

# **AERO MODELLER**

NOVEMBER 1961



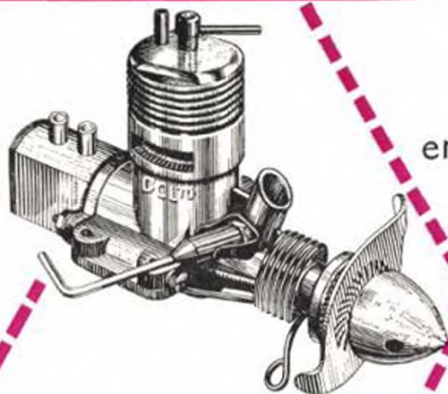
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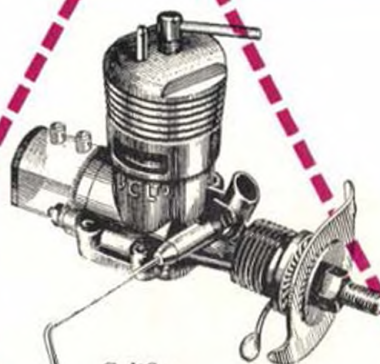


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# The answer is



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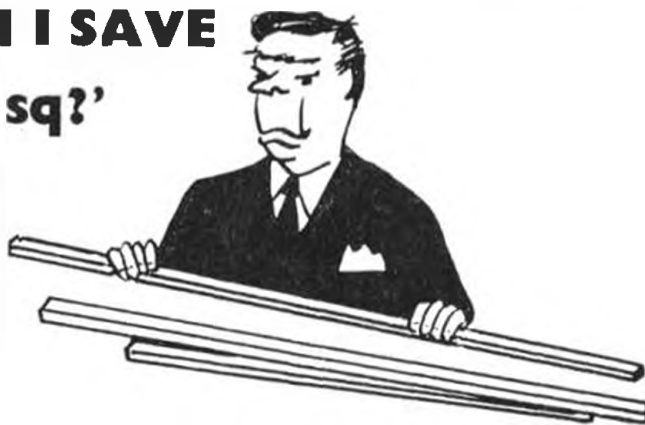
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# 'HOW MUCH WEIGHT CAN I SAVE IF I USE $\frac{1}{8} \times \frac{1}{4}$ INSTEAD OF $\frac{3}{16}$ sq?'

That's a question that needs working out.  $\frac{1}{8} \times \frac{1}{4}$  strip has  $\frac{8}{9}$ ths the cross section of  $\frac{3}{16}$  sq., so you would reduce the weight in that ratio for the same density of balsa—i.e., save roughly one tenth of the weight. In case you run into design problems like this, we have prepared the conversion table below for rapid solutions.



## HOW TO USE THE TABLE:

To find the weight of Strip A relative to Strip B, follow down the vertical column for Strip A until opposite the Strip B size. This figure will then show you the weight of Strip A as compared with Strip B for the same density of balsa. E.g.,  $\frac{1}{8}$ -in. sq. weighs  $1\frac{1}{2}$  times  $\frac{1}{8}$  in.  $\times$   $\frac{1}{4}$  in. strip.

The table can also be used to find what density balsa is required to give the same weight in different

strip sizes. In this case read *horizontally* from the new strip size and use the figure in the appropriate vertical column (original size) as a multiplier.

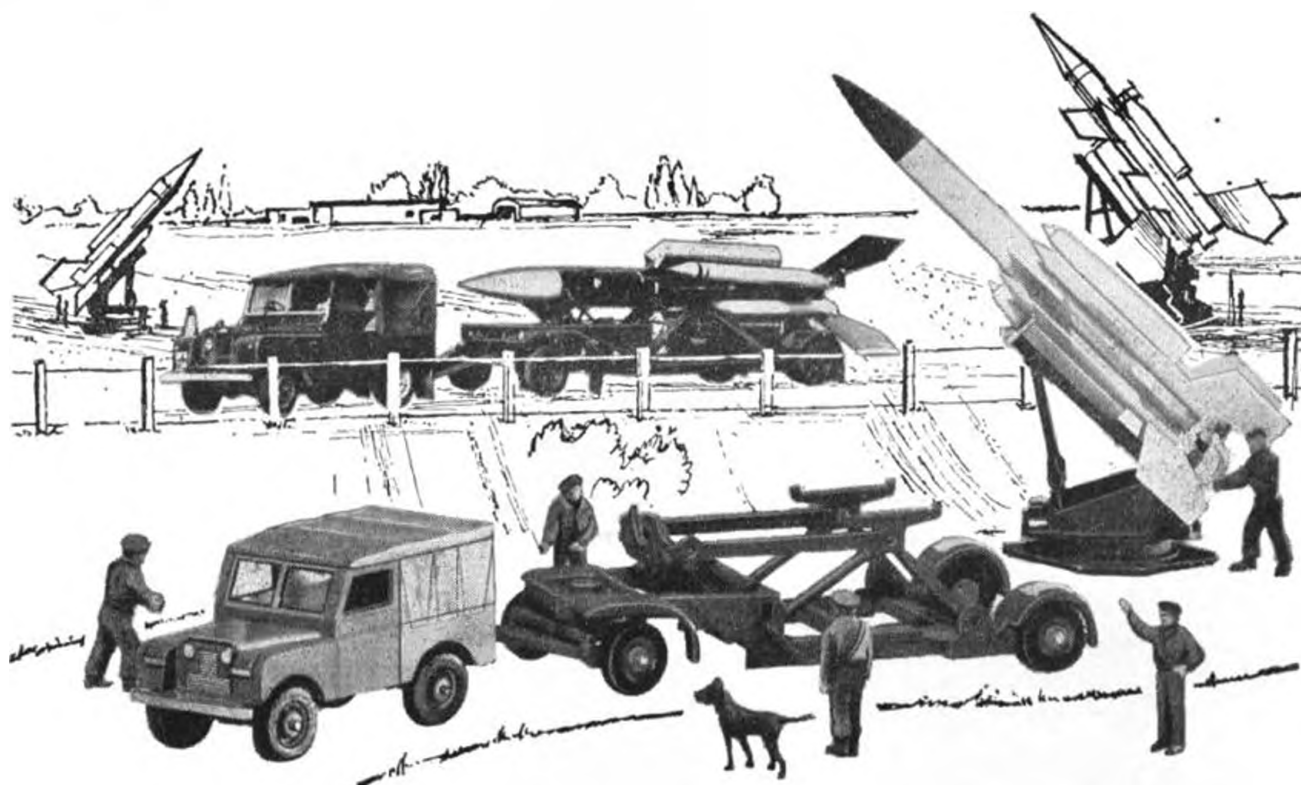
E.g., in the example above, the factor is  $\frac{8}{9}$ . Thus for *equal weight* the density of the  $\frac{1}{8}$ -in. sq. strip would have to be  $\frac{8}{9}$  the density of the  $\frac{1}{8}$ -in.  $\times$   $\frac{1}{4}$ -in. strip.

STRIP A ↓ STRIP B	$\frac{1}{16}$ " X...				$\frac{3}{32}$ " X...				$\frac{1}{8}$ " X...			$\frac{3}{16}$ " X...		$\frac{1}{4}$ "	$\frac{3}{8}$ "
	$\frac{1}{16}$ "	$\frac{1}{8}$ "	$\frac{3}{16}$ "	$\frac{1}{4}$ "	$\frac{3}{32}$ "	$\frac{1}{8}$ "	$\frac{3}{16}$ "	$\frac{1}{4}$ "	$\frac{1}{8}$ "	$\frac{3}{16}$ "	$\frac{1}{4}$ "	$\frac{3}{16}$ "	$\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{3}{8}$ "
$\frac{1}{8}$ " X $\frac{1}{16}$ "	1	2	3	4	$2\frac{1}{4}$	3	$4\frac{1}{2}$	6	4	6	8	9	12	16	36
$\frac{1}{8}$ "	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$1\frac{1}{8}$	$1\frac{1}{2}$	$2\frac{1}{4}$	3	2	3	4	$4\frac{1}{2}$	6	8	18
$\frac{3}{16}$ "	$\frac{1}{3}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	$1\frac{1}{3}$	2	$2\frac{2}{3}$	3	4	$5\frac{1}{3}$	12
$\frac{1}{4}$ "	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{9}{16}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{1}{4}$	3	4	9
$\frac{3}{32}$ " X $\frac{3}{32}$ "	$\frac{4}{9}$	$\frac{8}{9}$	$1\frac{1}{3}$	$1\frac{7}{9}$	1	$1\frac{1}{3}$	2	$2\frac{2}{3}$	$1\frac{7}{9}$	$2\frac{2}{3}$	$3\frac{5}{9}$	4	$5\frac{1}{3}$	7	16
$\frac{1}{8}$ "	$\frac{1}{3}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	$1\frac{1}{3}$	2	$2\frac{2}{3}$	3	4	$5\frac{1}{3}$	12
$\frac{3}{16}$ "	$\frac{2}{9}$	$\frac{4}{9}$	$\frac{2}{3}$	$\frac{8}{9}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$\frac{8}{9}$	$1\frac{1}{3}$	$1\frac{7}{9}$	2	$2\frac{2}{3}$	$3\frac{1}{2}$	8
$\frac{1}{4}$ "	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	2	$2\frac{2}{3}$	6
$\frac{1}{8}$ " X $\frac{1}{8}$ "	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{9}{16}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{1}{4}$	3	4	9
$\frac{3}{16}$ "	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	2	$2\frac{2}{3}$	6
$\frac{1}{4}$ "	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{9}{32}$	$\frac{3}{8}$	$\frac{9}{16}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{2}$	2	$4\frac{1}{2}$
$\frac{3}{16}$ " X $\frac{3}{16}$ "	$\frac{1}{9}$	$\frac{2}{9}$	$\frac{1}{3}$	$\frac{4}{9}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{4}{9}$	$\frac{2}{3}$	$\frac{8}{9}$	1	$1\frac{1}{3}$	$1\frac{5}{9}$	4
$\frac{1}{4}$ "	$\frac{1}{12}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{3}{4}$	1	$1\frac{1}{3}$	3
$\frac{1}{4}$ " X $\frac{1}{4}$ "	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{9}{64}$	$\frac{3}{16}$	$\frac{9}{32}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{3}{4}$	1	$2\frac{1}{4}$
$\frac{3}{8}$ " X $\frac{3}{8}$ "	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{12}$	$\frac{1}{9}$	$\frac{1}{16}$	$\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{9}$	$\frac{1}{16}$	$\frac{2}{9}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{4}{9}$	1



Even more important than selecting the best size of balsa is selecting the right grade and best quality. That, fortunately, is easy. Just be sure to ask for SOLARBO BALSA by name. All the experts do, for they know it is the best balsa you can buy—anywhere.

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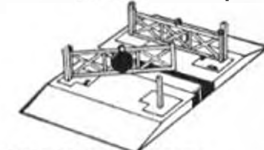
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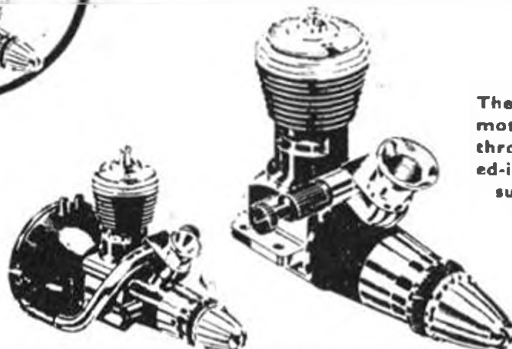
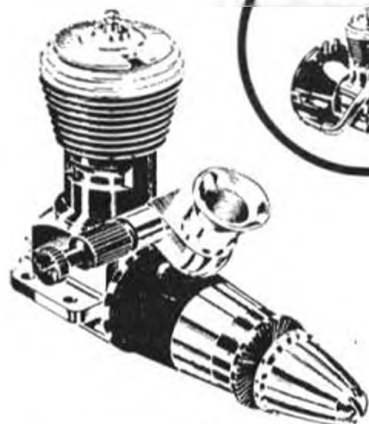


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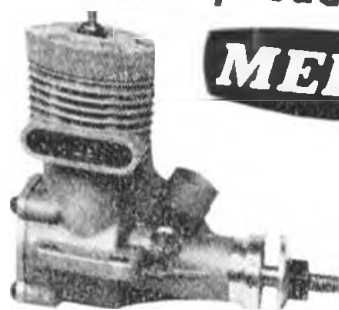
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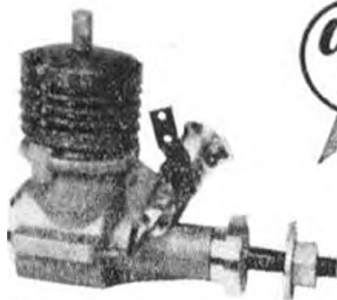
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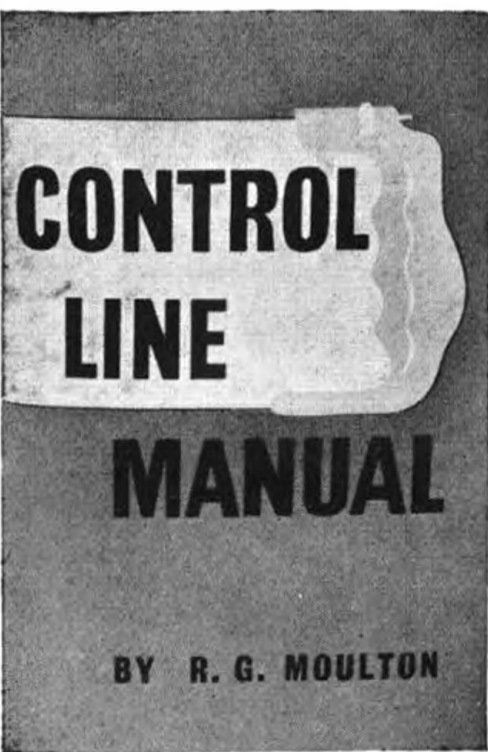
# AEROMODELLER ANNUAL

Here we are again with the enthusiasts' annual treat! Once again we are confident we have assembled a pleasing mixture, from the exciting painting by Laurie Bagley of the Hawker, tactical strike turbojet, P.1127, now bound on as a permanent part of the cover. A fine miscellany of articles includes latest gen on Engine Speed Control; Fanorama — a ducted fan summary; Leaf-type Power Model Undercarriages; Selecting Balsa; Measurement of Rigging Angles; Scale Radio Control; Gliders for Fun; Compass Steering and Similar Devices; Prototypes for Flying Scale Modellers; Watteyne on Model Helicopters; Glider C.G. Location by van Hattum; Laurie Barr on Professional Finish; Covering Materials and Doping. Then there is a wizard collection of model plans from all over the world, including a number of national champions, all dimensioned, and buildable from its pages, covering R.C. power, glider, Wakefield, jet, C/L team racing, stunt, speed, sports and contest power, scale . . .

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developments given, plus the very latest techniques. Here are some of the chapter headings to stimulate your interest: Why Control Line?; Basic U-Control; Basic Monoline; Basic Flight Control; Learning to Fly; Aerobatics; Speed; Team Racing; Combat; Carrier, Cargo and Endurance; Scale Models; Jet; The Engine in Control Line; Towards the Indestructible; Looking after the Lines; Variations on the Theme. Plus aerobatic schedules, speed charts, wire equivalents, etc., in an extensive appendix.

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## Heard at the Hangar Doors

ALL THREE INAUGURAL addresses by the President of the German National Olympic Committee, the President of the Deutscher Aero Club and the Bürgermeister of Leutkirch on the occasion of the 1961 World Championships for free flight models, included the same wish.

Each said that modellers should be there not only for the spirit of competition, but also for the opportunity of making new friends and improving good relationships between the representatives of all 29 nations. "Take back a pleasant remembrance", "enjoy perfect international harmony"—and "at the end there will not be winners and losers; but gainers of friendship with each other". These were three individual expressions, made with all sincerity long before the first event started.

That all hopes of such a spirit of friendly feeling should be handsomely exceeded, is due in no small measure to

the way in which the Academy of Model Aeronautics and the D.Ae.C. conducted the organisation of so large a gathering. The pleasant town of Leutkirch was *en fete* for the week-end and all inhabitants seemed imbued with the wish to play host. Old man Sol beamed from a cloudless sky and staved away the wind gods, so that one could excuse the small confines of the airstrip as flying conditions became almost idyllic, if not downright unbelievable for many of the far travelled visitors.

The interchange of ideas, swapping of hats, badges and accessories with promise of many continued exchanges by post were all part of what is now accepted at these great internationals. Yet there was something "extra" at Leutkirch. One could easily sense that the official speeches had been well and truly realised in their hopes, and this was all the more gratifying at a time when world tension in the political sphere had reached

# AERO MODELLER

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### ON THE COVER . . .

HB-MIC, running up before its final flight in the 1961 Lockheed Aerobatic Trophy at Ragington, Coventry. Flown by Francis Liardon, this Bucker Jungmeister is an annual competitor and always performs extremely well. A flying scale model of the earlier, in-line version appears on pages 582-583 of this issue.



a climax which was centred upon part of Germany itself.

In all our experience of these international gatherings, we cannot ever recall a single political discussion. At Leutkirch there was an exception. Politicians were discussed, and with universal approval from both East and West it was harmoniously agreed that the whole lot of them could well be dropped into nearby Lake Constance for all the good they were doing. It was not only the sporting occasion which provided such universal agreement, this was a real reflection on the feelings of men from all walks of life and from all quarters of the globe. Auckland, Vancouver, Cape Town and Moscow—could one ask for more widely disposed representatives?

If all the politicians were aeromodellers, what a happier world we should have! Perhaps we ought to start a campaign to convert our Members of Parliament to the hobby. They too would have profited by the immense experience of goodwill that all enjoyed on the flying field.

### Models at Farnborough

A lot of display models were on show for the first time at the S.B.A.C. Display, Farnborough this year, representing many midnight hours of effort on the part of Britain's professional model making industry.

But the model which caught our eye and obviously drew most attention from the crowds, was perhaps the most adventurous working display ever made for an aviation show. Produced by Mastermodels, it illustrates a typical operational application of the Avro 748, showing five of these aircraft painted in the liveries of the Airlines who have placed orders for the type. As can be seen in the heading photograph opposite, the aircraft are positioned about an Airways terminal and one of them, in the Company's demonstrating markings, is opposite two telescopic ramps which work.

By means of a tape sequence control which carries the broadcast commentary announced by four speakers in the base, the telescopic ramps operate out to the aircraft, passengers are loaded, the ramps retract, engines start after the ground service vehicles, starter and tanker have

moved back to the hangars and the aircraft taxis out with realistic noise to the take-off point. After a full circuit during which the runway lights and radar scanner operate, the undercarriage is retracted and let down again, the aircraft lands on another runway and taxis back to base.

### Day of the Fighter

The B.B.C. television programme bearing the above title was a combination of many months research into historical archives by Western Region studio and we are sure that it rewarded many thousands of aeromodellers with a galaxy of new and exciting pictures. Films of the Albatros factory; of Von Richthofen and his Fokker Triplane, and other World War I Aces, and air battles were a joy to see for all aviation enthusiasts. The production team must also be congratulated for their original filming of the veteran fighters now preserved in this country and in particular for the flying shots of the Bulldog, Hart, Hurricane and Spitfire. Incidentally much of this filming was made from a Piper Comanche flown by Neville Duke and which proved to be embarrassingly fast for some of the World War II aircraft! We understand that the programme is to be repeated.

### Success at Genk

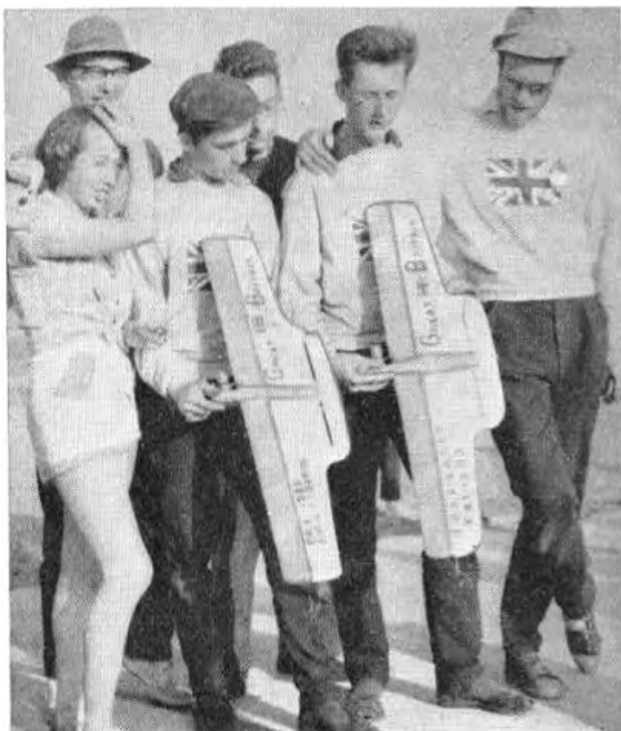
Great Britain first and second! Wish we could say that for all the control line classes at the 1961 *Criterion of Aces* held at Genk in Belgium September 15th-17th; but, anyway, the great effort by Northwood and Kenton clubsters in eclipsing the opposition in Combat is good news indeed. Photograph at left show finalists Peter Tribe and Peter Perry with their Oliver Tiger-powered *Razor Blades* and supporters, including the chief cheer leader and irrepressible Miss Penny Thatcher. A full report appears next month; but for those who are anxious for news, the other events went as follows:

Stunt went to Louis Grondal again, with Fox 35 modified *Nobler*. Most impressive flyer was second man Sirotkin of U.S.S.R. using deep-bellied design and fast running MVVS 35, followed by Herber of Czechoslovakia, similarly powered and two *Nobler* operators Seeger and Kroh of Germany. Frank Warburton's semi-scale *Stampe* impressed as the best looker there, but was at 14th place. Dave Day forgot the reverse wingover on his best flight and failed to qualify for the third flight to A.M.A. pattern by only seven points!

