

# AERO MODELLER

SEPTEMBER 1955



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1/72nd English  
Electric P.I. Jet

Mew Gull Scale  
2.5cc. Team Racer

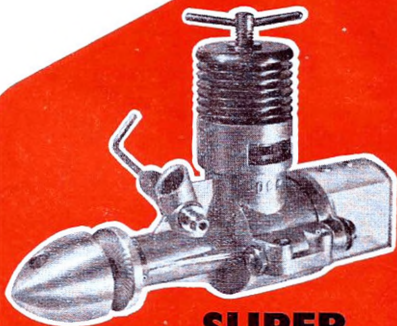
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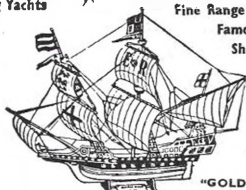
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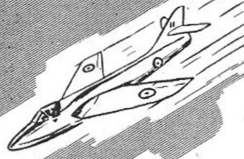
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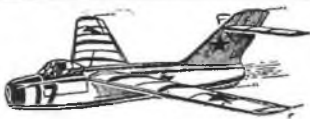
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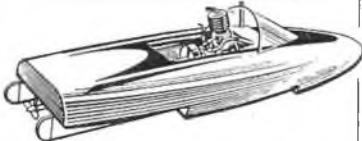
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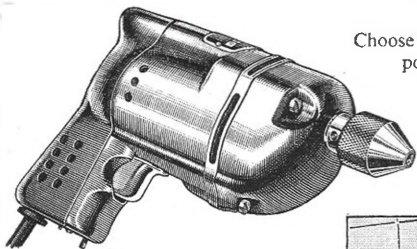
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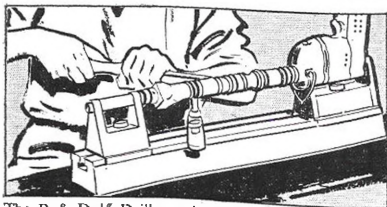
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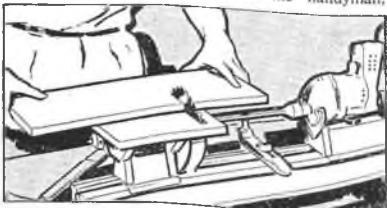


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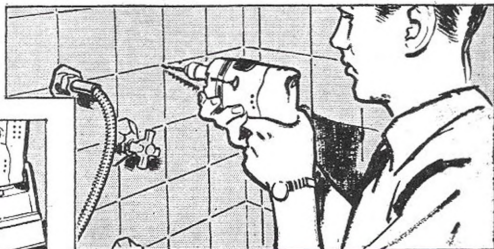


The B & D  $\frac{1}{4}$ " Drill can be used to drive the lathe. Makes wood-turning simple for the handyman.

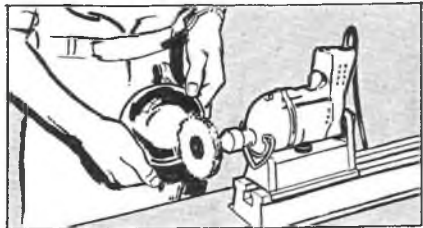


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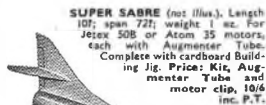


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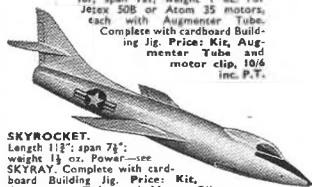
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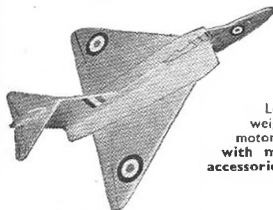
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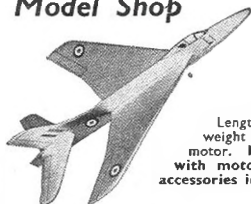
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Length 14"; span 12"; weight ½ oz. For Jetex 50 motor. **NOW ONLY 7/7** with motor, wick and all accessories included.



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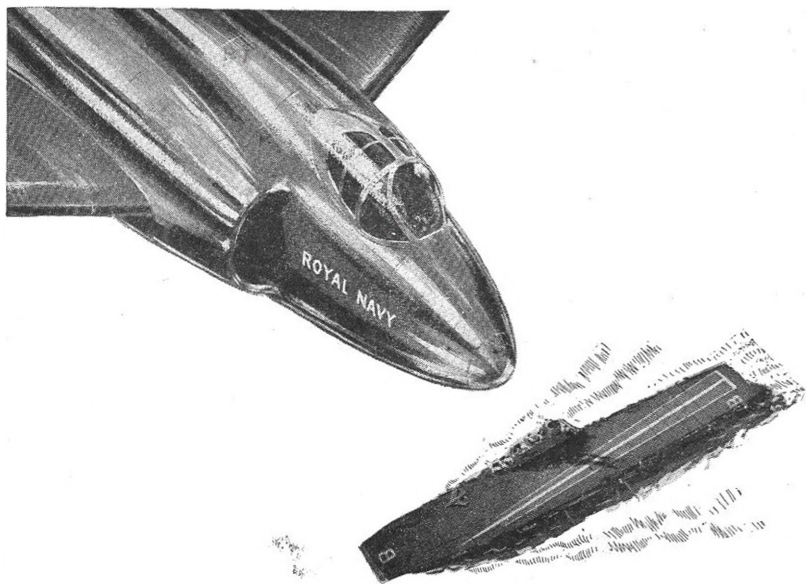
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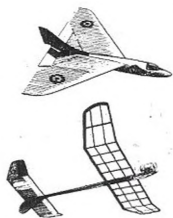
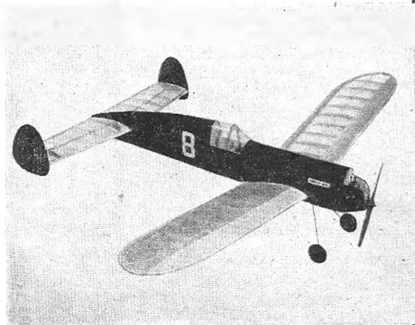
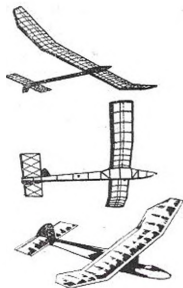
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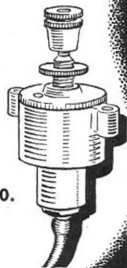
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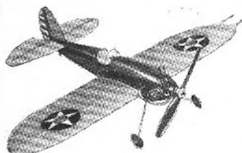
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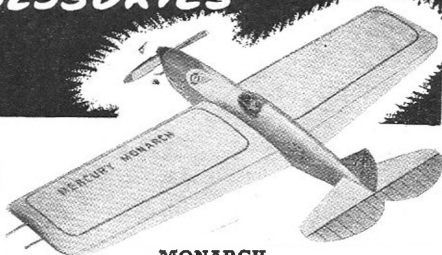


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Weights only 4 lbs. Exceptional performance 69/6

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# AERO MODELLER

'Covers the world of Aeromodelling'

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★

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## International Control Line Contests

WE REPORT IN this issue the recent World Speed Championships held in Paris, which for 1955 were for 2.5 c.c. models. This event marked the first participation of "Iron Curtain" countries in the international contest sphere, with Czechoslovakia underlining the occasion by winning at a speed of 179 k.m.p.h.

We congratulate the Czechs on their victory and welcome them, together with the other Eastern European Nations, to the sporting side of international aeromodelling. Reports have it that the Russians, who already have sent observers to international events this season, may be entering teams in the World Free Flight Championships in Germany in September. We trust this is correct, for aeromodelling undoubtedly provides a common bond which breaks down social and racial barriers, and in doing so brings the people of the East and the West closer to a mutual understanding.

Now that the present series of World Control Line Championships has reached its conclusion, we trust the F.A.I. will give serious thought as to which particular class of flying is most suited for Championship classification.

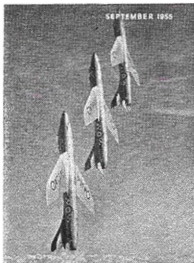
We consider that Speed should be dropped in place of Team Racing. Certainly as far as popularity is concerned, the latter has precedence. Sheer speed flying merely encourages the development of racing engines with no regard to durability or economy. It furthermore only utilises the skill of one individual—the pilot. Team Racing on the other hand, not only requires a fast and economical engine but, more important still, one that will start first time, everytime! It also requires two skilled aeromodellers—a pilot and mechanic—working together as a team.

Team Racing can be paralleled with international motor racing, being an entertaining event, not only from the participants' viewpoint, but also for spectators, with improved publicity value to the aeromodelling movement as a result.

We only hope that it will differ from motor racing in that the "works' team" angle will be discouraged. This aspect was very apparent at the Speed Championships where we gather one manufacturer paid for the whole team to attend.

### On the Cover . . .

Recent displays by Royal Air Force aerobatic teams include Number 43 Fighter Squadron shown in vertical echelon in this outstanding action shot. Based at Leuchars and known as the "Fighting Cocks" they are equipped with Mark I Hunters, and commanded by S/Ldr. Roy Lelong, D.F.C., who is leading this formation. They were the first R.A.F. squadron to be equipped with 200 m.p.h. "Fines" and the first to be equipped with 700 m.p.h. "Hunters"



## Heard at the HANGAR DOORS

### Home built

In France one is encouraged by generous Government subsidies to build and fly light aircraft. It is quite a natural step to graduate from model building to constructing one's own full-size airframe, and most of the model clubs are in fact allied to, or part of, full size flying clubs. Readers will already be familiar with the shape of the Jodel D.9 Bebe, which is the most popular of the French home-built single seaters and will doubtless recognise the similarity in outline of the two-seater in our heading picture.

It is in fact the Jodel D.11 Club, a side-by-side cabin design for a variety of engines, and F-BBBF happens to be the prototype with a 45 h.p. Salmson radial having 800 flying hours (with the same airframe) to its credit. Jean Delemontez, co-designer with Monsieur E. Joly, is seen returning the Club to its hangar at Beaune after giving us the opportunity of examining the aeroplane in detail. Over 100 of this type have been made in Europe from plans supplied by Avions Jodel.

### Honour accorded

As team manager for the British control-line team in Paris, Doug Gordon, Honorary Secretary of the S.M.A.E. was able to receive in person the Paul Tissandier Diploma in recognition of his services to the aviation movement. It was perhaps an act of spontaneous diplomacy that Jacques Allez, President of the Aero-Club de France (right) should have called upon Commissar Stepanov, the Russian delegate to the F.A.I. Models Commission and official Soviet observer at the World Speed Championships, to make the presentation. Readers will have to forgive us for the view of Doug's back, but will surely agree that the smile on Mr. Stepanov's face signifies the manner in which aeromodelling overcomes the political boundaries of the world. The same spirit of camaraderie was extended by the whole of the Czech team at the speed meeting.



### F.A.I. Conference

READING S.M.A.E. Vice-Chairman Bob Gosling's report of the F.A.I. Conference we found many items of interest to modellers. Firstly it was reaffirmed that no changes in the Sporting Code would be made before 1957. Countries suggesting rule changes should give them a thorough testing nationally before submitting same to the F.A.I. Model Commission.

It was agreed that for control line speed a single control line may be used, providing the minimum section of the wire is equal to twice the section of one of the wires in the equivalent two-wire control. With .25 mm. being the standard diameter for 2.5 c.c. speed, then for single line we may interpret that .34 mm. would be required. Converted to s.w.g. this means using 29 gauge wire (.0136 in.), while for the equivalent class of model in the U.S.A. it is current practice to use 27 gauge (.0164 in.). With more than 50 feet of line it is difficult to transmit sufficient torsion via "Monoline" on less than 27 gauge, so that the F.A.I.'s regulation would appear suitably practical.

The proposal from the S.M.A.E. to cancel R.O.G. for International contest work met with a mixed reception and was defeated by 7 votes to 5, with 5 abstentions. Great Britain's other proposal to reduce the number of flights from five met with no support whatsoever.

It was agreed to reduce motor run to 15 secs. and towline to 50 metres for F.A.I. Certificates.

The A/1 class glider was not considered suitable for International competition, but a sub-committee was set up to discuss proposals for a beginner's sailplane contest. Any country can submit plans for a suitable model.

A proposal from Denmark that 2.5 c.c. should be standardised for all types of International power championships was agreed. This will be operative from 1956. As the present series of Control Line Speed Championships terminates this year, the decision above will mean that in future there will be only one class, i.e., 2.5 c.c.

It was felt that the faster speeds in Team Racing necessitate longer lines as this reduces congestion and makes passing safer. For this reason, and in view of the fact that the new F.A.I. line length of 15.92 metres (52.21 ft.) had met with general approval, no consideration was given to reducing

line length. (S.M.A.E. line length for Class A racing is 46 ft. 8 in.) Various amendments to the rules were to be put into practice at the Brussels meeting in October and it is hoped that the December F.A.I. conference will then finalise Team Race rules.

The most important amendment was that for marking out the circle in 8 segments. Racers draw lots for starting in 4 consecutive segments (4 racing at a time?) and competitors must refuel in the nearest rearward segment to that of his point of rolling to a halt. If that segment is engaged he can move forward to the next segment.

Presumably this is intended to place a safety take-off gap between racers, an item normally left to the commonsense of competitors and referee in British events.

### Continental Trade

In recent weeks we have had the opportunity of taking a look at the model shops in France, Italy and Switzerland. It's amazing how one finds such contrasts in crossing from one country to another. Terrain, supplies and flying conditions change with the language, and if we had our choice should we live across the Channel, we would select the flat calm areas of Northern Switzerland for flying, and the model shops of Italy for selecting our material. Not that the vast spaces in Central France are unattractive, though it did happen to be windy when we were there, but the real bugbear for French modellers appears to be the high cost of supplies, particularly engines.

British balsa is obtainable everywhere, but some beautifully sanded sheet is now imported from the U.S.A. into Switzerland where we find many other interesting items including no less than five different types and sizes of pulse jet, ranging from £5 10s. to £7 each. In most countries there is a greater trade in plans and raw material than for kits, which are in any case limited to those cheaper lines for small scale models, plus a few imported items from the U.S.A. There is nothing new to report and we gather that no spectacular announcements are expected other than a big boost for Super Tigre engines after their performance at Paris.

### B.O.A.C. enters the Contest Field

Among the many trophies to be awarded at the All-Britain Rally on September 25th at Radlett are new "B.O.A.C. Speedbird" awards for first places in Class A and B team racing. This marks the entry of a British airline into the aeromodelling world, and we trust that the sponsors will be gratified by the response to their generosity. B.O.A.C. have also offered to take all contest winners of the Radlett meeting on a behind the scenes tour of London Airport—a trip which will be worth winning.

*Array of prizes at right are items for domestic decor to be distributed at the Scottish Festival of Model Aviation, Heathfield, on September 17th-18th. The hostesses are not included.*

### Volunteer Helpers

Though age and avoidance have long since boosted us from two to four wheels (yes, the three wheeled bath chair comes next!) we take an annual delight in reading the excellent accounts of the Isle of Man T.F. races in the *Motor Cycle*. This year our eye was caught by the following item penned by veteran writer Ixion, and it seemed so parallel to affairs in our own hobby that we reproduce it here in the hopes that some of the points will sink in.

*Does it ever occur to you, when you casually scan 'The Motor Cycle's reports of weekend motor-cycling fixtures, that thousands of folk must have toiled like galley slaves to make the events a success? The vast majority of the administrators who run the innumerable smaller meets are lucky if they even get out-of-pocket expenses. You may also have overlooked the fact that many of these honorary volunteers are by no means young. A man must have had some experience of command (and also of obedience) before he develops that indefinable gift of authority. But organisers are increasingly disturbed to find that the younger generation dislikes the "chores". I underline this disturbing aspect of the sport at the express request of some of the men who have been bearing the burden and the heat of day for many a year. Such fellows do not wish to be publicised by name, or even to be thanked. But they would appreciate more eager and good-natured help from the juniors whom they hope to train for command in the years ahead.*

"MOTOR CYCLE" 16/6/55.

Granted, we could name a considerable number of old hands who are never seen with a stopwatch in their hand unless it is to check on the official timekeepers; nevertheless the vast majority of competitors found at aeromodelling meetings are in their teens, and it is high time they learned to take their share of responsibilities.

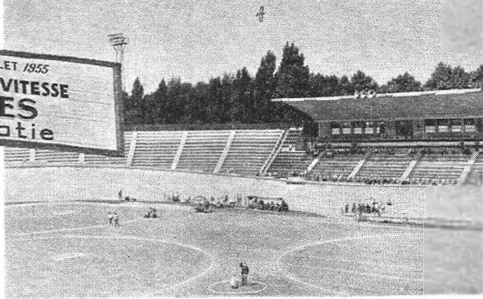
We favour the suggestion of some system of 'time-keeping credits' by which any contestant who cannot prove that he has pulled his whack during a contest is eliminated. The number of volunteers for the important task of clock-pushing is very rarely adequate for the job, and the sooner we adopt some method of coping with the situation the better.



SAMEDI 2 ET DIMANCHE 3 JUILLET 1955  
**CHAMPIONNAT DU MONDE de VITESSE**  
**d'AVIONS MODELES**  
Concours international d'Acrobatie

**Aero Club d'Italia cup returns to Italy for best team and Sladky of Czechoslovakia wins individual prize at WORLD C/L CHAMPIONSHIPS**

—reported by R. G. Moulton



*View of Stadium showing Bob Lutker flying in stunt.*

THE 2.5 C.C. CONTROL-LINE speed Championships finally happened on July 2nd and 3rd at Croix-de-Berny, a few miles south of Paris. Only the one class of speed was flown, supported by an aerobatic contest for the F.A.I. 50th Anniversary Cup, and two whole days were set aside for approximately 150 flights to be recorded. Team Racing, certainly the most attractive of International control-line events and a favourite with the paying public in the spectators stands, was inexplicably excluded from the programme. This, and other omissions subsequently discovered made it obvious that none of the Committee responsible had enjoyed the experience of last year's meeting at the Hague.

