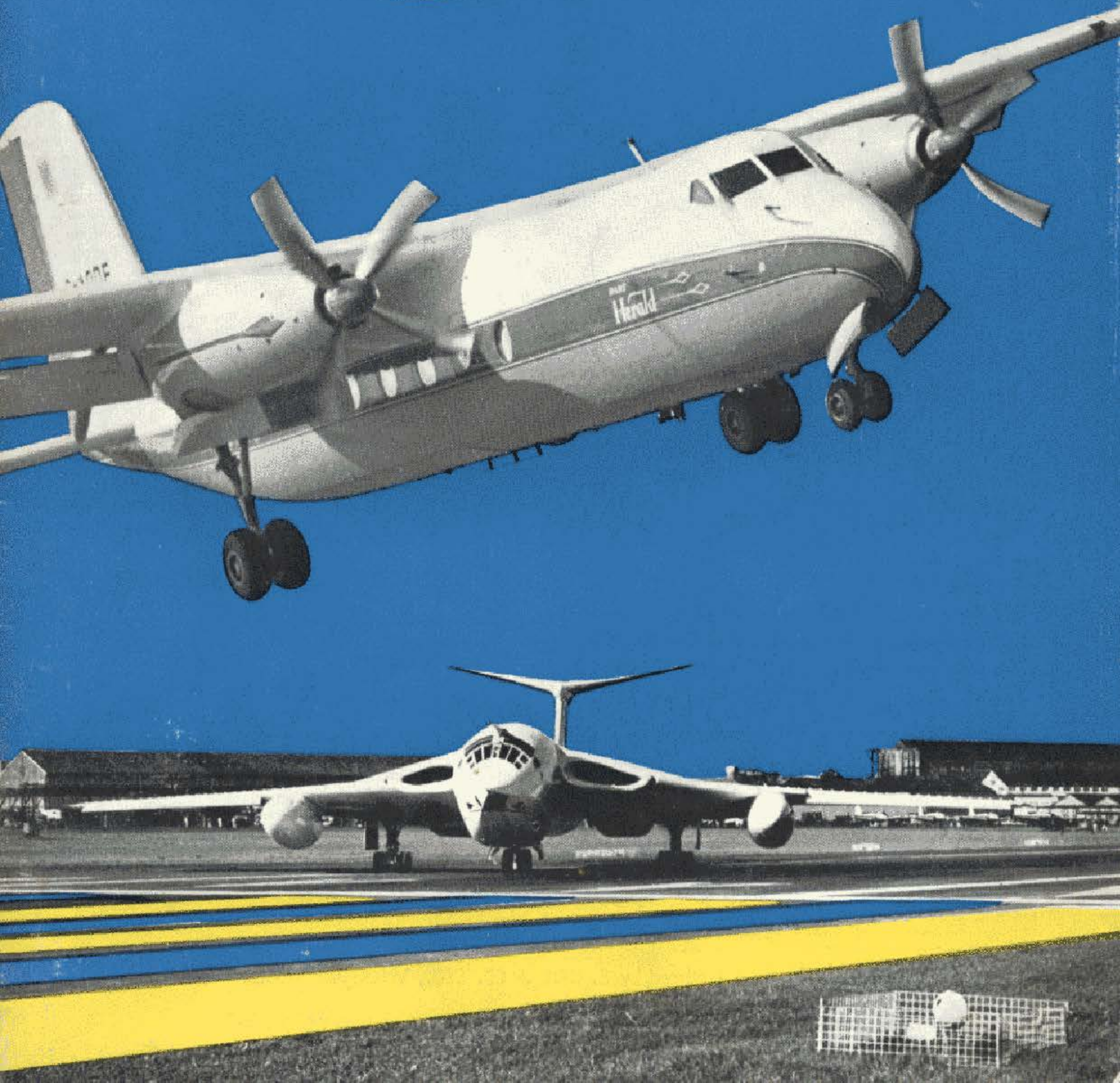
MODEL AIRCRAFT

1'6

JANUARY 1959



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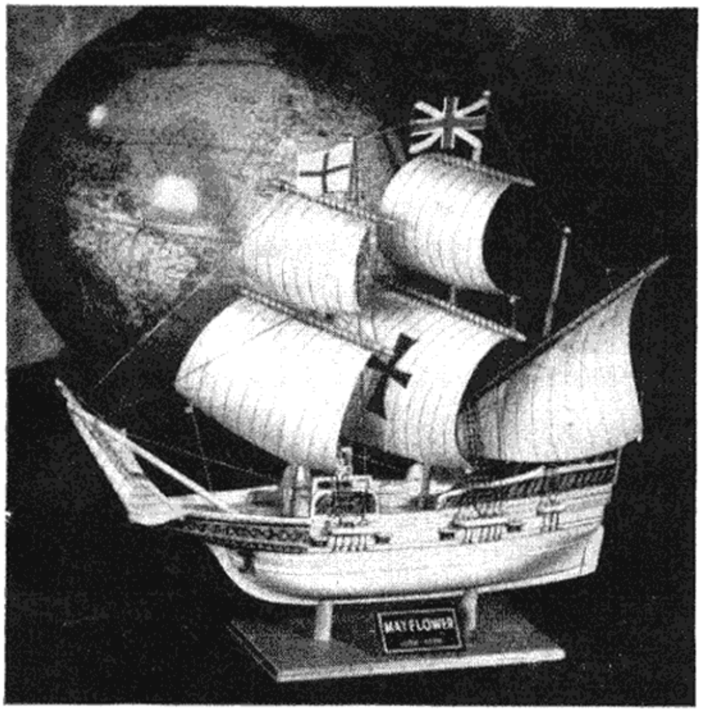

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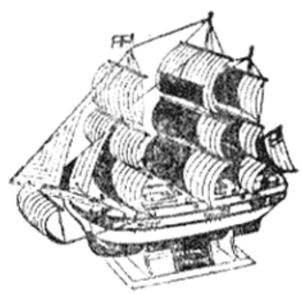
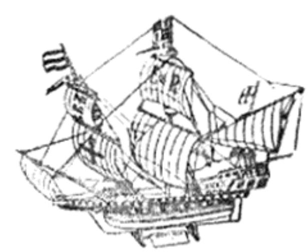


"BOUNTY"
Overall length 13 in.



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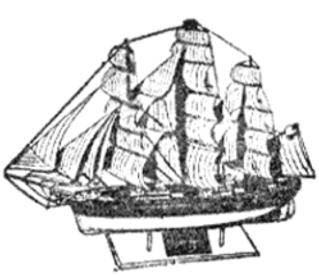

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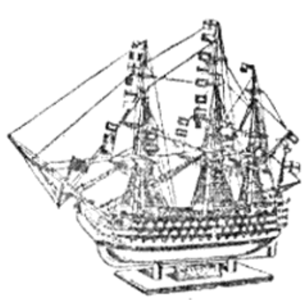

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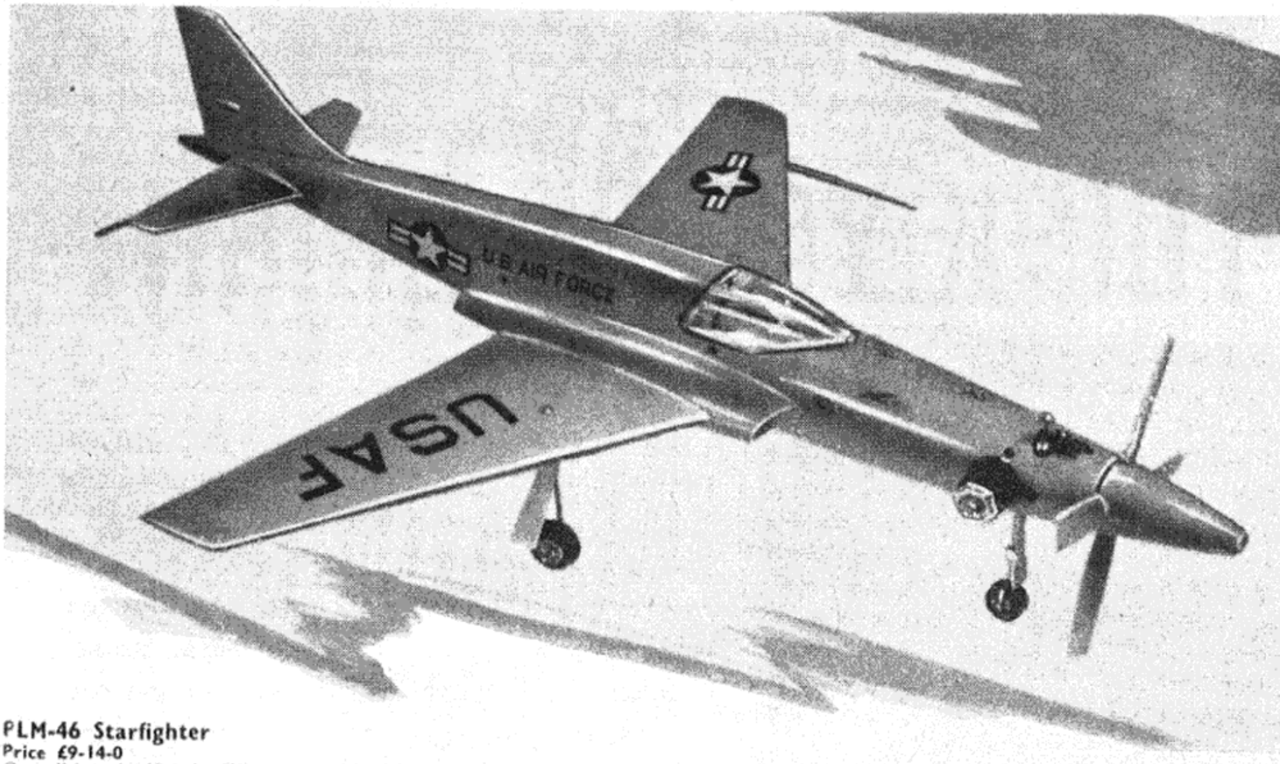

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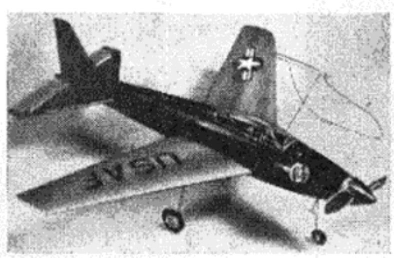

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Overall length: 14⅜ in. Wingspan: 14 in.
Motor: Herkimer 0.49B.
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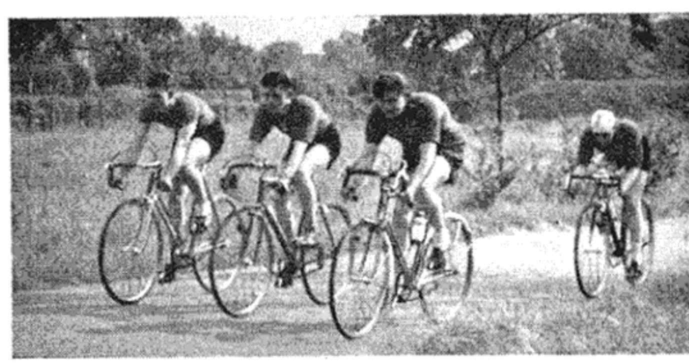

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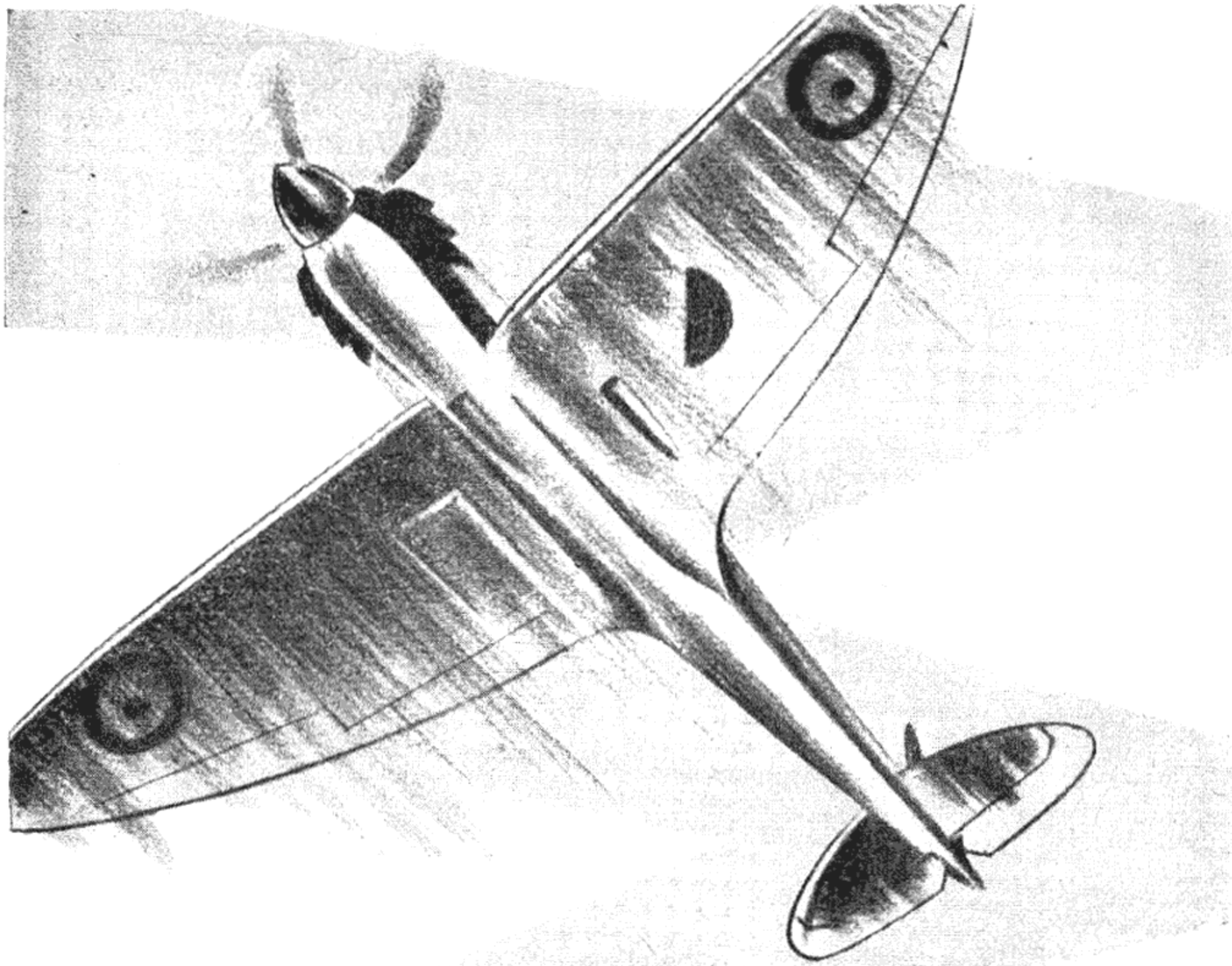

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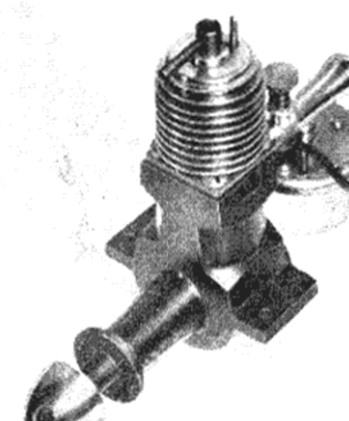

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JANUARY 1959

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The official Journal of the
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★

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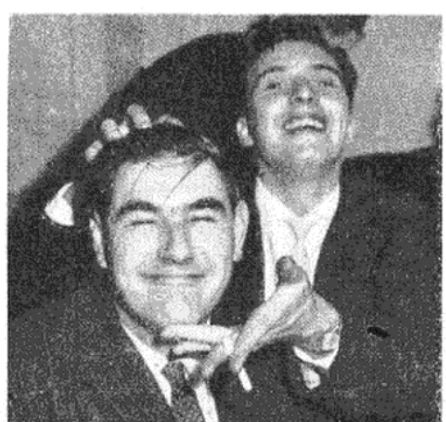
When is a World Championship not a World Championship ?

A WORLD CHAMPIONSHIP winner's plaque was awarded to Dick Edmunds at the S.M.A.E. dinner, for his team race win at the recent Brussels meeting. Congratulations Dick—it was a well deserved success, but was the award of the plaque correct? No, we are not querying the fact that you won, and deserved an award, what we are querying is the award of a *World Championship* plaque for an event which we were previously advised was *not* a Championship.

When the current apportionment of World Championship events was made, it was generally understood that there would be the Rubber and Power this year, Rubber, Glider and Power next year, and the *first* combined C/L Championship (Speed, Stunt and Team Race) in 1960. We then heard that an International C/L meeting for these three classes would be held at the Brussels International Exhibition—so far, so good.

When the official F.A.I. list of events was circulated it was seen that the Brussels meeting was listed as a World Championship, a fact which we understood the S.M.A.E. queried, and were told was an error. Why then, were other competing countries under the impression that it was a World Championship? Why were Championship Plaques awarded to winners?

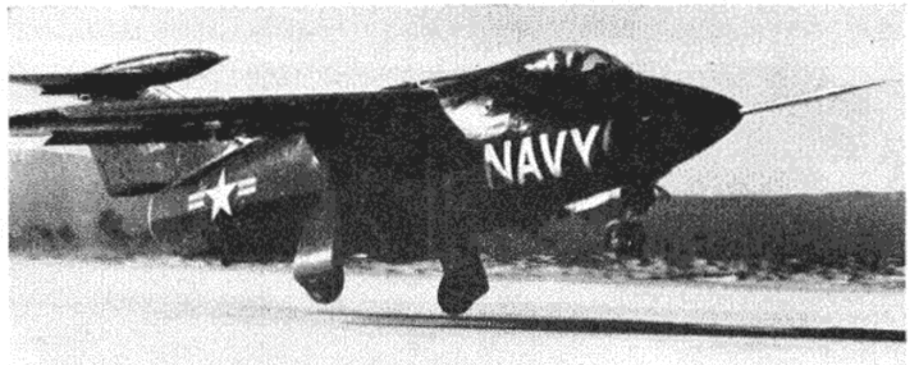
If it was a Championship then surely the S.M.A.E., following its accepted policy, should have financed fully an official British team (it did, in fact, pay a proportion of the expenses), instead of leaving it to individuals to uphold the prestige of the country. On the other hand, if the error has arisen through the fault of the F.A.I., and we understand an official request for an explanation has been sought by the S.M.A.E., then we will be interested to know exactly how this occurred.



In lighter vein at the S.M.A.E. dinner, Johnny Hall makes sure that the award of the World Championship plaque had not affected the size of Dick Edmunds' head! We need hardly add that it hadn't.

Good old John !

CONGRATULATIONS to John O'Donnell, the "surprise" (no one but the Council knew to whom it was to be awarded) recipient of the Arthur Mullett Memorial Trophy, at the S.M.A.E. dinner. John received this award for his sporting gesture in refusing automatically to accept the title of National Champion last year. He was not satisfied that the method by which this award is made had been worked out correctly, and although subsequently his objection was over-ruled, it was felt that his gesture earned him the title —Sportsman of the Year. Even if it hadn't his contest record would, for he also received no less than seven other awards—National Champion, Astral and Caton Trophies, and the Jetex, K.M.A.A., Short and Sir John Shelley Cups!



CAT OUT OF THE BAG

THE first really good photograph ever published (above) of the Grumman XF10F-1 *Jaguar*, has just been made available to MODEL AIRCRAFT, enabling us to fill in the gap between the familiar F9F *Cougar* and the supersonic F11F *Tiger*.

Although it never progressed beyond the prototype stage, the single-seat *Jaguar* was packed full of bright ideas. As a start, its sweepback could be increased by some 40 deg. in flight, to combine a top speed of 722 m.p.h. with "straightwing" deck-landing characteristics, with the result that span varied from 50 ft. 7 in. to 36 ft. 8 in. Full-span leading-edge slots were fitted; and, to overcome the limitations of manual controls at high Mach numbers, a system was developed whereby the pilot's stick mechanically operated a small delta foreplane on a boom attached to the all-moving delta tailplane. This in turn moved the tailplane aerodynamically, giving effective control without excessive stick forces. Spoilers were used for lateral control for the first time.

The 55 ft. long fuselage could hardly avoid being bulky, as it had to house a Westinghouse J40-WE-8 turbojet, giving 11,600 lb. thrust with afterburning, fuel for a longer range than that of the F9F, wing variable-sweep and folding mechanism, and all three undercarriage units. Intakes similar to those of the Supermarine *Swift* were on each side of the nose.

A PIONEER

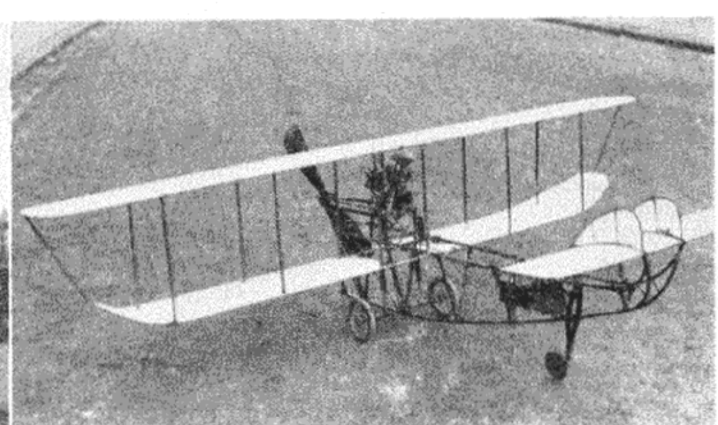
WE have a great respect for the pioneers of model aviation, especially when their work possesses the vision and quality, of that of the late David Stanger. Not only did Mr. Stanger design and build very successful flying models, but he also, albeit of necessity, for there was none commercially obtainable, designed and built the engines with which they were powered.

In the issue of *Flight* dated April 25th, 1914, is a description of the two machines shown in the photos below, both of which aroused considerable attention at the 1914 Aero show at Olympia. The monoplane had a span of 10 ft., with a chord of 2 ft., while the fuselage was of triangular section braced with 300 lb. breaking strain piano wire. Power was supplied by a "V" four, o.h.v., engine of $1\frac{1}{4}$ in. bore × $1\frac{1}{2}$ in. stroke, which drove a 30 in. dia. × 22 in. pitch prop of 1,600 r.p.m. This gave the model an all up weight of 20 lb., in spite of which it made a number of very successful flights.

Even more successful was the canard biplane, and this can doubtless be attributed to its much lower loading. Spanning 7 ft. × 1 ft. chord, it weighed $10\frac{3}{4}$ lb. in flying trim, and this time the engine was an o.h.v. "V" twin driving a 22 × 18 in. prop at 2,000 r.p.m. It was with this machine that Stanger set up a record flight of 51 sec. in 1914.

Constructionally these models were extremely interesting, following closely as they did, full scale practice, and no words could do justice to the details that are evident from a close study of the original photographs. However, to suggest, as is sometimes done, that today's modellers cannot execute this sort of craftsmanship is ridiculous, they can, and do, and indeed their models fly rather in the manner that Mr. Stanger's must have performed—i.e. realistically.

Mr. Stanger produced more than just the two motors and models mentioned, and although all that now remains of the models are photographs, the engines, plus two three-cylinder ones and a single, are still with us and it is hoped that they will be added to Peter Chinn's collection.



and so to.... RADIO

If you can build and fly sports models and are thinking of taking up radio, then this is for YOU. **HARRY STILLINGS** sets out in everyday language all you need to know to make a *successful* start in R/C flying and in this first part he tells you what equipment you will require

FROM my own observation, and personal experience, I am convinced that many modellers with ample grounding in the building and flying of F/F models would dearly like to embark on the fascinating field of controlled flight, but hesitate to take the plunge because of their unfamiliarity with the subject, and their fear of the unknown! This series is intended to guide them safely and surely from the very beginning right up to the point where they have an aircraft flying successfully under R/C.

