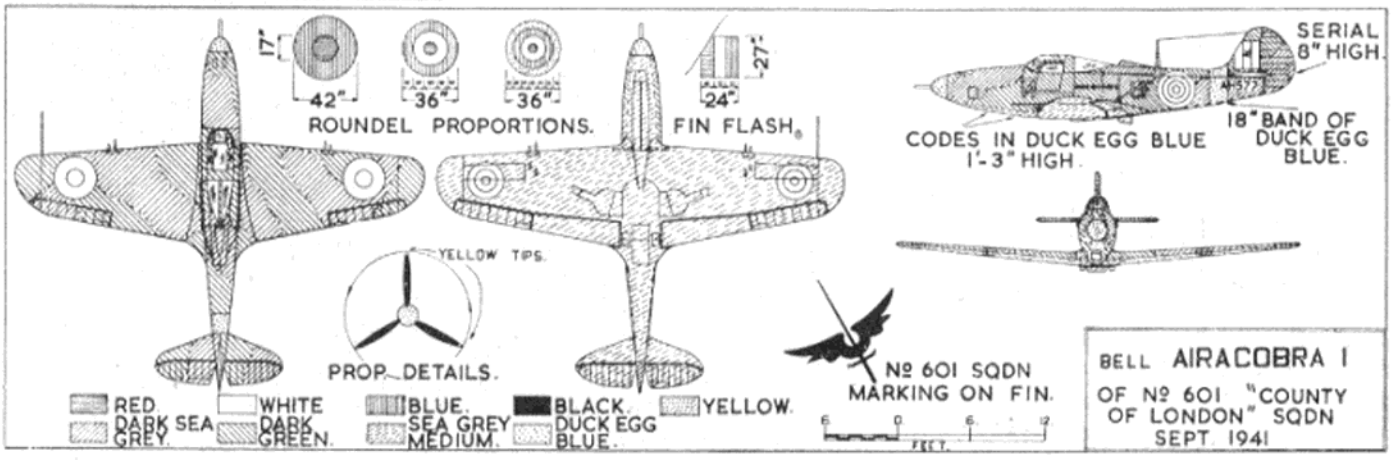
Photo below shows *Airacobra* 43474 formating on a P-63 *Kingcobra*. Picture on the right is of an *Aircobra* in British markings, and the line drawing at the bottom of the page shows such a machine in detail.

This particular *Airacobra*, AH577, has the 601 Squadron code letters UF and the individual letter M. The dimensions of the markings shown relate, of course, to the full size machine and should be scaled down accordingly for the model.



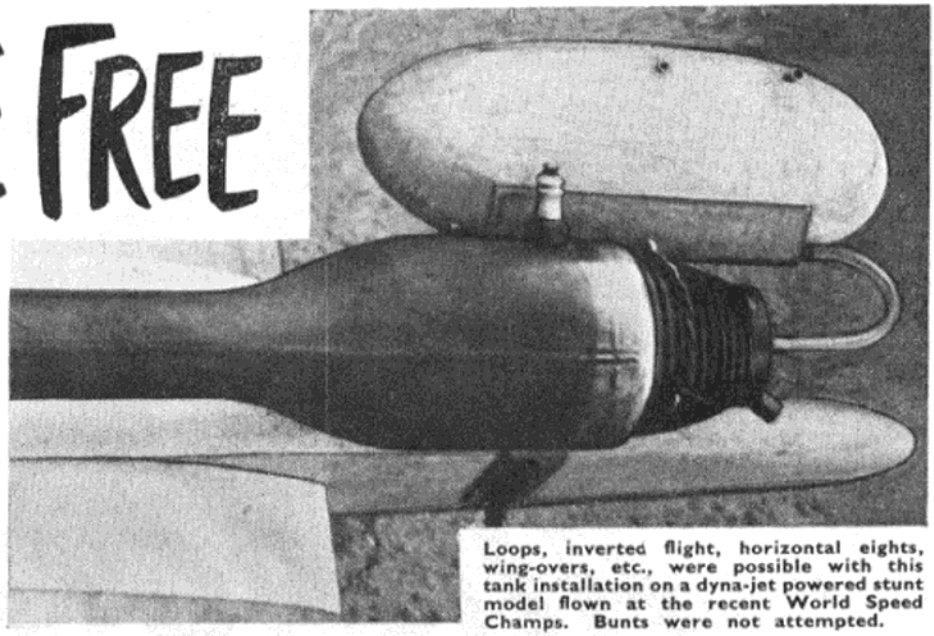


FULL SIZE WORKING DRAWINGS OF THE PLAN OPPOSITE ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 19-20, NOEL STREET, LONDON, W.1, 5s. 6d., POST FREE



TROUBLE FREE TANKS

by Ron Warring



Loops, inverted flight, horizontal eights, wing-overs, etc., were possible with this tank installation on a dyna-jet powered stunt model flown at the recent World Speed Champs. Bunts were not attempted.

FUEL supply problems on power models tend to become critical if the model is aerobatic, or is flown on lines at high speed. In such cases the "g" forces developed can interfere with, stop, or even reverse the fuel flow, when the motor will stop. Hence special consideration has to be given in such cases to tank design and location for consistent performance.

A majority of engines are sold without a tank, so the user is obliged to add this as a necessary part of the installation in any case. On most free flight models (radio control excepted) it is generally sufficient that this tank be mounted so that the fuel level when full is roughly the same height as the spray bar of the engine. For approximate flight timing, graduated tanks are the simplest solution. The engine can be started on a full tank, held with the engine running until the fuel level drops to the required mark and then launched—this "mark" being predetermined by a few tests as giving fuel for the required number of seconds motor run.

Another method used for duration flying, where engine run timing is critical, is to employ a length of fuel tubing, wound round the engine or mount. A full length of fuel tubing then gives the required engine run, and to avoid the annoyance of having to top up when the motor is running a separate header tank can be coupled up for starting and adjusting the engine, pulling this clear immediately before launching the model.

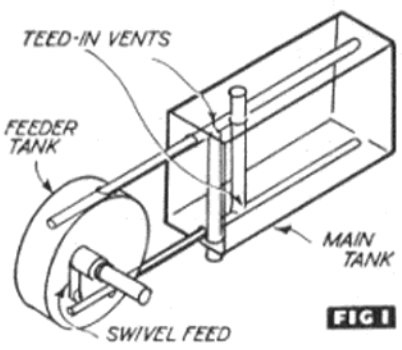


FIG 1

The *Mercury* flight timer utilises this principle, the timer being a cut-off valve which, when triggered, shuts off the supply from the main tank and leaves only the volume of fuel in the line between timer and engine to be drawn on. Thus a predetermined engine run is established by cutting this line to the required length and the main tank can be stowed conveniently in the fuselage.

Alternative systems working on the principle of cutting off the fuel supply at a pre-determined time require, basically, a tank, timer and cut-out as essential units. The cut-out should be located as near to the spray bar of the engine as possible (ideally on the end of the spray bar e.g. the Davies Charlton unit). Tank position is still critical, since the whole of the feed during flight is from the tank, but if the timer itself is accurate in triggering the cut-off valve, the system is independent of engine settings and therefore inherently more consistent.

Variations on this theme are the timer-tank (Mal Anderson of America), where a timer-operated cut-out is actually incorporated in the tank (usually integral with the engine); and specialised timers incorporating a cut-out, such as the Elmic in this country, which shuts down over a flexible section of fuel tubing to shut off the fuel supply.

All systems where the tank is remote from the engine are liable to cause variations in the mixture, and thus affect the running of the engine, with changing flight attitude. Thus,

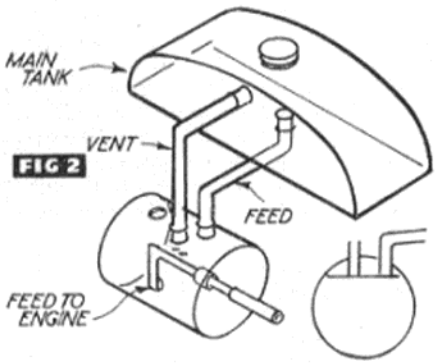


FIG 2

on free flight models, getting a tank as near to the engine as possible is just as important as tank level, especially if the flight attitude is very different from the ground or starting attitude. The suction head or vertical distance the fuel has to be lifted to reach the engine crankcase can be very different in a steep climb to that on which the engine was started and initially adjusted.

This is one possible cause of an engine cutting out shortly after launching. Another is that the acceleration of the model following the launch will tend to throw the fuel back into the tank, again causing starvation.

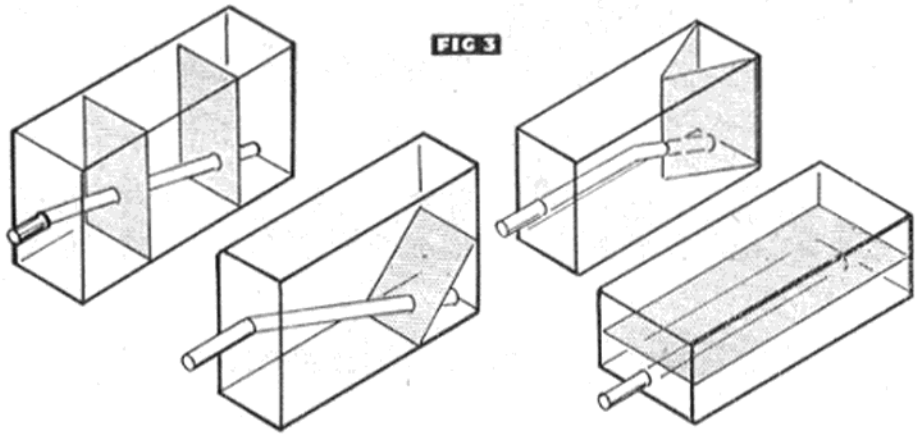


FIG 3

In the case of a manoeuvrable radio controlled model the reverse condition may also apply. In a steady dive, for example, the engine is now effectively gravity fed—although if accelerating in a dive, inertia of the fuel will tend to cancel out this effect. Thus radio controlled aircraft which really are manoeuvrable can be quite critical as regards tank requirements, even though the question of timing the engine run to a definite figure no longer applies. This latter feature is covered by arranging the tank capacity to give the required motor run for a normal flight and working to that figure, which may be five, ten or even twenty minutes.

For shorter test flights, rather than attempt to fill the tank partly and estimate, it is a very good plan to fit a small orthodox F/F tank which is used solely for short flights. Experience has shown this to be a very practical feature for test flying a new model, not coupling up the main tank until the control and stability features have been proven.

A majority of British R/C flyers are still operating within the range of performance where C/L stunt tanks or similar adaptions are giving satisfactory results. In America, however, considerable development has taken place with regard to special aerobatic tanks for highly manoeuvrable models designed to maintain a constant fuel level, and thus fuel supply, irrespective of the attitude of the model.

In such systems two separate tanks are usually employed—a main tank feeding into a smaller feeder tank. The supply to the engine is drawn from the latter. The Mahoney tank—Fig. 1—incorporates somewhat elaborate plumbing, but has proved extremely practical and consistent in performance, operating equally well inverted or upright. The level of fuel in the feeder tank is ingeniously controlled by the feed line from the main tank emerging from the fuel at extreme attitudes, and thus at such attitudes preventing interflow of fuel between the tanks.

The Beckman-Lenninger system—Fig. 2—works on a different principle in that the main tank is sealed and the vent is shut off when the feeder tank is full to a certain level. Thus there is no further fuel flow into the feeder tank, i.e. a constant head maintained in the feeder irrespective of the attitude of the model. For inverted flying the fuel feed pipe must be made to swivel and check valves incorporated in both the lines from the main tank (on the original these valves are simply steel balls falling onto a seating to seal when the system is inverted). With prolonged inverted flying, of course, the engine will continue to run only until the contents of the feeder tank are exhausted and the fuel level will not be constant.

A further possibility is to use a pressurised system, the simplest of which is just to use a fountain pen bladder for the tank, "inflating" this (and thus pressurising the fuel) by pumping it out with fuel. Capacity, of course, is strictly limited, but this type of tank is quite adequate, and most effective, for C/L speed models. Synthetic rubber balloons may be used in place of fountain pen bladders for a longer engine run; at one period they were greatly favoured for C/L stunt models.

The only commercial tank unit made on this system is the Walker pressure tank (American), where a flexible container is sandwiched between two rigid plates sprung together with rubber bands. The latter system is used with a regulator interposed between the tank and the engine to give a constant supply pressure. Otherwise an expanded "elastic" tank of any reasonable capacity tends to give a varying supply pressure.

A rigid tank can be pressurised provided it is sealed by connecting to a tapping point on the crankcase of the engine. Crankcase pressure is then transferred to the inside of the fuel tank and will remain substantially constant as long as the engine is running.

A simpler mechanical solution is merely to angle the non-submerged tank vent forwards to face into the airstream. Thus dynamic air pressure in the vent opening is transferred to the inside of the tank. In practice with such tanks—known generally as pressure tanks—both vents are angled forward. They are particularly effective on C/L models but can give undesired effects on radio models, since they tend to exaggerate the effect of changing "suction head" in climbs and dives.

For C/L models the rectangular tank is generally now regarded as the best, with the feed pipe angled downwards to feed from the rear right hand corner (or the opposite bottom corner for clockwise flying). Due to centrifugal force, fuel will tend to collect on the "outside wall"

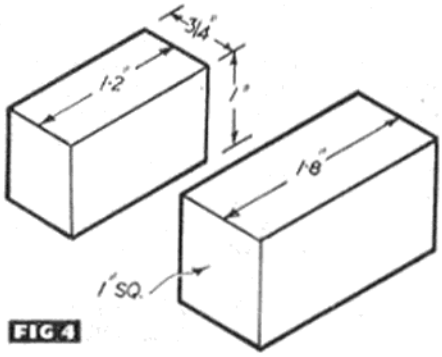
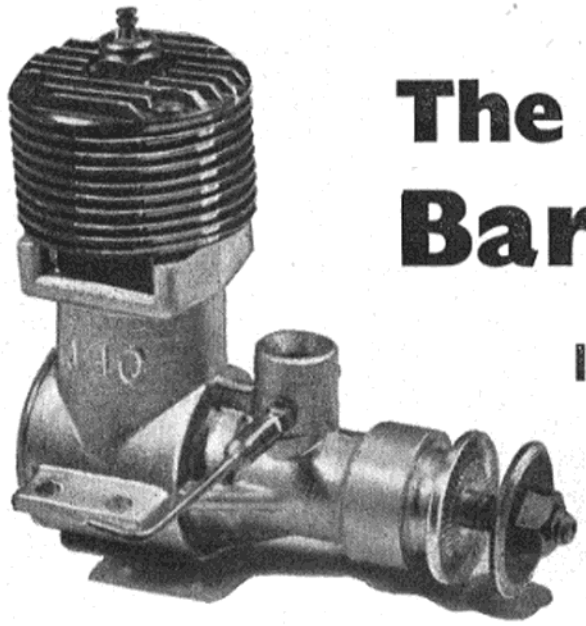


FIG 4

of any C/L tank and during manoeuvres is more likely to crowd to the back and bottom rather than to the front region.

In general, the narrower the tank the better, since there is less likelihood of marked changes in effective fuel level, but a square section is also acceptable. Shallow tanks, or those with large capacity, may give rise to fuel "surge" when more than half empty, momentarily letting the feed pipe emerge from the fuel. Where this could occur, fitting the tank with perforated internal baffles is usually an effective cure. Alternative arrangements of baffles are shown in Fig. 3 of which the first three are most effective. Fig. 4 details dimensions for standard team racer tank sizes.



MA ENGINE TESTS

The Barbini B.40 TN

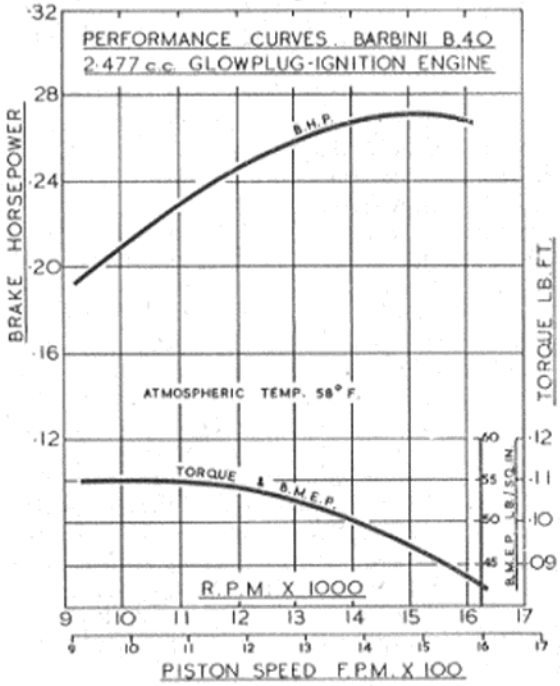
Italian 2·5 c.c. Glowplug Motor

"refreshing addition to the 2·5 c.c. competition class"

THE Barbini B.40 TN glowplug unit is the engine which, with tuning modification, Giovanni Cellini took third place in the World Speed Championships at Florence in September, recording a highly creditable 124.3 m.p.h. In so doing, he put up the best individual performance within the Italian team and it is also worth noting that, of the first four place winners, his engine was the nearest to a "stock production" unit.

The Barbini B.40 glowplug model is a development of the B.40 diesel, to which attention was first drawn in MODEL AIRCRAFT about a year ago. Shortly afterwards we published a "Supplementary Engine Report" article on this motor in which we began by remarking that the engine was a lot better than it looked, and continued: "Whatever the B.40 may lack in outwardly visible charms, it is well made and the internal fits and finishes on our test example were exceptionally good." The maker's regard for high quality workmanship and detailed refinement where it matters most, is no less obvious in the new glowplug model.

Actually, three new models of the B.40 are currently being produced. These are identified by suffixes, namely: B.40 TR, B.40 TN, B.40 TV. These letters refer to the colour of the cylinder barrel and head, viz.: *Testa Rossa* ("Red Head"), *Testa Nera* ("Black Head") and *Testa Verde* ("Green Head").



The B.40 *Testa Rossa* is a diesel and a revised version of the original B.40, having a new crankcase with one ball-bearing plus a roller bearing supporting the crankshaft. The B.40 *Testa Nera* is a glowplug version of this engine and is the model featured in this report. The B.40 *Testa Verde* is also a glowplug model, but has a plain, bronze-bushed, main bearing. The TR and TN cost 9,000 Lire (approximately £5 3s. 0d.), while the plain bearing TV model costs 6,600 Lire (approximately £3 15s. 0d.).

