MODEL AIRCRAFT

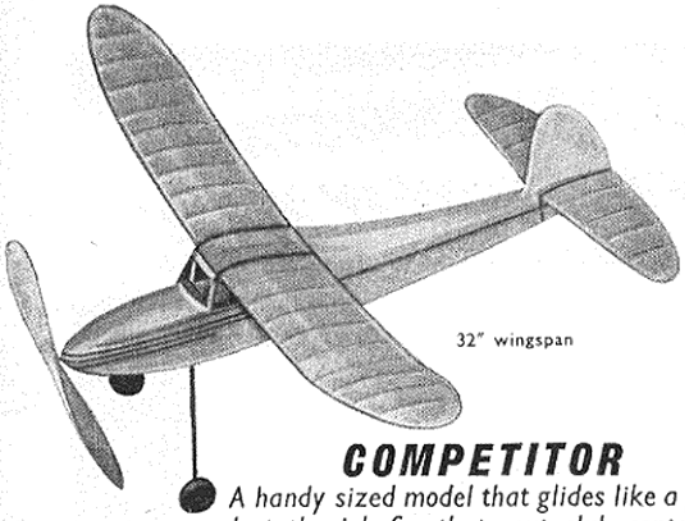
1.0480

J 9480

Christmas Greetings

1'6

DECEMBER 1957

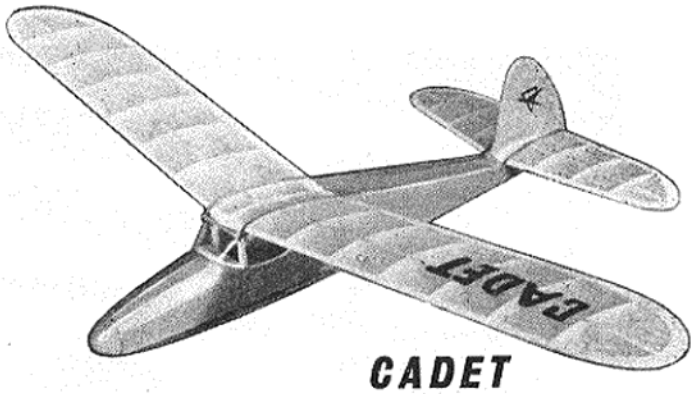


32" wingspan

COMPETITOR

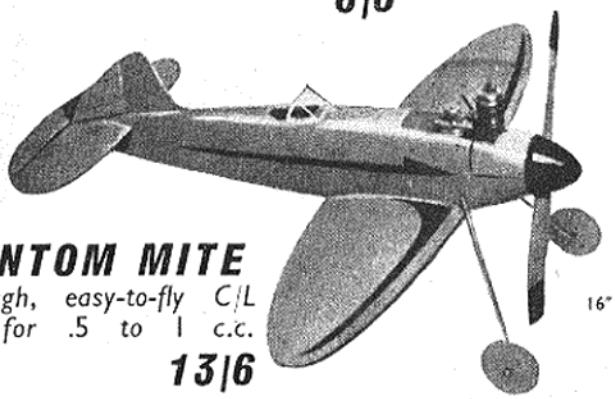
A handy sized model that glides like a gull. Just the job for that next club contest!

8/6



CADET

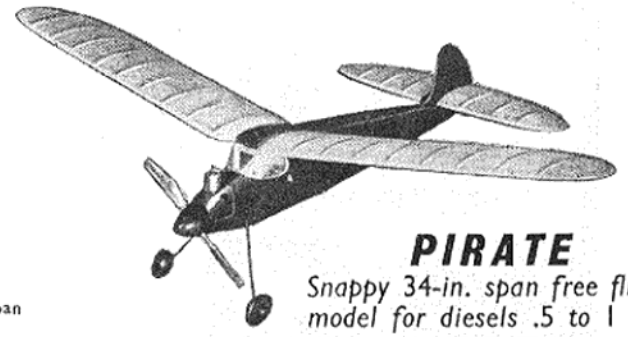
If you are looking for a good beginner's glider—this is it! The Cadet features simple, sturdy construction, and is easy to trim. 30-in. wingspan. **4/9**



16" wingspan

PHANTOM MITE

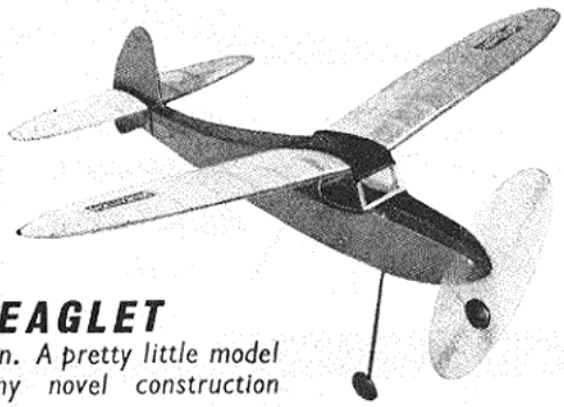
The tough, easy-to-fly C/L trainer for .5 to 1 c.c. diesels. **13/6**



PIRATE

Snappy 34-in. span free flight model for diesels .5 to 1 c.c.

14/3



EAGLET

24-in. span. A pretty little model with many novel construction features. **5/6**

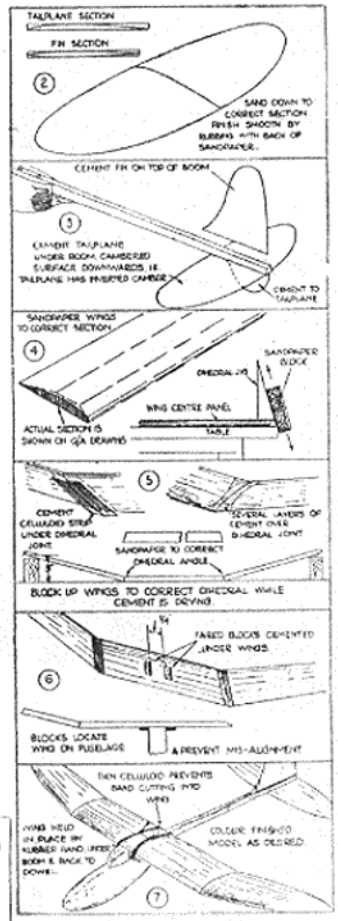
ACE

30-in. wingspan. Fine value for money, and a great flyer. **6/-**

The BIGGEST all balsa kit

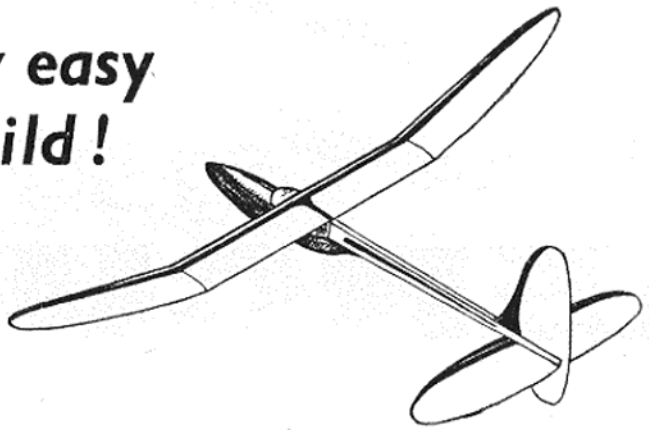
Skyleada

THREE FOOTER

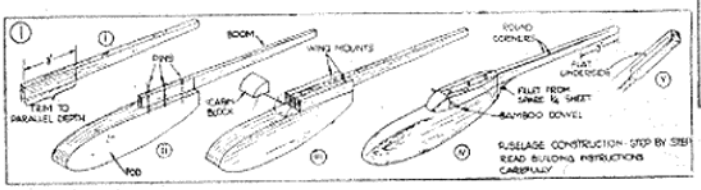


Look how easy it is to build!

With wings now machined to aerofoil section and die-cut tailplane, the **THREE FOOTER** is the only high performance glider which is really easy to build.



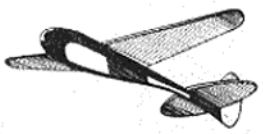
ONLY 6/-



Skyleada

GLIDERS FOR EVERY TASTE

SWIFT 20 in. Span, all balsa prefabricated. **Price 3/-.**



ALBATROSS 48 in. Span Glider for the more advanced modeller. To the A-1 Nordic specification this model is a real delight to fly. **Price 11/3.**

MIDGE 12 in. Span, all balsa prefabricated. Only requires glueing together. **Price 1/5.**

SEAGULL 32 in. Span Gull-wing Sailplane. A really delightful model to build and fly and without doubt unsurpassed value at the low price of **3/9.**

WIZARD 24 in. Span, all balsa. Completely prefabricated. A smaller version of the Three Footer, **Price 3/8.**

JEEP 20 in. Span built-up wing and tailplane, pod and boom fuselage. Ideal for either hand launch or tow line. Equally suitable for power by Jetex 50. **Price 3/11.**

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THE HOME OF FINE MODEL KITS

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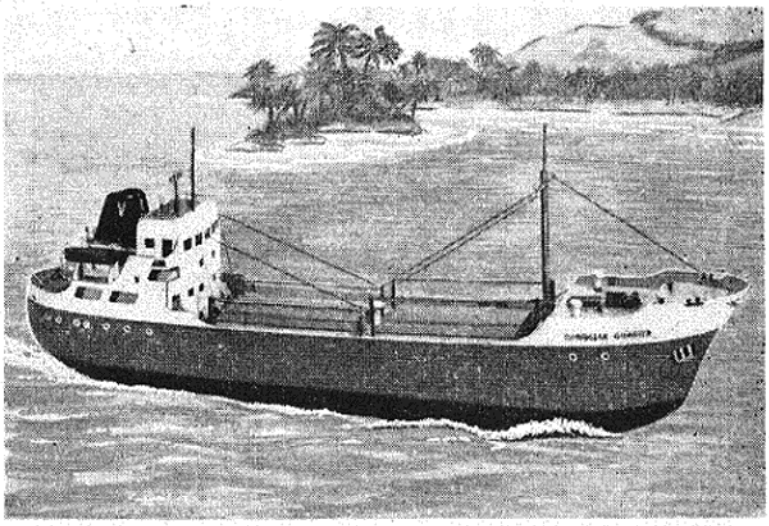
In time for Christmas

The 'CARIBBEAN COASTER'



Our latest and most progressive kit. Thousands saw our prototype "Caribbean Coaster" demonstrated under "Radio Control" at the 1957 Model Engineer Exhibition and on TV and described it as "CLASSIC"—a beauty in both hull and superstructure made from a kit full of qualitative die cut ply and spindle moulded balsa parts and fittings in a form conducive to easy, quick yet robust construction.

A high degree of pre-fabrication, plastic, metal and ready-made parts coupled with a graphically illustrated plan and instructions showing progressive sequence of assembly.

Suitable for Taycol "Torpedo" or "Target" (6 to 12 volt motors) or up to 1 c.c. diesels and radio control.

KIT PRICE **98/6** (Tax Paid)

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FREE FLIGHT · SOLIDS
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★

DECEMBER 1957

Vol. 16 No. 198

CONTENTS

★

The official Journal of the
SOCIETY OF MODEL AERONAUTICAL ENGINEERS

★

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New C/L Stunt Rules

WE feel sure that British C/L stunt flyers will welcome the news that the S.M.A.E. have decided to adopt the American Academy of Model Aeronautics stunt pattern and rules for future contests in this country.

Having had a good deal of experience of judging stunt contests abroad in which the A.M.A. pattern has been used, we know that it works well. The complete schedule, together with the maximum points obtainable, is shown below.

Design	... 10
Realism	... 10
Finish	... 10
Detail	... 10
Starting (within 1 min.)	... 5
Take-off	... 40
Reverse Wing Overs	... 40
Inside Loops (3) ...	... 40
Inverted Flight (2 laps)	... 40
Outside Loops (3) ...	... 40
Inside Square Loops (2)	... 40
Outside Square Loops (2)	... 40
Triangular Loops (2)	... 40
Horizontal Eights (2)	... 40
Horizontal Square Eights (2)	40
Vertical Eights (2) ...	... 40
Hourglass Figure ...	... 40
Overhead Eights (2)	... 40
Four-leaf Clover ...	... 40
Landing	... 40
Flight Pattern ...	... 25
Total:	670

Film for Clubs

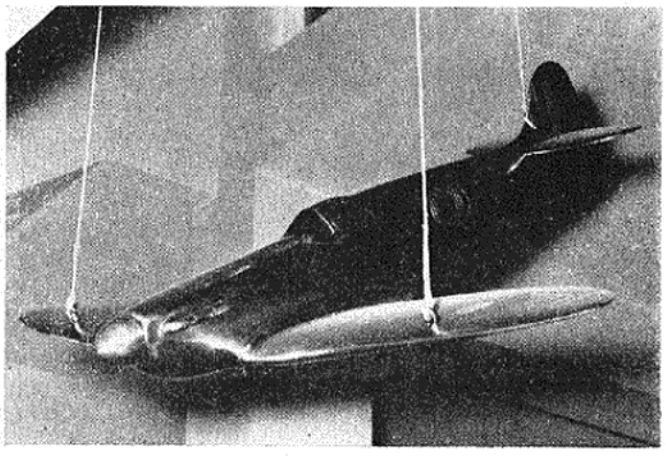
CLUBS can be assured of a "full house" on club nights if they put on "The Nationals, 1957," an 8 mm. colour film produced by the

(*Continued overleaf*)

In Memory of Mitchell

A YOUTH CENTRE at Hanley, Stoke-on-Trent, was opened on October 28th by Group Captain Douglas Bader, C.B.E., D.S.O., D.F.C. But this was no ordinary ceremony. The centre—full title the Mitchell Memorial Youth Centre—has been built to perpetuate the memory of the late R. J. Mitchell, designer of the *Spitfire*, who was born at Hanley. Nearly 400 people can be seated in the auditorium and a number of the smaller rooms contain models of Vickers aircraft.

Above the memorial plaque, unveiled at the opening ceremony, hangs a large bronze model of the *Spitfire* (photo below) presented by the Directors of Vickers-Armstrongs.



S.M.A.E. Tech. Sec., and which runs for 45 mins. Bookings should be made through the S.M.A.E., Londonderry House, 19, Park Lane, W.1. Fee is £1. 1s.—necessary to defray the production costs.

Our Apologies

In the report on the King of the Belgian's R/C Contest published last month, we regret that the results inadvertently showed the first round scores only. To keep the record straight we reproduce the correct scores herewith.

KING OF THE BELGIANS CUP
MULTI-CHANNEL

	Name	Country	1st	2nd	Total
1.	Stegmaier	Germany	2,126	1,990	4,116
2.	Gobeaux	Belgium	1,879	1,960	3,839
3.	Wastable	France	1,204	1,501	2,705
4.	Bernhardt	Germany	436	1,906	2,342
5.	De Hertogh	Belgium	904	1,049	1,953
6.	Klauser	Switz.	445	750	1,195
7.	Gorynin	Russia	195	699	895
8.	Malik	Russia	435	120	554
9.	Hemsley	Gt. Brit.	287	—	287
10.	Donohue	,,	108	115	223
11.	Redlich	,,	172	—	172
12.	Breeze	,,	149	—	149
13.	Franklin	,,	144	—	144
14.	Vigneaud	France	—	110	110

SINGLE CONTROL
MINISTER OF COMMUNICATIONS PRIZE

1.	Bickel	Switz.	408	482	890
2.	Laiy	Belgium	474	385	859
3.	Bocquet	Belgium	413	440	853
4.	Schmacher	Germany	410	426	836
5.	Schoorel	Holland	216	421	637
6.	Velitchkovsky	Russia	189	444	633
7.	Stetz	Switz.	169	463	632
8.	Erler	Russia	196	396	592
9.	Hallmann	Germany	193	287	480
10.	Berglund	Sweden	144	316	455
11.	Gerber	Switz.	143	310	453
12.	Soper	Gt. Brit.	112	287	399
13.	Adolfson	Sweden	112	285	397
13.	Christianse	Holland	143	254	397
15.	Sjogren	Sweden	—	363	363
16.	Rolle	Belgium	269	—	269
17.	Janse	Holland	222	—	222
18.	Dilot	Sweden	195	—	195

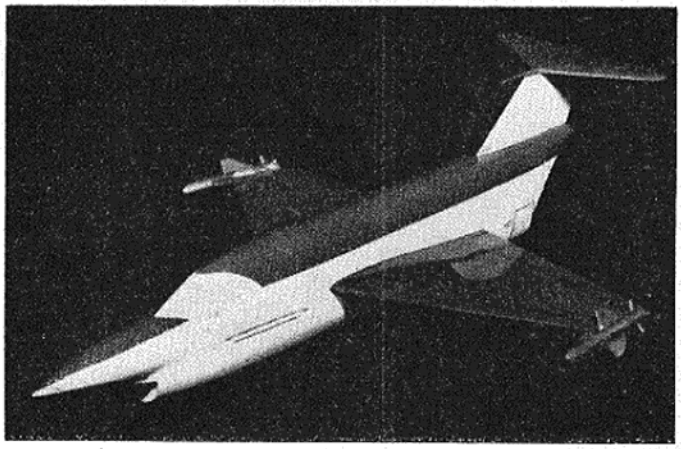
GLIDERS SINGLE CONTROL
MINISTER OF INFORMATION PRIZE

1.	Muller	Switzerland	75	426	501
2.	Muschner	Germany	163	331	494
3.	Schmidt	Switzerland	173	263	436
4.	Drozgin	Russia	46	383	429
5.	Erd	Germany	56	309	365
6.	Mabille	Belgium	120	219	339
7.	Dubois	France	25	46	71
8.	Lafitte	France	—	61	61

In This Issue

UNTIL this year, Russia and the satellite countries were more or less an unknown quantity as far as modelling was concerned, but with the World's Champs. being held in Czechoslovakia and an invitation to A. F. Houlberg to attend the European Free Flight Champs. in Moscow, we have been able to see just how they do things on the other side of the so-called "Iron Curtain." Last month Mr. Houlberg reported on the actual contest, but starting on the opposite page he records U.S.S.R. modelling activities as he saw them on a "behind the scenes" visit.

Although we couldn't produce a flying model of a satellite for this, the Christmas issue, we did the next best thing and had that wizard of the weird, Ray Malmstrom, to design Space Ray, which we've tagged "out of this world," and when you turn to the details on page 395—together with full-size plans—we think you'll agree it couldn't be more apt.



Our "Letters" feature makes a welcome re-appearance on page 398, welcome that is if we are to judge by the number of requests we receive from readers, who, it seems, are always anxious to read other people's views, even if they clash with their own. While on this question of readers' opinions why not write and tell us what *you* would like to see in MODEL AIRCRAFT? Suggestions and criticisms (especially constructive) are always welcomed; also there is always the chance that you will win an X-Acto Knife Chest—the details are on page 398.

Solid modellers with a preference for modern aircraft again have a crack of the whip this month with the details and 1/72nd scale plan of the Saunders-Roe SR-53 on page 402. It's the detail that usually counts on a solid model, but on the left we reproduce a photograph of a model on which detail has deliberately been kept to a minimum. The aircraft is the SR-177 and all the known details are included in SR-53 notes by John W. R. Taylor. Incidentally, we have something special in the way of super detail plans of a famous '39-'45 warplane in the next issue, but watch out for the really striking cover.

Finally, it only remains for us to wish you all the season's greetings and happy modelling in 1958. See you next month.

Living it up! Members and guests of the F.M.A.M.W. stopped "talking shop" for this photo to be taken at their annual dinner and dance on October 10th.

Modelling the Russian way

by A. F. Houlberg

THE fact that the U.S.S.R. has held the majority of the world records for model aircraft for some years has caused a certain amount of conjecture regarding model aviation in Russia and also the conditions under which these records were made. Indeed, we have often heard expressions of incredulity by some modellers as to whether some of the performances were genuine.

So far as the world records are concerned there can be no doubt whatever, since the proof and documentation in the hands of the F.A.I. are quite irrefutable and commendably complete. It is, therefore, of interest to review the position of aeromodelling in the U.S.S.R. and thus obtain some idea how these results have been made possible and achieved.

A recent invitation from the Central Aero Club of the U.S.S.R. to attend their European Championship for power-driven models provided the opportunity to obtain first hand information on the organisation of the model aeroplane movement in Russia. As this will undoubtedly be of increasing and vital interest to all British aeromodellers, it is hoped that the following brief outline of the Russian set-up will enable readers to assess the scope of the model aircraft movement on the other side of the Iron Curtain. This is additionally important now that there are signs of the Iron Curtain being replaced by one of less rigid fabric, as evidenced by Russian teams taking part in international events.

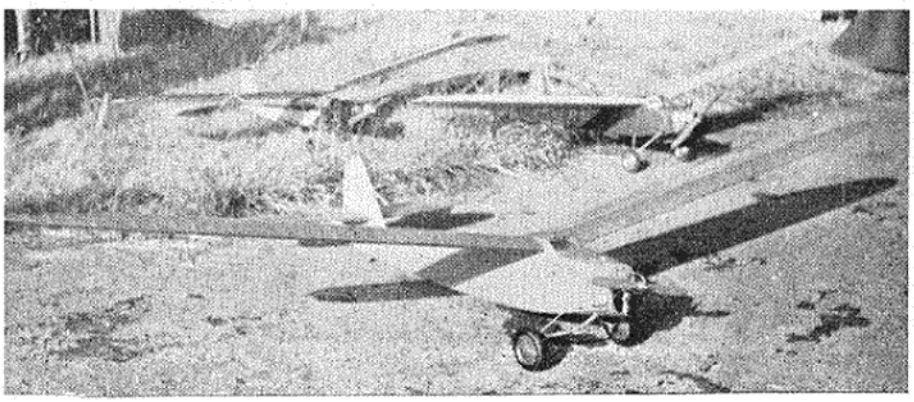
First of all it must be realised that Russian aeromodelling is very thoroughly organised under Government sponsorship and that it is one of the recognised activities encouraged under the youth movement, which is much more highly developed and co-ordinated than our own youth organisations.

The Russian youth movement starts with Pioneer Palaces, which are established in all districts and provide means of recreation and ex-curriculum education for all those who care to attend. Here, the youngsters are provided with facilities to indulge in the pastime of their desire, be it athletics, games, science, engineering, chemistry, electrics, aviation, etc., and it is here that the first selection is made and encouragement given to those who show aptitude in a particular pursuit. There are some 3,000 of these Pioneer Palaces in existence.

For the moment we shall confine ourselves to model aircraft, although the same principles apply to all branches of activity in the U.S.S.R. and this accounts for the high degree of success achieved by contestants from the U.S.S.R. in most competition fields.

Every Pioneer Palace has its modelling circle and any youngster showing an inclination towards aeronautical subjects is provided with facilities for making simple aircraft models by the provision of suitable work tables, and the supply of standard plans covering a series of beginners' models designed to give a sound grounding in the principles of flight. Any materials required for making the models are also provided as a free issue. If they prefer to work at home they may do so, but they are then supervised at frequent intervals by a visiting inspector.

It is interesting to note that the plans cover all aspects of aviation and start off with a simple hot-air balloon, following with a box-kite, chuck-glider, tow-line glider, simple single-stick rubber model, and simple helicopter. These plans are prepared and distributed by the Central Model Aircraft Laboratory in Moscow, which is responsible for co-ordinating the movement ; supplying technical manuals and pamphlets on model aircraft; the production and



Russian R/C entries at the recent Belgian meeting, world record holding machine in foreground.

supply of kit sets; the carrying out of experimental work in connection with model aircraft development; the sponsoring and supervision of record attempts; and the organisation of model aircraft contests.

From the Pioneer Palaces those who show sufficient aptitude graduate to the district laboratories or "Houses of Young Technicians" as they are called. Each of these serves a wider district embracing a number of Pioneer Palaces and they provide better equipment and working facilities thus stimulating further progress. In all there are at present 25 of these well equipped district laboratories.

The facilities afforded at the "Houses of Young Technicians" embrace model aviation in addition to their other activities, which cover all spheres of model making, science, electrics, optics, physics, chemistry, engineering, etc.