I must emphasise that the series is for *beginners* in R/C who have little or no knowledge of radio. Simple non-technical language will be used throughout, so that everything is easily understood, and for the same reason, I shall restrict myself exclusively to the simplest form of control—rudder-only. This is an essential first phase, and any novice who is misguided enough to jump right into the intricacies and pitfalls of multi-control is merely asking for all the trouble he will surely get. Having thus made myself clear, let's get down to fundamentals.

First, the basic principle of control by radio must be understood and, perhaps, the best illustration is that of ordinary radio programmes. Radio waves are sent out through the air from a transmitting station, and these are picked up by the aerial of the receiver. After being led through valves and other components they produce vibrations in the loudspeaker in sympathy with the originating signals, and so the music, speech, etc., is reproduced in our home.

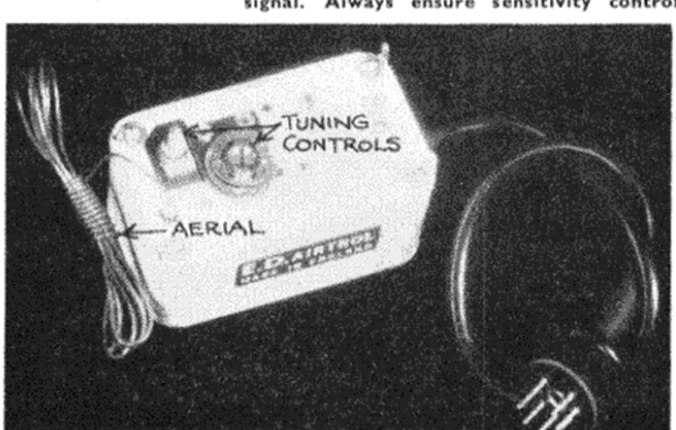
In the case of R/C models, we send out a signal from our transmitter each time we press the button; this signal is picked up by the miniature receiver in the model, but instead of reproducing sounds, it causes a special type of switch (the **relay**) to move and switch on the **actuator** circuit.

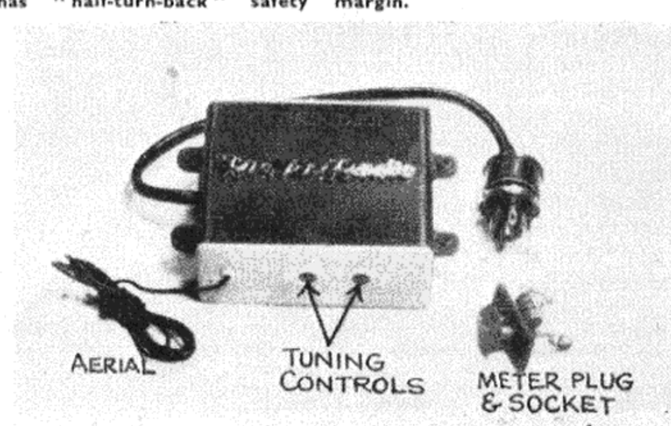
The actuator is a simple form of electro-magnetic mechanism which is supplied with sufficient energy, in the form of a wound-up loop of $\frac{1}{8}$ in. rubber, to move the rudder to one side or the other. When the transmitter button is released the signal stops and the procedure is reversed, so that the rudder returns to neutral.

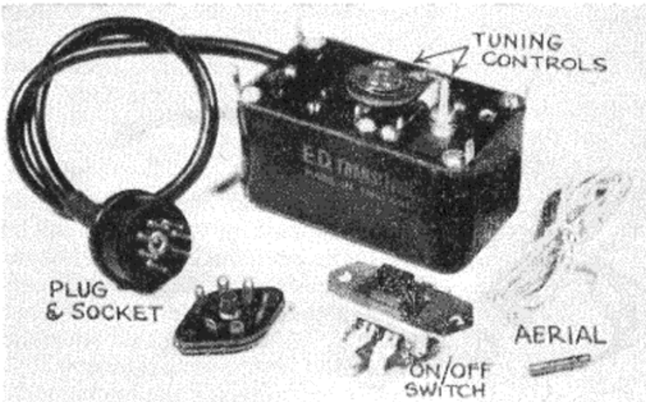
Thus, in reality, the model is F/F *until* we hold down the button, causing a turn, and reverts to (straight) F/F when the button is released. There are, of course, many other different types of mechanism used in R/C apart from the self-neutralising actuator, but this is the easiest type for a beginner to instal and maintain.

To be successful in R/C you must have had reasonable experience in building, trimming and flying sport power models; be prepared to

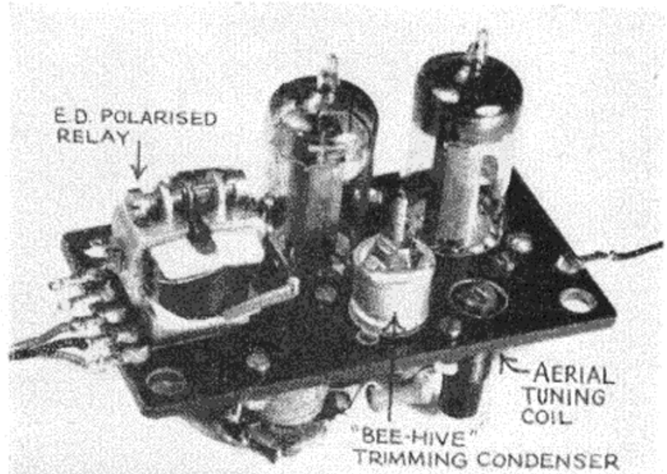
Left: E.D. "Airtrol" receiver. One hard valve plus two transistors. Current rises on signal. Aerial installation tends to be critical, as changes in position affect idling current. Right: Ripmax "Pathfinder" receiver. Sealed unit. One hard valve; current drops on signal. Always ensure sensitivity control has "half-turn-back" safety margin.







E.D. "Transitrol" receiver. One soft (gas-filled) valve plus one transistor. Current rises on signal. Tuning tends to be affected by atmospheric changes.



"Hill" miniaturised receiver. Two hard valves; current rises on signal. Available in kit form, with easy-to-follow instructions, from J. Dockerty, 26, Swarcliffe Road, Harrogate. The writer's personal preference, and strongly recommended to those willing to accept the extra "radio-work" involved. A ready-made commercial version may be available shortly.

specialise in R/C (at least for some time); and be able to make a sound solder joint. Thereafter it's a question of patience, attention to detail, and perseverance.

The various items of radio equipment you will need are:

(1) A TRANSMITTER, complete with sectional aerial, push-button and lead (or a hand-held transmitter, such as "Ripmax" or E.C.C.).

(2) A RECEIVER, complete with switch(es), plugs, and sockets.

(3) An ACTUATOR, preferably the current-saving type, such as the E.D. Standard.

(4) BATTERIES for the above equipment.

(5) A MILLIAMMETER having a reading of 0 to 5 mA (milliamps).

(6) A VOLTMETER, having two readings; 0 to 25 volts and 0 to 200 volts.

Fortunately, all these items can now be purchased over the counter, and expense can be reduced by two or more friends sharing one transmitter (as only one radio model can be airborne at any one time).

Now to take each item one by one and understand its function, etc.

The Transmitter

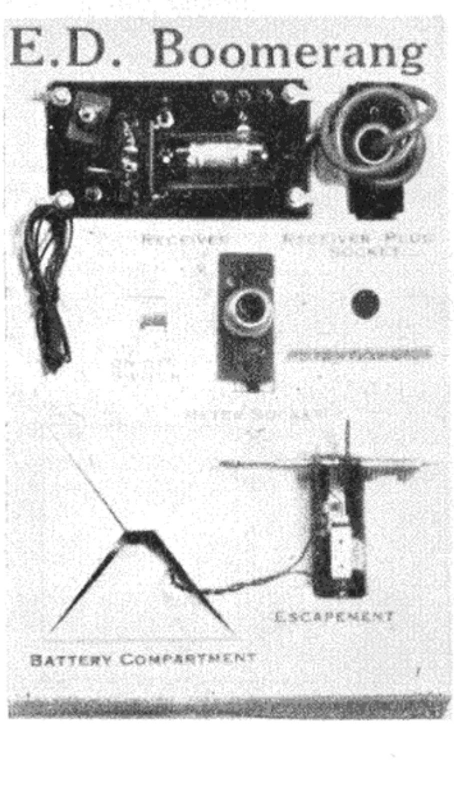
This is the largest and least trouble-prone part of the equipment. The circuit and batteries are enclosed in a metal box, with on/off switch, a handle for carrying, a sectional metal aerial (about 8 ft. 4 in. when erected) and the button and lead. (There are also hand-held transmitters, such as the "Ripmax," etc.) Any of the commercial transmitters will suit the purpose and, in use, merely fit the aerial, plug in the button lead, switch on and hold down the button each time the model is to turn left or right. In practice there is rather more to it than this, but I shall deal with that subject more fully later.

The Receiver

This is a miniature radio receiver, which is installed in the model, having one or two valves and/or "transistors" (according to make and type), and embodying the all-important relay—the electro-magnetic switch which "makes" and "breaks" contact according to whether the transmitter button is being pressed or not.

The receiver has to be "tuned" to the frequency of the transmitter and here again the illustration of radio broadcasts will help you to understand this function. You know that, in order to receive a certain station, you have to rotate the tuning knob of the receiver until it is on the same frequency as the broadcasting station; our transmitter is sending out a signal on a certain frequency, and we have to rotate the core of the aerial tuning coil until we get the position which gives the best reception—i.e., the greatest response when the button is pressed. Again, more about this later!

Being far smaller and more fragile than the transmitter, and subject to inevitable knocking about in the model, the receiver has to be suspended on rubber bands, or mounted in a foam-rubber "nest," not only to protect it from shocks, but also to eliminate relay chatter caused through engine vibration.

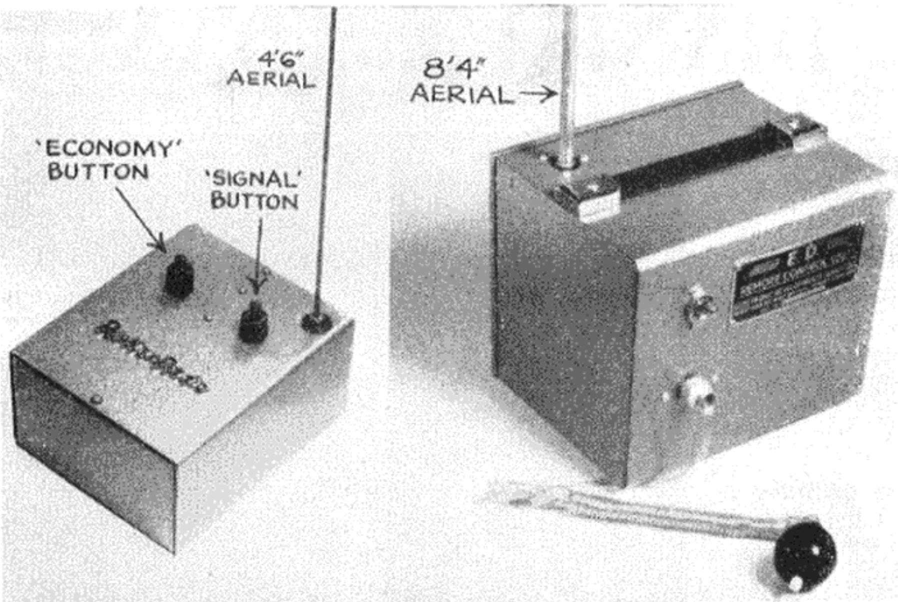


E.D. "Boomerang" receiver. (One hard or soft valve—former preferred.) Current drops on signal. All components ready-wired, needing only installation in model; therefore ideal for those wishing to reduce "radio-work" to a minimum.

The Actuator

For our purpose we select the self-neutralising current-saving standard actuator, of which the E.D. Standard is probably the most widely used. Given careful installation and reasonable maintenance this should give faithful service over a very long period.

It is made up of an electro-magnet, a double-clawed pawl, a spindle and a cross-arm. The rear end of the spindle is connected to a wire crank which moves anti-clockwise in a wire loop attached to the rudder, and the other end is in the form of a hook to which is attached a loop of $\frac{1}{8}$ in. flat rubber. When this is wound up, it provides the necessary energy to move the spindle, thus the crank, and thus the rudder, and so



Left: Ripmax "Pathfinder" transmitter. Hand-held. Uses short (4 ft. 6 in.) aerial, made from 12 g. piano wire. "Economy" button must be pressed 2 sec. before "signal" button to allow valve to heat up; or can be depressed continuously if increased LT battery consumption is not objected to. Right: E.D. lightweight transmitter. Stands on ground when in use, keying being done by extension lead and push-button. Supplied complete with sectional aerial and lead.

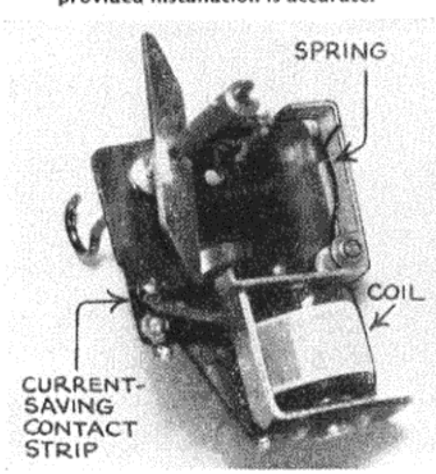
the chain of control is complete.

Each time the transmitter button is pressed the relay (in the receiver) moves to "make" the actuator circuit, the actuator electro-magnet is energised and the resultant magnetism draws in the pawl, allowing the cross-arm to make a quarter-turn, and holds it in that position (with the rudder thus held out to left or right) until the button is released, when the cross-arm and rudder again return to the neutral position.

Batteries

Each manufacturer supplies instructions with the equipment telling you what batteries are required. All I need to say is that, in the case of the actuator, it is better to use a 6 v. battery instead of the $4\frac{1}{2}$ v. usually recommended. This gives more positive and reliable action.

E.D. standard self-neutralising actuator, with current-saving coil. Extremely reliable provided installation is accurate.



Milliammeter

This is the means by which we measure the high-tension current flowing through the receiver. This varies according to whether we are transmitting or not, usually referred to as "signal-on" and "signal-off." It is this variation which energises the magnet(s) in the relay, so bringing about the chain of reaction already explained, and enabling us to control the model's direction of flight. The milliammeter is also used to check or adjust the points at which the relay cuts-in and cuts-out (i.e., switches the actuator circuit on or off). Thus, supposing the signal-off current shows 3 mA on the meter, and signal-on shows 0.7 mA, the relay should cut-out below 3 mA, and cut-in above 0.7 mA. Allowing a safety-margin either side, the relay should, therefore, cut-out at about 2 mA, and cut-in at about 1.5 mA.

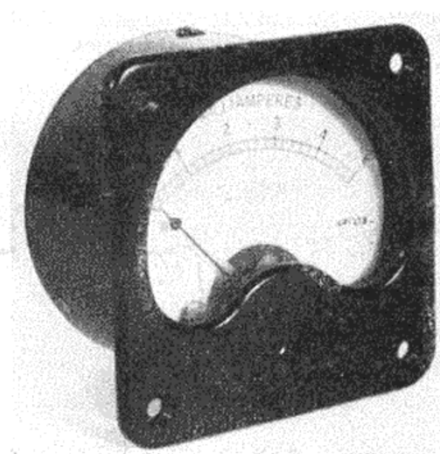
You will see from this that, as the current moves from 3 mA (signal-off) down to 0.7 mA (signal-on), it passes the point (1.5 mA) at which the relay cuts-in, and so switches on the actuator circuit. When the button is released the signal stops, and the current immediately rises again to 3 mA, passing on its way the point at which the relay cuts-out (2 mA), so switching the actuator circuit off. The milliammeter is plugged into a two-pin socket for these tests, and removed before flight, its place being taken on the model by a two-pin plug, shorted-out by a wire soldered across, joining the two pins.

Voltmeter

This meter is used to check that the batteries are of the correct voltages. The 0 to 25 reading checks the L.T. (low-tension) and actuator batteries, and the 0 to 200 checks the H.T (high-tension) batteries. Although it can be dispensed with, its use eliminates guesswork and so makes for greater reliability. Both the milliammeter and the voltmeter can be purchased from most model shops, or from surplus stores, at about 10s. each or less.

Miscellaneous

The above are the only permanent items of equipment you will need, but if you have no soldering iron you will have to buy or borrow one for the initial wiring-up process. The transmitter and receiver are almost always supplied with the necessary plugs, sockets, switches, etc., although a small quantity of PVC-covered wire will probably be required for



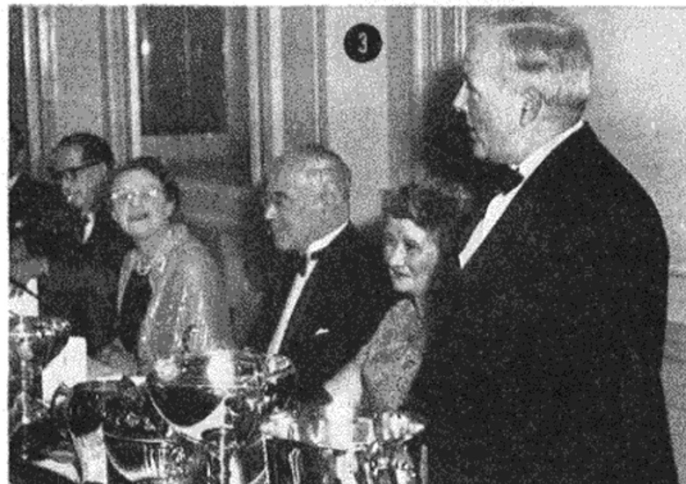
A milliammeter as described in text.

the actuator circuit and other sundry wiring jobs. A length each of 16 g. and 18 g. piano wire and a yard or two of $\frac{1}{8}$ in. flat rubber complete the list of requirements.

In this first article I have tried to put you fully in the picture as to what R/C is and what is needed to bring it about. Read in conjunction with the illustrations it should give you all the information you need to decide to make a start. Next month we shall publish the plans of an ideal R/C beginner's model, specially designed for this series, and embodying many unique features based on practical radio flying.

The S.M.A.E. DINNER and DANCE

IF, as has been stated, brevity is the soul of wit, then the speeches at the S.M.A.E. dinner were witty, as they were among the shortest we ever remember. This was a good thing, as was also "streamlining" of the prizegiving, for it enabled everyone to get on with the business of the evening—dancing if you could dance, talking if you couldn't, which all added up to a very enjoyable time for everyone. In fact, this was, in our opinion, one of the best dinner and dances yet.



CAPTIONS

1. *Eyes modestly closed John O'Donnell receives the Arthur Mullett Memorial Trophy (see Here & There) from Mrs. L. C. Nash, whose husband, Mr. L. C. Nash of the Ministry of Transport and Civil Aviation, proposed the toast to the Society (photo 3).*

2. *Super Scale C/L winner Cesare Milani (right) is lent a steadying hand as he puts the Knokke Trophy to good use.*

4. *For the first time the U.K. Challenge Trophy found its way north of the border. Here it is collected by J. Parsons of Prestwick.*

5. *Miss Mavis Pepper receives the Thurston Trophy, her just reward for beating all the boys in this popular event.*

6. *John O'D. looks pleased with the collection of Trophies he won, while S.M.A.E. Chairman, A. F. Houlberg, in background, prepares for the next comer.*

Topical Twists

by PYLONIUS

Starting Up

My association with the mechanical fuel sprayer—known in more respectful circles as a compression ignition engine—was a short and sticky one. The metallic honeymoon lasted only as long as my trousseau, which, at the time, consisted of two cement caked pairs of flannel bags and a moth eaten demob. suit. Having ruined my complete wardrobe (never was much good as a workbench) I could hardly venture onto the flying field clad only in my tattered combinations. An ex-Army gas cape came in useful for a time but after joining forces with the propeller at 5,000 revs. it was duly burned in the garden incinerator—the dustman refusing to cart it away, bribery notwithstanding.

All this, of course, goes back into the dim and distant "deezil" period when model engines consumed less than one hundredth part of the fuel input; the remainder being ejected over model and modeller, and anyone unwise enough to get within a 10 yd. radius. But I understand from the sprucer looking modeller of today that the modern engine is a much cleaner sort of animal—so clean, in fact, that it could be handled with kid gloves, although boxing gloves are recommended if you want to keep those wiggly things on the ends of your arms. Yet the vintage deezil had its points. Hewed roughly from a mixture of cast iron and putty it was not, perhaps, a pretty sight, but, come to think of it, neither was the oil-soaked wreck that clung on limply behind. Still, its power output was tame enough to give even the dimmest modeller more than two flights from his model. Often it was a race against time; to get in as many flights as possible until the model disintegrated under the sheer weight of fuel. Nowadays, with 16,000 revs. being loosed off up front, anyone who gets more than three flights out of a power model is hailed as a national genius, and the number of such geniuses known to model science can be accommodated in one small car, which proceeds from contest to contest, picking up the spare hardware.

Somewhere between the early chug-chug fuel spray and the modern model mangler there appeared on the market engines that weighed next to nothing, started first flick, flew a model in a reasonably horizontal position, and was completely house trained. But the age of the model flyer had gone, and that of the engine fancier had arrived. It was not a question of how the model performed in the air but what it looked like on paper. It didn't matter much if it weighed 1½ oz. as long as it had a hiduminium connecting rod; and if it started first flick who cared as long as it was loop scavenged—whatever that might be. In fact, if any manufacturer was naive enough to boast that his product started first flick he would be right up a gum tree. The fascinating feature of the bench-bound engine of today is how and when it can be started at all. Some will not start on wet days, or if there is a Tuesday in the week. Others will come to life only if the tommy bar is pointing magnetic north. For the really expert there is the engine that requires to be completely rebuilt.

We can reckon that the engine of tomorrow will be even more static than its present-day counterpart, and the publicity blurb of the future might go something like this:

"This new 2.5 c.c. engine has many fresh and startling features. The crankcase is of dehydrated crackerbarrel, with opencast obtruded lugs. The acoustic range is in the order of nine decibels at 5,000 yd., and the A.T.M. is 20,000 b.u.t's at 50,000 revs.

"The engine is supplied with built-in bench. We challenge you to start it!"

Snuff Said

Some earnest type has exhorted the powers that be to make d/t snuffers compulsory at all contests. He suggests that, to enforce the rule, all timekeepers be empowered to disqualify any model not so equipped.

A worthy suggestion, no doubt, but just how it would work out in practice is quite another thing. Where the usually dim variety of timekeepers come from I don't know, I only know where they are often told to go, but few, if any, of them could have seen a model plane before—or a stop watch come to that. As soon as the d/t is lit they retire to a safe distance—some of the more timid putting their fingers in their ears.

Even the experienced timekeeper would find it difficult to identify the snuffer amid all the gadgetry festooning the modern contest job. Some smart alec might dispute the effectiveness of a bit of damp cotton wool operated by a tip-up tail, and meantime another stretch of glorious Chobham countryside would be burned down to the bare sand.

A Big Hand

We have been told that the "aeromodeller of today is the full-size technician of tomorrow," which means, I suppose, that we should give the talented juvenile a big hand, and wave him goodbye as he puts down his plastic cement and picks up his screwdriver. This, no doubt, should bring joy to our patriotic hearts, but it does tend to leave an unwelcome gap in our not too crowded ranks. What I personally would like to see is the small size technician of today becoming the aeromodeller of tomorrow—such a comfort to look forward to a bit of company on the flying field.

