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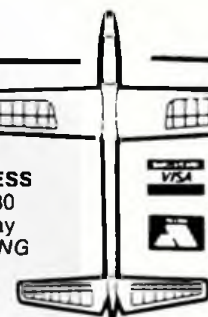
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AERO

MODELLER



p.563



p.566

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Cover: Full force as Dick Johnson launches for Great Britain at the World Free Flight Championships in Argentina. Full colour report starts on P.566.

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HANGAR DOORS



Above: Moths at Old Warden! Vintage Weekend saw the Saturday departure of nearly 70 of the type on the Famous Grouse Moth Rally. Report next time!
Left: Neat Slow Open Power job by Robin Beckwith seen at the Nats and correctly identified here (unlike in our Nats report)...

Eurochamps success

Warmest congratulations to Bill Draper, the new C/L Aerobatics Eurochamp, who mastered often unpleasant conditions at the Three Sisters site at Wigan in July to beat the rest of Europe's best. Solid support from the other areas of circulating activity reinforces the news that C/L is enjoying an impressive resurgence of interest which we mean to mirror in this magazine. Well done, especially, to Peter Halman (third in F2A) backed by Paul Eisner and Dick McGladdery, enthusiasts who gave the UK Team second place overall after very close competition; and Tony Eifflaender and Barry Robinson's 4th and 5th in Aerobatics gave us Team victory in that class.

Smith/Brown's eventual 9th place in F2C is deceptive; they dead-heated with Bulgaria's Bodurkov/Popov in the semi-finals - and went out under the 'count-back rule'. Nevertheless, third Team place was a worthwhile endeavour. 'Whacker' Whillance splendidly captured second F2D spot with only one loss on the way to the final, where he was unluckily disqualified on a technicality after a line tangle. Beliaev, USSR, charged straight to top spot with eight victories. The Russian models were incredible...

Full report next month. Key results below:

F2A

1 Kalmykov	USSR	297.19kph
2 Pitskalev	USSR	296.62kph
3 P Halman	UK	295.73kph
7 P Eisner	UK	282.94kph
9 D McGladdery	UK	279.43kph

Team

- 1 USSR
- 2 UK
- 3 Hungary

F2B

		Total
1 Draper	UK	5795
2 Compostella	Italy	5750
3 Kolesnikov	USSR	5737
4 Eifflaender	UK	5731
5 Robinson	UK	5705

Team

- 1 UK
- 2 USSR
- 3 Netherlands

F2C

1 Barkov/Suraev	USSR	7:13
2 Voghera/Rossi	Italy	8:00
3 Bodurkov/Popov	Bulgaria	ret
6 Sladdin/Gardner	Best heat	3:34.4
7 Smith/Brown	Semi time	3:30.8
10 Langworth/Campbell	Best heat	3:38.8

Team

- 1 Italy
- 2 USSR
- 3 UK

F2D

1 Beliaev	USSR
2 Whillance	UK
3 Faisov	USSR
6- John James	UK
6- Mervyn Jones	UK

Team

- 1 USSR
- 2 UK
- 3 Netherlands

And a Brit World Champ!

Late news is that we have a new World Champion - Nick Wright grabbed victory in the F3B Champs at Melun-Villaroche. So far ahead was he after four flights his final round was a mere formality... Well done again! UK



The passing of a pioneer - Juste Van Hattum as many will remember him, with slide rule at processing. Alex Imrie's brief appreciation on these pages will be augmented by a full-length feature soon.

Team result was a worthy fourth place.

Argentine adventure

Our bumper coverage of the F/F World Championships in this issue means that one or two regular items have been postponed for a month to make space. Lots to anticipate already! And we hope you like our continuing full-cover coverage of such important events...

Twice the speed of sound...

This is your last chance to win a supersonic flight in Concorde. Details of our subscription competition appear on p580. Worth reinforcing is the point that

annual subscription costs no more than monthly purchase at the newsagent - and Aeromodeller will plonk onto the doormat without any effort on your part. Fancy champagne on the world's only supersonic airliner? Have a go!

Juste van Hattum

Aeromodelling lost a true pioneer with the passing of Juste van Hattum on 28th July at the age of 82 years. An indefatigable worker for the furtherance of the hobby, his dedication to the encouragement of beginners is shown by the high percentage of 'ab initio' rubber and glider models that an examination of his list of some 150 designs



reveals. He was one of the first SMAE overseas members (membership No. 108) and visited this country frequently in the 1920s to attend flying meetings, eventually residing here for a period when he was attending the de Havilland Technical School in the early 'thirties'. He was soon an SMAE Council Member and served as Competition Secretary for a time. In the first Wakefield Competition held at Hendon on 22nd September 1928, van Hattum's entry represented Holland and thus provided the required ingredient that made the event International. After he returned to Holland he took up an appointment as the Technical Officer for Aeromodelling with the Royal Netherlands Aero Club and was often in this country in the years after the war, usually as the leader of the Dutch contingent in

team events or as Holland's FAI model representative. He was a regular contributor to many model periodicals both in this country and abroad and wrote a number of books on the subject. A full appreciation of his work that spanned some 70 years, and a look at his many contributions to the hobby will be given in a future issue of *Aeromodeller*.

Rule changes for 1990?

Within a few days of this magazine appearing the BMFA will sit to discuss rule changes for the next year. All disciplines have submitted their proposals to council; Dave Hipperson tells us details of the Free Flight Technical Committee's submissions - and wonders if you share his anxiety...

'It is proposed that the Builder of the Model Rule be scrapped. To inhibit model-swapping, all components will have to be marked with a complex identification number. All models you wish to use on a given day will have to be recorded on your flight card before the first flight... this would preclude you from making a decision as to which model you choose at flyoff time.

'It is also suggested that all contests start at 9am and close at 6pm, or two hours before sunset, whichever is earlier. All centralised contests should be flown in rounds (so you will have to be there right at the start) and run from a launch line. How this will be moved about when necessary, particularly during long

Open rounds, is unclear. Presumably contests can be held up by the CD - and for as long as he likes. The next step is cancellation when it is "Too windy".

'Another request is that more models be allowed in FAI events. Three models in five-round contests, four in seven-round events - and that excludes flyoffs. Presumably another model is allowed for that, and all will have to be registered before flying starts...

'The trials may be spread over all domestic FAI events with one mandatory event, contested by all interested in a team place, to break possible ties. A competitor's best two performances from the other events would decide his position. Scoring to be as per World Cup system, taking the top fourteen places into account. One World Cup event could be substituted for one of the non-mandatory domestic contests, as the flyer's choice. Certainly a move towards encouraging participation on the Continent, but as the variable max and 'hold for weather' clauses are still being proposed we will not know if comps are going ahead - and much of the point of 'throw-away' events will be lost.

'Other suggestions? Vintage Glider towlines to be increased to 250ft, with usual pull test restrictions; and A/1 to be brought into line with the new 6.35oz (180gm) limit. To bring 1/2A power into line with the FAI's F1J class it is proposed that the 1cc maximum capacity limit be adopted (the rather theoretical) minimum weight of 160gm applied. Lastlu, Junior Champs scoring at the Nationals could be brought into line with the Senior system, taking the top six into account and reducing points pro-rata if fewer compete.

'In this short precis are some very serious and far-reaching changes and many potential repercussions. If you wish to



Nifty logo, and the Museum's pretty good, too. Curator is Scale enthusiast Lindsey Smith so modellers are assured of a warm welcome.

have a say in the matter, as many of you may when you realise the full implications, your path is to your local Area delegate, either direct or through club your club representative. This is not the time to discuss with the Committee as its job is done - nor to write letters of complaint. It is the time to act - and fast, if you don't competitive F/F aeromodelling to change out of all recognition. Only the BMFA Council can decide which of these ideas becomes law, and you must let it know how you feel. There is very little time, for the meeting is on 16th September!

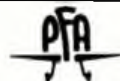
Strong words indeed from our Free Flight correspondent. Dave clearly feels worried by the outcome of some of the F/F rule change proposals; perhaps you do too?

More at the ME!

Right you lot! Here's your reminder of the '90 ME Exhibition at Ally Pally. We want even more flying models on the competition stand this time - don't forget to enter and get a free pass and a ticket!



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MODEL-NEWS

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*Jessica Nash
proudly holds aloft
her Nationals
Ladies' Cup entry
after achieving a
string of maxes.*

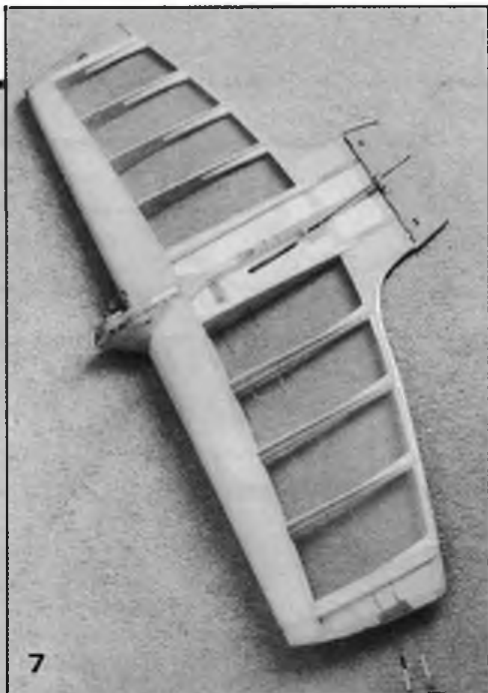


*Charlie Newman captured this
evocative shot of Keith Ridley's twin-
rubber Mosquito climbing away after
launch.*

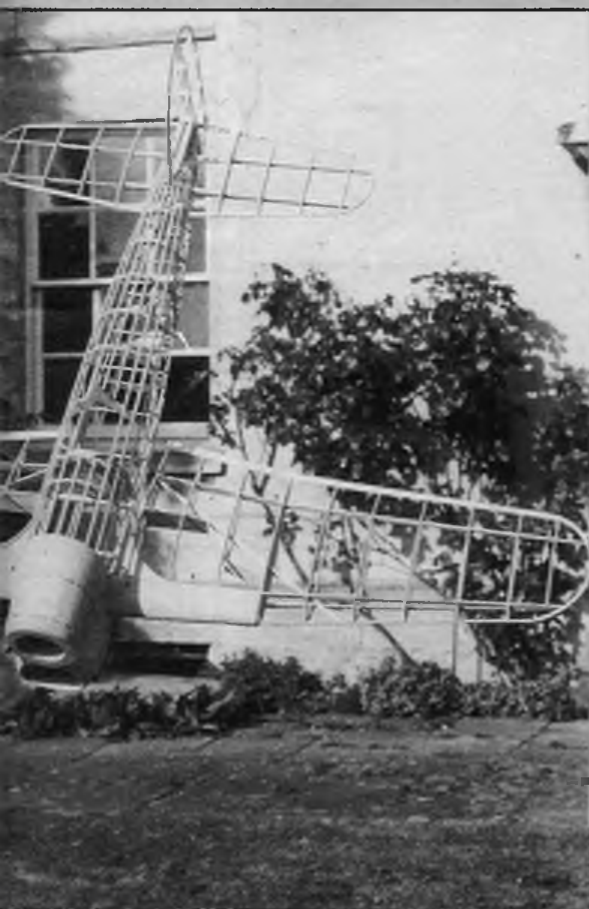




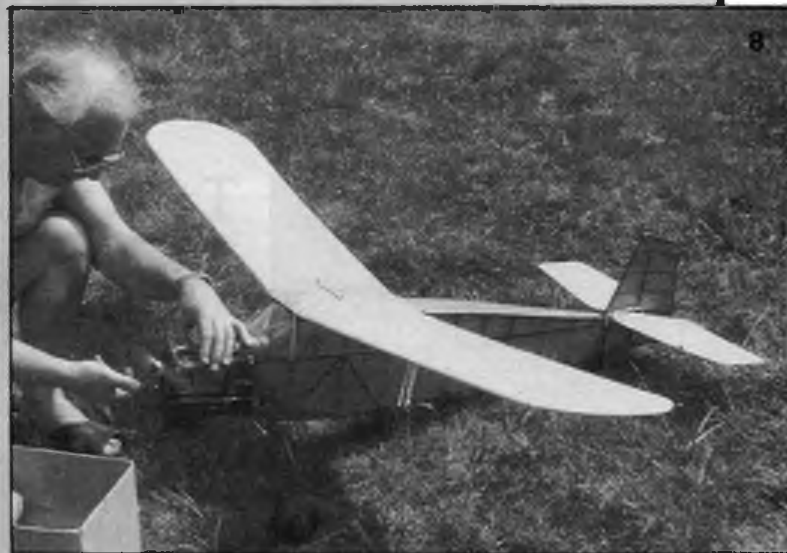
1: Harold Spink's interpretation of the Claus Maikis APS Winglet was prompted by the sight of a second-hand PAW 249 in the window of a local pet shop...



7



3: Nathan Sturman hails from China with his neatly-finished Monocoupe in red and white. 4: One of four(!) eleven-foot R/C DH 88s built by Messrs. Rawle, Crapp, Boddington and Toyer; fine flyers all - but two Comets lost at La Ferte Alais display thanks to interference... 5: Airframe of Richard Falconer's Rupert Moore Typhoon held by wife Virginia 'Drawing appalling - had to redraw the lot!' says Richard! The perils of the past... 6: 'Litho plate on balsa' fuselage distinguishes Barry Sims' 32in Tekfire semi-scale rubber craft. Plans to come!



8



9



10

7: Frank Smart's latest 1/2A Combat wing features ultra-light, super tough construction; awaits PAW 149 motor. 8: At the Nats, Mario Gandolphi fires up his Premier Lion for more sport circuits in the sunshine. 9: From Czechoslovakia, Antonin Alfery sends this shot of Peter Kolar with his Modela-powered Sopwith Triplane. 10: Seen at Large Model Day, Jim Shelley refuels huge semi-scale Auster before yet another banner-towing exercise.

GOLDEN MOMENTS

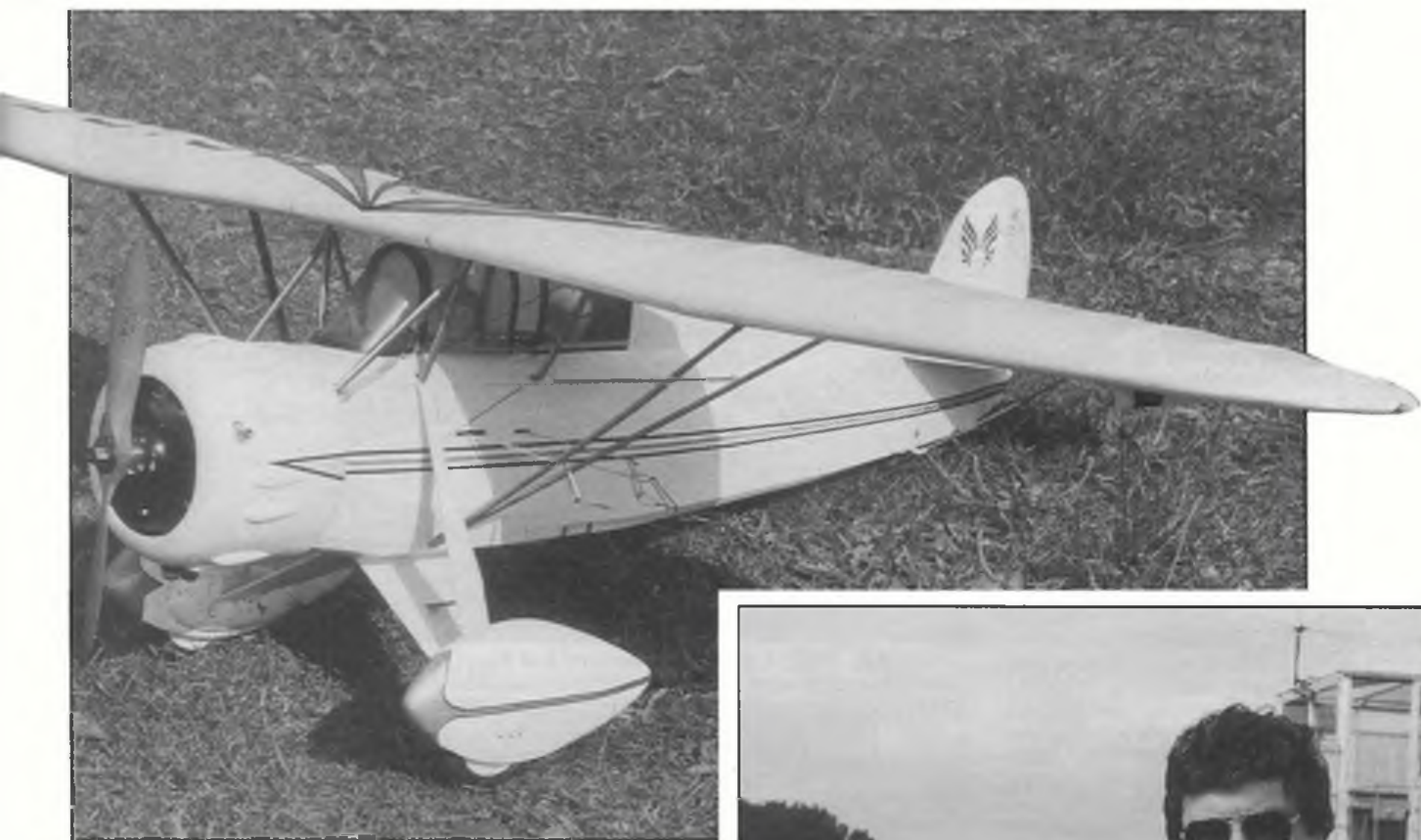


THE glorious, golden summer of '89 shone unabated over Old Warden for this period-piece event. With plenty of room in which to manoeuvre, the airfield was soon abuzz with radio, control line and free flight activity; a happy mixture of scale, vintage and pure sport designs, concentrated especially on those pre-war years - the Golden Era of flight itself. Special applause to those who made the effort to dress to suit the occasion!

First up in the R/C arena was Mike Whittard with his ME Snipe powered Vulcan 50, a reduced-size version of D.A. Russell's famous heavyweight. Most impressive was perhaps Dave Chinery's all-electric DH Albatross - seen before, certainly, but on this occasion flying with particularly smooth style. And John Siddall's fine Fokker Dr1 flew just as a Tripe surely should - powerful elevators kicking the striped-winged wonder around in almost square-cornered loops, with



**Golden Era day at Old
Warden on 16th July - an
energetic mixture of
stylish attire and super
subjects. On with the
fun!**



Far left: Award winners for best period dress, Brian and Janett Barwick flew a neat trio of Wedgy, Hells Angel and Cardinal. Well done! To the right: Cheery Geoff Burkett with Hanriot HD1, retrieved from the attic and flown with verve. Top of page: Absolutely the spirit of Golden Era - Bernard Sexton's superb C/L Davis D1-W Parasol. Below that: Perky red-and-yellow enlarged Sporty for R/C by Paul Hoey. Left: R/C magnificence - Richard Crapp's recently repaired Dragon Rapide in 'royal' colours. Above: Jimmy Squarefoot is a neat, own-design sports/stunt model for OS 20 FF. Chris Pinn promises plans...

a nifty dash of sideslip before lining up for one of the neatest landings of the day.

Many R/C'ers found plenty of time to try F/F between slots, including Paul Hoey who gave a radio airing to his enlarged APS Sporty biplane, a perky performer as ever was. All on the R/C circuit managed a healthy quota of flying time with Old Warden happiness a prime ingredient of the day.

Free flight fun included an abbreviated Lympe Scale event, ably contested despite the breeze and a victory for Bill Grigg and his Peyret monplane which managed a splendid forty seconds!

Phil Stubbs arrived with models en masse thanks to a remarkable, wheeled transporter and had a merry time. But F/F award just had to go to Charlie Jeffries' profile Bristol Bagshot for two Cox .010 motors, if you please. Tuned for maximum revs, the little glows posed few synchronisation problems and the baby twin flew as stably as many a sport model. Models new and old were seen - Mark Pedwell and his faithful Windbag 'airship' and Peter Scorey plus nine-year-old Air Trials Sportster; APS plans both. The elegance of Vintage Wakefield flying found its own base at the foot of the Old Warden Windsock - Peter Michel and Chris Strachan putting in a vast amount of airborne time, with others not far behind.

Control line, too, was full of participation. Think of Golden Era and, surely, you conjure up visions of radial cowled, bespatted, sporty craft - precisely what Bernard Sexton had brought along to the meeting. His Davies D-1W Parasol flew beautifully after ace mechanic Geoff Burkett solved engine problems; Geoff himself aired his Hanriot - back in circulation again after several years! - with customary verve. Indeed, his enthusiasm - he was *everywhere* - meant we just had to give him a special award at the end of the day. Wal Cordwell's Archaeopteryx was beset by troubles this time; but the stunt and sport fliers had no such problems, as high levels of flying time proved.

Well done, everyone - see you all next time, when the sport flying aspect of the day will be stressed with, hopefully, even more participation as a result.



A neat pair - Alan Jupp's Calamity Jane and Super Duper Zilch. Note Three Kings and Raynes Park club stickers - energetic groups both!



