## Aero Modeller MODEL AIRCRAFT

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Radio Controlled glider plans

# WORLD FREE FLIGHT **CHAMPS**

John O'Donnell reports from Säve, Sweden

Right, Wakefield winner Josef Klima of Czechoslovakia with his tubular fuselaged, pylon-mounted wing, model, Below, Dvorak also of Czechoslovakia was the winner of the A/2 event with a high aspect ratio, tapered tip design. For those who wonder, he is apparently no relation of Frantisek Dvorak who won Wakefield in '59!





THE CHOICE OF the military airfield at Säve, near Gothen-burg. Sweden, as the venue for the 1971 Free-flight World Championships led to a considerable amount of pre-contest speculation. Although the site had obvious appeal from such very necessary considerations as adequate accommodation and easy travel facilities and the like, the actual airfield was rather small. Furthermore it was surrounded by woods and outcrops of rock

To reconcile the field with the flying requirements the organisers (Sveriges Modellflygforbund) had scheduled the competition flights to be made in the early morning and evening — with a complete break from 10 a.m. till 6 p.m. It was anticipated that this arrangement would give both calm and relatively liftless conditions and avoid retrieving difficulties.

culties.

The extensive advance literature about the contest and its organisation included airfield maps and a summary of the preceding years' weather statistics. I understand that analysis of this information had led to the bringing forward of the contest dates from late to early July. Prophecy is often dangerous, but it worked out very well on this occasion. The calm weather, on which so much depended, arrived as anticipated and the contests were highly successful in consequence. It must be admitted that in anything resembling windy weather the championships would have become little more than a retrieving contest! The organisers took a very definite 'calculated risk' – and got away with it! 'Arrival Day' was Wednesday, 30th June, although some contestants got to Sweden well before this. Test flying was possible at Trollhatten some 60 kilometres (say 40 miles) from Gothenburg. The Americans, in particular, took full advantage of this facility, and said the field was superior to Save – even if they did land a power model on the roof of the SAAB factory!

On the Wednesday morning itself the officials at 'Reception' were seen event and the field was superior to fine the same to supplie the complexity.

On the Wednesday morning itself the officials at 'Reception were soon swamped by the number of people who appeared bright and early. Subsequent arrivals found they were kept waiting outside the airfield gates until the queue inside had subsided. Whilst this procedure should not have introduced any additional delay it was rather a sour anticlimax to one's journey.

There was a formidable number of entrants - not to mennere was a formidable number of entrants - not to men-tion team managers, helpers, Press and spectators. All in all, 37 nations (official list, plus Bulgaria) had entered, and all but four (Greece, Iran, Turkey and Venezuela) material-ised. It was claimed that the meeting had attracted more international participation than the Olympics! Whilst everyone attending should have 'booked in advance' this was not the case in practice. There were last minute changes in some countries teams, not to mention details like failure to

one attending should have 'booked in advance' this was not the case in practice. There were last minute changes in some countries teams, not to mention details like failure to pay before arrival!

Contestants and others were housed in military billets within the airfield base itself. The accommodation was somewhat spartan; comprising a number of cubicles, each with four bunks, arranged dormitory fashion. This was not conducive to getting a lot of sleep! Conversely, the food supplied in the 'Dining Hall' was generally far better than expected. Refreshments (both solid and liquid) were also available from a separate canteen – but at prices that could only be described as frightening.

Being a military base there were the inevitable restrictions on car parking. There were also some petty regulations such as the prohibition on using bicycles for retrieving. Rather more serious was the presence of a wooded area (at one end of the drome) to which access was strictly verboren. Any models alighting in this region were to be retrieved by an official Swedish recovery team. There was mention of armed guards with orders to shoot!

Test flying got off to a slow start on the arrival day as the afternoon was hot and breezy. The evening was better, and activity increased as the wind dropped. It did not go really calm, however, so practically everyone was out very early the next morning. As the first round of all events was scheduled to run from 4.30 to 5.30 a.m. there was an obvious need to evaluate the conditions and perhaps one's model performance. The sun rose at about 3.20 a.m.— and most modellers as well, Whilst it was certainly calm I gather that there was evidence of weak, but positive, lift as early as 4.00 a.m. This was hardly the thermal as usually envisaged — but the slightly 'helpful' air that produced a model intended specifically for the early morning rounds — with all the emphasis on glide rather than on thermal-riding ability. Elton Drew had a solid sheet winged model that looked like a cross between an SPL and

sion of the Kaczanowski Gro section, in the early morning conditions at Save they reckoned to be getting 2:55, 2:50 and 2:45 respectively.

In Wakefield Bryan Spooner had a duplicate (with slightly different prop) of the model he used at our Trials – and was satisfied that both it and its predecessor could do comfortable 31 minute flights, Laurie Barr had a model with solid, high A/R wings, and a new version with conventional built-up surfaces. He survived a spectacular test flight that shed the wing when the pylon-to-fuselage joint sheared under the shock load of the tension in the V.I.T. lines!

The power team were rather less fortunate with their troubles. Ray Monks put his latest sheeted-wing model out of commission through first bending and then breaking the Culpin engine-pan. Bob Bailey was even more afflicted as he broke two of the World Engine Seelig-style pans in successive D/T landings of the same model. These pans have a very sharp corner between the engine-mounting surface and the backplate – but a filed-in groove to provide a radius did not help.

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It is common at the test fiving sessions to try and pick out the eventual winnar – and even to claim success. This is an idiosyncrasy that I do not intend to indulae. What was apparent from watching the testing was that there were quite a number of very good models with more than enough potential to win their events – providing their filiers both made no mistakes and 'go' the breaks'.

This was particularly noticeable in Power where there were plenty of very fast models (and motors) in evidence. What registered even more strongly was the percentace that exhibited trim troubles. The modern trend in V.I.T. power models seems to have produced a set-up prone to flatten out under power, and make a long flat sweeping turn to the right – at tremendous speed but with little gain in altitude! The manoeuvre just described was commonplace on test, and proved to be only too frequent in the contest proper.

One model (or rather pair of models) that could hardly he overlooked was the much discussed 'flapped' desinn of Thomas Koster. They were distinctive in outline, test flown constantly and the centre of much interest. From test it was apparent that the concept had considerable potential – and that success was going to depend on whether or not the pattern was right on his 'officials'. Test flights were spectacular but hardly consistent.

Wakefield and A/2 are inherently less spectacular than Power and correspondingly harder to evaluate as regards genuine performance. Slight 'ups and downs' affect flight time drastically – and when watching a Wakefield climb, one really needs to know whether or not it is fully 'wound up. What did emerge was that either the air or the models, or both, was usually very good.

Processing proved to be a major undertaking. In theory models are suposed to be checked for conformation to

specification before they reach the Championships, and have specification before they reach the Championships, and have F.A.I. stickers affixed to confirm this. Processing should then be merely an inspection of the said stickers followed by a weight check. This idealistic assumption, plus that of assuming the models would be correct, seemed to have led to the tight processing timetable. A mere 15 minutes were allowed per team, which could involve dealing with 27 models. Delays commenced right from the start and were lengthened by models needing markings (by felt-tip pen) and/or ballast. In the end processing continued until late into the evening.

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The system used was for models to pass down a line of officials who each dealt with one facet of the requirements. Models were checked for stickers, national markings and weight. If applicable engines (plus any loose 'spares') had a number engraved on their mounting lugs 'to prevent interchange between contestants'. Models were then stamped and had an 'If found . . 'label affixed. Contestants were issued with numbered cloth squares to be worn during the actual competition. This was one idea I was very glad to see – as it simplifies the problems of identifying the competitors!