At the reception, held in the palatial Banquet Hall of the Aero-Club de France, models of the eleven competing countries were processed and given the rubber stamp of approval. This was to be the first meeting of East and West on a flying field and there was some speculation on the possible success of the Czech State produced engines. On the side of the West, Signor Jaures Garofali, the Super Tigre manufacturer from Bologna, had brought along a strong contingent including employee and World Record Holder, Amato Prati. From Berlin, Gunther Bodemann, the Webra designer, was competing in person.

The assembly retired to excellent hotel accommodation, where most voted for rest while the more energetic entered upon a series of nocturnal ramblings one might expect from a City that never appears to sleep. Came the dawn, and the Danes were to be found making up lines at 6.30 a.m. on the pavement, while two hours later the coaches began their trek to the Bicycle Racing Stadium at Croix-de-Berny. From the entrance it looked fine. Down at ground level in the centre, the team managers were gathering. Carlo Tione raised his hands in characteristic Italian fashion, Major Samuleson of the U.S.A. passed unfavourable comment, W. Kroger of Germany agreed and Doug Gordon tut-tutted as much as any of us. For the surface was a layer of cinder and dust about  $\frac{1}{4}$  in. thick, certainly not suitable for speed flying and little better for stunt. We thought it admirable for Speedway, the Italians said it might be better for Horse-racing!

There were three circuits laid out, and for each team, a work bench, line park, safety screen and seats. This was excellent, each team having ample working area and a patrolling Gendarme ensured security and privacy. Order of flying was such that three people were called up at a time, to pass through one line check for pull, thickness and length, and then proceed onto the circuits within 5 mins. In theory, this might have worked; but the first round rapidly degenerated from a World Championships for control-line flying to a rat-race for whoever could bully the line checkers to

pass one through within the five very unfair minutes. In the first hour only three official flights were recorded and in two hours, the number was a mere seven. So tight was the time limit that if one failed to make a take-off, and there was much to make it difficult, including a grass verge only 18 in. outside the line radius, then there was no time left for a re-start. To say that there was discontent would be an understatement, and this was not limited to the visiting teams.

Peter Wright reeled off a comfortable 99.4 m.p.h. to put Britain at the top of the list as we left for lunch, and after a manager's meeting, the tempo of the afternoon's events was considerably relaxed—so much so that some entrants were permitted unlimited starting time, and in the case of one team, all engines were started by someone other than the flier and the entire team turned out as assistants. Famed pre-war Wakefield flier, M. J. Desnoes, issued announcements in French, German and English, and the line check was open for business long before the flight was due.

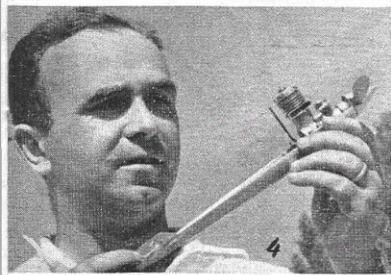
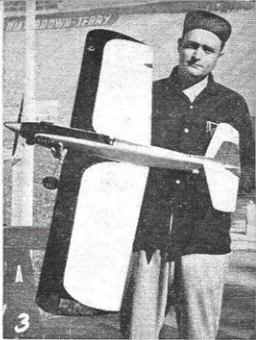
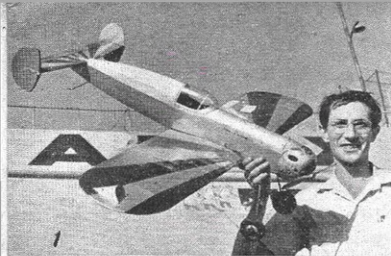
It was however, too late for some. In the haste to get airborne, one or two fliers had not taken time to use a plate under the model while starting. One of the Italian Super Tigris had to be dismantled to reveal stones in the crankcase, and unfortunately, Bob Lutker's K. & B. piston took on a tram-lined appearance that reduced r.p.m. to a very low level.

Sladky went to the circle in the high temperature of the afternoon. He was off the ground in a few feet, and in the pylon before a lap had been completed. At the end of his ten laps we knew that here was an exceptional flier with a superb engine and the speed of 109.4 m.p.h. reflected his individual superiority. The Super Tigre group were also liking the heat, now approaching 90° F., and two of them, Monti and Prati, came up to 105 and 102 m.p.h., with Zatočil of Czechoslovakia between them at 104 m.p.h. These were all glowplug engines and the supposition that with 15.92 metre lines of .25 mm. thickness, the diesel might be better, was rapidly passing as a myth. Olle Ericsson of Sweden returned 100.7 with the fastest diesel on the field (Alach. 1) and Dick Edmonds equalled Pete Wright's 99.4 m.p.h. with a standard Oliver Tiger; exposed cylinder and all.

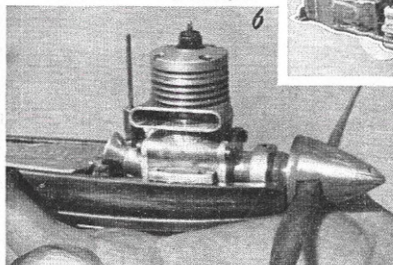
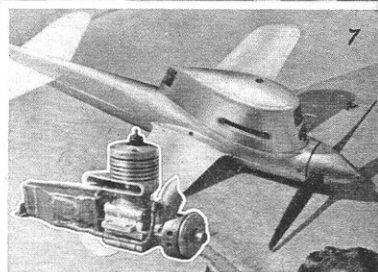
For Britain, competing against a Czech state supported team and Super Tigre works team, third place was as good as could be wished, and this was the situation at the start of the second round, thanks to good support by "Monsieur" Gibbs for Edmonds and Wright, with 90 m.p.h. after take-off troubles.

At the close of the day, after the 2nd round, only 1 k.p.h. separated Amato Prati and Josef Sladky, while the four Italians filled from 2nd to 5th places to give them 14 k.p.h. total superiority over the Czechs.

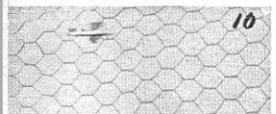




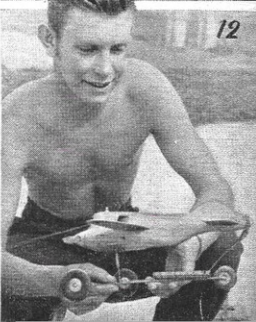
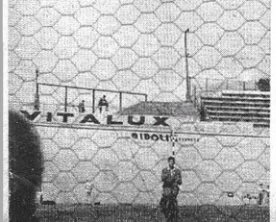
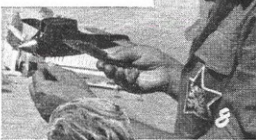
1. R. Humbert Jean's Fox 35 stunter had so much built-in drag, including 10 degrees sidethrust that it could hardly exceed 45 m.p.h. 2. Marko Vajic (Yugo) had smart carrying box and Aero 250 Delta. 3. Bob Luther and Torp 29 Aerobat in bright black and orange finish. 4. Jaures Garofali, creator of the Super Tigre, a much respected engine



5. Unlucky No. 13, Jerry-Desloges, was France's main hope but failed to make a flight. 6. Motor supreme, the Sladky Koci SK-25 held in place by screws from underneath. 7. Czech Grulich's superb all-metal model with State MY'S 25 engine inset, has deflected carb intake and side angle exhaust. 8. Sladky the maestro in serious mood



9. Gunther Bodemann, designer of the Mach 1, was dogged by ill-luck with his model, but helped Edmonds and Wright considerably—is now a glowing fan! 10. Pete Wright making a speed run, seen through the tinners' hutch. 11. Equipe Anclair: Edmonds, Doug, Gordon, Gibbs, Wright and Woods led the field of unsponsored entries, with the exception of Olle Ericsson in 12. Note simple dolly for this SAAB type model



**RESULTS**

Place	Name	Nation	Engine	Speed (m.p.h.)
1	J. Sladky	Czechoslovakia	SK-25	111.3
2	A. Prati	Italy	Super Tiger	109.4
3	S. Monti	Italy	Super Tiger	108.7
4	C. Cappi	Italy	Super Tiger	108.2
5	M. Zatochil	Czechoslovakia	MVVS 25	106.1
7	G. Gottarelli	Italy	Super Tiger	106.3
7	O. Ericsson	Sweden	Webra Mach 1	103
8	E. Fresl	Yugoslavia	K. & B. 15	101.3
9	R. Edmonds	Great Britain	Webra Mach 1 glow	100.7
10	L. P. Wright	Great Britain	E.D. Racer glen	99.4
11	V. Smejkal	Czechoslovakia	MVVS 25	98.2
12	G. Busch	Germany	Webra Mach 1	97
13	F. Couppie	France	Oliver Tiger	96.3
14	B. Grulich	Czechoslovakia	MVVS 25	95.1
14	R. Gibbs	Great Britain	Super Tiger	95.1
16	E. Kreulen	Holland	Webra Mach 1	93.3
16	P. A. Eliasson	Sweden	Webra Mach 1	93.3
16	M. J. Gordyn	Holland	Webra Mach 1	93.3
19	G. Bodenmann	Germany	Webra Mach 1	92.5
20	J. Janssens	Belgium	Super Tiger	60.1
21	M. Vujic	Yugoslavia	Aero 250	88.9
22	T. Prukner	Yugoslavia	E.D. 2.46	88.3
23	J. Frohlich	Germany	Webra Mach 1	87.6
24	S. Hie	France	K. & B. 15	84.5
25	H. Stouffs	Belgium	E.D. 2.46	83.3
25	P. C. Anderson	Denmark	Webra Mach 1	83.3
27	H. Hansen	Denmark	E.D. 2.46	82.6
28	J. K. Hansen	Denmark	E.D. 2.46	80.7
28	D. Woods	Great Britain	K. & B. 15	80.7
28	R. Labarre	France	Micron 15	79.5
31	E. B. Madsen	Denmark	E.D. 2.46	79.9
32	W. Godden	U.S.A.	K. & B. 15	67.7
33	R. D. Lutker	U.S.A.	K. & B. 15	56.6

**Team Places**

1	Italy	... 525	4	Yugoslavia	... 448
2	Czechoslovakia	566	5	Germany	... 446
3	Great Britain	... 475	5	France	... 419
		7	Denmark	... 197	

Apart from some juggling with the Italian positions, the order on the next day remained unchanged, with faster speeds recorded by most fliers. This may have been due to the more humid weather, broken by a rain-shower, which at least served to lay the dust. Peter Wright and Dick Edmonds changed to their Glowplugged Webra models, and Edmonds raised his speed by 1 m.p.h. Emil Fresl made a test flight at 111 m.p.h., but dropped to 101 on an official run in the pylon, and Sladky secured his lead with 111.4 on his last flight. Like the Italians, the Czech motors were running at more than 16,000 r.p.m. on the ground, at least 1,200 faster than their nearest competitors, though the State MVVS 25 engine had to use low pitch to get this figure. Sladky's own SK-25 engine, a miniaturised 16 x 12.3 mm. Dooling, built in collaboration with comrade Koci, was unique in using a metal tank, having an aircell dividing the "chicken-hopper" fuel feed from one fuel compartment to another, whilst most others had balloon tanks.

With the result now definite, we reflected on the misfortunes of others. The Danes and Germans were particularly unlucky—the former because of inexperience and lack of the right type of propeller, the latter because their dollies were unsuitable for the surface. France and the U.S.A. had fuel feed problems, except

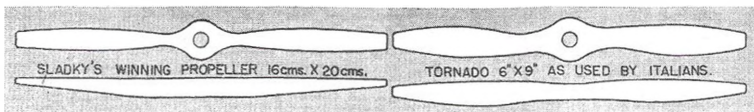
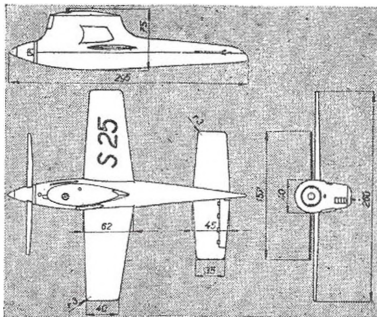
*Maile in software with the exception of the aluminium shid base. Sladky's winning model was finished in a reddish brown sholler. Protrusion at left of coil is an aerodynamic design intake for the carburettor. External needle valve control is removed after setting and an eccentric pulley wheel replaces bellcrank for elevator control. All dimensions in the drawing reproduced from "Letecky Modelar", are in millimetres. Below are the winning props showing contrast in blade area*

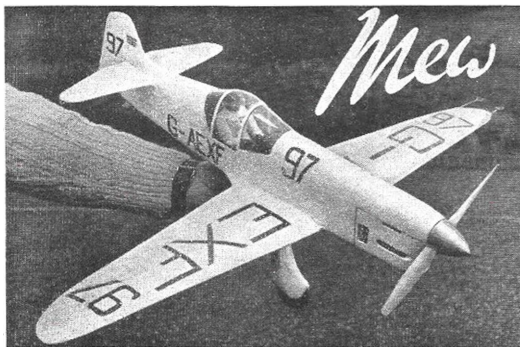


*Enjoying the spirits of team victory are the six people who made up the Italian contingent. J. Garofali, "Pino" Gottarelli, Carlo Tione with the pot, Clemente Cappi, Sergio Monti and World record holder Amato Prati—enjoying a cigar in this holiday from making Super Tiger cylinders and pistons*

for Couppie with his Oliver Tiger, and the other teams had valiant tries as will be seen in the results.

There remained the aerobatic contest, run as a separate event, that is to say, open to all. There were three entrants from France, none of them from the speed team and nine other Internationalists brought along models in addition to their speed entries. Lutker was supreme, his manoeuvres the acme of perfection with eights to the F.A.I. pattern, executed better than we have ever seen before though two of his three flights were curtailed through dirt in the carburettor. Stouffs, Jansens and Cappi also flew to the F.A.I. schedule, but the Cup was given to Humbertjean of France, who was neither impressive, nor to the pattern one would expect for a cup commemorating the F.A.I. anniversary. Reflection of Lutker's popularity came when he received his 2nd prize at the Banquet and was given personal congratulations for his performance by M. J. Allez, President of the Aero-Club de France amid loud applause. We particularly liked the blind loops he made whilst talking to newsreel cameramen in the circle centre during a special demonstration. Rarely do we disagree with an official decision; but this occasion defeated our understanding.

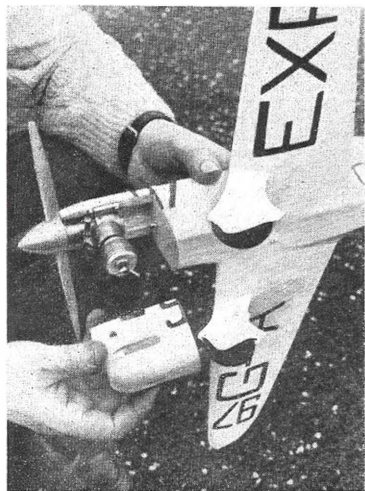




# Mew Gull

THE FAMOUS  
PERCIVAL  
RACER  
IN MINIATURE  
BY  
H. C. THOMAS

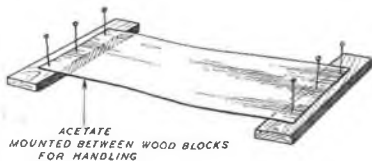
**An inch to the foot scale class "A" team racer which combines realism with high performance and durability**



ONE OF THE RULES with which one must comply when building a team racer is that the design should be "scale or semi-scale". Unfortunately this rule is not always enforced by organisers of team races and the result has been a gradual degeneration of appearance bordering on the hideous rather than realistic. However, there are very few scale subjects which lend themselves to the proportions of wing area, fuselage depth, etc., as required by the rules. The TK4, already in the APS range, is one suitable type; but for the wing area needed the fuselage becomes larger than one might desire for high speed performance, though 75 m.p.h. is still a possibility with a good engine. The earlier Percival Mew Gull possessed the right fuselage lines for high speed, and the blister type canopy fitted to G-AEXF soon after its return to Britain after the war allowed it to fill the requirement for fuselage depth at the cockpit—so this was chosen by H. C. Thomas for the most attractive model we describe here.

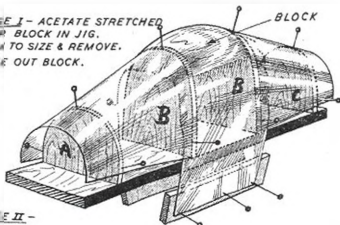
Wing area is 80 sq. in. and speed approaches the 80's with a plain bearing Elfin 2.49, so its potentialities will be recognised by all and the few concessions made for better T/R operation do not detract from scale appearance. These are the sweep forward of the undercarriage, and the very slightly increased tail area, plus the use of a fully symmetrical wing section. Three prototypes have been made, and apart from needing slight tail ballast to get the C.G. located correctly, have proved entirely trouble-free. Latest of the line has the elevator area increased to 50 per cent. of the total tailplane and this is a wise modification for the tempo of modern Class "A" team racing. For scale work, the elevator shown gives full control with ample reaction for sport flying.

Start with the wing by making the 3/16th spar over the plan complete with brace, fitting ribs, leading edge, and top sheet, and binding the u/c to ribs W.2. Make up the bellcrank assembly and lead-out wires, fit to wing by means of upper ply plate in top surface, add push rod passing through



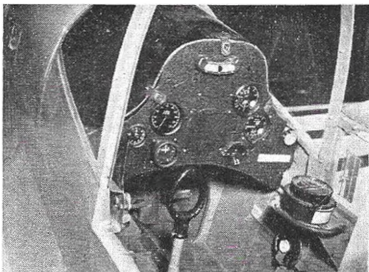
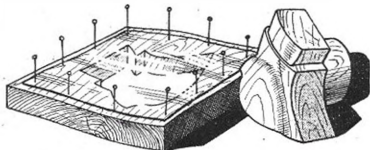
ACETATE  
MOUNTED BETWEEN WOOD BLOCKS  
FOR HANDLING

STAGE I - ACETATE STRETCHED  
OVER BLOCK IN JIG.  
TRIM TO SIZE & REMOVE.  
TAKE OUT BLOCK.