Above: Freshly made - Air Vice Marshall John Willis' Pfalz D.III for C/L is based on the APS F/F plan, but with much scale enhancement.



Charlie Jeffries flew his twin-Cox 010 F/F Bristol Bagshot as if it was a sport model! Pud'n'Pot, held at right, is a F/F derivative of the Tyro Trainer C/L speed trainer. Above: Time to go home as Peter Michel marches away with his Nobler stunter and Isis vintage Wakefield - a true modelling mixture!

VINTAGE CORNER

Another aeromodelling awayday for Alex Imrie - Golden Era Day on 16th July

THE ANNUAL Golden Era Day at Old Warden has always been one of my favourite events thanks to the more relaxed atmosphere that the reduced numbers (compared to Scale or Vintage Weekends) makes possible. Other, more densely populated meetings on 16th July meant that fewer traders were at this 'Old Warden', and thus there were not so many distractions as usual to keep one off the aerodrome. The ASP Brief, handed out to modellers on arrival, contained important information, most of it aimed at the promotion of flying safety, and this year's Free Flight Model Registration also gently reminded modellers of that 'constant vigilance, which is the price of safety'. This was the first time that free-flyers have been asked to register; it is a formality that merely takes a few minutes to complete. Only simple, essential details are recorded; but this information held on file could, for example, mean that an errant model will find its way back to its owner.

Activity

I parked next to a vehicle which began to disgorge models of every shape and description, and the three occupants Roger Godge, Peter Arnould and John Green, all of the Ipswich Club, were soon hard at it preparing the models for flight. The wind was, at first, fairly strong for small free-flight models, but this abated somewhat during the day and much good flying was enjoyed. Dave Baker's distinctive black and red VW Beetle was the centre of a hive of activity. As he never fails to produce a number of new models, it was natural to drift across. Focus of attention was two splendid Stinson O-49 Army liaison models designed by Delbert Swartz, whose original model won the Flying Scale Rubber event at the 1949 US Nationals. Although only averaging fifty seconds duration on that occasion because of poor weather conditions, later flights made in better weather produced averages of two minutes. The design was described in February 1950 Model Airplane News and has always attracted me, so I was

interested to see the model in the flesh. Dave first built a standard, 45in rubber powered version to take with him to the US Sam Champs, but as he was putting the finishing touches to his model, and (as is his wont) playing a tape from a US colleague as background entertainment, he heard that a recently introduced rule change allowed an increase in model size for the SAM event that Dave had entered. He immediately built another, larger Stinson for a Cox .049. However, he found to his chagrin that he could not get the models into their assigned box for his forthcoming US trip, and so had to leave them at home! I notice that Del Swartz used Trexler No 5 airwheels while Dave employs perished Rider Wheels...

David Baker with half-size, yellow-silked Miss Philadelphia made for him by John D Nogoy during a recent stateside visit. Love that Flying Aces shirt!



Bill Langley aired his red-and-blue Single Wheel Trojan, a Leon Shulman design from the 1938 Zaic Yearbook. Indian Mills 1.3 power.



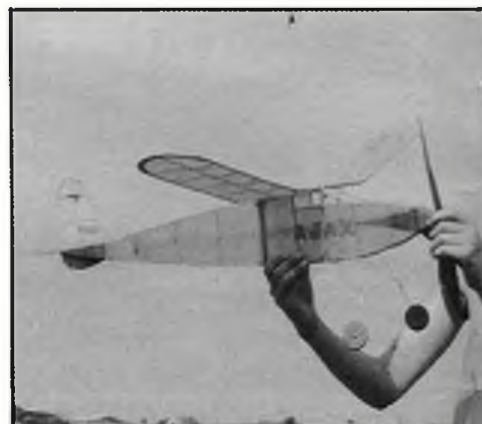
Shulman design which not only has an elliptical wing planform, but also elliptical dihedral. An Indian Mills 1.3 powered this red and blue model which was made from the plan in the 1938 Zaic Yearbook, where it is named Single Wheel Trojan since it used a monowheel landing gear and was powered by the Trojan petrol engine! The name of TAMBE on the drawing is often incorrectly used as the name of the model. TAMBE, in fact was the abbreviation of the forerunner of the Skyscrapers Club in Brooklyn: The Airplane Model Builders Exchange. Many famous modellers belonged to TAMBE including Leon Shulman, Sal Taibi, Scotty Murray, Maurice Schoenbrun, Herbert Friedlander and Carroll Moon.

I particularly liked Trevor Davies' DC Dart powered 54in Taylorcraft made from the prewar Comet kit, which is actually still available. Finished in orange and presenting a fine finish that Trevor states used up eight spray cans of Ford Phoenix paint, the model has been modified from the plan to incorporate a fully-detailed cockpit interior showing all structural members. It also features detachable wings and tail, and is fitted with correct-section wheels turned from balsa by Graham Simkin and appropriately lettered 'Simcord Aero'. Trevor told me that when the Taylorcraft was made under licence in this country (it became the original Auster I) the height of the fin was increased because of the slightly longer nose on the four-cylinder inverted in-line Cirrus Minor engine compared to the shorter nose of the Continental flat-four powered version. Trevor's model represents the original American machine.

Youngsters on the field

It was encouraging to see active participation by younger modellers. Eleven-year-old Edward Carpenter was getting consistently good results from his yellow Ajax, which is still a modellers' favourite after almost fifty years. As an aside, I should mention that about one month ago I was out on my local Common flying an old Ajax that I had hastily re-covered after it had reposed many years in my loft, and was most surprised to find two other Ajaxes being flown, one by a father (showing his son how) and other by three boys with an over-painted, warped example that one of them had built two years before. Although their model would not fly properly the boys resolved to get another kit after witnessing some of my short flights. It is an ideal, simple model for beginners and one can only guess at the number of modellers who have been initiated into the hobby by this Louis A Heath design that was named after one of the three small ships responsible for the loss of Germany's Graf Spee at the beginning of WWII. The other ships were Achilles and Exeter, so the same remarks apply to Achilles... but I wonder why there was never a model called Exeter? (*Ajax and Achilles were also linked via mythology; Exeter is not...GC*).

Julian Harland of Royston, assisted by Matthew Bradbrook, obtained ever-improving flights from their red and white Keil Kraft Gypsy, that well-known Bill Dean design. The thirty-second hops gradually increased to 56 seconds; than a final flight



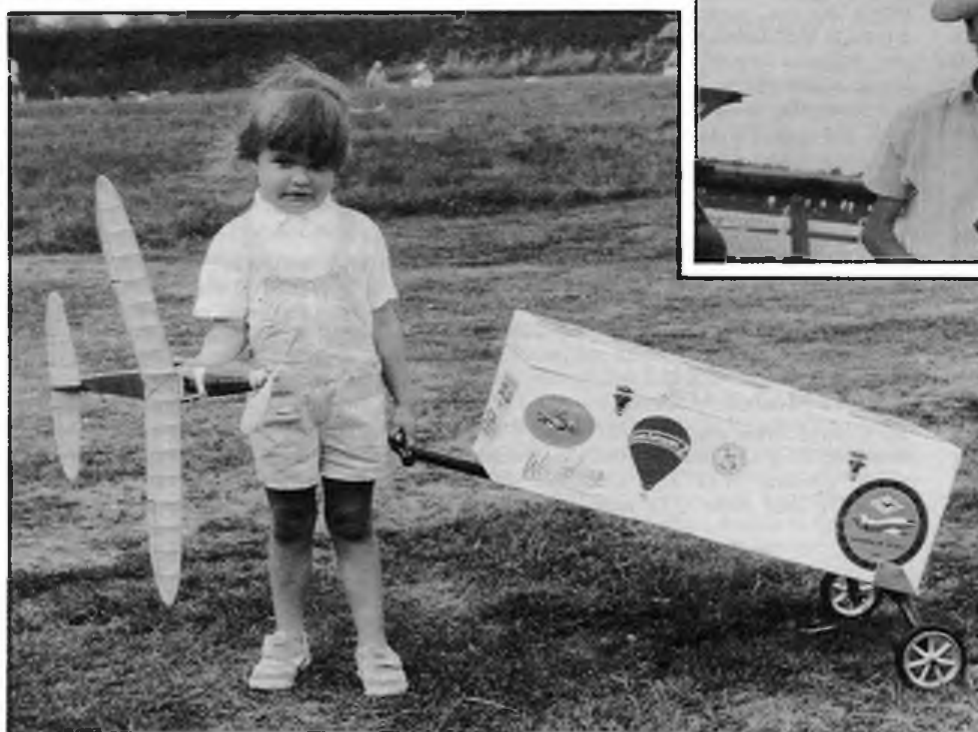
Top left: Brian Oliver displays his Earl Stahl Fairchild 24! **Top centre:** Youthful stuff! Eleven-year-old Edward Carpenter with his neat, yellow Ajax. **Above centre:** Peter Tomlinson with his OS Max 25 - powered R/C pylon job - can you guess the name of the design? And how about those shorts and hat... **Above:** Del Swartz designed Stinson O-49s from *Model Airplane News*, built by David Baker as explained in text.



Terry Brown has built three Diaspheres (an Ian Lucas design from Aeromodeller, July 1941); this is his latest.



Left: Indefatigable Mark Pedwell resorted to glowplug ignition in the Bullet engine of his Kanga Kub when gremlins attacked his coil and condenser. Below: Julian Harland and Matthew Bradbrook have chosen wisely – the famous Keilkraft Gipsy is straightforward to build, docile to trim yet capable of excellent performance. Well done, lads!



Start 'em young! Katie Gray flew her Keilkraft Eaglet most charmingly with help from her dad, competition flyer Tim Gray. We reckon the model box is as long as Katie is tall...

on 410 turns gave the boys a fine time of 1:32. This is the sort of thing that hooks the youngsters. Once they can actually experience success, they devote themselves wholeheartedly to the hobby, so I expect to see more of Julian and Matthew with their models at future meetings. I'll be looking out for them and will report further!

One could not help being attracted to a cluster of yellow-shirted Scout Cubs who were watching Tim Gray officiating and winding a small all-sheet-balsa low-wing model for the youngsters to fly. The number of holes in both top and bottom of the fuselage where enthusiastic small fingers had clutched the model did not appear to affect its flying! Tim's daughter Katie is following in the Gray aeronautical tradition. Tim, of course, is a successful competition free-flight rubber flyer, and his late father, Peter L Gray was always a modeller, but is better known for his World War One historical aircraft writings. All types of model were flown at the meeting, apart from the compressed-air variety. A high percentage were rubber-powered, ranging in type from Scale to Wakefields with just a sprinkling of small sport models.

There were few spark ignition models, but the majority of power flyers used diesels of every description. I noticed in particular many small models powered by Bambi, Dart, Amco .87 and, of course, Mills .75s of various sorts, so the small diesel is still the most popular engine for the 'fly for fun' brigade. Although I did not linger in the C/L or R/C areas, even a quick survey always seems to produce items of interest. Ron Hughes flew his Little Queen finished in chocolate and yellow. This is a 40in version of the old ED Radio Queen (which was a seven-foot giant). Ron's miniature was Irvine Mills .75 powered. And who could not be impressed by the fine flights of Dave Chinery's electric powered DH71 Albatross? He certainly appears to have sorted that one out. I have never before seen this fantastic model fly so long and so high. But the breath-stopper of the meeting was an absolutely splendid Davis D1-W monoplane, a rare type that simply oozed the Golden Era spirit. Carefully researched, drawn-up and built by Bernard Sexton of the Three Kings Club, this model was control-line, although it seemed light enough to have flown free-flight. I am sure



Regular Old Warden attendee Denis Stevens about to launch his fine-flying Earl Stahl Taylorcraft. Beginners to Vintage Rubber Scale could do no better than choose one of these robust American designs.

that F/F versions will eventually emerge, since this is a lovely ship. Bernard's creation, finished in gold and white, bore the registration NC13576 and was powered by a carefully-cowled Super Tigre .40.

Mark Pedwell obviously came determined to fly his Bullet .27 ignition powered, red and white Kanga Kub. When ignition trouble prevented normal operation of his engine, he replaced the spark plug with a glow plug and attached a small graduated tank to the needle valve - so he carried on flying, timing the power runs on fuel amount. Despite the availability of some very short grass on the aerodrome, not many enthusiasts indulged in ROG launches. There is something satisfying about getting a model of any sort to take-off from the ground unassisted, and while rubber models usually get off quickly without a long ground run power models are different. The engine has to produce enough power to accelerate rapidly the model to flying speed, and undercarriages have not only to be true, but wheels must resolve freely. It is surprising how often these simple requirements are not present, and I saw a few attempts that failed to make it. One model that achieved several fine ROGs was Terry Brown's Diasphere. This Ian Lucas design is a particular favourite of Terry's who has built three of the type, (sometimes flying

them as floatplanes - ROW is even more fascinating!) since the publication of constructional details in the July 1941 Aeromodeller. (But don't forget - ROGs at Old Warden are discouraged when it's busy! GC). Other Vintage duration designs fielded by Terry were Ted Evans' Vansteed and Dick Korda's Gullwing Wakefield which was made from the plans in the 1938 Zaic Yearbook. There was a number of Korda Wakefields, always a popular vintage duration choice. Vic Strange's model was finished in green and white, and Bert Platt's red and yellow Korda which had a detachable tail unit for ease of transport, D/Td right beside my car after a lovely, flat, floating glide. The first Studiette Master that I have seen was being flown by Terry Rose. This attractive diamond-fuselage thirty-inch model was claimed in the old Aeromodeller ads to be a '45 Minute Flyers'!

So we watched a good variety of models. Although the wind at times reduced the flying activity everyone that I spoke to seemed to be enjoying the meeting. Period attire has always been a feature of this event; there were not too many modellers with striped blazers and boaters this year, but all had models and entered into the spirit of things. An enjoyable meeting that gave a suitable warm-up for the forthcoming Vintage Weekend.



...and Alex examines a splendid new book

FROG Model Aircraft

by Richard Lines and Leif Hellström. Published by New Cavendish Books, 3 Denbigh Road, London, W11 2SJ. Hardback with attractive dust cover, 272 pages, over 900

illustrations (190 in full colour). Price £25.00. ISBN 0 904568 63 6.

This is a well-researched and beautifully-produced history of the flying models (both ready-to-fly and from construction kits) and the plastic kits that bore the well-known Frog name; it also covers associated items like engines. Many original documents are reproduced including the colourful Frog catalogues and advertising leaflets that have long been keenly-sought collectors' items. The story of International Model Aircraft Limited (formed by Charles and John Wilmot and Joseph Mansour with capital of £17,000 in 1932 to manufacture the Interceptor) and the association with Lines Brothers Limited, the makers of the well-known Tri-ang Toys is told in detail. It was Lines Bros that undertook marketing and sales of the IMA

Aeromodeller

VINTAGE REVIEW

products, and with sound finance, experience and the utmost stress on quality, success of the Frog name was assured.

FROG was an acronym of Flies Right Off Ground. This slogan, and the winged frog device used as a trademark from March 1931, were both shown at Olympia at the British Industries Fair early in 1932. However, no reason is given in the book why the name Frog was chosen in the first place, except that it was easy to pronounce and remember. It almost certainly came about because of the model aeronautical term ROG (Rise-off Ground); in fact, some model aeroplanes were labelled Flying Rise Off Ground to explain their true purpose, as opposed to models that did not fly at all, or others like stick pushers without undercarriages that could only suffer the ignominy of being hand launched (HL). IMA, however, also entered the scale, non-flying field and additionally produced marine craft, cars and even the Sindy doll! The whole fascinating story is related in this excellent book, the compilation of which owes much to the contributions of many people who were associated with IMA plus inside information unearthed from company archives, and the personal knowledge of Richard Lines who worked in the Frog division of the family firm of Lines Bros from 1947, being latterly with Rovex Ltd, the company that carried on Frog production for a further ten years after the re-structuring of the Tri-ang Group in 1966 that caused IMA to lose its identity.

The book is arranged in three main sections: a 135 page chronological history of Frog from 1932 to 1976, which not only highlights new models issued, many illustrated with contemporary studio photographs, but the fascinating story of company development shows that all was far from plain sailing and explains a great deal that the always attractive and usually colourful Frog adverts can't reveal. Also, Leif Hellström, a Swedish Frog enthusiast has compiled the Plastic Kits Compendium, from the pre-war Penguins, which were the first 1/72nd scale plastic kits to the final products in 194 fact-filled pages. The information on early releases is especially well-detailed and includes appendices on statistics, collecting Frog kits and a review of Frog artwork with comments on the various artists' accuracy and styles. From Denmark Vagn Espensen has resurrected a number of original built-up Penguins, and splendid colour photographs of these reveal that he has not updated them in any way. Thus, they retain all the magic of the early period: the Working Models Compendium covers, in the remaining 35 pages, the ready-to-fly models, and is beautifully illustrated with colour plates of existing examples carefully renovated and retained by avid Frog collectors. It also has informative notes on the various models described in their order of release. The rest of this compendium includes illustrations of the 130-plus flying models that were available in kit form from 1935 until this type of model was taken over by A A Hales Ltd in 1963. Frog engines are also shown, but unfortunately these and the previously mentioned kits only receive catalogue type treatment. The final pages contain information on Patents, Trademarks and a short background picture of Tri-ang.

Wealth

That this book will become the main reference work on Frog products is beyond doubt; the wealth of information given in some areas is absorbing stuff. One learns that the operators of the cellulose acetate moulding machines were on piecework and it was their hastening of the cooling process that was one of the main reasons for the warped components in some Penguin kits... at one period, different coloured plastic was used on different days of the week. The surprising use of incorrect serial numbers on models of service aircraft is mentioned, but why Frog, who usually paid the utmost attention to detail, allowed this to happen is not revealed. However, the present-day enthusiast should remember that information of this nature was not banded around then as it is nowadays. It is a pity that reproductions of Patents are not given in their entirety since they would have provided some interesting reading, but their inclusion in the book is illustrative only and space demands obviously precluded their whole display.

One learns that the tooling to produce the 18in ready-to-fly Puss Moth was £3290 in 1933 - a 'substantial sum in those days'. What the comparable figure was for the splendid Hawker Hart of similar size is not given and despite production at one time being 200 per day it was not a commercial success, but IMA continued to produce it as a 'prestige' model, the financial loss on each Hart sold obviously being balanced by the revenue which resulted from the sale of the Interceptor, which initially sold at 10/6 (52.1/2p), being reduced to 7/6 (37.1/2p) in 1933 and to 5/ (25p) in 1936. This highly popular model was eventually available in the markings of ten different countries, and production at one time was one thousand per day. It became the best known model aeroplane in the 1930s, when every boy, it seemed, had one. Every magazine of the time frequently had full-page Frog adverts, and these were carefully compiled to have the maximum impact on readers. Needless to say the Interceptor was almost always featured. In 1937 the whole front page of the Daily Mail newspaper was used as a Frog advert and cost £1440. No model aeroplane before or since has surely had such publicity.

A problem that besets a researcher using manufacturer's advertisements is that model changes are not always reflected in the illustrations presented. Due to cost, old printing blocks are utilised long after significant changes in the item have taken place. Examples in the Frog literature include the use of the 1932 black-topped Interceptor photo of the model in its winder-box until 1940, when, for the previous five years this original version had been replaced in production by the all-silver Interceptor. Similar treatment was given the Hawker Hart ready-to-fly model, and the finely detailed printing on the aluminium nose cowl of exhaust ports and panel lines and fasteners disappeared from production doubtless due to cost. From 1938 the Hart's markings were updated to reflect the changes that had taken place on full-size machines. This entailed deleting the rudder stripes and reducing the size of the top wing roundels in order that they did

not overlap the ailerons; thus, a new Hart emerged and this bore the serial K8446. In the book these two Hart models are called the 'De Luxe' and 'utility' versions respectively. There is a danger that these terms will come to be accepted, when they merely show the model at different periods of its lifespan. The so-called Hawker Hind is an enigma, the author incorrectly stating that the 'Hawker Hind was, in real life, a training version of the Hart...'. The reproduced 1940/41 catalogue shows a yellow Hind (which is a Hart with a Demon type gunner's cockpit) which has full-chord top wing roundels and uses the original production Hart serial of K2497. Yet the photographs in the book of the Hind show that this is actually a yellow Hart complete with rudder stripes, obviously utilising the printing blocks from the earlier Hart, but substituting yellow for silver. A Hawker Demon was also supposed to be available, but none have apparently come to light. It's a good guess that it was never made, the reason probably being associated with the change and cost of tooling necessary to alter the shape of the gunner's cockpit. I wonder, if one is ever found, whether it will turn out to be a Hart with exhaust pipes... in which case it will really be an Audax!

One of the hallmarks of all Frog products was quality. This superlative also applies to this excellent compilation. Authors and publishers are to be congratulated on producing such a fitting memorial to Frog, a word that endeared itself to generations of air-minded boys for almost half a century. In the Vintage movement we keep the Frog name well to the fore, and every meeting sees airborne examples of Frog designs powered by Frog engines, carrying on the proud tradition. We refuse even to let them fade away. Frog is part of our aeromodelling heritage, and this is its story. All enthusiasts should have a copy of this valuable addition to our model aeronautical history on their bookshelves. AI



FROM THE HANDLE

Claus Maikis examines a new motor with plenty

of Stunt potential...