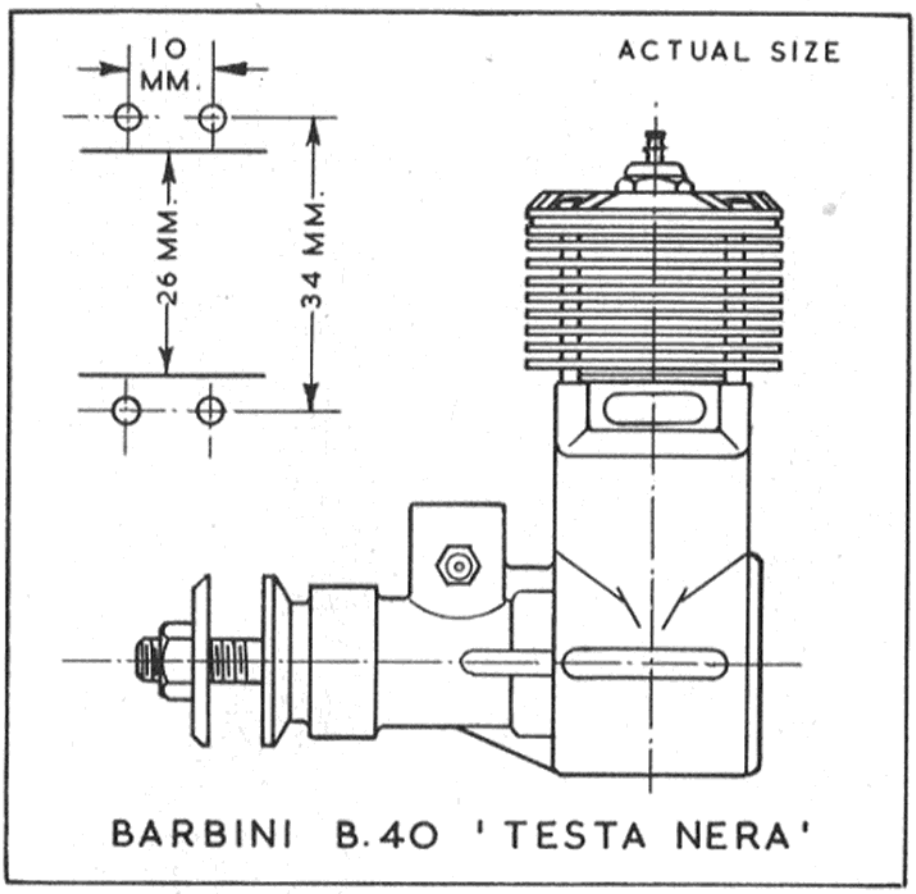
In many respects the B.40 is a breakaway from present trends in 2.5 c.c. engine design. In currently available high-performance engines in this popular class, two distinct approaches are evident, namely, the loop-scavenged glowplug engine as exemplified by the Torpedo 15, O.S.15, Super-Tigre G.20, and Enya 15, and the reverse-flow scavenged diesel (generally with 360 degree exhaust and transfer porting) as illustrated by the Oliver-Tiger, E.D. Racer, Frog 249 and the Webra Mach-1.

The glowplug B.40 TN by contrast uses a reverse-flow scavenged cylinder of uncommon design. In this, two large transfer ports, steeply inclined, are placed fore and aft. To further assist rapid unrestricted transfer of the charge, the piston, which has a shallow coned head, has two small deflector steps machined in the crown matched to the transfer ports. The cylinder head, very smoothly finished, has a shallow hemispherical shape with, of course, central plug location.

Among the most interesting refinements of this design are the bearings. The crankshaft, as already mentioned, is supported by a roller type inner bearing, supplemented by a ball journal outer bearing. The latter, incidentally, is neatly protected by the propeller driving hub, which extends back into the bearing housing. Of still further interest is the needle-roller big end bearing. This is the first time such a feature has been seen on a production engine since the Dooling 61 and is unique

on an engine of such small capacity.

The performance of the stock Barbini B.40 TN, as the following report discloses, reaches a very useful level. At the same time it is evident from the performance of Cellini's model that the engine responds readily to minor modifications and tuning, designed to raise the peak horsepower output and revolutions beyond the figures indicated by our dynamometer test. We therefore enquired of Dr. Fabio Ziffer of Messrs. Solaria, the Milan distributors, the precise nature of the work done on Cellini's engine. In reply, we learned that both the induction and transfer ports were slightly enlarged and that the piston and connecting-rod were lightened. Beyond this, the only adjustments were those carried out in the normal course of tuning, and in this case were confined to raising the compression ratio slightly (by using a thinner head gasket) to suit the fuel and American glowplugs that were used.



Specification

Type : Single cylinder, air-cooled, reverse flow scavenged two-cycle, glowplug ignition. Shaft type rotary valve induction with sub-piston supplementary air induction.

Swept Volume : 2.477 c.c. (0.1512 cu. in.).

Bore : 14.5 mm. (0.5709 in.).

Stroke : 15 mm. (0.5905 in.).

Stroke/Bore Ratio : 1.034 : 1.

Weight : 4.4 oz.

General Structural Data

Diecast aluminium alloy crankcase in unit with main bearing housing. Nickel-chrome steel counterbalanced crankshaft, heat treated and ground, and running in one roller type inner bearing and one SKF ball journal outer bearing. Heat treated nickel-chrome steel connecting rod, with needle bearing big end. Light-weight cast-iron piston. Heat-treated and ground tubular full-floating gudgeon-pin retained by circlips in piston bosses. Cylinder liner of alloy steel, heat treated, ground and lapped. One-piece finned cooling barrel and cylinder head secured to crankcase with four long screws. Beam mounting lugs. Brass spraybar type needle valve assembly.

Test Engine Data

Running time prior to test : four hours.

Fuel : (a) 70 per cent. methanol, 30 per cent. castor-oil (running-in) ; (b) 50 per cent. methanol, 25 per cent. nitromethane, 25 per cent. castor-oil (dynamometer test).

Ignition : Champion VG.2 and Record glowplugs. (1.6 volts to start.)

Performance

The recommended period for running-in, with the B.40 TN, is three to five hours. Four hours were given to the test engine and it would seem that this is the minimum necessary. The maker's leaflet lists six different fuel formulae, according to performance requirements and atmospheric conditions. No special attempt was made to critically determine the best fuel mixture for our tests, but the 25 per cent. nitromethane content blend chosen proved very suitable and gave a very considerable increase in power over standard methanol/castor mixtures. Both Italian Record and American Champion glowplugs were used. Little or no difference in power output was detected, but whereas the Champion plug would continue to support combustion when the engine was running very rich (as during running-in), it was noted that the Italian plug cooled off rapidly under these conditions when the battery lead was disconnected, this suggests that the element of the Italian plug may be of nickel-chromium rather than platinum iridium, or that it has a somewhat higher heat range.

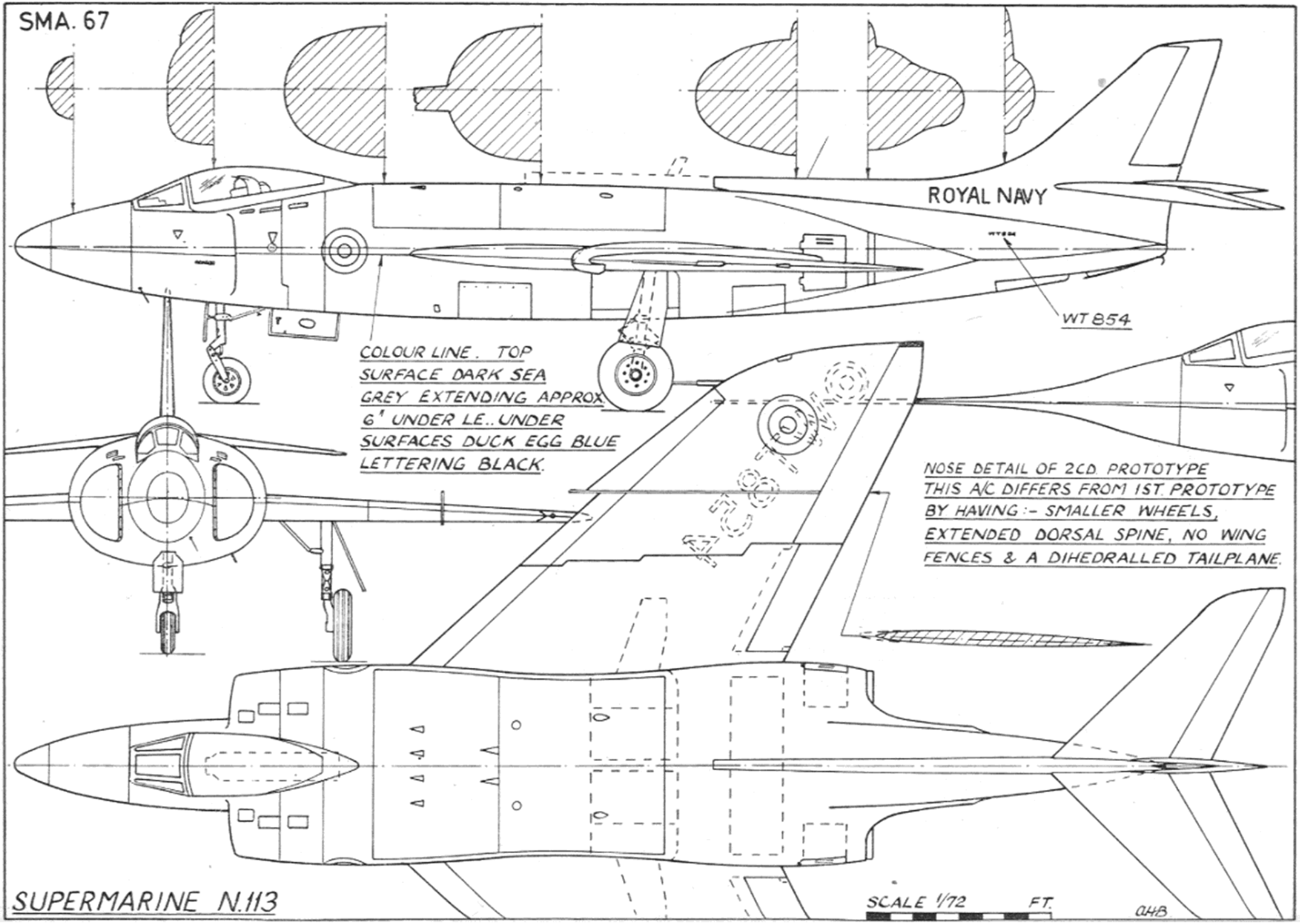
The general behaviour of the engine under test was entirely favourable. Starting characteristics were consistent and an initial start from cold was obtained quickly after priming through the ports. Restarts merely required one or two preliminary choked flicks. Maximum torque registered was equivalent to a b.m.e.p. of 55 lb./sq. in., a very good figure for engines of this type and capacity, which is reflected in the B.40's ability to turn the larger size props (e.g. 10 × 4, 9 × 6, 9 × 5) at between 9,000 and 10,000 r.p.m.). The actual peak output was indicated at between 15,000 and 15,500 r.p.m. where a figure of slightly over 0.27 b.h.p. was obtained.

Well suited to F/F power, in addition to C/L work, the new Italian engine is a refreshing and welcome addition to the 2.5 c.c. competition class.

Power/Weight Ratio (as tested) : 0.98 b.h.p./lb.

Specific Output (as tested) : 109 b.h.p./litre.

SMA. 67



SUPERMARINE N.113

SCALE 1/72 FT.

AHB

SOME NOTES
on

Supermarine's N.113

by J. W. R. Taylor

The N.113 just about to leave the rain-soaked runway of Farnborough (M.A. Photo).

THE Supermarine N.113 twin-jet naval fighter bears a distinct family likeness to the *Swift*, but is very much larger and more powerful. In fact, when it enters service in the next year or so, it will give the Fleet Air Arm an aircraft superior in its class to anything that the Royal Air Force will have.

Immediately after World War II, it was believed that the aircraft carrier was too vulnerable to survive in an age of jet bombers and atomic bombs, except possibly for convoy escort anti-submarine duties. But the U.S. Navy, in particular, refused to accept this attitude and ordered a succession of fast, jet A-bombers.

Gradually, it was realised that a carrier was, if anything, less vulnerable to attack than the two-mile static concrete runways of a land bomber airfield, and today carriers are being built in large numbers.

The job of the N.113 will be to protect the carriers of the Royal Navy from attack by enemy aircraft, and to form a high-speed strike weapon against ship and shore targets. Its two Rolls-Royce Avon engines, mounted on each side of the fuselage, should ensure the high rate-of-climb essential for the first task and, with the help of underwing drop tanks, of which the prototype shown at the 1956 S.B.A.C. Display carried four, it should have sufficient tankage for a most useful range on strike duties.

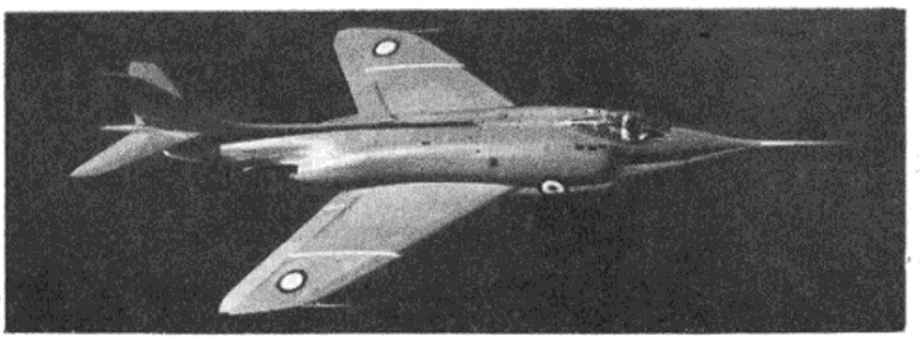
Its development began with the straight-wing, butterfly-tail Supermarine 508, which first flew on August 31st, 1951, with two 6,500 lb. thrust Avon R.A.3 turbojets. Most powerful single-seat fighter in the world at the time, it was followed on August 29th, 1952, by the basically similar Type 529. These prototypes were developed into the Supermarine 525, which first flew on April 27th, 1954, with 45 deg. swept wings and a conventional swept tail; and then by the N.113 which made its first flight on January 20th, 1956.

The N.113 introduced a number of refinements, including late-series Avons, probably in the 10,000 lb. thrust class, the now-familiar saw-tooth wing leading-edge and a one-piece all-moving tailplane which has since been given a marked anhedral. In addition, large fences have now been fitted to the wings, each made in two pieces, so that the front portion can droop with the leading-edge slats.

Early production N.113's will be armed with four 30 mm. Aden guns, but these may be replaced later by air-to-air guided missiles. Alternative strike loads of rockets and bombs will include the atomic variety. Performance is secret, but carrier trials on H.M.S. *Ark Royal* last April, showed that the N.113 has the fine handling qualities needed for deck operation, and it should eventually prove capable of supersonic speed in level flight, even without afterburning.

Wing span: 37 ft. 2 in. Length: 55 ft. 4 in.

Below : The Supermarine N.113 flying with a " nose probe " for test purposes. Right : Cabin close-up of the N.113 on a take-off run at Farnborough last September (M.A. Photo).



Topical Twists

by PYLONIUS

Public Danger

A few years ago we were pleading on our threadbare knees for the indifferent public to take a closer interest in our Cinderella sport. We tried every publicity gimmick in the book from building round models which, when airborne, looked deceptively like footballs, to model engines producing a noise identical to that of the latest jazz record. But all to no effect. Mr. John Citizen preferred to ignore the model flying world and concentrate his attention on the intricacies of his 3s. 6d. kit.

The scene on the flying field was indeed a pathetic one—not a solitary spectator in sight. Whether the fact that there wasn't often a model in sight either had any bearing on the matter we don't know, but even the odd, adventurous motorist, blazing a lonely trail across the windswept clump of Chobham Common, would fail to stop even when a model landed beseechingly on the road in front of him.

Radio types, with the memory of the heroic pioneering days now far behind them, were having a thin time of it, too. An audience of the inevitable two small boys and dog was as much as could be expected. Even at that, it could be argued that they weren't so much interested in the breathtaking spectacle, as the relief from stick throwing which a large doggy worriesome model afforded.

All this was before the increasing hordes of week-end motorists began to run out of parking space, giving up the hopeless seaside jaunt in a desperate search for somewhere to stop and rest their weary engines. Imagine their delight after crawling endless miles in nose to tail procession when a large parkable airfield looms up before their unbelieving eyes. To add to their pleasure, they find a model display is being held in their honour. Their happiness knows no bounds—not even the barriers around the radio area. A faint cry of "stampede" is heard as the radio modeller and his precious equipment disappear beneath the happy swarm of spectators.

Angry letters now reaching the model books suggest that we should put our publicity machine in reverse. Apart from spreading the word about models being such nasty, unpleasant things, all rallies should be held in strict secrecy behind a heavy screen of anti-car barriers.

Odd Mods.

It has long been a mystery to one-model-per-year men like myself how some of these rabid contest types maintain such a prodigious output of models. Having duly admired the rocket-like performance of so-and-so's *Scream Fever I*, you readily sympathise with him as he carries home his silver cup, leaving his super model behind in some distant cornfield. Meeting him again a few months later you are about to congratulate him on getting his model back when you espy on the wing the legend, *Scream Fever XV*. Now, being a mathematically minded sort of chap, you retire for a short finger counting session and come to the startling conclusion that the model is the fifteenth of the *Scream Fever* series. The wonder builder himself might then inform you of a strange phenomenon : whereas all the even numbered models turned out to be duds, all the odd ones flew like demons. This strikes you as rather queer as you yourself have built a number of exceedingly odd models which didn't even fly.

The question is : how do these contest johnnies manage to turn out such massive quantities of models? A clue to the mystery is given in a recent club report. A mass production expert is reputed to be faced with a serious re-tooling problem. His home-made rib-cutting machine is badly worn and in a decidedly ribby state. The rapid deterioration might have been due to excessive balsa cutting, in which case it's about time he changed to a new aerofoil anyway. On the other hand, his good lady might have found the gadget to be an excellent chip-chopping machine. If this is so, he should welcome a change of aerofoil in his diet.

* * *

From another club report we learn of the engine fancier whose latest acquisition makes a noise like tearing linen.

We can only advise him to tuck his shirt well in when next he tries it out.

* * *

R.O.G. and Roll

A relic from the old days, when model planes looked like model planes, is the much derided r.o.g. rule. Of course, we can sympathise with the old time modeller's passion for realism and his understandable pride as he watched his stick model, with open rubber motor bravely whirring, make a long sweeping take off. The especial joy of his life would be the fine pair of balloon wheels which he himself had lovingly carved from lignum vitae in pursuit of the widespread belief that only a large and hefty undercart kept a model flying the right way up.

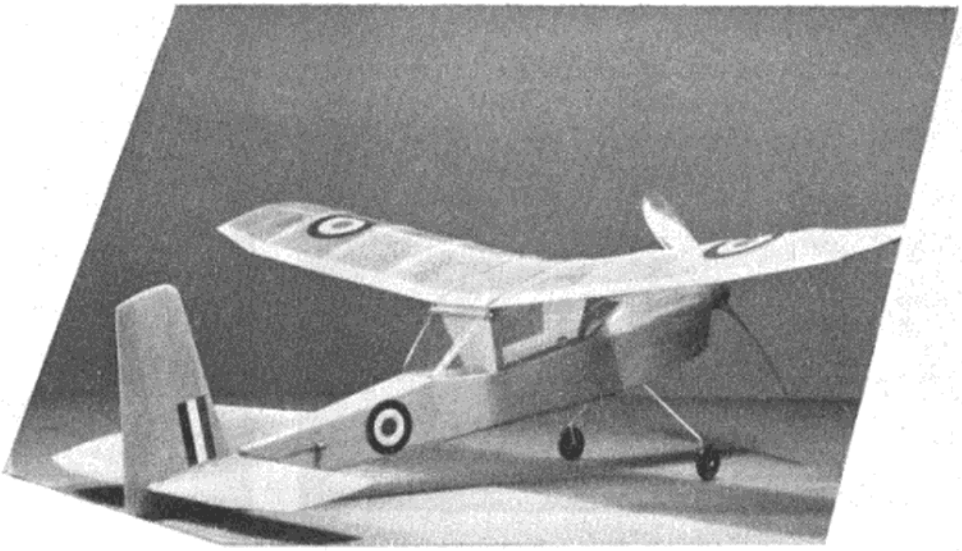
Anyway, along came a few progressives, who weren't perhaps so expert in the bending of piano wire or carving solid wheels, and who began to fly their models minus the undercarts. This was regarded with horror throughout the model world, where there was extreme scepticism about such models actually flying the right way up. Models being what they are it was only after long study of the flight antics of the undercartless models that it was generally conceded that by and large they were, in fact, flying the right way up. The only dissentients were the old gentlemen who make our rules. As the only models they had ever seen flying were A frame pushers, they still wouldn't accept that it was possible to tell if a model was flying the right way up without a tell-tale undercart.

