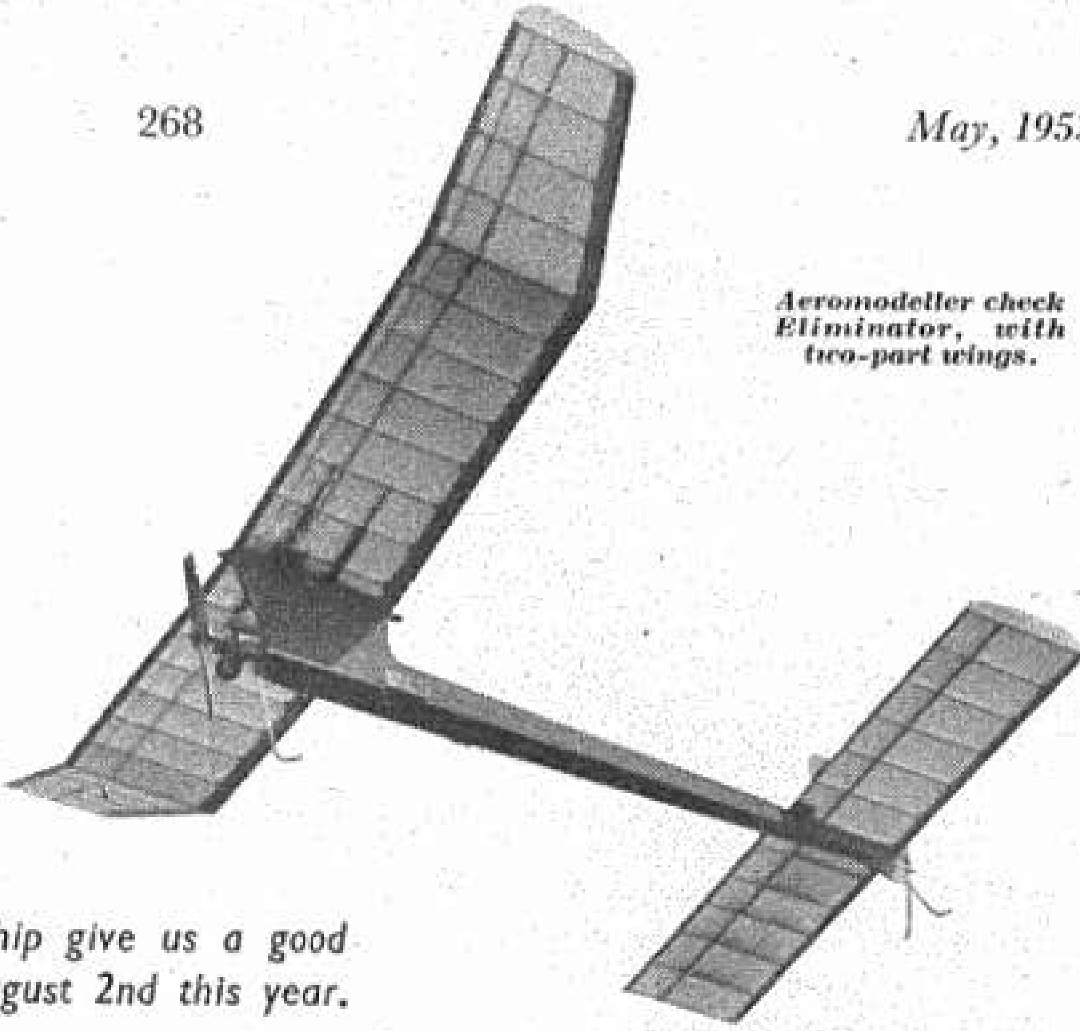


Aeromodeller check Eliminator, with two-part wings.

Spotlight on . . .

International Power

Reflections on the 1952 World Championship give us a good idea of what to expect at Cranfield on August 2nd this year.

THREE factors govern the design of an F.A.I. class power job. The engine must be no more than 2·5 c.c., the wing loading must exceed 3·93 ounces per square foot of total area, and the power loading must be at least 7·06 ounces per c.c.

