AERO MODELLER

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OCTOBER 1961

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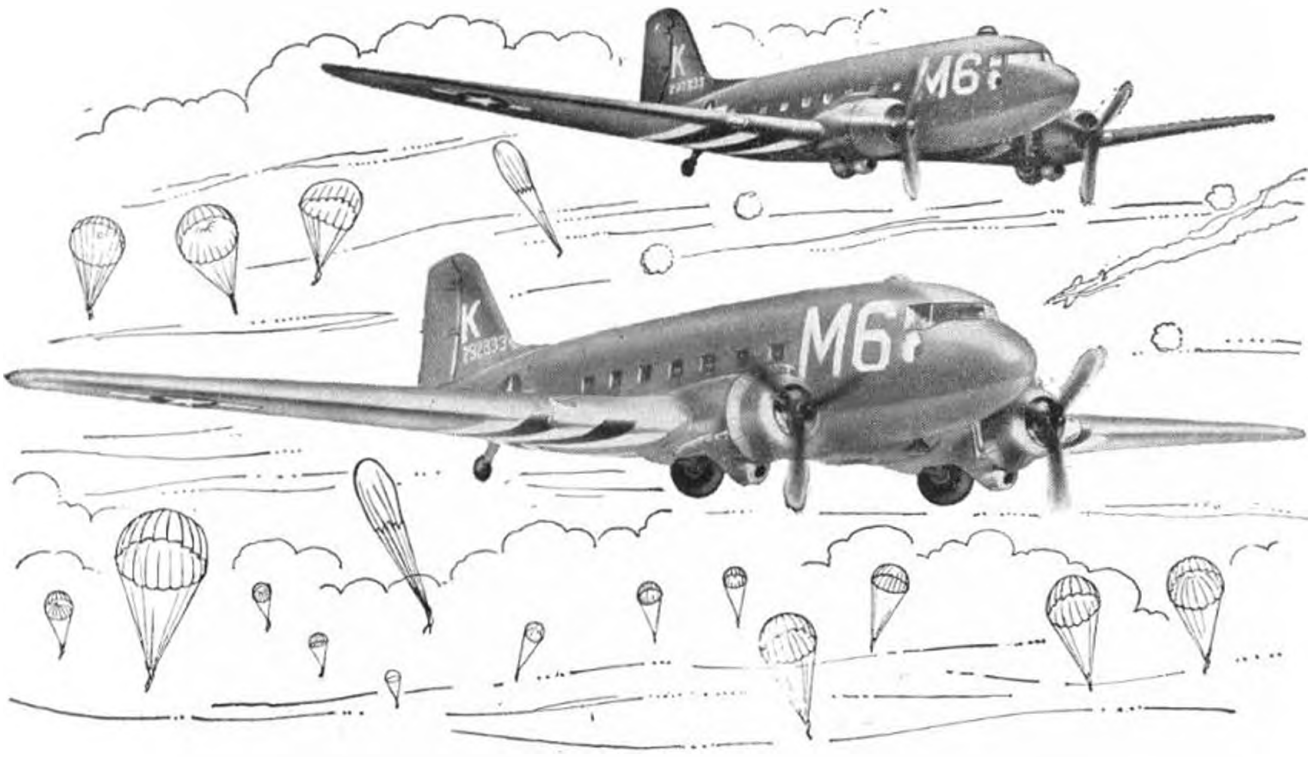

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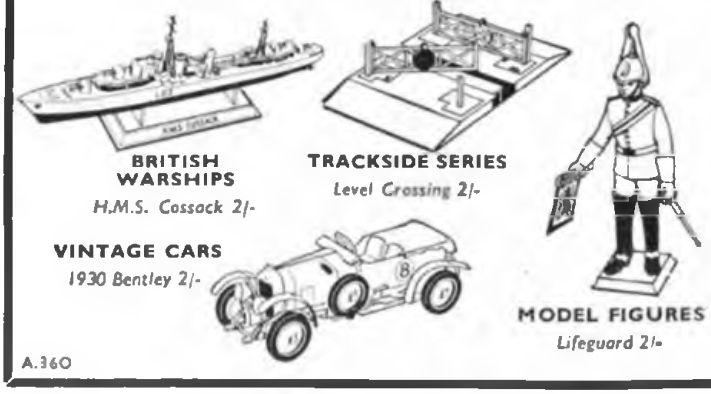

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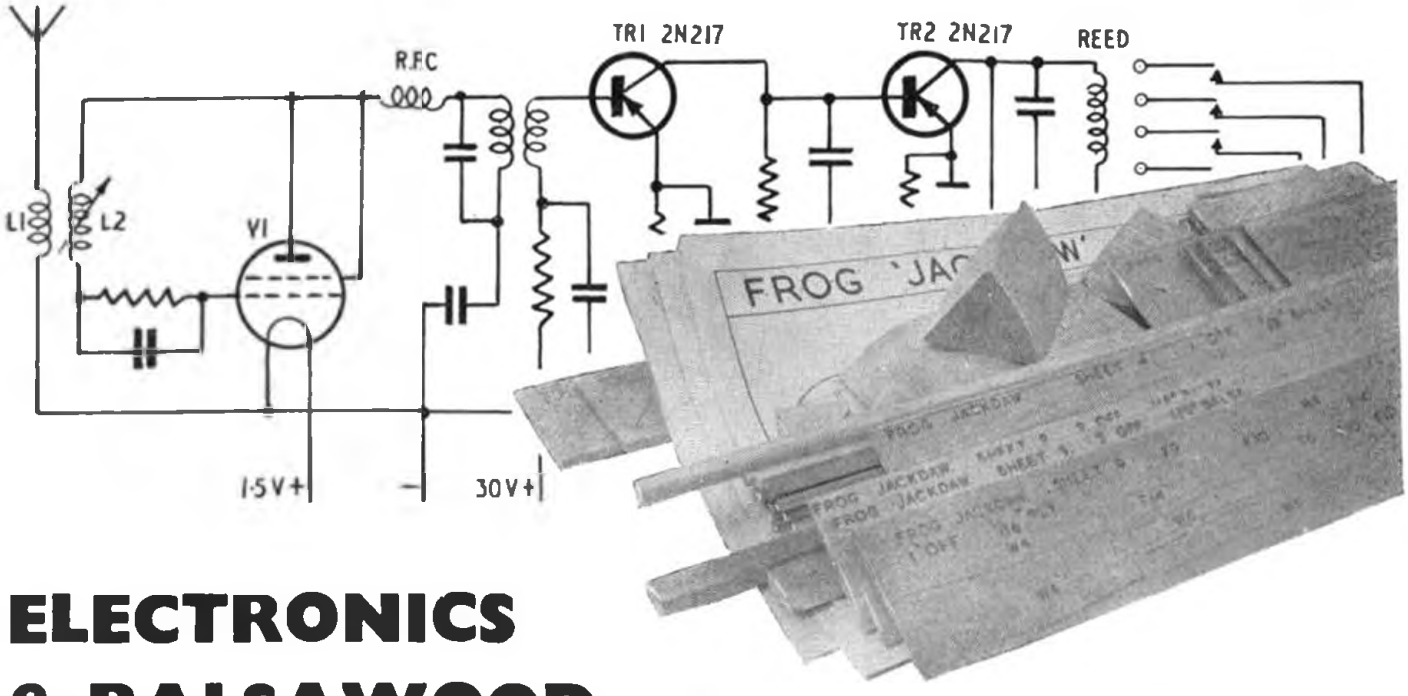

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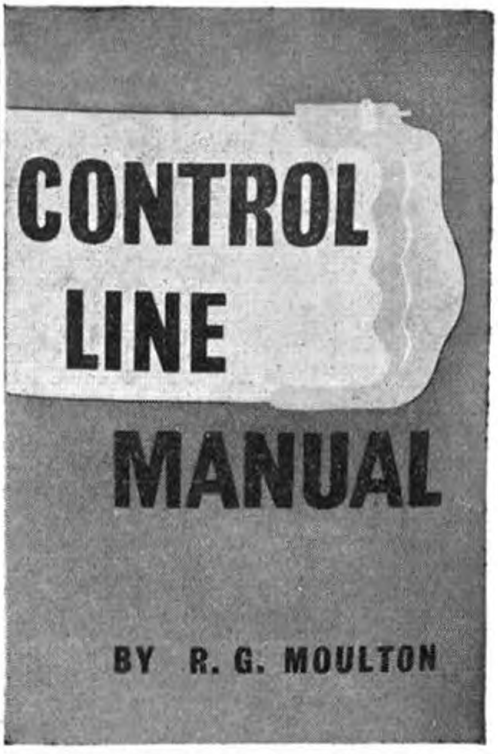

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Here we are again with the enthusiasts' annual treat! Once again we are confident we have assembled a pleasing mixture, from the exciting painting by Laurie Bagley of the Hawker, tactical strike turbojet, P.1127, now bound on as a permanent part of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

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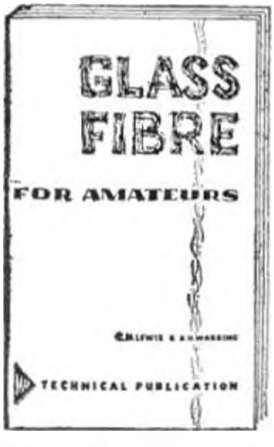

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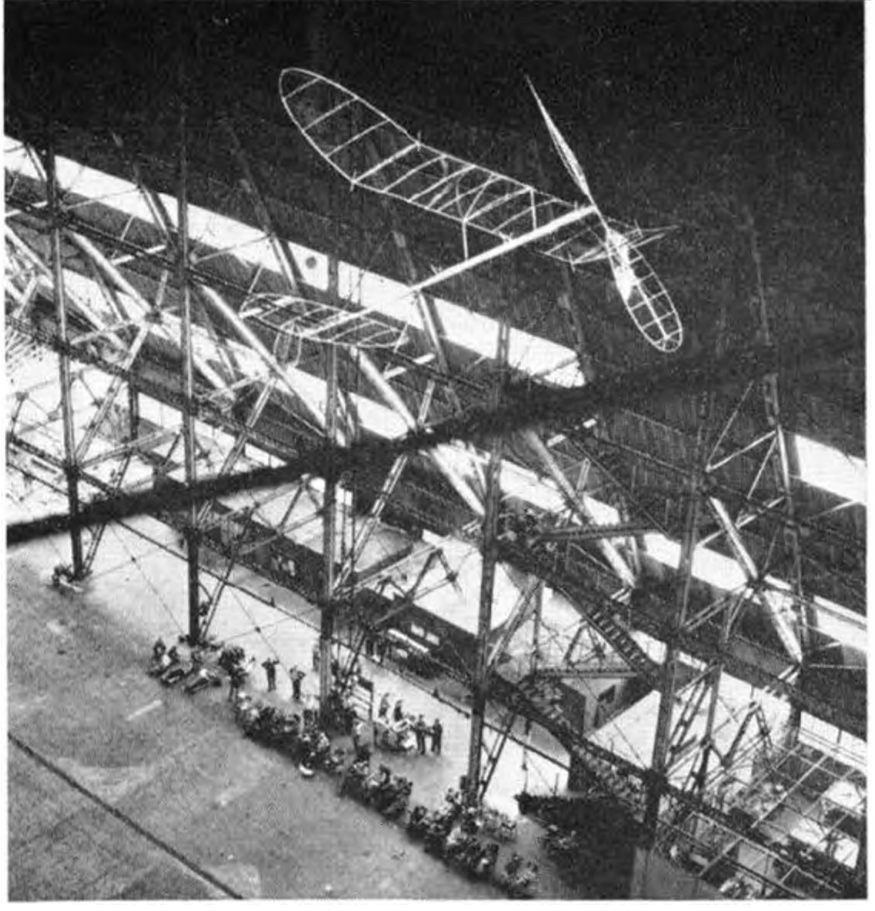

Heard at the Hangar Doors

Ooooh! It's a mighty long way down to those reclining timekeepers sweating out the half-hour flights at the World Indoor Champs, R.A.F. Cardington. Taken from the side catwalk, about 140 foot above the floor, this view of Ron Draper's model playing tag with the girders (see page 521 for sequel) gives one some impression of the vast interior of the airship shed, but will certainly never convey the feelings of the Editor on the occasion!

Points to ponder

THE DISTAFF SIDE of the editor's family is frequently insistent that the life of an aeromodeller is one long, crazy, mixed-up session of jargon, technicalities, frustration, travel, and time-consuming frivolity that serves to exclude him from all the family activities expected of an otherwise "normal" person.

On reflection of what has happened in our experience since the last issue was produced, we find emphasis in favour of such a viewpoint.

One might call it an International month. Quite apart from the Indoor Champs visitors, London has also been a magnet for other globe trotters. One morning we put the 'phone down from a call by Ernest Avory of Vancouver, B.C., who was seeking 164-ft. lengths of braided wire towline for the Canadian A/2 team, to have it ring again with Italian stunt and team race ace Fabio Contini on the line, followed by the next call from ex-USAF Sgt. and Air Force glider Champ, Harry Lowe over from Idaho . . . all in a brief half-hour, to be followed later by Tony Shennan, over from Australia to work a while. It's a small World! We took Fabio and Reino Hyvarinen from Finland to see Britain's oldest pub (A.D. 795 too!), joined by George Fuller, Henry Nicholls, Gunter Maibaum, the German Wakefield and Indoor ace, and Rezso Beck from Hungary. Five nationalities around one little table on such a historic spot only spoke one language — the universal jargon of aeromodelling. The publican thought we were talking Esperanto and did not understand a word!

AERO MODELLER

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ON THE COVER . . .

Ray Monks waits to pick his microfilm F.A.I. model out of the air after a twenty minute flight at the Indoor team trials. Ray placed 4th, and was appointed Team Manager.

SIDNEY TAYLOR

Aeromodelling, and the S.M.A.E. in particular, lost a stalwart worker for the hobby with the passing away on August 11th, 1961, of General Secretary Sid Taylor.

Sid, who became Competition Secretary of the Society in 1951, was a stickler for detail, and his work in the War Office well schooled him for the thousand-and-one details inherent in his spare-time duties. Following the sudden resignation of D. A. Gordon from Hon. Secretaryship in 1956, Sid volunteered to fill the gap thus created, and became the first paid S.M.A.E. Secretary.

Following a very difficult major operation in 1960, his health was seriously impaired, but he refused to allow this to materially affect his efforts on behalf of all aspects of the aeromodelling picture. Our last meeting with him was at the Team Trials at Barkston Heath, when it was obvious that things were far from right. It came as no surprise to learn that he had later been rushed into hospital . . . but the news of his death came as a very personal shock.

We are sure all our readers will wish to join us in tendering sincere condolences to Mrs. Taylor and Dick in their loss. He will be sorely missed.

more points . . . insurance

A rally organiser tells us the insurers covering his annual event have had to meet a £100 claim for damage to crops. Of course, this is more than the material value of all the models that caused the claim. Shall we see an insurance surcharge on entry fees next time? Or maximums reduced to meet the confines of the airfield?

. . . flight by prediction

Having aborted his first round attempts twice by means of hydrogen balloon and line in order to preserve the model, used a dud motor for his second round and hit the girders on his third flight; Max Hacklinger sat back to watch form at Cardington, and produced calculations from his torque measure that predicted a 45-minute flight. Such a duration was beyond the expectation of all at the Indoor Champs. Yet Max applied his calculated turns and 44 minutes, 20 seconds later had created the longest ever indoor model flight. Who said it was not a Science? What happened to the missing 40 seconds, Max?

. . . those powerful engines

After last month's editorial feature on the new breed of super-powerful glow engines we set about horsepower testing two of them. Each broke at the very last stages of the analysis, one in the shaft, the other in the cylinder! Seems like there's another limiting factor in realising the full potential of these engines beside the "Expertese" we mentioned.

. . . prompt delivery

First picture of a completed "Great Lakes Trainer" from our fullsize plans of last month arrived on our desk from Cheshire the morning of official publication date! Smart work by the modeller — and his newsagent. Wish we could be equally smart and get the printers to give you the World free-flight Champs results in this issue. Anyhow the New Zealanders will know what happened as they 'phoned up from the other side of the world as soon as we got back to the desk from Germany on September 5th!

Cement sniffers

From a cutting sent to us by a reader of the Birmingham *Evening Despatch*, it seems that the old bogey of associating our cellulose cements and "dopes" with narcotics has come up again, this time in St. Louis, U.S.A. Forty teenagers, aged between 13 and 16 have been given medical treatment in recent months following "gluing parties" at which they have been sniffing model cement. The police narcotics squad has appealed to shopkeepers to use discretion in selling cement.

— Mighty powerful stuff they must have over there!

Chuck gliders

There was a time (it takes an "oldie" to remember) when the chuck glider was regarded by almost all the free flight fraternity as a pleasant diversion from other classes, yet performance often rivalled that of towline models. There was an all-balsa glider in practically every model box. On our centre pages, and through our Plans Service, we introduce two high performance chuck gliders which may help to revive enthusiasm. It was most pleasant to see so many entries in the class at the recent S. Midland Area Rally at Cranfield (won by D. Greaves with an average of 1 : 37 over his best three "chucks"). So c'mon the *Yellow Birds*, let's be seeing more of you!

contest calendar

September 17th. Croydon Gala—Open Rubber, Glider, Glider, Power, ½A Power, Slope Soaring *Chobham Common.*

September 24th. South Western Radio Control M.F.S. Open Rally—Multi, Single R/C *Dunkeswell Aerodrome.*

October 1st. "The Northern Area All F.A.I. Meeting"—F/F, C/L. *R.A.F. Rufforth.*

October 1st. South Coast Gala, all F/F classes, F.A.I. T/R, R/C, Tailless, Combat *R.A.F. West Malling.*

October 1st. Luton D.M.A.C. Slope Soaring Rally—Single, Multi, R/C, F/F, Solid Glider—*Ivinghoe Beacon.* Pre-entry D. W. Bateman, 14 Ridgeway Drive, Dunstable, Beds.—R/C 2s. 6d., F/F 1s. 6d.

October 8th. Hayes Gala—Glider, Rubber, Power, ½A Power—*Chobham Common.*

October 22nd. English Electric Trophy. *R.A.F., Tern Hill, Shropshire.*

October 29th. Blackheath Gala—U/R Rubber, Glider, Power. *Chobham Common.* Pre-entry (1s. 6d.) and other details from P. Crossley, 11, Broadfield Road, London, S.E.6.

October 29th. Outlaws M.A.C. Rat Race Rally—*venue to be announced.*

November 5th. Wharfedale M.A.C. 1,000 Lap Class B Team Race. *R.A.F. Rufforth.*

S.M.A.E. CONTESTS

September 17th. AEROMODELLER Trophy R/C Multi. *Venue to be announced.*

September 24th. Keil Trophy U/R Team Power.; Frog Junior Trophy U/R Glider, Rubber; *Area Centralised.*

September 24th. Speed. *Centralised R.A.F., Debden.*

October 8th. Farrow Shield U/R Team Power; Team Racing ½A, A, B. ½A F/F Power *Area Centralised.*

October 15th. Area F/F Championships *Centralised*

THINGS HAVE COME quite a way since the commencement of Team Racing in this country. We can well remember, in our first race, being trounced by the Editor and his E.D. 3·46 model, pitted by his wife and H.J.N. That takes quite a memory, but by gum, it was really good fun, in the days ten years ago when 80 m.p.h. was really going, and not a single pilot so much as poked a friendly elbow in another bod's ear! However, the price of progress is bound to be more cut-throat competition, and well worth it to gain the satisfaction of a good, fast time.

It is a constant struggle to keep somewhere at the top in "B" as with any branch of our sport, but the fact that the West Essex Club have managed to win and place in quite a few races is due entirely to persistence, really hard work, and always the search for the little something that will give a few more m.p.h., that extra plus model—which could mean about 12 secs. on a 7 minute race—5 laps—which is a comfortable margin by which to win these days. We do feel that it might be a good thing if monowheel were outlawed, but whilst it is not, then we must use it.

One most important item on the model, of course, is the tank. Here opinions are divided between the single-cell tank and the "chicken-hopper" 2-cell type. We have used both once again, and far and away our best results have been obtained with the "old-fashioned" single-cell. Certainly it has proved the more consistent, but of course it must be of the correct shape, and perhaps even more important, be positioned correctly in the fuselage. The tank design we use is shown on the plan, and has been used in all our models for the past 4 or 5 years, working perfectly each time, proving that it is not suited to one model or motor only.

Chas. Taylor

Britain's most experienced team race pilot offers all his 'gen' on Class B racing with his fast, monowheel

RAZZAMACHAS

including tank detail and engine modifications

lap, and a second saved on a pit-stop. The means are at everyone's disposal to win, and if any tip this article contains may assist some aspiring future Nationals winner, then a decade will not have passed vainly.

The greatest advances have been made with motors and fuels. The model itself has remained more or less the same since the introduction of the present rules some nine years ago, and provided it is of clean design, of reasonably light, though tough construction, and flies steady as a rock in any weather, no fantastic advance appears possible. Monowheel undercarriage has made its appearance, and would seem to be a necessary evil whilst such a landing gear is permitted by the rules. Having tried both single and dual leg on the "Razzamachas", we know that the disposal of one leg and wheel does add at least 3/4 m.p.h. on a 100 m.p.h.

It should *not* be assumed that all the foremost Class B teams use motors of the "Special" variety that are not available on the open market. Obviously, if some re-working of a standard motor can improve performance, it should be carried out, but there is a limited amount that can be done by the average modeller without access to any sort of precision machinery or the skill and experience to carry out a complete re-build. A well-known example of contest success with a standard motor was the 7 mins. 9 secs. set up by John McNess at the 1955 Nationals, a time which was not bettered until 1960. Then there is Ray Tuthill, past Nats. winner, who has put up the very good time of 6:44, once again using a perfectly standard ETA 29, this motor certainly appearing to be the best bet in this country at the moment. We have recently carried out some trials with a Merco 29

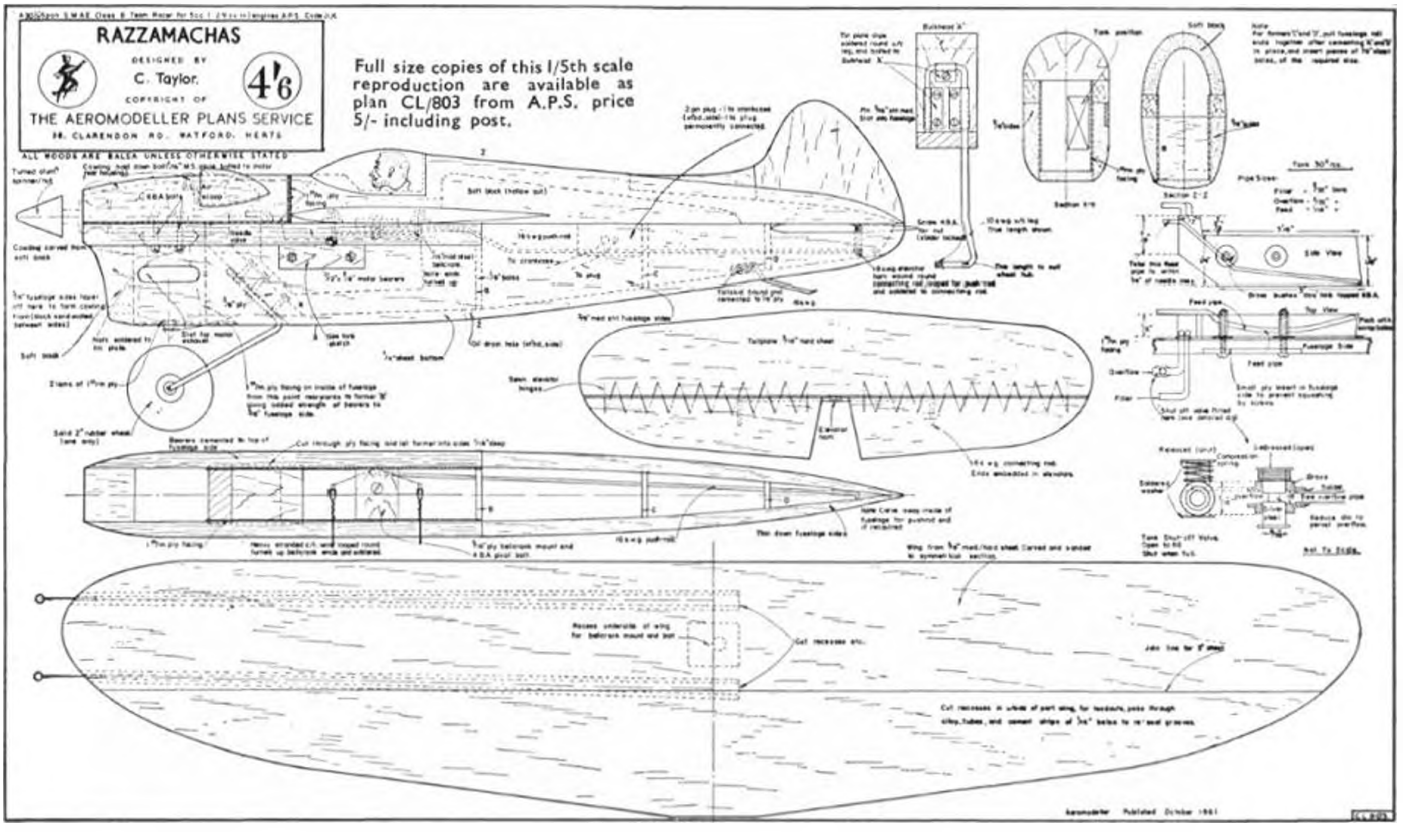
and found it to be most economical, the model doing 60 or so laps, although the speed was obviously down a bit, at 95. The model itself was a heavy (35 oz.) battered old test-bed, so there does seem a good chance that, given a new, very much lighter model, say in the region of 20 oz., it would not be beyond the bounds of possibility to do the 70 laps non-stop at around the 100 mark. We are sufficiently interested to be getting such a model constructed to investigate further, but for the moment, the ringed-piston racing motor is tops, it being unfortunate that the ETA VIc very good though it is, is the only one of its type and capacity manufactured in this country.

