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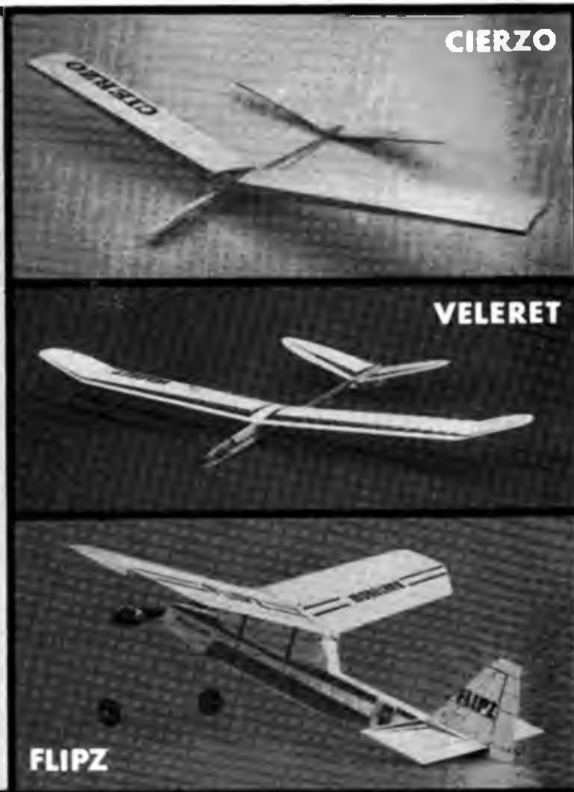
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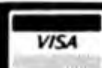
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# AERO

## MODELLER

AUGUST 1984

Volume 49  
Issue No. 583

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**Cover**

The *Stirling Piper Cherokee* shown here has been converted for use as an initial test bed for electric control line by Ian Peacock (see page 380). Other types from sports to combat are now becoming a practical reality using modern electric power units such as the ACOMS system also shown on the cover. The *Cherokee* was not built with 'super scale' in mind but to prove that this class of model could be tackled with some hope of success. It has proved its point — it flies perfectly on 40ft lines. Cover photographs were taken by our hard pressed darkroom duo, Manny Cefai and Nail Proctor

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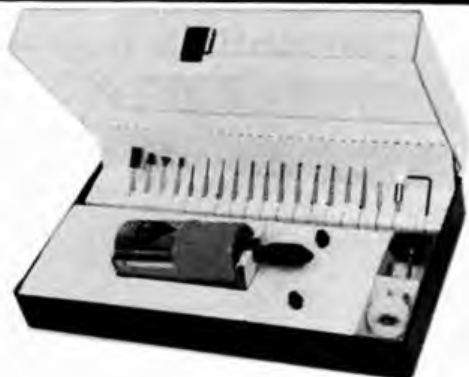


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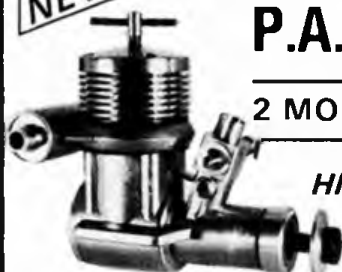
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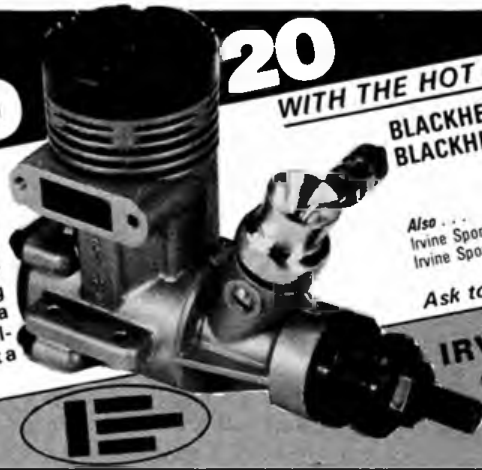
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# HANGAR DOORS

Dear Reader . . .

We move with the times, high-tech materials make our models stronger but lighter. Modern methods both at work and in our workshops aim to make everything more 'instant'. In theory we should have more time for other things, but this does not seem to materialise. One effect of these 'modern methods' is that your editorial staff seem to have less and less time to answer readers letters . . . Although there is always pressure to ignore these 'inconvenient time wasters' *Aeromodeller* feels strongly that this is an important part of our link with you, the reader . . . so, although lengthy letters may not be possible we will introduce an all-in-one answer sheet!

Please do not feel offended by this innovation just bear in mind that it enables us to answer more of you than would otherwise be possible . . . Please include an s.a.e. with your enquiries. Whilst on the 'editorial subject' always remember that we are constantly on the look-out for articles or plans to publish, or colour transparencies to grace our front cover. Any input is always welcome . . . you may even get a pre-printed reply . . . and a few pence to spend in your local model shop!

## Shuttleworth Trophy

Awarded annually to the builder of the best model of a *Shuttleworth Collection* aircraft during the Scale Days at Old Warden, the *Shuttleworth Trophy* has now had so many owners in its long career that the current holder, Rob Cavell of Deal, Kent, thought it ought to be jacked up onto a second stage plinth to cope with the engraved plaques naming the honoured winners. Aided by fellow Club member

Gerry Marsh, skilled carpenter who made the new tier, Rob has mounted the plates and engraving so that the 1984 winner can be duly recorded. Only snag is that no record seems to exist as to who won it in 1979! There is a blank set aside for the name if only the claimant would step forward . . .

## C/L Team Travel

This year over the week 17th - 22nd September the Control-Line World Championships take place in Chicopee, Massachusetts, U.S.A. In order to reduce as far as possible the personal financial commitment of the individuals selected to represent Great Britain, a travel fund has been established and donations to the fund are invited from individuals, clubs, retailers or manufacturers who feel able to assist.

Contributions should be sent to *Barclays Bank*, Sorting Code No. 20-05-06, PO Box 47, 37 Milsom Street, Bath. Payable to *C/L World Championship Travel Fund* (A/C No. 91096540). Alternatively payment can be made via any bank quoting the above information.

## Multicoloured Gremlins . . .

South London's Raynes Park MAC is going great guns at Cannon Hill Common, their flying ground since 1960. Control-line and free-flight activity has been boosted by the *Golden Gremlin* award. Winner for 1983 was Joe Reynolds (see above). A Red Gremlin for second place went to Vince Buttigieg, while third place and a Green Gremlin (*Wally of the Year*) was taken by Kevin Hallaway. Two Miss Raynes



A slightly worried looking Joe Reynolds receiving the Golden Gremlin award from Miss Raynes Park . . . Gremlins are notably unpredictable.

Parks presented the prizes in a packed clubhouse hung with *Oliver Tiger* team racers and *Nordec*-powered stunters. The judges look for originality, effort and flight performance. Local fliers wishing to win a genuine Raynes Park Gremlin (complete with oak stand!) should call Weybridge 53900 for further information.

## Jetex revival

Members of SAM are already aware that efforts by member Frank Gardner to resume regular 'Jetex' model flying activity. It never ceases to surprise us how stocks of Jetex fuel, even brand new propulsion units, continue to emerge from dingy lofts and storerooms to keep the dedicated enthusiasts going. Now there is so much enthusiasm for the fast-burning dry fuel form of jet propulsion, Frank is organising a special event on Vintage Day, Old Warden, August 19th, to which all jet-fans are more than welcome. All types are expected, including the novel jetcopter. If you need more info, phone Frank on Blackpool 55696.

## I could do that . . .

Five films designed to encourage people to turn their hobbies or interests into full-time jobs have been released by the

Small Business Unit of Shell UK Ltd. under the title 'I Could Do That.' Each film runs for up to 11 minutes and tells the story of an individual who has turned his talents to profitable use. The films themselves do not tell you how to set up a small business but are intended to catch the imagination and spark off enthusiasm in others to consider starting on their own.

One film that may be of particular interest is the story of Mr. Alan Heaver of Kent who has become a self-employed model-maker. Other films cover the following subjects: catering, furniture, nursery gardening and trailer manufacture.

The films are available on free loan on 16mm, VHS or U-matic video-cassette from the Shell Film Library, 25 The Burroughs, Hendon, London NW4 4AT (01-202-7803). A catalogue of Shell films is available from the library.

## Harriers strike again . . .

Museums need not be dull or boring — in fact the modern trend in exhibitions or displays of things air-minded is often quite the opposite. One such is the *Fleet Air Arm Museum* at the *Royal Naval Air Station, Yeovilton, Somerset* (off the A303). Over 50 aircraft are on display together with the *Science Museum*

Left: the refurbished Shuttleworth Trophy presented this year to Vic Willson at Old Warden on June 17th. Below: superb model of the *Harrier Ski-Jump*, presented to the *Fleet Air Arm Museum* at Yeovilton by Andy Hamilton, Ted Bolton, Graham Ashford and Dave Boyne on behalf of British Aerospace, Kingston.



Aeromodeller



'Concorde' 002. Masses of models for you to 'druol' over and set-piece exhibits such as the 'Falkland Islands Exhibition', which was recently opened by his Royal Highness Prince Andrew.

Cost of entry: Adults £1.70; children and OAP's 85p. Cheaper rates for parties of 15 or more and quite ridiculous rates for school parties (approx. £12 for a 50-seater coach!).

If you are travelling in the West Country don't miss the *Fleet Air Arm Museum* at Yeovilton.

### Navion too-light . . .

*Cambria Model Aircraft* have asked us to inform you that due to the pressures of getting ready for Sandown Park Show and packing a new kit at the same time, a batch of 'Navion' Microlight Kits was packed with insufficient  $\frac{3}{16}$ in. sq. balsa strip. Anyone who has one of these kits should contact *Cambria* on 0686-24337 or at Unit 15, Vastre Ind. Estate, Newtown, Powys, SY16 1DZ and the missing strip will be supplied.

Attractive 'Navion Microlight' from *Cambria Model Aircraft* . . . see above.

### Ever-Ready National Model Flying Championships

Thanks to extensive and most welcome support from Ever-Ready the 1984 National Championships looks like being the biggest yet. The dates are August 25-27th (Bank Holiday weekend), venues are RAF Cranwell and RAF Barkston Heath, near Grantham, Lincs., and there will be over 30 events for R/C power, R/C soaring and control-line aircraft. The *Ever-Ready National Model Flying Championships* will be opened by the Royal Air Force's astronaut candidate, S/Ldr. Nigel Wood, and will feature sky-diving on the Saturday and fly-pasts, conditions permitting, by both the *Red Arrows* and the *Battle of Britain Flight*.

This is the 37th *National Model Flying Championships*, the second in which the *SMAE* have enjoyed the backing of *Ever-Ready*. Competition entries in radio, free-flight and control-line together are now so great that the event has been held in two

One of several eye catching posters produced by the Electricity Council (Safety Branch) for their 'Play Safe' campaign. Aeromodellers should be reminded often of these potential hazards, why not display a poster or two at your club - more info from 01-834-2333.



parts for several years now. As an idea of the size, the first part of the 1982 Nationals, for free-flight, had over 800 entries, making it the largest model flying event of any kind in the world! The August Championships will see the top competition flyers from Britain and Europe in action, and will be an eye-opener if you have never experienced the excitement of model flying with high-performance aircraft in expert hands; quite unlike trade shows, the Nationals is all about flying to a standard — the competitor's best, and that adds immensely to the spectators' enjoyment.

In addition there will be demonstrations of Vintage and other types of flying.

Adults can visit the *Ever-Ready National Model Flying Championships* for £2.00, children under 16 for £1.00 and under 10's free. A special three-day pass is available for *SMAE* members only at £4.00. A minibus full of visitors will cost £18.00, a coach £50.00 and parking is free.

For further details, send a 9 x 4 SAE to: Ever-Ready Nats. SMAE, Kimberley House, Vaughan Way, Leicester.