Now along came a few other progressives, who, if unable to carve balloon wheels, had a natural bent with piano wire. They made themselves adept at the fashioning of collapsible wire prongs which enabled perfectly good hand launches to be made from ground level. This upset the old gentlemen no end, but as it was quite within the rules they could only retaliate by changing all the other rules once a year instead of every two years.

What with the rise off hand business and the constant rule changes, there are only a handful of international contest fliers left. It was quite naturally thought that if the r.o.g. rule was dropped the hand launching multitudes would flock to compete in the Wakefield. But there was just one fly in the ointment. As the area meetings are supported only by the international comp boys it was left to them to decide whether to throw the r.o.g. rule overboard or not. They understandably opted to keep it. After all, it had taken them a long time to learn the art of ground level hand launching, and they weren't too happy about lots of outsiders muscling in on their annual holiday abroad scheme.

ALI DID THE SKETCHES

Rubber Driven Models



The NEW M.A. BEGINNERS' COURSE PART XI

WE began our series of construction sequences by recommending and describing the building of a simple medium sized glider. We did so because we are of the opinion that this is the best type of model with which to learn the construction principles common to most models, while, at the same time, providing the newcomer with a finished model which can be expected to perform reasonably well in his rather inexperienced hands.

A glider can provide a good deal more interest than many beginners realise. Nevertheless, there will be some readers who prefer the idea of a propeller-driven aircraft or who, having built a glider, now wish to try their hand at a rubber powered model.

Rubber driven models are of various types, ranging from the simplest stick models, through small and medium sized scale, semi-scale and duration models, to large Wakefield class contest models.

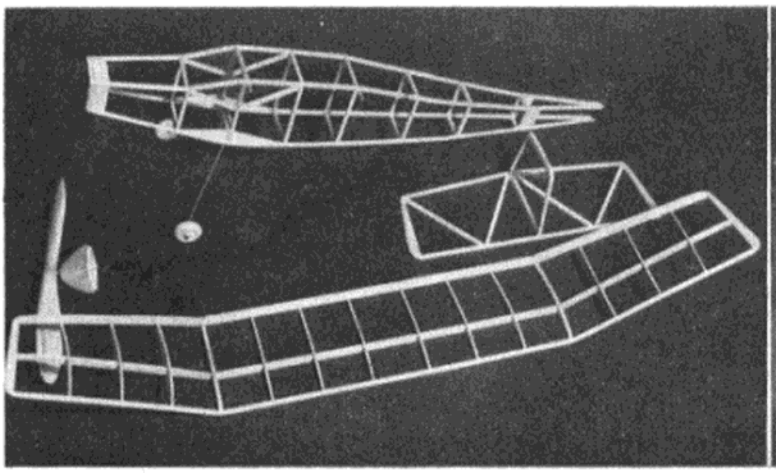
In the medium sized duration model category there are a number of designs in which the construction is basically similar to that of the glider dealt with in Parts 4, 5 and 6. There is, in fact, very little difference between the structure of the 30 in. span Jasco *Tutor* glider featured and its companion rubber model, the Jasco *Triumph*.

Other kit models of this class include the Keilkraft *Ace*, *Ajax*, *Achilles* and *Senator*, the Skyleada *Fledgling* and *Husky*, the Veron *Rascal* and *Sentinel* and the Frog *Goblin* and *Minx*. These models range from 24 to 36 in. wingspan, and have an excellent performance.

The main points of difference between the *Tutor* and rubber models of this type are to be found in the addition of an undercarriage, stranded rubber motor and airscrew, while the noseblock is made detachable and is drilled to support the propeller shaft. The ballast box is, of course, omitted.

The undercarriage on a rubber model is usually very simple, of steel wire, and bound and cemented to the framework. Make sure that it is well secured. It is much easier to fix an undercarriage properly while the model is being built, than to have to strip off the covering and refit it later.

Remember that, unlike the glider, the rubber model fuselage has not only to support the other components, but has also to resist the twisting force (and, to a lesser



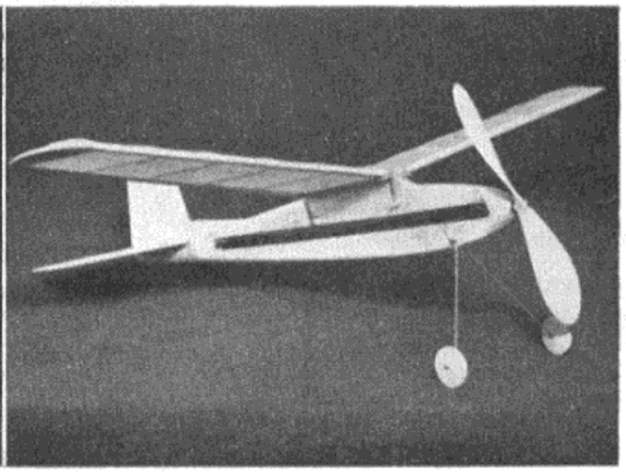


Fig. 1 (left). The framework of a typical rubber driven kit model : the Skyleada "Fledgling." Fig. 2 (right). Successor to the stick model of bygone years, as an easy to build beginner's model is the "profile" type. Here is an example built from a magazine plan.

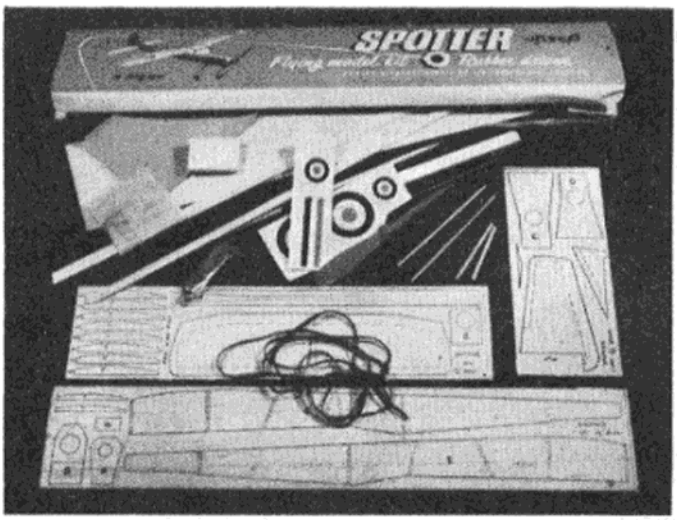


Fig. 3. Scale and semi-scale models are very popular. Shown here is the kit for the Jasco "Spotter," a completed model of which is shown in the heading photo.

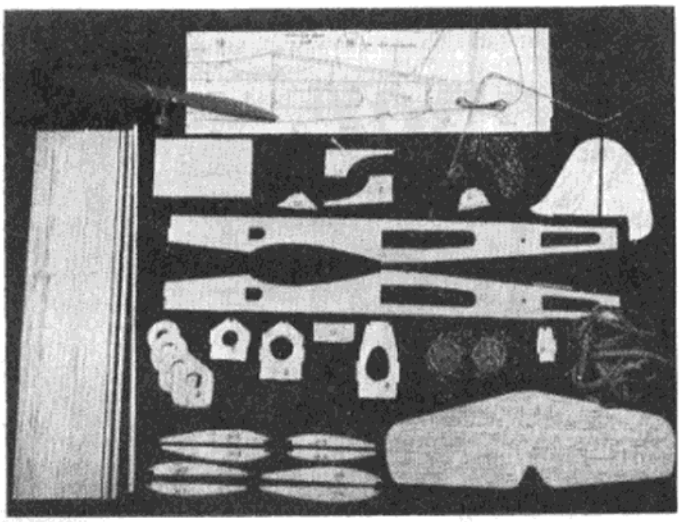


Fig. 4. Other examples of inexpensive small rubber model kits are to be found in the Frog Senior series, which include many ready formed parts.

extent, compressing action) of the rubber motor when wound up. Extra care should therefore be taken to ensure that all joints are strongly pre-cemented, especially at the front where the noseblock fits in.

Care should also be exercised in the drilling of the noseblock for the propeller-shaft bushing so that the thrustline is at the proper angle.

Rubber strip for the "motor" is made in two thicknesses (1/24 and 1/30 in.) and three widths ($\frac{1}{8}$, $\frac{3}{16}$ and $\frac{1}{4}$ in.). In some small kits (notably Frog) the strip is supplied in loops of the appropriate length, but in nearly all cases, it is necessary to join the ends of the strip to make up loops or skeins. The most satisfactory method of doing this is to tie them in a reef knot (Fig. 5) and to then secure the ends close to each side of the knot with a few turns of thread—while the rubber is stretched out.

Before use, the rubber motor should be washed, using a mild soap, and then thoroughly rinsed. When dry, it should be treated with *rubber lubricant*, a preparation consisting basically of pure soft soap and glycerin and available in tubes and jars from model shops. A little of the lubricant should be smeared on the palms of the hands and then thoroughly rubbed into the motor. As an emergency measure, castor-oil may be used in place of rubber lubricant. On no account, however, must ordinary lubricating oil be used as this will rapidly cause the rubber to deteriorate and break.

Before fitting the rubber motor to the model, wire hooks, such as that linking the motor to the propeller shaft, should be covered with rubber (bicycle-valve) tubing or plastic (Neoprene) tubing, in order to prevent the wire cutting into the motor. An alternative here, used with larger models, is the "run-true" bobbin.

Rubber should never be exposed to strong sunlight for longer than necessary, or to extremes of temperature and, when not in use, is best stored separately in a closed tin. If dust should be picked up by the strands, it is best to wash the motor and then relubricate it before re-use.

During the past ten years, duration type rubber models of the size we have mentioned and up to the largest (Wakefield) size, have declined in popularity due, mainly, to the wide use of small engines suitable for F/F models of 30 in. span and upwards.

More recently, however, there has been renewed interest in small quickly-built models that can be flown in restricted spaces. Kit manufacturers have responded

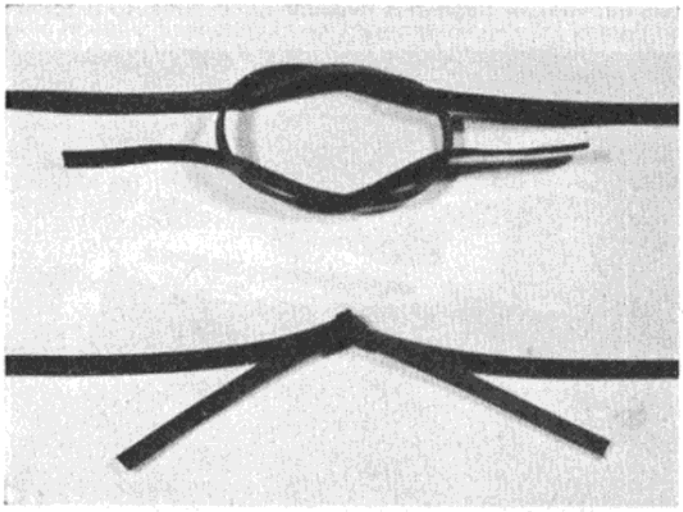


Fig. 5. Rubber strip can be joined by means of a reef knot. After the knot has been drawn up, it is locked with silk binding.

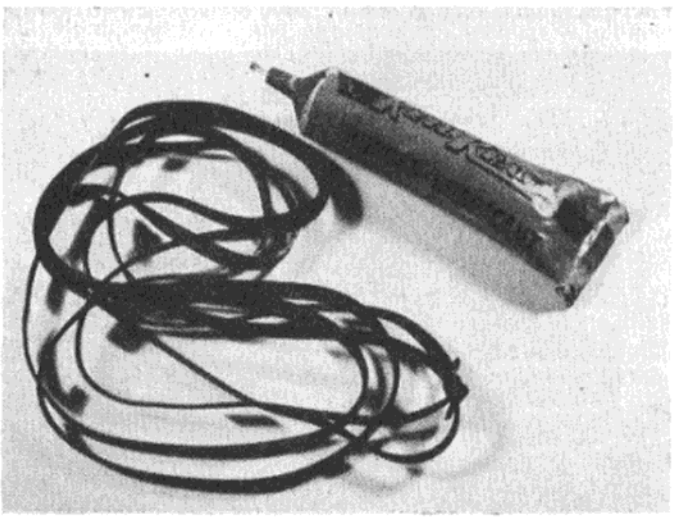


Fig. 6. The life of a rubber motor is greatly dependent on initial care. A new motor should be washed, then treated with lubricant.

with a large variety of designs in which many parts are ready formed, resulting in models that can be assembled in a matter of two or three hours.

Among models of this type are a number of good designs of 18 to 20 in. span and often of semi-scale appearance. These are to be found in the popular Frog "Senior Sports" series, the Mercury "Starflight" series etc.

Five steps in the construction of one such kit model, the Frog *Raven*, are shown in our photographic sequence Figs. 7 to 11. Much of the structure of these Frog models consists of diecut sheet-balsa parts and, with the exception of the wings, is put together without the need of pinning down to the assembly drawing.

These diecut parts are supplied in sheets from which they must be detached. Do not merely try to push out the parts from the sheets. Most diecutting is accurate but it is advisable to separate the parts with the aid of a razor blade to prevent ragged edges and splitting.

Most rubber model kits include a finished or semi-finished propeller. With the smaller models, many kits now contain finished props of moulded plastic. In the case of medium size and duration models, however, the prop is generally of the semi-finished, so-called "saw-cut" type.

It is also possible to buy finished balsa propellers in various sizes. However, where one is building from a magazine plan, and particularly in the case of Wakefield and other high-performance contest models, it is usual to carve one's own propeller from a solid block of balsa.

This is a good deal easier than might be imagined. The secret is in the simple process of first cutting the block to a given shape before starting to carve the blades. The dimensions, or a template for this, the "blank," are usually given on the plans of the model. Figs. 12 to 17 show the sequence of operations in carving such a prop.

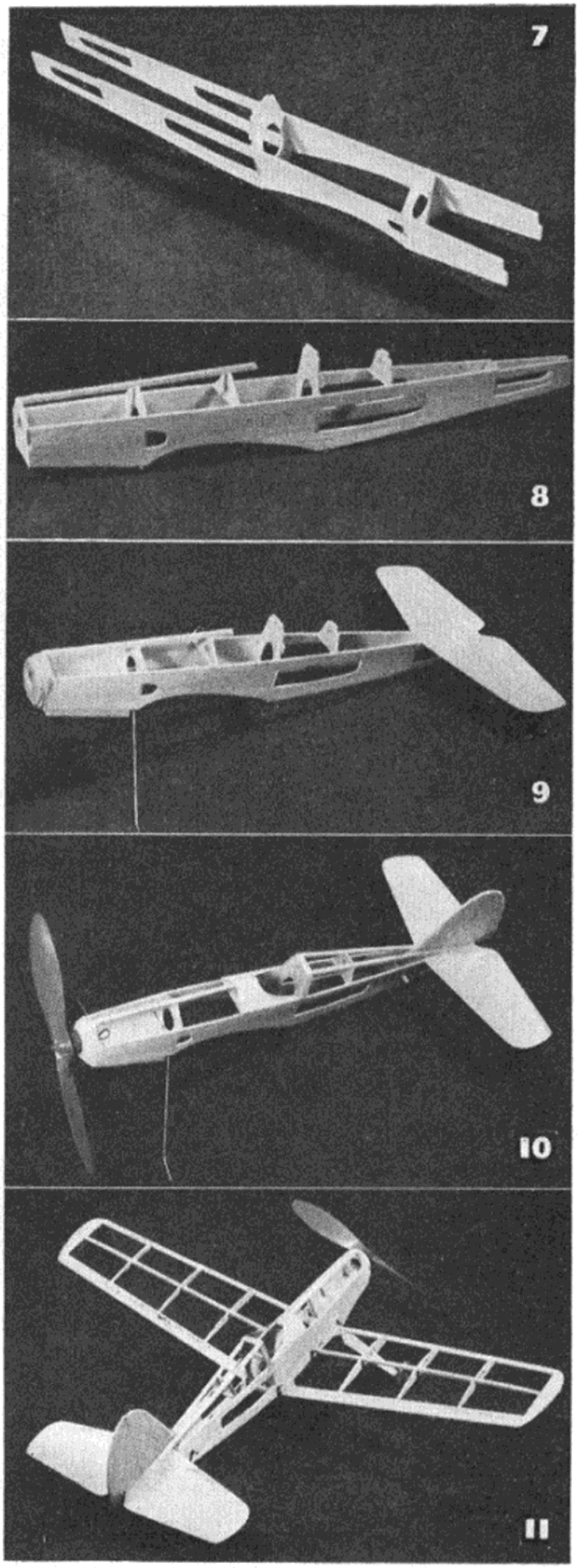
The first requirement is a piece of balsa as near to size as possible. The propeller shown in the photographs was of 18 in. diameter and called for a block 2 in. wide and $1\frac{1}{2}$ in. deep—a size easily obtainable. Choose a piece of wood which is of even texture throughout and not soft at one end and hard at the other.

A cheap ball pen is ideal for marking out the blank but if this is not readily available, a pencil can, of course, be used. First scribe the centre lines and other lines running around the block. Mark all four sides. From these the various tapers can then be marked off (Fig. 12).

Before beginning to cut out the blank, the shaft hole should be drilled. If you have access to a bench drilling machine, so much the better as this will ensure that the hole is bored truly vertically through the block. Most modellers, however, will have to use a small hand-drill.

Use first a $\frac{1}{16}$ in. drill and, with the block laid on a flat and level surface, centre the bit and, if possible, have an assistant to advise you whether you are holding the drill quite vertically. Drill only about one-third through the block, then reverse it and repeat operations from the other side. Then feed the bit through from each side until the two holes meet. Finally, ream out the hole with the appropriate size drill.

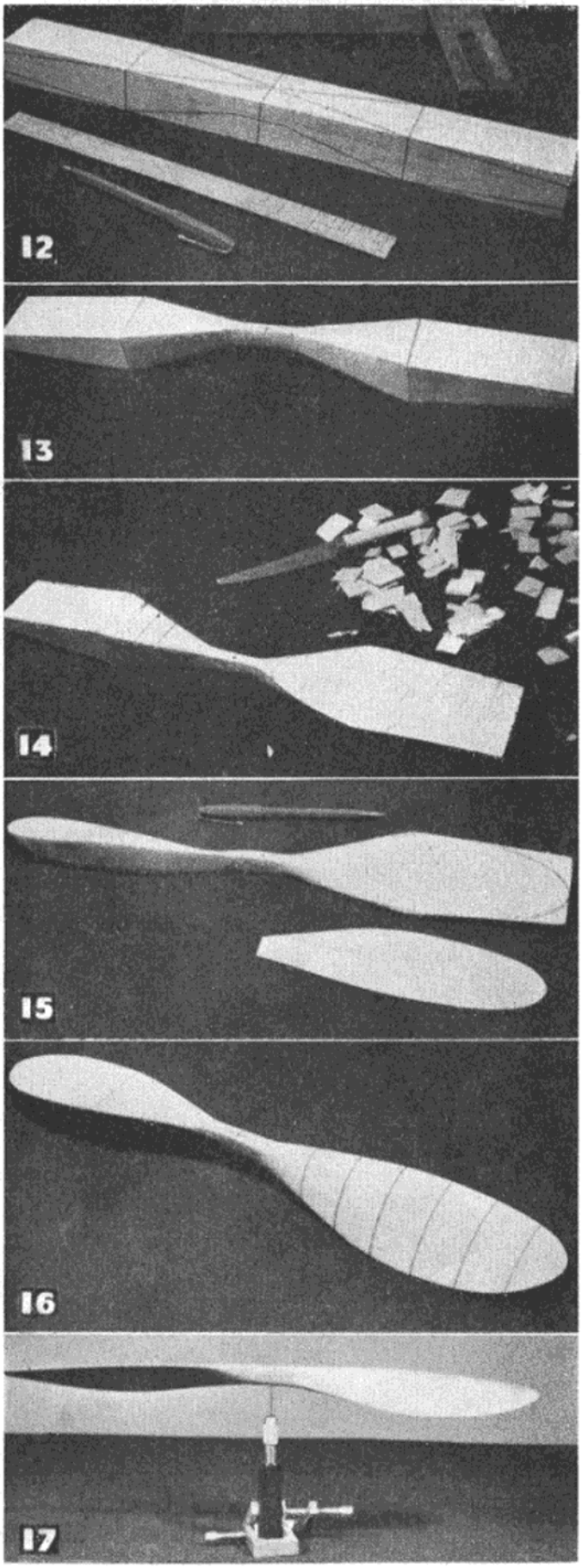
Start shaping the blank by cutting the end tapers—preferably with a tenon saw. These are followed by



Figs. 7-11. Five stages in the assembly of a Frog "Raven" show: basic assembly of two side panels and two main bulkheads (7); addition of nose and tail bulkheads, formers and front stringer (8); addition of noseblock, undercarriage, cowl block and tailplane (9); completion of tail-unit, cockpit sides and rear stringers (10); addition of built-up wing, cockpit canopy, undercarriage fairings and wheels (11).