STAGE II -

ACETATE PINNED IN POSITION AT EACH END, SMEAR WITH  
CEMENT AT FORMERS 'B' & PIN MOULDED PIECE IN PLACE.  
REMOVE WHEN SET & CUT TO FIT FUSE.



Above is a view of the full size cockpit showing the throttle, instrument panel, joystick and compass for those who want to model in detail. The seat is almost at floor level as will be appreciated by the size of the scale figures on the plan opposite. Lower pictures compare lettering changes and alterations to the cockpit which have been made to the full-size (bottom) since Mr. Thomas made his version of the '51 Mev Gull.—

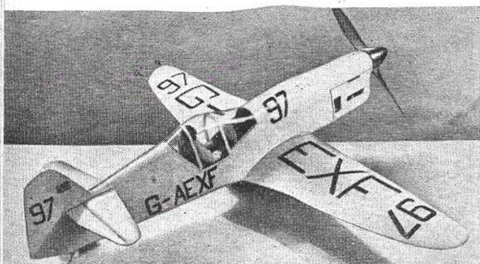
Full size copies of the 1/3rd scale reproduction of the APS plan opposite can be obtained priced 3/6 post free from APS, 38 Clarendon Road, Watford.

top sheet and fit bottom surface with edges bevelled at trailing edge. Secure the bellcrank by fitting bottom ply plate, centralising the crank with washers or tube spacers. Add tips, lead-out tubes and sand the wing smooth.

The tail components are simple sheet structure, tailplane and elevator having a sandwiched "hidden" hinge. Now start the fuselage by assembling formers F4 to F7 on the engine bearers. Make the crutch for the rear fuselage over the plan, adding F8 to F12 and sternpost. Add the fuselage sides, and, when set, the bearer assembly. Fit the tank and plank upper nose and sheet rear decking. Cement the wing in place after arranging push rod length and then fit the tailplane, the fairing block, fin and rudder. The tailskid and 1/16-in. sheet fuselage bottom complete the structure except for the nose cowl and the moulded canopy and spats.

The sketches demonstrate how a dummy jig is made to obtain the duo-curvature of the cabin roof. Heat the acetate sheet until floppy by holding it about 15 inches from an electric fire, and pull over the moulding block, cutting away excess when cool. Wheelspats are made by the system of heating acetate stretched across a profile hole of the spat, cut in ply or similar stout material, and pushing a wooden shaped spat half against the softened acetate. Two halves must be made, but the effort is rewarded with a quick lightweight reproduction of the full-size which is most realistic when doped.

Cover the entire model with Lightweight Modelspan, give at least two coats of sanding sealer and rub down, then several thin coats of gloss white all over. Letters of this version were bottle green, with racing numbers in black, whilst the latest scheme for 'EXF' is white with deep navy blue lettering rearranged as photo, bottom left. Propeller and spinner should have a natural aluminium finish.



# PERCIVAL 'MEW GULL'



DESIGNED BY

H. C. Thomas

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THE AEROMODELLER PLANS SERVICE

38, CLARENDON RD., WATFORD, HERTS.

SHEET BALSA 3/16" LONG		MATERIALS REQUIRED		MISCELLANEOUS	
3 SHEETS OF 1/4" X 3"	1 BLOCK BALSA, 1/4" X 1/2" X 2"	1 PIECE OF 1/4 SWG WIRE.		1 - "	1 - "
2 - " X 3/8" X 3"	5/16" OD PL. T.	1 - "	1 - "	1 - "	1 - "
1 SHEET OF 1/4" X 3"	SCAP 3/4" SHEET	1 PAIR - "	1 - "	1 - "	1 - "
1 STRIP BALSA 3/16" LONG	3" X 6" OF 1/8" PLY	1 PAIR - 1/2" STREAMLINE WHEELS			
2 STRIPS OF 3/16" SO.	15' OF 1/4" X 3/8" HARDWOOD	1 1/4" SPINNER			
3 - " X 3/16" X 1"	1 5/8" FT. OF 1/2" MOULDING	1/2 OD. T.R. TANK.			
	ACETATE				

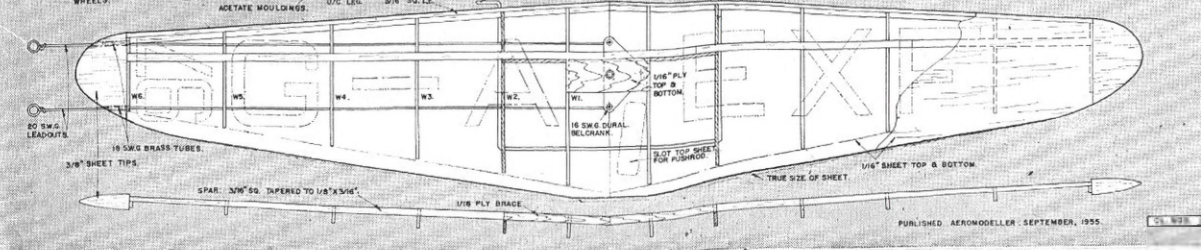
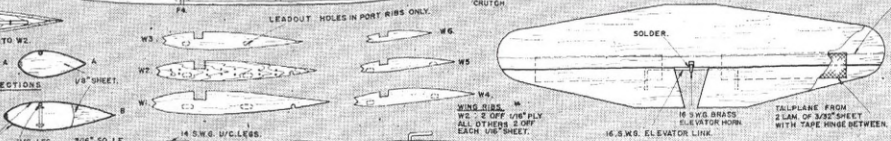
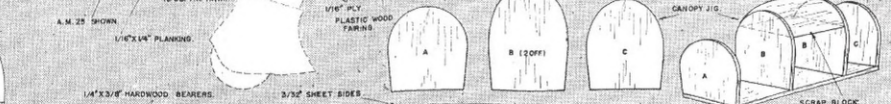
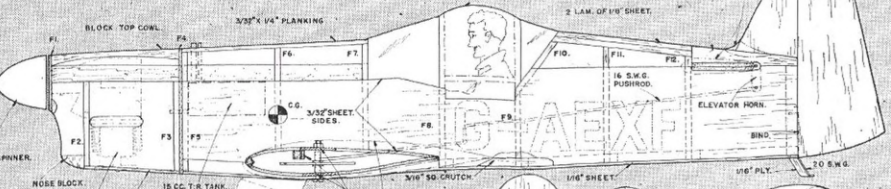
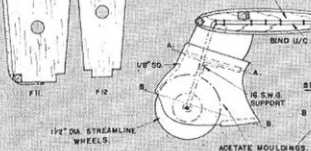
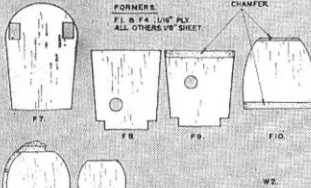
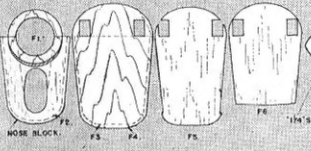


T.R.U. BADGE APPROX. FULL SIZE

PLASTIC WOOD FABRIC'S.

1/4" SHEET P.N.

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.



## Top Place Glider in the A/2 Trials

# ALTAIR

Designed by G. T. LEFEVER



Those who attended the Team Trials held under very blustery conditions at Odiham this year, will agree that the top place model and modeller are a pair to be reckoned with.

G. J. Lefever, the one half of the combination, hails from Chingford, was a former member of the West Essex Club, and is now an S.M.A.E. Country Member. A civil engineer by profession, and twenty-three years of age, he at present restricts his interests to A/2's, but hopes to have a go at Wakefields next season. He built the original prototypes of Altair (yes, there were two of them) early in 1952. They differed only slightly from the version presented here. The first was lost during trimming, the second lasted three years, and saw the designer through two years eliminators and finals.

In the 1953 London Area eliminators the model placed top with three five-minute maximums and a timed aggregate of 12 : 50. At the Trials only two flights were recorded of 3 : 40 and 5 min., the model being lost after the second. It was subsequently returned from Oxford several weeks later. Although not flown in the 1954 eliminators, it returned the modest aggregate of 16 min. over the two eliminators for the 1955 finals, this performance for the 164 feet towline, and on a five-flight basis.

At the Trials at Odiham flights of 2 : 55, 3 : 0, 2 : 49, 1 : 35 and 2 : 40 were recorded. The faithful old original was used for the first flight, and although it D.T.'d the model was not recovered. "Altair" was used for the remaining flights, the D.T. terminating all but the fourth flight.

### Construction

Good quality wood is essential, particularly for the fuselage sides and the wing spars.

**Fuselage.** Cut sides from  $\frac{3}{8}$ th sheet and splice at rear to accommodate length. Sand well and cut holes for wing retaining dowels. Cement sides together with scrap  $\frac{3}{8}$ th sheet between, leaving slot for fin, then cement main  $\frac{1}{2}$ -sheet former in position remembering to first fix the tow hook, etc., in position. Build the weight box, hold the fuselage together with bands and fit the remaining formers. Install the auto rudder, then sheet top and bottom of fuselage and sand smooth all over. Melt  $1\frac{1}{2}$  oz. of lead and while this is "brewing" wet the weight box thoroughly. Pour molten lead into box, ignoring clouds of steam! Cement laminated nose-block in position when steam has subsided.

**Wings.** More time will need to be spent on the wings than the rest of the model combined. Certainly they should be built with great care, as a high aspect ratio wing is prone to warps (see page 472—Ed.). The lower spar is cemented in position after the wing is lifted from the board, and the leading edge is sheeted with  $1/16$ th, and  $1/32$ nd at the tips. The two wing halves are then joined together temporarily with scrap sheet and the top sheeting added so that it continues across the four centre rib panels. The dowel tubes are rolled from paper and inserted in the centre section from the underside. The centre four rib panels are then sheeted on the underside, and it is a good plan to extend the sheet under the leading and trailing edges as a reinforcement against wear from rubber bands. The false sheeting is then cut away and the two halves separated.

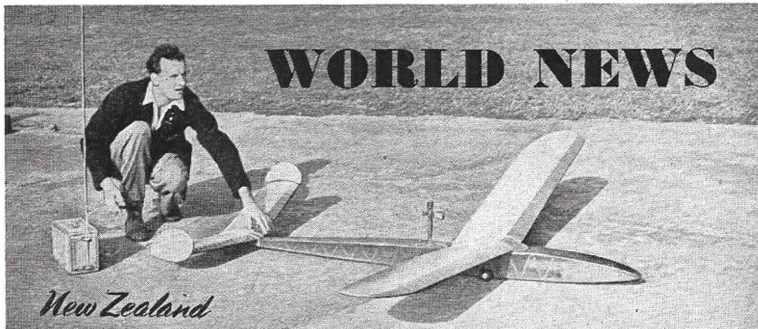
**Tailplane and Fin** are so simple that no explanation is necessary.

**Covering.** Cover fuselage with Jap tissue or Modelspan using thickened dope, and smooth out with a rag immediately after application, which will remove excess dope and impart a good finish. Use Modelspan for the wings, and either Jap or Modelspan for the tailplane and fin. Original has black fuselage and inboard wing panels, with red tailplane, fin and wing tips. It is a good plan to leave the wing inboards and the tailplane pinned down for a week or two after doping (see page 472 again!—Ed.).

**Trimming.** For contest work best results are obtained with a tight left turn. With still air conditions times may not be quite so good under this trim, but how many times do we see still air conditions in England?! Trim until a slight stall turn is apparent, then pack with  $1/32$ nd under the trailing edge of the wing. Two minutes from a 164 ft. towline in the evening indicates a reasonable trim.

Lastly, it takes a long time to build a model, and a mere second or two to light a D.T. fuse!





# WORLD NEWS

*New Zealand*



*Burma*



*Germany*



*U.S.A.F.C.*

TWO INTERNATIONAL EVENTS have taken place, the first at **Monaco** on 7/8th May where seven nations sent teams for the 3rd International Hydromodel contest. This took place in the centre of the famous Monte Carlo harbour, under the lee of those superb millionaires' yachts, and we understand that the hospitality and organisation was superb. Every competitor received a memento and the nine trophies were fairly well distributed among the countries. Monogasque Henri Novarro won rubber, and Morscheck of Germany the power event, while the "Regularity" trophy for precision in take-off and consistency in duration went to Zaugg from Lugano in Switzerland. Other cups went to France and Yugoslavia for performance in rubber so that everyone returned happy and fully imbued with the generosity of this Mediterranean Principality. Should a party of qualified British enthusiasts be considering a Continental trip in '56 we can assure them that this event is one of the happiest and most interesting they could possibly select to visit.

Second of the Internationals was the Criterium D'Europe for free-flight power on 12th June, held at Zagreb, **Yugoslavia** by virtue of Emil Fresl's win at Brussels last year. Four countries sent teams, and the Yugoslavs again secured the trophy with Nestic and Rancin in the first two places. Finus of Germany was third, Guidici of France, fourth. Emil Fresl was well in the running, having virtually four max's and an inexplicable 24 second flight.

A third contest, though not on the International calendar, was International by invitation with participants from Monaco, Switzerland and Italy. This was the **Italian Coppa Ostali** for rubber and power Hydromodels held on the man-made flying

*Heading shows Frank Bethwaite releasing his powered sailplane for a record attempt. Unfortunately the motor cut out after 120 minutes. From Burma Loi Mye Tho is busily winding his small rubber model, much to the admiration of the locals. Rubber, possibly tapped nearby, has to be imported back from England for model use! Young Gersonnier is holding Herbert Tait's 35-in. ducted fan model based on the N1g 15. Has clutch and pulley for starting, but needs 2.5 c.c. minimum to fly. Bottom: USAFE Lockheed P-38 (not 48 as last month's Hangar Doors report mentioned!) has two torpedo 29's and an immaculate finish*



boat base at Milan. This is a meeting which deserves higher status and which will be more fully reported next month. Winners of the July 10th meeting were Italians Robert Bacchi in power and Dante Prandini in rubber, each with as neatly constructed a model as we ever hope to see.

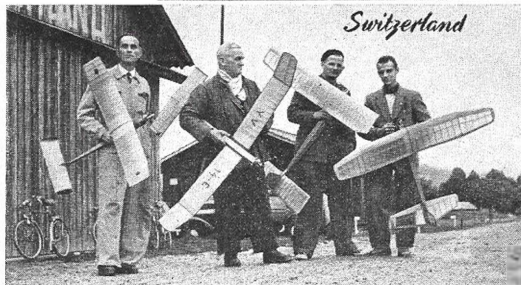
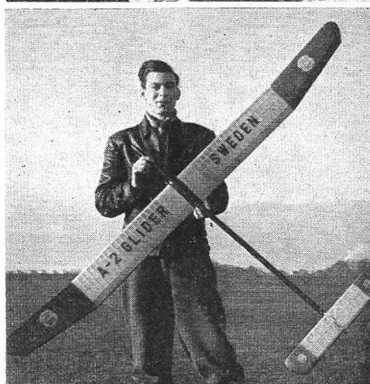
We understand that interest in A/2 in Italy is low, and no team for this event will be sent to Weisbaden, though in power and Wakefield the prospects of success are high. In Switzerland it is Wakefield that lacks support, though the two keenest fliers will make the short journey up the Rhine to the World Championships. In A/2 the Swiss are particularly strong, the four finalists being chosen from a two day, 9 flight finals which included all kinds of weather and 3 flights from 17 metres to weed out the lucky ones. People who should know, tell us that three minutes from the 50 metre line is a regular achievement in the still evening air of Northern Switzerland and the secret of this performance is no more than slow and painstaking development. Incidentally, proof of the value of aeromodelling is illustrated by the fact that Swiss team members of previous years, Bruno Bachli and Hans Leichti have each been selected for training as Swiss air pilots of the future—good luck to both of them.

Surprise news from Australia is that Bond Baker will be flying over to fly in the Wakefield and from what we hear, the man is quite a dynamo. He wears a five-gallon hat, talks science fiction by the hour, builds beautiful models and drinks anything except water. With that description we might also expect him to fly Class A team racers as well—he fulfils British qualifications!

Flash News . . . U.S. Teams for the World Championships include several well-known experts and are announced as we go to press.

<i>Wakefield</i>	<i>A/2</i>	<i>Power</i>
Manny Andrade	Henry Cole	Otis Goss
Bob Champagne	Joe Harris	Harry Gould
Herb Kothe	Jerry Kolb	Ernie Shailor
Gene Schaap	Herb Kothe	4th man not named

Bertil Beckman and his smart R/C trainer, published through the Swedish magazine *Looping*, is E.H. powered and is demonstrated on football field flying sites. Below is Sweden's top A/2 representative Rolf Hagel of Milmo. Bottom left: Danish Power Champ, Erik Johanson (E.D. 2.46) and bottom right the Swiss power team that went to the *Criterion d'Europe* at Zagreb. Left to right: Grieshaber, Restl, Schrafer and Pfenniger. Schrafer placed highest at 7th position in the contest with 11:45



# WARP PREVENTION

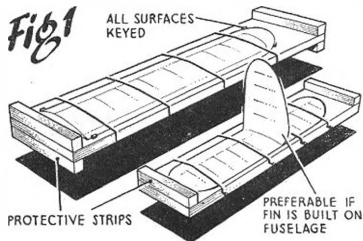
*Steady competition successes over a period of several years are not entirely due to good fortune. The Henley Club boys including Jim Waldron, Tony Cooke and Dave Painter, whose efforts at this year's Nationals are too well known to enumerate, pass on for the benefit of readers some of the regular "wrinkles" that have contributed to their many successes*

THE USE OF dihedralled building boards or jigs for the construction of wings is by no means new, throughout the years various types have appeared, but few have really caught on. Generally speaking, all these have one thing in common, the wings once built, were never returned to them, and the boards discarded or modified for the construction of other wings. On the other hand, if we could build and leave our wings permanently on their board, and only remove when actually flying, we could enjoy many real advantages.