But while we are on the subject of juniors, wouldn't it be a good idea if we could be more selective about the standard of youthful anarchist we allow into our clubrooms. It would be too much to expect that they should behave like civilised beings, but at least we could ensure that they have something above ear level other than solid plastic. An I.Q. test on the following lines would be topically useful:

Which of the following club members is the odd man out? A. A motor cyclist; B. Jive fan; C. Modeller; D. Televiewer.

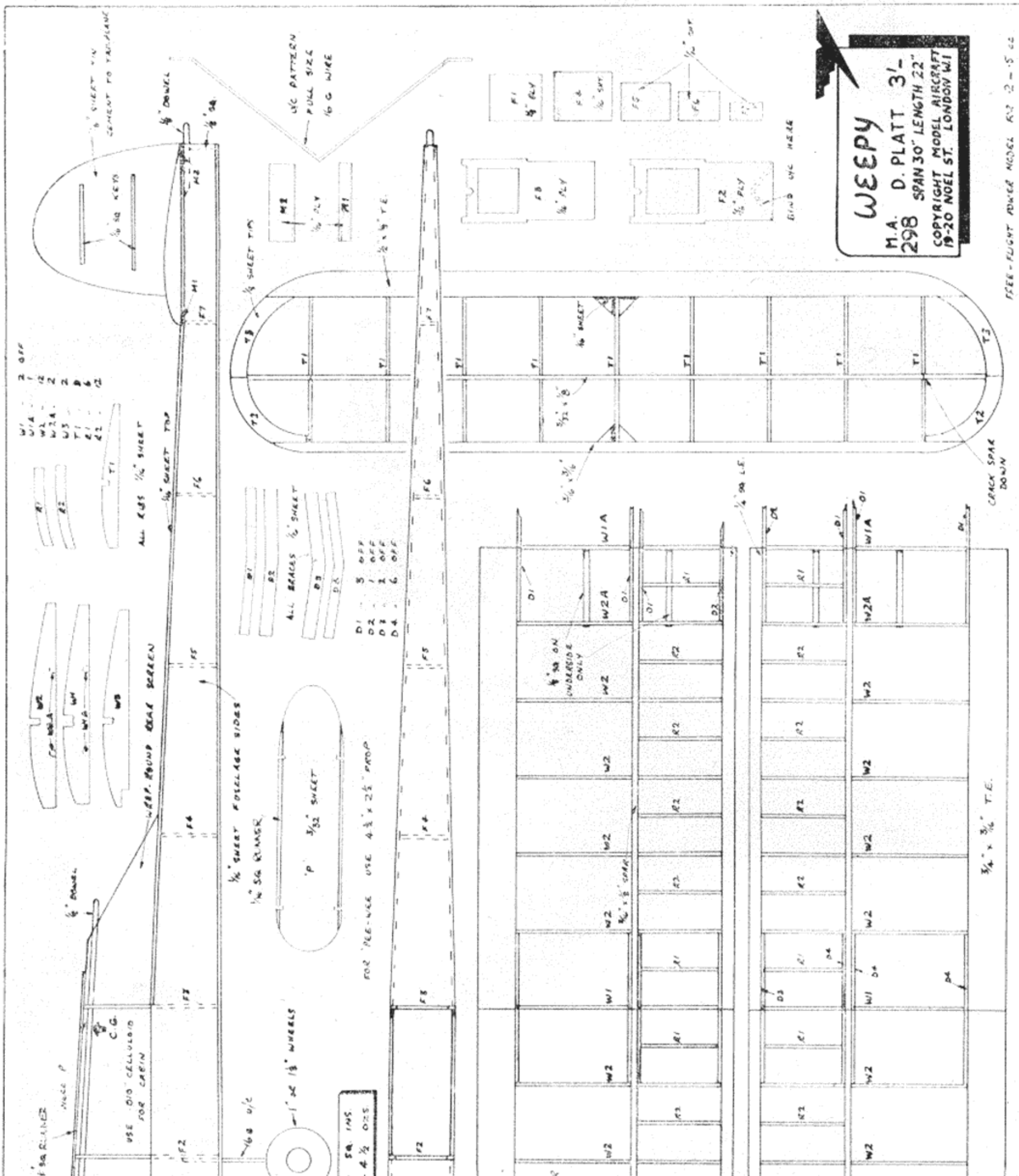
Bond Baker is—

A. Type of wrapped loaf; B. A plastic adhesive; C. A Wakefield winner.

If you were told that your motor bike was a three-stroke what would be your immediate reaction?

A. Laugh; B. Claim your money back; C. Jump clear.

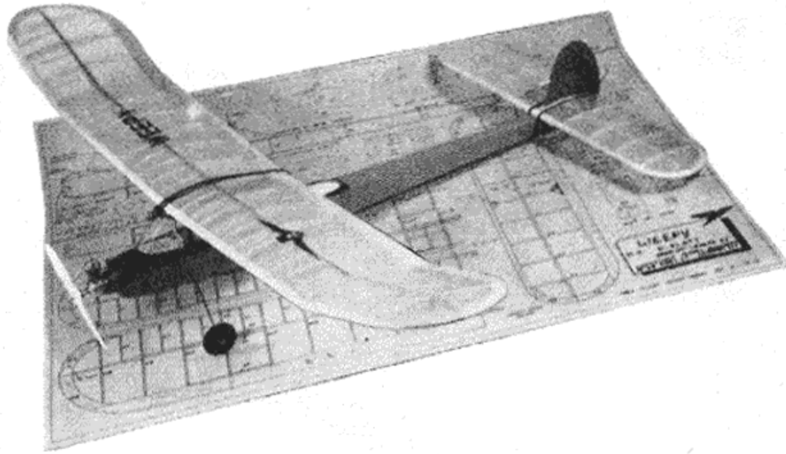
SKETCHES BY ——— ALI



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

WEEPY

A semi-scale design especially for the Cox Pee Wee—by DAVE PLATT



WHEN the Cox Pee Wee engine became available from model shops recently, many modellers took the opportunity to obtain one of these amazing little American 0.020 powerpots.

The power obtainable from this motor nearly equals that of the average 0.5 diesel—for most applications—and its tiny size and weight immediately conjure up thoughts of sub-miniature F/F power ratio and scale models. Unfortunately, however, the power is a little too much for truly diminutive models.

To date the usual application for a Pee Wee seems to be a converted rubber-model or glider, but I thought that a design especially to suit the potentialities of the motor would be much more satisfactory —hence *Weepy*.

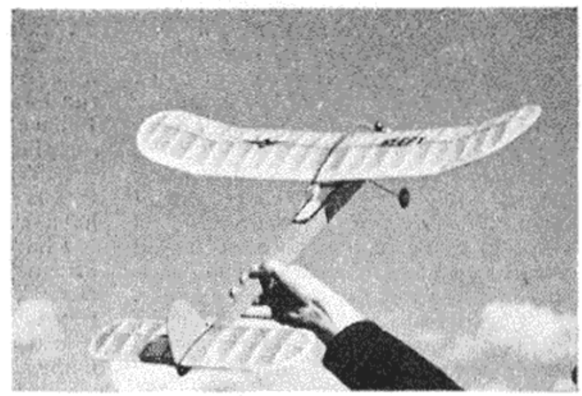
This model has 1 sq. ft. of wing area which gives it a "high-performance sport" type of flight, with ratios of around 10. I can recommend this model for owners of 0.5 motors, but if you install a good "Dart" or a 0.8 c.c. motor, go easy on the power at first.

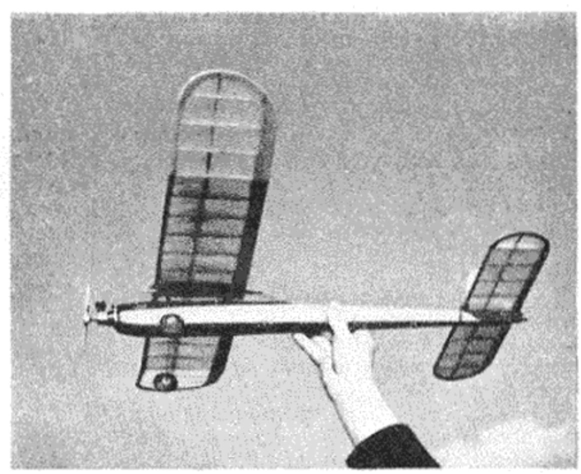
Construction is true beginner's stuff. The original was completed in about seven hours' building time and for a cost of less than 5s., less dope—hardly expensive!

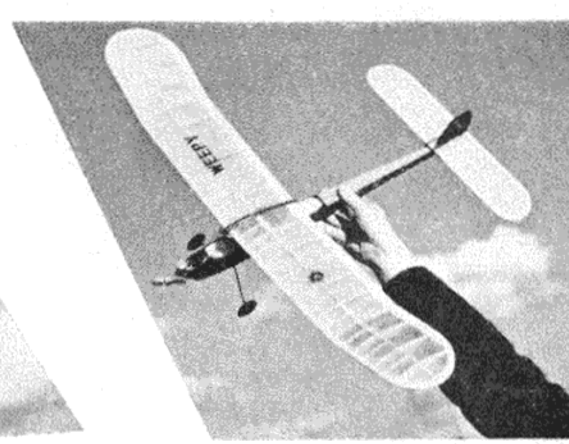
The appearance of the model rather inspires thoughts of PAA load. I haven't tried adding any weight to my *Weepy* yet, but no doubt I shall before the model is much older. The all-up weight of the original is 4.3 oz., but no effort was made to achieve light weight, 3.75-4 oz. should be easily possible if load-carrying is required.

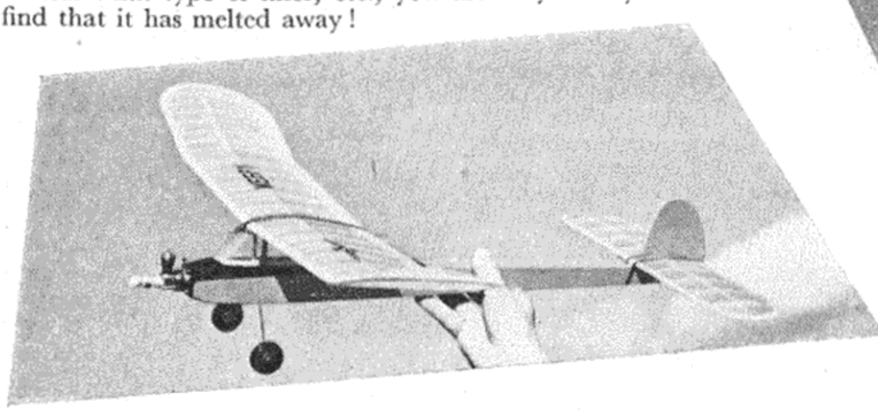
The model should be trimmed to fly left-left, the port wing panel being washed-in and left rudder used to get the glide circle. The motor thrustline is entirely straight.

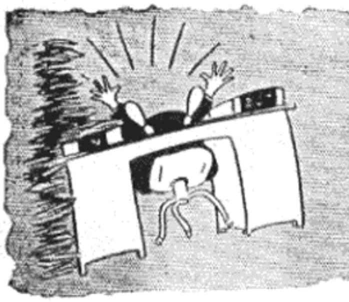
Finally, just one word of warning—glo fuel will attack many plastics that are immune to diesel fuel, so if you are using a glo motor for the first time be careful what type of filler, etc., you use or you may find that it has melted away!











LETTERS

F.A.I. or nothing

DEAR SIR,—If the members of the Northern Heights club are of the opinion that their models are insufficiently proved (Here and There, October), and could become so by more competition flying, what stiffer competition could they find than by flying in Open Rubber contests? Probably the answer is they want to fly their open rubber models in these contests.

In my opinion anyone who has any special interest in F.A.I. classes should fly F.A.I. models to the exclusion of all else—fly them in open contests in all weathers. I think that by doing this they will win some of the open contests, as it is consistency that counts in the end, and the new rule F.A.I. models should certainly be consistent.

Actually the best answer, I suppose, is to make all S.M.A.E. contests for F.A.I. classes but I can't see this happening. However, I do think that the S.M.A.E. might offer encouragement by allocating more of their contests to F.A.I. formula models, and then interest might be maintained over the year when there is no world contest.

Yours faithfully,

Bristol. H. BURNETT.

Trouble free escapements

DEAR SIR,—In the August issue you published a letter by a Mr. R. Pask under the heading "Radio Control Comments," and I can only agree with practically everything that this letter contains, with the exception of Mr. Pask's criticism of escapements, which he states he feels are a source of endless trouble.

Whilst some types of escapements may possibly be troublesome, I have always found that the standard E.D. self-neutralising escapement is completely reliable in itself, provided that it is fitted into an aeroplane correctly and that it is operated by a reliable receiver fitted with a high-grade relay.

I have flown R/C aircraft on and off for nearly 10 years, and to date have stuck largely to escapements of one kind or another, although I am fully conversant with pulse and tuned reed multi-channel systems. The pulse systems of either Dr. Walt Good or the simpler Simpl/Simul system, which have been used in America for some years now have, in my opinion, much to commend them, and I personally may shortly go to this form of control. The pulse systems, no doubt, give a smoother system of control and possibly more realism than those controls incorporating escapements, but for the average builder with not a great deal of knowledge on the radio side, a control system incorporating an escapement is, I feel, the safest proposition.

Much of the criticism that has been made against escapements—that they are inclined to skip and chatter—cannot as a rule be blamed on the escapement itself, but on the receiver which operates the escapement. From my experience I have found, when there has been skipping of the escapement, that it has been due to an unstable receiver or one that has been powered by batteries that have dropped in voltage.

I have completed a cascaded actuator system operated by a joy box lever control, which has just been bench tested over a lengthy period. This system includes escapements of my own make, based on the E.D. design, and which have been found to be *completely* reliable.

The escapement is used in the U.S.A. on a very large scale in simple and compounded layouts, and from reports that one gets in the American journals it would appear that these give complete satisfaction. For simple reliable control, therefore, it is necessary first of all to have a good receiver—preferably one of the latest transistor type sets which give a current rise on receipt of a signal.

It is also necessary to make sure that the H.T. and the L.T. batteries are fresh and up to standard whenever you fly. This will give the escapement a healthy action, provided again that care is taken to see that the escapement batteries, which incidentally should be of 6 volts, are always fresh whenever they are to be used. The escapement itself as received is correctly set, but it should be carefully examined before fitting, just to make sure that everything is in order. Examine and adjust if necessary as below:—

1. Make sure that in the "neutral" position, the rotating arm rests positively against the top armature stop, and that when the coil is energised the stop lifts sufficiently to just clear the rotating arm, and so allow it to move through an angle of 90 deg. until it reaches the "turn" stop. On release of signal, the rotating arm should then just clear the turn stop claw, and the arm then rotates through another 90 deg. back to the second neutral position.

2. See that all bearings are free and easy, and add a drop of thin machine oil to the rotating arm spindle.

3. Make perfectly sure that when the coil is energised and the armature is drawn towards it, a definite clearance exists between the end of the magnet pole and the armature itself. This clearance should be as small as possible, only a few thousandths of an inch, and can be checked by holding the escapement up to the light, when the clearance can be seen. Sticking, due to residual magnetism, may take place if the armature actually makes physical contact with the magnet pole.

4. Make perfectly sure that the contact between the phosphor bronze contact strip and the back of the rotating arm as it wipes past is electrically perfect.

5. Check the armature return spring to ensure correct tension. If the spring is adjusted too strongly, it will take a greater magnetic pull to release the escapement, and on the other hand if it is too weak, it is inclined to prevent a positive escapement action.

6. Install the escapement with care, and make sure that the rubber drive from the rotating arm spindle is in a straight line with the latter. The linkage from the escapement to the rudder must also operate freely without any chance of binding whatsoever.

7. Take care of the rubber motor and keep it lubricated, for if this snaps whilst the plane is in the air, control will be lost completely. It pays to remove rubber motors after use and store them in an air-tight jar.

The above comments are made as I feel that for the average chap who wants to fly a plane under control the escapement system will provide the simplest and most reliable means of carrying this out.

Yours faithfully,

Dundee. W. G. ROWELL.

. . . and actuators

DEAR SIR,—I could not agree more with E. Fearnley (Letters, November), about the efficiency of the Bonner Varicomp., except that being rubber operated there is the risk of neglecting to "put winds on."

However, I am sure F. Risings clockwork actuators are equal to or even better than anything yet sold in this country. These actuators pull in at 3 volts and are most reliable, working rudder, elevators or engine. I have been surprised at the number of R/C operators who use this useful accessory, which can also be coupled to work on single channel.

Yours faithfully,

F. STUART THOMSON.

Mansfield, Notts.

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.

J. W. R. Taylor's AVIATION NEWSPAGE

WEB-FOOTED WHIRLYBIRD above is the first of a new family of Sikorsky amphibious helicopters with flying-boat hulls. Known as the S-62, it is intended as a versatile turbine-powered replacement for the S-55 (*Whirlwind*), using the rotor blades, rotor heads, gearboxes, shafting, tail rotor pylon and portions of the flying control and hydraulic systems of the earlier machine. The main wheels of the tailwheel undercarriage retract partially into the stabilising floats during flight and operation from water.

Use of a 1,050 h.p. General Electric T58-GE-6 shaft-turbine helps to combine an increase of 250-450 h.p. with a 700 lb. saving in empty weight compared with the piston-engined S-55. As a result, the S-62 will carry 8-12 passengers or 3,000 lb. of freight at a max. speed of 120 m.p.h. and cruising speed of 92 m.p.h. Rough water tests have been made successfully in waves 3 to 5 ft. high.

Next in line will be the larger S-61 with two T58 turbines and doubled payload, for anti-submarine duties with the U.S. Navy and troop carrying with the U.S. Marines.

* * *

OKEY DOAK. Now complete with a decent covering over its steel-tube fuselage, Doak's two-seat Model 16 VTOL research aircraft has been sent to Edwards Air Force Base for flight trials, following initial vertical take-off and hovering tests at Torrance, California. Power is provided by a single 825 h.p. Lycoming T53 shaft-turbine, driving a ducted propeller at each wing-tip. The ducts are horizontal for vertical flight, rotating slowly through 90 deg. after take-off, to face forward in cruising flight. This enables the Model 16 to offer the advantages of a helicopter plus much higher cruising speeds for Army observation, liaison and rescue missions. Vertical and horizontal vanes in the exhaust efflux ensure control during transition and hovering.

* * *

RARE BIRD photographed at Luqa, Malta, was this Savoia-Marchetti S.M.82 *Marsupiale* transport of the Italian Air Force, with Maltese cross insignia superimposed over its normal fuselage roundels whilst ferrying pilgrims to Lourdes. First flown in 1938 and operated as a bomber-transport (40 seats) by the *Regia Aeronautica* from 1941 onwards, the S.M.82 had originally three 950 h.p. Alfa 128 RC 21 radials, giving a top speed of 224 m.p.h. and range of 2,361 miles at 186 m.p.h. The designation S.M.82Pw painted on the nose of the machine illustrated (serial No. MM61248) indicates that it is one of the surviving wartime aircraft which have been re-engined with 1,215 h.p. Pratt & Whitney R-1830-S1C3Gs. Span is 97 ft. 5 in., length 73 ft. 10 in. and loaded weight 38,360 lb.

* * *

RUDDER FLASH of black, red and yellow above the initials DDR shows that the Antonov An-2 illustrated below belongs to "the other Deutsche Lufthansa" operated in the East German Democratic Republic. The airline name and bird symbol are shared by the two Lufthansas.

Almost unique as a modern biplane transport, the An-2 has a 1,000 h.p. ASh-62 IR radial engine and carries 7-10 passengers at a cruising speed of 130 m.p.h. No tiddler, it spans 54 ft. 2¼ in. and has a loaded weight of 11,000 lb. Designed for short take-off and landing runs from small airfields, it is being built in China as well as Russia, and well over 2,000 are in civil and military service for transport, ambulance, survey, parachuting, agricultural and other duties.

Right: The Italian S.M.82.

Lower right: The Antonov An-2.

Below: Doaks VTOL research aircraft.

AVIATION NEWSPAGE

Plane of the month

The SUPER AERO

Our heading photograph was taken by the Editor at the full size display after the 1957 World Champs in Czechoslovakia. It is the identical machine which is now used for demonstrations in this country.

WE in Britain first learned the qualities of this light twin on August 1st, 1949, when one of the original *Aero* 45s, flown by chief test pilot Jan Anderle, won the Norton Griffiths Challenge Trophy Race in the National Air Races at Elmdon Airport, Birmingham. Averaging 163 m.p.h. over three laps of the 20-mile course, it proved not only the fastest of the 16 starters, but set up the fastest lap at 169 m.p.h.

Together with a little single-engined Sokol M1D, which finished sixth in the race for the Grosvenor Trophy, it showed that the Czech aircraft industry was firmly re-established, after being forced to produce German types such as the Fw 189 and 190, Me 109, Siebel 204 and Fieseler *Storch* throughout the war years.

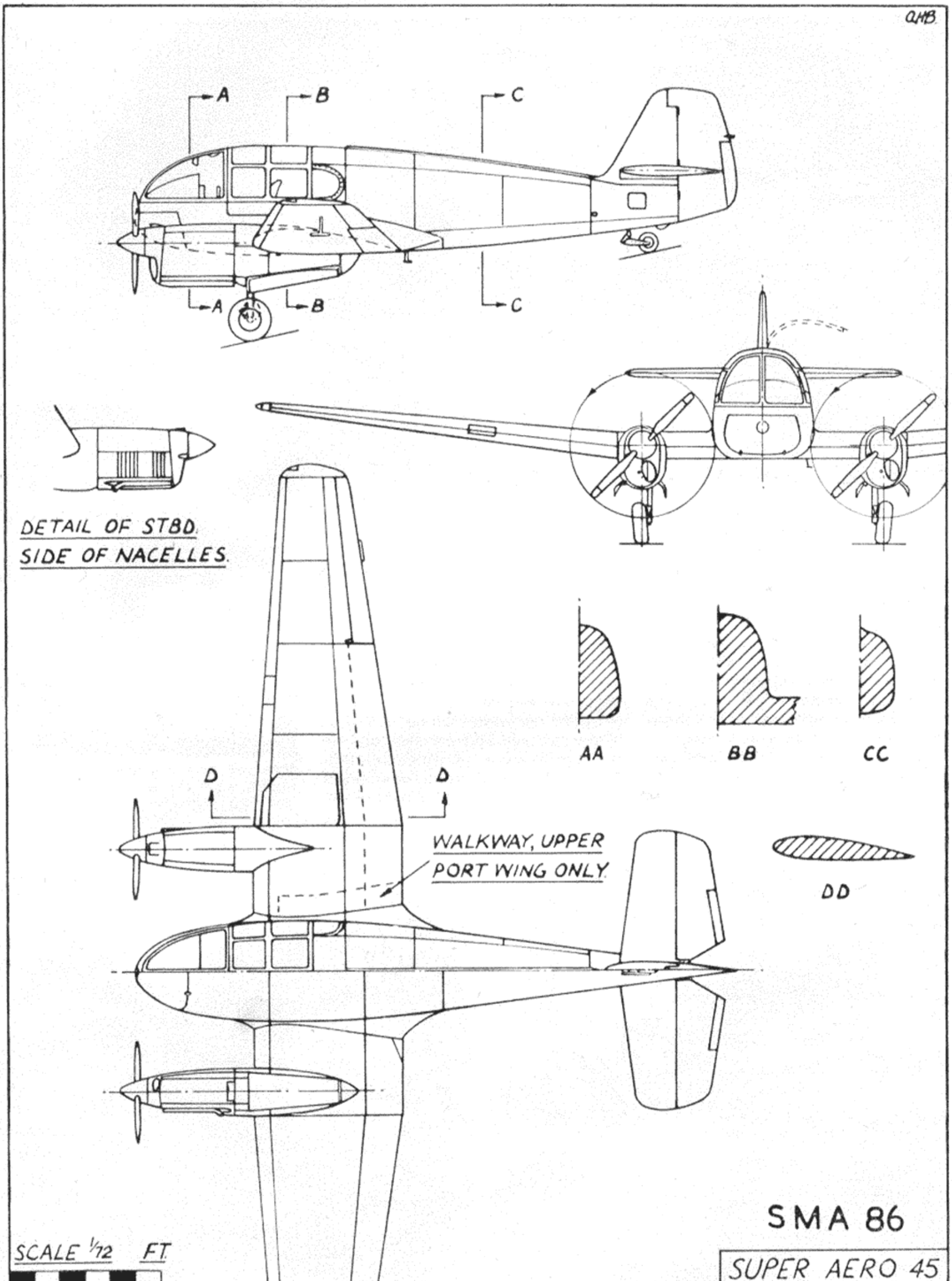
In the 'thirties, Czech designers had been responsible for many highly-successful lightplanes and some had continued to produce new designs during the war. As a result, the newly-nationalised industry was able to switch fairly rapidly to the manufacture of civilian light aircraft in 1945, and several single-engined training and sporting types preceded the *Aero* 45, which flew for the first time in July, 1947.