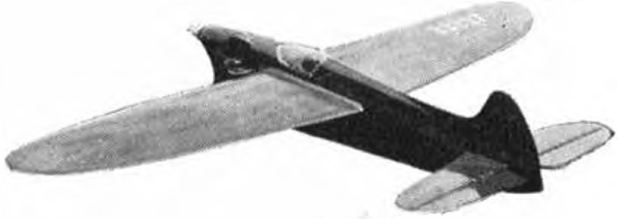
We ourselves have been using both the ETA and the McCoy 29 for some time, and carry out no mods to the standard ETA at all. The running-in however, on this motor, we do carefully and most religiously, until the motor has had at least 1½ hours running. With the McCoy, 4 basic mods are made. The cylinder head is scrapped and replaced with another having a hemispherical combustion chamber, with a cut-away for the deflector on the piston crown, as is now incorporated on the new "wisniewski" K. & B. 15 and 29. The alloy disc-valve is replaced by one made of "Tufnol", recessed on the rear face to reduce friction, and the "open" needle assembly is replaced with a single-hole spray-bar. The only remaining mod is to polish the transfer passage as much as possible, using a piece of emery cloth on the end of a shaped piece of wood (with the cylinder removed),

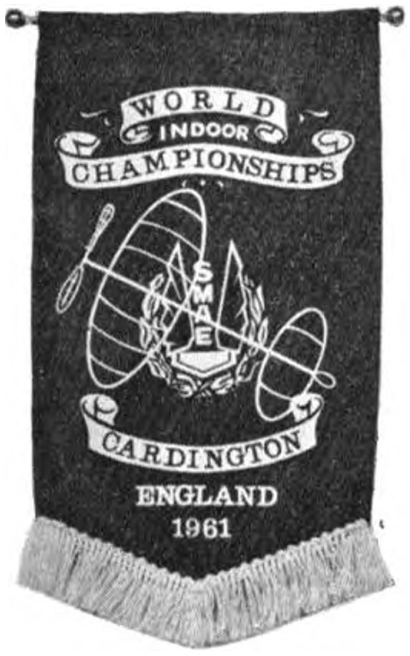
On the bench, we have found that, generally speaking, if one of our motors will turn an 8 x 8 "Power" prop at 14,000 r.p.m. or more, using any of the usual team-race brews incorporating 20 per cent. nitro methane, then it should be good for at least 105 m.p.h. But we have one notable exception which will do no more than 12,200 on this combination, yet musters 110 m.p.h. in the air, so where does one go from there? The moral, of course, is to treat bench readings a little sceptically as far as performance in the model is concerned—and fly the darned thing!

To do a fast time—something like 3:20 in the heat, 7 mins or under for the final, it has become absolutely necessary to do no less than ⅞ distance on one tankful in the heat—preferably about 40 laps, allowing a good margin for safety. Up to about 18 months ago we found this most difficult to achieve consistently, but since that time have been able to do so with regularity, due to a great deal of research on fuels, both theoretical and practical.

An article on Class B fuels, giving details and reports to all our past and present formulae, including that used in the *Razzamachas* when the present fastest time of 6:42 was established (in a race), will appear in next month's AEROMODELLER, and should be of considerable interest and assistance to those seeking either extra laps or extra "urge". Till then—the best of luck mates!







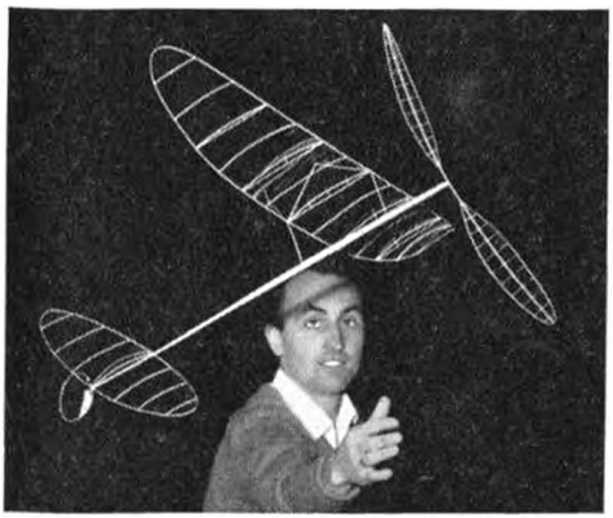
Astounding durations at the first World Indoor model Championships

RESULTS

1	J. Bilgri	U.S.A.	32:24	6:15	37:49
2	K-H. Rieke	Germany	31:18	—	35:11
3	W. Bigge	U.S.A.	33:07	34:56	29:22
4	E. Hamalainen	Finland	21:34	33:03	27:40
5	P. Read	G.B.	27:09	32:48	17:46
6	K. Hewall	Germany	1:05	32:00	30:31
7	R. Hyvarinen	Finland	31:02	28:19	14:12
8	C. Redlin	U.S.A.	30:56	18:26	26:55
9	Z. Ocsody	Hungary	25:49	8:20	30:41
10	L. Englund	Finland	30:04	28:35	11:31
11	A. Egri	Hungary	22:51	25:27	27:15
12	R. Parham	G.B.	15:50	22:01	22:35
13	M. Hacklinger	Germany	4:27	22:21	19:43
14	R. Draper	G.B.	19:44	20:45	12:55

TEAM RESULTS

1	U.S.A.	... ...	103:41
2	Finland	... ...	94:09
3	Germany	... ...	89:32
4	G.B.	... ...	76:08
5	Hungary	... ...	57:56



Top, is souvenir pennant for participants. Above: Max Hacklinger releases, note mono-spar prop flex, increasing pitch at power burst for steep initial climb. Below: Dick Kowalski, U.S.A. team manager, receives the Samuel Langley Trophy from Alex Houlberg, S.M.A.E. Chairman. On page opposite, anti-clockwise, Ray Monks and Phil Read prepare to wind. Karl Rieke holds his broad propped model (note pitch change). Joe Bilgri does the same, and above, Bill Bigge rigs his model. These were top three.

IF QUALITY comes in small packages, then we had a surfeit of superbly high standard flying from the five Nations represented at R.A.F. Cardington on August 5th to 7th. Four national records were broken, including a supreme flight lasting 44 minutes 20 seconds by Max Hacklinger of W. Germany, and of the 14 contestants (many of whom had never been able to use more than 65 ft. ceiling before and were unused to the techniques of hangar flying), only one is yet to become a member of the illustrious "Thirty-minute " club.

It was truly an event for the expert; yet at the same time we doubt whether there has ever been another contest where *everyone* learned some new approach. A word of advice from U.S. team manager, the widely experienced Dick Kowalski, was enough to add a full five minutes to Hungarian Zoltan Oczody's last flight. The British team learned the need for larger tail surfaces and less marginal stability. Maestro Joe Bilgri, the anticipated winner, saw his "thin airfoil" theory confounded by Hacklinger's small area, high camber wing.

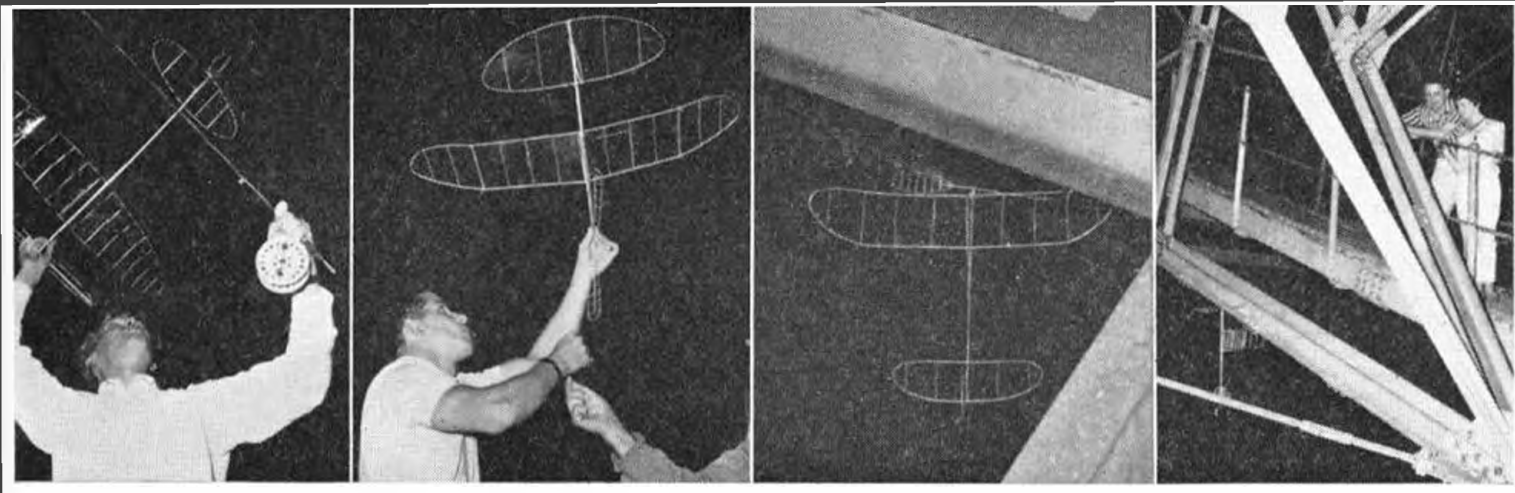
Indoor flying is both an art *and* a science. It is model flying with a clinical exactitude where the flight duration is technically predictable if one uses a miniature torque measure on the two-strand motor to determine the flight curve and length of cruise duration after the climb. Number of turns is set against the pitch and revs-per-minute of the propeller. Weight and loading is important as with outdoor free flight; but airframes are down to as low as .030 oz. for the smaller models and about .050 to .065 oz. in those which employ maximum possible area for the allowed 35·4-in. span. Rubber motors are stripped from 1/24 in. Pirelli (vintage of '55 and '56 is most treasured) and weigh about the same as the airframe.

The fascination of indoor flying, with its challenge of precise construction and patient handling, deserves far greater audience than can actually be granted. The flight path of a model can so easily be disturbed if an onlooker moves at fast pace and, for the World Championships, every effort was made to see that the least possible number of persons used the vast floorspace at any time during the three 4-hour rounds. Only the better of the three flights counted and so the competitor had a fair chance of establishing his best performance. Wall girders were the major hazard, beyond the control of the modeller (hydrogen-filled Met. balloons on lines could be called in to arrest a model in flight, or recover it from a wall collision), but to hit the roof girders, 155 ft. above the floor was very much a case of unwise over-power. A typical 32-minute flight is from 2,000 turns, with the climb to max height in about 12 minutes, followed by a cruise with little loss of height for 12 to 15 minutes, then descent to floor level with just a few knots left on the motor.

A measure of control over the initial rate of climb, and consequently the altitude gained, can be exercised by "backing-off" turns after full power has been applied. This takes the initial high torque burst out of the motor and avoids a power stall. For hangar flying, under a corrugated tin roof with all vents shut and a general rise in ground level temperature as the day passes, it is important to ensure that the model gets into the hot air level. This extends from the roof down to about 30 ft. below. Our personal estimate is that there was 15 deg. F. difference between altitudes as close as 50 and 120 ft. at Cardington. Beside the anticipated buoyant effect of the heat (and attendant convections close to the walls which saw the end of several good flights) there was also an effect on the rubber. Revs-per-minute might fall as low as 40 whereas on the *same* turns and at lower altitude, the *same* prop might have rotated at 55 r.p.m.

So much then for techniques, which will sound as strange and unattainable to the majority as they are automatically accepted by the small band of experts.

Saturday was set aside for arrival and practice. The Royal Air Force provided dormitory accommodation scarcely a stone's throw from the hangar door, and the International party enjoyed magnificent co-operation of the Service through the good offices of Wing Cmdr. P. H. Waterkeyn, D.F.C., O.B.E., Officer Commanding Cardington, and Sqdn./Ldr. Blake. Nothing was too much trouble, and when it was discovered that ex-Croydon clubster Ted Savage was in charge of the Sergt.'s Mess bar, the social occasion was a guaranteed success!



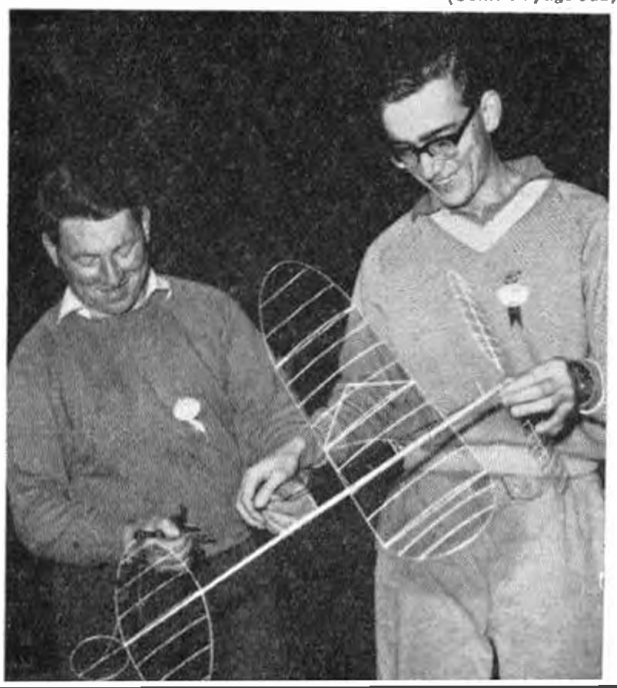
HAZARDS. Left to right: Leif Englund takes model off fishline up to balloon. Carl Redlin does same, to save model from a hang-up. Z. Oczody's model skates under roof girders, bumping at least 12 times, but not catching—unlike Ron Draper's at right, hanging by prop over 150 ft. void, see also page 516.

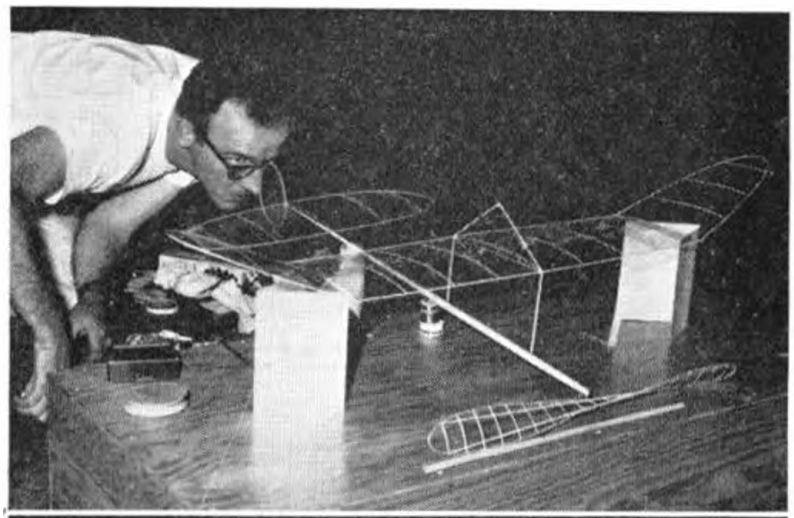
Not too much could be detected from practice. Top time of 32 minutes by Carl Redlin (U.S.A.) on 1700 out of 2000 turns was evidence of American capability, and when at a later stage, Joe Bilgri assembled to make just one test of 21 minutes which gave him all the information he wanted to know, the strength of their team was obvious. On the other hand, the Hungarians, Egri and Oczody were heavily involved in major repairs. They had flown over in an Il-18 with the National athletic team, and someone had mistaken the box for a throwing hammer! By hard work, they rebuilt their models, each having one with a reed fuselage stick, heavier than a rolled balsa tube, and further handicapped in Egri's case by a heavy (comparatively!) build up prop. In the Sunday morning practice, each smashed the existing Hungarian record by as much as 7 minutes.

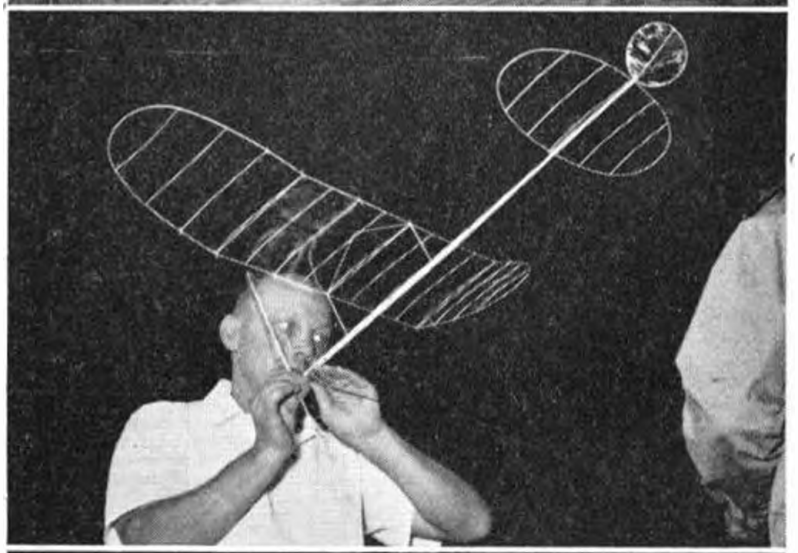
The Finns also broke records, with A/2 and Wakefield flier Reino Hyvarinen making a best time of 29:03, and they were using every moment to practice, rebuild and tend to their models. Winner of the previous International at Debrecen, K-H Rieke from Berlin and his clubmate protege Klaus Hewell, did not improve beyond 23 mins. but Max Hacklinger equalled his best previous time under 75 ft. ceiling with about 30½ minutes, and he was the man to watch in the team from Germany. The British lads were content with Reg Parham at 29:54, Phil Reid 27 minutes twice and Ron Draper 26 on 70 per cent. turns. It should be mentioned that meteorological conditions improved as the meeting progressed, and early practice took place with cold, windy weather outside. By midday on the Sunday, everyone was ready for the first round, beginning 2 p.m. and lasting four hours. Not unnaturally, there was a nervous atmosphere in the cathedral-like interior, no-one wishing to be first off. Calm (!) Phil Read broke the ice as a true host should; but the flight was not good as we hoped. First attempt was a power stall and tail slide that the multi R/C boys would appreciate, so Phil let some turns off, almost repeated the performance, then slowly made only 60 ft. height and landed in some office works at the side for 27:09. To have done so much on so little height was admired by the Continental visitors.

Then Esko Hamalainen, (pilot with Finnair), released and he too caught the girders and office works at 21:34. Drift was evident so there now came a cautious waiting gap, broken by Joe Bilgri who positioned his flight perfectly for a centre catwalk crawl, the lower pitch prop (30 in.) outlining his published advice for high ceiling work, yet turning only 58 r.p.m. on the climb. It was a fine 32:24 and this remained the high time until the very last minutes of the round. Joe had drifted (the model *and* Joe that is) from end to centre, then Egri did 22:51 without any drift at all.

(Cont. on page 522)







To understand the internal convections one would need to be clairvoyant. Englund (Finland) and Rieke flew from door to door down the 800 ft. hangar with excellent times of 30:04 and 31:18 setting new national records in the process, then Carl Redlin with the only underfin model (at one time this was a universal feature) made 30:56 on quite a different flight track. Reg Parham seemed destined *never* to join the "30" club for his model hung up at less than the halfway stage in a very good flight at 15:50 and to rub it in further, Ron Draper did the same. So G.B. collected three hang-ups!

Sometimes an indoor model tucks its nose down and refuses to climb at all as it orbits for 5 minutes then breaks away for the climb. A bending motor stick, can be the reason, but whatever it is, this happened to Oczody who simply ducked under as the model came overhead, and almost by telepathy, the nose rose for a perfect climb!

With half an hour left, Hyvarinen and Bill Bigge of U.S.A. almost left it too late. Rain was close by outside and thunder rolled. But whatever the pundits predicted, these two made the most remarkable flights of the day, Hyvarinen drifting one way, Bigge the opposite, and each landing within a few feet of the end. Hyvarinen had found his "best" motor about to break so switched to what was obviously (and luckily) much better and he used every turn for a dead stick landing, the prop all askew in the single bearing and losing a certain 30 secs. from what was another new Finnish record flight of 31:02 — by someone who had only started indoor stick-type models on May 15th! At the other end, Bigge's model descended also dead stick, losing its last vestige of power at 15 ft., the double prop bearing showing its advantage by holding the prop square to the very end of a superb 33:07 — quite the best of the day. In the meantime, Hacklinger had launched; but as the model did not climb as it should, he aborted the flight with balloon and line to make a second attempt which started with too steep a climb. The tactician spoiled the flight again in order to save the model. In practice afterwards, Reg Parham joined the "30" club at last, with 30:10.

The second round started at 8 a.m. on the Monday according to the official programme, but everyone awaited a rise of temperature until Egri flew to show that drift was very slight. The fact that he did not go above half the height available was probably attributable to lack of high flying technique; but when Carl Redlin held cruise height with no improvement over Egri, there was some doubt as to the advisability of launching. Redlin terminated the flight eventually to save the model from the girders.

British Misfortunes

Read was out next, for a power stall that almost ended inverted! One attempt! Later, he came out for a second try, and the motor broke. Bad luck with a vengeance? Still later, he released after letting off turns to avoid a stall and all appeared well until it stalled at 25 ft. After waffling down to 10 ft. it recovered and went on to return 32:28, using no more than 80 ft. altitude following such a bad start. One is left to wonder what *might* have happened had dame fortune smiled more brightly.