Team race was a sad tale of misfortune. The best Nixon model was cracked up in a practice accident and the reserve had the comp screw fall out. Dick Edmonds had tank trouble after all those years and Ken Long, who by all that is just and right was clearly in line for a second place in the final had wings break on *both* his models! Pilot Les Davy was recalled home to his mother in her last hours, and proxy Dave Balch, who was doing very well with an unfamiliar model brought the new *Tigress* in rather fast to Ken at his pit. Result was Ken stopped the wing but the fuselage wanted to carry on. It was Kjell Rosenlund with *Miss F.A.I.* all the way through heats and final, with 4:47, 4:47 and 4:40 with a borrowed Oliver for a loudly applauded victory. Leloup and Lecuyer were second with 4:55 and 5:06; Azor and Kuhn of Hungary third with 4:50 and 5:15.

In Speed, Monocable first and second with Toth of Hungary at 125.6 m.p.h. and record holder Pech of Czechoslovakia 125.1 m.p.h., followed by Krizsma on two lines with 120.2. Peter Wright was best for Britain at sixth place (113 m.p.h.), George Copeman 14th (109.2 m.p.h.) and Norman Butcher 18th with 106 m.p.h.

Czechoslovakia won the *Criterion* points, and the Belgians deserve every accolade for a magnificent flying site which must surely be the finest in the world.



# SQUADRON MARKINGS

## PART THREE

Described by Leslie A. Rogers

Drawn to 1/72nd scale by  
Ken McDonough

No. 4 Sqdn. Australian Flying Corps. Squadron Marking, when using *Sopwith Camels* was a white Boomerang (carried from December, 1917 to March, 1918) painted on the fuselage sides aft of the cockades and repeated on the top decking—some pointed to Starboard, some to Port. Flight and Individual Markings were:—

"A" Flight used letters A.B.C.D.E.F.G.H.

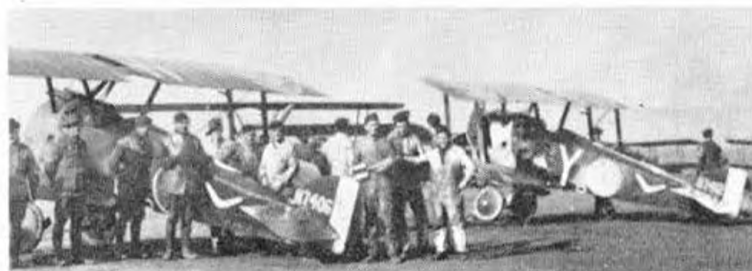
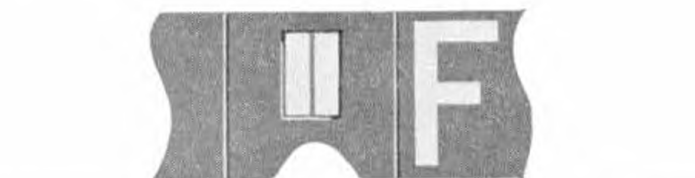
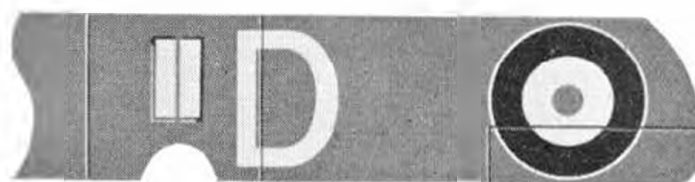
"B" Flight used numbers 1.2.3.4.5.6.7.8.

"C" Flight used letters S.T.U.V.W.X.Y.Z.

These letters/numbers were painted in large white capitals forward of the cockade on the fuselage sides and repeated on the top wing, to starboard of the centre section. It is apparent from these Flight Letters that the Squadron had up to 24 aircraft.

In March, 1918, the Squadron Marking was changed to a white vertical band in front of the cockade on the fuselage sides, this meant that the identification letters were moved to aft of the cockade and it is presumed that the same letters and numbers were still used, certainly there were in the case of "A" Flight. In October, 1918, the *Camels* were exchanged for *Sopwith Snipes*. The same Squadron marking of a vertical bar was used and probably the same letter/numbers.

Below: 4 Sqdn A.F.C. Camel with 2nd marking pattern and Major McCloughrey M.C. At right is part of Sqdn. line-up at Bruay, France in March '18. Imperial War Museum Photos E.2656 and E.1878. Drawings show, at top, Camel of "A" flt, fuselage and wing markings, the "B" and "C" flt. fuselages (wings were as "A" flt.) and a Snipe of Oct/Nov '18. Lowest is a Camel of "A" flt. with 2nd pattern of markings.



November, 1961

## 22 Squadron R.F.C. Bristol F2b

No. 22 Sqdn. R.F.C. This unit went to France on April 1st, 1916 equipped with the *F.E.2b* and carried out the usual mixed duties, including some ground strafing during the battle of the Somme. The squadron carried no Sqdn. marking but Flights were identified by coloured wheel discs. These are believed to be:—

"A" FLIGHT—White. "B" FLIGHT—Blue. "C" FLIGHT—Red.

In July 1917 the Sqdn. was re-equipped with *Bristol Fighters* which it retained until the Armistice.

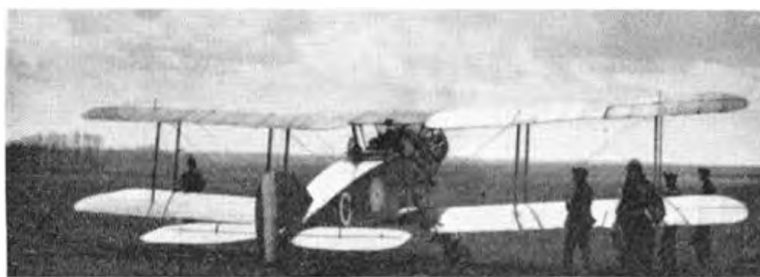
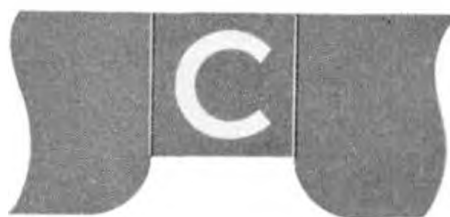
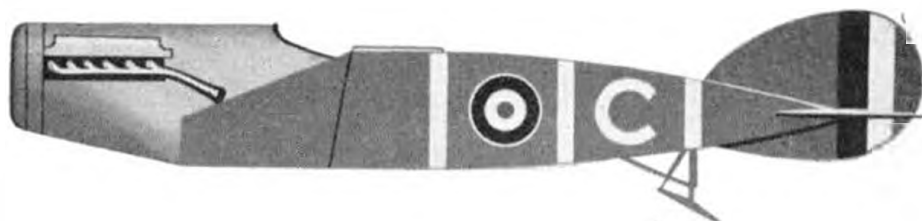
Sqdn. Marking (carried from July 1917 to March 1918) was three vertical white bands on the fuselage sides. One band either side of the cockade, and one in front of the fin.

Individual Identification was by large white letters painted on the fuselage sides between the second and third white bands and repeated centrally on the centre section.

After March 1918, the Sqdn. marking was discontinued by order, but the letters were still used in the same locations.

"A" Flight used A.B.C.D.E.F.  
"B" Flight used G.H.J.K.L.M.  
"C" Flight used N.O.P.Q.R.S.

Drawings show at top, the Sqdn. and individual markings from July '17 to March '18 of 22 Sqdn. Then "B" Flt. Individual markings of March '18 to November '18 and the centre section marking. I.W.M. Photo Q.11997 shows marking on Bristol F.2b Fighter.



No. 1 Sqdn. Canadian Air Force. The undoubted success of the Australian Sqdns. plus the large numbers of Canadian pilots already flying with the R.A.F. prompted Canada to establish its own Air Force.



Maple Leaf insignia of Canadian Squadron Dolphin seen in photograph and 1/72nd scale drawing at right.

ERRATA—In the description of 44 Sqdn. last month, fin serials should have been black on white and the drg. described as a 1½ Strutter, was of a modified night fighting Camel.

About the middle of 1918 steps were taken to establish the first Sqdn. this incidentally was the reason or excuse to bring back to England Lt.-Colonel W. A. Bishop V.C., who had been commanding No. 85 Sqdn. R.A.F. for some months.

The Sqdn. was equipped with *Dolphins* and although the Armistice intervened before going to France, all the aircraft were marked with a large Maple Leaf painted aft of the cockade on which was superimposed the figure "one". Some of the leaves were white with a blue "one" others appear to be a fawn colour with a white trim and a white "one". *Dolphins* on strength included E'4764, F'7076 and F'7085.







**A 36-inch span aerobatic trainer for  
·8 to 1·3 c.c. engines (larger sizes can  
be used by experienced fliers)  
that combines good looks with  
simplicity**

Some idea of the size of the designer's prototype can be gauged from view helper holding model. Light wing loading makes it a fine stunt trainer for calm days.



smooth, and shape as shown on plan to proper cross-section. Do not sand bottom edge until bottom planking is installed.

Cut balsa tail assembly parts, assemble rudder and tailplane and sand to streamline cross-section. Clear-dope and sand again; then bend and fit elevator horn/connector, joining elevators. Attach elevators to tailplane with linen hinges. Bend push-rod, engage in elevator horn, and install tailplane. Be sure to trim away enough of tail reinforcement to allow free movement of controls.

Add the rudder, alinging it carefully. Note that an off-set tab may be used if desired to increase line tension; this is advisable if you plan to fly in high winds. Weight may be added to the outboard wing-tip for the same purpose.

Cut the double wing spar from the straightest, hardest balsa you can find. Coat both pieces with cement and allow to dry; then re-cement and join under pressure (put the assembly under the work-board and sit on it, if you can't think of a better method).

Notch the spar carefully after it is fully dry, allow at least a couple of hours. Be sure not to cut notches too deep or you will weaken the wing. Cut 18,  $\frac{3}{4}$  in. x 6 in. rib blanks, pin together, and shape all ribs as a unit, using a rib template at each end of the stack. Separate, and bore lead-out holes in half the ribs, for left panel. Next, cement all ribs to spar, settling in notches so that both top and bottom surfaces are flush. Add leading-edge reinforcing strip to align ribs; mark positions of ribs on this strip, using actual spar as guide; this will ensure that ribs are parallel. Cut trailing edge strips from hard balsa; add lower strip, and, when dry, bevel to follow line of top of rib. Then add top strip, and trim to knife-edge.

Add leading edge and tips, bend and install leadouts, then add top and bottom leading-edge planking. Cut

slot for front lead-out in centre section. Cut and install cap strips, and plank upper sides of tips. Use a sanding block to shape the entire wing structure to a smooth airfoil shape, as shown on side view. Drill a small hole for the bell-crank mounting bolt, and cut slot for F3 and rear lead-out.

Install the wing now, and cement thoroughly. Slide bulkhead F3 in place from the bottom, and add bell-crank, engaging it with lead-outs and push-rod before installing bolt.

Add fuselage bottom planking and sand to shape. Check over entire structure for rough spots, and touch up as necessary. Extra care at this stage will pay dividends in looks and performance later.

Cover wing with heavyweight Modelspan. For an extra-fine finish, entire model may be covered; this also adds to strength. Water shrink the tissue and allow to dry. Then clear-dope and sand lightly with fine paper. Spray or brush three coats of pigmented dope over entire model. White is recommended, with trim in colours to suit individual taste. Mark position of canopy on top of fuselage, and cut a black paper panel to size and cement in place, then add canopy. Tape off all of canopy and spray to match fuselage. Add transfer numerals, colour trim, etc. Spinner may be painted to match trim. Solder wheels in place, and you are ready for testing.

Try to make your first flights on a calm day, over a smooth surface. Be sure the model balances well forward. Fuel up with about 2 c.c. in the tank for a fifteen second run; this will be long enough to see how the ship handles, and in case of trouble, it's a short flight. Try only modest control movements at first, until you get the feel of the model. Don't try that first loop until you're sure!

Larger engines may be installed in SHARPOON for more zip, after the training phase is over.

Tricycle undercarriage and shoulder wing make Sharpoon a pleasing and worthwhile deviation from the normal run of control line models. Take-offs and landings over prepared surfaces can be really smooth. Lead-out wires may be fitted externally under the wing, entering the fuselage under the wing root if the builder so requires. Original model was coloured white overall with strip transfer decoration.



*Last month we published Chas. Taylor's article on his very successful approach to Class B Team Racing with the Razzamachas. Now we have his partner's contribution, on the subject of fuels for the ideal combination of range and speed. Len Steward is probably the most experienced model engine operator in Great Britain. He has been concerned with the development of Kemp, Amco and A.M. engines over the past thirteen years and his masterly touch in engine fitting is to be found in every product of D. J. Allen Engineering Ltd. Renowned for his extraordinary fast pit stops and common sense approach to team racing, this article reveals how Len has not been content to rest upon the common constituents of alcohol fuels.*

IT HAS BECOME apparent in the past couple of years that interest in Class B Team Racing has been somewhat sagging at the seams. I think that one cause of this is the difficulty experienced by a large number of competitors in obtaining the necessary range of 35 laps to be "in the running". In this direction, I hope the following may be of some help and will foster more keen competition, which is the life-blood of our sport.



We are only just starting to "get our foot in the door" at present on new fuel brews and I think that many new developments will follow. Already we are getting as much as 70 laps in favourable conditions, but unfortunately, hot sunny days are few and far between on contest days this English summer, and consistency at this stage cannot be guaranteed.

Modern Class B fuels fall into two main groups:—

1. The fast 37-40 lap brew for the heats (one stop in five miles).
2. The long-range (48-70 laps) brew for the final (two stops in 10 miles), thus cutting out one stop and helping by eliminating the chance of line-tangles on the ground).

The main ingredient of fuels, until recently, has been Methanol. Unfortunately, nearly twice as much Methanol has to be used in order to provide the work that can be

done by other fuels, e.g., Petrol or Benzene. So it will be seen that one way to get laps is to cut down the Methanol content in favour of something else. Now *what?* 20 Per cent. petrol was first used by John McNess in 1958, with immediate success. This does not work in all motors. Then followed the Hackney Marshians with Iso-propyl Alcohol. This nearly always works. At the same time, Ron Lucas was using Benzene and Xylene. So let us take the ingredients in turn.

*Firstly*, lubrication. Any of the main brands of Castor oil will do. I do not recommend using less than 20 per cent., because with the very lean setting obtainable on the long-range brew, very little oil is getting into the motor.

*Secondly*, power. Nitro-paraffins fill the bill here. Nitro-Methane is the centre of the group, and also the best for our purposes. Nitro-Ethane gives long, cold runs, lacks power, and is erratic. Nitro-Benzene is good in small quantities when used to help large doses of

## Len Steward

reveals all  
the "secrets" for  
success in team  
racing with glowplug  
engines.

## Fuels for Class B team racing

Nitro-Methane to mix, and also, with its pungent smell, to disguise new mixes from the opposition.

Nitro-Methane forms azeotropes with nearly all the chemicals used for burning. An azeotrope is a mixture of two or three liquids having a constant boiling point, so that on distillation the mixture comes over unchanged in composition. A binary azeotrope may boil at a temperature below that of the most volatile component, or above that of the least volatile. Ternary azeotropes usually boil at a lower temperature than any of the three ingredients alone. Also, the composition of an azeotrope depends on atmospheric pressure. It will therefore be seen that some additives can have properties foreign to our use, but still work well when mixed with something else. Some of the additives that I would have liked to try are, unfortunately, right above our price range. One exotic fuel in particular, would have cost £130 to fill a 30 c.c. tank !!!—I didn't use it.



Other chemicals I have tried to obtain are sold only by the kilo, which is rather a lot for experimental purposes. With this in mind, I have drawn up a list of additives, which I think are within reach of the average modeller's pocket.

### Len's exotic additives

First, the three I have already mentioned:—Petrol (100 octane); Benzene (pure crystallisable) and iso Propyl-Alcohol (I.P.A.) not to be confused with India Pale Ale! These will run as "straight" fuels by themselves, mixed with Castor oil . . . lots of laps, but very little power. The rest we have tried are: iso Butyl-Alcohol (which is not as good as its brother, running hot and forming a mass of coke), Pentane, Cyclo-Hexane, Xylene, Furfural, Heptane, Hexane, Methylal, Tetra-hydro-furan, Ethelene-glycol-mono-butyl-ether (and the rest of the cellasolve group), iso-Propyl-nitrate, Benzyl Alcohol, di-iso-propyl-ether, Toluol and Propanol. Many of these are fractions from Petroleum, the best appearing to be Xylene. Up to 40 per cent. can be used, mixing readily and giving a very lean run. Pentane is a good additive, but in smaller quantities than Xylene. 20 Per cent. is a good mix. Hexane does not mix with Methanol, but is useful with Benzene up to 20 per cent. Heptane, also, does not mix in glow fuel, but works as well as others when shaken up and used immediately.

Of the Cellasolve group, Butyl-Cellasolve works the best, although there is very little difference with Methyl Cellasolve. They give cool running and are handy to have by on a very hot day, to be used in place of Nitro-Methane. Tetra-hydro-furan can also be used in place of Nitro-Methane, and is a very good mixer. 10 Per cent. is the most that should be used, as it tends to melt the tops of pistons. Tetra-hydro-furan is handy to use in speed fuels, as it helps to mix the Nitro-Methane, also giving a little extra "zip". Furfural is a good additive, if you can put up with the pong (it smells of burnt marzipan, which gets worse when it has been burned with castor oil, and it carries a long way from the team race circle). Up to 30 per cent. may be used, and it gives a lot of laps, the only drawback being that it is very prone to catching the model alight on pit-stops.

Iso-propyl-Nitrate definitely puts up the revs on a motor, but it is rather hard on bore wear. Benzyl Alcohol is a thick, viscous liquid, and only small amounts are recommended, as when mixed with Castor Oil it becomes very thick indeed, and open needle settings are needed to keep the motor running. However, 15-20 per cent. definitely helps towards a 70 lap brew.

We have used up to 40 per cent. of Propanol, or, to give it its proper name, n-Propyl-Alcohol, with good results. It has a similar effect as I.P.A. Toluol will run as a "straight" fuel, but it is very sooty. It makes a good additive in place of Methanol, and can be used in large amounts very successfully. Benzene will also run "straight", but it is not recommended in large amounts, as it cuts down power, and tends to be a "plug-cruncher".

This depends to a great extent on the peculiarities of the motor, and in some cases Benzene has been known to increase speed considerably.

### Wash after use

By the way, a word about motors. It is not a bit of good trying to run long-range fuels through a motor that is not fully run-in or, at the other extreme, fatigued. A good compression seal is essential, and motors that tend to seize should be avoided like the plague. Also, care should be taken to wash out any residue that may be left in the motor directly after a race, and several drops of thin oil applied to the moving parts.

### Availability

All of the chemicals mentioned in this article are available through chemical supply houses but it should be remembered that orders for small quantities are not usually accepted for economic reasons. Local dispensing chemists may be in a position to provide the individual modeller, but the best method of approach is for modellers to group themselves as purchasers in bulk, or for enterprising model shops to order for re-sale. Naturally, orders in small quantities cost proportionately more because of the handling charge, so there is quite a lot to be gained in bulk supply.

Most of these fuels do not like low compression ratios, and will not run below about 8 or 9 : 1. Some of the fractions from petroleum like it even higher than that, indeed they work better in diesel fuel.

In the heats you should aim at getting the highest amount of Nitro-Methane in the fuel as possible, juggling with the I.P.A. or Benzene to get the laps. I limit myself on race days to one part of this, to one part of that (and very tasty it is too!) I find that if you have to make up fuel quickly, you can get flustered with percentages. So I stick to: one part Oil, one part Methanol, one part Nitro-Methane and one part I.P.A., which is good for 40-42 laps.

If you cannot obtain 35 laps on this fuel, sort out either your tank or the motor before you proceed further. 30 Per cent. Nitro-Methane, 20 per cent. Benzene, 25 per cent. Oil, 25 per cent. Methanol is also a good heat fuel.

For the 10-mile final, I suggest: one part Oil, one part Nitro-Methane, one part Benzyl Alcohol, one part I.P.A. and one part Benzene, with a complete absence of Methanol. This fuel is good for 54-56 laps, but do not forget to have a test flight between the heats and the final, as the needle setting will of course, be leaner.

Finally, here is a good "recipe" to end up on:

One part 4-Nitro-N-Dimethyl-O-Toluidine, add the juice of a bottle of Nitro, salt and pepper to taste, and stew in a slow motor for 99 laps. Always fly in front of the opposition so they have the benefit of your exhaust fumes.

And the best of luck to all our readers!



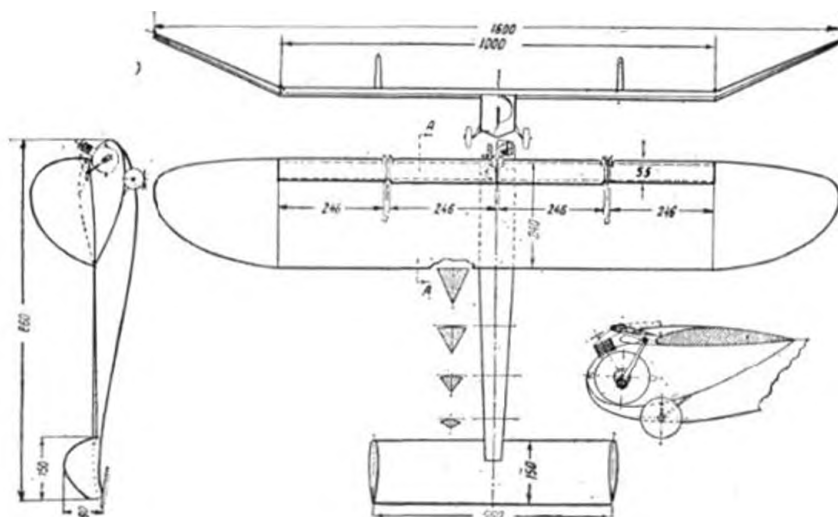
"Oh, I don't mind telling you — take a cup of nitrosomething, 6 tablespoons of castor, stir well and add 1½ tumblers of pure Vodka."