SINCE Mr Garofali ceased production of the G 21/46, stunt flyers have been on the look-out for a suitable replacement for this excellent engine. Of course, there are others on the market which - in the .40 to .46 range - produce the same, or even more, power. However, there's no other engine which offers that clean and precise four stroke/two stroke break we stunt flyers desire so much. Among some American flyers there's a special school of thinking which favours high-performance engines with tuned pipes operating at high rpm. No doubt this philosophy has some merit. But I'd prefer not to use a screaming engine - however muffled it may be by the pipe - in my slowly-circulating airplane. The world is very noise sensitive today and high revs are easily associated with loud noise. With the subjective nature of our event I feel the time has not yet come for hot 40s.

Now OS offers a new .46. The FS engine series is available in either a ringed or an ABC version. Since the ringed version is available as a helicopter engine only (at least in Germany) I bought it, cut off the extra cooling fins and turned the head to normal shape. I chose the ringed version because I didn't have any experience with ABC engines. The engine was flight tested in an old airplane, originally equipped with a Tigre. I must admit - I wasn't impressed very much.

Shortly after that, Swiss flyer Peter Germann offered me his newly acquired 46 SF S ABC for testing (he had read Peter Chinn's test in the April Aeromodeller, and was convinced that this engine could fulfill our needs). Since I had both versions now I made a comparison test with the ringed and the ABC engine. Those who are interested in the latter may read Mr Chinn's excellent report.

As ever, one is always fascinated by the superb workmanship when opening an OS box. With the engine comes the muffler and two venturis. There's also a very interesting instruction leaflet. OS has gone to considerable trouble to give precise instructions specifically for control line stunt use.

Tests

Measurement of the two venturis showed an inner diameter of 7.2mm and 7.7mm. After subtractions of the spraybar area, the open areas are 15.5 and 19.5sq mm (by comparison,

my Tigre is 12.3sq mm). The spray bar is a neat unit; it has an adjustable, angled fuel nipple which can be rotated to any desired position. Many pilots like the ratchet-less method of fixing the needle via gland nut. For the test I used the small venturi. Interestingly enough, in the instruction leaflet OS says '...With the large ID venture fitted, the use of an assisted fuel supply, such as silencer pressurised system, is recommended to compensate for the reduction in fuel section'. Enough said!

After some twenty minutes running time on the bench the following results were obtained:

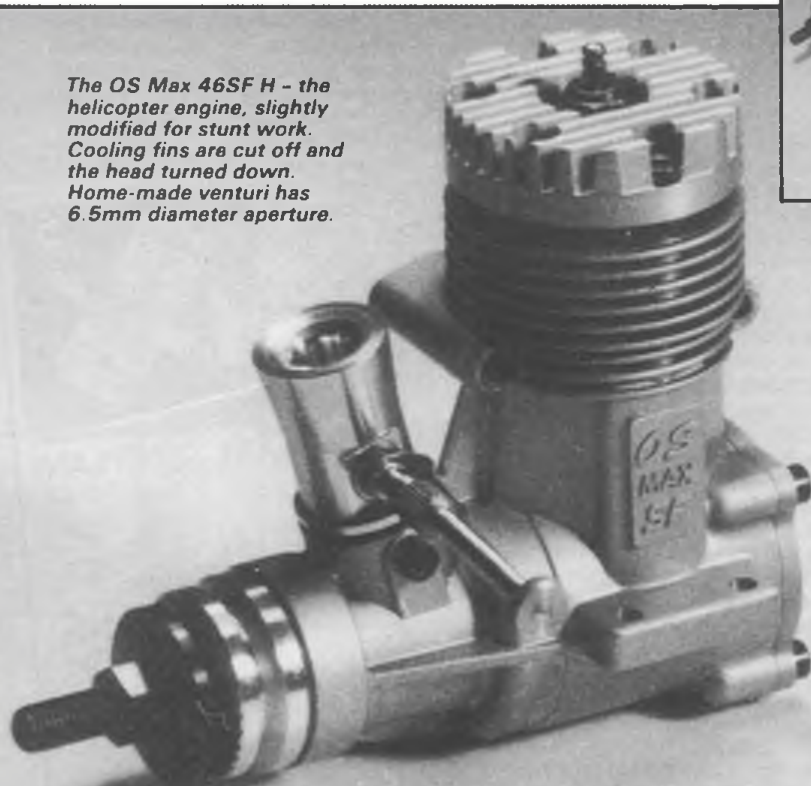
	Venturi Area	Low four-stroke	High four-stroke	Two stroke	Top rpm
ST 46	12.3	8400	9000	9800	10,500
OS 46 ABC	15.5	8000	9000	9500	11,800

This needs some explanation. 'Low four-stroke' means the speed when the engine runs at its lowest possible rpm, but smoothly. I set the needle by ear so that the engine sounds smooth - I wouldn't dare to launch an airplane with the engine running more slowly than that. This figure probably has only academic value. It just indicates that the engine can run slowly. 'High four-stroke' means fastest four-stroke speed; 'Two-stroke' means lowest clean two-stroke speed, 'Top rpm' means top speed. For this test I used

Bench-tested mufflers.
Factory item (left) - efficient but heavy;
Czechoslovakian model (right) too restrictive;
Kuentz muffler (centre) actually used for flight.

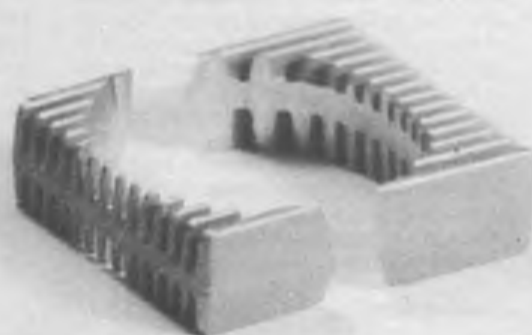


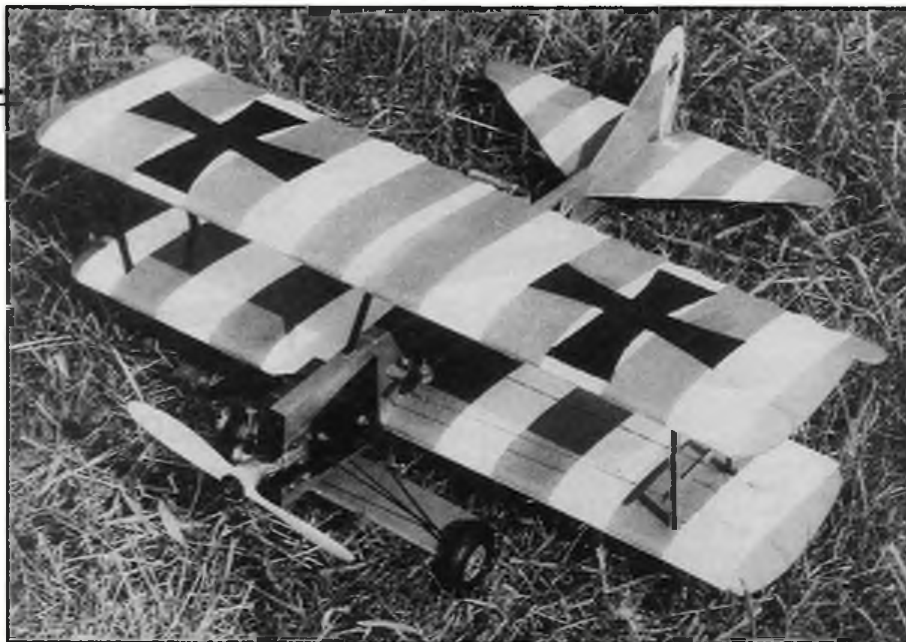
The OS Max 46SF H - the helicopter engine, slightly modified for stunt work. Cooling fins are cut off and the head turned down. Home-made venturi has 6.5mm diameter aperture.



the Graupner grey plastic 12 x 5 propeller and 12 per cent nitro fuel. The figures given for the ST are very exact. In particular, there's a very clean four-stroke run, either slow or fast, and then a precise break into a two-stroke. This can't be achieved with modern Schnuerle engines. They never sound smooth unless they are allowed to run at full bore. Reaction to needle adjustment was extremely slow. Sometimes it took three or four seconds before RPM changed.

Bench tests are only half the truth, so some test flights were made with different pro-





Isn't it lovely! Simple Fokker DVII style profile biplane for OS 15. Span is 26in. Basic stunts only, but great fun!

pellers. The original muffler was not used because of its weight. I mounted by well-proven muffler (made by Armand Kuentz). Both mufflers had been tested on the bench for power loss and noise level.

	Muffler	Top rpm	DB at 8.00 rpm	Weight gms
OS 46 SF Ring	without			
OS 46 SF Ring	Original	10,600	69-70	95
OS 46 SF Ring	Kuentz	10,600	72	48

It's quite obvious that the OS silencer is more effective, since a better noise reduction is achieved at the same power loss. However, the weight is prohibitive.

The OS 46 seems to have lot of power. I could use propellers which the Tigre wouldn't have handled. For example: a 12 x 5 three-blade (made from Top Flite blades) is what I usually fly on my 60 Tigre. The OS 46 had no problems with it, but for cornering ability I chose a 11 x 5 three blade (Top Flite). Fuel consumption was the same as with the Tigre, maybe slightly less. Since that particular airplane doesn't fly particularly well, I couldn't fly as slowly as this engine probably allows. Power was no problem, of course, but I was not quite satisfied with the engine's sound. That soft, purring sound of the Tigre is just not there. When flying, you may not quite be able to judge the four stroke/two break exactly, since most of your concentration is on flying. Instead, I have to rely on the remarks of Eric Janssen who watched my

flight and listened to the engine at a recent contest. Eric was quite impressed with the 'power switching' of the OS, especially when I assured him that the engine was strictly 'out of the box' (with the exception of a smaller venturi and another muffler).

After that contest the engine was supposed to be fully run-in.

Another comparison test was run with bos OS motors and the ST46. This time all engines had the same intake area of 12.3sq mm (that used during the contest). The venturi diameter is 6.5mm; spraycon thickness 3.2mm. Prop was Graupner 12 x 5, with 12 per cent fuel again used.

	Venturi sq. mm	Low four-stroke	High four-stroke	Two-stroke	Top rpm
ST 46	12.3	8000	9000	9400	10,100
OS 46 Ring	12.3	8200	9000	9300	11,100
OS 46 ABC	12.3	8400	8800	9400	11,200

Please note: it's not possible to compare figures of different tests. These were carried out on different days, so weather influence doesn't allow comparison!

Figure it out

Just from curiosity I wanted to know the port timing of the new OS engines. Since the ringed engine is a helicopter version I expected to find some difference. I must admit that my method of measuring is not the most

exact. However, I usually come out within one or two degrees of the figures given in Mr Chinn's engines tests, so it should be sufficiently precise.

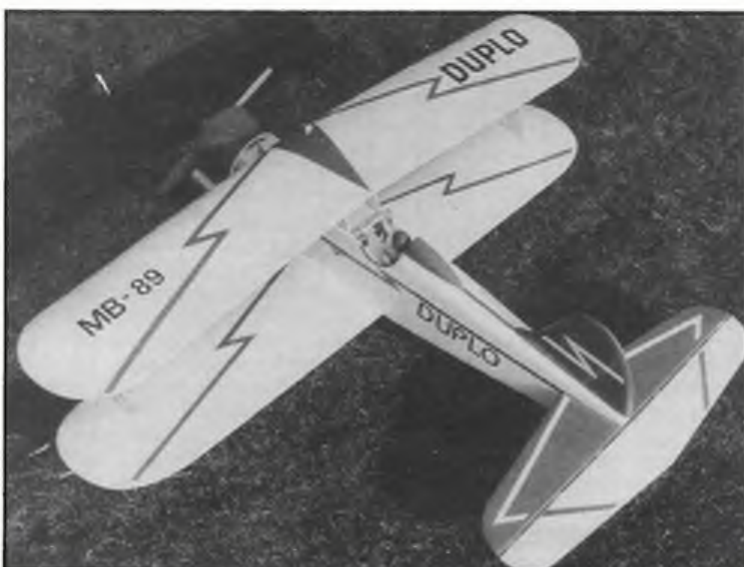
	Intake	Transfer	Three-port	Exhaust
ST 46	196	120		136
OS 46 Ring	195	108	104	146
OS 46 ABC	195	114	92	146
By Chinn	196	114	104	144

I was really surprised to find a substantial difference in some figures between my own measurements and Mr Chinn's. Two degrees (exhaust) may well be a measuring error. However the difference in intake and third port timing is astonishing, especially since Mr Chinn found the same figures in his ABC engine that I did on the ring engine. How come? I don't know. Perhaps Mr Chinn can give us an answer?

It's quite pleasant to read that OS can give us special information on how to operate the engine, concerning that important four stroke/two stroke break which is only required by control line aerobatic pilots. The leaflet says: 'The amount by which power varies is dependent on the engine's compression ratio. A decrease in compression ratio (by adding an extra head gasket, 0.2mm or 0.4mm thick, as supplied with the engine) will narrow the difference in power delivery each side of the transition point'.

Most interesting! I have not checked this characteristic. I know that a few stunt flyers have used this means for years on their Tigres to lower the point where the break occurs. This allowed the engine to break into two stroke earlier in the manoeuvre. I've had the same experience when experimenting with an OS.35. However, here I wanted the opposite result. Because the engine was already very near to the two-stroke range in horizontal flight (actually with occasional burps into two-stroke), I raised the break point slightly by removing one head gasket thereby increasing compression ratio. Now I could run the engine with the same RPM (means airplane speed!), but with a steadier four stroke. So we can use compression ratio as a means to control the break point. I'd like to try the same thing with the OS to have a cleaner four stroke run. However that's not possible. OS says: 'WARNING! Do not remove head gasket. If no gasket is fitted, the piston will hit the cylinder head and cause internal damage'.

As in most cases where two engine capacities are housed in the same crank-house, the bigger engine weighs less (the bore is bigger, so the liner is thinner). So there's no reason to buy the 40. What pleased me most about the 46 ABC is its compression seal. I was somewhat disappointed with the ringed version because right from the beginning it didn't have much compression. From all my engines - with the exception of the 60 Tigre - the 46 ABC is the only one which I cannot turn over with the fingers grasping the drive washer. Since an excellent compression is responsible for those reliable 'first flick' starts, this attribute is very high on our priority list. So - in summarizing - while the OS 46 SF S ABC may perhaps not quite fulfill our expectations (which engine ever can?), it might be the only acceptable successor to our beloved Tigre 46.



More biplane matters! Hit by the 'Bipe Bug', one of Claus' clubmates built this straightforward craft from our columnist's own drawing-board. Won't do squares, but excellent loops and eights on .40 power.



Top: Ken Morrissey and well-known OS 60 craft at 3 Sisters. Left: Ray Cox takes the strain of 140lbs for his Dynajet model. Cantankerous four-wheel dolly to Ray's left. Below left: Paul Eisner and Irvine 15R FAI model. Below: Dave Brewin fettling his FAI craft, also Irvine-powered. Foot of page: From Modellistica magazine, The Wrangler is for .29 Combat - an impressive class... Scale as reproduced here is one-eighth.

		Class	mph	% Score	Record mph
1	D. Ratcliffe	21N	175.21	106.83	164.00
2	P. Halman	F21	181.46	102.84	176.45
3	K. Morrissey	FAI	183.84	102.38	179.56
4	P. Eisner	10cc	210.28	97.37	215.93
5	R. McGladdery	FAI	162.84	92.29	176.45
6	I. Mander	F21	173.57	96.66	179.56
7	D. Brewin	FAI	173.43	96.59	179.56
8	R. Cox	FAI	169.22	95.04	176.45
9	M. Roberts	5cc	170.65	95.90	185.02
		21N	155.16	83.84	179.56
			12.55	73.49	164.00

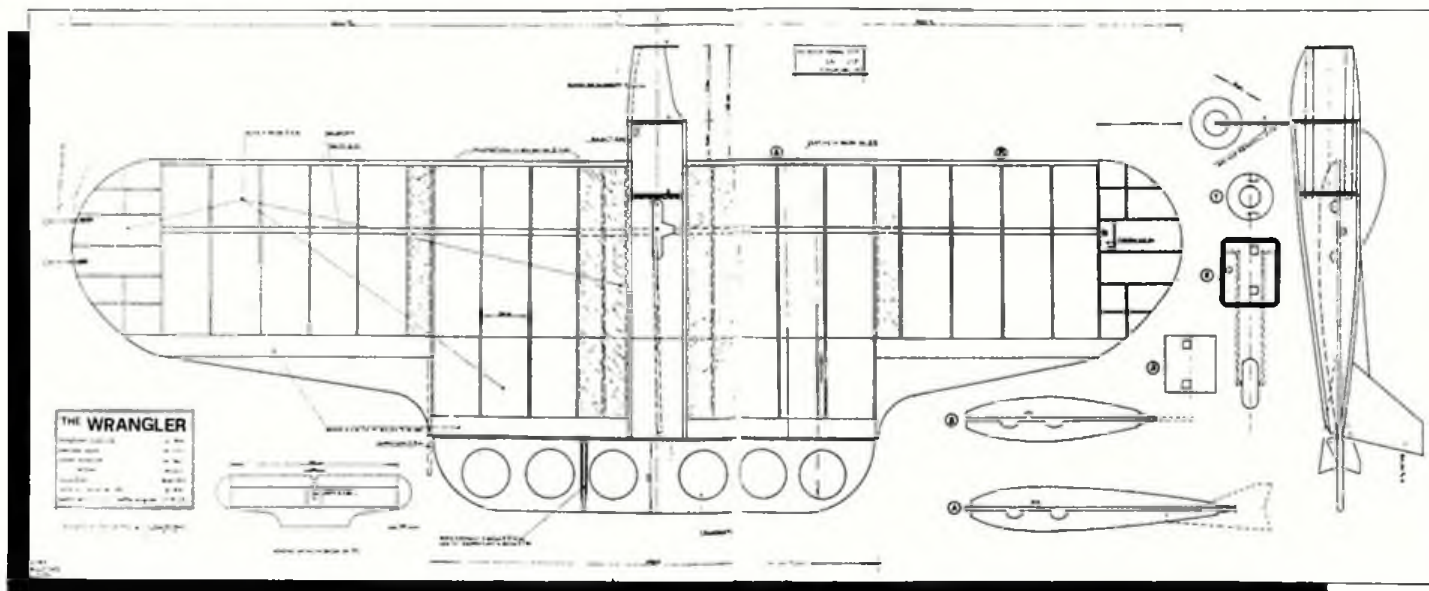
...and Dick McGladdery on Speed at 3 Sisters

SPREAD over two days and with only a modest entry of about ten, the pace of flying was pretty relaxed, but some of the flights were very fast indeed. The weather was kind, fairly calm and warm when the sun was out, which was most of the time, but the breeze was cool and humidity was unusually low, calling for compression increases for the more sensitive motors.

There were no fewer than six FAI entries, all using the Irvine 15R motor, and accumulating experience with this motor is yielding some impressive results. Peter Halman as designer and, more importantly, developer of the engine was predictably the fastest his latest motor setting a new UK record at 183.44mph. The 'also rans', comprising Paul Eisner, Dave Brewin and myself were not quite so fast, between 170-174mph, but these are very competitive speeds and we needless to say are working towards the point of giving Pete H a hard run for his money.

In the 21 classes, 'Formula' (for the 'experts') and 'N' (for the newcomer or novice) there were two remarkable performances; again, both new UK records. In F21, Peter Halman brought along a specially brewed Irvine 21 RE which hoisted the record (set by Dave Smith with a Nova Rossi 21 at last year's Nationals) to 181.56mph, equivalent to a handicap score of 102.84 per cent, which should have given him a comfortable contest win. However, Des Ratcliffe sprang the big surprise of the contest with his 21N model, a typical asymmetric, metal-winger powered by an OPS 21 on suction with an Irvine 21

Continued on page 596





AIRY FAIRY



Vic Smeed's forty-eight-inch powered-glider style free flighter for motors up to 0.8cc

POWERED gliders and ultra-lights go back a good few years and have provided some of the less conventional aircraft shapes, an aspect continued with today's microlights. The basic concept of the slightly weird-looking Airy Fairy originated in the late '50s when drawings for a free-flight version were made; it did not get built and neither did a slightly larger version for rudder-only radio. Regrettably these drawings, with others, including the Courtesan original featured last year, were ditched by a zealous colleague, but the general configuration remained in the mind and it was not difficult to draw it out and detail a suitable structure when the time came...

Strange shape

It is a strange-looking, spidery machine; perhaps the nearest one could get would be to describe it as an elongated, tractor version of the BAC Drone, though of course it is much more of a model designed for flying rather than one following scale practice. And fly it certainly does, much better than anticipated, to the extent that in anything but dead conditions a tip-up tail dethermaliser is a wise precaution. No special attempt was made to keep weight down on the prototype, but it came out at only 7.1/2 ozs. (about 213gm.) ready to fly, quite a low weight for a 48in (1219mm) power model, albeit of high aspect ratio and with only a 0.5cc engine. In fact the Dart motor originally used is about 1955 vintage, though equipped with modern cylinder, fins, and seems to be of ideal power for this design. Fortunately, trimming is fairly easy; but even so, 0.8cc (.049cu.in.) represents about the maximum engine size for lively sport flying. Quite possibly, in expert hands and with fairly hard balsa used

throughout, up to 1.1/2cc could be used to provide a sensational climb, but if you try this - on your own head be it!