Partly due to the 'slippage' of the processing schedule a large crowd of models and modellers assembled outside the building where checking was being done. This provided a marvelous opportunity to meet old (and new) friends, inspect models and take photographs, Many entrants were only too pleased to demonstrate their showpieces to anyone interested. Much of what I saw at this stage will be included in the technical feature intended as a sequel to this report. What did surprise me was the way in which models were left unprotected in any way from the strong sun for considerable periods, an open invitation to heat warps.

Some interesting tit-bits were learnt at this and other discussions. The Hungarians were represented solely by a power team as their country is short of 'hard currency' and funds were not available for three teams. They sent the one with the best chance!

The French made a very late change in their Power team. One member (Zimmer) had lost a model in the woods

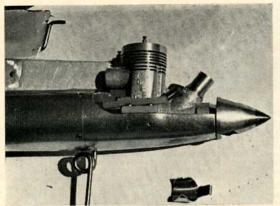
one with the best chance!

The French made a very late change in their Power team.

One member (Zimmer) had lost a model in the woods whilst trimming, and had wrecked another. These misfortunes put Michel Jean, who had attended as reserve (complete with models and photogenic wife) into the contest.

Rolf Hagel won the power event with a model utilising a Rossi 15 mounted at 45° to the vertical and fully cowled in sheet metal. Glass fibre prop needed to withstand the high r.p.m.





Americans Jim Taylor and Buzz Averill had to remove exhaust deflectors fitted to their motors (under the 'no exhaust extensions' rule) and fit deflector plates attached to the pylon to keep oil off the timers.

One of the Australian Wakefields intended to be flown proxy did not arrive. Bob Greenhill had his car stolen just two days before the models were due to be despatched – and lost his Wakefield propellers in the process. The car was recovered but not the airscrews! His proxy, Jan Zetter-dahl, subsequently flew Bob Emslie's models, and was showing a machined prop. assembly that he had fitted to one. This might be more than is expected from a proxy, but is only comparable with Pete Stewart re-equipping Brian

Roots power model with a much better engine.

The processing had an intermission for the official Inauguration of the Championships. This commenced at 6.00 p.m. with a parade and march-past of the teams. Differences in National outlook were immediately apparent. Some teams were uniformly attired, often in track suits, and invariably marched in step. (The Russians were even arranged in order of height!) Such could not be said of the British and some oth regnt?) such could not be said of the British and some other teams. An address, in three languages, was made by the Mayor of Gothenburg. Proceedings were wound up by a model flying demonstration. This started with free-flight and was followed by control-line and radio – and was presumably intended for the non-modellers present. Flying, even with short D/Ts, so close to the woods hardly showed free-flight in the best light.

#### F.A.I. Power

Contrary to previous practice, the Championships com-menced with the Power event. Far from being arbitrary, this decision was based on the probable numbers involved in flyoffs, and the likelihood of the power event requiring several extra rounds. In the event of weather difficulties demanding any form of postponement, then the event could be continued the following day. This, in fact, proved to be a very wise precaution.

It might also be appropriate to mention at this stage that the whole contest was flown under the 'old' rules of a 100 x 50 metre launching box, and using a progressive (increasing max) flyoff. The concept of a starting line, etc., were deemed not to apply until 1972. Nonetheless, binoculars were used for the first time at a Championship – they seemed to work very well and I heard of no complaints.

Power test flying must have commenced very early in the morning - and there was considerable activity right up to the start of the contest (in fact even during the contest it was permitted to test provided that it was done downwind of the launching area). A literally last-minute disaster overtook Franz Baumann when he had an engine shut-off failure but still had the auto-rudder and V.I.T. operate. This produced a mid-air structural collapse with at least five separate decea a micro and studied conspise with a least tive separate pieces descending! I was surprised, upon inspecting the debris to find just how soft was the wing sheeting!

Although scheduled to commence at 4.30 a.m. the first

round did not get under way until half an hour later. Conditions were dead calm with the bubbles from Jack North's machine drifting upwards in an encouraging fashion. As far as I could tell. Thomas Koster was first away - only to record over-run. His repeat attempt was not quite on trim but

still adequate for a max.

As the round progressed it became increasingly apparent that a surprisingly high percentage of fliers had trim or pattern problems. Without an actual count I would estimate that about half the first round flights were 'off' to a greater or lesser extent. Nevertheless many of these flights

still produced a max. It was also apparent that engine tuning has progressed sufficiently since Wiener Neustadt to more than compensate for the ban on tuned pipes!

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Trouble struck the British camp right from the start of our flying. Pete Buskell had his model 'tighten up' under power and cut with insufficient height to max. Ray Monks had opted to use his oldest and usually so-reliable model – only to have the engine richen in the air, and die prematurely at only 6 seconds. That the flight was still 2 minutes shows just how good were the conditions. As this was the end of Ray's engine troubles, he could only speculate that the forcing through the tank system of copious quantities of the supplied standard field (so, as to satisfy the timeof the supplied standard fuel (so as to satisfy the time-keepers) might have dislodged some sediment and hence altered the initial needle setting. Only Bob Bailey managed to provide a British max.

The West German's had a most unfortunate repetition of their 1969 experience of a member losing a first flight com-pletely. Anton Weber had his first model go flat and then

pletely. Anton Weber had his first model go flat and then dive into a group of trees still under power. He subsequently went on to record a string of six maxs. This illustrates one way in which World Championships differ from almost all the other contests. Everyone continues flying right to the end however dismal their initial attempts may be.

Few people had any doubts that the five morning and two evening rounds were only a preliminary to the real contest that would be provided by the flyoffs. In this context it would seem superfluous, even if it were possible, to describe how maxs were recorded by those competitors in whom one is interested. Likewise statistics concerning numbers of maxs per round, or those with unblemished whom one is interested. Likewise statistics concerning numbers of maxs per round, or those with umblemished scores at the end of each round, can be extracted from

the full results.

It is more practical, and I trust not too morbid, to recount how and why some contestants came to grief. The second round saw Alain Landeau (of Cd'H fame) have his G15 'cough' just after launch - with dire results to the cough just after launch - with dife results to the power pattern. Sten Agner (Denmark) has his motor cut at about 20 feet high, due to a flood-off leak, but got away with an attempt. Dusan Varda (Yugoslavia) crashed onto the runway in the fourth round. Shortly afterwards Sergio ('Joe') Savini had his model D/T at 40 odd seconds to give a flight of just over a minute. There was consternation amongst the rest of the Italians and Joe was all but lynched! He still doesn't know what really happened hut it lynched! He still doesn't know what really happened, but it was not the common error of putting the D/T arm in the wrong part of the Seeling timer. The time didn't tally with that explanation.

As the morning progressed it did not take long to become very bright and hot. It slowly became 'less calm' and had become breezy by the fifth round. The initially clear blue sky began to sport a few white clouds. It was apparent that closing the morning's activities at 10 o'clock was a very good advance estimate. There was a period when models were drifting onto the forbidden area but the official recovery arrangements worked well there. Most teams had their own helpers downwind to augment the Swedish system. Much walking was eliminated by having a couple of Volkswagen buses running a shuttle service between the

of Volkswagen buses running a shuttle service between the landing and launching spots!

British hopes were dashed in the fifth round when Bob Bailey dropped a flight badly. He launched a shade left, had the model go left under power, poor transistion in consequence, and poor air – all at once. Until then his very new Night Train development had been more than promising. Power unit was a home-tuned Rossi. In the same round Monks was visibly shaken when he changed a prop only to have the timers suggest the model be check-weighted! They took much convincing that this was unnecessary.

Verbitsky used a home built engine which turned a Russian 7½ in. x 4 in. (or 4½ in.) nylon propeller at 21,000 r.p.m. Neat cast engine pan installation.







