Aero Modeller

NOVEMBER 1969
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MODEL AIRCRAFT

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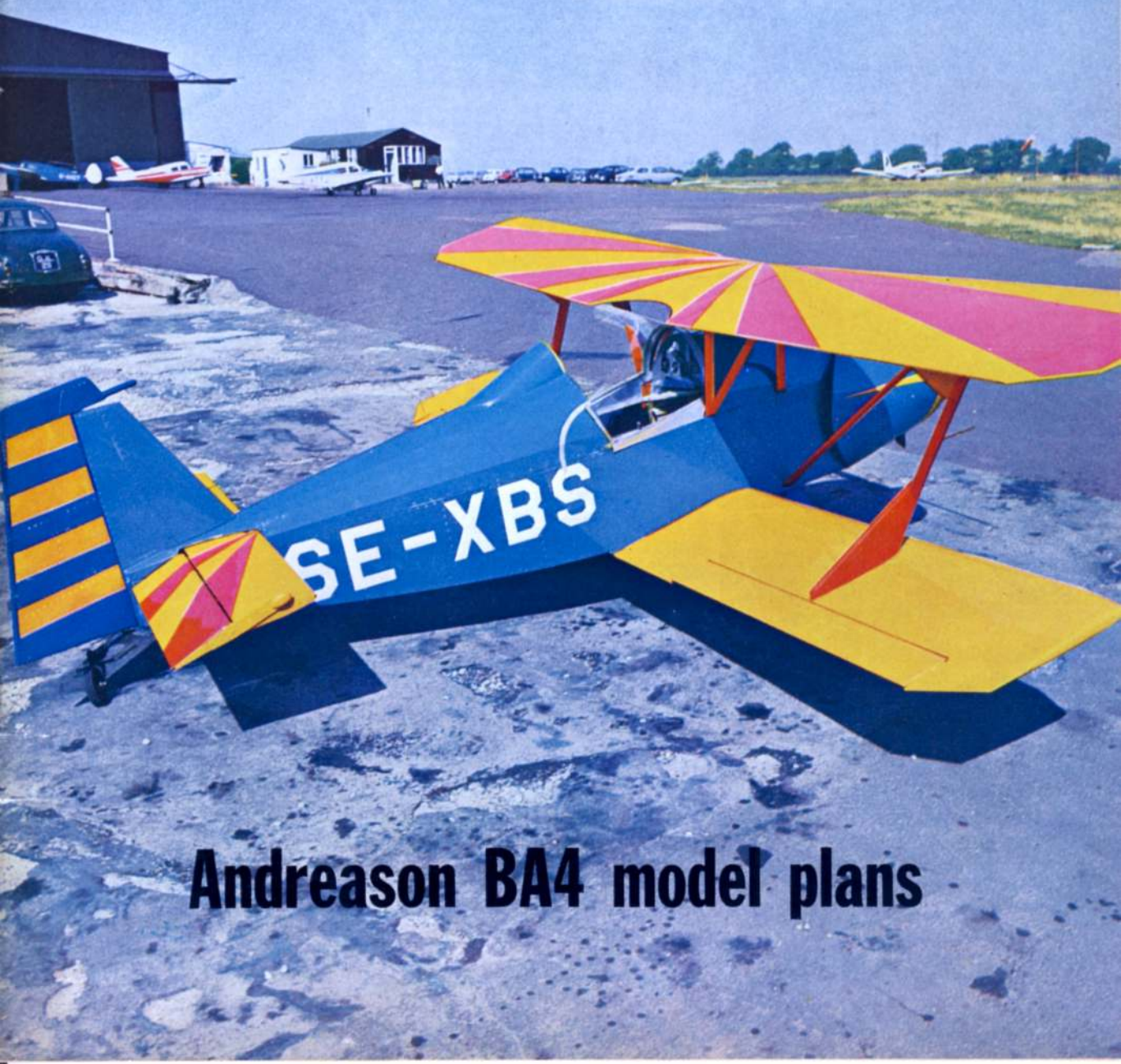
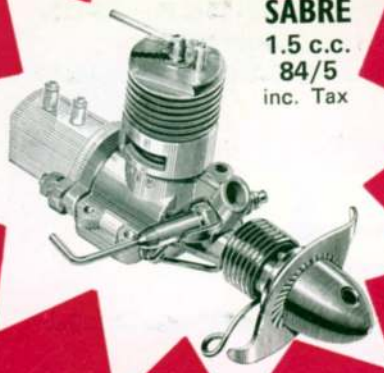


Andreason BA4 model plans



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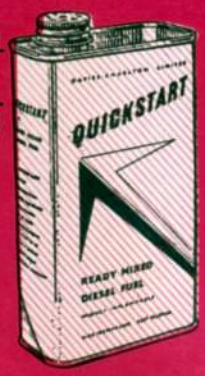

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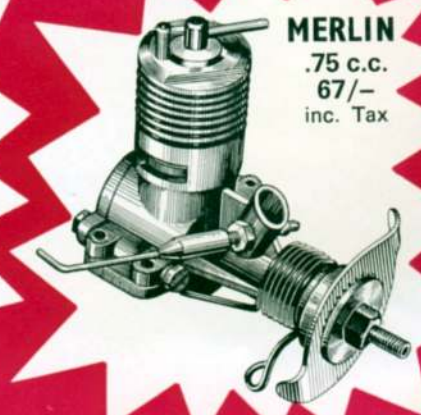

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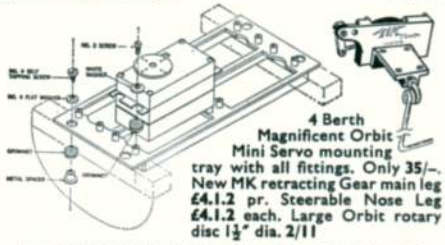

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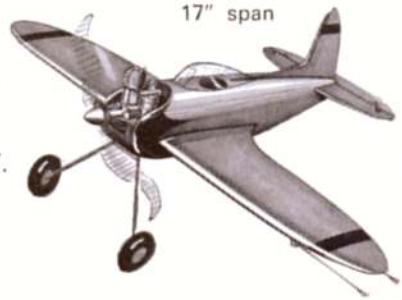

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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

November 1969 VOLUME XXXIV No. 406

CONTENTS

Editorial Director **D. J. LAIDLAW-DICKSON**

EDITOR **R. G. MOULTON**

Advertisement Manager **ROLAND SUTTON**

COMMENT

This is very much a contest issue, and rightly so, for there is nothing more important in the whole world of aeromodelling than the International Championships. In these days of strife in the political spheres, it is gratifying to be able to report that over thirty nations, among them sworn deadly enemies, can meet and mix happily on the model flying field. This exchange of goodwill and technical development may only directly involve a few hundred participants; but the end benefits are spread throughout the entire modelling movement. Though to the sports-flyer it may not appear that the sophistication of the modern contest design is of any use to his kind of aeromodelling, we can assure him that the side benefits in terms of progress in engine and model design are of inestimable value.

on the cover

The Swedish design by Bjorn Andreason which is the subject of Walt Mooney's 'Peanut Scale' rubber driven model design on pages 602-605. This little biplane of only 17 ft. 6 in. span is caught by Richard Riding's camera whilst temporarily resident at Elstree.

next month

More on the **Criterium of Aces; U.S. Nats.** and **World Champs.** with Tech. gen., ever popular **Luton Minor** converted for radio control, **two full size free plans, glider development** and the **McCoy .049** reviewed. Out November 21st.

Made and printed in Great Britain by Graphic Art Services (Brighton) Ltd., Burgess Hill, Sussex, for the Proprietors, Model & Allied Publications Ltd., 13/35 Bridge Street, Hemel Hempstead, Herts. Published by Argus Press Ltd., 12-18 Paul Street, London. E.C.2, to whom all trade enquiries should be addressed. Registered at the G.P.O. for transmission by Canadian Magazine Post.

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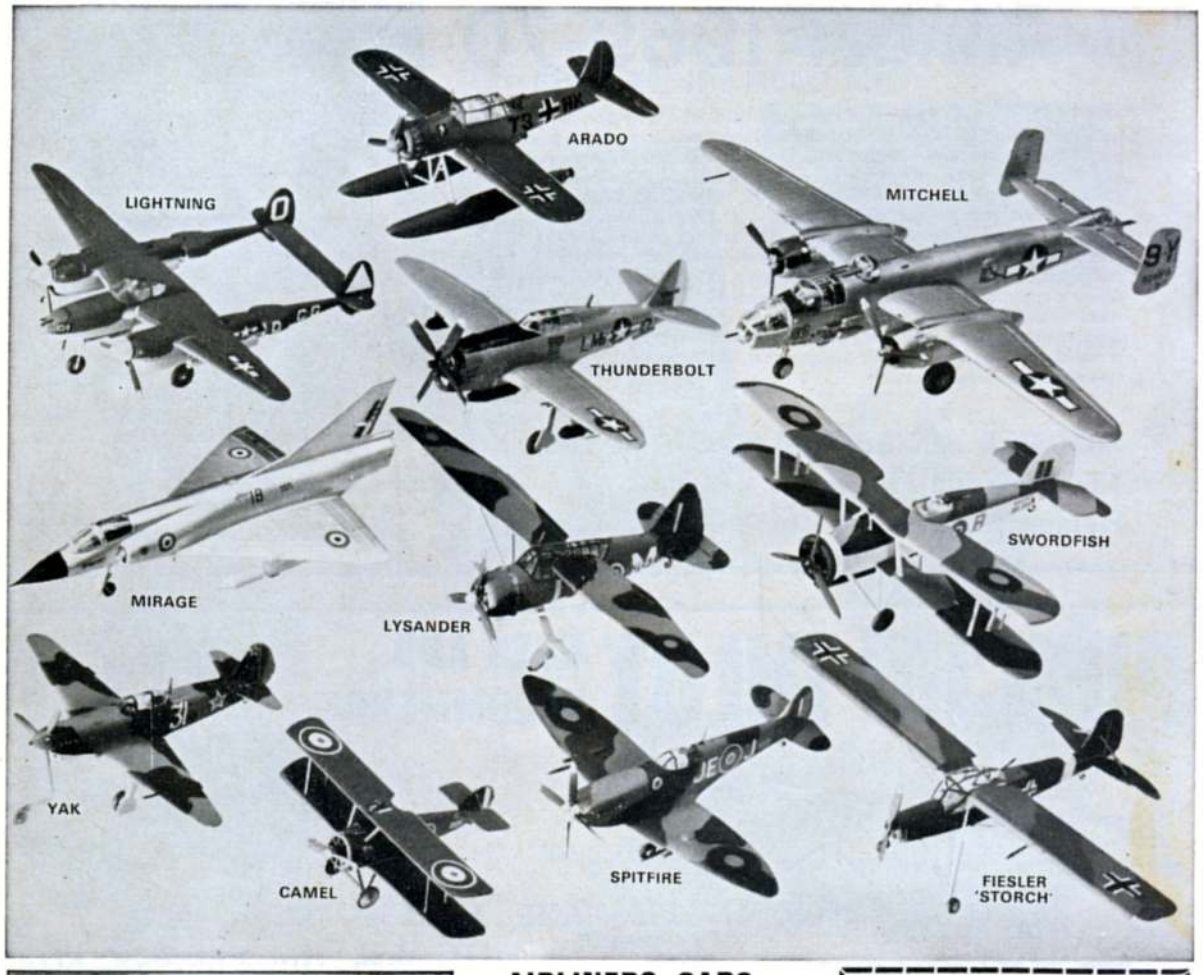

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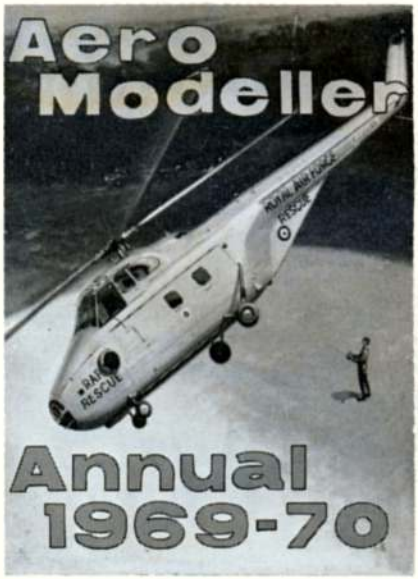
This is the 22nd year of continuous publication! Lucky the modeller with a full set! Laurie Bagley has provided a grand cover once again with his R/C scale model Whirlwind in bright yellow livery. To tie in with this Dieter Schlueter's fine article on Model Helicopter Technology. (Dieter was winner of 1st International R/C Helicopter Event – also reported in this Annual). John Burkham, of U.S.A. (who won *their* first 'Copter event), adds comments. Other articles include Tubular Fuselages from Balsa; Contest Model Performance Prediction (not to be taken too seriously!). Beginners Only Please; Facts About Propellers; Glider Construction Suggestions; Navy Carrier Event and What it's All About; Fuel Control. Fifty model plans – all scaled and with main dimensions shown – from the year's best, most interesting, curious, screwball, intriguing, different designs that have appeared in the world's aeromodelling magazines.



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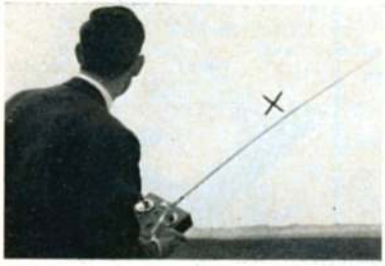


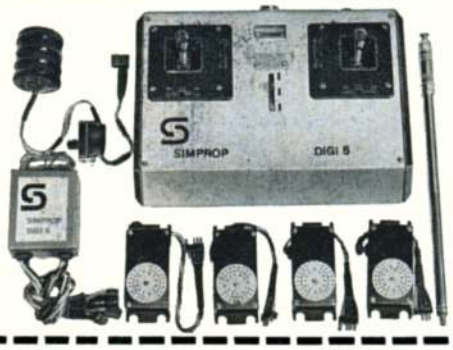
The winner of 'Find the Model' No. 2—R. D. Peet, of 84 Linksview Crescent, Newtown, Worcester, who receives a Kraft 4 Proportional Unit.

Near miss prizes of Navigator II Single Channel units were won by:

R. Grimes, 31 Hillcrest Road, Acton, London, W.3.

A. Pearce, 33 Blackwood Road, Milngavie, Glasgow.

R. Singleton, 16 Broughton Road, Sheffield 6.



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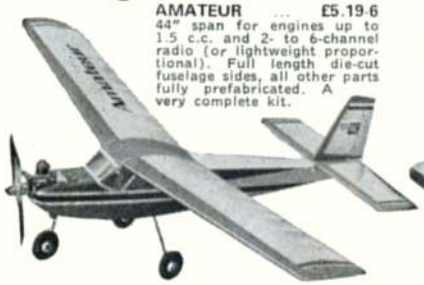

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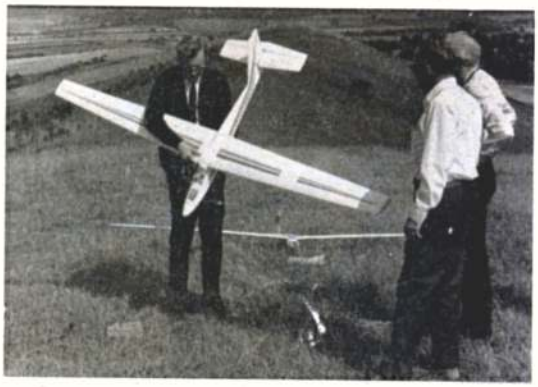


During a recent visit, Dr. Walt Good and Howard McEntee of the U.S.A. were duly escorted to our 'local' Ivinghoe Beacon slope soaring site. Guess what – it was so calm that all R.C.M.&E. editor Tony Dowdeswell could do with the Graupner Foka was to fly to the base of the hill.

COUPE D'HIVER ANNUAL CHALLENGE run by the Model Club in Nice in the South of France, is to be held on the 7th December this year at Levens for the traditional Coupe de la Cote d'Azur. First prize amounts to £10 in cash and a hotel is reserved for visiting competitors. Enquiries to Pierre Andreis, 38 Avenue de l'Arbre Inferieur, 06, Nice, France.

F.A.I. PROPOSALS of consequence tabled for the C.I.A.M. on 6th November in Paris include *Free Flight,* banning the 'Pipe' and introduction of Isopropanol Detuner in standard fuel as a power retardant. Also proposed is the use of binoculars by timekeepers. For *Control Line* it is proposed that combat mechanics should have safety helmets and that the team race method of heats should be applied rather than the 'knock-out' system. It is also proposed that silencers be obligatory for Control Line Stunt. *Radio Control* provides the biggest controversy in the presentation of three relatively similar sets of rules for Radio Control Pylon Racing – from the A.M.A. (for Formula II), from the Radio Control Sub-Committee and from Denmark. Differences come in the size of engine, 40 in the case of Formula II and 29 in the other two proposals, in model specification, and in the Radio Control Sub-Committee proposal, the suggestion that tank capacity be restricted to 60 c.c. There is, of course, already a strong following in the U.S.A. for Formula II and British modellers have adopted the Formula I Class for 'Goodyear' models. Details are now circulated to S.M.A.E. members so that they can express their views to their representatives.

Equally important is the Sub-Committee proposal to completely revise the F.A.I. R/C Aerobatic schedule with the introduction of new manoeuvres, the 'Figure M', and the 'Four Point Roll', whilst the 'Rolling Circle' and 'Inverted Figure of Eight' and 'Tail Slide' are taken out as they are said to consume excessive time and are difficult to judge accurately. Other new rule proposals cover Radio Control Slope and Flat Soaring.

VANDALISM at recent events really hurts us, especially as we were obliged to report on this unhappy state of affairs last May. Reader B. Wilson of Stoke relates his own sad experience and regrettably we know these cases were not isolated.

'First, my own model. This was a new model on its second flight at Woodford on 31st August, 1969. My wife and I watched the model land down wind on the runway; because I knew the spot where the model had landed I decided to walk after the model. After arriving at the spot the model had gone. I searched for well over an hour, hoping someone may have picked it up in mistake. I also reported to main control but no model had been returned there. The model was an A.P.S. ½A Train with a Cox TD 049 and a KSB timer.

'The second loss was at Cranfield on 21st September, 1969, when a fellow member, John Carter, left his ½A model by his caravan while retrieving a model. When he returned someone had smashed the front off his ½A model containing a TD 049 and engine timer.

Like you said ½A flying is expensive at this rate.'

THE WORLD RECORD CLAIM, 17 hours 43 minutes, has been submitted for ratification by Winfried Kaiser of West Germany, and this incredible flight is fully described in the November issue of *R.C.M.&E.*

Model recovery at Beersheba, Israel, by Naftali Kadmon who placed 6th in their A/2 glider trials is unique by any standards. Right: Keil Kraft Student test kit now completed, held here by Linda Charles, another M.A.P. staff member – anyone else care to join us?

Elton Drew wins A/2 glider

World Champs

for Free-Flight models at Wiener-Neustadt

IT WAS almost like returning home to revisit Wiener Neustadt, which had been the scene of an earlier championships in 1963. Krill was still at the helm as contest director with his pawky Viennese humour and unflappable manner; the 'office' still occupied the local union headquarters; the same enormous stony airfield continued to lose hundreds of contestants over its vast area – anyone without binoculars was definitely at hazard! After reports of super-policing of other events it was a great relief to be in Austria, where public opinion is so anti-police that they are usually referred to as 'gendarmes' rather than the hated 'polizei' . . . we only saw one policeman throughout the three days' flying actually on the airfield . . . and he was pointedly whistling Blue Danube as he looked the other way to avoid seeing a minor breach of the law !

A great entry of thirty-two nations with thirty-one actually taking part (South Africa did not arrive) was welcomed on the airfield parade ground by Austrian Aero Club officials, members of the government, the Mayor, with music from an enthusiastic brass band, and goodwill speeches of introduction. An interesting newcomer to international competition was the team from Egypt – three strong with a team manager, all speaking beautiful English – products of the British School in Cairo. They were enthusiastic, but were the first to agree their mission was not to win; but to learn. Wisely, they competed only in the glider event, but were keen students and will no doubt field a strong team next time. Turkey had a full team, including a most elegant young lady, who demonstrated that nation's new emancipation. Denmark also included Anita Delbaek in their team – who was subsequently awarded the 'most beautiful competitor' prize! From South America it was nice to see old friends from Brazil again. Even more distant visitors came from Australia – whose members, if not solely engaged in competing, had made it a major part of their trip to Europe. Another competitor/observer was Kei-Ichi-Kibiki from Japan, who competed only in the power event and was by no means outclassed in 49th place.

This was the first occasion that the new seven round programme with progressive fly-offs to follow had been put to the test. With a daily entry of 84, 72 and 61 competitors, an early start was imperative, so that breakfast was scheduled for 6.30 a.m., and on the bigger glider day, which included the official opening ceremony, on-field lunch was taken without an official break to keep to timetable.

A criticism of the 1963 event had been timekeeping/scoreboard delays. This could not be levelled on this occasion, as the organisers sported quite the prettiest little score booth we have seen. A metal framework enclosed a small 'office' and times were recorded on neat panels, filled from within. All 'max' scores of 180 were shown in pink, less perfect ones on white card, so that instant appreciation of contest 'state' was possible. Rounds occupied one hour each, broken into three 20 minute periods and at no stage did we check and find progress more than half-a-round in arrears; times were usually being posted within ten minutes of a given flight – or just walking time to hand in record cards! The whole scoring booth could be lifted onto a trailer and towed off to a new site when conditions changed and made it necessary.

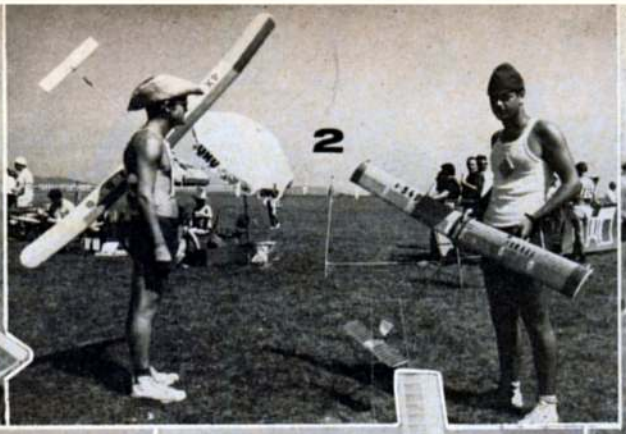
No organisation that we remember has been perfect and weakness at Wiener Neustadt was undoubtedly the public address announcements, where the second and third 'official' languages of English and French suffered sadly. Keen-eared British listeners could follow, but pity the poor Dutchman who may have relied on English for his information . . . It was also evident that a bi-lingual team manager is surely a *must* for future events. With the large numbers of timekeepers required very many of them had only German and matters of rule interpretation sometimes proved difficult to say the least. All timekeepers and officials sported Australian-type bush hats in various colours; all persons on the actual flying field were required to have either hats or other 'authority' to be there, or else remain behind rope barriers. From time to time sweet reason from the officials over the p/a sought to clear the areas. That it worked even moderately well was due to small numbers of public present because of bad weather. With hot days it could have been chaotic! Motorcycle recovery men were sometimes over-enthusiastic in their efforts and more dangerous than helpfull Apart from which, round followed round and programme times were kept admirably . . .

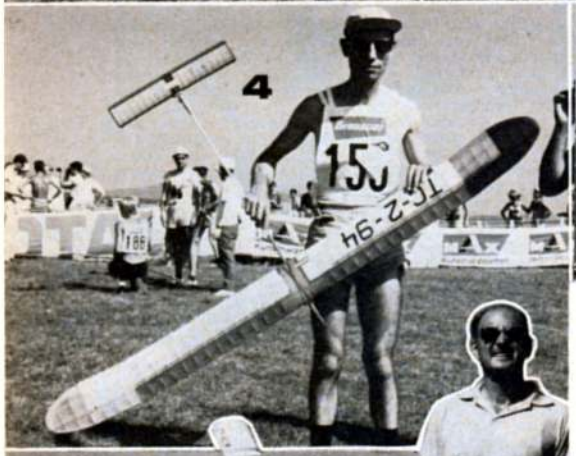
Glider

After a sunny start covering the opening ceremony the glider maroon for **round 1** was only a few minutes behind schedule. Shorts and sunhats seemed the order of the day, following the hot practice days which had preceded the event. Hardly had the first flights been towed aloft than a wind change involved a rapid change of operating venue. However, max flights seemed the order of the day even this early in the morning with prospects of an organisers' nightmare and a 50 strong mass fly-off at the end! A further wind change involved another change of tow-off area, but this was followed by a sudden, fierce storm with thunder and lightning which drenched nearly everyone, most of the models, and led to some review of final outcome. **Round 1** had produced 62 max. out of 84 flights; **round 2** reduced this to 56 still all-on; **round 3** a further drop to 42. At this stage our own Drew and Young were still clear; third man Batty had dropped 39 on his first flight. Four teams still had clear scores – USSR, Italy, Austria and France.

The shorter round times of one hour divided into twenty minute sections, plus the limited tow-off area introduced another major factor into contest flying . . . the efficiency or

Winner Elton Drew, G.B. with 2nd place man George Pataki of Hungary. Although it looks smaller, the Hungarian model is actually of about the same span as the winner's.





GLIDER

1, C. Boscard of Italy, 10th, has novel diagonal bracing. 2, Vishniza (left) and Herzberg, Israel, latter had string of 5 max's, then dropped. 3, J. Schreiner, East Germany, model like last year's winner. 4, A. Tanyu, Turkey, placed 9th this time after fabulous 4th in his first International last time. 5, N. Munnukka, Finland, 7th, model in A/Annual this year. 6, Martin Dilly – proxy for P. Lagan of New Zealand. 7, A. Young, G.B., who suffered from theft of his No. 1 model. 8, S. O'Connor, Australia, furthest travelled. 9, P. Klintworth, U.S.A., uses elliptical sweepback. 10, A. Lepp, U.S.S.R. 12th; in paper hat – Team Manager, Orletinov. 11, Jesus Lopez, Spain, their top man at 16th. 12, Amer Moh Fathi, Egypt, new Nation in W/Champs.

The winning U.S.S.R. Glider team, specially posed by their team manager for the papers 'back home'. They had borrowed their medals to wear in the picture in advance of their official award, left to right: Lepp, Pugatschenko and Grigorasch.

otherwise of various 'neddy boxes' or thermal sniffers. These varied from assorted transistorised marvels from Russian and American stables, including several barograph writing types, via Jack North's super bubble blower at a great height, to simple soap bubble dispensers walking through the mob with a bubble to the left, a bubble to the right like confetti at a wedding. Add to this the chase to get up after a good bubble . . . or special tips via the almost universal walkie-talkies in operation, and more line-snagging than usual became inevitable. Wind, though fitful, was never strong so that at times the air was thick with circling models at fifty to a hundred feet . . . the last fifty feet taking very nearly a full 50/60 seconds in most cases.