## SCALE MODEL NEWS

ALL THE MODELS in this edition of Model News are Scale types, hence the slightly altered title. Top left is a picture of Mr. H. Randall of Brighton seen with two brilliantly constructed 1/48th scale models. The one he is working on is a Vickers F.B.5, and in the foreground is a model of the Albatros DIII used by Herman Goering in May 1917. Mr. Randall has set himself the task of building models of all the 200 aircraft types which took part in W.W.I. Top right is a 27 ins. span Spitfire Mk XII control line model for the E.D. 2.46 c.c. motor, by R. W. MacDonald, Aberfeldy, Perthshire. As yet unflown, it has a complete lighting system and weighs 20 ozs. Readers will remember the A.P.S. Dornier Do 27 plan No. FSR/794, published in our August edition. Well, no sooner had we closed for press than more pictures of the designer's model arrived, one of which is reproduced here. It really is a pert little rubber model. Next two pictures down the column which come from the Model Engineer Exhibition, are the Vickers Armstrong (Weybridge) Model Club Team Entry winners, to a very high standard compared to many other exhibits. The Vickers Gunbus, in the upper picture has a Mills 1.3 cleverly disguised as the lower centre "pot" on the pusher Monosoupape engine, turned to fractional thickness from aluminium for weight saving. This model, by N. Barker of Surbiton, weighs 30 ozs. was made from Vickers original prints. It has spoked wheels and spans 42 ins. The Vickers Viny Commercial, in the lower picture is a non-flier as the weight crept up on builder M. A. Sheppard, Sandown, I.O.W. to make it exceed limits. To 1/12th scale (72 ins.), weighing 5 lbs., it has a furnished cabin, and took almost 1000 hours to construct. The two pictures at the base of the column will be of special interest to "plastics" fans. Built by Frank Normillo of Duarte, California, U.S.A. the Skyray is from a Lindberg Kit and the ME.109E is an Aurora model. Just shows what one can do with plastics!





## RUSSIAN ORNITHOPTERS

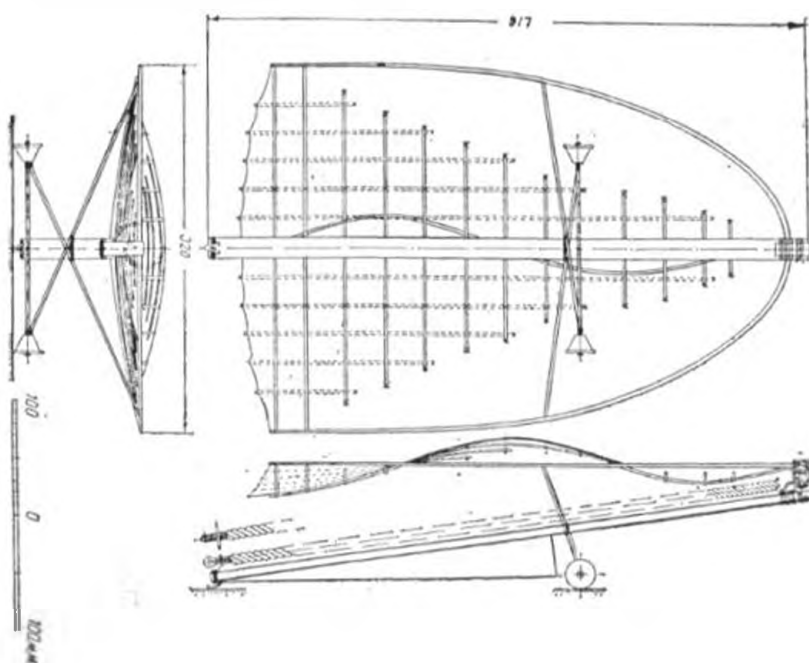
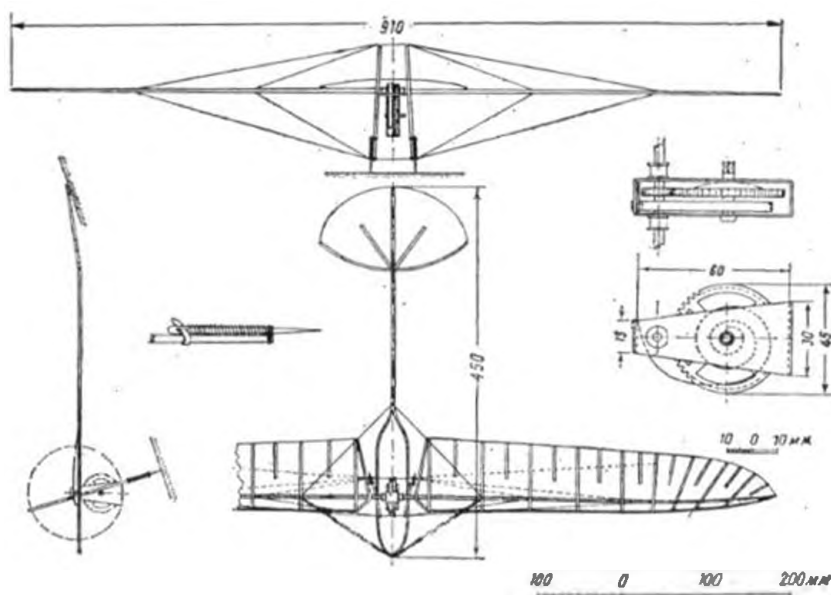
3 of many in a  
new Soviet book

A REMARKABLE Russian book entitled "Models with Swinging Wings" by H. Vaselev gives a wide variety of experimental layouts, from which we choose three examples.

Drawing No. 1 shows a machine fairly orthodox in outline, but using a diesel driven oscillating slat on the wing leading edge linked via horn and connecting rod to a flywheel.

Drawing No. 2 shows a true ornithopter with flapping wings. The mechanism in the centre of the frame is a clockwork motor, the spring of which is anchored to the shaft/spar running through the centre and out to each wing tip. The clockwork motor is wound and when released rotates about its anchored spring as an eccentric bob-weight causing the nose of the model to oscillate, up and down, with consequent ornithopter reaction at the wing tips.

Drawing No. 3 shows a rubber



powered machine having a non-rigid flying surface, with a stiff, perhaps bamboo circumference and paper covering. Spacers span this "wing", and a flexible wire cable is laced through the spacers down the "wing" from leading to trailing edge curving as one turn of a very elongated corkscrew. (A study of the drawing, particularly the front elevation, will provide a better understanding of this). The cable and the rubber motor are connected through gears rotating the cable. The effect of this is to cause waves down the wing in the same manner as when a large sheet of paper is shaken, and this is used for propulsion.

There is no reason to disbelieve Soviet claims that these machines have flown. The birds have been doing it for millions of years and they cannot all be wrong! Perhaps in a couple of years these models will be ratified by the F.A.I. as a competition class!



**In-line engine version  
of the plane on the cover !**

An easy to build 26 $\frac{3}{4}$  inch  
free flight scale model for .5-.8 c.c.  
described by W. Lister,  
flight tested by W. Newman.

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struts and cover with 1/32 in. sheet. Shape the undercarriage and bind to the lower wing C/S. Sheet this also with 1/32 in. balsa and cement to the fuselage, fairing with 1/32 in. sheet. Lay down the leading and trailing edges and spars of the outer wing panels add ribs and tips and finish. When set, remove from the plan and bind in the locating wire dowels, bending for a sweepback and dihedral angle and the interplane strut fixtures.

## Bucker Jungmeister

DESIGNED IN 1935 as an advanced aerobatic trainer, the Bucker Jungmeister is considered among the world's top aerobatic pilots to be one of the finest aerobatic mounts available. One look at the trim lines of the little Jungmeister, brands it as a machine just asking to be modelled, and what a corker for scale it is. Our prototype, designed by W. Lister was flight proven by Bill Newman who added several practical features to aid and simplify construction.

Start construction by cutting out the basic fuselage sides. Set these out upside down over the plan and fit the cross pieces. Cement in position the formers from the cabin forward and then from the cabin back to the stern post. Secure the bearers and 1/16 in. ply C4's. Shape the cabane struts and bind to the bearers. At this point the pendulum should be fitted and cabin detail added if required. Stringer the fuselage and plank as shown to the rear of the cockpit. Cut two C3's from  $\frac{1}{4}$  in. sheet and cement to engine bearers. Carve the nose block, hollow out to suit motor and bearers and part into two pieces across the thrust line of the cowl. Cement the lower half to the bearers with C1, then add C2 followed by C5, the cowl underside. Spot cement the top of the noseblock in place and then carve the top cowl block to shape, removing both (now as one) and hollow out. Wrap round the 1 mm. ply cowl sides cementing to C1, C2, C3 and C5, and the rear cowl fairing round the lower part of the fuselage.

Build the wing centre sections top and bottom, laying down leading and trailing edge and spars and adding ribs. When set, remove from the plan and bind in the metal tubes. Bind the upper C/S to the cabane

Cut the fin and rudder outline from  $\frac{1}{4}$  in. sheet cementing together over the plan, packing up 1/16 in. Pin in position the  $\frac{1}{4}$  in. x  $\frac{1}{4}$  in. spars and cement the 1/16 in. x  $\frac{1}{4}$  in. rib blanks in place. When set, remove the fin and rudder from the board. Fit the pendulum rudder horn and tape the two components together. Sand the



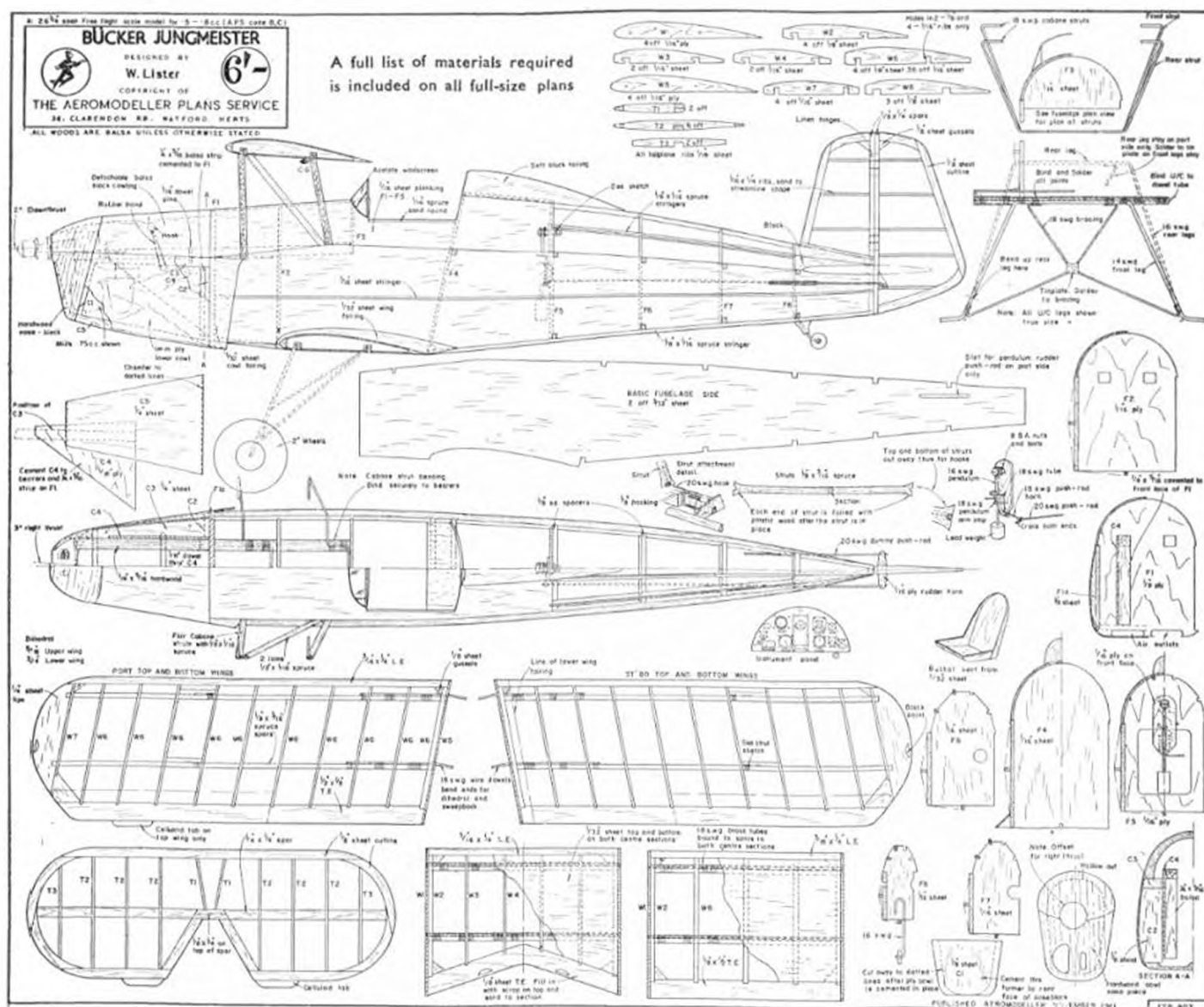


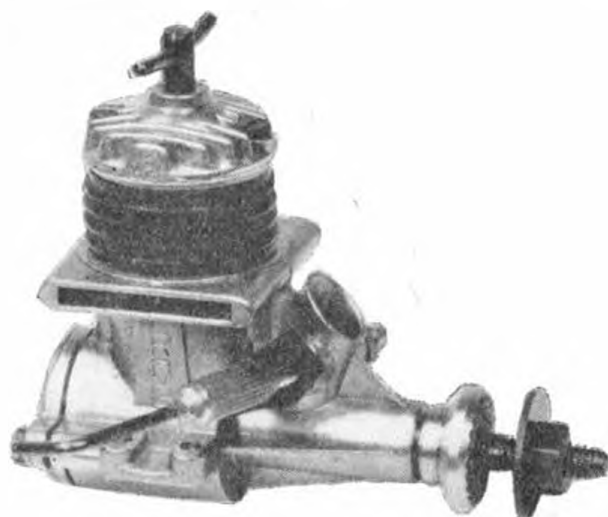
unit to section. Repeat for tailplane laying down the outline on 1/16 in. packing. Lay down the  $\frac{1}{8}$  in. x  $\frac{1}{2}$  in. spar flat on the plan and add the rib blanks. Remove from the plan and sand to shape. Carve and shape the stern block, cutting away the underpart to accommodate the tailplane, (slightly exaggerated to allow variation of tailplane incidence for trim and cement in position over tailplane. Add fin. Sand the whole model and cover with heavyweight tissue. Add the cockpit fairing and other external details. Give two coats of clear dope and finish. The prototype was finished silver overall with red fin and black markings. Those who require a very finely detailed model, besides a proven flyable design should refer to the article on the Bucker Jungmeister in



our famous Biplanes series, published in our October 1958 edition, reprints of which are available together with 1/48th and 1/36th scale drawings, price 2s. 6d.

FULL SIZE COPIES OF THIS 1/5th SCALE REPRODUCTION ARE AVAILABLE AS PLAN FSP 807. PRICE 6/6 PLUS 6d. FROM PLANS SERVICE





THE FROG "80" diesel, designed as a sports engine with easy handling characteristics, first appeared in late 1956 and has continued unaltered until the beginning of 1961. The Mark II version which now takes its place is essentially the same engine but utilising the Frog "049" cylinder and a lapped contra piston. The Mark II, however, retains the flat topped piston of the original "80" so that the timing is somewhat altered when applied to the "049" porting, giving earlier opening and later closing. The result is a noticeable improvement in performance over the Mark I version—and also in noise, due to the earlier opening of the exhaust! The original "80" showed a peak B.H.P. figure of .057 B.H.P. but again at the same speed. Higher speed performance is also improved and .05 B.H.P. is reached at 8,000 r.p.m. and maintained up to 14,000.

It is quite possible that these figures could be exceeded by individual engines which have been carefully run in. The engine used for test was, literally, picked off the shelf and given only a few minutes running time to free up, using a running-in compound injected through the intake. Test figures were taken when the "80" held a steady speed on a 6 x 4 propeller. At the end of about one hour's running it still checked out at the same

## ENGINE ANALYSIS

No. 89 by R. Warring

# FROG 80

Mark II Diesel

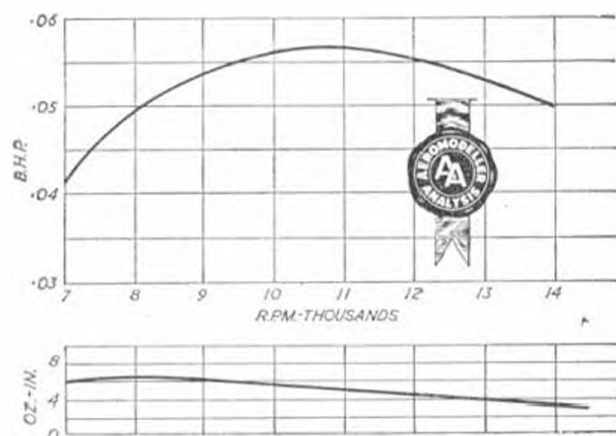
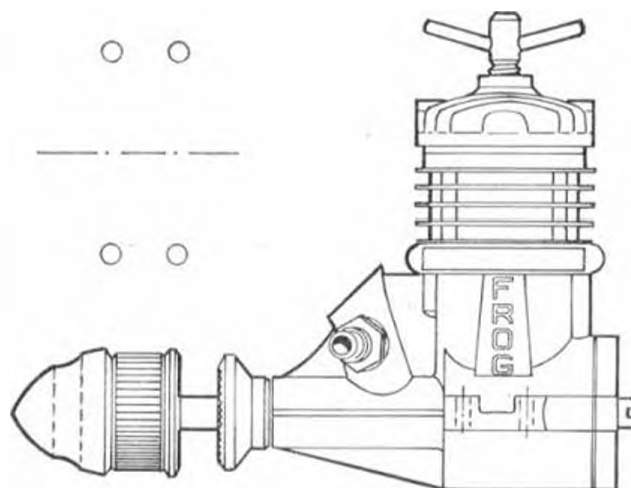


figure on the original propeller used. More carefully treated, the peak r.p.m. figure may well show at a higher level, especially as the test engine showed only very little drop over the speed range 11,000 to 14,000 r.p.m.

The original Frog "80", of course was the only diesel to remain in production with an O-ring seal for the contra-piston. In fact, the only other small production engine to use such a scheme was the McCoy 049 diesel, which had a comparatively short life. The O-ring did its job as a seal but resulted in a quite different "feel" to the contra piston, which many people found strange and difficult to get used to. The advantage of the O-ring seal was that it saved on production cost.

The "80" Mark II reverts to a conventional contra piston but which is lapped to finish, this being found to give an entirely satisfactory seal and performance. A nylon friction lock in the form of an insert on the underside at the head "stiffens" the action of the compression screw and provides a positive hold at all settings without making the compression screw difficult to adjust. This is an idea which Frog introduced on their larger diesels with considerable success and seems very sound practice.

## SPECIFICATION

Displacement: .80 c.c.  
(.049 cu. in.)  
Bore: .400 in.  
Stroke: .392 in.  
Bore/Stroke ratio: 1.02  
Bare weight: 1.9 ounces  
Max. Power: .057 B.H.P.  
at 11,000 r.p.m.  
Max. Torque: 5.25  
ounce-inches at  
8,200 r.p.m.  
Power rating: .071  
B.H.P. per c.c.  
Power/Weight ratio:  
.03 B.H.P. per ounce.

**Material Specification:**  
Crankcase: light alloy pressure die-casting incorporating stub exhausts  
Cylinder: leaded steel  
Piston: cast iron  
Contra piston: mild steel  
Connecting rod: light alloy forging  
Crankshaft: hardened steel—3BA propeller shaft thread  
Main bearing: plain  
Cylinder head: light alloy die casting  
Spraybar: brass (ratchet spring lock)  
**Manufacturers:**  
International Model Aircraft Ltd.  
Retail Price: 42s. 9d. inc. P.T. and Surchage P.T.

## PROPELLER—R.P.M. FIGURES

dia x pitch	r.p.m.
6 x 4 Frog nylon	13,400
7 x 4 Frog nylon	9,300
8 x 4 Frog nylon	6,500
6 x 4 K-K nylon	11,400
6 x 3 K-K nylon	13,800
5½ x 4 K-K nylon	14,000
7 x 4 K-K nylon	9,500
6 x 3 Top Flite nylon	14,200
6 x 4 Top Flite nylon	12,700
6 x 4 D-C nylon	14,500

Fuel used: new Frog "Powamix" diesel fuel.

The new cylinder "borrowed" from the Frog "049" hardly alters the appearance of the Mark II at all except for the number of fins. The original cylinder was also machined from steel with integral fins and a separate die-cast head. The Mark II simply used the later 049 cylinder with the same head as before (apart from the nylon inset). Porting is, of course, different, the 049 cylinder having a pair of upward-angled drilled transfer parts (one each side) emerging in the substantial pillars between the exhaust ports and overlapping the exhaust opening. Timing is affected accordingly. The original crankcase and crankshaft remain unaltered (and, of course, are also used on the Frog "049" glow motor).

The "80" Mark II appears just about viceless—easy to start, non-critical in adjustment and running consistently at all load speeds. It is perhaps not quite as happy running at very low speeds as the earlier versions—e.g. on large diameter propellers pulling the r.p.m. figure down below 7-8,000—but on the other hand it seems to have more to give and runs sweeter at very high speeds.

About the only "fault" which can develop is a slackening of the screws holding the head and cylinder in place. Should this occur it gives rise to difficult starting and inconsistent running at the higher speeds. We found the engine would still start with a loose head, but lost r.p.m. when running. If starting does appear difficult, or there is a marked loss of power when running, loose head screws are almost certainly the cause. The design is too well behaved to cause trouble otherwise.

All tests were carried out with the new Frog diesel fuel which now incorporates a small proportion of Shell two-stroke mixing oil, dyed blue for identification purposes and giving a characteristic colour to the fuel. The addition of this mixing oil appears to have a most beneficial effect on the castor content in that it prevents it from going gummy and even old fuel left on or in the engine does not go gummy as it dries out as is usually the case with conventional castor-base fuels.

With the considerable range of smaller sizes of moulded nylon propellers now readily available the Frog "80" owner has a considerable choice. The 7 x 4 would appear a good free flight choice, although perhaps not letting the engine develop peak r.p.m. in the air. The 8 x 4 size is a little too large, although it develops a lot of static thrust; and the 6 x 4 rather too small. A 6 x 5 would probably be a good control line size.