Koster gives the 'heave ho' to his in-genious Flapped Cream. Very sophisticated, but not too consistent.



Bob Bailey launches on his fatal fifth flight - model was released a shade left. which was exaggerated under power.



Rolf Hagel, Rossi screaming on its glass fibre 7 in. x 3½ in. prop based on a Cox product, launches for another classic climb.

The evening rounds saw few 'dropouts' from the large number who survived the morning with perfect scores. Strangely enough, those who came to grief included both Americans. Jim Taylor had a flight tighten and flatten - his trim troubles were a matter of some speculation. Both he and 'Buzz' Averill reported increased engine revs in the lower altitude relative to their Albuquerque homeland – but Jim also had qualms about the rigidity of his Super Monokote covered surfaces at high speed. Tom Kerr forgot to set his D/T and had the tail tip as the motor cut! I have seen few modellers so upset – or get it over it so quickly. The few modellers so upset—or get it over it so quickly. The other casualties in the final rounds were Franz Baumann and Klaus Englehardt (of West and East Germany respectively) and P. Stoilov of Bulgaria—all of whom dropped a few seconds. The nearest miss of all was that of Paul Lagan, over from New Zealand in person—who dropped but a single second in the fourth round. Team Manager Dave Tipper said that he could hardly criticise the timers—as he made the flight only 2-58! made the flight only 2:58!

The Team Event was decided by the seven rounds – with only the Swedes managing the unblemished 21 maxs that were possible. They nearly spoilt more than their score in the evening when Urban Nygren crashed his Special Eagle

were possible. They nearly spoilt more than their score in the evening when Urban Nygren crashed his Special Eagle (with aluminium tube front and built-up box rear fuselage) in the midst of a crowd of people – but he continued to max thereafter! Second and third team positions were very close – with just one second between the Russians and Danes – both of whom had two representatives in the flyoff. There were 19 qualifiers for the flyoff – the largest number yet at a World Championship (compared with 16 at Kauhava in 1965). It is also noteworthy just how many were regular World Champs finalists. There was a suggestion of a weight-check on the flyoff models but it didn't materialise. The flyoffs were flown to a progressive max using the normal 10 second engine run throughout. Following current F.A.I. procedure meant that the actual launch had to take place within a four minute period – although half-an-hour was to be allowed for retrieval.

Flying -off to a four minute max commenced at about 8.35 pm, and was signalled both by the P.A. system and Very light. It was cool with little wind – and little sign of lift. Dave Sugden was first away with a very smart start and launch whilst his compatriot, John Foley, was last to fly some 3½ minutes later. Bruno Fiegl failed to start his engine, despite having taken two models out to the flying area. Five others missed the max, although they all did over 200 seconds. Very 'close' maxs came from Pete Stewart (flying proxy for Brian Roots) with four seconds clearance, and John Foley with six.

There were still a round dozen fliers left in the battle. and John Foley with six.

There were still a round dozen fliers left in the battle, and they assembled to try for the five minute max, just after 9 o'clock. It was still cool and quite calm, although the drift had swung onto the woods just to the right of the runway. Again Dave Sugden was first away, and on-pattern, to record a comfortable 5:35 D/T'd down in front of the trees. Koster had the opposite approach and did an 8 minute flight that cleared the wood. Hagel and Mildner had trouble with the Swedish model remaining out overnight (till found the next morning by the Danes) and the German one suffering considerable damage. Verbitsky was having to use fuse for his D/T having expected the engine run to be cut for the flyoffs, and hence having a timer that only ran for 3 minutes odd.

use fuse for his D/1 having a timer that only ran for 3 minutes odd.

Pete Stewart provided the only near miss of this round with a 4:45 flight from Roots model. This had Night Train surfaces on a different fuselage – and was steady rather than spectacular. Using Pete's own modified G15, and a Meissner prop borrowed from Martin Dilly, it was a real co-operative effort – and the highest placed proxy model for years. Other fliers had real trouble. Meczner's model came down in a series of violent stalls. Michel Jean had his model 'wind in' and crash upwind very close to numerous people – perhaps through gadget failure. Sten Agner ran into trouble with a motor that ran, but very roughly. This was found to be due to a flood off pipe leaking fuel into the air intake – but there was no time to rectify it. As he was already down to his last model there was no question of using a spare. The Bulgarian, Goramov, also recorded a zero this round, but I am afraid I do not know why. The improvement in standard of the Bulgarian flying in the past two years since Wiener Neustadt is know why. The improvement in standard of the flying in the past two years since Wiener Neustadt is remarkable.

remarkable.

The announcement that the next flyoff (to a six minute max) would be held at 8 o'clock the next evening, caused a certain amount of surprise and considerable comment. There is little doubt, however, that a further round on the Friday would have given visibility troubles in the failing light. Leaving a description of the intervening A/2 contest for the time being, it is convenient to continue with the power event. power event.

What proved to be the final and decisive fly-off got underway around 8.10 or 8.15 under a clear blue sky. The wind was not strong enough to feel - but the drift was still wind was not strong enough to feel - but the drift was still onto the wooded area adjacent to the launching area. This time Hans Friis was first to fly, although he was closely followed by Sugden. Dave had found his model move trim during testing just before the flyoff. This led to a left bias on climb and a stally transition. Hagel, Koster and Onou-frienko launched all but simultaneously - with Hagel appearing to gain the most height. Horst Mildner followed, only to have his model flatten under power. Although the motor cut in the air, the dive-in continued. His troubles began with damage sustained in the woods and more during the recess. damage sustained in the woods, and more during the necessary retrim. Even so he reckoned everything was 'go' for the flvoff. Verbitsky was next (with a spiral type climb, but lots of height) with John Foley waiting till near the end.

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11. M. Jean France 1,260 + 240 + 10 1,510	
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25. V. Hajek Czechslovakia 180 180 180 166 180 180 180 1,246	
26. G. Barbarella Italy 180 180 180 163 180 180 180 1.243	
26. Y. Walconen Finland 180 170 179 180 180 174 180 1,243	
28. H. Huyben Netherlands 180 180 180 180 161 180 180 1,241	
29. J. P. Taylor U.S.A. 180 180 180 180 180 157 180 1,237	
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32. H-J. Benthin E. Germany 158 180 180 177 176 180 180 1,231	1
33. P. R. Buskell G. Britain 167 180 175 180 160 180 180 1,222	
33. A. Grechin U.S.S.R. 180 180 147 175 180 180 180 1,222	
35. P. Jorgensson Denmark 164 178 180 180 161 178 180 1,221 Team Results	
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	3,672
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43. S. Savini Italy 180 180 180 66 180 180 180 180 1.146 6. G. Britain	3,647
44. A. Denkin Bulgaria 180 180 162 74 180 180 180 1,136 7. Bulgaria	3,645
45. B. Krycer Czechoslovakia 50 180 180 180 180 180 180 1.130 8. Austria	3,609
46. T. C. Kerr U.S.A. 180 180 180 180 180 41 1.121 9. Czechoslovakia	3,595
47. M. Doujle Ireland 180 180 180 118 99 172 180 1,109 10. W. Germany	3,592
48. A. Weber W. Germany 0 180 180 180 180 180 1.080 11. France	3,585
49. A. Landeau France 180 42 180 180 123 180 180 1,065 12. Canada	3,583
50. J. B. Brooks Canada 166 180 140 87 180 174 136 1,063 13. U.S.A.	3,573
51, I. Fuijo Japan 180 54 153 176 120 180 180 1,043 14. N. Zealand	3,511
52. P. Emilian-Cringo Rumania 180 164 180 180 7 180 140 1,031 15. Jugoslavia	3,483
53. M. Blanco Hoa Cuba 120 125 180 180 124 106 180 1,015 16. E. Germany	2,835
54. D. Varda Jugoslavia 180 180 180 9 180 180 94 1,003 17. Finland	2,761
55. J. Johnsson N. Zealand 115 180 141 119 180 180 77 992 18. Cuba	2,755
56. O. Torgerson Norway 152 154 122 180 161 90 119 978 19. Ireland	1,552
57. J. Ferroa Diaz Cuba 96 141 180 119 180 159 101 976 20. Switzerland	1,260
58. S. Haapalainen Finland 130 141 180 133 96 102 42 962 21, Spain 59. R. Del Castillo Cuba 103 126 57 79 164 120 115 764 22 Netherlands	1,255
	1,241
60. M. Pyykko Finland 135 180 113 128 0 0 0 556 23. Japan 61. F. Jackson Ireland 180 180 83 5 0 0 0 443 24. Rumania	1,043
	1,031
62. D. Ducklaus E. Germany 180 175 0 0 0 0 355 25. Norway	9/8