Round 4, in improving weather conditions cut down the top scores leaving only 29 still with possibles. Only USSR still had a perfect team total, so that hopes began to rise for a GB team victory. Drew was still a max, but Young had a fourth of only 103; Batty had meanwhile redeemed a moderate start with three max's in following rounds. At this stage of flying, Pete Jellis, proxying for Graves, New Zealand and Martin Dilly for Lagan also New Zealand with max's, made a 'down under' victory quite on the cards. For Aussie David Anderson the event was becoming disastrous – adding to his incredible problems of world travel. Having successfully negotiated the South Pacific, USA, GB, etc. on the way, Quantas did not offload his box at Vienna – took it on to Baghdad! Consternation!! Three days later it arrived special delivery at W.N. having gone to Sydney, thence around the globe again just in time for practice! What a way to see the world! The weather did not hold and conditions became more and more 'typical British weather' so that **round 5** saw a murderous drop in possibles, only ten surviving at this stage; Drew, GB; Pataki, Hungary; Pugatschenko and Lepp, USSR; Soave, Italy; Graves, NZ; Braire, France; Patterson, Sweden; Kongsted, Denmark and Herzberg, Israel. The **sixth round** was really the vital moment, for in thundery conditions the ten contenders still there were reduced at once to two only. We were sorriest for Konsted of Denmark and Herzberg of Israel, who produced quite unexpected disasters with 88 and 50 seconds respectively. (In the event their last flights were almost equally disappointing).

Round seven started then with two only still there . . . a possible fly-off limited to two only . . . or an outright win. Elton Drew flew first and seemed quite unconscious that the occasion was something special . . . shy, a little nervous, with a half smile deprecating the whole thing . . . but then, he had been flying like that all day. Up smoothly under the eye of a grim, efficient lady timekeeper, who knew her rules to the last letter; a comfortable max was clocked without special fears. That left Hungary's Pataki to fly! Thundery conditions threatened so that uplift or down draught could be the order of the day. He towed up and showed at once that this could be no winning flight; but skilful lineplay (so well done by both the Hungarians and the French) to bring the model back to earth for a no-flight gave spectators an exciting few minutes. Up again shortly and off to a moderate but by no means perfect launch when the model snagged on someone's lines. Another 'nil attempt' claimed though it was not upset by its line contact and could have been a good flight. Last and final attempt with minutes passing and the final maroon imminent. Off! and a loud click as every available British watch went on! Two minutes, 2½ minutes and coming down . . . will it, won't it? . . . *No* . . . 2:55 so British watches said . . . a rush to the official watch . . . yes, 177 secs . . . A British outright win for Drew! . . . *Hurray* . . . Chris Fuller's Union Jack umbrella and chair the victor! Bad luck Pataki, but a truly wonderful effort to get there too, appreciated as a great sporting finish by all!

No team produced a full possible score, but USSR proved team winners once again with a convincing total of 3,642 from Czechoslovakia, Italy and United Kingdom in a modest fourth place.

Wakefield

Friday, 15th August was Wakefield Day and also a public holiday, Saint's Day in Austria, so that with fine weather, a good crowd could have been expected. The weather that had been so fine in the days before the contest continued to be wet and overcast with only occasional sunny spells. It was by no means cold, just fitfully wet. Only very modest numbers of spectators turned up in spite of the holiday. An innovation this year was the introduction of a military helicopter recovery service. This was very nice for those who had not seen helicopters at close range, but with the huge flat airfield, the available motorcycle recovery squads, and the absence of any strong winds, was really superfluous.

Entry at 72, though down on the glider total was still a formidable number to run through and **first round** provided 38 max's as a start. Models have nearly all moved into a standard pattern of tubular wound fuselage, folding prop, low pylon mounted wing so that the few unconventional entries made a sharp contrast with square fuselage or all sheet wings. Notable amongst the unusual efficient group was Hofsass of West Germany with his attractive 'Espada' – high aspect ratio wing of sheet construction and for the frankly curious department our old friend Mabille of Belgium with a twin boom, V-fuselage, twin prop design that never distinguished itself in the air – though it claims some considerable successes in the past, we understand. Good looking conventional models we liked included the ageless Kmoch of Jugoslavia – elegant as ever – the smart Russian team models and Burg of France with his neat, very long fuselage design. O'Connor of Australia was another with a sheet wing and – rare this – a diamond fuselage. The Brazilian entry by Eolo Carlini was another beautifully turned out model. Interest centred a great deal on methods of winding up – a number of metal protector tubes were in use, plus other breakage protector devices – and a number of winding stands enabling a one-man wind-up. Omo had provided teams with drums in which their rubber could be stored – or used as a seat by tired winders. The team stock was usually brought out from the shade and hustled back under cover again.

Second round ended with 24 max's left in. Weather was deteriorating into 'best British' again. Thermal sniffers were again largely in evidence – though again the simple soap bubble seemed as good as anything. In the more modest rate of Wakefield climb it was possible to watch bubbles going forty or fifty feet in the flight line of a model. More in evidence on this occasion was the use of bright tail fins, propeller flashes and so on to provide a sparkle that would help keep a model in sight on the edge of visibility.

On this second day there was a regular lunch break which coincided with the heaviest deluge of rain yet. This rain invalidated the beginning of the first post-lunch round, which restarted after several contradictory announcements. By this

Albrecht Oschatz, East Germany, Wakefield winner, taken after fifth round when prospects rosy but future still by no means assured !

WAKEFIELD

1, Luiz Serrano and Eolo Carlini with their beautiful models from Brazil. 2, Ray Elliott, Wakefield proxy for P. Lagan, New Zealand. 3, Laurie Barr, G.B., our top at 20th, fuses up, with eye on the 'magic box'. 4, R. Hofsass, West Germany, with 'Espada' sheeted wing model, most technically interesting entry. 5, V. Kmoch, Jugoslavia, 6th, with his usual immaculately built model. 6, G. Cassi, Italy, in fly-off 1967, only 2 max's this time. 7, John Gard, U.S.A., 5th, note also formidable American thermal sniffer. 8, A. Yurov, U.S.S.R. puts on last turns. 9, J. O'Donnell, G.B.; also wielded an invaluable camera and notebook. 10, A Burg, France. 11, Much-photographed A. Mabille, Belgium, with V-frame twin prop puller. 12, Canada's J. McGillivray.

Imposing array of hardware in local shop window. Largest trophy is famous Wakefield. Glass vase, left, is the Czech Journalist Trophy. Missing in 1967, Franjo Kluz trophy in delicate filigree work is next to salver on right and was duly awarded this year. Gold, silver and bronze medals on fine red and white (Austrian colours) ribands were also awarded.

time the first four rounds had winnowed out contestants somewhat drastically, going down in geometric progression from the **second round** 24, to **third round** 16 and **fourth round** 8. At this rate it seemed possible that a less than perfect score could win! Those with only a few seconds off began to enjoy new hopes. The **fifth round** ended more hopes – leaving in with max only Oschatz of East Germany, Kmoch, Jugoslavia; Sulkala, Finland; Parmenter, USA; and Simerda of Czechoslovakia. **Round 6** was even more time destroying . . . only Oschatz retained an unblemished total. Kmoch had dropped 40, Sulkala 13, Parmenter 53, Simerda 14, so that now those with minimal losses in earlier rounds came back into the running such as Martin of Austria (9); Silberg, USSR (10); Gard, USA (29); Loffler, E. Germany (19). It all depended on Oschatz achieving a final max! Once again the new scheme appeared to have eliminated the fly-off! There was little cliff hanging: Oschatz went ahead and flew quite early in the round and achieved a comfortable max . . . so was the unapproachable winner. Strangely enough, the same timekeeper who had timed Drew's flight the day before officiated at this flight. (She asked for an East German souvenir – we hastened to give her a British team supporter badge for the morrow – though it was not to prove helpful, alas!) Winning design is very much a team effort, other team members flying almost identical models. Conventional constant chord wing with tip dihedral, forward set fin, small tail, tubular fuselage, two blade folder, Pirelli rubber was the winning formula. Martin of Austria with a final max coasted into second place. It proved another team victory for USSR with their men Silberg (3), Melentiev (7) and Yurov (8). British efforts were unexciting with Barr best at 20th which included four max.; J. O'Donnell 34th and Wells 44th. Team position 10th.

Power

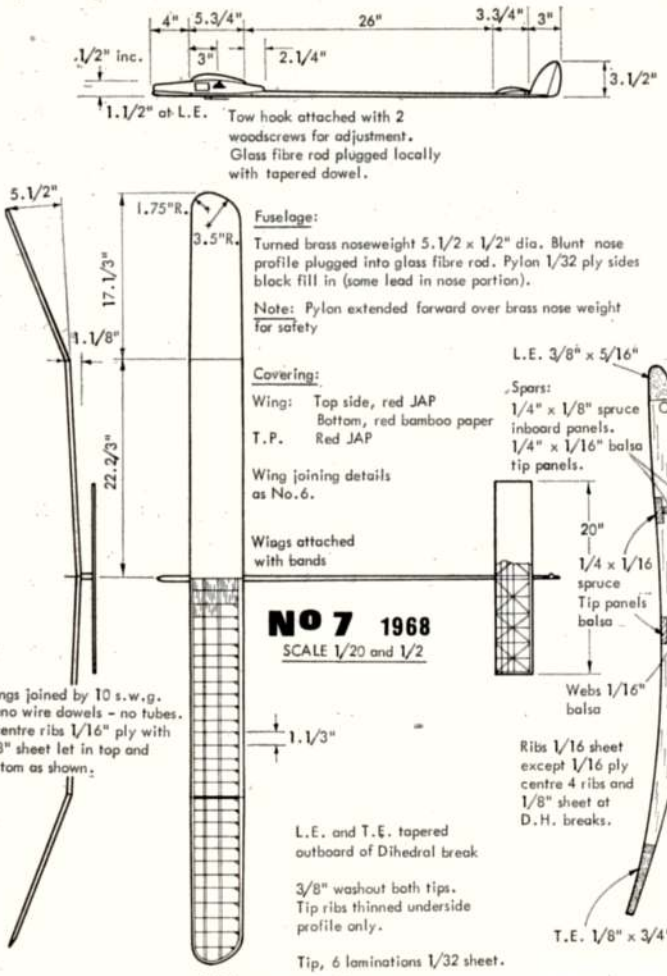
If weather had seemed bad before, it was nothing to that provided for the final event on the Saturday. Newly equipped with an ankle length 'peasant' plastic mac we joined the throng of anti-wet operators. Fortunately, the stony ground and sandy subsoil was absorbing water well and never developed into the quagmire that we feared. All kinds of ingenious devices were improvised to deal with the unexpectedly severe wet. Several people were wearing plastic bootees made from plastic luncheon bags (we still had our galoshes from Genk!). Numerous tent devices were rigged from plastic sheeting; the Bulgarians' fine weather tent really came into its own at this stage. Careful teams had brought more robust tent equipment, notably the Italians who thoroughly deserved their ultimate team win, and unofficial award of driest team in the event! The Africola sun awnings were pressed in to protect models; car heaters were running most of the day to dry off models; the British Union Jack umbrella was working overtime. The Danes rigged up a kind of hairdryer using their starter motor and batteries . . . everybody had his pet keep-dry method.

All this seemed to have little or no effect on performance – other than creature discomfort. Motors were going well, although not *quite* so well as they had during the dry, hot practice days before the comp. Some claimed the quality of the fuel had gone off, which might well be in the excessive wet and humidity, but max's were coming fast and furious . . . Again provision was made for a luncheon break, enlivened by stunting of military helicopters. Rain was evidently going to be there all day, as it was with unabating fury . . . but so were the max's. Of a total entry of 61, 34 had **first round** max's, 26 **second round**, 19 **third round** and 16 still in at the end of the **fourth round**. By the beginning of the **fifth round** Wiseman was the only British team man to have dropped points. He had had a disastrous first flight of 89 through variable incidence troubles and thereafter changed

Right, Baumann wiping down his winning model in the gloaming. Its sturdy sheeting and robust structure made it ideal for the conditions of the day.

Runner-up in the power event, K. H. Rieke. Tipped as a good prospect by the experts early on, his model was technically interesting and in spite of a launching mishap in one of the fly-offs, was seen to outclimb everything else.

POWER 1, Kei-Ichi Kibiki, lone entrant from Japan. 2, B. Fiegl, Italy, most successful of winning Italian power team, 3rd in '67, 7th this time. 3, A. Parovel, Italy, gives a shake-up before launching. 4, S. Savini, Italy, unlucky in the fly-off, but for 2nd time in top team. 5 S. Norton, U.S.A. with 'Lipstick', assisted by H. Spence and B. Sifleet. 6, Z. Malina, Czechoslovakia. 7, Jose Gorgorcena of Spain. 8, A. Grethcin, U.S.S.R. flick starts his motor, dropped in first round only. 9, H. Spence, U.S.A., 3rd – with his elegantly finished model, was also in '67 fly-off. 10, Dave Wiseman prepares to let go for a max. 11, Wet but cheerful Ray Monks with his models ready for the fly-off. 12, George Fuller gives it a good hard push in the rain.



Franz Baumann, power winner from West Germany, chaired on the stout shoulders of glider man Herbert Schmidt, his fellow clubman, also from Regensburg.

In the shelter of the British umbrella! Front centre 'Wiz' Wiseman, behind him is George Fuller and on his right Elton Drew. Extreme left Jim Punter – a tower of strength to Laurie Barr and extreme right the omnipresent John Bickerstaffe – in attendance at every free flight champs in the memory of man! Glider No. 7 is Elton's, as used for first flights.

to spare model, though even here it was dogged with trim trouble throughout. Meanwhile, George Fuller and Ray Monks had been going great guns. Young Chris Fuller proved a tower of strength in his efforts to keep Dad's models as dry as possible . . . *that* umbrella! The brightest weather period with a momentary rain stop let them both get quick max's with plenty of drying off time left in the round which enabled a longer choice of time in the critical sixth and seventh.

By this time it was clear that the Italians would be well in the running for the team prize with two members (Fiegl and Savini) still holding possible full scores; a team status also enjoyed at this stage by West Germany with Baumann and Rieke still at max. The **fifth round** 16 whittled down a mere three to 13 with one more departing after the **sixth**. Twelve then flew in the final round to lose yet another, leaving a grand total of eleven for the first fly-off. This included our own Fuller and Monks, the two from Italy, two from West Germany, and one each from USA, Sweden, Switzerland, Denmark and Czechoslovakia. With different luck of the trim, any of the first fifty of the sixty odd flyers could have been concerned in the finish. To drop half a minute in seven rounds earned no better than 20th place!

But back to the **fly-off**. Light was already murky by 5.45 (bad weather had lost just over a quarter of an hour on time schedule, which was later to fall back rather more) when the eleven lined up for the start maroon of the first fly-off, with a max of 4 minutes. Everyone got off quite smoothly, but four, alas, failed to make it. Our own two, Savini and Krycer of Czechoslovakia dropped out to leave seven still in. All, as was remarked, from the West . . . it must be a long time since no eastern bloc country was involved right up to the last stage . . . The next five minute stage followed swiftly with the light fading fast . . . a problem to timekeepers and the gathering hordes of photographers which the digger-hatted officials did their best to keep in check. Seven then became two, with Fiegl getting a sad 004, Koster 150, but Spence of USA only just failing with 287. This left Baumann and Rieke, both from West Germany, to contest the final fly-off. Baumann was down first with 240 and Rieke's 186 was obviously never going to make it. Chaired on the stout shoulders of fellow citizen of Regensburg and gliderman Herbert Schmidt, Baumann was pivoted round and round for the cameras, before a mass rush off to clean up for the presentation and beanfeast to follow.

Winner is a post office official with a sixteen-year-old son, who has twice been national junior champion . . . so a right good aeromodelling family. Model has interesting sheeted wing, high aspect ratio design, with rear fin. Super Tigre G.15 (worked on, of course) motor with pipe. Second man, K. H. Rieke, was flying a model very like the Seelig 'Gambrinus' which won last time.

Motor starters were very much in evidence throughout due to high degree of tuning needed today. Both Fuller and Monks seem to stick to the old fashioned finger – though George's, as usual, sustained passing damage. Piping continues to be a controversial question; often solved by one with, and one without.

Final stage was presentation of trophies in the hall which forms part of the union offices used by the organisers. Trophies, all beautifully displayed on the stage, were taken down and handed over by a bevy of attractive young ladies, much to the enjoyment of winners, who improved the occasion with appropriate embraces. (One team who had been unduly chaste in their kisses, rushed back for more!) Edwin Krill kept the ball rolling with a droll commentary – some of his best cracks went untranslated, alas! – and managed to award a prize to a Dutch entrant who had been presented with twins during the meeting.

Washed, smart and happy, everyone then went on in the strangely dry evening for a final beanfeast under the arches by the old city walls – with a delightful platter of meats and salad, two bottles of wine and additional vouchers. Wisely and happily we were at a Russian table and joined in the vodka. *Summary:* as nice an international meeting as we can remember . . . we hope our Austrian hosts do it again . . . So thank you, everyone.

POWER Team Results

1.	Italy	3,691
2.	Hungary	3,680
3.	U.S.A.	3,675
4.	U.S.S.R.	3,646
5.	**United Kingdom**	**3,626**
6.	Fed. Germany	3,600
7.	Sweden	3,569
8.	Czechoslovakia	3,559
9.	Austria	3,543
10.	France	3,454
11.	German dem. rep.	3,397
12.	Canada	3,348
13.	Switzerland	3,303
14.	Finland	3,282
15.	Yugoslavia	3,239
16.	Poland	3,003
17.	Bulgaria	2,690
18.	Denmark	2,486
19.	Brazil	1,120
20.	Rumania	1,102
21.	Turkey	1,021
22.	New Zealand	1,003
23.	Japan	987
24.	Spain	761

RESULTS

POWER F.I.C.

1. Baumann F.	W. Germany	180	180	180	180	180	180	180	1,260 (+240+300+240)
2. Rieke K. H.	W. Germany	180	180	180	180	180	180	180	1,260 (+240+300+186)
3. Spence H.	U.S.A.	180	180	180	180	180	180	180	1,260 (+240+287)
4. Friis H.	Sweden	180	180	180	180	180	180	180	1,260 (+240+222)
5. Spring P.	Switzerland	180	180	180	180	180	180	180	1,260 (+240+202)
6. Koster Th.	Denmark	180	180	180	180	180	180	180	1,260 (+240+150)
7. Fiegl B.	Italy	180	180	180	180	180	180	180	1,260 (+240+004)
8. Krycer B.	Czechoslovakia	180	180	180	180	180	180	180	1,260 (+233)
9. Fuller G.	**G.B.**	**180**	**180**	**180**	**180**	**180**	**180**	**180**	**1,260 (+209)**
10. Savini S.	Italy	180	180	180	180	180	180	180	1,260 (+207)
11. Monks R.	**G.B.**	**180**	**180**	**180**	**180**	**180**	**180**	**180**	**1,260 (+204)**
12. Simon G.	Hungary	180	180	180	180	180	177	180	1,257
13. Iribarne M.	France	180	180	180	174	180	180	180	1,254
14. Sedlak J.	Czechoslovakia	171	180	180	180	180	180	180	1,251
15. Schmeling G.	E. Germany	168	180	180	180	180	180	180	1,248
15. Grethcin A.	U.S.S.R.	168	180	180	180	180	180	180	1,248
17. Csizmarik F.	Hungary	180	180	180	165	180	180	180	1,245
18. Onufrienko B.	U.S.S.R.	180	180	180	180	180	180	158	1,238
19. Guilloteau R.	France	180	180	161	180	180	175	180	1,236
20. Keinrath H.	Austria	180	155	180	180	175	180	180	1,230
21. Agner S.	Denmark	174	180	180	180	180	180	152	1,226
21. Engelhardt K.	E. Germany	170	180	158	180	178	180	180	1,226
23. Foley J.	Canada	180	180	156	180	180	162	180	1,218
24. Sifleet B.	U.S.A.	156	158	180	180	180	180	180	1,214
25. Norton S.	U.S.A.	180	180	160	179	177	145	180	1,201
26. Hollander N.	Sweden	165	180	177	180	180	157	161	1,200
27. Sulisz Z.	Poland	170	166	180	134	180	180	180	1 190
28. Meczner A.	Hungary	180	180	180	180	180	180	98	1,178
29. Brooks J.	Canada	172	158	180	180	170	136	180	1,176
30. Hartwagner F.	Austria	180	99	180	180	172	180	180	1,171
30. Haapalainen S.	Finland	180	180	180	180	176	114	161	1,171
30. Parovel A.	Italy	180	180	172	177	180	151	131	1,171
33. Verbitzki E.	U.S.S.R.	180	180	125	179	177	139	180	1,160
34. Fritzsch L.	Austria	162	155	170	132	180	180	163	1,142
35. Kovacic L.	Yugoslavia	180	180	180	180	43	180	180	1,123
35. Schneeberger F.	Switzerland	180	180	180	129	180	180	94	1,123
37. Carlini E.	Brazil	150	180	120	164	180	171	155	1,120
38. Hagel R.	Sweden	180	168	180	41	180	180	180	1,109
39. Wiseman D.	**G.B.**	**89**	**180**	**148**	**155**	**180**	**180**	**174**	**1,106**
40. Cringu E.	Romania	157	167	148	143	180	180	127	1,102
41. Benedikt J.	Poland	180	177	149	180	170	169	76	1,101
42. Kumpulainen J.	Finland	180	178	159	176	168	163	70	1,094
43. Reda S.	W. Germany	0	180	180	180	180	180	180	1,080
44. Glogoscan M.	Yugoslavia	180	160	126	180	122	130	180	1,078
45. Malina Z.	Czechoslovakia	180	41	137	171	159	180	180	1,048
46. Matio R.	Yugoslavia	134	150	163	123	180	137	151	1,038
47. Rintamaa	Finland	180	180	134	180	80	180	83	1,017
48. Hewitson N. (Proxy J. Allen)	New Zealand	170	128	154	180	177	145	49	1,003
49. Kei-Ichi-Kibiki	Japan	108	159	140	142	153	105	180	987
50. Dazer L.	Bulgaria	76	136	139	132	123	178	180	964
50. Remy D.	France	0	155	180	172	153	171	133	964
52. Eggleston B.	Canada	180	180	31	77	180	126	180	954
53. Kammer A.	E. Germany	149	180	118	179	106	27	164	923
54. Schenker R.	Switzerland	134	140	126	165	79	134	142	920
55. Sinapou A.	Bulgaria	145	148	143	122	117	108	93	876
56. Gogorcena J.	Spain	5	137	113	113	175	142	76	761
57. Tser B.	Bulgaria	122	93	91	146	135	171	92	850
58. Krzeminski J.	Poland	160	85	119	128	105	0	115	712
59. Tecimer C.	Turkey	87	91	161	92	131	66	39	667
60. Akca T.	Turkey	9	27	23	31	74	24	91	269
61. Kalayciyan O.	Turkey	0	0	4	43	38	0	0	85

GLIDER (F.1.A.)

1. E. Drew	**G.B.**	**180**	**180**	**180**	**180**	**180**	**180**	**180**	**1,260**
2. Pataki G.	Hungary	180	180	180	180	180	180	177	1,257
3. Procházka O.	Czechoslovakia	180	180	180	175	176	180	180	1,251
4. Czerny P.	Poland	180	180	180	180	165	180	180	1,245
5. Grigerasch A.	U.S.S.R.	180	180	180	180	168	180	173	1,241
6. Horejsi I.	Czechoslovakia	154	180	180	180	180	180	180	1,234
7. Munnukka N.	Finland	180	180	180	180	141	180	164	1,205
8. Pugatchenko A.	U.S.S.R.	180	180	180	180	180	176	128	1,204
9. Tanyü A.	Turkey	180	180	180	122	180	180	180	1,202
10. Boscard C.	Italy	180	180	180	180	121	180	180	1,201
11. Varetto C.	Italy	180	180	180	120	180	180	180	1,200
12. Lepp A.	U.S.S.R.	180	180	180	180	180	121	176	1,197
13. Woien Th.D.	Norway	151	180	180	180	167	150	180	1,188
14. Soave P.	Italy	180	180	180	180	180	117	160	1,177
15. Weiss I.	Israel	180	180	180	180	162	180	110	1,172
16. Lopez J.	Spain	180	180	180	180	136	180	135	1,171
16. Graves A. R. (p.p. Jellis)	New Zealand	180	180	180	180	180	167	104	1,171
18. Höbinger R.	Austria	180	180	180	127	180	180	142	1,169
19. Kosorus S.	Yugoslavia	180	180	180	180	174	144	125	1,163
19. Müssig G.	W. Germany	180	180	180	180	87	180	176	1,162
21. Braire L.	France	180	180	180	180	180	166	87	1,153
22. Rihs A.	Switzerland	180	180	180	180	127	120	180	1,147
23. Hirschel M.	E. Germany	180	180	180	180	112	133	180	1,145
24. Batty CE.	**G.B.**	**141**	**180**	**180**	**180**	**135**	**180**	**147**	**1,143**
25. Borell M.	Sweden	180	180	105	180	146	180	170	1,141
26. Surri D.	Canada	180	180	180	141	160	180	119	1,140
27. Jurczeniak St.	Poland	180	180	180	180	116	180	122	1,138
28. Vörös E.	Hungary	180	180	93	180	150	180	173	1,136
29. Taylor J.	U.S.A.	103	180	180	180	130	180	180	1,133
29. Petterson J.	Sweden	180	180	180	180	180	133	100	1,133
31. Kongsted Th.	Denmark	180	180	180	180	180	88	144	1,132
31. Xenakis G.	U.S.A.	180	180	180	180	127	132	153	1,132
33. Young A.	**G.B.**	**180**	**180**	**180**	**103**	**122**	**180**	**180**	**1,125**
34. Klintworrh Ph.	U.S.A.	180	180	60	180	130	176	167	1,123
35. Schmidt H.	W. Germany	124	180	180	141	180	180	135	1,120
35. Bazillon M.	France	180	180	180	82	138	180	180	1,120
37. Aksu S.	Turkey	90	180	180	180	128	180	180	1,118
38. Haudenard A. V.	Belgium	168	180	180	141	174	180	92	1,115
39. Lagan P. (p. M. Dilly)	New Zealand	180	180	180	180	120	148	126	1,114
40. Skabraha A.	Czechoslovakia	180	180	180	180	117	115	160	1,112
41. Spann R.	Austria	180	180	180	140	180	125	105	1,090
42. Verbree G.	Netherlands	180	180	180	93	107	180	169	1,089
43. Sulisz A.	Poland	180	180	60	168	136	180	174	1,078
44. O'Reilly L.	Australia	180	180	180	180	102	144	109	1,075
44. Ducklaus J.	E. Germany	117	180	180	132	106	180	180	1,075
46. Berthe J. M.	France	180	180	180	180	93	111	147	1,071
47. Herzberg G.	Italy	180	180	180	180	180	50	120	1,070
48. Schreiner J.	E. Germany	180	180	180	180	127	78	133	1,058
49. Andersson K.	Sweden	180	180	64	117	172	180	163	1,056
50. Yalcinkaya N.	Turkey	180	180	58	176	175	129	152	1,050
51. Boduwo D.	Bulgaria	180	180	180	95	142	180	85	1,042
52. Zach G.	Austria	180	180	180	78	176	138	108	1,040
53. Vaeth Th.	Denmark	139	180	95	127	141	180	175	1,037
54. Fernandez A.	Spain	180	180	33	180	145	161	156	1,035
55. Aben A.	Netherlands	97	180	180	132	140	145	159	1,033
56. Schellekens A.	Netherlands	180	180	104	180	178	114	91	1,027
57. Klink D.	W. Germany	180	180	180	180	123	96	77	1,016
58. Sarpila A.	Finland	180	180	180	141	123	95	114	1,013
59. Geiser W.	Switzerland	180	180	180	119	117	107	126	1,009
60. Lommer P.	Luxembourg	180	180	90	96	177	180	104	1,007
61. Surry D.	Canada	180	180	56	180	163	125	115	999
62. Masari D.	Yugoslavia	180	180	180	180	118	114	45	997
63. Mikulcic E.	Yugoslavia	180	180	156	100	146	133	93	988
64. Mertes N.	Luxembourg	85	180	180	128	148	113	152	986
64. Thomson W.	Canada	180	180	180	50	168	123	105	986
66. Emilio R.	Argentine	113	128	180	105	125	175	155	981
67. Abadjier K.	Bulgaria	67	180	170	174	93	120	159	963
68. This M.	Luxembourg	180	91	112	180	118	135	144	960
69. Gaensli F.	Switzerland	180	180	134	23	150	145	118	930
70. Dehlbek A.	Denmark	77	180	180	66	125	180	93	901
71. Vishniza D.	Israel	167	101	180	180	152	96	5	881
71. Fernandez M.	Spain	126	180	163	177	55	109	71	881
73. Buggenhout J. V.	Belgium	180	83	64	180	180	144	49	880
74. Anester G.	Bulgaria	65	180	180	55	51	157	180	868
75. Glenny B. R. (G. Mabey)	New Zealand	180	180	70	123	126	86	95	859
76. Pyykkö M.	Finland	73	29	180	137	138	131	147	835
77. Vida G.	Hungary	180	51	95	101	113	177	114	831