Reg Parham was similarly afflicted. He had beaten the "30" again in early practice, yet in the contest flight it was only 22:01 with a load of turns left on the motor. Ron Draper's model stalled at 25 ft. for an attempt, held the nose down for three circuits after the second attempt, and lost all climb advantage.

But if British chances were being dashed, Hamalainen and Hewell were well up under the roof for excellent flights of 33:03 and 32 minutes exactly, to be joined by Bilgri who went too far and hit the girders. Rieke and Hyvarinen had the misfortune to collide, the German model being too damaged to continue.

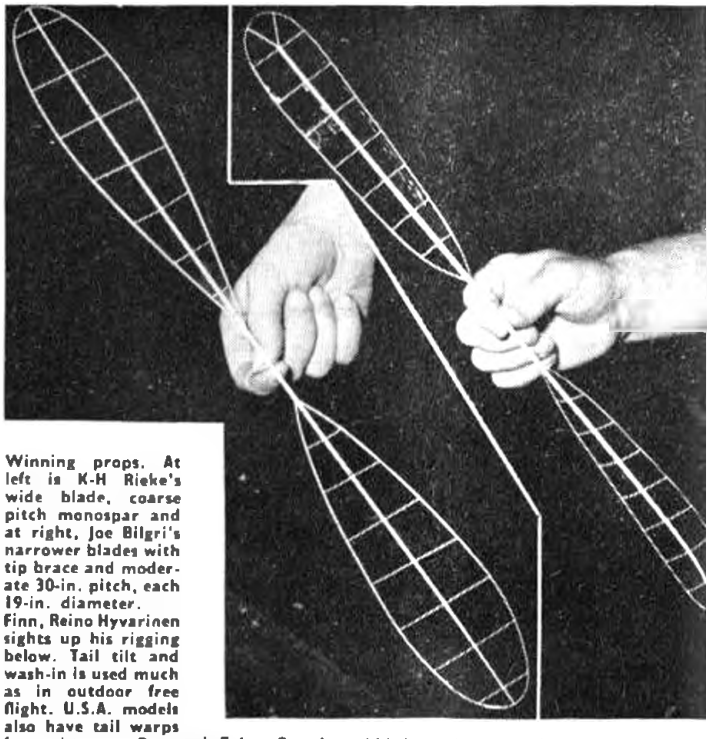
It was left again to the last flight, by Bill Bigge, for best of the round and what a magnificent flight it was, only 4 secs. short of 35 minutes! Yet this was his reserve model, the prop bearing having broken away whilst preparing the first model for flight

During the lunch break, Hacklinger set about trimming his model for higher climb — and was clocked at 39 minutes. At last he seemed to have the measure of the hangar, and with study of the climb and prop r.p.m. from the stairway to the roof, plus his torque measure, the ex-World Champion A/2 glider flyer clearly had a chance for an individual win. But it was not to be, and in the third round, the model settled to cruise at low altitude. In contrast, the comparatively less experienced Oczody, having been advised by Dick Kowalski to brace his motor stick, was executing a "*Danse Girdroise*" up in the roof for what became a new Hungarian record of 30:41. Draper also went up there, to hang up, as our photograph shows.

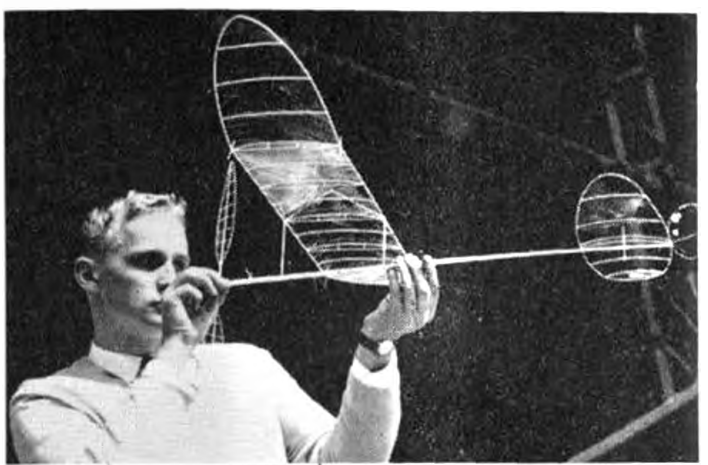
Almost concurrently, the two outstanding flights of the contest followed immediately as Bilgri and Karl-Heinz Rieke launched. While the German model hugged the wall girders for all of 35:11, Joe Bilgri's flight was perfection in positioning. We watched from above, and waited six minutes for it to come up to 110 ft., another six to reach 135 ft., then a long cruise holding 130 ft. for almost 18 minutes before descent for a total time of 37:49. It was a target-time that others could not hope to match, and gave "Old Baldy" top placing as well as sealing the American team lead.

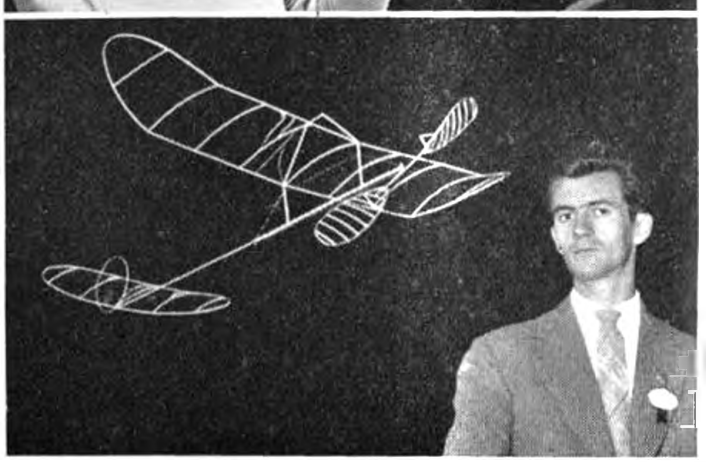
At prize-giving, we were particularly pleased to hear recognition for the hard work put in by our own C. S. "Rushy" Rushbrooke, who had sole responsibility for organising this Championship so successfully right from the first proposition that it should be held. Without exception, all participants were bubbling with enthusiasm for the facilities and the happy atmosphere which prevailed, to make this one of the really outstanding championships in memory. Certainly it has set the standard for the future, and Max Hacklinger's magnificent 44:20 record flight to conclude the meeting was a fitting climax.

R. G. M.



Winning props. At left is K-H Rieke's wide blade, coarse pitch monospar and at right, Joe Bilgri's narrower blades with tip brace and moderate 30-in. pitch, each 19-in. diameter. Finn, Reino Hyvarinen sights up his rigging below. Tail tilt and wash-in is used much as in outdoor free flight. U.S.A. models also have tail warps for anti-torque. Bottom is Zoltan Oczody and his braced prop model with Benedek style uplifted fin. Now holds the new 30:41 Hungarian record.





MAKING MICROFILM

The EXPERTS way described by Ray Monks

In our April issue we introduced Microfilm to the novice. Now we have the experts' view from Ray Monks, with latest techniques described.

MICROFILM CAN BE produced in many ways and thicknesses, but for the indoor enthusiast only some types are satisfactory. The film we require should be stable, (should not shrink), should be dry, and yet should be flexible, (not brittle). For ultra light models, a film which goes slack on the frames is preferable.

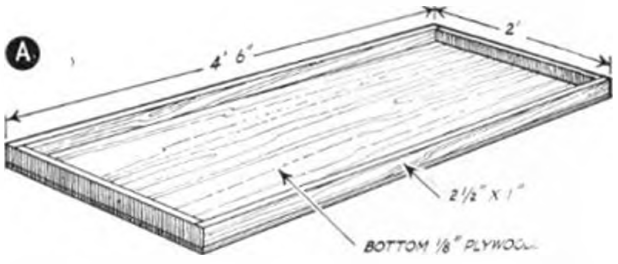
All the characteristics are not easy to obtain in one film, but that should be your aim.

There are three basic components to all film solutions: (1) Base Material; (2) The Plasticiser; (3) The Solvent. No 1 in the main, decides the stability or otherwise. No. 2 is used to supply the flexibility. Unfortunately, this in excess will also make the film sticky. The stability will also be affected. No. 3 is used to make the film spread.

For the Base almost any Nitro Cellulose solution will do (Dope, Banana Oil, Auto Lacquer, etc.). Unfortunately a lot depends on how it is used. Most of these materials contain some plasticiser, some Banana oils may contain too much.

The plasticiser is also open to choice. Castor oil is often mentioned, but is far inferior to Tri-Cresyl Phosphate. Another useful plasticiser, especially when trying to obtain slack film, is powdered camphor. (This is also useful to help the film to spread).

For the solvent, amyl acetate is fine, not acetone.



The basic rules for all films can be summarised as follows:—

1. Try to use a pure base material (no plasticiser).
2. Use an absolute minimum of plasticiser.
3. Use a minimum of solvent.

The way to judge thickness.

This is done by the colours which are reflected in the film. These range in order as follows:

Colour: Their use is as below:

Clear	"Celluloid" completely useless. Far too heavy.
Red and Green	Props and beginners models, RTP, etc. Good for strong models.
Green and Blue Blue and Purple Purple and Gold	These are the thicknesses to aim for.
Brown and Milky	Too thin.

Producing Film

The first problem is a suitable tank, the bigger the better. It must be at *least* 3 ft. 6 in. by 1 ft. 6 in. by 2½ in. deep. My own is 4 ft. 6 in. by 2 ft. Made from 2½ in. by 1 in. frame and an ⅛ in. ply bottom (Illustration A) into this place a piece of polythene sheet. The bath makes a pretty fair substitute.

Frames are made from ⅜ in. by ¼ in. balsa. These are wetted, and placed on top of the film, and, as they float, this leaves both hands free to manipulate the film. Make various sizes for the different parts of the models allow at least 2 in. all round model components when making frames. I personally use 3 ft. by 10 in. and 2 ft. by 7 in. frames.

Fill the tank to about 2 in. deep. (If you use the bath, about 8 in.) Water temperature should be about 60-70 degrees.

When mixing a solution from scratch, this is how to go about it:—

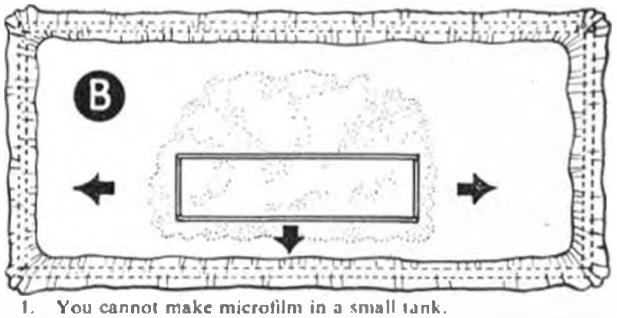
First try a teaspoon of the base. This will probably hardly spread at all, and dry thick and very wrinkled. Add thinner and repeat until film is spreading over at least 50 per cent. of the area of the tank. Now add a little plasticiser (just a few drops) and try again, the wrinkles should not be so noticeable, and the film should now be spreading evenly to within 2 or 3 inches of the sides of the tank. It will never touch the sides. Do not add sufficient plasticiser to remove all wrinkles, only sufficient to remove those from the centre of film. The length of the film depends on how the solution is poured.

When you are getting a satisfactory spread, allow film to harden 2-3 minutes, and then try to remove from water. Thoroughly wet frame of correct size and place on best part of film. Now push frame to each edge of tank (illustration "B") to compress edges of film. Turn film over edges of frame. The frame is then pulled to the near edge of the tank, and lifted with a sliding motion, (illustration "C"). Some practise may be necessary. If you can't get it off the water, you may have to add more plasticiser, but remember, as little as is absolutely necessary. When the film has little or no wrinkles, you have probably added too much plasticiser, so you add more base and start again.

When you are getting the result you require, allow a frame to drain and dry. The film when dry should stretch when touched, and must not stick to the fingers.

Always store your film as long as possible before using. (I always store mine at least a month).

Finally, here are one or two important points:

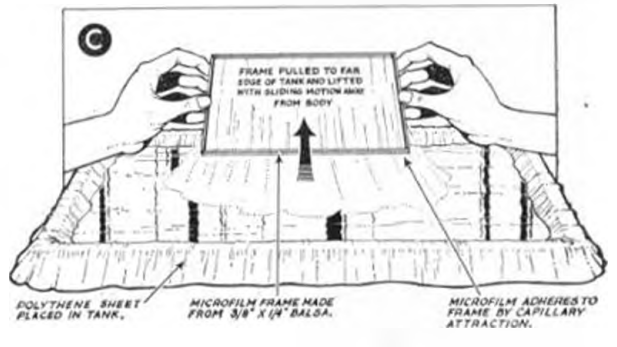


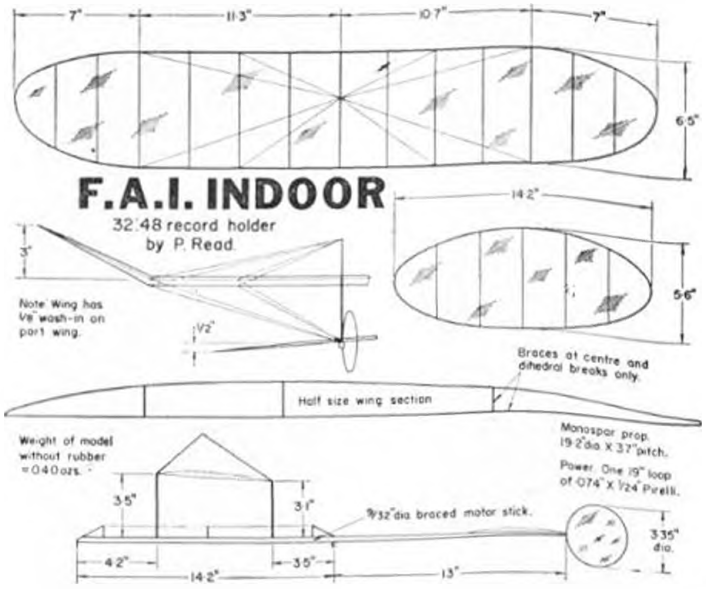
1. You cannot make microfilm in a small tank.
2. Microfilm does not adhere to the model by its stickiness or otherwise. The film is drawn tight to the framework by capillary attraction, therefore, water is a satisfactory adhesive; use no other.
3. All the indoor "experts" I know cannot always produce perfect film and have sometimes had to make do with second best, so don't worry if you can't get perfection straight away, you will improve with practice.

Two solutions which work well.

1. Is a film for beginners.
2. Is a film which will slacken off in about a week's storage.

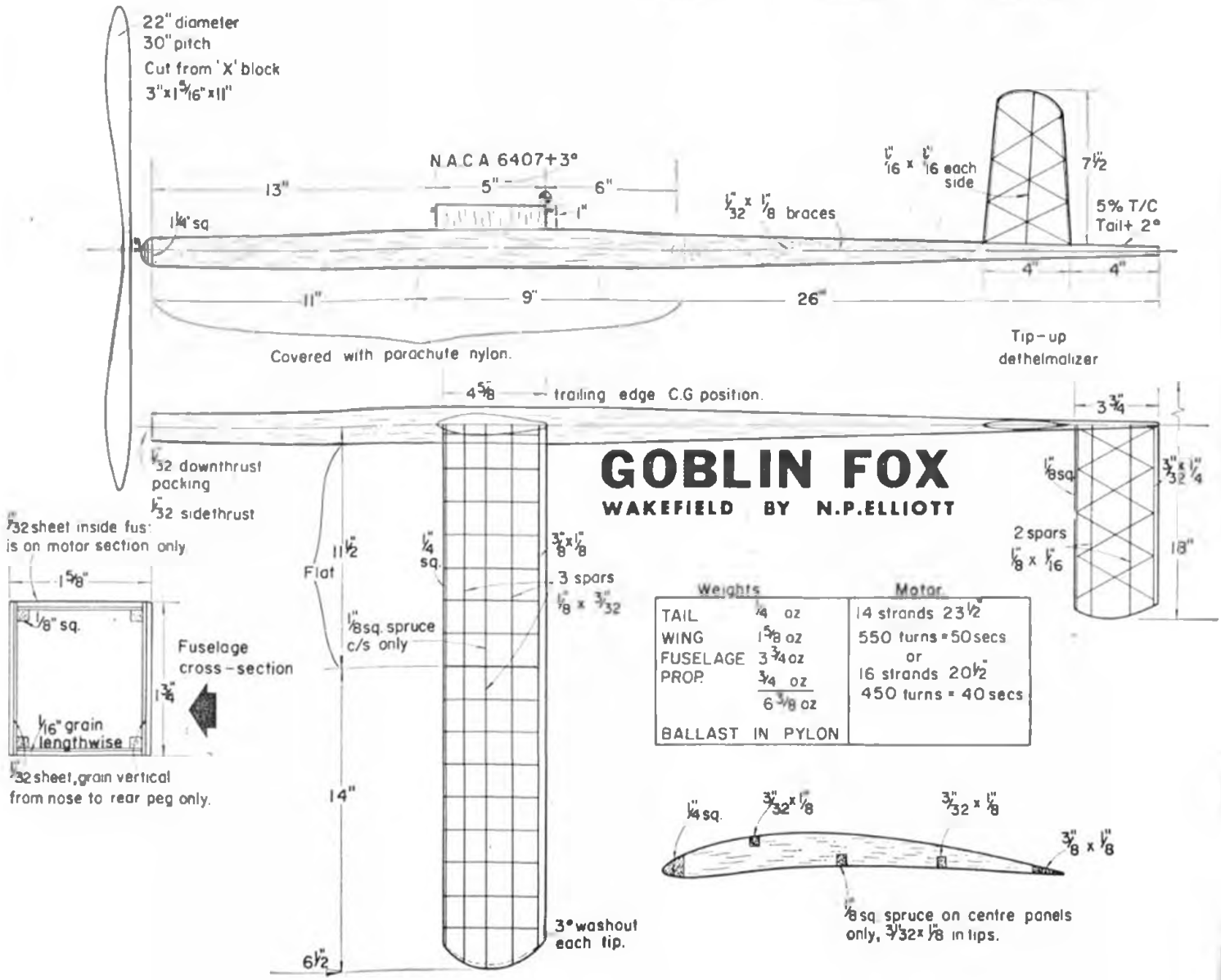
No. 1	No. 2
2 ozs. "Britfix" Clear Dope	2½ ozs. "Joy Plane" Thick Banana Oil
1 oz. Amyl Acetate	1½ ozs. Amyl Acetate
20 drops Castor Oil	3 c.c. Tri-Cresyl Phosphate
	½rd Teaspoon Powdered Camphor

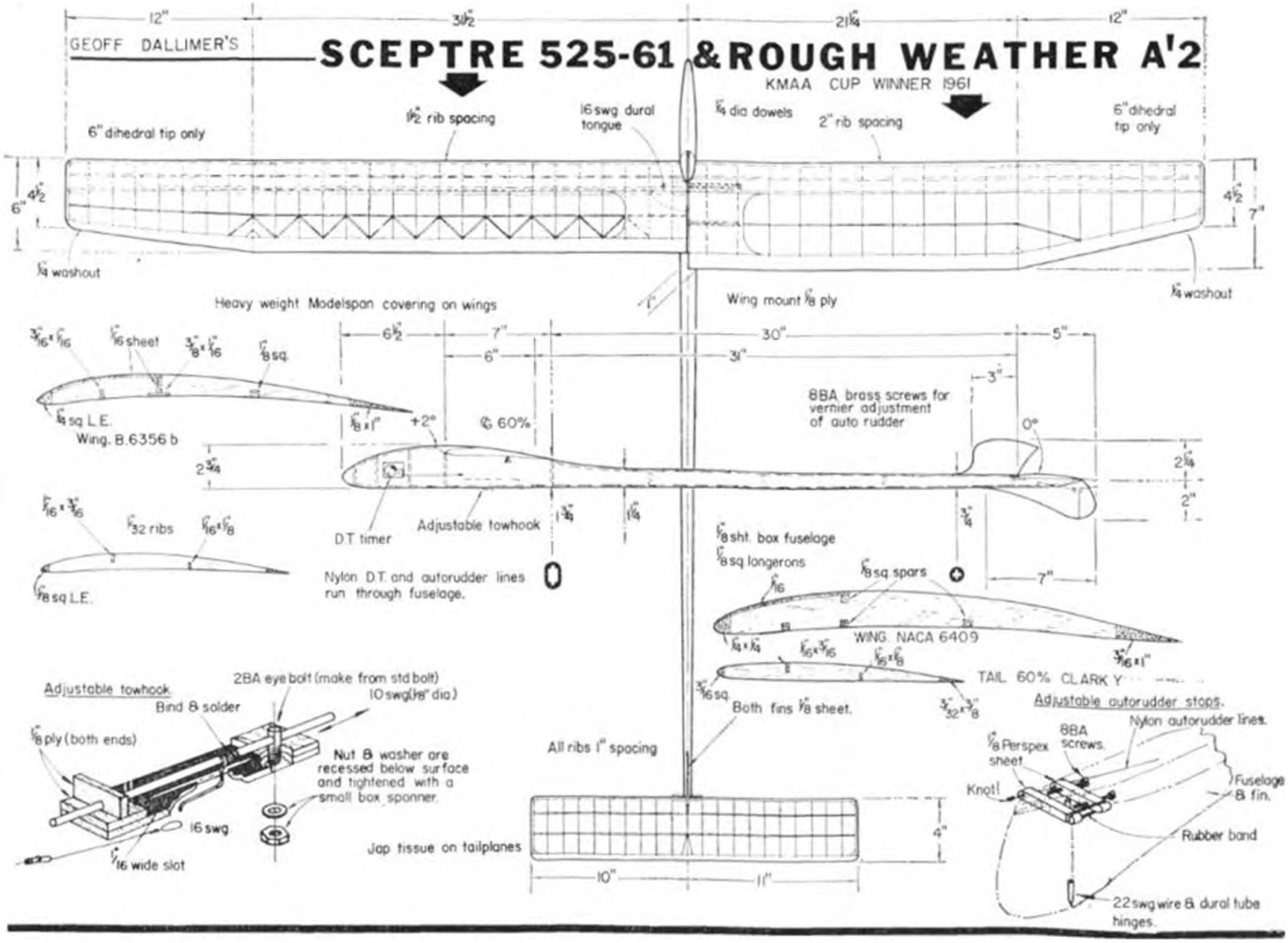




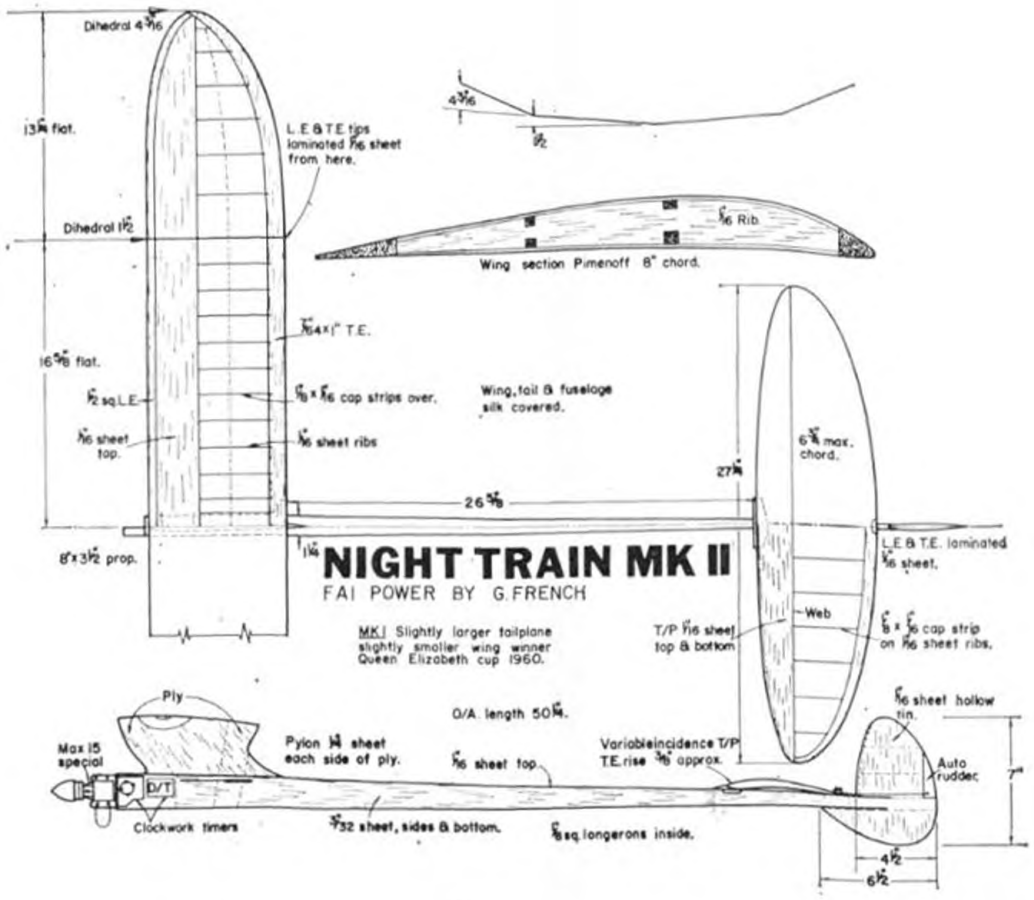
Great Britain's TOP FOUR Contest designs

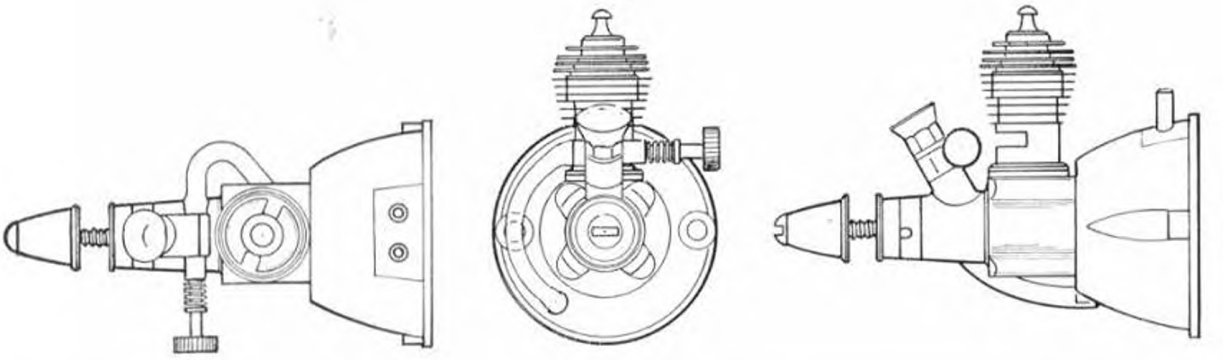
Leading each of Great Britain's teams for the free flight World Championships this year, these four models can truly be said to be the leaders in their class. Each has been drawn to a scale for the benefit of those who wish to enlarge details, and major dimensions are also added. Beginning at left, we have Phil Read's British record holding Indoor model to one-twelfth scale. This was one of the lightest models for its size at the World Indoor Champs. A picture appears on page 521.