The model in this sequence is the Frog *Raven*.

CARVING A BALSA PROPELLER



cutting the hub taper at the back. Cut slightly outside the guide-lines and rasp down level with them using a coarse sandpaper block. Now cut the centre tapers and shape up the blank to the lines with coarse, then medium, sandpaper blocks. Final shape of the blank immediately prior to carving is shown in Fig. 13.

Commence carving with the back surfaces of the blades. To assist accuracy and avoid risk of splitting off too much wood, it is a good idea to make a series of diagonal sawcuts through the back of the block, from leading to trailing edge of the blade to be cut. Run a $\frac{1}{16}$ in. pencil margin around the block and work to this to avoid sawing into the actual leading and trailing edges. For the actual carving, a modelling knife is not very suitable (except for small props) due to inadequate blade length.

When both back surfaces have been roughly carved to shape, they should be trued up with a straight sandpaper block, after which the required undercamber is put into each blade using the curved part of the knife and sandpaper. Check with a straight-edge to ensure equal undercamber on each blade. Next, mark out the required blade shape using a card template as in Fig. 15. Cut the remainder of the blank away to this shape.

Now carve the front surfaces of the blades so that a thin aerofoil section is obtained. This is really much easier than it sounds and you will be able to see and feel any unevenness in blade thickness as the work progresses. In Fig. 16 a series of parallel lines has been drawn across the blade showing the pitch graduation and gradual thinning blade section towards the tip.

Most beginners make the mistake of leaving their props much too thick, especially towards the tips. Don't be afraid to thin down the blades. The same applies to the saw-cut prop, which needs to have the blade section shaped and the trailing edge thinned down. Do not forget the hub of the prop. The blades should be cleanly moulded into it with a progressive taper for maximum strength and minimum weight. When you are satisfied with your two blades, the prop must be balanced.

A rough check is obtainable by balancing the prop on a piece of wire through the shaft-hole but, for greater accuracy, it should be balanced on a knife-edge (Fig. 17). Horizontal balance is not necessarily true balance, however. Like a properly balanced wheel, a prop should stay in any position in which it is left and should stop in any position after spinning and not run back. If necessary, the leading edge of one blade and the trailing edge of the other will have to be sanded slightly to achieve this balance.

The whole prop can now be given several coats of banana oil to harden the surface and fill the pores of the wood. By rubbing down between each, about six coats can be brushed on without adding excessive weight and a good durable finish obtained. For rubbing down, use a very fine sandpaper. A final rubbing with No. 400 silicon-carbide paper will give a really smooth scratch-free surface.

Finally, a light application of wax polish, such as " Simoniz " or " Johnson's Wax," will preserve a smooth glossy finish.

Figs. 12-17. *Six steps in the carving of a balsa propeller for a duration model : marking out the blank* (12) ; *the blank cut to shape, drilled and ready for carving* (13) ; *carving the backs of the blades after diagonal sawcuts have been made to prevent splitting* (14) ; *marking and shaping the blade outline with the aid of a card template to ensure identical blade shapes* (15) ; *carving the front surface of the blade* (16) ; *when completed the airscrew should balance on a knife- edge* (17).

the agile AGRICOLA

a 19 in. span rubber-powered scale job of Auster's crop duster

THE fuselage is constructed entirely of sheet. Choose light, soft $\frac{1}{16}$ in. sheet for the sides and top and bottom sheeting, and harder (preferably quarter grain) stock for the formers. The tail surfaces should be cut from very light quarter grain stock.

Outline of the fuselage side can be traced direct off the plan. More conveniently, remove the centre pages from the magazine, lay the fuselage drawing over a sheet of balsa and pin-prick, or transfer the drawing onto the balsa with carbon paper. Use the first side marked out to cut a second, identical side. The formers should be similarly marked out, F1 being of $\frac{1}{8}$ in. sheet and all the others of $\frac{1}{16}$ in. sheet.

Mark the position of the formers on the inside of each side. Before assembling on the formers, cement on the $\frac{1}{16}$ in. sheet doublers at the rear peg position and circles of celluloid to cover the rear windows. Assemble the sides on formers 3 and 4 first. Then join at the rear end and cement in formers 5 and 6. Finally fit formers 1 and 2, noting that the sides have to be pulled in at the bottom. Use pins to hold in place until the cement has set.

The top panels are cut from $\frac{1}{16}$ in. sheet and fitted. Clean up the nose, as necessary, and cement on the sheet bottom. The rear leg should be bent and secured before adding the rear bottom sheeting. The upper cowling is finished by covering with 1/32 in. sheet.

After cutting the tailplane and fin, check that these fit accurately together. Cement the tailplane into the fin slot and then cement the fin into a slot in the fuselage top. Note that the rear leg protrudes slightly to stick into the fin. Check that the fin and tailplane are assembled true and square.

The wing panels can be built directly over the plan. Two alternative forms of rib spacing are shown. Use the full line positions only if you want to build a light wing, otherwise use the dotted rib positions in the centre section and add additional ribs in the outer panels at the dotted positions. Ribs can be traced from the full size patterns.

The port wing panel can be built over the right wing plan by laying out the leading and trailing edges and spar over the dotted lines. The outer panels are cemented to the centre section with $1\frac{1}{2}$ in. dihedral at each tip. A $\frac{1}{16}$ in. sheet dihedral brace is fitted against the spar at the dihedral joint. No gussets should be necessary.

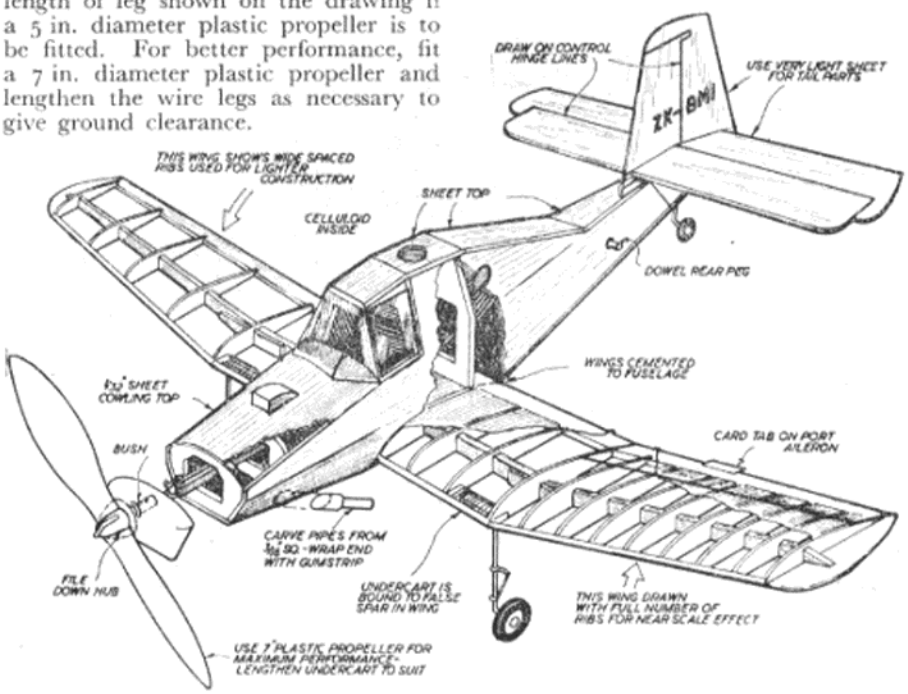
FULL SIZE PLANS OVERLEAF

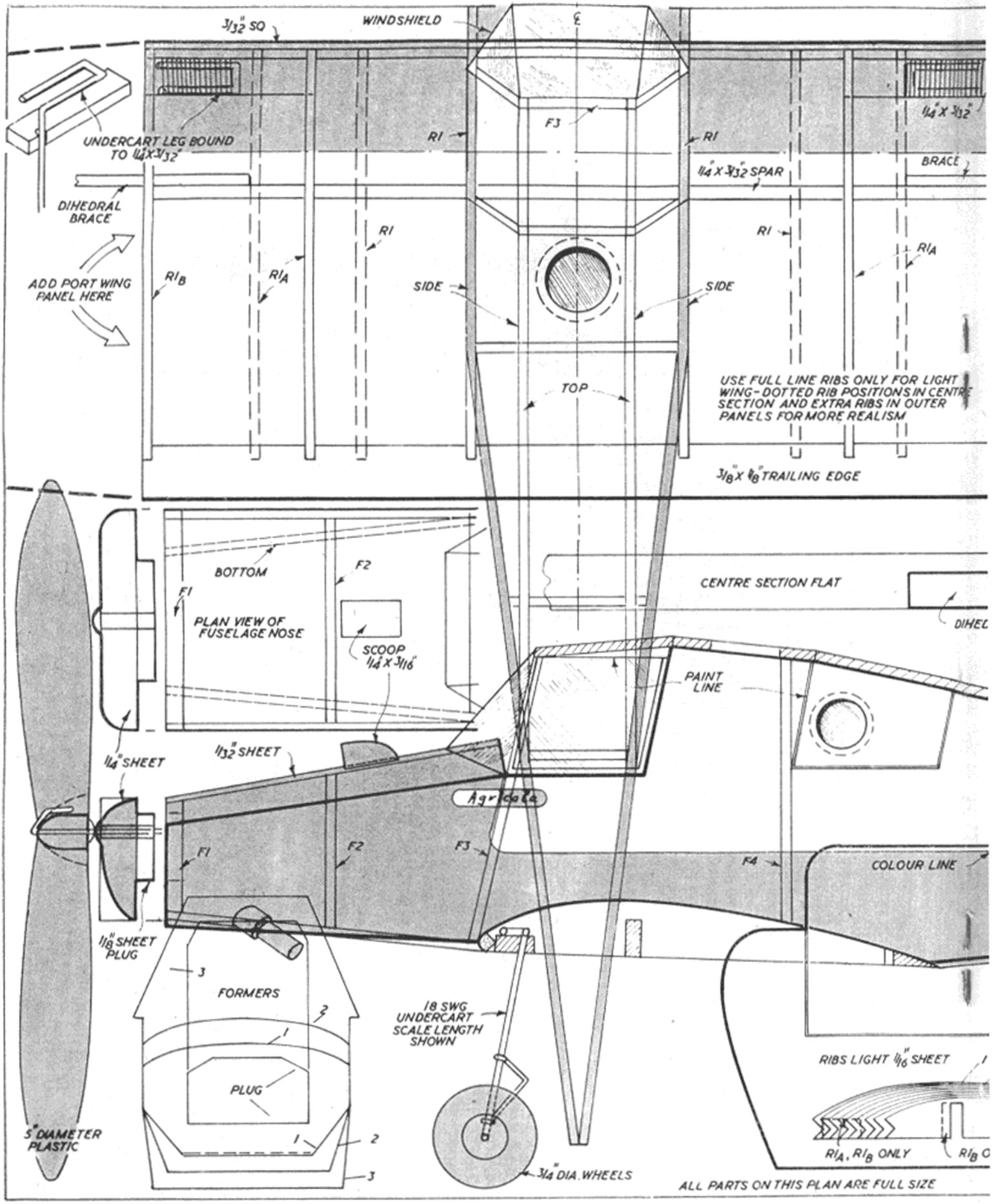
Two false spars are let into the leading edge of the centre section to carry the undercarriage legs. The legs should be bent and bound to these spars before cementing in place. Use the scale length of leg shown on the drawing if a 5 in. diameter plastic propeller is to be fitted. For better performance, fit a 7 in. diameter plastic propeller and lengthen the wire legs as necessary to give ground clearance.

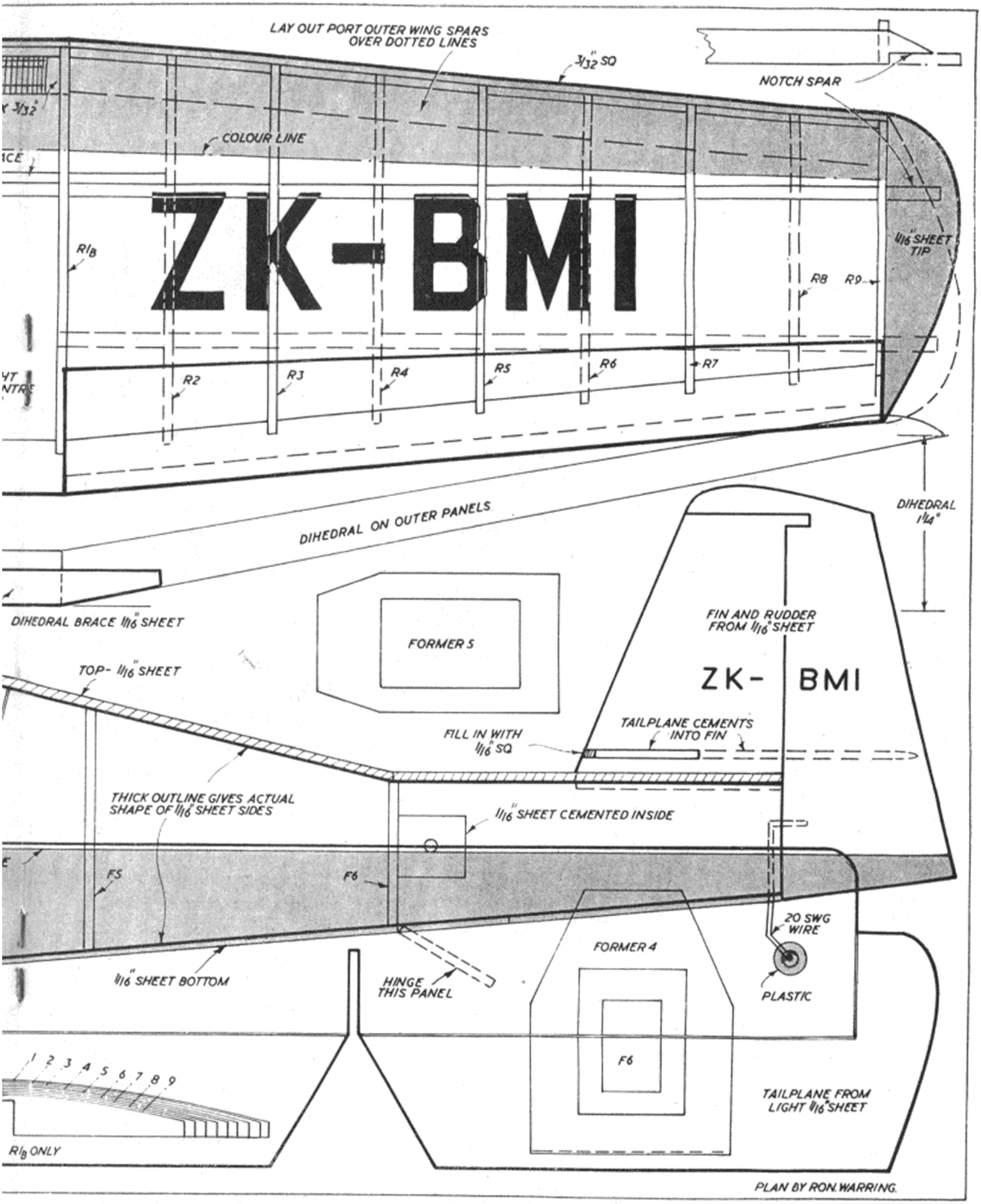
The wings are covered and doped before fitting to the fuselage. Check that the fuselage cut-out shape matches the contour of the finished wing. If not, trim to a good fit. Then cement the wings permanently in place, sighting against the tail surfaces for accurate alignment. The fuselage need not be tissue covered. After sanding down perfectly smooth, it can be coloured with dope to the line shown on the plan. Registration lettering and control hinge lines, etc., should be ruled on with black dope. The jet exhaust pipes are carved from $\frac{3}{16}$ in. square, wrapped with gumstrip and cut off at an angle to cement to the sides of the bottom cowling.

The noseblock is carved from $\frac{1}{4}$ in. sheet and fitted with a shaped $\frac{1}{8}$ in. sheet plug. This gives generous clear-

(*Continued on page 27*)




3/32" SQ
WINDSHIELD
UNDERCART LEG BOUND TO 1/4"X3/32"
DIHEDRAL BRACE
ADD PORT WING PANEL HERE
R1
R1A
R1B
SIDE
TOP
F3
1/4"X3/32" SPAR
BRACE
USE FULL LINE RIBS ONLY FOR LIGHT WING-DOTTED RIB POSITIONS IN CENTRE SECTION AND EXTRA RIBS IN OUTER PANELS FOR MORE REALISM
3/8"X 1/8" TRAILING EDGE
BOTTOM
F1
F2
PLAN VIEW OF FUSELAGE NOSE
SCOOP 1/4"X3/16"
CENTRE SECTION FLAT
PAINT LINE
1/4" SHEET
1/32" SHEET
1/8" SHEET PLUG
F4
COLOUR LINE
FORMERS
PLUG
18 SWG UNDERCART SCALE LENGTH SHOWN
5" DIAMETER PLASTIC
3/4" DIA. WHEELS
RIBS LIGHT 1/16" SHEET
R1A, R1B ONLY
ALL PARTS ON THIS PLAN ARE FULL SIZE


LAY OUT PORT OUTER WING SPARS OVER DOTTED LINES
3/32" SQ
NOTCH SPAR
COLOUR LINE
ZK-BMI
R1B
R8
R9
1/16" SHEET TIP
R2
R3
R4
R5
R6
R7
DIHEDRAL ON OUTER PANELS
DIHEDRAL 1 1/4"
DIHEDRAL BRACE 1/16" SHEET
FORMER 5
FIN AND RUDDER FROM 1/16" SHEET
ZK- BMI
TOP- 1/16" SHEET
TAILPLANE CEMENTS INTO FIN
FILL IN WITH 1/16" SQ
THICK OUTLINE GIVES ACTUAL SHAPE OF 1/16" SHEET SIDES
1/16" SHEET CEMENTED INSIDE
F5
F6
20 SWG WIRE
FORMER 4
1/16" SHEET BOTTOM
HINGE THIS PANEL
PLASTIC
F6
1 2 3 4 5 6 7 8 9
R1B ONLY
TAILPLANE FROM LIGHT 1/16" SHEET
PLAN BY RON WARRING.

Letters

Continued from page 1

A good many British modellers like glow motors and at every competition I have been to, including the Nats, glow motors have been well represented. It is only fair to suppose that if they were of British manufacture with easily obtained spares, more would be used.