Simple enough isn't it ? . . . a model for a 2·49 must weigh at least 17½ ozs. and a 1·49 model more than 10½ ozs. . . if you build to *minimum* power loading weights, then the biggest area allowed for a 1·49 is 384 sq. ins. for wing and tail, and for 2·49 c.c. we can jump to 646 sq. ins. Don't forget these are *maximum* areas for *minimum* weights . . . if you increase the model weight, you can certainly add on to the area and still be within the rules.

In actual fact, these rules are so flexible that few average models come outside of them. At the 1952 World Championships, only one model out of over sixty came sufficiently close to the borderlines to warrant a second check on the scales, suffice to say that it was one of the British team models—built to minimum wing loading.

Now, if it is easy enough to keep within the specifications, what kind of a model will give best performance ? Although last year's event was considerably influenced by thermal activity, it would be hard to get away from the fact that Barry Wheeler's "Eliminator" and Heinz Lauchli's version of Schmid's "Komet" took best advantage of the prevailing conditions, for after all, they finished first and second. Yet two more contrasting approaches to the F.A.I. specification could hardly be found ! One, the smallest, the other the largest in the field ; one a pylon, the other, low-midwing, one a 1·49, the other 2·49, they have but one common denominator—both are near to the wing loading minimum.

Take a look at the table of the top sixteen in 1952, and the popular size of model soon becomes apparent. Fourteen of them used the largest engine size, and doubtless, if the rules *had been* extended to include 3·5 c.c. then the majority would have gone one size up to take advantage. (Fortunately, the foresight of O.K. Engines in the U.S.A. in producing a special 2·5 motor for the American market has probably now set the seal at 2·5 c.c. top limit for ever.) Yet the smaller engine brought home the bacon last year. Why ? Because

1952 TOP SIXTEEN

Place	Name and Country	Engine (c.c.)	Wing (Projected dimensions)			Tailplane % Wing Area	Total Area (sq. ins.)	Weight (ozs.)	Wing Loading (ozs./sq. ft.)	Power Loading (ozs./c.c)
			Span (ins.)	Average Chord (ins.)	Area (sq. ins.)					
1	**Wheeler (Gt. Britain)**	Elfin 1·49 ...	45·27	6·5	292·5	52·0	446·4	12·75	4·11	8·83
2	**Lauchli (Switzerland)**	Castor 2·49 ...	78·75	7·7	607·6	31·0	795·1	25·92	4·69	10·04
3	**Castiglioni (Italy)**	Super Tigre 2·46	57·48	7·2	413·85	33·7	543·35	18·9	5·0	7·6
4	**Schnabel (Switzerland)**	E.D. 2·46 ...	68·5	6·6	452·6	40·0	632·4	22·74	5·16	9·3
5	**Prohaska (Yugoslavia)**	Elfin 2·49 ...	44·48	9·8	440·2	38·0	606·05	21·0	5·0	8·4
6	**Rupp (Germany)**	Webra 2·46 ...	57·48	6·1	350·3	28·3	447·95	18·65	5·95	7·58
7	**Lange (Germany)**	Webra 2·46 ...	53·54	6·5	347·2	29·4	449·5	19·1	6·1	7·77
8	**Bergamashi (Italy)**	Super Tigre 2·46	52·37	7·0	365·8	34·5	492·9	17·95	5·25	7·3
9	**Lippens (Belgium)**	E.D. 2·46 ...	57·11	6·1	347·2	41·0	491·35	28·0	8·22	11·4
10	**Teunissen (Holland)**	Typhoon 2·47	58·26	6·5	379·75	28·0	486·7	18·4	5·45	7·5
11	**Skalla (Austria)**	E.D. 2·46	67·32	8·0	436·3	26·0	677·35	21·16	4·47	8·6
12	**Kempen (Holland)**	Typhoon 2·47...	51·18	8·1	418·5	48·0	620·0	19·53	4·55	8·0
13	**Barth (Germany)**	Castor 2·49 ...	67·70	7·48	408·4	27·0	644·0	19·21	4·27	7·65
14	**Monks (Gt. Britain)**	Elfin 1·49 ...	44·48	6·69	351·05	47·0	435·55	11·88	3·93	7·95
15	**Ferber (Belgium)**	Elfin 2·49 ..	57·08	8·0	455·7	38·0	629·3	22·32	5·08	8·88
16	**Maret (Switzerland)**	Super Tigre 2·46	67·0	7·36	492·9	25·0	613·8	17·77	4·35	7·2

it took a lighter model higher, faster by having a superior thrust/drag ratio and then it caught three thermals in a row.