Intended for every kind of pleasure, air taxi, light transport and business flying, it was conceived as an all-metal four-seater, powered by two 105 h.p. Walter Minor 4-III four-cylinder air-cooled engines and with the emphasis on comfort and safety. An excellent all-round view from the cabin was ensured by extensive glazing and a snub nose. Instruments and controls were laid out neatly, with provision for dual steering wheel controls, radio and full blind flying equipment; while sound-proofing, ventilation and heating were standard.

Despite the low power of the engines, flight testing soon revealed the *Aero* 45 to be a "pilot's aeroplane." A top speed of 177 m.p.h. was combined with first-class controllability and manoeuvrability. Most impressive of all, with one engine out it could not only turn and bank quite happily in both directions, but would even climb to 5,000 ft. with a full load. Landing

Continued on page 10

A good idea of the spaciousness of the cabin can be obtained from this photograph of a Lufthansa (Lufttaxi as it is described on the back of the photo) Super Aero.


QHB.
A
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DETAIL OF STBD. SIDE OF NACELLES.
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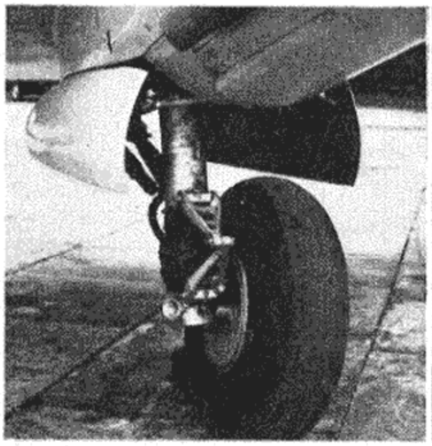
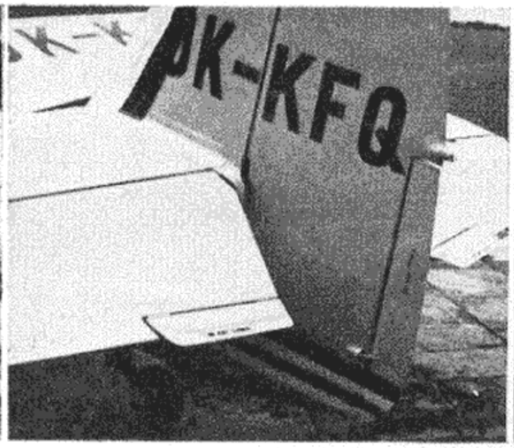
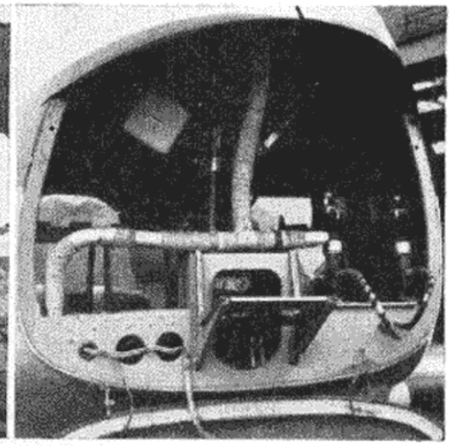
WALKWAY, UPPER PORT WING ONLY
DD
SMA 86
SCALE 1/72 FT.
SUPER AERO 45







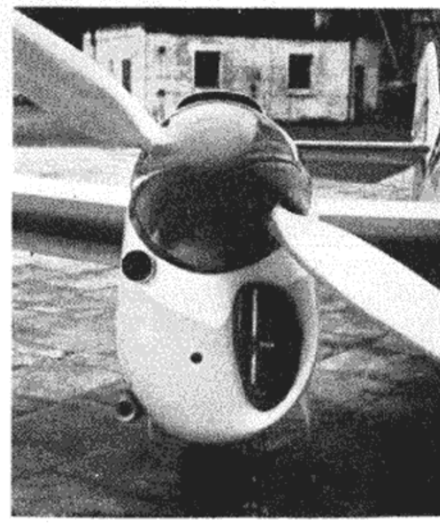
The detail photographs above will be of assistance to modellers and need no explanation except perhaps the one on the right, which shows the nose cone dropped down. The shelf is for radio gear.

and take-off runs were kept low by the use of large trailing-edge flaps and leading-edge slots which opened automatically between the engine nacelles and fuselage when the main wheels were lowered.

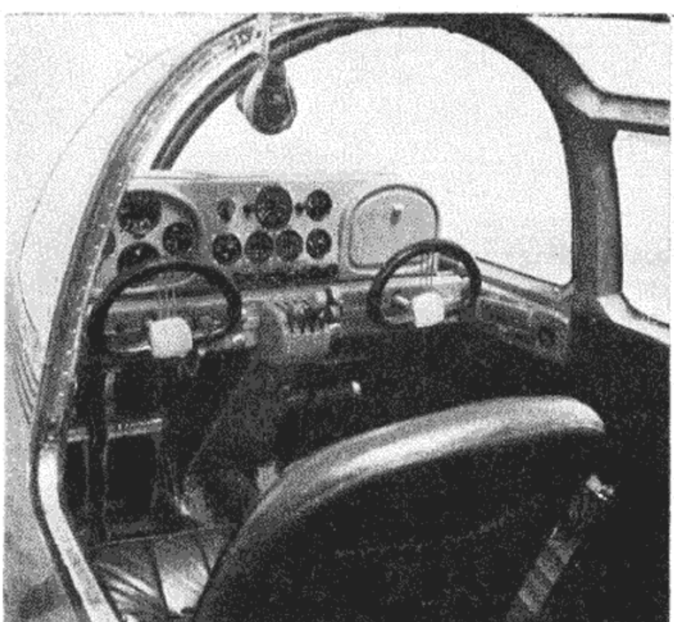
An initial production series of 100 *Aero* 45*s* was laid down in 1948, and flights such as a 10,500-mile business tour along the west coast of Africa, over forest and sea, to the Cameroons, and back over the Sahara to France, by the chairman and manager of a French textile firm, soon proved the rugged reliability of the little machine. In due course, refinement of the design led to the present *Super Aero*, with even more comfortable cabin and electrically-operated fully-feathering variable-pitch propellers as standard equipment. The following details refer to this version, of which very large numbers are used for air taxi and charter work by Aeroflot and the East German Lufthansa, in addition to those flown by private owners all over the world.

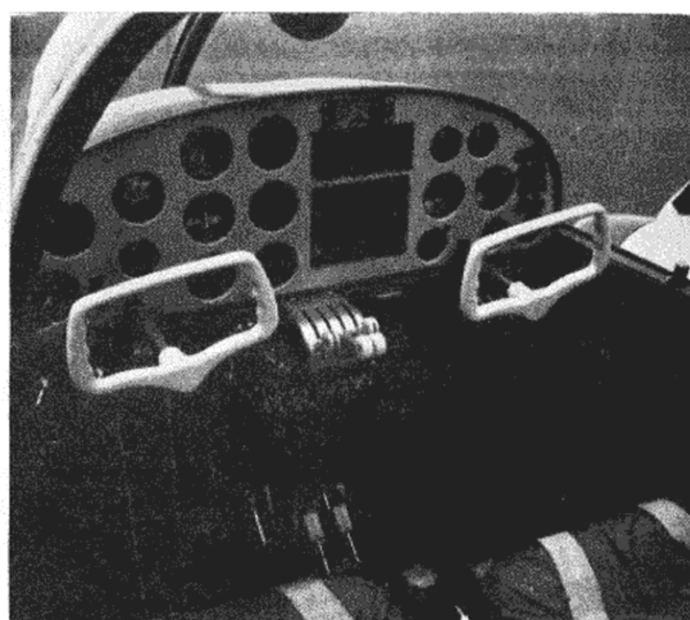
Span: 40 ft. 4 in. Length 24 ft. 9 in. Height: 7 ft. 6 in. Wing area: 184 sq. ft. Weight empty: 2,116 lb., loaded, 3,527 lb. Max. speed: 168 m.p.h. Cruising speed: 146 m.p.h. Landing speed: 62 m.p.h. Ceiling: 16,570 ft. Take-off run: 720 ft. Landing run: 900 ft. Range: 995 miles.

Colour details: Super Aeros are flying in a variety of colours, but there are four standard paint schemes for the current production model. These comprise a basic all-over finish of pale blue or yellow, with in each case a white-top fuselage and choice of red or dark blue flashes (outlined in white) along the sides of the fuselage and nacelles, and on the leading-edges of wing and tail-plane. The wheels, propeller spinners and tips, and decking forward of the instrument panel are painted to match the flashes.



Above we have a close-up of the engine nacelle, while the two photographs below show the difference in cockpit layout between the prototype (left) and the production Super Aero.





BELL VTOL

Unorthodox Semi-scale Twin Jetex model

. . . .designed by **LARRY CONOVER**

BELL'S VTOL was a design study of a vertical rising jet airplane which could take off and land on a "dime." I was fortunate in being able to see movies of actual flight tests, and it worked very well. The machine lifted, turned 360 deg. over the spot, progressed 200 ft. down the field, landed on a spot, minimum flying speed was zero m.p.h. Maximum was rumoured as 300 m.p.h., but the aircraft was not designed for this speed; it was intended only as a stability test bed.

The success of any aircraft is entirely dependent on stability, and this is the paramount problem for all VTOL aircraft. In hovering flight the Bell ship utilised compressed air ejected from nozzles at the wing tips and tail for control in all three axes. Powerplants were two Fairchild J-44 turbojet engines of 1,000 lb. thrust each, and they could be rotated from vertical to horizontal for varied flight attitudes.

The aircraft had a span of 26 ft., a length of 21 ft. and weighed 2,000 lb. Note the marginal thrust to weight ratio—no heavy eating for the pilot!

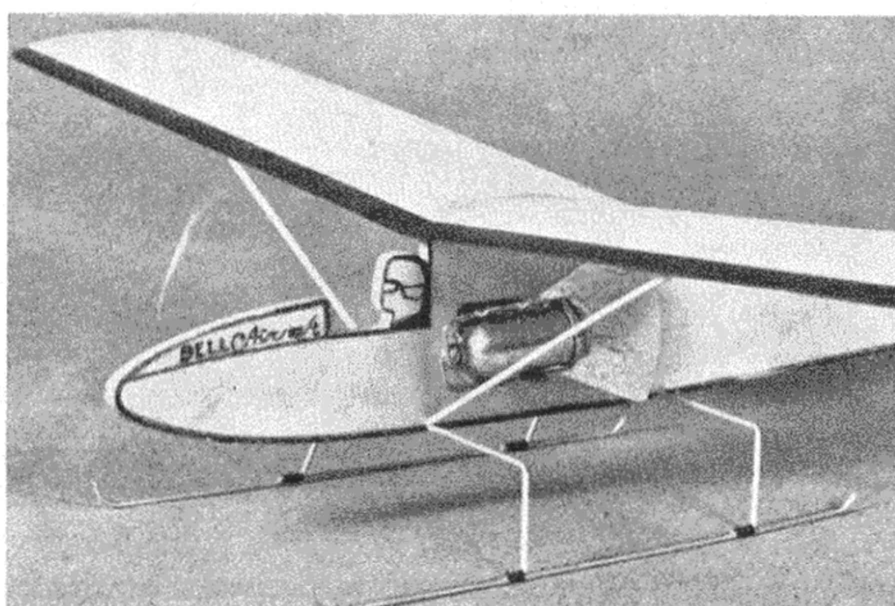
Your model is not intended for hovering flight, although you can gain some interesting experience by attempting to turn your Jetex engines as near vertical as possible and still retain flying ability, then you will appreciate some of the problems the full scale people had.

The plans tell most of the story on construction, but be careful to keep the tail end light, use quarter grain balsa for all flying surfaces, and take care to avoid splitting when bending the camber into the wings. No dope is required. To mount the motors drill a hole in the centre of the Jetex mounting clip and find a short machine screw that will just protrude enough to take the nut on the other side. The model should balance at 50 per cent. wing chord, and I used chuck glider techniques for trimming.

For initial flight tests use only one engine, and adjust for a slight circle on the glide, with the loaded engine on the inside of the glide turn. When using two engines always light the inside (of circle) engine first. Make small adjustments one at a time—this is a fast moving model.

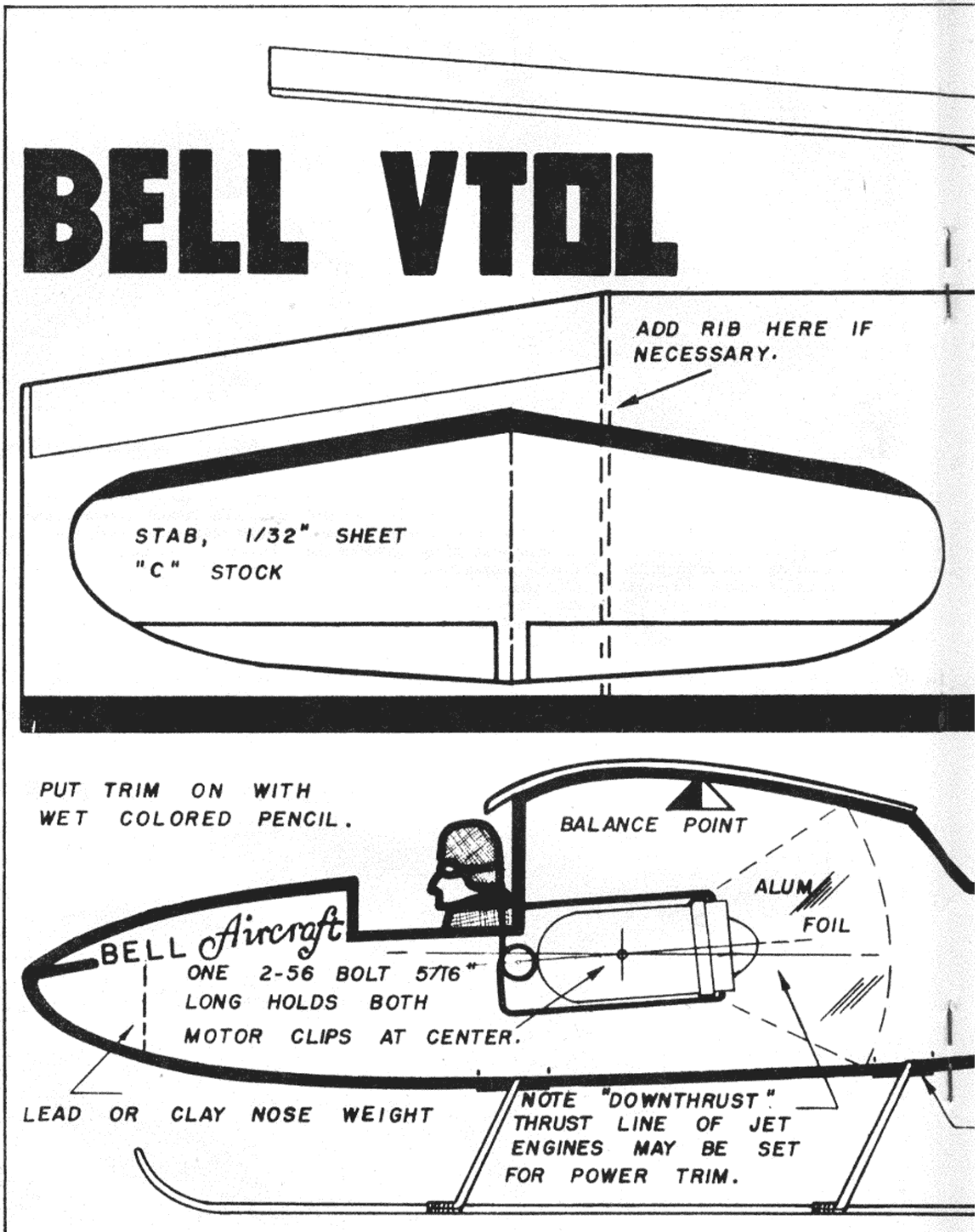
I have had flights of up to 3 min. and distance of, as the old-time magazines would put it, "flies 5,000 ft."

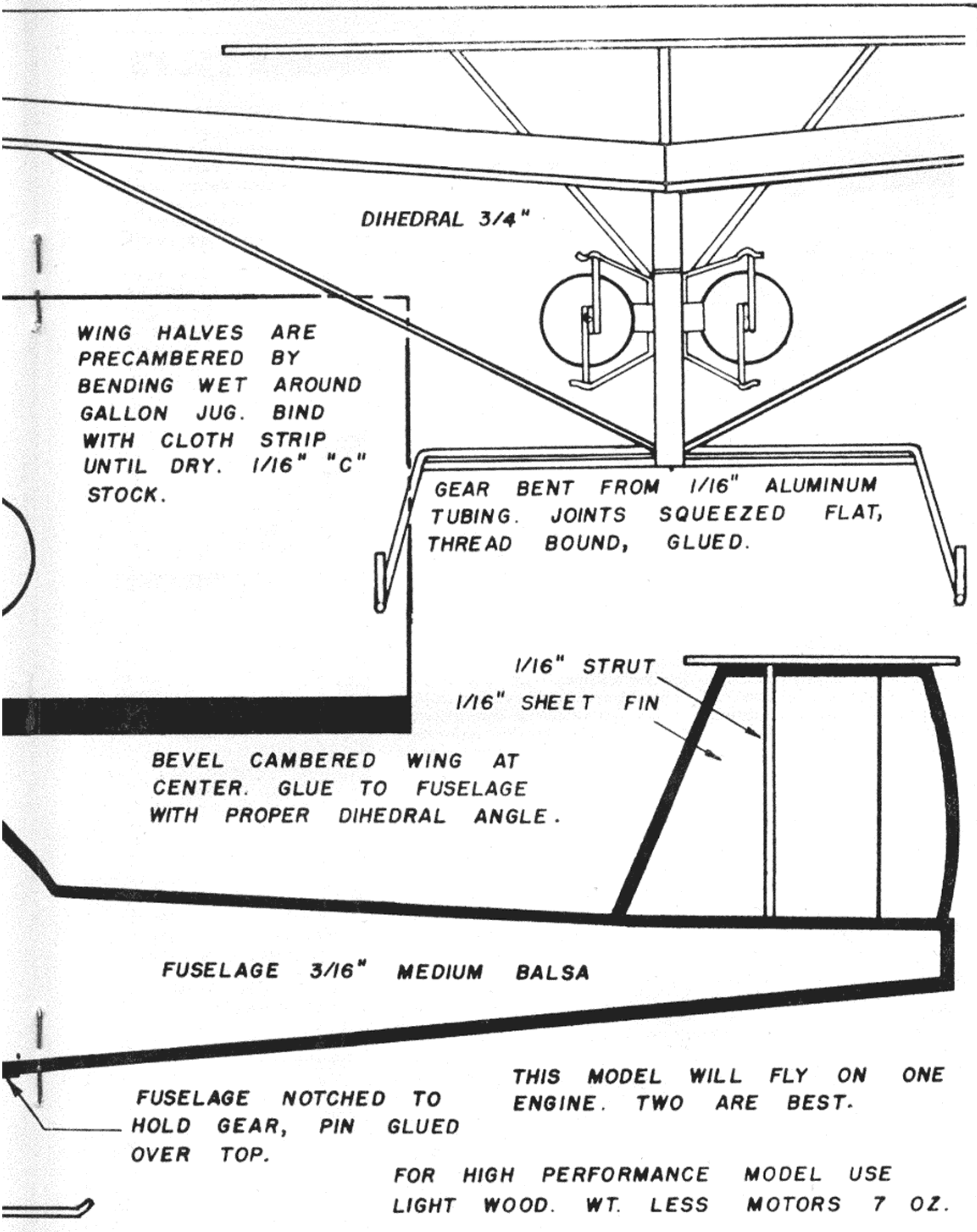
FULL SIZE PLANS OVERLEAF



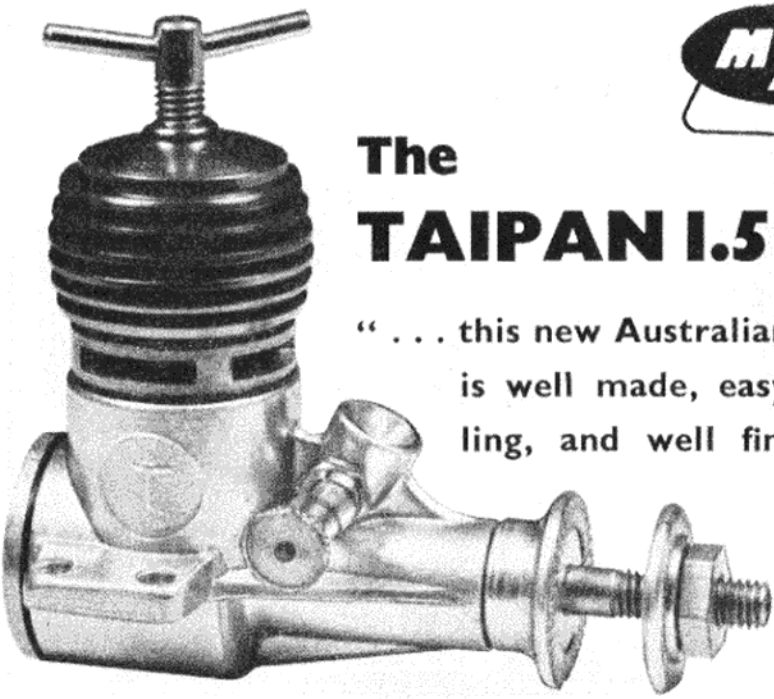
The two photos show the general lines and straightforward construction of this model. In the heading the motors are in the V.T.O. position, while right they are set for normal flight. When the photos were taken the model had made over 25 successful flights.

BELL VTOL


ADD RIB HERE IF NECESSARY.
STAB, 1/32" SHEET
"C" STOCK
PUT TRIM ON WITH WET COLORED PENCIL.
BALANCE POINT
ALUM FOIL
BELL Aircraft
ONE 2-56 BOLT 5/16" LONG HOLDS BOTH MOTOR CLIPS AT CENTER.
LEAD OR CLAY NOSE WEIGHT
NOTE "DOWNTHRUST" THRUST LINE OF JET ENGINES MAY BE SET FOR POWER TRIM.