It must be understood that all these facilities, material, advice, etc., from the Pioneer Palaces onwards, are "free" provided the modeller is prepared to work and make progress, even to the extent of engines and R/C equipment. In fact, the keen aeromodeller has all the best materials they can provide at his disposal, so long as he can demonstrate that he is capable of applying them to good effect.

A constant stimulant is the system of credits awarded in recognition of achievement, it being the ambition of every keen aeromodeller eventually to become a "Master of Sport," which is the highest recognition attainable in the scale of credits and awarded, together with a gold medal, only to those winning an "All Union" contest. In order to compete in the "All Union" events the competitor must go right through the elimination process; the winner of the pioneer-circle contests qualifying to compete in the district contests, the winners of these qualify for participation in an "area" contest, and these in turn qualify to take part in the "Republic" event.

Winners in the 15 Republic contests go forward to compete in the "All Union" contest and it is from these results that the title "Master of Sport" is awarded and from which the Russians select their international teams.

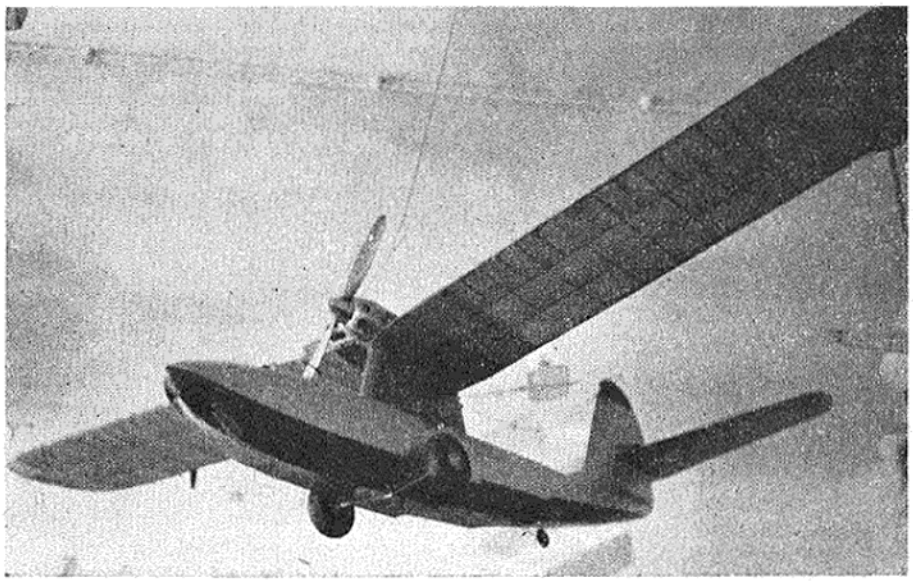
On the subject of material, that in Russia varies somewhat from that to which we are accustomed, largely because balsa does not grow in Russia and they are reluctant to import it. They have, therefore, explored home sources for an alternative, one of which was in evidence on the Wakefield models used by the Russians at Hoganas in Sweden last year. There, the whisper went round that they were using a type of reed in the construction of their models. This is, in fact, the case; the reed is known to the Russians as "Chee" and it grows in central Asia. It is a full $\frac{1}{8}$ in. dia. at the bottom end and grows in lengths of some 6 ft., but it has a slight knot similar to bamboo at approximately 2 ft. intervals. Chee has a hard outer skin, again similar to bamboo but less hard, and a pith centre which, although relatively soft, serves to effectively support the outer skin against local buckling and thus imparts to it a good strength to weight ratio.

It is extremely light, the sample brought back weighing 10 grains per ft. run or 1/5 oz. per cu. in., but construction is complicated by the fact that there is an unavoidable gradual taper over the whole length of each reed and it is not of uniformly circular section. Nevertheless, the Russians have succeeded —by careful selection—to make some very successful models capable of holding their own with the all-balsa type, as they demonstrated at Hoganas.

This does not imply that balsa is not available in Russia. It is, but it is restricted to use by leading aeromodellers and for use where "Chee" is not suitable, in order to cut down imports.

They are also using this reed to produce a very serviceable light tissue

(Continued on page 404)



Top left: The Russian team at the European Championships. Left: An interesting amphibian at the Central Laboratory. Above: R/C expert Velichovski with a glider entry at the recent International meeting.

Topical Twists

by PYLONIUS

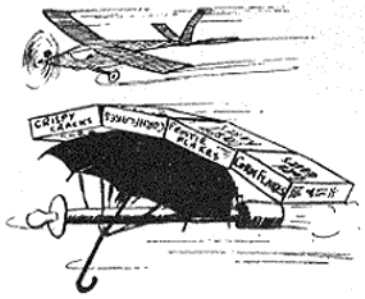
Electrifying

As a so-called model humorist I take off my tattered cap and bells to a witty word spinner of the first Teddy Boy era. Back in the year 1909 a certain Mr. Cannon had the gentle readers of those pioneer days exploding in bewhiskered mirth at his straight-faced skit on the new fangled model flying.

Taking the rise out of the lack of rise exhibited by the india rubber-powered models our whimsical friend introduced his super scientific electric model, complete with cardboard cut-out wing and a wing loading per cardboard square foot that would stagger a supersonic fighter. Climb was achieved by a new and revolutionary process—a tall pair of steps, while the d/t apparatus was simple in design and faultless in execution: a long piece of string.

An unusual feature of the model was the absence of a rudder. This omission being possibly due to the fact that the builder hadn't the strength to cut this out of corrugated iron after twisting his solid oak propeller into shape.

Perhaps a more practical model would have been the camphor ball special. Instead of the wing being cut out of a plain piece of cardboard, a more scientific principle is used: successive laminations of cornflake cartons. The cartons used should comprise a complete set, so that in the event of the model crashing, the wing can be carefully unglued and sent away in exchange for a spaceman's helmet.



For the fuselage, the planks of stout timbers can be replaced by a length of 3 in. galvanised iron piping. A chamber—non domestic—is located at the tail end to receive the heated camphor balls. The wing should be mounted parasol fashion. Any good quality umbrella can be used for this purpose, although a walking stick type is recommended so that the handle might be utilised for short passenger trips. No propeller is required as the machine operates entirely upon the moth induction principle; for the sake of appearances a dummy can be fitted. Be sure, however, to remove the ring from same before twisting into shape.

Owing to high all-up weight, some difficulty may be experienced in launching. Therefore, to make your helper heave, add more camphor balls.

Flagging Spirits

With all the panoply of flag waving, banqueting and general festivity overlaying the modern international meeting the insignificant programme feature of model flying is almost lost sight of. Indeed, you might imagine that the forests of flags were there to screen this odious activity from visitors who are innocent enough to believe that the nations of the world are met for some nobler purpose, such as a coronation or the inauguration of a five year plan. Entering into the carnival spirit of things, the visitors have but one grievance: the hordes of noisy people cluttering up the hotels with large boxes.

Happily, the zealous competitor is prepared to suffer much in the cause of the hobby. He can put up with all the tiresome preliminaries if only he is left in peace on the airfield. Leaving the final banquet he staggers to the flying field under a load of aspirin and bicarb. But, if he thinks his suffering ends there, he is very much mistaken. Before you can say "Union Jack" he is formed up in procession for a flag waving tour of the airfield. How many times he is called upon to undergo this penance we do not know—possibly every time someone does a max.

Two Years' Duration

I like that waggish remark about radio models taking "a hundred hours' work for ten minutes' flying." Wild exaggeration, of course, as far as the average radio flier is concerned. He'd like to know where the ten minutes' flying comes in.

Anyway, in radio modelling, the actual flying is quite unimportant. In fact, it is an ordeal which should be delayed as long as possible. "Two years' waiting for 15 seconds' flying," is nearer the mark, based upon a schedule which optimistically allows for eight flyable Sundays in two years.

Sunday 1. Concours exhibition and general equipment display on club field.
Sunday 2. Start up engine. Discuss with club pundits the technical difficulties of replacing broken engine bearers and bandaging damaged finger.
Sunday 3. Test glide model. Discuss with club pundits the best means of extricating undercarriage from inside fuselage, and where to locate 2 lb. of lead behind c. of g.
Sunday 4. Test radio.
Sunday 5. Test radio.
Sunday 6. Test radio.
Sunday 7. Fly model with faulty radio removed.
Sunday 8. Fly rebuilt model with rebuilt radio. Discuss with club salvage experts how to separate engine from 2 lb. lead weight.

All Catered For

The happy club is the club where every member has a job to do. Not everyone can be Hon. Sec., or Hon. Treasurer, and as these two jobs involve actual work, not everyone wants them. But members are hardly likely to hang around the clubroom unless they have some official status to cling to, and fortunately most clubs are inventive enough to think up enough non-functioning official posts to gratify the pride of these simple souls.

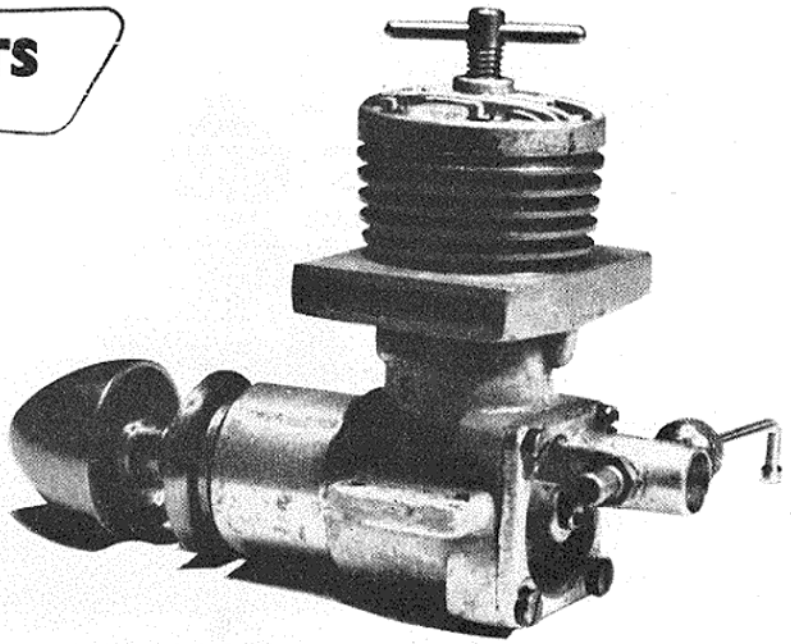
Posts can be allocated according to age and disposition. The elderly member is sustained by a vice presidency, while the younger and wilder member rejoices in the title of Combat Liaison Officer. Even the single junior member need not be forgotten. Junior Committee Representative will give him something pompous to boast about.

When I first heard that the Long Eaton Club had appointed a catering officer I thought that they were either displaying a simple sense of humour or pushing the appointments system just a bit too far. Amazingly enough, they have a catering officer who actually functions as such, following the club around with his pop and choc chuck wagon. At present, nothing stronger than lemonade is served, but if the club hopes to beguile the local councillors into allowing them the use of the park. . . .

SKETCHES BY—ALI

The 1957-58

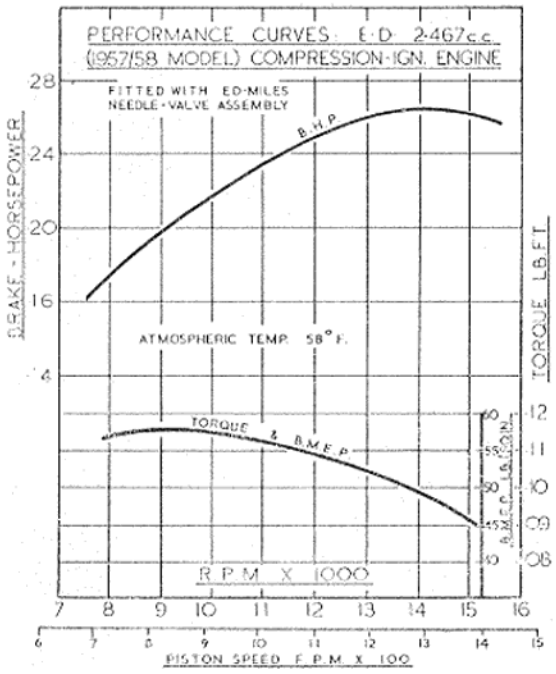
E.D. 2.46 RACER



THE E.D. 2.46 "Racer" has, of course, been dealt with previously in this series. However, as this was some years ago (in March, 1952), it is felt that a further report on this popular engine is justified if only for the benefit of MODEL AIRCRAFT's large number of new readers.

It is actually seven years since the 2.46 first saw the light of day in prototype form. Production models first appeared early in the 1951 season, when, on the performance side, the 2.46 was without equal in the 2.5 c.c. class. Although a few more powerful 2.5's of both British and foreign manufacture have since become available, the "Racer" is still an engine to be reckoned with on the contest field and in the right hands.

Its specification—notably by the inclusion of a twin ball-bearing crankshaft and disc type rotary admission valve—is such as to virtually put the "Racer" in the "luxury" class, yet its price remains extremely competitive at slightly under £4. For the modeller who requires a powerful, easy handling and well-built 2.5 c.c. motor, but to whom price is a major consideration, it is an excellent choice. This is further qualified by the fact that the 2.46 is a very good multi-purpose engine and will serve a wide variety of different types of model almost equally well. For F/F work it has demonstrated itself successfully in both power-duration and non-contest types and has also been used to good effect for R/C models. Yet the "Racer" has proved at least equally at home in C/L stunt and team-racing and, with glowplug conversion, has even put up some creditable performances in speed events.



Model engines are seldom beyond criticism and it has been suggested that the 2.46 is a trifle more bulky and heavy than is strictly necessary. We grant that the rearward facing intake and large exhaust ducts may slightly complicate installation in models having a closely cowled or an otherwise restricted engine bay, but, as regards weight, this is no greater than that of the majority of ball-bearing diesels. A minor criticism is the use of a rather large diameter boss on the propeller driver and spinner nut, requiring props to be opened out to $\frac{3}{8}$ in. bore.

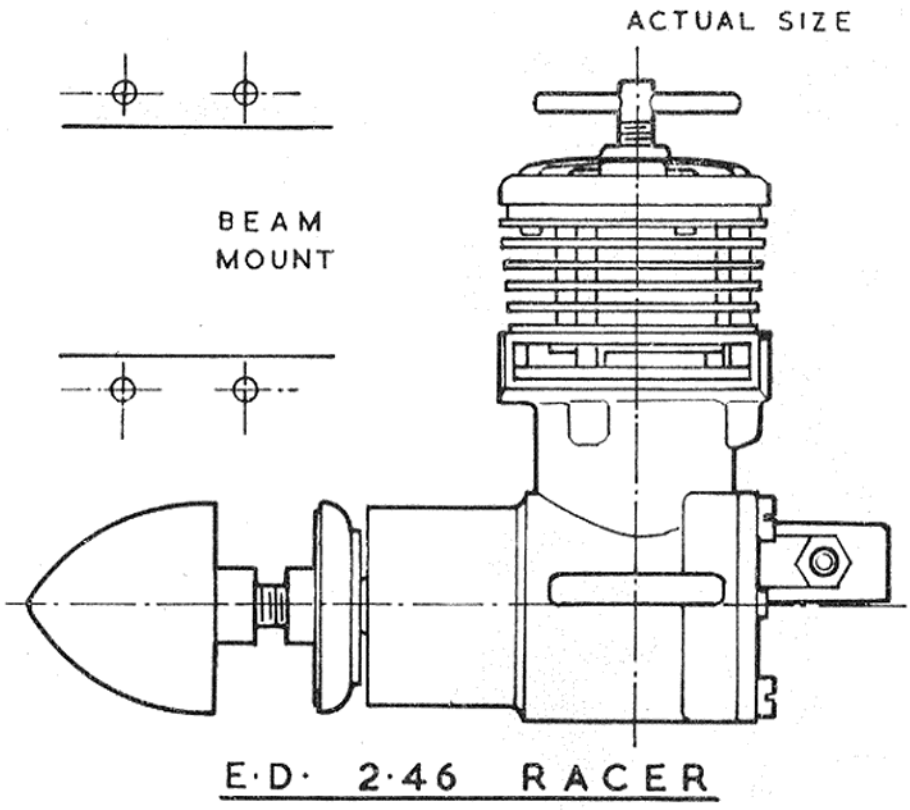
The E.D. 2.46 has changed very little since its introduction, but recently it has been given a new main casting which alters the appearance slightly and also offers a mechanical advantage over the previous pattern. The casting, which comprises crankcase, main bearing housing, and the lower cylinder casing including exhaust ducts, now has a plain, cylindrical housing carrying the two-ball journal bearings, in place of the webbed housing previously employed. Internally, it has three lands, spaced at 120 deg., to support the cylinder liner walls.

A slight modification has been made to the needle-valve assembly. Instead of the familiar 2.46 threaded needle, ratchet-tensioned by means of a wire acting on a knurled drum, the 2.46 now uses a threaded brass thimble, snubbed by means of a coil spring compressed against the spraybar retaining nut. Both the thimble and the brass operating knob on the end of the needle-valve stem are brazed on, so that the annoying habit (prevalent in soft-soldered assemblies) of the needle coming adrift from the thimble should not arise.

A further modification to the "Racer," suggested by the makers, is the replacement of the existing spraybar type needle-valve by an open type jet assembly, as fitted to the 5 c.c. E.D.-Miles engine. This merely involves tapping the carburettor to take the new jet and

needle-block and, at the same time, the carburettor venturi can be reamed out to a maximum of ¼ in. bore. Our test engine did in fact have this small modification, and although one might suppose that the extra power liberated—admittedly small—would be apparent only at ultra-high speeds, it was evident that a slight increase in torque actually resulted at low speeds also.

As regards workmanship in the engine generally, the new 2.46 continues the traditions of the earlier version in being finished best where it matters most—inside.



Specification

Type: Single-cylinder, aircooled, reverse-flow scavenged two-stroke cycle, compression ignition. Disc type rotary-valve induction. Annular exhaust and transfer porting with conical piston crown.

Bore: 0.590 in. Stroke: 0.550 in.

Swept Volume: 0.1505 cu. in. (2.467 c.c.).

Compression Ratio: Variable.

Stroke/bore Ratio: 0.932 : 1.

Weight: 5.7 oz.

General Structural Data

Pressure diecast magnesium alloy crankcase and main bearing housing. Detachable rear cover of pressure diecast aluminium alloy with integral carburettor intake. Aluminium alloy valve rotor. Counterbalanced hardened alloy steel crankshaft with ¼ in. dia. shaft and $\frac{3}{16}$ in. dia. crankpin and running in two Hoffmann ball journal bearings. Drop-forged duralumin connecting rod. Cast-iron piston with fully-floating gudgeon pin. Alloy steel cylinder liner. Separate finned alloy cylinder barrel and die-cast cylinder head. Cylinder assembly secured to crankcase by three machine-screws from cylinder head, with three extra screws securing head to barrel. Spraybar type needle-valve assembly fitted as standard. Beam mounting lugs.

Test Engine Data

Running time prior to test: 1 hour.

Fuel used: 38 per cent. I.C.I. Technical Ether BSS.579, 35 per cent. "Pink" paraffin, 25 per cent. Castrol "R," 2 per cent. Amyl-nitrate.

Modifications from standard: E.D.-Miles-Special needle-valve assembly fitted and carburettor choke opened to ¼ in. dia.

Performance

The general handling characteristics of the E.D. "Racer" are certainly among the best to be found in the 2.5 c.c. diesel class. No port priming is necessary for a start from cold; two or three choked flicks being the only preliminaries normally required, and we found that the carburettor modification to our test engine in no way reduced these easy starting qualities.

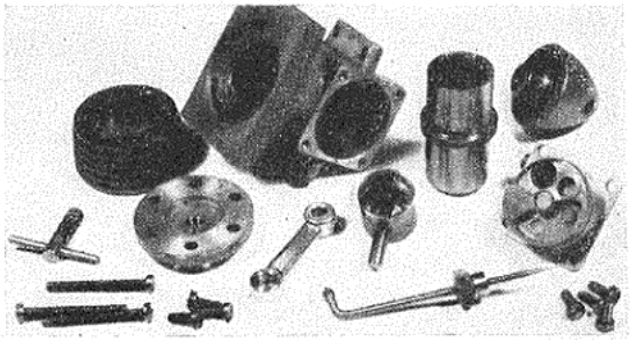
Diesels not infrequently suffer from an annoying habit of "freezing" their contra piston when hot. From our experience with about six different 2.46's over the past few years, however, the E.D. "Racer" does not share this fault. The smoothness with which the c.p. moved on our test engine, hot or cold, was most noticeable. Both controls, in fact, are excellent in every way. Also worth noting was the manner in which the engine held its speed, with only a minimum loss of power on warming up—even with negligible running-in time.

Earlier 2.46's averaged about 0.255 b.h.p. at 13,500-14,000 r.p.m. and the slightly above-average example tested previously recorded 0.265 b.h.p. at 13,800 r.p.m. We confess that the present model shows no appreciable increase on these already very useful peak figures, but a slightly higher low-speed torque was apparent in our tests where the engine reached a relative b.m.e.p. of 58 lb./sq. in. which, of course, is very good.

The past six years have shown the E.D. 2.46 "Racer" to be one of the best all-round model i.c. engines ever to come from a British manufacturer and it seems quite likely that it could survive for another half-dozen years.

Power/Weight Ratio (as tested): 0.74 b.h.p./lb.

Specific Output (as tested): 107 b.h.p./litre.



"Inside" view of the new 2.46, which "continues the traditions of the earlier version in being finished best where it matters most—inside."

R.A.F. MODEL AIRCRAFT ASSOCIATION

CHAMPIONSHIPS

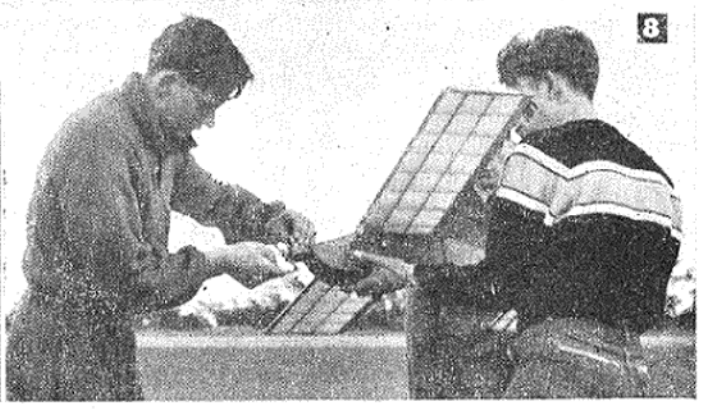
SIXTEEN events were open to members of the R.A.F. at the U.K. Championships organised by the R.A.F. M.A.A. over the week-end September 28th and 29th. Held at R.A.F. Debden, these events catered for just about everything and anything that was capable of becoming airborne and also quite a few non-flying models. Eight Commands and one Group participated and on this page are photographs of just a few of the many fine models that were seen over the two-day meeting.