The first and most obvious point is that we could forget warps. It is probable that more inconsistency and erratic flying is due to warps than any other single cause. There is not a class of model which can really be built or guaranteed free from them, and there are many contest fliers who will doubtless appreciate this.

In recent years there has been much more thought on warp prevention, and structures such as geodetics have appeared. Despite their efficiency, opinion is still divided as to their value.

Power models with excessive power, and rubber models, with lightweight and often fragile construction, all give very indifferent performances if the flying surfaces become distorted, while gliders with twisted wings give endless trouble under tow.



*Jim Waldron straps down by means of wide rubber bands, the wings of his International Class power model. Henley Club anti-warp boards are a regular feature at S.M. Area meetings, and have certainly paid the Club dividends over the past few seasons*

If we build standardised types of model such as Wakefields, it becomes easy when using a building board, to accurately duplicate sets of wings with the minimum of time and trouble. In one-piece wings for instance, there is no need to pin out separate panels when water spraying and doping, while packing up the dihedral angles is eliminated. Field repairs also become much easier to accomplish, and there is no chance of the basic trim being lost.

During the past few years, members of the Henley club have tried various types of board and the most useful are described in the following paragraphs.

Warp-free wood which has been well seasoned is necessary, with a minimum thickness of  $\frac{1}{4}$  in. to  $\frac{3}{8}$  in., depending upon the size required. Ply will do, but new ply can sometimes twist, so use the maximum thickness which the pocket can afford, thinner wood being more easily affected by climatic conditions.

The simplest and most obvious type of board is shown in Fig. 1 and is universal for normal tailplanes and split, plain dihedralled wings. In the case of split wings these can be strapped on both sides, but protective strips are recommended to avoid risk of crushing. Tailplane boards for instance

can be strapped together with the surfaces inward, but only if there is no attached fin.

The cradle types shown in Fig. 2 have one slight disadvantage, namely that they are inexpandable and do not allow of radical design changes. The plain dihedral type is probably the most useful, and is mainly used for Wakefield wings. With the Polyhedral type and the "Y" shaped version, one is tied to fixed proportions, although dihedral angles can be changed.

Butt joints with ply webbing pieces preferably  $\frac{1}{8}$  in. make for simple construction, but the webs should be screwed and glued for safety.

The most adaptable types of board are those on which the required dihedral panels are built up from a flat board. These boards can be used over and over again, even with changing designs, for the built up panels can be removed and re-built as necessary, without cutting up the board itself. Further, the built up panels can be built from scrap wood, and even balsa wood will suffice, with consequent reduction in weight.

For transport of models these are definitely heavier than the other types, but this is outweighed by their adaptability. A study of Fig. 3 illustrates the main types in use.

Other points become obvious when considering the use of these boards. Wash-in or wash-out can be "locked" in by suitable use of packing and this can easily be modified as necessary. Flying wing types for instance use large degrees of wash-out which can be accurately maintained indefinitely.

Fixed wing tabs are well protected if a suitable slot or hole is cut as in Fig. 4, but it is essential that keying blocks be used on all surfaces. For strapping down use wide bands or strip rubber loops, wooden turn keys which only grip the edges do not appear very efficient and can easily damage the edge of a lightweight wing or tailplane. Lightweight wings

with fragile ribs and trailing edges should be permanently supported by strip balsa as in Fig. 4, in order to maintain the section, application of soap will prevent all risk of sticking when building.

As a final note, the authors would mention that one board built for 7.6d. a year ago has produced three sets of power model wings to date, while another, built from odd lumber was the basis for no less than seven Wakefield wings. One of these wings, built on conventional lines was left off the board for a trial period recently. Even with care, it did not take long for definable warps to appear, so goodness only knows how the trim of the model would have been affected if the wing had been left to its own devices in the normal way.

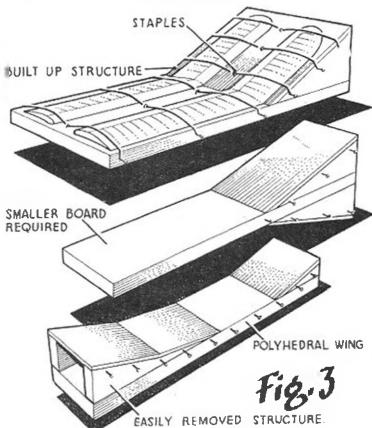


Fig. 3

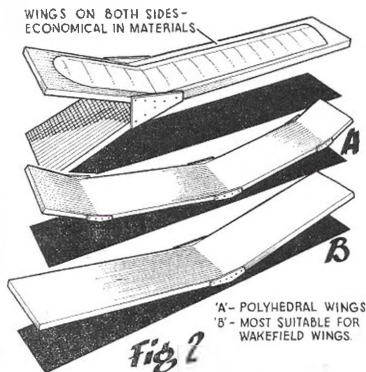


Fig. 2

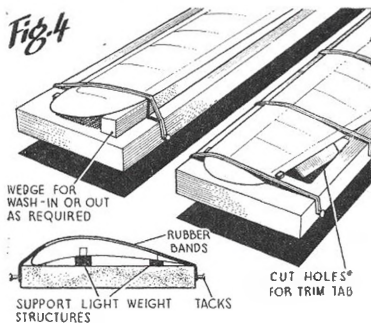


Fig. 4

# Northern Heights at Halton



Winner of the scale section in Concourse d'Elegance, the B-17 Flying Fortress by A. J. P. Briggs of Mitcham is an established feature of the N.H. Gala. Four E.D. 346's fly it at 60 m.p.h. plus. Runner-up was the Merlin powered Sea Bee by FJO Norman of R.A.F. Abingdon. It uses depressed flaps for lift and retracts after 9 seconds after take-off.



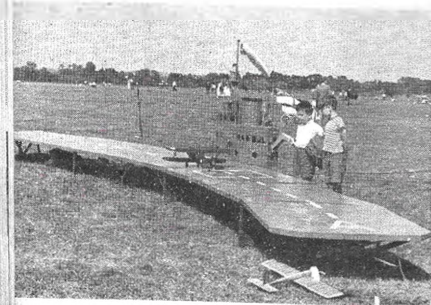
THE ANNUAL Northern Heights Gala is an event in the calendar of most aeromodellers, and this year's affair staged at R.A.F. Halton must have pleased organisers and contestants alike. Held for many years at Langley Aerodrome the shift to the picturesque site in Buckinghamshire did not seriously affect the attendance figures, and almost all the "old gang" were there, gathered in little bands all over the grass field, with every type of model aircraft having its devotees and admirers.

Inevitably, the drift made its way from the opposite end of the field to that "organised" for it, and in consequence events were scattered all over the "drome in similar manner to that at Waterbeach, but the gala atmosphere prevailed, and there was less grumbling from those who bothered to compete than obtained during the Nats. It is possible that competitors had the best of it, for we doubt if take-off conditions would have been as good had the wind come from behind the high ridge which is a distinctive feature of Halton.

Poor weather—usually a Northern Heights requisite—graced the day, and many weary modellers were anointing themselves with calamine during the days following! We feel that the maximum of four minutes fixed for the day was too high for comfort; nevertheless, the ridge was well scattered with enthusiasts eagerly seeking their erring models, and we did not see a great deal of damage. It made our day when witnessing a loving couple disappear into the woods, chasing a model that had alighted in the first tree of the copse. After an extraordinary long time, a blissful couple re-appeared hand in hand—but he had to go back for the model!!

D. Aldridge of Letchworth is the new holder of the Queen's Cup, competed for this year with A/2 gliders, and the ubiquitous Johnny O'Donnell followed up his Wakefield Team success with a win in the rubber class, for which no fewer than six had to fly off.

To all who made the day such a success, we say on behalf of readers and ourselves, thanks a million N.H.; a special word of thanks to the C.O. and boys of Halton for a good job of work; and to "Dennis the Menace" who continues to fling his stable of scale heavyweights about—the Big Insurance Man will catch up with you sooner or later!

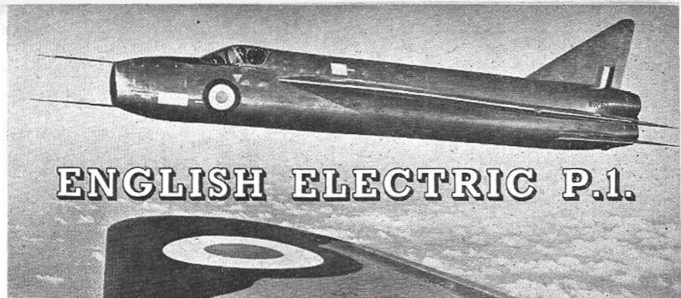


Above left: Latest version of R. A. Guntrip's Pteranodon twin tractor canard has single fin and flies on either engine or both. Below is the Cheltenham Carrier, a popular feature we hope will come again, and at right, Joe Fox prepares to dodge as he makes the winning spot landing

## Aeroplanes in Outline

No. 37

By J. R. ENOCH



# ENGLISH ELECTRIC P.1.

WORK ON the design of the English Electric P.1, supersonic single seat fighter prototype, which was originally conceived whilst W. E. W. Petter, who designed the Canberra, was with the company, was successfully completed under the direction of F. W. Page, B.A., F.R.Ae.S., the company's chief engineer. The design problems to be solved were of such a nature, that a wide range of the most modern test equipment was necessitated, including an entirely new Transonic Wind Tunnel, the first of its kind to be built in the United Kingdom.

Towards the end of 1950, the shape of the aeroplane had been finally established, and in order to prove the aerodynamic and handling qualities at low speeds, it was decided to build an almost full size scale model. Though this was not at first admitted it was subsequently revealed that the Short S.B.5, which so very closely resembles the P.1, was in fact the "Test Bed" for the fighter.

Design and construction of the S.B.5 was completed just less than two years after the placing of the order by the Ministry of Supply, and the aircraft was first flown on December 2, 1952. Powered by a single Rolls Royce Derwent Turbo-jet of 3,500 lbs. s.t., the S.B.5 (serial WG 768) was provided with wings, adjustable on the ground, to have sweepback of 50°, 60° or 69°, and a variable incidence tailplane to be positioned on top of the swept fin, or low on the fuselage. To allow the various configurations to be tested under alternative C.G. conditions, the position of the non-retractable tricycle under-carriage could be altered.

Whilst much valuable data was being obtained as a result of the exhaustive tests being carried out with the S.B.5, the construction of the P.1 was nearing com-

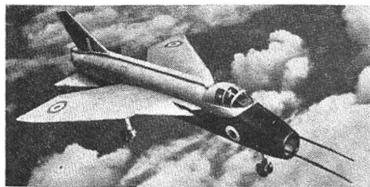
pletion and, after having been transported in sections by road to Boscombe Down, the aircraft was prepared for its first flight, which took place on August 4, 1954, with W/C R. P. Beaumont at the controls.

To date, only three re-touched photographs of the P.1 have been released, and apart from one or two minor facts, no technical details have been divulged, it is therefore only possible to comment on what can be deduced from the material available.

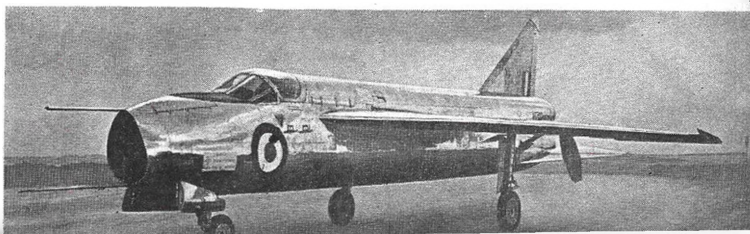
Ordered straight off the drawing board, the P.1, Serial WG. 760, is by no means handsome in appearance, being essentially a functional design. Power is supplied by two A.S. Sapphire turbo-jets, with a total thrust of more than 18,000 lbs., aspirated by means of the large area, knife edged nose intake. It is likely that in order to reduce frontal area, the engines are staggered, one being located further forward than the other, the position of ancillary intakes along the fuselage sides would appear to confirm this. The engines have independent tail-pipes and it does not appear that there is provision for any re-heat device on this prototype. A great advantage of having the engines superimposed "one above the other", is that this arrangement permits economical cruising on one jet without the asymmetric problems usually attendant on multi-engine installations. Between the two tailpipes it is likely that the streamlined fairing is used to contain a braking parachute. Fuselage proportions are such that a generous amount of space is available for fuel tankage. The cockpit, fitted with an ejector seat, has a large, wholly transparent canopy, hinged at its upper rear edge, and a wide windshield, which combine to confer exceptional visibility for the pilot whilst blending cleanly with the fuselage. Fitted with a single, thin high pressure wheel, the levered nose wheel undercarriage leg retracts forward turning through 90° to lie horizontal in the fuselage without obstructing the air intake duct. Swept back at approximately 60° the fin has a horn balanced rudder of relatively small area. The variable incidence tailplane is mounted low on the fuselage to be kept well clear of the turbulent wake from the wings, and is considered to be of the solid-slab type.

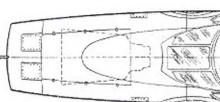
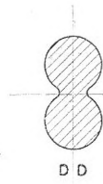
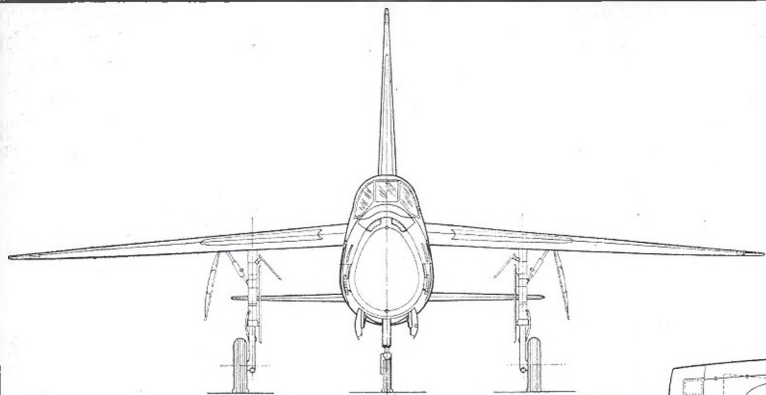
Of extremely thin section, the wings, swept at roughly 60°, have greater sweep than any comparative type, they are, however, deep enough to contain the main units of the undercarriage, which retract out and back-

(Continued overleaf)



Views at top and right show W/C 760 airborne and at rear. The Short S.B.5 whose was a scale test bed seen here with 60° wing sweep, low tailplane and drooped inboard leading edge





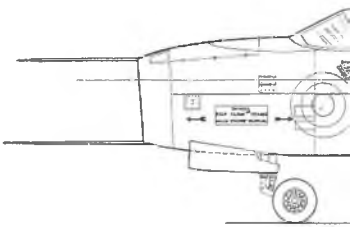
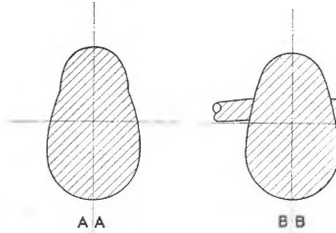
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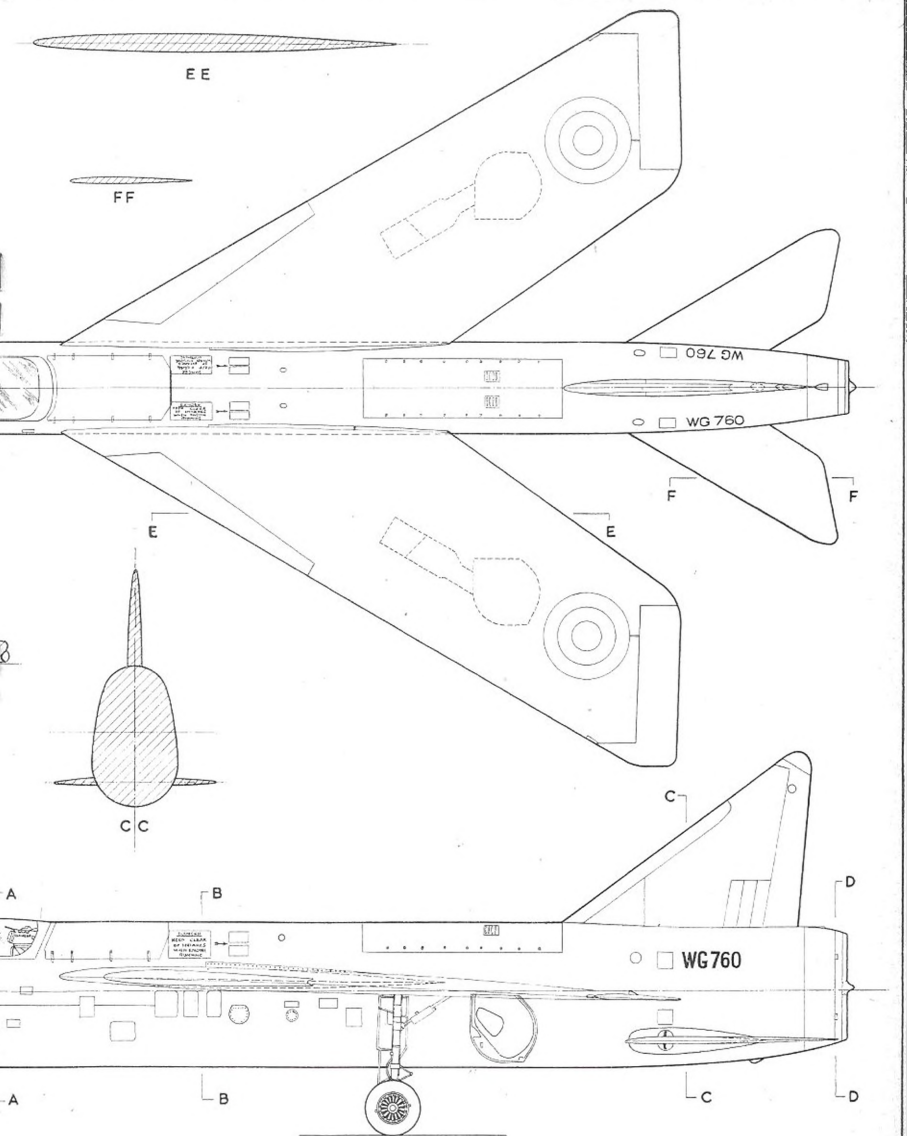
wards into the wing, to be enclosed within a single door, hinged at its inboard edge. Horn balanced ailerons mounted directly across the wing tips are in such a position that combined with the other control surfaces, they confer excellent handling characteristics at all speeds. Of particular advantage is the fact that bending loads induced by aileron deflection act on both front and rear spars instead of twisting the rear spar relative to the front, a condition encountered in the more conventional swept wing designs. The unusual form of the inboard section leading edge was no doubt introduced after being tested on the S.B. 5, which with low tailplane and wings in the 60° sweep position, was first flown on January 12, 1954. The effect of this is that airflow characteristics over the low tailplane (so positioned because of the structural complications of mounting on the fin) are greatly improved with a corresponding improvement in longitudinal stability.