TEAM RESULTS

1. U.S.S.R.	3,642
2. Czechoslovakia	3,597
3. Italy	3,578
4. United Kingdom	**3,528**
5. Poland	3,461
6. U.S.A.	3,388
7. Turkey	3,370
8. France	3,344
9. Sweden	3,330
10. Austria	3,299
10. West Germany	3,299
12. East Germany	3,278
13. Hungary	3,224
14. Netherlands	3,149
15. Yugoslavia	3,148
16. New Zealand	3,144
17. Canada	3,125
18. Israel	3,123
19. Spain	3,087
20. Switzerland	3,086
21. Denmark	3,070
22. Finland	3,053
23. Luxembourg	2,953
24. Bulgaria	2,873
25. Belgium	2,801
26. Australia	2,325
27. Egypt	1,722
28. Norway	1,188
29. Argentine	981
30. Rumania	826

NEXT MONTH

A review of technical developments in contest model design

78. Lefter M.	Rumania	826
79. Amer Moh.F.	Egypt	815
80. Foucart G.	Belgium	806
81. O'Connor S.	Australia	683
82. Anderson D.	Australia	567
83. Mabrouk Moh.A.	Egypt	558
84. Mehrez Moh.A.	Egypt	349

WAKEFIELD

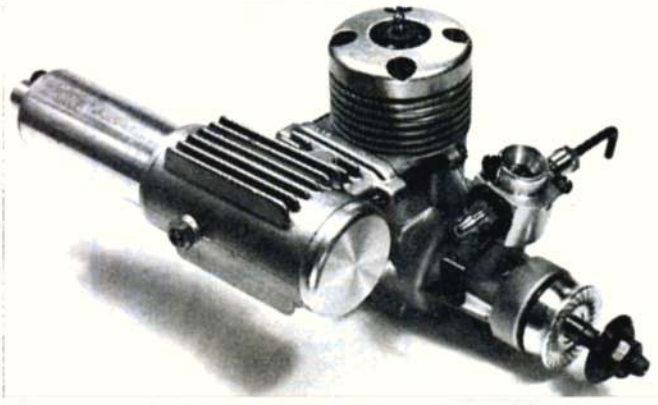
F.1.B.

1. Oschatz A.	E. Germany	180	180	180	180	180	180	180	1,260
2. Martin H.	Austria	180	180	180	171	180	180	180	1,251
3. Silberg I.	U.S.S.R.	180	170	180	180	180	180	180	1,250
4. Löffler J.	E. Germany	180	180	161	180	180	180	180	1,241
5. Gari J.	U.S.A.	180	180	160	171	180	180	180	1,231
6. Kmoch V.	Yugoslavia	180	180	180	180	180	140	180	1,220
7. Melentiev	U.S.S.R.	180	180	154	180	180	180	164	1,218
8. Sulkala M.	Finland	180	180	180	180	180	167	143	1,210
8. Yurov A.	U.S.S.R.	180	180	180	134	176	180	180	1,210
10. Formenter F.	U.S.A.	180	180	180	180	180	127	180	1,207
11. Tukiendorf Z.	Poland	180	180	180	180	168	136	180	1,204
12. Oskamp E.	Netherlands	180	180	180	120	180	180	180	1,200
13. Segrave M.	Canada	143	180	180	161	175	180	180	1,199
14. Schweinsberg	Netherlands	154	180	180	180	180	144	178	1,196
15. Simerda A.	Czechoslovakia	180	108	180	180	180	166	112	1,178
16. Schaller U.	Switzerland	144	180	180	163	150	180	180	1,177
17. Xenakis G.	U.S.A.	180	180	180	96	180	180	180	1,176
18. Kiss N.	France	180	180	180	160	180	135	157	1,172
19. Pierre-Bes G.	France	180	180	165	126	160	180	180	1,171
20. Barr L.	**G.B.**	**167**	**180**	**120**	**180**	**180**	**161**	**180**	**1,168**
21. Den Ouden P.	Netherlands	180	180	169	180	180	154	122	1,165
22. Cassi G.	Italy	156	178	174	148	145	180	180	1,161
23. Kosinski J.	Poland	180	180	156	125	160	180	177	1,158
24. Dohne W.	E. Germany	180	177	137	180	180	119	180	1,153
25. Zetterdahl J.	Sweden	180	180	180	180	154	163	115	1,152
26. Nienstaedt E.	Denmark	180	180	180	180	101	148	180	1,149
27. Jakobsen E.	Denmark	180	167	180	127	180	133	180	1,147
28. Czinczel W.	W Germany	180	180	180	160	135	123	180	1,138
28. Rothenberger Ch.	Switzerland	180	180	135	180	115	168	180	1,138
30. Thomas M.	Canada	118	180	180	153	180	141	179	1,131
31. Alujeuic N.	Yugoslavia	124	180	180	142	180	144	179	1,129
32. Durech L.	Czechoslovakia	180	180	146	144	162	135	180	1,127
33. Johansson R.	Sweden	164	180	180	180	168	102	147	1,121
34. O'Donnell J.	**G.B.**	**180**	**179**	**165**	**156**	**180**	**148**	**103**	**1,111**
34. Klima J.	Czechoslovakia	180	102	180	164	180	125	180	1,111
36. Ljutika M.	Yugoslavia	180	168	126	160	153	153	180	1,110
37 Aalto P.	Finland	127	180	120	180	139	180	180	1,106
38 Artoli R.	Italy	123	180	155	147	138	180	180	1,103
39 Popov P	Bulgaria	180	130	169	180	155	146	136	1,096
39. Serrano L.	Brazil	180	114	150	180	180	154	138	1,096
41. Rohrer E.	Switzerland	125	144	180	128	180	180	150	1,087
42. Hakansson A.	Sweden	135	162	180	104	180	145	180	1,086
43. Jürgen H.	W. Germany	180	166	155	130	110	180	163	1,084
44. Wells A. R.	**G.B.**	**136**	**189**	**135**	**96**	**180**	**169**	**180**	**1.076**
45. Legnani S.	Italy	172	180	157	105	176	180	104	1,074
46. O'Connor S.	Australia	134	180	180	141	70	165	174	1,044
47. Edwards A.	Australia	131	180	144	180	123	121	157	1,036
48. McGillivray J.	Canada	180	118	95	125	180	155	180	1,033
49. Koster Th.	Denmark	180	180	180	92	136	180	80	1,028
50. Hofsäsz R.	W. Germany	104	180	180	40	180	152	180	1,016
51. Pásztor J.	Hungary	180	147	75	155	151	131	174	1,013
52. Haiden A.	Austria	180	180	180	68	172	117	107	1,004
53. Farkas I.	Hungary	152	57	171	171	154	180	109	994
54. Pohjola S.	Finland	100	180	180	98	148	150	122	978
54. P. Legan (Proxy Ray Elliot)	New Zealand	180	96	141	123	175	83	180	978
56. Rauch A.	Austria	172	180	88	108	180	130	88	946
57. Nes e Yalcinkaya	Turkey	163	180	81	62	142	137	180	945
58. Skjulstad P.Th.	Norway	131	117	180	90	79	159	180	936
59. Mersenburger C.	Spain	145	112	152	156	154	124	92	935
60. Dihm J.	Poland	90	180	128	87	115	141	170	911
61. Akca T.	Turkey	180	134	63	138	180	112	103	910
62. Constantinescu R.	Rumania	153	130	180	96	107	165	76	907
63. Tecimer C.	Turkey	156	180	138	86	123	93	127	903
64. Malkin J. (Proxy M. Woodhouse)	New Zealand	137	180	120	0	110	153	180	880
65. Burg A.	France	75	180	110	61	109	164	180	879
66. Roots G. B. (Proxy D. Morley)	New Zealand	135	95	92	150	180	141	45	838
67. Kreisz R.	Hungary	144	124	33	88	131	137	176	833
68. Carlini E.	Brazil	180	61	124	89	120	134	118	826
69. Tavetkov D.	Bulgaria	111	104	165	77	62	134	109	762
70. Goldberg M.	Israel	69	113	163	95	84	96	134	754
71. Stamenor St.	Bulgaria	7	180	117	103	140	100	87	734
72. Mabille A.	Belgium	65	0	125	96	88	94	92	560

TEAM RESULTS

1. U.S.S.R.	3,678
2. German dem. rep.	3,654
3. U.S.A.	3,614
4. Netherlands	3,561
5. Yugoslavia	3,459
6. Czechoslovakia	3,416
7. Switzerland	3,402
8. Canada	3,363
9. Sweden	3,359
10. United Kingdom	**3,355**
11. Italy	3,338
12. Denmark	3,324
13. Finland	3,294
14. Poland	3,273
15. Fed. Germany	3,238
16. France	3,222
17. Austria	3,201
18. Hungary	2,840
19. Turkey	2,758
20. New Zealand	2,696
21. Bulgaria	2,592
22. Australia	2,080
23. Brazil	1,922
24. Norway	936
25. Spain	935
26. Rumania	907
27. Israel	754
28. Belgium	560

H. Martin of Austria, 2nd man in Wakefield. A home win would have been immensely popular but alas for a storybook ending, it was not to be.



ENGINE TEST

by Peter Chinn

SUPER TIGRE G.20/15 R/C

IN LAST FEBRUARY'S issue we published a test report on the throttle-equipped version of the Super-Tigre G.20/23. This engine showed an outstandingly good power output (over 0.4 b.h.p. at 17,000 r.p.m. on standard 5 per cent. nitro fuel) *provided that no silencer was used*. With the recommended Super-Tigre S.15 silencer, power dropped by some 40 per cent. to less than 0.25 b.h.p.

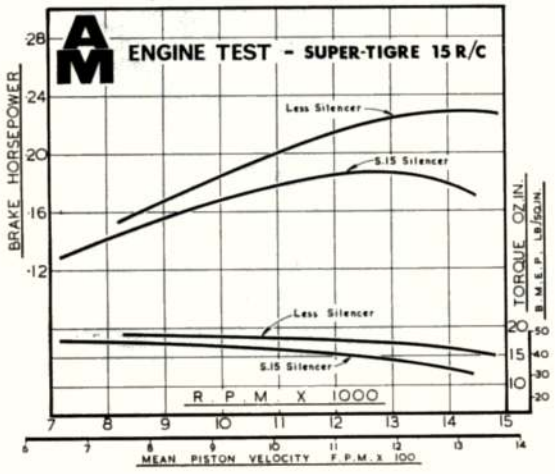
The reason for this loss of power was not merely the "back pressure" caused by adding the silencer. As then explained, having a 2 mm. longer stroke than the 2.5 c.c. engine for which the G.20 body casting was originally designed, the piston skirt, on the 23, rises above the bottom edge of the exhaust port and opens the primary compression chamber for approximately 80 degrees of crank angle at the top of the stroke—an aid to crankcase charging when the exhaust port is unrestricted, but allowing exhaust gas to pollute the fresh charge when a silencer is fitted.

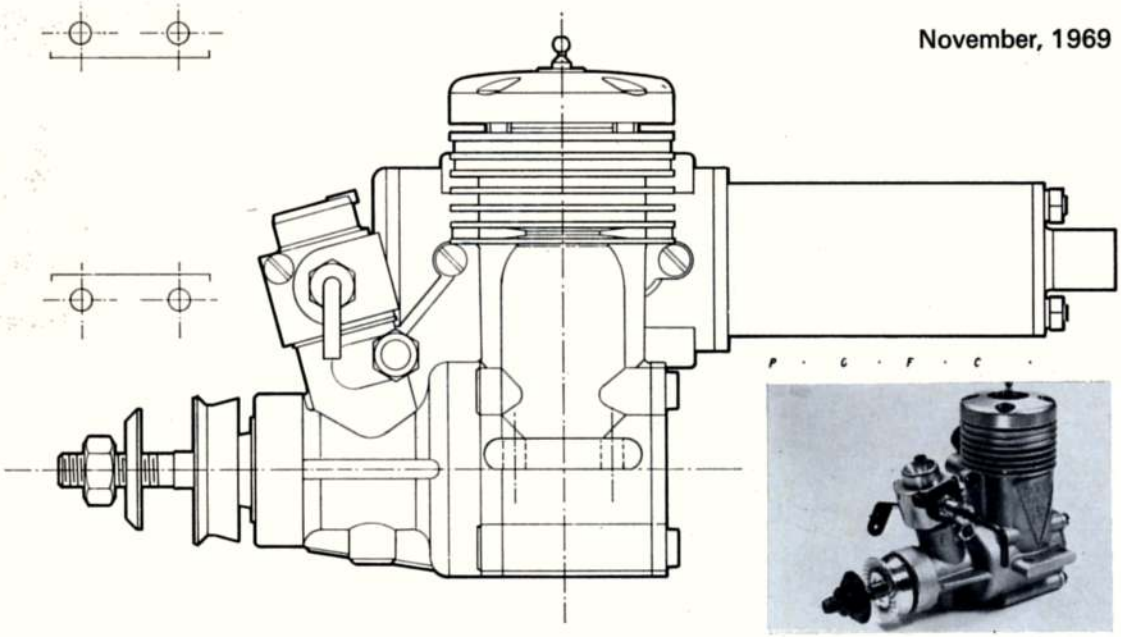
The G.20/15, with which we are dealing this month, reverts to the original 14 mm. stroke and thereby almost eliminates the troublesome (for R/C work) sub-piston intake period. The piston skirt still clears the lower edge of the exhaust port at the top of the stroke but only for a very brief period (approx. 12 deg.) so that, when a silencer is used, charge dilution is reduced to insignificant proportions.

Like most small R/C engines, the G.20/15 R/C was not designed specifically as a radio-control motor. It is merely the standard G.20/15 glowplug motor (now largely superseded by the various G.15 models for free-flight and control-line) to which the Super-Tigre Type B.19/2 carburettor is installed in place of the standard venturi and needle-valve assembly. The B.19/2 carburettor is also used for the G.20/23 R/C.

The G.20/15 R/C has, therefore, the well-known Super-Tigre system of racing type cylinder porting with simultaneous exhaust and transfer timing and a flat deflectorless piston. This has always worked well at the very high revolutions (18,000-22,000 r.p.m.) now used in the FAI free-flight and speed contest classes. It is, we believe, less suitable to R/C applications since one can rarely prop an R/C model for such high r.p.m. The manufacturer rates the G.20/15 R/C at 0.32 b.h.p. at 14,500 r.p.m. and our test engine did, in fact, peak at around this speed although with a very much lower output than the manufacturer's claim.

Here it is appropriate, perhaps, to comment that, while it is probable that a deflector piston and more orthodox porting would improve the G.20/15 R/C, it is quite possible that our engine, in achieving a gross output of 0.23 b.h.p., was a slightly sub-standard example. Actually, we have yet to find any 2.5 c.c. R/C engine that would reach 0.32 b.h.p. (the best to date falling just short of 0.30) and 0.23 b.h.p. is about average. On the other hand, one is apt to assume that all Super-Tigres are in the upper performance bracket and we will confess that we had expected a slightly better performance, particularly in view of the fact that the .23 had proved capable of such high performance. (As a matter of interest, the manufacturer claims 0.35 b.h.p. at only 12,000 r.p.m. for the 23 R/C on 5 per cent. nitromethane. Our test sample of this model achieved almost 0.34 b.h.p. at 12,000 but the power curve was still climbing steeply at this speed.





The curve eventually levelled out at some 17,000 r.p.m. where, as already mentioned, a figure of over 0.40 b.h.p. was determined).

Fitting the S.15 silencer to the G.20/15 R/C did not, of course, have such a violently depressing effect as it had had on the 23. Prop revs were reduced by between 200 and 800 r.p.m., according to prop size, and peak power by approximately 18 per cent.

Typical prop revolutions recorded by the G.20/15 R/C, running on our standard 5 per cent. pure nitromethane R/C test fuel and with silencer, included 7,800 r.p.m. on a 9x6 Power-Prop wood, 8,700 r.p.m. on a 9x5 Top-Flite wood, 8,900 r.p.m. on a 10x3½ Top-Flite wood, 9,300 r.p.m. on a 9x4 Keilkraft nylon, 10,400 r.p.m. on an 8x6 Power-Prop wood, 11,200 r.p.m. on an 8x5 Power-Prop wood and 12,800 r.p.m. on an 8x4 Power-Prop wood.

Starting qualities of the G.20/15 R/C were, on the whole, good. When the silencer was fitted, hot restarts on light 8x4 and 8x5 sizes were sometimes apt to be a little tricky but cold starting was always good and, in general, we found starting rather easier without the silencer. The needle-valve was remarkably non critical as regards running settings and could be turned through about three whole turns without any marked effect. However, for cold restarts it was usually necessary to open up the needle-valve a couple of turns from the leaned out setting and to then close it down again as the engine warmed up.

The idling speed on the G.20/15 R/C tended to be on the high side. In contrast to the more usual problem of an excessively rich mixture when the engine is throttled down, the G.20/15 R/C tended to run too weak when throttled, even with the airbleed fully closed. Throttle control was actually better with the coupled exhaust baffle fitted than with the silencer.

In general, the G.20/15 R/C is similar to the G.20/23 R/C in appearance but has several internal differences. Apart from the different cylinder porting and piston already mentioned, the head is shallower and unfinned, has a small bowl shaped combustion space surrounded by a wide squish band and, of course, does not need a slot for baffle clearance. The crankshaft, running in two ball-bearings, instead of a single ball-bearing plus an outer bronze bushing, has a smaller o.d. front end.

The difference in weight, between the G.20/15 R/C and the G.20/23 R/C is insignificant and the engines are of almost identical overall dimensions. In these circumstances, our test results would seem to indicate that, of the two, the G.20/23 R/C is likely to remain the more popular choice for R/C work.

SPECIFICATION

Power/Weight Ratio (as tested): 0.38 b.h.p./lb. (with silencer); 0.58 b.h.p./lb. (less silencer).

Specific Output (as tested): 75 b.h.p./litre (with silencer); 91 b.h.p./litre (less silencer).

Type: Single cylinder, air-cooled glowplug ignition two-stroke with shaft type rotary-valve induction and twin ball-bearings. Throttle type carburettor.
Bore: 15 mm. (0.5905 in.). *Stroke:* 14 mm. (0.5512 in.).
Swept Volume: 2.474 c.c. (0.1510 cu. in.).
Stroke/Bore Ratio: 0.933:1.
Weight: 176 grammes – 6.21 oz. (less silencer with exhaust baffle); 220 grammes – 7.76 oz. (with S.15 silencer).

General Structural Data

Pressure diecast aluminium alloy *crankcase/cylinder/main-bearing housing* unit with detachable *rear cover* secured with four screws. Hardened, counterbalanced *crankshaft* with 10 mm. dia. main journal, 7.5 mm. bore gas passage and 5 mm. dia. hollow crankpin. Shaft runs in one 5 mm. i.d. 6-ball brass caged ball journal bearing at front and one 10 mm. i.d. 7-ball brass caged ball journal bearing at rear. Lapped, cast-iron flat crown deflectorless *piston* with 4 mm. dia. tubular *gudgeon-pin* retained by wire circlip in piston bosses. Machined duralumin connecting-rod with plain eyes and lubrication slit at lower end. Drop-in steel *cylinder-liner* located in cylinder casting by flange at top and locked by cylinder head. Machined aluminium alloy *cylinder-head* with 0.2 mm. soft copper *gasket* and secured to main casting with four screws. Machined aluminium alloy *carburettor body* seating on rubber gasket and secured in intake boss with cotter pin and nut. Ground steel *throttle barrel* with stationary co-axial brass spraybar assembly. Separate idling and airbleed adjustment screws. Coupled centrally pivoted steel *exhaust restrictor*. Machined aluminium alloy prop driver fitted to shaft with alloy split taper collet. Beam mounting lugs.

TEST CONDITIONS

Running time prior to test: 1 hour.
Fuel used: 5 per cent. pure nitromethane, 25 per cent. Duckham's Racing Castor-Oil, 70 per cent. ICI Methanol.
Glowplug used: Super-Tigre standard long-reach, platinum filament, as supplied.
Air Temperature: 65 deg. F. *Barometer:* 29.9 in. Hg.
Silencer: Super-Tigre Type S.15.

design and development of the A/2 glider

Jim Punter winner at the 1969 Nats and many other events tells his story in a new series

THIS ARTICLE describes how an A/2 glider design was developed, where the original design was derived by attempting to apply sound aerodynamic and technical principles wherever possible. The development was also accomplished in a carefully controlled way. Nearly all flying sessions were documented in some detail, and these results referred to when designing subsequent models. This particular exercise has indicated just how unreliable one's memory is as to the flight characteristics of a model some weeks previous. By doing this, the snags were overcome much more quickly. Before going into details, it is best to explain something of the history behind the article.

In 1966 I returned to aeromodelling after an absence of about six years, and decided to fly A/2 gliders. A lot of the pleasure that I derive out of the hobby is to see my own creations flying, and so I designed my own A/2's. For the first year and a half of flying, I used mainly 'hit and miss' methods of design and construction, with mainly 'miss' results! Not only the flying characteristics, but the contest results provided sad evidence of fundamental design faults. The models just weren't good enough, and neither was my ability to fly them for that matter. So around September 1967, I decided to have a drastic rethink about the situation (take up radio!) and came up with some conclusions which formed the basis for a more satisfying development programme.

The current thinking around that time, by a lot of glider flyers, was that to do well in competitions, a model with a good glide was not really necessary, and that provided it towed well and remained stable in strong thermals, all would be well. At the time (and now), I did not agree with that philosophy. Tactical flying is all very well, but infinite patience is needed, and even then it is possible to come unstuck. Looking for lift on the line is probably fine for those towing artists, who seem to conjure the strongest lift out of the thin air, but I had very little success, and often what initially seemed like strong lift petered out well before the elusive max. Many were the times when a good model would have maxed, but mine didn't. So, to make up in part for my inability to put the model into good lift, it was decided to attempt to develop an A/2 glider which had as low sinking speed as possible, but remained stable both on the line and in lift. This was nothing new, every aeromodeller who sets out to design an A/2 glider has just these requirements in mind, but I didn't want to spend years using trial and error methods which still might lead nowhere. It seemed that the best way of cutting corners would be to spend a great deal of time studying the subject, both the history of A/2 development, and the relevant low speed aerodynamics likely to be important, then to tackle the practical development side in a more organised way than I had been doing up to that time. The approach finally decided upon, was to build two prototypes, of similar layout, but with different aerofoils, and moment arms, then to test them both extensively for a few months, documenting the results of each flying session, with particular reference to any vices encountered. From these results, a de-bugged model could be designed and built, which should incorporate the better points of both, with any serious faults largely eliminated.

The studying part took a long time, comparatively (three months), I would normally have had the next model built in this time. It involved scouring all my old *Aeromodeller's* back to 1952, and Zaic's Year Books, paying special attention to any articles specifically on glider design, and looking through a lot of very sophisticated technical journals on aerodynamics at low Reynolds number, most of which were not very relevant to the problem in hand. Ultimately, enough

information was available to design the two prototypes on a fairly sound aerodynamic basis, although this is never entirely possible with a model aeroplane, since so little research has been done into airflow at model speeds, and sizes.

The requirements for the layout, and design of an A/2, with a low sinking speed, and good towing stability, largely fall into two categories. The requirements which can be specifically stated, for example, high aspect ratio, and keeping the tailplane light, and those which are not quite so tangible, aerofoil section, dihedral layout, etc.

I am sure that there will be a lot of modellers reading this article who know a lot more about aerodynamics than I do, but for those people who are not boffins, I will describe and discuss the functions of the various components of the glider before describing the reasons for the specific layout and design of the first two prototypes. I will try and explain the function of the components in simple terms, with a short description of how they function together.

The wing: For any glider the wing is the most important component, since it provides at least 85 to 90 per cent of the lift to support the model (or full size glider for that matter), so particular care should be given to the design of the wing. When designing the wing the factors to be decided upon fall into three categories, layout, aerofoil section, and construction. The layout of the wing for a certain area includes span, chord, tip shape, etc., and the lengths of the various panels may also be listed under this heading. The three variables are not completely independent of one another, and each has some effect upon the other. Nevertheless, it is more convenient to discuss them separately, in the light of the particular design requirement, in this case a wing to have a low sinking speed without sacrificing stability.

Layout: For a low sinking speed, the wing should have as high an aspect ratio as possible. The aspect ratio, A.R. equals $\frac{(\text{span})^2}{\text{area}}$ and for a rectangular wing this will simply be the ratio of the span to the chord. So a long thin wing is required; one only has to look at the thin slender wings of full size gliders to realise that this is the case. In simple terms, the reason for this is because any wing has a very large drag contribution from the induced vortex of air flowing from the tip, see *Fig* 1. This vortex is caused by the conflict of airflow over the wing on the upper (suction) and lower (pressure) surfaces. The effect of the induced drag, as this is called, is less marked for a wing of high aspect ratio, than for a wing of the same area, but with a low aspect ratio. So we build a wing with a huge span, and hardly any chord. Obviously this would be impractical, and ultimately the size of the aspect ratio is governed by other factors. For a really high aspect ratio, the forces on the structure during tow on a windy day would be very large, and a wing strong enough to withstand these forces would be impractically heavy. Another point not mentioned is the scale effect. Below certain chord sizes, the wing section becomes far less effective, although in practice this consideration is never met because structural problems are encountered first. Incidentally, the exotically carved Hoerner tips seen on models lately is another mechanism for attempting to reduce the induced drag by modifying the vortex of air flowing off the tip; in the 1950's end plates were used for much the same purpose.