# APPROACHING MACH 1

## DATA ON PROP TIP SPEEDS

WE KNOW THAT 15-16,000 is fast—and 20,000 r.p.m. very fast but these are figures within the operating range of many modern engines. Have you ever stopped to calculate what this means in terms of *propeller tip speed*?

Here is a table which gives the tip speed for a range of propellers from 6 inch to 12 inch diameter at speeds of 6,000 to 20,000 r.p.m. Is your engine turning a 10 inch diameter prop. at 14,000 r.p.m.? That makes the tip speed of the propeller a mere 416.5 m.p.h.! We say "mere" because, within the possible model range, propeller tip speeds can approach Mach I as the higher figures in the table show.

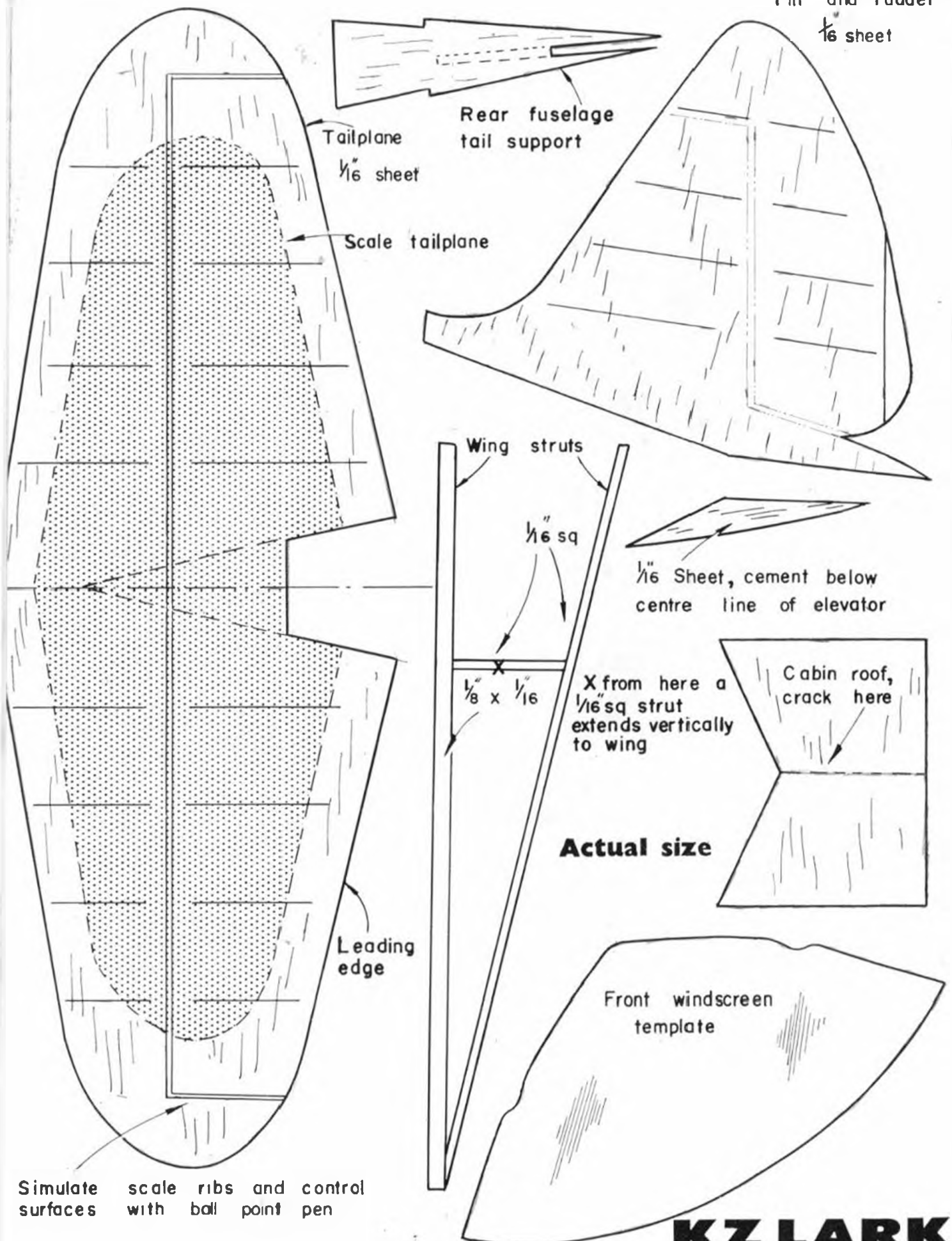
How does this affect propeller performance? It is almost impossible to hazard a guess. Compressibility effects start making themselves felt at 300-400 m.p.h., which should mean that at such speeds a certain loss of performance is likely. But full size propellers approach (and some exceed) sonic velocity and still retain high efficiency. In any case, for maximum performance from any given engine, the r.p.m. figure is governed by the peak r.p.m. figure of the engine concerned, so you cannot juggle with diameter sizes to "adjust" the propeller tip speed. And for any given r.p.m., tip speed *increases* with increasing diameter. Since we know that larger diameter sizes are usually more efficient in model sizes this could mean that compressibility effects are negligible within the usual model range, despite the high tip speeds that can be realised.

## TIP SPEED — M.P.H.

r.p.m.	PROPELLER DIAMETER—INCHES						
	6	7	8	9	10	11	12
6,000	107.1	124.9	124.8	160.6	178.5	196.4	214.2
8,000	142.8	166.5	190.4	214.1	238.0	261.9	285.6
10,000	178.5	208.1	238.0	267.6	297.5	327.4	357.0
12,000	214.2	249.8	285.6	321.2	357.0	392.8	424.4
14,000	249.9	291.4	333.2	374.7	416.5	458.3	495.8
16,000	285.6	333.0	380.8	428.2	476.0	523.8	571.2
18,000	321.3	374.7	428.4	481.8	535.5	589.4	642.6
20,000	357.0	416.0	476.0	535.2	595.0	654.8	714.0



"So this is what they mean by "breaking-in" an engine!"





November, 1961

*Build yourself a  
19½ inch span, rubber  
driven flying scale  
model of the Danish*



# KZ Lark

designed by J. A. Fleming

THIS 19½-INCH SPAN model was built to provide information for the design of a ½th scale diesel-powered version and with a larger than scale tailplane flies quite well.

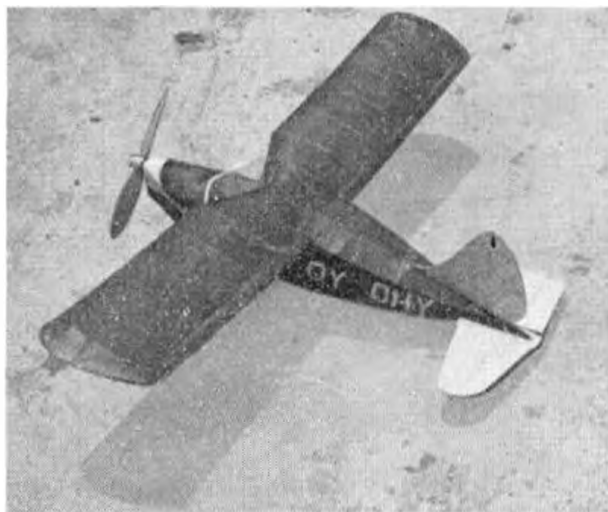
The original KZ III Lark was produced in Denmark in 1947 and has generally better lines than the majority of modern light aircraft. It was described in *AERO-MODELLER* for November, 1952, which contained a 1/72nd scale drawing. The following details will be of interest. Spanning 31 feet 6 inches it is 21 feet 7 inches long and cruises at 106 m.p.h. Full load take off run of this two-seater is 77 yards with a landing run of 55 yards.

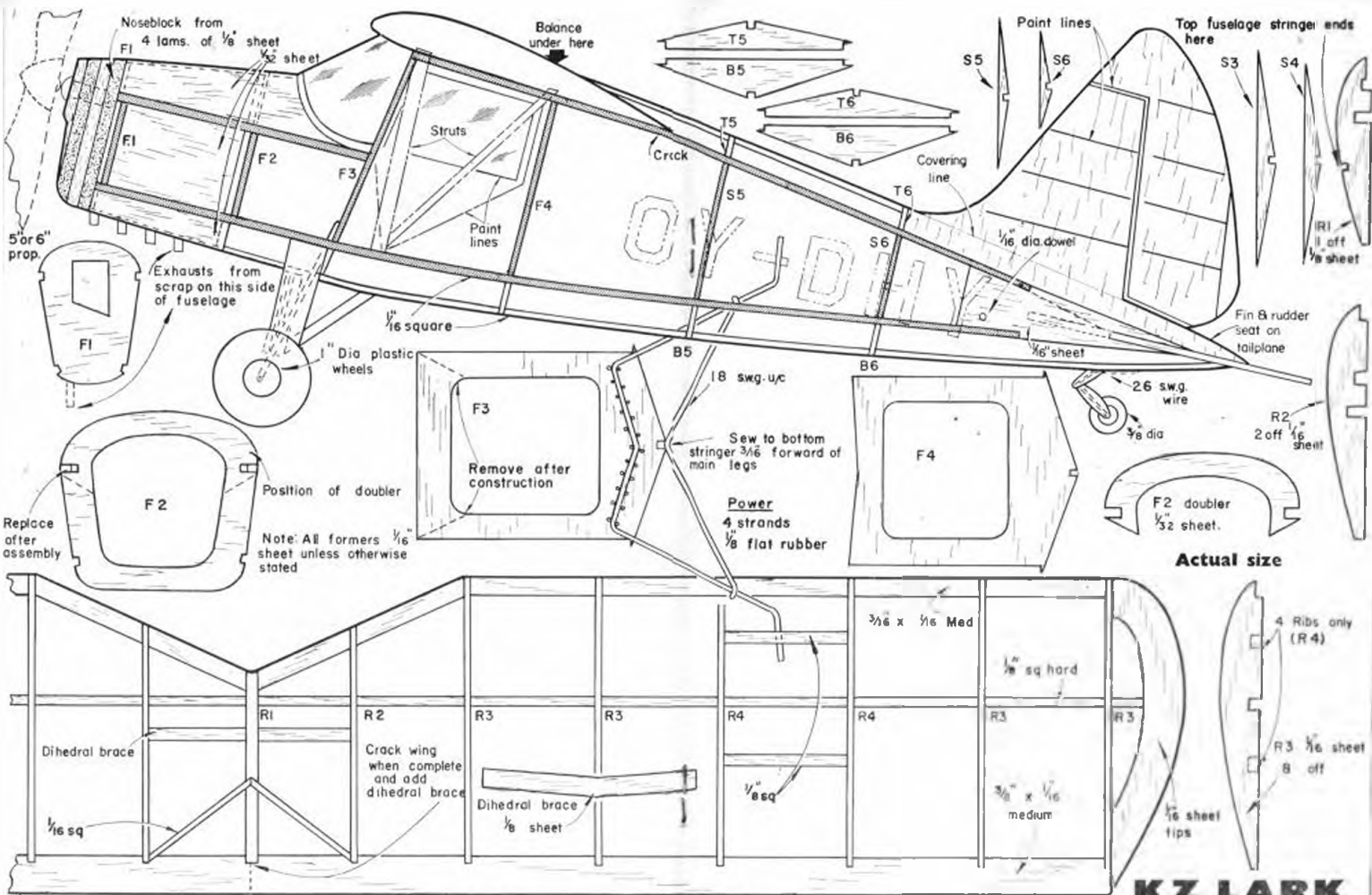
Now for the model. All parts are from 1/16 inch balsa with the exception of the 1/32-inch sheet nose covering and laminated balsa nose. Fuselage sides are built first (outlined in tint on the plan) from hard 1/16-inch square. Note the integral mount for the tailplane and rear motor peg. While both sides dry, the fin and rudder and tailplane are cut out and the wing commenced. Wing trailing edge is one strip of ¼ x 1/16-inch and the main-spar a strip of ¼-inch square. Pin these and the ⅜ x ¼-inch leading edges in place and add ribs and wing tips. When dry, remove from the plan and add ¼-inch spacers for the wing struts, crack along the centre line and add the dihedral brace. Note the diagonal strips of 1/16-inch square between ribs R2 and R1. Cover with coloured tissue of your choice, waterspray and dope before adding to the fuselage.

Now remove fuselage sides from the plan and the only difficult part in the construction will be the sharp curve in the sides from F3 to F1. Steam from a kettle will assist here. Only four formers are necessary, with fairings for the top, bottom and sides. Ensure that F3 to which the 18 S.W.G. undercarriage is sewn, is of hard balsa. The dotted lines on F3 are cut away when the fuselage is complete. With F3 and F4 in place, add the cabin roof and the remaining top, bottom and side formers. Now cut away the dotted line on F3 and cement in place the tailplane, fin and rudder. Cement the wing in place and add 1/16-inch square fuselage stringers. The top fuselage stringer ends at the point on R1 where diagonals join. Side stringers are faired at the front into the basic fuselage side and at the rear end at the leading edge of the tailplane. The space between formers F1 and F2 is covered with 1/32-inch sheet and on the upper fuselage this extends back as far as F3 before being trimmed as shown on the side view. Drill a hole for the nose plug in the hard balsa nose block accurately. A 5-inch diameter propeller gives a reasonable flight though a 6-inch propeller is recommended. Sew the secondary undercarriage leg to the lower fuselage stringer. Scale-type legs are simulated by thin card, on the main legs ¼-inch wide, on the secondary (centre) legs 3/16-inch wide, while the rear legs are ¼ x 1/16-inch strips sanded to aerofoil shape.

Use the front windscreen template as a guide before cementing the celluloid in place and with the side windows in place, the fuselage is ready for covering. Waterspray and use only one coat of dope—do not use coloured dope. Two give the final touch to the model, add dummy exhausts and ink in with Indian ink the control surfaces and cabin door. Registration letters are cut from black tissue and doped in position. Finally, add the wing struts, but do not cement the nose block in place until the required amount of downthrust and sidethrust has been decided from the first test flights.

Balance the model where shown, adding ballast at the nose or tail as necessary and test glide. Trim with the four strands of ¼-inch rubber installed, but do not wind the motor until a stall-free glide is obtained. Now insert temporary packing behind the top of the noseblock to prevent nosing-up under power, also slight right side thrust and you are ready to pile on the winds. Remember that small models like this perform best in near-calm conditions and—*Happy Flights!*





**KZ LARK**

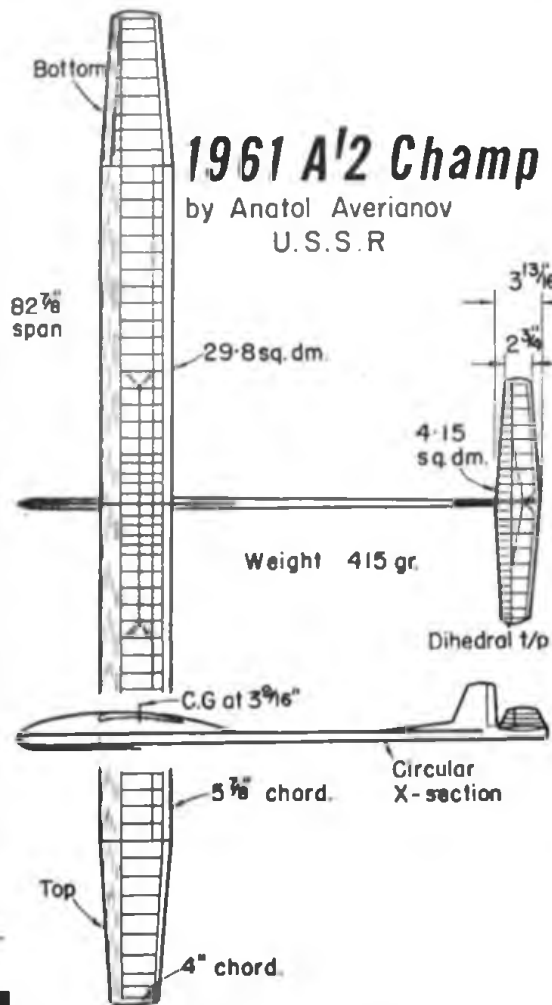


### A/2 Team results

1. Netherlands	2498
2. Czechoslovakia	2459
3. Italy	2420
4. Finland	2300
5. U.S.A.	2251
6. France	2235
7. U.S.S.R.	2232
8. G.B.	2185
9. New Zealand	2168
10. Sweden	2144

11. Germany	2136
12. Austria	2110
13. Denmark	1929
14. Norway	1927
15. Poland	1905
16. Yugoslavia	1829
17. Portugal	1804
18. Switzerland	1773
19. Belgium	1656
20. Canada	1654
21. Luxemburg	1500
22. Spain	1465

Victorious Dutch A/2 team, T. Van't Rood, P. Teunisse and J. Schulten with managers Jan Smolders and Jan Asselbergs seated. At right is the winning design, a high aspect variant of the well known Sokolov layout with wing on a dural spine.



# Triple World Champs

Leutkirch, Aug. 31—Sept. 4

SITUATED ABOUT 90 miles S. West of Munich in delightfully scenic wooded country, the private airstrip at Leutkirch might well have offered less happy results had the poor German summer not been arrested by a magnificent spell of high pressure conditions. Prevailing winds up and down the valley were so slight and at times indeterminate (we saw two A/2 flyers towing on directly opposite headings), and temperatures soared into the 90's with the result that practically every one of the almost one thousand official flights terminated safely in the surrounding farmland.

Farmland should be the operative word, for the airstrip was only employed as a base for official headquarters and tents. Ploughed land is too thermal-prone not to be ignored if it happens to be so close to hand, and it was among the fields of potato, beet, lucerne and cornstalk that this major event in the F.A.I. programme was enacted. By the end of three days, those farm fields were flattened.

The British team travelled by PanAm 707 out of London via Frankfurt to Munich on a trip which inspired confidence in the more conventional means of lateral control to which we are accustomed (and enjoyed on the returning Viscount); but which was nevertheless an experience to be cherished even if we did swelter for 30 minutes at over 100 deg. F. on the ground at Frankfurt, and had an emergency exit cover explode off into the cabin. Late arrival on the eve of the A/2 contest, and the subsequent discovery that the model boxes must have suffered even greater temperatures than their owners at Frankfurt, gave cause for slight concern, as rubber motors and wings were affected.

Processing by scale and camera was gratifyingly speedy, and, we hope, accurate. Each model had its span and other pertinent points registered, then was photographed on 35 mm. film on direct plan by long focus lens. Enlargement on to squared paper from the

negative would offer a theoretical projected view for quick check. Another example of thoughtful preparation was the most commendable feature of the whole meeting, and one which dates back to that original Power Champs nine years ago at Dubendorf. This was the provision of two permanent time-keepers for each team.

The system should be adopted for all future events, for coupled with the freedom of the Manager in placing his three flights at any time during the 90-minute round, the immediate availability of a time-keeper at a moment when thermal activity is evident is an asset that should be provided for all teams, and not restricted to those who happen to call for a timekeeper at the right moment (or who hold on to pooled 'keepers to the disadvantage of others).

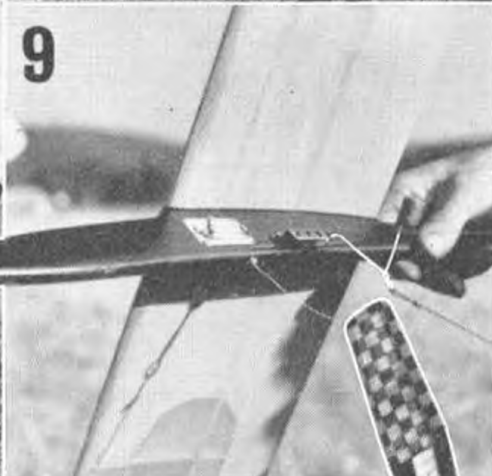
The system has the disadvantage of requiring a larger staff and creating a garden party atmosphere on the field as one can take the 'keepers where one wants. Both drawbacks could be overcome with good organisation, and restriction of spectator access would have given this Leutkirch meeting a more "Championship" aspect if perhaps at some sacrifice of the admirable *entente cordiale* which was the keynote of all three days, with one exception. This was at the newly-introduced line tension test, commonly referred to as the "Line twangery". Heavy nylon, perlon, twine or wire — all bust in the confusion of the 11-lb. pull, and an exciting new set of words were ready to be noted by any student of blasphemy in all languages.

### GLIDER

As we approached the field from our Gasthaus, six miles out of town (teams were widely dispersed in neighbouring villages) the smoke from a downwind quarry hung right along the valley, and over the field at 500 ft. in perfect demonstration of an inversion.

Naturally, no one was anxious to start until the heat of the sun became stronger; but when the Czech, Michal Hlubocky, broke the wait with a beautiful tow that earned him a max, everyone was ready to take the air. Without wind it was a battle for the unaccustomed and Erik Berg was one of several who just slowed up to look back at the model only to see it flop off the line. Made for Danish winds, his type of rig needed a fast tow and the same applied, of course, to our British models. Geoff Dallimer thanked his movable towhook which was pushed to its extreme aft position and he was fortunate enough to hook a riser as soon as the model reached full height. Graham Freeston had his model veer off on

Opposite: 1. Far travelled Pete Visser from Cape Town with his A/2 pair with bright orange finish. 2. Slimmest-ever fuselage on Len Lortz's model is a fishing rod, with brass knob weight at nose. Was well in running until hasty 5th flight. 3. Finalist Paulo Soave with unique egg-box ribbed wing, carved from the rectangular to section by sandpaper on plate glass. 4. Gunnar Kalen favours sheeted wings, was third. 5. Triangular surface turbulators on Teunisse's 11th place model, across centre panels. 6. Klaus Leiszner about to release Bill Cook's N.Z. model proxied by M. Schmidt. 7. Gunther Maibaum flew for N.Z.'s John Malkin with Fritz Pote helping. 8. High aspect surfaces evident on Van't Rood's 4th placer, helper Van Dijk of power team holds model. 9. France's R. Guilloteau had novel bob-weight replacing tow-ring, hooked in variable slots, whole model seen with bird in 10, placed tenth. 10. Otmar and Herwig Schnurer from Austria were 11th and 15th with contrasting models. 12. Anatol Averianov, a deserving winner with a genuine 2:51 model. 13. Lady competitor, Mrs. Betty Bell from Texas, flew a rough weather design, is more used to windy flying, earned herself a special prize.