According to some foreign reports, the P.1 is credited with having a speed in excess of 1,000 m.p.h., and a performance at altitude which leaves little to be desired, in addition to which it is suggested that the range of the P.1 would enable interceptions to be accomplished, a considerable distance from these shores. The manufacturers state that supersonic speed is achieved as a matter of course, without the use of re-heat or power boosting, and to date, the prototype has made over one hundred flights mostly at supersonic speeds.

The photographs reveal nothing with regard to the installation of armament, and it is possible that no internal armament is carried, the offensive strength of the fighter being provided, it is presumed, by externally carried guided weapons.

When the existence of the P.1 was first made known, it was revealed by the Ministry of Supply, that twenty pre-production aircraft had been ordered so that the time between prototype and production could be considerably reduced. The use of this batch of aircraft would allow various flight and equipment tests to be carried out in parallel. F. W. Page has, however, pointed out that it will be necessary to carry out a full flight testing programme at both subsonic and transonic as well as at supersonic speeds, which will make the development period longer even than normal. Of this batch of pre-prototype machines it is suggested that alternative power units such as the Rolls Royce Avon and Bristol Olympus, and possibly a combination of jet and rocket power may be installed for tests.





FT. 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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## "The Greatest Name in MODEL KITS"

THE WELL KNOWN trade slogan quoted above may not always immediately convey the name of the company which proudly claims this distinction, but the mere mention of the magic words KEIL-KRAFT conjures up the enormous output of the far famed British model concern, and the very wide range of supplies available through this go-ahead firm.

We have been in close touch with the Keil family since their entry into the aeromodelling field way back in 1934, when they tackled the specialised task of balsa cutting. Close attention to the exacting requirements of the aeromodellers in those days soon brought its reward, and the name of E. Keil & Co. became a byword where high grade materials were discussed.

Enterprise came to the fore in 1939, when the first Keil-Kraft kits appeared on the market, and rapidly established themselves by virtue of their quality and completeness; in fact much of the pre-war growth of the aeromodelling movement can be attributed to the interest aroused through the varied range of kits bearing the KK symbol.

Throughout the difficult war years, and up to the middle of 1954, KK output was produced from premises at Hackney Road, Shoreditch, and we know from personal observation that despite every single inch of space being pressed into service, the future plans of the energetic management were sorely handicapped owing to lack of room to expand. Miracles of ingenuity were accomplished and the same square yard put to multiple uses, but there comes a limit to improvisation, and so in mid 1954 the whole factory was moved to spacious new premises at Wickford in Essex.

After the close confines and traffic noises of Hackney Road, the new works at Wickford must have been heaven for the staff, for the commodious assembly shops and saw mill are situated in pleasant open country, and the whole place has an air of light and spaciousness that must be seen to be believed.

An existing factory of 15,000 square feet, plus office accommodation has been skillfully adapted to meet the requirements of model kit production and assembly, and the work proceeds on a production line method perfected through years of experience. In addition, a new saw mill has been built to handle the enormous stocks of balsa that pass through the KK works each year, and the whole concern shows the thought and planning that can come only from many years of experience.

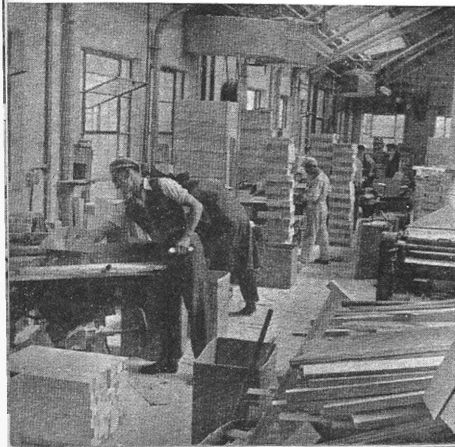
A well equipped showroom displays the very extensive range of present day KK kits, now embracing no less than 108 designs ranging from chuck builders to radio control models. In addition to the present buildings, there is a further acre of ground to accommodate additional expansion, which will make this British concern probably the largest model kit factory in the world.

When we paid our visit to Wickford, it was no surprise to learn that KK are exporting in quantity to no less than 33 countries, and can claim to have supplied every country in the world. (In fact, whilst we were there, their first order from Russia arrived!) 1955 exports are confidently expected to reach £60,000.

With a staff of 70, everything is manufactured on the premises, and a glance round the racks confirmed that



*A small section of the racks holding over a quarter of a million kits, with orders being dispatched on bench in foreground. Left, general view of the kit packing department which is run on a production line basis. Girl in foreground is shaping piano wire undercarriage legs with special jig tool. Below, interior shot of one side of the balsa mill. This latest extension to the factory can be seen externally on the extreme left of the heading picture on opposite page.*





## We visit the new Keil-Kraft Factory



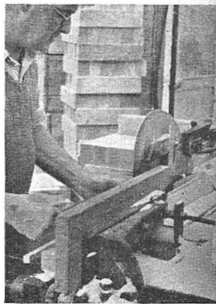
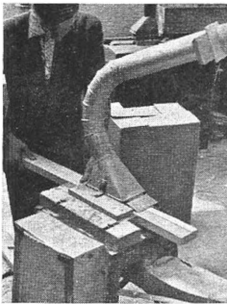
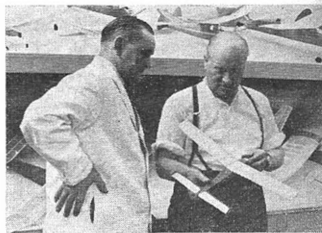
there are over a quarter of a million kits in stock. This high stock figure is a definite policy of the KK concern enabling them to meet each and every order without delay. One very interesting corner of the factory is devoted to the production of plastic components, the comprehensive array of injection moulding machines turning out props, cockpit covers, spinners and, numerous other items at bewildering speed. The modern trend to prefabrication is well catered for in the KK policy, and the equipment on view confirms their ability to cope with all requirements.

Vast stocks of kiln-dried balsa were in evidence, and we are assured that the timber is specially selected overseas for its suitability for model aircraft uses. Random inspection on our part endorsed the high quality of the sheet and strip wood on hand, and the KK kits are already benefiting from the introduction of this first grade basic material.

Any successful firm is a direct reflection of the management responsible for its conduct and policy and, it is no surprise to us to learn that E. H. (Eddie) Keil the Managing Director, started aeromodelling at 13 years of age with twin pusher models, and at one time was a keen competition flier. Nowadays he prefers to keep out of competitions and avoid the rigging label of "professional", but still flies regularly when the weather permits plus plenty of fun with radio controlled boats. Nevertheless, aeromodelling is still his main interest. With an engineer for a father, and grandfather a skilled cabinet maker, Eddie inherited a flair for craftsmanship which has been put to good use in building up the Keil-Kraft firm.

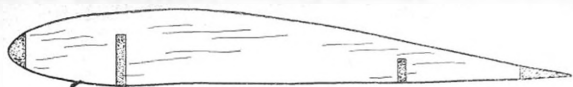
Ably backed up by younger brother Ron, who is in charge of production, E. H. K. looks forward with confidence to an even brighter future, which the new factory in Essex will go a long way to provide. With our knowledge of the principals concerned, and our inspection of the new KK factory, we are equally convinced that they will continue to justify their claim to be "the greatest name in model kits".

*Above: a general view of the premises with office block in foreground. Right, Eddie Keil is rarely seen with his coat on, and here discusses with brother Ron, in white coat on left, their recent "Nomad" kit. Below: multiple gang saw cutting strip from block, has special extractor to remove balsa dust*

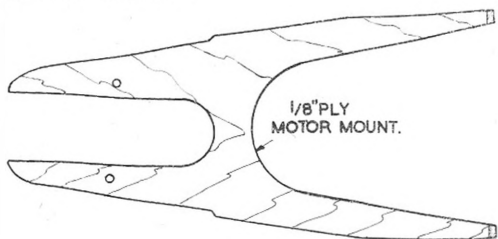


*Centre right: block stacked in background is fed into fine circular saw producing 1/4" sheet stacked on right. Kiln dried Ecuador balsa is delivered in a works baled in convenient size baulks. Right: a view of the plastics department which features the latest in injection moulding machines. Spinners, rubber model nose blocks, cowls, props, are all made here*

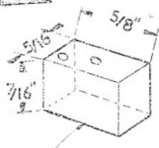




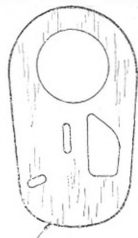
WING RIBS 3 OFF HARD  $\frac{1}{8}$ ", 2 OFF  $\frac{1}{16}$ "  
& 12 OFF  $\frac{1}{32}$ " SHEET.



$\frac{1}{8}$ " PLY  
MOTOR MOUNT.

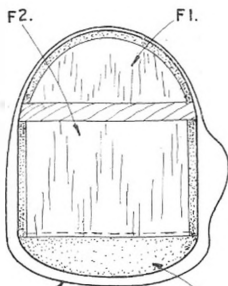


FUEL TANK  
 $\frac{1}{32}$ " SHEET  
CELLULOID.



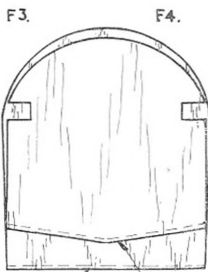
COWL FRONT.

FORMERS: F1, F2, & F9:  $\frac{1}{8}$ " SHEET  
ALL OTHER FORMERS:  $\frac{1}{16}$ " SHEET.



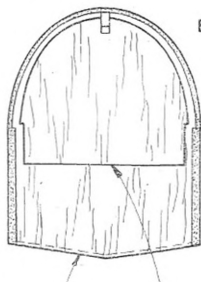
COWL SHAPE.

BLOCK.



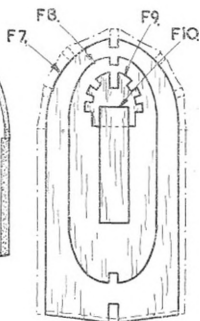
F3.

F4.



F5.

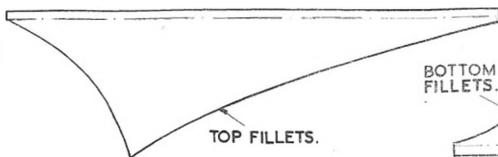
F6.



F8.

F9.

F10.



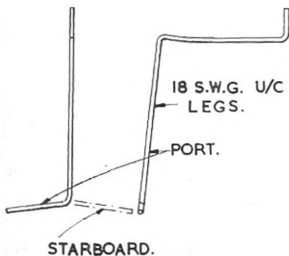
TOP FILLETS.

BOTTOM  
FILLETS.



WINDSCREEN:  $\frac{1}{64}$ "  
SHEET CELLULOID.

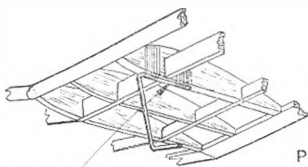
FILLETS: 2 OFF EACH FROM NOTEPAPER.



18 S.W.G. U/C  
LEGS.

PORT.

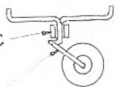
STARBOARD.



IMBED IN RIB.  
BIND & CEMENT.  
U/C FIXING DETAIL.



PLASTIC  
TUBE.



24 S.W.G. TAIL WHEEL LEG.



An 18½ inch span Free Flight Scale  
Model for Bambi Owners of the

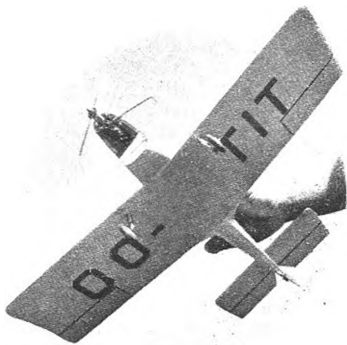
## TIPSY JUNIOR

THE TIPSY JUNIOR is a single place low wing design which has had considerable success as a full scale airplane. It is a simple design with much eye appeal with its small size and harmonious surface profiles. This free flight Bambi powered model of the Topsy has all the eye appeal and is still fairly simple to build and fly. It does take a little more care in trimming out for flight than say, a good high wing sport model, but, due to its small size and light weight, it is virtually crash-proof.

**Fuselage.** The fuselage is made up of two-sheet balsa sides, with sheet balsa formers, and a plywood motor mount. It is best to cut all of these out before starting any assembly. Note that the fuselage sides must be made to the extended length shown to account for their curvature in the plan view. Then assemble the fuselage starting with a 3/32nd square tail post at the rear. Install the formers working forward, and using care to see that the side sheets are bending symmetrically. Cement the motor mounting in on top of the sides before installing former F 1. Add the stringers, starting with the top and bottom centre stringers which are 1/8" x 1/8". Trim off the top stringer between F 5 and F 6 to allow for the 1/32 combing, and then install the combing. Install the combing forward of the cockpit, either wrapping or strip-planking with 1/16" sheet. Fill in the fuselage bottom between F 10 and the tailpost with 1/8" scrap balsa. The bottom of the fuselage forward of the wing, is made from block balsa after the wing is attached. Note that all balsa should be light grade unless otherwise noted, to keep the weight down.

**Empennage.** The rudder fin, stabiliser, and elevators are carved from light 1/8" sheet balsa solid model style. They are hinged with soft copper wire which greatly facilitates trimming.

**Wings.** Cut out ribs, spars, leading and trailing edges as indicated on the plans. The rib section shown is the centre rib, and since the wings have a slight taper to them, each



Designed by Walt E. Mooney

rib should be trimmed to fit on assembly. Trim off the trailing edge of the rib. The extra height this gives the aft end of the rib is sanded off after the basic wing assembly is lifted from the board. The spars can be cut from one piece of balsa with the dihedral angle already in them or spliced at the centre.

**Landing Gear.** The landing gear is made from music wire to the size and shape indicated on the plans.

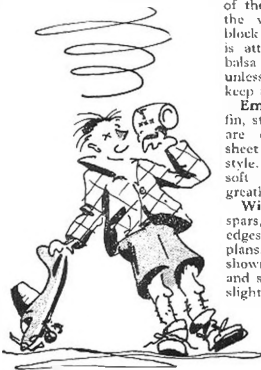
**Assembling.** Locate and cement the wing in place on the fuselage. Curve and install the forward fuselage block. Cement the stabiliser on the fuselage, and then fit and cement on the fin. Now give the entire model three coats of clear dope, being careful not to let the wing develop any warps. Press the tail wheel wire into the 1/8" fill-in and add a patch of silk to reinforce it, cementing well. Add the bond paper fillets. The upper ones can be rounded over a finger before installing. Slide the plastic tubing over the landing gear legs. Now give the entire airplane two coats of silver dope.

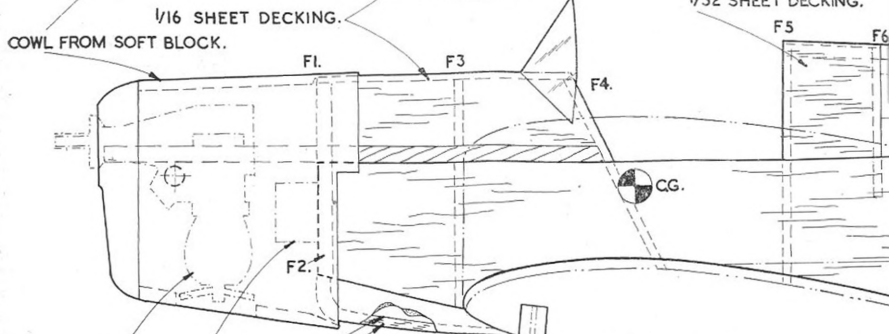
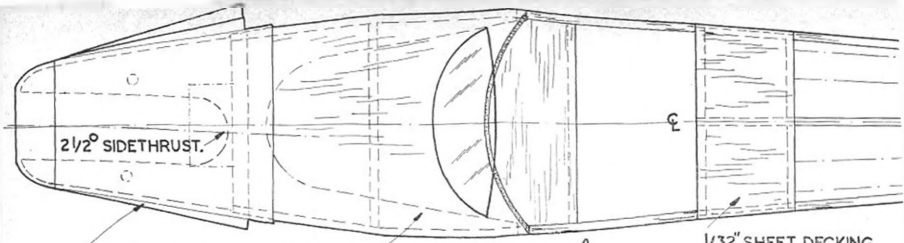
**Powerplant.** Make up the fuel tank from 1/32 celluloid sheet. Cement it to F 2 in the location shown after pushing in a piece of plastic fuel line which has enough length to allow trimming later. The line doesn't push well under the motor mount and around a corner. Remove the tank that comes with the Bambi and store it in a safe place for some other time. Then install the Bambi as shown with 2 1/2° of right thrust.