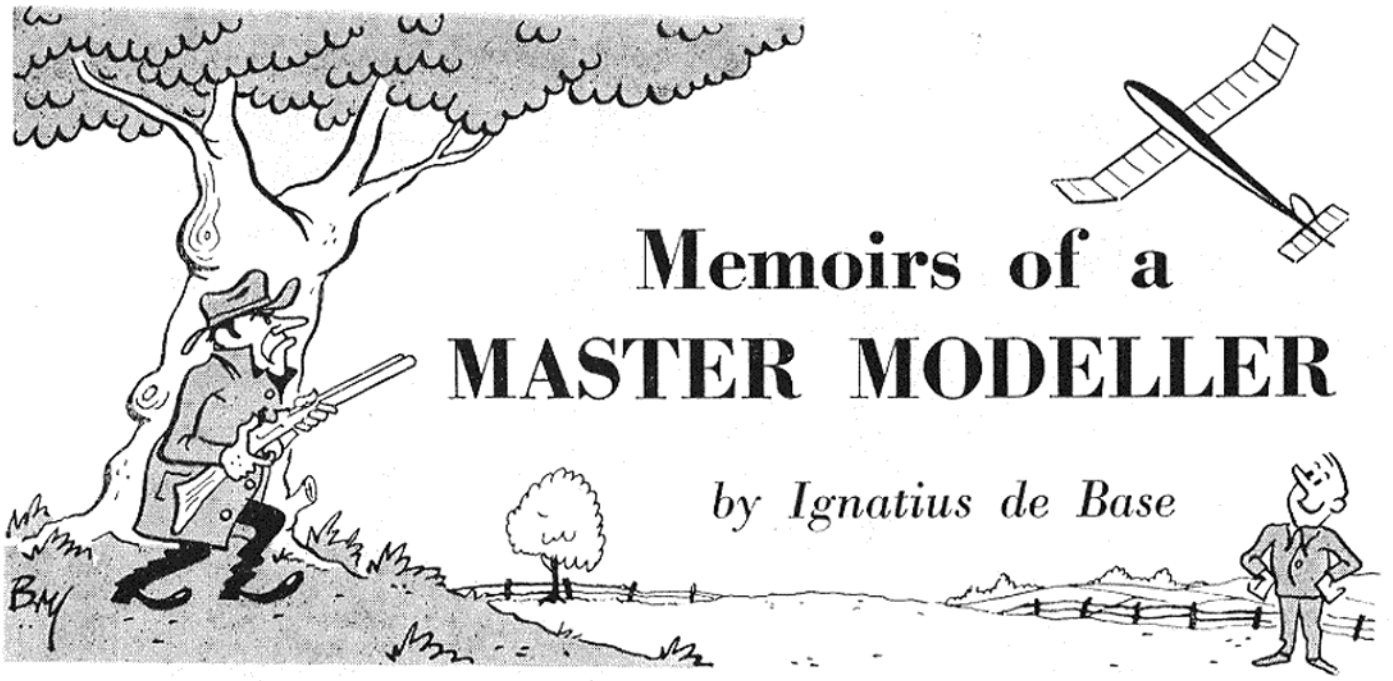
Strong winds and rain undoubtedly curtailed the performance of many of the F/F models, although the weather was brighter on the Sunday afternoon.

The *Victor Ludorum* was J/T Irvine (90 Group) and the placings in the Command Championship were as follows:—

(1) Flying Training 202 pts., (2) 90 Group 156, (3) Technical Training 112 (4) Fighter 82, (5) Transport 61, (6) Maintenance 31, (7) Home 20, (8) Bomber 19, (9) Coastal 4.

1. Cpl. Stevens of Sopely launches his Jetex entry which, despite the gusty conditions was quite stable.
2. "Kerlapso," the model in this picture, nearly lived up to its name after being launched by E. G. Grace of Boscombe Down. The Javelin-powered model dived-in almost immediately after being released.
3. The neat and effective team racer "Trog" of A/A Dicker of Technical Training Command, who came first in the ½A Team Race.
4. An Amco 3.5 mounted pusher fashion powered this "Cutlass" by P/O Graves of Bridgnorth.
5. A very fine piece of modelling, this C/L "Pembroke" gained Cpl. Godfrey of Waterbeach a first place.
6. Senior Boy Entrant Evans from Cosford came 3rd in the "Model Aircraft" Trophy with his Webra 1.5 powered job.
7. First and second place winners in the aerobatic event, Cpl. Tech. Barker and A/A Dibb, both of Technical Training.
8. L/A Gates of Halton had motor-trouble in the radio event.





Memoirs of a MASTER MODELLER

by Ignatius de Base

EVERY winter for the past ten years I have designed and built the new supermodels that were to win me undying fame on the flying field; every summer my hopes have crashed—literally—in the dust.

Reviewing my career recently, I realised my mistake; I had let my greatest talent lie unused! If I'm not a brilliant designer, I am a crafty rogue. In future, I resolved, I would live up to the family motto, "If you can't win fairly, just win."

Decentralised and area centralised comps. were a cinch. My trusty pseudonyms, Hamish Hooch, Wullie Makinporridge and Donald Og Nog,

formed the East Orkneys area. At once the scheme proved its worth, but even among its ace birdmen one club, the Eerie Haggis, was outstanding, and in that club there was only one modeller—me! Success followed success in an unbroken stream; cups, trophies, fame, a reputation, all were mine at last.

Suddenly came disaster. I was beaten! Some goon in the Scilly Isles outflew my five maximums and 30 min. fly-off. Or did he? As usual, I had checked the weather before deciding what my performance had been. (My performances, of course, are literally fabulous.) Nowhere in Britain were the conditions suitable for his sort of flying. I checked again, and also, found a vile fellow had been dishonouring our fine sport. That Sunday the wind in the Scillies was *forty knots*. A model would be 20 miles downwind long before his fly-off time.

My soft heart and forgiving nature, coupled with a disinclination to throw bricks in glasshouses, prevented my doing anything about this, but luckily an alias of mine, the Reverend J. J. Hamilton-Tuffs, D.D., D.Litt., also noticed the anomaly and wrote to the S.M.A.E. The cad has been suspended, pending investigation, for falsifying returns.

So far I had averted suspicion by various eyewitness letters to the Press, reports of marvellous weather that almost caused wholesale immigration to the new area, and speculation on a permanent thermal above the Gulf Stream. However, I knew I would soon have to appear at a centralised meeting. I laid my plans very carefully. My models really were good, but hardly up to top-notch opposition, so I decided to avoid the big galas.

Finally, I selected the Southern Altitudes Rally. It's a well-publicised affair, much more so than its support merits. Results from previous years showed a definite weakness in the Nordic class, and this I chose for my glorious debut.

A couple of quick flights showed that my models—Stradivarious II's—were in good trim, so I refitted the detachable ballast weights and had them processed. Now it was time for the first of my devilish plots. I "borrowed" every length of fuse on the field and replaced them with my treated stuff that looked, and was, exactly the same, except it didn't burn quite hot enough to part rubber bands.

It worked beautifully. I had the only

working d/t, so by the third round I also had the only first-class model within many miles. My one dangerous rival was a bod whose model was a little off trim, but because of strong thermals was consistently doing a max., then promptly landing without needing to dethermalise. Meanwhile, I was plugging away at my own maximums. It was difficult not to get them in the prevailing conditions, and my technique makes them fairly certain anyway. Let me tell you about it.

Model and line immediately before

the flight are completely legal, then John, my accessory, takes the glider to the end of the high-shock nylon line, hooks her on, and we stretch the line another 60 or 80 ft. This material returns to its original length very slowly, about 10 ft. per minute. Just before launching, John removes the ballast and gives the line a last good pull. I take her up and let her go if I get a perfect overhead tow, otherwise I break the line which is nicked beside the reel, below where I normally hold it. In case of accidents a friend is timing, ready to make any necessary mistakes.

My rival's fourth flight was like its predecessors, out of trim in a thermal, stalling in just after a maximum. I saw defeat looming up, and I hadn't gone to all my trouble for someone else's benefit. A spot of quick thinking gave the answer. I hurriedly cut a length of fuse, pushed Jetex igniter wick most of the way up the middle, and handed it to him as he checked the rigging. He used it, unsuspecting, and the model dethermalised off the line; victory was within my grasp. Then it hit the biggest riser in history, and promptly gave him his fifth maximum.

I was waiting for it to land, determined to tolerate no more nonsense. For the decider it was going to fly with its trimtab all the way over in the opposite direction.

In the fly-off I flew first, returned a good time, and waited to see the prang. The model all but went straight in on the tow, but he played her magnificently and made a good launch. You can guess the rest. By ill fortune I had hit his perfect trim. He was minutes over my performance.

Furious, I jumped into my car and drove off—then inspiration came. Had not Hitler said "Victory can be achieved not only at the eleventh hour but at five past twelve!"? I retrieved my model, replaced the ballast and looked for the bod's job, finding it in a nicely secluded spot just beyond the airfield boundary. The weight compartment was sealed by Sellotape, so it was easy to get rid of a couple of ounces of lead shot. He didn't arrive on the scene till I was well clear.

I awaited him at the official table.

"Congratulations. That's a fine model you have there. May I see it?"

Then, with my best shocked expression I put the glider down and turned to the judges.

"I don't want to seem unsportsmanlike, but this seems very light to me. Will you please weigh it again?"

I insisted and they finally decided to re-process both models. Mine (now) was legal, but the other was *three ounces under weight*. The rotter! As usual, dozens of people had thought his job was flying abnormally slowly, so he has a very strong case to answer at the next S.M.A.E. Council Meeting. Officially he was "disqualified, with the strongest censure, for altering a processed model deliberately and dishonestly to evade the rules."

All this is beside the point. I had won my first centralised contest, stilled any suspicious thoughts, taken home a lovely pot, and thus started a career that is to become famous, indeed unique, in the number of its victories. My way, how can I lose?

Int. Flying Wing Contest

Held at Terlet, Holland

A CHANGE of formula from unrestricted to A/2 for the gliders in this year's contest did not favour our boys, who were unable to repeat last year's success. However, our private enterprise team, consisting of I. Crawshaw and D. Tipper (St. Albans) and P. Hedgman and J. Marshall (Hayes), were amply compensated by the latter's individual win in rubber.

The K.N.V.v.L. Gliding Centre (full size), Terlet, near Arnhem, was the venue for this year's event and the facilities were excellent, the modellers being housed over the glider workshop and fed in an adjoining restaurant.

Processing provided the only chance to examine the other entries at close quarters and it was noted that there were no design oddities—just variations on sweep back and aerofoils. In fact the most original layouts were I. Crawshaw's crescent wing *a la* H.P. *Victor*, and a Yugoslav true crescent with three separate stages of washout. It was interesting to note that the four Yugoslav team members had each entered for rubber and power as well as glider, but due to the restricted flying periods they had to withdraw two members each from rubber and power before the contest started.

J. Marshall was first off in the glider as he also had to cram in three rubber and three power flights in each round. His first flight of 76 sec. was to remain the best score in the 1st round apart from a max. of 180 sec. from the Dutchman, J. Osborne.

The wind was soon blowing strongly and a dull sky sent down a light rain which made it necessary to pack up, cover up, and reassemble the models for each flight. This appeared to disturb the aileron settings and all the British team had towing troubles. The models usually gained considerable height on tow, then dived off to one side and had to be released on the way down.

It was obvious after the first few flights that our team were not doing too well, but it was not until the other scores were examined that the British team found themselves together near the bottom of the list. Before the event it was thought that a good flight would be about two-thirds of the duration of a conventional A/2 and everyone was surprised to find that J. Osborne's model was averaging 2 min. in the drizzle and could claim a still air time of 2½ min.

Sunday morning dawned, windy and wet, and the start of the two final rounds was delayed until 10.30 a.m. Ian Crawshaw was our first man off and obtained what was to be our best time of 83 sec. Our team manager, Dave Tipper, pulled out his best effort in the last round—70 sec.—but we could not climb up in the final results.

Running concurrently with the main glider event were the two other classes, and J. Marshall's veteran return-geared rubber job was having an easy victory, besides giving all the team their longest retrieving runs. After a first flight of 164 sec. it was flown with reduced turns (to save the ensuing chase) but its final total was by far the best of the meeting.

The victorious Dutch team.

The second in rubber, W. Schubert, Germany, did extremely well, as his model complied with the 1958 Wakefield rules and was, therefore, handicapped by using only 1¾ oz. of rubber; his last flight of 133 sec. being excellent.

The power event was won by W. Klinger, Germany, with a well-constructed and flown pusher machine, powered with a high mounted Jaguar 2.5 c.c. engine.

The winners of the glider section now emerged as J. Osborne (Holland) with K. D. Boretius (Germany) second, and G. ten Hagen (Holland) third. The Dutch deservedly won the team award.

Results

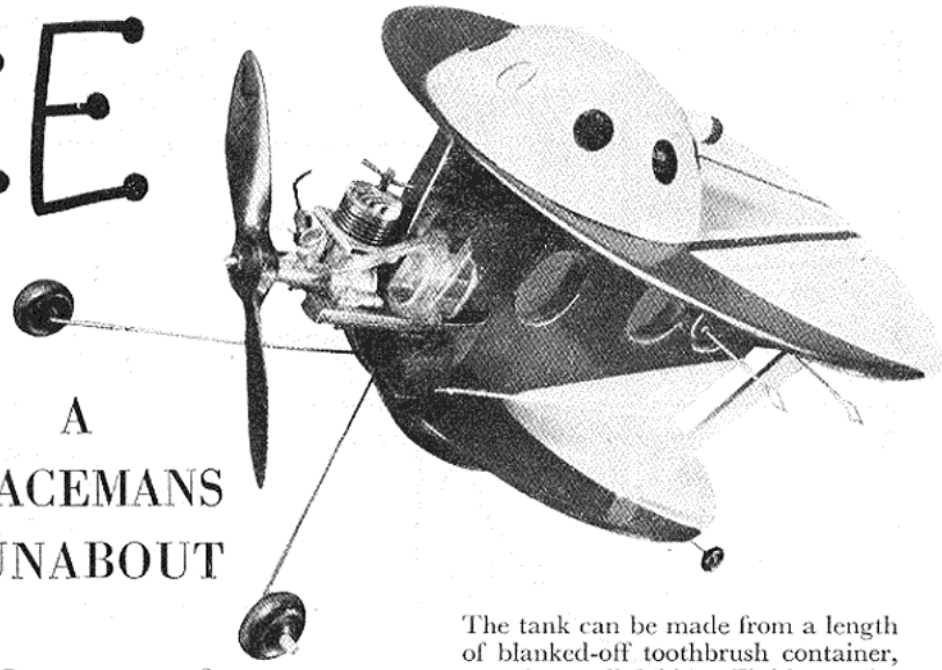
Gliders			
1.	J. Osborne	Netherlands	609
2.	K. D. Boretius	Germany	452
3.	G. ten Hagen	Netherlands	411
13.	J. D. W. Marshall	Great Britain	225
14.	D. H. Tipper	Great Britain	211
15.	I. Crawshaw	Great Britain	210
Rubber			
1.	J. D. W. Marshall	Great Britain	664
2.	W. Schubert	Germany	398
3.	M. Zupanski	Yugoslavia	305
4.	C. Janic	Yugoslavia	95
Power			
1.	W. Klinger	Germany	395
2.	J. D. W. Marshall	Great Britain	161
3.	H. Kron	Germany	23

Team Results—Glider

1. Holland	1,366	2. Germany	1,112
3. Yugoslavia	1,030	4. Great Britain	646

SPACE RAY

A SPACEMANS RUNABOUT



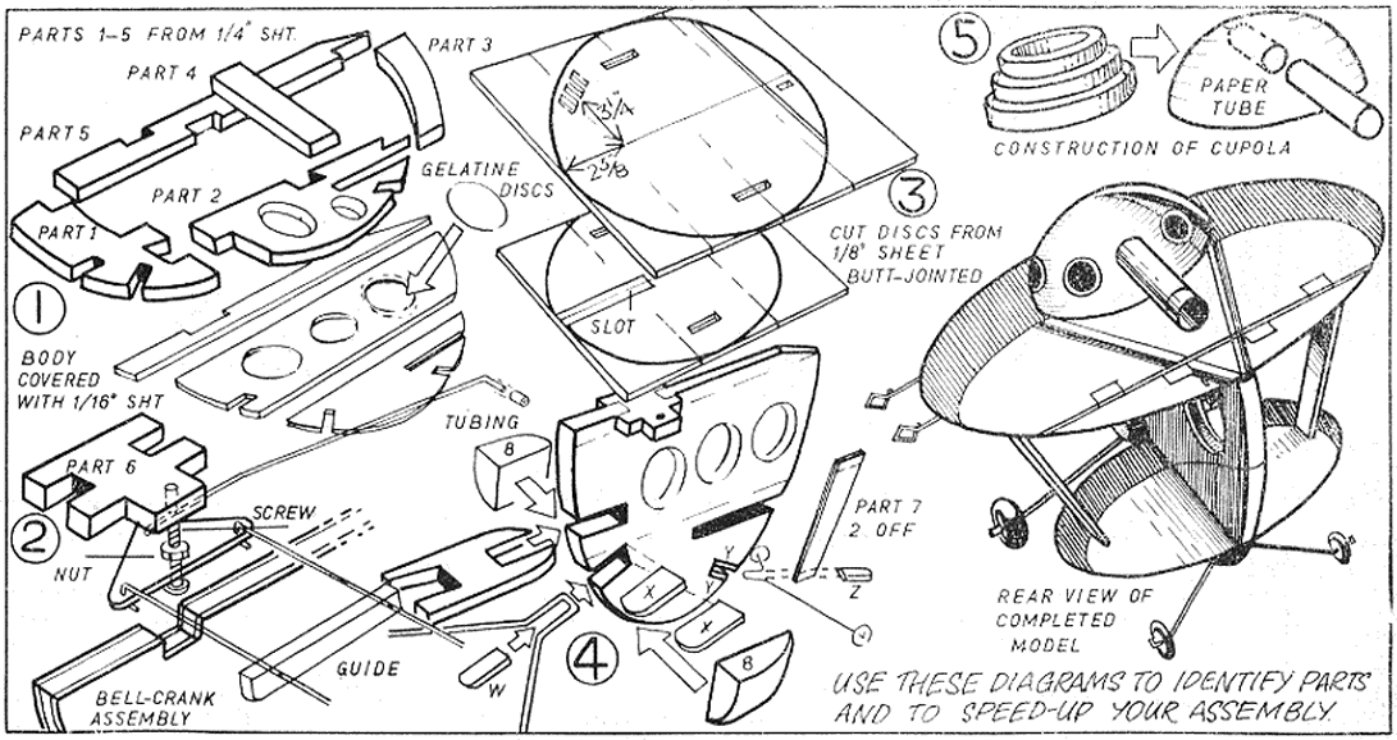
RAY MALMSTROM'S "out of this world" C/L job for the .75 c.c. range

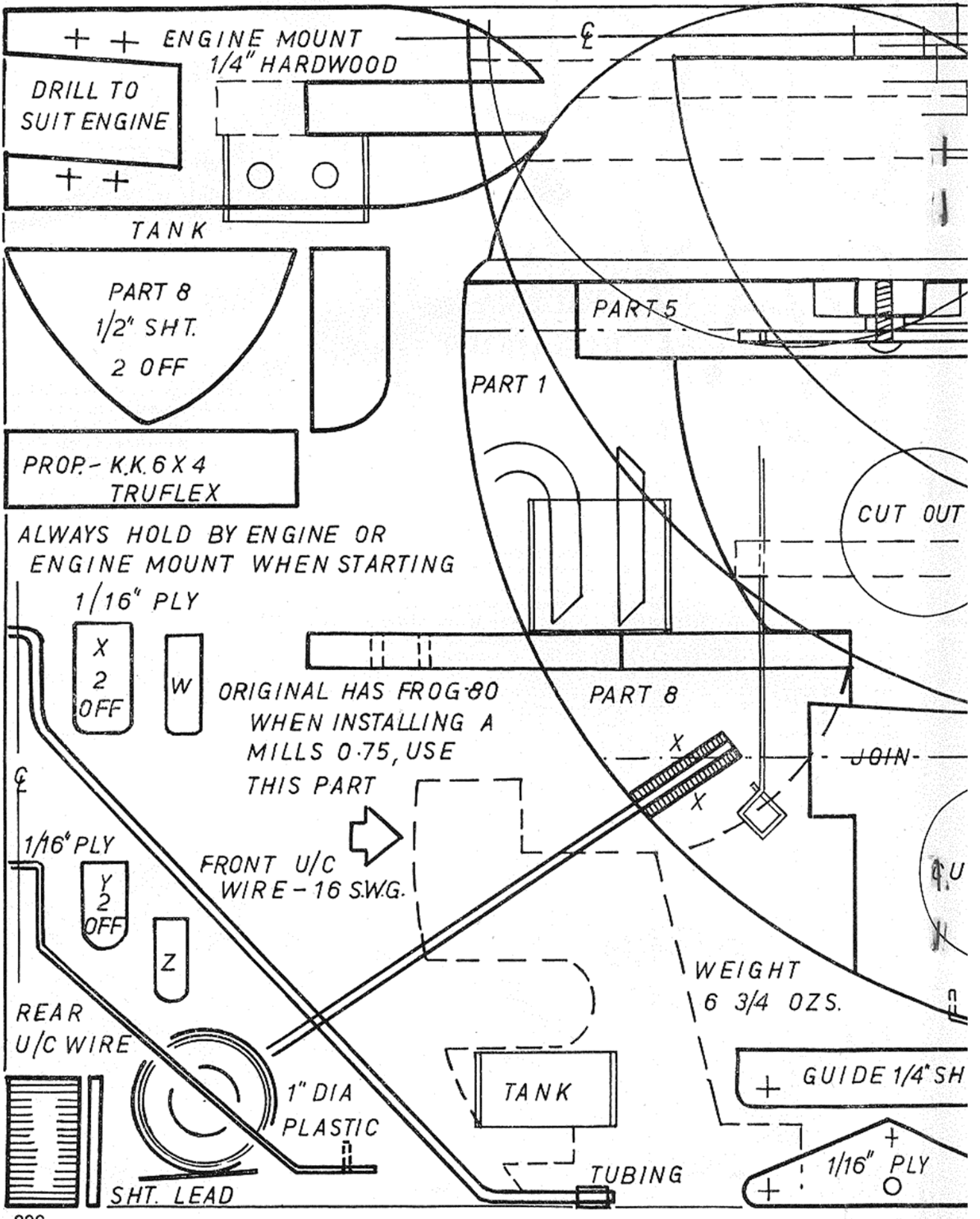
SEEING this little "out-of-this-world" creation in the air for the first time, the Oldest Member was heard to mutter, "I'll never touch another drop!"

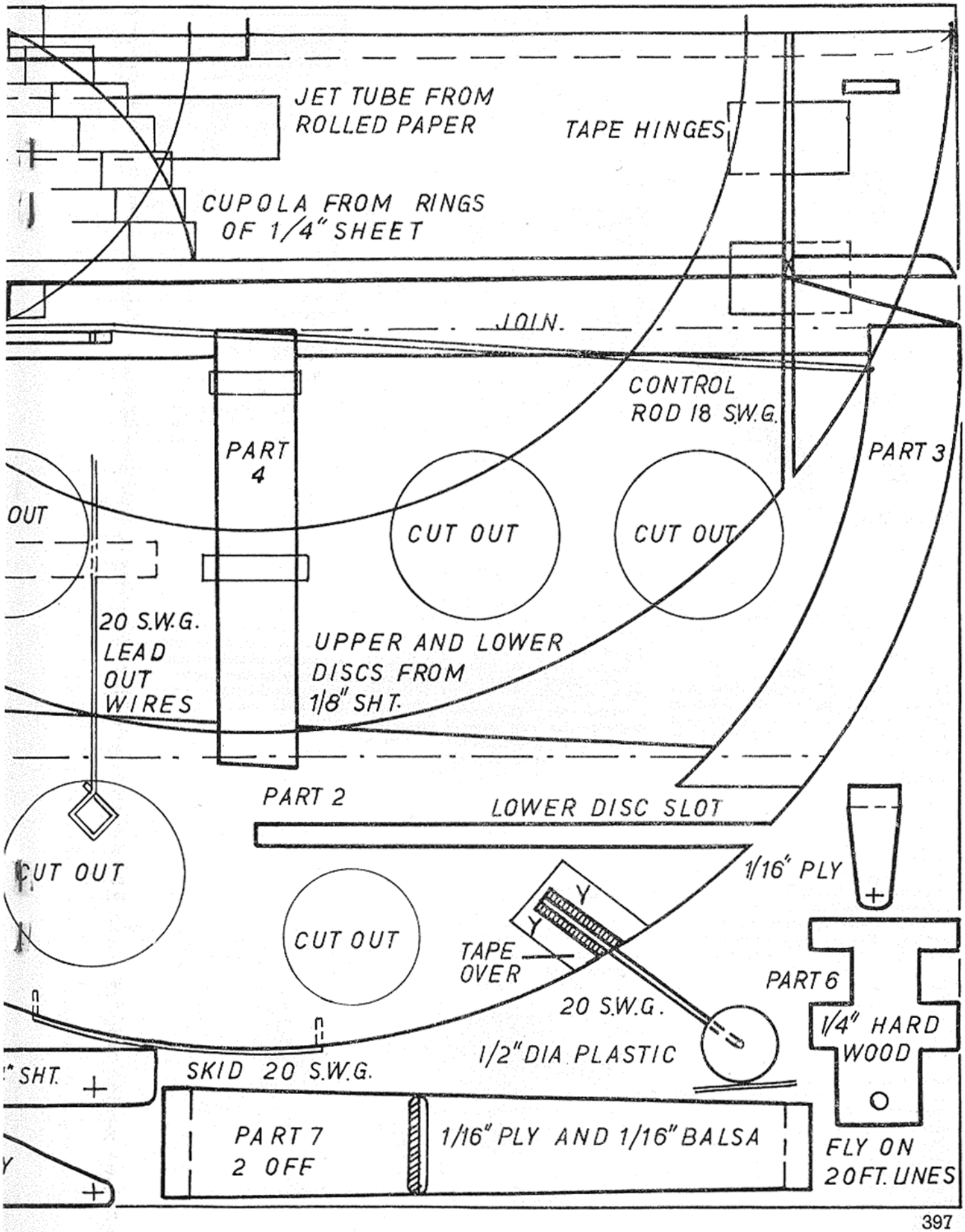
Believe it or not, construction is easy—and quick, and is fully detailed in the sketches below. Pre-cementing of all joining areas is advised. Cover both sides of the basic body frame with soft sheet balsa and round-off all edges. Use coloured cellophane for the windows. Mine came from some old pieces of gelatine from a theatre spot-light. Be careful about locating the lead weight, or piece of old cement tube, according to the position given in the sketch. Hold in place with several layers of doped tissue. Check parts 8 for fitting, sanding if necessary. Ensure both undercarriage units are sandwiched tightly between the ply plates, with locking pieces firmly cemented in. The tank can be made from a length of blanked-off toothbrush container, or sheet-celluloid. Finish entire model with two coats of clear dope, then colour trim, and finally seal with a coat of fuel-proofer.