## A/2 results

1. A. Averijanov	U.S.S.R.	180	180	180	180	180	900
							+171
2. P. Soave	Italy	180	180	180	180	180	900
							+159
3. G. Kalen	Sweden	180	180	180	180	180	900
							+147
4. T. Van't Rood	Netherlands	180	180	180	180	180	900
							+131
5. A. Rodrigues	Portugal	180	180	180	162	180	882
6. J. Michalek	Czechoslovakia	180	180	147	180	180	867
7. M. Hlubocky	Czechoslovakia	180	180	180	180	135	855
8. J. Daley (jun.)	U.S.A.	180	180	123	180	178	841
9. L. Lortz	U.S.A.	180	180	180	180	102	822
10. R. Gouloreau	France	98	180	180	180	180	818
11. T. Strang	Finland	180	89	180	180	180	809
11. P. Teunisse	Netherlands	180	110	180	180	159	809
11. O. Schnurer	Austria	180	180	180	180	89	809
12. G. W. Dallimer	G.B.	180	180	87	180	180	807
12. A. G. Freeston	G.B.	154	164	180	180	129	807
13. K. Gunther	Germany	124	180	180	180	142	806
14. A. Sulisz	Poland	81	180	180	180	180	801
15. H. Schnurer	Austria	180	180	136	119	180	795
16. J. Schulten	Netherlands	152	123	154	80	180	789
17. A. Boncompagni	Italy	180	180	156	128	137	781
18. A. Skard	Norway	151	180	180	105	150	766
19. M. Pyykko	Finland	180	180	141	132	127	760
20. R. Borrás	France	115	180	180	180	96	751
21. W. Cook	New Zealand						
Proxy: M. Schmidt	Germany	106	180	180	180	103	749
22. C. Boscurol	Italy	152	180	180	78	149	739
23. I. Spejzl	Czechoslovakia	180	64	180	180	132	736
24. S. Takko	Finland	68	180	170	171	142	731
25. G. Simon	Hungary	180	93	135	130	180	718
26. McGarvey	New Zealand						
Proxy: G. Roemer	Germany	82	180	180	177	96	715
27. J. Malkin	New Zealand						
Proxy: G. Mailbaum	Germany	180	54	180	180	110	704
28. E. Berg	Denmark	80	90	164	180	180	694
29. A. Semskij	U.S.S.R.	76	180	180	124	130	690
30. A. Hermann	Germany	139	180	180	112	77	688
31. H. Michel	Switzerland	97	180	180	180	49	686
31. J. McGillivray	Canada	101	180	180	91	134	686
32. I. Sares	Sweden	64	180	113	180	148	685
33. F. Fernandez	Spain	119	180	180	121	79	679
34. V. Miroslav	Yugoslavia	71	180	180	180	64	675
35. T. Borthne	Norway	180	91	55	180	168	674
36. R. Leduc	Belgium	156	180	180	75	80	671
37. G. Giudici	France	180	95	180	76	135	666
38. A. Hansen	Denmark	180	55	56	180	180	651
39. J. Glod	Luxembourg	180	149	35	180	103	647
40. A. Mederer	Germany	78	108	119	180	157	642
40. J. Nestratow	U.S.S.R.	131	74	118	180	139	642
41. S. Babic	Yugoslavia	106	65	76	180	171	598
41. P. W. Visser	South Africa	178	61	149	139	71	598
42. Mrs. E. Bell	U.S.A.	180	44	180	71	113	588
43. A. Hertig	Switzerland	97	65	63	180	180	585
44. B. Hansen	Denmark	180	82	180	52	89	584
45. G. Fitzpatrick	Ireland	83	180	65	180	68	576
46. St. Rozycki	Poland	81	52	173	180	87	573
47. B. L. Halford	G.B.	87	80	83	180	141	571
48. M. Sousa	Portugal	76	77	180	147	82	562
49. J. Benedikt	Poland	92	92	109	117	151	561
50. B. O. Modeer	Sweden	91	83	180	173	32	559
51. P. Stevo	Yugoslavia	67	77	113	180	119	556
52. R. De Graef	Belgium	82	83	80	180	90	515
53. H. Kargl	Austria	80	53	180	58	135	506
54. Ch. Bachmann	Switzerland	41	102	180	75	104	502
55. D. Mackenzie	Canada	115	49	49	180	97	490
56. R. Hassrod	Norway	180	59	69	44	135	487
57. B. Price	Canada	180	56	47	80	115	478
58. J. Guffens	Belgium	57	99	103	99	112	470
59. L. Pando	Spain	180	61	29	75	107	452
60. J. M. Leick	Luxembourg	78	74	119	28	143	442
61. F. Kraemer	Luxembourg	133	32	43	92	111	411
62. A. Sereno	Portugal	92	58	76	72	62	360
63. S. Gonzalez	Spain	70	27	92	63	82	334

the line but held something from moderate height for 2:34 and Brian Halford was on the edge of lift for 1:27. If our team had towing problems, then Stefan Rozycki of Poland had worse, for he managed to pull a wing right over the ply tongue even in zero wind! It was the only glider to break in the entire meeting.

No less than 28 of the 63 entries found lift for a max in this first round, giving the Czech and U.S. teams a full score each, including a really lucky one for Mrs. Betty Bell from Texas who had the timer trip hang up on the model for it to drag down low and in front of her, then release to catch a thermal virtually at birth over the dry soil. Already it was evident that downdraughts could be more potent than thermals. Many flights of under 90 secs. were clearly not representative and in consequence the "waiting game" we saw at the last Glider Champs resumed from the second round onwards.

It was a case of either knowing or guessing when to tow, and even though the A/2 class offers the modeller greater opportunity to seek a thermal for his model than in other

freeflight events, this second round was to illustrate how the mighty could so easily fall. The number of "full scores" was reduced by more than half, to 13. Windy weather models simply stood no chance, for example, the unfortunate Halford who ran like a demon (so much so that he had two fouled line launches), that even on his third attempt he had the model slip off the line for a typical 1:20 with disheartening sink to a point only a few yards from the launch.

Drift was decreasing and as the third round began, the wind as such began to go around the clock. Control had been set up at the extreme end of the landing strip, and the flight path of some A/2's was now back to hangar and team tents. Graham Freeston caught a whopper to record his first max after two moderate flights and this heartened the British team though Geoff Dallimer's 1:27 was cruel to watch as the model obviously left a patch of lift.

The patience of some competitors was incredible. A 45-minute wait for firm evidence of a thermal was sometimes wasted; but more

Opposite: 1. Large underfin on Spanish J. Gorgocena's Wabra Mach 1 model. 2. E. Verbitki used a Kharkov diesel (like MVVS) to place a worthy 6th without a max. for U.S.S.R. 3. Ware model . . . or words to that effect from 2nd placer Erno Frigyes with Moki S-2 screaming to go. 4. Strong and experienced Czech team was 2nd, with Rolf Cerny 16th, Jiri Cerny 3rd and Vlad Hajek 11th. 5. Built in two days before contest, Chas. Sheldon's "Quickie" for Cox TD. 6. Pete Muller proxied New Zealand John Henry's Cox TD high thrust red and white elliptical model. Karl-Heinz Denzin times. 7. All-sheet covering on both K-H Riecke's models for Oliver and K & B 15R, was 9th. 8. Winning modified Pulteri with Fireman Fritz Scheberger, a true champ. 9. Hard trying by Lothar Piesk with Mossie Clements' Lightning Rod high thruster. 10. W. Zwilling adopts character for proxy flying Japanese model by Iwai. 11. Peter Buskell with a design he knows well! Sent over by John Sheppard and placed a deserving 4th. 12. Fastest model/motor by Rolf Hagel, but off trim for three rounds.

Left: Victorious Hungarians, for third time running! Meczner, Team Manager Antal Reti, Frigyes and Simon with well prepared models.



## Power team results

1. Hungary	2442
2. Czechoslovakia	2408
3. Switzerland	2354
4. Canada	2333
5. G.B.	2326
6. Austria	2217
7. Finland	2182
8. Sweden	2128
9. Germany	2042
10. Italy	2023
11. U.S.S.R.	2010
12. Yugoslavia	1994
13. France	1985
14. New Zealand	1947
15. U.S.A.	1816
16. Portugal	1730
17. Japan	1701
18. Norway	1440
19. Denmark	1377
20. Spain	1103



**Power  
contest  
photographs**



often rewarded with a maximum. Proxy flyers from Germany, operating the New Zealand models, all collected full scores in this round, and among the eight individuals who by now had amassed 540 secs., one must congratulate Rodrigues of Portugal who, despite lack of previous International event experience, was proving himself a most capable exponent of the arts, flying a Ritz style "Continental" which could truthfully be said to be the only evidence of design influence on the field. There were about eight of this type; all remaining models displaying a diversity of approach, as can be seen in the photographs.

It is very difficult to convey the experience of this World Championship to those who were not there. As the A 2 event progressed, so did it become more and more spread out as teams selected their particular thermal-prone areas. Many pilot models were flown to seek lift, and with such dispersed launching sites, the organisation could have no control over this doubtful tactic. In any case, for the fourth round it seemed so easy to hook lift that such efforts were superfluous. Graham Freeston was now in seventh place, as top man behind the six who had perfect totals, a rewarding position after his serious efforts. In team, the Dutch lads were comfortably ahead, a fact that was pleasantly surprising for at least it indicated that Nordic Country techniques were not infallible. It had been frustrating for the Swedish team manager, Hansheiri Thomann, to have only Gunnar Kalen with his magnificently-prepared sheet surfaced models survive the battle to avoid downdraughts, and Torsten Strang, leading Finn, was, like Dallimer, robbed of a chance by just one flight. Len Lortz of the U.S.A. could be said to be the only "lucky" man of the equal six at the end of the fourth round, for his unique fibreglass fishing rod fuselage model, with large brass "doorknob" nose crept across the field at no more than 80 ft. to hold low lift. He was less fortunate in the fifth, to record 1:42; but for a down-draughted time it was better than most.

The young Austrian, Otto Schnurer, one of two brothers in the team, was last survivor of the "four up, and one down" entrants, his sheet balsa covered model sinking for the seemingly inevitable less than 90 seconds after a most patient wait. So quite early in the 5th round, as those with greater chance got away quickly, we knew that there would be four finalists. Each deserved his place and no one could safely predict the likely winner for, until fly-off time, thermal activity had influenced every flight.

At the fly-off signal, it was Averianov who shot forward like a greyhound out of a race trap to pull the purple and yellow Sokolov-

influenced model up on a whistling and stretched line. He released as soon as full height was gained. He knew that the air was dead, without lift; but Italian Soave with his beautifully finished egg-box construction wing and Dutchman Van't Rood ran and ran in vain hope. Gunnar Kalen let go when he realised the lost cause of thermal seeking and so all four models were flown to their very best, with a justifiable final result. The new World Champion is 28-year-old Anatol Averianov who has been modelling since 1947, a student of Sokolov who works in a Moscow factory as a mechanic. He clearly had the better model, while on a team basis, the Dutch are to be congratulated for their lead over a strong Czech contingent.

## POWER

There had been considerable speculation as to what would happen on the second day when a number of those ex-aquo leaders from the 1960 event let go their same or similar models, now fitted with even more powerful engines, and having the handicap of a cut from 15 to 10 seconds engine run. In practice, the Swede Rolf Hagel sent up some staggering climbs with his personally-modified Super Tigre G.20 replacing the Oliver. Guerra had extra streamlining including a cowl on his new model which held the same climb pattern as at Cranfield, and Sandy Pimenoff was also on form. Yet when the reckoning came, it was to be John Sheppard's relatively unchanged model sent all the way from New Zealand and ably proxy-flown by the quiet Peter Buskell which alone found a leading place (at fourth) after such triumph last year.

Right at the beginning of the first round, Guerra stalled down from great height (his engine was checked at 22,000 audibly) and Hagel looped at the peak of the climb, without auto-rudder on the twin fins. His engine was doing 22,500 on a 7 1/2 x 3 1/2 static! George French was safely over the max but into a tree, then Ray Monks had the galling experience of being clocked off at 179 secs. into the top of the same foliage. At the time it seemed cruel, especially as the Czechs and Finns had scored two max's, and a fly-off appeared inevitable. Hagel's team mates were also using Tigre G.20's but the diesel variety — and on 7 x 4's they sang a fine song. Lother Pieck was operating South African Nats winner Mossie Clement's Olympic-powered high thrust model rich, to avoid premature engine cuts, but it did not have the climb rate, while the Austrian models with Bugl diesels, one of them having a bronze cylinder and aluminium piston, were going

up high and taking advantage of still conditions such as they have at home.

By the time the first hour and a half round had been completed, with 14 max's, the pattern settled down as on the day before, to a strict game of patience.

Vic Jays had been unlucky in losing a flight for John Winn's model as he had an over-run, then failed to get the engine going again after return, due to pen bladder bothers: but this was the only serious tale of woe. When Hagel looped again on the second flight, his position was definitely not to be expected among the leaders, and Ray Monks just missed a thermal to get 2:40 after a searing climb with K & B 15R, to be followed by George French stalling down out of lift and all else for 2:14. Tony Young was more or less in the same unfortunate boat so there were a lot of glum faces around. Happiest were the Canadians, who held leading team place, and luckiest was Chas. Sheldon of the U.S.A. team. He had lost his model-box somewhere between the American and German transportation bases, so had to build a replacement on the spot. Fortunately, he had his Cox TD's with him but not enough dope, and on the second flight, the surfaces fluttered like mad. It was an over-run so he had another chance, fixed the flutter and maxed! There were three double max's, and most looked to the experienced Jiri Cerny and Vlad. Hajek with their old models (Hajek's wings were at least five seasons old) rather than the Swiss Schneeberger to carry on. Yet each of them failed and the Swiss made the only treble. It was his glide that scored and after watching his modified Pulteri for each of his flights from the second round on, one could see how he had the advantage over the "rockets" — and climbed almost as high as the highest, too. Thanks to steady flying, G.B. now went to third place in team results which was encouraging.

It now remained to be seen whether the Swiss could continue to glide his way through two more rounds, for there were several others with a chance if he fell, including K-H Becker of Germany and Sheppard with their less fashionable yet reliable Eta-powered charges, as distinct from the screaming Moki and MVVS racing glow motors used by Erno Frigyes and Jiri Cerny. The positions changed but little, except that Becker fell right out, and by judicious use of sending up pilot models, the Hungarians were able to get Meczner a couple of max's and this, with steady flying by the young Simon and Frigyes' ultimate second place, gave them leading team place for the third time in succession.

It could have been said that not until the last rounds did some of the more renowned experts begin to find their trim for the truly remarkable conditions. Against that, they had all of the previous day for practice, in identical hot, calm weather, and really there was no excuse. When Schneeberger clinched his win with a last flight that might well have been that of an A 2 from several times normal line height, he showed who was master of the weather and 10 secs. engine run. His Pulteri modifications are now on our A.P.S. drawing, showing the revised airfoil, fuselage length and wing area. (Plan PFT 764, price 8/- inc. post.) Nor was there any doubt about second place, for the Moki S-2 took the beautifully-prepared model by Frigyes up in a flat spiral that was as fast as any we have seen. Cerny was simply unlucky to get a down draught on his final glide. Our own G.B. team was not in any way disgraced with an eminent fifth placing and the general consensus of opinion was, after that exhausting series of rounds: "hands off the rules" — the ten-seconds engine run has solved the problem.

German proxy fliers for the New Zealand models were handled by M. Schmidt, G. Maibaum and H. Waldhauser in Wakefield, managed by Ken Glynn off G. Britain at right and watched by veteran New Zealand flier, Vernon Gray, who diverted from a business trip to see the Champs.



## WAKEFIELD

Last of the three-day marathon event was the classic Wakefield, and from first glimpses of the models being prepared in their dispersed encampments, it was obvious that more effort had been applied in the development of this class than for the other F-F types by most nations, except Great Britain. Elegance may not be entirely essential, nor a glossy multi-coloured finish considered a duration maker: but little details that accumulatively add up to a lot in the way of improved performance were much more in evidence on, for example, the Swedish, Italian, French, German, Yugoslavian, Soviet and U.S. models than our own. The reason for this is simply that in order to succeed in Great Britain one has been able to continue flying the same old models, and score on reliability. Competition has failed to produce the thoroughbreds we shall need in time for the 1963 event.

Lest it be thought that our team lacked enthusiasm, we must be most emphatic in that they did their very best, and are just as mystified as ourselves as to what happened to their Pirelli power. Each member went through several kilograms of rubber to select his motors so that the final choice might have been the best of 500. Yet on the field, it could have been the worst at times! Such was our case, and there are no excuses. The team returned chastened, and educated. We are sure they picked up enough encouragement out of the Championships to improve the breed on home ground, and are ready to take up the International Challenge in future.

From the start, we were not exactly lucky. John O'Donnell was down-draughted, Lou Roberts just could not get high enough and Norman Elliott got away after one motor break to fall short by 5 secs. The one model which impressed with its fast, smooth climb was that of Carl Perkins (U.S.A.), yet he, too, was sucked down for 2:32. It was a sad story to be repeated over and over. Wind was light, but more than for the other two days, and with it came much less predictable thermals. Little Ivan Ivanikov of the U.S.S.R. had a fabulous rate of climb after a javelin launch that became a feature item for photographers, yet it was not to be until the fourth round that he managed to beat the down-draught bogey.

The French were jubilant, then lost all spirit after three max's followed by three downs, while the Yugoslavs seemed invincible, surviving three rounds with a perfect team score.

Norman Elliott broke a prop blade in the second round but recovered with a max; Carl Perkins broke a motor, then fluffed a launch so that one blade went into coarse pitch yet he max'd; and this gave the U.S.A. hope that they had passed their "bogey". Yet in the third round, Perkins was *again* the unlucky one as his model was upset by the slipstream of a Piper J-3 bearing the name of a cement which doesn't deserve publicity.

Sokolov was flying this class instead of A/2 and he joined the broken motor brigade, taking the setback with commendable calm. The heat of the day was to make this awful sound a common one. Peter Visser had his timer's watch go wrong. He tried to convince them it was a max; but the second timer's clock was O.K. and acceptable! Gunter Maibaum, proxy flying John Malkin's N.Z. model was delayed at launch by an Italian A/2 that was towed right through the take-off area as a feeler — and duly admonished! The flight was 9 secs. short of a max. Now, at the end of the third round, came first sign of other than a clear sky and activity completely stopped for a full half-hour. Niestoj of Poland had flown just as the cloud came over, and after an initial power stall, went up for 2:42 to spoil what may well have been a winning performance.

As soon as the fourth round start was announced, Emil Frel made sure of his fourth max, but his team mates each down-draughted. The old fox was through now with

## F.A.I. Power Results

Name	Nation	1	2	3	4	5	Total	
1. F. Schneeberger	Switzerland	180	180	180	180	180	900	Cox T.D.
2. E. Figyes	Hungary	180	162	180	157	180	859	Moki S-2
3. J. Cerny	Czechoslovakia	180	180	161	180	153	854	MVVS 2.5g
4. J. Sheppard	New Zealand							
Proxy: P. Buskell	Great Britain	132	179	180	180	180	851	ETA 1SD
5. A. Meczner	Hungary	158	180	137	180	180	835	Krizsma K 8
6. E. Verbitki	U.S.S.R.	160	176	149	175	171	831	Kharkov
7. G. Parry	Canada	153	180	134	180	180	827	Super Tigre G20g
8. H. Raulio	Finland	180	102	180	180	180	822	Super Tigre G20g
9. K. H. Rieke	Germany	180	102	161	180	180	803	K & B 1SR
9. G. R. French	Great Britain	180	134	129	180	180	803	OS Max Sol.
10. S. Ranta	Canada	180	131	124	180	180	795	K & B 1SR
11. V. Hajek	Czechoslovakia	180	130	103	180	151	794	MVVS D.
12. R. Monks	Great Britain	179	160	180	101	166	786	K & B 1SR
13. W. Horcicka	Austria	180	138	96	180	180	774	Bugl-D
14. M. Eriksson	Sweden	128	130	180	180	105	773	Super Tigre G20d
14. J. Fontaine	France	180	115	180	173	125	773	Super Tigre G20g
15. H. Wagner	Austria	180	86	180	180	138	764	Bugl
16. R. Cerny	Czechoslovakia	122	180	144	154	160	760	MVVS-D
17. G. Simon	Hungary	137	126	162	180	143	748	Krizsma K.8
18. E. Eng	Switzerland	85	180	168	180	133	746	Webra Record
19. S. Pimenoff	Finland	180	166	86	180	126	738	ETA 1SD
20. A. Young	Great Britain	116	159	102	180	180	737	ETA 1SD
21. M. Bjelajac	Yugoslavia	180	115	180	152	98	725	Oliver Tiger
22. L. Larsson	Sweden	118	180	180	120	118	716	Super Tigre G20g
23. D. Surrey	Canada	174	106	179	132	120	711	Super Tigre G20g
24. R. Schenker	Switzerland	90	180	78	180	180	708	Cox T.D.
25. J. Soares	Portugal	136	126	125	180	137	704	ETA 1SD
26. R. Guilleateau	France	129	31	151	180	156	697	Super Tigre G20g
27. E. Padovano	Italy	136	143	97	140	180	696	Super Tigre G20d
28. K. H. Becker	Germany	131	180	180	89	114	694	ETA 1SD
29. G. Guerra	Italy	79	130	112	141	180	692	Super Tigre G20g
30. W. McCormick	U.S.A.	127	121	180	180	79	687	K & B 1SR
31. J. Thomson	Ireland	175	106	82	143	180	686	Super Tigre G20d
32. P. Billis	Austria	73	161	85	180	180	679	Bugl
33. M. Van Dijk	Netherlands	160	166	109	84	142	661	ETA 1SD
34. G. Poorman	U.S.A.	162	103	81	125	180	651	Super Tigre G20g
35. B. Filipinovic	U.S.S.R.	92	180	78	180	117	647	Kharkov
36. A. Stepanovic	Yugoslavia	119	145	180	161	39	644	Aero 2.5
37. R. Hagel	Sweden	71	101	107	180	180	639	Super Tigre G20g
38. V. Pecorari	Italy	107	120	94	180	134	635	Super Tigre G20d
39. J. Benadik	Yugoslavia	132	82	102	129	180	625	OS Max 15
40. P. Laxmann	Finland	47	180	96	180	119	622	ETA 1SD
41. Kusara-Ma	Japan							
Proxy: R. Schwenn	Germany	122	89	114	180	109	614	Enya 1SD
42. B. Bulukin	Norway	127	78	138	138	129	610	Super Tigre G20d
43. Jwai	Japan							
Proxy: W. Zwilling	Germany	89	163	118	142	91	603	Enya 1SD
44. Z. Sulisz	Poland	130	98	161	167	18	574	ETA 1SD
45. I. Henry	New Zealand							
Proxy: P. Muller	Great Britain	180	86	—	168	130	564	Cox T.D.
46. A. Sereno	Portugal	161	139	74	94	86	554	ETA 1SD
47. N. Christensen	Denmark	66	168	52	180	80	546	Oliver Tiger
48. W. Czinczel	Germany	95	103	135	92	120	545	Webra Machl
49. T. Johannessen	Norway	85	111	124	87	129	536	Super Tigre G20d
50. John Winn	New Zealand							
Proxy: V. Jays	Great Britain	—	176	113	92	151	532	Cox T.D.
50. A. Jermakow	U.S.S.R.	126	97	88	113	108	532	Zeiss
51. G. Giudici	France	136	82	100	92	105	515	Oliver Tiger
52. H. Pregaldien	Belgium	92	69	86	67	180	494	
53. Sugata	Japan							
Proxy: A. Dreyer	Germany	117	85	164	66	52	484	Enya 1SD
54. C. Sheldon	U.S.A.	113	180	96	89	—	478	Cox TD
55. F. Martino	Portugal	51	67	180	60	114	472	ETA 1SD
56. M. Clement	Southern Rhodesia							
Proxy: L. Piesk	Germany	109	123	37	75	119	463	Cox Olympic
57. J. Oxager	Denmark	73	73	180	47	77	450	Webra Machl
58. E. Balasse	Belgium	83	81	55	72	151	442	Cox Olympic
59. J. Gogorcena	Spain	83	75	85	95	100	438	Webra Machl
60. V. Matute	Spain	96	67	77	87	98	425	Webra Machl
61. F. Mortensen	Denmark	54	83	31	180	33	381	Super Tigre G20
62. G. Dalseg	Norway	78	75	33	79	29	294	Oliver Tiger
63. P. Gonzalez	Spain	11	47	71	61	50	240	Oliver Tiger

his well-aired model, one which had been lost for 18 months, played with by schoolboys and now obviously back in trim. Pentti Aalto launched with wing askew to spoil his run of max's and Alinari of Italy just scraped in by a mere second. He was joined by Reich and Kosinski so that we now had four possible finalists.