Now for the dihedral. As most readers will know, there are three basic dihedral layouts normally used on model aeroplanes, V-dihedral, tip dihedral, and

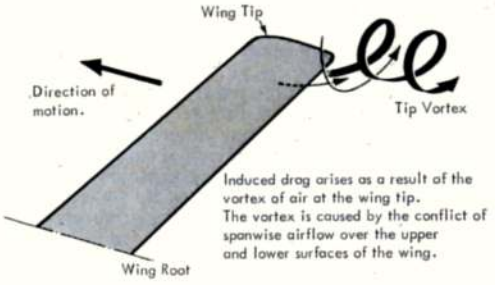


FIG:1 Induced Drag

polyhedral. The purpose of using dihedral in models, is to provide the model with interent stability; this is not a requirement in full size aeroplanes, or radio models for that matter, because the pilot is controlling the aeroplane at all times. For free flight models it is essential, however, so that they will fly in a stable manner of their own accord. Looking at the types of dihedral used by successful A/2 flyers in the past is not particularly useful, since just about all types have been used with equal success. So this is a matter of choice, but it may affect the issue from the structural point of view.

Structure: The structure of the wing for a glider is in my point of view a very important consideration and one which is often not given enough attention. A glider wing is normally built up of leading edge, trailing edge, spars and ribs. Do many modellers really think about the forces on the wing, let alone how they are distributed before deciding where to put the spars, or how far to extend the leading edge sheeting, or how many ribs to have and why? Most free flight modellers must have seen the odd A/2 descending at about 30° with its wing fluttering like an overloaded sparrow, or a model weaving uncontrollably on tow in a high wind, when the same model towed perfectly in calm conditions. These are the sort of problems that can be encountered with faulty structural design, assuming of course that the structure is built accurately. I know, it's happened to me! Of course, this problem can simply be overcome by building the wing very strongly (overkill!), but a heavy model may result. Anyway, careful stressing of the structure is going to be very important if a high aspect ratio wing is required. Its worth mentioning here that the aerofoil section may influence the choice of wing structure to a considerable extent. A thin section will provide many more difficulties than a thick one. Of course, most sections likely to be used for A/2 gliders are thin.

Airfoil section: This is a thorny problem, and the aeromodeller faced with the problem of choosing a section for his latest creation, has a far more difficult decision than the designer of a full sized aeroplane in a similar situation. The modeller has very little precise information about the performance of model airfoil sections, on which to base his choice. The full size designer, on the other hand, has a great deal of detail information available to him.

The glide performance of a model using a particular airfoil is normally judged by reference to the polar diagram of the airfoil. The polar diagram is a graph on which the lift coefficient and the drag coefficient for a particular airfoil are plotted for various angles of attack. The polar diagram for a

model airfoil is shown in *Fig.* 2. It can be seen from this graph, that as the angle of attack increases, so the lift increases, with the drag remaining fairly constant; this continues until the wing is nearly stalling, when the drag increases quite suddenly. It is important when comparing airfoils in this way to make sure that the sections were tested at the same Reynolds number, and that it is the number relevant to the conditions in which the section is to be used. The Reynolds number is just a method by which the scale effect may be taken into account; for example, a good model airfoil may not produce such good results on a full size glider where both the wing chord, and the speed are quite different.

$$\textit{Reynolds No.: } \mathbf{Re} \text{ equals } \frac{\text{wing chord (ft.) x speed (ft. per sec.)}}{0.0016}$$

For a model glider (A/2), **Re** is approximately 40,000 but this is only really of academic interest within the context of this article. Very few polar diagrams for model glider airfoils have been published, to the author's knowledge, except in the *Aeromodeller* in November 1965, when the computed polar diagrams for a number of airfoils were included in an article by Werner Thies.

Apart from providing the model with a low sinking speed, the airfoil section has a considerable effect on the longitudinal stability of the model. This is largely due to the movement of the centre of lift of the airfoil at different angles of attack. The centre of lift movement is governed by the motion of the centre of pressure of the airfoil. For different sections, the extent of this movement is different. The greater the centre of lift movement, the more difficult it is to control the longitudinal motion with the tailplane whose function this is. If we now look at the function of the tailplane the reasons for this will become apparent.

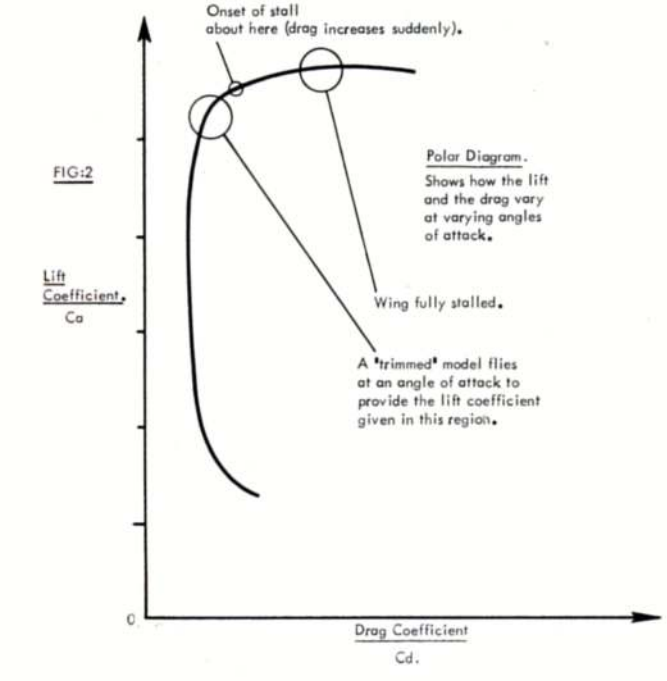


FIG:2

Tailplane: The size and position of the tailplane is dependent on the characteristics of the wing section and as we have seen already, these are rarely available. To help explain matters, I will briefly outline the reason that a tailplane is needed in the first place. If a glider is flying in a straight and stable manner, the lift from the wing can be estimated to act at some distance across the chord at the centre of lift, see *Fig.* 3. This may not be directly in line with the centre of gravity, and usually it isn't being slightly ahead. Unless some form of stabilisation is now introduced, the wing will topple over and over as a result of the couple acting on it, *Fig.* 4. The tailplane provides the necessary stabilising moment to prevent this happening. The position of the centre of lift on the wing airfoil, varies as the angle of attack of the

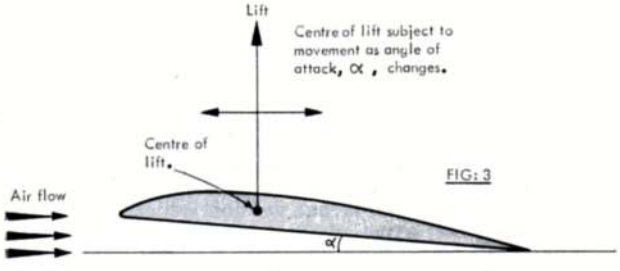


FIG: 3

wing changes. This occurs whenever the model encounters a gust, or disturbance of any kind. If the movement of the centre of lift is large, then a large tailplane is required to stabilise the wing, otherwise a poor longitudinal stability will result. The degree to which the tailplane controls the longitudinal motion of the model is also governed by the airfoil section of the tailplane, a lifting tailplane exercising more control. In real terms then, the behaviour of the centre of lift of the wing airfoil governs to a large extent the size and type of tailplane required, and its position (moment arm). This is directly reflected in the stall recovery of the model. It is convenient to mention here the position of the centre of gravity is also important within the context of longitudinal stability. *Fig.* 4 also shows that the C.G. position will affect the forces acting on the wing, and how rapidly instabilities are damped out by the tailplane. Generally speaking, the best C.G. position for an A/2 glider will depend on the airfoil section, but is normally about 50–60 per cent of the chord from the leading edge. To find the optimum position for the C.G., I initially set it further back than I expected it to be, say at 65–70 per cent, and then gradually moved it forward until the best stall recovery was obtained when the model was purposely stalled off the line.

Finally, it is preferable to make the glider tailplane small, because we want the wing to do most of the lifting, since it should be specifically designed for the job, and in a correctly trimmed model the wing should be flying much nearer to its optimum angle of attack than the tailplane. If the tailplane is small, it has to be placed further from the wing to provide the necessary stabilising moment; this means a fairly long moment arm.

Fuselage: The primary function of the fuselage is to hold the various components of the model in position. Aerodynamically, it does very little except to provide some side area ahead of the wing, and this may aid towing stability slightly. The main factors to

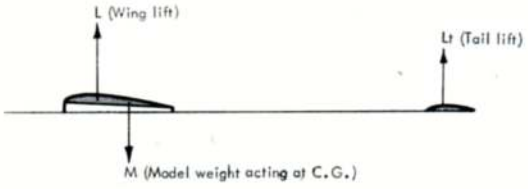


FIG: 4 The combined effect of the wing lift, and the weight of the model is to turn the model about its longtitudinal axis and lift the nose. The tailplane prevents this happening.

decide upon when designing the fuselage are, moment arm, and nose length. The moment arm of the glider affects the stall recovery, as does the length of the nose. When a model stalls, it oscillates approximately about the centre of gravity and it will oscillate for longer if the moment of inertia about the oscillation axis is large. The moment of inertia is given as I equals ML^2 where M is the mass, say, of the tailplane, and L is the moment arm. The moment arm is likely to be fairly long, as explained above, so as to reduce the moment of inertia, it is best to build the tailplane and rear fuselage very light. Similarly, it is advisable to reduce the moment of inertia of the nose, including the ballast. Here a short nose could be used; it may be necessary, from total weight considerations, to build a model with a slightly longer nose. Should this be the case, the moment of inertia will be reduced if the ballast is evenly distributed throughout the length of the nose. Although this will be slightly heavier than if it were all placed in the end of the nose, it will certainly require less ballast than a shorter nose to bring the C.G. to the desired position. It is best to keep all the weights of the components at the extremities of the model as small as possible from inertial considerations, this means the tips, tailplane and rear fuselage.

Fin: The fin provides the model with directional stability. To design the fin, one only has to decide upon its size and position and to a certain extent these are related. If the fin is mounted in front of the tailplane, of a particular model, then to produce the same effect, a fin placed behind the tailplane could be made smaller, because it can exert a greater momentum about the turning axis of the model. The size of the fin depends on the side area round the region of the C.G. If the model has a lot of dihedral, then a bigger fin will be required than for a model with shallow dihedral. Sizing the fin during development is best achieved by trial and error. If the model shows a tendency to spiral out of thermals, and this is not the result of inadvertent warps, then it is likely that the fin area is too large. On the other hand, if the model flies square corners and is reluctant to turn, there may not be enough fin area.

Next Month: Development leading up to the 'Graduate'.

Readers' Letters

Dear Sir,

I was distressed to find my favourite magazine describing as 'hazardous' my flying of the model *Concorde* at Old Warden.

Unlike many other models present, in nearly 30 flights it hit neither trees, buildings, people nor other models. Its nose is not as sharp as it looks and it is certainly less dangerous than those model aircraft which are preceded by whirling two-bladed swords.

The fact is that I had so many favourable comments and enquiries from onlookers (many of whom apparently wrote to you for the plan) that I was encouraged to fly it as much as possible.

I would like to suggest to those who make this model that they build strictly according to the plan. The 'engine pods' in particular have a positive effect on stability and should not be blanked off by dummy tail pipes.

Nettled by your remarks, I am now converting my pterodactyl (the prehistoric variety) glider to engine power. Watch out for those teeth, Moulton!

Barnet, Herts. *R. Burnham*

Teeth duly on guard! Readers will be pleased to learn that the mini-Concord design by K. J. Downton for Cox .020 engines is now available as Plan U 1038 price 2/6d. plus 6d. post from A.P.S.

Dear Sir,

Regarding the report of the All Scale meeting at Old Warden. The danger with the *Flying Flea* was that above a certain speed it could not be pulled out of a dive. This was not discovered until after a number of fatal accidents. The machine seemed perfectly alright below the critical speed.

The spelling of *ARCHAEOPTERYX* was wrong. I wish I had known earlier about Dennis Bryant's interest in this type. Having had difficulties with the thrust line of tractor driven tailless types, I would have liked to talk to him about it.

Howard Boys

Lower Weedon, Northampton.

Dear Sir,

Amid all the heated discussion and argument about who should use whose flying field and whose club one should join, have D. Giles or M. Reeves ever considered the lone modeller? Amongst the lone modellers standing figuratively at the edge of his happy band, with his well worn but nevertheless well built models with their equally well worn second hand motors – ½ pint tin of fuel in hand. Plenty of enthusiasm and know-how *but notice*, – no radio models, for obvious reasons.

There are lone fliers who are not 'lone' fliers entirely from choice, but who, from lack of funds are unable to join clubs no matter how attractive the benefits. One hates to plead poverty but as regards clubs to suit one's tastes', it may be difficult to find a club locally that isn't dominated almost entirely by multi radio fliers. And if a suitable club is further afield, how does one get there without suitable transport? My cherished old 'Reliant' car provides us with the necessary 'cartage', but when you consider club membership fees, plus S.M.A.E. fees etc., this, plus the ever rising cost of materials, may be the straw that breaks the camel's back for some modellers.

Robert and Howard Lowe

Oldham, Lancs.

Dear Sir,

Last weekend I had my faith in human nature restored. Some nine weeks ago I was testing a large, single channel radio-controlled model aircraft, and for some unaccountable reason it decided not to respond to the controls and went O.O.S. After a good deal of fruitless searching I had to admit defeat and wrote off the model, trying to be as philosophical as possible over its loss.

However, out of the blue, it was returned, in very good condition, by a lorry driver, on contract to a farmer, who saw the model from his perch on a combine harvester. Luckily, it carried my name and address. He informed me that he was approached by someone wishing to purchase it from him, but he refused to do so.

Apart from the monetary value of the radio receiver, the engine and the model itself, I had spent many hours building it, and so I was extremely pleased to reward the finder, whom, I am certain, felt that he had done his good deed for the day.

It is nice to realise that there are still some honest people in the world!

Hove, Sussex. *Roger M. C. Abrahams.*

Dear Sir,

A 30 in. span, Cox powered radio model, coloured white and red, has been found in the Lichfield area. No-one has made any attempt to claim it for the last month or so. Perhaps the owner would give full details to myself or the actual finder : –

Mr. E. Hayward, 9 Park Avenue, Port Hill, Shrewsbury, and we will be glad to reunite him with his model.

21 Eggshill Lane, Yate,
Bristol, BS17 4BH. *D. Collin.*

Dear Sir,

One of the chaps in our club has found a model in the shape of a flex wing parasol, covered in clear plastic and powered by a Frog 1 c.c. diesel. It was located in a field (just before being gobbled up by a combine harvester) between Brighton, Newhaven and Lewes, and without a doubt it was made by an engineer and someone who knows his aerodynamics. If the owner is interested in recovering it, then perhaps he would like to contact me and we'll see what we can do.

17 The Square, Tatsfield, *D. Bishop,*
Westerham Secretary,
Kent. Sevenoaks & District M.A.C.

PLANE ON THE COVER

introducing

"Peanut Scale"

WALT MOONEY'S

Andreason BA-4B

Currently based at Goodwood and often seen at airshows, the diminutive BA-4B being flown by Peter Phillips is caught by Richard Riding's camera for photos on this page.

HISTORY :
Peanut Scale was originated by the Bridgeport, Connecticut FLYING ACES club, spark-plugged by Dave Stott and Bob Thompson, of Pinkham Field. The first event was won by Capt. Henry Struck, SCMA Flight, Connecticut Squadron, flying a 12 in. wingspan Howard 'Pete' racer. His best single flight time was 29 seconds, and his total three flight time was 56 seconds.

RULES :
Models must be built-up reproductions of actual man-carrying aircraft. The maximum permitted wingspan is 13 in., and the minimum permitted wingspan is 10 in. Motive power must be furnished by rubber band(s).
Models will be hand-launched, and timing will commence upon release. Timing will stop when model lands.
Any flight of six seconds or more will be counted as an 'official'.
Three official flights are allowed, and total will be contestant's score.

SANCTION :
All Peanut Scale contests will be sanctioned by the Great God of the Thermals, **HUNG.**

Bjorne Andreason's airplanes all seem to look right and fly right also. The author flew the original BA-7 in California when it was first built, so when the three view of the BA-4B was published in the Experimental Aircraft Association's journal, *'Sport Aviation'* he just had to build a model of it. Peanut Scale, with a limit of 13 inches maximum span has lots of appeal so the BA-4B model was designed to be a 'Peanut Scale'. As a flying model it turned out really fine and flew right off the board. Early flights with a twelve inch loop of one eighth flat Pirelli were between thirty and forty seconds with the landing under power. Later flights, outdoors, with a shorter motor and more climb disclosed a slight lack of vertical tail area which caused the model to spiral down to the right in the glide if it was adjusted to fly well under high power. A clear plastic tail extension was added to the model and it flies and glides well. This extension is indicated on the plans and perhaps can be discerned in the photos.

Construction of the model is very much standard for a small rubber scale biplane. Therefore we will touch only the highpoints of the construction sequence and the few deviations from standard procedures.

The fuselage is a box frame made up of two side frames with cross-braces and formers and stringers added on the top. Build the frames over the plans noting that the cabane struts are an integral part of the side frames to simplify later assembly of the upper wing to the fuselage. Because most models tend to be tail heavy, shaping of the side and bottom nose contour is done with balsa blocks. The upper nose contour is wrapped sheet balsa trimmed to size on assembly. Note that the bottom of the fuselage is narrower than the top, requiring shorter cross pieces than the top. This is important later because it will make the cabane struts wide enough apart at the top to fit the upper wing root ribs.

The tail surfaces are made flat over the plans from one sixteenth square balsa. Round the edges after they are removed from the plan.

Both the upper and lower wings can be built over the single wing drawn. A centre section is constructed between the two outer panels for the upper wing. The lower wing just consists of a right and left outer panel which is finally attached to the fuselage. All wing ribs are identical. Note the airfoil shape of the wing tip piece. After the wing structures are dry sandpaper the leading edge and the trailing edge to the shape shown at the rib drawing. Then cut the top wing at the

arrows outlining the centre section, leading edge, trailing edge, and spar. Block up each tip for the proper dihedral, trim the spar length to fit, and re-cement.

Nose block, propeller shaft, and tube bearing follow common practice. I recommend any plastic propeller that is the right diameter or that can be cut down to the right diameter easily. Half the landing gear wire shape is shown in the front half-view. It should be bent symmetrically and cemented in place in the fuselage. Thin balsa fairings are used to simulate the real springleaf leg.

The model can be covered with your favourite lightweight tissue. The real BA-4B is metal, but since this is a homebuilt type almost any colour scheme is possible. The original used blue and yellow tissue and the authors took some liberties with the registration in the name of amusement. After covering, shrink the tissue by lightly spraying it with water and let it dry. Then using dope, thinned about two parts thinner and one part dope, lightly coat the parts. When dry give only the fuselage one more coat of dope.

Install the windshield. Cut a slot in the aft stringers just above the side frames to insert the horizontal tail. Cement the vertical tail in place on the top stringer and aft end of the fuselage but do not get cement on the horizontal. Cement the top wing in place. The side view is drawn without dihedral so the wing struts could be shown exact size. Make the struts and cement in place on the top wing. Now the lower wing can be cemented to the fuselage and to the struts and should be easy to position properly.

This Biplane has no wires so all you have to add to the structure is the lift strut running from the fuselage just above the landing gear to the front of the interplane strut at the upper wing. See the front half-view for the lift strut length.

Add other details as desired, spinner, fuel tank cap, exhaust stacks, etc. Add a tailwheel (it doesn't have to roll, in fact, its better if it doesn't because the model won't fall off shelves or tables so easily). Main wheels can be made from balsa if you so desire or any available the right size can be used. A drop of cement applied carefully to the end of the wire will retain them, but, be sure they roll freely.

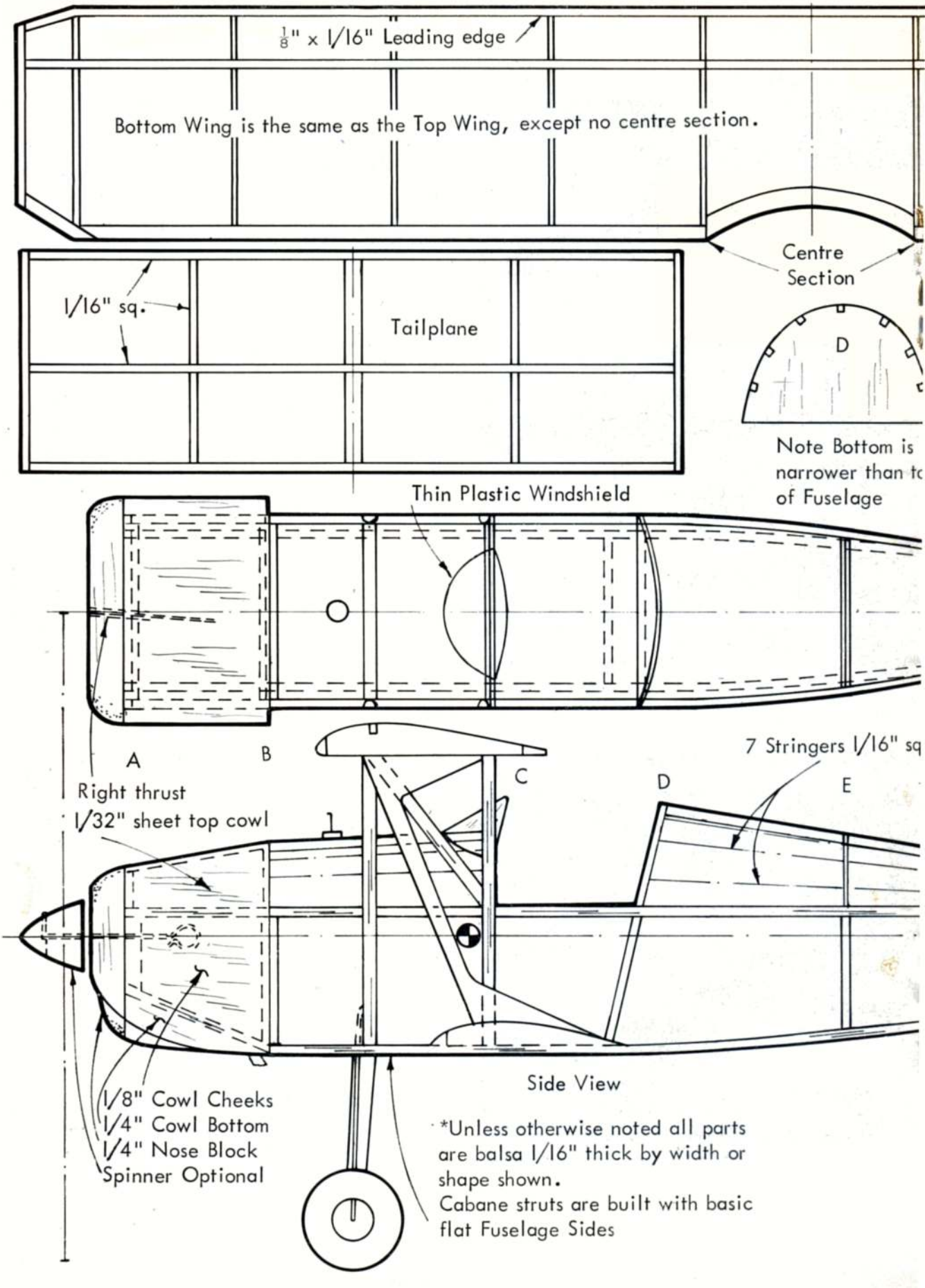
Ballast the model as required to get the centre of gravity in the spot shown on the side view. It will probably need very little, the amount depending on the weight of your components. Try some hand glides and shim the leading edge of the horizontal tail up or down as required to get a smooth glide. The glide will not be flat because a biplane is relatively loaded with drag. A glide ratio of 2½ to 3 is all you can expect.

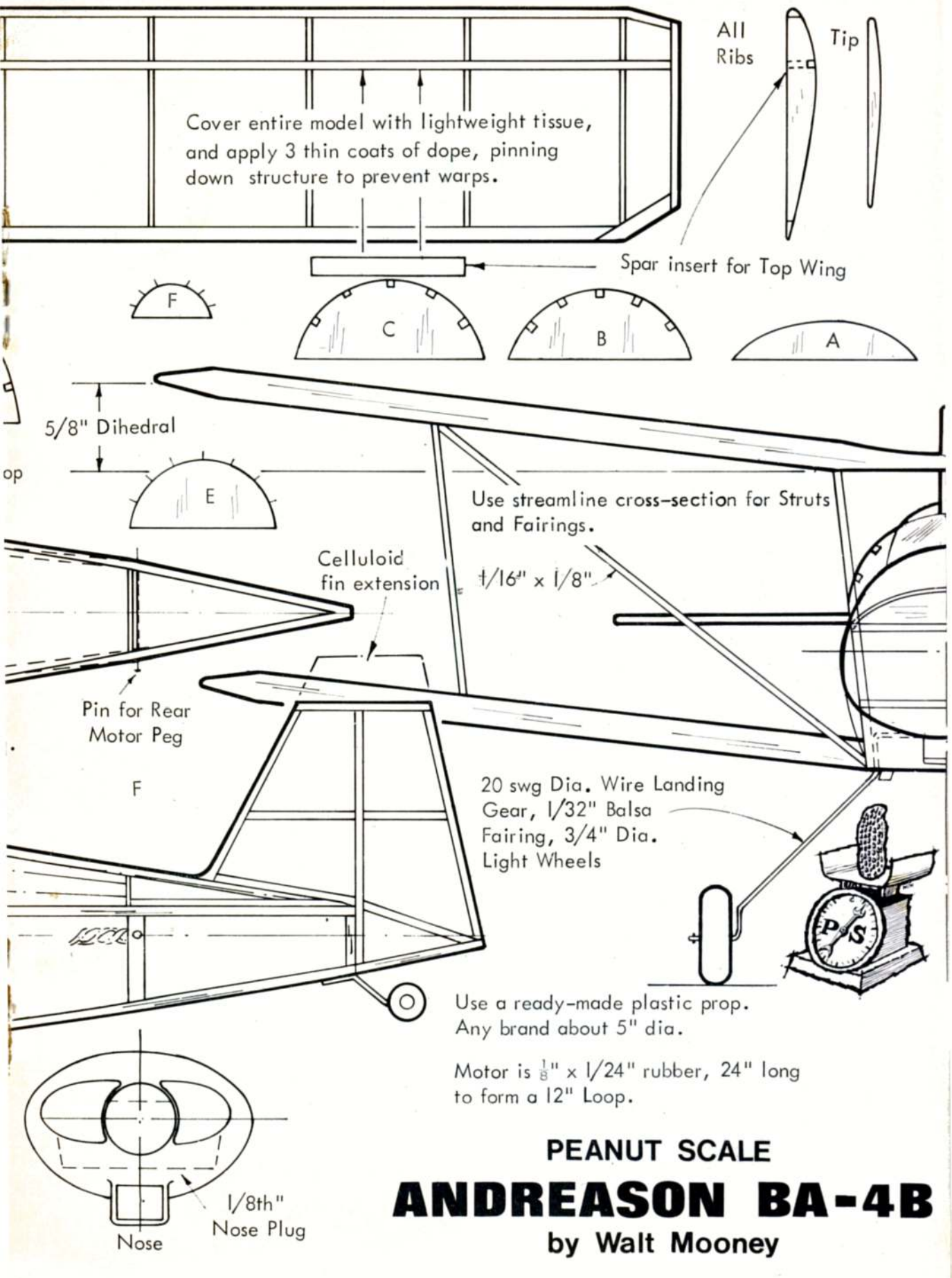
Now start power flights with only a few winds in the motor, gradually working up to the maximum you can get in the motor (less one turn, of course). Use shims between the noseblock and the cowl to make the model go in the direction you want it to when it is under power.