At left: Norman Elliott's Wakefield (one-eighth scale), the latest in his series of Goblins which are working through the phonetical alphabet. Has a high rate of initial climb, trailing edge balance and a large two-blade folding prop. At right: George French's outstanding power model to one-twelfth scale features a combined auto rudder/ motor cut-off/tail incidence trip device to control power and glide. Has latest O.S. Max. 15. Above: are the pair of A/2 gliders used by Geoff Dallimer, using common fuselage dimensions, one for calm, the other for rough weather. Drawn to one-twelfth scale. Sketches show adjustable towhook and micro adjustment auto rudder.





THE TEE-DEE .01 was the first of the new Cox front rotary series which we have had the pleasure of handling and testing and without qualification we rate it as the finest example of precision-miniature production engineering we have seen. Pro-British as we may be, this is a job which only Cox could have done so well and we freely admit that no British manufacturer could begin to compete on such lines. Apart from the considerable difference in the commercial market—the Americans have about ten times the sales potential with their greater population and higher average income—we just have not got the equipment or "know how" in this country to tackle such a sub-miniaturised job so successfully.

The Tee-Dee .01 is worth the money just to look at and handle, outstandingly attractive in appearance and presentation and equally admirable as an example of engineering skill. The Tee-Dee design—and this will, no doubt, apply throughout the rest of the series—has the same impact on the model engine world as did the Arden when it first appeared—a design and production in a class apart.

The Tee-Dee .01 is, of course, really a "toy" with a primary appeal because of its novelty value in matching tiny model sizes. It is not the smallest commercial motor that has been produced, nor the lightest, but whereas its sub-miniature predecessors have been "marginal" in power output—and often tricky to start and handle—the Tee-Dee retains ample "full size" model engine characteristics and develops plenty of power in proportion to its size. It is the only *sub*-miniature motor which has yet been produced which will fly a stunt control line model, for example, and give a genuine aerobatic performance. Many motors four times the capacity of the Tee-Dee leave much to be desired in this respect.

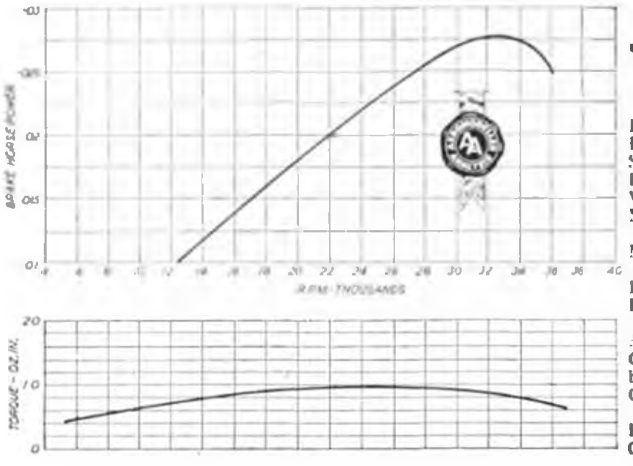
On the performance side the most outstanding characteristic of the Tee-Dee is its extremely high operating speed, and also the considerable range of speeds over which it can be run. The extremely efficient moulded plastic propeller supplied by the engine is 3 inches diameter by 1¼ inch pitch with wide blades, which it turns at 27,000 r.p.m. to develop a very appreciable thrust. It will also drive larger size propellers right up to 6 x 3 sizes, but not with the same verve. Starting remains easy, but the engine is definitely struggling on a 6 x 3 or 5 x 4 and revs quite obviously pulled right down. Thrust is also decreased, and in view of the characteristics of the torque curve there is no point in trying to operate the engine on larger propellers. It develops maximum *torque* somewhere around 24,000 r.p.m. and maximum power output at approximately 32,000 r.p.m.

Since the torque generated is only of the order of one ounce-inch, testing an engine of this size sets particular problems as conventional equipment is not sensitive enough or accurate enough to measure the small difference involved. Even speed measurement is difficult, without further special equipment, since the "normal" r.p.m. operating range for the Tee-Dee is well above the maximum available on the stroboscope. Nor can a reed tachometer be used to check the order of stroboscope readings. Apart from the fact that the reed tach. scale does not extend up to anything like the speed range covered, there is just not enough vibration most times to energise the reed in any case.

The majority of torque readings were, therefore, established using calibrated torque bars normally used for sub-miniature electric motor testing. These readings must still be regarded as somewhat tentative, largely because the calibration figures are not rated for such high speeds and true values may be modified by scale effect. Although shown to be free from scale effect, for the purpose for which they were originally intended, this did not visualise speeds greater than 10,000 r.p.m. and hence torque absorption figures have been extrapolated from the original calibrations.

In any case, the peak B.H.P. figure is largely of academic interest only. The real proof of performance is that there is a sub-miniature engine which will really fly a matched size of model, free flight or control line, with performance to spare, on the design propeller.

The peak B.H.P. figure arrived at, in fact, is quite fantastic—virtually the same order as that of 0·5 c.c. glow motors—but direct comparison is unrealistic because of the extremely high speed at which peak B.H.P. is given. Thus the useful load—in terms of propeller



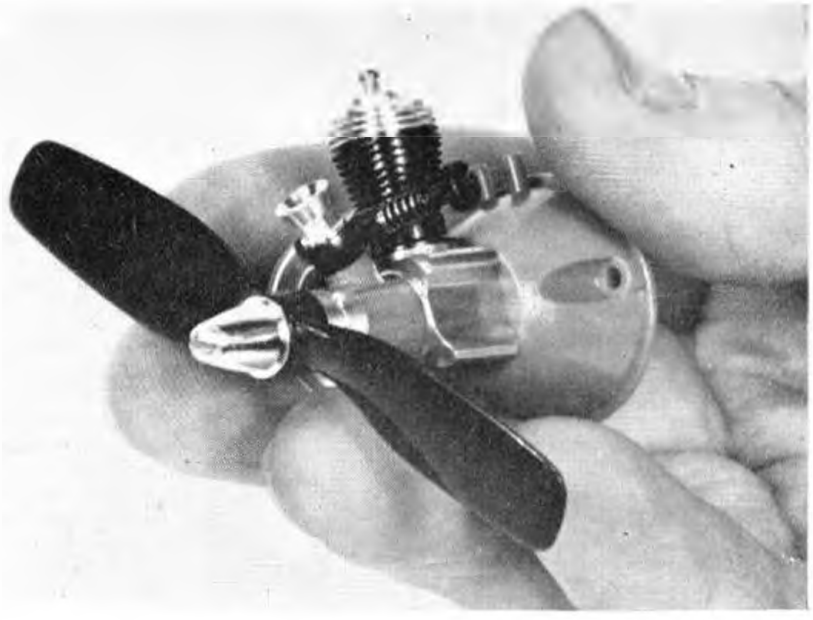
SPECIFICATION

Displacement: .163 c.c. (.00997 cu. in.)
Bore: .237 in.
Stroke: .226 in.
Bore/stroke ratio: 1.05
Weight: ¼ ounce
Max. power (approximate): .028 B.H.P. at 32,000 r.p.m.
Max. torque: 1.0 ounce-inches at 24,000 r.p.m.
Power rating: .172 B.H.P. per c.c.
Power/weight ratio: .056 B.H.P. per ounce.
Material Specification:
Crankcase: machined from light alloy bar, "gold" finish overall
Crankshaft: hardened steel, 1/16 in. diameter steel screw propeller shaft
Piston: hardened steel
Cylinder: soft steel
Connecting rod: machined from dural (ball-and-socket little end)
Intake body: moulded plastic, located by screwed dural collar
Venturi: turned aluminium
Spraybar housing: steel
Cylinder head: turned dural, integral 1.5 volt glow element
Crankcase back cover: moulded plastic
Rear-cover tank: moulded plastic, with plastic end
Main bearing: plain
Manufacturers:
L. M. Cox Mfg. Co. Inc., Santa Ana, California, U.S.A.
British Importers:
A. A. Hales Ltd., 26 Station Close, Potters Bar, Middlesex.

ENGINE ANALYSIS 88

COX TEE-DEE ·010

By R. H. WARRING



Propeller—R.P.M. Figures	
3 x 1½ Cox plastic	27,000
5½ x 3½ D-C Nylon	7,800
6 x 3 Top Flite nylon	5,800
5½ x 3 Top Flite nylon	6,000
5½ x 4 Top Flite nylon	5,500
5 x 4 K-K nylon	6,000
5 x 3 K-K nylon	7,000

size—is directly restricted by the necessity of obtaining high speed operation so that a small diameter size and very small pitch is the only practical choice.

Starting characteristics are excellent, and perfectly straightforward. A coil spring starter is supplied, which can be slipped in place over the front of the engine and located by engaging the loop end over the stub pipe on the side of the intake moulding. The Tee-Dee likes a little prime through the exhaust with the port *closed* and needle valve opened to a slightly rich position (approx. five turns open).

The only thing that does upset the handling characteristics to any extent is gummyness resulting from residual fuel, causing excessive initial drag on the piston (and possibly a flooded cylinder by the time it has washed off), or even clogging the jets. It will not take kindly to being left after running on some of the fuels notorious for the gummy deposits they form on standing.

We did not find fuel mixture as such critical, but a high nitro content fuel is necessary for maximum performance and smoothest running. A nitromethane content of 10 per cent. seems a minimum requirement. All the test running was conducted on Record Super Nitrex which have perfectly smooth running and first-time starting and a r.p.m. figure for the standard propeller within 100 of the manufacturer's figure (the manufacturers specifically recommending Thimble Drome fuel for optimum performance.

Constructionally, the Tee-Dee features a number of original design features. The familiar Cox-type crankcase is retained, machined from solid bar, with a standard Cox-type mild steel cylinder screwing into position. Two transfer ports are formed on the inside of the cylinder, diametrically opposed, overlapping the exhaust by some 80 per cent. The turned aluminium head containing an integral glow element screws into the top of the cylinder and seals on a thin copper washer.

A front rotary port opening is machined in the top of the crankcase bearing length giving a rectangular opening approximately 3/16 in. long and just over 3/32 in. wide in a cut-out "flat". Onto this assembles a plastic moulding comprising a sleeve and angled stub intake tube. A ridge inside this moulding locates it accurately with respect to the "flat" so that the choke tube opens directly into the crankcase port. The moulding, which is an injection moulding, is retained in position by a threaded collar screwing onto the front of the crankcase.

To complete the intake assembly a venturi insert screws down into the plastic stub tube, carrying also the needle valve housing. The latter comprises a screwed housing for the needle valve itself to the rear of the main body which is drilled out to fit over the venturi stem. A small hole admits the fuel mixture into the body hole (and how this small hole is drilled, we do not know). From there passage into the venturi throat is around a narrow circular passage covered by the needle housing body and three tiny holes through the venturi stem. These four small holes are the ones which can readily be blocked with dirty or gummy fuel. The spraybar body, incidentally, can be locked in any position when tightening the venturi, so if desired it can be angled backwards slightly. Provision is also made for utilising the crankshaft port to provide tank pressurisation, if required. A pressure tapping point is given by a small tube projecting to the right on the plastic moulding. This is blanked off by the crankcase metal, as originally fitted, but can readily be drilled through (with shaft removed) to produce the necessary port opening.

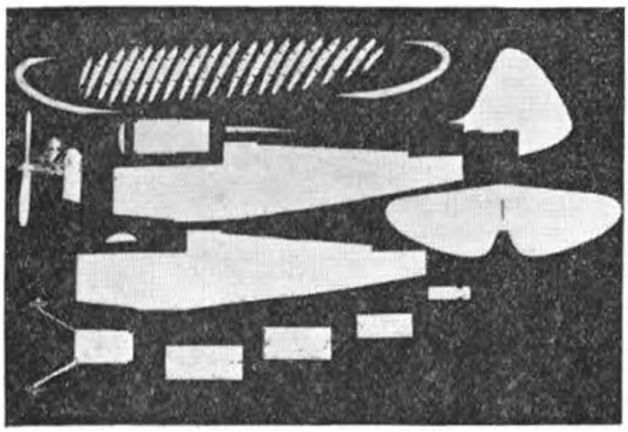
The crankshaft is quite large for the size of engine—.162 in. diameter with 3/32 in. diameter hole down the centre. The port is rectangular, just under 3/16 in. long and 3/32 in. wide. The shaft terminates immediately in front of the bearing in a knurled length carrying the propeller driver and is drilled and tapped from the front to carry a screw to form the propeller shaft. The crank web is 5/16 in. diameter and counterbalanced, with a 1/16 in. diameter crankpin. The whole shaft is hardened and ground to finish, including the crankpin. The main bearing length appears to have been honed to finish.

The flat topped piston is machined with very thin walls, copper plated inside and the top and then hardened and ground to finish. The diminutive connecting rod actually tapers in diameter, terminating in a ball little end, spun over to lock into the top of the piston. Piston-cylinder fit is extremely good and undoubtedly truly concentric. Compression is quite outstanding.

Two alternative backplates are provided, both injection moulded plastic. One acts simply as a backplate and radial mount; the other incorporates a tank and integral radial mount. Each backplate attached with four screws to the crankcase and in the case of the tank mount a further moulded plastic backplate is used, held by a central screw, to provide a tank end. The material used for these mouldings and the front intake unit, is one of the high-strength materials peculiar to America and relatively unknown in this country, combining the strength of nylon with none of its disadvantages.

The complete pack also includes a diminutive "universal" wrench for disassembling all screwed parts, moulded propeller, starter spring and alternative backplate.

If a summary of qualities is needed, we can best say that the Tee-Dee .01 is way out ahead of anything else in its class in performance, design, quality of workmanship and value. Not even the most competent model engineer could produce a better job as a "one off" project.



SHARP SCOOTER

by Keith Laumer

A 4 slick 29 inch sportster for ·5 to ·8c.c engines.

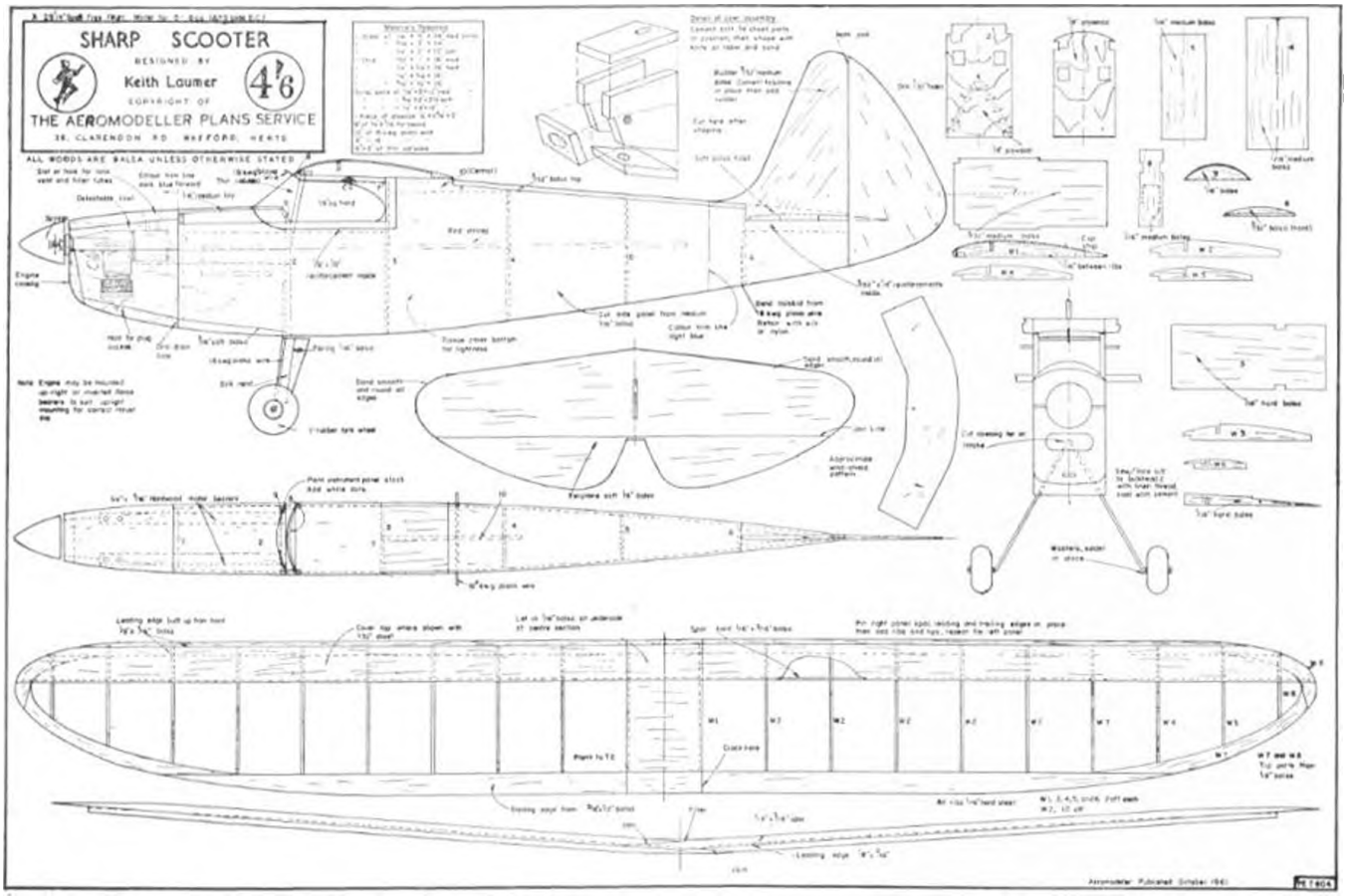
THIS IS THE first power model in our series and we have specially chosen a design and structure that will give a maximum reward of fun for minimum effort.

With the thrust of a miniature aero engine to haul your model skyward, you can afford to build heavier stronger structure—which is fortunate, since these power plants require a rigid, vibration-proof mounting. Surprisingly, added weight detracts nothing from the flying ability of a model (within limits, of course). In fact, a little added wing-loading makes for smoother, more realistic flights and better performance in windy weather.

Sharp Scooter is a sturdy all-balsa (*well*, almost!) ship with a high-aspect ratio (long and skinny to you) wing, sheet tail surfaces and ultra simple construction which gives yet another exercise in different types in this Beginners Course. Start by cutting out two fuselage side panels, tracing the pattern from the plan and add reinforcing strips. Now cut out bulkheads 1 to 6. Bend the landing gear from 16 s.w.g. piano wire, bore holes in bulkhead 2 and lace the wire to the plywood with heavy linen thread. Coat the lacing with cement, forcing it through the holes to make a secure job.

Bend the tail skid from 18 s.w.g. piano wire and attach to bulkhead 6 with a strip of cloth (silk). Decide on the engine you will use, and bore the hardwood motor bearers to fit. Attach the engine to the bearers, then mark the locations of the notches to receive the bearers on bulkheads 1 and 2. (The locations shown on plan are for inverted mounting of a D.C. Bantam and upright mounting means that the bearers must be raised by the thickness of the engine lugs in order to retain the correct thrust-line).

Join the fuselage sides on bulkhead 2 and 3, then add



the remaining bulkheads. Bevel the rear edge of the fuselage sides so that they can join as shown.

Add part No. 10, then the cabin roof (7) after bending the front wing hold down wire and cement to the underside of 7, then add part No. 8. Fit part No. 9 and cement motor bearers in position.

Cut the fuselage top panel and cement in place behind the cabin. Cut a section of 1/16 in. balsa to cover top of fuselage forward of cabin, soak in water and hold in place with rubber bands until set; then trim and cement in place. Add the balsa block to the underside forward of the u/c, then cut cowl sides, notch to fit over motor bearers and cement in position. Add ¼ in. cowl bottom and front. Fit a soft balsa block in place temporarily to complete cowl outline. Use a sharp knife and a sanding block to trim cowl to final shape.

Add cabin posts of hard ⅛ in. sq. and sand entire fuselage smooth; apply a coat of clear dope and finish-sand with fine sandpaper.

Cut the rudder and tailplane, using wood noted on plan and join as shown. Sand surfaces smooth.