One is always tempted to regard these classic events in terms of "who deserves the honours?" and one must admit that before the fifth round, most sympathies were with Emil Frel and George Reich. They've been at it a long time and placed so close to victory before.

Emil had broken his fin when adjusting the tab and cemented it true. He checked care-

fully, but the usual power model style climb was not quite what it should have been and there was a pang of disappointment for all who like this Yugoslav all-rounder as his red and black model returned 2:34 — far less than its proper capability. The other three all made perfect scores and with a change in wind direction, the delayed fly-off took place from the opposite end of the field.

Motors were handed out by the timers as they had been throughout the contest, and at the signal, all wound together. Kosinski was first off, climbing in a tight spiral, then Reich's model 5 secs. after and Alessandro Alinari 15 secs. later still. Light was failing, and 3:30 was a strain, but there was no doubt about George's flight of two seconds more than

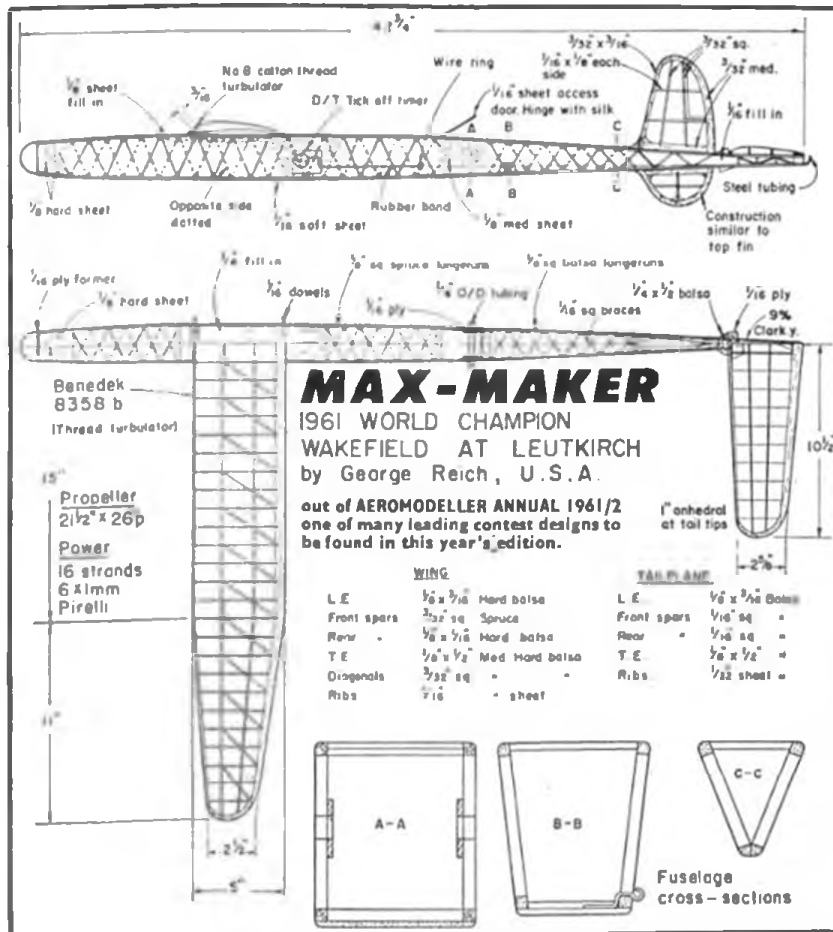


## Wakefield Results

1. G. Reich ...	U.S.A.	180	180	180	180	180	900	+210
2. J. Kosinski ...	Poland	180	180	180	180	180	900	+207
3. A. Alinari ...	Italy	180	180	180	180	180	900	+169
4. L. Azor ...	Hungary	180	180	167	180	180	887	
5. W. Niestoj ...	Poland	180	180	162	180	180	882	
6. L. Riffaud ...	France	180	160	180	180	180	880	
7. W. Zapaschni ...	U.S.S.R.	180	180	155	180	180	875	
8. E. Fresl ...	Yugoslavia	180	180	180	180	154	874	
9. S. Sjogren ...	Sweden	180	150	180	180	180	870	
10. J. Petiot ...	France	180	145	180	180	180	865	
11. J. Osborne ...	Netherlands	180	180	152	167	180	859	
12. E. Hamalainen ...	Finland	180	180	136	180	180	856	
13. K. Bousfield ...	Canada	174	180	180	149	172	855	
14. I. Ivannikov ...	U.S.S.R.	171	154	169	180	180	854	
15. G. Rupp ...	Germany	180	129	180	180	180	849	
16. G. Krizma ...	Hungary	159	180	145	180	180	844	
17. W. Kmoch ...	Yugoslavia	180	180	180	136	164	840	
18. U. Axelsson ...	Sweden	139	180	180	180	158	837	
19. G. Roberts ...	G.B.	142	180	180	180	147	829	
20. J. Sokolov ...	U.S.S.R.	180	158	180	126	180	824	
21. P. Breith ...	Austria	173	180	180	111	180	824	
22. J. Patterson ...	U.S.A.	180	180	101	180	180	821	
23. St. Zurad ...	Poland	129	180	180	180	149	818	
24. K. Leissner ...	Germany	180	170	180	137	149	816	
25. B. Storgards ...	Finland	168	136	148	180	180	812	
26. J. Merori ...	U.S.A.	152	180	116	180	180	808	
27. R. Perikins ...	Yugoslavia	180	180	180	127	129	796	
28. P. Aalto ...	Italy	136	178	180	180	122	796	
29. B. Murari ...	Finland	180	180	180	66	180	786	
30. R. Kieft ...	Italy	131	159	135	180	180	785	
31. C. Meseburger ...	Netherlands	180	180	120	180	123	783	
32. D. Mackenzie ...	Spain	123	158	180	135	180	776	
33. N. Elliott ...	Canada	127	180	180	122	166	775	
34. O. Ehmman ...	G.B.	175	180	154	180	85	774	
35. E. Tammel ...	Germany	180	153	110	180	143	766	
36. M. Segrave ...	Austria	138	180	180	180	82	760	
37. L. Flodstrom ...	Canada	154	77	155	178	91	755	
38. F. Fernandez ...	Sweden	153	180	180	86	153	752	
39. M. Rohlena ...	Spain	178	115	96	180	180	749	
40. R. Liechti ...	Czechoslovakia	178	116	180	145	129	748	
41. P. Lust ...	Switzerland	180	169	129	112	154	744	
42. J. O'Donnell ...	Netherlands	157	88	131	180	180	736	
43. E. Nienstedt ...	G.B.	126	121	138	180	165	730	
44. P. W. Visser ...	Denmark	172	180	133	180	60	725	
45. J. Malkin ...	South Africa	180	172	113	134	125	724	
46. Proxy: G. Maibaum ...	New Zealand	136	180	171	92	136	715	
47. P. Rasmussen ...	Germany	180	122	115	156	139	712	
48. E. Frigyes ...	Denmark	77	180	128	180	138	703	
49. A. Rodrigues ...	Hungary	180	180	117	68	154	699	
50. E. Balase ...	Portugal	180	148	95	177	91	691	
51. A. Sereno ...	Belgium	107	129	153	174	128	691	
52. E. Hegglin ...	Portugal	113	81	180	172	144	690	
53. J. Fontaine ...	Switzerland	180	129	85	108	180	682	
54. P. Grunbaum ...	France	180	180	94	102	119	675	
55. N. Hewitson ...	Austria	108	91	144	150	179	672	
56. Proxy: Waldhauser ...	New Zealand	138	180	151	91	105	665	
57. L. Muzny ...	Germany	83	180	103	150	135	651	
58. J. Cunderlik ...	Czechoslovakia	180	161	63	136	99	639	
59. H. Dahl ...	Norway	118	145	156	102	116	637	
60. W. Cook ...	New Zealand	126	101	164	112	131	634	
61. Proxy: M. Schmidt ...	Germany	96	129	180	67	162	634	
62. J. Meier ...	Switzerland	90	115	99	103	109	616	
63. A. Simonsen ...	Norway	126	117	147	—	92	482	
64. V. Matute ...	Spain	145	58	85	23	166	477	
65. N. Stovland ...	Norway	110	85	91	51	61	398	
66. M. Sousa ...	Portugal							
67. H. Mikkelsen ...	Denmark							

## Wakefield Team Results

1. Poland ...	2600	8. Hungary ...	2434	15. Switzerland ...	2068
2. U.S.S.R. ...	2553	9. Germany ...	2431	16. Czechoslovakia ...	2064
3. U.S.A. ...	2529	10. France ...	2427	17. Spain ...	2041
4. Yugoslavia ...	2510	11. Canada ...	2385	18. New Zealand ...	2024
5. Italy ...	2481	12. Netherlands ...	2378	19. Portugal ...	1867
6. Sweden ...	2459	13. G.B. ...	2333	20. Denmark ...	1835
7. Finland ...	2454	14. Austria ...	2259	21. Norway ...	1755



needed as it was confirmed by many who were positioned half-way between launch and touchdown. He was higher, glided better, and had that small margin over the Pole. Alinari was unfortunate in that his launch crosswind lost a lot of height in a vicious first turn. His "Lonely Eagle" was the most complex on the field, with alloy noseblock carrying three-point offset adjustment and a planked fuselage with fishlike spine.

Team honours went to Poland with every justification. Zurad and Niestoj were strong supporters for Kosinski. So ended a memorable marathon. Serious and confusing, enlivened by incidents such as Stovland's Norwegian Wake diving in vertically, and running out the turns with the fuselage rotating about the prop boss, and, of course, by the wonderful spirit of friendliness which words can never amply convey. As an American said: "I wish that more people could appreciate these Championships so that they could realise the rewards of placing on a National Team."

A report on the International Tailless contest, run concurrently with each of the free flight classes, will appear in our December issue.

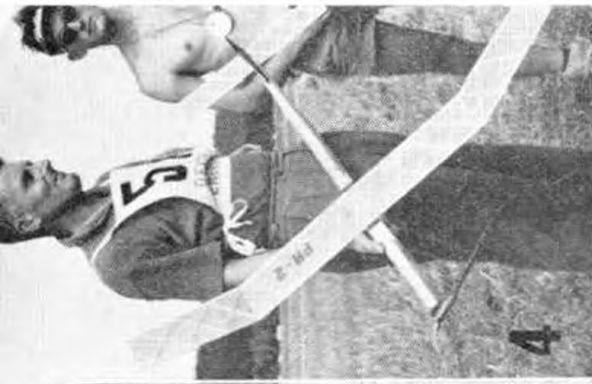
**WAKEFIELDS:** 1. Louis Pierre Riffaud was 6th for France using comparatively rare single blade folder. 2. W. Zapaschni prepares his egg-box structure wing. 3. Finalist Kosinski of Poland with long tail moment, two-blade folder and 14-strand motor. 4. Tailless expert J. Osborne of Holland, was 11th with diagonal ribbed surfaces, prop has two blades. 5. Alessandro Alinari's ingenious 3rd place model with clockwork d/t timer under nose, spine over planked fuselage and forward fin. 6. Happy winner George Reich, chaired by team manager Herb Kothe and power man, Dub McCormick. 7. Niestoj of Poland piles on turns for last round max. 8. Old stager Emil Fresl, in midst of repairs before disappointing fifth flight, he deserved a fly-off chance. 9. From Canada, Mike Segrave and sheeted wing, with small tail area. 10. Azor (4th) waits for a thermal with Krizma (16th) for Hungary. 11. Jet speed record holder Ivannikov, loads his 32-strand motor in fast climbing model, was 14th. 12. Carl Perkins prepares his elegant white model with Herb Kothe holding. 13. Carlos Meseburger of Spain used fuselage mounted wing and outrigger style prop. 14. Norm Elliott digs out burst motor from fuselage as Uralan Wannop and team manager Sid Smeed strain in sympathy.



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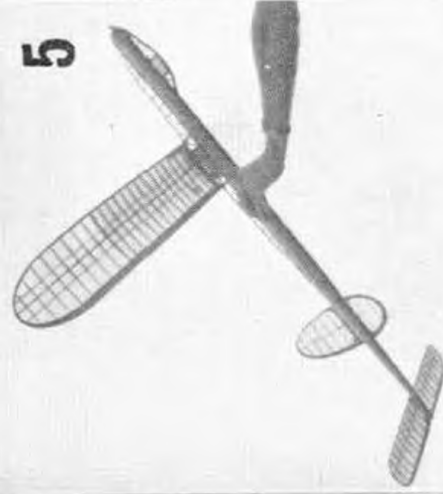
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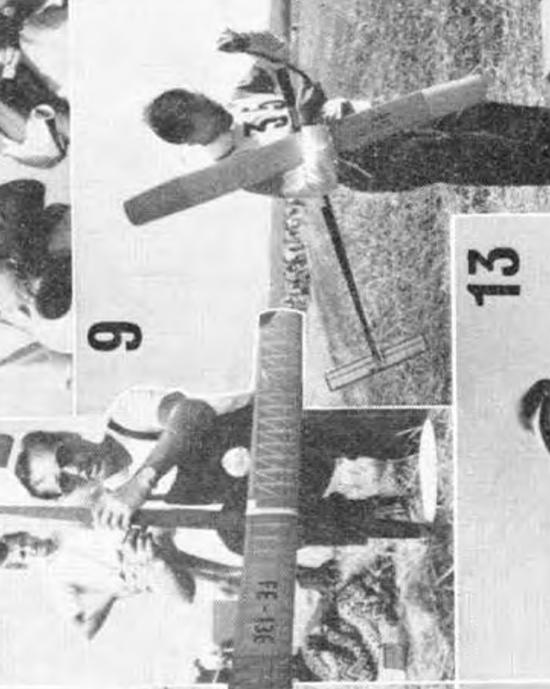
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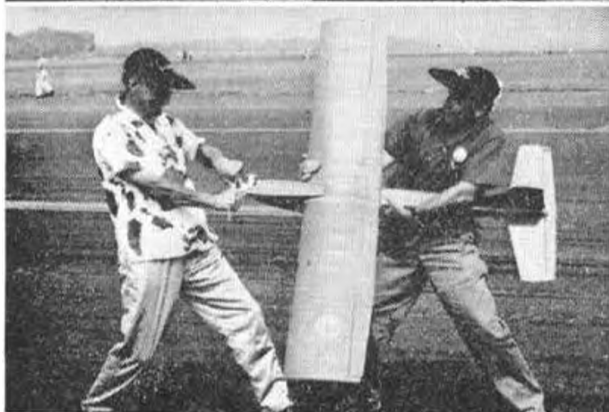
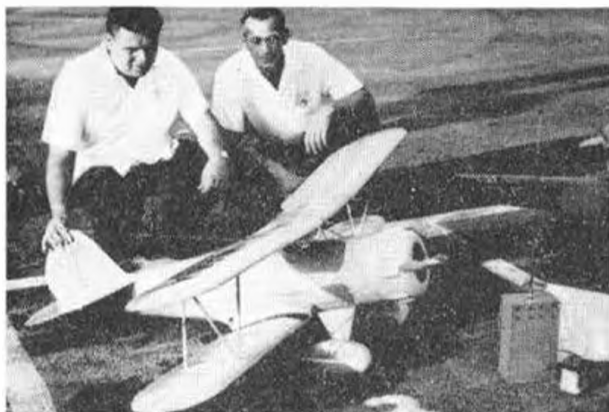


14



# Impressions of R/C at the U.S. Nats

by [HENRY J. NICHOLLS



THERE CAN HARDLY be a Modeller in this country who would not give almost anything, certainly beyond what his discretion would tell him he could afford, to go to the American Nationals. Certainly I had looked forward without much hope of such a trip being realised, for many years and when I say that in the event it proved to be even more thrilling than I had expected, you will realise that this was one of the experiences of a lifetime.

The A.M.A. invited me to run the F.A.I. Team Race event for them, and as this event was only spread over two days including the processing of the models, and the Nats lasts for a full week this made the temptation to go irresistible. Five whole days at the Nats with nothing to do but spectate, and meet people, and talk, incessantly with the most enthusiastic crowd of modellers it would be possible to find anywhere in the world.

That, I think, was my very first impression of the American Modeller on his own ground. His terrific enthusiasm. It literally knows no bounds and for a whole week the most difficult thing to achieve is to get to bed at all. They simply sit up ALL night talking modelling having done that very thing all day long.

My other chief impression was a general appreciation of the excellence of the organisation. Many weeks of concentrated work go into the preparation for the Nats at A.M.A. headquarters under the able supervision of the General Secretary Russ Nichols. Every Competitor gets a folder giving him all possible information about his accommodation, the events in which he is to fly, the programme throughout the meet and so on.

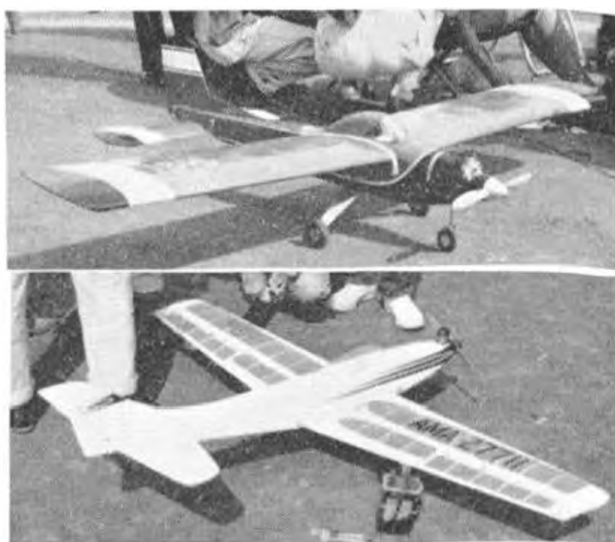
The Nats this year were held, as they have been for many years, on a Naval Air Station, this one being at Willow Grove in Pennsylvania. The liaison between the A.M.A. and their naval friends, largely due to the personal efforts of Russ Nichols, whose ability to persuade "big wheels" to help is notorious, was splendid. There were between two hundred and three hundred Navy men working as contest officials at various times throughout the meeting as Timekeepers, Judges, Marshalls etc., in fact every job other than those of the Contest Directors and a few volunteer processors and organisers was done by the Navy. Without the Navy it just would not be possible to run a Nationals on these lines.

Another aspect that also impressed was the general high standard of finish of the models, whether they were 1/4A free flight, control-line stunt, radio control or indeed in any category. There were of course the odd models that were really rough and looked as though they might fall apart the moment they got airborne, but these were in a very small minority and it was a real pleasure to see so many models that had a true exhibition or Concours d'Elegance finish and were still capable of a real contest performance. As to the actual flying, I regret that I got so interested in the Radio event that I did not see as much of the other events as I should have liked. I was frankly disappointed with the general standard of R/C flying which I had expected to be much higher. All the Multi Models there could certainly do all the manoeuvres, but the pilots did not make the most of their models.

Left, Top to Bottom: Beautiful blue and yellow scale (Third place) Waco F-3 has an Anderson Spitfire 65 and is a team effort by Harold Theken and Gene Landis of Summit Aeromodellers, Akron, Ohio. R/C equipment is Citizen Ship Tx and Microtone 8-channel Rx. The North American P-51 Mustang displaying flaps down is by Paul Martin of the Arizona R/C club. Has 10-channel Orbit R/C gear and an Orwick 73 on coil ignition. U/C retracts after take-off. Messerschmitt Me 109 by Bill Bertrand has a K & B 45 and 10-channel Min-X gear. Bottom is author, trying to get the prototype Merco 49 back from Dr. Walter Good's model after making 13th place with TTPW R/C. Doc was holding on . . . but H.J.N. won!