Make the cowl next. The original model has a two-piece hollow balsa cowl which has since been replaced with a fibre-glass cowl in the interests of greater abrasion resistance. The model doesn't break, but its small size makes even a good runway the equivalent of a ploughed field, and nose overers are to be expected.

**Finish.** The original model has decal letters in red and Indian ink striping to indicate the ailerons. Then two very thin coats of clear were sprayed all over.

**Flying.** The best way to test fly is to do all the flights R.O.G. gradually increasing power until a take-off is effected. Glide tests should be made previously to obtain a straight fast glide. Ballast is necessary to give the centre of gravity shown, and then use the elevators and rudder for trim. Once a satisfactory glide is obtained, use thrust adjustments to give a shallow climb with a wide left turn. A right turn with the original model always gradually winds on in.

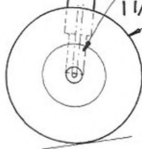
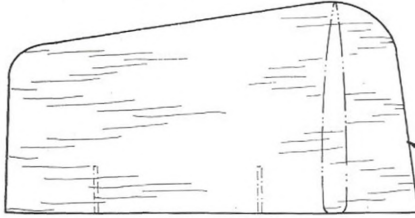




ALLBON 'BAMBI'  
TANK.

BLOCK BALSA.  
HOLLOW OUT.

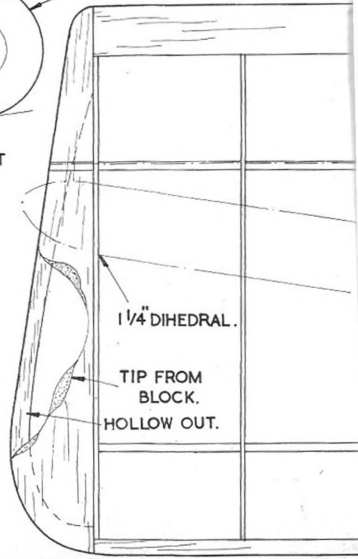
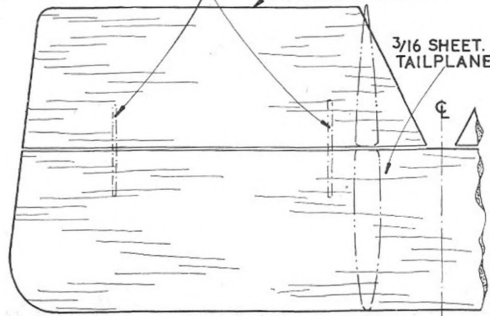
PLASTIC TUBING.  
1 1/16" DIA WHEELS.

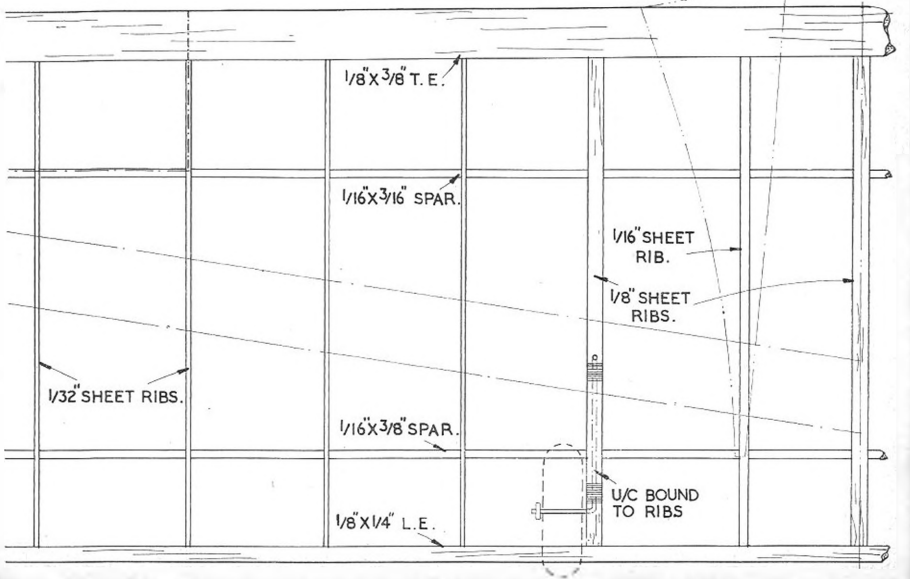
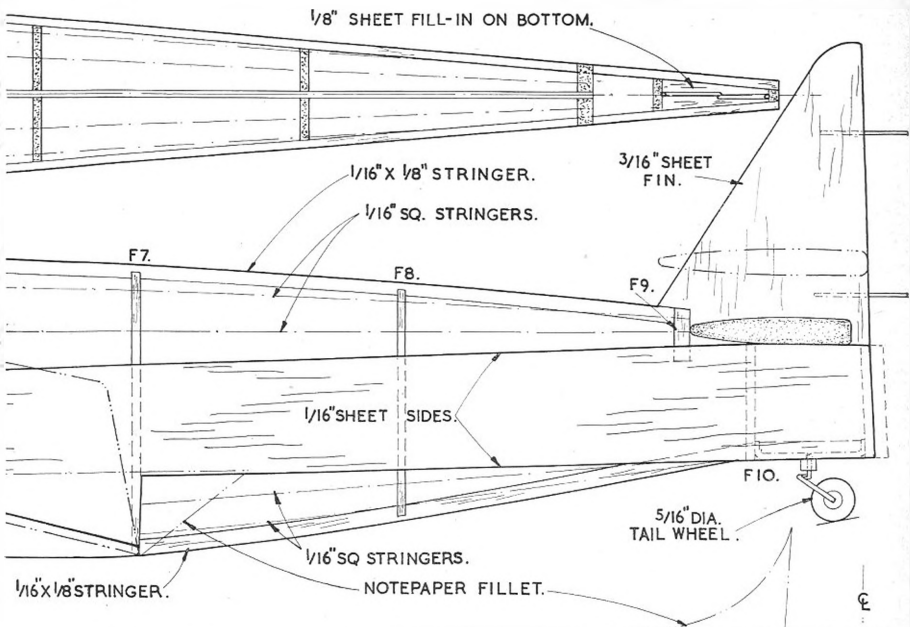


SOFT WIRE HINGES

3/16" SHEET ELEVATOR.

3/16" SHEET  
TAILPLANE.







# BYRDIE

*A dual-purpose power or glider 66-inch flying wing*  
 . . . by **GEOFF BYRD**

VERY FEW MODELS lend themselves to quick power conversion from straight glider trim, but this Vee-wing from Loughborough College is the exception to the rule. It is an out-of-the-rut model to interest both contest types and sport fliers, takes up very little room in the model box, and can be flown in any conditions without fear of damage through a heavy landing.

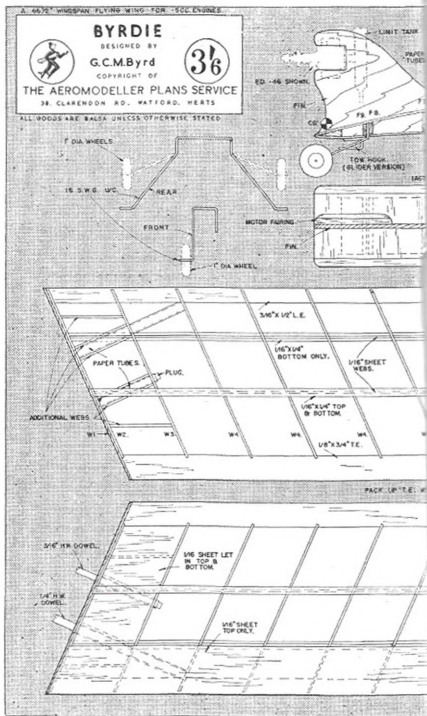
There has been very little development of the flying wing as a contest model, and there is unlimited scope for improving the type. Building time is less than for a conventional model; they cart-wheel when a tip happens to touch down first and trimming is easier than their appearance would have us believe. Why not try one, starting with Byrdie?

Designed especially for the '55 Nationals, but unfortunately not able to fly when the day came, Byrdie is a 4-ounce lightweight with wing strength equal to that of any tough A/2 glider. The main span is built perfectly flat, with a reflex trailing edge section and washout is incorporated in the tip panels together with "biplane" elevons to which are fitted small trim tabs. Construction is therefore simple, and the plan self-explanatory.

Trimming technique closely follows that used for the conventional type of model. Treat the elevons as one would a tail-plane, raising the trailing edge to cure a dive, etc., and in the case of a stall, adding noseweight or decreasing the elevon angle.

One of the characteristics of a flying wing is its quick stall recovery with little loss of height, and they are also able to hold a very tight turn by having one elevon slightly higher than the other. Auto rudders are not needed for the tow, and, on demonstration at Odiham, Geoff took his prototype up on 50 metres of line for us to see, and despite a strong wind it went almost overhead and made a duration of 1 : 15 with a small-circle flight pattern.

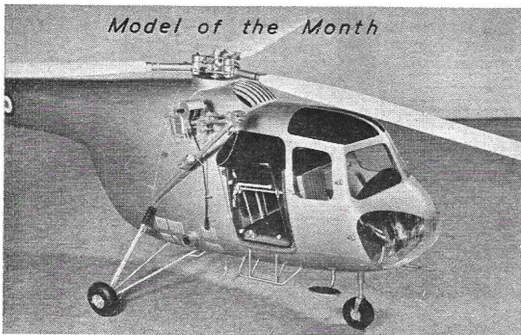
The power version is strictly for low power, less than .5 c.c. is recommended, and low revs are definitely suggested for the first few flights. With its low wing loading, Byrdie is a fast climber, best



FULL-SIZE COPIES OF THE ABOVE 1/4th SCALE REPRODUCTION OF THE



Model of the Month



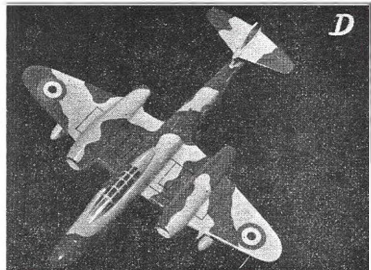
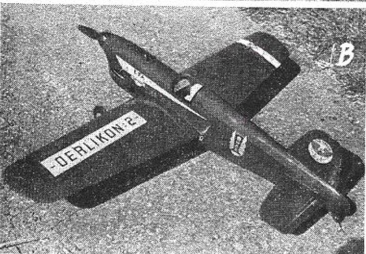
# MODEL NEWS

A good photograph of a professionally-made "solid" model always serves as a stimulant for the amateur, and the Bristol 171 built by Westway Models Ltd. is certainly no exception. No small model this; the cabin depth is 10 in. and overall length 4ft 6in., the helicopter is in reality five models in one. Interchangeable parts (the seats are adjustable and ambulance blisters and stretchers can be fitted as alternatives) all contribute to a wealth of detail making this worthy of our title "Model of the Month"—and yes—the winch really does work!

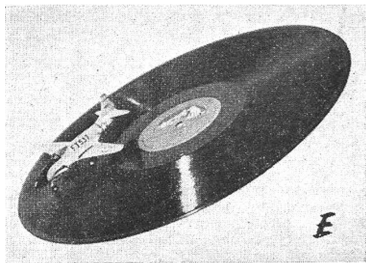
This picture gives us some idea of the high standard of work expected of the professional model-maker—a fact which should be borne in mind when answering those "Situations Vacant" advts. that do occasionally appear in our classifieds!

E. P. Edwards, of the newly-formed Crittal (Braintree) M.A.C., sends the P.51 D Mustang in **A**, which is a 37-in. scale control-line model weighing 2 lb. all up and flies with a Frog 500. Covered entirely in sheet balsa and with detailed cockpit, the Mustang is a fine flier. Builder Edwards apologises for the 2-blade prop—four blades are a trifle hard on the fingers! Another control-line model comes in **B**, and this is a Class B racer from Junior Technician Higgins of R.A.F. Kinloss. Performance of Orlikon Mk. 2 is 33 laps at 90 m.p.h. with 56-ft. lines.

It's big; it's handsome; and it has been flying for at least three seasons—that is the claim of F. Smith's Luscombe Sedan in **C**, which is one of the regular performers at the major rallies. In bright red and silver trim, the Sedan always has a retinue of admirers, for it is realistic right down to the noise produced by its French 6 c.c. REA engine. Somewhat smaller is the 1/72nd scale Meteor NF XI in **D** by R. Jones stationed with the R.A.F. at Ahlhorn in Germany. As might be expected, the Meteor is accurate in every respect, the finish speaking for itself in the photograph.







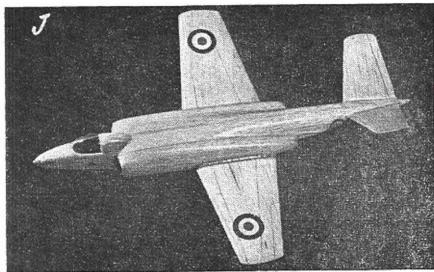
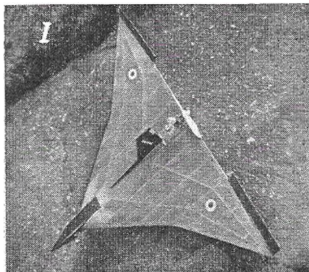
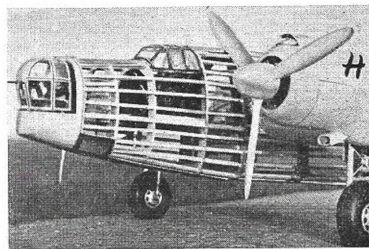
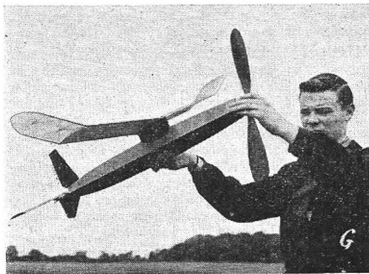
Not a flying saucer, but merely a standard 12-in. gramophone record is used by veteran Danish modeller Carl Host-Aris to display his 1/100th scale Lockheed Shooting Star in picture **E**. Carl puts 150 hours of work into these miniatures which are made from maple.

Fine weather and plenty of wide open space for sport flying, that was the spirit at the East Anglian Area Gala day, R.A.F. Debden, on July 10th. In **F** we see Reg Chowns and Ron Goulds with their Bird Dog and Crop Duster scale models about to enjoy use of the smooth runway. Proof that not only the O'Donnells can have success with a "Maxie" design is photo **G**, where clubmate W. Cooper of Whitefield shows his model which gained a recent 2nd place at the *Daily Dispatch* rally.

Last month we reproduced a fine selection of scale "twins" and no sooner had we closed the issue for press than picture **H** arrived from F/O King at R.A.F. Hemswell, with details of this 1/12th scale control-line Wellington. Two Frog 500s will power the 7ft. 2in. beauty which has been made over the past 18 months by Flt.-Lieut. Slater, and we gather that a large number of people are anxiously awaiting the first test flight. All turrets and the cockpit are detailed, the vic retracts, flaps operate and engine speed can be controlled.

A flying solid is the best description of the 1/48th scale catapult model by J. S. E. Pearson of Kingston-on-Thames in **I**. Mr. Pearson has built a series of these mini-fliers, and each has a flight duration of 15-20 seconds. One Meteor cleared a three-storey block of flats on its third flight and managed a steady 30 seconds!

Last, but not least, **J** shows young J. Baldwin's "Condor" delta for a Mills 75. Despite some scepticism from elder brother and friends, the sharply-pointed delta flies well, so well in fact that a duplicate has been built by a fellow Rebels club member at Maidenhead.



# RADIO CONTROL NOTES

Conducted by  
Howard Boys

MANY PEOPLE hearing about wonderful things called transistors that operate like a valve, yet use very little battery power, have wondered if they could be used advantageously for radio control purposes. They can be used, but not to much advantage as things stand at present. One difficulty is that those capable of replacing our orthodox receiver circuits must be capable of oscillating at more than one megacycle per second, which at present means experimental type transistors costing about £5 each! It would be possible to use a germanium rectifier followed by a bank of transistors in the form of an amplifier, but a few at 30s. 0d. each soon run away with the money, and the couplings between transistors become weighty.

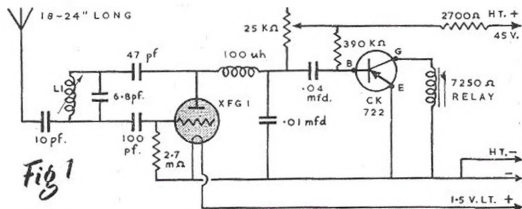
Howard McEntee has sent a circuit diagram (Fig. 1) that has been used most successfully in America where transistors are much cheaper. The transistor is added behind an ordinary super-regenerative detector, to give a good current change through the relay. In this way the XFG1 valve can be run at a low anode current to give long life, and the current through the relay will be two or three milliamps according to the transistor. Using a hard valve receiver the H.T. volts can be reduced to 22½ and maybe less, still with two or three milliamps through the relay, and this only while the signal is on. Transistors vary quite a lot and it is necessary to adjust the circuit components to suit each individual transistor. In Fig. 1 the 390 K ohms resistor between H.T. plus line and the transistor base may need altering to anything between 200 K and 800 K ohms for the CK 722. The nearest British transistor to this is the Mullard OC71 though the Hivac XFT1 may also suit. Mr. McEntee has promised to send more information when it is available.

Those readers interested in reed unit operation may remember that in the April issue the writer stated that George Honnest-Redlich and Sid Allen were using one reed each on sequence control of engine and elevator. George has kindly written to say that this applied to only one each "knock-about" models using four-reed receivers, and has given some details of his set-up. The usual uses six reeds, one each way on three actuators. Each of these gives a progressive trim movement of about ten degrees

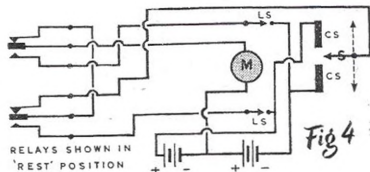
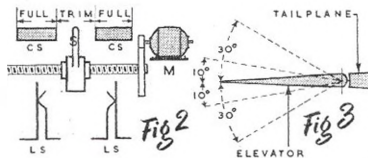
each way, with about thirty degrees each way for full deflection, this full movement being self-returning to the trim position. The scheme is shown in Fig. 2 and the control deflection in Fig. 3. The circuit is shown in Fig. 4, the letters being the same as for Fig. 2. LS is limit switch, CS contact strip, S sliding contact, and M the motor. This is a generally similar scheme to Harry Cuckson's described in the "AEROMODELLER" for July, 1954. For the engine control, the contact strips and slider are left out. The trim movement allows the model to be trimmed for level flight at top speed for heading into the wind, and trimmed for climb at reduced speed. There is also full down and full up elevator for manoeuvres. The same thing applies to the rudder.