Cement elevator in place, then add the rudder and align both surfaces carefully. Add a soft balsa fillet to carry on the fuselage lines, then clear dope and sand the tail assembly. Cut landing gear fairings, sand smooth, and attach with silk. Start wing construction by cutting all ribs tip parts, spar, and leading edge members. Study the front view, then assemble spar and leading edge—and be sure they match! Sand the trailing edge to shape from a strip of 3/16 in. by ½ in. hard balsa to come out slightly shallower; score on upper surface at position of ribs W-1, and crack to proper dihedral angle.

Pin leading and trailing edges in position on plan; block up left tip two inches and add ribs and tip parts to right panel. Then block up right tip and complete left panel. Now add the spar, cementing all joints carefully. Remove the wing from plan, sand carefully and add leading edge and centre section planking.

To increase strength of wing, daub all joints thoroughly with a half-and-half cement-dope mixture. Clear dope wing planking, and sand lightly.

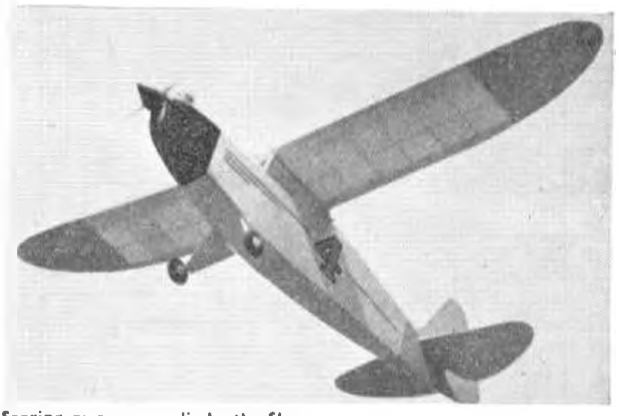
Cover wing and bottom of fuselage with jap tissue or lightweight model span, moisten with water, allow to dry thoroughly, and clear dope. Remove upper half of engine cowling, hollow to fit over engine; fuel-proof the interior of the engine compartment. Cut the drain hole, glow plug access hole, air intake and fuel access hole.

Spray or brush the entire model with two coats of white dope, sanding lightly between coats. Tape off all but nose and tail of model; spray tail assembly with a light colour and nose with a darker tone of the same colour. Paint instrument panel black and add white dots. Cut and install windshield and paint window outline. Add rear wing-hold-down.

Install engine and spinner; cut transfer strips for fuselage sides and apply transfer numerals, etc.

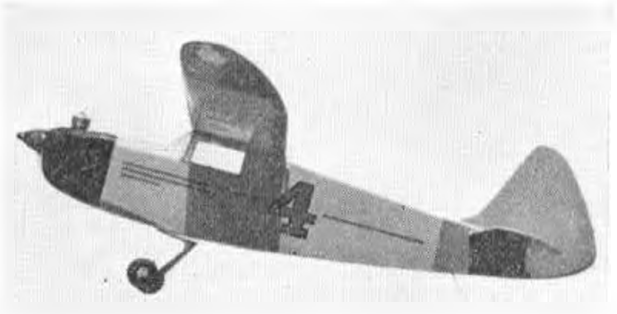
Attach the wing with a couple of two inch rubber bands, add wheels, and solder retaining washers in place, and you're ready for flight testing. Pick a calm day and try a few hand launches over tall grass; Sharp Scooter has a fast, flat glide, and requires a healthier toss than a lightweight rubber job. If the model stalls, add a 1/32 in. strip under the trailing edge of the wing; for dives, block up leading edge. If more than 1/32 in. blocking is required, use a weight added to nose or tail.

When a smooth glide is achieved, fuel the engine for a five to ten second motor run, and hand launch with the engine at half throttle, correcting any stalling or diving tendencies by adjusting engine thrust angle. Gradually increase power (but not motor run) until Sharp Scooter is blasting away under full thrust—then just lean back and watch her go!

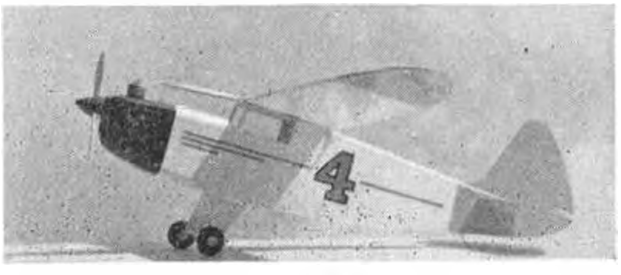


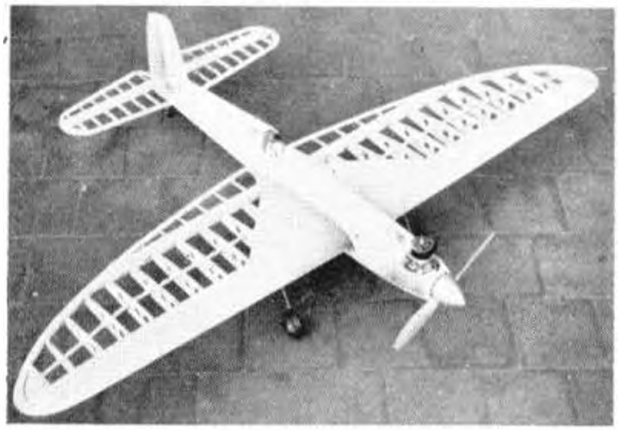
Soaring away on a climb, the Sharp Scooter shows off the smart yet simple lines that are characteristic of a really good model, ideal for the novice

Rear view from a launch of the Scooter fitted with an upright engine. Mounting can be alternatively inverted for those who prefer extra realism in the cowl

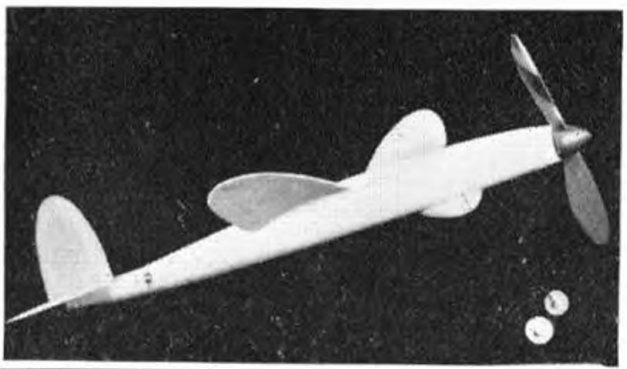


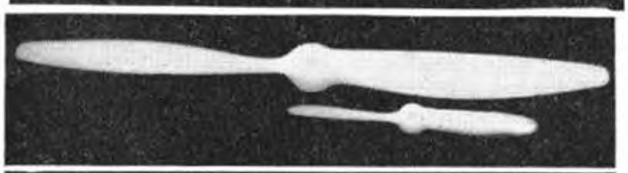
Whichever way one views the Sharp Scooter, it has an appeal. On opposite page is a view of all the shaped parts to be cut out, and a 1/5th scale repro. of the full size plan which is available price 5/- inc. post as PET 804 from AEROMODELLER PLANS SERVICE

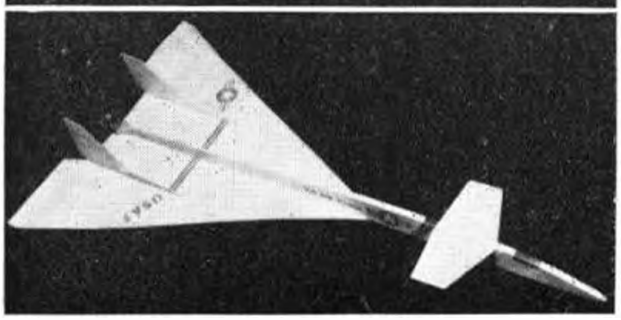




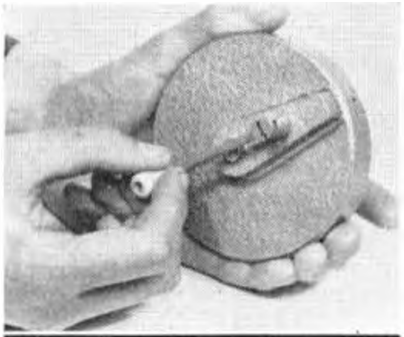
Top: "Pellicano" A/2 R/C by Aviomodelli of Italy, a beautiful model from a well-produced kit. *Next:* Frog "Attacker" 50-in. stunter for 3.5 to 5 c.c. as made by Ray Brown from the kit. *Below:* Jap Sanwa all-plastic 18½-in. rubber job, 12-in. and 5-in. KeilKraft nylon props and Bob Linn's B.70 from the kit. Drawing is Attacker side elevation

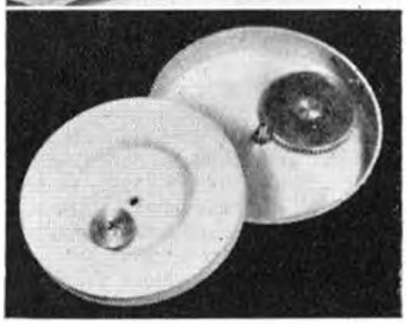






Trade Notes





Ossie Czepa, well-known Austrian A/2 exponent is making this "handy" glider winch which is light-weight and self-contained with internal reel. Should take wire line and is geared 6½ : 1. Has folding handle, costs 32/6 at H. J. Nicholls Ltd.

CATALOGUES ISSUED by Continental manufacturers and model shops never fail to impress us for their lavish illustration and excellent printing. In the last month we have had examples from **Aviomodelli** and **Olympic** in Italy, each of whom produce kits of top quality, and also from **C. Streil & Co.** of Zurich. The latter is a massive 152, 8 x 11¾ in. page volume covering items from all over the world and is normally sold for Fr. 2.50, or about 4/4. We wonder how many British shops could produce such a trade list — and get that much money for it!

On the British market, **Frog** brought out a large broadsheet of all their kits a few weeks back, carrying first illustrations of the *Jackdaw* (which we have under construction from a very well-engineered kit) and the *Attacker* stunter. Ray Brown has made one of the latter (*see pic. and drawing below*) which is an endeavour to cater for those who prefer to fly stunt on 3·5 c.c. Fuselage is based on large profiled blocks, and Veco wheels plus ready-made tank are innovations for this manufacturer. Another modeller's aid is the provision of ready-shaped and soldered wire parts for controls and undercarriage.

Performance Kits, whom we saw demonstrating their wares at the *Model Engineer* Exhibition, have a new pack for the *Lynx* stunt Bipe using gloss silk screened printing which is most attractive. They also tell us that the new Australian GB *Taipan* BB 2·5 engine featured in Motor Mart last month will be retailed by them at £5.19.6.

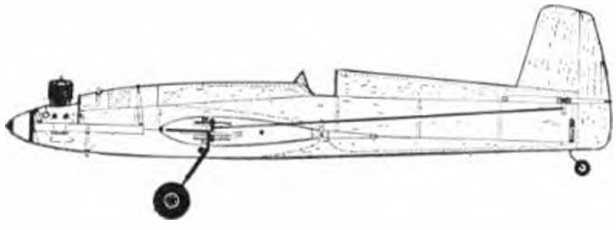
Pli Aerosol spray cans have had a major revision in production and content plus distribution that benefits the modeller. Price is right down to 4/6 per 6-oz. can and the new colours include Bright Orange and Cosmo Blue which are particularly attractive and give excellent cover per application. For those new to spray decoration, Pli have produced a handy instruction leaflet, free on application with S.A.E. to them at 75 Greystones Close, Sheffield 11.

From what we hear, the new **KeilKraft** three-blade plastic prop for the ·049 engines is going to be a "hit" for contest F.F. Early examples have shown marked superiority over two-bladers. K-K have now extended the range of nylon props with some most useful sizes up to 12 x 4 at 7/6, ideal for R/C; 10 in. and 11 in. props with 4 in. and 6 in. pitch are much in demand, too, and these good-sectioned, efficient props will satisfy.

There has been so much confusion over the **Humbrol** *Butyrate* and **Britfix** *Nitrate* dopes that a leaflet has been issued to explain the why's and wherefore's. Get one from your dealer.

Quite the best little (practically) ready-made rubber job of less than 20 in. span we have ever assembled is the all-plastic *Thunderbird* distributed by **Ripmax** at 12/6. Delightfully stable and clean in its pristine white expanded polystyrene, it can be put together as quickly as the PVA glue will dry, and will overjoy any youngster.

Finally, a correction. Messrs. **A. A. Hales** inform us that the correct price for the *Super Tigre* 51 is £10 3 3 and not £9 1 5 as in last month's advertisement.



YELLOW BIRD

A 'How-to-do' feature by A. J. Webber on high performance chuck gliders

DO YOU WANT a contest model you can fly on the village green and not end up in jail? Then Yellow Bird's the answer!

The aim at all stages of development has been to obtain a safe launch in rough weather, have ability to recover from gusts and eddies and maintain sufficient altitude to catch thermals, rather than to rely upon fresh patches of low-level lift.

This might be expected to produce poor calm-air duration; but that is not the case. Flown after sunset on three occasions last summer the larger "Y.B." 20 recorded a tranquil 90 seconds *plus* on each outing.

Careful trimming on damp evenings gave maxima of 65, 58 and 74 seconds.

The long tail moment, 40 per cent. tailplane and big fin keep the "Y.B.'s" on the right climbing track in rough weather. Less fin area is fine for the glide but allows swinging-off to one side on the launch.

The 4.7 per cent. wing section is just right. Thinning it down produces no gain in height and sinking speed goes up sharply. Yet if it is thicker the rate of sink is the same; but on go the brakes early in the climb.

Both "Y.B.'s" will go over the 100 ft. altitude mark and the adjustments used produce (1) something between ½ loop and right-spiral climb under power, tending to nose up if the turn over-tightens and (2) a very flat, safe left glide circle.

Building the "Y.B.'s" to lower all-up weights than those shown does not improve performance. Increasing the weight may give one extra time, but calls for more force in the throw.

Bamboo leading edges are well worth the extra effort, placing tremendous strength where chuck-gliders take all the knocks. If necessary, "borrow" a piece off the neighbour's bean-poles.

The dangle dethermaliser causes a curious descent but landings have been effected safely on roofs, hawthorn trees and other unfriendly objects!

Colour-scheme on the originals was yellow wings, tailplane and black fin with black trim on fuselage. For elegance this takes some beating. Orange, used on two of the later versions, gives remarkable visibility.

Wood Selection: Cut wing, tailplane and fin from quarter grain sticks. This has a shining, mottled look and strong resistance to bending. If you have a choice, pick the lightest. Fuselage for the "Y.B." 20 needs hardest spruce, straight-grained, without natural bends. Softer spruce (usually lighter in colour) for "Y.B." 13, or, if you prefer balsa, use the hardest piece of straight-grained wood you can find.

Components: H.M.G. "Adhesive" was used on the prototypes for all joints involving spruce and all joints are pre-cemented.

Curve the bamboo leading edges over a candle flame and cut for dihedral breaks before cementing in place. Finish—sand the underside of wing and tailplane and add the linen thread edging to all parts. Reduce the wing to the tapered thickness shown and mark the high-point line of the section on the upper surface.

Study the section carefully and then carve and sand to shape, restricting sanding action to work from leading edge to trailing edge and at 45 deg. across the wing. Note the sharp-nosed leading edge. Don't try for a knife-edge sharp trailing-edge.

Cut the wing into four panels (build in throw-tab on 'Y.B." 20 at this Stage) and re-set for dihedral, using nylon or Jap silk stuck on top of centre joint.

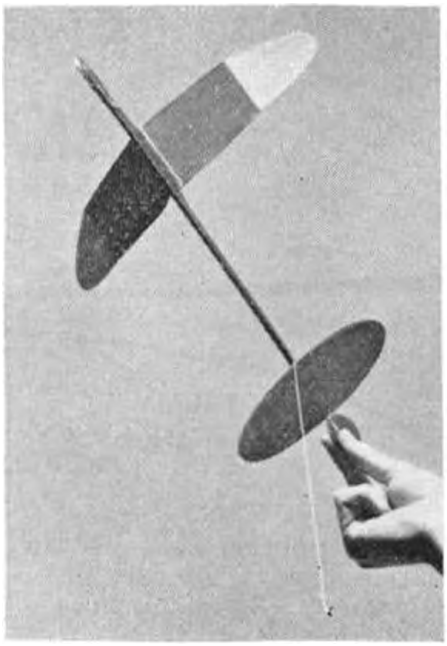
Throw-tab for "Y.B." 13 is now cemented in place, leaving it slightly off-centre to butt against the fuselage side. Steam in the wing warp as shown. Sand the tail-plane and fin to section, but not too thin.

If using a balsa fuselage for "Y.B." 13, do not taper or reduce to a circular section between wing and tailplane, and do not cut grooves for wing rests.

The dethermaliser slot is deeper and longer than the dethermaliser block to allow additional ballast if needed. Note the lip at the aft end, which ensures the block cannot fly out during a launch. The size of the dethermaliser block is adjusted after completion of the model to give correct balance (positions shown are maximum rearward ones needed).

Finish: Use superfine Jap tissue, "Joyplane" Banana Oil No. 2, a 50/50 Banana Oil—Amyl Acetate mixture and clear dope (4 drops Castor Oil added to a 2 oz. tin).

Apply Banana Oil with cotton-wool pad, working along the grain. Rub down lightly with dry "Wet or Dry" paper (400 or finer grade). *(Continued on plan)*



Designer with the larger, 20-inch version above. Plans available through AEROMODELLER Plans Service. At left, the "dangle d/t" shows how the Yellow Bird 13 descends when the fuse releases the brass nose weight, and brings the model down stalled

FULL-SIZE PLANS FOR 13 in. VERSION OVERLEAF

Yellow Bird 13

by Alan J. Webber

done by working with the line of flight.

Tissue cover everything except spruce fuselages, using a minimum amount of dope, smoothing out thoroughly. Leave margins uncovered for wing and tailplane where fuselage joints occur.

Brushing with the grain, put four or five coats of Banana Oil (or clear cellulose lacquer) on wing, three on fuselage and fin and one on the tailplane. After the first coat use the thinned mixture. Rub down between each coat using wet and worn 400 paper with soapy water as a lubricant. Aim to keep the film of finish as thin as possible.

Spruce fuselages need two coats of Banana Oil over all and two extra on the nose. Rub down with finest grade paper.

Finally, polish everything except the tailplane with fresh *Duco Glo* using fast light action. Remember to leave the fuselage pylon area unpolished.

The dethermaliser slot should be well banana-oiled to prevent possibility of damp swelling the wood slightly and jamming the dethermaliser block.

Note that the tailplane has negative incidence relative to the wing. Use undersurface of wing, lower line of fuselage and a ruler to get this right. Sand the fuselage so the tailplane fits at the correct angle without distorting the section. Cement in place with model inverted, measuring tip heights from the building board for tilt.

Steam in port wing warp, avoiding distortion of wing section, and adjust for correct C.G. Check that tailplane is unwarped.

Trimming:—Avoid a "half power" launch. Test at *normal* gliding speed and adjust by trim-tab for left turn of 30-40 ft. diameter circle. Cure a stall by use of extra nose-ballast; flatten out any steep glide by washing out the tailplane evenly. Avoid any tail wash-in.

Launch by gripping fuselage firmly between thumb and crooked second finger; index finger fits in the wing cut-out. If fuselage slips through one's fingers, cement squares of rough "wet or dry" paper on the fuselage.

Use a side arm movement with *no* wrist movement—keep the wrist bent well back.

At point of release, the Yellow Bird should be in a near vertical right bank, into wind and pointing upwards 20 deg. or more from horizontal. Don't look at the model, aim at a point in sky. Practice without releasing, until you are thoroughly used to the "heave" procedure.

Launch flight-pattern is an elongated half loop with the model reaching gliding speed and rolling from inverted position just before the high-point of the half loop. Direction of roll is clockwise, viewed from the rear.

Throwing to the left of the wind and/or using insufficient right bank tightens and speeds up the loop and, if badly overdone may cause spinning to the left.

Going to the right of wind and/or using increased right bank opens out and delays the half loop. This is useful in windy weather and modifies the flight pattern to nearer a right spiral climb. If overdone the worst that can happen will be a shallow, fast turn and a big stall.

If the model runs out of power while still vertical, move the C.G. forward 0.1 in., re-trim the glide by more wash-out on tailplane and try again.

Moving the C.G. back and reducing negative angle of tailplane induces a bigger half loop if the power is available to get the model round. Ability to recover from dive fades out. In high winds, a full power throw is still needed; energy installed in a chuck glider is not governed by air speed on release but by the model velocity relative to the ground.

AERO MODELLER

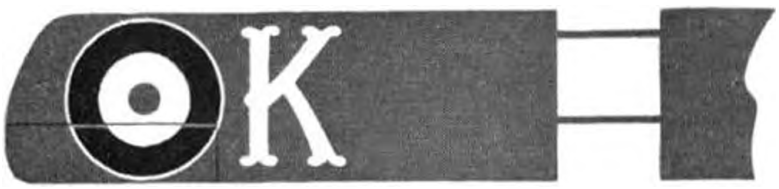
Royal Flying Corps

SQUADRON MARKINGS

PART TWO

Described by
Leslie A. Rogers
with all drawings
to 1/72nd scale

Drawn by
Ken McDonough



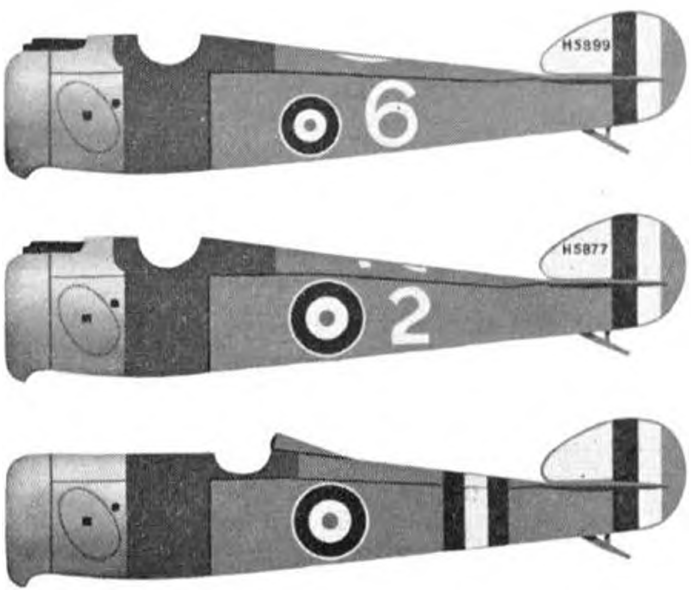
No. 44 Sqdn. (Home Defence) R.A.F. Originally equipped with *Sopwith One and a Half Strutters* and formed mainly for the Night Defence of London. Re-equipped with *Sopwith Camels* in August/September 1917. Some of these *Camels* were armed with twin Vickers in the normal manner while others were modified with two Lewis Guns on a double Foster mounting above the centre section.

No Sqdn. marking as such was used but Flights were distinctly marked. This was due to the general practice of operating as "Detached Flights".

"A" FLIGHT—Large numbers painted in white on the fuselage sides behind the cockade and repeated on the top decking. white serials on black fin.

"B" FLIGHT—Broad white band with a blue band on either side, around fuselage, between cockade and tail. Sopwith 1½ Strutter shown below.

"C" FLIGHT—Broad white band with a red band on either side around fuselage between cockade and tail. When on Hainault Farm in late 1918 the Sqdn. carried the above markings, also, all had white painted fins and wheel discs.



No. 79 Sqdn. R.F.C./R.A.F. on February 22nd, 1918 arrived in France equipped with *Sopwith Dolphins*. Squadron Marking was a white square painted aft of the fuselage cockade, carried from March 1918 until the Armistice. Individual Identification was by white letters painted in most cases aft of the Sqdn. marking and on the top wing.

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

Lt. G. W. Case flew aircraft "F" of "A" Flight, Seria unknown.