One thing you'll like about *Peanut Scale* is that they are nearly indestructible by their own actions and another is that they don't cost much to build. So go *Peanuts!*

Four views of Walt Mooney's prototype illustrate poetic licence with the registration letters. Why not try one for fun – there's lots to be said for the joys of a rubber driven scale model.

FULL SIZE PLANS OVERLEAF


1/8" x 1/16" Leading edge
Bottom Wing is the same as the Top Wing, except no centre section.
Centre Section
1/16" sq.
Tailplane
D
Note Bottom is narrower than to of Fuselage
Thin Plastic Windshield
A
B
C
D
E
7 Stringers 1/16" sq
Right thrust
1/32" sheet top cowl
1/8" Cowl Cheeks
1/4" Cowl Bottom
1/4" Nose Block
Spinner Optional
Side View
*Unless otherwise noted all parts are balsa 1/16" thick by width or shape shown.
Cabane struts are built with basic flat Fuselage Sides



PEANUT SCALE

ANDREASON BA-4B

by Walt Mooney

LATEST NEWS ENGINE

by Peter Chinn

Two views of the new Indonesian-built TS.35 diesel. This example, the first seen outside Indonesia, is owned by Swedish collector, Sten Persson.

Australian Speed News

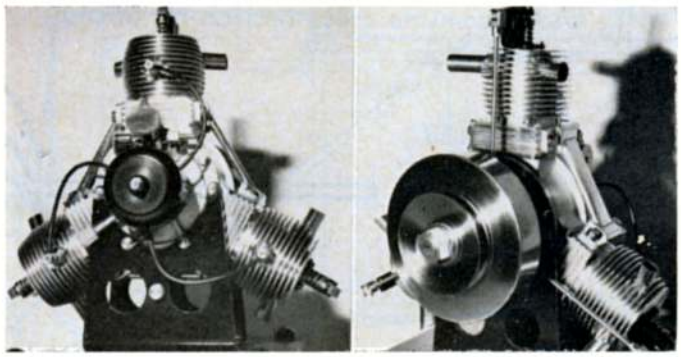
ONE OF THE best known 'names' in Australian C/L speed and overall speed winner in this year's Australian Nationals, is Len Buck. Len kindly keeps us abreast of developments in the Antipodes where, over the past few years, quite considerable progress has been made in speed. This contrasts with the decline of interest in this branch of the hobby in Britain and consequently it is not surprising to find that performances in Australia are generally higher than the levels reached in the U.K.

The C/L speed fraternity nowadays is – at least so far as the leaders in western countries are concerned – becoming quite a closely knit international group and there is regular exchange of information between certain European, American and Australian exponents. This does not mean that they always agree, but one finds that, after a while, this co-operation does tend to produce useful answers and to eventually lead to similar conclusions on points at issue.

That opinions are often diametrically opposed, initially, is frequently indicated by letters we receive. A typical case this year has been the reaction to the Super-Tigre G.15RV. One European speed flyer told us that he thought the G.15RV was the worst engine that ST had made for years and not to be compared with the MZ G.15 front induction engine. In contrast, Len Buck's impressions are quite the opposite. With 'as delivered' disk valve timing and with a head that had produced 25,500 rpm on his MZ G.15 using an MZ glassfibre test prop, the G.15RV turned up 25,800 (piped of course). He tells us, moreover, that fellow Australian speed flyer Ivan Vodopivec's G.15RV powered FAI model has twice reached 140 mph under the new 2-line rules. (This compares with Wisniewski TWA speeds of around the same figure.)

Commenting further on the G.15RV, Len claims that tuning it for a pipe is fairly simple. 'Take approx. .045 in. off the top edge of the exhaust port and lift the liner until the piston at B.D.C. is level with the exhaust and bolt on an E.D., or similar, pipe, 11 inches in total length from the centre of the exhaust. This gives between 160 and 165 degrees exhaust and doesn't appear too finicky.' He says that he regards the correct head as the big secret: 'Lots of com and the Cox heads are probably the best'.

Len Buck has been doing quite a bit with ABC 'Tigres. He finds it best to lap the alloy piston to a somewhat easier fit and has had very encouraging results with both the 60 and 29. With one of the latter on .024 monoline, he has been getting consistent 160+ mph unpiped flights without anything special in the way of climatic assistance. Only mods to the engine are the aforesaid lapping, plus a ⅛in. drill through the venturi.



Three cylinder double diameter piston engine designed by Edgar Westbury many years ago and made for last year's Model Engineer Exhibition by F. G. Boler of Leatherhead. One section of piston was used to boost charge to upper cylinder where exhaust is controlled by single poppet valve. Flywheel on rear shaft extension. Total capacity 15 c.c.

Metor MD-2.5

This engine from the Soviet Union, briefly mentioned in our August issue, is just about the most 'modern' of current Russian production engines. Its distinctly Super-Tigerish appearance is no coincidence. It is quite a close copy of the Super-Tigre G.20 Jubilee model first seen in 1960. There is still a distinct family resemblance to the current G.20/15, the R/C version of which is dealt with in this month's Engine Test report. Unfortunately, the Russian product falls lamentably short of its Italian prototype in quality of construction and finish.

The main casting, comprising crankcase, cylinder casing and front housing, has the same overall dimensions as the G.20 and cylinder liners are virtually interchangeable. The piston is an iron casting instead of being machined from bar stock and is slightly heavier. Like the latter G.20 pistons it has the skirt relieved below the gudgeon-pin, but to a rather excessive degree (0.2 mm. on diameter). The cylinder head is similar to that of the early G.20's with transverse curved inner surface.

The hardened crankshaft is a rather rough hewn copy of the ST shaft but with a shorter crankpin. It runs on one 10 mm. i.d. x 22 mm. o.d. x 6 mm. rear, and one 5 mm i.d. x 16 mm. o.d. x 5 mm. front, ball journal bearings, both brass caged. A brass split taper collet is used to mount the prop driver which also incorporates a machined alloy spinner assembly.

Instead of the Super-Tigre's two venturi inserts (8 mm. bore for use with tangent spraybar and pressure feed, interchangeable with a 7 mm. venturi with central spraybar for suction feed) the Meteor comes with a single 6.5 mm. venturi with tangent spraybar. No tapping is provided for crankcase pressurisation of the fuel system, but bosses are cast into the bottom of the main bearing and centre of the backplate – either of which could be drilled and tapped for this purpose. Alternatively, the upper left hand

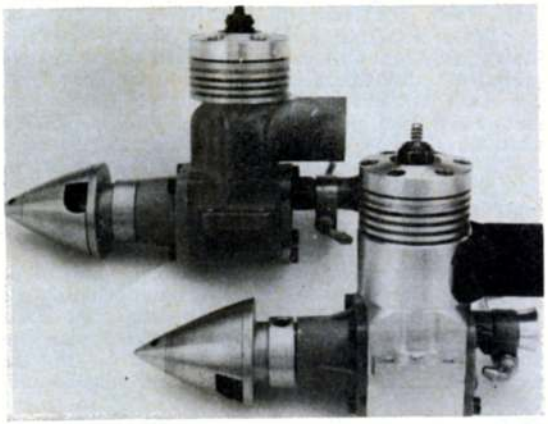
The Russian MD-2.5 Meteor 2.47 c.c. glow motor. This engine is clearly a copy of the 1960 Series Super-Tigre G.20/15.

backplate screw hole breaks into the transfer passage and could be used. polythene as a backplate gasket Incidentally, a novel item is the use of material. The checked weight of our example of the MD-2.5 Meteor is 164.5 grammes (5.80 oz.)

New Indonesian Diesel

There are many parts of the world where it is impossible to buy a model engine and many more where engines, which have to be imported, are prohibitively expensive when viewed against average individual incomes. Several years ago in Indonesia, because of this situation, a group of modellers got together and, with the co-operation of a local engineering works, designed and produced, in small numbers, their own engine.

This engine was the BOMA 150, a 1.5 c.c. diesel which we described and illustrated in an earlier article. It was



Cast crankcase version at rear and machined crankcase version in the foreground of the Lee special 2.55 c.c. racing engine described in text.

Parts of the Russian Meteor. Although some of these are actually interchangeable with Super-Tigre components, quality falls well short of western standards of construction.

the brain child of a Mr. Tan Hien Tjong who not only designed and made it, but also built the diecasting equipment necessary to produce the crankcase casting.

Now, Mr. Tan has designed a new engine, the Tiga Serangkai TS.35 which is being made in Surabaja on the island of Java.

The TS.35 has a bore and stroke of 16 x 16 mm. which gives a swept volume of 3.216 c.c. or 0.196 cu. in. It is a diesel of orthodox design with crankshaft type rotary valve induction, plain bearing and reverse flow scavenging. The crankcase is quite well diecast with large beam mounting lugs and is threaded for the screw-in cylinder and backplate. The finned machined aluminium cooling jacket screws onto the top of the cylinder. Cylinder porting is on the Cox pattern and comprises twin opposed exhaust ports with, between them, twin opposed internal transfer flutes. The piston has a flat crown.

Fairly large, overall, for a 3.2 c.c. motor, the TS.35 has a height, less compression screw, of 3.04 in. and a width across its mounting lugs of almost 2in. Checked weight of the example examined was 197 grammes (6.95 oz.).

Books on model Engines

The first example of the TS.35 to leave Indonesia was obtained by one of our Swedish readers, Sten Persson, who very kindly sent it along to us to have a look at – from which the above information was obtained. Mr. Persson, incidentally, is a keen collector of model engines and model aeronautical literature. He is particularly anxious to obtain out-of-print books on model engines and if anyone has copies with which they are willing to part, we will gladly forward letters.

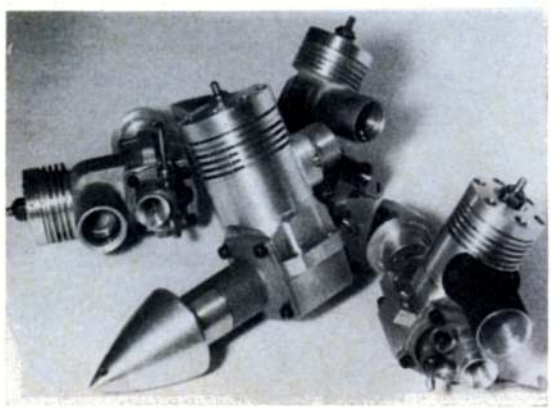
More Lee Specials

In the July 'Latest Engine News' we included some notes on Schnuerle-port 2.5 c.c. FAI speed specials constructed by A. F. Lee of Wythenshawe, Lancs, for members of the Sharston M.A.C. Mr. Lee has now sent us photos of his latest efforts, some of which are illustrated here. He comments:

'The machined crankcase 2.5 uses K&B 15 front and rear housings, connecting-rod and piston. The piston has the baffle machined off and the skirt is cutaway at the back to clear the boost port passage, also grooves are machined in the piston bosses to accept circlips to retain the gudgeon-pin which is also shortened to allow for this.

The crankshaft is altered by inserting a smaller diameter pin to engage the rear rotor which is made with a different timing from the normal K&B 15 (new one turned from Tufnol). After running-in, a new wick-feed venturi is installed to improve flight characteristics from the needle setting on the ground.

The cast crankcases were supplied by Brian Jackson of Sheffield and employ the same K&B parts, except for the front housing, the K&B part not being long enough when used with the cast crankcase.



Various complete A. F. Lee Specials. Centre foreground is 5 c.c. unit, with 2.5 c.c. machined case engine on right. Two cast crankcase 2.5's in background. All use Schnuerle type porting.

Ron Irvine reports on the

U.S. NATIONAL CHAMPIONSHIPS

Photos by Ron, and Dick Stouffer

★ ★ ★ ★ ★ ★ ★ ★

THE 1969 U.S. Nationals took place on July 14th to 20th at U.S. Naval Air Station Willow Grove, a short drive from Philadelphia. Held in what I thought were near perfect model flying conditions (apart from the high temperature and humidity). The events attracted a total of 1,392 entries (1,074 flyers plus 318 mechanics) in 38 different competition events, made up of 17 control line, 12 outdoor free flight, 5 indoor free flight and 4 radio control. Many of these events were sub-divided into three separate age categories, Junior, Senior and Open, as is customary in American competitions.

50 sponsors contributed to the trophy programme providing a total of 512 trophies not including the perpetual awards. Some idea of the sheer scale of the Nationals can be judged from this and from the fact that approximately 100 A.M.A. Officials directed the events, assisted by Naval Officers and enlisted personnel.

The A.M.A. are very fortunate in being able to obtain assistance from the Navy as this tremendously reduces the work burden on A.M.A. Officials. Navy personnel are used for all the routine tasks such as time-keeping and spectator control, leaving A.M.A. officials free to concentrate on the organisation of the events. Also of course the Navy make many of the base facilities available for contestants including accommodation and a workshop hangar.

Officials and pressmen were housed in the batchelor officers' quarters and I was very warmly welcomed when I arrived there on Sunday afternoon, by John Worth, Executive Director of the A.M.A., John Paton, President of the A.M.A., and many of the officials. I must say at this point, that in my week's stay everybody went out of their way to be friendly and helpful and also did everything that they could to make my stay enjoyable.

The main body of the contest events were not scheduled to begin until Wednesday and from then they continued through until early the following Sunday afternoon. In view of the Navy flying schedules, Monday and Tuesday were set aside for settling in and registration of contestants and R/C pylon race qualifying rounds, whilst the last Sunday afternoon was to be devoted to a spectator event in the form of a model aircraft flying display in place of the usual full size air show.

Indoor events were held in the huge blimp hangar at N.A.S. Lakehurst some 70 miles away on Monday and Tuesday and also the final contest in the programme to select the U.S. team members of the 1970 World Indoor Championships was held on Sunday,

Latest Engine News

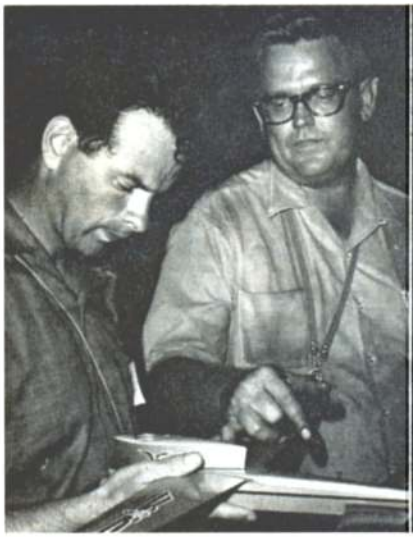
The 5 c.c. motor employs Eta 29 front and rear housings, the crankshaft is made on the same principle as the K&B built-up cranks and a lapped cast-iron piston in a leaded steel bore is used. Exhaust timing is 154 deg., transfer 134 deg. and rotor timing is 45 deg. ABDC to 60 deg ATDC. Using the lapped piston, the motor reached 19,700 rpm on the pipe but, due to excessive vibration, a Dykes ring piston and cylinder assembly are to be employed as soon as I get time to make them.

The pipes were made from 1¼in. dia. and 1½in. dia. magnesium bar as per the Wisniewski article in *Aero-modeller Annual*. Pipe seal to the engine manifold is achieved with the use of O-rings located in the manifold or header pipe, except in the case of the 5 c.c. motor which employs the old type of silicon rubber seal.'

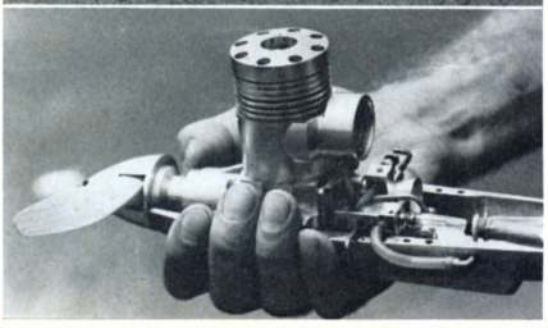
Up to the time of Mr. Lee's report, five of his 2.5 c.c. engines were undergoing tests by speed flyers: three of them by Brian Jackson and two by T. Lee and A. Morris of the Sharston club.

A. F. Lee 2.5 and 5 c.c. racing engines with pipes. Larger motor uses Eta 29 front and rear housings, but is otherwise original.

Some experimental shafts, pistons and liners used in the Lee 2.5 c.c. engines. Two of the crankshafts are modified from K & B 15 shafts.



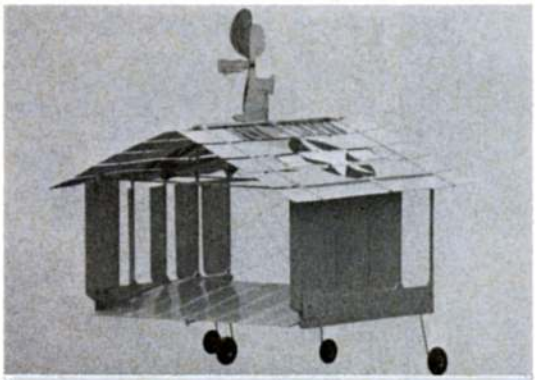
Author Ron Irvine chats 'engine dope' with George Aldrich above left. Centre is 7-year-old Gary Scheller, just one of 1,500 A.M.A. Delta Dart entrants in this fantastic meeting. Right, F.A.I. power line-up awaits timers. Below right is speed team of Chuck Wiechard and Bob Hemingway from Pennsylvania with 'front Runner 65', home-built engine has front induction through twin port shaft and plenum chamber. A.B.C. liner/piston and tuned exhaust. Below centre, typical sidewinder Rat Racer, by McIntyre/MacCarthy team was 2nd with 5:42 (K. & B. 40 series 69). Bottom is Roselle and Fry 65 with high and low speed needles actuated by centrifugal switch. Pen bladder tank.



the day preceeding the Nationals. The team selected were Jim Richmond, Pete Andrews and Clarence Mather. To enable contestants to commute between Willow Grove and Lakehurst the Navy arranged bus transport.

There is little doubt that the most outstanding contestant in the indoor events was current world champion Jim Richmond. He set up the top time in the team qualifying round on Sunday, his time being a new record of 41 mins. 45 secs. He also won the indoor paper stick event with a time of 26 mins. 56 secs., the indoor cabin with a time of 22 mins. 43.2 secs., was second in the indoor scale and was fourth in the indoor stick.

By 9 o'clock on Wednesday morning, the first full day of the contest, the base was alive with modellers and models. The size of the Nationals programme meant that events were scattered right across the airfield in roughly four separate areas. Carrier and team race by the central main hangar housing A.M.A. headquarters, remainder of the control line events in the southern corner of the airfield by the workshop hangar, radio control in the opposite northern corner and free flight events in the western corner. The result of this meant that it was impossible to follow all the events *even if you had wheeled transport*, and if, like the majority by far, including me, you did not, then you had to miss out on many events and wore out a lot of shoe leather trying to see as much as possible. I think that if I ever go again, I will have to try to persuade the A.M.A. to lend me one of the little buggies that some of their officials had as transport. Genial Texan, Bob Lutker, seemed very much at home on his any time I saw him. Bob had a roving assignment to tour the various events with a mobile public



address system so that he could give spectators a little bit of information as to what they were watching and fill in some of the background.

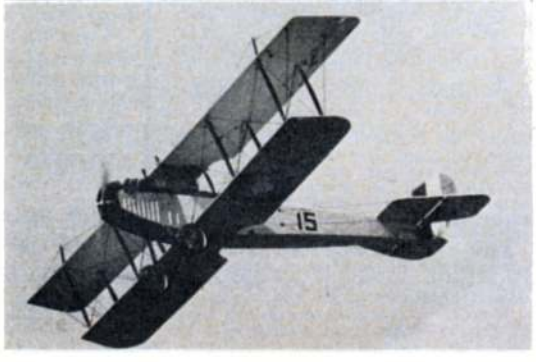
Some events, notably in control line, were a little marred as far as the final results were concerned by virtue of the fact that many of the top California flyers did not manage to make the long trip to Philadelphia. If they had, some results would probably have been very different and certainly no more so than in F.A.I. speed where the top speeds were slow, at least by U.S. standards.

Looking at the actual standard of models and flying it would be fair to say that the average was very similar to what one would expect to find in this country. The worst were somewhat worse but the best were *very* much better. The finest standard of construction and finish were to be seen in those events in which points were awarded for these features, *i.e.* scale, control line stunt and R/C Goodyear, perhaps this is a pointer to what could be done to improve the overall standard of models in other events.

Congratulations must go to the small bunch of Canadian flyers who journeyed down to the Nationals and carried off some of the trophies. Dave Kelly and Ken Parent won a well deserved victory in F.A.I. team race with very smooth flying, and put up the respectable time of 10 mins. 12 secs. in the final. Pete Puchyr from Acton, Ontario, seemed very pleased with his second place in open combat. It was also good to see my old friend John Franklin, who also came down from Toronto, with models, but unfortunately owing to delay in receiving entry forms and the fact that John was unable to arrive until mid-week, he was not allowed to enter even as a late entry. Freeflighting Cannucks also gave a good account of themselves, notably Peter Allnut, who won A/2 glider (after winning Wakefield at the British Nationals!), Don Mackenzie (who won Open Rubber) and Ron Higgs.

Top left: Snoopy, airborne on Al Signorino's Dog House, shows off his slatted sides. Centre is Lee Cleveland with 2nd place F.A.I. power 'Night Train', G 15 on tuned pipe. Jim Walker Stunt Trophy went to Bob Campoine with his Fox 35 'F-86D' with star studded tail. Below left, Canadian T/R winners Ken Parent and Dave Kelly – note the discreet flag waving! Centre is Dale Johnson with strictly non scale carrier model, having Cox 049 on inner wing to get model into Class II as well as Class I. Dad is at right; Bill Johnson, the fuel control specialist (see A/M Annual) with Rossi 60 33 in. Guardian weighing 41 ozs. Note flaps.

Above left: Roselle and Fry with record breaking 197 m.p.h. Class C, 24 in. model. Static r.p.m. is 19,800 on 9⅝ x 12 in. Steegens prop. Centre, Pete Puchyr, second in Combat with Fox 36X 'Voodoo' from Acton, Ontario, Canada. Senior Stunt winner Mike Stott of Mankato, Minnesota, used ST40 'Chipmunk' kitted by Sig, designed by Jim Van Loo. Right, top, are Margaret and Dave Platt with their Fock Wulf 190-A7, another scale finish beauty. ST60FI, Micro Avionics R/C is 1/6th scale, weighing 9¼ lbs. Centre is the FW 190; in flight Dave had U/C troubles. Bottom, Walter Moucha's R/C Scale 'Jenny' with 102 in. span, has OS80, weight 12¾ lbs. Micro Avionics R/C.



In speed, top honours must go to Jerry Roselle and Jack Frye who showed everybody that a tuned pipe could be made to work despite a temperature and humidity which approached 98°F. and 98%, with a new A.M.A. record of 193.68 m.p.h. on the new regulation .031 monoline wire, and then went on to do back-up flights of 188.21 and 197.07, the latter time should be put forward for ratification as a new World record, and 200 mile an hour is obviously just around the corner. What a pity though that the originator of the tuned pipe on our model engines, veteran speed flyer Bill Wisniewski, was not there to show his paces.

Perhaps the biggest surprise of all as far as I was concerned was the success of the Navy's Delta Dart competition for the kids. If it wasn't for the Delta Dart competition it is possible that Navy support would not be available for the Nationals and therefore the A.M.A. were doing everything in their power to make this event a success. Junior programme chairman, Bob Lopshire, told me that they had distributed a thousand Sig kits to local stores for free issue to children and the results were most encouraging with approximately 1,500 entries on the final Saturday and a total entry over the three days approaching 2,500. Perhaps here is a way in which our own S.M.A.E. could gain a similar kind of support from either Navy or R.A.F.?

R/C champion without any shadow of doubt was Californian Larry Leonard who placed first in both pattern and Goodyear events. But another outstanding performer was 16 year old Whit Stockwell who placed third in Goodyear and first in Junior pattern. Nor should we leave out 12 year old Jim Hiller who gave an impeccable display of flying in the final air show with his full house *Sperry Messenger* or Jerry Nelson who also inspired the crowd with a demonstration flight of his 12 foot wing span all-fibre-glass R/C glider.

Are you between 10 and 16 years of age? Then don't delay, join today

Dear John,
I have recently bought an engine from an advertisement. The crankcase proclaims it to be a D.A. DRABANT; an investigation of the insides shows it to be ball-race. I have had it going and it seems to be fairly powerful. It also has 2.5 written on the side; therefore it is a 2.5 c.c. engine.

Could you please tell me a little more about it, including an address to write to for spares. I intend to put it into your Stuka (A.P.S. No. FSP/CL/675). And could you tell me the correct prop to use?

I also have an A.M. 15 in the Slick Schick (CL 968), and I would like to know a prop size for this, too, please.
London, W.2. *Nicholas Kitson*

The 'D.A. Drabant' engine was a Norwegian engine, made by David Anderson and imported by Performance Kits Ltd. Unfortunately, this well built, ball race diesel engine is no longer available, and few examples are to be seen in this country. Although the workmanship was first-class, its power was in the 'sports' category, for which it was a little expensive. Use a 9" x 6" propellor for the Stuka, and a 7" x 6" for the A.M. 15 powered 'Slick Schick'.

Dear John,
I am in possession of a D.C. Bantam .75 c.c. motor and wish to know whether I can fit a silencer without reducing the power.

A power pipe may do it, so can you give me the size?
Kings Norton, Birmingham. *Kevin Eacock*

Davies-Charlton produce a muffler for the 'Bantam' which whilst reducing the noise level considerably does also reduce the power to some extent, this being practically unavoidable.

The E.D. 'Power Pipes' are not made in a suitable size, besides which they are intended for competition engines, which would gain most from their use. The Bantam is a 'sports' engine and thus a reduction in power is not usually critical.