Saturday, Aug. 25th	R/C Aerobatics, Club 20 Pylon Racing, Helicopter, Soaring, C/L Events, F/F Scale (depending on weather)
Sunday, Aug. 26th	R/C Aerobatics, FAI Pylon Racing, Club 20, Scale, Helicopter, C/L Events, including Scale (depending on weather), Soaring, F/F Scale, R/C Aerobatics, FAI Pylon, Club 20, Helicopter, Scale, Soaring, C/L Events, F/F Scale (depending on weather)
Monday, Aug. 27th	R/C Aerobatics, Club 20 Pylon Racing, Helicopter, Soaring, C/L Events, F/F Scale (depending on weather)

## What's On . . .

July 21	<b>AIR DAY 1984 AT HMS DAEDALUS</b> Venue HMS Daedalus, Lee-on-Solent, Hants. Sharks Display Team, Red Devils Parachute Team, Royal Naval Historic Flight, Marlboro Pitts Display Team — many others. Bands, Karate, Gymnastics, Gates open 10.30am — flying display from 2.00pm	July 22	<b>SHUTTLEWORTH MODEL GROUP OPEN DAY</b> All classes Venue: Old Warden, Biggleswade. Contact M Staples, Tel: 0223 241978	August 5	<b>THE SECOND OXFORD SUMMER MODEL FAIR</b> Venue Randolph Hotel, Beaumont Street, Oxford. Contact Ian Hicks-Mudd Tel: 023587 332. Model railways, cars, boats and aircraft, working models, model making demos and trade stands	August 31	<b>58500 CONTROL-LINE SPEED COMP.</b> Venue Littleton Road Playing Fields, Salford. Contact Andy Brough Tel: Rochdale 59603. Motors up to 1.5cc — plain bearing diesel only 42ft. Light lay strate lines — 7.30pm start
July 22	<b>ELLIOT CONTROL LINE COMP. FAI T/R, B T/R, GOODYEAR, STUNT, NOVICE STUNT, SPEED</b> Venue: Rochester, Kent. Contact: R.W. Tribe, Tel: 0322 63791	July 29	<b>SMAE CONTROL LINE MEETING — F2B, F2C, F2D, SPEED, A/T/R, A COMBAT</b> Venue Three Sisters. Contact: Bob Horwood Tel: 0272 48769	August 12	<b>WHARFEDALE 1000 SILVER JUBILEE B/T/R</b> Venue RAF Dishforth. Contact: Jeff Smith Tel: 0532 863432. Pre-entry only £2.00	September 1, 2	<b>INDOOR NATIONALS — EZB, 1.2g INDIVIDUAL (HOULBERG TROPHY), AGMTROPHY (NOVICE/EXPERT), PAIRS FINAL (MANHATTEN, CO), (SPARKLETS TROPHY), 1.3in PEANUT DURATION, 36cm, 65cm F1D (AEROMODELLER TROPHY), OPEN MICROFILM (HUMBROOL PLATE), ALL-IN EZB</b> Venue Cardington. Contact: Laurie Barr Tel: 0628 25595
July 22	<b>WAKEFIELD — OPEN NOVICE STUNT</b> Venue Wakefield. Contact: Brian Temoral Tel: 0924 270690	August 4, 5	<b>WOODVALE INTERNATIONAL RALLY</b> F4C, Stand off Scale, Quarter Scale, GBR/CAA Scale, Aerobatics, F/F Scale. Venue: RAF Woodvale Nr. Southampton. Contact: John Armstrong, Tel: 061-528 8857	August 17	<b>OUTDOOR CHUCK GLIDER COMP.</b> Venue Littleton Road Playing Fields, Salford. Contact: M.C. Reeves Tel: Rochdale 44999. Friday evening — 7.30pm start	September 2	<b>HOLKER HALL MODEL AIRCRAFT RALLY</b> Venue Holker Hall, Cark-in-Cartmel, Grange-over-Sands, Cumbria. LA11 7PL. Tel: 044 853 328. Entry £1.00 includes four tickets to the grounds and gardens. All modellers welcome
July 22	<b>RAF FAIRFORD'S OPEN DAY</b> Venue RAF Fairford, Glos. Hosted by the USAF — British and American aircraft. RAF Red Arrows: RAF Falcons Parachute Display Team: Battle of Britain Memorial Flight. Gates open 8.30am. Flying programme from 1.00-5.00pm	August 6	<b>LEEDS &amp; DISTRICT MFC 60th ANNIVERSARY RALLY</b> O/R, O/G, O/P, SOP, A1 and Cd H. Precision. Venue: Contact: M. Hargreaves Tel: Guiseley 72069. Entry £1.00 — SMAE members only	August 18/19	<b>PLUMPTON MODEL SHOW</b> R/C aeroplanes and boats, cars and steam trains, traction engines and helicopter rides, powered hang gliders, plus Dutch 300mph pulse jets. Camping facilities available. Venue: Plumpton Racecourse — 10 miles from Brighton, Sussex. Contact: Dave Bishop Tel: Tatsfield 550	September 9	<b>SHEFFIELD AERONAUTICAL RC SOCIETY RC VINTAGE COMP AND FLY-IN.</b> Texaco, Walsall rules. Full details from D. Hanson, 23 Meadowhead, Sheffield S8 7UA
July 22	<b>3RD ROUND CLASS 'A' BRITISH DIESEL COMBAT CHAMPIONSHIPS</b> Venue The Embankment, Peterborough. Contact: B. Waterland Tel: 0778 343722	August 5	<b>INDOOR — UNIVERSAL CONTESTS AND FUN FLYING PLUS SCALE CONTESTS AND PEANUT TO MIAMI RULES</b> Venue: Cardington. Contact: B. Hunt, Tel: 0628 72402	August 19	<b>VINTAGE FLY-IN</b> Venue Newbigging. Contact: Bruce Duncan, Bursledon, Perithshra, PH13 9PL. Flying starts at 12.30pm	September 9	<b>5TH AREA MEETING — F/F, O/P (TEAM, PLUGGE), F1B (GUTTERIDGE TROPHY) A1</b> Venue Local Area Venues. Contact: Area Comp Sacs OR SMAE 0533 58500
July 22	<b>SUTTON COLDFIELD RCAC FRADLEY SCALE '84 R/C SCALE, FLY FOR FUN, VARIOUS TROPHIES.</b>			August 19	<b>AEROMODELLER VINTAGE DAY</b> Venue Old Warden. Contact: Aeromodeller Tel: 0442 41221.	September 9	<b>SHUTTLEWORTH MODEL GROUP SILENT FLIGHT DAY</b> Venue Old Warden, Biggleswade. Contact: M. Staples Tel: 0223 241978. Rubber, glider, electric, CO <sub>2</sub> — Free flight and R/C. No IC engines
				August 25, 26, 27	<b>EVER-READY NATIONAL MODEL FLYING CHAMPIONSHIPS R/C, C/L, SCALE (as above)</b> Venue: RAF Barkston Heath and RAF Cranwell. Contact: SMAE Tel: 0533		





**Photo 2**

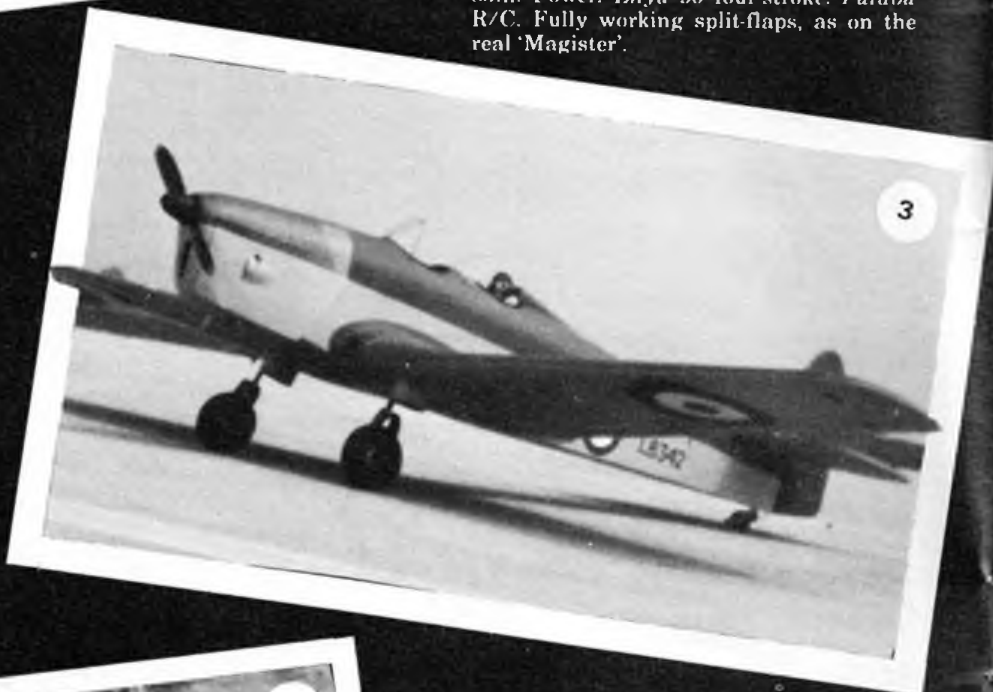
This superbly detailed peanut scale Albatros D2 prototype comes from Barrie Taylor of Manitoba, Canada. Barrie tells Flair Phil that the engine was carved from foam and painted, radiator pipe from copper wire, bracing from silk thread and even the air foil section is to scale. He adds: "flight tests are looking good." Happy flying Barrie!



**A**FTER AN AFTERNOON on the flying field with that favourite model 'riding high' in the thermals, which abound on an English summer day (?), Flair Phil invites you to relax! Wipe the perspiration from your brow, grab a glass of 'you know what', and enjoy this month's 'high riding' selection of model photos.

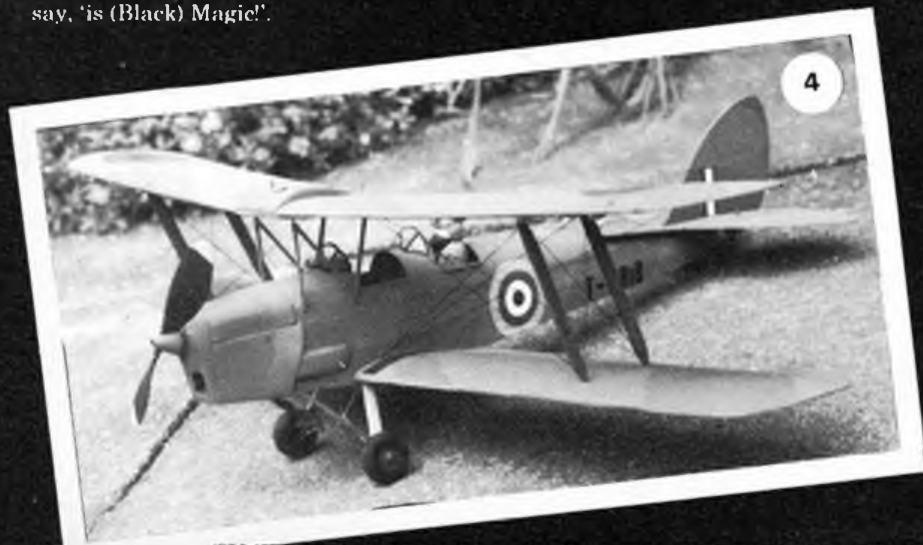
**Photo 1**

Let's start with a modern version of a popular vintage model. None other than 'Black Magic' from the *Aeromodeller Plans Service*. This fine 'portrait' comes from Donald George of Plymouth. Donald built his first 'Black Magic' in 1958, and reminds Flair Phil that a picture of it appeared in 'Model News' in the June 1958 *Aeromodeller*! Donald's modern version has an O.S.30 up front, and Futaba R/C. He says it is just as stable and flies just as beautifully as its predecessor. And that, as Paul Daniels might say, 'is (Black) Magic!'.



**Photo 3**

A well posed photo of a model of that trusty RAF trainer of yesteryear — the Miles 'Magister'. It winged its way to Flair Phil from Malcolm Taylor of West Midlands, who kindly supplied F.P. with some comprehensive data. Scale 2 1/2 in. to 1 ft. Span: 85 in. Power: Enya 90 four-stroke. Futaba R/C. Fully working split-flaps, as on the real 'Magister'.

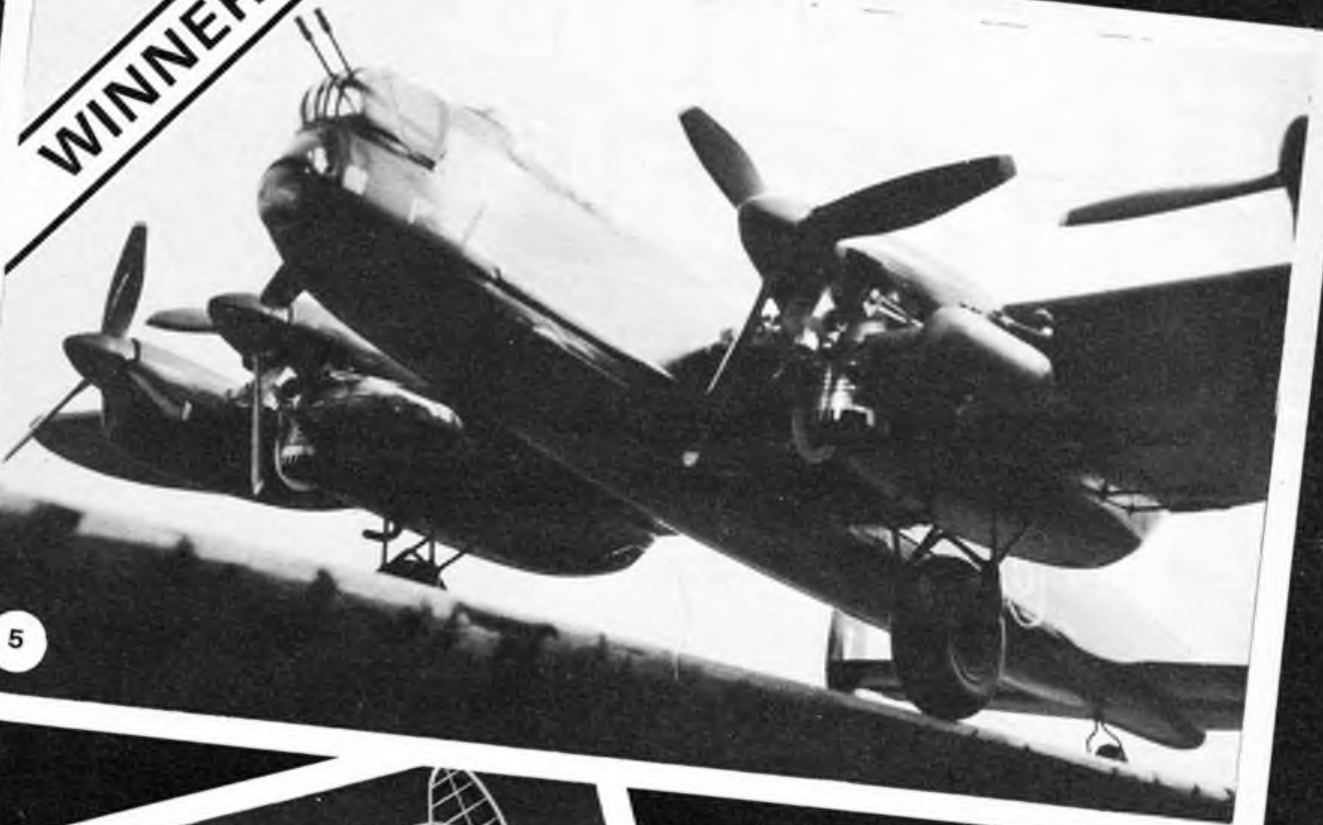


**Photo 4**

If you have the patience to build a scale model biplane, a 'biplane' is always especially rewarding. Obviously Geoff Spencer of Tipton, West Midlands, has the patience (and the skill!), as this photo of his CO<sub>2</sub> powered 'Tiger Moth' well displays. Geoff says it is Telco powered and spans 20 ins. F.P. sends Geoff his congratulations on its coming second in last years CO<sub>2</sub> 'Nats'. A very nice 'Tiggy' Geoff!