Lt. Snyder flew aircraft "K" of "B" Flight, Serial B'7927.

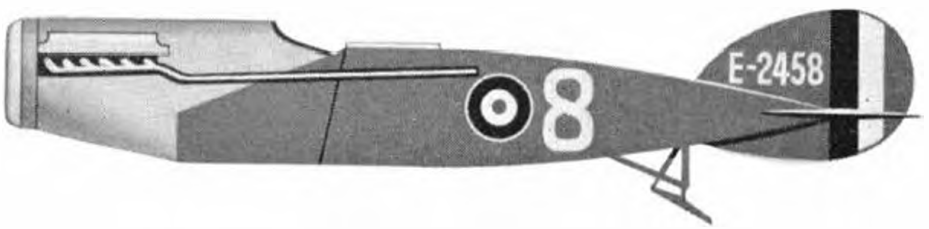
Capt. F. J. Lord D.F.C. flew aircraft "N" of "C" Flight C'3944 and was Flight/Cmdr. (7 E.A.). *See above*

Above: H. H. Russell picture of 79 Sqdn. Sopwith Dolphin
Below: I.W.M. picture Q67903 of 44 Sqdn. at Hainault

88 Squadron R.F.C. Bristol F2b

Top: "B" Flight (Blue)
Centre "C" Flight (Red)
Bottom "A" Flight (White)

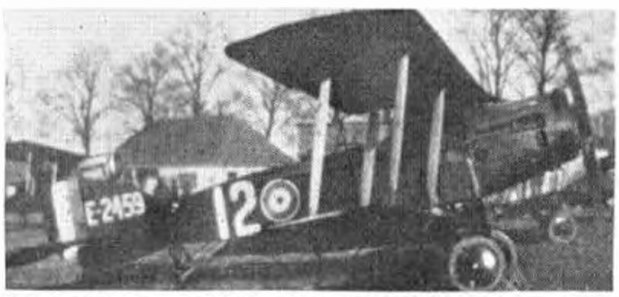
Colours are for cowls and wheel discs. All identity Nos. and serials in white.



No. 88 Sqdn. R.A.F. Equipped for the whole of its service on the Western Front with the *Bristol Fighter*, this Sqdn. carried no Sqdn. marking.
Flight Markings were:—
"A" Flight Wheel discs and Radiator Cowls painted White.
"B" Flight Wheel discs and Radiator Cowls painted Blue.
"C" Flight Wheel discs and Radiator Cowls painted Red.

Individual Identification was by large numbers painted in white on fuselage sides aft of the Cockade.
"A" Flight used numbers 1 to 8
"B" Flight used numbers 9 to 16
"C" Flight used numbers 17 to 24
} When up to complement of 24 aircraft.

About September 1918 the Flight/Comdr. of "A" Flight was an Australian—his aircraft is reported as having the Rising Sun painted in front of the fuselage Cockade. Aircraft No. 22 Serial No. E'2220 was flown by Lt. Foley.



88 Sqdn. F.2b above, & I.W.M. picture Q.3912 cf R.E. 8 below

No. 52 Sqdn. R.F.C. Originally equipped with *B.E.2e's* the Sqdn. changed to *R.E.8* in May 1917 and retained the type until the Armistice.

Using *R.E.8's*, the Sqdn. marking (carried from May 1917 to March 1918) was a white zig-zag painted on the fuselage sides and repeated on the top decking. This marking was of unusually large proportions extending from the leading edge of the fin to just below the rear cockpit.

Individual Identification was by large white numbers 1 to 24 painted on the fuselage sides forward of the cockade.

52 Squadron R.F.C. R.E.8.

above and at left

Over the Waves

MONTHLY REVIEW OF RADIO CONTROL NEWS

IT IS PROBABLE that the American Nationals does more each year than any other event, to set the fashion in Radio Control. The first news we have of the 1961 Multi Channel event shows that for the second time in succession, Doug Spreng was the victor with his flat top "*Stormer*" design, scoring 213½ points. Particularly interesting was the fact that he was using a new set of radio gear, Deans, a name already famous for the reed banks and relays produced by that company. Doug's engine was again the Lee 45.

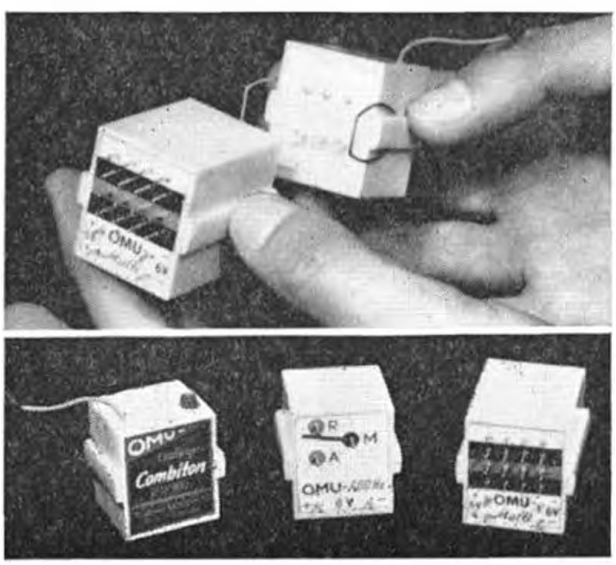
In second place was Don Brown flying an own design shoulder wing K & B 45 powered machine using Dr. Walter Good's Two Tone Pulse Width system (T.T.P.W.) with Coupled Ailerons and Rudder (C.A.R.). This is a pulse proportional simultaneous rudder and elevator system (joystick control instead of lever switches as in reed system sets) and in this particular case Ailerons were interconnected with the rudder (C.A.R.). Although this type of radio set has existed for some years now, this is the highest national placing of which we have heard by anyone using the system. Brown scored 209½ points (wonder where the ½ point creeps in!)

Readers will remember *Nimbus* by Tom Brett, a drawing of which was featured in these columns last month. Tom Brett placed 3rd. with this design, scoring 209 points (close thing Eh!). It was not a week for the well-knowns it seems. Current World R/C Champion Ed. Kasmirski had ni-cadmium battery troubles and crashed. Famed Bob Dunham did not in fact compete this year, but demonstrated his latest machine, the swept low wing *Sorcerer*, from a parking area at the motel, Hal. de Bolt placed 9th using the highly complex Space Control fully proportional (on all flying surfaces) radio outfit. Incidentally the last three mentioned flyers comprised the American team at the First World Radio Control Championships held last year in Switzerland, and first three come to Europe in '62.

Pete Russell, noted control line stunt flier, and designer of the A.P.S. 334G decided to make the most of his E.D. 4 channel set. This set utilises the standard E.D. *Octave*, 8 channel reed unit. Requiring extra channels Pete added these by hooking up transistor boosted servos to the reed unit. After some consideration however we decided that it might be even more economical to first add two extra relays to the 4 channel receiver since it is identical to the six channel set minus two relays. The remaining two reeds could then be hooked up to a transistorised servo. Which ever way one goes about it however, one will require a transmitter to suit the revamped receiver and this will entail either modifying the transmitter to operate the extra channels or the purchase of a new transmitter to suit, or the exchange of one's present unit for same. We feel that this idea does offer at least some solution to the very vexed question of multi-on-a-budget.

Uproar fans will be pleased to hear that the A.P.S. plan for this fine R/C aerobatic model by well-known flier Chris Olsen has once more been revised to the extent of being an entirely new plan which will replace the earlier *Uproar* design. Structure of the machine has been revised particularly in the wing where a much stiffer trailing edge is now fitted. Aerodynamically the design has undergone some revision as designer Chris's experience dictated. The nose is slightly lengthened and the fin area increased. The wing section is now the thinner NACA 0015 and, perhaps the most noticeable change of all, a nose wheel type undercarriage is now featured although the normal type may still be used if desired and is advised for grass fields. It is now four years since the original *Uproar* appeared and the design has been thoroughly contest and world championship proven. The *Uproar* we would say, has played no inconsiderable part in establishing multi channel R/C in this country and has contributed much to the present state of the art here, so many newcomers undergoing their baptism of fire with this machine. The revised plan was published in the September edition of *Radio Control Models and Electronics* together with a discourse by Chris Olsen on the comparative virtues of shoulder and low wing type models for R/C (Chris has flown both). Anyone who does not take R.C.M. & E. regularly but wishes to obtain a copy of this issue may do so from our offices. The revised plan is available from A.P.S. as plan No. R/C/710 price 8s. 6d. plus 6d. post.

We have received our test kit of the *Frog Jackdaw*, a fuselage elevation of which appears on page opposite. The Jackdaw is a 60 ins. wing span high wing design and is intended for either Single or multi channel radio gear from 1 to 8 channels, instructions for the installation of which appear on the well detailed plan. The wood in the kit is good (no soft stringers in ours), the extensive



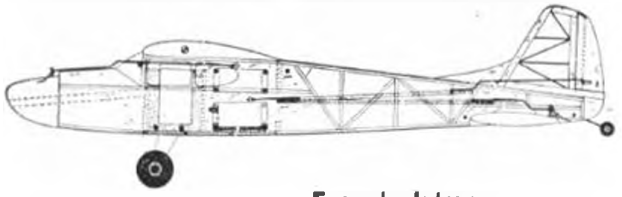
Twin engined R/C scale in Japan with Cessna 310 and Douglas Invader, seen in our heading picture. At left are the new OMU receiver units for single or multi- see text. Moulded in neat yellow plastic, these "cubes" are evidence of very advanced thinking.

die-cutting, including 1/16 in. ply is first class. Kit contains hardwood, including horns and nylon bellcranks, pre-formed dural u/c and Veco Airtrap wheels. The *Jackdaw* has already been making its mark in Rudder Only contests, winning the first five such comps. entered in the hands of Stuart Uwins, using three channel gear. Apart from its obvious appeal as a Single channel R/C model we cannot help feeling that the *Jackdaw* will be of particular use to those people looking for a first multi job in which to install their six channel outfit and not wishing to build too large a model to accommodate. Anyway we like it and anticipate a great deal of enjoyment with it.

Our Dutch friend "Windy Keulen" sent us first news of some new German OMU receivers. There is one basic receiver which can be used for a variety of combinations. This basic unit is all transistor 6 volt working and is the detector and amplifier. For single channel a final stage relay switcher is then clipped onto the basic unit and this combination measures 1 5/16 in. x 1⅛ in. x 2⅛ in., weighs only 2 ozs. and price in Germany is DM.118. However things do not end here for by removing the single channel switching stage, substituting the OMU driver-reed unit, a relayless eight channel receiver is achieved. The extra eight channel converter, costs DM.72.30 and the complete eight channel receiver measures 2½ in. x 1 5/16 in. x 1⅛ in. weighing 3 ozs. It is intended that a transistorised servo will be available for the set with a specially built electromotor with 4 brushes and 2 windings, which will require only two transistors per servo. All this leads us to wonder if that really small small multi channel model is any nearer to becoming a possibility. Certainly with this new set, a 48 inch. span eight channel job seems a more feasible proposition (it has in fact been done before).

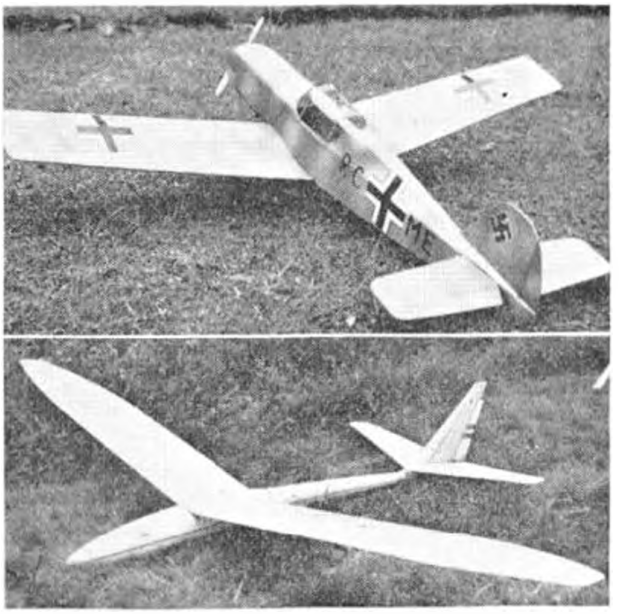
Mini Reptone Mods.

The Mini-Reptone receiver circuit has now, we understand, been amended to reduce the susceptibility of the receiver to outside interference from electrical noise. In our case even switching on the electric light was enough to make the receiver jump. We have however found that our receiver is not too happy with three Pen Cells for power and after much deliberation decided to substitute four DEAC 225 rechargeable cells of 4.8 volts total. For those who are also contemplating such a revision, here are the details of our conversion. Dismantle the receiver and battery cases. Drill 6 B.A. and countersink the battery case at dead centre point (tight fit) and fit a 6 B.A. CSK bolt and cover its head with insulating material. Reassemble the two cases and remove the end pencell end contact plate, soldering flex to positive and negative pick-ups, the loose ends of which are wired to contact plates, in our case end contact clippings from an old B.122 battery. These must be mounted on a rigid paxolin (or similar) pressure plate for contact. The Body of the bolt must be insulated up to the point where it clamps the pressure plate down onto the DEACs. The DEACs are held in position by packing out the empty spaces around them with scrap balsa. This modification has considerably enhanced performance of our set and is one which we strongly recommend. A comprehensive test on the Mini-Reptone appeared in the September edition of *Radio Control Models and Electronics*.



Frog Jackdaw

At the U.S. Nats. Claude McCullough produced this magnificent scale Fairey Barracuda V. Weighing 11 lbs. for its 70-in. span, gives a loading of 34 oz./sq. ft. Flies well with McCoy 60, Bramco Apollo 10-channel Rx on 52 Mcs. Flaps works and torpedo drops! Below from Scotland, is D. Burt's semi-scale Messerschmitt 109 for single-channel, which shows what one can do with some design ingenuity.



Above, an Austrian eight-foot wingspan radio controlled glider with latest full-size design features of swept fin and cabin for supine pilot. Below: Our modifications for the R.E.P. Mini Reptone, using DEAC 225 cells to replace pencell dry batteries, which have limited life and marginal power. Balsa blocks pack out the gaps and pressure pad is of rigid Paxolin.

CONTEST GLIDERS

PART SEVEN by Jim Baguley

Explanation of glide stability with data to find ideal tail area and tail moment arm.

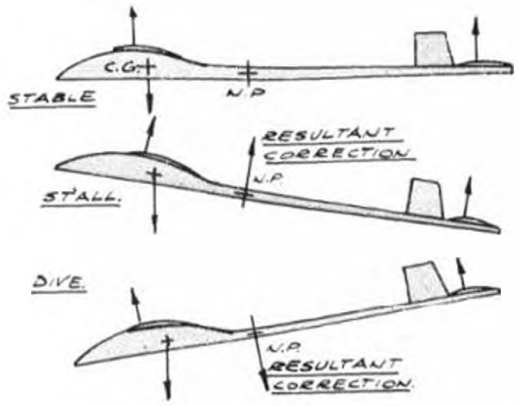


DIAGRAM 81.

WHEN A MODEL is gliding stably with no change of speed or direction it must be in equilibrium and all the forces acting on it must cancel. As the weight acts at the C.G. the total resultant vertical downward force must also act at the C.G. and consequently this must be balanced by a resultant component representative of the total lift and drag of the model acting vertically at the C.G. The neutral point theory states that any correcting force when the model is disturbed will act at the neutral point. See *Diagram* 81.

Hence if the model is reared up into a stall the theory states that the correcting force will be upward, and if the model is diving, it will be downward. Actually the correcting moment will be the resultant of all moments about the C.G.

These will be the moments of drag of the wing, lift of the wing, and lift of the tailplane all increased,

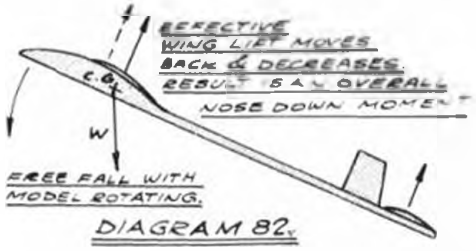


DIAGRAM 82.

or decreased from normal depending on the situation. Hence the force may be said to exist at any distance providing the product of the two equals the correcting moment. The neutral point is, therefore, a point used in an empirical formula. For a particular wing area, wing airfoil and tailplane airfoil combination, fuselage inertia etc. there are particular minimum acceptable combinations of tailplane area and moment arm for minimum stability. It is only with gliders that this minimum is approached to improve efficiency as powered models need a larger tailplane by comparison.

An attempt to determine this "optimum minimum" has been made in the "tailplane volume coefficient" which the writer regards with suspicion. Many people consider that if the tailplane area is increased from this value the model will be overstable. This is not necessarily

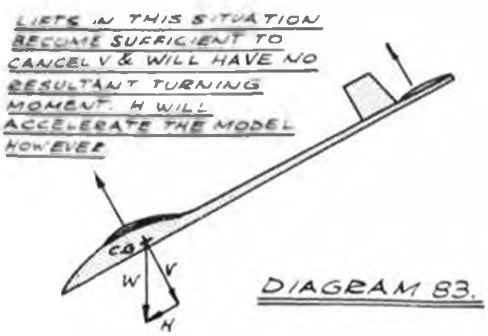


DIAGRAM 83.

so. If it were, how would power models whose glides are usually stable fare with their comparable moment arms and 40 per cent. tailplanes?

For those who feel they must have a guide to this aspect of design, an empirical formula will be derived of a similar nature to the "tailplane volume coefficient". But first, we should have a practical explanation.

A stall can be caused in several ways. The most usual way (if the model is trimmed) is by stalling the model off the line although it can be caused by circling in wind or gusts. Consider what happens when a model stalls:—

Initially the model will have achieved a nose up attitude where either just the wing or both the wing and tailplane are stalled. Consequently the forward speed will have become virtually zero. See *Diagram* 82.

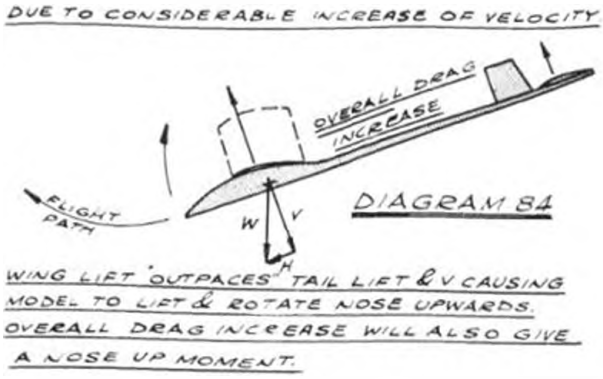
The model will start to free fall and rotate.

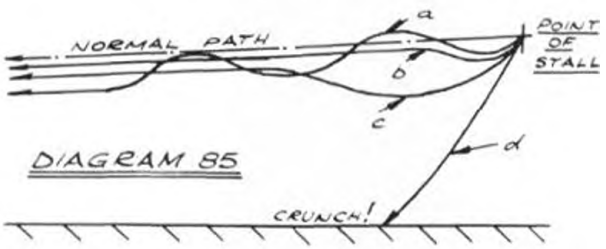
The overall longitudinal moment will be nose down. This is obviously so if the tailplane is not stalled. If the tailplane is also stalled, the wing and tailplane will be acting in a manner similar to plane surfaces inclined perpendicularly to the airflow in that their effective centre of pressure will approach 50 per cent. of their chords. This means that the effective centre of pressure will be further back than in normal stable flight thus producing a nose down moment. The model will then continue to rotate in a nose down direction until a certain situation is reached. See *Diagram* 83.

At this point the wing will just have reached an unstalled state, in all probability slightly after the tailplane has done so. The real difference between this situation and that of normal flight at the same forward speed is that the weight of the model, by acting vertically downwards from the C.G. will not now balance out with the resultant lift of the model. The model will then rapidly accelerate and the wing lift will increase out of proportion to the tailplane lift. A further effect will be that the drag will have increased and as the effective centre of drag is inevitably above the C.G. (especially due to wing dihedral or a pylon) this will also provide a nose up moment. Also, the nose up moments of lift and drag will cause the model to rotate nose upwards, this also tending to decrease the wing lift by the addition of a further velocity vector. This situation is shown in *Diagram* 84 and the path taken by the model will be one in *Diagram* 85.

Almost inevitably the correction will be too great and the model will use its excess forward speed and increase of lifts caused by the centripetal force as the model achieves and passes the horizontal to rear up into another stall. This will continue with the stall amplitude gradually decreasing (an analogy here is a rubber ball bouncing) until a stall can no longer be achieved and the model settles into a glide.

Diagram 85 shows the possible paths taken in recovering. Path (*a*) is the result if correction is too large and will take time to settle as shown; also it may prove detrimental to the airspeed variation stability. Curve (*b*) is the result if correction is just right although in practise it is difficult to realise as neatly as shown. Curve (*c*) is a possible result if correction is insufficient. Curve (*d*) is the result if correction is virtually non existent



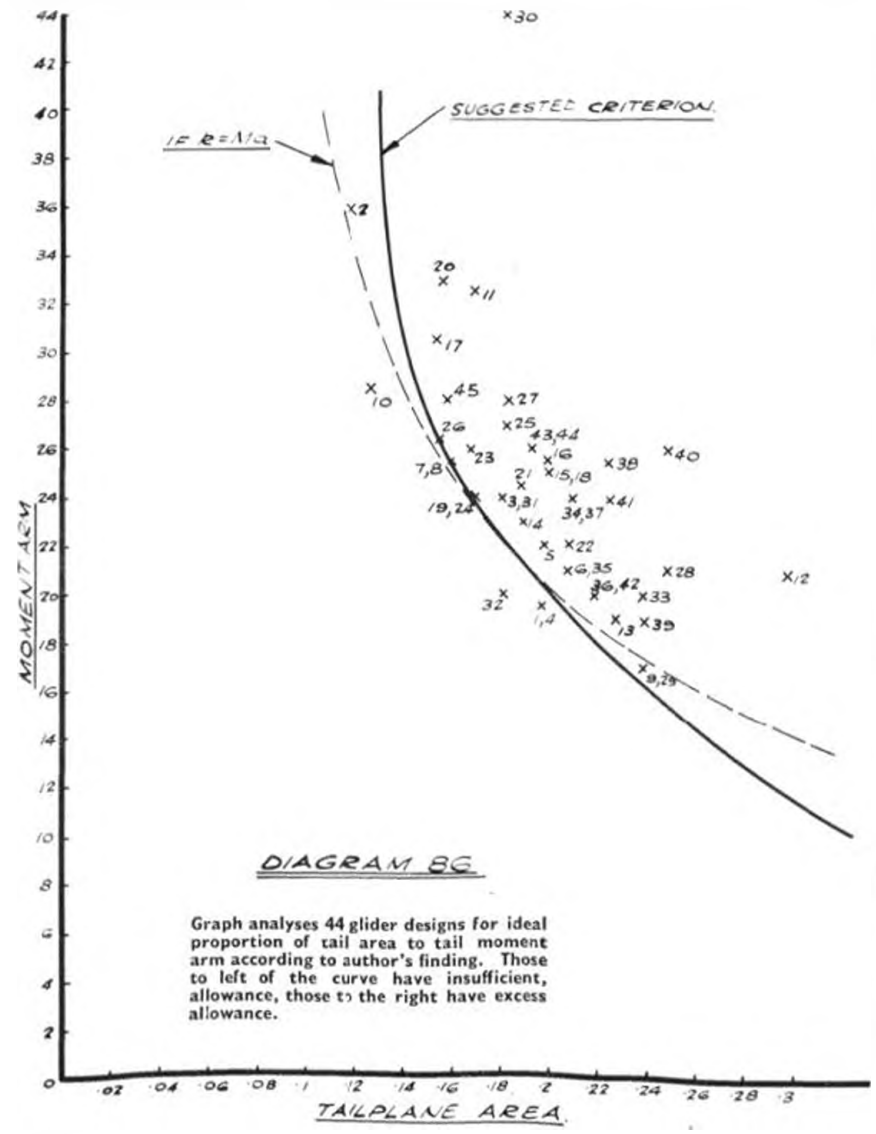


such as frequently occurs with power models when the downwash is removed from the tailplane during recovery and the tailplane just manages to take over due to an increase of lift out of proportion with a long moment arm and large tailplane. This latter effect can readily be achieved with most power models while maintaining a normal glide until disturbed. It is achieved by putting the C.G. too far back when the stall recovery is reasonable until an angle of no return is reached! Condition (*a*) I call overstable. (*c*) and (*d*) I call understable.