Above is Doug. Spreng's new model, much after the style of his earlier *Orion*. Most noticeable changes are tricycle U C and revised tail surfaces. Top right: Multi R/C Champ. Doug. Spreng's *Flat Top Stormer*, has brakes, steerable nosewheel, Lee .45 engine and 10-channel Deans-Mathes Rx. Lower right is Tom Brett's third place *Nimbus*.



The system for running the Radio event was interesting. For the first five days there is a "qualifying round" each day, and the top five men each day go into the final which is flown over the last two days. In theory therefore twenty-five men *could* qualify, but in fact many of the top men fly every day and several qualified more than once by getting into the top five on two days or even more, thus eliminating one other competitor from the final. Towards the end of the five qualifying days it gets to be a bit of a tense situation and last minute high scores by a late qualifier can ruin the chances of a man who flew earlier in the day and felt certain his mark was high enough to get him into the final.

### Dual Frequencies

During the qualifying rounds there are two separate sets of judges for the Multi event, one taking all the competitors on 27 Mcs and the other all those flying on 50 Mcs, the American amateur band which is available for R/C work to those who take the trouble to qualify

for a "Ham" licence. Naturally this helps the organisation.

The most popular Multi equipment is still ten-channel with relays although relayless equipment is becoming rapidly more popular. Having talked to most of the R/C men there I am not yet convinced that the present relayless equipment is in fact better than equipment with relays. The general argument seems to be that it ought to be better, a source of failure having been eliminated. But the experience of many users does not yet confirm this view.

The fully proportional "Solidtronics" equipment was being used by Harold deBolt and Maynard Hill. It certainly seems to be a very good answer but it requires the development of a new technique in flying after using normal multi-channel equipment.

Walter Good was flying with his own particular set-up of twin-tone proportional which certainly works very well and gives a fine measure of control. Walt's home-made equipment is, as ever, a joy to behold and a

Below: Left to right, Bob Dunham and his swept wing *Sorcerer* (he sells plans at \$3) which was demonstrated from local Motel parking area, and subsequently pranged. Centre is Howard McEntee with his *Kicking Duck*, equipped model, leader by a wide margin in the intermediate class. Uses Bonner motors. Right: William Hutchins of Portland, Indiana, with a very smart elliptical winged CG *Hercules/Midas* 10-channel, equipped multi design for K & B 45. Note colourful decoration and high building standard of all these models.





As reported last month, Don Brown of the DC/RC Club, Washington D.C., place 2nd in Multi R/C at the U.S. Nats. using T.T.P.W. equipment. This machine cannot be modified for reed work, the requirements for the two systems being totally different. Designer claims model capable and comfortable in inverted passes at 3 to 4 ft. altitude, proportional ailerons making inverted flight easy. Shoulder wing layout is said to aid relatively small ailerons in roll manoeuvres, together with the low set tailplane allowing rudder to effectively assist ailerons, operated in parallel by the C.A.R. system. Compared for airspeed by flying close to a full size aeroplane flying at 85 m.p.h., some estimates of the model's airspeed were given as 100 m.p.h. Full size plans are available from Dee Bee Engineering Co., 1102 S. Broadway, Pitman N.J., U.S.A. Price 3 dollars.

## AEROPLANES IN OUTLINE

Number 62

drawn by

D. H. Cooksey



### Dassault MIRAGE IIIc

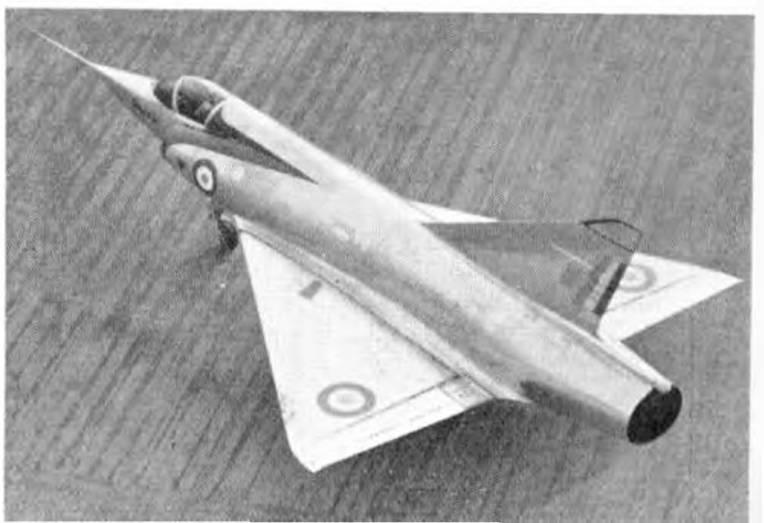
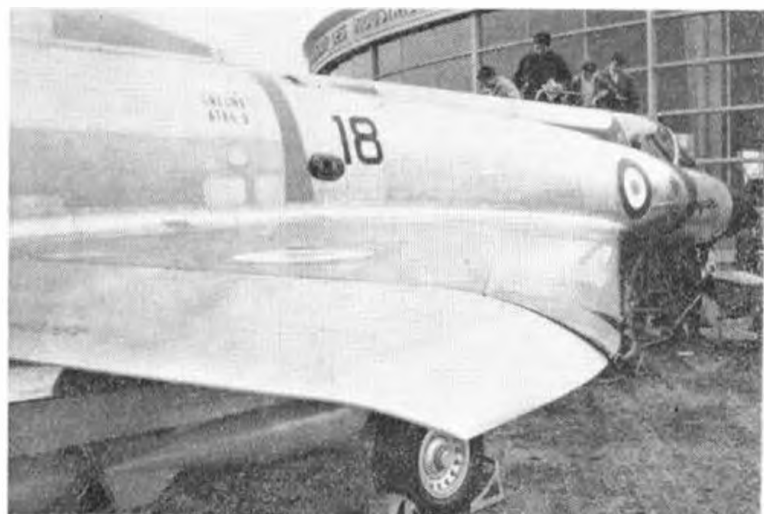
THE DASSAULT FACTORIES at Argenteuil and South at Bordeaux-Mérignac are busily engaged in the production of more than 400 of these remarkable multi-purpose Deltas which are capable of Mach 2 and are proving to be as advanced as any other equivalent aircraft in production today. The first French squadron is now being formed at Dijon and export aircraft will soon be on their way for the Air Forces of Switzerland and Australia. In the running are the Forces of Israel, India and South Africa, each of whom have sent study groups to the French factories for handling reports. With such confidence in the type as has been expressed by the Swiss and Australians in their most exhaustive analyses, the French industry has cause to be extremely pleased with its success. Export orders are most prone to snowball once they are established and it may well be that many other Governments will take up this type for its equipment. One of the great advantages of the Mirage is its versatility. It has low pressure tyres and can operate from grass strips. It carries Cyrano radar for the most refined gun or missile fire control plus navigation aids, can be adapted with a 3,300 lbs. thrust rocket motor replacing an under-belly fuel tank and can carry a wide variety of underwing stores, all on the thrust of a single, French built Atar 9 jet. Ceiling is reported to be 97,000 feet and the enormous internal fuel capacity amounting to some two tons will provide long range which can be extended up to three hours with other tanks.

Structurally, the Mirage began as a twin Viper Powered Delta of 24 foot wing-span. It was not considered powerful enough and so the Mark 2 was equipped with twin Gabizo jets and a larger wing. Then the single engine derivation became the Mark 3 and this type has now been developed as the type C single seater for production, with type B two-seat trainer and type D and E photo Recon or ground attack variants. It is a very strong aeroplane, with advanced wing structure and heavy gauge metal used on the fuselage. The peculiar sections of the wingtips illustrate the aerodynamic techniques and the thickness of the wing is such that the power controls have to be accommodated in external blisters.

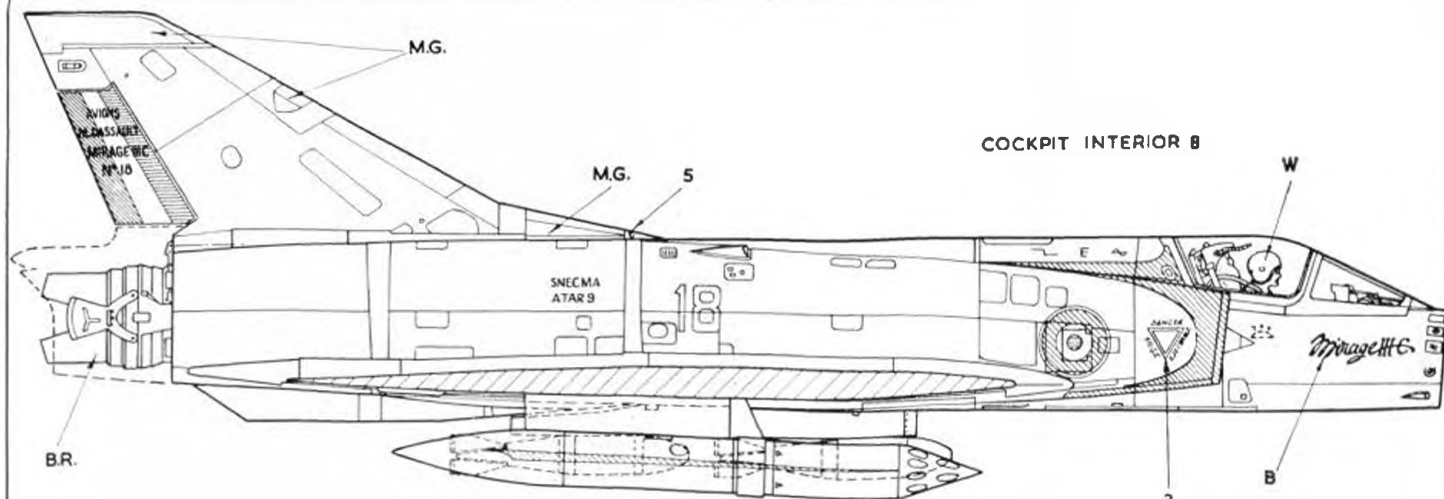
It has been suggested that Dassault engineers were impressed by the behaviour of the Fairey FD-2 Delta before entering their development programme so it may well be that Great Britain has paid a small part in the evolution of a most remarkable aeroplane.

Although there was a serious consideration of equipping the Australian Mirage with a Rolls-Royce Avon Mark 67, the export version will now be entirely of French origin with no change in radar or engine. As for handling, it is said to be easier to fly than a Hunter and thanks to a relatively low wing loading is extraordinarily manoeuvrable at all altitudes. The cost per aircraft is said to be about £275,000.

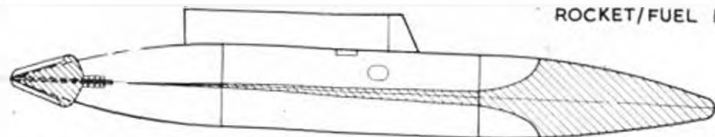
Top, the Mirage IIIA-07, compares with the prototype III at bottom, with early fin shape and rear fuselage. The 18th production IIIc was on show at the 1961 Paris Aero Show and two wing tip views illustrate the thin, conical camber tips with external control blisters.





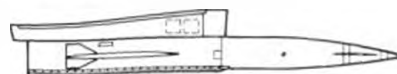


ROCKET/FUEL POD JL100



EXTERNAL LOADS:-

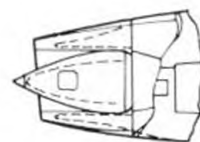
375 GALL. DROP TANK  
2 OFF ON WING



MATRA R511 MISSILE



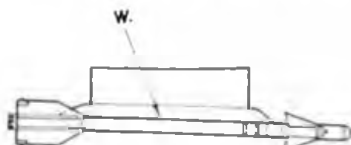
ROCKET PACK



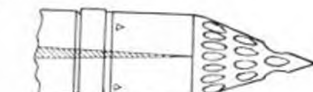
INTAKE CENTRE BODY



NOTE:- A/C NATURAL POLISHED  
METAL OVERALL. PYLONS  
AND PACKS, ALSO MISSILES W.



2. SIDE WINDERS.



ALTERNATIVE NOSE  
TO ABOVE



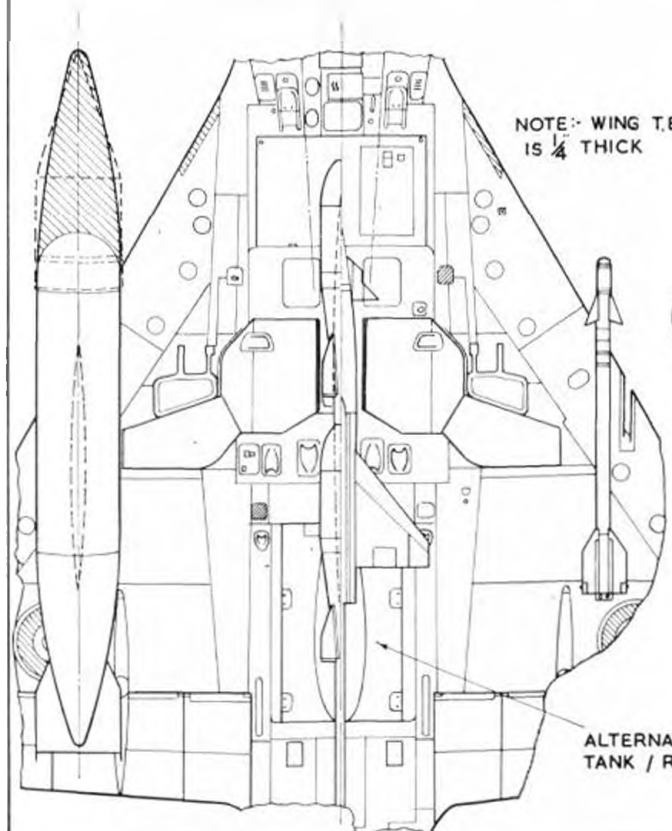
2 400 KGS BOMBS  
CENTRE FUSELAGE

M.G.

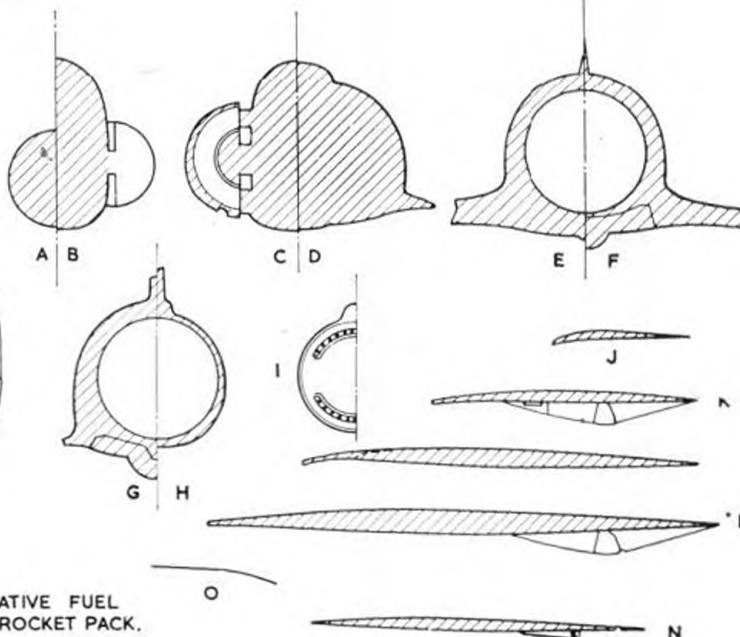
BR MATT BROWN  
B. BLACK  
MG MEDIUM GREY  
W. WHITE  
Y. YELLOW

(MATT)

RED  
BLUE



NOTE:- WING T.E.  
IS  $\frac{1}{4}$  THICK



ALTERNATIVE FUEL  
TANK / ROCKET PACK.





Carl Simeons with winning Glider at Cranfield

### SOUTH MIDLAND AREA RALLY Cranfield August 27th, 1961

The usual breezy Cranfield conditions blessed the South Midland Area Rally on August 27th, but bright sunshine was enjoyed by competitors, rather less in number than previous years. Chuck Glider, however, had a much greater entry, but ½A power would appear to be already becoming the province of experts — it needs novice support.

Will people never learn? Found on the airfield after the event were a Black F.A.I. Racer with lines and handle (Rivers engine) and one wristlet stopwatch; really expensive items to leave lying around.

Results			
<b>Open Glider</b>			
1. C. Simeons ...	St. Albans ...	8:35	
2. R. Neilson ...	Springpark ...	8:24	
3. M. Turner ...	Charlton ...	8:15	
<b>Open Power</b>			
1. N. R. Johnson ...	C.M. ...	9:00	
2. G. Fuller ...	St. Albans ...	8:55	
3. R. A. Haisman ...	Belfairs ...	8:34	
<b>Open Rubber</b>			
1. R. Godden ...	Cambridge ...	8:16	
2. J. North ...	Croydon ...	8:02	
3. J. Wassel ...	Hayes ...	8:01	
<b>½A Power</b>			
1. D. Posner ...	Surbiton ...	9:00	
2. V. Jays ...	Surbiton ...	7:37	
3. M. Burrows ...	St. Albans ...	7:15	
<b>Chuck Glider</b>			
<i>(best 3 of 10 chucks)</i>			
1. D. Greaves ...	Leamington ...	4:53	
2. G. Hall ...	Walsall ...	3:47	
3. A. Fathers ...	Abingdon ...	2:37	
<b>R/C Multi</b>			
1. F. Knowles ...	Reigate ...		
2. S. Uwins ...	C.M. ...		
3. K. Marsh ...	West Essex ...		
<b>R/C Single</b>			
1. S. Uwins ...	C.M. ...		
2. R. Yates ...	—		
3. M. J. Dumble ...	A.R.C.C. ...		
<b>Combat</b>			
1. M. Kendrick ...	W. Bromwich ...	+9	points
2. G. Williams ...	Brierly Hill ...	—8	
3. R. Gibbard ...	Derby ...	—15	
<b>Stunt</b>			
1. D. Day ...	Wolves ...	523½	points
2. F. Warburton ...	Bolton ...	492	
3. G. Higgs ...	Bolton ...	480	
<b>T/R "A" (10 kilometres)</b>			
1. A. Wallace ...	Novocastria ...	4:45	
2. L. Davy ...	Wharfedale ...	4:48	
<b>T/R "B" (10 miles)</b>			
1. R. Lucas ...	West Essex ...	7:13	
2. C. Taylor ...	West Essex ...	7:16	
3. D. Greenland ...	Ecurie Endeavour ...	9:58	

Wallace's successful F.A.I. Racer at Cranfield and Rufforth



## OUT and ABOUT

THE ORGANISERS of the *East Lancs Open Rally* wish to apologise for the fact that some thirty or forty contestants were waiting on the field when the organisers arrived at noon. The best excuse they can offer is that most of their committee had been on holiday in the preceding weeks and so had become rather out of touch with each other. They do not intend this to happen again. Weather was sunny but the wind was strong, with downdraughts. The Glider winners flew A/2's but C. Wyatt of Ashton was unlucky with his big glider when the only lull in wind strength occurred as his model was released, unhooking for a flight of only 32 secs. On his second flight his D/T failed, with consequent fly-away.

<b>Open Glider</b>			
1st J. Birks ...	Chorlton ...	6:31	
2nd B. Faulkner ...	Cheadle ...	6:27	
3rd J. O'Donnell ...	Whitefield ...	5:43	
<b>Open Rubber</b>			
1st J. Chadwick ...	Ashton ...	3:34	
2nd R. Linton ...	Whitefield ...	3:00	
3rd D. Wolstenholme ...	East Lancs ...	1:43	
<b>Open Power</b>			
1st D. Barber ...	Baildon ...	4:34	
2nd J. D. Bailey ...	Whitefield ...	4:27	

Over the sea the *Irish Control Line Nationals* were held on August 20th at Raheny. The North Dublin A.C. Herrievan/Corwell team won F.A.I. Team Race and T. Rafter won ½A. Combat, which for the most part was fought out between the Cahir and Dun-Laoghaire lads, The F.A.I. and Class B team races, Stunt and Combat were all won by A.P.S. designs, *Tigress*, *Tantivy*, *Calamity Jane*, and *Peacemaker*. Quite a field day in fact!

Dun Laoghaire also visited the popular Butlin Control Line Rally with considerable success. T. Harpur won F.A.I. Team Race and T. Stewart cleaned up C/L Scale with a beautiful *Sopwith 1½ Strutter*. The B. Harper/T. Stewart ETA Mk. 1 (!) *Tantivy* came second in B T/R. Limerick M.A.C. were also represented by one member. He wrecked his model in the first heat of ½A T/R, but managed to get through to the semi-final in Combat to be well beaten by Belfast flier G. Dickson in a very sporting joust.

In the London Area Clubrooms, Northwood M.A.C. members have shown renewed interest in Jetex R.T.P. Flying, but when the motors were new the speeds were so high on the six feet line used that the models could not be seen and therefore no official times were recorded until motors had been "run in".

Better safety precautions will now be taken after a Jetex Scorpion broke loose in the club hut. Imagine the panic! Cosmo A.C.'s winter programme is getting under way early with a series of quizzes. In the first of these they used the A.P.S. Engine Data Sheet with the names of engines blanked out for an engine recognition test. The seniors were rather disappointing,—top scorer was 13 year old S. Curling with 46.5 per cent. correct.

In the South Eastern Area, scale interest has been aroused in Isle of Thanet M.A.C. where Mr. Bonigli has recently built a *Breda 88* finished in desert camouflage. First attempt to put the model in the air failed; but they are determined not to be beaten.

Laindon M.A.C. are pleased to report that their L. Moorcroft took first place in B class Combat at the Wanstead Combat Rally and second place went to their "Toz" Taylor. They enjoyed the rally enormously and congratulate Wanstead on a well organised meeting.

Down South, East Grinstead M.F.C., that happy band of funsters, have a craze for *Ebeneezers*, started by friends from Horley who visit them regularly. These little 20 ins. span machines fly in all configurations, Biplane, High Wing, Low Wing and no wings at all. Final humiliation of their secretary Les Fuzzard came when one of these machines was seen to easily out-climb his Enya 19 *Dixielander*!