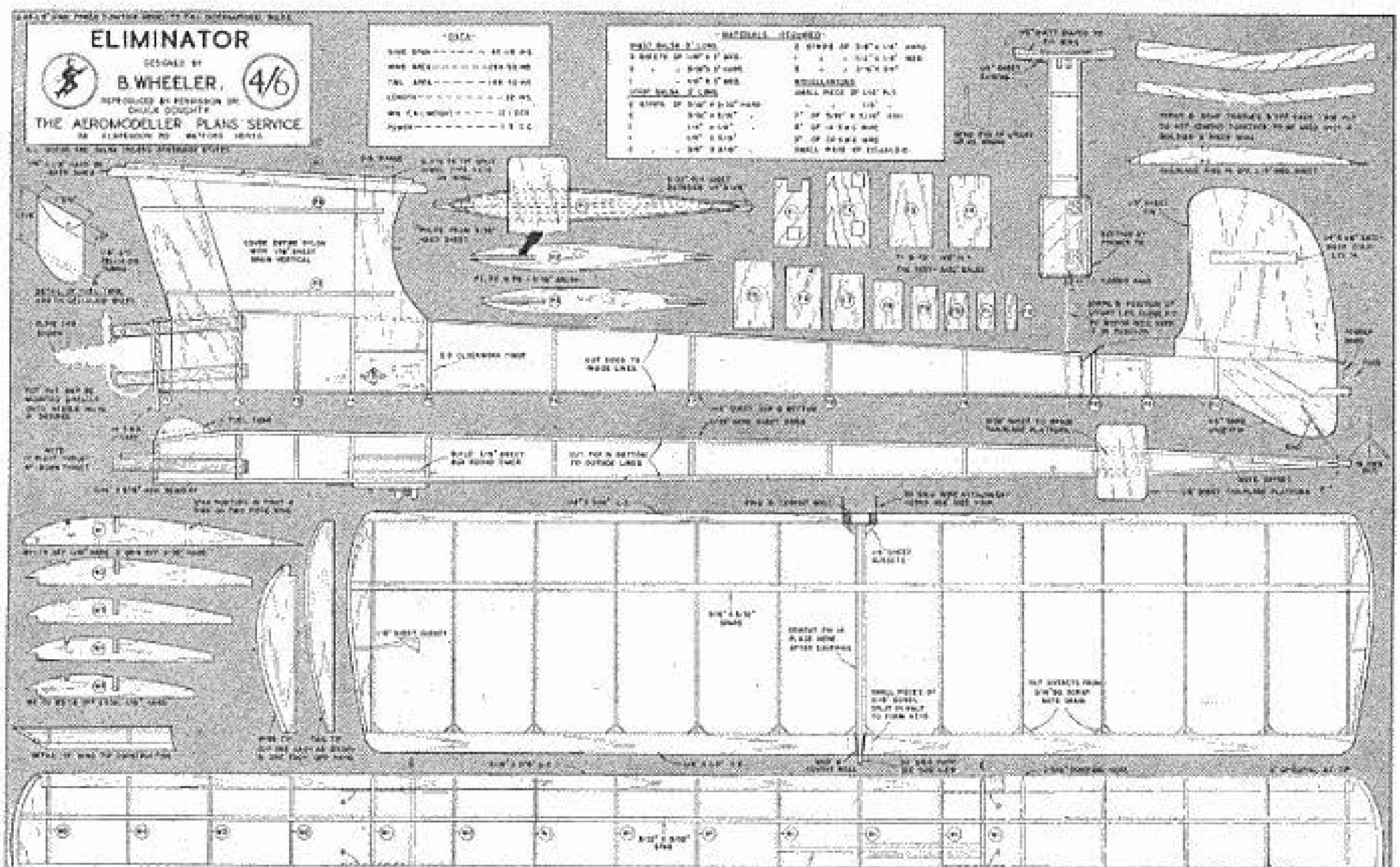
On the other hand, discounting design for climb, the larger 2·5 c.c. model has it all its own way when it comes to gliding angle and rate of sink. The ideal is of course, to have the fastest, steepest climbing model with the finest glide. Roger Maret of Switzerland had that of course, but ran off the rails somehow on his second (17 secs.) flight. The Swiss are divided into two camps. French-Swiss use smaller Glo-plug engined jobs, German-Swiss have large diesel powered designs. But both parties design for the glide, and sort the climb out later.