Dear John,
Would it be possible to convert a K.K. Ranger and Phantom to F/F, and if so what (additions) changes should be made to the structure, and is a built up fuselage absolutely necessary on a F/F model? What does 'R.O.G.'s' mean?
Stewartstown, Co. Tyrone. *David Sinclair*

Briefly, the answer is NO! These models were designed specifically for control line flying and thus are quite unsuitable for free-flight. So many modifications would be needed that it would be better to design a new model from scratch!

Built up fuselages are by no means essential for F/F models, a recent example of a profile fuselage being the 'Hawk' presented in the June issue.

'R.O.G.' is the abbreviation for 'rise off ground' – that is an unassisted take off.

Dear John,
Please could you tell me if the Graupner R.C. model 'Mini Piper' could be converted to control line. Also, would the 'Pee Wee' engine be used in the converted model as in the R.C. model.
B.F.P.O. 45 *Peter Flood*

This model COULD be converted for control-line flying, but there would be little point as it would not be capable of any stunts, and would be virtually a tethered free-flight model. The Cox Pee Wee, .3 c.c., is rather small to cope with this size (28" span) model as well as the drag from the lines – an .049 cu. in. motor would be better.

TIP OF THE MONTH

Modellers who wish to make cheap, very light and accurate pilot dummies will find this an easy method.

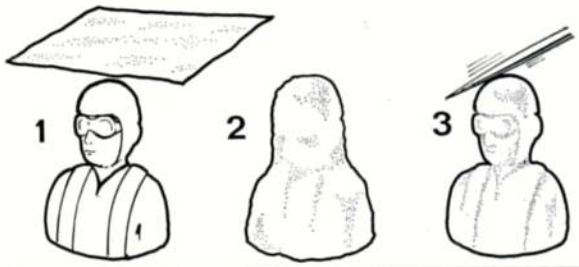
First of all, cut a piece of silver foil about 6 in. square and pull it over an original pilot (the plastic variety bought in shops). Then rub all over with a round, smooth object such as a compass point, until all the details come through, if necessary glue down any loose ends. To remove the foil cut down the back and release the original, and then cover the slit with another piece of aluminium foil. It is then ready to paint.

Stevenage, Herts. *Jeffrey Horton.*

Dear John,
I recently bought a KeilKraft 'Competitor', the first of my rubber powered planes. The rubber, 17 feet of it, was folded up into eight strands. Strangely enough the eight strands broke off in the middle of the fuselage when I only wound it 280 times, when a safe maximum of 500-550 is recommended in the instruction leaflet. Most likely this was due to the rubber being perished, for when it was stretched, tiny slits along the edge became big ones, and this eventually led to it being snapped. Could you please recommend an oil to lubricate the elastic, as it mentions in the instruction leaflet that this should be done.
Llanelli, Carns. *Wynne Jones*

One of the main snags in preparing a rubber motor is in selecting a long length of rubber strip which does not contain any flaws. All 'Wakefield' competition fliers could confirm that to find a good length suitable for a motor, many yards have to be discarded. One of the problems is storage at the model shops – never buy rubber which has been stored on spools exposed to sunlight. When making up a motor, hold the rubber strip, under slight tension, to a light – which will clearly show up any defects – and discard this section. This may seem expensive, but a broken motor is useless and often damages the fuselage.

Rubber lubricant may be obtained from your local model shop, or else use medicinal castor oil in emergency.



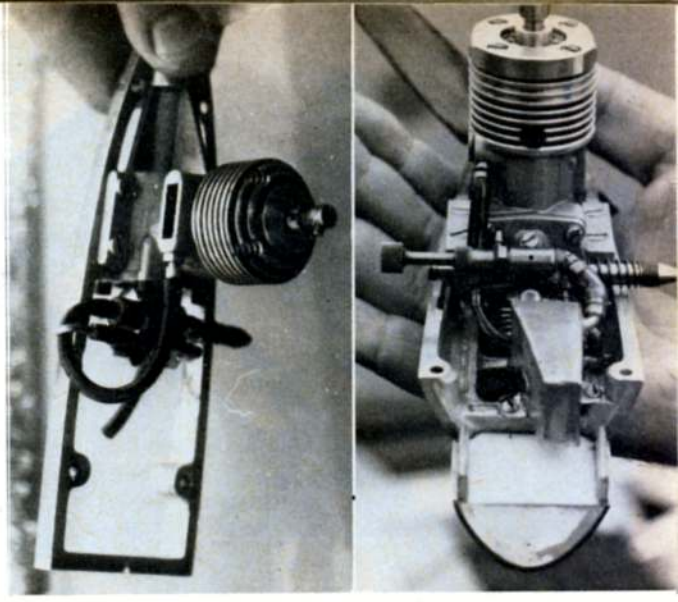
Dear John Bridge,
I am between 10 & 16 years of age and would like to become a member of the "Golden Wings Club". With this application I enclose postal order (International Money Order) for 2/6d. to cover cost of the enamel club badge, two coloured transfers and membership card.

NAME IN FULL .....
ADDRESS .....
.....
YEAR OF BIRTH ..... **SCHOOL** .....
NAME OF ANY OTHER CLUB OR CLUBS TO WHICH I BELONG (if any) .....

SEND TO:–GOLDEN WINGS CLUB, AEROMODELLER, 13-35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS

CONTROL-LINE INTERNATIONAL

15th CRITERIUM of ACES



Left, Winning team race motor – H.P.15D complete with exhaust primer. Right, Plotzinsh's home-built motor has slight resemblance to the H.P. Attention to detail is evident by careful wiring on of all tubing.

THE FIFTEENTH *Criterium of Aces* meeting, held at Genk, Belgium, must surely be remembered for the wettest weather that an international contest has been unfortunate enough to suffer. The rain commenced late on the practice day, precisely as the British team race entries were due to begin their practice session – so at least they felt at home ! The first contest day (Saturday) was dampened by intermittent showers, whilst on the Sunday there was scarcely a break, and virtually every competitor was soaked to the skin. Every tent was filled by cold, wet aeromodellers – pasty faces peering from every opening watching their unfortunate compatriots in the rain.

The brightest aspect of the meeting was the superb organisation by Pierre Baudine and his fellow helpers of the **Assoc. Belge D'Aeromodelisme,** and, of course, the magnificent flying site. Genk is unique in Europe in that all its facilities, which include four tarmac circles, one grass circle, one large tarmac area for R/C, plus a control tower, were provided and paid for *entirely* by the town of Genk This air-minded community also provided the private flying club's field and bar/clubhouse which adjoin. In fact, so keen are they that a tarmac circle was recently dug up and turfed to provide a combat circle, following complaints from previous competitors who found the carnage rather high over the hard surface.

The British entrants were all privateers – having paid all their entry fees and travelling expenses out of their own pockets, although the Belgian Air Force had generously provided air transport to Liege – as they have done in previous years. Disappointingly, no Americans were present this time, but the Bulgarian team's eleventh hour entry provided additional international competition.

SPEED

This was to be the first international meeting to be held to the 'no-monoline' ruling, which was introduced by the CIAM meeting at Paris in November 1968, and it was obviously going to be interesting to see how the times compared when flown on two lines. The main difficulty with the two-line system was keeping the model stable, as with monoline the model could be trimmed for level flight before entering the pylon, and the model virtually flew itself. However, with the new system this was not possible, and as the pilot ran round the pylon with the handle in the yoke, it was practically unavoidable to jerk one's wrist up and down, causing some erratic flying at times.

The British contingent (Brian Jackson, Peter Halman and Alan Woodrow) had been camping at the flying site for the whole of the previous week, spending the time practising and turning in some respectable times. Practice day itself produced few good times – in fact, only the Russian team was successful in breaking the 200 km/hr barrier, and this was way down on their normal form, as at their recent championships in Kiev, they had recorded 225 km/hr (139.8 m.p.h.).

First to fly in **round one** was Z. Pech of Czechoslovakia, but he did not enter the pylon as his M.V.V.S. engine was not fully on song. He later had his second attempt, and recorded 120.8 m.p.h. – his only official score of the meeting. Second away was our own Peter Halman. His Super Tigre G15 fitted with an E.D. tuned pipe running rich, the model took 1½ laps to take off. Whipping hard brought the pipe 'in' so he entered the pylon – only to have the engine sag shortly afterwards and he failed to complete the necessary 10 laps – hence no flight.

Frohlich and Scheiderheit of Germany both flew impressively with their low aspect ratio models powered by Super Tigre G15s – equipped with a centrifugal fuel switch, as described by Peter Chinn in the October issue. These worked extremely well enabling the model to take off quickly, and the engine to reach peak r.p.m. very rapidly, a great advantage over the rather hit or miss system of relying on setting the needle rich enough for the pipe's requirements, which often meant that the models were reluctant to take off. The Germans whipped their models very hard by swinging round the pylon with one hand, which soon necessitated the pylon being refixed to the centre of the circle with bolts fired from an impact gun !

I. Toth of Hungary put in a perfect run of 138.1 m.p.h. during this round, which proved to be the fastest time of the meeting, his Moki sounding really beautiful as the pipe quickly came in, and his style in the pylon was superb. It was obvious when a really fast time was put up, as all the helpers and other persons within the safety fence discreetly, but quickly, made their retreat to the safety of the chicken wire barrier ! Immediately after this flight was Lapinin (Russia) who joined the over 200 km/hr 'club' with 209.15 (129.9 m.p.h.) with his beautifully made all metal wing model, and equally well made engine of his own design, turning a 6¼in. x 6½in. narrow bladed propeller. No centrifugal switch was used – nor was one needed as the model took off within half a lap, reaching peak speed within two or three whipped laps.

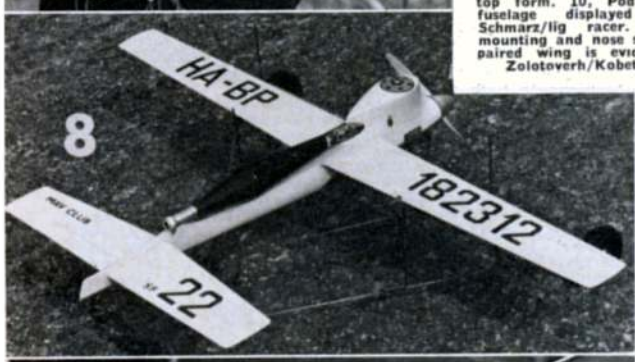
Brian Jackson's first attempt was unlucky as the T.W.A. engine sagged when his *Pink Lady* lifted off the dolly, and came down to suffer just a propeller breakage. He had his second attempt later, when he recorded 122.2 m.p.h., but his motor had slowed, as he was unofficially timed at 127 m.p.h. for the first five laps. Alan Woodrow, among the few not using a tuned pipe achieved 118.4 m.p.h. – his personal best and a very fine effort. In fact, he did not think that this flight would be recorded, as his handle was stuck only half in the pylon and he continued only for the practice.

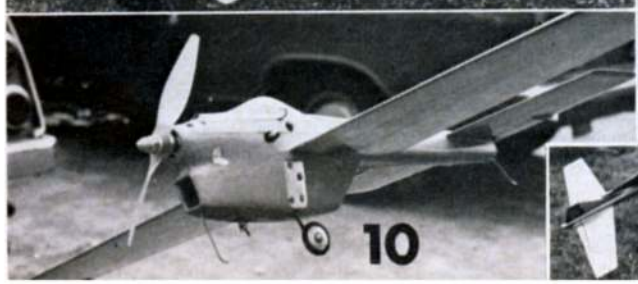
At the end of the first round it was obvious that the Hungarians were the pace-setters and the team to beat – as Krizsma had returned the second highest speed (133.4 m.p.h.) with Bathge also well placed following a run at 128 m.p.h. – both using Mokis with very narrow bladed 5¾in. x 6in. props. In fact, the deteriorating weather prevented most competitors from improving on their speeds in the remaining two rounds – a notable exception being Bathge who upped his to 132.3 m.p.h. to join his compatriots in the top three positions. Peter Halman managed to get in a good run with his model, a *Pink Lady* with enlarged tail surfaces, due to the extra weight of the pipe, and equalled Brian Jackson's best speed at 122.1 m.p.h. – whose motor went right off song to record a poor 104 m.p.h. Alan Woodrow failed to record a run with his second flight, and in the third round his Super Tigre again went off tune to register 104 m.p.h. also. However, from the British point of view the contest was far from discouraging, and as a team they acquitted themselves well – being the strongest team to represent this country for many years.

Team Racing

This year the familiar lap counting clocks had been replaced by an illuminated score board, which registered each team's laps and also any warning that may have been awarded. The system was very clear from a distance, but when close up it was often a little difficult to distinguish the numbers. Towards the end of the second day, they had to be disconnected, as water had seeped in and the lap scorers received a shock every time they clicked up another lap !

From the practice sessions, it was obvious that the





1, Team race winners Gurtler/Baumgartner display their V-tailed racer, using one of Jurgen Bartel's new 'Drazek Special' glassfibre props. 2, Highest placed British team member, Pete Halman's Super Tigre G15 powered 'Pink Lady'. 3, Tony Harknett prepares his model for the semi final. 4, Brian Jackson with T.W.A. Pink Lady – motor now seems past its peak. 5, Close up of cut-off resetting button and large finned bellmouth on the Plotzinch/Krasnorutsky racer. 6, High aspect ratio model by Klemm/Dolejs has pod and boom fuselage. Note common use of pressurised refuelling systems. 7, Krizma's Moki powered speed model uses very narrow bladed prop. 8, Toth's winning model also used a Moki, but a different tuned pipe. 9, Lapinin looks unhappy with his home-built engine which failed to produce its top form. 10, Pod and boom fuselage displayed on the Schmarz/lig racer. Note u/c mounting and nose skid. 11, Repaired wing is evident on the Zolotoverh/Kobetz model.

Russian teams were going to be the ones to beat – their pit stops being exceptionally quick, due to the use of a fuel cutout, operated from the down elevator movement. The pit man signalled the pilot by means of a coloured board, who on the next lap operated the cut-off when level with his segment – the engine cutting cleanly and the model landing very fast at the pit man's feet on the next lap. This system was very reliable and was probably worth at least 10 seconds per heat. There was little else technically new – and the only retracting undercarriage was on Sundells' three-year-old model. The British team were due to start their practice session at 4 p.m. – which heralded the arrival of the rain! However, it later cleared and they put in some useful practice – for as it happened Heaton/Ross broke a con-rod in their E.T.A. and Place/Howarth discovered that their mysterious loss of power was due to the front bearing housing not having been fully tightened. Don elected to use his much modified E.T.A. rather than his very original home-made engine – due to its better consistency and easier starting. The Harknett/Smith equipe's model flew steadily, giving no problems. That evening, Malcolm Ross fitted a new con-rod (obtained from Don Haworth's spares) and removed a burr from the piston skirt.

The **first round** started well with Molnar/Kuti of Hungary setting a fast time of 4:44.5 with their Moki TRS engined model, aided by a little whipping, which was spotted by the Jury, resulting in a warning. Their opponents, Evens/Olsen (Sweden) recorded a reasonable time of 5:03, whilst trailing badly were Turlizzi/Signorini, of Italy (5:44.8).

The jury made it clear that they wanted clean flying and were, very rightly, harsh on those who transgressed. The message finally got through to the competitors that they must fly fairly, this being illustrated by the fact that in the first round (13 heats) eight teams were disqualified – whilst in the second, only one team was !

Heat 2 saw the appearance of the experienced Dolejs/Klemm team (Czech) and also the start of the day's rain. What should have been a good race was marred by constant whipping and pulling of the model whilst overtaking, resulting in their disqualification on the 26th lap. Goudsmit/Buys (Holland) had also received two warnings for the same offences, leaving just Nore/Ekholm, of Finland, flying by the book. Even this state worsened when the two remaining pilots began to obstruct each other, resulting in the Dutch model pranging and Ekholm's feet bound up with broken lines. He hopped around the circle until rescued by Dolejs, recording 5:01.8 in the process.

First British appearance was in **Heat 3**, when Smith/Harknett flew with Schwarz/Ilg, of Germany, and Billon/Enfroy, of France. All models were rather slow in starting, but the German pair were first away with their H.P.15D powered pod and boom type fuselaged model, followed closely by the others. The H.P. was going well, cutting after 34 laps for a very good pit stop, and the British hopes began to fade as the Super Tigre slowed due to over-heating, taking some 15 flicks to restart. Schwarz received one warning for whipping and Billon two – to be later disqualified for leading when overtaking. Schwarz came down again for an extra stop on the 96th lap, as did Steve Smith on his 98th, their motor still running hot – later traced to the top cowling having worked loose and rubbing on the prop driver. The Germans recorded 5:10, the British 5:50.8.

Regular Criterium competitors, the Sundell brothers, from Finland, complete with their 1966 model (rather worn) still equipped with a retracting monowheel, flew in **heat 4** with Milanov/Rashkov (Bulgaria) and Lopez/Fernandez (Spain). The Finns and Bulgarians leapt into the air, together, leaving the unlucky Spanish team busily flicking, losing three laps, a deficit which steadily increased as they toured round, their Hosé Perez built motors being rather low on power. The Sundells' retract gear worked well, although the model landed very slowly when the leg was lowered – possibly losing much of its advantage. Their motor, a Mk. II Oliver, returned a consistent 38 laps at 98 m.p.h., a combination which resulted in a time of 4:51, probably good enough for a place in the semi-finals in those weather conditions. The Bulgarians, their Super Tigre G20D having 'hardened' early in the race, did well to record 5:05. **Heat 5** promised to be fast as Zolotoverh/Kobetz (U.S.S.R.) and Gurtler/Baumgartner (Austria) had both been impressive during practice. On the starting klaxon, the Austrians leapt into the air, leaving Kobetz furiously flicking his Super Tigre, but losing only one lap. Zolotoverh was the very epitome of perfect flying style, and as he walked round the circle his eyes were on the scoreboard for a full half lap. Gurtler, however, was indulging in a little whipping – for which he was awarded two warnings. The Russians' cut-out (working on the exhaust only) worked very well, but their motor was a little slow restarting, requiring on average 10 flicks for each of their three stops. A very fast heat, giving the Russians 4:40.5 and the Austrians 4:53.2.

Kropf/Nitsche (Austria) had an easy race in **Heat 6** (turning 5:17.8) as Samuelsson/Ahlstrom, of Sweden, were disqualified, and the Fichet Bros., from Belgium, were over a minute slower. The Danish Geschwendtner brothers were disqualified in **Heat 7** for pulling and leading when overtaking, while Bader/Kaul (Germany) were unlucky to have their model run into the circle, out of the pitmen's reach, leaving Valls/Montez, of Spain, lone finishers at 5:21.8.

Heat 8 was uneventful, resulting in Molnar/Nyarady, of Hungary, recording 5:05, with the Dutch Metkmeyer brothers and Nevenkin/Petrov, of Bulgaria, nearly three-quarters of a minute behind. Next to appear in **heat 9** were British hopes Haworth/Place, Cator/Harskamp for Holland and Brendel/Rumpel, of Germany. Don Haworth started his E.T.A. immediately the klaxon was sounded, as did Rumpel, whose HP15D powered model gradually began to pass the British model, which was popping badly. Happily, a few laps later it came on-song, to fly at around the 96 m.p.h. mark. Brendel, blatantly whipping and flying high, created what must have been an all-time record for disqualification – when he was 'red lighted' at around the 15th lap ! The Dutch pair were circulating steadily but several m.p.h. slower than Dick Place. The British pair had two excellent stops, for a time of 4:44 – very fast and practically certain to qualify for the semis, while the Dutch tried hard (two warnings!) for a disappointing 5:45.

Heat 10 saw Fischer/Meusburger (Austria) have a good fast run of 4:57.4 with their HP15D model, as the Italians, using Super Tigre ABC engines, were disqualified (guess why ?) and the Mohai/Markotai team from Hungary had overheating troubles with their M.V.V.S. TRS motor, to record a slow 5:43. **Heat 11** was a two-up affair between Fagerstrom/Aarnipalo (Finland), who had the unfortunate distinction of making the slowest time of the meeting (7:48) and Arroyo/Ruiz of Spain, who managed a 5:25.2.

The second Russian team of Plotzinsh/Krasnorutsky met our third team of Heaton/Ross as well at Topalov/Petkov, of Bulgaria, in **Heat 12.** All were evenly matched for speed, with the Bulgarians a little low on laps. Next down were the Russians, using a cut off to the fuel supply of their own designed and built engine. Derek Heaton landed at 47 laps, but the engine, which had been running a little lean, was reluctant starting – resulting in a 12-second stop, compared with the Russian's incredible 3½ seconds. The E.T.A. was off again, but down on speed, resulting in a slowish 5:11. The Russians, with another stop of only 5 seconds, recorded the very fast time of 4:39.6. The **last race** of this round also produced the fastest time, when the Hasling Bros., from Denmark, brought off a magnificent 4:26.2 with their v-tailed, clear finished model, powered by yet another HP15D, which consistently returned 100 m.p.h. for 25 laps. Unlike the majority of competitors, who used a pressurised refuelling system, they had a squash bottle on a piece of elastic attached to the pit man's arm – which resulted in fuel being sprayed far and wide on release of their model. Italians Magli/Ferroni, using an ABC series Super Tigre which was way off tune, recorded just 5:22.

Round 2, held on Sunday, commenced in the rain with Molnar/Kuti flying with Magli/Ferroni – the Russians Plotzinsh/Krasnortusky deciding not to fly in order to preserve their model for the semi-finals, as their first round flight was bound to qualify – it being unlikely to be beaten in the worsening conditions. The ensuing heat was very close, with the Hungarians really banging the model down hard on each landing, but losing out on having an extra pit stop to the Italians, whose model, although not quite as fast, was more consistent. The result was 5:01.2 to the Hungarians, 5.08 for the Italians. **Heat 2** saw the reappearance of the Hasling Bros. – this time with an elderly Super Tigre powered reserve model, keeping the best model for the semis. The Sundell Bros., aware that their first round time was marginal for qualifying for the semis, were obviously keen to improve, but as it happened, it was Kropf/Nitsche who made the improvement, for a 4:53.2 – largely due to extremely quick pitting, whilst the Sundells were much slower at 5:51 – his pitman using a whistle to warn him of warnings received ! The Haslings' deep-bellied model was slow warming up, losing 15 laps at the start, and set off on a badly popping run, but even so made 5:10.8.

Bulgarians Milanov/Rashkov had to improve on their first round time and Samuelsson/Ahlstrom (Sweden) had yet to register a time in **Heat 3.** Although the Bulgarians did manage to record a faster time, it was not quite good enough – a great pity as their 4:53.2 was well deserved. The Swedes, collecting two more warnings, were way behind at 5:38.2. **Heat 4** contained Brendel/Rumpel, Dolejs/Klemm (both of whom were disqualified in the first round) and Ekholm/Nore, of Finland. The race was very close, the Czechs and Germans getting off together, with the German two laps behind – and still indulging in whipping in order to catch up, hence yet another warning. Klemm brought his streamlined model, with glass fibre covered wings, in first for a pit stop, and was off again almost immediately – followed by the Finns a few laps later. After his second warning, Rumpel eased up and his model noticeably slowed, being rather over-compressed. The result of the race was a very close finish with the Czechs registering 4:58.2, the Finns 5:00 and the Germans 5:02.2.

The fastest British team – Place/Howarth – then met the

Metkmeyer Bros. and Geschwendtner Bros. in **Heat 5.** At the start the Geschwendtners were left two laps behind as their HP15D proved rather obstinate to start – they, too, using the 'bottle on elastic' method of refuelling. Place's model was slightly the faster of the three – his E.T.A. sounding very healthy. First down for a slow stop, at 30 laps, were the Danish pair, whilst the Dutch pair followed suit a few laps later – leaving Dick Place still circulating to return 41 laps. In fact, one member of the F.A.I. jury was so astonished at the range of our lads that he was querying as to whether their tanks were oversize (although, of course, they had already been checked and were quite O.K.). Seems the Continentals have difficulty in attaining 34 laps safely. When Dick did eventually land, the motor was a little reluctant to start, but Don got it going again in six flicks and as many seconds. The Danish and Dutch teams were getting decidedly rough in the centre and each received warnings for pushing. The result was a little disappointing, as the race seemed faster than the 5:03 awarded to the British pair and 5:07.5 and 5:12.4 to the Dutch and Danes respectively.

Heat 6 was surprisingly slow – and the German team of Schwarz/Ilg managed only 5:13.1, being unable to obtain the practice times with their HP15D powered, clear finished model, using home cast fibre glass props. The Swedes Evens/Ohlsson were much slower, too, at 5:34.5, but the Spaniards Lopez/Fernandez improved considerably, even if it was only for 5:56.8. Trying too hard to improve their time was the Austrian team, Gurtler/Baumgartner, who were disqualified in **Heat 7** – receiving the distinction of being the only team disqualified in this round. This left Fagerstrom/Aarnipalo, of Finland, to partially recover face by recording 5:48.3, whilst Topalov/Petkov were way behind at 6:12. Perhaps the weather, growing ever colder, was to blame for the slow times at this period – but in **Heat 8** the winners, Fichet/Fichet, only just managed a sub-six-minute time, whilst Cator/Harskamp were well over at 6:15.4. Third race members were Arroyo/Ruiz, of Spain, who unfortunately pranged due to binding lines.

Heat 9 saw Magli/Ferroni fly their unusual pod and boom fuselaged model with a long, large diameter tube mounted directly behind the engine to duct the exhaust away – not a 'pipe' as was first thought. Their opponents, Mohai/Markotai and Bader/Kaul, where somewhat obstructed by Ferroni's headgear – which consisted of a plastic bag, the excess length of which constantly flapped in their faces ! However, a slow race due to the Germans missing a catch and the Italians' Super Tigre hardening after the halfway mark.

Malcolm Ross and Derek Heaton, determined to better their earlier time, flew against Fischer/Meusburger (Austria) and Goudsmit/Buys in **Heat 10.** The Austrians gained a lap advantage at the start and Malcolm's E.T.A. was popping badly. First down, at 36 laps, were the Austrians, who were off again in six flicks. Next to cut was Derek's E.T.A., but it did not cut cleanly, wasting a lap and then landing rather fast. Malcolm's hand caught the wing, and then suffered the ill luck to have it slide through his fingers – the wet wings being very slippery. However, retrieving the model quickly, he refuelled and restarted in record time, but the motor still missed slightly. The damage was done and they clocked 5:02.9 to the Austrians' 4:58.4.

Heat 11 was a slow affair, Billon/Enfroy recording 5:52.5 whilst their Spanish opponents crashed, again due to binding lines, caused by the rain.

The last British hope appeared in **Heat 12** in the form of Smith/Harknett, who needed a great improvement to reach the semi-final. This was to be a two-up race – the Russians scratching to preserve their model for the semis, thus leaving just Molnov/Nyarady to race against – and what a race it was for the British. With one team not competing they had a good chance for a fast time – which they certainly achieved – a magnificent 4:49.9, the fastest time of the second round. Tony Harknett catching the model and restarting the motor very rapidly each time pilot Steve Smith delivered it into his hands – so . . . we would have *two* teams in the semi-finals !