It was impossible to watch or time all seven models but there did seem to be four close together, all gliding well, with Koster's appearing to sink slowest. Flights continued down to the tree-line with at least one model 'flitting' in and out of the trees and doubtless giving trouble even to the binocular-equipped timekeepers. As models were not timed to the ground, this flyoff was the least satisfactory of all. The top two scores were very close with Rolf Hagel having seven seconds lead over Thomas Koster (the Danes were not pleased with this result as they claimed Koster did longer in the air). The next three were significantly less were not pleased with this result as they claimed Koster did longer in the air). The next three were significantly less but only spread over a range of 5 seconds! Victor Onou-frienko edged out Eugene Verbitsky from third place whilst John Foley was fifth. Both the Russians used Verbitsky's home-made engines whilst Foley had transformed his old models by re-powering them with Rossi's.

Rolf Hagel's win made him World Champion for the second time - as he was one of the five joint winners in 1960 at Cranfield. Always renowned for having powerful engines, this year was no exception. He used a self-tuned Rossi, with modified intake and transfer ports for 'better breathing'. The races had been freed, and the larger changed.

Rossi, with modified intake and transfer ports for 'better breathing'. The races had been freed, and the larger changed to a better Swiss one. The whole motor was inclined at 45 degrees to the vertical and hidden inside a metal speed-type cowl. Prop used was a glass-fibre example, made by friend Ake Quarnström, and based on the grey Cox 7in. x 3 jin., but with slightly wider blades. The Cox worked well, but shed blades on two occasions – hardly surprising at 24-25.000 rpm. Hagel's model is far from the modern

trend, having swept back tapered wing tips with plenty of dihedral and the Scandinavian favoured triple-fin tail unit. Wing section is a Swedish derived one, resembling NACA 5409 but with a much sharper L.E. Three views of an earlier version were in the 71/4 issue of Free-Flight News.

Thomas Koster has devoted his energies recently to power models rather than Wakeleids. A lot of work has gone into developing his Flapped Cream and there is more to be done. Koster is reported to have built six of this design – but only appeared to have two left for the Championships. Certainly they were the most discussed models on the field and the centre of much attention and interest. As a means of reconciling the conflicting demands of power and glide, flaps have much to offer – and Koster demonstrated the potential of the system. Main problem would appear to be consistency, as despite almost continuous test flying the trim seemed really knife-edge. His official flights were mostly on-pattern but test flights were 'all over the sky' at times, I hope to be able to give further details in the technical report intended as a sequel to this article. It might also be the best place to describe Verbitsky's models and motors.

There is no doubt that for success in the FAI power event the first essential is a year fast motor, with tuned.

There is no doubt that for success in the FAI power event the first essential is a very fast motor, with tuned Rossi's being the current favourite. Having got such an engine, there seems to be problems in persuading the modern V.I.T. model to be consistent. For those prepared to cope with the mechanics and development programme a flapped design is worthy of consideration.





Larse Larsen's A/2 has unusual curved wing dihedral. Note also the fin position - midway down the fuselage. Placed

#### A/2 GLIDER

The A/2 event scheduled to com-mence at 4.30 a.m. on the second flying day - Sat. 3rd July. It started promptly on time - and hence illus-trated how the Swedish organisation rapidly improved as it "learnt by doing". This in fact, is one of the signs of a basically sound setup. Certainly the remainder of the events ran like clock-

work!

Glider is often treated purely as a thermal-catching contest, and usually rightly so. However, an event flown so early in the day was liable to be rather different. Many entrants had produced special models for the early round(s), including the British Team as already recounted. Pre-contest flying had revealed that the conditions were not likely to be true 'still air' – and this was confirmed in the contest. It was hardly surprising that there was

It was hardly surprising that there was little rush to fly. The first to make an official flight was Markov of Russia. some 8 minutes after the round began. Presumably judging conditions before-hand, he simply towed up straight, then veered into a smooth 'catapult' release that gained valuable height for the contest's first max. The flight for the contest's first max. The flight was also interesting that it was made from the wrong launching area. There were two equal sized boxes next to one another. The purpose of the second was to provide space for the model launcher - but it certainly confused quite a number of fliers. The flights stood, however, as did one or two isolated examples of line (or winch) release that passed unobserved

Munnukko of Finland placed second in A/2 with his silk-covered wing design. Unusual in employing a fuse D/T.

by timekeepers steadfastly watching the model.

The second Russian, Ehtenkov demonstrated the circular-tow that they demonstrated the circular-tow that they used extensively throughout the contest. This has been rendered considerably more reliable by the use of a spring-loaded towhook complete with a positive lock to retain the ring and line. (Further details of this gadget next month.) Their whole technique looked most impressive and professional. sional

As it became apparent that maxs were far from impossible and that there must be lift, there was some signs of tactical flying, this was hardly safe as one 'mass' launch at around 5 o'clock showed. The lift was very small as well as weak, and a model had to be released just at the right time and place. place

British World Champ, Elton Drew spoilt his chances with a stalled re-lease of his dead-air model, and a 2:25 rease or nis dead-air model, and a 2:25 first round score in consequence. Mike Woodhouse did little better despite flying as the bubbles from Jack North's machine were rising. It was left to Tony Young to uphold British hopes with an initial max. His very high A/R sheeted-wing model worked its way into ground lift and eventually D/T a few feet up at 3:50. D/T a few feet up at 3:50.

This was by no means the longest flight. I saw Herbert Schmidt O/T around 4 minutes with at least another half-minute in hand. This looked like a thermal flight, apart from the immense circles in which the SPL was

flying!
All in all there were 38 maxs in the first round, out of 89 competitors, and five countries with all three members having maxed!

The second round saw the weather warming up right from the start al-though it was still very calm. There was one real example of 'piggybacking' was one real example of piggybacking twenty models in the same patch of air around 6 a.m. One regulation that soon proved an irritation was that of requiring a line check before each flight. Giving the winch back to the time keepers after flying (for them to time keepers after flying (for them to impound) might be considered an adequate safeguard but is not what the F.A.I. Sporting Code requires! Lines do stretch in use, as Martin Dilly (proxy for Trevor Martin of New Zealand) found to the tune of 14 inches!

There was a variety of techniques used to try and detect lift. These in-

cluded thermistors (sometimes in walkey-talkie contact with the teams manager or other helper who relayed information to the competitor), soap bubbles (or the talcum 'baby' powder) bubbles (or the talcum 'baby' powder) I saw used instead and straightforward tactics. It was still rather calm for lengthy tows (unless the circling technique was used). I saw Hirschel tow for many minutes in this fashion, ignoring a mass launch and rising bubbles, surviving a line tangle with an Egyptian and a subsequent towup when the model was within 2 or 3 feet of the ground. before releasing for feet of the ground, before releasing for

a max.