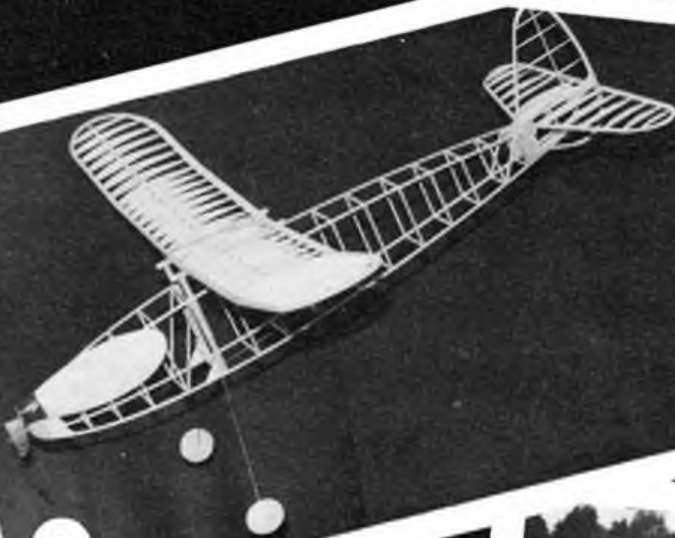


**WINNER**



**Photo 5 — Winner**

In addition to being a deadly bomber, the Aero 'Lancaster' was also a dramatic looking aeroplane. Mr. Green of Notts., echos this dramatic quality in this photo of his A.P.S. (plan 1081) control-line 'Lancaster'. It features throttle control on its two Enya 19 B.B.T.V. engines (outboard props are free-wheeling). Cockpit canopy is from a lemonade bottle and gun turrets — as Mr. Green puts it — "are bits of Dettol bubble bath bottles!" Dare Fliar Phil comment, "A very tasty and clean model!" It wins this months camera.



**Photo 6**

Fliar Phil was delighted to receive this photo from well-known aeromodeller Ron Prentice of Taunton, Somerset. It is of Ron's 1940 *Gutteridge Trophy* winner (design by Norman Blacklock). Built exactly as per *Aeromodeller* plan, except for the addition of a dethermaliser. Shortly to be 'clothed' in red *Modelspan* (fuselage) and white Jap tissue (wings and elevator). Ron intends to fly it in those pre-1951 contests. All the best Ron!

**Photo 7**

Yes, you have all recognised it! A Keil-Kraft 'Super 60'. This example comes from Peter Bull of Kilkenny, Ireland and a very nice picture it makes too! Peter supplied the following information. *Solarfilm* covering, two-channel R. C. Power: P.A.W.19 diesel.

That's it! Looks like another good flying day tomorrow. Why not take your camera along? Who knows? You too could 'snap a winner!'

## Win a Cosina SLR Camera

All entries should be good quality black and white or colour prints. Your name and address should be on the back of the print. Details if possible should be given about the model and its construction. Send all entries to: Aeromodeller, Photo prize Feature, PO Box 35, Wolsley Road, Hemel Hempstead, Herts. HP2 4SS. Photos will be returned after publication.

# Free-Flight Nationals

## Barkston 1984 wet and windy triumph for some ...

THE 1984 British Free Flight Championships will be remembered by all those attending as cold, wet and windy. For a number of years now they have been held at RAF Barkston Heath over the Whitsun bank holiday and reading through past reports the weather is often described as cold, wet or windy, but *never before* has the rain been more or less continuous for all three days, from a light drizzle to a heavy downpour, the wind consistent in direction and strength, blowing from the north at about 15mph, or the temperature so consistently low, 10-12°C for all three days. At least with this wind direction, not one model needed to be retrieved by the missile personnel and its consistency in direction required no move of contest control.

In 1983, the Free Flight Technical Sub-Committee under the Chairmanship of Dave Hipperson agreed when formulating this year's contest calendar that the Nationals would be held on the August bank holiday, thus coinciding with the C/L and R/C events, preferably flown on a site that was independent of crop/farmer problems or restrictions such as the missile site at Barkston. Sites such as Everleigh or Beaulieu readily come to mind but others do exist. Various difficulties and objections prevented this decision being implemented and the SMAE Council eventually overruled the Sub-Committee and determined that the Free Flight Nationals should be held as usual at Barkston Heath in May. This decision was made relatively late and left little time for this year's Sub-Committee to organise the event. In addition communication between the SMAE and its membership, for this year at least, is minimal, this being one of the economies made in order to balance their books. Information about this year's Nationals therefore, was by word of mouth, published details in the media, such as the *Aeromodeller* and a late contest newsletter from the SMAE. This hotch-potch naturally led to some confusion and inconsistency and it is hoped that lessons have been learned and

*First in HLG, M. Page (left) receiving a pat on the back(!) from runner up M. Benns, both fly for Peterborough Club.*



future national events will have accurate consistent information from the one source that matters, the SMAE.

In spite of these difficulties this year's Nationals attracted 659 entries in the 15 official events compared to 770 last year, making it still the largest aeromodelling event in the SMAE contest calendar. Free flight enthusiasts travelled from Germany, France and Belgium to compete, making it a truly international event. It is a shame that none of the foreign visitors flew and all of them went home early, the Germans leaving on the Sunday. The programme was scheduled as for the past few years, namely Mini events on the Saturday, Open events on the Sunday and FAI events on the Monday.

An important feature of the Nationals each year is the campsite and its attendant atmosphere. This year there were as many tents and caravans as usual on the Saturday but such was the weather that by Sunday evening almost half had packed up and departed and overall, it must have been the quietest campsite ever. If it was not for a well-known local hostelry in Wilsford with its welcoming open fire and good reasonably priced food, then many more may have left for home early.

## Saturday 26 May ... Mini events

Contest Director — K. Faux

Mini events traditionally are slow to start since many competitors do not arrive until mid-afternoon. This year the rain and the wind proved an effective deterrent to those competitors present, so no official flights were made until after lunchtime. It is quite normal for free-flight contest flyers to wait as long as possible to make their official flights when conditions are unfavourable, in the hope that the conditions might improve. Those flyers who intended to fly in more than one event and it must be remembered that Mini events are flown to a five flight formula, were thus forced to make a start in the early afternoon to allow sufficient time to make ten official flights. Notable double event flyers were Hipperson, Philpott and O'Donnell. It was soon apparent that even with a two minute maximum models were going the full length of the airfield but fortunately, relatively few were going outside it.

By 3.00 pm two completed sets of *A1 Glider* flights were recorded: namely Cooper and O'Donnell who each only dropped one flight and were separated by only seconds. They set the pace for the others. Madelin flew later and in spite of losing his number one model on its third max he continued with his reserve to drop only five seconds on his fourth flight to win, with Cooper second and O'Donnell third. Madelin's use of two models emphasises the importance of having reserve models. Not so fortunate were Auckland and Owens who both lost their only models with three maxes recorded. Auckland's model was in fact found and returned to control just as the contest closed at 6.00 pm.

*Chuck Glider* as usual was flown from a 'box' but lift was obviously difficult to detect. At the end of the day, only Page had achieved a full score and even then, he had to use his full allocation of nine attempts and maxed on his last three flights. Second was his Peterborough club mate Benns who dropped only six seconds, flying a model of the same design as Page. Third place with 4:50 was Ball (senior) and the junior Neil was fourth.

*1/2A Power* produced what was to be the largest fly-off of the entire meeting with



*A triumphant Stafford Screen, having added yet another '1/2A first' to his collection. Followed this with a win in F1C Power two days later.*



three flyers involved! It was a surprise that only seven flyers out of 20 that started completed five flights. In the fly-off Screen flew first, had a good climb and found what was to be the best air of the fly-off period. He recorded the longest timed official flight of the 1984 Nationals of 6:10. Unfortunately the model was destroyed downwind by cattle who made a good attempt at eating it! Flying second and placing second was Harris who had arguably the best climb on the field but did not find air as good as Screen and was down for 3:18. Third place went to Buskell flying his smallish sheet covered wing model late in the period.

The only other event to require a fly-off on the Saturday was *CO, Duration*. This was a two-way affair between Hipperson and Philpott. Hipperson flew first and had a very creditable flight of 2:02 but Philpott waited and by judging mylar streamers and no doubt relying on his considerable experience of lift picking acquired by flying many glider events was able to record a flight of 2:39 to win. Philpott has really dominated this event at the Nationals and his enviable record over the past four years is three firsts and a second. He was flying his usual VHTL pusher which is really like a walking stick with wings. It is surprising in view of its success that no-one else has tried this layout. Third place went to Pool, of tailless fame, with 9:18.

*Coupe D'Hiver* provided the most exciting finish. The winner Davitt dropped only one flight and second place Kaynes dropped two to score 9:37 and 9:25 respectively and finish comfortably clear of the rest of the field. However, the next four places were separated by only two seconds! Joint third place went to the junior Dixon and fellow club member from Birmingham, Colledge with 9:01, fifth place to Roche with 9:00 and sixth to former winner Chilton with 8:59. Davitt's model was of average size for a modern coupe with a wing area of around 200sq. in. but was unusual in that a left/left trim was used.

After the prizegiving the weather started to improve. The rain stopped, the wind dropped and a watery sun appeared. The national weather forecast on Friday had predicted conditions would slowly improve as the weekend progressed and this appeared to be happening. Some even started trimming models ready for the Open events next day. How different it was to be on the Sunday.

## Sunday 27 May . . . Open events

Contest Director — T. Faulkner

There are good days for flying, there are bad days . . . and there are days not fit to be mentioned in decent company. At 10.00 am on Sunday, the scheduled start of the contests, the wind was blowing around 20mph, the rain was very heavy and it was cold. Visibility was naturally poor and the contest director set the maximum for the day for all events at 2½ minutes. The weather really was foul and an indication of its effect on the competitors is shown graphically below in the numbers actually flying.

The tactic of waiting as long as possible before commencing official flights in the hope of the weather improving came unstuck this time as the weather worsened in the afternoon and the scores showed it. By mid-afternoon, the cloud had closed in and the rain increased so that models were going out of sight at around two minutes. Power flights were going through the cloud-base either during the motor run or shortly afterwards if lift was contacted: yes, lift was there, even in these conditions.

Tony Smith's 'Super Nog' climbed straight into the cloud long before the motor cut and was lost. Peers and Harris went out of sight on glide even with shortened motor runs to record low scores. Screen decided conditions were unfit for serious competition and did not fly. Top class Open Rubber flyers such as Hipperson and Carter recorded scores uncharacteristic of their models. O'Donnell, who when it comes to contest tactics is second to none, employed a technique used in indoor flying of using a weak motor with the turns backed-off before launch in an attempt to keep the model below the cloud base. This worked very well for his first two flights but a curious stall developed low down on his third flight for the model to land at 2:25 thus just missing the fly-off but still good enough for third place.

So the afternoon progressed with few maximums recorded. The winning *Open Glider* score of 6:38 by Cooper included no maximums but Dilkes who won *Vintage* flying a 'Lanzo' dropped only one second to score 7:29. Hopper's winning *Open Power* score was 6:25. Nash won the *Women's Cup* with 5:56, Dixon the *Frog Junior* with 6:56 flying an open rubber model and



Roy Miller placed second in *F1B - Wakefield*. His use of thermal detection equipment contrasted strongly with winner John O'Donnell's empirical use of experience and the back of his hand!

Peers the *Tailless* with 6:11 flying a John Pool design. All these winning scores reflect top class flying under difficult conditions, yet in spite of the conditions the contests were hard fought and from a competitive point of view were enjoyed. The winners really did earn their honours.

The only event requiring a fly-off was *Open Rubber* involving Davitt (who had won *Coupe d'Hiver* the day before) and Chilton. Davitt flew first using a Wakefield but the model tail-slid soon after launch and crashed to record eight seconds. Chilton must have thought the contest was his, flew soon afterwards . . . his Open model dived in to the right to record four seconds! So Davitt won his second major event of the meeting and one wonders if a record has been established that will not be beaten for the lowest fly-off score to win Open Rubber at the Nationals.

In an effort to encourage the development of tailless models a new award of 'Highest Original' was introduced this year to go to the highest placed individual flying a model of a different class to that of the winner. This year it was won by Staines flying a glider. The winner, Peers, used a rubber model.

As a footnote to the Open events it is disturbing and therefore, worth recording that doubling-up between the Open and Ladies events and the Open and Frog Junior events was permitted. Such departures from the SMAE rules should not be encouraged. It



Another double winner this year was Ian Davitt, *Coupe D'Hiver* and *Open Rubber*, the latter with what must be one of the shortest winning fly-off times ever!

is not difficult to imagine the possible adverse situations that could arise in the future if SMAE rules are ignored or adapted on the day.