In this country we seem to take the view that he who gets highest in the allotted time gets the greatest chance of catching a thermal.

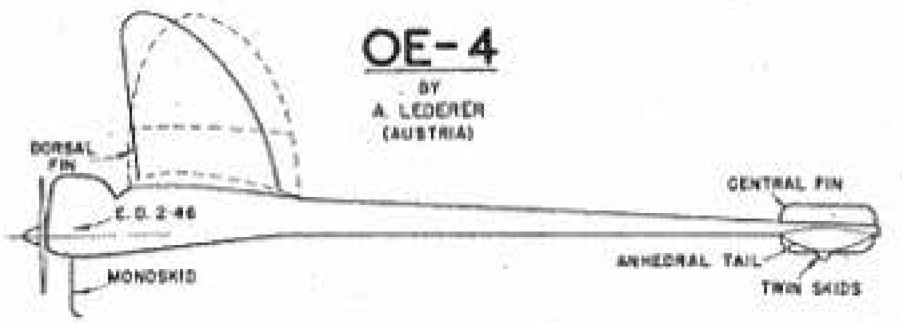
Thus, we tend to get the climb first, then try for the best glide. Hence the prevalence of the pylon—the constant demand for more and even more powerful motors—and we might add, the high rate of crashery.

Is there another way of tackling the problem? Charles Hampson Grant in his "Design for Flight" told us that for spiral stability, the centre of gravity should lie approximately on a horizontal line

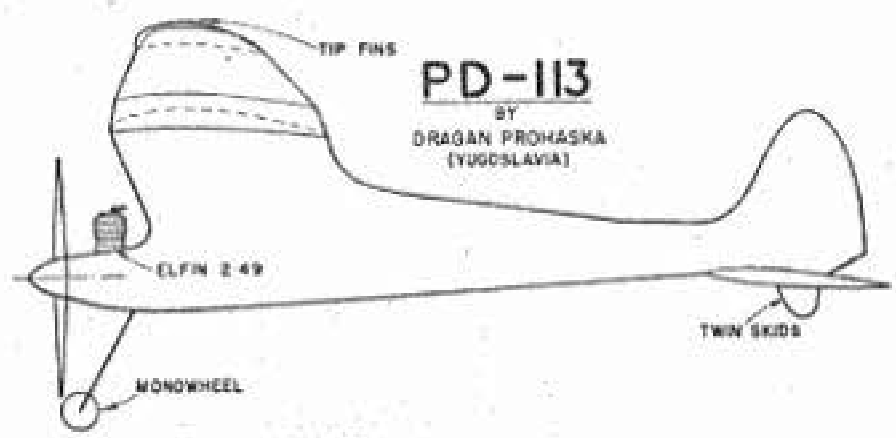
passing through the centre of lateral area. That didn't save Roger Maret's HB-2 from spiralling in at Dubendorf; but Grant also said that a *low* C.L.A. is a good thing for flight stability, and this was borne out by the revolutionary designs of Bragaglia (Italy) and Kempen (Holland). Both these models climbed straight ahead, perfectly stable and at a commendable rate of climb. On the other side of the fence, some European exponents, doubtless inspired by Italian Ing. Di Pietro's dorsal fin designs, favour a wing close to the thrustline,