Any dealer in this country who handles modern glow motors from abroad has little difficulty in selling them. Is it also not a fact, that Japanese glow motors are finding a ready market in Europe?

Most glow motors offered for sale in this country other than the Eta and Frog 500, are miserably inefficient conversions of current production diesels. Surely if a British manufacturer took time off from making diesels up to 2½ c.c. and marketed a good glow 35, if not a whole range of glow motors, they would sell. The Australian market, neglected by British manufacturers, has its own home produced 35 now.

In the local club over 50 per cent. of the senior members use glow motors of foreign manufacture. There is a market for glow motors in this country—Frog's, Yulon's and Eta's have all been purchased, so how about a good 35, manufacturers?

Having got this far I would like to express my appreciation of M.A. Engine Tests, but I would like to see some of the larger motors tested—Carter, Dooling, Fox, Forster, K.B., McCoy 35's, Fox 29R, KB 29R, etc.

Yours faithfully,

Rochdale, Lancs. P. BEARNE.

Still glowing

DEAR SIR,—Let me say right away that I am a stunt enthusiast. At the moment my main engine is the Fox 35, and it sure is tops. I also fly 10 c.c. stunt with an Atwood Glo-Devil, which is also terrific. Other motors that I use are the Frog 500 and Amco B.B.3.5.

I have obtained my copy of MODEL AIRCRAFT for fully five years now, and one of my favourite features is the articles on engines.

A recent article included Mr. Long's new 2.5 c.c. racer and also the possibility of the Miles 5 c.c. engine being converted to 5.7 c.c. or 0.35 cu. in. capacity. It is about the latter that I write.

Firstly, when I hold my Frog 500 in one hand and the Fox 35 in the other, right away I can feel the difference in weight, the Fox definitely being the lighter unit. Then, on examining them with the eyes it is hard to believe that the Fox is of larger capacity. I will add, however, that I thought the internal workmanship of the Fox the poorest I have ever come across. But what is all-important, on the end of a pair of lines the Fox is really something to make the heart tick faster. Let me hasten to add that I am not crying down the Frog, I have yet to hear one better than my own and I have had it now for about five years. At the price there is no finer engine value available.

Secondly, I would be among the first to applaud the introduction of an engine in the "35" class, but to be honest, I cannot for the life of me see this Miles engine filling the bill. Supposing the output were increased to that of the Fox, and by every account it should give a dashed sight more, look at the price paid to obtain it, with twin ball-race crankshaft, rear disc induction and a weight that compares with my Atwood Glo-Devil. I have no doubt also that the price in pounds would almost reach the two-figure bracket. Mind you I wouldn't be so much against the cost, provided it was something comparable with the Fox or a K & B 35.

To my mind something that would fill the bill would be a Frog 500 with increased bore and stroke, with possibly an altered cylinder head design to accommodate 360 deg. porting.

In conclusion may I congratulate you on a really first-class magazine and ask if it would be possible for you to publish a letter or two on this subject, as I feel it would make interesting reading and who knows, it may even make some manufacturers sit up and take note.

Yours faithfully,

Methil, Fife. G. HALLEY.

Flying grounds

DEAR SIR,—Being one who suffers through the shortage of suitable flying gounds, I found Mr. E. Pritchard's letter in a recent issue very interesting.

The Royal Navy and the Royal Air Force have been very kind to the model flying movement on many occasions, and I feel that if a committee was set up consisting of representatives of the National Playing Fields Association, S.M.A.E., model trade and model press it may be possible for them to negotiate an agreement with the Royal Navy and the Royal Air Force for the use of an aerodrome within easy reach of each city and large town for model flying on at least one week-end a month.

If such facilities could be made available I am sure the number of aero-modellers would greatly increase.

Yours faithfully,

Shenfield, Essex. R. LANDYMORE.

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.

IS EVERYTHING UNDER CONTROL ?

by HARRY STILLINGS

PART THREE

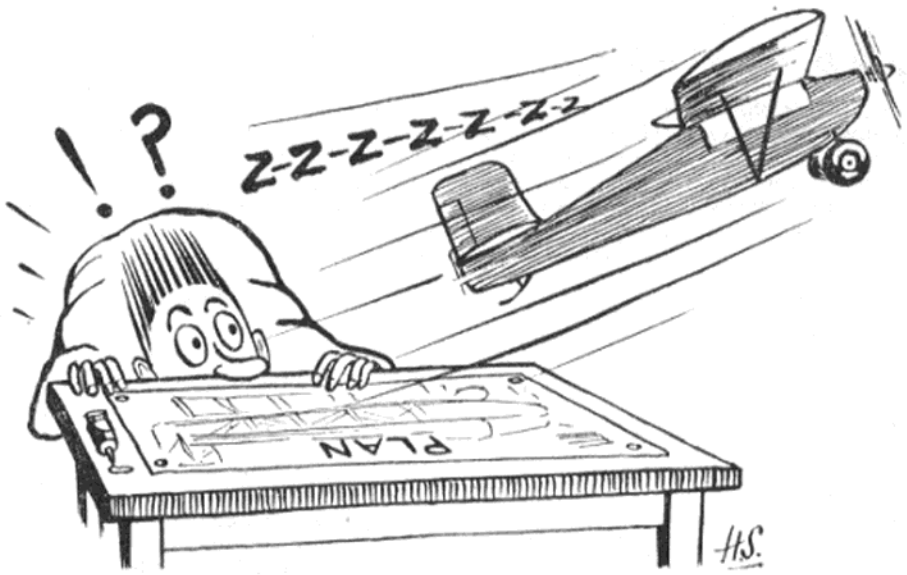
I HAD by now been flying R/C for nearly two seasons, sometimes with consistent and gratifying success, and at other times beset by a succession of mishaps, mistakes, and miscalculations. I had passed my "driving test," inasmuch as I was by now quite confident in the use of the button, and did not panic into frenzy or immobility if anything went wrong during flight. I would do all that could be done from the transmitter end, and if this wasn't enough, just silently pray that some miracle would unstick a stuck-on rudder, cut the motor, or avert disaster in some other way. If a crash did occur I would pick up the pieces (although, thanks to strong building, I would often "get away with it") and try to learn what went wrong so that I could avoid a repetition in the future.

I had my fair share of troubles and disasters, and I am afraid that even the most careful of us must expect such tribulations from time to time. The chain of control in R/C is a very long and elaborate one, and it is inevitable that a weak link somewhere along the line should cause failure at times. This is in no way to be taken as an attempt to discourage you from taking up R/C, but forewarned is forearmed, and if you know that even veteran enthusiasts meet with such setbacks now and then, it should encourage you to persevere with your own efforts. I can honestly say that I have never once felt like "chucking it all up" because of the hazards and disappointments, and going back to the relatively carefree delights of F/F. There may be (indeed, there are) far fewer problems in F/F, but there is absolutely no comparison to the satisfaction to be derived from controlled flight. Care, patience and perseverence you simply MUST have, but the rewards are well worth the effort.

Some radio men of my acquaintance have been inclined to "chop and change" models in their efforts to attain consistent results. Quite frankly, this leads nowhere. Assuming that your model is a reasonably stable and reliable design, it is far better to persevere with it, ironing out one bug after another until you have really tamed it. Scrapping the model out of hand because it doesn't perform perfectly after two or three flights, and starting on another design, is just defeatism. In any case, you'll have exactly the same teething troubles, and perhaps more, with the new job. Unless you have had considerable success in own-design, it will pay you to select a well-tried and proven kit design or one of the plans published in the model mags. An excellent kit for a beginner in R/C is the veteran Keilkraft *Junior* 60, especially now that the fuselage has been widened for radio flying. Stable, reliable and docile, it should fly straight off the building board, given careful and accurate construction. If a magazine plan is preferred, there are plenty to choose from. I mentioned last month M.A. Plan No. 120—the *ABC Robin*—and there are many more just as suitable.

The author prepares "Homer" for one of its many successful flights.

Which brings me to the next phase in my own R/C "career." My *ABC Robin* had logged many hours of fully-controlled flight (and many minutes of uncontrolled flight) during its months of useful life, but by now it was getting pretty dilapidated and after a very heavy landing one day I decided it was time to pension it off, having served its purpose gallantly and well. I decided to have a shot at designing my own R/C model. Inevitably, it took something of the form of a scaled-up and much modified "Robin." I retained the same wing-root and method of attachment, but increased the span to 66 in. and length to 41 in. With the all-up weight not much more than that of the "Robin," but with a much larger wing area, this gave me a flatter, safer glide, and increased stability under power. The fuselage featured a crutch construction which gave great strength, and a form of undercarriage which I have never seen bettered. This was made up from a pair of car foot-pump springs, had amazing shock-absorbing qualities, and was virtually indestructible.



"It literally flew straight off the board."

My aim was to produce a safe, sturdy, stable model which would need a minimum of attention between flying sessions. This meant that it had to be strongly built, but not too heavily loaded, and extremely good-tempered in its handling characteristics. Having been careful to restrict my designing efforts to a well-tried high-wing cabin layout, and with the experience gained with the *Robin* behind me, I was fortunate enough to strike lucky "first time"—the model literally flew straight off the board, and only a minor thrust adjustment was needed for perfect flight. I gave it a rather high-falutin' name—*Happy Wanderer*—but this was simply due to the fact that, while scratching my head for a suitable title, I suddenly realised that the then popular tune of the day was being played on the radio, and I simply pinched it for my new model! Later on, the design was published in MODEL AIRCRAFT as Plan No. 190, and I would be most interested to hear from readers who built it as to their experiences with the model.

For my part, I was highly delighted with such resounding success with my first-ever R/C "own-design." The model performed exactly as I had hoped it would—although slow-flying, it was extremely stable, even in gusty conditions, and could be left to fly on its own for quite long periods without getting into any sort of mischief. Response was good, thanks to the large rudder area, and recovery to straight-and-level after turns quite remarkable. I had a lot of fun with *Happy Wanderer*, and it duly fulfilled the hope that it would go on flying, session after session, without much attention. But it had a most regrettable tendency to live up to its name, and went "absent without leave" on no fewer than six occasions, remaining lost for varying periods between 24 hours and four weeks. But, having justified the "wanderer" element of its name, it seemed to want to put things right by living up to the "happy" part as well, because it never failed to turn up again eventually.

The "wandering" habit was, of course, no fault of the model, being due on each occasion to a break in the radio link, resulting in lack of response to signals, and with the large fuel tank I always use, this meant a cross-country flight of anything up to four or five miles, depending on wind drift. On one occasion the fly-away was caused in a rather unusual manner. I was trying an r.o.g. from rather rough, rutted ground on our local common, and just before the model became airborne it hit a particularly large bump at some speed, the recoil from which switched off the radio! Meanwhile, the model bounced up and gleefully remained airborne, climbing away happily with a nearly full tank, and, of course, with no control at all! The switch was, I knew, rather loose, but I felt I could not have been expected to foresee such an unusual result. Anyway, all I could do was to try to keep "Wanderer" in sight, but on so long an engine run it went o.o.s., and was not located again until three weeks had passed.

Other fly-aways were due to faulty batteries, two were directly due to a transmitter fault which baffled me for a long time, and others to silly little errors on my part, like forgetting to rewind the actuator motor. Here I should like to recommend very strongly that you consider taking out o.o.s. insurance on your R/C models. The risk of loss is ever-present, as engine runs are far longer than with F/F, and with the best care in the world, it needs only some small failure to lose control.

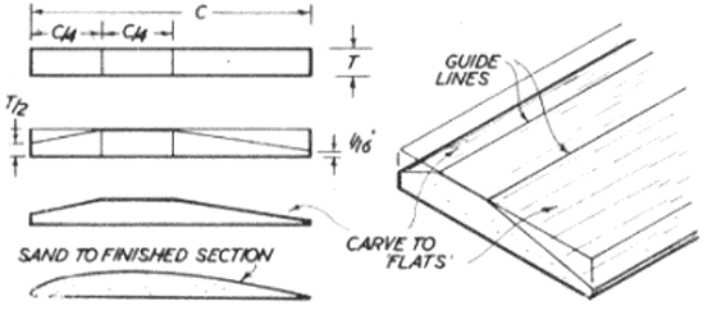
Happy Wanderer continued to give me many hours of satisfying flight until one day it got itself lost once too often, and defied the combined efforts of several search parties to locate it. I decided it was gone for good, and started another model. This was basically the same design, but with narrower and more streamlined fuselage, giving better penetration, and slightly increased wingspan (72 in.). It proved to be an excellent flier, and, remembering what had happened to the "Wanderer," I called the new one *Homer*, and hoped it would! Incidentally, the day after *Homer* had passed its first trials with honours, *Happy Wanderer* was found—but I was so disgusted with its bad behaviour in remaining hidden for four weeks that I relegated it to the workshop wall, where it still hangs!

Homer turned out to be an extremely reliable model over the next 12 months, and was also my first model to be fitted with a hard-valve receiver, in place of the soft-valves I had used till then. I soon found there were different characteristics which had to be mastered, and we will go into these next month.

SHAPING AIRFOILS

BY far the most satisfactory method of carving solid balsa wings to a good aerofoil section is to first shape the wing panel into three 'flats' either by planing or carving. Then the final aerofoil shape can readily be worked in with sandpaper.

To get the camber in the correct position, measure the width of the wing panel (C). Then mark the top of the panel out into two quarters and draw guide lines from tip to tip. Mark another line along the leading edge at half the panel thickness, and a line along the trailing edge to give a thickness of about $\frac{1}{16}$ in.



The first (and only) 'carving' stage then consists of trimming down the front quarter and the rear half of the wing panel, as shown. A really sharp modelling plane is the best tool for this job, but carving with a knife is just as good provided you do not let the blade 'dig in' and cut away too much wood. Your wing panel after this shaping should have three distinct, and even, 'flats' formed on the upper surface.

Finishing can then readily be done with a sanding block (or a piece of sandpaper wrapped around a 6 x 3 x $\frac{1}{4}$ in. panel of wood), working off the definite 'edges' and smoothing to a uniform aerofoil section. Round off the leading edge and reduce the trailing edge to a near knife-edge. It is quite unnecessary to try to sand in *undercamber* on a solid balsa wing.

Spanish Armada
(airborne!)

PETER COOKSLEY suggests that the smaller air forces offer interesting possibilities for scale modellers and gives some notes on Spanish Civil War markings

HAWKER *Hunters* bearing the insignia of the Royal Swedish Air Force, *Mosquitos* in Israeli Air Force colour schemes, Republic *Thunderbolts* of the Mexican Air Force—the variety is limitless and it certainly gives added interest when a model is finished in a colour scheme not usually associated with a particular aircraft type.

The Spanish Civil War period (1936-39) produced a host of unusual colour schemes on a large variety of aircraft, but models in accurate finishes of this period are few and far between. Consequently, it is hoped that the following notes will provide a basis for readers who would like to give the appropriate models a "new look."

Mainstay of General Franco's Air Force was the German operated Condor Legion. At first its fighter strength consisted of biplane Heinkel 51s, later replaced by the Messerschmitt *Bf* 109*B*.

These differed from later types by the large beard radiator under the nose, small intake above the starboard cowling and two-bladed airscrew. The engine was a Jumo 210 and the armament, twin machine guns and a cannon through the a/s shaft.

The rudder marking was a black diagonal cross on white; the wing, a white cross on a black disc. This was repeated on the fuselage sides but the cross sometimes stopped short of the disc edge, here. One machine was 6-42.

These were later replaced by the Bf 109C, with a three-bladed propeller, four machine guns and a triple radiator layout.

FIG 2

FIG 3

The fuselage marking was now the Condor Insignia (see Fig. 1), white on black; and a black flash ran from the exhaust back across the wing fairing. One such was 6-126.

Almost indistinguishable was the 109D (Fig. 1) with a Daimler Benz motor. Some carried personal insignia as shown, another, 6-13, sported the pistol-packing mouse in Fig. 2. He was black with white details, in red pants with yellow buttons.

FIG 1

Modellers should notice the large air intake on the port side of the C and D and that these machines measured only 30 ft. 3 in. span. On all these examples the colour scheme was lead-grey above and light blue beneath; while the markings were reversed on the starboard side, i.e. with the prefix nearest the tail.

The bombers were Heinkel 111*a's*, with raised cockpit and elliptical wing form. Their markings were similar except that the wing crosses lacked a disc, those on the fuselage being shown in Fig. 3, red on black.

The Condor badge appeared just above the mid line on the fin.

One carried "25-92" in 15 in. numerals.

These aircraft were camouflaged green and brown in a rather angular pattern above, and pale blue below. The side dividing line ran from wing T/E to tail plane L/E.

The Franco Air Force also flew some S.M.79 bombers. These retained their Italian camouflage of small irregular patches of brown and rust on light green above, and silver below. They seldom carried fuselage insignia and the wing markings were plain against the dark colours.

Foremost among the motley Republic Air Force were the Russian I-15 *Chato* and I-16 *Mosca* (Rata) fighters.

One of the former is shown in Fig. 4. The national marking on the wings was a roundel of red and yellow with a blue centre and similar horizontal stripes on the rudder. The fuselage number was white, others being "56" and "200."

Camouflage of both types was dark green and dark grey above, rather like British shadow shading, and pale grey below.

Personal insignia were sometimes carried (although not on the three described) usually on the fin. Some even lacked the number and flew innocent of all except the Republic markings.

All numerals were painted in a style similar to those depicted.

Over 200 Polikarpov I-15's were sent to Spain during the Civil War. A few still remain in service, powered by 700 h.p. M-25 (Wright) engines. Armament consists of four 7.62 mm. Maxim guns. Current Spanish Air Force markings consist of a red-yellow-red roundel, with a black cross on a white rudder.

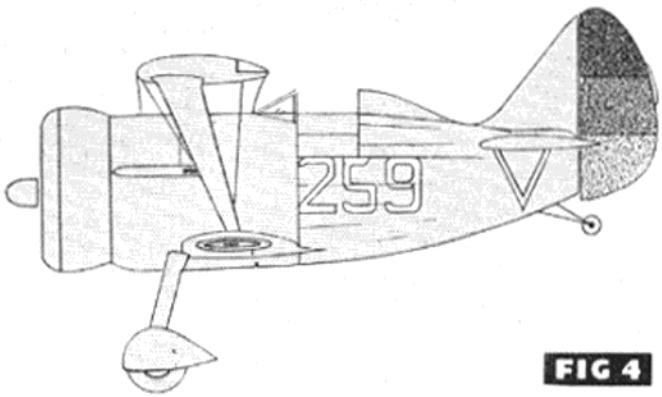


FIG 4

The assistance of Col. Bengoechea of the Spanish Embassy and Comm. Seymour-Haydon, R.N., in Madrid is gratefully acknowledged.

OVER THE COUNTER

We regret to have to report the death of Mr. P. S. Fisher, who for many years operated a wholesale model business in Colchester and Twickenham. Mr. Fisher will be missed by his many friends in the trade and we offer our sincere condolences to his family in their bereavement.

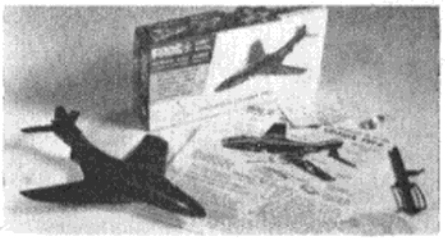
* * *

Humbrol Art Oil Enamel is now available in an entirely original packaging. Six intermixable colours

are contained in plastic capsules and are sold in a cellophane packet at 1s. 3d. complete. This should be the perfect answer for plastic solids, where one usually requires only a very small amount of each colour. Being intermixable, any intermediate shades can be obtained.