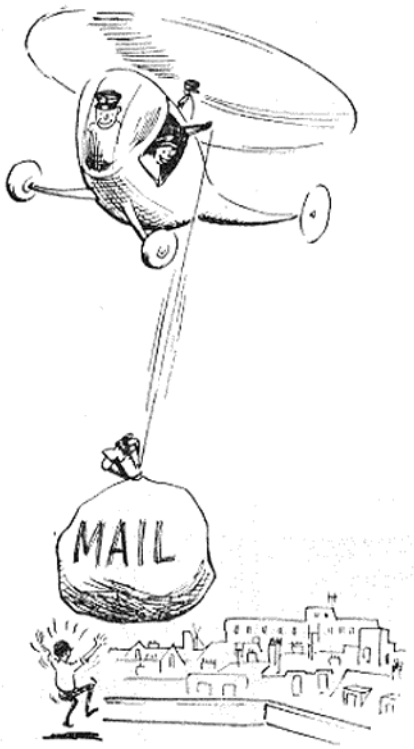
This little job is happy on lines of approximately 20 ft. Balance point must be on the *front* lead-out wire. With varying power units, a small amount of ballast may be needed fore or aft. Choose a calm day for first flights—come to the breezy stuff when you are used to the model—believe me she flies well.

FULL SIZE PLANS OVERLEAF




ENGINE MOUNT
1/4" HARDWOOD
DRILL TO SUIT ENGINE
TANK
PART 8
1/2" SHT.
2 OFF
PROP.- K.K. 6 X 4
TRUFLEX
ALWAYS HOLD BY ENGINE OR ENGINE MOUNT WHEN STARTING
1/16" PLY
X
2
OFF
W
ORIGINAL HAS FROG-80
WHEN INSTALLING A
MILLS 0·75, USE
THIS PART
PART 5
PART 1
CUT OUT
PART 8
JOIN
1/16" PLY
Y
2
OFF
Z
FRONT U/C
WIRE - 16 S.W.G.
REAR
U/C WIRE
WEIGHT
6 3/4 OZS.
1" DIA
PLASTIC
TANK
GUIDE 1/4" SH
TUBING
1/16" PLY
SHT. LEAD


JET TUBE FROM ROLLED PAPER
TAPE HINGES
CUPOLA FROM RINGS OF 1/4" SHEET
JOIN.
CONTROL ROD 18 S.W.G.
PART 4
PART 3
OUT
CUT OUT
CUT OUT
20 S.W.G. LEAD OUT WIRES
UPPER AND LOWER DISCS FROM 1/8" SHT.
PART 2
LOWER DISC SLOT
CUT OUT
1/16" PLY
CUT OUT
TAPE OVER
PART 6
20 S.W.G.
1/4" HARD WOOD
1/2" DIA PLASTIC
SKID 20 S.W.G.
" SHT.
PART 7 2 OFF
1/16" PLY AND 1/16" BALSA
FLY ON 20FT. UNES



Viva Vintage !

DEAR SIR,—As a World War I enthusiast, may I offer my congratulations on the excellence of your special Vintage issue. In particular, the article dealing with instrument panels pleased me no end, for, as any W.W.I fans will admit, these are extremely hard to come by.

Being especially interested in the many Nieuports, I wonder: could your research staff dig up the following panels for publication in a future issue of MODEL AIRCRAFT? Nieuports, 11, 17, 24, 27 and 28?

As a matter of interest the S.E.5, A.8898 (page 231, July issue) was flown in 56 Squadron by a New Zealander, F. J. Horrell—hence the fernleaf on the fin. I understand, however, that Ball flew this machine on at least one occasion. I would say that the markings would bear out McCudden's remarks in "Flying Fury" about 56 Squadron's gaudily painted aircraft.

Once again my congrats. on your sterling effort and may we hope to see more W.W.I gen in future issues.

Yours faithfully,

Masterton, DAVE A. DONALD.
New Zealand.

DEAR SIR,—I have been taking your magazine now, for some time, buying it, to be frank, in the hope of getting material on World War I aircraft and details of them, so you can imagine how I "lapped up" your Vintage issue of MODEL AIRCRAFT.

I have been chasing information—like many others—of World War I aircraft for many years and have some details of the following aircraft:—Nieuport 24, 27, 28, Fokker Triplane, Albatros DVA cockpit detail, Pfal D111 and DX11 cockpits, controls, guns, ammunition, tanks, etc., also Avro 504K, Bristol F2B and DH9A details, including instrument panels.

As a suggestion for the future, what about an article on the Fokker E111 with drawings, or to be really greedy on my part, a regular monthly article on W.W.I aircraft and engine drawings?

Finally, one thing that has always puzzled me and that other readers may be able to help with, is the actual means of airspeed indication on German W.W.I aircraft, having never seen an airspeed pito head on any drawings or photos, other than captured aircraft with English instruments fitted. So if anyone could oblige me by giving details of their A.S.I system and indicating instrument I would be very grateful.

Yours faithfully,

Brayville, B. WAUGH.
S. Australia.

DEAR SIR,—With reference to Mr. Thompson's letter in the September issue of MODEL AIRCRAFT, I should like to point out that in nearly every past issue there has been a scale drawing, or some strong reference to one of the "speed record 'planes."

Also, I think that the position is completely in reverse to Mr. Thompson's idea that the modernistic solid scaler is getting a "poor deal."

In past issues, the ratio of vintage to modern aircraft is about 10 : 1 in favour of the "moderns."

Surely Mr. Thompson does not begrudge just one issue of prolonged interest to a vintage fan?

Yours faithfully,

BRUCE A. H. HARPER.

Chelsea, S.W.3.

We can assure all vintage fans that we have some real treats in store for them for 1958, while the "moderns" surely could not have a better finish to 1957 than the S-R.53 featured on pages 402-4 of this issue—Ed.

Trade Tasked

DEAR SIR,—Some time ago you published a letter asking for the trade to produce a reliable beginner's model. The trade pointed out that several larger sized beginners' models had already been kitted.

I would be very pleased if the trade could point out to me the models that have been kitted for ½A flying scale fans.

The fact that there are many people keen on building this type of model is proved by the large number of kits produced in America for ½A engines, and also by the number of plans published in the model magazines.

I admit that there are a few kits, about four to be exact, but these are mainly early post-war, with but one notable exception, the Davies-Charlton "Chipmunk" control-liner.

A large number of my friends build an occasional rubber-powered flying scale kit simply because there are few larger models on the market.

I expect that the trade has noticed the continual rise in popularity of ½A motors, but whether or not they will take the hint is another matter.

Yours faithfully,

Kilmacolm. DONALD R. MCSWEIN.
Scotland.

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.

Telling Tails

DEAR SIR,—In connection with the article "Safety in Turns," in MODEL AIRCRAFT, October, I thought you might be interested to learn of my experiences with a short-fuselage 1954-rule Wakefield.

With the c.g. at 50 per cent. of the chord, it showed no tendency to turn, although the tailplane was tilted considerably. The tail was, therefore, squared up, and an offset trim-tab (rudder) added. Still no joy!

As a last resort, a little tilt was tried in conjunction with rudder offset, and a really vicious turn resulted. This phenomenon has also appeared on later models, so if trouble is experienced in getting a model to turn on the glide, a mixture of tail-tilt and rudder offset seems to be the answer. Incidentally, even with the rudder offset, an increase in tail-tilt seemed to have much less effect than an increase in rudder offset.

Yours faithfully,

Burnsland, D. BURT.
Cardross.

Yes, we've got another supply of these fine X-acto Knife Chests to GIVE AWAY FREE. Each month the reader who, in our opinion, sends the most interesting, amusing or controversial letter will receive a Knife Chest with our compliments. Mr. Donald R. McSwein, whose letter appears on this page, receives the Chest this month.

R/C Flying—
PYLON STYLE

PETER CHINN describes the latest U.S. radio event. Also—the new Cox Pee-Wee engine

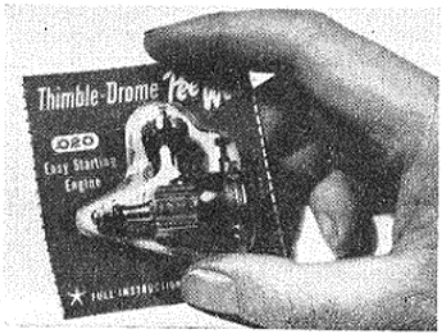
Something to whet the appetite. Keith Storey's " Gold Rush of '57 " radio-controlled racer, winner of the first R/C Pylon Race which was a feature of this year's U.S. Nationals; 8-channel radio and simultaneous rudder and elevator control allow near-vertical banked turns around pylons at under 30 feet !

IN the October issue we gave some details of the newest R/C event in the U.S., pylon racing, including a brief description of Keith Storey's winning Oliver-Tiger powered model specially built for the event.

Now, to suggest that R/C pylon racing is imminently likely to catch on here in Britain would, undoubtedly, cause guffaws of laughter from those who have witnessed the same somewhat dreary performances, year by year, at the Nationals and other R/C events. However, though many may despair of ever seeing advanced radio-controlled flying in this country, there are a few multi-channel stalwarts, at present hiding their lights under bushels, who have got as far as outside loops and inverted flight, and it could be that within a year or two we shall be seeing something a bit more lively. When this happens, we suggest that it may not be long before an R/C speed event is instituted.

The idea of a fast-flying radio-controlled model making banked turns around pylons at an altitude of 30 ft. or less sounds more than a trifle risky and, of course, it is, at least when learning. However, provided the rules are framed right, there is a lot that can be done in the direction of really tough construction —particularly with fibreglass—to reduce serious crash damage.

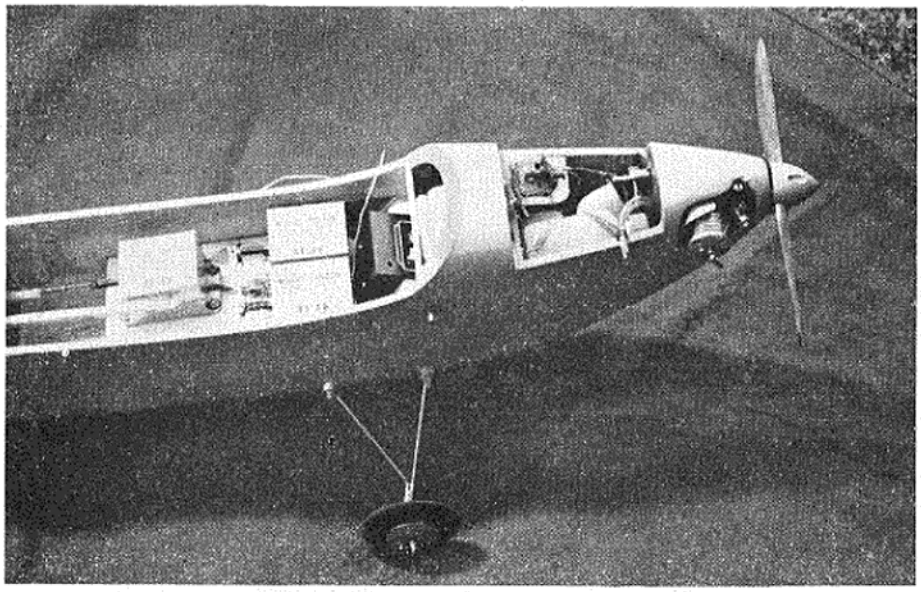
Keith Storey's winning average speed over the one mile course was 24.5 m.p.h. This may not sound very high but it must be remembered that this includes ten 180 deg. turns and ten 528 ft. straights, so for a start, the " one mile " is a purely nominal distance and the actual distance flown is likely to exceed this by at least 25 or 30 per cent. (and possibly nearer 50 per cent. at first) depending on how tight one can make the turns and how straight a course is maintained between the pylons. Added to this is the fact that the model is timed from a standing start and must r.o.g. Windy conditions, naturally, can be expected to have some further adverse effect on handling precision and, therefore, lap times, and in this respect, conditions were by no means ideal at the U.S. Nationals contest.



Something new in packaging. The Pee-Wee is encased in a plastic " bubble " attached to a card, with instruction sheets at the back.

As related in our October article, the rules for the event, drawn up by the American Academy of Model Aeronautics, gave a choice of three model sizes: 766, 576 and 386 sq. in. minimum wing area for maximum engine capacities of 0.199, 0.15 and 0.099 cu. in. respectively and Keith Storey adopted the middle size and a British Oliver Tiger Mk. III for power. The final model weight was 4 lb. 6 oz. giving a wing loading of just under 18 oz./sq. ft. As can be seen from the photograph, the model shows evidence of team-racer and Goodyear racer influence in its aerodynamic design and really looks the part. It is finished in bright yellow, decorated with racing numerals and the emblems of both the Fast and Larks clubs of which Keith is a member.

Under the detachable wing, the model carries three Bonner-Servos giving direct push-pull coupling. One of these operates the rudder which has a 22 deg. movement, left and right. The other two Servos are placed side by side and are linked together by a cross-piece to



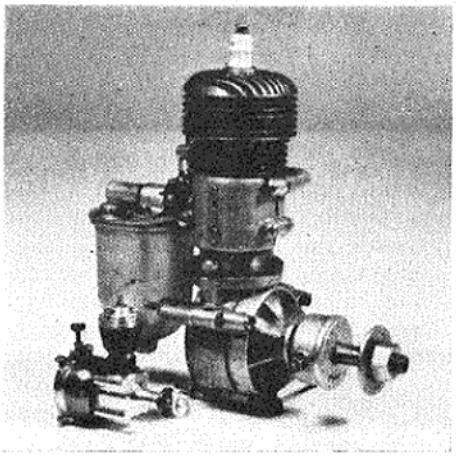
Control components in Storey's R/C racer comprise (left to right): three Bonner-Servos for rudder, elevator and elevator trimmer, Orbit 8-channel receiver and Bonner four-arm escapement for motor control. Latter is linked to K & B shut-off valve which, in turn, is connected to secondary needle-valve on Oliver and slows model for engine-on landing.

which the elevator push-rod is attached. One Servo acts as a normal self-centring control with 22 deg. up, and 10 deg. down, movement. The second Servo provides a variable neutral position superimposed on the first, by the simple process of altering the pivot position. This trims the neutral point from approximately 7 deg. up to 3 deg. down.

Ahead of the Servos is the Orbit "Simultaneous" 8-channel receiver which allows two controls, rudder and full-action elevator, to be used at the same time for steep turns. In the nose, under a removable hatch, is a "squeeze-bottle" tank and a Bonner four-arm escapement coupled to a K & B fuel shut-off valve. Operation of this control opens the valve, allowing an excessively rich mixture to reach the Oliver, via a secondary needle-valve, to slow the engine for landing. Incidentally, for ease of adjustments, a 10 × 6 (Top-Flite) prop was fitted during test flights: probably not the ideal size for maximum speed but, due to limited time before the event for practice and further experimentation, this was retained for the race.

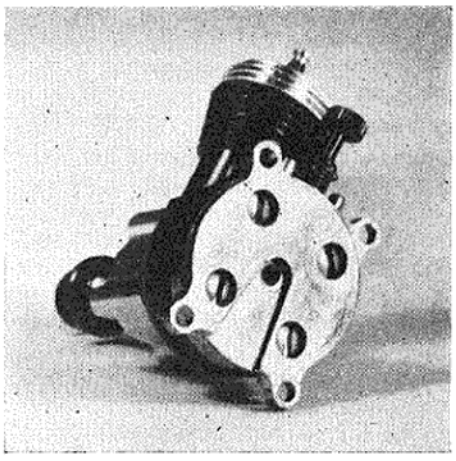
About 3 deg. right thrust was used on the engine to compensate torque reaction, plus 1½ deg. down. The symmetrical section wing is rigged at 1½ deg. incidence and the tailplane at zero. Centre of gravity position is at 24 per cent. chord. The tailplane and fin are in unit with the fuselage but the undercarriage, like the wing, is held on with rubber.

Despite having the appearance of an overgrown teamracer, with its 4 : 1 aspect-ratio and almost negligible (2 deg.) dihedral, the model, Keith reports, is quite easy to fly. Under normal conditions, it takes off in about 150 ft., hands off, and heads for the first pylon in a fast, shallow climb so that it is about 30 ft. up for the first turn. Full left rudder puts the model into a bank estimated at 75 to 80 deg., and the tendency to spiral dive is counteracted by full up elevator, bringing the model round rapidly. A slight amount of right rudder may be required when levelling out for the return leg of the course and the elevator trimming control is now used to drop the nose a fraction and trim the model for its fastest level flight speed—about 50 m.p.h. After the five laps are completed, the engine can be throttled back and the elevator trimmer moved "up" for a reduced speed engine-on landing.



Twenty years apart, the Pee-Wee engine and a famous pre-war motor, the Ohlsson Gold Seal with 30 times the Pee-Wee's cylinder capacity.

It is interesting to note that, far from being a new idea, R/C pylon racing was first suggested by the Californian Fast Club (originators of C/L team racing) some 10 years ago. At that time the suggestion was received a trifle derisively in most quarters, but now there is little doubt that the pylon race has come to stay, as far as the American contest calendar is concerned. It is thought that the event will take another two or three seasons to get under way properly, after which it is expected that it will be possible to stage pukka races in which two, three, or even four models take off together and fly against each other instead of against the clock. Much credit goes to Keith Storey, both for his early efforts to arouse interest in the possibilities of R/C racing and for demonstrating the practicability of this type of event.



A rear view of the Cox Pee-Wee, showing the air channel to the tiny central intake.

The Cox Pee-Wee 0.3 cc. Engine

Four years ago we spent the best part of a whole four page article in MODEL AIRCRAFT analysing one engine, the then new Cox Thermal-Hopper, because we saw it as the most technically advanced small engine yet produced. One or two people probably thought this was an unnecessarily lavish treatment, but subsequent successes by the Thermal-Hopper and its acceptance, on both sides of the Atlantic, as the best engine of its class by far seem to

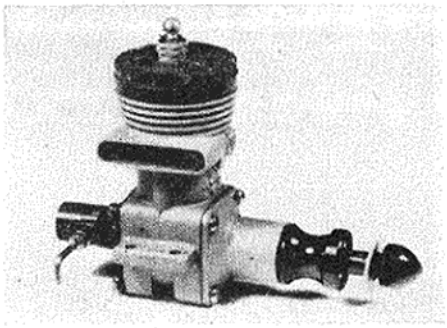
have more than justified our earlier enthusiasm.

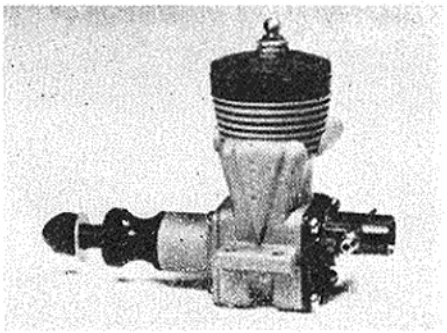
Notwithstanding its easy handling characteristics, the 0.8 c.c. Thermal-Hopper was, of course, intended to make its mark as a competition engine. Now, from the same maker, comes another small engine which, by reason of a cylinder capacity less than half that permitted under the rules of the smallest (Half-A) contest class, is presumably aimed (apart from its use in ready-made models) at the fly-for-fun modeller and, in particular, for really small and simple models that can be flown in restricted space. Despite this, the Pee-Wee, as it is called, is another example of ingenious design and superb production. The engine weighs but three-quarters of an ounce and has a swept volume of only 0.02 cu. in. (0.33 c.c.) and while one might, therefore, have expected the manufacturer to choose the simplest possible layout and eschew all minor refinements, the Pee-Wee once again demonstrates the Cox talent for originality of design with no pains spared on the engineering side.

Basically, the cylinder and shaft assembly is similar to that of the Thermal-Hopper but on a smaller scale. A reverse-flow scavenged cylinder, having twin opposed exhausts and twin transfer flutes and with integral cooling fins, is used. This screws into the crankcase/main-bearing unit which carries a miniature version of the Thermal-Hopper counterbalanced two-journal shaft. A steel conrod, with a ball-joint small-end, is retained, and, of course, the familiar Cox screw-in, hemispherical head, with confined copper gasket and with built-in glow filament, is employed. As with other Cox engines, cylinders and pistons are finished to such extremely fine tolerances that the need for selective assembly is eliminated. For this same reason, running-in, in the normal sense, is unnecessary.

The reed-valve induction unit, which also embodies the fuel tank, differs appreciably from that of the Thermal-Hopper. Immediately behind the crankcase is a machined bell-housing (the inside of which forms the fuel tank) having a short projecting boss on its forward end which fits inside the crankcase and carries the reed valve. The intake tube to the valve is in the form of a long spigot on the inside of the housing which connects with the backplate/carburettor casting at the extreme rear of the engine. Reference to the accompanying photographs will clarify these details. The needle-valve, it will be noted, is inserted in the top edge of the backplate, where there is a bushing for the needle-thread. Fuel pickup is by means of a short, wire-filled neoprene tube, which can be positioned to the side (for C/L) or bottom (F/F) of the tank. The complete assembly is secured to the crankcase by four machine-screws through the tank from the back.

The reed-valve is simpler than that of the Thermal-Hopper and consists of a star shaped beryllium-copper reed, secured at the edges by a circlip. Since the intake is in the centre of the backplate, the latter is channelled to provide an air passage between it and the front bulkhead of the model. The induction passage between the backplate and reed valve, incidentally, is very small indeed (3/64 in. dia.) although air supply is supplemented by a short sub-piston period at the top of the stroke.