## Monday 28 May . . .

### FAI Events

Contest Director — P. A. Ball

The FAI contests for **Glider (F1A)**, **Rubber (F1B)** and **Power (F1C)** were flown in rounds commencing at 6.00 am. Unlike last year there were no breaks between the rounds nor a scheduled lunch-break so flying was continuous from 6.00 am to 3.30 pm. Each round was scheduled for 45 minutes' duration and a maximum of three minutes was possible all day. The sequence of flying was F1A for 45 minutes, followed by F1B and F1C combined for 45 minutes followed by F1A and so on.

The weather conditions remained fairly consistent all day being dull overcast relatively low cloud, intermittent rain and drizzle and a wind speed of 10-15 mph. Thus, although not ideal, these conditions represented the best over the Championships and as such attracted 44 competitors to the line for the first glider round of which 10 maxed. The first round of the F1B/F1C attracted 24 and 7 flyers respectively of which 5 maxed in rubber and surprisingly only 2 in power, namely Screen and Jack, who are both members of our power team for the European Championships later this year.

There were only 4 double maxes at the end of the second glider round and two, Cordes and Shepherd, remained with full scores at the end of the third. Cordes then dropped with 1:43 in the fourth to leave Shepherd clear with four maxes. In power Screen and Jack continued to max until Jack dropped with 2:43 in the fifth. This allowed Chilton to move into second place with a margin of three seconds while Screen again maxed to remain in the lead. By now, there were only

five competitors left flying. In rubber, Pollard dropped in round two by D/T'ing early from a good height and in round three Miller dropped to leave no one with a full score. In round four, O'Donnell maxed to take the lead and by the end of round five the order was, O'Donnell, Miller, Hipperson and Pollard. These four fought it out over the last two rounds. O'Donnell made no mistake and with two further maxes the worthy winner. Miller also made two maxes for second, but Hipperson dropped round six with 2:42 to allow Pollard with two maxes to take third place. Overall this was a fine contest with a good exhibition of flying under difficult conditions and it was a shame that so few were around to see it!

The glider contest meanwhile was reaching an exciting climax. At the end of round six, the order was Page, Cordes, Shepherd and Owens. Page flew first in round seven to drop badly with 1:15 Cordes flew next needing a score of 2:45 to win but his model veered badly on tow to release low and record a miserable 1:18. Inspection of the model afterwards revealed a broken mainspar in the wing tip and a badly warped tailplane resulting no doubt from the wet conditions experienced all day. The moral must be to check models *very* carefully each flight and on a wet day to use a fresh dry model for such a crucial flight. This then opened up the contest and Shepherd competently took his chance with a good flight of 2:41 to win. Second place went to Gibbs and third place to Carter who both as it were, came up on the rails with maxes.

The final two rounds of the power contest produced only one change when Chilton dropped round six with 2:44 to allow Jack into second place. Once again, Screen had won with the only full score of the day. His consistent and professional approach has to be admired but where is the competition in FAI power?

### Results

**A1 Glider (63 entries, 37 flew)**

<b>British Airways Trophy</b>		
1. G. Madelin	Crookham	9:55
2. J. Cooper	Biggles	9:38
3. J. O'Donnell	C/M	9:37
4. J. Bailey	Biggles	9:08
5. C. Shepherd	Birmingham	9:05
6. P. Bayram	Richmond	9:00
7. J. Cuthbert	Grantham	8:57

**1/2 A Power (46 entries, 20 flew)**

<b>Hales Trophy</b>		
1. S. Screen	Birmingham	10:00 + 6:10
2. P. Harris	Birmingham	10:00 + 3:18
3. P. Buskell	Crookham	10:00 + 1:33
4. T. Payne	Biggles	8:53

**Coupe d'Hiver (58 entries, 33 flew)**

<b>308 Trophy</b>		
1. I. Davitt	Leeds	9:37
2. I. Kaynes	Croydon	9:25
3. N. Dixon (jnr.)	Birmingham	9:01
3. W. Colledge	Birmingham	9:01
5. D. Roche	Anglia	9:00
6. M. Chilton	EPS	8:59
7. G. Ferer	Leicester	8:53

**CO° Duration (26 entries, 11 flew)**

<b>Sparklets Trophy</b>		
1. S. Philpott	Biggles	10:00 + 2:39
2. D. Hipperson	Grantham	10:00 + 2:02
3. J. Pool	NYFFG	9:18
4. J. O'Donnell	C/M	9:08

**HLG (21 entries, 12 flew)**

<b>HLG Trophy</b>		
1. M. Page	Peterborough	5:00
2. M. Bennis	Peterborough	4:54
3. P. A. Ball	Grantham	4:50
4. G. Neil	Anglia	4:36

**Open Glider (105 entries, 20 flew)**

<b>Thurston Cup</b>		
1. J. Cooper	Biggles	6:38
2. D. Hambly	C/M	6:29
3. J. Bailey	Biggles	6:11
4. M. J. Brown	Birmingham	6:01
5. W. Colledge	Birmingham	5:16

**Open Rubber (74 entries, 15 flew)**

<b>Model Aircraft Trophy</b>		
1. I. Davitt	Leeds	7:30 + 0:08
2. M. Chilton	EPS	7:30 + 0:04
3. J. O'Donnell	C/M	7:25
4. J. Carter	Falcons	6:41

**Open Power (51 entries, 10 flew)**

<b>Sir John Shelby Cup</b>		
1. J. Hopper	Freebirds	6:25
2. T. Payne	Biggles	6:05
3. N. J. Bridges	Bristol and West	5:17
4. L. Moore	Biggles	5:01

**Frog Junior (13 entries, 5 flew)**

1. N. Dixon	Birmingham	6:56
2. A. D. Ball	Grantham	6:29
3. T. Owens	Liverpool	5:47
4. J. McDonald	Biggles	4:05

**Women's Cup (15 entries, 2 flew)**

1. J. Nash	Anglia	5:56
2. S. Coy	Freebirds	3:35

**Tailless (12 entries, 4 flew)**

<b>Lady Shelley Cup</b>		
1. R. Peers	Falcons	6:11
2. I. Kaynes	Croydon	4:49
3. J. Pool	NYFFG	4:48
4. R. Staines	(Highest Original)	3:48

**Vintage (49 entries, 10 flew)**

<b>Jubilee Cup</b>		
1. T. Dilkes	Falcons	7:29
2. P. A. Ball	Grantham	7:16
3. G. Ferer	Leicester	6:08

**FAI Glider (75 entries, 44 flew)**

<b>Ronytube Cup</b>		
1. C. Shepherd	Birmingham	19:07
2. A. Gibbs	Birmingham	19:00
3. J. Carter	Falcons	18:36
4. M. Page	Peterborough	18:19
5. A. Cordes	Birmingham	18:01
6. M. Kinder	Falcons	17:59
7. P. Williams	Richmond	17:49

**FAI Rubber (41 entries, 24 flew)**

<b>Fred Boxall Trophy</b>		
1. J. O'Donnell	C/M	20:13
2. R. Miller	Croydon	19:58
3. R. Pollard	Tynemouth	19:47
4. D. Hipperson	Grantham	19:24
5. I. Davitt	Leeds	18:16
6. I. Kaynes	Croydon	17:50
7. M. Duce	Liverpool	17:12

**FAI Power (21 entries, 7 flew)**

<b>Eddie Kiel Trophy</b>		
1. S. Screen	Birmingham	21:00
2. A. Jack	Tynemouth	20:43
3. F. Chilton	Crookham	20:14

*Prayer, supplication, invocation or just plain physical effort . . . just some of the launches seen at the Nationals this year.*



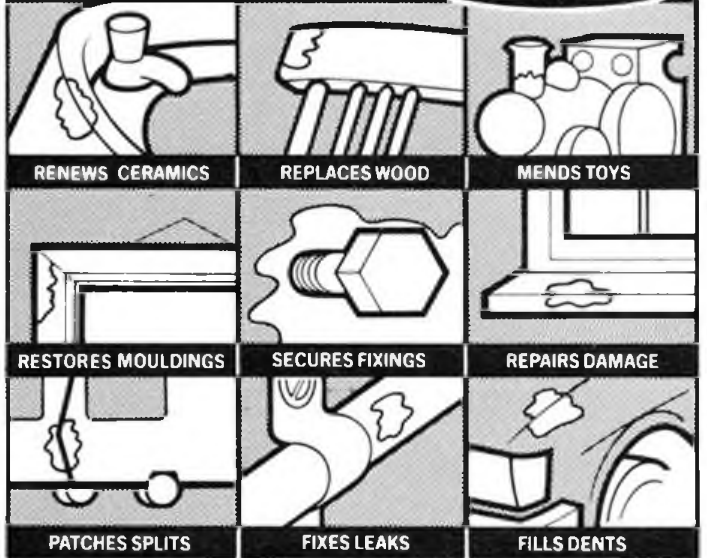
*Although thermals were well in evidence throughout Monday, many glider fliers waited for extended periods to find the best air. Here Toby Owens launches for his father after a 20 minute wait in the cold! Toby placed third in the Frog Junior flying rubber powered 'Performer!'*





# Permanent, Strong

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# SCALE MATTERS

## Free Flight with Bill Dennis

### Rubber powered scale models

Over the last few years there has been a surge of interest in outdoor rubber models, prompted, I am sure, by the indoor boom. In particular, the event at the Nationals has become increasingly popular since its inauguration in 1978. I have been involved with running this contest and so have been able to observe trends and get some idea as to why some models succeed where others fail. While I still maintain that the rubber model is not the best type with which to embark in scale modelling, I do not believe it is as difficult as is sometimes made out.

The rubber model has many different aspects to consider when weighing up its potential and they are largely inter-related. I have jotted down a few headings, so let's see how it goes.

#### (1) Size

Most outdoor models are too small and should be of similar size to the average power model which, in turn, is also too small! I think the small model is a hangover from the indoor scene, but if you look at the classic designs from Riding, Moore and Towner, they were all over 36in. span. Having seen models of all sizes from 13in.-48in. span, I would recommend 30in. minimum for a biplane and 36in. for a monoplane. A large model will fly through turbulence, while the smaller one can get tossed about like a leaf. Also, a big one is more in keeping with the scale of the outdoor environment, and SMAE outdoor contests have a minimum span limit of 60cm!

#### (2) Weight

It has become almost a cliché that the rubber model must be built light to succeed, but no one ever states what they mean by 'light'. In any case, the term is meaningless since it is the wing-loading that is important. I believe that too much lip-service is paid to weight, particularly where flight realism, rather than duration, is the aim. To try and place this on some sort of firm basis, I have tabulated the vital statistics of three models that have shown good flying performance, combined with scale structure and finish.

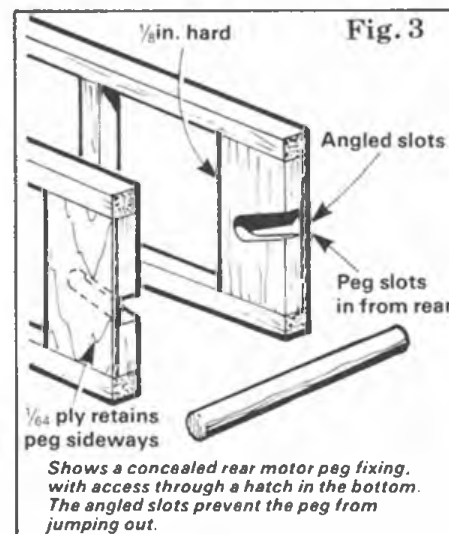
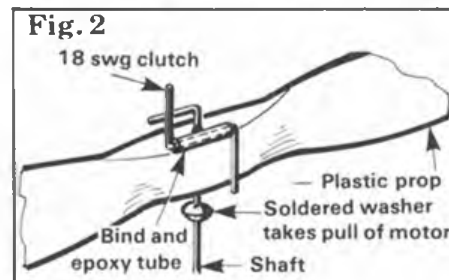
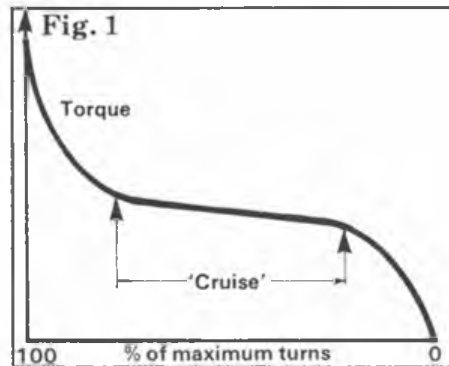
Model:	Mike Hetherington <i>F.W. 'Stosser'</i>	Alan Callaghan <i>Rearwin 'Speedster'</i>	Bill Dennis <i>DH60 'Moth'</i>
Span in.	34	38.5	36
Area sq.in.	158	206	357
Weight of Airframe oz.	4.0	8.0	10.5
Weight of Rubber oz.	1.0	2.0	1.5
Wing loading oz./sq.ft.	4.5	7.0	4.8

A low-wing loading is easier to achieve on a large model and note the beneficial effect of building a biplane! An extra pair of wings weigh very little — most weight is concentrated in the fuselage and ballast. Because of scale effect, a small model needs a lower loading than a large one, otherwise its

flying speed becomes too high. Speaking to Mike Hetherington, he told me that some of the early, large models were operating at wing loadings of up to 20oz./sq.ft.!

#### (3) The rubber 'motor'

Another thing I am convinced of is that many people do not use enough rubber. A rubber motor shows a characteristic power curve, with high torque at maximum turns, rapidly falling to an extended 'cruise' period (Fig. 1). If the motor is too small, it has to be wound to near-maximum turns, giving that characteristic 'zoom' on take-off, followed by a sagging cruise. By using a larger motor, you will only need wind to, say, 70% turns to get adequate power and duration. You will be operating on the 'cruise' part of the power curve throughout and the flight will be smoother. There will be *turns in hand* for extra duration and for take-offs, you will be able to wind up the left part of the curve to



get a little extra 'urge'. Finally, your motor will last longer and not blow up inside your fuselage!