All the British team scored maxs in the second round - but only Mike Woodhouse in the third. He caught 'ordinary' lift, and precipitated a group of 7 or 8 into following. Tony Young missed a max by nine seconds, through the seconds through the seconds through the seconds with the second of the second missed a max by fine seconds, intoday in the considers using his dead air model for a round too many. It contacted lift but was 'pushed out' rather than the opposite. This in fact was to prove fatal to Tony's hopes as he maxed out for the rest of the contest.

There was a 15 minute break be-tween the end of the third round at 7.30 and the start of the next. This allowed those who wished to attack the packed breakfast provided at the

allowed those who wished to attack the packed breakfast provided at the contest area.

By 8 o'clock it was getting really hot, and the first real thermal was seen in the shape of 2 or 3 models climbing rapidly. British fliers all remarked on the weakness of the lift, especially considering how hot all three days became. There were very few up currents in which a complete flyaway would have been possible! The wind had begun to appear after breakfast and models were heading towards the woods. These were unquestionably within normal flying distance during the last two rounds in the morning. By now normal tactical flying was prevalent, even if not particularly well done. Elton Drew, for example, found lift in the fourth round only to be ignored by the opposition. Yet in the fifth round, he had many followers who released into doubtful air (that proved more than adequate) whilst Elton still continued to tow upwind.

more than adequate) whilst Elton still continued to tow upwind.
Surprisingly the 'thermal rounds' seemed to give trouble. There were only 8 contestants with trebles, and the number with 'full houses' decreased to 3 by the end of the fifth round. This of course, left the contest much more 'open', with those who had



only dropped a few seconds still very well placed, There were, in fact, half a dozen people within 20 seconds of the leaders.

The evening's flying started at 6 o'clock, as originally decided. It was still sunny and hot, but cooling noticeably. It was breezy enough for long straight tows without difficulty. Tactical flying was common — Hugh Langerin of the U.S.A. towed for a quarter of an hour! The Russians still used their circling tow, but were able to work their way downwind of the launching box. They were invariably accompanied by a team member in walky-talkie contact with an upwind thermster! Even with all this 'applied science', Ehtenkov failed to max in the sixth round — to leave Pavel Dvorak and Niilo Munnukka as the only ones able to force the contest to a flyoff. It was obvious that Tony Young had

It was obvious that Tony Young had a good chance to place. As he liked (or was forced) to find his own lift via lengthy tows upwind, he was accompanied by Jack North who surveyed the ground for likely pitfalls.

The seventh round started with a good big thermal right at the start, and very little afterwards. About 10 models

The seventh round started with a good big thermal right at the start, and very little afterwards. About 10 models got away in the early mass launch—whilst many more were simply not ready in time. There was nearly no need for a flyoff. Dvorak flew on his own', started well, and then fell through the lift! Despite the binoculars there was a slight discrepancy between the two timers' watches with one under and the other over the max. There was quite a discussion before the card was filled in with the crucial max. Incidentally, there were separate flight cards for each round, with a carbon copy being provided for the Team Manager or flier!

The British teams had a rather mixed final round. Etton Drew had his model fall-off the line prematurely for a submax flight. Tony got the max he needed to place fourth, just behind Herbert Chmelik (of Austria) who dropped two flights to Tony's one. Mike Woodhouse towed for 20 minutes, finally being forced to release by the round close becoming imminent.

becoming imminent.

As already described the final power flyoff took place immediately after the end of the seventh A/2 round. The power event decider was then followed by the glider flyoff. This was announced as the usual 4 minute period. Although Munnukka trooped out to fly in leisurely fashion, Dvorak was still getting ready in the Czech tent – and

The two lined up side by side as the flyoff beginning was signalled – and stood watching each other for over 3 minutes. Then Dvorak started to tow and was immediately followed by Munnukka. They both towed up and released without hesitation, with Munnukka fractionally the sooner. The real difference came in their manner of release. Whilst the Finn floated his model off in the textbook fashion, Dvorak managed a catapult launch. This was not very energetic but it did gain a few valuable feet altitude. The two models drifted down the runway circling together for what was obviously going to be a very tight finish. There was a bit of coat waving under the models at one stage – but this stopped as the models got lower. The Finnish model touched down first, leaving Dvorak to become the winner by a mere 12 seconds. Without his gain of height off the tow, the result could have been almost a dead heat.

Dvorak's model was quite high aspect ratio with very long and highly tapered tips. The wings were mounted by a tongue plugging into slots in ply root ribs, and were slik covered. The fin area appeared very small, partly through its disposition partly above and partly below the fuselage. I understand that both Model Airplane News and Free-Flight News are likely to print 3 views. Mannukka flew two models in the contest. Both were straight dihedralled, 'T' tail designs, again with silk covered wings! He used a constant chord model, with a very narrow pylon wing mount, and fuse D/T for the early morning flights and the flyoff. In the middle of the contest he flew a taper tip model, without pylon, but with D/T time.

a constant chord model, with a very narrow pylon wing mount, and fuse D/T for the early morning flights and the flyoff. In the middle of the contest he flew a taper tip model, without pylon, but with D/T timer.

Somehow the Team event seemed well and truly overshadowed by the individual situation. This is not intended to detract from Austria's achievement in topping the list. They managed individual placings of 3rd, 8th, and 25th to beat the Russians by a scant 9 seconds. Third place went to the U.S.A., closely followed by the Italians and Czechs.

On balance the event worked out

On balance the event worked out well. It was not a still air event despite the times at which it was flown. Nevertheless there was a need for performance as well as lift detection. That conditions were far from easy is reflected by the small fly-off. This made for a good mixture and a good contest.





The North Korean team were most impressive, indeed quite a threat, with their predominently hardwood constructed models. Here Li Sung Chan winds his D/T timer.

#### WAKEFIELD

The third and last flying day of the Championships saw the Wakefield event – or class F1B as some would like to call it. Once again the weather was to behave itself – and run true to forecast.

At the start of the event, dead on 4.30 a.m. it was cool, calm and with a clear sky overhead – with cloud evident on the horizon. Test flying had demonstrated that there was already the weak lift that had almost come to be expected. The officials had banned the erection of lofty thermal detectors of any sort (thermistor, bubble or streamer) inside the launching box as these could prove a serious obstacle whilst launching. Even North's portable 'bubble machine' had to remain upwind of the box – to his evident displeasure.

It was very soon apparent that the conditions were no problem to the sort of Wakefields possessed by most entrants. Performance is clearly well above the max—at least in the prevailing weather. There were numerous models with V.I.T. and auto-rudder, mostly operated by Seelig timers, with but a handful of torque-operated examples. Most models with timer operated tails exhibited a slightly uneasy transition stage between the actual power burst and the remainder of the climb. There were also lots of machined prop assemblies and aluminium tube front fuselages in evidence. Why the latter is so extensively preferred compared with the 'conventional' winding tube is not apparent. Certainly there can still be trouble when winding inside the fuselage proper, as unfortunately demonstrated by Dieter Siebenmann (Switzerland) when a broken motor shot through the motor tube and wrecked the tail boom and tailplane.

There were maxs aplenty in the first and subsequent rounds. Like the power event, the contest was really a 'game of no mistakes'. As the morning progressed the conditions became first

British A/2 team. At left Elton Drew the reigning (now sadly 'ex'!) World Champion, Mike Woodhouse and Tony Young (right) who placed fourth, our best individual performance of the meeting.