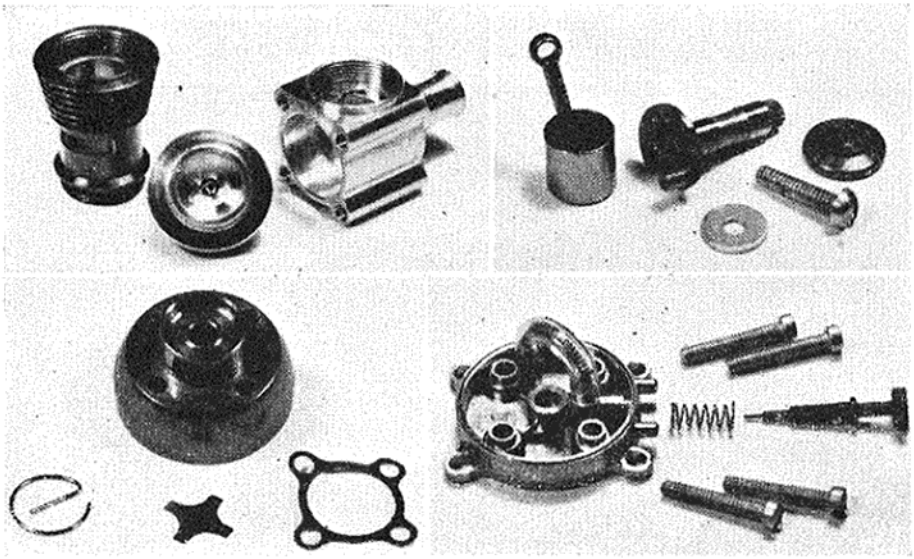


Two photographs of the British Eta 29 racing engine in its latest Mk. V version which is now in production. A description of this engine will appear in our next issue.

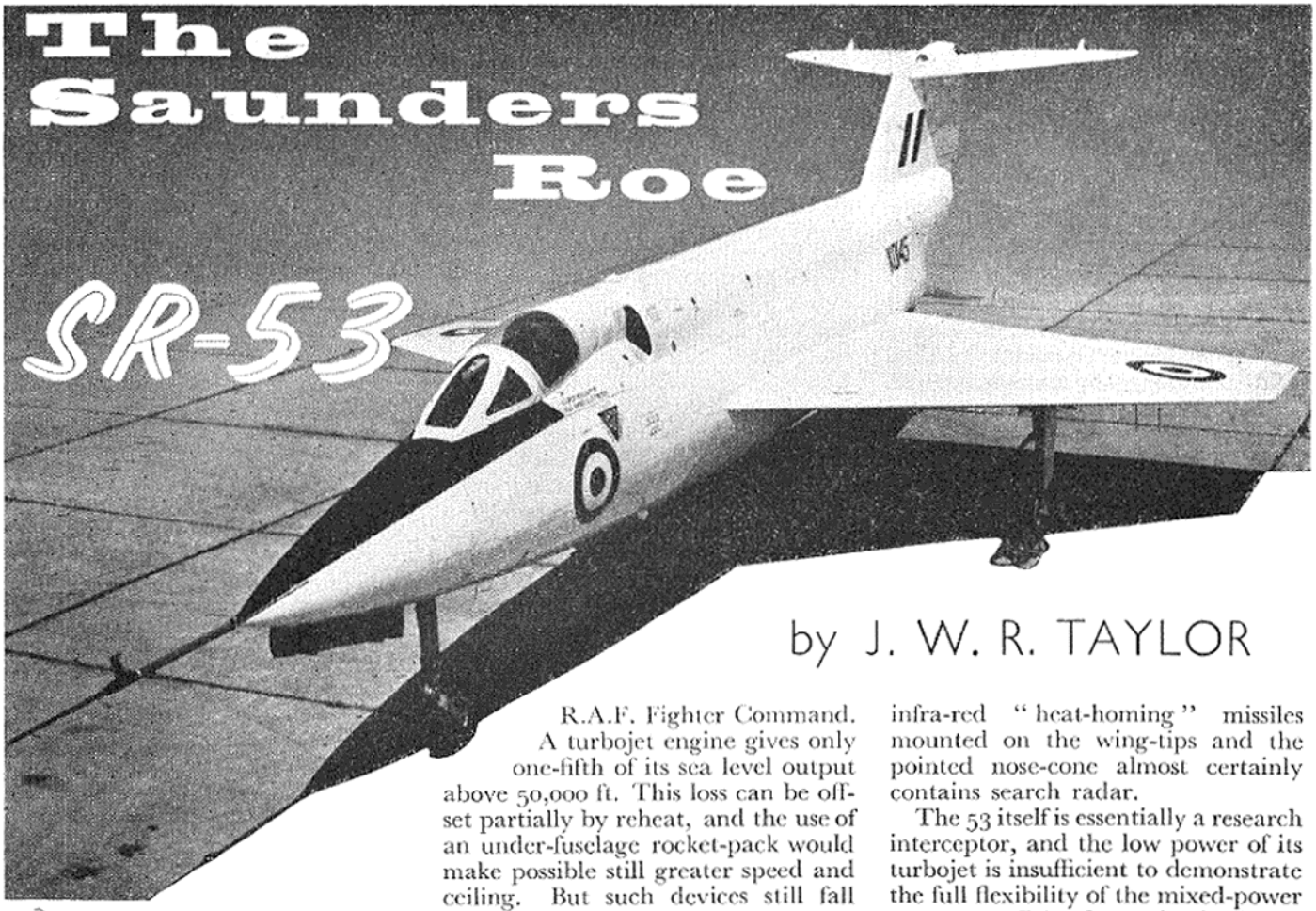
The Pee-Wee is essentially a high-speed motor, with a peaking speed in the region of 18,000 r.p.m., requiring a prop of 4 to 4½ in. dia. and not more than 2½ in. pitch. The smallest British made prop we had available for preliminary testing was a 5 × 3 Trucut. On this the Pee-Wee turned up 11,000 r.p.m. and started easily, but the engine was steadier when running (on a 4½ in. fan brake) at higher speed. The recommended prop for the engine is a Thimble-Drome 4½ × 2½.

There have, of course, been ultra-small engines before and the British D-C Bambi diesel is still only half the capacity of the Pee-Wee. There have also been a number of American glow engines below the popular 0.049 cu. in. size, but few of them have become very popular. Whether or not the Pee-Wee will catch on more widely remains to be seen, but, from the design viewpoint, it is certainly an interesting achievement and, production-wise, a remarkable example of the fruits of automation in the model industry.

Parts of the Cox Pee-Wee are here reproduced approximately full size and show its neat and unusual construction.



The Saunders Roe SR-53



by J. W. R. TAYLOR

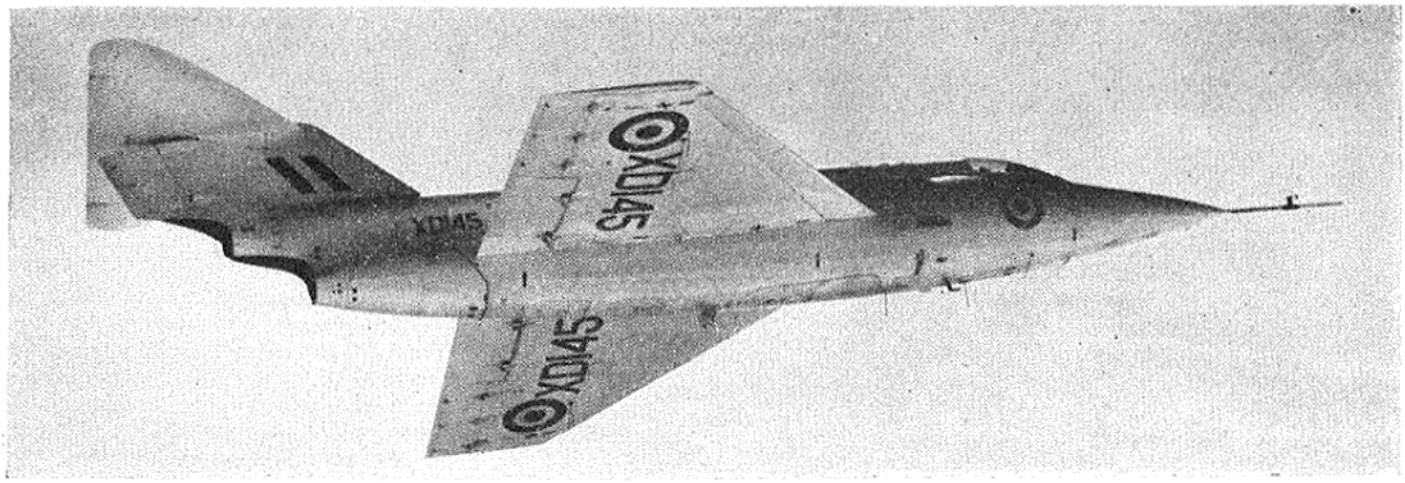
FOR many people, the S-R.53 offers the finest possible proof that the Government's decision to order no more interceptor fighters for the Royal Air Force after the P.1 is a tragic mistake. This is no reflection on the P.1, which is the finest fighter currently in production in the western world; but until we can be certain that anti-aircraft guided weapons will be good enough to take over much of our defence system by the early '60s, a rocket-powered fighter would seem to be a vital weapon for R.A.F. Fighter Command.

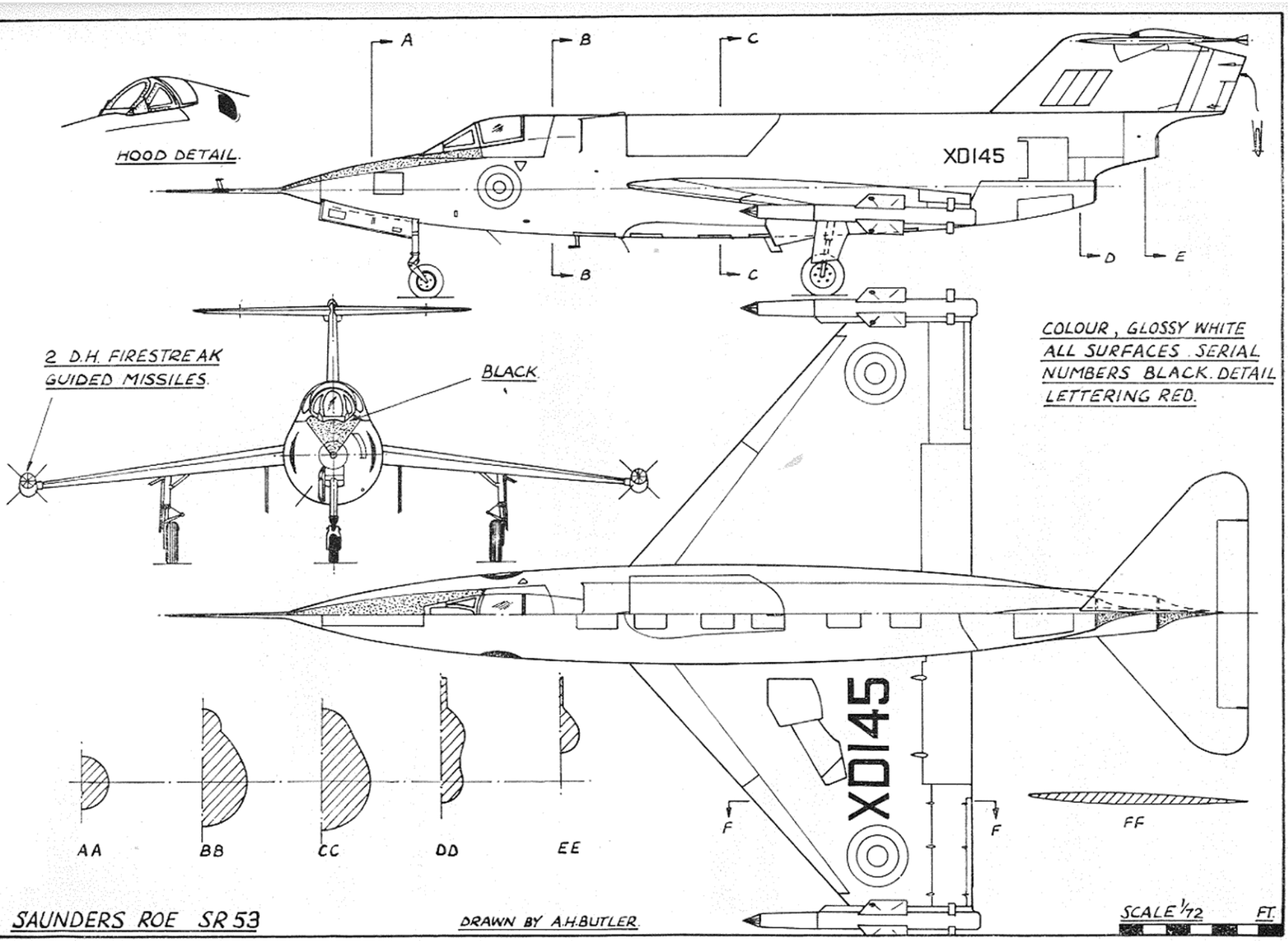
A turbojet engine gives only one-fifth of its sea level output above 50,000 ft. This loss can be offset partially by reheat, and the use of an under-fuselage rocket-pack would make possible still greater speed and ceiling. But such devices still fall short of the capabilities of a primary rocket-motor, and that is why both the Royal Navy and the West German Luftwaffe are interested in the S-R.53 and its developments.

Structurally, the two S-R.53 prototypes are small, simple and fairly conventional. Cropped-delta wings are used in conjunction with a T-type flying tail, and the Armstrong Siddeley Viper turbojet is mounted in the fuselage above a de Havilland Spectre liquid-propellant (H.T.P. and kerosene) rocket-motor. Armament consists of two de Havilland *Firestreak* infra-red "heat-homing" missiles mounted on the wing-tips and the pointed nose-cone almost certainly contains search radar.

The 53 itself is essentially a research interceptor, and the low power of its turbojet is insufficient to demonstrate the full flexibility of the mixed-power concept. But from it is being developed the S-R.177 interceptor for the Royal Navy. This aircraft, although very like the 53 in appearance, is slightly larger and far more powerful, with a de Havilland Gyron Junior turbojet partnering the Spectre, in place of the tiny Viper.

We can only guess at its performance, although some indication is given by the statement by Saunders-Roe's chief designer, Maurice Brennan, that even the smaller, slower S-R.53 has a potential speed of nearly 2,000 m.p.h. and is capable

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2 D.H. FIRESTREAK GUIDED MISSILES.
BLACK.
COLOUR, GLOSSY WHITE ALL SURFACES. SERIAL NUMBERS BLACK. DETAIL LETTERING RED.
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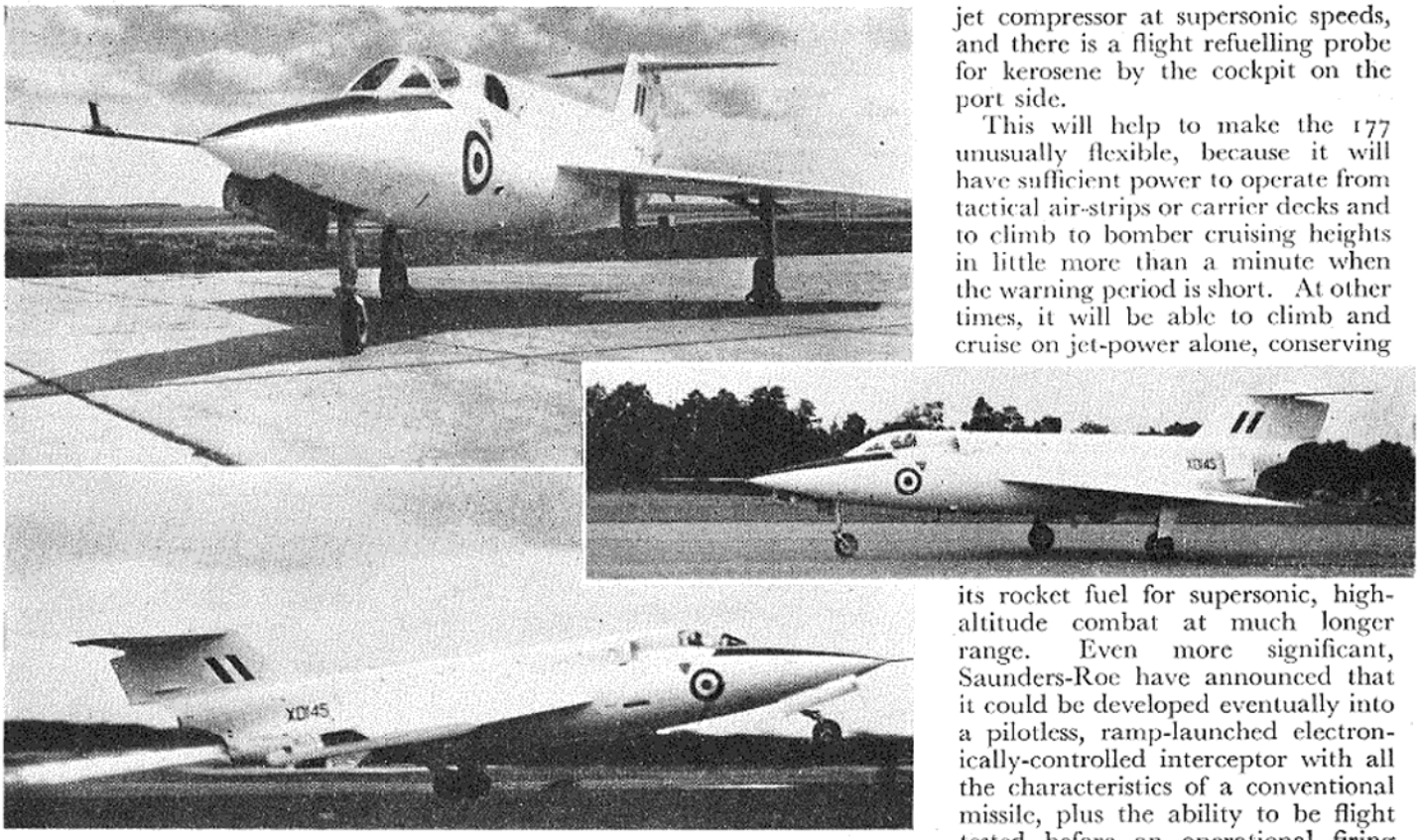
SAUNDERS ROE SR 53
DRAWN BY A.H.BUTLER.
SCALE 1/72 FT.



Two S-R.53 prototypes have been completed and here XD145 is seen with and without the two D.H. Firestreak missiles. In the lower picture can be seen the spear of flame from the Spectre rocket motor.

of climbing at a rate of around 50,000 ft./min.—which is 600 m.p.h. *vertically*! He added that, because of "heat barrier" problems, it will probably be restricted to 1,500 m.p.h. when fully developed, but there are unlikely to be similar restrictions on the S-R.177.

Like the S-R.53, this aircraft will have conventional controls, with ailerons, trailing-edge flaps and full-span leading-edge flaps, plus a sideways-opening dive-brake on each side of its jet exhaust. Instead of the two small high-set air intakes behind the canopy of the 53, it will have a chin-intake with a shock-wedge to slow down airflow entering the turbo-jet compressor at supersonic speeds, and there is a flight refuelling probe for kerosene by the cockpit on the port side.

This will help to make the 177 unusually flexible, because it will have sufficient power to operate from tactical air-strips or carrier decks and to climb to bomber cruising heights in little more than a minute when the warning period is short. At other times, it will be able to climb and cruise on jet-power alone, conserving its rocket fuel for supersonic, high-altitude combat at much longer range. Even more significant, Saunders-Roe have announced that it could be developed eventually into a pilotless, ramp-launched electronically-controlled interceptor with all the characteristics of a conventional missile, plus the ability to be flight tested before an operational firing and to be recovered by a normal landing afterwards. Meanwhile, as the company's chief test pilot, John Booth, has said, there is still no substitute for the kind of guidance system that "weighs 200 lb. and drinks gin," can discriminate between friend and foe, and is impervious to electronic countermeasures.

S-R.53 data:— Span, 25 ft. 1¼ in.; Length, 45 ft.; Height, 10 ft. 10 in.

First flight: May 16th, 1957.

MODELLING THE RUSSIAN WAY

Continued from page 389

which bears comparison with the equivalent light Jap tissue.

An interesting experimental Wakefield model seen in the Central Establishment utilises a thin duralumin tube about 1½ in. dia. for the "business" part of the fuselage and looks both promising and practical. It should be able to sustain a broken motor without damage.

In order to maintain interest among the instructors and workers in the laboratories the title of Hon. Master of Sport is awarded to those who have given outstanding service to the movement.

Regarding world records, it is obvious that the large number held by Russia is not just a matter of chance and enquiries revealed that this surmise is correct.

The Russian records are made under two conditions: either in the course of a national contest where all necessary certifying officials are, of course, on duty and the necessary machine checks available, or as the result of a special attempt. The procedure in the latter case is that any modeller in the Soviet Union can apply to the Central Laboratory for permission to make an attempt on the record, and provided he can satisfy them that he can achieve this, the Central Laboratory gives him all possible assistance to do so, including official observers, measuring appliances, and following vehicles or aircraft as needed. In fact, during my visit, I was shown the radio-controlled model with which they propose to make a new bid for the height record and as a result of our discussion on F.A.I. regulations they are laying on two following aircraft with independent observers and recording barographs.

In addition to the items already mentioned, the Central Laboratory decides on the contest calendar for the year; decides on the rules (based on F.A.I.), carries out experimental work, and develops theoretical work for all the movement. It also provides accommodation, fares, and food to competitors taking part in the Area, Republic, and All-Union contests.

From the foregoing it will be seen that while the aeromodelling concept in Russia is similar to the S.M.A.E. individual club, area committee, central council scheme, it goes very much further, is much more comprehensive in its coverage, and the facilities which it is able to provide through the government exchequer, are infinitely more vast than anything conceived in this country.

Our self-supporting organisation is going to find itself hard-put to hold its own in the near future against the well organised, officially financed movement of the U.S.S.R. and the similarly organised movements in the satellite countries.

Converting the Deacon to R/C

IN Part XX, we suggested that, allowing a radio installation weight of approximately 12 oz., the best sized model for the newcomer to R/C would have a weight of about 36 oz. and a wing area of 400 to 432 sq. in.

A kit model which falls precisely within this specification, when suitably adapted, is the 53 in. Veron *Deacon*. As we have dealt, in some detail, with this model in our F/F section (Part XIV), it was decided to use this same model for conversion to simple single-channel, "rudder-only" control, as an introductory R/C project.

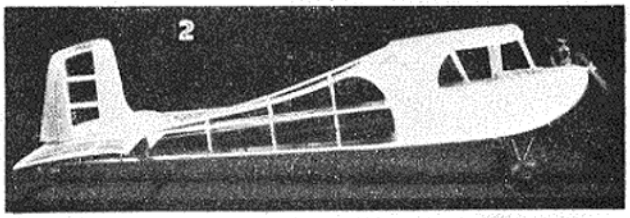
The NEW M.A. BEGINNERS' COURSE PART XXII

The *Deacon* is essentially a lightweight model in its basic F/F form and, for R/C, it is advisable to strengthen the framework a little, in order to cope with the model's higher wing-loading and higher landing-speed when loaded with radio equipment. Reference to Part XIV will show how the *Deacon*, in its original F/F form, differs from the strengthened version into which it was subsequently modified before covering.

Firstly, the undercarriage was reinforced because, in a radio-controlled model, single leg struts all too frequently become bent back when landing. We used 14 s.w.g. steel wire, bound and soldered to the main struts and connected to the front bulkhead. For this latter a piece of 14 s.w.g. wire was bent to a "U" shape and securely bound to a plywood former which, suitably packed with scrap balsa and backed by a piece of hard $\frac{3}{16}$ in. sheet balsa, was then strongly cemented and clamped to the back of the front bulkhead and to the fuselage sides. To connect these two wire members, a $\frac{1}{2}$ in. wide strap of tinplate was soldered around them with a rubber pad at the apex of the front legs. (See Fig. 9.) A simpler method would be to suitably shape the front legs so that they could be bound direct to the ply former and then soldered to the front legs after fitting. Whichever method is used, be sure to install the gear really strongly.

When modifying the undercarriage, it is necessary to have the bottom of the fuselage open and this also enables us to deal with the hatches giving access to the radio gear and batteries—a most important point!