Further to these stall effects the changes of airspeed due to circling in wind must upset the model as little as possible. For this to be so, if the airspeed increases, the moments of wing and tailplane lifts and increased drag must nearly balance out or there will be a resultant unstabilising nose-up moment. The rate of speed increase and actual speed increase will be relatively small so this can be achieved in practice.

It can be seen that over-correction of a stall and this requirement are conflicting. When proportions are correct the criterion is the use of matched wing and tailplane airfoils. Here, inertia can help to prevent any rocking tendency if balance is not achieved. Also if the model has low lift, low drag sections and flies fast, the effect will tend to be less i.e. low thickness and camber.

If a model's stall stability is marginal, its airfoil matching is poor, and it has a certain inertia, it will be rocked on coming into wind and out of wind at the same rate as its natural recovery and will eventually build up into a massive stall. Such a model will be said to have a



Graph analyses 44 glider designs for ideal proportion of tail area to tail moment arm according to author's finding. Those to left of the curve have insufficient, allowance, those to the right have excess allowance.

1	BERNFEST
2	TOOTHPICK
3	BG 44
4	AURIKEL
5	SKYMASTER
6	HALSEN
7	SPINNE 1964
8	SPINNE 1955
9	BREMS
10	PETREL
11	CONTINENTAL
12	SATU
13	QUICKIE
14	BYRD
15	BOBCAT
16	ALTAIR
17	LUCIFER
18	TOPSCORE
19	MP/2
20	AQUILA
21	DUHA
22	CEMIS 55
23	ICARUS
24	SOKOLOV
25	LEENA
26	SUNRAY
27	NEBULA
28	SHORTY
29	THUNDERBIRD
30	DESIGN 1
31	DESIGN 2
32	DESIGN 3
33	DESIGN 4
34	DESIGN 5
35	WANDERER
36	MEANDERER
37	MITZI
38	DESIGN 9
39	DESIGN 10
40	DESIGN 11
41	DESIGN 12
42	MAX MAKER
43	DESIGN 14
44	DESIGN 15
45	DESIGN 16

Contest Gliders

critical air speed. If moving the C.G. does not rectify this fault, then the stall correction may be decreased and the airspeed variation compensation of the tailplane increased by increasing the tailplane lift versus speed value over the incidence range. This may be done simply by increasing tailplane camber. Moving the C.G. back or forward will have little effect on the airspeed variation compensation but will profoundly affect the stall recovery. Putting the C.G. back will cause under-correction of the stall and putting the C.G. forward will cause over-correction of the stall.

To ensure that both these requirements (airspeed variation compensation and stall recovery) are satisfied is a formidable task in initial design.

The writer would suggest that calculation from first principles is impossible and that computer simulation is too expensive. What hope have we as humble aero-modellers? We can play with formulae like the tailplane volume coefficient in order to obtain the correct proportions to choose the correct airfoils. Previously a thinner version of the wing section has often been used but this is not necessarily correct. Observation will then tell us what is wrong in flight and enable us to correct it.

Let us now endeavour to create an empirical formula to replace the Static Margin and Tailplane Volume Coefficient theories assuming correct airfoil matching to follow. The 45 models described previously will be used.

Firstly, why don't I believe in the tailplane volume coefficient?

The tail volume coefficient $= \frac{TA}{WA} \times \frac{MA}{CHORD}$

for example $\frac{1}{5} \times \frac{4}{1}$

Where TA = Tailplane area
WA = Wing area
MA = Moment arm from C.G. to centre of pressure of tailplane
CHORD = Wing Chord.

It can be seen to be proportional to the product, tail area times moment arm, for a given wing. Due mainly to inevitable lower efficiency of the smaller tailplane this will not be true. In practice the moment arm must be made larger for a smaller tailplane than the tail volume coefficient would indicate. Although for the tail volume coefficient the centre of pressure travel effect is assumed to be proportional to the chord, the writer feels that if the VL factor and relative velocities are considered, the degree of control necessary varies more with wing area. This particularly justified with our small (comparatively) range of aspect ratio of 9 to 15.

Also take the moment arm as a direct measurement between the wing and tailplane for convenience.

Let W = Wing Area
T = Tailplane Area
M = Moment Arm
K = Coefficient

Let $A = \frac{T}{W}$

For models larger than an A/2 we calculate for a given aspect ratio and scale linearly all dimensions in the original ratio.

Now K = MA + correction factors.

Referring to *Diagram* 86 we can see an actual plot of M versus A for the 44 designs. Also we can see an arbitrary graph of K = MA.

It can be seen that a chosen minimum moment arm for tail area selection line taken of these various designs differs from K = MA as expected due to tailplane efficiency.

Let K = MA—xA—yM where x and y are constants to modify K = MA to the practical result.

TAILPLANE sq.ft	TAILPLANE	MOMENT ARM IN
50	.105	6.86
55	.117	4.96
60	.129	3.9
65	.141	3.25
70	.157	2.7
75	.17	2.4
80	.184	2.16
85	.197	1.98
90	.212	1.82
95	.226	1.71
100	.24	1.6
105	.25	1.54
110	.264	1.43

DIAGRAM 87

From the graph, calculation finds:—
x = 5.5. y = .078 and K = 1.273
∴ 1.273 = MA — 5.5.A — .078M.

Note that Toothpick, Babic's and Bernfest's models were made stable by a very forward C.G. which as stated is not the best arrangement while Design 3's stability left much to be desired anyway! Also note that the graph shows no distinction for aspect ratio. This would seem to verify assumptions made.

From $M = \frac{1.273 + 5.5.A}{A - .078}$ derived

from the formula we are now in a position to compile table *Diagram* 87 which will be seen to produce a reasonable result. Here we are attempting to achieve the ideal!

If we go below the figures shown we will have to put the C.G. forward to maintain stability with consequent detrimental effects on stall recovery and airspeed variation.

For each combination the correct C.G. position will not vary much and will be about 50 to 55 per cent. of the wing chord.

If we go above the figures shown we can then use a less extreme tailplane section e.g. on a power model.

Having obtained the proportions, we now have to choose the correct airfoils. This cannot be done with certainty. However, if we adhere to the proportions arrived at we will almost certainly finish up with a tailplane airfoil something like the wing airfoil.

As stated above exceeding the proportions will lead possibly to less extreme tailplane sections e.g. flat undersurfaced. It can be seen from *Diagram* 87 that our practical limit comes with a 65 sq. in. tailplane and 32.5 inch moment arm as above this we will have inertia problems which leads us back to structural design. A good compromise as stated in Part 2 is a 75 sq. inch. tailplane with say a 24 in. to 30 in. moment arm and a slightly less extreme tailplane section than wing section. In view of the discussion with J. Van Hattum it is interesting to note that *Diagram* 86 shows Bob Amor's design to be of reasonable proportions especially when considering the flat undersurfaced tailplane airfoil The method makes no pretence of being a scientific derivation but will serve its purpose well. Referring back to *Diagram* 85. The best C.G. position can finally be determined by deliberately stalling the model off and observing the manner of its recovery assuming it is trimmed for a glide if undisturbed. If (*a*) is the result then the C.G. should go back. If (*c*) or (*d*) are the result the C.G. should go forward. If (*b*) cannot be achieved and the proportions have been adhered to then a tailplane section re-design is called for. If stall recovery is good and the model is upset in wind the mean camber of the tailplane section should be increased if effect (*a*) persists. If effect (*c*) and (*d*) persist the tailplane section mean camber should be decreased.

Armchair Aeronautics

Bumper package

THE OBSERVER'S WORLD AIRCRAFT DIRECTORY by William Green. Frederick Warne, London. 354 *pages* 5¼ x 7¼ *ins.* 800 *illustrations.* 15/-. $3.50.

A complete and most compact guide to the entire world of aviation, this follows on from the popular annual "Observer's Book of Aircraft" series, but with far wider scope, covering everything from airlines to missiles. As a reference it will be highly valued and for the collector it will be a "must" since it includes many rare photographs from the lesser known air forces.

World War One

SKY FIGHTERS OF WORLD WAR I by W. Stevenson Bacon, Fawcett Book 484, *Greenwich, Conn, U.S.A.* 144 *pages* 6¼ x 9¼ *ins. Illustrated.* 75 *cents.*

The oft-repeated stories of ten renowned air fighters of World War I, collected in one economic paperback with liberal illustration and many well-chosen and rarely seen photos. Each ace is described by either William E. Barrett, William W. Walker, Richard Hanser or Arch Whitehouse in breezy style and a Jo Kotula cover adds colour to a book that the W.W. I fans will treasure as good value for the U.S. price.

Boys' introduction

THE BOYS' BOOK OF WORLD AIRLINES by K. Wolstenholme, Burke Books, London, 144 *pages* 7¼ x 9¼ *ins. Illustrated.* 10/6.

A book for the younger ones, introducing them to aviation in general with ample illustration of the modern airliner and description of airline procedure. The lad who is inclined towards an interest in air affairs will appreciate the details of flight planning, meteorology, navigation methods and the summary of airliners. Something to remember when selecting that Christmas present.

For historians

AVIATION MAGAZINE — SPECIAL POTEZ ISSUE distributed by Flying Review, 98 *pages* 9¼ x 12¼ *ins. Illustrated.* 3/6.

The fascinating life story of the French pioneer aviator Henry Potez, from 1911 up to present day, with a full analysis of his company's latest product, the type 840. Many unusual prototypes, the racers, the unusual tandem engined Potez 41, the flying boats, the lightplanes and the military types are all illustrated and described in a history that must represent countless hours of research. Limited print of the international edition in English will be a collector's item in future.

Revision

AIRCRAFT CAMOUFLAGE AND MARKINGS by Bruce Robertson, Harleyford Publications, 213 *pages* 8¼ x 11 *ins. Illustrated.* 50/-.

We last reviewed this book in 1957, when it was predicted that it was a volume which all modellers would enjoy. Now we have the 4th edition. Revised and enlarged by 20 extra pages to take in black and white reproductions of R.A.F. and Commonwealth Squadron badges, as well as having the 24 colour sample chart bound in. Stouter board and real cloth binding makes a more robust volume and allows for the constant handling it can expect from the enthusiast. Some pictures are changed and corrections made over the original edition and an immediate distinction is that the multi-nation P.40 Warhawk cover is now in full colour, also repeated inside.

Latest

FOKKER — THE MAN AND THE AIRCRAFT by Henri Hegener, Harleyford Publications, 224 *pages* 8¼ x 11 *ins. Illustrated.* 45/-.

Written by one who first met Fokker in 1919 and who can claim to have known him well throughout his lifetime, this book first covers the personal life story of the great Dutch aviation pioneer, goes on to a series of 48 line and tone three-views of Fokker aircraft and concludes with a type by type summary. Obviously it represents a tremendous amount of effort by the author, the draughtsmen and the production team at Harleyford. They have managed to summarise in most impressive manner, all the fascinating details of this complex character and his associates and have sieved through controversy to present the story in authoritative style. This has been done by seeking out those who knew most about the man — a task that involved interviews in the U.S.A., Germany and Holland.

Tone drawings follow the style of those in the earlier "Spitfire" book by the same publisher, and have obviously been arranged to show unique as well as involved decor for each aircraft. We regret the lack of colour detail, which would have been invaluable to the modeller, particularly as all drawings are to constant 1/72nd scale. (*See picture of example.*)

Duiker to P.1127

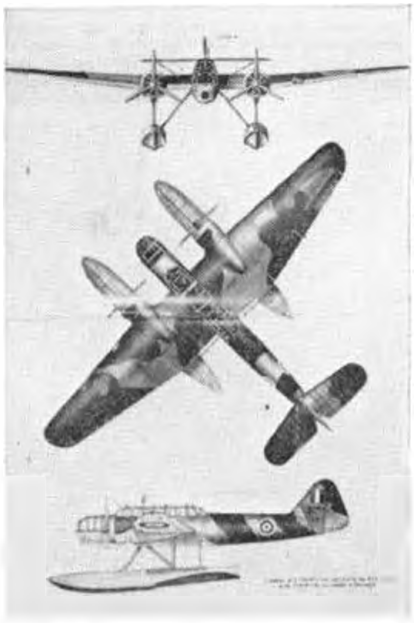
HAWKER AIRCRAFT SINCE 1920 *by Francis K. Mason, Putman, London.* 480 *pages* 8¼ *x* 5¼ *ins. illustrated.* 63/-.

Another "mammoth" effort, this time in Putman style, and one to be followed by others on one-make only. History of the company, prototypes, projects and incidents are depicted in drawing, photo and description to a degree before unknown on the Kingston products. The Typhoon tail failure, the Junkers engined Horsley, the P.1091 delta Hunter project are but three of many fascinators. No enthusiastic aerophile can afford to be without so informative a work, produced by one who has had most fortunate access to all records and archives.

Biggest and best ever

1959/61 *MODEL AERONAUTIC YEAR BOOK by Frank Zaic, Model Aeronautic Pubs. NY.* 288 *pages* 5¼ *x* 8¼ *ins. illustrated.* 15/-.

For any aeromodeller worthy of the name and capable of creating an original design, this mighty collection of no less than 340 contributions in the form of model plans, charts, tables, practical articles and including a most apt spread of advice for the fatigued by a Doctor, is absolutely essential. Frankly Frankie we don't know how you do it! You've even included control line! If one wants 3-views of the World's leading designs, including all top placing F.A.I. models, multi R/C or experimentals from canards to deltas, drawn so you can scale up or study for inspiration, then Zaic's MAY-B is the byword carrying our fullest recommendation.



Top: Hawker Aircraft Zaics Yearbook back up W. Green's new directory. At left are two others we review plus a Polish book of interest which deals with model engines and is one of a technical series. At right, sample tone drawing from the Fokker book by Harleyford

DORNIER Do 28

AIRCAFT DESCRIBED, 111
Drawn by E. Tage Larson

Prototype demonstrator at top and production version in smaller photographs of the Do28 which is a remarkable aircraft, possibly the ideal for a twin-engined free flight model project. Burly and tough in appearance, the cockpit gear is most reminiscent of the Do17 seen in less favourable circumstances

THE TWIN ENGINED version of the Dornier Do 27, with added safety measures and instrumentation for instrument flying is rapidly becoming recognised by aircraft operators as an ideal type for Short Take Off and Landing (STOL) needs. Equipped with full span flaps and ailerons, the Dornier 28 has a fixed leading edge wing slat and is most adaptable for slow flying. It is in fact as versatile as the single engine version, with the advantage of greater power and weight carrying capability. Cruising speed of 160 m.p.h. with a maximum of 174 contrasts with the landing speed of 45 m.p.h.

There is seating for up to 8 persons, two in the pilot compartment and 6 aft of the main structural member beneath the mainspar. Passengers are seated facing each other, fore and aft.

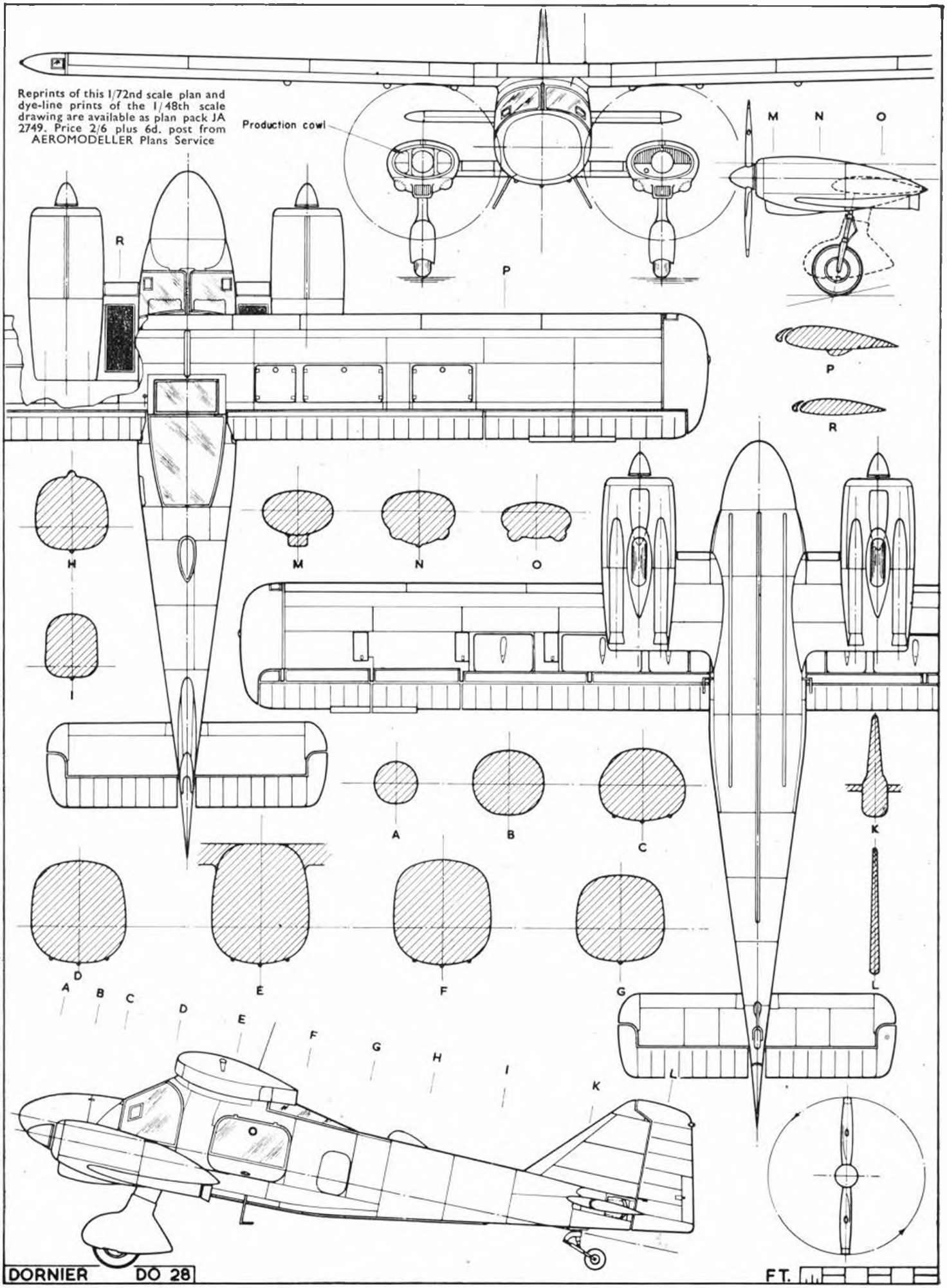
The 28 was originally a modification of the 27 with stub wings to carry the 180 h.p. Lycoming engines. Thus the aircraft is virtually a sesquiplane. In the production version, larger and more powerful 250 h.p. engines are fitted and the wingspan increased by six feet. This not only gives added area but the extra volume was needed to accommodate wing tanks which actually form part of the wing surface. Examination of the demonstrating aircraft over here last May (D-IATA) left one with an impression of the way in which these tanks are so usefully employed for the wing undersurface.

Cutaways in the monocoque fuselage for access to the compartments are enormous, and the range of vision for the occupants quite unmatched by any other comparable type. In fact, most passengers in demonstrations have seen more of the surrounding countryside through the roof windows than out of the side, for the agility of the Do 28 is such that it tempts all who try it to exercise the dual controls to the full.

One characteristic is that power can be taken off, the stick held right back, and the Do 28 descends in steady rate of sink with flaps down and fully stable. It can also be flown at alarming angles, stall warning horn issuing protests, down to less than 30 m.p.h.

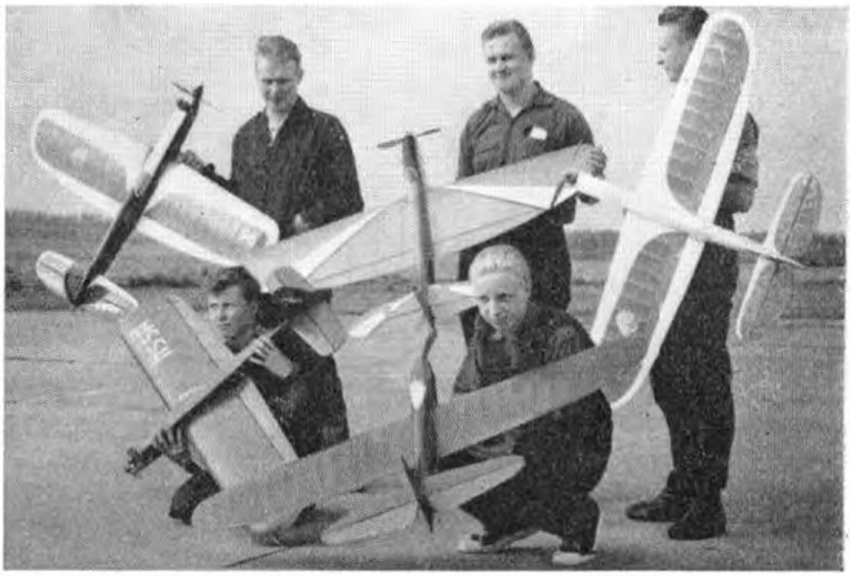
As a project for flying scale, the close coupled engines and their low set mounting offer greater opportunities than any other aircraft we know. For Control Line stunt, similar possibilities are envisaged though there would be a natural reluctance to outside loops—perhaps in keeping with the full size design! *Span* 45 ft. 3 ins. *Length* 30 ft. 2 ins. *Height* 9 ft. 2 ins.

Reprints of this 1/72nd scale plan and dye-line prints of the 1/48th scale drawing are available as plan pack JA 2749. Price 2/6 plus 6d. post from AERODMODELLER Plans Service



DORNIER DO 28

F.T.



Enormous fin on B. Patocka's R/C glider from Prague, CZECHOSLOVAKIA, also short tail moment. At right are C/L stunt Champs from FINLAND. Standing, Olof Sundell (Merco 35), Pekka Ruokolahti (Johnson 35) the Champion, and Guy Sundell (Merco 35). Kneeling are Juhani Kari (Veco 35) and Rolf Ekholm (Fox 35)

World News

Clubs in **East Java** had a get-together on July 30th, with each club permitted two A/1 and A/2 gliders plus one power model. Unfortunately they too have strong wind and there were many breakages. Pasuran club came out winners and for those who like unusual names, how about *Tjelepuk* (Owl) for the leading A/1 designed by Liem Goan Tan and friend.

Results of the **German** Nationals for control line events give fastest team race time to Uhl and Ziegler at 5:07 and top speed at 169 k.p.h. on standard fuel for F.A.I. speed also to Gerhard Ziegler, who will of course be in the National team for the Criterium of Aces at Genk, September 15th-17th. Innovation of control scale for the Criterium has met with immediate approval in Germany and winner Erich Heimann is taking his very detailed SPAD S.XIII. We hope that other countries will also be represented in the new class. New record for jet speed was established by Horst Diemer after the Nats at 266 k.p.h.