From the West comes Cheltenham M.A.C.'s fine annual magazine, "Wreckord". In a stiff paper cover, the "Wreckord" has 25 pages. Edited by S. B. Perry, the magazine has a wealth of interesting articles. How's this for interest? "Selection of Prototypes for Scale Control Line Models" by S. B. Perry, "Covering With Microfilm" by C. C. Aitkenhead, "On the Right Lines" a discourse on the preservation of control lines by M. G. Chaplin, "An Electrically Operated Undercarriage for the Hawker Typhoon" by D. Harper, "Engine Speed Control" by R. Spragg, "Is this the Way to Better Models?" by M. G. Chaplin (a discussion on design), "Kraft Paper Honeycomb" by J. Spragg, "Evolution of an Open Rubber Model" by E. Drew.

Up in the Midland Area, Leicester M.A.C. arrived at Barkston Heath, Grantham on September 3rd for an interclub competition with the

Grantham and Littleover clubs. In contrast with similar events held earlier this year for Combat, this one was for free flight only. Leicester won Open Glider and Power, and Grantham won Chuck Glider.

Foresters M.F.C. had a stand at the Nottingham Model Engineering Society's exhibition held in Victoria Hall. Their stand was in fact given more space in the local press than the organisers themselves. At the invitation of the Commanding Officer of R.C.A.F. Station, Langar, Ken Moore and Geoff Pike gave a demonstration of all multi R/C flying on the occasion of the Airfield's Annual Open Day. A demonstration of Combat and Control Line Stunt was also given.

The *Northern Gala* on September 10th was attended by area club Halifax M.A.C. with mixed fortunes. B. Hollingworth gained 6th place in F.A.I. Team Race and D. Piggin reached the semi-finals in 1/4A. J. Bullock's Class B *Dalesman* was doing very well until it shed its propeller and began to sing a song of about 35,000 r.p.m. (?) John Pool spoiled his chances in Rubber by launching into a downdraught for 2:05. Alan Nobbs made 3:57 and 3:59 on two consecutive flights! Baildon M.F.C. had a field day there, as the results show.

Henry Tubbs, Geoff Tidswell and Tom Stoker also managed to fly off their round in the Northern Area Knock-out comp. against Rotherham, whom they beat with a perfect 27:00 total.

12 members of Wharfedale made a 216 mile journey to R.N.A.S. Abbotstown for the Scottish Gala on August 20th. Their Hawarth/Horton team won Class B Team Race with a time of 7:03, a new club record. Ken Long and Les Davy won the F.A.I. Team Race event in 4:57 using their Tigress V with ETA 15. Don't forget the Wharfedale 1000 lap Class B Team Race to be held at R.A.F. Rufforth on November 5th. Entries and enquiries for this event should be sent to Don Haworth, 38 Lidgett Park Avenue, Roundhay, Leeds 8, Yorks, and entries should arrive not later than October 29th, pre-entry being essential at 2s. 6d. per entry. Remember—1000 laps is no less than 74 miles, so be prepared!

Lastly, who lost a certain F/F sport model in the Portsmouth area on September 3rd? The motor was still warm when a thoughtful young man found it. The owner can collect his model upon correct identification of type and engine from R. C. Howes, 2 Serpentine Road, Widley, Portsmouth, Hants.

## NORTHERN GALA

R.A.F. Rufforth September 10th

Slickly organised by the committee and member clubs of the Northern Area, S.M.A.E., this year's event at York attracted visitors from parts as far distant as London and the Scottish area; but could still have accommodated more competitors. Maybe the stayaways did not appreciate the fine conditions with only slight breeze, falling off in the fly-off period at 6.10 p.m. to six-minutes flight visibility despite overcast.

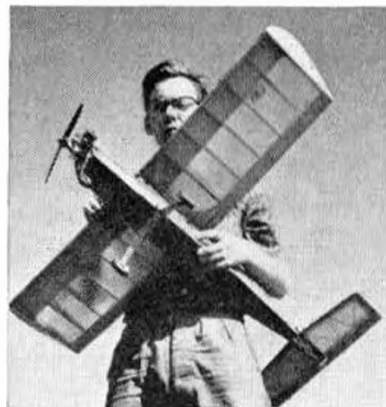
Single channel R/C seems at last to be headed the right way with greater use of excess power and throttle control as well as selective rudder. Experienced John Dumble and Arthur Collinson proved their point well: John with a servo rudder, Arthur with a Varicomp. Lots of *Gassers*, large and small, predominance of glow engines, mostly Jap, and a trend to high speed flight for penetration were keynotes of this premier R/C event, transferred from the Nats programme.

Wharfedalesters ran C.L. events and Novocastrians made it a benefit with wins in F.A.I. and B at respectable speeds. Piloting standards need an overhaul. The business of "backing-up" and flying from behind the ear is certainly not within the intent of the contest and any form of radius alteration should be more firmly admonished next time. As at the Nats, the 1/4A lads provided a thrill: young Northage's *mini-Dalesman* showing both range and speed to beat the nine-minutes for ten miles; but he'll have to keep his tyre on to remain eligible in future. Stunt was a David Day/Frank Warburton tussle, the former scoring well with his model appearance as Frank used an "oldie" to preserve his best for Belgium. Each fluffed in horizontal square eights, and lost points for positioning consecutive manoeuvres; but showed continuing improvement otherwise. It's a pity there are not more new names to rival them.

Free flight was a local victory in the case of glider with Baildon's Malcolm Jackson as top scorer with 8:42. It seemed that 164 ft. was not high enough to catch the lift area in midfield, whereas the high climbing open power and rubber models called for two impressive fly-offs. Carl Simeons climbed highest by a small margin with his A.M.35 *Dixielander* over Dave Posner's O.S. Spl. *Dream Weaver* and George Fuller's identical A.M.35-D1 dr combination. All three landed in the same field corner so that times reflect on visibility. Scorchers of the day was Brian Eggleston's 18 1/2-oz. frame around the Eta 29 which was going like a rocket when a backplate screw was tightened (after the comp flights!).

Rubber was a battle of names as well as models. The rapid corkscrew climbs varied in pattern from Joe Barnes's single blade featherer chopping its way up, to the almost roly-poly action of J. O'Donnell's *Maxie*. Pop Miller's model seemed more leisurely, but got high just the same and one is tempted to wonder how high an open model does

J. Dumble's Ripmax Trophy winner, was also third at S. Midland Gala, Cranfield



J. Northage pits his Mini-Dalesman 1/4A winner

climb. Would be interesting to find out precisely. Anyway, it was enough for six minutes without dethermalising!

Thanks, N.A., for a good meeting, and also for the Rubber Supplement to their Newsletter. Something no contest modeller should miss, with loads of tips and pans.

## NORTHERN GALA

R.A.F. Rufforth, September 10th, 1961

Power	103 Entries		
1. C. Simeons	St. Albans	12:00	6:17
2. D. Posner	Surbiton	12:00	5:16
3. G. Fuller	St. Albans	12:00	4:06
4. K. Hunt	Hinckley	12:00	
5. J. Moseley	Baildon		11:57
6. T. Stoker	Baildon		11:55

Glider	85 Entries		
1. M. Jackson	Baildon		8:42
2. M. C. Bayram	Lincoln		8:26
3. O'Donnell	Whitefield		8:15
4. R. Sleight	Hayes		7:53
K. Pickles	Baildon		7:53
5. V. Jays	Surbiton		7:46

Rubber	40 Entries		
1. J. Barnes	Liverpool	12:00	6:09
2. H. Tubbs	Baildon	12:00	6:07
3. J. O'Donnell	Whitefield	12:00	6:02
4. C. P. Miller	Baildon	12:00	4:52
5. G. Tidswell	Baildon	12:00	3:59
6. D. Morley	Lincoln		11:51

R.C. Single Channel	Ripmax Trophy.		
16 Entries			
1. M. J. Dumble	Richmond, Surrey		988
2. A. R. Collinson	Baildon		848
3. S. E. Uwins	C.M.		733
4. J. Singleton	A.R.C.C.		306

Class 1/4A	27 Entries		
1. J. Northage	Wharfedale		8:59
2. Newton	St. Helens		10:26
3. H. Lorrimer	Prestwick		10:32
4. Atkinson	Debdenairs		—

Class A F.A.I. "Wharfedale" Trophy			
33 Entries			
1. A. Wallace	Novocastra		5:16
2. C. S. McPhail	Ecurie Cadzow		5:39
3. Cooper/Allen	West Essex		6:10

Class B "Eta" Trophy	17 Entries		
1. Dugmore/Bell	Novocastra		6:55
2. Greenland	Sidcup		7:52
3. A. Wallace	Novocastra		—
4. T. Pasco	Thornaby P.F.		—

Stunt	6 Entries		
1. F. L. Warburton	Bolton		576 pts.
2. D. Day	Wolves		542 pts.
3. Perry	Richmond		464 pts.

Concours D'Elegance—Selby Trophy			
6 Entries			
1. J. Bridgewood	Doncaster "Vigilant"		210 pts.
R. H. Jones	Chorlton "Alb DV"		181 pts.

## 1961 DEVON RALLY

Eighty-eight entrants attended on Woodbury Common on August 26th. For the first time in four years members of the organising club, Exmouth & D.M.A.C., were spared from organisation and were able to compete.

First flights got away as soon as shop was set up to receive entries. Most first round flights collected "max's". Those who made their flights early, certainly benefited, for lift had completely gone by 3 o'clock. Elton Drew of Glevum has certainly changed his luck. For the first time in five years he recorded all three rubber flights and returned home with his model.

A good day of combat was rounded off by a very exciting final in which P. Tribe was chopped up by G. Copeman and his *Cleaver*. The 400 miles round-trip from London was no deterrent for the usual band of F.F stalwarts who collected most of the hardware.

Power	Results	secs.
1. G. Fuller ...	St. Albans ...	540
2. G. Castell ...	Stevenage ...	519
3. B. Mack ...	Stevenage ...	504
<b>1/4 A Power</b>		
1. M. Dilly ...	Croydon ...	522
2. A. Young ...	St. Albans ...	500
3. J. Clappitt ...	Bristol Aces ...	160
<b>Rubber</b>		
1. A. Parker ...	Exmouth ...	540
J. Rowland ...	Exmouth ...	540
3. E. Drew ...	Glevum ...	481
<b>Glider</b>		
1. D. H. Tipper ...	St. Albans ...	406
2. E. J. Langton ...	Cardiff ...	395
3. D. G. Laiter ...	Brighton ...	391
<b>Free Flight Rally</b>		
Champion	A. Young ...	St. Albans
<b>Combat (Finalists)</b>		
1. C. Copeman; 2. P. Tribe	(Kenton/Northwood "Kombo")	



Above: J. Pool winds with Urian Wannop holding at Scottish Gala and U.K. Challenge.  
Below: Joe Barnes with winning single blade featherer's at Rufforth for Northern Gala

SCOTTISH GALA  
and U.K. CHALLENGE MATCH  
Abbotsinch August 20th, 1961

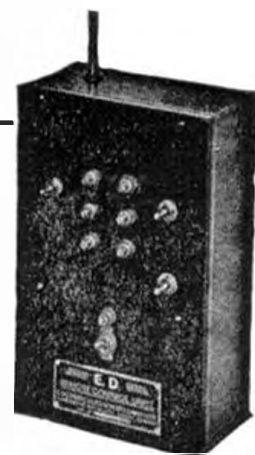
The Scottish Gala on August 20th was poorly attended, the main support coming again from the Northern and North Western Areas. Weather was most unpleasant until about 2 p.m., after which it steadily improved until by 6 p.m. when the wind had dropped to 10 m.p.h. Brian Eggleston in power and John O'Donnell and Urian Wannop in rubber did not make official flights until 6 p.m., a tactic which paid off. The U.K. Challenge saw a hastily-formed English team take the honours. Farthest travelled competitors present were Sue Allsop and D. Miller from Cambridge.

<b>Power</b>			
1. B. Eggleston	Baildon	...	7:04
2. C. Hutton	Wallasey	...	6:07
3. T. Bailey	Novocastria	...	6:07
4. R. Firth	Sheffield	...	5:56
5. J. O'Donnell	Whitefield	...	5:55
6. D. Bathgate	Edinburgh	...	5:35
<b>Glider</b>			
1. J. O'Donnell	Whitefield	...	7:14
2. R. Sleight	Hayes	...	6:27
3. S. Allsop	Cambridge	...	5:22
4. J. Hannay	Wallasey	...	5:06
5. J. B. Harris	Prestwich	...	4:59
6. H. O'Donnell	Whitefield	...	4:18
<b>Rubber</b>			
1. J. O'Donnell	Whitefield	...	9:00
2. U. Wannop	C.M.	...	9:00
3. H. Tubbs	Baildon	...	7:41
4. C. Shristie	B.A.T.	...	7:15
5. J. Pool	Halifax	...	6:57
6. R. Pollard	Tynemouth	...	6:38
7. P. Montgomery	Kirkcaldy	...	6:06
<b>U.K. Challenge Match</b>			
	<b>Power</b>	<b>Rubber</b>	<b>Glider</b>
England ...	12 pts.	9 pts.	7 pts.
Scotland	3 pts.	6 pts.	8 pts.

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## PREVIEW

OF WHAT WE HAVE IN STORE  
FOR NEXT MONTH'S

### Model Maker & Model Cars

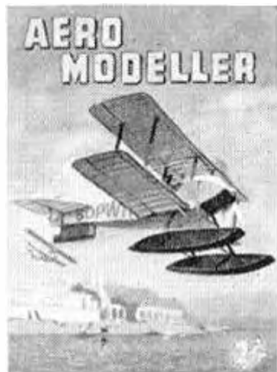
out October 25

The November issue of "Model Maker" will feature plans for a magnificent 36½ in. trawler model *Boston Arrow*, John Lewis's latest 10-rater, *Red Herring*, miniature drawings of the Wallasey Ferry Fleet over the last 140 years — 46 ships! — the cargo vessels *Romanby* and *Kent*, and other marine features. For car enthusiasts, drawings and photos of the rear-engined Lotus, tyre moulding, and a fabulous automatic lap recorder/position indicator will be three of the main articles, plus the usual reviews, motor tests, etc., etc.

AND IN NEXT MONTH'S

### Aeromodeller out Nov. 15

The traditional enlarged Christmas issue of your favourite magazine has lots of new material in store this year. Main feature item will be the introduction of a new class for rubber models, already well established in many countries in Europe and named "Coupe d'Hiver". This calls for virtually a *Mini-Wakefield* design and one of our two free plans will be for a specially commissioned Derl Morley design "Garter Knight" which attracted great attention on its outing at the Northern Gala. Second free plan will be Peter Moir's "Bouncer" all the way from Zululand, South Africa; a virtually unbreakable construction control-line trainer. Full report on the Criterium of Aces European C/L championships, more World Champ details, engine tests, plans for sport models, humour, and a superb feature of Ken McDonough on the 1913 Schneider Trophy winning "Sopwith Tabloid" with solid and free flight scale plans are just some of the main features we shall have to offer.



AND ALSO CURRENT EDITION

### Radio Control Models

out October 10

November issue of "Radio Control Models and Electronics" carries valuable gen for builders of large and small models alike: "Multi-Speed Glow Motors" deals with problems from the multi-flyers angle. Followers of the pin-sized sport model will welcome "Windy" Kreulen's Matchbox, a miniature ultra-light receiver, which, of course, could be employed in the smallest of boats. Switch-tuned Superhets shows just how easy it is to modify a standard transistor broadcast kit for spot frequencies in the 27 mc/s band . . . Just what the boat boys have been waiting for and, of course, more than one boat at a time! Servo Development continues an interesting series for the true proportional fan, a Low Cost Tone Tx provides an easy task for the 'home-built' enthusiast. Boat installation gen and an even better pulser. P. Lovegrove has a simple tone generator and provides further notes on the Two Tone Pulse width system . . . To which are added the regular favourites: Gimmickry, Reviews, Service Sheet, Here, There & Everywhere, Page Plan, 'Feedback', Query Column, etc., etc.

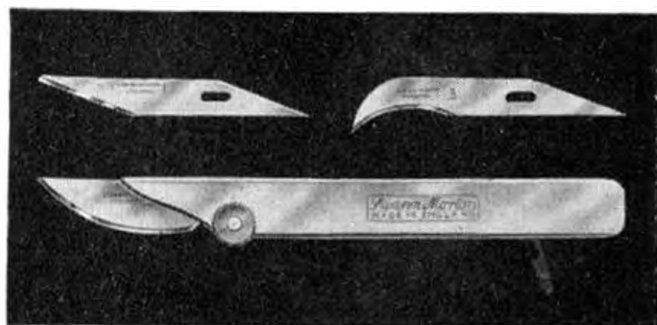
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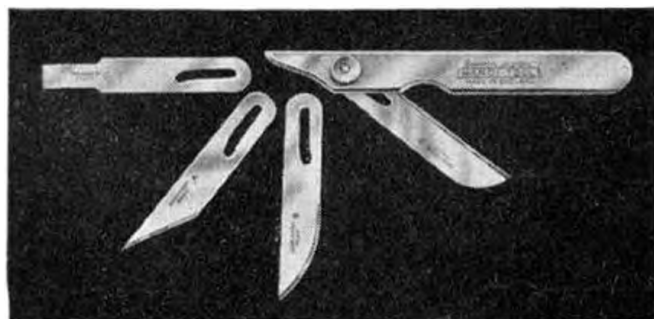
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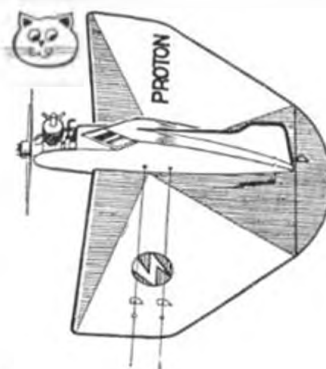
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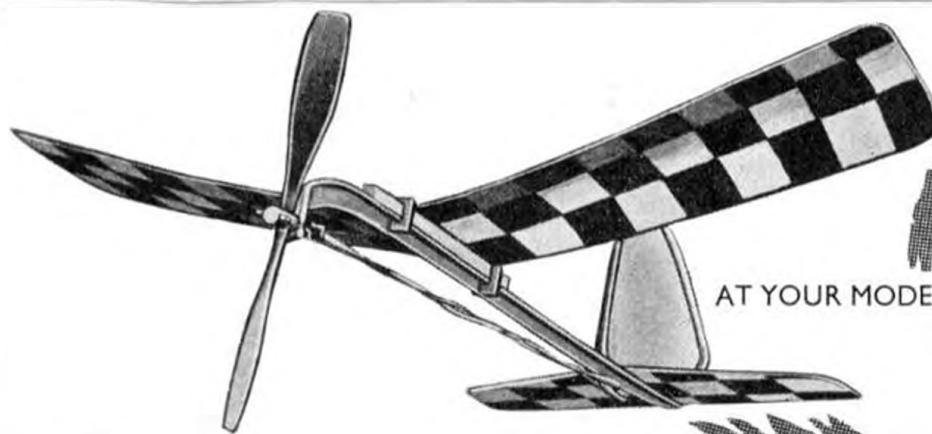
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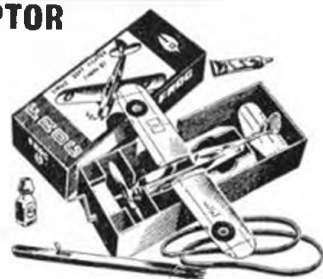
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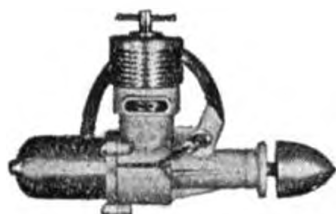
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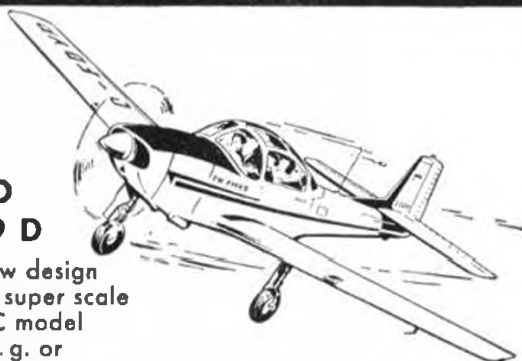
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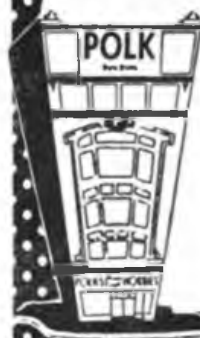
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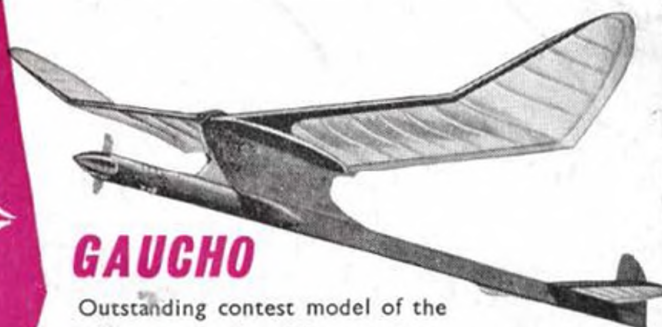
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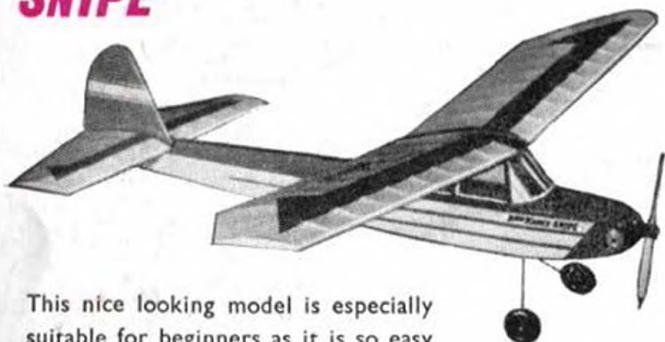


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