I.	P. Dvorak	Czechoslovakia							1,260	+ 168
2.	N. Munnukka	Finland	100	100	100	170	100		1,260	+ 156
3.	H. Chmelik A. G. Young	Austria G. Britain	180	180	180	179	180	176	180	1,255
5.	H. L. Langevin	U.S.A.	175	180	170	180	180	180	180	1,245
6.	C. Varetto	Italy	180	180	180	180	168	180	175	1,243
7. 8.	Ehtenkov	U.S.S.R. Austria	180	180	180	180	180	142	180	1,222
9.	H. Kumhofer D. Ducklaus	E. Germany	161	180	180	180	180	160	173	1,214
10.	K. Abadjiev	Bulgaria	180	180	131	180	180	180	180	1,211
11.	A. Bucher	Switzerland	180	127	180	179	180	175	180	1,201
11.	Markov H. Motsch	U.S.S.R. W. Germany	180	180	180	180	121	180	180	1,201
14.	F. Gaensli	Switzerland	180	180	137	180	180	180	151	1,188
15.	Lepp	U.S.S.R.	177	164	180	139	180	180	167	1,187
16.	P. Soave D. L. Bronco	U.S.A.	180	180	180	105	180	180	180	1,185
18.	I. Horesii	Czechoslovakia	180	180	155	180	116	180	180	1,171
19.	L. Larsson	Sweden	180	147	140	180	180	178	164	1,169
19.	G. Arghir C. Martensson	Rumania Sweden	180	180	147	180	180	151	151	1,169
22.	J. Schreiner	E. Germany	180	125	180	180	180	180	138	1,163
22.	R. Sung Chan	N. Korea	152	180	180	180	180	111	180	1,163
24.	L. F. Polansky	U.S.A.	180	174	152	180	154	138	180	1,158
25.	R. Hobinger H. Sun Hen	Austria N. Korea	180	180	140	180	180	124	165	1,149
27.	J. Sillgren	Finland	180	180	113	179	180	131	178	1,141
28.	T. Martin	N. Zealand	174	174	119	180	180	151	157	1,135
29. 29.	A. Cosma E. P. Drew	G. Britain	180	180	155 175	180	76 180	180	180	1,131
31.	F. Bjerre	Denmark	180	141	167	180	180	161	109	1,118
32.	A. Eldik	Netherlands	180	165	141	180	89	180	180	1,115
33. 33.	V. Morizo	Japan	176	142	142	180	180	112	180	1,112
35.	G. Anestev J. Michalek	Bulgaria Czechoslovakia	180	180	106	180	180	132	153	1,111
36.	K. Sin Duk	N. Korea	180	180	121	111	180	157	180	1,109
37.	A. Coppock	Australia	149	180	136	170	123	180	169	1,107
38. 39.	M. Hirschel J. Ensoll	E. Germany N. Zealand	175	180	119	166	133	180	151	1,104
40.	M. Van Dijk	Netherlands	167	180	147	180	180	135	112	1,101
41.	H. Schmidt	W. Germany	180	180	127	180	111	180	139	1,097
42. 43.	W. R. Thompson M. J. Woodhouse	Canada G Britain	166	156	172	180	180 92	125	164	1,085
44.	E. Romero	Argentina	169	180	126	180	97	180	146	1,078
45.	R. Katajamaki	Finland	180	179	130	180	116	145	142	1,072
46:	E. Huge J. Lopez	Belgium	180	154	106	158	159 75	139	161	1,057
47.	J. Guffens	Spain Belgium	140	146	137	180	143	163	147	1,056
49.	A. De Mello	Canada	180	104	135	95	180	180	180	1,054
50. 51.	S. Kosorus K. Andersson	Jugoslavia Sweden	180 87	164	154	98	180	96	180	1,052
52.	Z. Orlio	Jugoslavia	164	180	132	180	96	115	180	1,047
52.	A. Leeuwangh	Netherlands	124	167	141	106	180	180	149	1,047
54. 55.	M. Thies J-M. Berthe	Luxembourg	137	160	142	180	169	116	138	1,042
56.	Y. Fishler	France Israel	154	160	117	180	180	109	137	1,037
57.	D. Vishnitzer	Israel	160	152	139	180	91	129	172	1,023
57.	S. Popov	Bulgaria	180	120	180	180	126	95	142	1,023
59. 60.	U. Fernandes Polo A. Gastelon	Cuba Spain	151	115	121	180	180	128	138	1,013
60.	G. Mackenzie	Canada	81	95	162	175	180	180	129	1,002
62.	O. Torgersen	Norway	180	180	97	180	131	105	122	99.7
63. 64.	G. Hertzberg G. Mussig	Israel W. Germany	171	129	145	180	180	103	180	988
65.	L. M. C. Valdez	Cuba	152	112	134	180	123	106	180	987
66.	M. Torres	Spain	157	129	50	180	180	114	176	986 951
67. 68.	K. Appleby L. Bernisson	S. Africa France	151	152	108	180	72 180	162	108	945
69.	S. Hesthagen	Norway	180	141	156	180	71	75	141	944
70.	A. Bailly	France	57	180	116	180	180	180	45	938
71. 72.	P. Lagen J. Calefate	N. Zealand S. Africa	145	180 150	124	112	90 24	124	149	924 921
73.	P. Lommer	Luxembourg	121	51	120	180	180	117	143	912
74.	P. Grunnet	Denmark	157	177	63	180	103 74	82	139	901
	N. Mertes I. Poots	Luxembourg Ireland	180	180 145	143	136	87	63	120	896 883
77.	S. G-Fredriksen	Denmark	172	131	140	59	83	116	180	881
78.		Egypt	127	110	99	180	120	120	115	871
79. 80.	E. Mikulcic	Jugoslavia Switzerland	144	50 165	131	180	73 68	93	154	825 809
81.	W. Haller L. Godwin	S. Africa	145	101	109	180	134	55	80	804
82.	P. Nitschke	Australia	138	154	104	117	80	96	113	802
	S. Penate Marsella	Cuba Ireland	180 84	35 126	97 95	158	107	99	129	747 746
84. 85.		Ireland	146	140	22	129	31	150	116	734
86.	H. Mena Tadros	Egypt	131	117	102	40	0	161	146	697
87.	L. O'Reilly	Australia	149	98	107	61	58 58	85 46	111	675 668
89.	A. Herzog M. Fathy A. Amer	Belgium Egypt	110	80	132 83	180	2	50	107	612

### GLIDER

CLASS F.I.A.

Saturday, 3rd July

#### **Team Results**

1.	Austria	3,619
2.	U.S.S.R.	3,610
2. 3. 4. 5. 6. 7. 8.	U.S.A.	3,577
4.	Italy	3,559
5.	Czechoslovakia	3,542
6.	E. Germany	3,481
7.	Finland	3,473
8.	G. Britain	3,462
9.	N. Korea	3,421
10.	Sweden	3,385
11.	Bulgaria	3,346
12.	W. Germany	3,280
13.	Netherlands	3,263
14.	Switzerland	3,198
15.	N. Zealand	3,162
16.	Canada	3,141
17.	Israel	3,050
18.	Spain	3,044
19.	Jugoslavia	2,924
20.	France	2,921
21.	Denmark	2,900
22.	Luxembourg	2,850
23.	Belgium	2,781
24.	Cuba	2,747
25.	S. Africa	2,676
26.	Australia	2,584
27.	Ireland	2,363
28.	Egypt	2,180
29.	Norway	1,939
30.	Rumania	1,169
31.	Japan	1,112
32.	Argentina	1,078
The Paris of the Land		HA HARLEST AND THE RESIDENCE OF THE RESI

Dvorak readies his A/2 for the fly-off, in which he managed a successful 'catapult' launch which gained a little extra altitude, sufficient to give him a winning total. Wing section is 'own designed' with a slightly flapped T.E.