Some time ago, George stated that one fear of the accepted self-centering motorised circuit was that if both relays made contact then the full voltage of the two actuator batteries in series would be short circuited across the relay contacts, causing them to burn and stick together. This battery short also prevents any other action being taken (if other controls come from the same batteries) to prevent a fly-way, or crash. He has seen this happen to himself and others. If the control is snapped over quickly, the first relay may not come out before the second comes in. The circuit in Fig. 4 prevents this happening.

Mr. Fisher of Emneth was flying a 6 ft. span model at the Nationals, with escapement control of the rudder, which operated an auxiliary escapement to give an engine slow position. Both escapements are rubber powered, and the scheme is shown in Fig. 5. The sequence as the transmitter button is pressed, is shown in Fig. 6. The arm A touches only the engine escapement, B has two points, C catches only the bottom pawl, which is slightly off-set to the top pawl, and D will catch both pawls. In Fig. 6, "a" shows transmitter off and neutral rudder, with engine full speed. "b" shows transmitter on, rudder right, and full speed. "c" is transmitter off, rudder just about neutral, and full speed. "d" is transmitter on again operated to give engine slow. "e" is transmitter off again, engine full speed, and rudder about neutral. It will be noticed that the engine escapement has only one arm. This is



L1 16 turns of 30 s.w.g. enamelled copper wire with  $\frac{1}{8}$  inch cored former. X.F.G.1 gives .5 m.a. with no signal and .1 m.a. or less with signal. Turn 25K Resistor to get lowest steady idling current. Total no signal current .8 to 1.5 m.a. Total current with signal 2 to 3 m.a., or higher depending on transistor. 390K may need to be altered to 2-8 m ohms. as transistors vary widely in characteristics.



because Mr. Fisher was able to adjust one choke to give slow engine with the arm in one position, but with a two arm escapement the adjustment in the second position proved difficult. It was much easier to cut off the other arm.

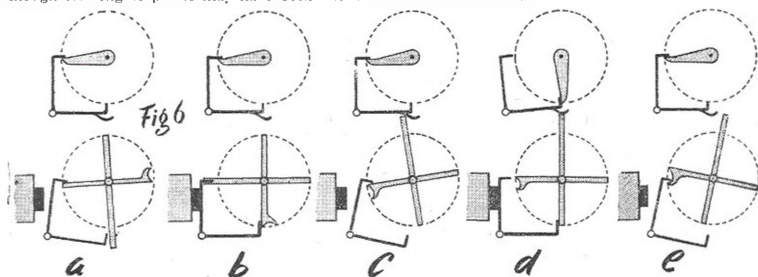
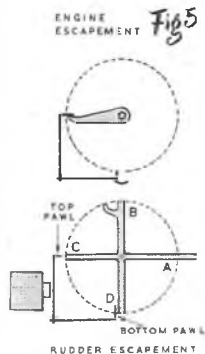
So far this year the standard of radio control flying seems to have deteriorated, so at the Northern Heights Gala, the writer took a few notes to see if any lessons could be learned. In the two rounds there were 31 entries (one person being too late to enter the first round). Of these there were 12 failures due to the radio or actuator, and four other failures. The contest had a bad start. First man off flew over the allowable three minutes and crashed on landing. Second man could not get his McCoy 29 running properly within the five minutes. Third model hit the ground shortly after launching and the rudder failed to operate. Fourth man had trouble with the escapement running away due to engine vibration. Fifth man could not fly because when he reduced engine speed with his three reed receiver, the rudder gave up, though it worked all right with the engine at full speed. Sixth man did at last get a good flight with a *Rohma* powered with an E.D. 3.46, and landed as near as 16 yards. The next one scored no points, the reason not being observed by the writer due to getting ready for the next flight. This went all right with a landing at 24 yards. Next came Mr. Fox who made a nice flight and hit his transmitter aerial to land the model at 11 yards. The next was a good flight, followed by another failure due to radio or actuator. Then came two more reasonable flights and two more with radio trouble.

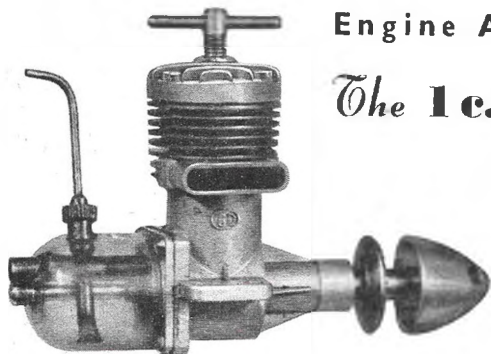
In the second round the first did not turn up, probably due to his first round crash. The second man did not get away due partly to bad launching though low engine power may have been another

factor. This was followed by a radio failure, actuator trouble and then the three reed set which was still giving trouble. Then came seven flights straight off, two more radio failures and another flight. This last finished up in a most remarkable way as the posterior of a certain gentleman bears witness!

Of the troubles, actuators vibrating and running down with the engine running, relays vibrating or going out of adjustment, and reeds or their oscillators going off tune seem all too frequent. All these things show up much more in contests than at any other time.

Relays and escapement are the two most common causes of trouble. By its very nature an escapement is liable to be operated by vibration. Some positions in a fuselage give more trouble than others, so others should be tried in the event of trouble. Most sensitive relays for radio control are liable to chatter with vibration, or go out of adjustment. It is a pity that a light relay of the Sigma type has not been produced for the home constructor.





## Engine Analysis No. 13

# The 1 c.c. E. D. Bee

### SERIES 2

Reviewed by

R. H. WARRING

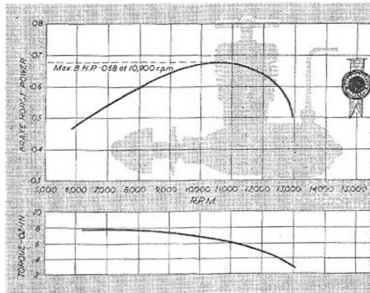
LATEST VERSION of the popular 1 c.c. "Bee" represents, essentially, a thorough "clean up" of the original model. Bore and stroke remain the same (the measured bore actually being a few thou greater on the latest model) but the overall appearance is markedly changed at the expense of an increase in weight of  $\frac{1}{2}$  oz. Thus in spite of certain common features, the latest "Bee" is essentially a new model.

External appearance is vastly improved. With all due respects to the original "B", it was a rather crude looking production with the cylinder unit cast integral with the crankcase. In the new "Bee" the crankcase casting is extended only to exhaust level, the cylinder being an integral unit machined from steel complete with its cooling fins. It is secured by three screws through a cast finned head in light alloy, the screws locating in the finned flange at the top of the crankcase casting. The cylinder itself beds down on a narrow flange formed inside this casting against an extremely narrow gasket and is an entirely new design with

machined by-pass grooves on the inside opposite the exhaust ports.

The crankcase itself is very much neater, terminating in a square flange at the rear end. The back cover is also square and attached with four screws, instead of screwing in as on the original "Bee". A similar rotor disc and metal intake tube are employed, but it is no longer possible to alter the port timing by rotating the backplate as on the old Bee. The same needle valve and spray bar assembly is used.

The .218 in. diameter hardened and ground steel crankshaft has a .008 in. (total) taper at the front, to which is fitted the bossed propeller driving disc. Boss diameter is  $\frac{1}{4}$  in., calling for this size of propeller hole. An aluminium spinner screws on to the threaded end of the crankshaft, closing up sufficiently to the drive plate to accommodate 4 in. or greater propeller pitches. Finer pitch propellers require either a spacing washer or a trimming of the drive plate boss length for proper grip. There is a generous allowance of metal around the threaded portion of the spinner and so the possibility of stripping this thread is remote,



#### E-D "BEE"

Displacement: .99 c.c. (.0605 cu. in.)  
Bore: .438 in.  
Stroke: .40 in.  
Bore/stroke ratio: 1.095  
Rare weight: .31 oz.  
Max. B.H.P.: .068 at 10,000 r.p.m.  
Max. torque: 8 oz.-in at 7,000 r.p.m.  
Power rating: .07 B.H.P. per c.c.  
Power/weight ratio: .021 B.H.P. per oz.

#### Specification

Crankcase: pressure die-cast light alloy  
Cylinder: case hardened steel  
Piston: cast iron  
Crankshaft: ground and hardened steel  
Cm. rod: case-hardened steel.

#### Manufacturers

Electronic Developments (Surrey) Ltd.,  
Villiers Road, Kingston-on-Thames  
Retail Price: £2.15 0.

with normal usage (often a failing with this type of alloy propeller nut).

The crankshaft web is a pure disc .110 in. thick with an integrally machined crank pin .140 in. diameter. The cast iron piston has quite thick walls and the connecting rod is case-hardened steel. Rotational unbalance, therefore, is on the high side, but since the stroke is short, vibration is not excessive at normal operating speeds. This is undoubtedly one of those engines which will give its smoothest performance with a slightly unbalanced propeller, the heaviest blade being set opposite to the piston at top dead centre. We had a certain amount of vibration trouble during the test runs, both with the eddy current dynamometer and a sensitive reaction rig and it would appear that fairly generous bearing sizes are required for rigid mounting, particularly as the integral tank gives a considerable overhang.

We found the new "Bee" very easy to start and adjust. Priming through the exhaust produced rather easier starting than finger choking, although this operation is made a little difficult by the presence of the exhaust stack. Two generous size exhaust ports are cut in a groove machined in the cylinder proper, facing the exhaust stack cast in with the main casting and ejecting on the right hand side of the engine. The tendency is to overprime, but the engine will normally fire straight away, although indicate that it is overcompressed. Slacking off, re-flicking and taking up the compression again as the engine gets running, is best procedure in such cases.

With finger choking we found it necessary sometimes to increase compression slightly to start, re-adjusting almost at once. A particular virtue is that the "Bee" will start over quite a wide range of compression settings according to whether the engine is over or under primed and can then readily be adjusted to consistent running.

Yet it can be stopped quite easily by slackening off the compression one quarter to one half turn.

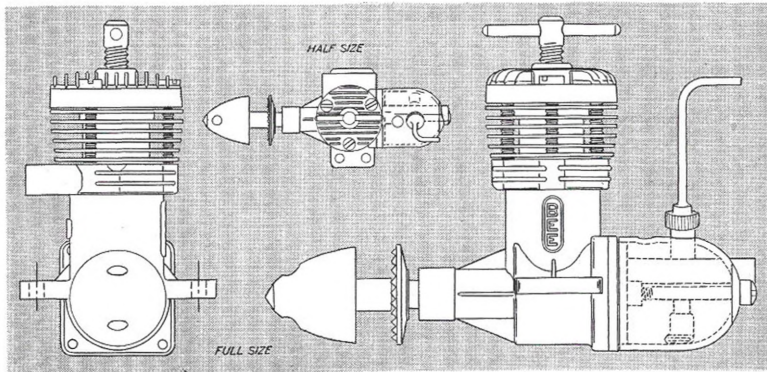
The needle valve control is quite responsive. The recommended setting was one turn open, but we found for small propeller loads that the needle had to be closed right down for optimum "lean" mixture. With all loads, however, opening up the needle valve produced a definite throttling effect, the engine speed dropping slowly and progressively with increasing rich mixture and with steady running maintained all the time. It is quite easy to run this engine too rich without realising it when a further closing of the needle valve could increase speed appreciably. For sports flying, in particular, it would probably be an advantage to run slightly rich rather than lean.

With smaller propeller loads, we found a tendency for the "Bee" to run a little erratically, but this was traced to the head having worked loose. If the head screws are checked after the initial runs and tightened down when hot, this trouble is unlikely to occur. But check this point if the engine does not hold a consistent speed with a particular propeller load. At very high speeds we found it impossible to adjust the compression to eliminate missing, using normal commercial fuels. This effect is more pronounced on some fuels than on others. It could undoubtedly be cured by increasing the nitrate content of the fuel but essentially the "Bee" appears to be a moderate speed engine.

#### PROPELLER-R.P.M. FIGURES

Propeller dia. x pitch	r.p.m.
8 x 4 (Stant)	7,900
7 x 4 (Stant)	9,300
6 x 4 (Stant)	10,750
6 x 4 (E-D plastic)	11,800
6 x 3 (constant)	12,200
7 x 5 (g.m.p.)	9,600

Figures approx. common to E-D, Mercury No. 8 & Allbas fuels.



The torque and power curves established are representative of normal fuel running, no marked differences being shown with a range of fuels tried.

Peak horse-power was established at 10,900 r.p.m. and of somewhat moderate value for an engine of this size. As mentioned previously, the vibration level of the tests was somewhat higher than normally considered desirable and undoubtedly a better B.H.P. figure could be achieved under what we could term "laboratory" conditions as opposed to representative practical operating conditions. Maximum torque is sustained well over the 6-9,000 r.p.m. range, and up to the 10,000 r.p.m. mark running is particularly consistent and the controls most flexible. As well as being responsive to the controls, both the compression adjustment and needle valve are easy to grasp and adjust and well clear of the propeller.

We would say that to get the best out of a new "Bee", a careful, and if necessary prolonged, running-in period is necessary. Even after an hour's initial running there were still obvious signs of friction leading to a hunting tendency at high speeds and the main bearing still lacked a smooth, polished appearance. It is an engine which will certainly pay for running in for it is sturdy enough to last a lifetime.

Apart from its lack of high speed performance, its weight also classifies it as a sports type engine, for 3½ oz. is quite a high figure for an engine of this size. The cylinder, incidentally, accounts for 1 oz. of this figure.

For free flight power work, a 7x4 propeller should give about the best results, equivalent to a flight operating r.p.m. slightly in excess of 10,000 r.p.m. A 6x5 or even a 7x5 might be tried for control line work. An 8x4 could be used for free flight work to operate the engine in the region of

maximum torque and take advantage of any increase in propeller efficiency given by the larger diameter. Running was not particularly satisfactory on the 6x4 plastic propellers tried (which in any case are normally intended for a smaller engine).

The fact that the "Bee" is fitted with an integral exhaust stack limits the exhaust spray to the right hand side of the engine and also means that it could effectively be coupled to a silencer for quiet running, not that the "Bee" as it is, is a very noisy engine. Had "open" exhaust porting not become so universally popular, we might have seen some concrete attempts made to silence model engines and eliminate the chief cause of complaint against the flying of control line models in built-up areas. Ignoring questions of efficiency, the only practical objection to the integral stack on the "Bee" is that it limits the length of the mounting bolts which can be fitted in the lugs to ½ in. maximum, if mounted head up, or prevents a box spanner being used to tighten up the nuts if the mounting bolts are fitted head down. A shorter stack or a rounding of the ends would have eliminated this criticism.

Our overall impressions of the engine were most favourable—an excellent little power plant for sports models of all types, but watch the weight factor if you are using it to replace a much lighter engine on a standard design. And do not take it apart unless you really have to. The cylinder gasket is already marginal in size and all too readily damaged. The cylinder is automatically aligned when replacing by positioning the exhaust ports opposite the stack. A certain amount of exhaust is free to bleed around the cylinder and can escape via small cut-outs in the top of the main casting, so do not be too worried at seeing dribbles of dirty oil appearing here.

### What's the answer ?

Harry was the club "Handyman", always around to lend a hand to hold a rubber model for winding up or a glider for launching. But he was always a bit dubious about holding George's Wakefield.

"Can't understand it", he said to one of the club's other Wakefield fliers. "When I hold for you I never get pulled all over the place. Yet I know you put on more turns. I've counted as you both wind."

Obviously George's winding technique was wrong somewhere, but why?



The experts wind as much by "feeling" as anything else. I should mention that you and then start winding you can then attend a powerful Wakefield more than one "pull" of nearly fifty pounds. On the other hand, if you start winding slowly as your finger exceed about seven pounds of force, you are getting the same amount of stretch on the way in. Come in with the rubber, don't fight it both ways—torque you cannot control, but pull you can.

What would YOU do in a case like this? Think a moment, then twist the page for the solution to the problem which is printed below





THE QUESTION of unattached Associate Members of the S.M.A.E. is one that has cropped up in several areas. There are hundreds of these members who do not appear to take an active part in any club programme and it may well be that many of these do not fully appreciate just what advantages membership can offer.

Despite frequent references to such modellers during the past few months, no one seems to have done much about it, and we are therefore very pleased to see that a lead has been given by the London Area Committee, who invite all associate members in and around London to attend the monthly meetings held by the area at the Grosvenor Hotel, Tottenham Court Road, W.1, on the second Monday of each month at 7.30 p.m. If anyone feels any shyness they are invited to write to the Area P.R.O., K. J. Smezzett, 281, Cornwally Street, Leyton, London, E.10, who will be pleased to give them the address of their nearest club and information on the society's activities.

### Northern

Tales of woe were commonplace after the Nationals, but a new club the HUDDERSFIELD CIRCLE BURNERS (urrrgh!) tell us that they considered their luck extremely good, since they managed to get there without a breakdown last year a spring went at Newark, but this time everything went all right until half way back, when one piston was blown out, complete with conrod, and another jammed at the top of its stroke, complete with rod. The remaining 150 miles was travelled on cylinders 3 and 4 using 1½ gallons of oil and 2 gallons of petrol, not to mention 12 hours of time! Apart from demonstrations, the recent activities of the club have included a trip to Woodford, where D. Dickinson and A. Farrer each took a 1½ lb share of the combat prize.