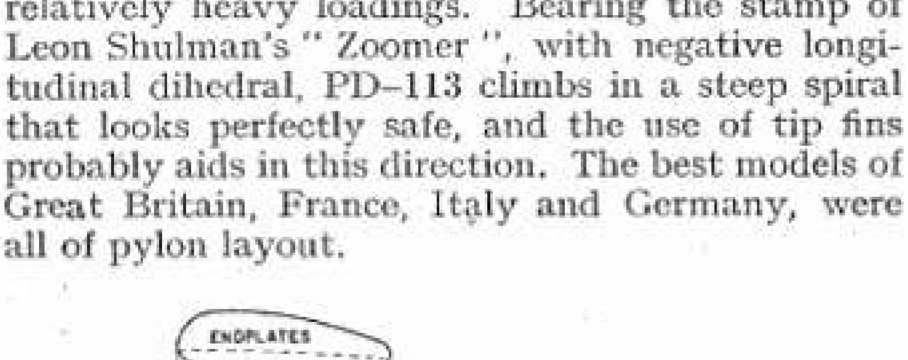
Full size copies of this plan can be obtained from the Aeromodeller Plans Service, price 4/6 post free.



and what would have been pylon area, in the form of a huge forward fin. This *high* C.L.A. layout was used by the Austrians, Lederer and Dejaco at the World's Championships, and they coupled the idea with enormous tail moment arm fuselages. Motor trouble and poor stall recovery are not conducive to good performance, so we were not given the desired opportunity to check the exact value of the "Cock's Comb" fin. Perhaps the fact that one of these boys refused to fly after the fin had been broken off, is indicative of its usefulness.



One should not forget, however, that the popular pylon layout is also a *high* C.L.A. form of design, and if we are to make an example, then Prohaska's Yugoslavian entry last year, was the only model to gain two maximums, and this in spite of its relatively heavy loadings. Bearing the stamp of Leon Shulman's "Zoomer", with negative longitudinal dihedral, PD–113 climbs in a steep spiral that looks perfectly safe, and the use of tip fins probably aids in this direction. The best models of Great Britain, France, Italy and Germany, were all of pylon layout.



Without *really* knowing the value of the "Cock's Comb" fin, the recommendation for 1953 design would be—if you favour the pylon, stick to it—if you've had little luck with the pylon, try a high thrust-line and low centre of lateral area and play safe. Keep off the toothpick tail moment, use a mechanical timer and shut-off valve, keep the appendages (wheels, etc.) down to a minimum and concentrate on the glide.

Barry Wheeler, top man in '52 Power Tables and holder of the World Championship.

The Top Two

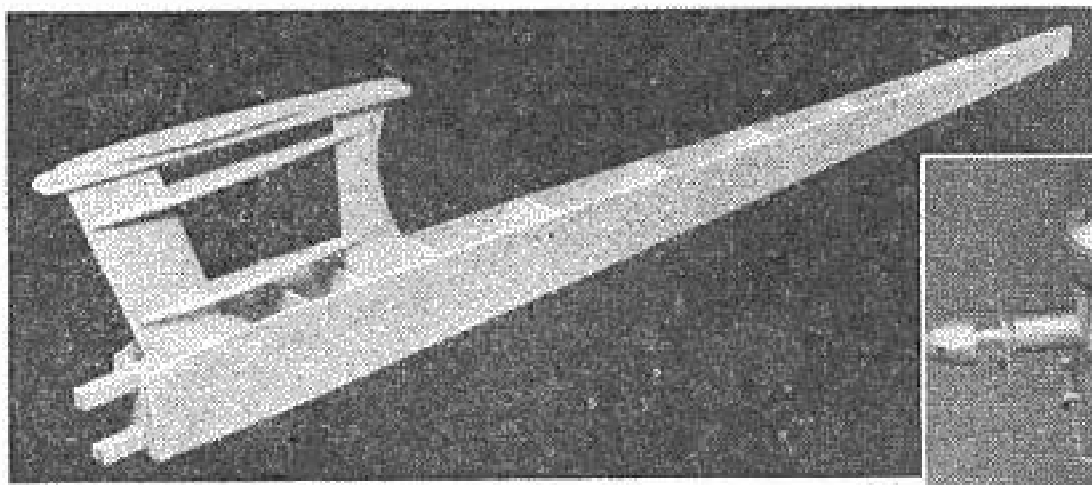
Barry Wheeler's "Eliminator" is the Birmingham club's development of the very successful "San de Hogan" American design. In planform it closely follows Bill Winter's "All-American", and it incorporates a Denny Davis drag tab for glide trim. Add to these features, a sheeted box section fuselage, tip-up tail d/t, skid undercarriage, offset underfin, side-mounted 1·49 motor on side and downthrust pre-set bearers, flat bottomed sections, 52% tail, and you have a potent model.