#### (4) Propellers

If the motor is large, the propeller will need plenty of blade area to absorb the power and extend the run. An obvious limitation here is ground clearance, and blades of wide chord may have to be used. Another alternative is to gear the propeller up, but I feel gears are outside the scope of this article. Perhaps if Mike Hetherington is reading this, he could give a few tips?

Since your model will certainly require nose ballast and the best place to put it is in the propeller, I would recommend using a plastic prop. An excellent range of *Peck* props is available from *Sams*, but these only go up to 9/16in., which is too small for a decent size model. The *Keil-Kraft* 12in. prop can still be had and although it is a little narrow in chord, the width of the blades can be easily increased as follows. Cut two large blade shapes from 1/8in. ply, and epoxy them to the rear faces of the plastic prop, which should be roughened with sandpaper. The front surface is then filled with *Plastic Padding* and sanded to section. It is a good idea to make the blades oversize — they can be trimmed with scissors to get the best motor/prop/length of run combination.

All these plastic props feature a singularly useless freewheel ratchet, but a simple and effective alternative is shown in Fig. 2.

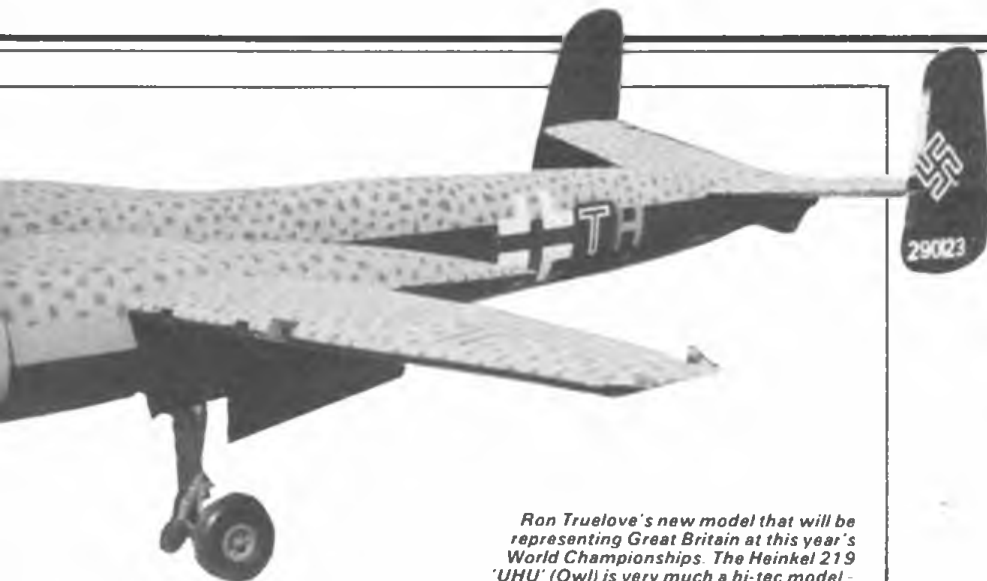
To be continued next month

★ ★ ★

Those of you who fly F/F scale, either indoors or outside, will be interested in a newsletter produced, or should I say compiled, by Alan Carr. Called 'Scale Flight', there are approximately six issues per year, and the subscription is £2.50. Please note that Alan runs this on a voluntary basis and is heavily dependent on input from the subscribers, so why not send him your news/articles/plans etc. with your subscription?

Alan tells me that *MAP* have given permission for him to reproduce the early 3-views by Eddie Riding that appeared in *Aeromodeller*, but are no longer available. I understand the first drawing will be the *Austin 'Whippet'*, and this series should be worth the subs. alone. Alan's address is 56 Carlton Road, Romford, Essex.





Ron Truelove's new model that will be representing Great Britain at this year's World Championships. The Heinkel 219 'UHU' (Owl) is very much a hi-tec model - see text.

Great Britain will therefore be represented in C/L Scale at le Bourget by Ron Truelove with his new *Heinkel 219 'UHU'* ('Owl') powered by two *Irvine 40's* and fitted with electronically controlled flaps, undercarriage, throttles, and drop tank, which together with a multi-engine option gives him the chance of achieving a very high flight score.

Chris Bradford of the Marlborough Club is a comparative newcomer to C/L Scale competitions but has shown that a skillful flier with a reliable model can put up a very respectable performance. He will be flying his well-proven *Nieuport 17* in France.

I have resurrected my *Zlin 526A* which I originally built in 1975 for the 1976 World Championships held in Sweden where I was the only representative for Great Britain. The model is built to 1/6th scale (72in. span) and uses an *HP40F* for power. Control is by a two-line electronic system operating throttle, flaps and undercarriage.

We shall be accompanied by the Radio Control Team which includes Peter McDermott — *Sopwith 'Snipe'*, Brian Taylor — *Gloster 'Gladiator'* and Mick Reeves — *Hawker 'Hurricane'*, this team having been selected at the trials held at RAF Elvington 5/6th May. Doug Sheppard will act as Team Manager for both teams.

The record of Great Britain in World championship R/C scale over the years is second to none but apart from Mick Reeves' win in 1970 at Cranfield, our record in C/L scale is rather sparse — let's hope that 1984 brings better luck.

## Control Line with Vic Willson

### Scale World Championships 1984

Due to the present uncertain financial positions of the *SMAE* and the deadline for the entries to be paid (1st May), entries for the Team Trials were only accepted on condition that a declaration was signed to the

effect that the entry fee of approximately £260 would be paid immediately after the trials by anyone selected to represent Great Britain.

There were eventually only three modelers in the control-line class who accepted this condition, namely Ron Truelove, Chris Bradford and Vic Willson, thus rendering a trials unnecessary. Mention must be made here of the generous sponsorship given by the High Wycombe Club to both Ron and myself without which I would have been unable to make the trip.

Just when you thought it was safe to go back to modelling!

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OVER THE YEARS I have been misguided enough to pursue some of the more oddball avenues in our hobby. Despite frequent wanderings into the realms of cars, boats, railways and plastic kits, I invariably find myself drawn back to the field of aeromodelling. Even here, excursions into CO<sub>2</sub>, Radio Control, RTP to name but three have never really weakened the delight and satisfaction gained by a bit of 'handle-waving' in the centre of a control-line circuit. Recent work on Profile Scale and my involvement in the 'Stoneleigh' event, further emphasises an interest lurking in the back of one's mind.

Over the last year I have been involved with electric powered R/C models (a series planned for RCM&E) and more than once the thought of similarly powered C/L models found its way back into my conscious mind. Previous exercises in aeromodelling have produced odd power sources for control-line, in fact we still possess a twin Telco powered C/L 'Beaufighter' and a 4 x Telco powered B17 'Flying Fortress'. The low power and light weight of these models restricts their flying to short lines and calm days, the 'Beaufighter' was flown indoors at the *Model Engineer Exhibition* at Wembley. (Much to the concern of the security staff who insisted that they stood by with a CO<sub>2</sub> fire extinguisher in case the motors 'backfired'!).

More recently, in fact at last year's MAP 'do' at Stoneleigh, we were taken with John Stroud's 'Stoneleigh Classic' event. Particularly when one of the entrants, a girl no less (!) flew a completely silent version of the model.

Rachael Turner's 'Silent Classic' caught us all on the hop for 9-year olds are rare in control-line circles and 9-year old females, are more like hen's teeth. At first it seemed that the young lass was merely helping a brother by carrying the handle out to the centre, for there she stood, demure and feminine, complete with shoulder bag, when suddenly she was flying! If that wasn't sufficient on its own — she was flying electric!

Closer inspection showed an intelligent

Right: the contents of Rachael Turner's shoulder bag... power pack and switch unit for her 'Quiet Classic' which she is seen holding below. Far below: lightweight twin boomed, electric stunter built by Rachael's dad Stan.



youngster (with a madly modelling Dad) who, whilst quite keen on the 'Stoneleigh Classic' event, couldn't equate with the noise, smell and general aggravation of an infernal combustion engine.

Now Stan Turner, Rachael's Dad, is a stalwart of the Coventry and District Model Aircraft Club and has, amongst other attributes, a liking for indoor RTP flying.

Father and daughter between them figured that the 'Classic' was no more than a jumped-up RTP model (apologies to John Stroud!) and set about building one for a Mabuchi 380 motor filched from a Tamiya 'Holiday Buggy'. Construction followed the plan, with the electric motor buried in the nose and the connection wires sunk beneath the surface of the wing, exiting at the in-board wing tip (Fig. 1). So far, so good! Finish was done by Rachael herself with deft feminine touch.

Initially thoughts were to use shellacked Laystrate steel wire but it was figured that (a) the voltage drop over 20-25 ft. of steel line would be excessive, and (b) the line tension would be insufficient, even when trimmed for safety, to warrant the use of steel lines. Accordingly an old ex-Government mains transformer was unwound to yield an ample supply of enamelled copper wire similar to the club's RTP lines, (perhaps just marginally thicker). Even so to get

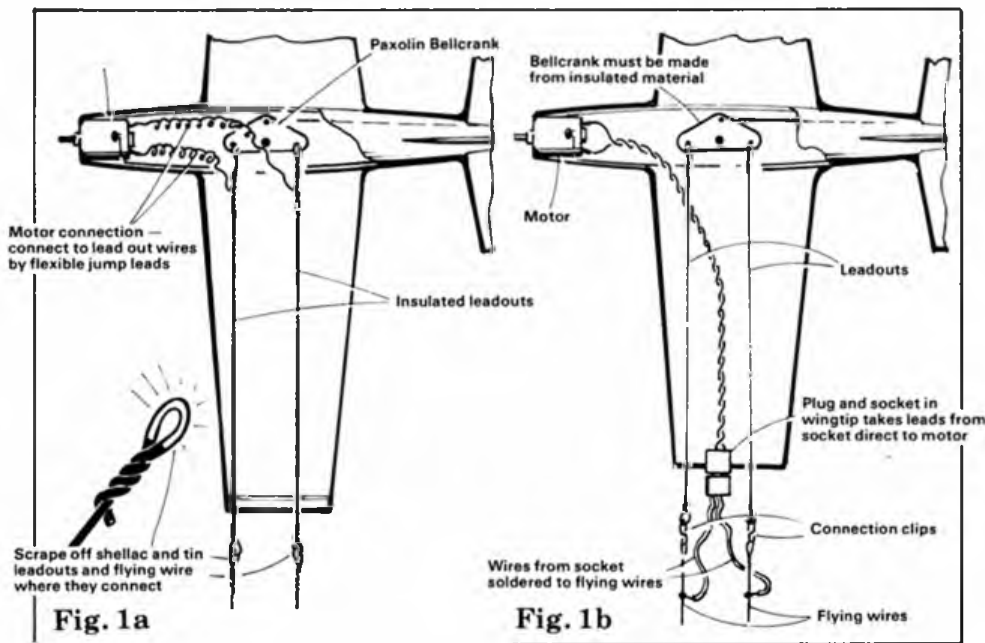
anything like a reasonable voltage at the model, a 14 cell pack of Ni-Cads was needed at the handle! In Rachael's case, the 14 x 1.2Ah battery pack was housed in the fashionable shoulder bag, the connection to the handle being via an old electric blanket cable and switch. The total package produced quite satisfactory results and stimulated Stan to look at other electric control-line models and a couple of RTP sized (and powered) models were produced for indoor flying at the Club's RTP venue, namely the famous Rugby School.

The Beechcraft 17 staggerwing is a stock profile scale kit from the SIG stable, produced for .049 power. Re-engined with a large slot car motor (FT 36D) once available from Harry Butler and subsequently from



# ELECTRIC Control-Line

Ian Peacock introduces the latest in clean, quiet rotation — is this the beginning of the end of oily tarmac?



Keil Kraft as their Model B30, and turning a K.K. 125mm x 50mm three bladed propeller, the staggerwing flies as might be expected. Not overly powered but adequate for indoors or calm days outdoors. At 18in. wingspan it is very comparable with RTP models and leads one to wondering about the age-old idea of electric control-line — flown from outside the circle (Fig. 2).

Stan's other approach was for a very light-weight, twin-boomed stunter of 20in. span. Drawing on his experience in RTP it was powered by an FT16D (re-worked and with a 'tuned' armature) and flown on enamelled copper lines. By Stan's own admission the model is a bit of a handful and whilst the principle has proven valid, the model design could benefit from a re-think as it does tend to be a bit 'twitchy' on the controls.

Whilst all this was going on a modelling colleague of mine, Rick Willoughby, from Daventry, on one of those halcyon evenings, where, after a successful few flights with our Acoms 'Cessna', we were quaffing the odd ale or two (or three! — Ed.), came up with the question — why not control-line?

In hindsight ours turned out to be the totally opposite approach to Stan and Rachael and opens up yet another route to the electric scene.