Construction is a little different from convention as far as the fuselage is concerned, but the wing and tail are fairly normal. Tapered flying surfaces make some builders turn away, but when you look at the plan you will see a representation of about one foot of 1/16 x 3in sheet with all the wing and tail ribs crowded on it. All that is needed is to get a photocopy (or two if you wish) made on the usual 'black powder' machine,



Motor detail shows simple mounting, fuel tank from 35mm film canister and DC Dart with exhaust collector ring, a one-time DC accessory.

invert this on to a piece of 1/16in sheet and iron over the back with a warm flat-iron. This transfers the lines, and all the ribs can be cut; use a straight-edge on all straight lines. The cut ribs can be used as templates to cut a second set, or the process may be repeated with a second photocopy if preferred. This should remove most of the pain from building the tapered surfaces!

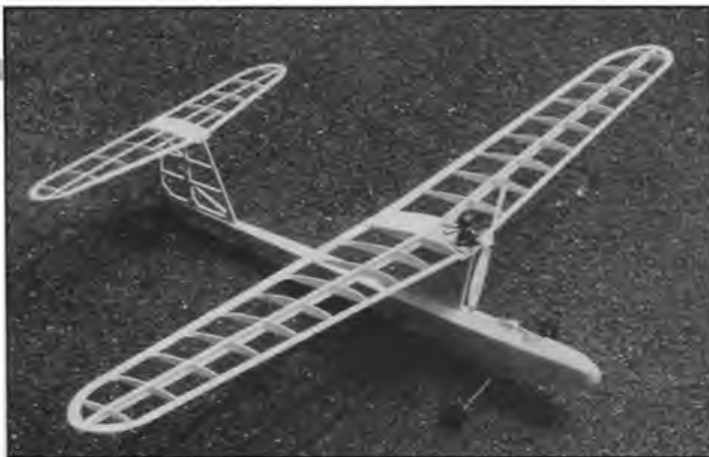
Get on with it!

The only departures from normal are the use of a tapered wing trailing edge cut from hardish, 1/8in sheet and the installation of a flat, 1/8in ply motor mounting plate in the centre section. All that need be said about the trailing edge (TE) is to taper it in section by slicing away small 'flakes' with a very sharp blade, using only a minimum of sanding. Doing it all by sanding will induce a considerable bow; the cure for this is to sand the opposite side, but it is difficult to get it flat and true again. Cutting small chips - don't try to cut a couple of inches at a time - so that only a light sanding each side is needed will result in a more accurate and less warp-prone wing.

Build the wing using your preferred approach; that is, either in separate halves to be joined, or building the second half on to the completed first half. Build flat and incorporate the W2 ribs and the rear part of W1. When the halves are joined and dry, add the front part of W1, the two W2B bits and the two bottom front W2As. Cut the rectangular motor mounting plate to fit on the W2As between the W2s, cutting to the dihedral brace at the rear and flush with the LE at the front. Carefully pare away the LE as necessary for the plate to seat fairly. Cut and drill the plate for the motor to be used before cementing it in place.

More on motor mount

If a radial mount motor is to be fitted, cut an appropriate firewall and cement it to the LE. Use a full rib front for W1, obtained by tracing the front of W2 and cutting the remainder fractionally long. Sheet the centre section, on top of W1 and W2 on the upper surface but inset between them beneath, then



Bare bones of Airy Fairy reveal straightforward construction and attractive lines. Start yours now!

carve fillet blocks to support and fair in the firewall.

Returning to the beam mount, cement the upper parts of W2A in place and fuel-proof all round. Position the motor and check what needs to be cut away, both to seat the motor on the plate and to clear bolt-heads under the plate. If a separate tank is to be used arrange for this, then fit sheet panels between W1 and W2A/Bs beneath the plank over the top to suit motor/tank.

On the original a tank was made by cutting down a 35mm translucent plastic film container to about 1/2in high and securing the lid with cyano-acrylate. It wasn't expected to stick but it has done so adequately, so far. A hole was drilled in the lid for filling and another to pass the neoprene feed tube, the tank then being stuck to the mount plate and a soft balsa fairing positioned round it. The engine is started and before launch the feed tube is pulled out of the tank; this particular Dart seems to run about 20 secs on the contents of a 2.1/2in length of tube!

La couverture de l'empennage

The tailplane needs no comment as it is entirely conventional to build. Some modellers find this component a bit of a chore, but it deserves at least as much care as the wing. This one somehow has a pleasing shape to which makes you want to see it finished! (*Build it first and get one-third of the model over and done with...* GC) Probably, Lightweight Modelspan is the best tissue for covering the wing and tail, though the original used an unusual tissue obtained from an Old Warden stand, rather like heavy 'sap' without the grain. It shrinks well and needs little dope but punctures fairly easily. The model in the pictures was taken, uncompleted, to a meeting at which it rained and there was a degree of irregular shrinkage and slight warping as it dried out, but it had been trimmed in that state rather than risk the warps returning after correction and trimming.

Fuselage facts

Cut the two sides and all the formers. Cement the two pieces of B3 together, bend the undercarriage to shape and sew to B3. Assemble the sides on the formers, checking for symmetry, and while this is drying cut the parts for the pylon frame and assemble over the drawing. Sheet the upper side as it lies with medium 1/16in (noting the grain direction) and when dry, lift from plan and sheet the opposite side. Check for fit and slide into place through slot in B5, with TE cutting to B6. The slot should ensure that the pylon is aligned vertically but ensure that it is absolutely central on B6. When satisfied cement in place and add the hard

1/8x 1/4in front braces.

If a seat is required in the cockpit fit it now. It is structurally helpful if the model flies into an obstruction! Sheet the top and bottom of the fuselage by slicing appropriate-width strips from across a sheet of 1/16in so that the grain runs across the fuselage rather than along it; this adds stiffness and strength. Note that the upper sheeting butts up to the sides of the pylon and continues along flat as far as B4. Once in place the two top triangles of B5 can be added, followed by the fillet sheets which extend from B4 back to the TE of the pylon. You may like to cut a stiff paper template to give an exact fit before cutting these two identical (but handed in chamfering) parts. The grain runs fore and aft on them, but reverts to crossways forward of B4, where it now forms an inverted 'V'.

Sand off any surplus sheeting at B1 and fit the nose block. A small headrest block is also needed. When the nose has been sanded to fair smoothly in you may like to add a 1/4in wide skid cut from 1/16in ply, or even acetate, particularly if you are fortunate enough to fly off an old runway. The skid would then take landing wear.

It will be seen that the fin extends into the tail of the fuselage at the LE and spar positions, and it may therefore help if the bottom fuselage sheeting at the tail is left until the fin has been fixed in place. It is a simple flat structure, tapered at the TE; and when it is cemented into the fuselage it must, repeat, must be aligned with the pylon. Lay a straight-edge a true sheet of balsa at a pinch - against each side of the pylon and fin to check that they are in line; that they line up vertically - can easily be checked by eye. After making sure of a good joint for the fin spars the underside sheeting can be completed and the tail subfin fitted.

Both wing and tailplane sit in platforms made from hard 1/16in sheet, grain across-ways. That for the wing is angled to match the dihedral and each half is filleted into pylon by a strip cut from scrap 1/4in sheet. It has to be cut because the internal corner has a slightly obtuse angle and square strip would thus not fit. The strip is carved away and radiused using a worn rat-tail file or a scrap of fine grasspaper wrapped round a dowel of appropriate diameter. No fillets are needed for the tailplane platform, but check alignment of the surfaces carefully.

Finishing

Now sand the whole assembly all over, rounding the pylon and fin leading edges and tapering the trailing edges. A trim tab in the fin TE is desirable, or one could be stuck on after cutting it from thin aluminium, such as is used for soft drink cans. Drill and glue in the wing dowels and those for the tailplane.

If a fuse dethermaliser is fitted mount a snuffer tube on the fin TE; and above this, insert a wire. The rubber band to be melted holds the fuse against this wire, thus preventing the dowel above it from burning. A thread adjusted to give the right angle of tip is tied to the dowel and a small fin, bent into a hook, is inserted in the tailplane TE. A second rubber band from the front dowel engages on this hook and flips the tailplane up smartly when the first rubber band melts through.

...and covering

Tissue cover the fuselage by doping-on Lightweight Modelspan or similar. This not only covers up the grain of the balsa and allows a better and lighter finish, but adds considerably to strength and resistance to surface damage. Apply any additional colour carefully to avoid building up too much weight. Fuel-proof around the vicinity of the engine, solder the wheels in place, add the cockpit windshield and you're ready for trials.

Away you go!

Assemble the model and check that it balances close to the point marked on the plan. Provided you are within, say, 1/4in, it should be simple enough to get a smooth, flat glide with a little packing under the tail LE or TE; but if it is further out than this a little ballast is a better answer. Tape coins, washers or bits of lead sheet to nose or tail as needed; instal them permanently once trim is established.

As with any model, get the glide right before making adjustments to the power part of the flight by altering the motor thrust line. High thrust line models can have their noses pushed down by the thrust/drag couple; so, although a small amount of upthrust is incorporated in this design, think immediately of increasing upthrust if the model seems reluctant to climb. Conversely, in the unlikely event of stally power flight, slacken off the engine bolts and shim in a little downthrust. Sidethrust should not be needed but if a touch of right is built in, trimming will probably be a little safer, especially with motors near the top end of the power range. Most engine lugs seem to be drilled for 6BA or, at smallest, 8BA, but with under-1cc power, four 10BA bolts are adequate for strength and will hold the motor firmly if washers are used under the heads and under the nuts. Slightly slackening the nuts will thus allow the motor to be twisted a degree or so, to be held sufficiently when the nuts are retightened, so that sidethrust can be adjusted on the field.

Aim for wide circles in either direction under power and glide, starting (in the usual way) by running the motor rich to cut the revs and allowing a long enough run to climb to a height from which the glide can be studied. Lean out gradually through three or four flights. The model seems very forgiving but a little caution doesn't come amiss.

R/C reflections

Building the pylon nearer the width of the fuselage would provide stowage for a small receiver, battery and mini-servo, reached perhaps through a door in the side. This hasn't been tried but even at 12oz (that is, 4.1/2oz of radio) we would expect the Dart to give a steady, gentle climb and the model to show soaring capabilities in reasonable conditions. It would be difficult to get cheaper power radio flying!

BALSA CUTTINGS

Cyano de Bergerac sticks to the facts...

The old order changeth

Heading borrowed from Tennyson - must be a serious bit coming. Well, yes. Aeromodelling has two long-term troubles; flying fields disappear, and youngsters don't appear. Forget the first - just buy your own and don't upset the neighbours. But what is the answer to the second? Many illustrious chaps have spoken and written about it. Let us draw together the threads of the most recent. Aeromodeller, August '89; and Alex Imrie, well-researched and informative as ever, looks at the way things have gone, and are still going. It's a bad day when even his fertile mind can't come up with anything more promising than the hope that the BMF might urge schools to help recruitment through Arts & Crafts. He speaks sombrely of us as an ever-diminishing group, and of traditional aeromodelling fading away. Not a pretty sight.

Disagreeable reality is also stared boldly in the face by Dave Hipperson with classic commentaries in Northern Area Newsletter and June 89 SAM Speaks, to which latter thanks for leave to quote. He accepts that the days of our youth have gone with the flannel bags and Fair Isle pullovers, and that we must see things as they are. He will soldier on, in what however he fears may be 'the final stages of a hobby which, when looked at in the perspective of all man has ever done, will be seen as one brief, bright, but ecstatic flash.'

These two gentlemen, whose uncharacteristically gloomy pronouncements only mirror concern expressed in Hangar Doors and the Model Engineer F/F Forum, know what's what. We've all read the writing on the wall. 'These days, aeromodelling is no Pied Piper', it says, and nobody knows what to do about it. Even the deft-fingered, technically-inclined Cyano Junior never betrayed the slightest interest, and there is small reason to suppose that his little Stickiness de Bergerac will either. Why should they? The reasons why youth rejects aeromodelling are perfectly understandable, and mostly undefeatable. But let us pause for thought inspired by the Hippersonian reflection that we might do as the politicians do, and solve the entire problem on paper, by raising the Junior threshold to admit 55-year olds!

Ah - many a true word is spoken in jest. Our problem is no different to that of the Scout Movement, which has been forced to make many changes by trends in social development. To keep what we have, we must be prepared (unintentional) to do so too. Perhaps we must come to terms with the idea that the aeromodelling youngster was a phenomenon which will not be repeated, and that ours is *naturally and properly* a hobby for the middle-aged. Has it ever occurred to you that the Vintage Movement is just a name

we mistakenly apply to what we have finally come to realise is Traditional Aeromodelling As It Will Always Be? - a fascinating pastime which starts to get you at a time in life when the kids have grown up and peaceful evenings passed in pleasant creativity are just the job. Round about when you're getting on for 55...

Tempus fugit aeronauticus

Aeromodelling is not the only aerially-orientated institution to feel concern over the low intake of youngsters. A large branch of the Royal Aeronautical Society has just completed a voyage around itself and - possibly with a sideways glance at your columnist - gravely reports in its newsletter the finding 'that the average member is of a certain age.'

Digital read-out

The average clubman can have no idea of what we have to put up with. There's Mad Ray, bashing away at his Ohlsson 23 which as usual is too far advanced with not enough needle, so all it does is go 'brraatt, brraatt!' Innocently trying to start a conversation, a bystander says 'That's a Banshee designed by Leon Shulman, isn't it?' 'Close!' says Ray, 'Actually, it's a Recipee designed by Col. Sanders. You have to start with a Kentucky-Fried Chicken stick because the motor is so finger-snicken' good.' Like many others before him, his questioner edged away.

Per centage ad astra

Long ago in contests for free-flight power, the idea was that you put just a dribble of

fuel in the tank, started the motor, held the model up staring at the juice level until you were cross-eyed - then when the meniscus fell to the little mark you had made, you bunged. Engine run - seven seconds, glide - twenty minutes. (*Old men forget* - Henry V). Expressed as a ratio, your score was 171. Simple. Nowadays, by the time you've grasped the basis of scoring, already it's time to go home, you finished 65th and you still don't know why. Many letters have been received by B.Cttngs demanding why the old, manly ratio way of life cannot be re-introduced. Sorry folks, can't be done. Ratio Relations Act, you know.

Split decision

That readworthy author of the famous tall-end column in one of our little-sister magazines - the one he suggests doesn't take itself far too seriously, ho, ho - has dwelt a couple of times on his worry about the shortcomings of the English we aeromods use. After, that is, excusing his inability to spell 'programme' on the grounds that he writes (and presumably thinks in) computer-speak. He then tears off a perfect show-piece of grammar with a wealth of apostrophes properly placed and a complex subordinate clause pleasingly positioned, just to show ya. However, (and note this 'however' is followed by the comma he insists on), it is said that residents of vitreous domiciles should refrain from chucking petrous missiles. Is there any chance, Roly, that you'll break your habit of splitting your infinitives?



Gone on your package holiday yet? Terry Rosa's view at right...

1989 WORLD FREE-1

THE 1989 Free Flight World Championships were scheduled for the Argentinian autumn, giving more compression of time than usual for team preparation after the Trials. Martin Dilly's tasks as Team Manager were considerably lightened by the appointment of Lauren Fantham as Assistant Team Manager; particularly as she is a Spanish speaker! After much investigation the Brazilian airline VARIG were entrusted with the job of transporting the British team and precious cargo; and how pleasant to find that VARIG's station manager at Heathrow was an ex-model flyer who insisted on masterminding the loading of the model boxes, supervised by Dilly.

An uneventful 747 flight to Rio was followed by hitch-free transfer to the Buenos Aires-bound DC10, the only intervention being when it seemed at one point that the Team's container might be opened. The 450-mile journey from Buenos Aires to Embalse Rio Tercero was mostly on well-surfaced roads, although local drivers did not share that distinction. Five cars had been rented; the main reason for choosing not to fly part of this leg being simply to avoid unnecessary baggage handling. Despite the lack of a map to the accommodation address, successful navigation was made, the journey being enlivened only by one vehicle hitting a spectacular pothole, causing not only a flat tyre but a flattened wheel! Repairs cost a grand total of 80 pence; petrol at 45 pence per gallon helped offset the high car rental charges.

Trials, tribulations

Some of the original, top-placed flyers at the Trials decided they were unable to go to Argentina, partly for financial reasons and also thanks to individual doubts about Britain's relationship with Argentina after the Falklands conflict. Both factors may well demand further investigation; in the event, our reception was most friendly.

Thus Jim Baguley, most enthusiastically flying F/F again these days after a long spell at R/C, was admitted to the Glider team; he gained in confidence throughout the meeting and performed most creditably. Similarly on board came Ivan Taylor (FIB) and Roger Baggott, flying Power. Once again Gatorade provided substantial quantities of the well-known drink concentrate, such continuing, enthusiastic support is most welcome. Two personal donations also helped defray expenses - which amounted to almost £1000 per team member. Contribution from the BMFA Team Travel fund was also most welcome.

We're here!

Teams were accommodated in one of two hotels in a rambling tourist complex by a large lake, about one mile from a nuclear power station. Food was adequate. Currency dealing involved changing dollars in various stores because banks were closed for a week; inflation of 58,000 per cent (yes fifty-eight

An Argentine adventure fully reported by Lee Hines with additional information by Martin Dilly



*Australian F1A contender Vin Morgan
hums it up for the camera. Down early in
round seven to drop from the fly off
finished 25th...*

thousand!) was an eye-opener...

A fraternal lunch for all teams on one of the practice days meant the astonishing sight of a 50-square-yard barbeque; pleasant enough, but rather a waste of three hours' valuable trimming time. The opening ceremony had taken place in a sports stadium, just a short bus ride away from the flying site. Teams marched in led by schoolchildren bearing national flags, all accompanied by an Argentine Air Force band. The UK Team's welcome seemed loudest of all... After speeches, a small air show and parachute drops came a charming presentation of a flower and individual message of welcome by small children dressed in white, knee-length coats, described by the UK Team Manager as 'looking like miniature psychiatrists'!

Lastly, we were treated to model rocketry, an R/C demo which would have earned some of the pilots a grounding in the UK, and some daylight fireworks.

Action begins

Processing took place, punctually and smoothly in a sports hall large enough for the 50 metre glider towlines to be checked within. Minor problems, such as incorrect identification sticker marking, were soon remedied, as was a slightly underweight model.

The contest site was a large grass military airfield, sloping slightly towards a lake about a mile-and-a-half from the perimeter. Most was short, reasonably smooth grass; other

FLIGHT CHAMPIONSHIPS



Findahl (Sweden) prepares in F1B. Mylar-tailed craft dropped time in Rounds 1 and 3. Came 32nd.



21st in F1B was Pym Rijter of the Netherlands. Another well-invigorated design.



Stafford Screen was highest Brit, at seventh, in F1C. 26 seconds dropped in the fifth round put an end to his fly off chances.



The German contingent hired this modestly-painted bus for ten days. Nuttgens (F1A, seventh) poses in front of the vehicle.



Above: America's Jim Parker points to his own event seen on the entrance to the Aerodrome La Cruz. Actually finished 16th.

areas were rougher, demanding care when glider towing. Occasional stubble cause damage to fail and sheet-surfaced models. Launch lines, about a quarter-of-a-mile apart had to be changed only once, after a swing of drift.

F1A Glider Thursday 25th May Rounds 1-7; 08:30-16:00

26 countries were represented in the Nordic event; but conspicuous by its absence was the Chinese glider team that has done so well in recent world champs. Due to the extremely high cost of air fare at \$3500 US per return ticket the budget of the Chinese aeromodelling association only allowed them to send six competitors, so F1B and F1C teams were chosen as representatives with the highest chances for victory.

Neither in attendance were the North Koreans, Czechs, East Germans nor Cubans. Hungary only sent a Power team; and the Danes were only four in number; Thomas Koster (twice World Champ) was sole F1C entrant. Three Norwegians comprised the glider team. Japan had two F1C flyers; Ozzie Vasquez flew Wake for Venezuela (ten years after his country's first entry in a World Champs) and Cenny Breeman (of 82 and 84 European Champs final) flew Glider, alone, for Belgium. At nearly the last possible minute, three Yugoslavs arrived, Blagojevic, Kapetanovic and Jusefbasic (the Livon '85 Comp Director).

A cool, sunny dawn found the glider-guiders putting up check flights all over the field in quiet preparation for the hard event. Sunrise occurred at 8:10 with a light mist rising from the lake which lay about one-and-a-half miles to the west. The slight drift was to the northeast and the only true

obstructions; buildings and the tree-lined compound of Aerodromo La Cruz, the local field of the Argentine Air Force.

The siren at 8:30 was greeted by quick (and probably nervous) action as several launched in search of some buoyant air. Prominent among them was Andres Lepp, back on the Soviet team for the first time since Spain '81, flying AL-33, his long glider from that same World Champs, to a nice max.