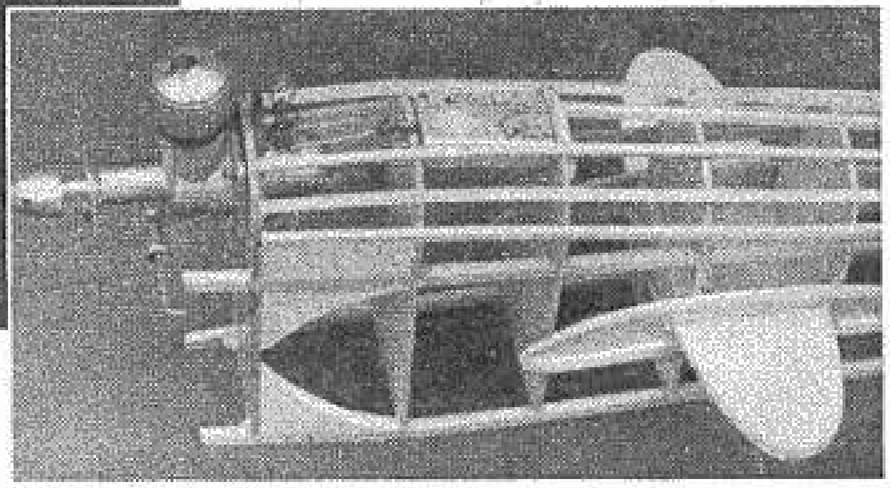
The APS plan will be found perfectly self-explanatory, needing no further comment. We have added detail for detaching the wing halves as an aid for transport, this is used in our own test model, (built from Chuck Doughty's kit), and the whole model can now be carried in a box measuring only 8 × 8 × 33 ins.

As with the "Komet", the "Eliminator" can use a little wash-out on each wing tip panel. Barry Wheeler recommends that the C.G. should be between 85% and 95% of the root chord, and that glide tests should be made with tail packing to trim for a long and fast glide. Then set the clockwork timer for 6 seconds, add an extra 1/32nd trailing edge packing under the tail, and launch with the engine at low revs. Best trim is for a 100 ft. right hand spiral climb, followed by 100 ft. left hand circles in the glide, the offset underfin taking care of this and also helping to stabilise the spiral climb. To increase forward speed, that extra piece of 1/32nd tail packing can now be removed. To tighten the glide turn, add plasticine ballast weight to the drag tab, and for best climbing performance, fit an 8d × 6p wooden prop.

The Kit

The speed with which Chuck Doughty produced his 19/6 kit for the "Eliminator" after its success at the 1952 World Championship and win of the Frog Senior cup, deserves comment as the fastest piece of kitting yet.