*Right and below: Stan Turner's Beechcraft 17 staggerwing 18in. span and powered by a slot car motor (FT36D or B30). note simple motor mount.*



Quite elated at what appeared to be a 'new' idea (funny how a few beers cloud one's judgement) the powerplant and battery were quickly removed from the Acoms 'Cessna' and a test-bed was built. In fairness to Rick, whose standards of model building tend to be somewhat better than mine, this test-bed was somewhat of a lash up. Wings were surplus to requirements from a long defunct thermal soarer and the balance was from the rubbish box. However, it was only made to prove a point and never did have any pretence at looking pretty! And — it did fly! In fact it flew well enough to encourage both of us to go further. Rick in one direction, me in another! Rick's test-bed

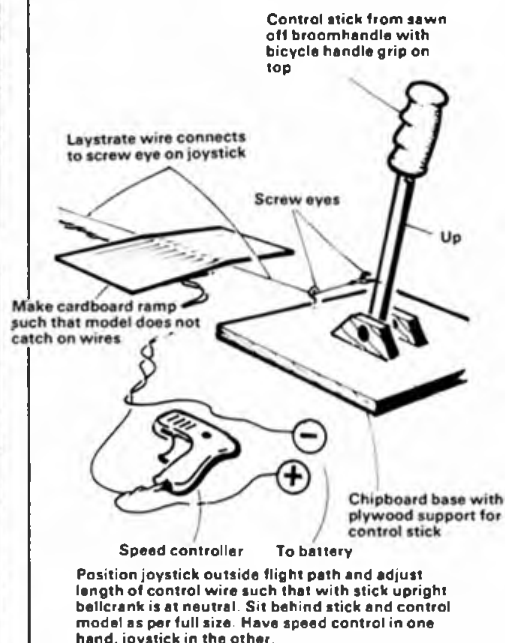
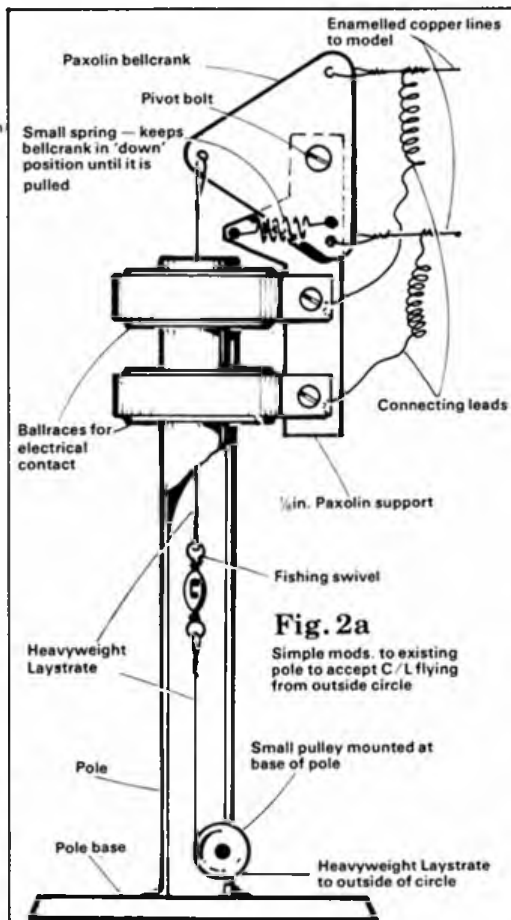


was re-engined in turn with:

- (a) an RS540
- (b) an MFA Olympus
- (c) a Graupner geared motor

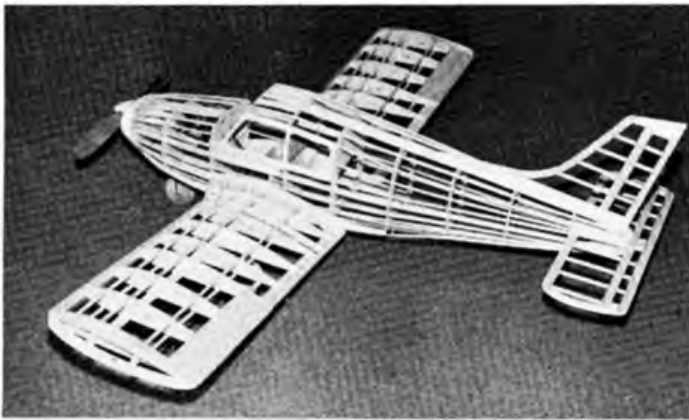
Battery packs from 5 x 600mAH to 8 x 1.2AH cells were tried to establish comparative performance figures (much of these test results will form the basis of a future article from Rick).

Furthermore he built a lightweight foam combat wing — roughly class 'B' size and proceeded to carry out similar comparison



**Fig. 2b**





Ian Peacock's Piper 'Cherokee' converted to electric power, only modifications needed were in the mounting of motor and batteries. Note motor slightly off centre - see text.

trials in a search for aerobatic performance, to date, results look highly encouraging.

Mind you, the idea of two combatants fighting it out in the sky — in total silence — seems a bit mind boggling!

Of course, the prime advantage of carrying the battery pack in the aircraft, which is a fundamental point of Rick's experiments, is that it removes the need for any form of 'special' flying wire and all Rick's flying is being done on 'standard' lengths of *Modelec* stranded steel wire. Furthermore, it also removes the problems of voltage drop along the lines as the battery pack is hard-wired to the motor by the shortest, thickest wire convenient to the model's design. It does, however, carry the problem of weight penalty, for whichever way you approach the subject of electric flight, the delicate balance between performance and weight must still be preserved.

Meanwhile, back at the balsa factory (!) Peacock had returned to the scale kick. Like many modellers, the idea of a model 'looking like the real thing' has always appealed and the success of Rick's test-bed had spurred me on to look for a suitable subject. At times such as this I am greatly blessed by having 'left-overs' from previous magazine articles. In this case we had a couple of *Sterling* rubber powered kits left over from our foray into the CO<sub>2</sub> powered scene. One such kit was for a Piper 'Cherokee'. At 37½ in. wingspan this kit was really a bit big for CO<sub>2</sub> powered free flight and consequently, still on the shelf. There is obviously a lot of truth in the adage that 'it will come in useful one day' for this was the *very* size for electric C/L. In fact, *Sterling* even provide the parts for C/L conversion and show a Cox .049 for power (having seen the performance on electric, it's speed with a 'Tee Dee' .049 must be frightening!). The wood selection in this kit was a bit suspect, but we pressed ahead with it and with the aid of modern cyano-adhesives the airframe was all together in a couple of evenings.

Motor installation was quite straightforward. The motor-gearbox system had to go in sidewinder fashion to avoid having a conflict of interest with the nose leg. Although it produces a somewhat lopsided appearance there is nothing technically wrong with this layout and the nose of the 'Cherokee' is plenty broad enough.

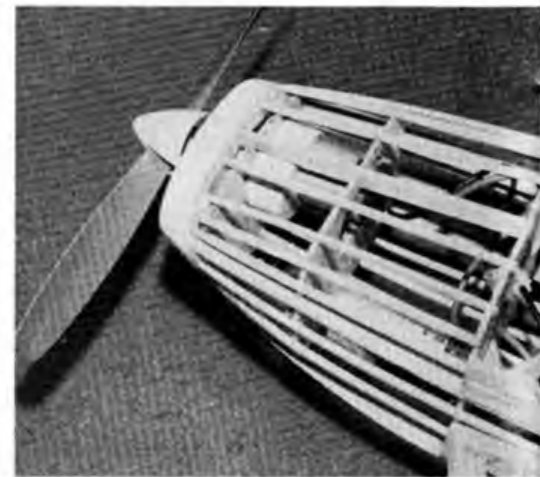
The front couple of formers were routed out with the ubiquitous *Dremel* flexi-drive to clear the motor and gearbox and a false nose former manufactured from ¼ in. plywood. This was carefully fretted out to produce a snug fit on the front of the gearbox-housing paying particular attention to cutting a hole in line with the cooling intake. Again this looks a little odd being offset and, of course,

its important that the propshaft is central, even if the rest is one-sided. The gearbox/motor fixing screws are just long enough to cope with the ¼ in. ply and once satisfied with the fit and alignment, the false former can be glued in place. Not knowing quite what to expect as regards to line tension the motor was offset to the right by about 3° (by glueing the former in on the skew!) in the same manner as with conventional diesel or glow plug motors. In practice this turned out to be just about right.

The battery pack in any electric model is the heaviest part and in the event of it moving in a rough landing it may be relied on to cause havoc to the light structure, consequently a box of ¼ in. balsa was made between the wing leading edge and main spar such that the battery lies on its side, transverse across the fuselage. It might reasonably be argued that some form of breakaway structure would benefit and a flat box with a sloping front seems like a good scheme.

The argument goes on to say that in the event of a sudden stop, the battery will move forward until it meets the sloping front of the battery box and then move down and forward — out of the airframe. I haven't tried this yet but it sounds a great theory! Up to this stage the power drive system was absolutely 'stock', for the exercise was quite deliberately *not* to make special parts. However there was one concession and that was the addition of a second On/Off switch wired in series with the existing switch. The existing switch was mounted beneath the front fuselage just behind the noseleg. The additional switch was mounted on the bell-

*Author's son Kevin holds Rick Willoughby's 'Wing' - motor appears to be held in position with elastic bands ... is this a forerunner of 1986 combat?*



crank plate with a small hole drilled through the toggle. A subsidiary pushrod passes through this hole and is joined to the main pushrod. A little juggling with the adjustment provided a reliable and repeatable Off/On operation with full 'up' or full 'down' elevator.

Reaching back into my youth, I remembered how to cover a stringered structure with lightweight tissue, fitted windows and cowl and lightly sprayed on the colour dope. Of course, being electric powered, no fuel proofer is needed. Being idle of nature I did not research the colour scheme but simply copied the box art, even resorting to the kit transfers. Total all-up weight when finished was 1½ lb., pretty well what was expected.

The first flight was somewhat of a disaster for, due to an oversight on my part, I had managed to get the tailplane on at a slight positive incidence, resulting in full up elevator being required to get the model to stay airborne, and we all know what full-up elevator does — don't we? Right! It turns the motor off! After a series of circuits and humps we took the model home (all of 200 yds.) Re-setting the tailplane to zero produced a magical transformation with the aircraft flying as perfectly as one could wish for.

Flight times, on 40 ft. *Modelec* lines, average around four to five minutes, with a smooth power-on landing during the last half minute or so of battery life, taxiing round to the pits and with a deft flick of up-elevator — turn the motor off!

Whilst the 'Cherokee' is not going to set the world alight, it does offer a different approach to scale modelling of this nature and leaves one wondering about other subjects. Twin- and multi-engine layouts must be equally viable and whilst the choice of kits might be limited, a quick scan through the *Aeromodeller Plans Handbook* will yield many freeflight rubber and power designs just crying out to be converted to electric flight.

So, if you fancy something a bit different, then why not join the quiet revolution?

# VINTAGE CORNER WITH ALEX IMRIE



Above: the 'Cruiser Pup' that went through the revolving propeller of a 6cc 'Mechanair,' all repaired and still a performer for Ron Brownson (see text).

Below right: Model Shop 'Bee' by Mike Parrott, fitted R/C and powered by a replica Mills Mk1. This design by C. W. Lutman was based on the Maxwell Bassett 'Cardinal' kitted by Megow's Models in 1938.



## Mike's Dream ... the Comet II

Looking at his brother's copies of *Practical Mechanics* in the 1930's left an indelible impression on Mike Parrott from Bletchley, petrol engined models with long slim fuselages, lots of dihedral, rounded wing tips, spindly wire undercarriages, 'Moth' type tailplanes, huge fins and engines hung on the front, were to him far more real than the lightly built American gassies. He never forgot the names associated with these shapes, 'Skyrocket,' 'Comet II' and their designer A. E. Brooks. Mike became an aeromodeller, then eventually a SAM 35 member, when ... "In the March 83 edition of SAM 35 *Speaks* Tony Penhall wrote an article about the 'Comet II' which brought back the old dream to build and fly one of these. Shortly after, an advert appeared in the model magazines in which Phil Smith offered plans for this model. Plans and timber were soon bought and a timely birthday produced a Saito 40 four-stroke. Construction commenced in October and the model was just finished in time to be exhibited at the 1984 *Model Engineer Exhibition*.

This aeroplane is built like the proverbial brick outhouse; the fuselage is all spruce and ply, the wings and tail units are heavily sheeted, with the weight of a four-stroke and three channel R/C it finally came out at about 7lb. The weather so far this year has not been very kind to us model flyers, so my first flight wasn't made until early April. I was almost convinced in my mind that it wouldn't fly, it was too heavy, it would be underpowered; a right lemon ...

A cool, sunny April evening, down to the strip, should I hand glide it first? Why no. Let's fly the thing, fire up the motor, check the controls, point it into a steady eight knot wind, let go, it runs along the ground tail down, it'll never go off, suddenly up comes the tail and she's off, climbing at 45 degrees, without using any up elevator at all, push in some down trim, throttle back and back more. At three quarters closed it cruises around in a delightfully wavering flight pattern, a bit sensitive on rudder but no problems. A few short flights altering the trim to get it right, all OK, let's try the glide. Climb up and stop the engine, crumbs! This thing floats, smooth fully controllable, quite a slow sink rate. Another flight, a long one, I

stand back and watch it fly, bright evening sun glinting off the new varnish. Magic. When I was a boy I had this dream ..."

Tony Penhall's father was in the Bournemouth club before the war, knew A. E. Brooks and flew some of his designs, this was sufficient incentive for Tony to research and build a 'Comet II.' While at the 1982 SVAS meeting at Old Warden I met Noel Crane with a delightful CO, powered version and published the photograph in the October 1982 *Aeromodeller*, what I did not know was that Noel's model had been reduced from a pre-war 'Comet II' model that he still owned. Phil Smith then burned the midnight oil on the measuring job and produced the drawings mentioned by Mike, these are still available from Phil at 32 Verwood Crescent, Southbourne, Bournemouth, Dorset, BH6 4JE, price £4.50 post free.

This is an important British power model and Phil's plans contain some historical notes that explain why there were variations in the 'Comet' designs. The writer would particularly like to learn more of A. E. Brooks, the 'Comet' designer, especially details of his early models and engines used in 1934 while a member of the Leicestershire Model Aero Club.