The first **semi-final** was between Gurtler/Baumgartner, the Sundell Bros. and Plotzinsh/Krasnorutsky. All started instantaneously and it was interesting to note the different tactics used – the Austrians' HP15D providing 100 m.p.h. for 25 laps, the Finns using retracting gear and two stops, whilst the Russians returned 35-38 laps, with cut out, at around 97 m.p.h. The Austrians were the fastest but suffered from relatively slow stops, and the Russians somehow lost some range, requiring an extra stop. The Sundells' landing gear gave some trouble when lowering – the model landing very slowly indeed. The Russians achieved a 4:47.8, the Austrians 4:51.5 and the Finns 4:55.4.

Next were the strongly fancied Hasling brothers, Molnar/Kuti and our own Place/Howarth. British hopes sank as Don Haworth was left at the start frantically flicking his E.T.A. – eventually releasing some three laps behind. Surprisingly, the Haslings' model was only slightly faster than Place's – and it also needed an extra stop. Upsetting the apple cart was the Hungarian team, who collided with the Danish model, damaging it severely. The result was disqualification for the Hungarians and a re-fly for the other two.

Before this re-fly was the third semi – between Kropf/Nitsche, Zolotoverh/Kobetz and our second team Smith/Harknett. The Russians were the fastest, despite the Austrians' whipping and they cut the motor at 25 laps, adjusted the needle and were off again. Then disaster struck the British pair as first Tony Harknett missed the model, landed quickly by Steve, and then, having restarted quickly, had the misfortune for the motor to cut after only one more lap. Slight richening of the needle and another quick start put them back in the air, but not the race (5:31), which went to the Russians with 4:53.

The re-fly was then held – the Haslings being reduced to their 'hack'. Neither team benefited from this re-run – the E.T.A. missing badly at first and later picking up, whilst the Danes Super Tigre cut after four laps of very rough running. On the first pit stop the model slipped through Don's fingers but he retrieved it quickly and sent it on its way – for 5:03.6. The Danes having had their motor cut yet again recorded 6:30.

The **final** therefore consisted of the 'long range' Russian team of Plotzinsh/Krasnorutsky using their own motor, the 'short range' Zolotoverh/Kobetz with a much modified Super Tigre and the Austrians Gurtler/Baumgartner with their HP15D.

All were evently matched for speed but Zolotoverh/Kobetz lost half a lap at the start. The Austrians, low on laps at 25 were first down, whilst the 'short range' Russians cut their motor on the same lap. The Russians were extremely quick at pitting and the model hardly seemed to pause on the ground – not that the Austrians were slow either. Plotzinsh, having regained his lappage, continued for 37 laps before stopping his motor and making a very fast pitstop. Zolotoverh and Gurtler landed on the same lap again for their second pit, whilst Plotzinsh continued for another five – all making classic refuelling stops. Disaster then overtook the 'short range' pair, as Zolotoverh's lines bound due to the rain and he crashed. Troubles also hit the other Russian team, when, for the first time throughout the contest, their cut out failed to work – it taking two laps to finally operate – meanwhile, slowing the motor right down. Their luck was right out when on the next landing the model overshot the pitman by some three segments, it taking a further seven flicks (albeit rapid) to restart his motor. Meanwhile, the Austrians were having a trouble-free run – if not particularly fast, and won the race with a time of 9:45, compared with Plotzinsh/Krasnorutsky's 9:57.

Despite our shortcomings in the semi-finals, we did, however, qualify for the team prize, just beating the Austrians (there was not a full team from Russia). Actually, the prize was awarded to the Austrians at the banquet, but thanks to our team's mathematics being better than the organisers' – it was later given to the rightful owners.

Next month: Full report on the combat, aerobatic and scale events.

SPEED

			Rnd. 1	Rnd. 2	Rnd. 3
1	I. Toth	Hungary	138·1	136·0	—
2	G. Krizsma	Hungary	133·4	133·2	131·5
3	K. Bathge	Hungary	127·8	127·8	132·3
4	H. Dusi	Italy	130·8	124·3	117·7
5	J. Frohlich	W. Germany	130·0	—	128·5
6	A. Lapinin	U.S.S.R.	129·9	127·8	124·3
7	V. Natalenko	U.S.S.R.	124·3	126·3	128·5
8	M. Lahtinen	Finland	122·2	128·5	—
9	K. Jaaskelainen	Finland	116·5	122·8	95·3
10	**P. Halman**	**Great Britain**	—	122·2	114·2
11	**B. Jackson**	**Great Britain**	122.2	104·0	—
12	A. Prati	Italy	115·9	122·2	122·5
13	D. Scheidereidt	West Germany	121·5	120·9	—
14	Z. Pech	Czechoslavakia	120·9	—	—
15	L. Eskildsen	Denmark	120·0	117·7	117·7
16	**A. Woodrow**	**Great Britain**	118·4	—	104·0
17	C. Saudella	Italy	—	117·7	—
18	D. Enfroy	France	—	—	116·5
19	H. Heinsius	Netherlands	—	—	114·7
20	V. Malanchuk	U.S.S.R.	—	—	114·7
21	E. Buys	Netherlands	112·9	—	106·5
22	G. Kambourov	Bulgaria	—	111·9	—
23	A. Kitipoy	Bulgaria	98·1	102·3	—
24	J. Bartels	West Germany	101·6	101·2	—
25	H. Freundt	Austria	—	—	—

AEROBATICS

			Round 1	Round 2	Round 3	Best 2 Total
1	M. Vanderbeke	Belgium	2,874	3,087	2,839	5,961
2	J. Gabris	Czechoslavakia	2,866	2,845	2,903	5,769
3	L. Compostella	Italy	2.819	2,929	2,715	5,744
4	G. Billon	France	2,875	2,855	561	5,730
5	G. Egervary	Hungary	2,830	2,876	—	5,706
6	O. Andersson	Sweden	2,623	2,849	2,813	5,662
7	L. Vandenhout	Netherlands	2,648	2,835	2,709	5,544
8	C. Cappi	Italy	2,676	2,755	2,734	5,489
9	I. Cani	Czechoslavakia	2,601	2,844	2,553	5,445
10	L. Eskildsen	Denmark	2,575	2,700	2,732	5,432
11	H. Twerda	Netherlands	2,664	2,591	2,711	5,375
12	J. Bartos	Czechoslavakia	2,617	2,676	2,687	5,363
13	K. Seegers	West Germany	2,609	2,748	2,612	5,360
14	E. Kondratenko	U.S.S.R.	2,369	2,692	2,650	5,342
15	K. Plotzinsh	U.S.S.R.	2,687	2,649	2,648	5,336
16	V. Esjkin	U.S.S.R.	2,656	2,639	2,662	5,318
17	E. Madsen	Denmark	2,615	2,703	2,395	5,318
18	A. Kaminski	Germany	2,736	2,562	2,507	5,298
19	R. Raeymackers	Belgium	2,578	2,707	2,403	5,285
20	G. Liber	Belgium	2,651	2,621	2,549	5,272
21	S. Rossi	Italy	2,683	2,544	1,158	5,227
22	G. Masznyik	Hungary	2,597	2,603	—	5,200
23	A. Jankov	Bulgaria	2,309	2,516	2,572	5,088
24	E. Mayer	Finland	2,525	2,370	2,547	5,072
25	**J. Mannall**	**Great Britain**	2,472	2,477	2,589	5,066
26	**M. Reeves**	**Great Britain**	2,524	2,497	2,534	5,058
27	S. Marconcini	France	2,063	2,523	2,493	5,016
28	G. Kaiser	Austria	2,536	2,468	—	5,004
29	G. Weinwurm	Hungary	2,549	2,443	2,118	4,992
30	R. Kessels	West Germany	2,283	2,453	2,421	4,874
31	B. Metkmeyer	Netherlands	2,329	2,365	—	4,694
32	A. Milanov	Bulgaria	2,177	2,285	2,197	4,482
33	**M. Harvey**	**Great Britain**	2,028	2,368	72	4,396
34	A. Kalev	Bulgaria	1,978	2,049	2,069	4,118

SCALE

			Static	Flight 1	Flight 2	Total
1	**A. Day**	**Great Britain**	1,048	353	345	1,401
2	**A. Briggs**	**Great Britain**	1,036	255	164	1,291
3	O. Angelov	Bulgaria	918	92	—	1,010
4	E. Struik	Netherlands	633	324	357	990
5	**R. Ivans**	**Great Britain**	889	65	—	954

COMBAT

1	**S. Jones**	**Great Britain**
2	**J. Dixon**	**Great Britain**

TEAM RACING

			Round 1	Round 2	Semi-Final	Final
1	Gurtler/Baumgartner	Austria	4:53·2	—	4:51·5	9:45
2	Plotzinsh/Krasnorutsky	U.S.S.R.	4:39·6	—	4:47·8	9:57
3	Zolotoverh/Kobetz	U.S.S.R.	4:40·5	—	4:53	
4	P & O Hasling	Denmark	4:26·2	5:10·8	6:30	
5	Molnar/Kuti	Hungary	4:44·5	5:01·2	—	
6	**Place/Howarth**	**Great Britain**	4:44·6	5:03·8	5:03·6	
7	**Smith/Harknett**	**Great Britain**	5:50·8	4:49·9	5:31	
8	G & O Sundell	Finland	4:51	5:51	4:55·4	
9	Kropf/Nitsche	Austria	5:17·8	4:53·2	5:10·7	
10	Milanov/Rashkov	Bulgaria	5:05	4:55·6		
11	Dolejs/Klemm	Czechoslavakia	—	4:58·2		
12	Fischer/Meusburger	Austria	4:57·4	4:58·4		
13	Ekholm/Nore	Finland	5:01·8	5:00		
14	Brendel/Rumpel	West Germany	—	5:02·2		
15	**Heaton/Ross**	**Great Britain**	5:11	5:02·9		
16	Evers/Ohlsson	Sweden	5:03·2	5:34·5		
17	Molnar/Nyarady	Hungary	5:05	5:49·4		
18	B & R Metkmeyer	Netherlands	5:56·8	5:07·5		
19	Marini/Penso	Italy	—	5:08·3		
20	Bader/Kaul	West Germany	—	5:09		
21	Schwarz/Ilg	West Germany	5:10	5:13·1		
22	H & J Geschwendtner	Denmark	—	5:12·4		
23	Valls/Montoy	Spain	5:21·8	5:18·1		
24	Mohai/Markotai	Hungary	5:43	5:20·2		
25	Magli/Ferroni	Italy	5:22	5:31·6		
26	Arroyo/Ruiz	Spain	5:25·2	—		
27	Samuelsson/Ahlstrom	Sweden	—	5:38·2		
28	Nevenkin/Petrov	Bulgaria	5:42	5:41·5		
29	Turlizzi/Signorini	Italy	5:44·8	5:41·8		
30	Cator/Harskamp	Netherlands	5:45	6:15·4		
31	Fagerstrom/Aarnipalo	Finland	7:48	5:48·3		
32	Billon/Enfroy	France	—	5:52·5		
33	Lopez/Fernandez	Spain	7:23	5:56·8		
34	M & J Fichet	Belgium	6:17·5	5:57·3		
35	Topalov/Petkov	Bulgaria	—	6:12·2		
36	Goudsmit/Buys	Netherlands	—	6:21·8		

FREE FLIGHT

COMMENT

By John O'Donnell

IT WOULD SURELY be inappropriate to start in any other way than by congratulating Elton Drew on winning A/2 in Wiener Neustadt. To win the *Weltmeisterschaft* is noteworthy enough – but it is also the first time Britain has had an *individual* victory in the A/2 category. As readers of his articles in the January to March issues of AEROMODELLER will appreciate Elton prefers to 'go it alone' when thermal hunting – but is not above tactal flying when he considers it appropriate. In Austria he certainly mixed the two approaches correctly – and incidently provided adequate vindication of the current British approach to glider contests. As I know he did not retrieve any of his contest flights himself I am sure he will join me in acknowledging the help of the volunteer 'recovery squad' who spent the contest hours downwind. The contest itself is fully reported elsewhere in this issue.

★ ★ ★

The **Area-centralised events** held on 10th August were only a few days before the World Championships – and were affected in consequence. There had been rumours that this Area meeting would not be counted for the club and individual championships. Early in August the S.M.A.E. council reaffirmed a decision made in April, but not published, to withhold championship points. The reason for this unprecedented resolution was the number of British modellers going to Austria in one capacity or another. It was also decided that such people could have their models flown by proxy in the **Keil Trophy** at least.

The only real solution to such a situation is to avoid the clash when planning the contest programme. Strangely enough it does not seem to have been the *Team* members who demanded consideration – but the clubs supplying proxies and/or spectators.

All-in-all the Area meeting was not well supported. Half the Wakefield entrants plus a good percentage from the other events flew with the Northern Area at Topcliffe. There the weather started calm, sunny, extremely hot and with plenty of lift. There were a few 'holes' and everyone dropped at least one flight. The **Gutteridge Trophy** was won by Tony Cordes with a straightforward design that he built in under a week. Runner-up was Bill McGarvey, flying at Chobham, who has apparently been in England too long to get into the New Zealand team again. I used the opportunity to try out my brand new Wakefield under thermal conditions. This model was intended for, but not actually flown in Austria.

The **Keil Trophy** for Team Power was won by Brighton's 'A' team with Tony Child providing one of the contest's few trebles. The team included Jack Allen's model flown by proxy. Close behind and robbed of victory by one member under D/T-ing a flight, were Northampton. I gather from Trevor Payne that flying conditions were marvellous at Henlow, it being calm all day. My club filled third place – but would have tried much harder if they had not felt they were being legislated out of their chances in the Plugge. St. Albans had *three* of their team flown proxy – surely a unique occurrence !

A/1 glider attracted substantially more entries than Wakefield and the top three places were decided by the fly-offs. Winner was Northampton's J. Cooper with over four minutes on the decisive flight, Runner-up was my clubmate (and N. W. Chairman) Mike Reeves flying at Beaulieu where he had the company of exactly three other f/f modellers. Model was his usual square-tipped design with all fin area underneath. The fly-off trio was completed by Jim Baguley.

Disinterest in the S.M.A.E. events was evident in the N.W. Area where a relative handful of people flew at Cark – again in ideal conditions. Main attraction was the N.W. 'open' contests with Russell Peers and Brian Picken striving for the season's overall grand total. The power entrants 'doubled up' for the Keil – but no-one bothered with Wakefield or A/1.

A not dissimilar situation existed in the East Anglian area where the R.A.F. Championships were being held at the Area venue of R.A.F. Watton. Activity in the R.A.F. events was not reflected in simultaneous participation in any S.M.A.E. event other than A/1.

★ ★ ★

Barry Hyde sent me details and results from the **Torbay Rally**, run by his club at Woodbury Common, near Exmouth, on 24th August. Although he refrained from commenting on

the number of entrants, they must have disappointed the host club – especially as two events (Coupe d'Hiver and Chuck Glider) were completely unsupported.

Perhaps this was due to the day being windy at first with max's going the length of the Common. Later, however, the wind dropped and retrieving was much less energetic. The power event resolved itself into a struggle between Peter Ward (with a large own-design pylon model) and Fred Chilton who flew very consistently but who was not quite so 'lucky' with the air he picked. Third place went to Les Long despite still having power pattern problems with his *Ramrod 600* that features egg-box structure.

Open rubber produced low scores although all the models survived 'to fight another day'. Barry himself was the winner. Glider had the most entrants, and was topped by Dick Woods despite only trimming his *Wichita* on the day itself. Also noteworthy is the fact that this gentleman is an R/C flier !

The All-in F.A.I. was won by Chris Chapman with four A/2 and one Wakefield flight. Doubling was permitted and allowed him to take second in glider as well. The model in question featured surface spars, a rolled sheet (round a billiard cue) fuselage boom, and a *fuse* D/T.

A similar mixing of A/2 and Wakefield was used by R. Cummins to take second in F.A.I. and third in glider. Barry Hyde flew his 'only' Wakefield despite its calm weather layout. This includes a 60in. span wing (with a $\frac{1}{16}$in. sheet upper surface and $\frac{1}{32}$in. square turbulator) in two halves connected by wire 'dowels', and a tiny tail of 47 square inch area. Sixteen strands turn a 23in. x 30in. prop. Barry reports good climb and stability, even in wind, but little improvement in glide performance compared with previous models.

★ ★ ★

The season's major meeting in the North is the **Woodford Rally** organised by the N.W. Area at the Hawker-Siddeley aerodrome near Bramhall in Cheshire. Traditionally this meeting is run to attract the public as well as the modeller – and to act as an advertisement for the hobby as well as a means of raising revenue. This year's rally was no exception, although there were some changes as a result of 'new blood' on the Committee. One example was the awarding of trophies (instead of the usual merchandise) of stereotyped design but with unique engraving. I'm sure the event will be remembered as 'Woodford *Valley* 1969'.

The free-flight side of the comprehensive programme (R/C, C/L and Scale being reported elsewhere) seemed poorly supported – especially in view of the excellent flying weather. Although generally overcast, and initially misty, it was very calm all day. This was just as well in view of the rather limited space available.

Both open power and rubber only attracted 20 entries apiece and surprisingly few perfect scores. In fact Tony Dakin was the only person to max out in power. He flew early and did his treble between 11.00 and 12.30 – but lost his modified *Sloworm* on the third flight due to D/T fuse failure. Main alteration was the use of a 45in. x 6in. wing. Otherwise he took Dave Hipperson's advice – even to that of flying under the glider experts ! Runners-up were F. Elton and Doug Barber each of whom dropped a few seconds on their last flights.

Rubber only produced six trebles – a phenomenon I find difficult to explain. The fly-off produced quite a spread of scores with Ted Prince being the only one of the first four away to find lift – and that low down. Dave White and I flew a little later. My *Maxine* got appreciably higher – but Dave's model found some weak lift and eventually D/T'd for over 8 minutes. His model was the same one as flown to second place at the Nationals

In comparison, glider had 11 trebles out of 43 entrants,

Left, winner of the Woodland chuck glider event was John Sumner (Sheffield). Right, Pete Oliver's new model features 'Sans Egal' surfaces on a fibreglass rod fuselage.

despite quite long liftless periods when patience was even more essential than usual for tactical flying. The fly-off was in keeping. Everyone lined up in their usual downwind locations as soon as the 15 mins. fly-off period was announced. Those who flew early found the air very dead – except for Mike Musgrove who managed an almost unnoticed 4 mins. plus. I waited till almost the end, then moved upwind out of the long grass so I could run fast enough to tow for my own lift. What I encountered was weak but there was no time to be over-fussy. Whether by necessity or design Gerry Simpson launched his orange winged model a little downwind just afterwards, and centred into the thermal rather better. My A/2 came down, his held height and even gained a little until it D/T'd at presumably one revolution of its D/T timer.

Tailless reappeared in the Woodford programme and results were only surprising by the absence of John Pool. Henry Tubbs managed to repeat his Nationals win with the same model. This relies on a very long motor run of almost the required 3 minutes. Second and third were clubmates Ken Attiwell and Alan Nobbs, the latter's model boasting a free-wheeling propeller. Peter Brannigan appeared with a large and involved tailless glider – and it was only afterwards that I discovered he was flying it proxy for C. Doyle of Belfast.

The best supported event compared with expectations was chuck glider – judged on the total of the best five flights out of nine launches. Winner John Sumner managed four maxs of 1½ minutes and a fifth of just 6 seconds short. Runner-up was Mike Turner who 'found' the rally on his parents' doorstep when visiting, and who promptly brought out one of his old *Bomark* indoor models. Third was Andy Crisp with my brother's 'Pest' design.

One thing does emerge from the Woodford results. It shows that major events *can* be won by fliers other than the 'regulars' in the 'contest circuit'.

★ ★ ★

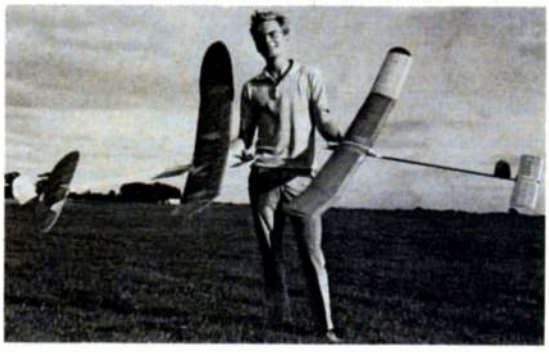
The following *week-end* saw the holding of the **S.M.A.E.'s Two-Day Centralised F.A.I. Meeting.** This has suffered from two suggested date changes due to airfield difficulties – but was eventually staged at R.A.F. Watton.

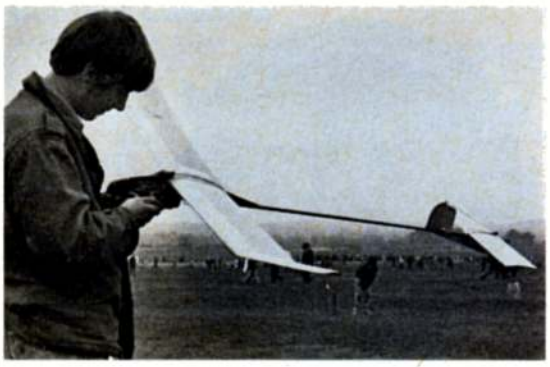
The concept of such a meeting arose out of the successful and very hard fought Trials last Autumn. The September 6th and 7th meeting inevitably lost much of the trials atmosphere simply because it was a contest pure and simple as distinct from being a selection meeting. Nevertheless it can be regarded as a successful enough experiment. Advance attempts to simulate F.A.I. concepts by requesting signed statements of adherence to specifications and the demanding of templates are useless if not followed up on the contest field. I, for one, will be very loath to waste time and effort on such paperwork in the future. Likewise the acceptance of field entries (one for the second day only!) after prior announcements to the contrary will surely be quoted as precedent.

Watton's locations near to Norwich had one unexpected drawback as I and other people found out. This was the choking of the roads with Norfolk holiday traffic. Obviously, I have got over-accustomed to driving under the conditions existing early on Sunday morning. I was not the only one to miss the first Wakefield round, and I would suspect that some absentees on the entry-list gave up partway!

The contest itself was held in 45 min. rounds, in a rubber/glider/power sequence, over the two days. There were four rounds of Wakefield and three of the others on the Saturday – and the remainder on Sunday. Adherence to the published schedule of round times was commendably

'Wiz' Wiseman displays both his models which achieved 7 max's at the Watton F.A.I. meeting.





accurate. Generally the weather felt breezy, but max's were usually inside the 'drome. There was plenty of lift and some surprisingly protracted periods of sink.

Glider was an out and out tactical contest with most of the entry going well downwind to wait for someone to go-it-alone and perhaps trigger off a mass launch. Out of 47 entries, 37 flew and 24 maxed first flight. This set the pace for the rest of the contest. There were twelve fliers with trebles, eleven with four and five max's. (Dave Hambley being the unlucky one), but only six with six. Tony Cordes missed the seventh, leaving Dave Bailey, Dave Wiseman, Jim Baguley, Tony Young and myself with perfect scores.

The method of flying off had been the subject of some discussion and there was talk of asking the qualifiers whether they preferred the 'sudden death' or 'progressive' alternatives. The latter was used – together with the F.A.I.'s 4 minute fly-off round. Jim Baguley and Dave Wiseman commenced towing as soon as the signal was given, 'Wiz' appeared to launch into lift, I launched under him and Jim released almost at the same time but crosswind. Two circles afterwards the lift petered out and all three models landed within a hundred yards or so. Dave Bailey towed a little longer, saying he did not like the 'feel' of the lift, and found better air to clear the 4 mins. max quite easily. Tony Young had veering trouble on tow and poor air, capped only by a cartwheel landing on the runway and a snapped fuselage. The winning model was quite conventional except for a hardwood block forward fuselage plugged into an ⅛in. sheet box rear (on the lines of the *Lucifer*).

Meanwhile the other classes had produced perfect scores – but not the need for fly-offs. Eighteen fliers in Wakefield dwindled to two trebles (Derl Morley and Laurie Burrows). Derl had some model trouble (breaking a prop-blade on launch) – but twisted his leg and was eventually forced to retire. Laurie continued recording max's to total 21:00 and a very convincing win. His model was illustrated in the September issue of AEROMODELLER, has V.I.T., changing 1° ten seconds after launch (by timer), autorudder worked off the prop stop, and a wing section described as being like Conover's *Lucky Lindy* airfoil with about $\frac{1}{16}$in. undercamber. Runners-up were George Sharp and Laurie Barr (with his World Champ models) – both managing 6 max's out of 7.

F.A.I. Power started with only 11 fliers but gained another on the Sunday. Ray Monks had a sub-max score returned by his timers – apparently through *both* timing the wrong model. Ray didn't find this out until after the round was over – but was allowed to refly and max. Alan Moss had his troubles testing (after an initial max) when he lost his only model on a full tank engine run and no D/T. One of the snags of V.I.T. is that unless the timer releases the tail from the power position it usually cannot D/T. If the model can glide with the tail in power position then a long chase is required. If not, then the model's demise is quicker and more certain.

Dave Wiseman proved to be the 'man of the meeting' maxing out in power as well as in A/2. His piece of luck came in the first power round when his newest Miebach powered model went left under power – but overran. His *un*piped 'Trials' model (now with a different fuselage) then flew 'on rails'. The other two team members followed a few seconds behind – both dropping scores in the second round.

★ ★ ★

One common factor may be noted throughout all these recent contest reports – a distinct fall off in entries. There is little wrong with the standard of flying from top class contestants – but there are precious few of them. Whilst the reasons for this state of affairs are undoubtedly many and varied, I am sure that the present do-it-yourself attitude of **f/f** contests is contributory. Whatever the reasons, some sort of cure is needed pretty desperately. *Perhaps the time has come to rethink the whole concept of f/f contests???*

CLUB NEWS

ELTON DREW's fine Glider victory apart, the general level of our placings in the recent Wakefield Champs does seem to indicate that this country of ours has retreated still further from the dominant position it once held in the aeromodelling world – at least in the free flight sphere. To what extent the general swing over to Radio at grass root club level or a general falling off in model flying interest, it is difficult to say, but certainly the competitive side of the movement does not attract the following it once did. This is a pity, since flying of a general sportive nature is not productive of that keen edged finesse and development research that tends to raise model flying to the level of an art.

Anyway, no dearth of enthusiasm and new ideas from the direction of Mitcham, where members of the **Three Kings Aeromodellers** circulate. The usual fulsome report from P.R.O. Laurie Glover starts off with the news of an entirely new project, if not a unique one. Seems that the club's pet boffin, H. C. Queck, has devised an All Scale Team Racer. Contest wise the model to conform to a common scale of 1½ in. to the foot, with maximum motor size .099 (1.6 c.c.). Says that models must be absolutely accurate – presumably in its scale proportions – with correct colour schemes, markings, etc. Offered as a prime example is W. B. Caldwell's *'Rivets'*, which has a T-tail and .09 Cox. One point of doubt, though: would such an event tend to stultify into a relatively few designs, those that give the best performance? If so, the turn out will look markedly different from a conventional Team Race. However . . . On the Stunt front Dave Morbin's twin fuselage, red and white *'Pegasus'* is carving great hoofy chunks out of the sedate Mitcham air, whilst Mick Harvey adds to the aerial bestiary with a *Yak 9D*. Designer: H. C. Queck. This Russian A/F marked model carried the club hopes at Genk. Yet even more beasts of the air – and beastly behaved beasties, too. Laurie's very own *Jaguar* met disaster on the 'Up' line, and it was 'Down' all the way, but survived the 80 m.p.h. impact. Not so tarmac proof was Pete Mason's beautiful *Aero Super Commander*, nor Wally Cordwell's *Fokker D21*, on the remains of which he sacreligiously danced. Don Burgess, who took second T/R place at the Elliott meeting, has some very hot engines up his sleeve, and is getting worked up, blistered forearm notwithstanding, to have a bash at Speed. And lusty circulating down at the Three Kings ground, particularly that unsilenced Roundabout. Yes, its all the fun of the fair with a ruined and rutted piece of territory as a legacy. Finally, we are asked to correct any impression that the Three Kings Club is an All Radio Group. The club is strictly an *all C/L Stunt* and *Scale* affair in spite of all rumours and U.F.O.'s to the contrary.