The first fuselage bay behind the engine—i.e. that between the two u/c bulkheads—is just large enough to accommodate the HT, LT and actuator batteries. This is a good position for the batteries since it is forward of the centre of gravity and helps compensate the weight



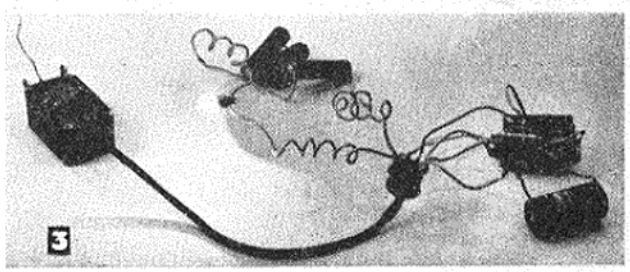
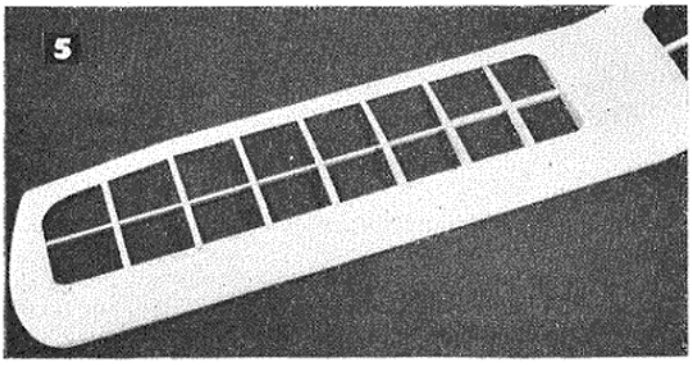
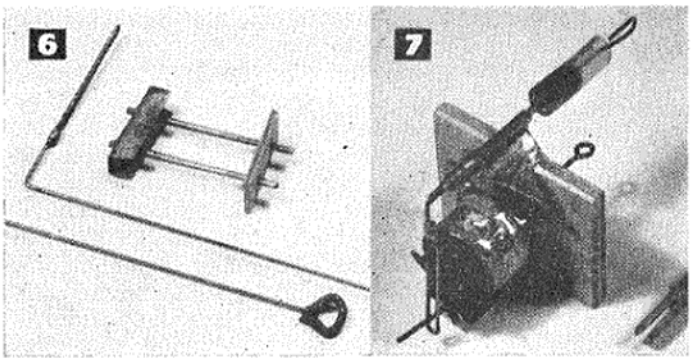
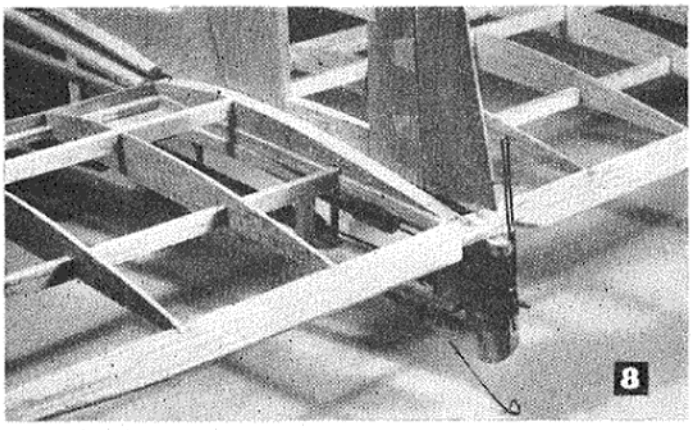


Fig. 1. The E.D. Transitrol outfit: transmitter, receiver (with socket and double-pole switch) and standard escapement. 2. The converted "Deacon" fuselage, ready for covering. 3. A temporary hook-up using a 4.5 v. bulb to test the receiver.







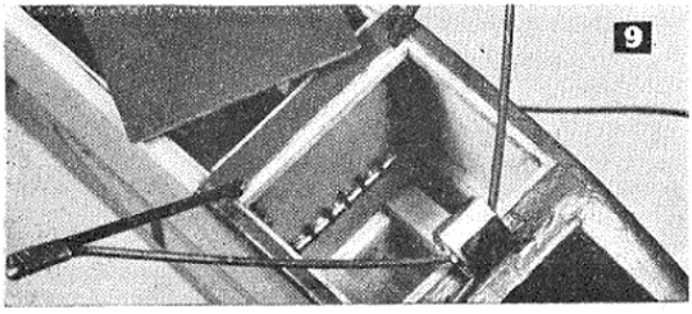


Fig. 4. Batteries required. Large HT and LT for transmitter, with receiver HT (2), LT (1) and actuator (3) batteries in foreground. 5. The "Deacon" wing sheeted and cap-stripped for added strength. 6. Rudder arm, rear hook and bearing assembly. 7. Escapement and semi-rotary linkage ready for installation. 8. Tail unit showing rudder arm and pin with winding loop below. 9. Undercarriage reinforcement and battery hatch prior to lining.

of the actuator and rudder linkage. Aft of this is the cabin and, as will be seen in a moment, it is helpful to have a full-length hatch here also. Accordingly, strips of $\frac{3}{16} \times \frac{1}{16}$ hard balsa were cemented along the outside edges of the fuselage bottom, leaving a $\frac{1}{16}$ in. rebate into which the flush-fitting hatch covers could be inserted. (See Fig. 9.)

The hatch covers consist, basically, of $\frac{1}{16}$ in. hard sheet balsa, with the grain running across the fuselage, and lined with $\frac{3}{16}$ in. sheet to fit between the longerons and bulkheads fore and aft. To further stiffen the main hatch and also to preserve its curvature, two suitably shaped side rails of 3/32 in. hard balsa, $\frac{3}{8}$ in. deep at the centre, were glued along the edges.

The cabin section of the *Deacon* can be strengthened considerably. As will be seen from the photographs, a number of extra upright and diagonal members were added to the sides and the area around the windscreen and cabin windows was stiffened by gussets and by additional $\frac{1}{16}$ in. sheeting. To avoid local weakness behind the cabin and also to eliminate covering irregularities, the sheet balsa covering was extended slightly beyond the rear cabin bulkhead and was scalloped to mould smoothly into the longerons as shown. In addition, a $\frac{3}{16}$ sq. dorsal stringer was fitted, supported on $\frac{1}{8}$ in. sheet formers.

The wing was strengthened by the addition of $\frac{1}{16}$ in. medium-soft balsa sheet covering over the leading edge as far back as the front spar. The trailing edge was stiffened with a 1 in. wide strip on the upper surface only and the ribs were capped between with $\frac{1}{16} \times \frac{1}{4}$ balsa. The centre-section and tips were also sheeted. (See Fig. 5.) To improve appearance and also give a built-in incidence wash-out, a slight taper was applied to the trailing-edge, starting from the third rib from the tip and widening to $\frac{1}{2}$ in. at the tip rib. A piece of $\frac{3}{16}$ in. sheet was then added between the last two ribs from below and the trailing edge restored by sanding the bottom surface only. Finally, strips of 3/32 in. sheet were added to the sides of the ribs, underneath, to modify the undercambered wing-section to a flat undersurface.

The tailplane was unaltered, except for a similar slight tip taper treatment to match the wing and a small section cut out of the trailing-edge at the centre in order to keep the retaining rubbers well clear of the rudder linkage. The trailing edge of the fin, however, was rebuilt to accommodate a 4 in. high, tapered rudder of $3\frac{1}{2}$ sq. in. area. This was attached with hinges of nylon tape. A slightly lengthened dorsal fin was fitted and an 18 S.W.G. wire skid was fitted to the tail bumper as shown in Fig. 8.

The complete model, including all sheet and block balsa surfaces, was covered with lightweight parachute silk and given three coats of clear dope, followed by colour finishing, in accordance with the instructions given in Part XV. Before covering the fuselage, however, the actuator and rudder linkage was installed.

In order to permit the longest possible rubber motor length for the escapement type actuator (and thus allow

Fig. 10. Fuselage bottom hatch and distributor panel prior to assembly. 11. Inside of the distributor panel and hatch-cover after wiring and before cementing together. 12. Components and batteries can be plugged into distributor panel outside model for testing and adjustment. 13. The receiver box showing the foam lining.

a wide safety margin on the number of rudder movements available per flight) it was decided to use a return linkage system. With this method, which is very popular in America, the escapement is positioned well forward in the fuselage, the rubber drive being taken to the tail end of the fuselage (instead of being led forward) where it can be easily rewound by means of a hand-drill. The crank is on the actuator itself and imparts a semi-rotary motion to a torque-rod extending back through the fuselage above the rubber motor. This rocking motion is then conveyed to the rudder by means of a vertical arm which moves a pin attached to the rudder. Another advantage of the system is that the rudder pin can be re-positioned higher or lower and thus increase or decrease rudder movement according to the required degree of control sensitivity in flight.

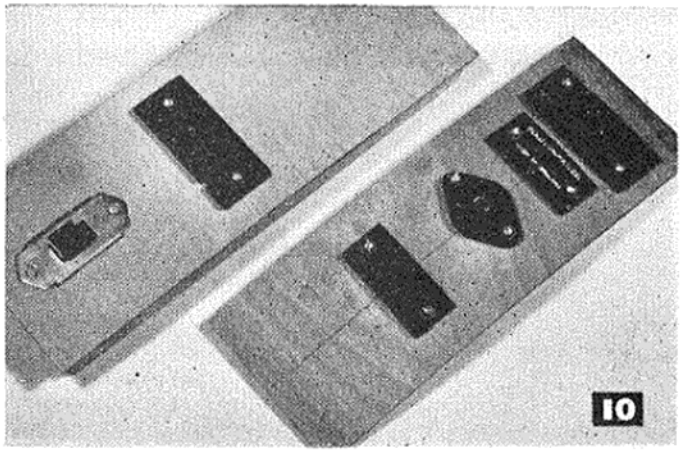
A general idea of the system will be gained from reference to the photographs, particularly Nos. 6, 7, 8 and 15. The escapement shown is actually an American "Super-Aerotrol," which is not at present generally obtainable in the U.K., but a similar type, the Dutch-made "Typhoon," is available, or, of course, a standard British type, such as the very reliable E.D., although a little more bulky, can be suitably adapted for the *Deacon*.

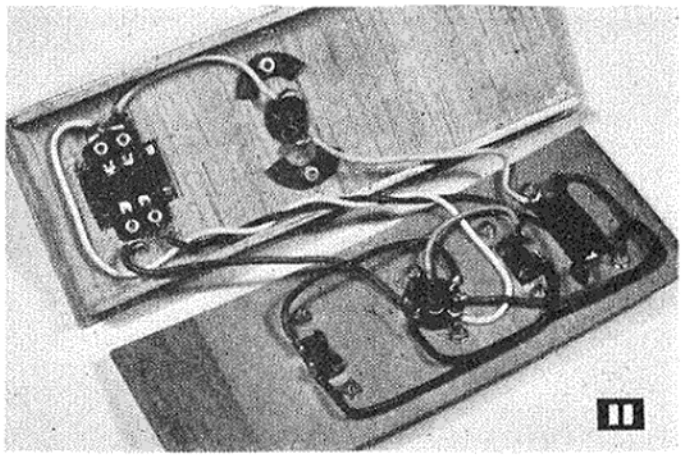
To facilitate servicing, it is helpful to have the actuator removable, but the mounting must be rigid. For our model, the escapement and semi-rotary link and bracket were attached to a $\frac{3}{16}$ in. plywood plate. (See Fig. 7.) Runners of $\frac{1}{8} \times \frac{1}{2}$ hard balsa were cemented to each side of the rear cabin frame, extending 2 in. up from the bottom and braced by gussets, to provide a channel in which the ply plate would slide.

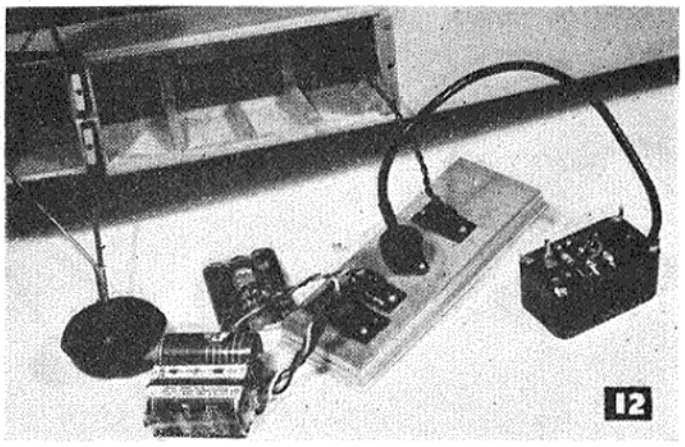
Components for the rear linkage and bearing assembly can be seen in Fig. 6. Two 19 S.W.G. bore brass tubes were positioned $\frac{3}{8}$ in. apart and soldered into a tinplate bearing support, $\frac{3}{4} \times \frac{3}{4}$ in., channelled to fit around the rear end of the fuselage. The tubes were pushed through suitably drilled holes in the rear end and well cemented, their front ends being supported by a $\frac{1}{16}$ in. plywood plate cemented to the fuselage spacers G.4. The 19 S.W.G. (0.040 in. dia.) wire L-shaped rudder arm was bent to form a 1 in. long slot and soldered. It was then passed through the upper tube (in which it must be a free fit) and its end bent back with needle-nose pliers and secured to the torque-rod.

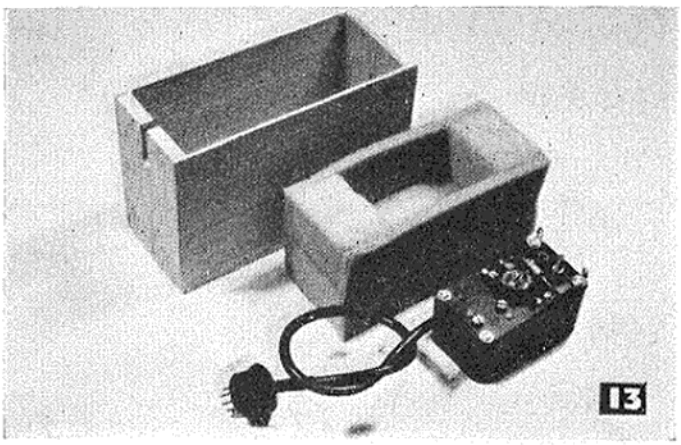
The torque-rod consists of a hardwood dowel, not less than $\frac{3}{16}$ in. dia. It can be bound to the rudder arm, but, at the escapement end, it is helpful to have a detachable connection if the escapement is made removable. Fig. 7 shows a way of achieving this. The torque-rod is carefully slotted and the doubled end of the semi-rotary link spindle (19 or 20 S.W.G.) forms a tongue which slips into this. A short length of large-diameter Neoprene tubing is used to secure the joint by sliding tightly over the tongue and slot. The tube is mounted on the wire spindle by means of smaller diameters of Neoprene force fitted over a brass tube core.

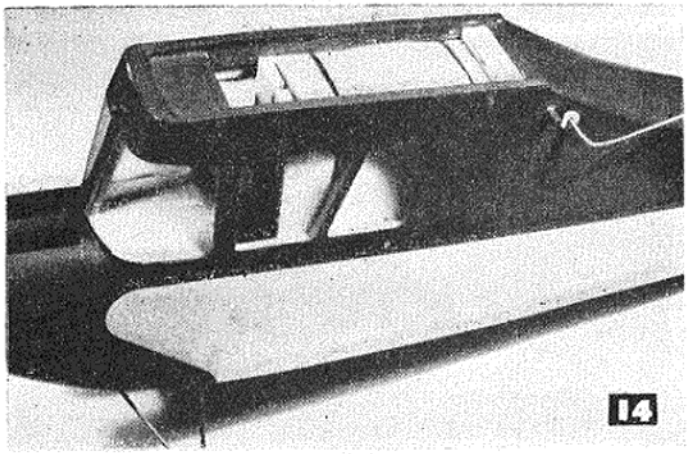
The rear rubber anchorage and winding spindle is inserted from the inside after bending the motor hook and covering it with rubber or plastic tubing. It should

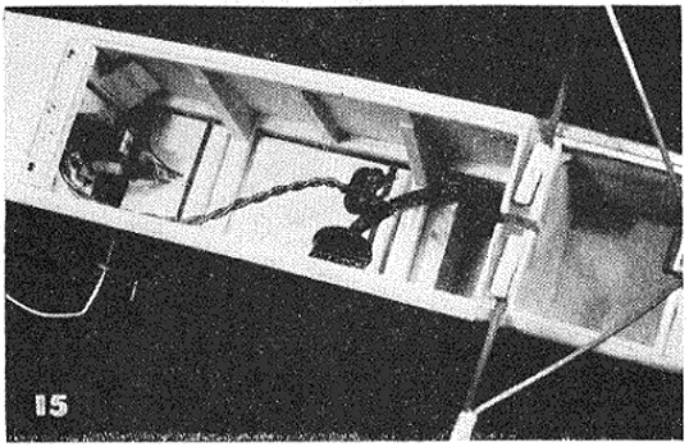


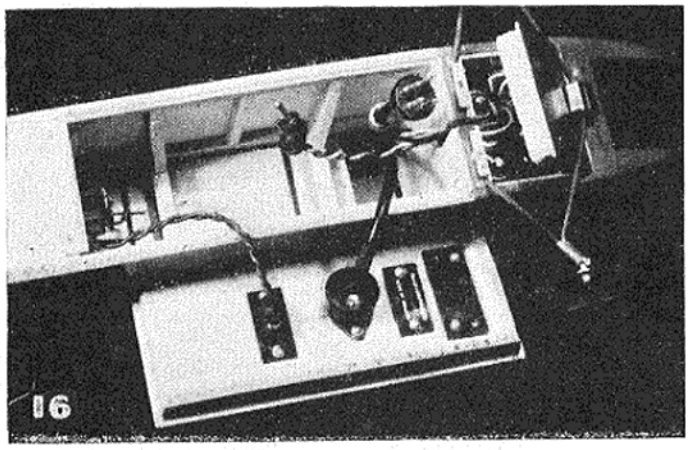












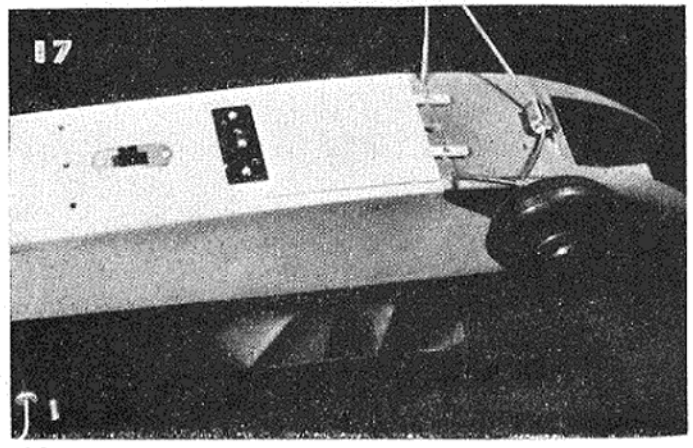


Fig. 14. The receiver installation, well insulated from shocks and crash damage. 15. Underside of fuselage: note foam-plastic lined battery compartment, also receiver and escapement leads. 16. Underside of fuselage, batteries installed, receiver and escapement connected to distributor panel. 17. Distributor panel in position and battery hatch closed.

be about 4 in. long, so as to be well clear of the torque-rod connection above, and may then be bent into a small diameter winding loop, the free end being bent forward to engage the side of the tinplate bearing support and prevent rotation. For winding, of course, the spindle is pulled back.

One disadvantage of the *Deacon* for R/C is its rather narrow fuselage, making it difficult to work with the hands inside the cabin. Our radio installation was therefore planned in such a way as to allow the entire equipment *and wiring* to be quickly removed for servicing as necessary.

Figs. 10 to 17 show how this was done, including the somewhat unusual departure of using the removable cabin floor as a distributor-panel to which the various components are connected by miniature plugs and sockets.

Receivers must, in all cases, be flexibly mounted to reduce risk of crash damage and to absorb engine vibration. One method of doing this is to sling the receiver between rubber bands hooked to the corners of the cabin. With the *Deacon*, however, there is some risk of the receiver hitting the sides of the cabin, when so suspended, and it was decided to encase our E.D. Transitrol receiver in foam plastic material within a balsa box that would slide through the open cabin top and rest in the upper part of the cabin on two suitably braced and padded cross-members, as shown in Figs. 13 to 16.

The cabin was also lined with strips of $\frac{1}{4}$ in. thick foam and a $1\frac{1}{2}$ in. " crash-pad " of sponge rubber was interposed between the receiver box and the front cabin bulkhead.

The battery compartment was completely lined with $\frac{1}{4}$ in. foam plastic (Fig. 13) including the underside of the hatch cover. The two B.122 " Batrymax " (HT) and U.11 (LT) receiver batteries, together with either three ($4\frac{1}{2}$ v.) or four (6 v.) pen-cells for the escapement, fit into this compartment exactly. These were soldered up into two packs with four-pin and two-pin polarised plugs, respectively, the bulkhead between the battery compart- and cabin being slotted to take the battery leads. (Fig. 16.)

The E.D. Transitrol receiver is, of course, sold complete with a wiring diagram and the manner in which this was used to wire up the distributor-panel-cum-hatch-cover can be seen in Figs. 10 and 11. On the outside of the hatch-cover, towards the rear, are the double-pole slide switch and meter socket, while, attached to the $\frac{1}{16}$ in. plywood inner panel, are four-pin, two-pin, seven-pin and two-pin sockets for, respectively, receiver batteries, escapement battery, receiver and escapement. Obviously, care must be exercised to ensure that components are wired correctly and the use of coloured stranded radio wire will help here. The ply panel is cemented to the side rails of the hatch-cover after making sure that all soldered joints are secure and that none of them touch when the two panels are put together.

Remaining details and also the preparation of the Veron *Deacon* for flight will be dealt with in our next article.

Some of the scale models made by the writer for the Imperial Services Exhibition at Earl's Court in 1913, to take part in the demonstration of Naval and Aerial Warfare given in the Empress Hall, and worked by an apparatus designed by him.

Modellers, You Lack Originality!

says DONALD STEVENSON A.F.R.Ae.S.

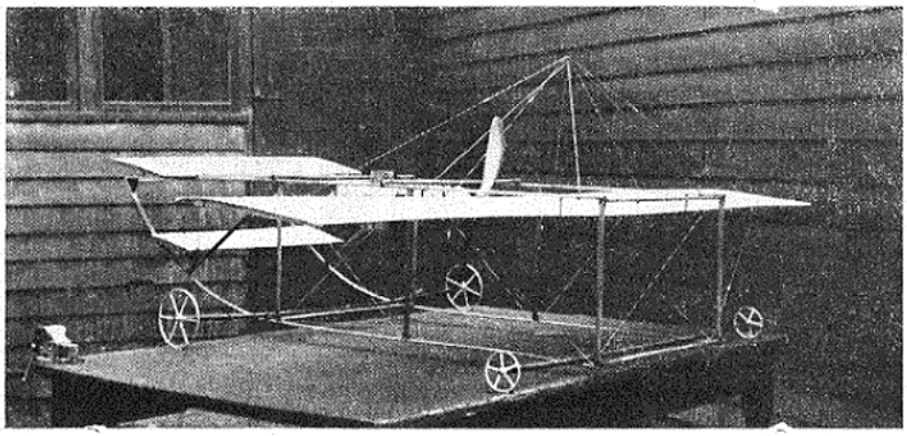
THERE is no doubt that, taken as a whole, model making has reached a higher standard of efficiency than generally attained in the past. Most model makers are now more highly skilled, have better technical knowledge and many more have access to machine tools than their predecessors. In addition they have finer materials to work with, also a lot of well finished standard parts are now obtainable and many have more money to spend on their hobby, so do not have to put up with makeshift methods and any materials available, like one had to use years ago, hence the magnificent models one sees today.