DIHEDRAL 3/4"
WING HALVES ARE PRECAMBERED BY BENDING WET AROUND GALLON JUG. BIND WITH CLOTH STRIP UNTIL DRY. 1/16" "C" STOCK.
GEAR BENT FROM 1/16" ALUMINUM TUBING. JOINTS SQUEEZED FLAT, THREAD BOUND, GLUED.
1/16" STRUT
1/16" SHEET FIN
BEVEL CAMBERED WING AT CENTER. GLUE TO FUSELAGE WITH PROPER DIHEDRAL ANGLE.
FUSELAGE 3/16" MEDIUM BALSA
FUSELAGE NOTCHED TO HOLD GEAR, PIN GLUED OVER TOP.
THIS MODEL WILL FLY ON ONE ENGINE. TWO ARE BEST.
FOR HIGH PERFORMANCE MODEL USE LIGHT WOOD. WT. LESS MOTORS 7 OZ.

ENGINE TESTS

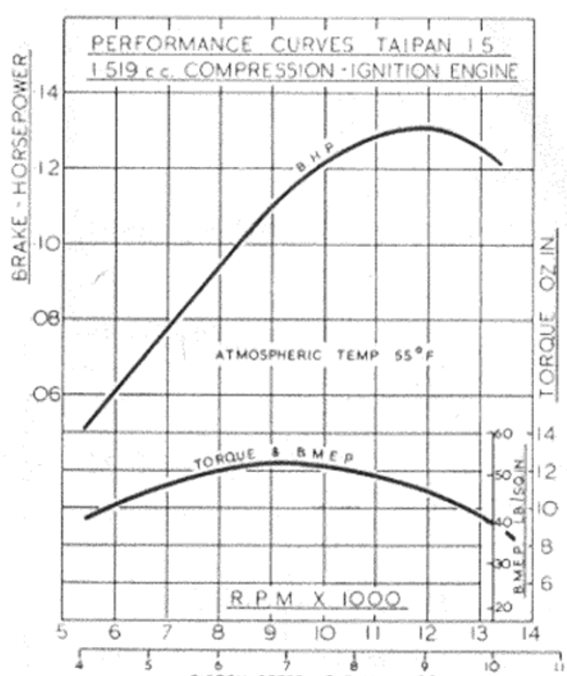


The TAIPAN 1.5 c.c.

" . . . this new Australian diesel is well made, easy handling, and well finished."

FOR many years, the quantity production of model i.c. engines in Australia has been in the hands of one manufacturer: Gordon Burford of Grange, South Australia. Both glowplug and diesel engines of numerous different types, under the trade names of "Gee-Bee," "Sabre," "Glo-Chief" and "Taipan," have been produced. The latest model in the diesel range is the 1.5 c.c. Taipan and this unit is the subject of our test report this month.

The Taipan 1.5 is a shaft induction, short-stroke, radially-ported engine of conventional design and construction. Despite a low selling price (£A3 19s. 6d. or about £3 sterling) it is well made and nicely finished. It compares more than favourably on a value-for-money basis, with European engines of similar size and type.



The Taipan 1.5 bears little resemblance to the earlier Burford Sabre 150 which we featured some $5\frac{1}{2}$ years ago in this series and, although the latter earned a quite favourable report, we feel that the Taipan is a definite all-round improvement on the earlier model. This is particularly noticeable in its handling characteristics and power output.

The design of the Taipan is, as we have said, orthodox. A very cleanly cast beam-mount crankcase unit, with integral bearing adequately webbed for strength, is employed. The cylinder liner has four external type transfer flutes and screws into the casting, being topped by the usual one-piece finned barrel and head. The transfer passages, of which there are four, spaced at 90 deg. intervals, terminate in circular $\frac{1}{8}$ in. dia. ports drilled at 45 deg. to the cylinder axis, to improve gas flow, and breaking into the bore between the exhaust ports. Exhaust area is normal (present design trends are away from oversize exhaust ports in favour of larger transfer ports) and the exhaust period is approximately 130 deg.

Induction timing is conservative; the rotary valve opening 75 deg. after BDC and closing 20 deg. after TDC for a total intake period of only 125 deg. It is supplemented by a period of sub-piston air-induction of approximately 20 deg. each side of TDC.

Specification

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

The "Americanised," and very effective packaging of the Taipan.

Bore: 0.511 in. Stroke: 0.452 in.
Swept Volume: 0.0927 cu. in. = 1.519 c.c.
Stroke/Bore Ratio : 0.885 : 1.
Weight: 3.2 oz.

General Structural Data

Diecast L.33 aluminium alloy crankcase and main bearing with integral air intake. Machined alloy screw-in rear cover. Disc-web, non-counterbalanced crankshaft of 3 per cent. nickel steel, hardened. Cylinder liner of hardened mild steel, flanged at exhaust port level and screwing into main casting. Meehanite piston with pressed-in gudgeon-pin and machined dura-lumin connecting-rod. Meehanite contra-piston. Cylinder barrel machined from aluminium alloy bar, anodised red and screwed over cylinder liner. Brass spraybar assembly. Beam mounting lugs.

Test Engine Data

Running time prior to tests: 2 hr.
Fuel used: Mercury Super-6.

Performance

Following the American trend in model engine "merchandising," the Taipan is sold in a neat "bubble-pak" consisting of a transparent moulding clipped in a card folder with instructions printed on the back. The engine is intended for beginners as well as experienced modellers and, to simulate a "beginner approach," we followed the maker's starting instructions closely.

Recommended procedure is to choke the intake, while turning the prop, until fuel reaches the jet and to then give three more turns, followed by an exhaust prime. Using this basic procedure, we had the engine running within 30 sec.

Once the engine has been run and any internal stiffness due to residual oil, removed, the Taipan starts very easily and, when warm, a couple of choked flicks is the only preliminary required.

When starting the engine from cold, it is helpful to open up the needle-valve a turn or so beyond the normal setting, but when using largish props (e.g., 9/4-9/6), the engine will re-start hot on the running settings of both needle-valve and compression. With the smaller props (8/4, 7/6, etc.) used to achieve r.p.m. nearer to the peak output, however, it is desirable to slacken off the compression lever a quarter turn to obtain a re-start. These characteristics are, of course, normal.

On our test engine, the contra-piston tended to stick in the bore under certain conditions. That is to say, when the engine was thoroughly warmed up, it would not return to a lower setting when the compression lever was released. This is not uncommon in current diesels, but with the Taipan, it occurred over a narrow range of compression settings only—i.e., when loaded with a certain size of prop. It was found that, by changing the fuel blend to one requiring a higher or lower compression-ratio for a given speed, this critical period could be moved up or down the r.p.m. scale. It would appear likely that this was a peculiarity of the test sample only and is not characteristic of the Taipan generally.

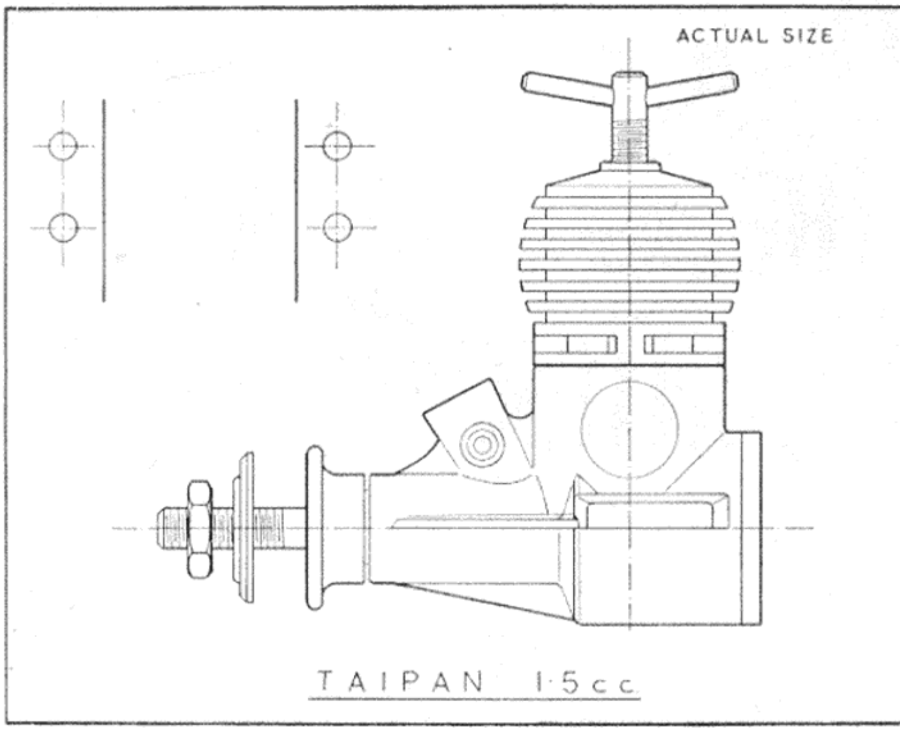
Torque tests of the Taipan revealed slightly unusually shaped torque and b.m.e.p. curves. Maximum torque was delivered at around 9,000-9,500 r.p.m. and declined quite appreciably at speeds below this figure. Since maximum torque exceeded 12 oz. in., however, the power output was particularly good on useful size props (e.g., 8/4) and over, 0.12 b.h.p. was realised at 10,000 r.p.m., with a maximum of 0.131 b.h.p. delivered at the peak speed of 12,000 r.p.m.

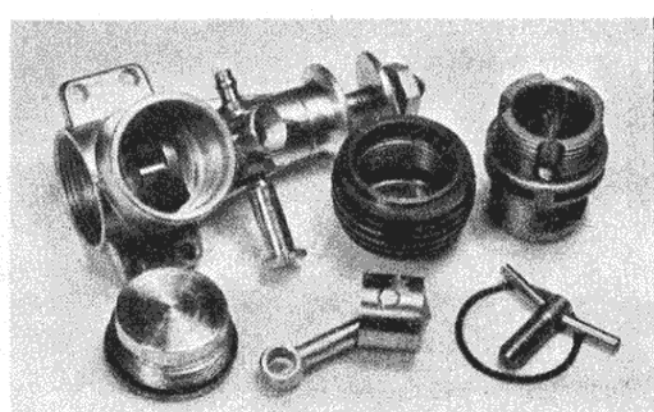
In general, running qualities were good. There was an appreciable power loss with warming up on the heavier loads, but this diminished as prop size was reduced and was negligible when running on the recommended Australian-made "Strato" 8/4 airscrew. This latter, incidentally, seems to suit the engine very well. Its blades are thinned and tapered at the tips and with it, revs should approach to within a few hundred r.p.m. of the peak in the air.

To summarise, this new Australian diesel is a pleasing motor, well made, nicely finished and easy handling. It is not the most powerful of 1.5 c.c. engines, but its performance is well up to present-day standards and is better than some other contemporary 1.5s. It, like the other current Burford engines, undoubtedly represents very good value.

Power/Weight Ratio (as tested): 0.67 b.h.p./lb.

Specific Output (as tested): 86 b.h.p./litre.





The high standard of the finish of the Taipan is apparent from this photograph.

OVER THE COUNTER

TO model railway enthusiasts the name of **Bradshaw Model Products** of 40, Waterloo Street, Hove, 2, Sussex, is well known, but we doubt if more than a few aero-modellers have heard of them—until now; for this company will shortly be distributing a considerable quantity of American model aircraft equipment, imported by their allied company Nucro Ltd.

In recent months quite a few firms have arranged token imports of American engines, etc., but these have in many cases, done little more than whet the appetite for the prolific range of kits and accessories that are available in the U.S. Nucro, however, have been fortunate in obtaining a licence which has enabled them to import goods that range from Dooling 29s to ready-to-fly plastic control-liners.

We have heard much of these plastic flying kits, and welcomed the opportunity to examine them closely. Although perhaps they are, when considered from the strictly model angle, toys, they are nonetheless, well made, well presented, and could easily be the turning point for a youngster, who has perhaps built a few plastic solids, but has jibbed at the apparent complexities of a flying kit. A few successful training flights with a plastic model and the bug will probably bite for something more potent—which he will have to make—and thus another modeller is made.

If only one in every 10 youngsters who get a ready-to-fly model became active model builders, the result—from the strictly model point of view—will be well worthwhile, while from the trade aspect the availability of these models is a good thing in itself, for there has long been a demand for a ready built design that will really fly. The four models available are shown in the photographs on these pages.

Stunt enthusiasts will be pleased to note that kits for George Aldrich's *Flitestreak* (£2 11s. 3d.) and *Nobler* (£5 16s. 1d.), and Bob Palmer's *Thunderbird* (£5 16s. 1d.), *Chief* (£4 10s. 2d.) and *Smoothie* (£5 3s. 2d.), together with the Fox (0.15 or 0.35 at £4 10s. 2d. and £10 6s. 11d. respectively) to power them, are on the list, and among the C/L accessories are the Thimble Drome C/L handle, which has a built-in reel holding 200 ft. of line. This will cost £1 18s. 4d.

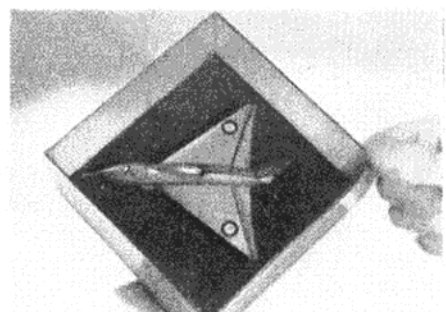
For the R/C boys there is the Deltron 109 receiver at £9 8s. 6d., and for two-speed glo-engine users the Ohlsson Full Range plug at 8s. 6d., while if you haven't yet bought a multi-speed motor there is the Fox 0.15 R/C (£12 12s. 11d.) or 0.35 R/C (£16, 3s. 5d.).

The items we have mentioned are but a few taken at random from the first shipment of goods, which will be available very early in January. There will also be another shipment later, and although exact details are not yet available, it seems likely that the full range of K & B engines, U Reely C/L handles, and Bonner compound escapements, will be included.

One point we must emphasise, these goods will be available from any reputable model shop—Bradshaws are wholesalers and do not supply direct. The prices we have quoted are retail ones, but shops can obtain trade lists by writing to the distributors.

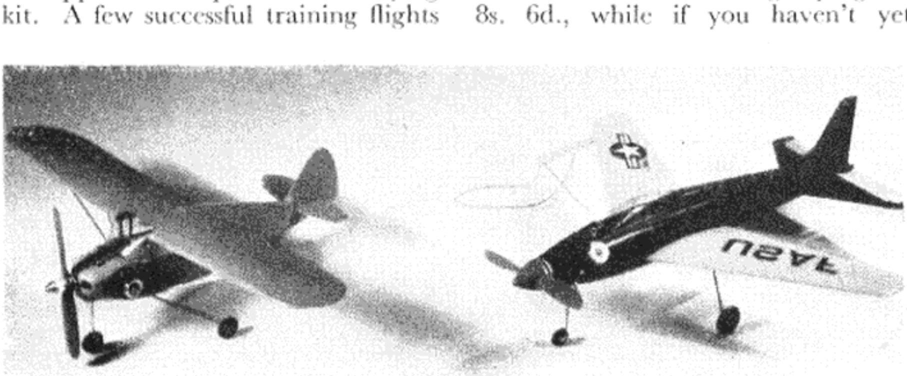
* * *

The mention of cut-out models usually conjures up visions of breakfast foods, but not if you've once seen a completed **Micromodel.** As the name suggests—and as the photo shows—these models are real miniatures, and although, because of the materials used, one cannot expect a normal " solid " finish, they do make up into very pleasing replicas.



The Micromodel Avro 707B.

There are three aircraft sets available, A.V.2 containing the Wright Bi-plane and the Bleriot, A.V.3—the Avro 707B and Canberra, and A.V.4—the Sikorsky and Bristol helicopters and the C.30 Autogyro. The contents of each set are very similar, consisting of the parts ready printed and coloured on thin card,

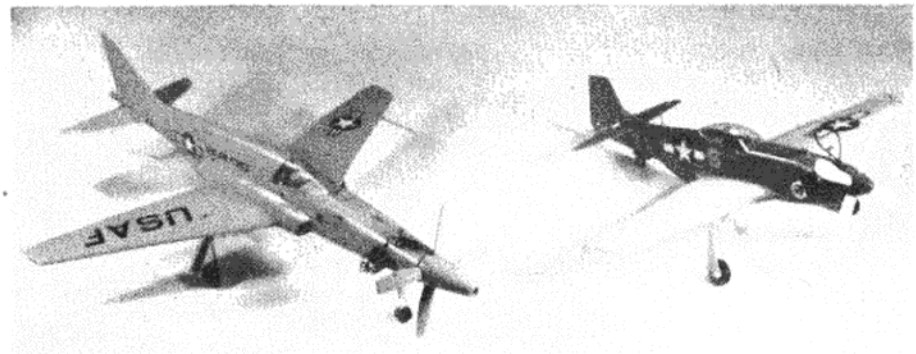


Bradshaws are importing four different ready-to-fly C/L models, each being complete in box with line and handle, but no fuel or starting batteries. Left are the Piper Tri-pacer (£5 5s. 0d.) and Sabre (£6 9s. 2d.), and at the top of the next page are the Starfighter (£9 14s. 0d.) and Mustang (£8 8s. 0d.). The motors on the last two have automatic starters.

which only requires cutting out and gluing together, and each set costs 2s. 6d.

* * *

In the past there have been three types of balsa cement user—the pin in nozzle, pick the end off, and chew the end off—now there will be a fourth, the plastic cap user. Several weeks ago we received from the Humber Oil Co. a tube of their well-known **Britfix** cement, which is now being sold with a plastic cap that is an (air)tight push fit on the nozzle. We found this most useful for keeping the nozzle of the tube clean, and the contents fresh—even after three weeks there was no film of dried cement—while as regards the



Our photograph shows a retailer's pack of Top Flite nylon props. Considered by many to be among the best plastic props. made, four sizes will be obtainable from Bradshaws, 5¼ x 3, 5¼ x 4, 6 x 3 and 6 x 4, all costing 2s. 11d. each.

Britfix cement itself, what more can we say than that it is one of the most popular on the market.

* * *

Many readers who have expressed interest in the Australian Glo-Chief 0.29 and 0.35 engines, which were described in our last issue, will be pleased to know that **Performance Kits** of 61, Pounds Avenue, Coventry, have been appointed sole importers and distributors for these motors. They will sell at £6 12s. 8d. each from all Performance Kits stockists.

From the same firm comes a range of new stunt tanks. Of very rugged construction, they are of elliptic wedge section, and feature a baffle, also the filler pipes are soldered together internally. Four sizes are available—small (30 c.c. 6s. 6d.), medium (2.5 in. × 1.6 in., 7s. 6d.), large (3 in. × 1.8 in., 7s. 6d.), and giant—to special order only—(4.2 in. × 1.8 in., 10s. 6d.).

* * *

Two of the new **Keil Kraft** kits —both control liners—which were shown at the Model Aircraft Exhibition will be out anytime now.

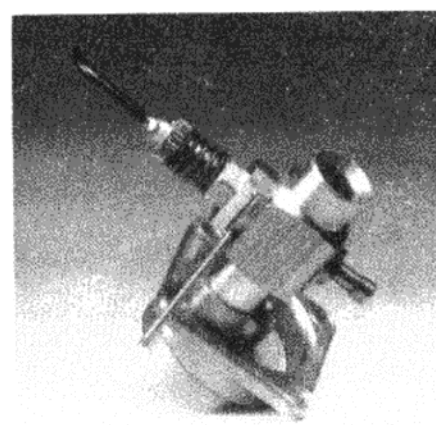
The *Spectre* will be first and this is a semi-scale, flapped, stunt model, which it is claimed will "do the book." Designed for 2.5-3.5 c.c. motors, the kit includes a plastic cowling, finished tank, wheels, and all the usual die cut parts, etc. This very complete kit will cost 38s. 5d.

The other model—called the *Talon* —is a very futuristic looking flying wing combat design, with a lively performance. In addition to the usual parts, this kit also will have a finished tank, while the instruction leaflet contains some very useful hints on combat flying. At a cost of 25s. 6d., this should be a popular model.

Incidentally, both kits include a steel bell crank, a feature that will be appreciated by everyone who has experienced a "pull-out" due to rapid wear with an aluminium one.

* * *

Owners of **E.D.** 2.46s who want reliable two-speed engine control will be pleased with the new backplate, incorporating a built-in throttle control, which is now available. All one has to do is remove the standard backplate and replace with the new one, and voila, a two-speed motor for a cost of only 18s. 3d. Owners of the 3.46 Hunter or 5 c.c Miles Special have not been left out, for a two-speed, screw in type, carburettor is also available for these motors at the same price of 18s. 3d.



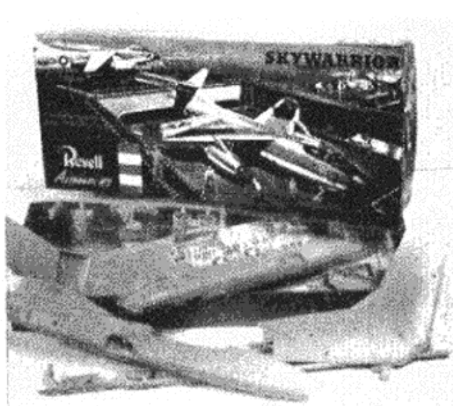
E.D.'s new backplate/throttle for the 2.46.

Also new from the same factory is the Taplin/E.D. twin, which is described in this month's Latest Engine News.

* * *

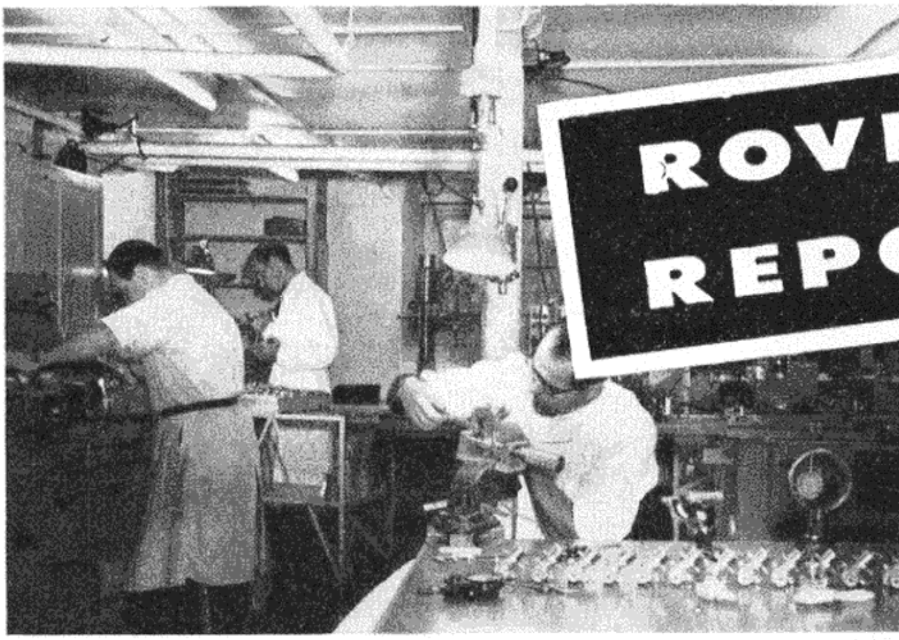
We have just received from **Revell's** an example of their *Skywarrior* kit, which is illustrated left.

Revell's Skywarrior kit.



An unusual feature of this model is the way in which the wings are made to fold, in the same manner as the original, to enable it to be accommodated in an aircraft carrier hangar. Life-like figures of the crew are included in the kit, and installed under the transparent canopy they lend an authentic air to the model.

Two other additions to the Revell range are the Lockheed *Hercules*, and the Martin *Seamaster*, both of which have a span of 11 in. plus. The retail prices of all the kits mentioned is 8s. 11d. each.



ROVING REPORT

Brings you up to date on the latest world model news

NORWAY. A corner of the David-Andersen machine shop at Bestun, Oslo, where the new D-A Drabant racing diesel is now being made. Jan David-Andersen is in the foreground.

BACK in the days of the Warneford Tractor Monoplane (1 per cent. of readers will know what we're talking about), it was possible to buy ready-built model aeroplanes. We mean real, built-up ones—made of wood and covered—not plastic control liners.