* * *

What promises to be one of the most popular plastic solids range yet is announced by International Model Aircraft. Known as the Frog Comet Series, the six models currently



available are all American jets, the Grumman *Cougar*, *Super Sabre*, *Starire*, *Thunderstreak*, Douglas *Skynight* and *Skyray*.

All models are to approximately 1/96 scale, the kits are complete with stand and polystyrene cement, and the standard of finish is comparable to the 1/72 scale range. Retail price is the same for all models—2s. 6d. each.

* * *

A new booklet by MODEL AIRCRAFT contributor P. G. F. Chinn has lately been published in America by John Maloney of World Engines. Entitled " Peter Chinn's International Engine Review," the booklet will acquaint American enthusiasts with some of the more worthy foreign makes now available commercially in the U.S.A.

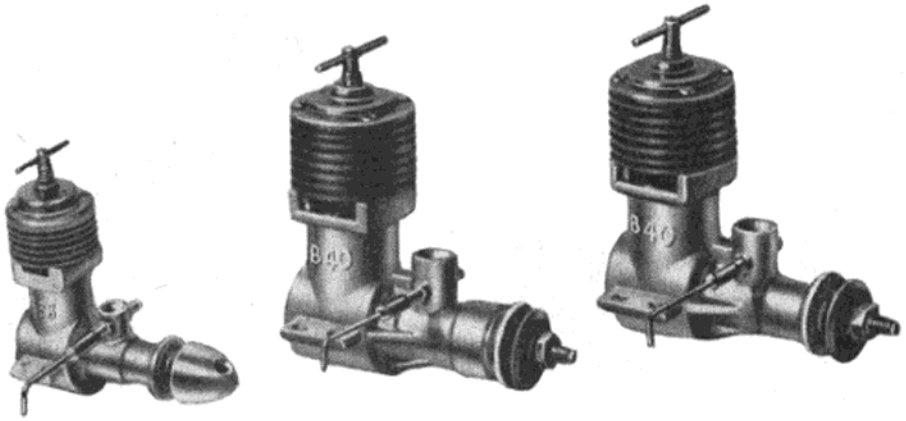
Included are eight " Engine Test " reports from past issues of MODEL AIRCRAFT, including four dealing with British engines, plus further chapters describing British, Italian, Norwegian and Japanese engine development. Price is 35 cents (2/6)

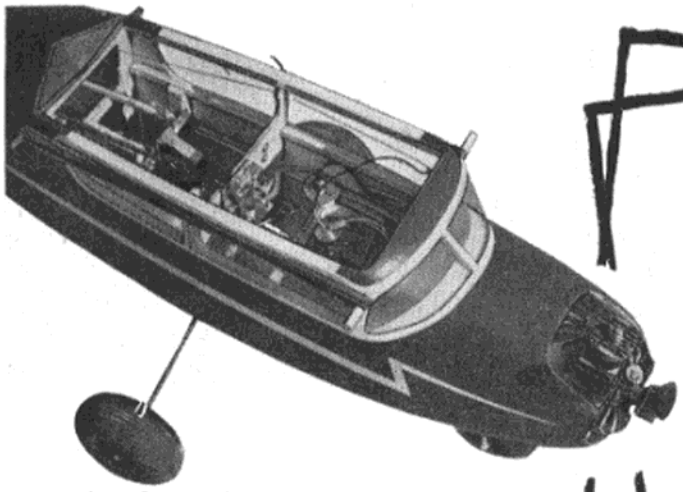
and the publisher's address, P.O. Box 905, Warren, Ohio, U.S.A.

* * *

We often receive letters enquiring whether foreign engines that we test are commercially available in England. Mostly the answer is no. The Barbini range of engines, of which the TN model is tested this month, is being imported by Keilkraft and should be available shortly. In addition to the glowplug TN, there is the 1 c.c. B.38 diesel (tested April, '55 " M.A."), the 2.5 c.c. plain bearing B.40 TB diesel (tested July, '56 " M.A."), and the B.40 TR ball bearing 2.5 c.c. diesel (the TN is basically a glowplug version of this latter motor). No details are available yet of the retail prices of these motors, but every effort is being made to keep them competitive.

The photo below shows the B.38 and the ball and plain bearing versions of the B.40 diesel.





Japan. Sigeo Ogawa's 2-channel R/C model, which has an O.S. compound, escapement and motor control unit.

HOME AND AWAY

with Peter Chinn

ONE can detect what promises to be a swing back to larger R/C models now that multi-channel controls are becoming more widely used.

One of the problems that arises with the bigger and heavier types of multi-control models, nowadays, is of finding motors of sufficient power. In the "old days," this was fairly simple, especially if one had access to the American market. There were many good 10 c.c. engines, several 8 c.c. models and one or two 15-16 c.c. jobs. Today there are very few engines bigger than 5 c.c. being manufactured—even in America.

What seems to be one answer to this problem, however, now appears in the shape of the Miles 8 c.c. Diesel. Similar in design to the already well established E.D.-Miles 5 c.c. model, this is a ball-bearing, radial-port motor with disc valve induction.

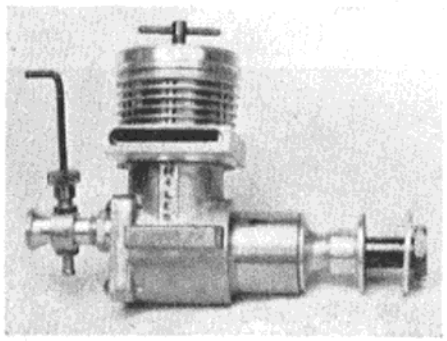
Many people, the writer included, do not like big diesels in general, having found them harsh running and prone to lead to trouble with radio-controlled models due to vibration causing relay chatter, etc. On the other hand, about twenty of these Miles 8 c.c. units have now been put into service and we are given to understand that they have proved very satisfactory in some large types of R/C models.

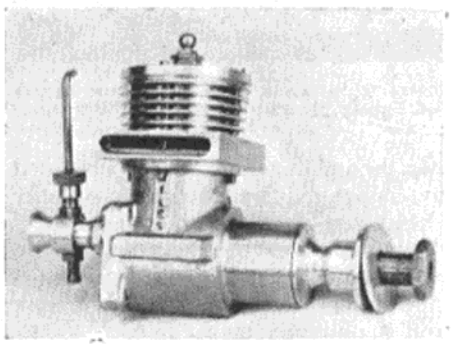
Designer Basil Miles tells us that these engines swing a 14-in. prop at between 9,000 and 10,000 r.p.m., which is very good indeed and must mean that an output in the region of 3/4 h.p. is realised.

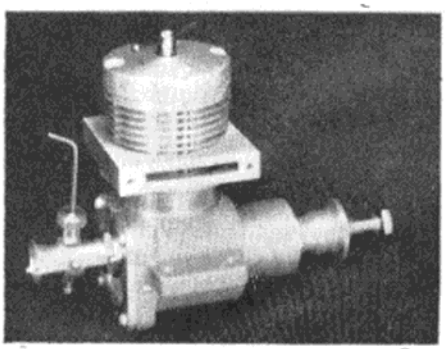
The crankshaft of the 8 c.c. Miles runs in two ball journal bearings ; a ½-in. inner and a ⅜-in. outer bearing, and, instead of the valve rotor pin being fixed in the backplate, it is fitted to the valve disc and rotates in a bronze bushing in the backplate. The carburettor is fitted with a throttle control.

The sandcast crankcase is integral with the main bearing housing and also embodies an exhaust collector. It will be observed, from the photograph, that there are a pair of tapped stud holes on each of the exhaust ducts. The engine is also available in a marine version, when special exhaust elbows are fitted to these flange faces.

We mentioned, in a previous article, Miles's experiments with a 5.7 c.c. glowplug engine based on the bottom end of the Miles 5 c.c. diesel. One of our photos shows one of these prototype units. Also shown is the 5 c.c. diesel in its latest guise with new diecast crankcase in place of the previous sandcast component.







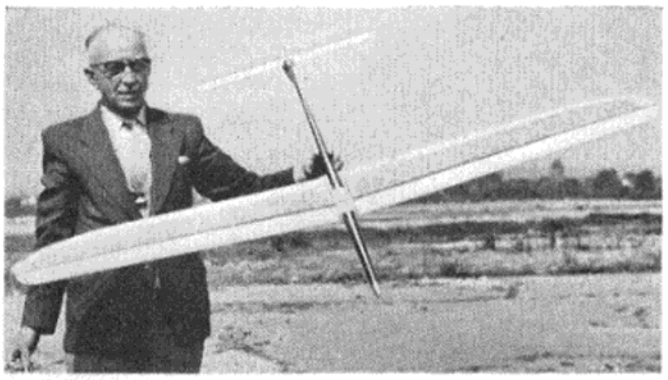
Development of a design. (Left) The latest version of the Miles 5 c.c. Diesel. An integral exhaust duct is now featured. (Lower left) the very short-stroke Miles 0.35 cu. in. glow motor, the first British built engine of this class. (Below) Big Diesel. The 8 c.c. Miles Diesel which is now available to special order.

Italy

The resounding victory of Gibbs, with the Carter-McCoy Red-Head 19-based motor in the Speed Championships at Florence, rather overshadowed the efforts of the other competitors, whereas, in actual fact, the performances of all the top men were little short of astonishing. No less than nineteen competitors equalled or exceeded the winning speed by Sladky of Czechoslovakia in 1955.

Before the meeting, the undoubted favourites, in addition to Gibbs, were the Italians, with their Super-Tigre G.20s and the Czechs with their special MVVS designs. In the actual contest, however, the Italian team Super-Tigres were beaten by a Hungarian-entered and modified Super-Tigre with disc valve induction (Vitkovics with 127.38 m.p.h.—2nd

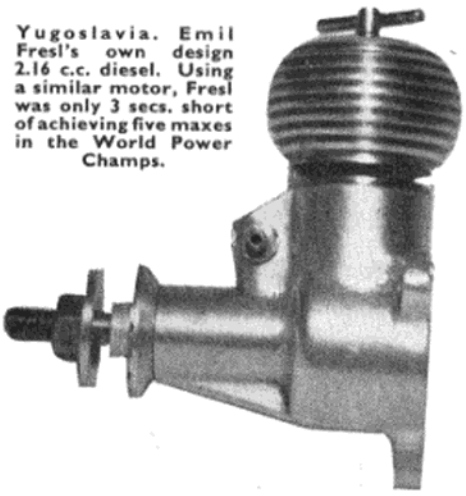
place) while the highest-placed Italian (Cellini in third place with 124.27 m.p.h.) did not use a Super-Tigre at all, his model being powered by a special racing version of the Barbini B.40 glowplug engine which is featured in our "Engine Tests" series this month. It is anticipated that the Barbini range of motors will shortly become available on the British market—for further details read "Over the Counter" on page 24.



Seen at the German Championships at Kassel, was this unique A/2 built by C. W. Lapp. It had clockwork operated d/t and auto-rudder system. Wing fitted saddle-fashion over the fuselage and no rubbers were used.

Yugoslavia

The valiant effort of Yugoslav champion modeller Emil Fresl in getting within three seconds of a perfect 15 : 00 score and a place in the fly-off at Cranfield was all the more notable for the fact that he was using one of his own motors, a 2.16 c.c. diesel. Fresl was, of course, responsible, with Dragan Prohaska,



Yugoslavia. Emil Fresl's own design 2.16 c.c. diesel. Using a similar motor, Fresl was only 3 secs. short of achieving five maxes in the World Power Champs.

for the Yugoslav Oskar engines that were built in small numbers at Zagreb a few years ago.

The only engines produced in Yugoslavia in any quantity since that time have been the "Aero" series, designed by Radisav Miloradovic and turned out under the direction of the Aeromodelling Institute of Belgrade. Production has been concentrated on two main types, a 1.5 and a 2.5. These are conventional, shaft-valve, radial-port diesels.

Japan

One of the features common to virtually all the numerous copies that have been made of the American Dyna-jet pulse-jet motor has been that they have, unfortunately, copied the Dyna-jet dimensions also. We have often thought that, if someone had marketed an engine of about half the Dyna-jet's size and a quarter of its power, the pulse-jet might have become a lot more popular. There are no insurmountable difficulties to making such a motor—a Swiss enthusiast (whose name escapes us for the moment) did, in fact, make a number of "miniature dyna-jets," some years ago, which were highly successful.

One commercial engine which does, however, come a step nearer to the power and weight we have envisaged is the Japanese Tiger-Jet engine. Claimed static thrust is $1\frac{3}{4}$ lb.—as against $4\frac{1}{4}$ lb. for the Red-Head Dyna-jet—and weight is a little under half that of the American engine. Unfortunately, the tuned length required for the tailpipe still means that the Tiger-Jet is over 18 in. long—only 3 in. less than the Dyna-jet—although the maximum diameter is only $1\frac{3}{4}$ in. The tailpipe has a $\frac{7}{8}$ in. bore.

We have no personal experience of the Tiger-Jet, but a number of kits for it have been put on the market in Japan and the engine is also imported into the U.S.A. by the Eureka Importing Company of San Diego, so it is reasonable to suppose that it is regarded as being quite successful.

Unlike another Oriental copy of the Dyna-jet, which had a simplified valve head with only four ports and valve petals, the Tiger-Jet retains the basic pattern of ten ports, and is, to all intents and purposes, a standard pulse-jet design scaled down. The valve-head is of aluminium and serves as a mounting for the jet assembly at the front and valves at the rear. The combustion chamber and tailpipe are welded up from stainless steel.

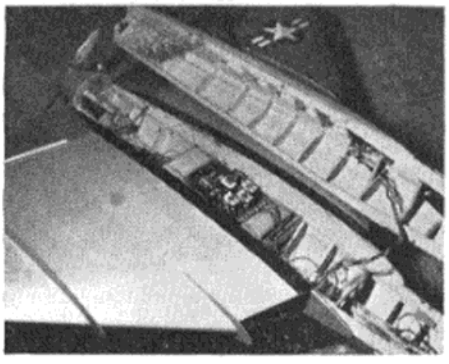
The Wilsco 79 Engine

In response to our comments on this engine in the September issue, we have received two letters throwing further light on the origin of the Wilsco. One of these letters comes from Charles Skinner, proprietor of the Model Shop, Redcar, Yorks, who still has one of these engines in stock if anyone is interested. The other letter comes from David Blackwell of Earlsdon, Coventry, who also owns a Wilsco and reports that the throttle control works admirably when used on a C/L model.

Combining the information given by these two correspondents, it appears that these motors were built at Balsall Common, near Coventry, by a Mr. Williams and a Mr. Scott (hence "Wilsco") and were distributed by Messrs. F. C. Parks and Co. of Leamington Spa. The Wilsco 79 was apparently built only for a few months in the summer of 1948.

Germany

Delta wing R/C models seem to be popular. Following Bickel's convincing win in the mono-control event in Belgium with a delta, Germany's Wilfred Biesterfeld took fourth place in the German Nats with an impressive looking semi-scale *Skyray*. The accompanying photo



Biesterfeld's astonishing near-scale Skyray R/C fighter. It placed fourth in the German Nats.

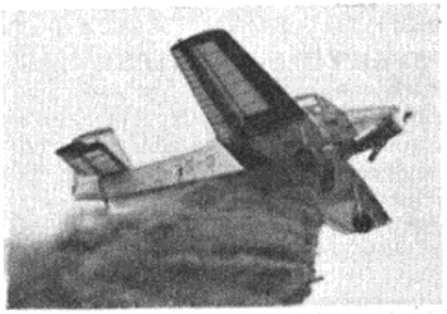
(for the use of which we are indebted to S/Sgt. John Stewart of the U.S.A.F. Chad Club in France) shows some of the features of this remarkable model. It has a 3-channel tuned reed (E.D.) receiver and is powered by an O.S. Max 29.

The Auster AGRICOLA—*continued*

ance for the rubber motor—a common failing of many small models where the propeller is mounted on a small nose-button. The noseblock should be bushed with an 18 s.w.g. brass bush or tubing to fit an 18 s.w.g. propeller shaft. If the plug is made a tight push fit in former 1 the propeller will not fall out and ruin the glide when the motor is unwound.

A commercial plastic propeller is used in preference to a carved balsa type. The spinner hub standard on plastic propellers should be filed down to the shape shown on the plan to conform to scale appearance.

Depending on how light you have made your model, power required will be either one loop (two strands) of $\frac{3}{16}$ × 24th or $\frac{1}{4}$ × 24th. The latter is



The Agricola in action—the full size job, not the model.

advisable, in any case, for rising off ground flights.

The assembled model, with motor inserted, should balance at about the mid point of the wing. If you have used a light propeller (e.g. carved balsa instead of plastic) some ballast weight may be required in the nose to trim. Otherwise the model should trim satisfactorily without ballasting merely by adjusting the elevators up or down slightly by warping. If any degree of "up" elevator is required to trim, then downthrust must be added to the noseblock to counteract the stalling tendency under power.

Being a small model, flight duration is, of course, limited, but times of up to 30 seconds should be obtained consistently with careful trimming on a loop of $\frac{3}{16}$ in. rubber. For rise off ground flights, the take-off must be made from a smooth surface and at least half maximum turns used on the motor. If there is any tendency for the model to drop a wing or prove critical on turn adjustment, applying washout to the wing tips is a cure. Otherwise, despite the fact that the "Agricola" is a low wing layout, stability should be quite good. The only departures from true scale outline are a slight increase in dihedral angle and fin area and a fairly generous increase in tail area. Scale propeller diameter for a non-flying model, incidentally, is $3\frac{1}{2}$ in.

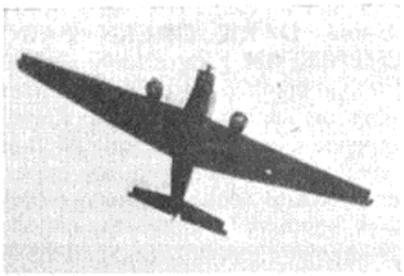
M.A.'s "Easy Ten"

£2 2s. goes to the winner of our new Cash Quiz Contest!

Entries must reach us by December 31st—the first "all correct" line opened on that date gets the prize. It's as simple as that!

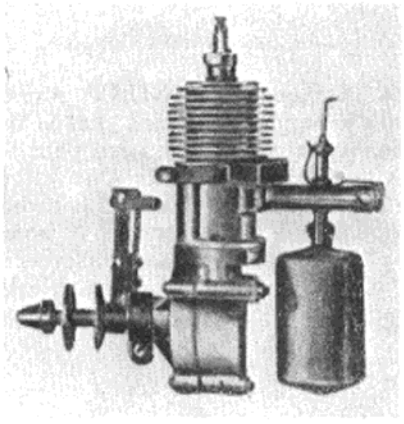
Address is "Model Aircraft" 19-20 Noel Street, W.1

1. A pterodactyl is :
(a) a tailless aircraft (c) a rotating-wing aircraft
(b) a tail-first aircraft (d) an oscilating-wing aircraft



2. This three-engined C/L model is of a:
(a) Ford Trimotor (c) Stinson Trimotor
(b) Junkers Ju.86 (d) Junkers Ju.52

3. Winner of the Wakefield Cup in 1952 was:
(a) Sweden (c) Switzerland
(b) Finland (d) U.S.A.

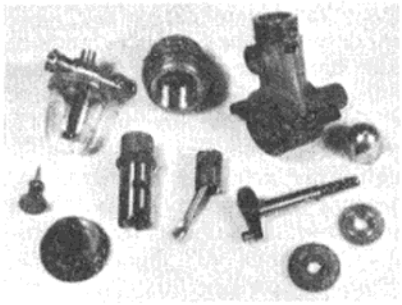


4. This AMM engine comes from:
(a) Russia (c) Germany
(b) Czechoslovakia (d) U.S.A.

5. Jean-Pierre Gobeaux is a noted :
(a) Engine designer (c) Wakefield flier
(b) R/C exponent (d) A/2 designer

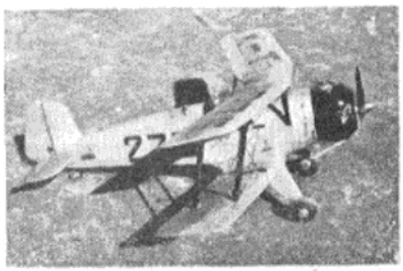
6. The team championship at the 1956 FAI World Speed Championships was won by :
(a) Great Britain (c) Hungary
(b) Italy (d) Czechoslovakia

7. The regulation F.A.I. length for A/2 glider towlines is:
(a) 50 feet (c) 50 metres
(b) 100 feet (d) 100 metres



8. The engine shown here dismantled is a:
(a) Kalper 0.32 (c) Barbini B.38
(b) Mills Mk.II (d) Mills 0.75

9. The David-Andersen diesel motors are made in:
(a) Sweden (c) Denmark
(b) Norway (d) U.S.A.



10. The prototype of this C/L scale model was much favoured for aerobatics exhibitions. The prototype was the :
(a) Bristol Bulldog (c) Bucker Jungmeister
(b) Stits Biplane (d) Tiger Moth

MARK YOUR ENTRY "MODEL QUIZ"

AVIATION NEWSPAGE

by J. W. R. Taylor

NEW VIEW OF NUCLEAR NB-36H above reveals the shape of its redesigned fuselage nose and flight deck. Also visible are the airscoops on each side of the rear fuselage which supply cooling air to the reactor when it is working.