Gary Madelin scored a nice 180, but Jim Baguley fared less well, his 169 sec suggesting 'a lack of performance', as he put it. Mike Fantham's flight with his new Robin 14 variant stalled to the ground in the cold damp air for 151 - a shattering start, apparently the result of condensation on the upper surface of the wing, indicating that different turbulence might correct the problem.

As testament to the excellent flying, 41 maxes were recorded in relatively neutral air of the opening round. Misses of note were Tahkapaa (Finland), Palmier (Argentina), Bucher (Swiss), Blagojevic (Yugoslavia) and MacKenzie (Canada), who was foiled by gliding behind those trees at the Aerodrome! Several nations had 'full house' scores; Austria, Denmark, Bulgaria, F. R. Germany, The Netherlands, Poland and the perennial odds-on favourites, the Soviet Union.

The organisers had wisely provided a five-minute space between rounds for station switching, testing and so on (which your reporter certainly found helpful!). Round 2 thus started at 9:35 in variable and gentle conditions. Soon the fliers were quietly in search of faint lift all over the pampas grass terrain. Lepp flew early, using AL-33 again while the air was smooth for his second max then switched to a normal glider, AL-37 (of 2100mm span) for all remaining flights.

It was Victor Tchop who found the first thermal. Quickly a locust swarm of Nordics were in the area, with inevitable line-tangles occurring. Jim Parker

(USA) was one of them, but he landed in the soft grass undamaged. Not all who flew could max in Tchop's soft lift, including Polish flyer and Australia's Peter Nash, who had a bad day, dropping in rounds 4 and 5 as well. Parker made no mistakes on his refly, maxing nicely to match his team-mates. After two rounds the USA had only dropped one second in all, but several teams naturally had perfect scores, notably, the Russians and the Nyhegan family (father Henning and sons Bo and Jes) from Denmark. The rounds progressed fairly normally throughout the day, but not without drama, since the thermals were not big and a fair amount of turbulence accompanied the afternoon breeze.

Those who could verify it didn't get easy included De Boer (Netherlands) with 167 sec in round 3, Van Wallence from the same country (166 sec in round 2 and 91 sec in round 5) and team-mate Somers with 167 sec on round 3 and 109 sec in round 6. Others to falter were the Argentinian, Dondero (136 sec, round 3), Gary Madelin with a round 3 score of just 84 sec, Kochkarev (USSR; 119 sec in round 4), Breeman (Belgium; 63 sec in round 6 and 147 sec in the following round), Wilkening (FRG, 53 sec, round 4) and even the 1983 F1A Champion, America's Matt Gewain, dropped to 148 seconds in the fourth round.

Going into round 6 the Nyhegns of Denmark were tied with the Austrians on full scores. Close behind was Finland (16 sec down), USA (-32) and USSR (-61), but now came the upheaval in the rankings as Henning and Bo Nyhegn each did 90 sec. Klaus Salzer of Austria clanged with 101 and Kim Henriksson dropped Finland out, scoring 120.

That meant the US leading USSR by 29 seconds, and with only one more round to go it looked like the Nordic Team Trophy would to Stateside for a second time. Round 7 began at 3pm. Dale Elder maxed to advance to the flyoff. Parker finished strongly with six solid 180s for the dubious distinction of being the first flier below the flyoff group.

Eugene Verbitski confirmed that, yes, the Russians had all made maxes. The Americans thought that Gewain had as well, but congratulations were premature when it was sadly discovered that his flight was only 60 sec, making the excellent team from the USSR glider champions once again.

Jim Baguley finished strongly in 19th with maxes in the last 6 rounds for the distinction of top UK Glider placing. Fantham righted his boat after round 2 for equal 25th and poor Gary Madelin dropped to 42nd due solely to his downer in the 3rd. So the UK and the USA tied for 8th team position at final reckoning.

At 4.30pm the four-minute flyoff round began. The fifteen remaining fliers faced a cooling breeze which would make circle-towing an adventure in frustration for the less attentive, (or experienced or fit) among them.

Almost immediately Lepp towed up and circled downwind, apparently in lift which he must have sensed on the ground. After two more test circles progressively further downwind, he zoomed off into the thermal, along with Rojadies, Sexton, Tchop and others. Sahi then found a bigger piece of lift upwind which Aringer also saw, sprinting crosswind very fast and skilfully to intercept with a massive zoom, placing his white-and-bright orange glider at the same elevation as the Finn's climbing model! Gobbo of Italy also got in on that ride which should surely reward them with maxes.

Several had still not flown, as what lift there was appeared to be narrow, difficult to detect and passed quickly since the wind seemed to have increased during the 15 minutes allotted. Dale Elder was one of them, kiting his bird some 200 metres upwind looking for his piece of air. Suddenly, he was in trouble, crashing, trying to circle in what appeared to be lift, but unable to spring fast enough in the grass to bring it 'around and off'. So with two minutes remaining, a very tired tower ran back to the flightline where his backup glider was setup and ready for his second attempt.

Elder waited on the ground for a few seconds, catching his breath and hoping for a last-ditch thermal; but it was not to be, as he went straight up and off to glide in for only 78 sec and 14th place; a gallant try anyway.

Reigning champ Viktor Tchop had flown VT-38, his '87 (France) and '88 (Yugo Euro Champ) winning



glider all day with obvious success, but this time he just missed, returning a time ten seconds short at 2.30 sec. Nuttgens of Germany, in his first World event, did well near the end of the round with 227 for seventh spot. New Zealand's Malcomb Sexton had tried to max in Lepp's thermal but didn't centre, landing at 212 sec. These situations can be a bit of a lottery at times, and it was apparent that the best times were returned from those fliers who launched from the southern end of the flightline or field, either over the longer pampas grass or just downwind, in the stubble field.

Five of the fifteen fliers had maxed and were awaiting the return of their gliders from downwind. Even with the brisk wind, retrieval caused no undue waiting or grief because the fields were good for chasing and didn't puncture covering very often thanks to the grass being unmowed, thereby guaranteeing (general) soft landings.

The five-minute flyoff (5:00-5:15pm) was the decider. Conditions were just about the same as the prior round and again Lepp was towing at the siren's sounding from his position southern-most of the five remaining flight stations. Andres and his AL-37 seemed to be perfectly in tune, as they tested the air together, circling downwind once, then again, feeling apparent thermal tension, pausing to masterfully sidestep the somewhat out-of-control model of a competitor, yet obviously keeping supremely controlled and aware of the situation at hand. They made one last tow-circle downwind to make sure of the air and zoom-

Top of page: Anselmo Zeri flew for the Netherlands in F1B.

Above left: F1C matters under discussion between Screen (UK, left) and Verbitski. Centre right: Viktor Eskov, with CB, is distracted as Viktor Tchop and Andrez Lepp (USSR) exchange views. Above right: Colossal barbeque of steak and sausages was a notable feature of the meeting!

Opposite page: Main picture: Lauren Fantham launches for husband Mike in F1A... Top left: Russell Peers waits for the signal to go from Gary Madelin (42nd). Top centre: Polish interpreter Dorota Putrzynska holds one of that country's F1B craft. Top right: This interesting Chilean F1A featured an unusual wing planform. Below left: The Brits: Baguley, Fantham, Screen, Baggott, Johnson and Madelin stand behind Peers, Gaunt and Taylor. Below right: Second-place Randy Archer (US) goes for max in the fly off.



Launch action on this page begins with GB's own Stafford Screen who finished 17th overall in F1C.



Sergei Korbut, winner for the USSR, achieved an incredible 25 seconds in the fly off.



Second in F1B - also for the USSR - was Andriukov, whose now-familiar delayed-prop-release system is seen working well!



Enthusiastic participation in the Russian 13th in F1B, 13 seconds in the flyoff, means Wake fliers look out in the future!



in, F1C
Soviet
ved an
minute
ff time.

Enthusiastic
by UK's
Peers
and 18
of the
fellow
should
uture...

Always in the
running, Verbitski
eventually gained
third place, helping
the Soviets to top
team position in F1C.

Ken Phair (USA) was
well out of luck this
time, mainly thanks
to an eleven-second
effort in round seven.
Finished 37th

An energetic launch
speeds one of the
Australian team's
F1A on its way,
hopefully, to a max...

Strukov's solid
performance - he
finished 8th in the fly
off - was another to
lift the Soviet's to the
top in F1A, F1C and
unassailably, the
Challenge France
aggregate.

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launched; up in a left-handed open climb, recovering perfectly. No one else was in position to reach Lepp's air and so AL-37 soared away to what increasingly looked to be a sure max as the others searched in vain for lift that was not to be. Andres sat where he had launched, watching the entire flight, not daring to hope that no other maxes were clocked off. As it became obvious he was the winner, Verbitski rushed to congratulate him as he began walking back to increasing applause and cheering from the crowd of friends and admirers at the flightline. Andres was beaming ear-to-ear with pride and happiness as Eugene shook his hand, then bear-hugged him. This was finally freeflight justice written in victory celebration for the Nordic flier who has contributed so much and been so close to winning at least twice before.

F1B Wakefield Saturday, 27th May Rounds 1-7, 8:30-1:00

This, the third competition morning, dawned clear, calm and not quite as cool as the day before. The organisers, being watchful and concerned to provide the best possible conditions for the competition, announced that the rounds would be shortened to 45 minutes. This was because of the forecast that the winds would almost surely increase in the afternoon; Wakefields are generally more affected by wind than Nordic or Power models, which are heavier. Obviously this was a wise decision, even though retrieval teams (and reporters!) were going to be kept quite busy.

Flying commenced promptly with the start of round one, with Giovannetti of Chile having first-in-air honours. Unfortunately a horrid power stall occurred, showing the presence of a turbulent wind shear layer again, producing an 81 sec flight for him in his first World Champs. Up went the new Espapa of Reiner Hofsass, which also showed a slight stall under power. After his great victory at Livno in '85, Hofsass has built new models with wings of solid Rohacell foam covered with light Kevlar, plus carbon spars and tips that plug into the one-piece dihedralled centre panels. The aerofoil was quite thin and had some upsweep, patterned after an admired Bob White section, but the wings were stronger and seemed to handle the higher launch speed forces with apparent ease.

Jim Quinn flew first for the US, but his climb was not strong because of the effect of the cool temperature on his rubber. His glide was very good, though not quite good enough for the max of 3.1/2 minutes now required for first F1B rounds - landing 20 sec short. Bob White was given the position next to the US team by the organisers, so that it would be convenient to inform the chase crew by radio when Bob flew; which he and Walt Ghio did for beautiful maxes. Jack Brown then took his turn and after a fairly good climb seemed to be riding a small bubble of good air, which upset his glide just enough to cause a loss of 9 sec. Half of the 74 fliers had made the max, with notable exceptions; Ben Itzhak of Israel, the '79 F1B victor (147), Doug Rowsell of Canada (178), Ivan Taylor of England (206). France's consistently high-placing Louis Dupuis had a disastrous 13 sec(!); but Ruben Clemencea dropped only one second for the Argentine home team.

Rounds 2 through to 7 proceeded quickly and sure enough, the breezes came as predicted. The climbs of many suffered on this day; due to the cold air's effect on the rubber early on; and later, from the wind, which remained somewhat turbulent, although never quite reaching the velocity of the day before. The lift once again was soft, small and hard to read as the scores showed. For example, 56 maxes were recorded in the third round, with a low of only 40 in round 6. It was a very real challenge to read the indicators properly and fly when you thought the moment was there, and then have the model behave according to the script! A lot of frustration up and down the flight-line proved the difficult conditions, but still, with two flights



Doug Galbreath (USA) with distinctive V-dihedralled F1C - and winglets. Down the field at 25th this time.

to go there were fifteen fliers without any misses. A testament to their excellence. The defending World Champion, Bob White, was one of them, flying one of his familiar red and white swept-tipped twin-lined Wakefields (No 24, to be exact). Jim Quinn had done well after round One, with all maxes since. Walt Ghio, on the other hand, was having a day best forgotten, as was Brown. A mechanical glitch of some sort caused a very short flight for Walt in Round 2, while poor Jack suffered without a max until the fifth round.

After looking strong early on, Anselmo Zeri (of Italy, but he lives in and flies for, Holland) dropped three seconds in the 6th round after a power stall, which in the end gave him equal 9th place with Wenyi of the victorious Chinese team. Another piece of evidence underscoring how tough it was to max was reflected in the fact that during the 21 flights of a winning competition; even the superb and

consistent Chinese dropped three flights! The great all-rounder from the UK, Russell Peers, who is said to prefer flying in the wind, finally came a cropper with 162 sec in that fateful 6th round, as did Kapitanovic (Yugoslavia). Swiss thinker and flier, Dieter Siebanmann (194 sec), Jordanov of Bulgaria (112) and Poland's Luniewski (144) were the least lucky, as they waited until round 7 to make their mistakes. Seventeen more seconds by Luniewski would have seen the Poles beat the Chinese team.

A repeated comment, which matched observation, was the need to remove decalage and/or tighten glide circle to achieve the best trim compromise for the turbulent, windy conditions on each of the event days.

Herbert Hortman (Sweden, 39th) prepares in F1A, with Bror Eimar at his shoulder.



F1 B Individual Results

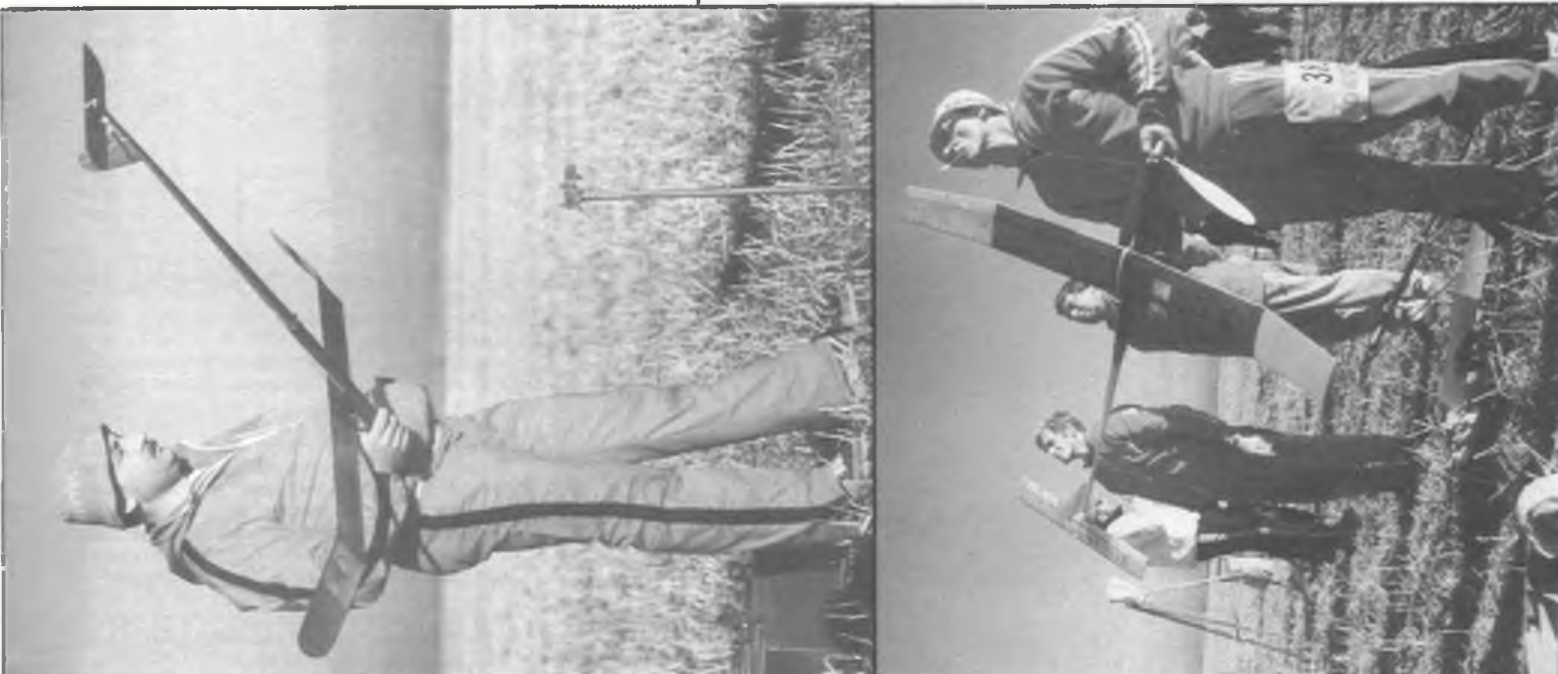
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Andriukov (USSR) prepares in the mist before the flyoff.

	Total
1 USSR	11483
2 Poland	11248
3 Germany F.R.	10976
4 Italy	10801
5 Bulgaria	10724
6 USA	10659
7 GB	10632
8 France	10330
9 Canada	10101
10 Switzerland	9395
11 Argentina	9312
12 Australia	8267
13 Sweden	8172
14 China	7782
15 Brazil	7616
16 Netherlands	7352
17 Finland	7148
18 Israel	7036
19 New Zealand	6793
20 Austria	6205
21 Uruguay	5905
22 Spain	5904
23 Chile	5362
24 Denmark	4911
25 Yugoslavia	3912
26 Hungary	3256
27 Mexico	3241
28 Japan	1829
29 Belgium	1110
30 Venezuela	975

Above left: Cofalek (Poland) in thoughtful mood; victory by 80 seconds over Andriukov proved the soundness of his approach.

Peter Gaunt watches the opposition as Russell Peers waits to go.

[illegible]

	Total
1 USSR	3960
2 China	2966
3 Poland	3923
4 Germany F R	3683
5 USA	3615
6 Bulgaria	3683
7 Hungary	3626
8 Italy	3648
9 GB	3443
10 Canada	3231
11 France	3182
12 Argentina	2523
13 Switzerland	2400
14 Japan	1829
15 Brazil	1821
16 Denmark	1320
17 Australia	1296
18 Austria	1292
19 Sweden	1288
20 Spain	1075

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Above: Roger Baggott pensively regards his F1C as he hooks up the D/T lines. **Left:** Australia's Bruno Chinchilla (at left of photo) had a merry time despite placing 43rd in F1B.

success. His launch looked fine but the shear at 80ft flattened the climb just enough to cause an over-bunt condition, losing some altitude, then stalling for the first minute before finally flattening out to a beautiful glide still high enough to make his four minutes with some to spare. Breathing somewhat easier now the first max was in the books, Randy Archer then flew a picture-book flight for his max.

Ken Phair's rough day continued right into his first official flight. His model stalled to the ground in 140 sec, virtually killing any chance for a team prize. He wasn't the only one in trouble, as Dave Sugden (Canada), Dick Johnson and Roger Baggott (G.B.) and Gunnar Agren (Swed.) were among the sub-max sorrowful. That aside, there were 33 competitors achieving the four-minute max out of 48 fliers.

Midway through round two the wind shear stopped, but the wind didn't. It looked to be a windier day, and was; settling on the normal south-west direction earlier than usual. With no warmth in the air extra layers of clothing were required just to keep warm. As the rounds progressed the wind rose and power patterns deteriorated thanks to the buffeting turbulence. Many low scores and several crashes were the direct results of the very trying and harsh conditions; it being nearly impossible to detect the small thermals, let alone start your motor and launch in time with wind speed gusting high! Argentina's Mauricio Zito had a substantial 'home field' advantage and was doing very well until dropping the sixth flight for his only error. In fact round six was statistically the worst, with only 26 maxes and 18 drops.

Even so, after the sixth round - incredibly - two teams still retained full scores! The Poles and Russians had managed to keep from losing any time so far, but unlucky Jan Ochman could only manage 143 sec in round seven, while the deserving Soviet team maxed out to win by four seconds over the Chinese and the right to join the flyoff.

In the interest of achieving a sporting result (and because it was so windy!) the organising committee declared the flyoffs were to be on Sunday morning, which was a relief to almost everyone. So the 'lucky 13' who maxed out left the Aerodromo La Cruz field earlier than expected on this day, with two nights to think over their strategies for final phase of competition...

F1B flyoff: 4-minute round. 3:45-4:00

This had all the marks of a difficult time for the eight remaining heroes, for it was not warm and the wind had a blustery feel about it, which almost certainly meant a bumpy ride and higher drift above the ground effect. Winding started as soon as the siren sounded. With only fifteen minutes for launching no one could afford to miss a chance at this stage of the game. First one, then another motor broke in the effort to pack in more climb. The waiting began as the audience watched in quiet anticipation.

A sudden flurry; down the line were two climbing, then a third, then Andriukov, White and Gorman from stations 3, 2 and 1 respectively, at the north end of the flightline. Who power stalled? Andriukov, someone answered, but did you see Cofalik's climb?