warm and then distinctly hot. I personally was amazed at the lack of protection afforded the models, that were left lying about on the grass between flights. Only three teams (Czechoslovakia, North Korea, and New Zealand) put up tents to shelter their models. It is interesting to remember that the N.Z. proxy fliers were British! The British flights started disappointingly for Bruce Rowe when he failed to max by a mere three seconds. Thereafter he and the others max'd all morning. At the end of the first five rounds we tied with the Italians for top team

we tied with the Italians for top team position. But it was going to be a case

of many a slip ... Like the two previous days the lift increased (and holes appeared) as it got hotter and breezier. The fifth Wakefield round was apparently the most field round was apparently the most difficult, as all three teams (North Korea, U.S.A. and Yugoslavia) with 12 initial maxs then dropped scores. By this stage the green track suit-clad North Koreans had been recognised to be a real contest threat—despite it being their first appearance at a World Championship. They obviously were far from new to the game, however, as their models and attitude revealed. Presumably they gained experience. sumably they gained experience at Soviet Bloc events, as their models displayed a certain amount of Russian influence. The models were

teresting from the amount of hardwood

teresting from the amount of hardwood utilised in their construction.

The morning's flying had a second intermission—a quarter of an hour break between the fourth and fifth rounds—whilst the launching box was rotated. The wind had veered onto the woods in its customary fashion, but even further round than on the previous days. This had led to the box having its length along the direction of drift during the fourth round, and encouraging tactical flying, Whilst rearranging the box complied with the F.A.I.'s stipulations for contest procedure, a complete re-location was really needed. A lot more airfield could have been used to advantage.

A lot more arrived used to advantage, inevitably there were incidents that only happen at inopportune moments only happen at inopportune. The sole only happen at inopportune moments at important competitions. The sole Spaniard C. Merserburger, had the misfortune to launch just as a parked 'spotter plane' started its engine just upwind of the flying area. This produced turbulence (and dust) to an extent severe enough to shift the Spaniard's tailplane in mid air – leading to some indescribable manoeuvres and a 30 second fifth round score. Rather luckier was American Bob White a round earlier. He had his motor peg come out letting the motor fly forward and causing the model to dive in amongst the parked cars upwind. amongst the parked cars upwind. Miraculously only the prop blades were damaged. New blades were substituted

damaged. New blades were substituted and the same model used again!

The weather was still hot when the contest was resumed at 6 o'clock in the evening. Bright sun with but a few white clouds gave the promise of lift to be found. The wind was still blowing straight on to the woods – but dropped as the evening cooled.

as the evening cooled.
Out of the 17 fliers with five maxs apiece at the end of the morning only five failed to qualify for the flyoff. Disappointingly those five included Laurie appointingly those five included Laurie Barr and Bryan Spooner. They both did under three minutes in both sixth and seventh rounds. Laurie had been suffering warp trouble during the contest, but found that twisting the wing prior to launch provided a satisfactory, it temporary, remedy. His sixth flight started tight, but improved alterwards only to fall out of lift on the glide. His final flight simply lacked lift. Bryan

Left, East German Joachim Loffler pre pares to wind - missed Wakefield fly-off by just five seconds. At right, Cuban Wakefield of Manuel Menendez Rico (right). Model held by Fernadez Polo. Vilim Kmoch of Yugoslavia (left) took two near 'identical' models to the fly-off, in which he placed second, just six seconds behind Klima.

had a mysterious stalled glide after getting a good height on his sixth flight. The model was perfectly satisfactory on test both before and after He changed models (to his Trials one), only to launch left of wind, and loop. The air was good but not good enough for a max. (The British team had flown almost completely on the indications of the soap bubbles, and had remained at the upwind end of the box' during the evening. In combox during the evening. In com-parison almost everyone else had re-treated to the downwind end where comwhere they could attempt to fly tactically).

they could attempt to fly tactically). Whilst sub-max flights were disheartening to our hopes, there was worse to come. Bruce Rowe was among those subjected to a 'spotcheck' for weight prior to the sixth round. Like three others he was found slightly underweight and provided with ballast to compensate. His model continued to belie its old-fashioned appearance with another max. Those underweight were recalled in the final ground and scrutinised by the FAL livre

underweight were recalled in the final round and scrutinised by the FAI Jury as well as by the processing officials. Upon removing the ballast that had been so recently added, Bruce's model and that of the best performing Cuban were adjudged to be over 2 grams underweight even assuming the rubber weighed exactly 40 grams. The other two were less than 1/10 gram short. Models were checked on two different laboratory scales. Even these were not considered accurate to 1/10 gram when weighing a complete model. The Jury concluded that Bruce and the Cuban were unquestionably underweight and would be disqualified from the whole contest - whilst the other two would be let go. It is appropriate to mention be let go. It is appropriate to mention that the contest organisers were far from happy at having to disqualify competitors – but were also faced with enforcing the regulations. They also went out of their way to ensure that I was given the "full story!"

Bruce's troubles seem attributed to his model drying out during the very hot weather experienced throughout the contest period. Even so, 2 grams

hot weather experienced throughout the contest period. Even so, 2 grams is more than anyone might have anticipated. Bruce himself took the affair much more calmly than the rest of the British contingent. Perhaps it was as well that he had dropped those few seconds in the first round as he was already out of the flyoff. Even a seventh round max plus the rest of his score would not have given us a team place. would not have given us a team place.





It is relevant to recall that Wake-fields had been weighed without motors during the pre-contest processing. A model dead on weight at 190 grams structure would require exactly 40 grams of rubber to meet the specification (which is based on 230 grams a.u.w.) A certain amount of safety margin is obviously needed. This is unlikely to be overlooked in the future, but it was a hard way to learn. Incidentally, Wakefield motors were weighed the day before flying, impounded and held by the timekeepers from whom they were obtained as required. The heaviest motor offered to the processors weighed 46 grams! the processors weighed 46 grams!

The controversy just described caused quite a diversion from the contest proper - which had continued uninterproper – which had continued uninter-rupted! A round dozen of the Wake-field fliers managed a seven max total to qualify for a flyoff. The Danes, West Germans and the North Koreans had two representatives apiece. It was an-nounced that the 'first' (and as it proved, only) flyoff would be held com-mencing at 8.10 p.m. This seemed very close to the finish of the round but didn't seem to embarrass anyone.

Conditions for the flyoff were coolish with a low sun. The sky was blue overhead – but had masses of cloud downwind. The start of the four minutes was signalled – and practically average. wind. The start of the four minutes was signalled - and practically everyone started to wind. I think that at least one competitor had started to wind beforehand - a perfectly legitimate procedure with obvious advantages. I was also told that some timekeepers would not allow their charges to do this, and even made one contestant unwind what he had put on! had put on!

First away was Josef Klima, a move that may well have given him the slight edge that was all he needed for first place. His model certainly climbed well, and all but managed the four minute max. Other models followed in quick succession. Reiner Hofsass continued to fly his very high A/R solid wing model, and, but for an indifferent launch that produced a flat region in the initial climb, might have been placed even higher. higher.



At right, Dupuis' model held in its very neatly made self-wind stand. Large fin area extends above and below tailplane.

Below right, Monique Jean poses with Emile Gouverne's Wakefield, Judging by the shadows in the background several other camera eral other camera operators appreci-ated her photogenic properties!