About every 10 years or so, someone comes out with a similar idea, but not on such a scale as the latest from U.S. wholesaler and importer John ("World Engines") Maloney.

World Engines are offering a "custom-built" *Astro-Hog* . . . no less! We understand that they are being built in Japan, by arrangement with the O.S. Company. They are covered and doped, complete Max-II Multispeed 35 engine, airwheels and fuel tank. They have rudder, elevators, ailerons and throttle controls, with all linkages installed and ready to connect to Bonner type servos. Servos, receiver and batteries are the only items not fitted.

These *Astro-Hogs* will be listed at $129.95—or £46 8s. 3d.—which is not bad when one considers the number of skilled man-hours that a good modeller spends in building such a model.

* * *

A new name to challenge Prati, Cellini and the Grandessos in Italian speed circles is that of the brothers Rossi of Brescia. Both of them were in the 1958 Criterium d'Europe speed event, Cesare being the highest placed "Western" entry (6th) behind the Hungarian and Czech leaders. A week later, brother Ugo topped the 2.5 c.c. class results of the *Coppa Celeste Patrona Aeronauti* with the exceptional speed of 211.764 km./hr. (131.59 m.p.h.), while Cesare was second with a performance almost identical to his Brussels speed: 204.545 km./hr. (127.1 m.p.h.). Both used the Super-Tigre G.20V motor.

In the 5 c.c. event at the same meeting, it was, as is common in Italy, a battle between American Dooling 29s and Italian Super-Tigre G.21s. Once again, a Dooling powered model won, Mario Sabbadin of Venice clocking 222.222 km./hr. (138.08 m.p.h.). Amato Prati (G.21) was second at 219.512 km./hr. (136.40 m.p.h.) and Renzo Grandesso (Dooling) third at 211.764 km./hr. (131.59 m.p.h.).

McCoy 60s, as usual, dominated the 10 c.c. event and filled the first five places, the best speed being by Antonio Giuponi of Venice with 243.243 km./hr. (151.15 m.p.h.). An identical speed was returned by Elio Zanin, with his own Zanin pulse-jet, in the jet speed event. Zanin jets, incidentally, were used by no less than six other competitors.

In the team racing event, the team of Berselli and Monti won in the very good time of 5 min. 18 sec., beating the Rossi brothers (who had the top eliminating time) by 17 sec. Both teams used Super-Tigre G.30 diesels.

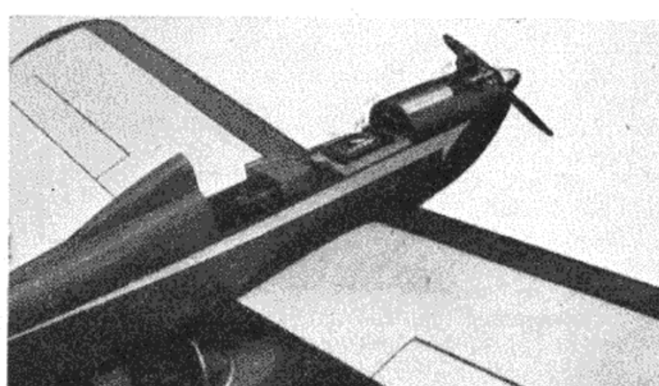
* * *

We have lately received a very nice illustrated catalogue from the Italian model firm, "Olimpic" of Melzo. This concern is offering a number of plans and kits by such notable Italian contest flyers as Carlo Bergamaschi and Fabio and Marco Contini. They are also marketing one of the few commercial R/C outfits in Italy, the "Golden Star" tone modulated equipment.

This is a single channel outfit operating on 28.5 Mc/s with 400 c/s modulation. The transmitter is of the portable, hand-held type and employs a two-valve circuit (DL.93 and DL.94). The receiver uses three valves (IU5, DAF.91 and DL.92) and is entirely enclosed in a

U.S.A. World Engines of Cincinnati are offering this "custom-built" 6-ft. AstroHog (right) complete with O.S. Max Multispeed-35 engine and all control linkages installed. It is priced at £46 8s.

CZECHOSLOVAKIA A superbly built Wakefield, featuring a long fuselage and small tail, by Forejtnik of Brno (left). It placed 7th in the Czech Nationals with a total of 817 seconds.



plastic case with short lead and plug for direct connection to a special plastic battery box. Also available is a motor-driven 3-volt actuator on the American pattern and known as the "Servo-Matic."

* * *

PNFMs (plastic non-flying models) are now being made in Australia. First kit to be manufactured there is a *Tiger Moth* by Alex Tolmer Ltd. It is claimed to offer better value than imported kits and contains 45 parts plus special jigs to assist accurate assembly.

* * *

Report from the Newtown Model Aeronautical Association of Queensland under the heading: "How's this for enthusiasm."

Four members of the N.M.A.A. recently travelled a round trip of 900 miles to fly in a meeting at Gunnedah, a small town in New South Wales. Arriving early Saturday morning after an all-night drive, they managed to win first and second places in the Class A team race and flew in numerous other events during the two-day meeting. They left for home at 8 p.m. and arrived 9½ hours later, just in time for breakfast and to start work. Final comment: All four will be there again next year. What's 900 miles and a couple of days running around the flying field? There's all the week at work to recuperate. . . .

* * *

Some of the keenest modellers we have met have been those of the R.A.F. clubs affiliated to the Royal Air Force Model Aircraft Association and there is a particularly active group at R.A.F. El Adem in North Africa. Secretary Jr./Tech. Lowther tells us that they call themselves the "El Adem Sky Pirates" and have 11 members at present. O. i/c is Flying-Officer Edwards, himself a modeller, and the lads are also fortunate in having a C.O., Group-Captain Low, who takes a great deal of interest in their activities.

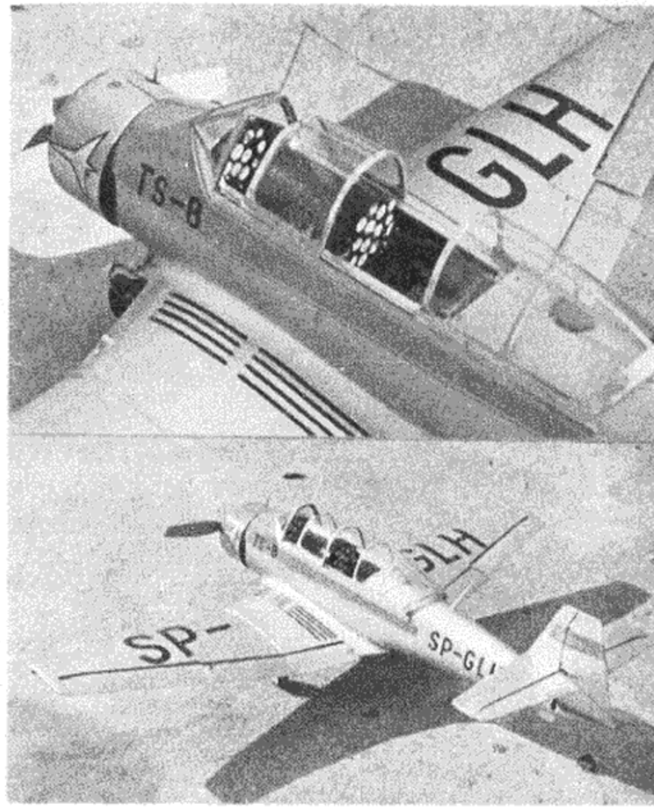
Main interest is in C/L, with the emphasis on team racing. Quite a variety of engines are owned by the club members, including Olivers, Etas, the ubiquitous E.D. Racer and Frog 500, P.A.W. Specials, Webra Mach-1, Dooling 29, Enya 15-D, Super-Tigre G.21 and even a German AFM-600 pulse jet. Jr./Tech. Lowther tells us that he ran some tests on the Enya, a Mk. II Oliver, a works-tuned Mk. III Oliver, P.A.W. Special and Webra Mach-1, to determine comparative fuel consumption levels for team-race work and that they came out in the order quoted, the Enya having the lowest, and the Webra the highest, consumption.

The AFM pulse-jet, says our correspondent, works very well and starts quite easily. For starting, a 2,000 p.s.i. air bottle, regulated to give 100 p.s.i. at the air line connection, was used, in conjunction with a transformer of 2,000 volts h.t. output for the spark supply. These jets, which are marketed by the Johannes Graupner concern, seem to be little known, even inside Germany, and it was interesting to have this first-hand report on one. Jr./Tech. Lowther also has an E.D. Racer on which he has done a considerable amount of work, taking it a stage or two farther than the Buskell-E.D. and Robinson-E.D. modifications and converting to glow ignition.

* * *

Perhaps someone has already used it here in Britain, but, if so, we haven't heard about it. . . . "It" is the latest American idea in fast team-race starts (glow, of course). . . .

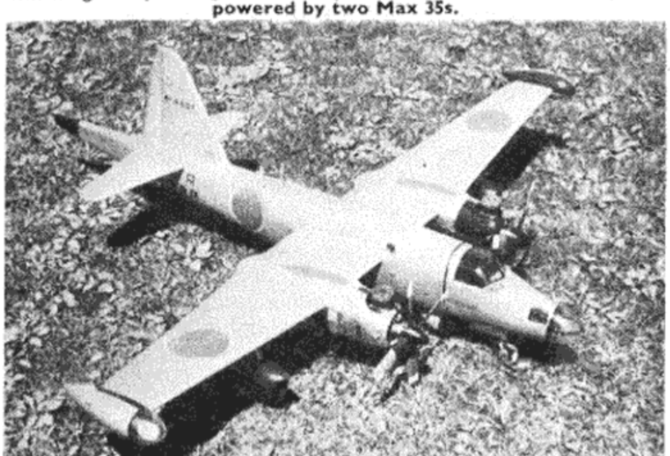
Your pit man is equipped with power at his finger tips . . . i.e., a wired gloved, contacts on forefinger and thumb, battery on his belt, battery leads taped to arm. Two brass shim contacts either side of the engine cowling coupled to plug and earth and no fiddling. Just grab the model naturally and hit the prop. (*We saw this system tried in 1953 but not very successfully.—Ed.*)

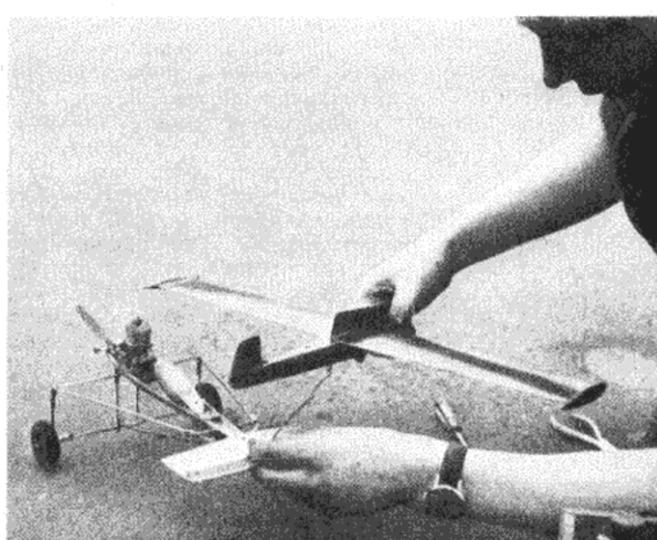


POLAND. This beautifully made C/L scale model of the Polish TS-8 Trainer, won second place in a scale model contest held by the Warsaw Aeroclub. It was built by Leslaw Pawlowski of Bialystock.

FINLAND. Super-Tigre G.20V powered Monoline speed job by Jarmo Jaaskelainen (right). He was Finland's team manager at Cranfield.

JAPAN. A fine Lockheed Neptune (below) in Japanese Navy markings. Spanning 50 in. and planked all over with balsa, it is powered by two Max 35s.





SCHOOLER

by

R.M.THOROGOOD

A 30 in. wingspan lightweight rubber model for contest beginners

SCHOOLER was designed as a competition model with the emphasis on simplicity, and intended to be suitable for modellers with experience of elementary sport models, such as can be gained from many popular kits. It was thought that a model of small size would be most suitable but with a minimum still air performance of $3\frac{1}{2}$ min. To obtain this performance a wing span of 30 in. was the minimum size that could be used, so the design was based on this dimension.

For simplicity and stability a parasol wing mounting was used—this avoided the use of a pylon mounting with its inherent complications, and dictated the use of a slab-sided fuselage. The folding propeller and dethermaliser are an essential part of the competition lightweight and these were naturally incorporated in the design. The resulting model has a performance in calm air of $3\frac{1}{2}$ to 4 min., with a rapid climb and floating glide, and the design has been built and flown by juniors and seniors with highly satisfactory results.

Fuselage

Commence construction by building the fuselage sides. The first side should be built over the plan omitting the sheeting and gussets. Care must be taken to set the $\frac{1}{16}$ in. sq. spacers with their lower faces flush with the bottom of the longerons. The second side must be built directly over the first but with the top faces of the $\frac{1}{16}$ in. sq. spacers level with the tops of the longerons.

All the cross spacers should then be cut to size from the top view of the fuselage, and the three central pairs of 3/32 in. sq. spacers cemented to the inside face of one of the fuselage sides, taking care with their alignment. The second side can now be cemented to the spacers, the assembly being held together with elastic bands; it is important to keep the fuselage square at this stage. When dry the remaining spacers can be added ; the nose and tail being drawn together first, then the intervening spacers added outwards from the centre.

The nose sheeting and gussets can now be added, also the plywood reinforcements. The parasol supports should be bent from 20 S.W.G. wire and also the dethermaliser hook; these must be bound to the fuselage with thread and given a liberal coating of cement. Finally, the motor peg must be carved from hardwood, be careful to see that the peg is sufficiently strong for its job.

Wings

Lay down the leading and trailing edges on the plan, packing up the trailing edge to allow for the undercamber, also remember to pack the lower main spar to the correct height when placing it in position. Cement all the ribs in place except the centre one, then when dry remove the wing from the plan and cement the upper main spar in position, finally building up the wing tips as shown.

To set the dihedral angle, pin one wing panel flat on the building-board and pack the other panel up until its tip is $2\frac{1}{2}$ in. above the board. Trim the spars to fit at the centre and cement them together, then cement the dihedral braces in position, followed by the centre rib—trimming this as required.

Tailplane and Fin

The tailplane construction is similar to that of the wing. Lay down the leading and trailing edges on the plan, cement the ribs into position, the spar can then be glued into place and, when dry, the assembly removed from the plan, and the tips fitted.

Now the fin, and here the first step is to build the laminated tip. Cut a former from 3/32 in. sheet to correspond to the inside curve of the tip. Then cut four strips 3/32 in. × 1/32 in. from soft balsa. Pin one of the strips to the former allowing an overlap at each end, the second strip is cemented to this and allowed to dry ; the other strips can then be cemented in turn and the whole removed when dry.

Build the fin outline on the plan, add the 3/32 in. sq. spar and when the cement is dry remove from the plan and add the $\frac{1}{8}$ × 1/32 in. cross spacers and $\frac{1}{16}$ in. dowel. The trim tab is best cut from thin aluminium (e.g., an Oxo tin) and inserted in the trailing edge of the fin. Finally cement the fin into the tailplane.

Propeller Assembly

The propeller assembly is the most difficult part of the model to construct. Mark the outline of the propeller blank onto soft $\frac{1}{2}$ in. balsa and cut to shape. Next mark the diagonals for the leading and trailing edges onto the curved sides of the blank, these are to give the correct twist to the blade. Carve the upper surface of the propeller first, using templates cut to the sections shown, and taking care not to cut the hub away. Completely finish the upper surface before beginning the lower. The lower surface is best carved by gouging away the wood until it is slightly thicker than required and then sanding it down to the exact thickness.

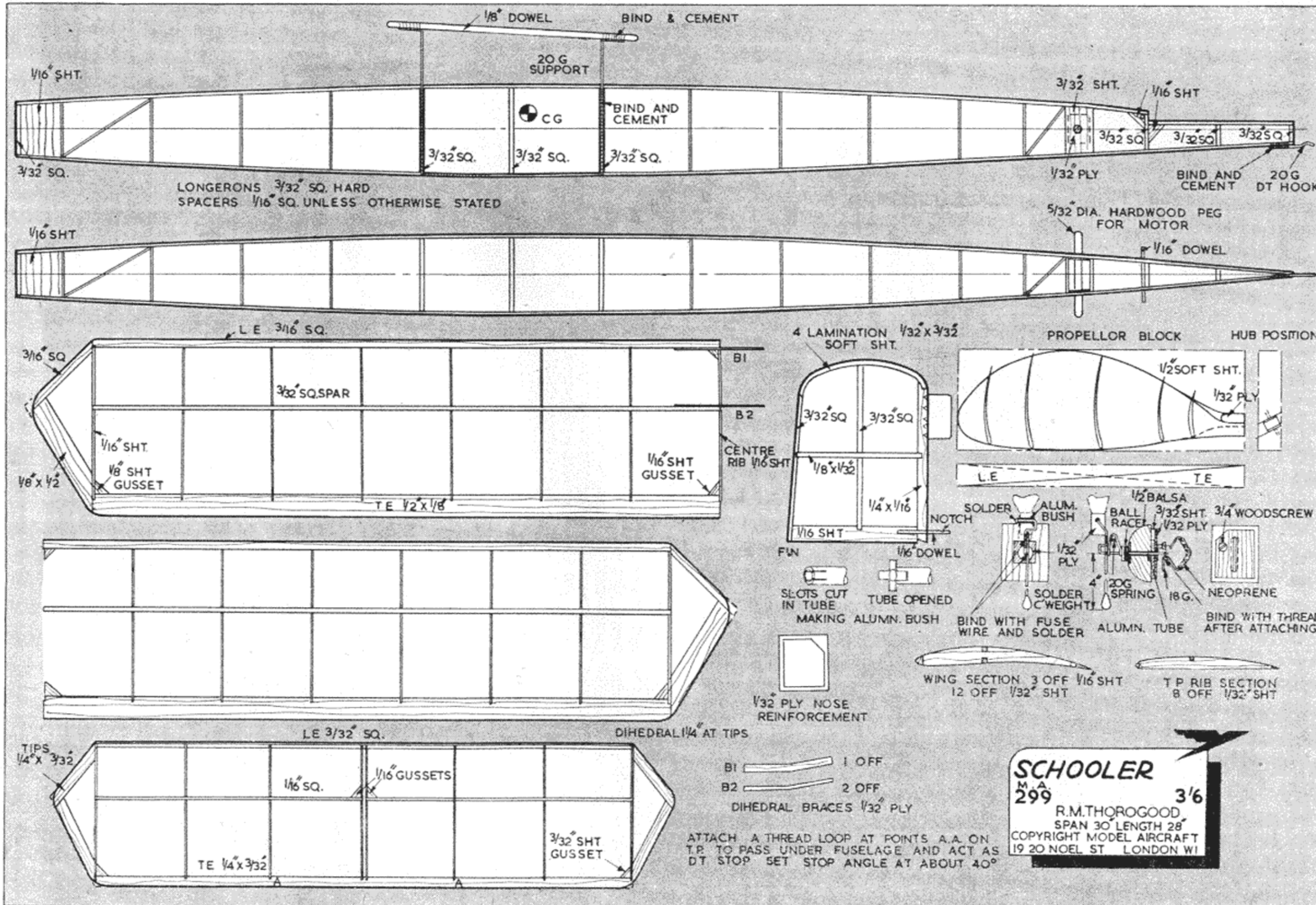
Lastly, the hub is carved to the correct pitch (as shown on the plan) and reinforced with 1/32 in. plywood as indicated. The propeller must be covered with lightweight tissue and given two coats of sanding sealer before mounting on the nose assembly and balancing.

Shape the noseblock from $\frac{1}{2}$ in. sheet and add the 3/32 in. sheet and ply reinforcements, then drill to take the 18 S.W.G. aluminium tube. Before fitting the tube, open out one end by making two cuts at right-angles to a depth of 3/32 in. then opening out as shown on the plan. Fit the tube in the noseblock, cementing well, and open out the other end. Bush the propeller in a similar way.

Bend the propeller hinge and winding hook on the 18 S.W.G. shaft and solder the counterbalance arm to this, binding it first with fuse wire. Then bend the spring from 20 S.W.G. wire and mount the spring and ballrace on the shaft. Attach the propeller, place the assembly in the noseblock, and balance the propeller with a solder counterweight.

The motor hook should next be shaped and neoprene tubing fitted to protect the rubber. Finally set a woodscrew

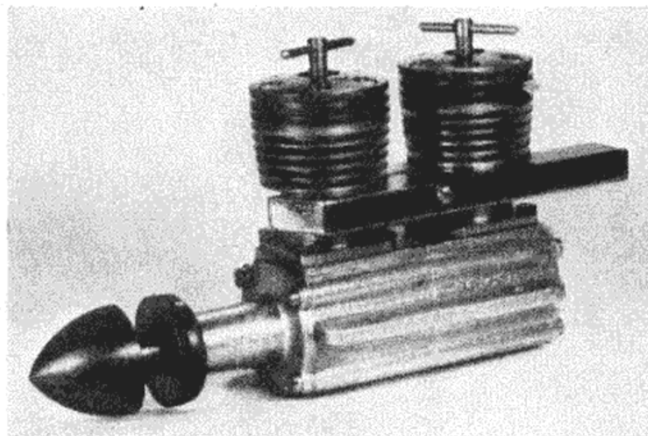
Continued on page 31



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

Peter Chinn's

Latest Engine News



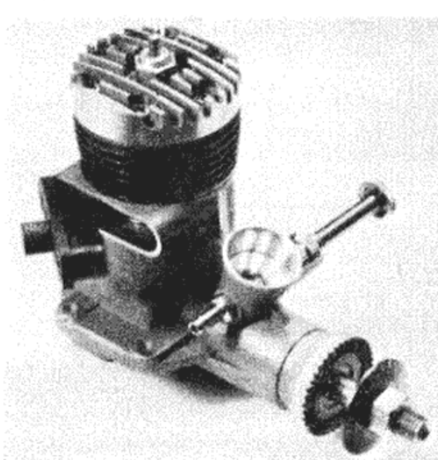
An interesting "in line" twin—the Taplin/E.D. model which is now commercially available.

THIS month we have a truly mixed bag, diesels, glowpluggers, twins and pulse-jets and from five different countries.

Starting at home, we begin with the Taplin Twin, the first production examples of which will be available by the time this issue appears. This engine is something really out of the rut and has been designed expressly for R/C.

The Taplin Twin was developed via several earlier vertical twin experimental engines of 4 and 5 c.c. capacity and readers may care to refer back to our May, 1955, article: "Twin Cylinder Topics," where the Taplin 5 c.c. model was described and some of the design problems of twin-cylinder motors were discussed.

The earlier 4 and 5 c.c. Taplin engines utilised cylinder and piston assemblies of the E.D. Competition Special and Mark III engines. The present unit, which is built partly by E.D. and partly by Col. Taplin's Birchington Engineering Company (and is marketed by the latter), employs modified E.D. Hunter 3.46 c.c. cylinder and piston assemblies. The cylinders are modified to have a single, smaller, exhaust port, plus an intake port, since the Twin is of the 3-port (or cylinder-induction) type and does not use a crankcase induction valve.



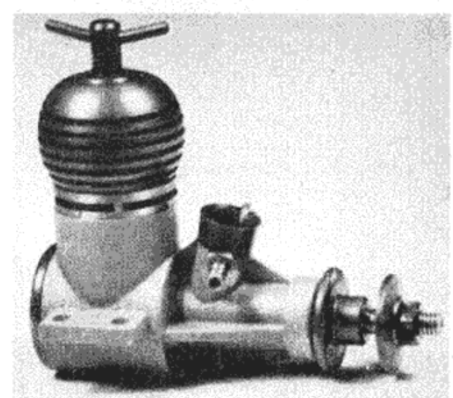
New 1959 O.S. Max 35 stunt engine has more power and the biggest shaft diameter of any 35. Note rubber exhaust plug.