## Proof of Vintage

That designs might be verified as belonging to the vintage period, the term publication is usually taken to mean that the design

appeared in the model press, or was available from a recognised source before the cut-off date of (in our case) 1st January, 1951. The SAM rule is, however, open to interpretation since it (SAM Official Rule Book) only says that the design should have been "... designed, kitted or plans published prior to..." The late John Haggart was more specific when he drafted the rules for the

trophy which now bears his name and his Condition 1 states "... published in any national model magazine, or kitted, or manufactured prior to..." Many obscure models have in the meantime emerged (and doubtless will continue to turn-up), these are usually accepted as suitable since no one seems bothered to enforce the rule or investigate the origin of certain designs and to my certain knowledge, some of our vintage competitions have actually been won by models that should not have been allowed to compete at all for this very reason. My mention of Vic Smeed's 'Tiresias' in June Vintage Corner as not having been published during the required period has caused Vic to write in as follows:

"All the dictionaries I have consulted agree that 'to publish' means 'to put into circulation,' 'to print and offer for sale' etc. By these criteria the 'Tiresias' glider design being used for a one-design glider class by SAM 35 was quite clearly published; I had prints made and these were freely available (price, if I recall, 1/6d or 7/10p decimal) round about 1949. Quite a number were built, mostly in Kent and by RAF modellers. The

Marion Bull from Kilkenny, Eire, is almost becoming a regular feature in this column (and long may it continue!). Here she is again with her father Peter's ten year old 'Super Sixty' (see text).





aside in Vintage Corner, June issue, is therefore regrettable since the design quite clearly meets the requirement '... published before 1st January 1951,' a fact known by most SAM 35 members."

While I cannot claim to have an encyclopaedic memory, I have read most of the books and magazines related to our hobby for the years 1930-1950 but have to admit that I had never heard of Vic's 'Tiresias' until SAM 35 announced that they would run a competition for it at Warwick, hence my remarks. Yet, this must also be true of thousands of designs made during the vintage period whose existence was only known to the designer and a relatively small number of local modellers. So I stand corrected and apologise to Vic but feel that the true meaning of publication depends on the manner used to 'promulgate or proclaim abroad' and think that the model press medium should be recognised as the yardstick since its evidence is irrefutable.



Herr Punke of Western Germany made this 'Hummel' for diesel power in place of the original's Kratmo petrol engine. Designed by Helmut Antusch 45 years ago, the all hardwood structure had fretted plywood ribs.



Left: Gordon Merrifield, Hon. Sec. of the Bournemouth MAS in the 1930's made this fine looking Mills 2.4 diesel powered control liner when he was serving with Scottish Airlines at Prestwick in the late 1940's. Below: Phil Smith with demob suit and the 'Apocalypse' before display at the Dorland Hall exhibition in 1945 (see text). Cockpit canopy from a shattered 'Lancaster' gun-turret.

## Apocalypse Sailplane

The sailplane showcase at the Second National Model Aircraft Exhibition held at Dorland Hall December 1945 to January 1946 was dominated by a 9ft. span brilliant yellow machine that was earmarked for inclusion in the *Aeromodeller Plans Service* but somehow this does not appear to have taken place. The builder, Phil Smith of Bournemouth tells the story of this fine looking model that can be seen on page 232 of the March 1946 issue of *Aeromodeller*.

"At the near end of the war, Air Force personnel were encouraged to do EVT, that is Educational and Vocational Training, before returning to civvy street. As I was in the model trade, I opted to 'train' by building myself a model at His Majesty's expense (circa 1945). So, having seen a very beautiful and unusual model built by one of my pupils, a Free French aircrewman, a model with a unique all elliptical wing and tail plan form and the most intriguing 'bent-banana' fuselage, I chose a similar format and drew up the model twice size!

Called 'Apocalypse' it had a 9ft. wing-span, used a lot of spruce and was covered in sheet balsa planking on the fuselage. Topped with doped-on Madapollam fabric (Egyptian Cotton fabric for covering full-size glider wings!). The whole model was then coloured like a banana, in golden Titanine Trainer Yellow! It weighed about 9lb, was a pig to fly and was really waiting for someone to invent radio control! It had to be winched-up by being towed behind a two-litre car (or equivalent). The model eventually went on public display as the centre-piece of the centre stand at the

Dorland Hotel exhibition run by D. A. Russell of the *Aeromodeller* and the photograph was taken at Dorland Hall just before the model was slung up! I wonder how many readers can remember it? I shared a show case with Leofric G. Temple's 'Celestial Horseman'... but like most of my glorious ventures, it suffered a Norseman's funeral — in flames! If only I had known then that radio control was on the way!"

## Readers' letters

### Cruiser Pup

Ron Brownson of Altrincham tells us that his 'Cruiser Pup' that flew into the revolving propeller of Brian Ferrett's 'Mechanair' on the last Vintage Day meeting (photo in April issue) was repaired a few weeks after the accident and still turns in stable flights of 40 seconds in up to almost gale strength winds, a tribute to Ron's skillful repair technique (see photo of repaired model).

### Super Sixty

Peter Bull writes to give some details of

his ten year old 'Super Sixty.' This model has been flown with single, two and three channel radio and has been powered with Veco 35, OS 40 and a PAW 19. Originally covered with nylon and coloured orange with black trim, it is now covered in Solarfilm attractively decorated in red, white, blue and black as per the photograph. (Sorry... our pics are only in black and white... Ed.). In the recent complete re-build he managed to save 14½oz on the original weight, the model flies better now having a quite fantastic glide, ballast has been dispensed with and the model is currently PAW 19 powered and uses McGregor two channel radio.

### Vola/Volas

Mike Russell (son of DAR) writes to confirm that our Latin scholars Paul Wiburg and Trevor Lambert are right on the ball with their explanations of the 'Vola/Volas' NGA motto and adds "...I can recollect that Dad's intention was 'Fly with Care' (an instruction from the underwriters, I think!) but someone pointed out that his models were better than his Latin and it was duly altered. 'Volas' transfers promptly became collectors' pieces!" Mike is still a regular reader of *Aeromodeller* (and has a complete set!) apart from being an airline captain with *Brittania Airways*, he is usually to be found at Duxford with his 'Russavia' collection of vintage aeroplanes which includes a Miles 'Gemini', 'Tiger Moth' and a BAC 'Drone.' Coming from the







Above: Mills 1.3 powered control line Fokker 'Triplane,' showing the then common trend of cylinder head sticking through the cowling, use of non-scale wheels and the inevitable Kail Kraft flexible (Truflex) propeller. Your columnist refuelling in 1949!

background that he did, he was, of course, a keen aeromodeller and one of his own designs, a 38in. span glider 'The Challenger' appeared in December 1943 *Aeromodeller*.

### St. George

Both John Coolen from Southgate and A. L. Glider from Weybridge wrote in to point out that the models being held by the two young competitors at Basingstoke in 1947 shown in the May issue were examples of 'St. George' by C. A. Rippon. This model was the successor to 'George' the 1940 'Flight' Cup winner which was described in the August 1941 *Aeromodeller*. Of much simpler construction, the 37in. span 'St. George' was kitted by *Premier Aeromodel Supplies Ltd.* in 1946 and lacked the aileron tabs that characterised the earlier C. A. Rippon cup-winning model. Although at least one 'George' has been seen at recent vintage meetings, the writer has not yet seen any examples of 'St. George' but plans for this model must be around, a worthy subject for vintage builders.

### Us and them

Peter Michel, the *SAM 35* Membership Secretary comments on the 'Us and Them' controversy, which he sees as one of the most important issues facing the practical flyer. "It is my opinion that only radio flyers can close the gap between RC and free-flight in the physical sense that free-flyers cannot fly from the down-wind side of the field. Surely, in the interests of sociability alone, the radio-assist flyers could come and join the free-flyers up-wind once in a while? We would love to see them. As a free-flyer who also dabbles in radio I can appreciate the problems. But flying a radio-job down-wind is not at all difficult and should be child's play to any experienced RC man. Anyway, there is just no alternative. As things stand, the 'us and them' syndrome is rapidly developing into something very like a psychological hang-up."

### Skybirds

A. G. Sinclair of Wimbledon writes asking about the *Skybirds* flying models 'Speedy' and 'Sturdy' as well as the 'Swan' sailplane, does any reader have information on these models especially working drawings and/or instruction sheets? I was a *Skyleague* myself and remember the flying models being advertised, I am sure that they were introduced to retain interest amongst members of the *Skybird League* by the proprietor A. J. Holladay who must have been concerned at the drift of the 1/72nd scale modellers towards the flying model in the late 1930's after having enjoyed almost a complete monopoly since 1932 over airminded



Roy and Des Yeabsley with red and white A2 glider 'Revenge' which was described in February 1951 *Aeromodeller*. Plan still available from MAP as G415X price £2 10 plus 50p postage

youngsters with the solid wooden models. Apparently the first *Skybird* flying model competition was arranged to take place in August 1939 but was cancelled. Can any reader tell us more about *Skybirds*? That fascinating name was not Holladay's idea, it was culled from the title of a 10 cents American aviation pulp magazine!

### Fun Flyers

A nationwide model club is being formed in the USA by Joe Wagner (the man who

*Pete Cock with his 'Kan-Doo' powered by ED 'Competition Special' diesel seen at the Air Service Training display at Hamble July 3rd 1948. Man and machine won the Gold Trophy at the 1948 British Nationals.*

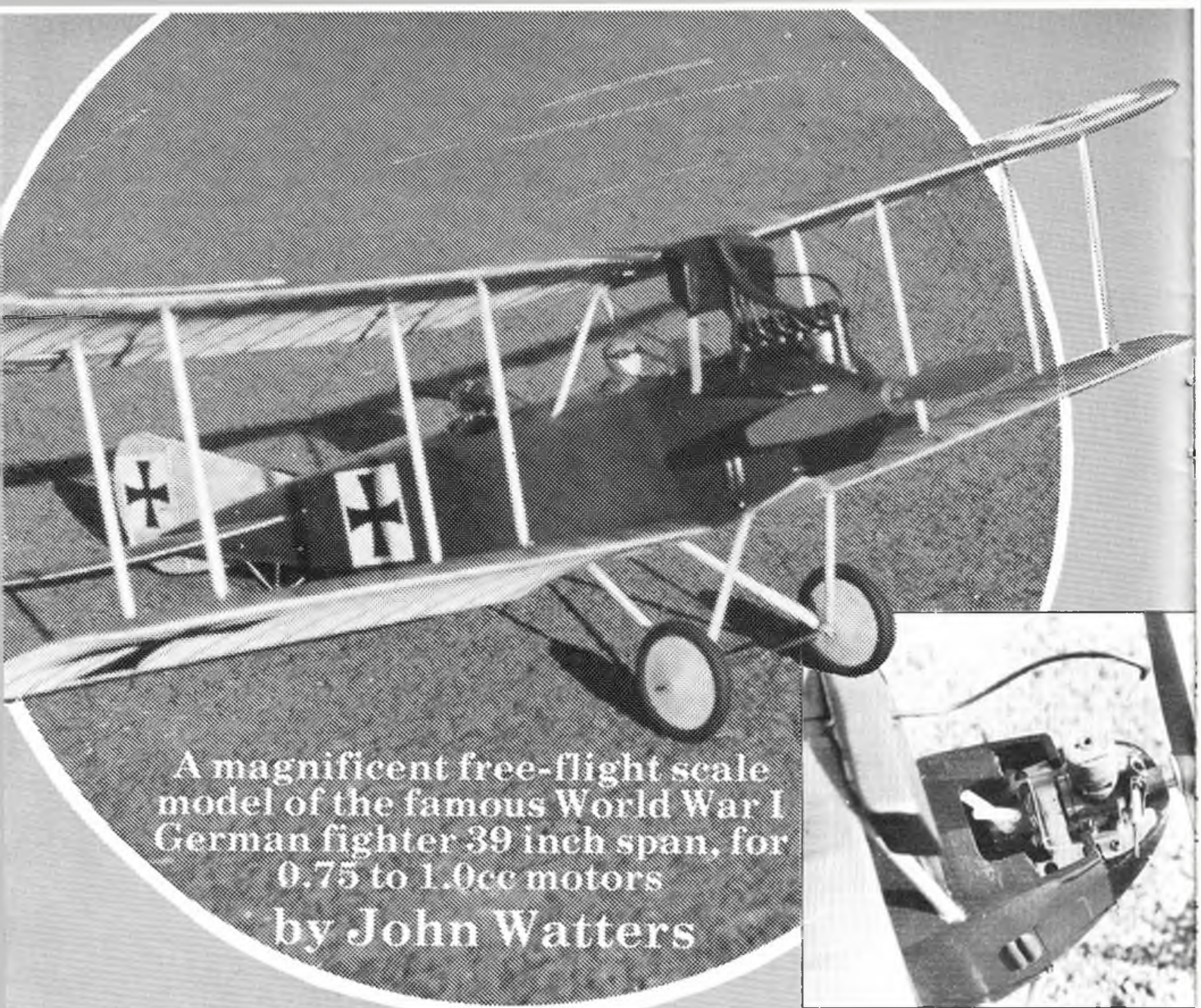


founded the *Model Engine Collector's Association* some 25 years ago) which will be 100 per cent devoted to recreational modelling, no rules at all, no competitions, no design cut-off dates, no authenticity problems just pure enjoyment of building and flying any type of model but with the emphasis on small-field types and old-timers. Meetings will be called 'Fly-Togethers' and sound like a great deal of fun. A book and quarterly magazine with full-size plans of good looking models of all types and periods are in the process of preparation, membership will also include free insurance. Estimated yearly dues will be about \$21, further information can be obtained from *Fun Flyers*, PO Box 95, Volant, Penna. 16156, USA. This must be the answer, just imagine all the extra time we will have for enjoying the hobby, instead of squandering it in pursuit of rule compliance. I feel sure that Joe has got his priorities right, now we can build what we like, how we like, for most of us this will be nothing new, just imagine ... re-inventing aeromodelling! How about a UK chapter? Development in USA will be watched with interest.