Bob White launched to excited cries of 'Go-go' from several Americans. Kjeld Kongsberg managed three wind-ups in Kongsberg managed three wind-ups in the four minute period! He broke the first motor in his best model. Whilst his helpers sorted out the pieces and replaced the motor, he then wound up his reserve model. This was then held ready by a helper, whilst he rewound the first model. The motor held and he launched it with but seconds to spare. The model and Very light went up almost together. Klaus Leissner was not quite so quick at coning with a motor break and launched coping with a motor break and launched just a second or two after the round ended. (It seems that the start of the 'finish' signal is the cut-off point.) As he only did 2½ to 3 minutes his final place was unaffected.

place was unaffected.
Final scores were really very close
with Klima top with 3:52 and the tenth
man (Christian Schwartzbach of propeller theory fame) clearing three minutes, followed by Dupois only a few
seconds under Quite a remarkable show
of consistency especially when compared with power!

pared with power!
For an event crowded with models displaying complex construction and gadgetry the winner was remarkably straightforward. I believe he flew the model depicted in Free Flight News, issue 5/71, for the seven maxs and changed to a new model for the flyoff.

Left, Bryan Spooner launches his model which was unfortunate to drop short of maxs in the last two rounds.

Below, second British Wakefield team member (and best placed at 27th) Laurie Barr, prepares to give a javelinlike launch.





Both are tubular fuselage designs, taper-tip wings, pylon mounted. Klima upset the officials by removing his rubber motor after the flyoff but before the

ber motor after the flyoff but before the model was impounded for post-contest cheeking. In consequence it was check weighed with every motor that he had submitted, and only just passed the weight check on the lightest!

Runner-up Vilim Kmoch of Yugoslavia, is an old hand at Wakefield and has been in the final flyoff before (1965). He took out a pair of very similar square-tipped circular fuselage models to the flyoff Rob White's models did not really tipped circular fuselage models to the flyoff. Bob White's models did not really follow modern trends with their high pylons and twin fins – but flew well enough for third place. Reiner Hofsass' high aspect ratio model looked like the one he flew at Wiener Neustadt two years ago, and which was described with a contractively than the contractively the contractive that the contractive the contractive that the contracti quite extensively then.

The Wakefield Team event had quite

The Wakefield Team event had quite a clear cut win for the Danes who only missed a single max out of their 21 flights. France, Russia and East Germany filled the next three places with very little separation in scores. The remarkable consistency of the Russians in placing second or third in all three team events should not an unnoticed.

The unusual contest hours also meant The unusual contest hours also meant an unusual arrangement for the traditional prizegiving dinner. This was held in the evening of the day following the Wakefield event. The celebrations were preceded by an afternoon's sightseeing via a coach ride to and round Gothenburg and a boat trip up the archipelago. Most of the modellers looked much too tired to really appreciate their role of tired to really appreciate their role of

1. J. Klima 2. V. Kmoch 3. R. P. White 4. R. Hofsass 5. A. Lonardi 6. K. In Sik 7. K. Kongsberg 8. K. Dong Sik	Czechoslovakia Yugoslavia U.S.A. W. Germany Italy N. Korea Denmark N. Korea U.S.S. R							1,260 + 1,260 + 1,260 + 1,260 + 1,260 + 1,260 + 1,260 + 1,260 +	232 226 214 210 199 187 186 186		(EFIE	LD
6. K. In Sik 7. K. Kongsberg 8. K. Dong Sik 9. Jourov 10. C. Schwartzbach 11. L. Dupuis 12. K. Leissner 13. J. Loffler 14. Melentiev 15. H. Martin 16. P. Lagan 17. E. Nienstaedt 18. A. Oschatz 19. A. Landeau 19. A. Hakansson 21. D. Dopof 22. E. Gouverne 23. W. Dohne 24. F. Geansli 24. H. P. Benedini 26. P. Gervasi 27. L. G. Barr 28. K. Jusufbasic 29. Zilberg 30. H. Zachhalmer 31. M. M. Rico 32. D. Siebenmann 33. J. W. Allen 34. J. B. Spooner 35. F. L. Parmenter 36. O. Yasuo 37. A. Morrison 38. D. Chintz 41. J. Zolcer 42. E. Oskamp 43. M. Thomas 44. J. Dobelmann 45. J. D. Van Rij 46. R. Licen 47. R. Johansson 48. E. Reitterer 48. H. Schweinsberg 50. J. Kuchta 51. U. Schaller 52. G. McGlashan 53. S. Stamenof 54. M. Goldberg 55. N. Alujevic 56. R. Emslie 56. O. Nerud	N. Korea Denmark	180 180 180 180 180 180 180 180 180 180	180 180 180 180 180 181 180 181 180 180	180 180 180 180 180 180 180 180 180 180	180 180 180 180 180 180 180 180 180 180	180 172 180 180 180 180 180 180 180 180 180 180	175 180 180 180 180 180 180 180 180 180 180	1,260 +   1,26	187 186 184 182 174 0 1,255 1,252 1,249 1,247 1,242 1,240 1,238 1,237 1,238 1,237 1,220 1,210 1,290 1,211 1,207 1,204 1,211 1,207 1,204 1,176 1,176 1,176 1,175 1,162 1,176 1,175 1,163 1,179 1,176 1,175 1,163 1,179 1,176 1,175 1,163 1,179 1,176 1,175 1,163 1,179 1,176 1,175 1,163 1,179 1,176 1,175 1,163 1,179 1,176 1,175 1,163 1,179 1,176 1,175 1,163 1,179 1,176 1,175 1,163 1,179 1,176 1,175 1,163 1,179 1,176 1,	Team Res  1. De 2. Fr: 3. U. 4. E. 5. N. 6. Y. 7. U. 8. Ita	sults  mmark since	3,762 3,723 3,773 3,696 3,699 3,699 3,630 3,683 3,583 3,552 3,478
58. P. Aalto 59. A. Douglas 60. V. Dan 61. M. Segrave 62. L. Stajnov 63. P. Pasanen 64. A. Edwards 65. A. R. Perez 66. Szabo 67. J. Calefato 68. K. Appleby 69. H. Marttila 70. P. Hearn 71. C. Merseburger	Finland N. Zealand Rumania Canada Bulgaria Finland Australia Cuba Rumania S. Africa S. Africa Finland S. Africa S. Africa	157 153 134 180 136 43 176 138 164 120 112 123 53 121	163 166 180 180 169 152 149 141 140 125 156 80 135	149 100 180 139 174 119 144 139 153 76 60 95 70 117	180 180 122 61 180 180 180 180 97 65 85 112	180 126 180 177 76 180 100 74 104 180 61 135 180 34	105 180 177 151 120 142 112 180 97 83 105	122 147 65 129 145 161 118 123 103 92 96 45 106 0	1,056 1,052 1,038 1,017 1,011 994 982 942 920 879 731 716 657 624	15. Sw 16. Bu 17. Ca 18. Rt 19. Fii 20. G 21. S. 22. Ct 23. Au 24. Aa 25. Ja 26. Ist	etherlands veden Ilgaria Inada Inada Iland Britain Africa Ilstralia Ilstrali	3,476 3,451 3,339 3,288 3,134 2,766 2,414 2,267 2,146 2,042 1,220 1,183 1,087 624

The dinner and presentation were held in a restaurant-cum-ballroom adjacent to the main amusement park of Gotherburg. The prizegiving was dramatised with bugle blasts, but speeches were commendably short – with many in English. But it is best not to dwell upon the actual meal – which compared unfavourably with those served at Save, whilst

actual meal – which compared unfavourably with those served at Säve, whilst being several times the price.

'Goodbyes' came the next morning, just as the weather brokel It was cool and windy, and underlined just how lucky – or clever – were the Swedes to get the ideal weather on which they had relied for the success of the Championships. To run a present-day F/F Championship is a mammoth undertaking – and this year's organisers did it well.

## **NEXT MONTH**

John O'Donnell reviews the technical developments in contest model design