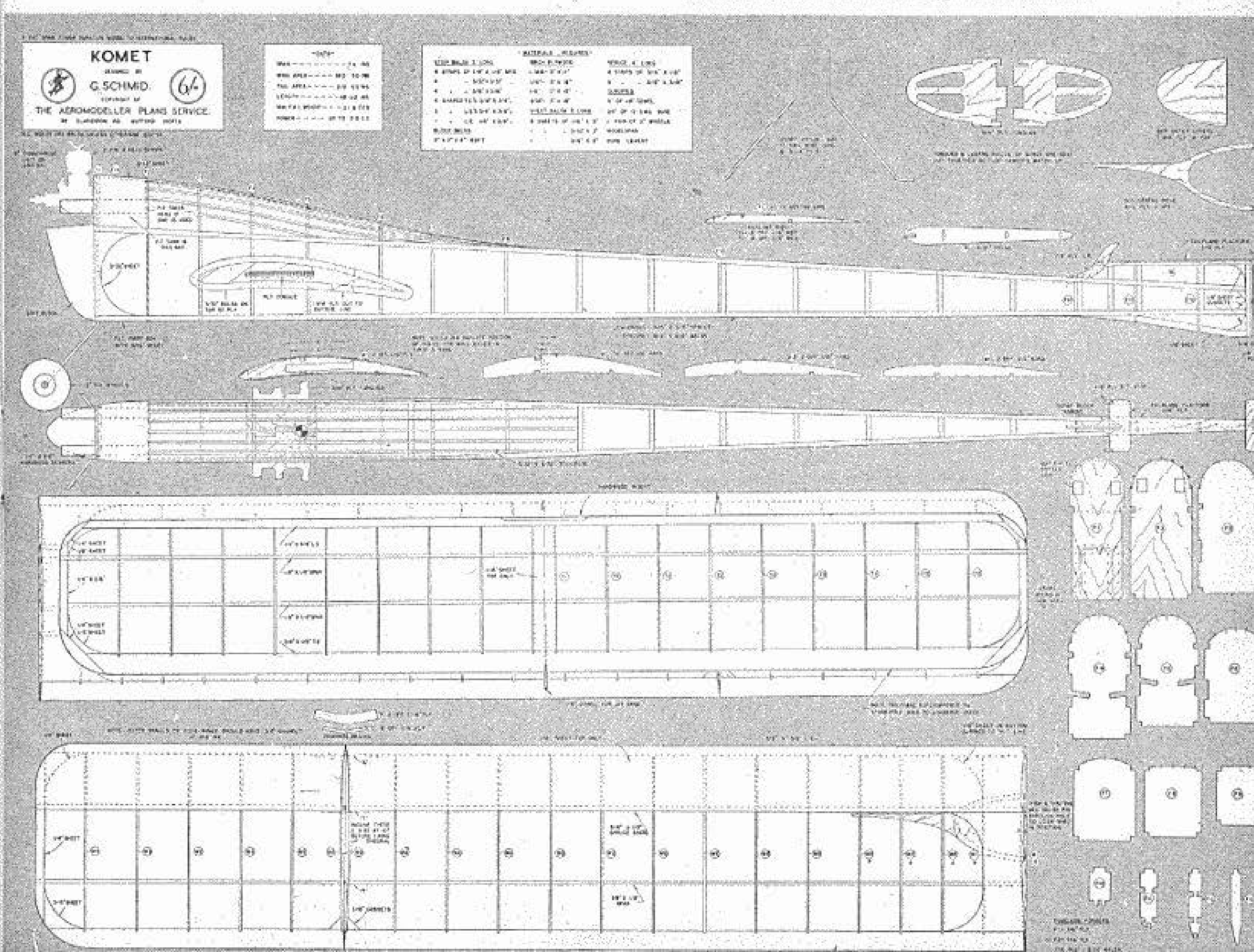


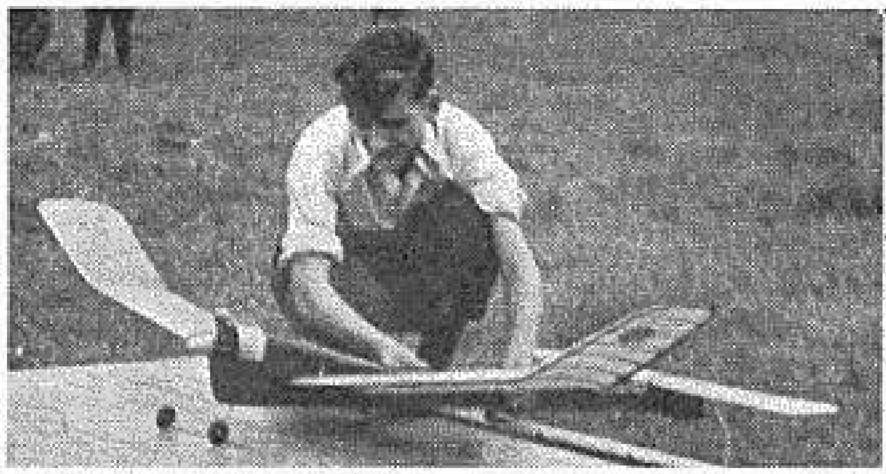


Eliminator and Komet fuselages show two entirely different constructional methods. Timer installation, with shut-off tank and radial motor mount is seen on the Komet.