Quickly they drifted away, making it difficult to tell one from another; the grapevine will tell after the timers turn away from their binoculars to read their watches. First came news that the Swede, Tornkvist had a low flight, as had Cheneau of France, and Gorman of the USSR. Hoffsass' fine flight of 203 sec was closely followed by White (196) and Zhaoyi (192). The only maxes were by Cofalik of Poland and Andriukov, both using the advanced system of delayed prop release combined with a hard, vertical 'javelin' launch, with obviously superb results. They achieved their four minute 'bogey times' without benefit from lift. Andriukov

Continued on page 591

F1C Power Friday, 26th May Rounds 1-7; 08:30-16:00

Clear skies and moon-set greeted our pre-dawn arrival on this second day of the championships. Our feet, fingers and a bit of frost on the grass confirmed that it was cold; nevertheless, first light brought the sound of engines and the inevitable last-minute check flights filling the air. Wind shear was present this morning above, approximately, eighty feet, with a fair drift to the normal southwesterly direction causing many power patterns to deflect flatter when passing through the shear line, since the drift on the ground was from the southwest!

This year it was clear that aluminium-foil-covered F1C models were in the majority. It was evident that most of the really dangerous competitors were following the lead that Verbitski and the Russians began in the 70s when they began using thin metal-over-balsa construction techniques. The Americans used this system for all of their power ships, and many thought Archer looked especially strong. His very high and consistent climbs and smooth bunt pullouts made him a pre-game favourite to upset the 'Russian four' of Strukov, Mukhin, Korban (F1C team) and Eugene Verbitski, ever friendly and proudly defending his hard-fought and highly popular '87 victory. In addition to those mentioned, the Chinese were expected to be in contention, as were the Italians, Poles, French and Hungarians.

Three-time Champ Thomas Koster is always a strong contender with some of the most exciting ideas in design and equipment on any contest field. This year he had the only flapper I saw. It met an unfortunate demise when, on a check flight before the start of round one, it was quite literally blown apart as the RC DT control button was pushed too early during nose-down position after over-bunting! The guilty party shall remain nameless, although Thomas was muttering something about 'instant divorce' as he went to collect the bits and pieces. Thomas seems to have set aside his Excalibur all-plastic moulded F1C design in favour of Verbitski style models and certainly had them going very well. If you can't beat 'em, join 'em, eh, Thomas?

Verbitski proved he is not fallible by stacking his new, long BE-49 golden ship, thereby solidifying his decision to fly BE-43, the '87 winner. That wasn't all, for just a couple of minutes before the start the first trouble of the day struck the American camp when Phair launched a check flight which hit a gliding model, destroying Ken's model while the other rocked and continued on seemingly undamaged. Ken turned around to set up another, which he said was the one he planned to fly in any case...

The beginning of the first round saw the usual flurry of activity as seemingly everyone was anxious to get their flight in early.

Doug Galbreath fired up the hot Nelson engine in his V-dihedral and triplet design he calls V-Max, which he and Ken Oliver have been developing with

Moreover the use of actual flight times, rather than relatively easy maxes, makes the also-rans terribly obvious. Not surprisingly, Indoor duration contests tend to be supported only by the handful of fliers who know they are in contention.

And progression...

For years the Northern events were contest-orientated, until – eventually – the effects just described caught up with them. Support and participations declined – and it became more than doubtful if the meetings could continue to be financially viable. Sports halls are readily available – but they do not usually come free! Changing rules and introducing new events were moves that worked for a while – until ‘progress’ once again saw the events dominated by the same, small, handful of fliers.

Reaction saw Fun-fly meetings take over – even in the North West during the Spring of ‘88 – but these soon palled. Moreover, they did not appeal to the dedicated contest fliers who perform the work necessary to stage and run such an event. There was every likelihood that the whole system would collapse. The trend was predictable enough, even if the answers were less obvious.

...to P15

One successful idea, tried last Autumn, was the introduction of P15, an allegedly beginners’ class utilising ‘Sleek Streak’ prop assemblies. As was more fully described in February’s *Aeromodeller*, some of the implications of such a concept were foreseeable. Thinking things through led to the holding of two separate sub-divisions – one for models built to a standard, published design, and the other for almost anything else!

This segregation worked from the start, as it kept the experts away from the club-fliers. Surprisingly, the stronger category, with the more sustained interest, has proved to be the one for modified designs – or P15-GT, as some call it. This has also seen some very real competition with high scores from a number of entrants.

Obviously, most work has gone into propeller development, within the constraints of being ‘plastic with a maximum diameter of five and a half inches’. The obvious, and expected, approaches were those of scraping or sanding the blades for lightness, and twisting for more pitch. The next trick was that of using a larger propeller (usually seven-inch) and cutting it down to size. This gave a lot more blade area than that available from the basic five-and-a-half-inch propeller. Whilst all of this worked, there proved to be alternatives. The propellers do not sand well, and scraping with a blade is tedious. Much the same effect can be accomplished with less effort by punching (or drilling) a series of holes through the blades – and then covering the upper surface with Mylar. The next stage was to scrape first, and then make the holes – but a better idea arrived before things got to extreme.

The way ahead

I was not the only person to think of making a plastic propeller from scratch – but I was the first to produce one in public! I remembered ideas for cutting propeller blades from plastic food-containers (note the position of the ‘hype’) from some American articles on scale models. A slight extension of the idea was to use foam plastic drinking cups to give lightweight blades. These could be cut and



Above: Squire Kay at the Chorley Indoor meeting in February caught adjusting the tail warp of his mini Zombie. **Below:** Cheerful Brian Horsefield with his Peanut Church Midwing at the Coppull Indoor meet in May.



sanded to airfoil prior to (or even after) mounting on a plastic spar – much like a miniature version of a conventional EZB propeller. Those who realised afterwards why I had collected disposable coffee cups and tea-stirrers from certain fast-food establishments soon dubbed the results the MacDonald propeller! Copies soon appeared – with favourable comments regarding their ease of construction.

Plastic bearings were no trouble. A scrap of nylon, drilled for the shaft, and then cut to an L-shape is more than adequate – and very easy to make. Material is readily available – any broken, nylon power propeller can be utilised!

Surprisingly these ideas have not found acceptance elsewhere. The SMAE Indoor Technical Committee have scheduled a P15 contest in Cardington on 6th August (long

Below: Wigan again; and Roy Roberts, back on the Indoor scene with his P15. **Right:** Mike Colling dodges his profile scale Cosmic Wind at Coppull.



gone by the time this article will be read), but have made their own decisions as to what can be done to the propellers. I would have expected success to be copied *en toto*.

But this is really getting ahead of the story – especially as other things happened in the NW area. Although contests were re-scheduled they were not allowed to fill the day. Extra time to test, or fun-fly, was felt to be important – with contests held in a limited period towards the end of a meeting. Naturally this implied that the contests were also limited in scope – with P15 one meeting and EZB as another. The temptation to hold several events each day was restricted manfully.

Norwind news

But perhaps the most fundamental change came elsewhere. This was in the formation



Below: Bill Murray's best flight of 4:21 was nearly enough for EZB victory at Wigan...



of a specialist organisation tailored to suit the needs of the local fliers. The North Western Indoor Model Flying Association (Norwind) is a loosely-knit group, intended to promote this branch of modelling, and to provide some sense of fellowship amongst those involved. Advantages to the membership include a newsletter, whilst the subscriptions effectively underwrite the series of meetings planned for the winter season. The £5.00 (that forty people have thought a bargain) is really payment-in-advance for the hall hire charges. Hence members feel encouraged to attend, whilst those responsible for the booking do not have to worry about meeting the bill. The system works!

There are plenty of suitable venues available, as sports halls have proliferated in many districts. Certainly, there is no shortage of such halls available for public hire

in the North. The recent winter has seen new sites tried out, partly to see just what is available (and whether they offer any advantages) and partly to 'spread the load' and add variety to the scene. So far, nowhere else has been found with a smooth ceiling to match that of Wigan Technical College - although the Chorley site has the advantage of more floor area (albeit at the price of having a girder roof).

One development was not planned at all, but happened spontaneously. A group of sports fliers has arisen - complete with an interesting assortment of electric and CO₂-powered models. They fly a lot, and in some cases extraordinarily well. This is particularly true of the Scale models - the performance of which makes me wonder why there is so much trouble reported elsewhere. The models of Derek Hardman, Bill Harwood, Squire Kay and their associates may not please the scale pundits, but they certainly fly - and fly well. We have even seen formation flying - talk about confidence!

Pitfalls

Mind you, there are still unsuspected pitfalls. Reg Boor had a combination of taut covering on his Bristol Brownie and KP electric motor that resonated to produce a hideous screech - the complete antithesis to the much vaunted 'silent flight'. Nevertheless, for scale and sports flying, modern electric technology has a lot to offer. The KP package is attractive and convenient - but there are DIY alternatives for those inclined. Choice of motors can vary but those from cheap Matchbox cars are more than adequate. Quick-charge systems, monitored by stopwatch, seem to be the norm. Finally, to be fair, CO₂ should still be a viable alternative, but it does not seem to have the following.

Developments

Elsewhere in the country there have been developments. The Indoor Technical Committee ventured out of Cardington for what is probably the first time ever. This historic occasion came in late June when the hall at the West of England Exhibition Centre, Shepton Mallet, was available as part of the Model Craft Show. Perhaps the decision to use this venue for an Indoor contest was made when the show was still being considered as SMAE affair. Be that as it may, the contest

remained scheduled for this venue. The actual hall was large, with an arched girder roof bordered by two longitudinal catwalks. These made for a much restricted flying space than appeared at first glance, and hang-ups were commonplace.

Regrettably, the non-competitive approach prevalent at Cardington also appeared at Shepton Mallet. The Index event was poorly supported, with entrants flying what they had, rather than what they needed to win. A few advance calculations showed that EZB was a poor choice - and that PND was likely to fare much better. It all depended on what could be done under (say) 35 to 40 feet compared with the (Cardington) target score. Despite initial hangups, and poor recovery from contact with the girder, I managed three flights of 3:20 plus, any of which was sufficient to win with 60 per cent of the target. This was equivalent to a fifteen-minute EZB flight - well above the twelve-minutes-odd recorded by Bob Bailey and Bernard Aslett. Somehow I wondered what I had achieved!!

More at Mallett

The demonstration side of the meeting went better, and seemed to be appreciated by the public - with the modellers willing to show off their planes and to talk about them. Everything was seen, from Chuck Glider to Scale rubber and F1D - not to forget Reg Parham's ornithopter. Conspicuous, at intervals, was the R/C electric biplane flown by Robin James - looking as if the limited space was no hardship at all. Even loops were seen - very competent and very impressive! Mind you, it did stop all other free-flight...

What it did not stop was the electric RTP flying, strategically situated just inside the entrance and run by the South Bristol club. A number of models were available for flying by the public at twenty pence a time - with balloons provided for bursting. Variable draughts would delay the inevitable for a few laps at a time! The result and sound effects were a little disconcerting for anyone winding rubber motors at the other end of the hall.

All in all, a good display but a poor contest. So what do we conclude? The scene may be indoors, but it is far from static. Fashions wax and wane - so change is only to be expected. If we look at what has been happening, perhaps it will help tell us where we should be going. Certainly we cannot continue for ever with the mixture as before.

1989 Low Ceiling Indoor Results			
28th Jan	Wigan	Standard P15	1 B Bibby 3:10
		2 P Boddie	2:36
		Modified P15	1 J O'Donnell 7:13
		2 D Yates	6:18
		3 R Roberts	6:05
25th Feb	Wigan	Standard P15	1 R Sabey 3:22
		Modified P15	1 J O'Donnell 8:13
		2 W Murray	8:11
		3 D Yates	7:14
5th April	Wigan	Easy B	1 D Yates 21:38
		2 J O'Donnell	20:23
		3 D Wolstenholme	20:22
6th May	Copphull	Standard P15	1 R Boor 3:57
		2 D Wolstenholme	2:32
		Modified P15	1 R Roberts 9:10
		2 D Yates	8:35
		3 W Murray	7:12
25th June	Shepton Mallet	Index	1 J O'Donnell 61% PND
		2 R Bailey	50% Easy B
		3 B Aslett	49% Easy B

**You have control! Get aloft and soar
with the birds – Ian Tunstall explains
how to start in silent flight...**



Top: One of the Coventry Club's fleet of Bocians. Above: The ASK-13, easily identifiable by its distinctive swept-forward wing, is used by no less than sixteen clubs for holiday courses.

GO GLIDING!

FROM time immemorial man has envied birds their ability to fly. Around the turn of the century the reality of manned, controlled flight was simultaneously being developed in several countries. With the outbreak of World War I, emphasis, not surprisingly, was on powered flight. Unwittingly the Allies, with their ban on powered flight immediately following the 1918 Armistice, provided real stimulus for the development of gliding in Germany. Suffice it to say that Germany became the hub of world gliding; today it is the leading manufacturer of sailplanes. Examples are to be found at every Gliding Club either privately owned or as the club fleet for training to solo status and for holiday courses. The usual types seen are ASK 13, ASK 21 or Ka-7. British, Czechoslovakian and Polish types – Slingsby T-21b, Blanik and Bocian respectively – are also used by some clubs for their holiday courses.

Aero-tow thrills

Many aeromodellers have progressed to gliders which they themselves can fly, and have become totally hooked on this most exciting of sports. Once you have experienced the undoubted exhilaration of gliding there is a grave danger that you too will become

a gliding fanatic. I can still remember the thrill of my very first flight – a launch by aero-tow to two thousand feet in an ASK 21 at Booker near High Wycombe. This flight was a trial lesson as a birthday present from my wife. Hints dropped in the right quarters could well produce the same result for you.

The instructor was keen to find out what I knew about gliders and why I had come for a flight. Depending on how much one already knows about flying – as modellers you are better informed than most – the instructor will pitch his spiel at the appropriate level before take off having established if you are interested in taking the controls for a brief spell. When I was settled in the front seat, the instructor came on board and from the rear seat went through a pre-flight check that all of the controls – rudder, elevator, ailerons and air brakes – were satisfactory. Safety is of paramount importance in gliding and the final check was on the tow cable release. With everything checked and in perfect order the hinged cabins were closed, the tug plane took up the slack in the cable and we were off.

The freedom of flight can be yours for as little as £10.00 – see our table opposite, and send for a comprehensive list as described in text.

Can you imagine the thrill of steady acceleration along the grass runway, becoming airborne, climbing quite quickly for ten to fifteen minutes in wide circles with the flying field and other aircraft on the ground becoming always smaller? This is an experience you will remember for a very long time. There was a fair noise transmitted along the tow cable into the cockpit but when at two thousand feet the instructor pulled the release the silence was quite deafening! After following the movements of the control

CLUB DETAILS	TYPE OF SITE	GLIDER FLEET FOR COURSE	SCHEDULED NO. OF FLIGHTS AND TYPE OF LAUNCH	ACCOMMODATION ARRANGEMENTS	COST OF 5 DAY COURSE OR TRIAL LESSON	MEMBERSHIP BEYOND START	OTHER INFO/ ATTRACTIONS
Booker Gliding Club Wycombe Air Park, Marlow, Bucks. Tel 0494 442501 or 23263. Sec. M. Cumming. 41 Westbourne Terrace, London, W2 3UR	Flat field, thermal soaring	5 ASK 13	15 aero-tows. Credit given for lack of flying due to bad weather. Use credit during post-course membership.	Off-site in local hotels/ guest houses. NOT INCL. in cost of course. Bar and restaurant on site.	£270 all year round. Trial lessons £30, zero tow launch.	2 months	1, 2, 5 and 7 day courses are available. Nearby towns - Marlow and Wycombe.
Bristol & Gloucestershire Gliding Club Rymondfield, Nr. Stroudwater, Gloucestershire, GL10 3JX. Tel: 0453 880 342. Secretary: P.R. Andrews. 38 Charles Close, Thornbury, Bristol, BS7 2LW. Tel: 0454 415200	Hill top, ridge and thermal soaring	4 ASK-13 3 tugs 5 winch cables	20 aero-tows or winch flying charges NOT INCL. in cost of course typically £130	On-site. Cost of course includes full board from Sunday supper to Friday lunch. Bar/restaurant on site.	£100-£165 depending on date. Courses April-October. Trial lesson £20, zero tow to 2000ft or £12 winch launch.	28 days	A discount on course fee is given in the event of bad weather depending on how many flying days are lost. Golf courses and Cotswold country attractions.
Buckminster Gliding Club Salthby Airfield, Salthby Heath Entrance, Skillingington, Grantham, Lincs. NG33 5HJ. Tel: 0476 860385. Sec. G. Polkinghorne. Reservoir Cottage, Denston Manor Farm, Denston, Grantham, Lincs. Tel: 0476 870820	Flat field, thermal soaring	1 ASK-13 1 Bk-7 1 tug 2 winch cables	By aero tow or winch, as many flights as possible. NOT INCL. in course fee. Pay as you fly at club rates.	Off site in local guest houses, NOT INCL. in course fee.	£80-£85 depending on date. Courses May-Sept. Trial lesson £15, zero tow or winch [2]	28 days	Stately homes, Air Museum, golf courses.
Yorkshire Gliding Club, Sutton Bank, Thirsk, Yorkshire. Tel: 0845 597237. Sec. Site address	Hill top thermal and hill soaring	2 ASK-21 1 Bk-7 1 T-2ib	By aero tow or winch. As many flights as possible. NOT INCL. in course fee. Pay as you fly. Typical cost £130	Full board on site 5 days/5 nights included in course fee. Bar on site.	£136-£161 depending on date. Courses April-Oct. Trial lesson £18 zero tow £11 winch launch.	28 days	Yorkshire Dales, Castle Howard, Byland Abbey, Ripon, York, York Railway Museum etc.
Cotswold Gliding Club Aston Down Airfield, Aston Down, Nr. Stroud, Glos. Tel: 028576 472. Sec. E. Black. Lemon, 56A School Road, Charlton Kings, Cheltenham, Glos. Tel: 0242 31031	Flat field, thermal soaring	2 Ka-7 1 Bergfalke 4	25 by car tow. Credit given for lack of flying due to bad weather. Use credit within the ext. of membership.	Off-site in local hotels/ guest houses. Acc/ meals NOT INCL. in cost of course. Some kitchen facilities.	Flat rate of £195. Courses June-August. Mini-course of 3 flights, £27.50. Tues or Thurs eve.	28 days	Cotswold attractions, golf courses, etc.
Conventry Gliding Club Hubsands Conventry Airfield, Lutterworth, Lincs. LE17 4JU. Tel: 0858 880521. Sec. Miss M. Shingcliffe. Enquiries to office at airfield	Flat field, thermal soaring	5 Bocan 4 Tugs	12 aero-tow. Credit given for lack of flying due to bad weather. Use credit within the ext. of membership.	Bunkhouse acc., breakfast and lunch incl. in cost of course. Eve meals are NOT INCL. Bar on site.	£280-£270 depending on date. Courses May-Sept. Trial lesson £16 zero tow to 2000ft.	28 days	Shakespeare country, battle fields of Naseby, Edgehill, Bosworth. City shops of Coventry, Lincs and Northampton. Horseriding.
Norfolk Gliding Club Titcham Airfield, Long Stratton, Norfolk NR16 1NT. Tel: 037977 207. Sec. R. Woodhouse. Oak Cottage, The Hill, Long Stratton, Norfolk NR15 2AH. Tel: 0508 31406	Flat field, thermal Unrestricted airspace	2 ASK-13 Singsby Swallow ASK-18 Motor Falke 2 tugs	Aero tow as many flights as possible. Pay as you fly.	Full board on site from Sun. dinner to Sat. breakfast incl. in cost of course. Bar on site.	Flat rate £130. Courses June-Sept. Trial lesson £15 zero tow to 2000ft.	28 days	Sailing, fishing, stately homes. Historic Norwich is only 30 mins by car. Coast and Norfolk Broads approx 1 hour by car.
Kent Gliding Club Squids Goss, Chislehurst, Nr. Ashford, Kent TN25 4DR. Tel: 023374 307 or 274. Sec. J. Bailey. 71 Cypress Ave. Ashford, Kent TN23 3JS	Hill top, ridge and thermal soaring	3 ASK-13 1 T-49 6 winch cables	20-25 by winch. No credit given for lack of flying due to bad weather.	Full board on site from Sun. dinner to Fri. lunch INCL. in cost of course.	£210-£260 depending on date. Courses April-Oct. Trial lesson £13 zero tow on 1500ft or £8.50 winch launch.	None	Maidstone Cathedral, Leeds Castle, Canterbury is only 11 miles away.
London Gliding Club Tring Road, Dunstable Downs, Dunstable, Beds. LU5 2JP. Tel: 0582 663419.	Flat field below ridge, thermal and hill soaring	5 ASK-21 6 winch cables	Winch launches, as many flights as possible. No credit for lack of flying due to bad weather.	Full board on site at an extra cost of £75 to course fee.	£164-£260 depending on date. Courses March-Oct. Trial lesson £25 zero tow to 2000ft or £15, winch launch.	None	Whipsnade Zoo, golf courses, Inghoe Beacon for model gliders.
Midland Gliding Club The Soaring Ground, The Long Mynd, Church Swanton, Shropshire, SY6 6TA. Tel: (05861) 206 (14 hrs) Manager: R. Dalling. Site address.	Hill top, ridge thermal and wave soaring	3 ASK-13 2 ASK-21	Mainly winch launches, zero tow and bungee possible. Details of flights not provided in course literature.	Full board on site included in cost of course. Sleeping quarters are in the club bunk house. Bar on site.	£100-£270 depending on date. Courses March-Oct. Trial lesson £10-£12, winch launch.	Weekend immediately following course	A full range of attractions within reasonable reach. Course applicants who weigh more than 235lbs cannot be accepted!
Worlds Gliding Club The Airfield, Pocklington, Yorks. Tel: 0795 303578. Manager. Site address	Flat field, thermal soaring	2 ASK-13 1 Ka-7	25-30 by winch. No credit for lack of flying due to bad weather.	B/B is available on site or off site in hotels/ inns. Meals NOT INCL. in cost of course.	Flat rate of £175. Courses April-Oct. Trial lesson £8.50 by winch launch.	28 days	City of York, Humberside with prehistoric museums, abbeys and country parks.

column made by the instructor I was allowed to slowly lower and raise the nose of the glider a couple of times to control the speed of the glider by using the horizon, rather than the air speed indicator, as my reference point. If the attitude of the glider is correct then the flying speed will also be correct. I was then allowed to make a wide gentle turn all on my own. Immediately before handing over control, pilots always say 'You have control'. These were the most exhilarating moments of the flight to be actually in sole command of a seventeen-metre-wingspan fibreglass sailplan. Without any thermals either to maintain or gain height, the instructor resumed control and used the air brakes to land back at the launch point after a flight of twenty-five minutes.