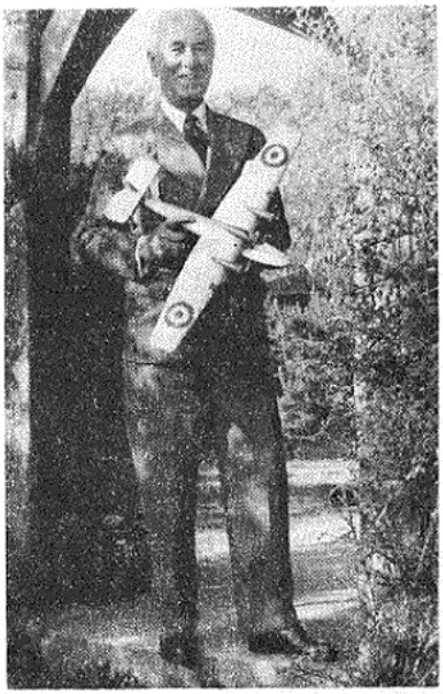
In spite of this the writer, who has been a keen model maker for over 55 years and has repeatedly acted as a judge at model exhibitions in recent years, has no hesitation in saying that model making generally has deteriorated in one very important direction, *it lacks originality.* Although beautifully made as a rule, most models are only copies of others which have put up good performances, merely altered in size and minor details, or are lovely scale models of existing aeroplanes, ships, cars or engines.

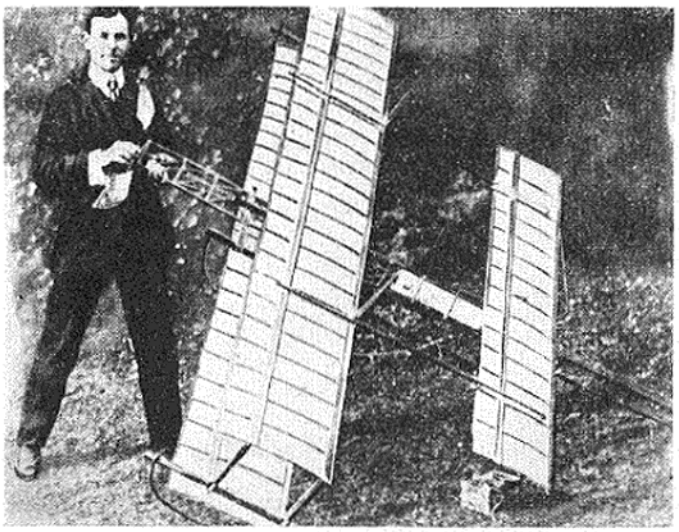
This is a great pity, because it shows a lamentable lack of initiative and enterprise through which many valuable ideas may be lost to progress, just for the want of a little courage and energy to try them out. In the old days the majority of models were useful ones, seriously made with great patience through many alterations, to try out ideas from which many valuable inventions originated. Today, the greater number of models are only for amusement, in other words merely glorified toys, in spite of the beautiful workmanship put into them. Notable exceptions to these are controlled models from which much can be learnt, and scale models made for reference purposes.

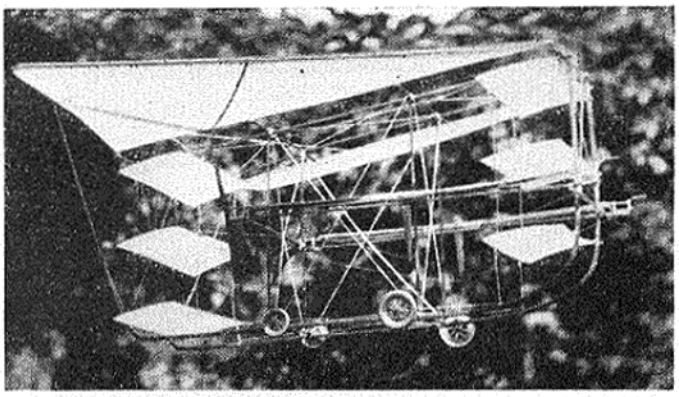
It cannot be due to any lack of inventive power or skill because this country still leads in this field. There are so many "experts" and "specialists" today and it seems that we are nervous about facing up to their criticism, and too often sneering remarks, but they do not know everything in spite of what they may think. They may not even

Below: A 7 ft. 6 in. span experimental steam driven model made by the writer in 1911. Right: A pioneer modeller, Sir Alliot Verdon-Roe, holding what would appear to be a three-engined flying boat.



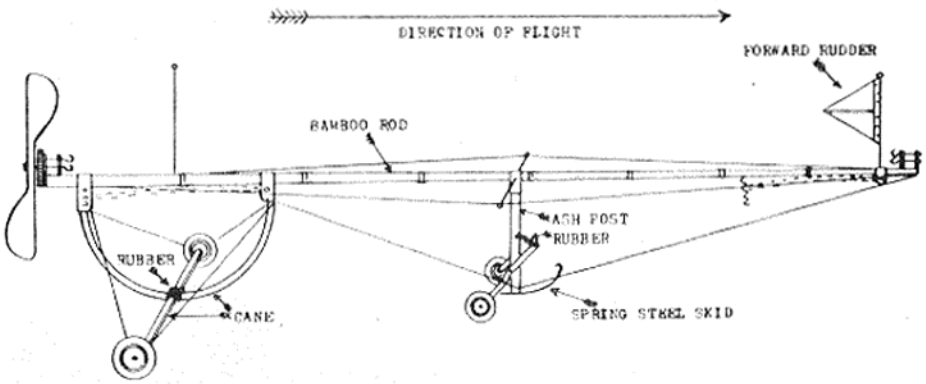






Left: A much earlier picture of Sir Alliot Verdon-Roe with the model that won for him the Aero Club Competition in 1907. Right: An experimental model built by Donald Stevenson in 1913. Much more primitive in appearance is the bamboo and cane model shown in the diagram below. This was built in 1907 and was 6 ft. long

fully appreciate or realise what you are aiming at, so it is wrong to be put off from experimenting with however crazy an idea it may seem at first, when a little more courage might help eventually to bring out a valuable improvement or useful invention. Many great inventions were scoffed at and looked upon as fantastic when they were first thought of; yours might turn out to be one of these if you gave it a chance. Do not let it be condemned and fade out without being tried out.



The writer can remember the time when people would come and look at drawings and models and say, "How clever," without in the least understanding them, and as they went away they would look at each other, shake their heads and say, "Poor fellow." Anybody who thought flying was a possibility was looked upon as a crank or fanatic and treated as such. In spite of this model makers persevered and aviation, like other forms of engineering, today owes much to their untiring efforts.

Sir Alliott Verdon-Roe, the founder of the great firm of A. V. Roe Ltd., started with small paper gliders, then model aeroplanes and the prize won by his model in 1907 helped him to build his first full size machine, which flew in 1908, and which was the first British power driven, man-carrying aeroplane to fly.

Sir Hiram Maxim was another famous model maker and inventor. His big steam driven aeroplane, which weighed over 7,000 lb., and had a lifting power of 10,000 lb., left the ground on July 31st, 1894, but as it was not a controlled flight and the machine crashed almost immediately, it could not be officially counted. His model and parts of the big machine can be seen in the Science Museum at South Kensington.

Mr. N. S. Norway, the well-known aeronautical engineer and founder of Airspeed Ltd., better known today as Nevil Shute the world famous author, was also a serious model maker. Before he moved to Australia he had a very fine workshop in the grounds of his beautiful home on Hayling Island. It had power driven machine tools, and he even kept time sheets so that he could see how long each model took to make, something which could well be copied by other model makers.

All the models illustrating this article were made for a purpose, to try out and develop new ideas and each served a useful end. We all know the joy of looking at a beautiful model one has just completed, of some famous aircraft, ship or engine, but the satisfaction obtained from experimenting with a model made to develop and demonstrate some new idea, especially if it is successful, far outweighs anything given by other forms of models. It has in it something akin to the spirit of adventure, and is just as thrilling. Most model makers have the gift of looking ahead, they develop the power to improvise and are continually forming new ideas; this capability should not be wasted.

The enthusiasm was greater in the past, this is well known to people who find it difficult to keep clubs and model associations going today, through lack of serious interest, especially among the younger members; there are too many distractions such as television, films, dances, etc., and the same concentration is not given to model making now. There are more really first class model making periodicals today than there ever were, and more people reading them, but it is to be feared that many of these readers prefer to read about models than to put in the hard work and time necessary to make them—arm chair model makers.

To sum up, in spite of increased skill and technical knowledge, fewer serious experimental models are being made today, and more merely for amusement, thus there is a very serious decline in the useful standard of model making.

UNDER THE COUNTER

M.A. reviews the new AN/GPS-4Q2 radio control set

THE AN/GPS-4Q2 is an entirely new development in the field of radio. The basic components are a transmitter and receiver, each mounted on a separate bipod.

The receiver is mounted in a handsomely finished cabinet, equipped with two main tuning dials, a coast button and a resonant cavity type of receiving waveguide.

The transmitter consists of a less handsomely finished cabinet more of a utility model, whose most prominent feature is the radiating monopole antenna located at the lower end of the chassis. This antenna is fed through a five (5) M/M waveguide from the twin transmitting tubes which are operated in " push-pull."

The equipment may be operated while mounted on the bipods when time is insufficient to prepare a more suitable installation, but optimum performance is not to be expected under such conditions. In general, the equipment should be laid along the ground. The bipods may be folded up or left extended along the ground but are rarely ever detached.

There is an almost endless variety of suitable positions for the components, and the more experienced operators feel that the most satisfactory results are obtained when a new arrangement is tried at least once a week. In almost all set-ups, it is found that the receiver bipod, which is adjustable through a wide range, can be interlocked with some portion of the transmitter chassis, providing firm support for the entire installation.

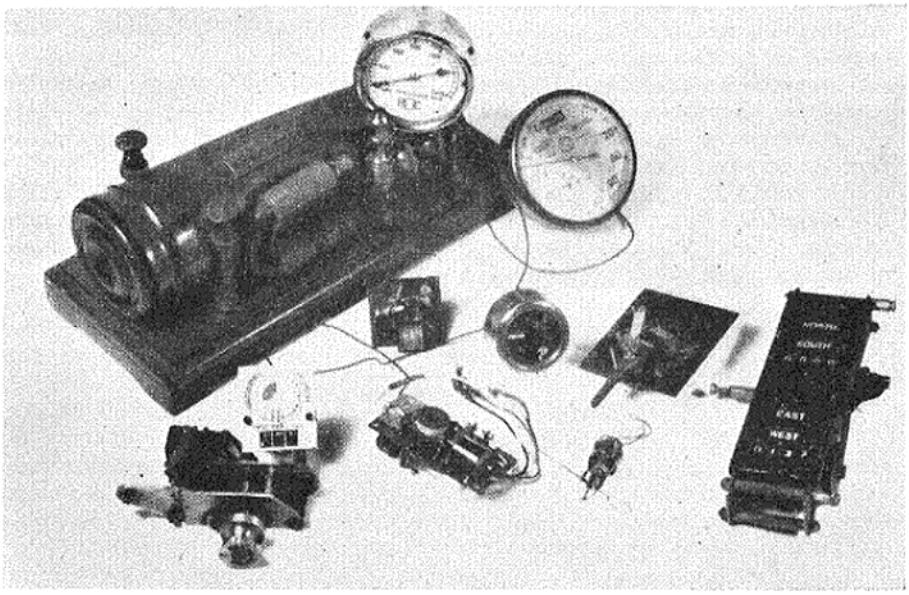
The site of the installation is important. The equipment should be bedded down on a surface which is soft but not springy. Excessive springiness of the foundation may cause spurious vacillations which interrupt the pulse repetition frequency and may cause premature transmission.

To prepare the equipment for operation, it is advisable for the operator to manipulate the main receiver tuning dials continuously while the receiver is warming up. The operator should also touch the grid cap of the local oscillator which is located just forward of the resonant cavity. If the receiver emits a low sigh, an excellent operation is assured. Practically no checks are possible on the transmitter, but these units are generally of such rugged construction that they seldom fail in operation. Some operators give the transmitter a dry run with a dummy antenna, but this is not a reliable test. Operation into a sand load is strictly forbidden; this will invariably ruin the radiating monopole.

The distinguishing feature of the AN/GPS-4Q2 is its mode of operation. Unlike the majority of R/C sets, the PRF is continuously adjustable over a wide range. In optimum operation, the PRF varies gradually, starting at a low rate, increasing slowly, decreasing again and going through several cycles of increasing and decreasing PRF. During this time, if the receiver is operating properly, the resonant cavity will become highly sensitive to the transmitted frequency. In rare cases, a receiver is found which still retains the protective shutter in the resonant cavity. This shutter is utterly useless, and will generally be destroyed by the first main bang.

A common mistake on the part of inexperienced operators is to start the transmitter off at too high a PRF. Entirely apart from the strain on the mechanism, this type of transmission is inadvisable as it invariably results in premature operation. Repeated strains of this sort will generally result in a complete breakdown of the receiving stem, which in general, will never again operate satisfactorily with that particular transmitter.

Some operators are able to make continuous check of the equipment by inserting the main tuning knobs in their ears, and listening for unusual set noises, arc-overs in rotating joints, etc. This is only possible with the larger or " long stemmed American beauty " type of receiver. In proper operation the cyclically varying PRF will gradually rise to a tremendous crescendo. At this time, a transmitted pulse of approximately 10 megawatts is operated, the radiating element arcs over, and various parts of both transmitter and receiver become virtually incandescent. The equipment must now go off the air for a short period of maintenance, repairs and general policing of the area. The operator should pay careful attention to the receiver, making sure that all capacitors discharge slowly and that the equipment is gradually brought back to quiescent condition. One of the most frequent causes of set failure is tendency of the operator to go to sleep at this point without remembering to turn off the receiver. This causes violent erratic motions of the receiver and it will blow several fuses causing damage to the base of the transmitter.



Component parts of the new AN/GPS-4Q2. Simple in construction, it is also a very robust unit. On the right is the neat direction change indicator marked North, South, East and West.

AVIATION NEWSPAGE

by J. W. R. Taylor

AIR-LAUNCHED ROCKET-PLANES like the U.S. Bell X-1A and X-2 are now eligible for world record attempts, following a modification of the official F.A.I. rules, which stated previously that an aircraft had to take off from the ground under its own steam. The amendment is too late to turn the 126,200 ft. height "record" of Capt. Ivan Kincheloe in the X-2 into an official world mark; but North American's first X-15 piloted research aircraft, due to fly next year, is intended to reach Mach 5 (3,300 m.p.h.) at heights up to 250,000 ft.

Meanwhile, Russia's Tu-104A twin-jet airliner has caused something of a sensation by snatching the world 1,000-km. closed-circuit speed record from a jet-fighter, the Saab-29. It covered the 621.37-mile course in 61 min. 48 sec., at an average speed of 604.45 m.p.h., carrying a ten-ton payload. At times, it is said to have touched 639.9 m.p.h.

* * *

THE PAINT INDUSTRY has good reason to be grateful to Aer Lingus, because the latest photos of the Irish airline's *Viscount* 707 and 808 airliners, just received, show that it has again changed its colour scheme. In place of the dark "English green" over the flight deck, there is now a canopy of Daz white. However, we are assured that the reasons are non-political, and passengers still sit under a roof of "Winchester green."

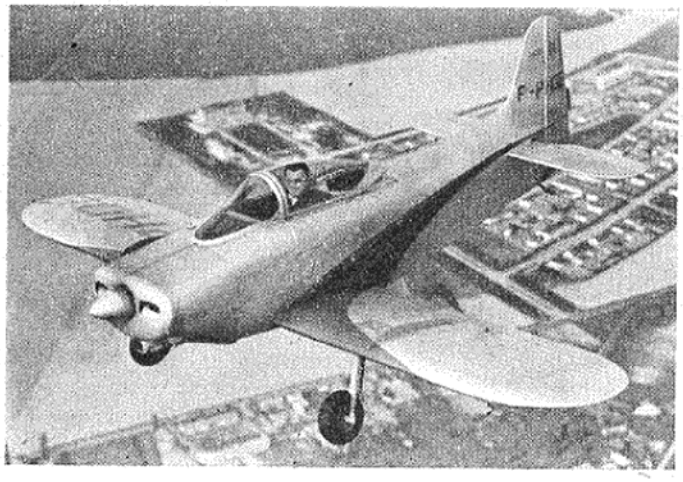
* * *

TOSS-BOMBING with atomic weapons is one of the jobs allocated to Boeing's six-engined B-47 *Stratojet* now that sufficient B-52s are in service to allow the release of B-47s to Tactical Air Command. Never before done by anything larger than a fighter-bomber, toss-bombing involves putting the aircraft through an Immelmann turn. Racing low over the countryside, to elude radar and fighter defences, the B-47 pulls up vertically at the end of its run-in to the target and releases its bomb on the way up. The weapon describes a high arc, falling on to the target a great distance from the point of release, while the bomber completes its half-loop, rolls off the top and speeds away.

UNTIGERLIKE TAIL on the *Tiger Moth* in our heading photo is quite a common sight in Holland, where this veteran biplane is still widely used for training and banner and glider-towing—jobs for which some extra fin area is useful. This particular aircraft belongs to the State Flying School, at which all potential young K.L.M. pilots receive their training.

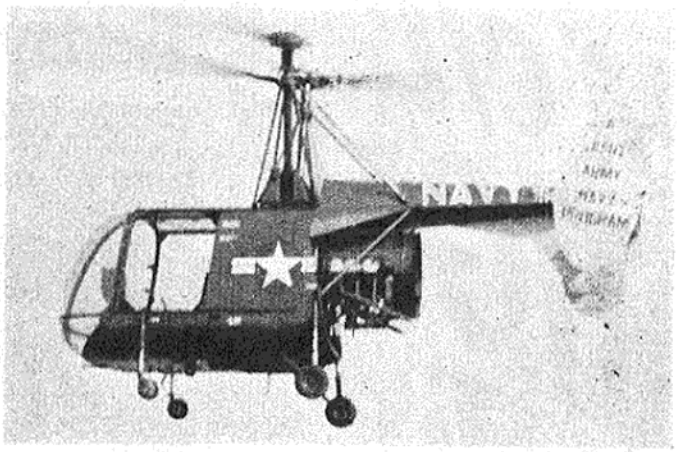
* * *

LATEST LIGHTWEIGHT for home construction by amateurs is the sporty-looking M.J.2 *Tempête*, designed by a young French ex-military pilot named Marcel Jurca and built by members of the Aero Club of Courbevoie. Using a fair number of Jodel components to save cash, it spans only 19 ft. 8 in. and gets a top speed of 120 m.p.h. out of a Continental flat-four of only 65 h.p.



Left: A home-built French lightweight, the M.J.2 "Tempete." Above: Aer Lingus "Viscounts" have gone "white on top" rather prematurely, as this photo of the latest colour scheme shows.

Construction is all-wooden, with plywood-covered fuselage and fabric-covered wings and control surfaces. Standard Jodel parts include the undercarriage legs and wheels, engine mounting and cowling and fuel tank. Cruising speed is 106 m.p.h. and this junior *Spitfire* offers an endurance of 3 hr. 20 min. on 13 gallons of petrol.



Above: And well might this "Beaver" be kept hidden away; see para on left. Right: The pilotless HTK-1.

FAR MORE UNUSUAL is to see a D.H. *Beaver* in R.A.F. markings, especially complete with wartime-style code letters. A clue is provided by the fact that the photograph was taken at Denham, haunt of movie-makers, and the insignia were in fact painted with distemper on a civil-registered *Beaver* as make-up for its part in a new film. The result will no doubt cause pain in due course to cinema-going enthusiasts who are sticklers for historical accuracy.

* * *

MONEY IN DROP TANKS may sound like pennies from heaven—but what we mean is that Bristol Aircraft are finding it good business to manufacture plastic drop fuel tanks for other people's aeroplanes. In addition to their standard use on many R.A.F. and F.A.A. types, there is a flourishing overseas market, and the latest order for 100-gallon tanks for the *Hunter* 6 fighters purchased by India brings the total value of Bristol's plastic tank exports to over £250,000.

* * *

Several **SPECTACULAR SUCCESSES** have been achieved during this year's air exercises by *Javelin* all-weather fighters of the Horsham St. Faith wing. For the first time, R.A.F. pilots had little fear of running out of fuel during a lengthy sortie and one crew, having already made two interceptions over the Dutch coast, made a third kill over the centre of Brussels and still had time and fuel to chalk up yet another victim on the way home.

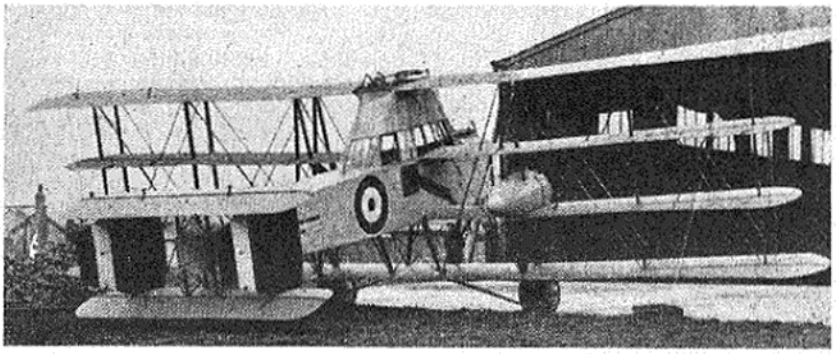
* * *

LOOK—NO HANDS! Kaman's pioneer work on developing pilotless helicopters was rewarded on July 30th this year by a relaxation of the official regulation that a safety pilot must be carried on all remote-control flights. With nobody aboard, an HTK-1 intermeshing-rotor 'copter took off vertically, hovered, flew forward, backward, sideways and then landed, under radio control by an engineer who has never piloted any type of aircraft in the air.

Idea behind the robot, which was built under a joint U.S. Army-Navy programme, is to prove that small remote-control helicopters could be used to carry TV cameras for battlefield surveillance, to lay communication wires, transport supplies and equipment to otherwise inaccessible areas and perform normal photo-reconnaissance missions, without danger to human crews. Bearing in mind the skill and co-ordination required to fly a helicopter from the cockpit, the Kaman radio-control system represents quite an achievement.

FROM THE PAST . . . . . No. 19

Supermarine Night Hawk



THE SUPERMARINE *NIGHT HAWK* of 1915 was an aircraft with the mostest of everything, from wings to range. Powered by two 100 h.p. 10-cylinder Anzani radials, it was designed by that remarkable man, Noel Pemberton-Billing, as an anti-Zeppelin fighter. It had swept quadruplane wings, a biplane tail and a square-section fuselage in which most of the wooden structural members were fabric-wrapped to reduce the possibility of injury to the crew from splinters in an accident.

The pilot sat at the rear of an enclosed glasshouse with side windows in the fuselage to give a good downward view. In action, the gunners occupied open-air positions in the nose and above the pilot's cabin, level with the top wing. Lewis machine-guns were fitted in the nose and to the rear of the top platform, but the real "secret weapon" was a 1½-pounder Davis gun, with 20 rounds of ammunition, in the front of the upper position. No less interesting was the searchlight on a flexible mounting in the nose, which was intended primarily for target illumination and so foreshadowed the Turbinlite night fighters of 25 years later.

The *Night Hawk* carried a ton of fuel in its nine tanks, sufficient for a patrol endurance of 18 hours, and even contained a bunk on which one crew member at a time could get some sleep. It flew well, and its non-production was probably because the Zeppelins had been mastered by standard fighters by 1916.

Span: 60 ft. Length: 37 ft. Height: 17 ft. 8½ in. Wing area: 962 sq. ft. Weight empty: 3,675 lb. Weight loaded: 6,145 lb. Max. speed: 75 m.p.h. Landing speed: 35 m.p.h.

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by Frank Buckland

for 1.5-2.5 c.c. engines

HERE'S your chance to fly a "Tiggie"—to have your hand at the controls of this much loved little biplane. Although it is a model, it's as tough and stouthearted as its famous original.

Fuselage and Tailplane

Start by cutting out all the formers, cut a hole in C for the stunt tank, and when this is correctly positioned glue the bearers to formers B, C, and D, having first drilled the holes for the undercarriage fixing bolts.