An item in the *'Internationalist'* which caught my eye was a comment on the way the air bubbled at the recent Dutch F/F trials. Heathland, it seems, is very conducive to thermal activity even with the sun tucked out of sight. Suggestion here is that F/F comps are best held over grassland where the air is more quiescent. Talking of thermals, it may sound silly, but I have often noticed that models drifting say, to the left of the field will contact lift, whilst others drifting to the right will not. This suggests a tie up between thermal activity and wind direction – but whether the variation is detectable at the time of launch is another matter. Also mentioned in the mag is something of a reversion to vintage trends on the part of the French A/2 flyers. Models had short tail moments and large stabs – very stable in strong winds.

From the Committee of the **Witham M.A.C.** (Essex) comes what amounts to a manifesto on model flying demonstrations. We have not, unfortunately, the space to reproduce the letter in full, but it lays down particular guide lines for success and safety at the garden party rodeo. For instance, if anything bores old Jim Citizen more than penny Hoopla, it is the frustrating silence of a baulky engine. To stay 'alive', displays must be continuous and full of action. Combat, as a case in point, should be 'staged' for maximum thrill effect rather than be offered as a purely competitive joust. Safety is a subject often commented on in these columns, though in the untutored club it is given relatively little importance, and even less so by the Fete organisers who, in all fairness, have little idea of the dangers involved. The suggestion here is that clubs should not elect to fly unless the flying area is of adequate proportions and has at least a rope barrier. Only the other month we reported an incident of a collision with a spectator in these columns, and the Witham report cites an occurrence at a local display (with which they were entirely dissociated) where an engine worked loose in flight but no attempt was made to ground the model. The engine finally projecting itself into the spectator enclosure – fortunately without hitting anyone.

There is no doubt that Radio today is becoming more and more synonymous with Proportional – Single shrinking into something of a minority activity. This trend towards the fully controlled, more-than-one-up-at-a-time scene was amply demonstrated at the **South East Area** Slope Soaring meeting at Wilmington. Whereas the Multi Pylon Race attracted a field of eight, the Single Channel event could muster only two entrants. Ken Binks of Eastbourne won the Pylon Race, just pipping John Dumble of Sussex by 4 seconds. Third was Chris Foss, who also came second to Peter Lang in Single. Still on the Radio tack, there is a very smooth looking design in *'Seadog'* of a model designed specifically for Thermal Soaring. Named *'Merlin'* the model has a span of 100 inches, is equipped with 3 channel proportional and has attractive, near Scale lines. Designer: Nicholas Neve.

Stacks of activity reported in the **Leicester M.A.C.** Newsletter. So much so that the local youth, whose ways of keeping of the streets is to scour the fields, just cannot keep pace with the outflow of lost models from the club field – there are still two nestling in some obscure turnip patch. At least this is one club that can mount full scale comps within its own resources. Listed in the bulletin is a club F/F event featuring six in A/1 Glider, seven in Open Glider and five in Open Rubber; a Scale event with eight entries, and contests laid on for Open Power, Precision Power and Vintage. In addition, the lads engaged in a friendly comp with the R.A.F. at North Luffenham. Radio Control, C/L and Sports only. No F/F – too many crops. The Vintage event previously referred to is to the now accepted specification, which includes r.o.g. Personally I don't particularly favour that rule, perhaps because my own 1938 American stick model – which, incidentally, has done a three minute plus flight – has no undercart. Seriously, though, the r.o.g.-ing of small, light models is quite pointless, as it is more like blow-off-ground, and extremely dicey. Given any sort of wind it is the most efficient means of writing off a model that I know, short of jumping on it. Concluding on a happier type of down to earth note, it is nice to see the occasional static display. Craftsmanship still has a place in the hobby; so let us hope that the Lutterworth Grammar School exhibition puts over this point with some purpose.

News of the Nationals is still coming in! This time from the newsletter of the **Liverpool & D.M.A.C.** A good representation from this club: fifteen keen campers, all of whom survived the famous deluge. Brian Picken took top honours with a fine Rubber win in the Model Aircraft Trophy. His fly off time of 8 mins. plus must have caused a red eye or two on the timekeeping site. The club sec. also got into the rubber fly off, but only after the heartbreaking experience of breaking three motors. Other members did their valiant bit in Power and Glider, while Bill Smith went all aquatic with a

Multi Schedule attempt in a cloudburst; sad to say no-one told him he could have wrung out his model and had a re-fly. Talking of Radio, we are told the standard of flying is improving all the time – they can land 'em on a sixpence, though the runway is preferred. But where to fly still remains a problem. Approaches are being made to Bootle Corporation for the use of Altcar Rifle Range, but the application was disallowed on the basis of noise! There is some hope, though, that Glider flying might be acceptable – hardly likely to drown the rattle of the musketry.

Talking about noise, we hear little of silencers these days – and see even less. But that problem for which they were conceived still persists, and has even spread to the wide open spaces of Africa. *'Prop Shaft'*, the Newsletter of the **Mashononland Model Club** of Rhodesia, dares to broach the hoary old silencer chestnut in its editorial. So far, the matter has been one of more or less academic interest, but now the gnu pastures have given way to new housing estates the distant trumpeting of the elephants is drowned by the whine of diesel and glow, and the noise/site syndrome is very much in evidence. They, just as we, have discovered that the C/L model hasn't quite the same penetrating acoustic range as the higher flying Radio model. True, but 'horses for courses' should be the maxim to apply; suiting the site to the flying. However, I am of the decided opinion that the less raucous model is more 'visible'. In an odd way noise tends to blur the model, so that you can't see the stunts for the decibels. It's sad here, though, that the most ear-shattering noise of all is that of A/2 wings crunching on tow up. An article on aerofoils suggests that the use of certain types of section for particular models is more a matter of usage than experimentation, and suggests that chuck glider development might well indicate that thin, flat sections are highly suitable for models with low wing loadings.

Are there now too many C/L classes knocking about? The point made in the **M.A. Council of Ireland's** Newsletter, apropos their C/L Nationals, is that C/L events require a lot of organising resources and tend to become agonisingly protracted. Why not, it is asked, civilise Rat by amalgamating it with B Team? It is noticeable of late that organisers have been limiting the field to two events, and have been at pains to match entry numbers to the time factor.

Mostly, the reports we get of model flying on **London Area's** Wanstead Flats are of Radio Flyer/Resident contests – the usual outcome of using urban open spaces. This time, however, our attention is blithely directed to a write up in a local paper in which there is not one mention of an apologetic resident going inverted, only bouquets and back slaps for the model flyers on this grassy oasis in the urban desert. It represents yet another large nail in the boys'-with-toys coffin; treating the subject in a straightforward, non-angled way. About the worst publicity for the movement are those hair raising stories of 100 m.p.h. rocket propelled models swooping realistically over the heads of the thrill dazed crowd. Or, perhaps, even worse, the sort of treatment referred to in the **L.A.R.C.A.S.** Newsletter. The interviewer of a well-known free flighter did an o.o.s. flight of fancy of his own, and the gentle readers of an evening paper learned that model flying was a sort of paper chase, using rather sophisticated pieces of paper. The pursuing modeller, in his enthusiasm is likely to trample anything underfoot that comes betwixt him and his long flying quarry, or so the reader might imagine. Naturally, the Larcas boys do not find this sort of publicity all that helpful in their approaches to farmers for a bit of flying space.

Still, there are worse things in life than irate residents and fuming farmers. We have to hand *'Nitro'*, the perhaps *too* explosively titled newsletter of the **Belfast M.F.C.** For the first time the club has had to postpone a contest because of the political situation, but the barricades and violence notwithstanding, the model flyers have still managed to raise an optimistic wing or two. For instance there was a hectic day's flying at Bishopscourt in early August Plenty of wind gave the tower uppers a rough time – the antics of some providing diversion and amusement for the onlookers. The Newsletter includes a tragi-comic piece of verse about rioters spraying a member's car with Nitro outside the clubhouse. Let us hope the next newsletter brings news of an improved situation.

'The Message', Newsletter of the **North Western Area** includes a run down on the F/F World Champs. Looking at the results it seems we did quite well on Glider and Power team ratings but flopped a bit on Rubber; though it should be said that our Wakes were well up to good average standard, but with seven flights and downdraughts you've got to have *some* luck . . . From the sublime to the perhaps not quite so, the newsletter contains quite a stack of Chuck Glider results. First there is the *'Der Thermik etc.'* International event, in which this country showed that it could still flex a mean bicep or two with the combined scores of our three entrants, Tony Slater, Roy Roberts and Dick Godden making up to a fourth team placing – or would have, had they known there was a team event. Second, there is the Chuckie contest at the Area F/F Meeting at Flookburgh, and third a quite formidable turn out – twenty-three, no less – at the Woodford Rally. Area ambition: it's very own flying ground. Suggestion here is that a more determined effort should be made in this direction. Talking about sites I have recently done some flying in the East Anglia Area. Wonderful flying fields if you're prepared to do a spot of hard, country road driving. Anyway, you S.M.A.E. members, don't forget the **York Rally** at Elvington on 19th October. Good prizes with the five bob entry fee covering A/2, Open Rubber and Power.

Contest Calendar

October 19	**YORK RALLY.** A/2, Open rubber, Open power. Prizes £10, £3, £3 (min.) respectively. No pre-entry. 5/- entry fee covers all events. Details from D. White, 24 Surtees St., Burton Stone Lane, York. Commences 9 a.m. at R.A.F. Elvington, Nr. York.
October 19	**LONDON AREA C/L CHAMPS** 3rd Round F.A.I. T/R, ½A T/R Combat, Charville Lane Circuit, Hayes, Middx.
October 26	**ST. ALBANS WINTER COMP.** All-in F.A.I. C.d'H., A/1, Chuck Glider, ½A Power, Chobham Common.
October 26	**HARPOLE C/L STUNT COMPETITION.** Pre-entry 12/6 (includes lunch and beer), Lunch only (for wives, girl friends, etc.) 10/-. Full F.A.I. Standards. Details from I. Peacock, 41 Carrs way, Harpole, Northants.
November 2	**WHARFEDALE 'RUFFORTH 1000'.** Class 'B' 200 lap heats, 1000 lap final. No entry fee, but all intending competitors please contact J. C. Horton, 10 Lawn Avenue, Burley-in-Wharfedale, Ilkley, Yorks.
November 9	**RICHMOND GALA.** Open R/G/P, ½A, C. d'H., Chuck at Chobham Common.
November 16	**ST. ALBANS THERMAL SOARING** event for R/C gliders, Nomansland, Wheathampstead.
January 11	**BILL WHITE GALA.** Open R/G/P, All in F.A.I., Entry fee 2/6d., unlimited re-entry, **NO** pre-entry. Venue Chobham Common.

What on earth is Hand Launched Glider I asked myself as I came across a contest result sheet under this heading in the Newsletter of the **New Zealand M.A.A.** Looking at the size of the entry and the well rounded scores it was obvious it was not primitive old Chuck, but could be, I dare to guess, what we call Open Glider. Whatever it is, it does seem to attract the entries down under. In fact Glider, including A/1 and A/2 seems to dominate the score sheets. Very popular over here, too; always the best supported event at any rally. Many people find it satisfying because it is sheer, uncluttered model flying. Of course, it could be that Glider flying is so popular in New Zealand simply because you have to get an import licence in order to obtain Radio gear.

Glider may still retain the virtue of simplicity – up to a point, but generally our models are becoming more and more gadget bound. Published in *'W.M.C. Patter'*, the newsletter from **Willamette Valley, Oregon,** is an illustrated piece on how to achieve that highly complex auto stab and rudder devices. All very ingenious and requiring the utmost in precision craftsmanship. George French's *Night Train* gadgetry is one system described. For those, like myself, born with ten thumbs, it would hardly be a case of French without tears. Making international headway is the getting-to-be-popular R/C Glider Soaring event. Oregon featured such an event during July. Good prizes and power winch supplied. Doesn't say if this was Single only, or Multi included event. Trouble with Single is that the gear is usually super regen, which means only one up at a time, although the ideal type of event for wide participation would be A/2 Single. It would be really cunning, for instance, to incorporate down elevator neutral with normal elevation on left and right rudder.

The **Model Aeronautics Association of Canada** have produced a nice magazine which emblazons the slogan, apropos to model flying, of course, *'Sport of the Times'* (and I always thought it was the Crossword). It also carries other highly complimentary references to this humble hobby of ours such as *'Relaxation, Concentration and Education'*. The second term certainly applies to diminutive print types used, but good timekeeping practice. The editorial discusses the definition of model flying, whether sport or hobby. Strictly speaking, a sport must involve the chasing of something live (not girls, though), otherwise its a game or activity. It also suggests that Man became master of the world because he learned to think creatively – but don't let the Radio model become our dinosaur.

Happy autumn flying.

THE CLUBMAN.

Woodford Rally

Blessed by calm and bright weather, this year's rally, held on August 31st, produced plenty of keen competition. Handicap speed, welcoming a resurgence in support, produced some decidedly 'different' models, ranging from Mick Billington's traditional McCoy 60 speedster to the rather basic Tee Dee 15 powered machine of R. Wadsworth (Wharfedale). Eventual winner, Gordon Farnsworth, achieved 92.65% of the Open 2.5 c.c. class record. The combat event gave yet another victory to Vernon Hunt – although John Hammersley looked likely to upset the applecart with his very rapid Cox Special powered wing. ½A team race saw Turner/Hughes continue their unbeaten run with their four-year-old motor, while in F.A.I. the final brought together the British team, just returned from Genk – winners being Harknett/Smith recording a very fast 9:21.5. Free Flight scale, attracting only three entrants, was won by T. Manley and his fine flying R.E.8. In control line, Bob Ivans redeemed his Genk performance by taking top honours with his Ju 87 G. The free-style multi R/C event was won by D. Gladwin, who discovered that the 'K' factors encouraged quantity rather than quality of manoeuvres, whilst in R/C scale Barry Purslow flew the ex-Dennis Brunt 'Tony' to first place.

Left, How simple can you get? R. Wadsworth's stark Cox powered speedster. Note the large fuel tank protruding from under the tiny plywood wing. At right is Bob Ivan's familiar Ju 87G, now with extra detail.

Below left, 'Lift off!' Terry Manley's fine R.E.8 takes to the air. Centre, ½A winners yet again – Turner/Hughes, and at right, J. Hammersley displays his lightweight wing. The bulge behind the motor houses the 'baby pacifier' tank.

RESULTS

Open Glider *(43 entries)*: 1. G. Simson (Nuneaton) 9:0 + 5:35, 2. J. O'Donnell (Whitefield) 9:00 + 4:20, 3. M. Musgrove (York) 9:00 + 4:07. **Open Rubber** *(19 entries)*: 1. D. White (York) 9:00 + 8:26, 2. E. Prince (Congleton) 9:00 + 7:08, 3. J. O'Donnell (Whitefield) 9:00 + 5:29. **Open Power** *(20 entries)*: 1. A. Dakin (Cardiff) 9:00, 2. F. Elton (Baildon) 8:51, 3. D. Barber (Leyland) 8:50. **Tailless** *(6 entries)*: H. Tubbs (Baildon) 8:43, 2. K. Attiwell (Halifax) 7:54, 3. A. Nobbs (Halifax) 6:32. **Chuck Glider** *(23 entries)*: 1. J. Sumner (Sheffield) 7:24, 2. M. Turner (Sheffield) 6:01, 3. A. Crisp (FACCT) 5:43. **Senior Rally Champion:** J. O'Donnell (Whitefield). **Junior Rally Champion:** J. Carter (Spitfires). **F.A.I. Team Race:** 1. Harknett/Smith (Feltham) 9:21.5, 2. Heaton/Ross (Leigh) 9:56.5 3. Place/Howarth (Wharfedale) 10:02.5. **½A Team Race:** 1. Turner/Hughes (Wharfedale) 7:31.1, 2. Heaton/Ross (Leigh) 8:42.6, 3. Campbell/Perkins (Hinckley) 8:43.4. **Handicap Speed:** 1. G. Farnsworth (N. Sheffield) Open 2.5cc – 131.6 m.p.h. (92.65%), 2. M. Billington (Brixton) 10cc – 155.3 m.p.h. (92.34%), 3. M. Radcliffe (Feltham/Hayes 5cc – 138.0 m.p.h. (90.0%). **Combat:** 1. V. Hunt (A.C.E.), 2. S. French (Scunthorpe). **Multi R/C Free Style Aerobatics:** 1. D. Gladwin (R.A.F.M.A.A.) 3761 pts., 2. P. Soden (Kinver) 3250 pts., 3rd equal S. Foster and P. Ashmore, 3245 pts. **F/F Scale:** 1. T. Manley (Blackburn) *RE8*, 526 pts., 2. E. Coates (Lee Bees) *Hawker Nimrod*, 460 pts., 3. D. Priest (Long Eaton) B.E.2E, 363 pts. **C/L Scale:** 1. R. Ivans (Wolves) *Junkers 87G*, 1270 pts., 2. J. Bodey (Heswall) *Black Widow*, 1060 pts., 3. R. Clarke (Sharston) *Swordfish*, 1005 pts. **R/C Scale:** B. Purslow (LARCAS) *Tony* 855 pts., 2. D. Foskett (Sutton Coldfield) *Tipsy Junior*, 849 pts., 3. W. Nield (LARCAS) *Gipsy Moth*, 770 pts.

With Prototype Parade drawings for the Ferrari Dino 166, details on the construction of two 1/32nd scale F.1 anglewinders, full photo report on the recent Tottenham Open meeting, details of some Canadian models, E.C.R.A. news, and Racing Review, this promises to be yet another much sought-after issue. For collectors there is a Chad Valley post script from Ken Wootton, more Collector's Corner from Cecil Gibson and Autominology. Cover to look for on the bookstalls is the Opel G.T.

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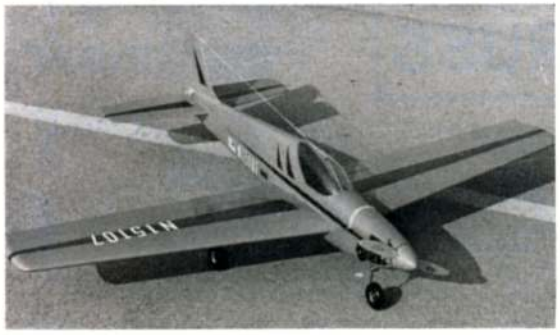

November R.C.M.&E. will carry plans for Phil Kraft's superb Slik-Fli design, long awaited by multi R/C enthusiasts. Also included in this issue will be a report on the U.S. Nats, Test Report on the Simprop Digi 5 R/C system, and construction details for a new servo amplifier for the R.C.M.&E. Digital. Also look for 'Scale News, 'Throttle Benders Union' our pylon racing feature, and R/C engine news in 'Radio Motor Commentary'.

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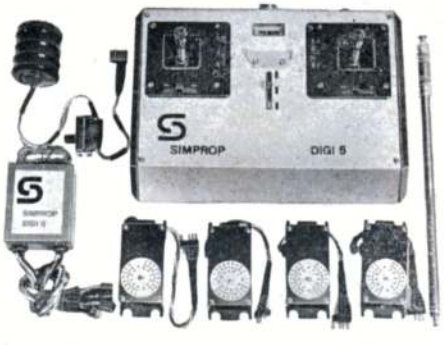

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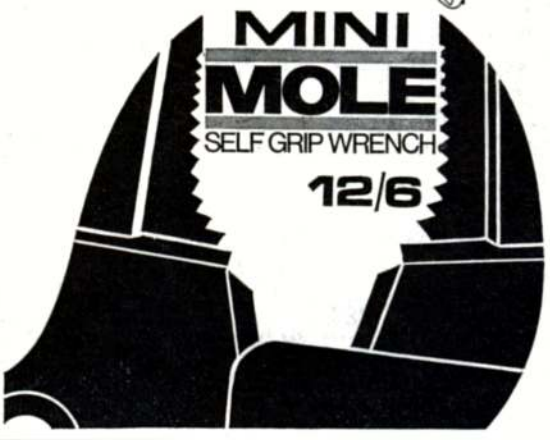

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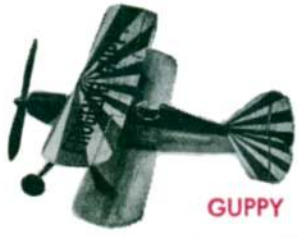

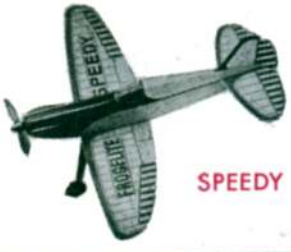

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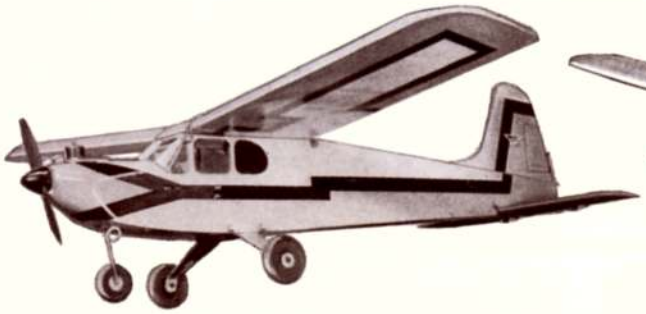

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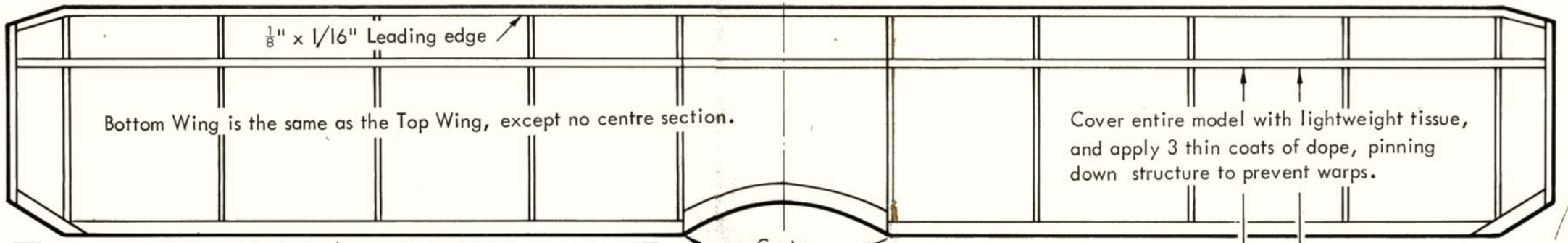
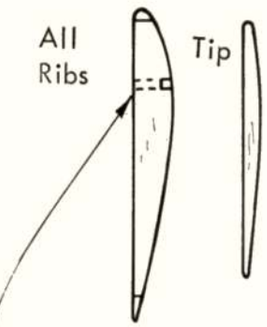
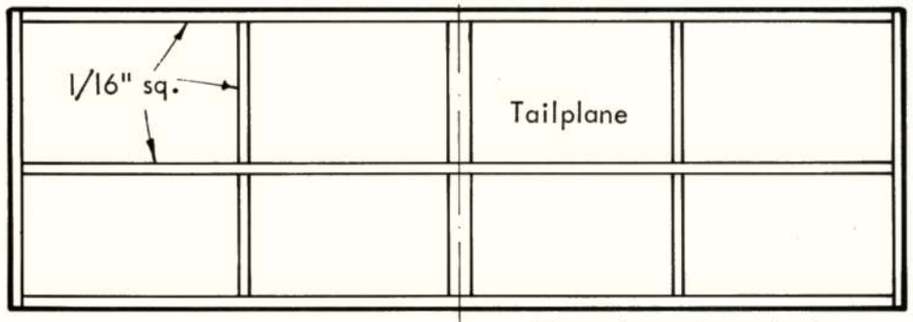
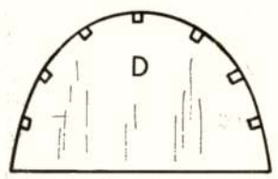
Complete Building and Flying Instructions. One-piece die-cut fuselage sides. Identical die-cut wing ribs. Low Bounce Air-wheels. Hard ware – preformed U/C., fuel tank, hinges, nylon horns, etc. Ample selected building materials.

£12.12.0

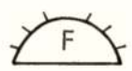


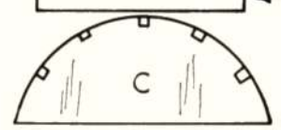


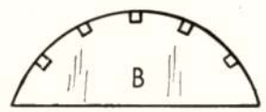


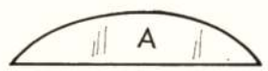


Note Bottom is narrower than top of Fuselage



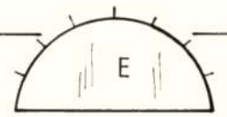






Spar insert for Top Wing

5/8" Dihedral



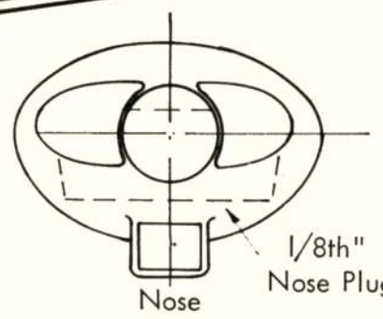
Use streamline cross-section for Struts and Fairings.

1/16" x 1/8"

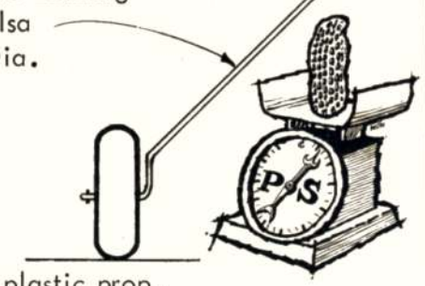
Celluloid fin extension

Side View

*Unless otherwise noted all parts are balsa 1/16" thick by width or shape shown.
Cabane struts are built with basic flat Fuselage Sides



20 swg Dia. Wire Landing Gear, 1/32" Balsa Fairing, 3/4" Dia. Light Wheels



Use a ready-made plastic prop. Any brand about 5" dia.

Motor is 1/8" x 1/24" rubber, 24" long to form a 12" Loop.

PEANUT SCALE

ANDREASON BA-4B

by Walt Mooney