Many aeromodellers imagine that gliding as a sport or holiday is too expensive to be considered. This feature details the costs and opportunities for gliding so that you can revue the situation for yourself. Gliding in this country is organised by the British Gliding Association which has 85 member clubs, more than thirty of which offer holiday courses; so a club is no great distance away wherever one lives.

How to start

Without doubt the best way to start gliding would be a one week holiday for which there are a number of possible arrangements - full board with pay as you fly; full board with a specified number of flights; or optional accommodation and meals on site with a fixed payment for flying. All arrangements include the cost of instruction and most of them offer

an extension of club membership to continue flying at club rates after the course.

The following table shows all of the arrangements on offer from which individual requirements at most times of the year can easily be selected:

A special supplement containing a comprehensive review of all 1989 gliding courses is available. Details of how to obtain your copy are given at the end of this feature.

Anyone of average ability can learn to fly a glider. The only requirements are that one must be in good health with no disability or illness which could endanger either the pupil or the instructor during ground handling operations or whilst flying. Applicants for a course are required to sign a form to this effect, which is also an indemnity statement. Given reasonable conditions during a one-week holiday you could be well on the way to flying solo. Depending on aptitude a further week should herald the great day.

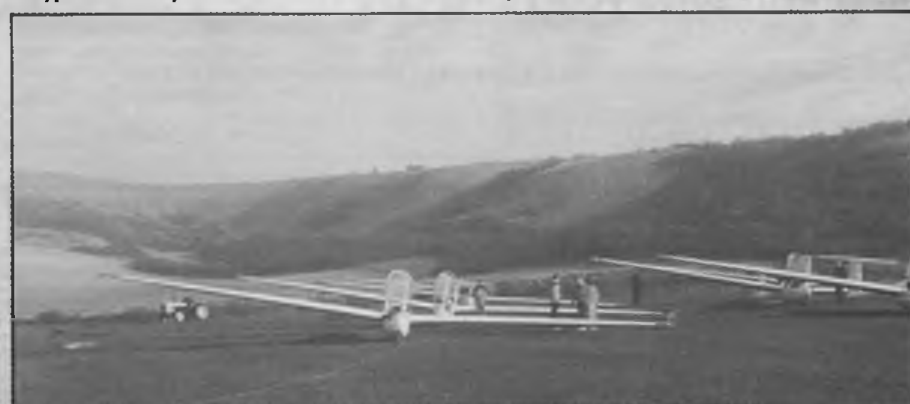
Possibly you may be unsure about com-

mitting your holiday time to try something as different as gliding. A trial lesson, which I described earlier in this feature, would certainly enable you to be convinced one way or another without too much outlay of time or money. Such a flight can usually be by either winch or aero-tow launch. It is hard for me to imagine that having once been airborne in a glider you would not be completely hooked on the sport.

Even if you decide not to take a gliding holiday, do have at least one flight - it is a never to be forgotten experience.

As mentioned earlier, a comprehensive list of the thirty-three UK gliding clubs which offer gliding holidays and courses is available (in the style of the table shown above) as a photocopy, price £1.00 including postage from Aeromodeller, ASP, Argus House, Boundary Way, Hemel Hempstead, Herts. HP2 7ST. Cheques and postal orders P.O.s should be made payable to ASP.

A typical holiday course scene - a club fleet ready for the 'off'.



WHAT'S ON

17th September
WALSALL MAC F/F SCALE DAY
Venue: Essington. Contact: Geoff Spencer.
Tel: 021 556 3376

17th September
INDOORS AT CARDINGTON FF
Venue: Cardington Airship Shed. F1D W/
Champs Trials - second three flights, best
3 from 9. Fun flying too. Contact: Bob Bailey.
Tel: 0438 723642

17th September
BMFA C/L SCALE WORLD CHAMPS
TEAM TRIALS
Venue: RAF Hullavington. Entry fee: £10.
Contact: Eric Coates, Arosa, Liberty Road,
Newtown, Fareham, Hants.

24th September
HERTFORD MAC VINTAGE FLY-IN RC,
CL
Venue: Throcking, Nr. Buntingford R/C and
F/F only. Proof of insurance needed. Con-
tact: Steve Wheeler. Tel: 0920 830147 (7-
9pm)

1st October
EAST COAST MODEL AND LEISURE EX-
HIBITION
Venue: Richmond Hotel, Richmond Drive,
Skegness. All types of modelling on display.
Contact: C. Firth, 7 Laythorpe Avenue, Skeg-
ness, Lincs.

1st October
THREE KINGS C/L SCALE DAY CL
Venue: Old Croydon Aerodrome, Purley
Way, Croydon, Surrey. FAI Scale and Profile
classes: Best WWII, Silencers and proof of
insurance essential. Contact: Wei Cordwell.
Tel: 01-764 1661

1st October
FREE FLIGHT FAI RALLY
Venue: Driffield. Contact: Dennis Davitt. Tel:
0532 675433

1st October
SAM 35 OKTOBERFEST
Venue: Cocklebarrow Farm, Aldsworth,
Glos. Vintage flying of all kinds. R/C
contests - classes 3, 4, 5, 6, and 7. R/C
entry fee approx £2. Plenty of chance to run
your own. R/F events of just fun-fly!
Contact: Mike Whittard. Tel: 0453 860793

8th October
BMFA INDOOR SCALE MEETING
Venue: Alumwell Centre, Walsall. 8.30 to
5.00 Peanut, Open Rubber, CO₂/Electric and
Air Racing. Experimental rules revision - see
Hangar Doors. Contact: Doug Sheppard. Tel:
0272 697595

8th October
EASTBOURNE MFC VINTAGE R/C FLY
IN
Venue: Golden Cross, Sussex. Contact: Stan
Coombe. Tel: 0323 506370.

15th October
BMFA MIDLAND AREA FLY FOR FUN
RALLY
RC, CL, FF
Venue: Barkston heath. Informal flying for
R/C, C/L, F/F. Trophies and prizes for best
model (Hemswell Trophy), best flight, top
Junior
Comps for A/1, (PAMAG Trophy), CDH
(PAMAG Trophy), SOP (GD Shield), Vintage
(Bullins Cup). Contact: Brian Perks. Tel:
0858 63829
Essential to ring to confirm R/C frequencies.

15th October
MARLBOROUGH MFC FLYING SCALE
CL EVENT
Venue: Marlborough College Field. Scale
flying and barbecue. Contact: Chris Bradford
for map. Tel: 0672 52309.

22nd October
MORLEY & DMAC ANNIVERSARY
MEETING FF
Venue: Driffield Vintage Power Duration
Vintage Plus 10 Duration for 1950s power
models. Other events too. Free entry. Prizes.
BMFA members only. Contact: Stan Horne.
Tel: 0532 610429.

22nd October
SOUTH BIRMINGHAM MFC VINTAGE
CONTROL LINE RALLY
Venue: Rubery Hill Hospital, near
Birmingham
10am start. General flying for all SAM 35
and BMFA members. Speed and Stunt
comps to SAM 35 rules. Contact: Peter
Martin. Telephone: 021-459 5520

29th October
SAMS INDOOR FUN FLY
Venue: Watford Leisure Centre. Fly indoor
all day! Contact: George Wallbridge. Tel: 076
388 384.

13th November
THREE SISTERS C/L OLD TIME EVENT
Venue: Three Sisters, 10am start. Vintage
T/R, A&B, Old Time Stunt, Midge speed.
Contact: John Noble. Tel: 061 790 4056.

28th January 1990
CRAWLEY INDOOR MEETING
Venue: Crawley Leisure Centre, Haslett
Avenue, Crawley, HLG, EZB, Peanut Scale
CO, and Open Rubber Scale. Contact: John
Dolding. Tel: 0293 510272.

New Year's Day 1990 - All the details - DPR Model Flying day at the 1990 ME!

'HIT THE KIT' COMPETITIONS AT 11.00 a.m., 1.00 p.m.
and 4.30 p.m.
If you are under 13 years old, you can enter these events on
the day! Score a direct hit on one of the D.P.R. Kit Targets and
the model is yours! ANY suitable D.P.R. Model may be used
(NO catapults to be used). Build a model and bring it with you
- or make one on the day!

12.00 JUNIOR 'SUPERFIGHTERS'
Another event for the under 13's using the Slot-Together
rubber powered 'SUPERFIGHTER' models. Choose a SPITFIRE,
HURRICANE or MUSTANG which can be assembled in a matter
of minutes on the day!
* SUPER PRIZES TO BE WON FOR THE BEST FLIGHTS*

2.30 p.m. JUNIOR & SENIOR 'NATIONAL CHUCKIE
CHAMPIONSHIPS'
Anyone can enter this indoor duration event using D.P.R.
Models high performance 'CHUCKIE' hand launched gliders -
kits are available from your local model/toy shop or direct from
D.P.R. Models and may be built in less than an hour.
FREE ADMISSION TO THE MODEL ENGINEER EXHIBITION FOR
'CHUCKIE CHAMPIONSHIP' COMPETITORS.

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Container with clear liquid contents. Numbered 924 but also identifiable by observation as this glue runs easier than the 956/960 high viscosity type. Low viscosity Rapid Set Adhesive is ideal for applications after assembly or on placing of component parts. It can be touch applied to the joints, the adhesive wicking into the joint and setting firm in seconds. Most suitable for bonding plastics, rubbers and balsa wood including EPDM and SBR and some of the more difficult-to-bond plastics. Product dried to a hard clear bond.

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Super Lube comes in ozone friendly aerosol complete with a jet lance for accuracy and less wastage.

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1989 WORLD FREE-FLIGHT CHAMPIONSHIPS

Continued from page 584

continued to use his heater blanket to keep his US-made rubber in the 35 degree Celsius region, while Cofalik was said to be using Pirelli for his super climbs. Maybe it keeps better in the frozen north regions of Poland?

At this point, the organisers announced that the F1B flyoffs would be continued the next morning, alternating with the F1C flyoffs. So again, we experienced an early departure from the flying field, with the two remaining Wake boys joining the thirteen Power fliers for one last night to check over the bits and stew about the strategies.

Sunday, 28th May, Flyoffs for F1B and F1C

As we drove to the aerodrome for the final morning, a low-lying mist added another dimension to the task at hand. Everyone was bundled up and stomping about to keep warm, it was just 40 degrees Fahrenheit. Overhead was a clear, blue sky, so test flying was not only possible but in progress up and down the line. The two Wakefield finalists were at the south end and the Power finalists at the north end of the abbreviated flight line with a space between. The organisers' car (with translation aboard) went up and down the line announcing in the official languages that a delay was, regrettably in force until the mist went away. The sun, slowly rising in its northward sloping winter's arc, but the mist got a bit thicker, no doubt due to the special prevailing temp/dew point conditions. None of this, of course, was doing anything to ease the nerves of the fliers or the organisers; and 9am came and went, but the mist hung around.

The delay allowed the chance to look over who was flying what in more detail. Aluminium foil-covered power models were used by no fewer than ten of the 13 finalists, Venuti choosing glass-on-foam and Plachetka and Stetz still using balsa and glass. The Verbitski influence certainly was showing, but it truly is difficult to differentiate one from the other in flight after mass launches. Analysis comes thanks to the superb competence of the timing crews who so flawlessly manned the watches and followed the flights for four days overall using tripod-mounted binoculars. It was suggested that the CIAM consider the tripod setup for the future.

Visibility increased after 9:30 and soon came the word that at 10am the four-minute flyoff for F1C would begin. Everyone was anxious to go with Koster starting his engine at the sound of the siren to be first away. Conditions were stable, so it was an easy round for a modern Power model. All launched quite soon; the only one to miss was Germany's Stetz, who stalled nearly to the ground but still did 215sec.

Everyone's attention now shifted south a few metres to watch the five-minute F1B flight. The air and temperature seemed unchanged and without lift, so the two combatants had to work for this one. Cofalik was away first; another good launch and climb, his white with black trim model being followed less than half-a-minute later by Andriukov's darker-coloured craft to approximately the same altitude. They drifted off to the west, steadily gliding to the ground, in what looked to be a close contest. Cofalik's Wake was only a few feet high as it approached the five minute mark, when it suddenly D't'd! Three of the official watches were just on, or a few tenths over the mark, while the fourth read 4:59.5! The flight of Andriukov's passed the five-minute mark a few metres high without such drama, so they would remain tied and proceed to the six-minute round in due course.

Back to the Power boys for their five-minute round, beginning at 10:30, still in virtually neutral air. Again there was no reason to wait, so off went Roux, quickly followed by Koster and the rest, with

Archer clearly the highest, judging by the applause of the crowd. Most made it with ease. Even Mukhin, who after no bunt, recovered 100ft. lower after a huge stall. In fact, only Plachetka (Poland) dropped with 280 sec, thereby eliminating the last of the balsa-glass-only F1C models. Eleven now remained to go for the six-minute flight where the cream would surely begin rising to the top.

By 11am the sun was beginning to warm the earth, so it was clear that thermals would determine the outcome. The siren sounded to announce the beginning of the six-minute flyoff for F1B, which seemed a hard task in this 'transitional air' condition. The drift, which was less than before, had swung slightly to the south as the two fine rubber fliers wound and were set, trying to sniff out a piece of good air, in the hope the other would miss it. After a short wait of possibly less than a minute, Cofalik made his launch, again followed about ten seconds later by Andriukov, using the same strategy as his last flight. Again the climbs were almost equal, so now the result depended on the glide. The Polish team was running and flapping shirts under Cofalik's Wake for a while; then as it went south over some taller pampas grass, the circle opened slightly and the glide began to bounce around. Andriukov's, further to the west, was merely settling gently to the ground to land at 237 sec, so Cofalik was surely going to win, as his bird rode that very light bubble to land victorious at 317 sec.

As his team members rushed to congratulate him, the crowd applauded the first ever Polish World Champion, Eugene Cofalik.

The six-minute round for F1C commenced at 11:30, with Roux, Koster, Verbitski and Archer leading the mass launches away. Roux ended his effort with 241 sec, matched by Venuti (Italy), the last of the non-ali-skinned fliers. This was the end of the line for Koster (326), Xian (326), Strukov (307), Anxin (317) and Czerwinski (236), so now there were only four remaining, Randy Archer and three of the Russians.

At high noon began the seven-minute shootout. Randy had his work cut out for himself, but certainly looked up to it. Based on his earlier flights he still was the favourite; in fact, the Italians were giving 3:1 odds on him. Flight stations had been drawn by the respective team managers, with Korban on the north end, Mukhin next, Randy at the third and Verbitski on the south position. The breeze had come up like clockwork, but it did not seem as strong as the previous two days, nor was the haze likely to cause a problem for the timers.

A bit of a waiting game was played for the first five minutes of the period until Korban fired up and launched his model which used a right-rolling vertical climb to reach a fine, bunted recovery. Mukhin flew next; good climb, a bit left as usual, some loss of height. Archer's model was screaming up his tailpipe, ending higher with a perfect transition; now Verbitski was away to complete the excitingly quick procession within a minute. Now Archer was given an over run - 7.3 sec. Was his backup model as good? He looked cool and confident, then waited for his moment, which came at 12:11 when Walt Ghio signalled from upwind. Archer fired up and launched right in the warm lull of the light thermal which carried him on for a full seven minutes. Even though the other three had looked fairly good as they soared downwind, only Korban had made the max, with Verbitski (374) third and Mukhin (364) an excellent fourth, for two champs in a row. Now it was man-on-man for at least another round.

The eight-minute flyoff, 12:45-1:00pm. This exciting competition still had more stories to tell. Archer had drawn the northern position this time, so Korban was on his right with the drift only moderate to the southwest. The fliers this time were in less of a hurry. No doubt 'psyching out' was part

of the game. A few minutes had passed, then Korban engaged the started and launched. Archer only three seconds behind, but to noticeably better height. As the seconds ticked by Korban was sinking, while Randy's silver and red craft was bouncing a bit and looking good. The obvious thought was in everyone's mind; it seemed very likely there would be an American Champion this year. Korban was now going south, widening and searching for better air. Down it headed over the same longer pampas grass area where Cofalik's Wake had found the bubble to win the prior event less than two hours ago! At 2.1/2 min the situation had surprisingly reversed, with Korban's ship soaring in left, higher than Archer's, which was sinking rapidly as it too began to run to the south after the thermal. Alas, it was too low, and ran out of luck as the Soviet model thermalled away OOS with the DT tied down. Sergei Korban, the new F1C World Champion, shook hands with Archer first, then a host of others, to generous applause from the crowd, while downwind (it was told later) the Soviet team manger, Vladimir Brusov, was chasing the flyaway, crossing field and swimming stream, finally to bring it back, and to be in his banquet suit by 4pm! The winning flight was 25 minutes and about five kilometres long. Sergei is from the Leningrad group of Soviet aeromodellers along with Mikhail Kochkarev, the new boy on their glider team. Like Randy Archer, they were competing in their first Free Flight World Champs, illustrating how well they had put into practice the lessons they had learned.

Challenge France

A Russian clean sweep was obstructed by the excellent Chinese team performance in F1B. Poland's strength was reflected in the fact that they finished a close second to the Soviets in the Challenge France in which the aggregate totals determine positions overall. Britain's eventual seventh out of 27 was a reasonable performance - and one which beat the Argentine team on their home ground.

But certainly, after the uneventful return journey home and time for reflection thought will be devoted to how the selection of British teams might produce more aircraft capable of beating world-class opposition.

**Championship
coverage
continues next
month with
our report on
the Control
Line
Eurochamps at
Three Sisters.
Don't miss it!**

SCALE MATTERS

Try a Tiger! De Havilland's best-known biplane - and variants - comes under the spotlight this month

IT'S always good to hear from Scale Modellers who have returned to our ranks. Eric Whitehouse recently did just this. Readers may remember that Eric was a notable competitor in the Selby Trophy events about fifteen years ago. Intending scale competitors will enjoy this candid account of honest effort.

Over to Eric

My DH 82A Tiger Moth (built from the Aeromodeller plan) was entered in the Selby Trophy competition in the autumn of 1976. The day dawned with squally showers and blustery winds. Of five or six enthusiasts there, I was the only one to manage a flight (in a momentary calm spot ten minutes from the end of the competition, at 5.50pm!). The result was that I won with a virtual walkover.

Next year produced a real flying day - bright and sunny with light winds. This time I took along the DH82A and an own-design SE 5. Multiple entries were now allowed; I recall that two of us entered two models. There it was - my first, real competition.

Conquering my nerves I flew both models from hand launches in the first round. By round two I realised that I would have to attempt something new - an ROG. Heart in mouth I released the Tiger Moth. Was it good? Was it great! Beautiful to watch. After building up speed for about ten metres it lifted off the tarmac and flew in a gradually climbing left-hand turn. Out of fuel, it settled into a shallow glide back to earth (promptly tipping-up on landing). Was that good enough? Wait and see...

The SE 5 wouldn't ROG so I flew it from a hand launch. With nothing left to do I watched the opposition, inwardly biting my nails. The Tiger won the trophy and the SE came equal third. At another Scale competition that year (organised by the Morley Club) I managed second and fourth places with the same models.

On to 1978 and the Selby Trophy again. This time I had a new model, a Sopwith 1.1/2 Strutter. Flown in a blustery wind, the model fluttered about like a fledgling sparrow before flying inverted onto the Elvington tarmac. After this farcical display I all but gave up, until 1985 when I began again with renewed vigour.

By 1988 I had built an Armstrong Whitworth FK8 (Big Ack) plus several vintage models. Then I heard of a scale meeting at Barkston Heath that May. Off with the Big Ack and DH 82. On arrival I went a little downwind of the others to test the Tiger - its first flight for ten years! I started the engine and - holding my breath - let go of the tail. It went like a



dream. Just as in its flight in the Selby Trophy it rolled a short way, took off and climbed left, then glided back to earth happily. Great, I thought, and entered the event.