The two intake ports are connected by a short induction manifold between the cylinders, to which a neat carburettor, with barrel throttle is fitted. The latter, like the K. & B. Multispeed carburettor, is provided with a screw adjustment for setting the slow-running speed. On the other side, a chromium-plated exhaust manifold connects the two cylinders to lead away exhaust smoke and oil.

The crankcase is entirely different from the earlier Taplin Twin design. Instead of being split along the horizontal centre line, it is now of the barrel type with a detachable front housing. The crankshaft remains basically the same in that the two crankwebs are coupled rigidly together in a single unit, the separate propeller shaft being driven by the extended front crankpin, which engages a hole in the propshaft disc. However, since the engine is now equipped with ball bearings (two on the crankshaft and one on the propshaft), the crankshaft now has to be made in two parts, the rear crankweb being pressed onto a serrated extension on the centre journal, after the latter has been inserted through the centre ball journal bearings.

The success, or otherwise, of any twin-cylinder model engine is, to a great extent, dependent on mechanical design, particularly in the alignment and rigid coupling of the two units to eliminate distortion, undue frictional losses and excessive wear. In the Taplin engine, these requirements have obviously been well taken care of and we feel sure that the engine is capable of giving long and trouble-free service.

In many respects, the Taplin Twin gets much nearer to "full size" engine characteristics, than most other commercially produced model engines. Its handling and performance will be the subject of a later report, when we have had the opportunity of fully testing a production model, but, in the meantime, it may be remarked that the motor is infinitely smoother running and easier starting than we have come to expect of large capacity diesels, has quite exceptionally good speed control, via the barrel throttle fitted, and is a good deal quieter running than other engines of similar capacity.



The Hungarian Alag X-04 1.49 c.c. Diesel which is now being sold in Britain.

Despite the more complicated construction of the Taplin Twin, it is very reasonably priced: £8 12s. for the air-cooled version and £9 10s. for the water-cooled marine model.

By now, you will be asking: what are the snags? On the debit side, therefore, it is only fair to remark that the engine is heavy: more than 17 oz. all-up, or double the weight of the average throttle-equipped 0.35 cu. in. glowplug engine, for rather less power. This weight is not, perhaps, so prohibitive as it sounds, because one can save a little and restore balance, with the average large R/C model, by making the nose shorter. The chaps who fly *Astro-Hogs* and similar fully-aerobatic multi-channel designs, where engines of high specific output and high power-weight ratio are desirable, may not feel disposed to throw out their Torpedoes, OS-Maxes and Foxes in favour of the Taplin-Twin, but for many other types of large R/C model, we believe that the Twin will prove to be a welcome addition to the British market—at present woefully short of domestically-produced engines suitable for multi-channel models. For the boat enthusiasts, of course, this new Taplin engine should prove very popular.

* * *

One of our most recent acquisitions from overseas is a new Tiger-Jet M-2 pulse-jet motor made in Japan. This is a development of the earlier Tiger M-1, a very good small pulse-jet which has proved very popular. The "M" type Tiger Jets stemmed from an earlier design, the "L" type, which like most others, was very similar to the American Dyna-Jet. The "M" types, however, are much smaller and lighter than the customary Dyna-Jet size and thereby fill a need that has existed for some time, namely, for a less ferocious unit suitable for smaller, lighter C/L models, such as 24-36 in. span jet fighters, etc.

The Tiger M-2 is $17\frac{1}{2}$ in. long and weighs only 6.9 oz. against the usual 16 oz. for Dyna-Jet size motors. Another advantage of the M-2 is that it does not need a special high-tension induction-coil starter system, the sparking plug of the earlier models having been replaced by a specially designed heavy-duty glowplug. This latter, which is much bigger than the standard $1\frac{1}{2}$ and 2 volt plugs used in piston engines operates from a 4 volt starting supply and has the element only partially shrouded.

The general appearance of the M-2 is similar to the earlier model and has the usual combustion-tube construction of stainless steel formed in two halves and welded. The head and intake construction is different, however, and features a separate valve plate with spun aluminium venturi choke, the two units being clamped to the combustion chamber by a wide alloy locking ring. A neat, red anodised cowl, is riveted to the latter.

Claimed static thrust for the Tiger Jet M-2 is 750 grammes—i.e., 1.65 lb.

* * *

The latest development in the popular 0.35 cu. in. glow engine class is a further improved version of the well-known O.S. Max-II 35, which will be available for the 1959 season. It has a new crankshaft and crankcase and offers greater power than the previous model.

The shaft journal is actually 13 mm. dia. (0.512 in.), the largest yet seen on a 35. The front bearing housing has been increased in diameter to cope

The component parts, and the new 4 volt glow type starting plug, of the Tiger M-2 "small" pulse-jet.

with this, which has had beneficial results in further strengthening the main casting. The shaft has been re-balanced and the induction timing modified.

The 1959 type Max-II 35 will also be available in the Max "Multispeed" version equipped with the O.S. system of coupled exhaust valve and carburettor butterfly.

* * *

Although based on the earlier type MVVS 2.5 racing glow motors which were so successfully used by the Czechs in former World Championship speed events, the Vltavan 2.5 has thus far failed to distinguish itself as a speed engine, just as its 5 c.c. brother also failed to live up to the promise of its MVVS prototypes. This will cause no surprise among speed enthusiasts, who now know well enough that top class performance is seldom factory-made, no matter how "classic" the specification may be, but in the case of the Vltavans, the gap between potential and actual seems to be quite a bit wider than usual.

Nevertheless, the Vltavan is interesting to examine, if only because it is the sole F.A.I. class I speed motor (being made on a "commercial" basis) that follows the classical racing engine layout.

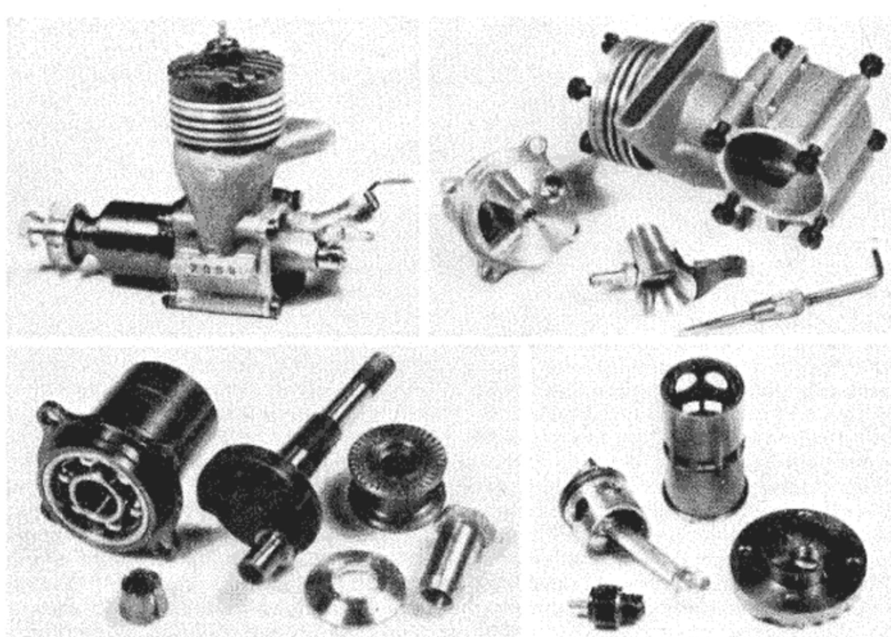
Briefly, its construction is much the same as that of the Vltavan 5 described in our July and Sept., 1957, issues and we will not, therefore, deal with it in any detail, especially as the accompanying photos clearly show the main features of the motor. Rather pleasing is the light piston and the excellently fitted and aligned con-rod bearings. The disc valve also deserves mention. It employs a very neat die-cast and machined rotor mounted on a 3.5 mm. dia. spindle, running in a $\frac{5}{8}$ in. long bronze bearing and secured at the rear by a collar and grubscrew. The rotor spindle is drilled to enable lubrication to reach the bearing. Unlike the 5 c.c. Vltavan, in which gas entry from crankcase to transfer passage is entirely via the piston skirt ports, the 2.5 model has a normal entry below the skirt of the cylinder liner.

The Vltavan 2.5 has the "standard" Continental bore and stroke of 15 × 14 mm. and weighs 4.2 oz.

* * *

Supplementing the Alag X-3 2.5 c.c. diesel that has been available in Britain for the last two years, Messrs. Relum Ltd., importers of these Hungarian engines, are now offering the 1.5 c.c. version of this design, the Alag X-04. This is a neat and compact little engine, smaller in overall dimensions than the average $1\frac{1}{2}$ c.c. diesel, and weighing only $2\frac{1}{2}$ oz. It has a bore and stroke of 13 × 11.2 mm., giving a swept volume of 1.487 c.c.

The same importer is also now handling the Hungarian Aquila Baby 1 c.c. motor, which was featured in our Engine Test series in June, 1956.



Parts of the Czech Vltavan 2.5 c.c. racing type glowplug engine. This example belongs to Ron Draper, former World F/F Power Champion.

Power Model Propellers

Some tips on what propeller to use for what job, with useful hints on checking pitches, and using different propellers to vary trim, by **RON WARRING**

THE modern model engine is an extremely efficient power plant which is one reason why relatively inefficient propellers can be used on a model and still give a reasonable performance. Only in a contest type model, where performance is the main aim, do modellers worry much about propeller shapes and sizes. For sport type flying, the propeller only becomes really important where the power available is marginal and has to be used as efficiently as possible.

This does, in fact, occur with some of the smaller sizes of glow motors, and with the really diminutive diesels. The latter, for example, are comparatively inefficient with a wooden propeller. But when fitted with a metal propeller on which the pitch can be adjusted by twisting the blades, it is possible to arrive at "optimum" pitch values so clearly defined than from merely operating a model as a "powered glider," a duration-type climb can be obtained. The same is true of some of the small glow motors. They make a lot of noise and run fast, but to get anything like a reasonable performance out of a model requires a considerable amount of trial-and-error testing to adjust the pitch of the propeller to its best setting.

The pitch of a propeller is not just the *angle* at which the blades are set, although this does govern the pitch. The propeller is effectively a screw. If a screw is assembled into a matching thread or nut, and turned, it will advance into that thread or nut. The actual distance it would advance in one complete turn (one revolution) is known as the pitch, and so is a straightforward dimension.

The pitch of a propeller is defined in exactly the same way, assuming that the propeller screws itself through some solid medium without slipping. In practice, of course, the propeller does "slip" in advancing, for air is far from being a solid medium and the *actual* advance per revolution of a model in flight is less than the stated pitch of the propeller—usually called the *geometric* pitch since it is defined by the geometry of the blades (i.e. diameter and blade angle). Since no accurate figures can be given for actual pitch since this will vary with different models, etc., obviously the geometric pitch is the only one which can be measured or quoted. In the extreme case, of course, with the model stationary there would be no *actual* advance, so that the effective pitch of that propeller would be zero, under those conditions.

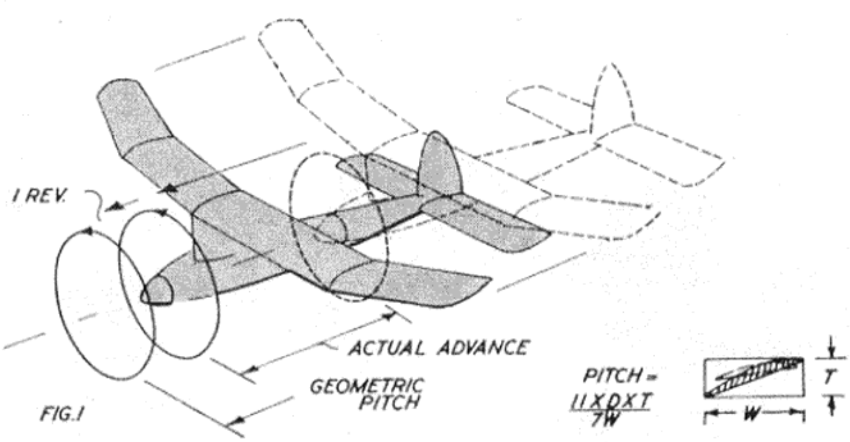


FIG.1

The difference between the geometric pitch and the actual pitch is called "slip." A little thought will show that when there is no slip—as in the case of the screw entering a nut—the blade or thread of the screw is working "edge on." When there is slip, the propeller blade is actually working at an angle to the air. It is this angle, equivalent to the angle of attack on a wing, which enables it to develop any forward force at all (thrust) when operating in such a thin medium as air. When slip is a maximum, i.e., the propeller is not advancing at all, the angle of attack of the blades is a maximum and equal to the *pitch angle* of the blades.

Remembering that propeller blades act like wings in generating "lift"—only this time the lift is forward thrust—they will also have a stalling point like wings. The greater the pitch the greater the blade angle, and thus the more likely the propeller is to be "stalled" when running with the model stationary.

This does not mean that the propeller will not generate any thrust. Even stalled, an aerofoil still develops lift, but more particularly it is generating very high drag. As a general rule, the greater the angle the lower the lift and the higher the drag.

Thus, for static running, a propeller with a high pitch will have a large braking effect on an engine without developing a lot of static thrust. A fine pitch propeller, on the other hand, may develop quite a lot of thrust and not much extra drag. Hence the engine will run a lot faster and appear to be more effective since it is obviously pulling harder.

In flight, however, conditions are considerably different. Any forward movement will "offload" the propeller by reducing its operating angle *through the air*, so the engine will speed up. The greater the change the greater the difference in speed, so the engine with the high pitch propeller will tend to speed up more than the one with low pitch. On the other hand, the model with the low pitch propeller will tend to accelerate faster since its static thrust is higher.

Changing the pitch of the propeller will therefore alter the behaviour of the model. Which pitch will suit it best is nearly always a matter of trial-and-error testing. As a general rule, the faster the claimed maximum speed for the engine (or the higher the peak r.p.m. figure as established by power tests), the finer should be the pitch of the propeller on *free flight* models to enable it to reach this speed. The actual model speed is not all that important.

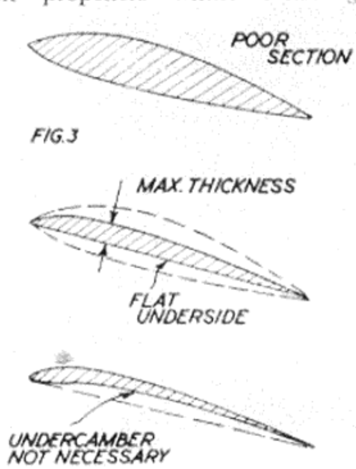
For C/L work the reverse is true. Most C/L models—and models designed for speed especially—have a very much higher flying speed than F/F models. A little thought will show that there is a limit to the speed at which any propeller can drive a model. It can easily be worked out. Multiply the pitch of the propeller by the revolutions per second and that will give you the speed per second for no slip—a maximum speed which a propeller will never obtain under working conditions, since it would not then be generating any thrust to pull the model forward.

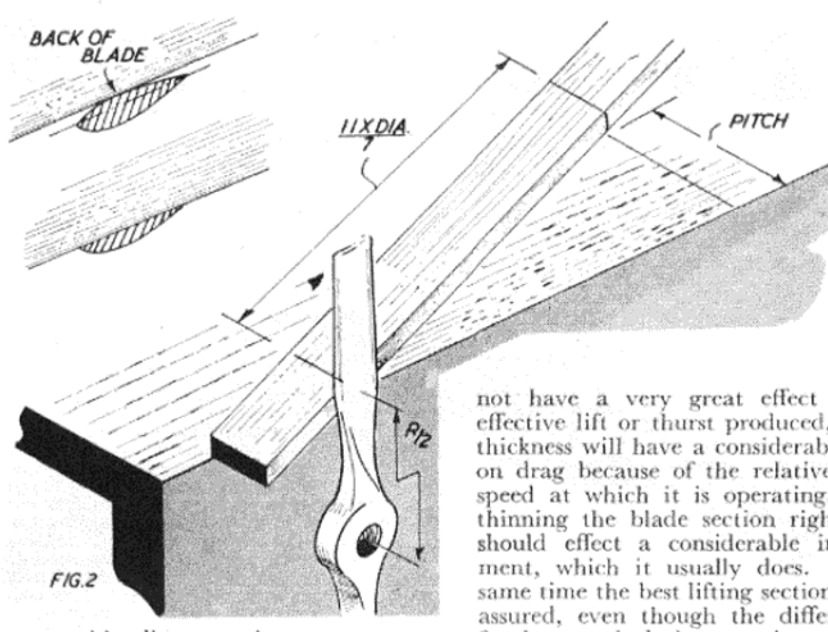
Absolute maximum speed of the model will also be governed by the peak r.p.m. figure of the engine. If this is, say, 15,000 r.p.m. or 250 ft. per sec., and the propeller pitch 6 in., theoretical speed with no slip would be 125 ft. per sec., or roughly 85 m.p.h. Its practical maximum speed would be lower for the propeller to be operating under "slip" conditions to generate thrust. For speed work reasonably accurate estimates can be made assuming a slip of 15 per cent. when everything is matched correctly, making the actual maximum speed of the above model about 72 m.p.h.

The only way to increase this speed is to use a higher pitch on the propeller. However, a higher pitch means increased drag and so diameter must be reduced to balance. Otherwise the engine would never achieve its peak r.p.m. figure. So the solution is a compromise, finding out the highest pitch value which can be used on a diameter size which enables the engine to operate at its peak speed and still generate enough thrust via the reduced blade size. It is usually found that an upper limit of pitch is soon reached, depending on the size of the engine, simply because the resulting diameter and blade area reduction necessary with higher pitches, reduces the efficiency of the propeller as a thrust-producer so much that the model will never have enough thrust to get up to the intended maximum speed.

From a theoretical analysis the optimum pitch for peak r.p.m. figures representing current practice in racing engines is about $10\frac{1}{2}$ in. Most speed models, however, are forced to use less and the smaller the engine the smaller the maximum pitch which they can accept. This is not so much a result of decreasing engine efficiency with decreasing size but decreasing *propeller* efficiency with decreasing diameter.

This also holds true for F/F work. Given two propeller sizes which represent an identical "in flight" load, generally the one with the largest diameter will be more efficient. In other words, large diameter fine pitch propellers should be best for duration work, and usually are. This becomes even more true the faster the engine type. Glow motors are inherently faster running than their diesel counterparts, although they develop rather less power for the same size. This leeway can be made up to a large extent by ensuring that they operate at their peak r.p.m. figure, calling for very fine pitch propellers whilst retaining a





reasonable diameter size.

The pitch as quoted for or marked on a commercial propeller is largely arbitrary. Without going into the geometry involved it can be said, simply, that the blade angle from root to tip must vary in a particular, progressive manner for all parts of the blade to have the *same geometric pitch*. This implies a twisted blade form with the pitch angle decreasing progressively towards the tip.

This pattern is normally followed on all propellers, but not necessarily in the exact manner as to give a true and constant geometric pitch. Thus when pitch is specified it normally refers to the geometric pitch *at a particular point along the length of the blade*. Where this point is taken can vary, but it is usual, in model practice, to take this as the mid point of the blade, i.e., the half radius point.

A simple method of measuring the pitch of any propeller is to mark the half radius position and hold the propeller upright against the side of a table, as shown in Fig. 2. A straight-edge (e.g. a length of balsa sheet) is then laid along the back of the blade at an angle conforming to the blade angle at this point (if the blade is convex, this position must be estimated carefully). Mark off a length along the straight-edge equal to 11 × propeller diameter divided by 7 and then measure the actual pitch of the propeller from this point *perpendicular to the edge of the table*. This figure is a more accurate measure of the actual geometric pitch of the propeller than the figure normally stamped on the blade.

It has already been shown that reducing the diameter of a propeller tends to decrease its efficiency. But reducing the diameter was necessary to reduce its drag. An alternative solution is obviously to decrease its drag by some other means, if this can be done. It can, quite simply, by improving the blade *section*. Thinking of the propeller blade as an aerofoil again, with such a small chord the actual shape of the section will not have a very great effect on the effective lift or thurst produced, but its thickness will have a considerable effect on drag because of the relatively high speed at which it is operating. Thus thinning the blade section right down should effect a considerable improvement, which it usually does. At the same time the best lifting section can be assured, even though the difference is far less marked, by ensuring that the maximum thickness of the blade comes well forward—Fig. 3. It should also be noted that incorporating undercamber in the blade will also improve its lifting characteristics slightly, but at the expense of increased drag. This undercamber *at a particular* section should not be confused with the normal "undercambered" appearance of a propeller blade produced by the twist or change in pitch angle.

The limit to blade thickness is governed largely by the material from which the propeller is made. Wood blades can be taken down extremely thin, but they become flexible or weak. Plastic blades are weakened as soon as the hard outer skin, produced when moulding, is broken through, but should retain enough residual strength to be worked down to quite a considerable extent. Best strength will be realised with nylon blades although it should be borne in mind that all the plastics used are of the thermosetting type and are rather prone to distort or warp when reduced to thin, unbalanced sections. Thus the ideal material for making really thin blades is something tougher, like red fibre.

The increase in performance which can be obtained by reworking standard commercial propellers is really worthwhile for contest work; although this does introduce a further problem, in that, with a finely trimmed model identical propellers should be available for replacement in the case of breakage. Changing a propeller, other than with an identical one, may affect the trim of the model. Thus a propeller which slows the engine down will increase the torque and tend to generate a turn to the left. A faster running propeller will tend to make the model turn more to the right. Either could be dangerous on a F/F model trimmed to the limit. But the sports flyer can adopt this technique for trimming, if he wishes—changing the pitch of the propeller to counteract an unwanted turn.

CLUB NEWS

"FORESTERS" M.F.C.

After a relatively inactive period, we are now back to our old strength, most of the new members are R/C enthusiasts, but a great many youngsters have also joined during the summer months.

We have about 12 active radio bods, mostly with single channel, using Hill type receivers and a very simple actuator employing the Mighty Midget motor giving—left: no signal; right: signal on, and neutral with 50/50 manual pulsing.

One or two of the members have had flights with the "Galloping Ghost" system, and we have at least three multi-channel enthusiasts. R/C models consist mainly of "Junior" 60s, but we also have one or two *Live Wires* and one *Smog Hog*. Veteran modeller, Fred Rising, is a frequent visitor at meetings and is very helpful to the newer hands in demonstrating R/C mechanisms to the uninitiated.

We held a film show recently, which was a great success. In addition to our own films taken during the 1958 summer season, we also had films of the 1957 S.M.A.E. Nationals at Waterbeach plus two films from Pan-American World Airways.

Mike Green (ex Croydon M.F.C.) made 11 : 32 under very bad conditions and Dave Bainbridge 10 : 30 in the Hamley Trophy, while our members took 2nd, 3rd, 4th and 5th places in the K.M.A.A. Trophy.

Our C/L experts are active again and they have been seen frequently practising combat and team racing, so we hope that once more it may be possible for the Foresters to shine in these events.

HUCKNALL & D.M.A.C.

Despite a series of new designs, the boys still favour the old "White Elephants" for combat. Even our radio man, Russ Tomlinson, has built two of them! The prototype, now Oliver-powered, scored our only win in a challenge match with the Kombat Kads, and also got through to the prize draw at Chesterfield. Our sole representative at Wigsley was unlucky in breaking his engine bearers when landing in his heat.

CROYDON & D.M.A.C.

Of late there seems to be quite a vigorous Wakefield movement springing up, and when the dreaded Wakefield symposium finally came around, it hardly hurt at all; even new member, D. Partridge, who recently topped the London Area S.M.A.E. Cup results with a full complement of maximums and 2 : 36, was seen negotiating for a winding tube. Now all that the boys are trying to find is some rubber. . . .