Build the basic $\frac{3}{16}$ in. sq. fuselage and cement it to the front former assembly, then add the control plate mounting of $\frac{3}{8}$ in. sq. hardwood, and fit the control plate and pushrod in place. Bend and solder the undercarriage to shape and fix it to the ply formers with tin straps. Fill in the spaces between the first three formers, and back to the rear of the cockpit line, with $\frac{1}{8}$ in. balsa, making sure that this is a flush fit with the outside of the fuselage.

Cement the top formers in place and add the $\frac{1}{16}$ in. sheet decking, then when this is dry the cockpits may be cut out. Fix the tail skid very securely to the tail post which is of hard balsa well cemented and gusseted to the longerons. Shape the tailplane support from soft block and cut a slot in the forward end to take the fin tongue, then cement in position.

Make the tailplane from two layers of 3/32 in. sheet, with hinges and control horn sandwiched between, cut and sand to section and mount on fuselage. Connect up pushrod and make sure that the elevator movement is satisfactory. Cut the fin and rudder from $\frac{3}{16}$ in. sheet, sand to finished shape, and cement in place, noting how the fin slots through tailplane and into the soft block.

Make the top wing centre section as shown on the plan, and stitch the cabane structure carefully in position on the $\frac{1}{16}$ in. rib pieces. When satisfied with the accuracy of the unit, screw the bottom ends of the struts to the bearers with small wood screws, after first cutting away a small portion of the $\frac{1}{16}$ in. sheet decking at each fixing point. Fair-in later with plastic wood over the screw heads.

Cement a 3/32 in. square "appearance" stringer along each side of the fuselage on top of the existing framework; add cockpit floors and the soft balsa crash pads. Sand the fuselage smooth after cutting a slot in the bottom to take the lower wing mainspar. The imitation oil tank of soft balsa can then be added

After thoroughly fuel proofing the engine compartment mount the engine in place using "U" bolts if possible, and fit the nose former and block.

The cowlings are made from thin aluminium, and the easiest way to ensure a good fit is with the aid of thin card templates which are carefully cut to shape by trial and error. From these the metal cowlings can then be cut. Be sure to allow the bottom cowling to bell out at the rear for engine exhaust and scale appearance. The cowlings are held in place with wood screws.

Wings

Construction is straightforward and the wings can be built over the plan in the usual way, but be sure to angle the root ribs correctly to allow for the dihedral.

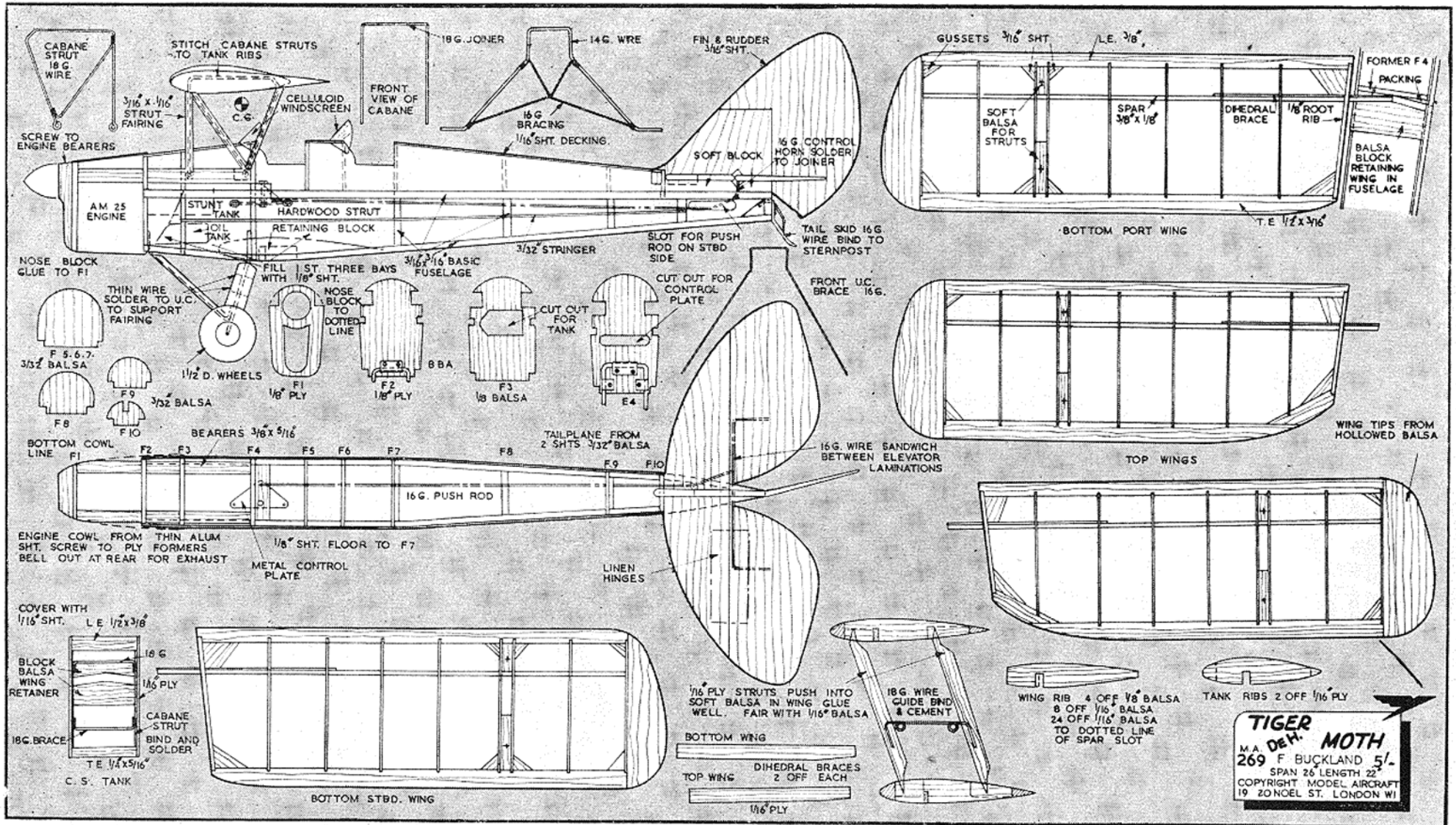
When the halves are dry offer lower wings to the fuselage having first placed the retaining balsa block in position. Using plenty of cement, slide each wing half through the fuselage slot making sure of a good snug fit to the retaining block. Small wedges should be placed between the spars and former D. Work quickly while the cement is still soft and pin the wings securely and accurately into position, blocking up the tips if necessary. Once you are satisfied that all is as accurate as possible, leave until the cement is thoroughly set. Cut out the $\frac{1}{16}$ in. ply braces for the top wings, and these are then fitted into the slots in the wing tank in the same way as for the lower wings.

The interplane struts can be slotted and glued into position to help support the top wings while the cement is setting.

Fill in the underside of the fuselage, from the firewall to the wing trailing edge with 3/32 in. sheet fitted flush with the bottom longerons. Add the lead-out guide to the port struts and fair off all struts as shown on plan. Cover top and bottom of the wing tank with $\frac{1}{16}$ in. sheet, and fix the scrap balsa filler cap.

Finishing

Cover the entire model with heavyweight Modelspan and build up a good finish in the usual way with sanding sealer and thin dope. Before applying the final coats of dope to the fuselage fit the celluloid windscreens. Colour schemes, both civil and R.A.F., are numerous but the original model was dark purple with yellow flying surfaces and white letters—the colours of the Bristol Aeroplane R.F.T.S. in 1937 at Yatesbury.



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Club News

LOUGHBOROUGH COLLEGE M.A.C.

The club has grown somewhat this year and some keen "Freshers" were welcomed. All types of models are under construction and we hope to compete in nearly all types of contests next year.

SPRINGPARK M.A.C.

The club is delighted by Tony Straker's win in the power contest at the All Britain Rally with his A.M. 3.5 powered *Creep*. "Kit" Percival is anxiously awaiting delivery of an E.T.A. 29 with which he hopes to emulate T. Straker's rate of climb.

An exhibition held on Battle of Britain day was a great success and raised the morale of our 45 members to great heights. Our annual power trophy, flown for at Epsom, was won by "Kit" Percival and the rubber trophy by A. Evans, who is better known for his scale models. Rally visits have so far prevented a glider contest from being held.

Keen aeromodellers are always welcome at the Coney Hall Assembly Rooms on Tuesday evenings.

COLNE & D.M.A.C.

We are holding our second annual winter rally at Colne on December 15th. Classes are the usual F/F events, plus combat and radio. The venue is the same as last year and details are available from: S. James, 140, Knotts Lane, Colne, Lancs.

COVENTRY & D.M.A.C.

The annual inter-club contests between the Leamington, Rugby clubs and ourselves took place at R.N. Air Station, Bramcote, in ideal weather conditions—a very light breeze mainly overcast and no appreciable lift, and with a 3 min. maximum very few models flew outside the confines of the airfield. Support was up on last year with a total of 25 entries being made in the three events run, and only two had to retire with no flights to their credit.

With the closing of the outdoor season, members are looking forward to the indoor sessions. We have again obtained use of the usual hall which is at Radford Primary School, Lawrence Saunders Road, Radford, Coventry, and a welcome will be made to any new members at our Friday night meeting there.

CHEADLE D.M.A.S.

The annual club dinner and prizegiving will be held at Parker's Cafe, Gatley, on December 13th—a Friday—at 7.30 p.m.

At the recent club championships, held on Rootes Day at Tern Hill, Bob Lawther won the power, Wally Nield the glider, and "Gib" Gibson the rubber.

SOUTH EASTERN AREA

Continuous rain and high winds threatened to put an end to the South Coast Gala at Ashdown Forest, but to everybody's relief in the early afternoon conditions improved and a start was made. A small entry put up a good show, and most people seem to have enjoyed themselves.

WIGAN M.A.C.

'Flu cut our transport and attendance to the All Britain down by half; the members who went down on the Saturday had checked and packed all their models and stuff only to find on arrival that the tent had been left at home. 'Flu also robbed B. Talbot of being N.W. Area power champ. through missing the area meeting at Tern Hill, where his clubmate S. Wood flew to a shared third place with his O.D. glider.

The club have now got a room for the winter where any interested bods will be made welcome. The address: Wigan Wheelers Club House, Moorfield Street, Woodhouse Lane, Springfield.

FARNBOROUGH M.A.C.

The October club comp. was held in perfect conditions. D. Sibbick flew very consistently into first place with his Oliver-powered *Helicanth*, totalling 8 : 47. J. Harris was lucky with lift and managed 8 : 11 with *Trog II*, a heavyweight glider, but secretary M. Gates, with easily the fastest climb (Oliver again !) suffered from an erratic flight pattern on his last flight, giving him a total of 8 : 08 for third place.

New members are invited to club meetings, the dates of which are posted in the local model-shop window.

ENGLISH ELECTRIC M.A.C.

Five members attended the area meeting at Chetwynd. Although no success was obtained in team glider, T. W. Smith and his two models topped the area results in the Halifax U/R power with a time of 10 : 14. Two of the flights were made in poor visibility.

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

The club rally held at R.A.F. Wellesbourne Mountford was a great success (*we* think !). No fewer than five Midland Area clubs turned up which seemed to be about 10 times the numbers at the S.M.A.E. T/R (½A, A, B) on the following Sunday. Several clubs turned up for sports flying when the area centralised team rubber and U/R glider was progressing with a background of snarling engines, including a stentorian Fox "59."

Would all members and prospective members please note that club meetings are NOT on Tuesdays, but are now held on the first Monday of every month at 7.30 p.m., Central Chambers (S.-on-A.). Anyone interested is welcome.

CHINGFORD M.F.C.

During the year we have made the usual rounds of the competitions, and J. Hall did 150 m.p.h. in speed at the York rally. This is the sole success of the club this year.

The R/C group continues to put quite a lot of flying hours in, with Ray Groom managing to loop his Merlin-powered *Breathless*. The others are flying a Javelin-powered R6B, Javelin *Matador* and 4/5 scale Oliver *Smoghog*.

Anyone interested in joining the club should contact: S. Cameron at Wellington Avenue Youth Centre, E.4, on Fridays.

Books: the Ideal Gift

New Cheap Editions

CONTROL-LINE FLYING *by R. H. Warring.* Numerous photographs, diagrams and tables. The first of three companion books by a famous author. This is a general introduction to the subject and consideration is given to the following: How control-lining started; types of control systems; control-line model types; control handles, lines, equipment; operation and flying technique. Then follow chapters on the design characteristics of control-line models; considerations in airframe construction; types of motors; suitability for flying scale models; sport flying, etc. **6s.**, post 9d. (U.S.A. and Canada $1.50, post paid).

SPEED CONTROL LINE MODELS *by R. H. Warring.* Aerodynamic design and airframe construction are dealt with in detail in this second book, with scale drawings of outstanding models and data tables analysing over 60 different types. Motors, fuels, operational technique (including dolly and drop-out under-carriages) are all treated in a thoroughly practical manner. Jet speed models are covered in a separate chapter. There is also a complete set of speed tables, covering one lap, quarter-mile, half-mile and one kilometer distances. 6s., post 9d. (U.S.A. and Canada $1.50, post paid).

STUNT CONTROL LINE FLYING *by R. H. Warring.* The third book deals comprehensively with the design of stunt models, covering wing and power loading, design, layout, component shapes and proportions, control systems, rigging angles and balance. Airframe construction is dealt with under specific headings, together with motors and stunt tanks. A special feature of this book is the 18 general arrangement drawings of outstanding stunt models by world experts with over 100 line illustrations, and 8 tables summarising design and constructional data of over 40 models. **6s.**, post 9d. (U.S.A. and Canada, $1.50, post paid).

Popular Titles

THE "EAGLE" BOOK OF BALSA MODELS *by Bill Dean.* In quarto size and beautifully illustrated with photographs, drawings and plans, this book gives detailed instructions that anyone can understand for the building of 18 different models. Aeroplanes constitute over half of the designs, together with gliders, rubber-powered, Jetex, flying scale models and several unothodox types. Each stage is carefully explained with the aid of photographs that "show how" and simple plans which can be traced off. Advice is given about tools and wood and the cost of equipment, and no hint or tip has been omitted which is likely to help the beginner. **7s. 6d.**, post 10d. (U.S.A. and Canada $2.00, post paid.)

POWER DURATION MODELS *by R. H. Warring.* Numerous diagrams and tables. Every designer is influenced by previous practice and it is this fact which has prompted the author to analyse some 150 successful models and to present the result in tabular form. The book is divided into two parts: Part I summarises design data for a considerable number of various types and, subject to certain limitations, provides the would-be designer with all the facts and figures he needs in order to produce a successful model of one of these types. Part II takes each type of design layout in turn and describes optimum or best design proportions and layouts, with attendant structural details. **6s.**, post 8d. (U.S.A. and Canada $1.50, post paid).

HOW TO MAKE MODEL AIRCRAFT *by P. G. F. Chinn.* An attractive book in magazine format which incorporates articles by the author reprinted from *Model Aircraft.* It is packed with information and contains nearly 200 explanatory photographs. Covers everything of importance in the building of model aircraft, from the choice of essential tools, through basic construction problems to the thrill of the first successful flight. The book provides a short cut, under expert guidance, to the more advanced stages in model aircraft building and flying. Over 40,000 copies have been sold at the time of writing. 3s., post 6d. (U.S.A. and Canada, $1.00, post paid).

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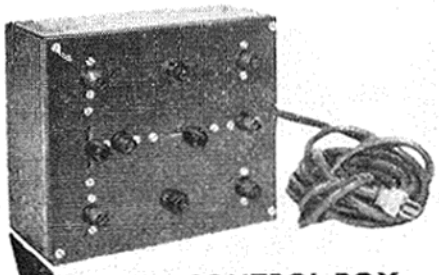
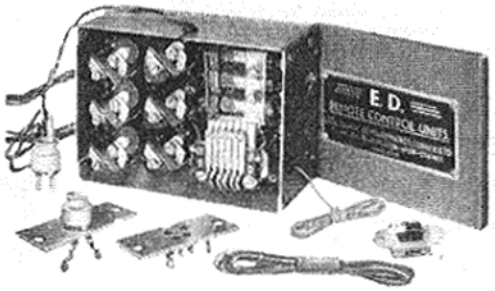
E.D. TRADE MARK for REMOTE CONTROL of your models

The Mk.V. "EVEREST" *TUNED REED 6 CHANNELS*

MULTIPLE RADIO CONTROL UNIT

The crowning achievement for the remote control of all models. The prototype of this set "swept the board" at the Radio Control Competitions during the 1955 season and the outstanding qualities of the "EVEREST" have been fully demonstrated by its consistent successes in Radio Control Competitions during 1956 and 1957.





CONTROL BOX

Control Box, size 6 in. x 5½ in. x 2½ in. giving up to six Controls with ample lead to Transmitter easily held in hand.

RECEIVER

Fitted with Standard Hard Valves with an average life of 3,000 hours, and six Standard Relays. The Receiver output will operate either Electric Motors or Escapement.

TRANSMITTER

Self-contained for housing all batteries, and with 8 ft. sectional Aerial. Fitted with two Standard Hard Valves.

PRICE COMPLETE	£29 . 3 . 11
RECEIVER	£17 . 15 . 3
CONTROL BOX	£4 . 12 . 5
TRANSMITTER	£6 . 16 . 4

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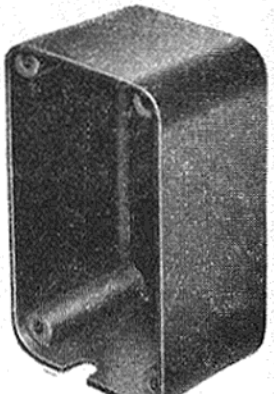
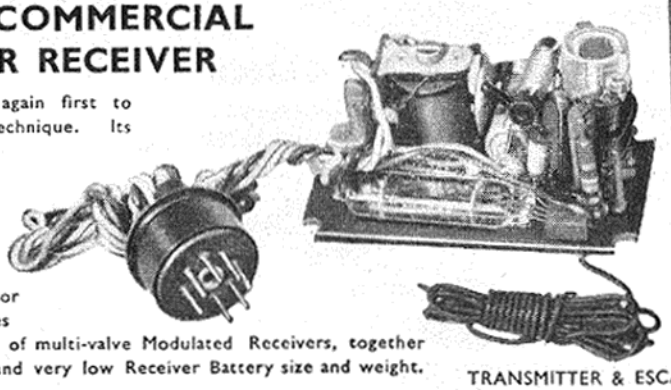
RADIO CONTROL UNIT

THE FIRST COMMERCIAL TRANSISTOR RECEIVER





E.D., of course, were again first to introduce this new technique. Its advantages in size, weight, current capacity and quality of reception will appeal to all Radio Control enthusiasts. This valve transistor Receiver combines all the advantages of multi-valve Modulated Receivers, together with simplicity and very low Receiver Battery size and weight.

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Size 2½ in. x 1½ in. x 1½ in. Weight 2½ ozs. Current change from approximately 0.2 idling up to 4 Ma. All connections via a 7-way cable and plug. It operates from any standard carrier type transmitter on the 27.12 M/cs band.

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Transmitter Receiver & Escapement. Completely wired. Soft or Hard Valves. **£11 . 18 . 6**

E.D. Mk. IV. "MINIATURE"
Tuned Reed, 3 Channel, Hard Valve, Transmitter Control Box and Receiver less Escapement **£20 . 9 . 6**

All prices include P. Tax

E.D. Diesels

Seven models available from 0.46 c.c. to 5 c.c. and suitable for use by the beginner or the expert in model aircraft boats or cars. Each engine is individually tested for accuracy and reliability up to a standard that ensures the greatest possible speed and performance for your models.

Write for our illustrated list giving details of all E.D. Engines, Radio Controls, Mechanisms, Accessories, Spare Parts, etc.

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ISLAND FARM RD. WEST MOLESEY. (SURREY) ENGLAND.
GRAMS: "EEDEE" EAST MOLESEY

DECEMBER 1957

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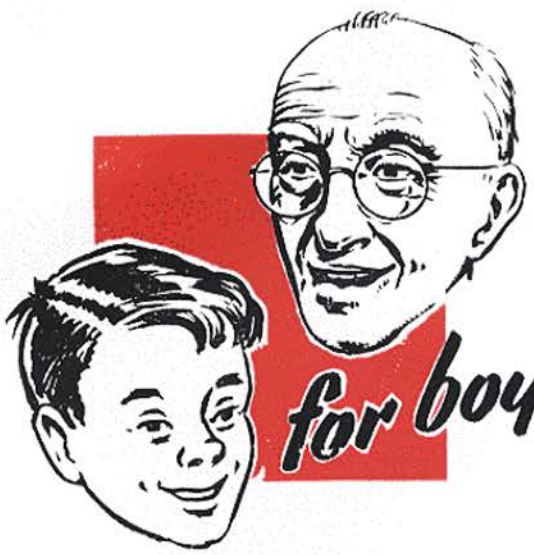

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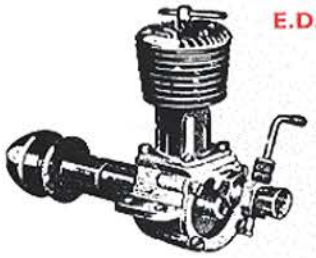

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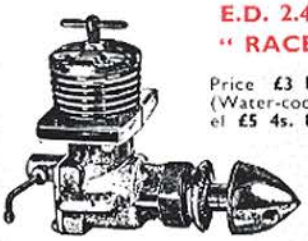
(Water-cooled Model £5 7s. 1d.)



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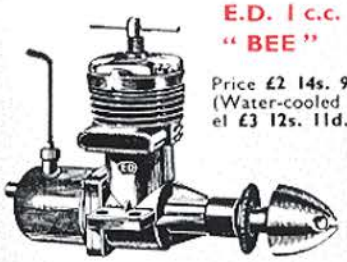

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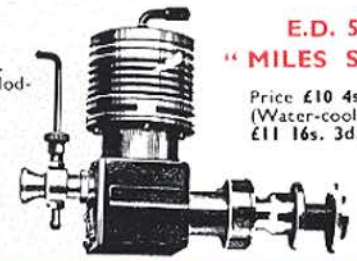

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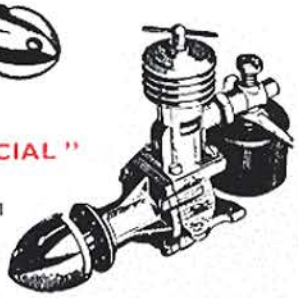

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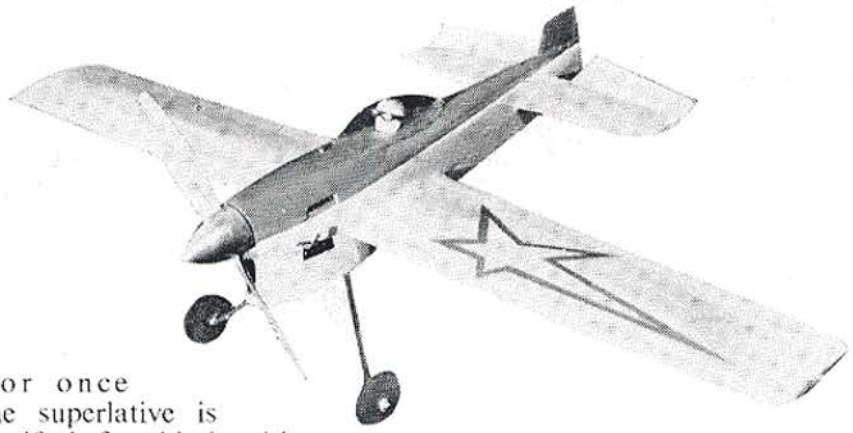

For once the superlative is justified, for this is without doubt the finest team racer ever designed. One look at the astonishing record of the Voodoo, flown for over two years against Britain's best, will convince you that the design is without parallel. A second look inside the kit will prove that this is also the most prefabricated control-line model yet produced—all balsa, ply and oak parts are fully shaped and need only light sandpapering. The cowling, always a source of trouble, is particularly simple — no carving at all is required to accommodate any 2.5 ! The instructions give many race winning tips that will help you to receive the checkered flag every time.

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