From the elims to select **Canadian** reps for the World F/F Champs, we think that junior Brian Price of Vancouver takes the honours as the total of 1536 secs. he accumulated was enough to eclipse many well-knowns. Run in zones, the elims had 13 entries in Wakefield, 22 in A/2 and 25 in Power. Comes the big question that is also bothering the AMA in the United States—where are the F.A.I. enthusiasts going to and what about future support for World Champs? Entries in practically every country are way down this year.

The great week-long **U.S.A.** Nationals will be described next month with Henry J. Nicholls' impressions; but advance results are interesting. For example, Grand Nats Champ is yet once more Woody Blanchard, and to get that honour, Woody had to work very hard indeed. Warren Kurth topped ½A speed with 102.4 m.p.h., Fred Carter (must be something about that name) made 139.2 in class A, Larry Grogan 152.3 in "B" and Bob Lauderdale 163.5 in "C". Stunt went to Jim Vornholt in Jr., Bill Werwage in Senior and Lewis McFarland in Open. There were no full maximum scores in F.A.I. Power, Wakefield or A/2 classes despite the hot weather,

Soaring at the Tauernpasshohe, Salzburg, AUSTRIA, amid picturesque scenery, 5,700 ft. above sea level, at a Germany/Austria try-out of the site for the later "Coppa Austria". Bottom is line-up of Schneider Trophy contest models from ITALY at Varese. Won by Macchi M.52R, number 4, and M.C.72, number 7, second

and matter of interest is that Kurth is not only a fast man, he won Open class A/1 as well. Woody Blanchard lifted 55½ ounces with an .020 for Clipper Cargo 1st, and the name to watch for in the future is undoubtedly that of Jr. Nats. Champ, Dennis Bronco of Lakewood California who won several events.

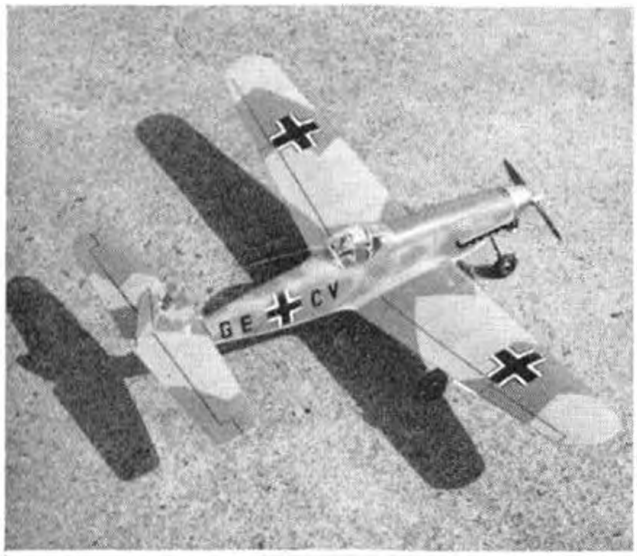
The Air Youth State Champions are juniors who qualify for a fully sponsored trip to the U.S. Nats. In the *Wichita Plainsmen News* we read of Steve Nestelroad's experiences. He left home at Wichita on the Sunday by TWA, joined a 707 at Kansas City to New York, then to Philadelphia. The Navy provided a spot to sleep, then all 50 State Youth Champs assembled at 8 a.m. Monday. Models have to fly for stunt, speed and endurance and though Steve was not among the winners he enjoyed the trip (Who wouldn't).? A tour of Philadelphia was arranged, then back home by Constallation the following monday after a week of modelling. Only regret is that next year he'll be too old to qualify.

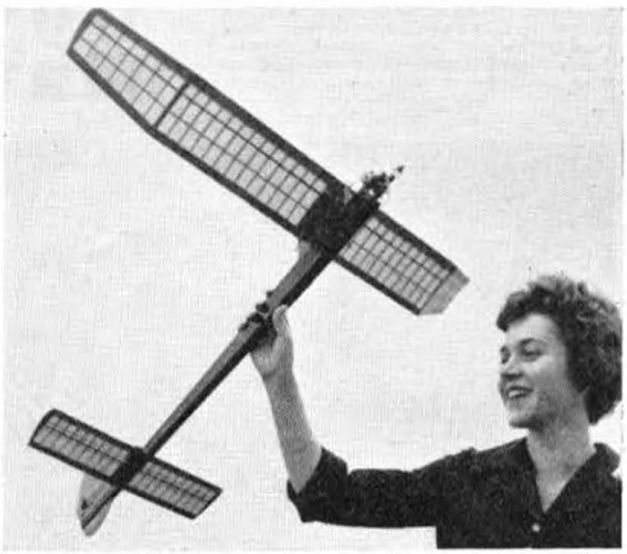
South African modellers lost a great friend in H. E. "Benny" Boxall, Chairman of the Western Province M.A.C. and a keen protagonist for the hobby, when he died in July aged 43. Benny was an active participant at the Easter Nats but since then was hospitalised and finally succumbed to the same disease as has taken Alan King and Sid Taylor as well this year. We knew Ben at a time when one had to be keen to stay with the hobby, when supplies were hard to get and there was not too much inspiration to continue. He was always the practical man, and trimmed by experience rather than theory with the result that he was National Champion in 1949. He also had a happy knack of helping juniors as well as far from home Servicemen, including the Ed. who will always remember him.

New contest? This day and age it seems hard to think of anything else to explore, but the **Italian** modellers have found something which is bound to stir the imagination. A scale Schneider Trophy event! Judged for take-off, speed and alighting, the first event drew five Macchi's, two M.C.72s, Two M.52R's and one M.39 with Silvio Taberna whose M.C.72 was in May AEROMODELLER placing 1st and 2nd.

Now what about Curtiss Racers from the U.S.A. and Glosters or Supermarines from Britain? Contest is to be annual at the lake of Varese.

At the GERMAN Nats. Top left, Armin Borstel's F/F scale Me309 with Cox Babe-Bee flew well. At right is third model in Class L for up to 1 c.c. by Oskar Rabenseifner who won in '60, has A.M.10 diesel. Bottom left: Gunter Rupp has flown this Wake for three years and qualified for this year's team with a succession of 15 max's. Finest performance ever in German rubber contests. To right is the A/2 Nats winner, Alfons Lau with Gerry Ritz influenced design. Wing appears to have surface sheeting





Malcolm 'Mossie' W. Clements poses with his K & B 29R Satellite which climbs at 3,200 feet per minute, open power winner. *Below:* Roger Stern and his scale Douglas Invader. *Bottom:* Dennis Hunt of Salisbury chats with S. African Monte Malherbe at right, each with Orbit-equipped Orions

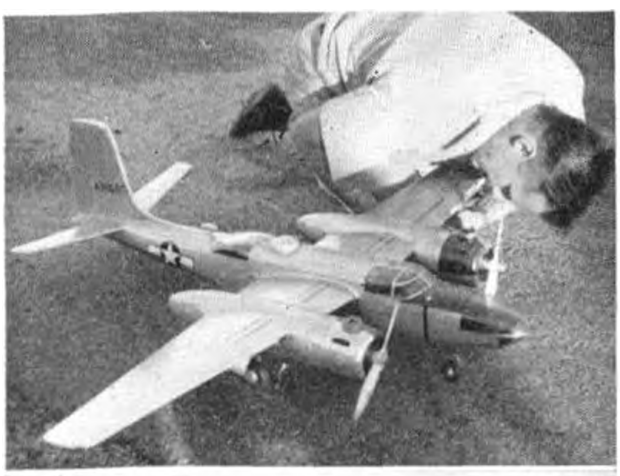
Rhodesian Nationals

reported by P. D. Michel

IF THERE IS one thing you can count on in Rhodesia, it is perfect flying weather throughout the year—so there were harsh words all round when a stiff breeze blew up for the country's first "Nats", held near Salisbury during the four-day Rhodes and Founders holiday. But Rhodesian luck held out, and the wind gradually dropped for the finals to be held in near-ideal conditions. Competition was limited to two days to allow for travelling—and in this part of the world, travelling is quite a problem.

Entries came from Beira in Portuguese East Africa (350 miles to the *East*), Pretoria (700 miles *South*), and Bulawayo (300 miles *West*). One group spent 15 hours in a small car travelling over dirt roads from Blantyre in Nyasaland (370 miles away). The Blantyre stalwarts included former A/2 champion of Greece, Charles Planodis, who deserved better luck with his superbly-finished glider.

People think of Central Africa as a place of sweltering heat, where pith-helmets and mosquito nets are the order of the day. But in the middle of the Rhodesian winter—and at 5,000 ft. altitude—it was cold enough for thick pullovers, as can be seen in the accompanying photographs.



Radio control is popular in Southern Africa, and the large holiday crowds were treated to some beauiful. multi flying by South African champion Monty Malherbe He won the multi event comfortably with his 10 channel *Orion*, followed by Stanley Fine (Pretoria) and Dennis Hunt of Salisbury. All three used *Orions* powered by K & B 45's.

A feature of the C/L stunt events was the relaxed flying of Carl Jensen, the South African junior champion. Control-line scale was won by Roger Stern of Salisbury, flying his beautiful Douglas Invader. Stern also won the stunt event and came second to "Mossie" Clements (Salisbury) in Combat 11. Salisbury's A. van Breda cleaned up the A and ½A team races, and was second to I. C. Bell in Combat 1.

F.A.I. power went to Clements. "Mossie", who did so well in the South African "Nats", flew a modified high-thrustline *Satellite* which he claims "just can't come down in less than three minutes." This model must have the fastest climb in South Africa, and certainly lives up to "Mossie's" theory—for it was yet to record a sub-max flight when given the gun. Clements also won the ½A Power with a KK *Halo*. His *Lightning Rod* (Cox Olympic) has gone to Germany for the World Championships.

The standard of glider flying was disappointing, with lucky risers deciding the first three places in A/2.

Another big disappointment was that the open rubber event had to be scratched through lack of entries. In fact only one rubber job was flown during the whole meeting—a 62 in. span Wakefield operated by one of the Salisbury boys who has proved that rubber does *not* shrivel up in the Rhodesian sun.

FOOTNOTE.—*Biggest laugh of the meeting came from the recorders' table. An official looked up at a competitor and asked "R/C?" "No" came the reply. "Church of England". Absolutely true . . .*

OUT and ABOUT

AEROMODELLING is a tough game in the **LONDON** area where Adders chase on Chobham Common, scene of St. Albans Gala, August 13th. Norman Elliott ran from one in what was an "off" day for this Wakefield team leader and **Croydon** member. In ½A, Dave Posner's mini-weaver with Tee Dee .049 ousted Martin Dilly's Hornet model for a **Surbiton** victory but usual ½A winner Al Wisher produced yet another 10 footer to make 3:19 in the dead air glider fly-off.

		Fly-off times
Open Power		
1. G. French	Essex	5:45
2. P. Manville	Bournemouth...	5:41
Rubber		
1. F. Boxall ...	Brighton ...	7:01
2. A. Payne ...	Stevenage ...	5:55
Glider		
1. A. Wisher	Croydon ...	3:19
2. J. Wright ...	Northern Hts.	1:43
½A Power		
1. D. Posner	Surbiton ...	5:08
2. M. Dilly ...	Croydon ...	4:20
R/C (Spot landing) Slope Soaring		
1. R. Saunders		5 ft.
2. A. J. Holloway		34 ft.

Next event on Chobham is Croydon's own Gala, September 17th, then **Hayes Gala** on October 8th and the **Blackheath Gala** on October 29th. all entries on the field for open F/F.

Elsewhere on August 13th, the Speed Comps. at R.A.F. Oakington found new name of Malcom Waddle of **Esher** tying with Pete Wright (W. Essex) for 2nd. at 115.3 with G.20 Jubilee on Standard fuel—a good sign that F.A.I. Speed is gaining support. Winning speed by Pete Drewell is a new British record at 119 m.p.h. (C.C.S. 2.5) and Mike Billington **(Brixton)** pushed the 10 c.c. figure to 163.2 (McCoy).

The **North Kent Nomads** of **SOUTH EASTERN AREA** have been busy making preparations for the Roberts Cup for waterplanes, experimenting with a tank construction employing a polythene sheet on Dartford Heath. Lost models are finding their way back to owners in this club quicker since a local police force member joined! Very handy—other clubs please copy!

When it comes to sport flying it seems that the boys from the **SOUTHERN AREA** really know how to enjoy themselves. **Southampton** held a Scramble at Beaulieu on July 23rd and with gliders and power models scattered in all directions, fliers did a great deal of running. Best time was six minutes by W. Beasant. **East Grinstead** members have also been enjoying some light hearted diversions, one in the form of a F/F delta with Cox Tee Dee .010 mounted atop the fin. Another is an autogiro which had them helpless with laughter as it looped, rolled and climbed. They have also had fun with lighter-than-air machines. A coal-gas filled polythene bag was launched (address attached) to be picked up a couple of days later on the Holland—Belgium border! On July 8th-9th, the **United Southern Aeromodelling Clubs** held another Barbecue-flying meeting at Goodwood, with balloon busting and a Scramble (popular eh!) interrupted by other hilarious forms of enjoyment. The Scramble was won by B. Bumstead, and E. Hodge took first place in the balloon popping event.

A well organised and publicised exhibition can do much to increase the membership and public relations of a club. For one week at the end of September **Leatherhead M.F.C.** will be holding an exhibition at the local Gas Board showrooms. (Does anyone have a Mike Gaster "Gastove" F/F power model to loan for the occasion).

WED! SMAE Public Relations Officer Ken Brooks and Sandra Sinclair on their happy occasion, August 13th. Also wed this month was contributor Jim Baguley

In last month's "Club News", we announced that the **SOUTH WESTERN** Radio Control Rally on September 24th is at Dunkeswell near Honington. Well, the town should be **Honiton.** Sorry S.W.R.C.! Incidently, no F/F will be allowed at this meeting as the Taunton Vale Gliding Club also use the field. 10/- pleasure flights to be offered by the gliding folk.

Still in the West we hear of yet another club formed in the Bristol area known as the **Bristol University A.S.**—further information from J. R. W. Smith, 16 Congleton Road, Macclesfield, Cheshire. The lads of **Glevum M.A.C.** are showing great enterprise and foresight. Planning well ahead for the winter, they have evolved rules for a scale R.T.P. comp., to be held in conjunction with their A.G.M. In this way it is hoped to attract,—or should it be blackmail?—more members to this important function.

Out in **EAST ANGLIA, F.A.S.T.E.** club members spent two days at the U.S.A.F. competition held at Molesworth in late June. They won *all* the speed events, took first place in Stunt and were also placed in Combat. They also took part in the Rat Race which was won by Hank Nixon using a Combat model fitted

ASHFORD M.A.C. RALLY

This fourth rally was a different story from the first. Staunch support from **Kenton** and **Northwood** clubs in the last three years has enabled Ashford to persevere. Now the entries have grown too big for the park and there may be no more due to various complaints received. **Crystal Palace** lads did not favour the 3 in a circle combat, they knocked out aces Copeman and Fountain but lost to the third man in the circuit. Litter boxes were well filled with broken models and wire and the organisers thank all visitors to their rally for leaving the park tidy.

Combat (58 *entries*)
1st D. Balch. *Hayes.*
2nd. M. Pinnock *Enfield.*

F.A.I. Team Race (22 *entries*)

1st	D. Ewen *Enfield*	5.03
2nd	G. Yeldham *West Essex* ...	6.10
3rd	S. Groom *Uxbridge* ...	retired

Combat finalists M. Pinnock and D. Balch with the "remains" at left. To right is winning FAI racer operated by D. Ewen of Enfield

Scale stunter is Frank Warburton's latest. He also says the Stampe Monitor is his best ever. Black and Orange finish. Fox 40, 605 sq. in. wing. 47 ozs.

Pete Russell has forsaken the stunt circuits for multi. Wife Bridget seen here with ex-Franklin Bros. deBolt Custom bipe used for practice, has Merco 35

with an undercarriage. Second place was taken by an F.A.I. Team Racer and third was a Nobler doing 100 laps per tank—Some Rats!!

The **SOUTH MIDLAND AREA** club, **Bletchley and D.M.F.C.**, dormant for some time, has been re-activated under its new title of **Buckaneers M.F.C.** Popularity of control line in **High Wycombe** has brought forth a string of club control line events lately. One was a handicap F.A.I. Team Race held on July 16th. Everyone stands an equal chance, since each model is checked for speed and lappage per tank. Theoretical times for 100 laps are then calculated for each racer allowing 10 seconds for starting and 20 seconds for each pit stop. Each model is then given a starting time advantage in order from slowest to fastest model. Result of all this was some keen competition and a win for Mike Bassett—not bad for a "newcomer" to the club!

In **EAST MIDLAND AREA, Peterborough M.F.C.** have lost their flying field at Westwood Aerodrome and a similar state of affairs exists in **Five Towns M.A.C.** over in the **MIDLANDS.** For some years now Wier Aerodrome has been denied them by Stoke-on-Trent City Council but despite this, membership has not declined a great deal A happier story comes from **Outlaws (Cannock) M.A.C.** where their establishment in a new club room, conveniently situated at the rear of a pub was marked with a grand "House Warming" party, with buffet and bar. Mention of free "eats" attracted a large attendance of some sixty bods from 7 neighbouring clubs. (The hogs!) Arrangements for their forthcoming Rat-Race Rally are well in hand, although confirmation of the proposed venue is still awaited. Moving to the **NORTH EASTERN AREA** we hear of **Sunderland and D.M.A.C.'s** control line display at Seaburn Recreation Park, South Shields on July 16th. Some 10,000 spectators passed through the park they say, and saw Stunt and Combat displays. Unfortunately they too have flying field problems, with an eviction rate of two fields a week although they hope for some help from the town Council.

The **NORTHERN AREA'S No. 168 (City of Leeds) Squadron A.T.C.** club have made the A.P.S. Lulu the subject of their first training programme. Several have been built and flown successfully by cadets new to the hobby.

In the **NORTH WEST, Chorlton M.F.C.** are proud of the fact that their John Turner placed first in glider at the P.A.A. Festival, repeating the performance of John Birks who won the similar event at the **East Lancs Rally.** Radio Control Slope Soaring has attracted the interest of some **Oldham and D.M.A.C.** members. Soaring from Harts Head Pike, L. Gabriel puts in regular one hour flights. A similar, if not identical interest is taken by members of **Macclesfield,** where a radio control semi-scale power assisted "Foka" Sailplane is on the stocks. Interesting this, but we hope the builder will overcome any wing flutter problems that might creep in with such a high aspect—ratio wing. The N.W. Area is to run a competition at Tern Hill Airfield, Shropshire, on the main Whitchurch—Newport A41 Road, for the *English Electric Trophy* on Sunday October 22nd. This is for rubber models conforming to rules set out in J. O'Donnell's article in the March 1961 AEROMODELLER. Briefly this calls for disposable ballast to be carried equal to, or more than the weight of the rubber motor. Contest is open to all S.M.A.E. members provided they pre-enter to G. K. Mutch, 16 Brian Drive Heswall, Wirral, Cheshire, by October 8th—fee 2s. 6d. Due to airfield regulations, airfield access is not normally permitted for anyone outside the N.W. Area.

Well,—there we are folks! We've done a little streamlining on those lengthy and so purely domestic reports and tried to restrict the news to matters of interest to modellers *outside* your particular circle. Hope YOU like it! THE CLUBMAN.

RUSH TROPHY GALA

Newcastle-upon-Tyne Town Moor : Sunday, 13th August, 1961

Reported by RON FIRTH

THE NOVOCASTRIANS again ran a nicely organised contest on Newcastle Town Moor and attracted some 80 competitors for the five events. The wind was towards the town and was strong enough to blow models over the built-up area after a flight time of about 2 : 30. Ron Pollard (the open rubber winner) lost his model after a second round max; came back to fly his reserve but to his dismay had lost his car-keys as well ! ! So he couldn't use the reserve model in the car boot; fortunately though he had his first model returned and made his third max just before the contest closed. Several others were lucky with their models. I observed (through field glasses) J. O'D.'s Veco 19 "Overdrive" to drop into the built-up area; this was returned by the finder shortly afterwards whilst John continued to search. My own modified "Quickie" A/2 dropped on D/T within inches of the lake at the South end of the Moor much to the surprise of the model yacht enthusiasts and Jim Modeley's "Apple-Honey 10" landed in the gardens of the local Maternity Hospital.

Some interesting models were being flown. Ron Pollard was using a well-tried original lightweight ("Buck Clayton Special 1960", *see F. Zale's* 1959-61 *Year Book*), which performed well in the turbulent conditions. J. O'D. was flying his "Fossil Mk. 1" (similar to "Benzedrine" but with a thicker wing section and smaller tailplane), Ron Swinden won the power event with his Oliver-powered "Ripthor" (AEROMODELLER, March 1961), but like his ¼A model, this was lost in the town. (He got some compensation in the excellent prizes given.) Other models included a huge 10-ft. "Thermalist" (last seen disappearing towards the Tyne trailing a small white D/T parachute); Peter Montgomery's twin-propped pusher canard which had a terrific climb, *(below)* and a Veron Viscount performed and attracted a large and interested audience.

RESULTS

Rubber (13 entries)		
1. R. Pollard	(Tynemouth)	9:00
2. H. Tubbs	(Baildon)	7:29
Glider (18 entries)		
1. J. O'Donnell	(Whitefield)	7:16
2. G. McGowan	(Novocastria)	6:19
Power (20 entries)		
1. R. Swinden	(Teesside)	8:35
2. J. Moseley	(Baildon)	8:29
¼ *Power* (4 entries)		
1. A. Cordes	(Novocastria)	7:32
Combat		
1. A. Wallace	(Novocastria)	
2. J. Minshull	(Whitefield)	

Herman Ramsey with A.M.35 Dixielander, up from Colchester and Peter Montgomery's fast climbing twin pusher canard with staggered props

PREVIEW

OF WHAT WE HAVE IN STORE IN OUR COMPANION

Model Maker & Model Cars

out Sept 25

The Mersey ferry *Royal Daffodil* and the Thames multi-chine tender *Olan* are two of the working model plans in the next issue, the latter in the Small Craft series which also includes two other small-scale boat drawings. Other ship plans will be the liner *Viceroy of India* and two destroyers, the *Saumarez* and *Hero* classes. Car drawings include the most interesting Ferguson Grand Prix car and detailed working drawings for converting Dinky toy cars to fully steering and sprung racing models with an automatic braking system built in! The first international slot G.P. is reported, plus reviews of new equipment, motor tests and the usual regular features.

AND NOVEMBER

Aeromodeller

out Oct. 14

The World Championships for Wakefield, A/2 glider and power models in full detail with all results and round by round account of this great model olympics in Germany. Colour cover features the *Bucker Jungmeister* aerobatic single seater, plans for a free flight version appear in this issue. Keith Laumer's *Sharpoon* introduces the beginner's course to controline. Ron Warring analyses a new .8 c.c. diesel. Motor Mart gives gen on latest developments. Russian Ornithopter and unique experimental types are revealed for first time in the West. Actual size plans for a smart rubber powered model. Contest design 3-views and all the very latest information from the mag that "Covers the World of Aeromodelling."

AND ALSO

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Col. Taplin discusses standardised boat installation, an article which should be followed closely if one is to start R/C boat modelling on the right foot. A power converter to save those expensive H.T. battery replacements will be welcomed by those whose thumb is constantly on the button.

Followers of the Kitchen Rudder Control system will be interested in the Lovegrove eight-channel control gear designed by this well-known aeromodeller who is having a spell of boating at the moment. Simple installation is employed in *Sea Scout* and a new series dealing with servo mechanisms start this month. The Continental Rx and Tx provide gen from overseas and the popular Query column, new equipment, Reviews, Views and News make this issue of R.C.M.&E. a rewarding two shillings' worth.

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