John Palmer won the Northern Heights Wakefield "do" at Chobham, with his elderly weighted-up model which was performing better than ever after John decided that tail tilt was strictly for the birds; Jack North's model unfortunately developed hygroscopic characteristics and wasn't dried out in time to fly that day.

Ken Smith's Super-Tigre found a new lease of life when fitted with a large-bore speed intake (nine turns open!), and managed to record 7½ min. in the Hamley on the front of his open model before the wings gave up the struggle.

We were very glad to welcome new members Johnny and "Pop" Knight into the fold a few weeks ago, and feel this also bodes well for our Wakefield contingent.

On Tuesday evenings we've been doing some indoor flying as well as our winter series of talks and slide shows; much appreciated was one on the '58 world champs. by John Palmer and Jack North, as well as Gordon Cornell's talk on the C/L championships at Brussels.

Our congratulations to St. Albans on beating us and reaching the final of the L.D.I.C.C. contest; an interesting competition—we found bit of up-country Chobham we never knew existed . . . mostly submerged.

CONTEST CALENDAR

Jan.	18th	Northern Area Winter Rally. R.A.F. Linton-on-Ouse. Open R/G/P. T/R ½A/A/B, R/C single. Pre-entry to P. Hollis, 15, Sitwell Grove, Warbrook Avenue, York.
Feb.	1st	N.W. Area Winter Rally, R.N.A.S. Stretton. Open R/G/P. Combat, T/R, A & B. R/C. multi and single. Full details next month.

OUTLAWS (CANNOCK) M.A.C.

The 1957 "Nats." film finally found its way to this part of the country and was very well received. Members of the neighbouring Walsall and Norton Canes Clubs were invited to the showing, and many were the derisive cries at the scene showing a certain Walsonian pranging his PAA-loader.

Biggest laugh in years occurred recently when one of our regular supporters, Miss Elaine Harvey, decided to try her hand at combat and then proceeded to beat the club "butcher" at his own game by deftly chopping his tailplane away! Junior member, Alan Beasley, recently produced a "Peacemakerish" job, which, despite being powered by a rather elderly E.D.2.46, turned in a performance which made many of the senior members reach speculatively for rulers and pencils after trying the handle. Mick Jarvis's apparently ageless Fox 35 is now pulling a 40 oz. *Calamity Jane* through the schedule, and this has inspired Roy Lockley to obtain a new Fox 35 and put it in a Bob Palmer *Smoothie*, first flights of which are eagerly awaited.

We recently obtained a bit of unexpected publicity with a mention in the national Press of the local council's decision to allocate a part of Cannock Park for flying.

FARNBOROUGH M.A.C.

The November club comp. was held in cold, breezy weather, but a pale sun provided slight lift.

M. Brown's Frog 2.49 B.B. powered *Landrail VIII* came through with a perfect total. This model looks like a *Gastove*, but has a rear-mounted fin and flat-bottomed airfoil sections, these latter being popular in the club for fast climb rate.

Nine seconds behind was junior R. Brown flying one of his *Hound Dog* models, powered by A.M.25; this design is fast earning a reputation for consistency, and despite a plain-bearing motor, its climb rate indicates no lack of thrust.

Third was J. Harris with E.D.2.46 *Hot-Pot V*, who was unable to complete three flights due to timer trouble.

NORTH KENT NOMADS

The club's recently formed entertainments committee got off to a flying start in organising a first class evening's entertainment. We were privileged in having Mr. Hundleby along to show us a two-hour colour film show of R/C flying in the "States." This film was received most warmly, and it was interesting to see how those across the water compared with ourselves. Mr. Hundleby and a well-known local modeller, Mr. Judge, judged our concours d'elegance during the evening, which showed that the club members had not been idle during the winter evenings, and in their own words "it was a very difficult task to pick out the two best models."

Our club championship this year was won by our hon. sec., Ray Parker, and in second place was our chairman, Jack Ascombe. We are wondering why the competition secretary did not occupy third place!!

As a result of our advertisement in MODEL AIRCRAFT for entries for the R/C, we have had a very interesting letter from Denzil Pompeus, 161, Kalubovila Road, Dehiwala, Ceylon, who would like to correspond with modellers in this country in connection with any branch of the hobby. In particular he requested details on how we run our competitions and championships, etc.

ST. ALBANS M.A.C.

Four members flew in the Hamley at Nomansland Common, but nobody placed despite G. Fuller's 6 : 18 fly-off time. George again achieved a motor run of over a minute on a test flight, the model climbing into cloud in doing so. About a minute later the model descended out of the cloud under d/t!

On November 2nd our slope soaring rally had to be postponed due to bad weather conditions. Apart from nearly continuous rain the mere fact that the flying site was 700 ft. above sea level and cloud base was at 500 ft. did not help matters.

On November 9th we flew off the L.D.I.C.C. semi-final against Croydon. The usual team of G. Fuller (rubber), B. Cox (power), and J. Simeons (glider), flew, beating Croydon by about 5 min. We now meet Surbiton again in the final.

SCOTTISH A.A.

The annual general meeting of the Scottish Aeromodellers Association will be held on Sunday, January 11th, in the Christian Institute, Bothwell Street, Glasgow. The meeting will commence at 3 p.m.

Any clubs interested in the proceedings are invited to send along two representatives. A fares pool is operated, so distance need be no deterrent.

CAMBRIDGE M.A.C.

During the past month, the club has lost five models, including a chuck glider and a scale *Luton Minor*! Dick Godden's chuck glider was lost from Ivinghoe Beacon, and was last seen as a speck going steadily upwind, while on the following day Dick also lost his *Luton Minor* —3 min. o.o.s.—while flying in the club scale contest.

Several members visited Ivinghoe for the St. Alban's slope soaring rally, and lost three models before they had to give up owing to very low cloud. The club has since discovered a sizeable mound at one end of its flying field, and is using it successfully for slope soaring.

A line snag and an into wind take-off put both our team-race entries out of the running at the E. Anglian team event, just when they were beginning to show promise. However, we gained some consolation from the fact that another Cambridge club, Impington M.A.C., won the race.

Mike Hobbs inevitably treed his model while flying in power, and though it was rescued after several unsuccessful attempts to shoot it down, he lost it again after his second comp. flight. (The area round Debden must be littered with models by now.)

Found at Debden.—A payloader with white wings—Amco-powered. May have been lost at R.A.F. Champs. The R.A.F. will be pleased to hand it over to the owner if he gives them a fuller description of the model.

LOUGHBOROUGH COLLEGE M.A.C.

Many "freshers" have been welcomed to the club and much building has been going on. Our congratulations go to Dave Topham for putting us on the map with his fine win in the Halfax Trophy. He used a radial-Elfin 2.49 in a fast climbing lightweight based on Tom Smith's layout. It was good compensation for the cold motor-bike ride and a thorough soaking received whilst retrieving.

STEVENAGE M.F.C.

Comp. sec., Ray Rawlinson, came in for some black looks recently when eight members attended the South Midland Area rally only to find that they were ineligible to enter, this must have been the only glider contest where the timekeepers were queueing for competitors!

For the area picnic at Benson the weather man repeated his Northern Heights performance with a glorious flying day for the 16 members who attended by coach. Geoff Dallimer placed second in glider, whilst John Brookes by a crafty hand launch won the "fifth down takes all" glider mass launch, only to have his conscience get the better of himself and admit it! Whilst the contest boys were away at Benson, Vic Searle lost his "Topper" kit glider 10 min. o.o.s. from the club flying ground.

We would like some advice—how does one keep up interest at the clubroom during winter months? We are unable to do any building there, but we can brew as much tea as required. Any ideas?

URMSTON & D.M.A.C.

Recent activity in the club has centred manly on C/L, and at the N.W. Area rally at Stretton, club members took first and third places in combat.

SOUTH COAST GALA

Held at Ford for the first time, the South Coast Gala was favoured with fair weather, the threatening clouds never did more than threaten and the wind was such that a model de-thermalising at three minutes landed well inside the aerodrome. The only complaints came from the glider flyers, who were having to work quite hard at times to get their models to the top of the line.

Although there was some thermal activity there were few fly-aways and the quality of the flying can be adjudged from the results with fly-offs in all three classes. Possibly the greatest variety of models could be seen in the glider contests with many large spans, some tailless, in evidence. Many illustrious names were beaten by junior C. Fuller in this event.

The gala was organised by the south-eastern area committee of the S.M.A.E. and clubs in the area were responsible for the running of the various events.

Results

Glider (75 entries)

1. S. Hinds	Wallasey	7 : 42 + 2 : 12
2. C. Fuller (J)	Spring Park	7 : 42 + 1 : 45
3. D. A. Williamson	Spring Park	7 : 29

Power (49 entries)

1. B. Eggleston	Baildon	9 : 00 + 3 : 24
2. M. Gaster	Surbiton	9 : 00 + 2 : 48
3. P. Buskell	Surbiton	8 : 55 + 3 : 08
4. K. McClave	Colne	8 : 55 + 1 : 41

Rubber (25 entries)

1. F. H. Boxall	Brighton	9 : 00 + 4 : 25
2. N. Elliott	Men of Kent	9 : 00 + 4 : 23
3. G. Fuller	Croydon	9 : 00 + 4 : 14
4. J. Baguley	Hayes	9 : 00 + 4 : 10
5. J. North	Croydon	9 : 00 + 3 : 10

Chuck-glider (63 chucks)

1. Young	Surbiton	1 : 16
2. Sturgess	Croydon	1 : 15

EAST LANCASHIRE M.A.C.

At a meeting held recently the above club was formed by an amalgamation of the former Colne & D.M.A.C. with the Accrington M.F.C and a group at Burnley. Eric Lord of Accrington—well known in the North-Western area—was elected chairman.

Any local modellers interested in joining the club can get full details of membership from the secretary. (See under new clubs.)

LIVERPOOL & D.M.A.S.

Most of our 64 members turned up for the A.G.M., where our president, R. F. L. Gosling, aware of the growing competition spirit in the club, announced that he will present a cup to the member showing the best results in S.M.A.E. comps.

We had a good day out at Stretton for the Hamley, with Alan Carter best on the field with three max's and a fly-off of 3 : 45, all in shocking visibility. In support, two more of our power men put in good times, all using Alan's own design *Incinerator* (watch out for this job at the contests).

In the Neal Trophy for single-channel radio, Al (the Sax) Palmer placed 3rd with an American job, *Breathless*, and Dave Thomas was 4th with a low winger called *Westwind*. It looks like the sparks are starting to fly at last (ouch).

SIDCUP M.S.

Due to increasing interest in other forms of modelling in the club, particularly R/C boats, we have changed our name to "Sidcup Model Society." We have lost several active members due to our policy of encouraging juniors rather than go pot-hunting every week, but thanks to the efforts of Mike Bassett, we were able to bring home the team-race trophy from the Southern Area rally at Beaulieu.

We fielded three class "A" and two "½A" teams, and Mike's Oliver-powered models romped home to win both classes. His times were 8.32 min. for 10 miles in "A," and 5.17 min. for 5 miles in "½A."

We have had a new transfer made which consists of the Kentish white horse on a blue rectangular background surmounting a pair of crossed swords. Underneath is a white scroll on which is mounted "Sidcup" in red.

A "Sidcup Model Society Film Unit" has been formed and its first film, now in the making, is in technicolour—its subject being the boat section's activities. We are also developing a way of synchronising a tape recorder for the sound track and results so far have been very promising.

WALLASEY M.A.C.

We held a very successful meeting at our newly acquired hall, "Beechcroft," the use of which has been kindly granted by Birkenhead Education Committee. The hall will be well suited to indoor flying.

An excellent talk was given on design o gliders by our well-known A/2 exponent, John Hannay, designer of *Topscore*. The basic design of an A/1 was delved into, the junior members learning a lot of useful gen. The model is as simple to construct as possible, but with a lot of design features of *Topscore* which ensures good towline stability and good flying times. It is felt that the best thing to hold a beginner's interest is—*results*, which we know this model will give.

BAILDON M.F.C.

A very high wind decimated our F.A.I. power contest at Baildon, and only two machines—A. Collinson's world championship model and J. A. B. Pannett's Torpedo-powered *Swiss Miss*—stayed the course, finishing first and second respectively, with the pathetic aggregates of 4 : 27 and 4 : 08 ! (Arthur's model, in fact, was lost on its last flight, but was fortunately recovered safe and sound three days later.)

In contrast, the following Sunday—although damp and misty—produced almost ideal still air conditions for the Hamley and some high aggregates were recorded; Arthur Collinson excelled himself by achieving a triple max plus the astonishing fly-off time of 7 : 58. J. A. B. Pannett's *Super Creep* turned in two max's and logged 10 : 53, and Stan Eckersley came third with 10 : 46—while Pete Barnes (unluckiest of men) lost sight of his model UPWARDS after following it for 12 min. across country on its first flight !

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

Meetings are now taking place between ourselves and the R.A.F. Gaydon club at their clubrooms on the first Monday of every month. A fortnight after the Gaydon meeting (in the middle of the month) we hold our own club night at Office 15, (1st floor) Central Chambers, Stratford-on-Avon, at 7.30 p.m. New members are always welcome.

ENFIELD & D.M.A.C.

Indoor rubber team racing is now becoming very popular, and we have now agreed on a set of rules which are as follows:—

Maximum fuselage length 20 in., wing span 60 per cent. of fuselage length, maximum weight 2 oz. including rubber. Races are to be run over 30 laps on 8 ft. lines. The models must also be of semi-scale appearance (within general team race limits). Some of the models which have appeared have been very impressive, giving a speed of some 40 m.p.h. for up to 15 laps.

WEST BROMWICH M.A.C.

The club underwent a minor crisis last month due to the resignation of Maurice Philips, who over the past three years has done the jobs of treasurer and chairman. His resignation was due to ill health, and the club regrets the loss. The new chairman is Dave Wilkes, one of the Black Ghost combat team. The new treasurer, P. Thomas, is a new arrival in the club, but he has already proved himself a good contest flyer by winning the club F/F trophy.

Our requests to the local council about a flying field are still being ignored, and we are losing good members, through the juniors not having transport to get them to the nearest flying field. Highgate Common, which is nearly eight miles away from West Bromwich and is impossible to reach by bus.

As ever, the club has a steadily declining senior membership, and anyone in the district who is interested should come to our meetings, every Thursday night in the Boys' Hall at Charlemont Schools.

NORTHERN HEIGHTS M.F.C.

The weather was perfect for our Wakefield competition—very calm—cold, but slight thermal activity which must have flattered the performances to some extent.

We were a little disappointed that there were only 15 entries, but think that the comp was held a bit too early, as, significantly most of the models were not new ones, but old ones refurbished.

Notable in the entries was J. Rowlands, who has recently come under the spell of Geoff Lefever's enthusiasm. He has been modelling for many years, and last entered a competition 18 years ago !—this he won with a duration of 80 sec.

Results

1. J. Palmer	Croydon	14 : 58
2. N. Elliot	Men of Kent	14 : 29
3. G. Lefever	South Essex	14 : 05
4. R. Copland	N. Heights	13 : 40
5. J. Rowlands	South Essex	12 : 12
6. R. Chesterton	N. Heights	11 : 50

Schooler

Continued from page 24

with a countersunk head in the noseblock to act as a stop for the propeller, arranging it so that the blade folds on the right hand side of the fuselage, looking towards the nose.

Covering

The model should be covered with lightweight tissue and given two coats of dope, when the final weight distribution should come out approximately as follows:—

Fuselage	¾ oz.
Wing	½ oz.
Tail and fin	⅛ oz.
Propeller	¼ oz.
Motor	1½ oz.
Total	3⅛ oz.

Motor

The motor should be made up from 21½ ft. of ⅛ in. × 1/24 in. rubber into eight strands approximately 32 in. long. This must be well lubricated with castor oil and when run in will take approximately 950 turns. After the motor has been attached, the hook should be bound with thread to prevent it from opening out.

Trimming

Before test gliding the model, give the motor 300 turns and allow it to unwind while the model is held in the hand. This tensions the motor and holds the noseblock in position. Trim the glide to a slight stall with the model flying straight, and then adjust the trim-tab to give a fairly tight right turn. All subsequent trimming under power should be carried out by adjusting the side and downthrust at the nose-block.

For the initial trimming flights under power, give the motor about 200 turns and adjust the side and downthrust to give a moderately steep right hand turn. Increase the turns by increments of 50 up to a maximum of 950 to 1,000 obtaining the best trim at each stage and being careful to avoid power stalls.

Under full turns the model should climb almost vertically with a slight right turn which develops into a full spiral as the power slackens. Adjust the propeller stop so that no height is lost at the end of the power run, and when correctly trimmed, times of 3½-4 min. should be achieved.

Last but not least, don't forget to put your name on the model and use the dethermaliser at all times.

NEW CLUBS

EAST LANCASHIRE M.A.C. P. Wilson, 42, Newmarket Street, Colne.

CHANGE OF SECRETARY

PORTSMOUTH M.F.C. I. Evans, 6, High Grove Road, Copnor, Portsmouth.

READING & D.M.A.C. K. Bell, 18, Russell Street, Reading, Berks.

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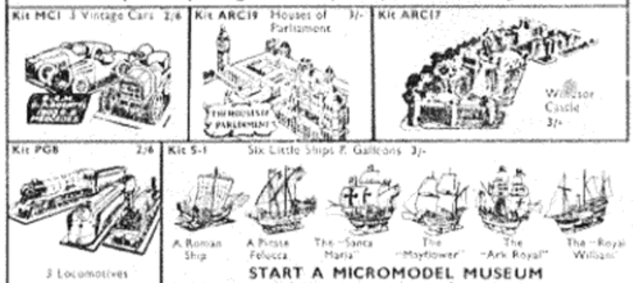

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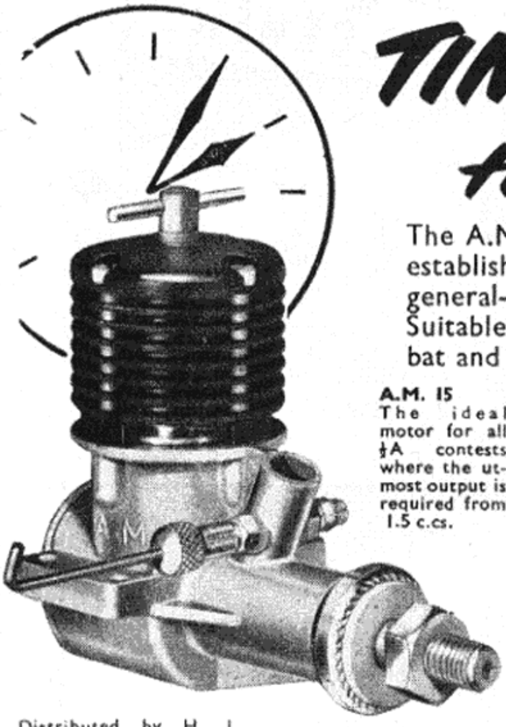

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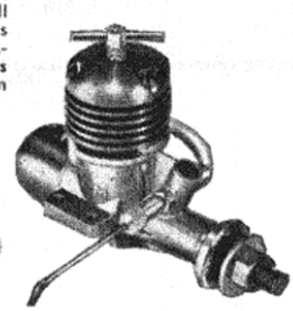

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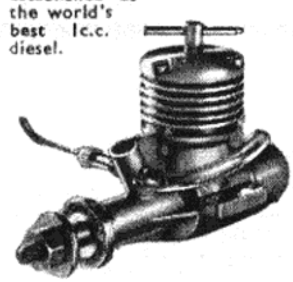

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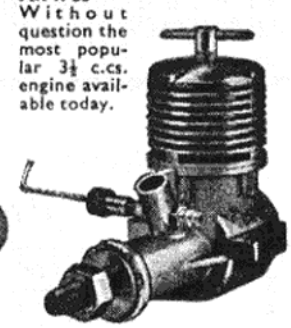

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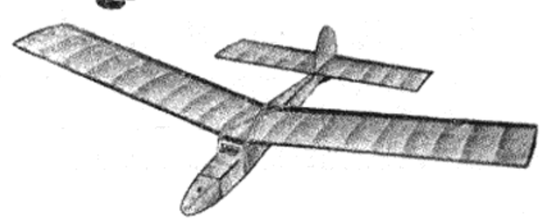

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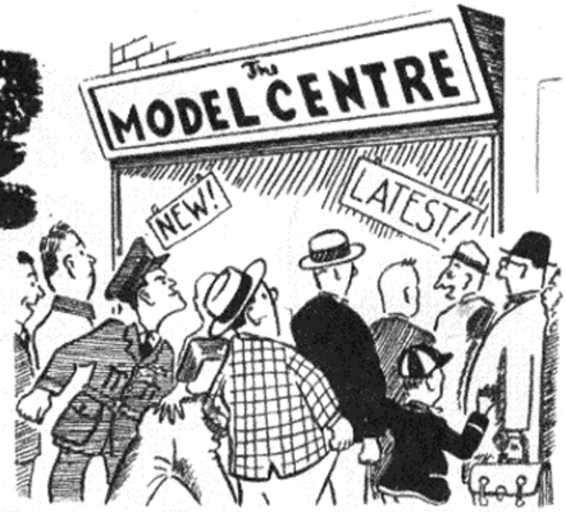

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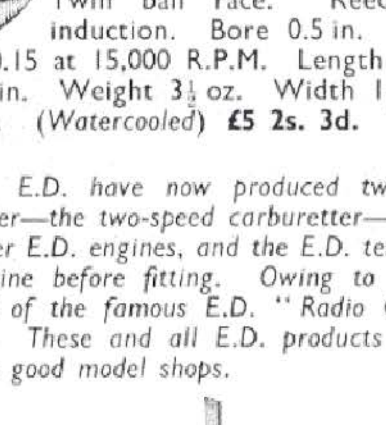

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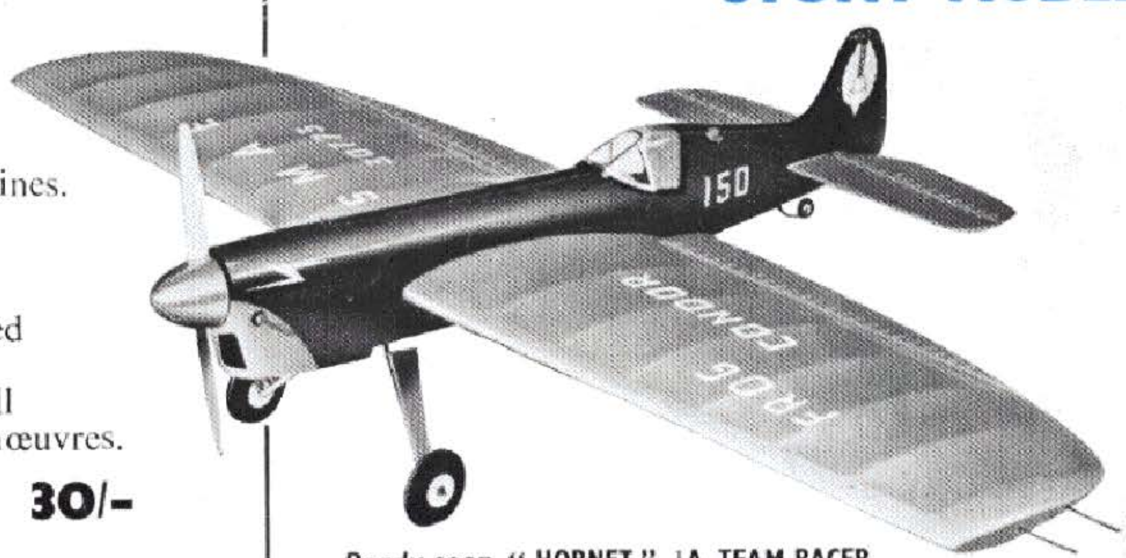

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