However, if the kit builder wishes to build a *true* replica of the Wheeler prototype, he had better proceed with caution. There are many cut-out parts in this complete kit, and for the ribs, there are metal templates. Each should be checked *carefully* against the plan, as required for construction. We had to alter the bearer slots in the ply formers, file down the rib contours, trim the pylon parts, and space the 4th and 5th formers wider apart to take the E.D. Timer. But lest we give the wrong impression, let us hasten to state that each of these parts erred on the favourable side, and after all, it is a kit for the contest man, who will undoubtedly have his own ideas as to detail construction. In the instructions, a number of typographical errors bring forth a smile or two, but these too, may be attributed to hasty production. Verdict: A full kit for a very good model, and at the right price.

Full size copies of this Komet plan can be obtained from the Aeromodeller Plans Service, price 6/- post free.





Gerhard Schmid about to launch his Komet R.O.G. in a Swiss contest. Outer panels of polyhedralled wing have 3/8 ins. washout, original model had straight dihedral only. Gerhard's model does not have leading edge covering; but this is advised on lighter version in A.P.S. plan.

Komet

Spelt with a "K", thus avoiding confusion with the slightly larger De Havilland product, Gerhard Schmid's second place model is a totally different approach. Virtually a glider, with engine mounted at safe high thrust line, the Komet represents Swiss design and construction, with mixed balsa, ply and spruce parts. This version, with balsa taking the place of ply formers, can be built right on to the minimum wing loading weight. We venture to suggest that its slow climb, but magnificent glide will put it right up with the best in British power events. Now for the development of the design, we turn to Gerhard Schmid :—

"For a year I had been a member of the Model Aeroplane Group of the Apprentices at Brown Boverie and after having built a beginners model and Bruno Bachli's A/2 'Sperber', I gained an interest for power-driven models. Clubmate Kurt Speck had already built two models similar to the model by Fritz Strub's F.19 (A/Annual 1949, APS drawing PET 353), and in the spring of 1950 we had the idea of developing a new model. To avoid loop climb, we put the wings low down and raised the thrustline. Motor was the Micron 10 c.c. Wingspan was to be 90½ ins. and the total area was to be 1,240 sq. ins., while the outline was similar to the Komet. In Autumn 1950 the model was completed, but it proved to be very disappointing. The glide was very good but the climb extremely unstable—I thought the fault lay with the very powerful motor. At the same time I won a new motor in the Club contest, similar to the Swiss Castor 2·5 c.c. diesel. I immediately made it my business to build a new model, with the same shape, but somewhat smaller. I reduced the dihedral to 9° while I increased the side view by 1/10th.

I christened this model Komet. In the spring of 1951 it was finished and test flights made. The results were astonishingly good. The thrustline was altered to 5° downthrust and now the model soared in a beautiful left spiral. The gliding was similar to the 'Sperber' A/2 glider.

May 1951 I participated for the first time in a contest with the Komet, on the occasion of the Swiss Power model event at Frauenfeld. I got 4th place and in June 1951 with my clubmate Heinz Lauchli who had also built the same model, went to the World Championship in Paris and took first place. During a light wind we found that the climb was slightly unstable and inclined somewhat to right spiralling. To rectify this fault Mr. Degen, model expert of the Swiss Aero Club, advised me to raise the outer part of each separate wing 20° and to have polyhedral instead of dihedral. I took his advice and the result was excellent, and stability left nothing further to be desired. The successive results are doubtless known to you.

Last December, at Dubendorf, in Switzerland, Heinz Lauchli placed second in the 1952 World Championship with an average of 4 : 08. I need hardly add that the Komet owed much to its gliding angle and slow sinking speed to place so high in two successive World Championship events."

There we have the two best models in the International class of 1952. Check models of each have been made by the AEROMODELLER staff, and we hope to issue a comparative report of their performance in a future issue. Timers will be set at identical settings, the models launched together and timed over a lengthy series of flights.

***At left:** Heinz Lauchli, in the Swiss power team for the past two years, and who placed second in 1952. He uses leading edge covering and tail rib gussets. We reproduce the view of Gerhard Schmid's glider at right, to show how the Komet is designed primarily for its super glide. Note the strong resemblance to his Komet design, polyhedral being one of the few differences.*