When my turn came - go it would not. Neither would it ROG nor fly from a hand launch. The judges were kind and allowed me more than the regulation number of attempts, but to no avail. The FK8 was underpowered so with some chagrin I retired. Next day I discovered that the Tiger's undercarriage had sprung out of alignment, displacing the fairings...

The Big Ack was re-engined with a DC Spitfire, and general fun-flying occupied my time until this year's Scale Weekend at Old Warden. For this meeting I had designed and built a Christen Husky which had been tried at Driffild. The day before Scale Weekend I took it to a local field for some final trimming.

Final it proved to be - into a huge thermal and out of sight two miles away. What to do? No name and address on the model, only the scale registration. I circulated photographs and details in newspapers and post offices. It worked - the Husky was returned while I was at Old Warden. But what to build for next year? Plenty of time to choose!

Tiger topics

This talk of Tiger Moths reminds us of the continuing popularity of this perhaps most famous of British biplanes. As reported last month, a merry trio appeared at Old Warden, all built from the plan published in the October 1954 issue of this magazine. Of course, other plans for the Tiggie do exist, both for F/F and R/C; but whichever you

choose, the aircraft's lines are surprisingly difficult to capture in model form. Indeed, we venture to suggest that no-one has ever got it exactly right. Greatest discrepancies occur in the cabane and cowlings areas; and given the Tiger's unequal stagger and dihedral we see that here is a craft with little truly vertical or horizontal datum reference.

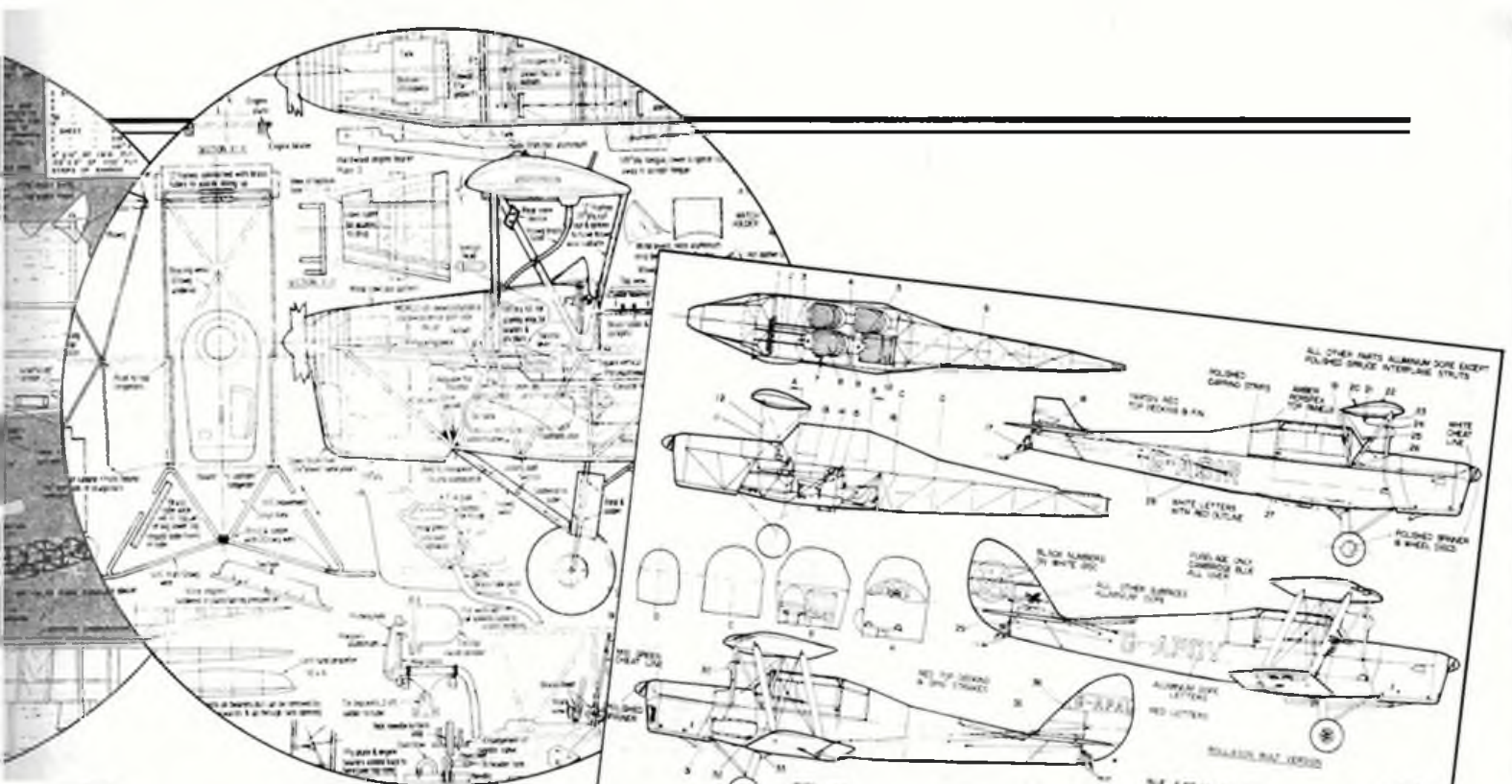
We present a variety of DH 82 drawings, particularly side views - with particular emphasis on Ron Warring's plans from Model Aircraft, March 1957. Accuracy of outline may need to be tested here, but considerable measurements are given, courtesy of de Havilland's own drawings, which gives this reference particular weight.

The Aeromodeller plan FSP 555 is, as we have said the most popular of the F/F Tigers. At 44 inches span (one-eighth scale) careful jiggling is needed to achieve those classic angles of sweepback and dihedral. The Warring drawings give the following values:

	Dihedral	Stagger
Top Wing:	2° 45' (say 2° 1/2)	6° 16' (say 6°)
Lower Wing:	4° 30' (4 1/2°)	5° 13' (say 5°)

Our suggestion would be to use templates to guarantee these angles.

More accurate in outline but larger, at 50 inches span, is Harold Townner's version, published in the March 1972 Aeromodeller. Intended for R/C (plan reference is RC 1131) the model would convert to F/F, although the wings would need to be more 'knock-off-able', and rearward springing should be incorporated in the undercarriage. The cabane fixing also looks decidedly flimsy for F/F... In all cases we recommend more robust tail

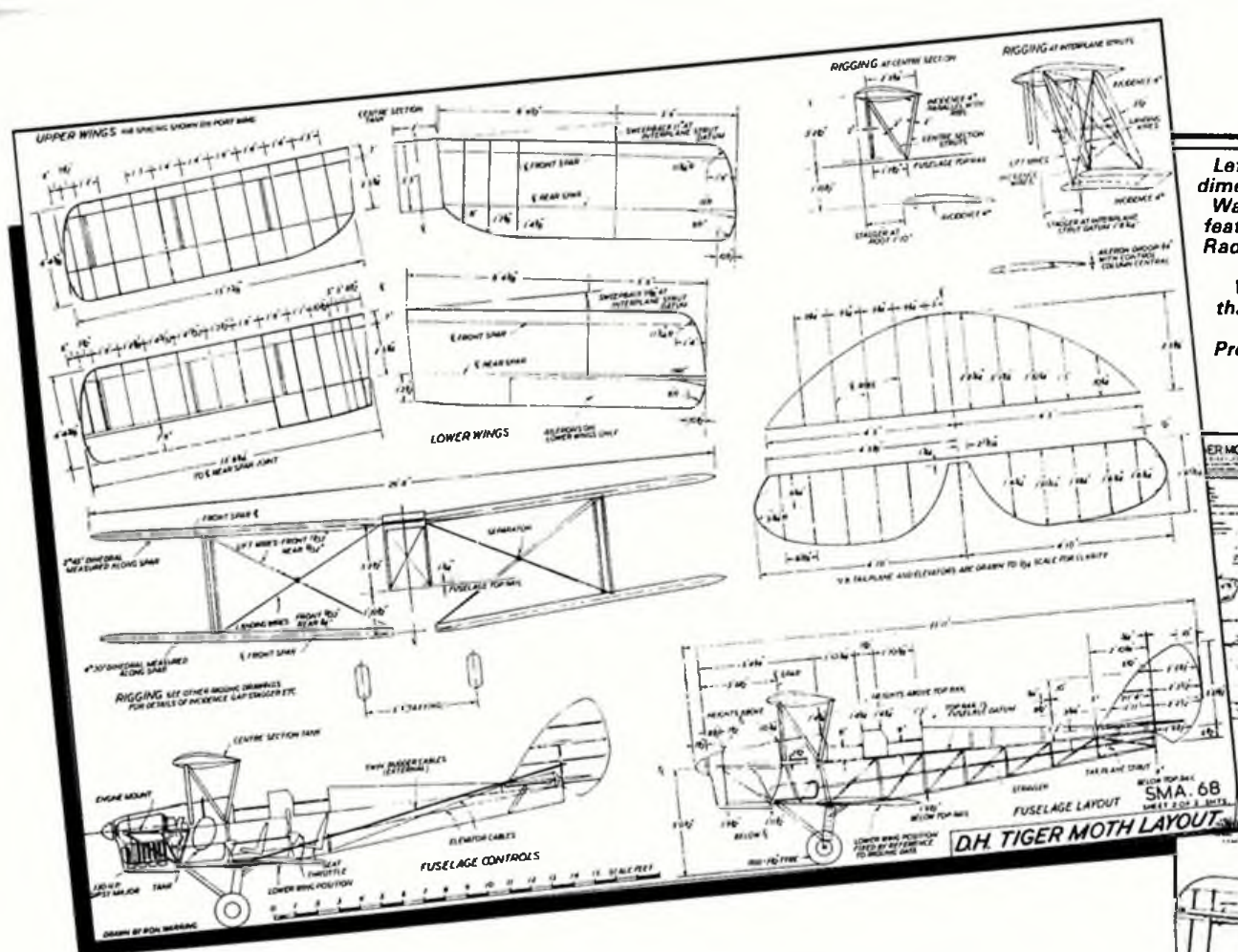


Heading: G-AOAA, 'The Deacon' of the Tiger Club sideslips by. Yellow and black Tiger was modified for racing; no wing tank and faired-over front cockpit.
Above: Nose details of APS 555 and RC 1131 plans. Right: Thruxton Jackaroo would be a refreshing subject. Below: More fullsize detail from G-ANRF, David Cyster's London-to-Australia Tiger at Bahrain in 1977.

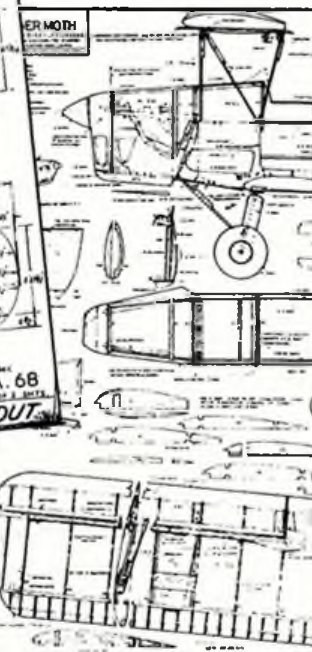
surfaces from 1/32in sheet with laminated outlines and ribs top and bottom. The Tiger's prop spinner, a tiny affair, cannot really be duplicated by a standard, model shop item; and as this is one feature that really gives the aircraft its character we would even advise the effort of creating a specially-turned spinner and sleeve nut. An easy task for a friend with a lathe...

Why not be different? Build a Thruxton Jackaroo – that tadpole-fuselaged, cabin conversion meant to impart a degree of comfort and sociability to an ageing airframe,





Left: Crucial rigging dimensions from Ron Warring's 1957 MA feature. Below: Neat Radio Modeller Tiger by Gordon Whitehead, larger than usual just over 47in span. Right: Preserved Tiger and Jackaroo at Old Warden over ten years ago.



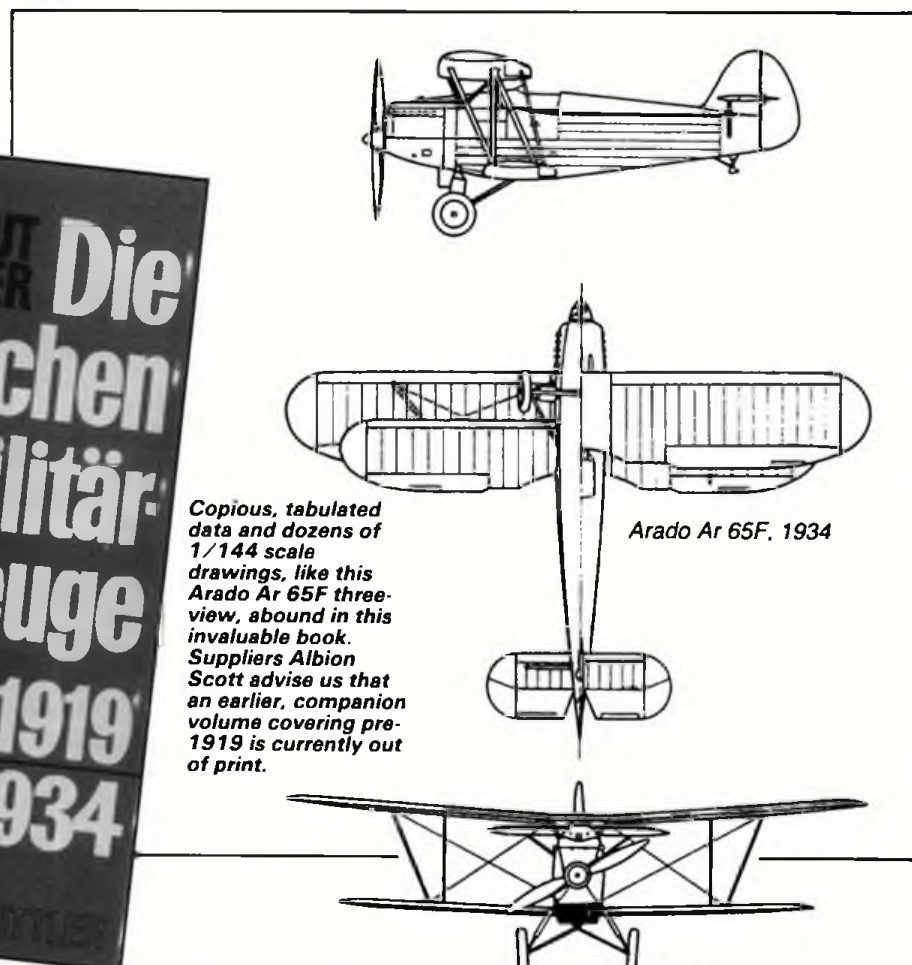
at a time when the growing popularity of 'club' flying in the UK was in danger of being strangled by legislation preventing the purchase of modern American lightplanes. Our scale drawings give full data and colour details. Who'll be first?

Super book... Die Deutschen Militärflugzeuge 1919-1934

by Helmut Stutzer (published by E S Mittler & Sohn. ISBN 3 8132 0184 8. Available from Albion Scott, £25.

Flying scale subjects abound in this splendid reference work. All German military aircraft in service from 1919 to 1934 are featured in full, tabular detail and drawings to 1/144 scale. In many cases these provide sufficient data to enable models to be built; otherwise, more information must be sought elsewhere. There are no photographs, but such a wealth of mouthwatering material will encourage the enthusiast to search with impetus.

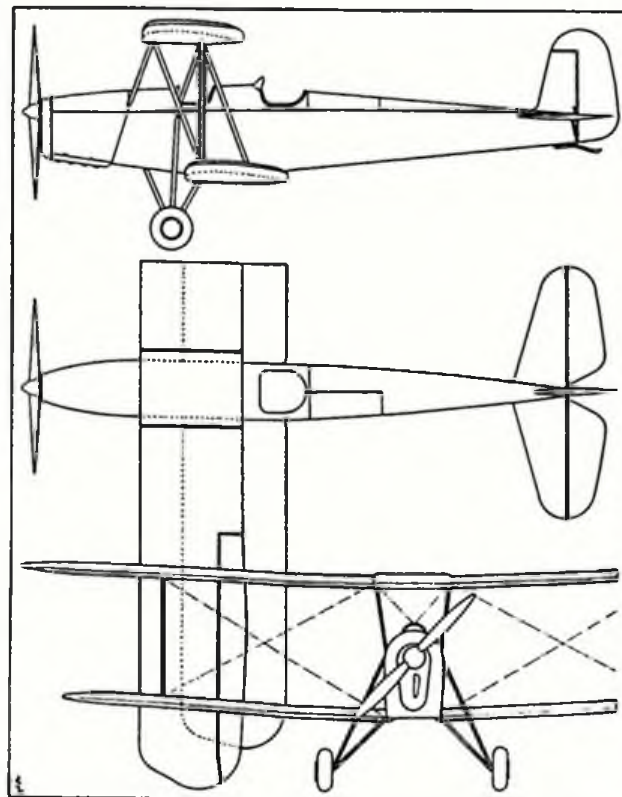
Sandwiched between the Albatros L30 and Junkers Ju52/3m ge are rarities from Caspar, LVG, Dornier, Dietrich, Arado and Gotha, as well as more familiar types. Read - and be captivated!



Copious, tabulated data and dozens of 1/144 scale drawings, like this Arado Ar 65F three-view, abound in this invaluable book. Suppliers Albion Scott advise us that an earlier, companion volume covering pre-1919 is currently out of print.

Arado Ar 65F, 1934





Not a Moth - but it would fly just as well! The Weiss WM 10, a Hungarian design from 1931, spanned 29ft, was 22ft long, and was fitted with a 120hp in-line four of the company's own manufacture.

From the Handle: continued from page 562

pipe. This model had always sounded strong, and this time it delivered its promise with a speed of 175.21mph, for a handicap score of 106.83 per cent. I can't recall any contest where the percentage score was so high, and this rather underlined the basic weakness of the 21N class rules. Des had a lot of help from Ian Mander (entirely within the rules) but if we are to make things attractive for genuine novices, a radical rethink will be needed. However, Des's winning flight was remarkable for yet another season - after completing the timed run and lifting his hand out of the pylon, the unaccustomed rate of rotation caught him napping, his feet got crossed up, and to catch up with the model he had to do an overarm lap - and he got away with it!

Ken Morrissey flew in F21 and FAI as well

as organising the contest, but saved his main effort for his OS 60 (10cc class) model. This was his record holder from two years ago, fitted with a new unflown motor and flying on a pair of 0.55mm wires (grouped) which will be required under the anticipated 1990 rules. His first flight was a bit lean at 200mph or so, but on his next go, needle man Peter Halman got it nearer right for 210.28mph/97.37 per cent and third place. This model cannot fail to impress in flight, and although Ken maintains piloting is no problem ('I could have whipped it' he says) his facial expression minded me of lines from some ditty I've heard somewhere, which to paraphrase: 'But though he grinned it put the wind up the other thirty-nine'.

Three Sisters is the only venue at present where jets can be flown, and these have a fascination of their own and always draw a lot of spectators. Ray Cox is one of the most

enthusiastic jet fliers and concentrated most of his efforts on his Dynajet model, a design published in an American magazine. Trying a more potent fuel than before plus trying to pick up the threads of where he was last time he had a chance to fly it, Ray couldn't manage an official flight, but he tried repeatedly, swapping jet sizes and so fourth, but just as it was beginning to come together, the four wheel dolly also began to give trouble, spoiling many attempts. Whenever he did get it in the air though, it was very impressive. Alan Lee also had a Dynajet model that was better sorted out in the powerplant department, but flight behaviour was two twitchy and an 'undemanded dive' (pilot talk for a crash) ended his efforts prematurely.

Overall, it was a very enjoyable jamboree with plenty of opportunity to test or practice as well as take part in the contest. It was a pity more were not there to join in the fun.



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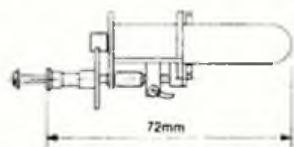
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Weight hasn't been mentioned. Litespan weighs just about one ounce per square yard (28 to 35 grammes per square metre) - and that's apart from a little extra for the adhesive. In laboratory tests we haven't been able to get down to that weight with doped tissue, except by using so little dope that the tissue went slack in damp conditions.

Yes - you may be asking "Where's the catch" - well we don't know of one. Provided you follow the instructions carefully and to the letter. After all we have been using the material for two years, so know more about it than any of the magazine 'experts'. The 'experts' tell us that Litespan doesn't add 'stiffness' like doped tissue, which is just another way of saying it isn't brittle like doped tissue. Yes, we admit that Litespan is a very tough and shock resistant material - far superior to doped tissue. If you want extra stiffness it is best to add a few triangulation members in the airframe (balsa strip or thin thread) at the building stage. Its always seemed a bit daft to build a flexible airframe and then hope the tissue is going to shrink up just right after doping and leave no warps. If you think about it, being a 'tissue & dope' expert is probably a disadvantage when first using a new material like Litespan - 'old dogs' never like learning new tricks. And using Litespan is completely different from using tissue & dope. It's all there in the instruction sheet included with every sheet of Litespan.

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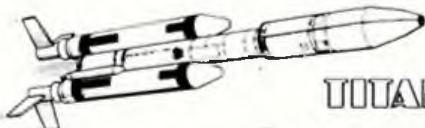


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