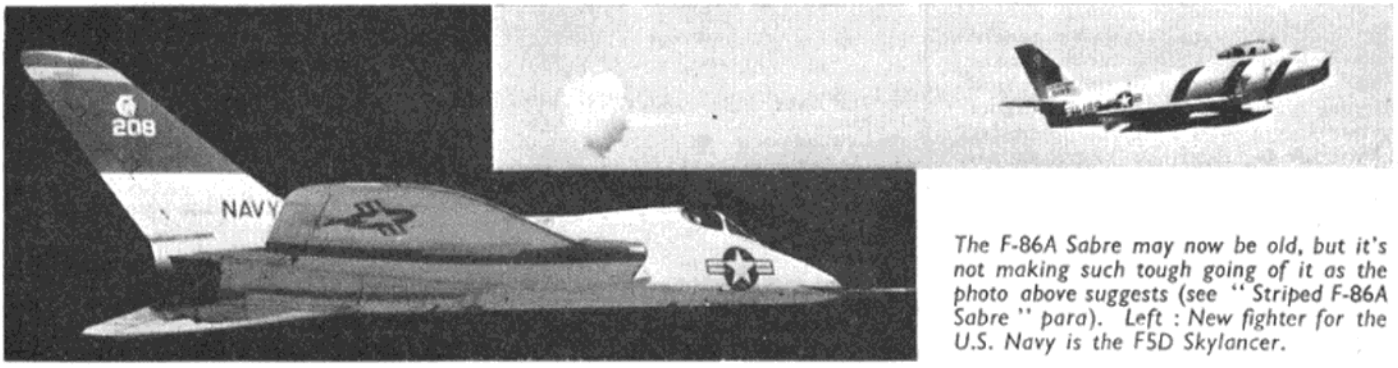
Few details of the Convair-designed reactor have been released, except that it is comparatively small and does not power the aircraft. It is turned on only when the NB-36H is high over an unpopulated area, to measure the effects of radiation on the airframe, instruments and equipment. Methods of shielding the air crew, reactor operators and electronic devices are also being tested, together with new types of nuclear instrumentation.

First flown on September 17th, 1955, the NB-36H has a dark blue nose and orange radiation warning symbol on its fin. It had the name " Convair Crusader " painted on the blue fuselage flashes ; but this has presumably been dropped to avoid confusion with the Chance Vought F8U-1. It is accompanied on every test flight by a B-50 *Superfortress* escort.

Not yet satisfied with their unique two-tone **DARK GREEN PAINT SCHEME,** Aer Lingus have recently added a black line under the white flashes on each side of their *Viscount* fuselages. In addition, one of these aircraft has been given an experimental white cockpit canopy.

A £27,000 VISCOUNT sounds quite a bargain. In fact, that is the price reported to have been paid by Continental Air Lines for a travelling cutaway model of this British turbo-prop airliner. The model is being displayed at airports and conferences as advance publicity for the airline's forthcoming *Viscount* services.

STRIPED F-86A SABRE illustrated below is one of 16 aircraft used by North American's Autonetics Division to test advanced electronic weapon-firing systems. It is used as a target for interceptors fitted with the systems, but no guns or rockets are actually fired. Instead, when the attacking interceptor's radar operates its weapon-firing gear automatically, this transmits a signal which triggers-off smoke-puff equipment on the wing-tip of the *Sabre* target-plane. In this way, it is possible to check the interceptor's angle-off the target when its weapons would have been fired.



The F-86A Sabre may now be old, but it's not making such tough going of it as the photo above suggests (see " Striped F-86A Sabre " para). Left : New fighter for the U.S. Navy is the F5D Skylancer.

Douglas's new F5D *Skylancer* is a **REFINED SKYRAY** with the same delta-type wing planform, but with a thinner aerofoil section, longer and more slender fuselage, V-shaped windscreen and canopy, and increased fuel capacity, giving an all-round improvement in performance. The prototype made its first flight on April 21st, 1956, and production *Skylancers* are scheduled for use as ship-board day and all-weather single-seat fighters. Powered by an afterburning Pratt & Whitney F57 turbojet, they will presumably be armed with *Sparrow* and *Sidewinder* air-to-air rocket missiles, operated by electronically-controlled auto-pilot and fire control systems for automatic interception.

* * *

An **ABSENT-MINDED HUNTER PILOT** who made a wheels-up landing in Cyprus during recent operations has good reason to be grateful for the strength of the Bristol plastic drop fuel tanks carried as standard underwing equipment. They took the full force of the belly-flop without breaking up and the aircraft was hardly damaged.

* * *

LITTLE-KNOWN FEATURE of the Lockheed F-104A *Starfighter* is that its liquid-spring undercarriage shock-absorbers are made by Cleveland Pneumatic Tool Company under licence from Dowty Equipment. This is a great tribute to the British company, because the F-104A is an unusually hot ship, with a touch-down speed of around 170 m.p.h.

Despite the short "travel" permitted by retraction into the fuselage, Dowty were able to design a small, immensely strong shock-strut able to contain oil pressures of more than 22 tons to the sq. in.

* * *

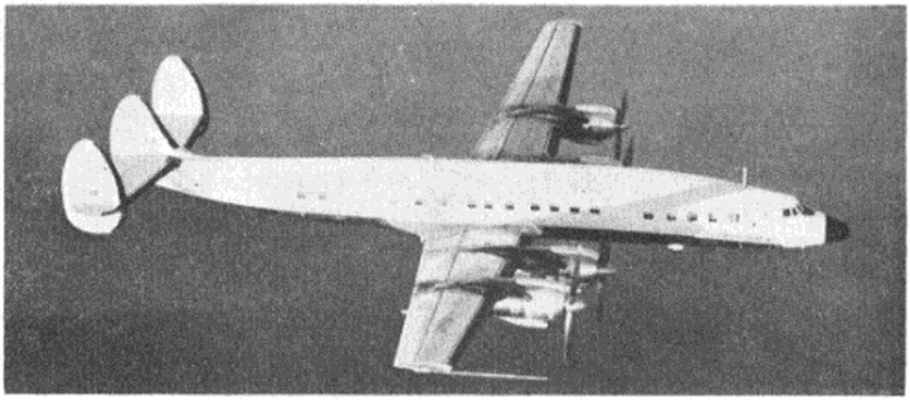
Despite progress with the NB-36H, **CHEMICAL-FUEL BOMBERS** are believed to be more practicable than atomic-powered aircraft by many U.S.A.F. planners. Development of the nuclear-powered Convair WS-125A project, with General Electric power plant, has apparently been stretched out ; while new prototype contracts have been placed for the chemical-fuelled WS-110A supersonic bomber designs by North American and Boeing, as 1962 replacements for the B-52.

The WS-110A weapons system specification calls for an over-target Mach 2 performance, achieved by the use of pentaborane fuel, which can be burned in standard turbojets. It has a heat content of more than 29,000 B.Th.U./lb., compared with under 19,000 B.Th.U./lb. for present turbine fuels. Being lighter than the latter, it requires more tank space per lb., but this is far offset by the gain in heating efficiency on a long-range aircraft.

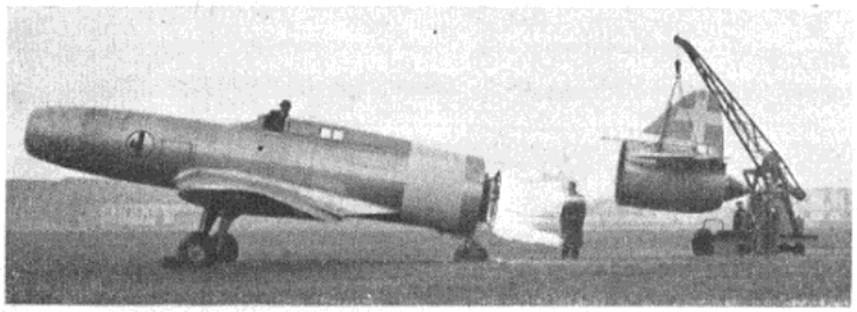
* * *

NEW WING SHAPE that will become familiar over the U.K. in a few months is the 150 ft. straight-taper planform of the Lockheed L.1649A *Super Star Constellation*. Sixth major stretch of the basic Connie design, the new 1649A will carry 58-80 passengers for distances up to 6,300 miles, making possible non-stop Rome-New York services. Its wing has an aspect ratio of 12, compared with 8.5 for the earlier *Super Constellation*, is one-sixth thinner and houses 9,600 U.S. gal. of fuel. The four 3,400 h.p. Wright Turbo-Compounds are further outboard, offering a quieter ride.

So far, a total of 44 *Super Stars* have been ordered by T.W.A., Air France, Lufthansa, Italy's L.A.I. and Varig of Brazil. (Photo below.)



FROM THE PAST . . . . . No. 8



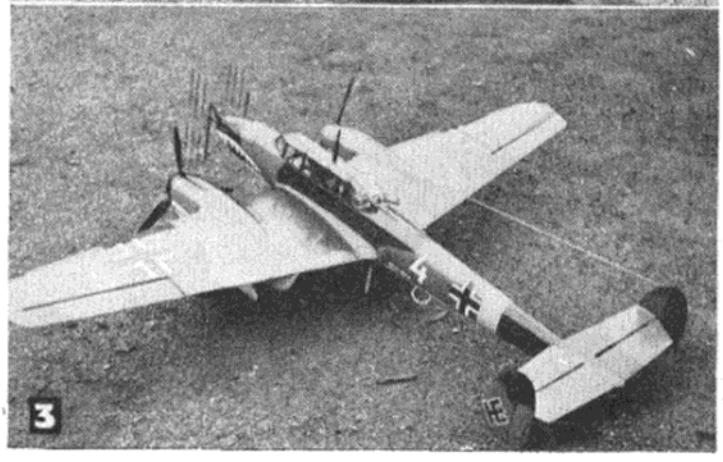
The Caproni-Campini C.C.2

The Caproni-Campini C.C.2 hit the headlines in the early years of World War II, before anything was known of experiments with jet-propulsion in Germany and the U.K. It used a primitive method of jet-propulsion of a type that had been patented by a Dr. Harris of Esher in 1917 and investigated briefly by Whittle 12 years later. In this, the propelling jet was generated by a low-pressure fan driven by a conventional piston-engine, both fan and engine being mounted as a ducted fan installation inside the tubular fuselage.

The all-metal, two-seat C.C.2 had a 900 h.p. liquid-cooled Isotta-Fraschini engine, driving a three-stage ducted fan with variable-pitch blades, and with an afterburner in the form of a vaporising burner in the rear fuselage. As Whittle had foreseen, the results were not spectacular and the top speed was only 205 m.p.h. at 9,800 ft. without afterburner, and 233 m.p.h. with afterburner. Nevertheless, the C.C.2 worked and its first flight on August 27th, 1940, exactly one year after the Heinkel *He.* 178, made it the world's second successful jet-plane.

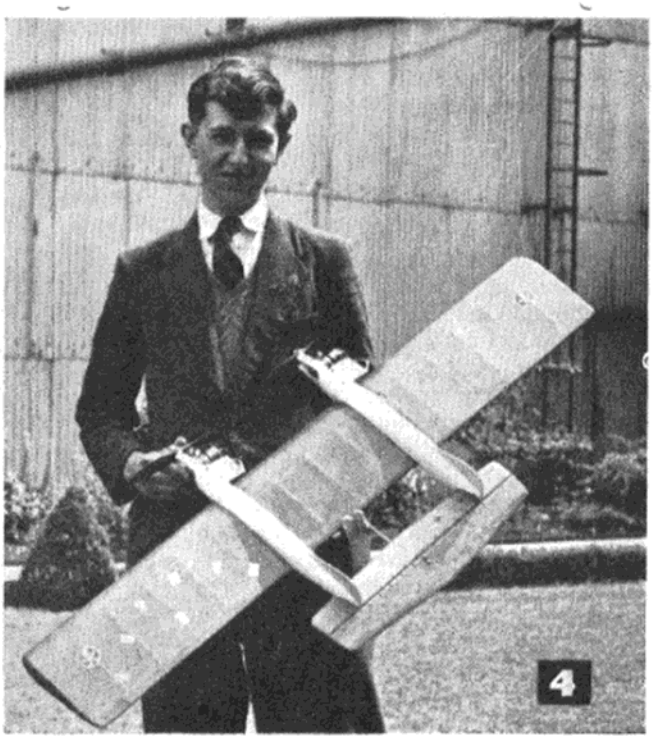
On November 30th, 1941, the C.C.2 flew the 168 miles from Milan to the Guidonia Research Establishment near Rome, at an average speed of 130 m.p.h. It was tested there for eight months until the anomaly of combining piston-engine and jet was finally recognised and the idea abandoned.

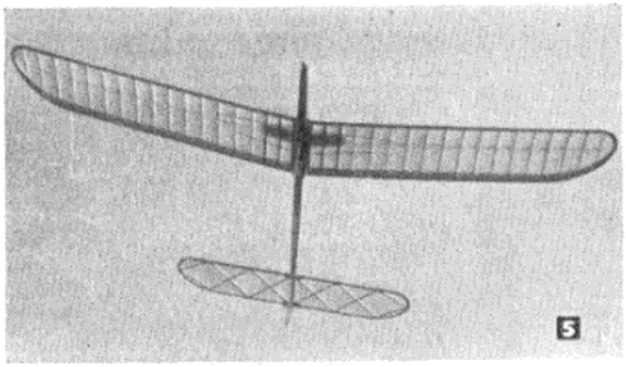
Wing span : 52 ft. Length : 43 ft. Empty weight : 8,024 lb. Loaded weight : 9,250 lb. Climb to 13,000 ft.: 53 min.



WE are always pleased to receive the excellent photographs and newsy letters that this feature attracts from overseas, and photos **1, 2** and **3** from Wilfried Kroger of Germany are good examples of what we like. Taken at the German Nats., **Nos. 1** and **3** are of the 1st and 2nd place concours winners. Photo **No. 2** shows the *Mustang* as it appears now that it has been converted to represent the Bendix Racer version. Built by L. Oeckinghaus, it features clockwork operated undercarriage, engine control, navigation lights, etc. The Me110 night fighter is the work of Winfred Scharz, is powered by two Mach 1 engines, fitted with every conceivable detail, an electrically operated u/c, and has a superb finish.

Twin engined models have an appeal all their own, and we have, at several meetings this year, noticed an interested group watching S. Robinson's *Zephyr* 2 (photo **4**) performing. This is a twin version of the M.A. Plan design *Zephyr*, and S. Robinson, who is responsible for both models, tells us that flying characteristics are very similar. Though originally powered by two Oliver Tigers, trouble was experienced with " sympathetic " vibration, but now that one of the Olivers has been replaced





with an S.R. Special (originally E.D. 2.46) all is well.

Ask any experienced photographer which are the most difficult models to " action " photographed, and he will almost certainly put gliders on the list immediately after controlliners. Photo **No. 5** however is a really nice action shot taken by N. Osbourne of H. Stevenson's o.d. model. This machine has a 72 × 8 in. wing and an all up weight of 16 oz.

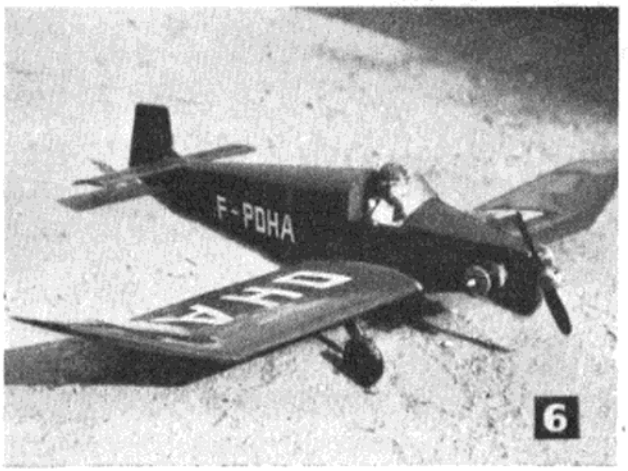
The *Bebe Jodel* is a popular prototype with both the F/F and C/L boys and this version (photo **No. 6**) is of the latter type. Built by Hie Serge, who was French 2.5 c.c. speed champion in '53 and '54, the model performs well, powered with a glo-E.D. 2.46.

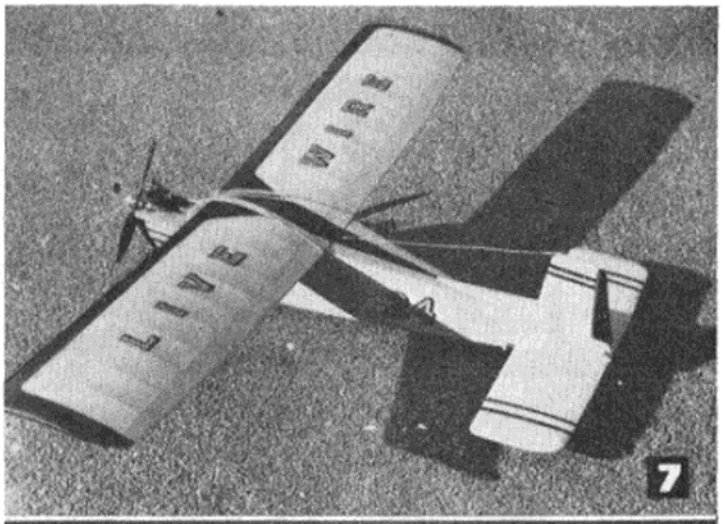
Another form of control for the model in photo **No. 7**—radio. Machine is, of course, a *Live Wire*, which was built by J. Hulme from plans he scaled up from the original magazine drawings. Rudder-only control is employed, and the model weighs 3¼ lb. all up, power being delivered by an E.D. 2.46.

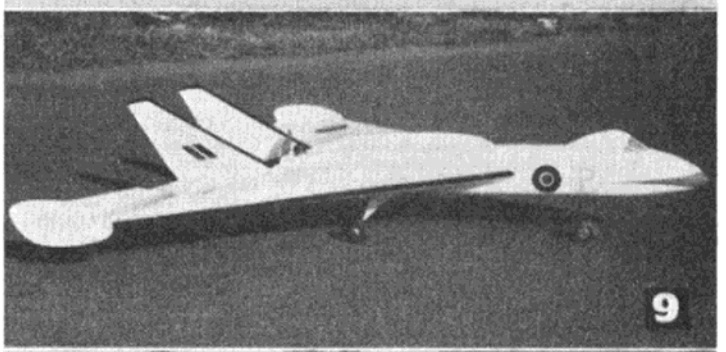
With the large quantity of plastic kits now on the market, we are receiving many photographs of completed models. The *Starfire* shown in photo **No. 8** was made from a Revell Kit by H. J. Pitcher, who also took the photo.