The more ardently-titled HUDDERSFIELD D.M.A.C. held a rally in May before the good weather arrived, and of the visiting clubs WHITEFIELD swept the board in the F.V. events. The result of this club's postal contest with the HASTINGS (N.Z.) club is not yet determined, since the Hastings results have not yet arrived.

### East Anglian

Anxious for new members is WITHAM D.M.A.C. (P. Newman, 6 New Lane, Fressing, Colchester), who meet each Sunday and Wednesday, and have a modest competition programme. The Golden Wings

contest has aroused considerable enthusiasm in this club.

Regrouping has caused the formation of the THAMESIDE M.A.S., an offshoot of the old Balfour club. Present membership is around twenty, including several people whose names are regularly to be seen in the contest lists.

### London

A close-fought rivalry saw WEST MIDDLESEX M.F.C. win the narrow margin of 1:28 over Croydon in the first round of the L.D.I.C.C. The annual club rubber contest produced some very high scores with G. Owers topping the list.

Fifteen GODALMING D.M.F.C. members visited the Nationals, highest placing being R. Peviss, who was tenth in Power. All events achieved satisfactory results, and the whole morning was held to be very enjoyable.

A rebirth of the ST. ALBANS M.A.C. magazine *Thermal* has taken place. In the current issue it further information on the All-Britain Rally, which this year will include Jetex duration on slightly different lines, R.C. split into multi and single channel, and Clipper Cargo reduced to 1 c.c., but otherwise as before; the team races will definitely be to S.M.A.E. rules. Members of HAYES M.A.C. had an excellent and successful day at the Northern Heights Gala with F. Welbourne collecting silver and the Rally Championship, and J. Marshall getting a second place in Concours. Club flying takes place in Cranford Park on Wednesday evenings, and one member apparently intends to wear his Oliver there in a team race, since he flies it from the time he arrives until dark. The suggestion is made that this is possibly more interesting than just pouring the fuel on the ground!

Anyone looking for the finest flying field in the London and West Essex areas should drop a line to HORNCHURCH M.A.C. secretary E. G. Hodges, 244 Parades Avenue, Dagenham, who will gladly supply particulars including conditions of use. The latest all-in club contest came to a grand finale with a dramatic cloudburst which caught one model airborne. It is alleged that this model created a new club record—for the 100 yards event stroke! The club secretary headed the results with his *Corair*, followed by D. Thompson with a lightweight rubber job. The latter has raised his school-room microfilm record to 2:47 with a 15in.

Some of the 20 members of LLANELLY D.M.F.C. display a group of their models out for the day at Fairwood Common

flimsy, L. Ratson's 30-in. tailless rubber job hooked a thermal at the N.H. Gala, hencing into a sewage farm at 4:23! It got quite high, but it is receiving attention from P. Fraser who is outbidding many A.2s with consistent 2 minute places. Members of the CRYSTAL PALACE M.A.C. had mixed luck at the N.H. Gala, some losing their models O.O.S. and the others pranging theirs well in sight . . .

### East Midland

THE FORESTERS (Nottingham) M.F.C. circus had a good day at the N.H. Gala, though without success in combat. T. Woodward was in the lead in the Queen's Cup, but in the three-man fly-off returned an unlucky 1:20 to place 3rd. Weather interfered with racing at Woodford, but the club placed 1st and 2nd in A, and had three models in the last combat 16, when Tim stopped play.

### Southern

SOUTHAMPTON M.A.C.'s annual trip to the N.H. Gala was rewarded with the almost habitual election of the Helicopter Trophy by M. Ingram; this is in fact the fourth successive year. Other recent news includes N. Worley's third place in the Hamley and the enrolment of the club's first lady member.

The R.U. Glider Trophy event staged by the WEST HANTS A.C. will this year be on September 11th at Stover Cross, Cadnam, near Ringwood, Hants. (On the A.31 road.) Entries will be taken on the field. The proposed club exhibition has had to be slacked for the time being, since it is impossible to find premises for less than £25 a day, but an excellent flying display was put up at a recent late dispute difficulties caused by long grass. Competition-wise, Sid Taylor did extremely well to place 8th in the Wakefield Triak, and is still sucking himself for altering his trim for flights 2 and 3, going back to the original trim gave him: max. in flights 4 and 5!

### North Western

Eight club competitions remain to be flown off in SHARSTON D.M.S.; a recent stunt event was won by M. Corledge with A. Roberts as runner up, both flying Anco P.R. 3.5 models. Despite a slight dampening physically, club members enjoyed their coming to Woodford, and put in a great deal of flying.

The A2 event at Clwed was again won by a WALLASEY M.A.C. member, this time by a 100% success. About £100.00 also collected in the Gosling Trophy for the day's best flight. At Woodford H. Banks was third in A racing, while S. Hinds won the glider trophy, flying the club's A2 design.

Finances in the WHITEFIELD M.A.C. are on the up grade and contest successes are remaining satisfactorily frequent. After their clear wins at Huddersfield, little was experienced at the Nationals, but J. O'Donnell's place in both Wakefield and A.2, and J. Perrott's making the power team in the Trials were then compensated for this. Apart from H. O'Donnell's senior championship and four of the top

### CONTEST CALENDAR

- Aug. 21  
Soc. Midland Area Rally, Cranfield  
Sept. 11  
Roberts Cup (rubber flying boars), Blackheath  
Sept. 17  
U.K. Challenge Match, P.A.A. Rally, Prestwick  
Sept. 25  
All-Britain Rally, Radlett.

## CONTEST RESULTS

## KEIL TROPHY

Decentralised	26 Entries	July 3rd.
1. P. Buskell, Surbiton.		9: 51
2. N. Worley, Southampton		9: 48
3. J. Webster, Farnborough		8: 46
4. D. Painter, Henley		7: 46
5. R. Parsons, Prestwick.		7: 30
6. F. McNulty, Leeds.		6: 43

## FROG JUNIOR CUP

Decentralised	7 Entries	July 3rd.
1. R. Burwood, Blackheath		9: 22
2. P. King, Croydon.		6: 02
3. P. Lacey, Henley.		4: 00

## DAILY DISPATCH RALLY

Power		
E. Lord, Ayrington.		8: 00
Glider		
S. Hinds, Wallasey		5: 28
Rubber		
R. Howarth, Whitefield.		8: 31
Jetex		
K. Pratt, Ashton.	30.9 Ratio	
1.5 Fuelled		
D. Posner, W. Middlesex.		1: 58

Clubs A Team Race		
J. Thompson, Foresters.		
Women's Cup		
Miss M. E. Coppuck, English Electric M.A.C.		
Flying Scale—E. T. Riding Trophy		
J. Bridgewood, Doncaster		
Senior Champion		
H. O'Donnell, Whitefield.		
Junior Champion		
J. Northrop, Leeds.		

## NORTHERN HEIGHTS GALA

Night Trophy		
E. R. Welbourne, Hayes.	8: 00+2: 00	
Freev. Cup		
J. O'Donnell, Whitefield.	8: 00+4: 59	
The Queen Elizabeth Cup		
D. Aldridge, Leamington	972 pts.	
Thurston Helicopter Trophy		
C. M. Ingram, Southampton.	232 pts.	
De Havilland Trophy		
C. C. Gunter, B. O. C.	8: 00	
Krit Krut Combat Trophy		
G. M. Smith, High Wycombe		
R.A.F. M.A.		
Boy Entrant Welsh, Cosford		
R.A.F. Flying Review Cup		
J. Fox, Hatfield		
Concours D'Elegance		
Power: M. Gaster		
Flying Scale: A. Briggs		
General Flying: C. Read		
Unorthodox: J. Marshall		
Aeromodeller Cup—Gala Champion		
E. R. Welbourne, Hayes.		

## CLWYD SLOPE-SOARING

A/2 Class		
R. Hinchliss, Wallasey.	4: 59	
Senior Open Class		
D. Whitehurst, Cheadle.	4: 23	
Junior Open Class		
B. Jackson, Cheadle.	2: 53	
R/C Class		
W. Nield, Cheadle.		

five rubber places being filled by the club at Woodford little other success was recorded. Present activities are waiting for the clearing of the hay crop when the sport fliers who, it is freely acknowledged, form the backbone of this top-line club, will once more be getting cracking.

The fourth anniversary of MILLOM M.A.C. was celebrated by contests which received the full support of the press and local Rotary Club, who presented prizes and a cup. Unfortunately the weather was less co-operative and the comps were accompanied by the usual sounds of splintering. Ultimate winner was T. Moyle with the best all round performance. The club regrets its lack of experience in competition flying and is anxious to take on any local club, either direct or proxy.

## Midland

The high average of 9: 16 per man was achieved by the five LOUGHBOROUGH

COLLEGE M.A.C. members flying in the A/2 Trials. Despite this, no member made the team, but activity has already reached a furious pitch for next year's eliminators. Appearances at A/2 trials is popular, and many old C/L jobs are being brushed off in preparation for a college display in October.

A new club in this area is SANDIACRE D.M.A.C. with a membership of 30. S.M.A.E. affiliation is in the offing, but contact with any local clubs able to pass on a few tips would be appreciated. Several members are entering for the Golden Wings event as a first move in serious flying.

Going one stage further is LEICESTER M.A.C., who are running a special competition for juniors entering the Golden Wings competition. The event will include cash prizes presented by senior club members and also give juniors a chance of making qualifying flights with the help of club officials. Ready Aerodrome is now in use again, but chief activities are at present concentrating on C/L models for two big displays.

Although up to now sport flying has been predominant, LONG EATON D.M.A.C. is creating a contest fleet for Sherburn. Despite lack of a good flying site the club is chiefly interested in F/F and models just appearing are *Corvar*, B.G.44, *Nebula*, *Y-Bar*, and a pair of *Eliminators*.

The long trip to Hatton was made by the FREEMASONS A.R.C. (Warminster), but members had so good a time that a full bus next year is assured. In this club too control line practice is going on for a display at a local fest.

## South Eastern

High winds eased off in a school flying display by LEWES M.F.C., but the display got off on the wrong foot with a new power job landing on a roof, dropping three stories and breaking in two! N. Dunnett spent afternoon time to imitate someone on his *Hypodermic* sailplane, but narrowly escaped having his own head removed by *Radio Queen*. Some real interest is appearing, though scale and semi-scale models still occupy many members. Regular Saturday night meetings are enlivened by regular film shows.

Satisfaction is widespread in BRIGHTON D.M.A.C., with A. Mussell making the power team and P. Giggie coming 8th in A/2. At the Northern Frigates R. Baxall received the considerable entry with his *Gen. M. Minshall's Rectangular Riot* placing second.

## Western

What may have been the last area meeting at Lulgate was held in bad conditions on June 17th. Only one of the five competitions could be run, but a large hangar placed at the modellers' disposal proved large enough for C/L and H/L gliders. A second rally is being held on October 7th at Wroughton, when all the International eliminators will be held together.

An enjoyable day was spent by SWINDON M.A.C. at the N.H. Gala, although no places were obtained in the various contests entered. The club is temporarily without its comp. secretary, who is at present in hospital, but the secretary, that having seen his nurses they don't expect him back for a long time yet!

## South Midland

Preparations are now well in hand for the Area Gala on August 21st at Cranfield. This gala gains in popularity each year and will consist of a number of "one day" events, the success of which is being watched with interest.

HENLEY M.C. are feeling very pleased with their first places in the Thurston and Hamley and a near miss in the power trials. Forward Keels are still much in evidence and D. Painter has frised a dual

one to his new A/2; this is retained in a slot by bolts and besides its aerodynamic advantages is an excellent visibility aid when highly polished. Other experimentally-minded members are going to air systems of tailplane, feathering strips, and safety winding systems.

Despite losing its main flying ground, REDDING D.M.A.C. has been active on a smaller field, though so far the only contest luck has been D. Stenning's 4th place in the Shelley. Considerable experimental work is going on with glass fibre team racer fuselages, cowlings, and such things as curved induction pipe extensions, etc.

## South Wales

Three more displays at L1 is, Od, per time fee have been given by CARDIFF M.A.C., who report that three in a circle combat goes down best with the crowds. The club's engagement book is bulging as a result of the resounding success of their displays so far.

## South Western

Popularity of the combat event in a carnival demonstration is also mentioned by BUCKFASTLEIGH M.A.C. Members of the Plymouth club are active in team racing, and the show was generally well received.

## Scotland

Latest news of the big P.A.A. meeting is the inclusion of yet more contests—Jetex, class R combat (2.5—5), 50-line and class B racing to S.M.A.E. rules. The prize value so far is almost £200.

A new British club is the DUNDEE & ANGUS F.C., an all-C/L group numbering 15 so far. A squad of Eta 29's and McCoy 29's are put to good use in races and speed jobs. The club flies at Caird Park cricket pitch and a welcome awaits anyone who care to pop along at 2 p.m. any Sunday.

Two requests for pen pals have been received from the Naftali Kaelman, 6 Hama'ad Street, Jerusalem, Israel, who would like pen friends in Burma, and the other from J. B. Lumsden III, of Mineral, Virginia, U.S.A. Both C/L enthusiasts who is interested in corresponding with similarly interested modellers of either sex.

An odd story from the Nationals is told by K. Boughie, who had a lost model returned to him. Accompanying his own model was a second which appears to be a black and yellow Javelin-powered *Eliminator* with no name and address, and, apparently, no provision for a D/T. The foolish owner is invited to contact Mr. Boughie at Norfolk Cottage, Tuxley Lane, Godalming.

Finally, J. A. Wood, of 33 St. Martins, Stamford, Lincs, is anxious to form a club in his neighbourhood, and invites any local enthusiasts to get in touch with him.

## THE CLUBMAN

## NEW CLUBS

HUDDERSFIELD CIRCLE BURNERS	W. Riding, Eskdale, Paddock Road, Kirkstoum, Huddersfield.
THAMESIDE M.A.C.	M. King, 156 Marine Parade, Leigh-on-Sea, Essex.
SANDIACRE D.M.A.C.	D. Sandiacre, 7 Ilkerton Road, Sandiacre, Notts.
DUNDEE & ANGUS F.C.	R. Laing, 21 Newbank Road, Broughley Park, Dundee.

## SECRETARIAL CHANGES

LAINDON PROP SPINNERS	G. French, High View, Wash Road, Laindon, Essex.
LONG EATON D.M.A.C.	T. Watson, 4 Wood Avenue, Sandiacre, Notts.
BUCKFASTLEIGH M.A.C.	D. Trude, 9 Gblebords, Buckfastleigh, S. Devon.
NORWICH M.A.C.	J. Ward, Turret House, Wymondham, N. Norfolk.



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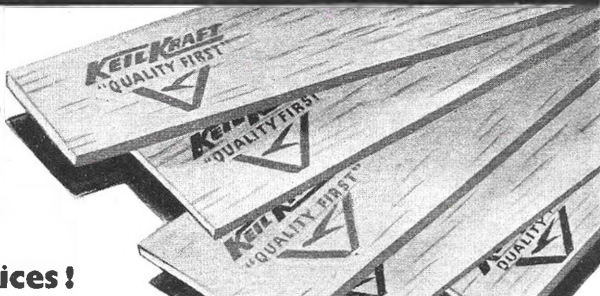
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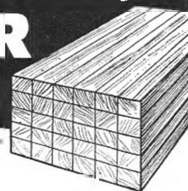
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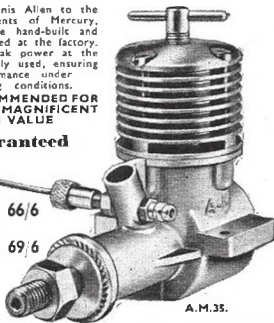
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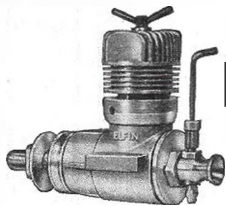


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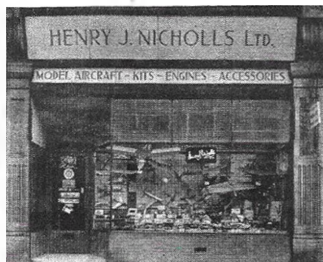
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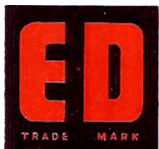
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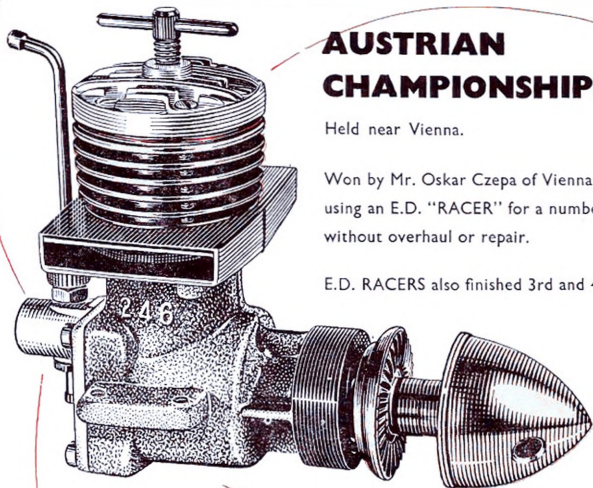
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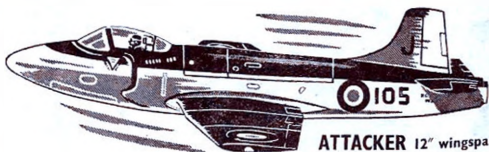
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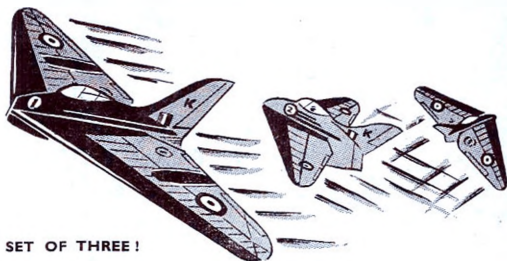
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