Neat o.d. delta in photo **No. 9** is the work of J. Rayne of the Cheltenham club, and is called *Vulton*. A. E. Dowdeswell, who took the photo, tells us that at the moment the model has only been test glided, so when the Allbon Sabre is started up—best of luck.

Overseas reader Charlie Choong of Penang, Malaya, sent photo **No. 10,** which shows him holding his F8F *Bearcat*, which he built from an American Berkeley Kit. Finished in midnight blue, the model features scale rockets, drop tank, and full cockpit details. Flying speed is approximately 70 m.p.h.







CLUB NEWS AND NEWS FROM THE S.M.A.E.

DEBONAIRS (LOUGHTON) M.F.C.

Adopting the Greek "Delta D" as the first letter of our name, this new—and we hope lively—body has adopted a title which we feel will help to draw members from both the old and new districts in the area, i.e. Old Loughton and the more recent Debden Estate. Regular fortnightly meetings (Friday 8 o'clock) are held at Loughton Hall, Rectory Lane, Loughton.

We're happy to announce that limited flying, of all kinds takes place (club members and guests only) at Grange Farm Centre, Chigwell Lane, Chigwell, Essex, by kind permission of the Warden and management.

Any "lone wolves"—or wolf-esses !—"out in the sticks" of Epping Forest area will find a welcome—and a canteen laid on, with a keen bunch of lads at Loughton Hall. We're approaching 20 in number so far.

We fortunately have a bright, comfortable clubroom and flying facilities, *with permission*, in the area.

So, "if you want to fly, don't be shy"!

ENFIELD & D.M.A.C.

The club seems to be getting much more contest minded of late, with the result that the "Bambridge Trophy" competition, the club's annual open F/F comp., ended in a fly-off for the first time ever.

Things were really close right up to the end, and it was only two or three seconds and some lost models which reduced what looked like being a five up fly-off to two up. The comp. was eventually won by Jim Moseley with his sailplane. Second, after some very hard luck, was Brian Downham ; up to the signal to "go" for the fly off, it looked as though he had it "in his pocket," with his rubber job averaging a bit over Jim's times, then his last motor decided it had had enough, and that was that !

A club combat comp., run to the new S.M.A.E. rules, also proved remarkably popular with almost everyone turning up with something. After much chopping during the afternoon, the final turned out to be between Mike Pinnock and Rex Gough. Unfortunately Rex's motor "played up" and spoilt what would have been a "real good carve up," and Mike was finally declared the winner.

BRIGHTON D.M.A.C.

The Arthur Mullett Rose Bowl for unrestricted duration was held on October 21st and resulted in a 3 max. win for Fred Boxall with brother Reg only 7 sec. behind. Both were flying rubber jobs while Peter Brown who was third used a power job. In the Hamley on the same day Peter racked up 9 min. 41 sec., unfortunately, however, a badly running engine spoilt his first flight.

The following Sunday a precision duration event for the Lanes Cup took place, the object being to score exactly 4 min. with three flights. Designed to help the less experienced members the entry was disappointing, but despite a win for Reg Boxall, Frank Cresdee, a newish member, was second.

NORWICH M.A.C.

Taking advantage of recent fine weather, we club members have flown off the annual "A" and "B" class combats and the "A" team race. R. Howard-Alpe completed a hat-trick by winning each of these, despite much competition; indeed, the "B" combat final had to be flown off four times before a decision could be reached. Our club combat rules differ from most others in that we have two classes :—"A" for up to 2 c.c. motors, and "B" for 2-5 c.c. Recent events have included Jetex R.T.P. speed comps.—with models using Jetex 50R's and Jetmasters, life has been made rather dangerous in the clubroom.

WALLASEY M.A.C.

Although the flying season is drawing to a close, activity in the competitive field seems to be still as hectic.

The club are feeling pleased with themselves over the results of the M.E. cup and Gutteridge trophy. In the M.E. we placed second to Croydon, while in the latter event John Hannay topped the National results to lift the Gutteridge "pot."

CHESSINGTON 1034 A.T.C. M.A.C.

We are now taking members from outside the Air Training Corps. In spite of the fact that we have a C/L site on our premises, our membership is rather on the small side and we welcome anybody whatever his branch of the hobby. For further information write or call on the secretary, P. Finch, 32, Orchard Road, Chessington, Surrey. At the recent Surrey Wing A.T.C. model aircraft championships Brian Lawrence came first and second in the advanced design class, and also second and fourth in the glider and scale classes respectively.

FARNBOROUGH M.A.C.

The contest between Farnborough M.A.C. and Reading & District M.A.C., took place on November 4th, at Reading. Despite cold, and a strengthening breeze, a very interesting A/2 glider contest (and general get together) was organised by our hosts.

First contest flight being made by Maurice Gates, for Farnborough, we were horrified to see his D/T-less *Inchworm* drifting O.O-S.-wards. But a stout piece of retrieving returned it in one piece late in the afternoon.

Meanwhile, J. Arscot put up two maxes, and just missed a third. A nice consistent round by J. Harris gave him a well deserved third place.

As the day drew to a close M. Gates put in his remaining flights while we watched with bated breath. To our great joy he scored two further maxes, giving him first place.

HAYES M.A.C.

We are pleased to report that the club won the final of the London District inter-club challenge cup from St. Albans by 28 : 45 to 20 : 58. A very enjoyable day's flying was had by all, but the new high tension wires at Chobham claimed their first victim when John Thompson's power model cut its wing clean in half.

The club started its series of competitions for the individual club championships. As usual these were marked more by the number of models destroyed than the high times recorded, the sole exception being in the glider competition. It seems likely that next year there will only be one club competition in each class, and that will be run concurrently with the S.M.A.E. de-centralised comps.

The C/L section of the club flies regularly in Cranfield Park on Sundays. Enthusiasm for combat is very high and the section is keen to fly against other combateers. If any club would like to arrange a match with the section, would they please contact the secretary, J. Marshall, 43, Keith Road, Hayes, Middlesex. The competition will be flown to S.M.A.E. rules.

HALIFAX M.A.C.

K. Grant has an interesting power job. He built a *Swiss Miss* when the club were without a power man in the 1956 knock-out series. The new machine is a *Swiss Miss* scaled down to Wakefield area and weight, with an A.M.10 for power. Performance—terrific.

Also on the stocks is a new "cross-bred" Wakefield area lightweight by J. B. Pool. Adapting many of Rutter's principles to a favourite Wakefield has produced a 40 in. × 5½ in. wing with an S.1 section and uncovered weight of ½ oz. Allied to this are a 38 in. warren girder fuselage (⅛ oz.), anhedralled tailplane, 24 in. prop and 4½ oz. motor. Anticipated airframe weight is 2¾ oz.

To keep things going in the winter we have a menu of film shows and contests for rubber models of 100 sq. in. area, all to use a popular 7¼ in. plastic propeller. Best flight so far is 1 m. 42 sec.

NOVOCASTRIA M.A.C.

Our hon. president, Squadron-Leader James Rush, kindly decided to present a trophy to the club when he was elected this year, but details of how it is to be awarded have not yet been worked out.

W. Hume of the Seaham M.A.C. sent this photo of a Frog 500 powered R/C model, built by club members John Armes (in photo) and John Henry.

A contingent of about 50 members attended the Darlington Gala, the best performance being that of a new member Tony Kay, who placed second in the Class " A " team race. His model was conventional, powered by E.D. 246 fitted with flutter valve. The meeting was poorly attended, but the weather was ideal and a good time was had by all.

SOUTHAMPTON M.A.C.

The Southern Area Rally was held at Stoney Cross and for once the weather was good. We did quite well at the rally. P. Giggle took first place in the rubber comp., Miss M. Pepper second, R. O'Rourke third in glider and N. Worley second in power. One member had some bad luck in the Class " A " team race ; he only had four laps to go, and was well in the lead, when one of the control lines snapped and the model piled in. He found his Oliver Tiger in two complete parts.

At the moment the club's interest is in indoor team racing for the winter months. Various suggestions have been forthcoming and one member is considering trying a " pusher " to see how it goes.

WHITEFIELD M.A.C.

We placed third in the Plugge which rather surprised us as interest had dropped in this event after last year's bother over the winner. J.O.D. placed third in Gutteridge with 15.00 plus 4 min. flyoff ; he was again National Champ, congratulations ! In the Frog Senior, four members flew on a fairly windy day, top time being J. N. Trainor's 9.40 with a straightforward pylon job with a 60 per cent. tail.

In the C/L section a number of flying wings have appeared. These large and exceptionally stable models are powered by A-M 3.5 and E.T.A. 29s. Details are e.g. on the leading edge with a 17 per cent. symetrical wing section and a large bellcrank for smooth movement.

HYDE (CHESHIRE) M.A.C.

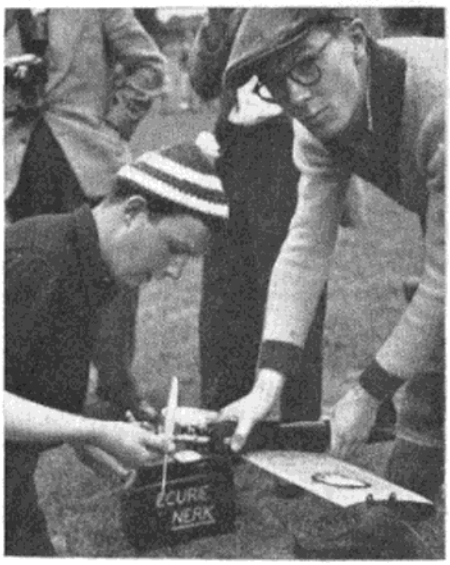
The fourth annual rally went with a swing. The entries poured in on the field when it was seen the weather was going to be fine, although gusty and chilly. The R/C entries were as good as any, if not better than, most big rallies and comps. Perhaps it was because of the simplicity of our rules.

Results : 1. Power, A. Collinson, Bradford, 9 : 0 ; 1. Glider, J. N. Fletcher, Manchester, 6 : 14 ; 1. Rubber, C. Day, Sheffield, 7 : 25 ; R/C, 1. C. Parkinson, Kendal, 186 points ; T/R " A ", F. Vaughan, Chesterfield Skyliners ; Rally Champion, E. Shenton, Stalybridge.

WEST ESSEX AEROMODELLERS

The winter programme has opened with two film shows—the first being a resumé of the club's activities since its inception, ten years ago. With the use of three projectors provided by Ken Marsh, Sid Sutherland and Fred Carter, a continuous programme lasting over three hours was well received by our many visitors from neighbouring clubs. At the subsequent show Fred Carter was able to demonstrate his new sound equipment with an interesting programme of aeronautical films.

We hope to hold similar meetings on the second Wednesday in each month at which a report on the current London area meetings will be given. A new interest for the winter will be the re-introduction of indoor flying and the fostering of interest in F/F and glider models. New members will be cordially welcomed at our meetings held at Markhouse Road Schools every Wednesday evening at 7.30 p.m.



Inspired by motor racing Equipes a group of combat enthusiasts have banded together under the name of Ecurie Nerk. Here members G. Perkins and J. Wood prepare the former's model at a recent meeting.

CAMBRIDGE M.A.C.

Members are being asked to pool their old plans and books to form a comprehensive club reference library during the winter months. Club secretary Clive King, has offered to act as librarian and plans are to be loaned for a few pence each week. Youngsters hope to be able to cut building costs by taking advantage of the new service.

NORTHWOOD M.A.C.

For many years now there has been an informal model aircraft club at Northwood, however, two months ago the club was formally inaugurated and the strength now stands at 30 members.

An open glider competition was arranged in order to stimulate interest, and there were 14 entries.

The club meets every other Friday evening at 7.30 in the " Derby and Joan " club hut.

Further details may be obtained from the secretary (see under new clubs).

BRADFORD M.A.C. & LEEDS M.F.C.

Due to postponements caused by the foul " summer " weather, we are a little late this year with club contests ; but one, for rubber enthusiasts (all three of them), took place in calm, but murky, conditions. This accounts for the low times—Gerry Tideswell's first of 7 : 38 and C. P. Miller's second of 6 : 45. Our A/2 event was held in a gale, and once again there were only three entries—top being Keith Pickles with 4 : 40.

However, the weather was rather better for the F.A.I. power contest which attracted eight fliers ; top by a comfortable margin being Arthur Collinson's *Creep* with 12 : 57. (In all fairness to Silvio, though, it must be stated that he had a disastrous day, piling in one machine and breaking his spare in half bringing it back to the take-off point after his first flight—the subsequent hasty repair job somewhat impairing its performance. Even so, he still managed to lose it later on !)

Because the Frog Senior coincided with the Hyde M.A.C. rally, most of us compromised by going there and making one set of flights do for both. As a result, Arthur's *Creep* took first prize in power with the only perfect score, and we also cleaned up the rubber prize, too—Gerry Tideswell being the highest-placed in this case.

BUCKSBURN A.T.

Since the start of the year the team has multiplied to some 14 members. Due to restricted space, it has been decided to accept no more members. Fees now stand at 30s. for seniors and 20s. for juniors.

Club champion is Roy Yule, with Ron Robertson second, in this, his first year of F/F. We have, thanks to the above mentioned, won the Strathmore Trophy after a close fight with Montrose. It is to be hoped that certain other clubs in the league will pull up their socks, by next year, and provide some competition for Montrose and Bucksburn.

SIDCUP A.S.

Our stunt and combat rally at Dartford was blessed with good weather and the much appreciated help of Henry J. Nicholls and Eddie Cosh, who judged the stunt competition and presented the prizes.

Flying started sharp at 1 p.m. with 31 entries in combat, and six entries in stunt. Biggest hard luck story of the day came from Dave Platt of Wanstead, who gained second place in stunt with a borrowed model, only to be told that he was disqualified ! Due to the clocks being put forward once more, there was not sufficient light to run off the combat final. The names of the competitors involved were placed in a hat and two names were then picked out for first and second places resulting in a win for Pinnick (Enfield) with Hammond (P.M.A.L.) second. Chizlett of Dagenham, flew a smooth looking A.M.25-powered model to win the stunt, with our own Mike Templeman second, flying a nicely finished Mercury Monarch powered with an AMCO 3.5.

In the club itself there seems to be a greater interest in speed models, probably encouraged by the noble efforts of Mike Bassett who once again broke the British Class I speed record at the All-Britain Rally with a speed of 88.4 m.p.h. (subject to ratification).

A general analysis of contest placings for the club throughout the last season shows the following rather startling results :— four first placings in major contests ; seven second ; seven third ; 11 fourth plus three British speed records in Class I. In passing, it is encouraging to note that the club has placed in the first four placings of every contest which it has attended throughout the year.

SOUTH WEST R/C M.F.S.

The final rally of the season of the S.W. R/C M.F.S. was held at Crownhill Downs, near Plymouth. Being the last rally and with short daylight hours, a full attendance made it a " fly-for-fun " day, with no official contests, but some good flying was seen. Best performances were by Harry Stilling's *Zoom* in fast stunts near the ground (once clearing the deck by 3 ft. at the bottom of a screaming loop) and Roy Dunstan's own-design E.D. 246-powered model, which has a wonderfully flat glide. Hilton O'Heffernan's R6B was troubled with uneven motor-runs, but performed well otherwise. Alan Thomas and Graham Gissing both put up good flights, only to lose their models out of range, Graham recovering his *Sparky* later, none the worse. Annual subscription has now been fixed at 10s. for flying members and 5s. for associates, who can convert to full membership at any time when they have a model ready to fly. All R/C enthusiasts in Cornwall, Devon, Somerset and Dorset are eligible, and full details can be obtained from the hon. secretary, H. Stillings, 6, Alpha Street, Exeter.

NEW CLUBS

DEBONAIRS (LOUGHTON) M.F.C. R. G. Harris, 14, Sandford Avenue, Loughton, Essex.
NORTHWOOD M.A.C. P. Duffy, 40, Litchfield Road, Northwood, Middx.

CHANGE OF SECRETARY

NOVOCASTRIA M.A.S. R. Sanderson, 9, Ashbrook Street Kenton, Newcastle-on-Tyne, 5.

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Satisfied Customers . . .

Almost every post contains a letter or a newspaper clipping with news of a record flight or competition win, from yet another "satisfied K.K. customer." Here are a few typical samples from our postbag.

Dear Sir,
You may be interested to know of the performance of my "MINIMOA" glider. On Saturday, May 17th, at Epsom, it did a flight in 4¼ minutes and a week later, May 24th, at the same place, it flew out of sight and was fortunately returned the next day from Morden—a flight of approximately six miles. These are just two of the excellent flights I have had with the model. D.J.T., Morden, Surrey.

Dear Sirs,
You may be interested in a flight made by one of your "POLARIS" glider models, which took place on Sunday, August 19th, at Barbondale, n'r Sedburgh, Yorkshire. A much repaired Polaris model was launched by hand about halfway up a steep hill. The model flew steadily across the valley and then commenced to gain height, flying in large circles. Its progress was followed with the help of field glasses for about a quarter of an hour, when it disappeared from view almost straight overhead. It was last seen flying strongly and still gaining height at an estimated altitude of 5,000 ft.
P. S., Dent, Yorkshire.

Dear Sirs,
On Sunday, April 14th, I was flying my Keil Kraft "INVADER" and, launched by winch, the glider was timed 31½ minutes O.O.S. I have witnesses of the flight.
R. A. D., Hereford.

Dear Sir,
May I compliment you on your "ACHILLES" 24 in. duration kit. I bought one recently, and I was amazed at its low cost and simple building. I first flew it on the Chester race course and I have constantly had flights over 1 min., and in one flight the plane flew for 2 min. 3 secs. Its stability and steady flying are all that could be desired. My next kit shall be the "AJAX" and I hope it flies as well as the "ACHILLES." W. E. M., Bebington, Yorks.

Dear Sir,
On Sunday, September 2, near Huddersfield at 3.30 p.m. my Mills powered Keil Kraft "SLICKER" made a flight of 15 minutes on a 20-second engine run. I feel that this was an outstanding flight, even for a Slicker, and therefore worth while bringing to your notice.
D. L. B., Goole, Yorks.

Dear Sirs,
On Sunday, July 20th, my Keil Kraft "COMPETITOR," on its second flight, and with 400 turns on the motor, was timed out of sight after 5 min. 30 secs. The flight was timed and witnessed by several persons.
P. N. C., Kingsbury, N.W.9.

Dear Sirs,
May I offer you congratulations on your really excellent model "AJAX"? At the school we have a number of various types of machines, and the Ajax wins every time! I myself have three of this make and for consistently good flying, I have never seen any machine to come up to it.
M. F., Birmingham 27.

Dear Sir,
I recently purchased a Keil Kraft "PHANTOM" control line model kit, and I am very pleased with the result. I find that the model is everything you claim for it. I am a beginner to C.L. flying, but I find the Phantom is an ideal trainer. The construction is extremely robust, as witness by the fact the model did a wing over and crashed nose first into terra firma (due to my inexperience), and all that came adrift was the detachable cowl. C. G. B., Coventry.

Dear Sir,
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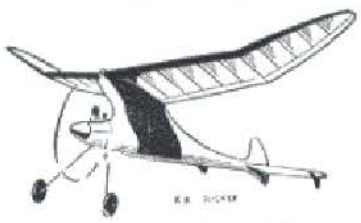

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