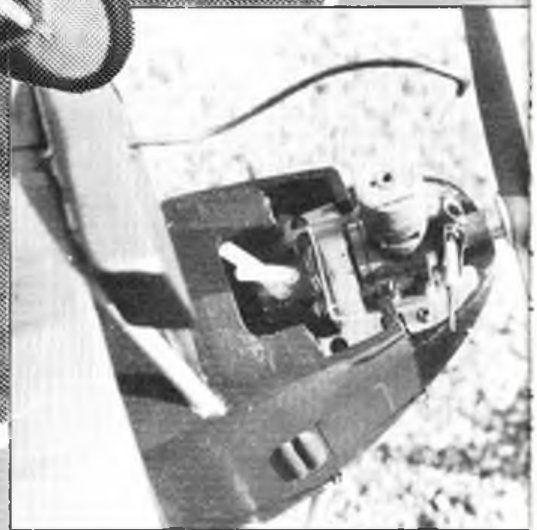
### Plecan wall charts

The *John Pond Old Time Plan Service*, PO Box 3215, San José, CA 95156, USA still have flat folded copies of the two fine 24 by 35 inches wall charts of *Famous Free-Flight Models* by Paul Plecan as mentioned in August 1983 *Aeromodeller*, at US\$2.00. These accurate to scale side views are well worth having for reference and are suitable for framing. Get yours while stock lasts!





A magnificent free-flight scale model of the famous World War I German fighter 39 inch span, for 0.75 to 1.0cc motors by John Watters



# ALBATROS

**E**VOLVED FROM the *Albatros* BIII unarmed reconnaissance design, the *Albatros* CIII became the most widely built *Albatros* C type of the First World War.

Coming into service late in 1915 and continuing to serve on most of the war fronts until early 1917, undertaking throughout the period many different rolls, from photographic to light bombing duties.

My interest with this type of aeroplane is a result of building an *Albatros* CI, radio-control model some years ago for the BBC television series 'Wings.' The *Albatros* has many attributes to make it a good free-flight model and as a result of its long service career various colour and camouflage schemes can be applied.

## Tailplane and fin

Cut out the shape of the tailplane and fin from  $\frac{1}{8}$  in. medium hard sheet. Draw onto

one side of the sheet the positions for the ribs and spars and then, by poking a pin through the sheet, the positions for the spars and ribs can be matched on the other side. The main spars are made from  $\frac{1}{16}$  in. sq. and the ribs from  $\frac{1}{16}$  in.  $\times$   $\frac{1}{16}$  in. The leading edge from  $\frac{1}{16}$  in. sq. and the trailing edges from  $\frac{1}{16}$  in. sq.

The leading and trailing edges are formed by nicking the inside of the strip with the thumbnail, nicking as required to form the radius required. The structure is first built up on one side of the  $\frac{1}{8}$  in. sheet core. I use PVA white glue for building up all structures, as this glue does not shrink and induce any twisting.

After building up one side of the tailplane and fin, the opposite sides can be built by the same method. When all the parts have been completed and set, they can be sanded smooth to an airfoil section. The elevators and rudder although separate from their

# CIII

*Above and right: detail of motor installation showing view from the port side of dummy cylinders and exhaust system. Normal compression screw is replaced with cheese-head bolt 'buried' between first two dummy cylinders and their exhausts.*



respective tailplane and fin, are attached by small pieces of thin aluminium or tinplate, which act as stiff hinges.

## Wings

Start to build the wings by making plywood or aluminium rib templates for both the top and bottom wings, with the spar holes and notches cut out. The majority of the ribs and all the riblets are cut from  $\frac{1}{16}$  in. medium grade balsa. The ribs are best made by the sandwich method, from rectangles of balsa slightly larger than the templates then pinned together between the templates and sanded to shape.

With all the ribs still sandwiched together, the leading edge notch and spar holes can be cut. The holes for the central spars are made by first drilling through the ribs and then filing out. To make sure of a good fit, a spar can be pushed through the block. After shaping, the ribs can be cut to length. Riblets can be made by the same method, or by cutting each one out around a template.

In building up the wings, first pin down the trailing edge (which should have the rib slots already cut in) and pack up the front edge to suit the undercamber. The ribs are slid onto the spruce main spars as a block and then each rib is slid to its correct position before slotting into the trailing edge and pinning down. Next add the leading edge, riblets and tip sheeting.

When the wings have set remove from the building board and add the remaining bottom spar and the  $\frac{1}{16}$  in. sq. strips to the top and bottom of the wing tips, forming by nicking as described for the tailplane. The ailerons are constructed separate from the top wing but are best built along with the wing to obtain a close fit. A design feature with some German aircraft of this period was to have reflex ailerons, this model is no exception. Although there is quite a bit of work involved in building up the ailerons the results are worthwhile. Cut out the ribs for the ailerons as shown on the plan and with the piece of trailing edge blocked up, build up the ailerons as you would the wings.

Finally bind and epoxy the wing dowel and rigging wire tubes plus the interplane strut hooks to the spars. The wing structure can then be sanded smooth all over. The wing trailing edge scalloping being formed by wrapping sandpaper around a piece of dowel.

## Fuselage

The fuselage is a straightforward construction using  $\frac{1}{16}$  in. sq. balsa longerons

Right: port wing aileron detail showing characteristic reflex of German aircraft of this period. Below right: rear cockpit - as yet unmanned - with dummy Parabellum machine gun.



and spacers. Start by building up two identical sides one on the other, when dry remove from building board and sand smooth. Glue formers F2 and F3 to the side frames and pull the structure together at the nose and tail, after adding formers F1 and F3. When the structure is set the remaining top and bottom spacers can be added.

The engine bearers and bottom wing dowel tubes can now be added along with the cabane section strut wires. The cabane wires are best added at this stage, requiring cutting away part of the top longeron for a good fit.

Because the cabane centre section is very narrow it is worth spending some time in getting it right, also the even spacing between the top and bottom wings. To do this, fit the bottom wings to the fuselage structure and sit the model on a flat working surface, with the bottom wings blocked up the required amount at the tips. Bind the top wing fixing dowels to the cabane strut wires, with fuse wire or similar, and temporarily solder. Position the top wings onto the dowels, and using scrap blocks to get the correct centre section distance, either fit the interplane struts (if made) or use scrap pieces of the correct length. With the wings and fuselage structure now jiggled, re-heat the top wing dowels allowing them to take up their correct position. Next bind and solder the cabane struts together where they meet and fit the centre section ribs.

If any cockpit detail is to be added it is best to do it at this stage (sparse though the cockpit of the original aircraft was).

The undercarriage and tail skid frame can now be added and the fuselage completed by sheeting the sides and bottom, not forgetting to sheet the bottom crosswise. The top rear fuselage decking can be either from sheet or block.

The nose and engine detail are made up from various pieces of sheet and block. I found it best when making the detachable engine cover to build up the dummy engine detail on the cover and then cut away to suit your motor.

## Finishing and flying

When all structural parts have been completed, brush on to all the individual parts a coat of thinned down dope and sand smooth. Parts like the fuselage should be given further coats until you are satisfied with the smooth finish.

Each part of the model should now be covered in lightweight tissue, including the fuselage — the tissue will give extra strength to the sheeting. Some care should be taken in ensuring that the tissue adheres to the undercamber of each wing rib.

When all parts have been covered they should be water shrunk and then given a coat of thinned down dope, pinning down the surfaces if necessary.

Depending on your requirements for your model you can now go on to apply your individual colour scheme and add the finishing detail, but for a more realistic appearance and much stronger model, the flying surfaces should be covered again on

top of the tissue with either lightweight silk or chiffon.

My model was covered in chiffon which is somewhat cheaper than silk but has a slightly coarser weave, weight for weight there is not much difference. Whichever material you choose the technique for applying is the same.

Start by cutting pieces of the material slightly larger than the surface you are to cover (just as you would for tissue covering). Lay the material on the surface, and brush on a mixture of thinned down dope (50/50) through the material onto the tissue underneath. If you have not tried this method of covering before it may be best to start with one of the smaller parts first. When all surfaces have been covered give a final coat of thinned dope. Your chosen colour scheme can now be applied, but do watch the weight if using coloured dopes — thin them down.

The rigging and flying wires were made from dyed (black) nylon fishing line. This is looped at the end and held with small pieces of crimped aluminium tubing. The nylon line has a certain amount of built in elasticity, and if the lines are made slightly shorter than the length required will keep taut without the use of end bands. If you do use this type of rigging make sure that you do get equal tension in each line.

With the model rigged and balanced we can now proceed to do some test glides (over long grass). Even though it is a model with quite a lot of inherent drag a reasonable glide can be obtained. Initial power trimming should be done on low power, building up the power slowly. I did in fact find that the model flew quite well on less than full power.

I hope you have a lot of success with your model and if you do cover it in either, silk or chiffon you will find that you have a very sturdy model.

Further detail information can be found in *Aeromodeller Plan Pack No. 2705, Scale Models* issue No. 1 October 1969. *Reconnaissance and Bomber Aircraft of the 1914-1918 War* by Harleyford Publications Ltd. and *Bombers 1914-1918* by Kenneth Munson.



# 1983 Ornithopter Postal Contest



**T**HE IDEA for an international ornithopter contest arose at the 1980 World F1D Championships during a conversation with Shigeyoshi Nonaka, the well-known Japanese indoor modeller and ornithopter fan. But Nonaka's responsibilities as Japanese team manager prevented us from pursuing the subject at the time.

The idea then fermented until 1982, when the time seemed ripe for an international postal contest. Around the world, there were a number of people who might be interested. There were not many in any particular country but a postal contest could promote contacts between all builders of these striking models and allow them to indulge in a leisurely competition. So the *International Ornithopter Postal Contest* was launched.

As there were and are, no accepted international rules for ornithopters, new regulations were drafted for the contest. The main issue was whether fixed wings should be allowed. Since a goal of the contest was to promote design innovation, a fairly pure approach seemed justified and consequently rules were framed to encourage models which obtained both lift and propulsion from the flapping surfaces.

Another departure from standard practice was to define areas by traces around the flapping surfaces. Ornithopter wings tend to have a free edge whose location over the flap cycle is not fixed relative to the spar. As a result, the commonly used 'projected area at the mean flap angle' is not very well-defined and still less measurable. The method suggested seems simple and satisfactory.

The notion that man might imitate bird flight is as old as the myth of Icarus. But, as in so many things, the first person to grapple with the practical issues was Leonardo da Vinci. His *Codex on the Flight of Birds* discusses matters like the arrangement of surface necessary to maintain stability along the principle axes. He seems to have been the first to suggest that birds might use the downstroke to obtain lift and the upstroke to obtain propulsion. He sketched linkages which could be used to simulate wing motion mechanically and even estimated the power which a human source could deliver!

Centuries later, in the 1870's, the Frenchmen Jobert and Penaud sketched ornithopters with mechanisms little improved from those suggested by da Vinci. But these were rubber-powered model aircraft and so had a chance of actually flying.

Real successes were first achieved by members of the Chicago Aeronauts. In the late 1930s, they developed the classical monoplane planform. They were able to obtain flights over 4 minutes and Dennis Turner's model, documented in F. Zaic's *1938 Yearbook*, recorded an official time of

by David W. Erbach

4:19. That standard was not surpassed for more than 40 years. In 1983, at the US Indoor Championships in West Baden, Walter Erbach, the author's father, flew an unprecedentedly light ornithopter, less than one gramme, to a time of 4:23. The model climbed about 80ft., an altitude which, scaled for model's size, is comparable to the cruising altitude of a jumbo jet!

However, with the results of this contest, the Japanese have clearly established themselves as the most numerous and strongest ornithopter builders. Nonaka arranged two local contests in the Yokohama City gymnasium, and each attracted over a dozen entrants, including well-known F1D flyers. Despite the stringent rules about fixed wings, the Japanese were able to obtain times 40% higher than the best previously recorded with any configuration ... and that in a ceiling only 13 metres high!

First place in the contest went to Masahiro Yamanashi, an industrial designer from Tokyo, with the remarkable time of 6:30. His model was a 51cm span biplane with 7.4dm<sup>2</sup> in four flappers. It weighed 1.156gm. The model was covered, as were all the Japanese models, with 1.7 micron polyester film.

Only eight seconds behind, second place went to Kazumasa Kihara, a micromechanical engineer from Kanagawa Province. His model was a monoplane about the same span as Yamanashi's but weighed only 0.6gm and displayed remarkable craftsmanship. It is not so easy to build an unbraced microfilm model that size to that weight, much less build a structure with the mechanical resilience required by an ornithopter.

Third place went to Philip Watson, a 21-

*Masahiro Yamanashi with Fairy V flown for a fantastic 6:30. Note out of synch flap motion mentioned by Reg Parham opposite.*

year-old arts student of Melbourne University, Australia. Watson flew in such isolation that he had to have his time notarised for lack of a regulation contest to fly in. Still he managed about 5½ minutes and has since exceeded six minutes unofficially. This was a praiseworthy performance from 'Down Under.'

There were other noteworthy flights as well. Patrick Deshayé, of Washington State,

USA, made nearly 4 minutes with a model which weighed three times as much as the Japanese models. One of the Japanese flyers who did not make their top five still recorded 1:45 with a pusher ornithopter. Nonaka himself had a tandem, with two flapping wings, one immediately behind the other.

While the contest resulted in a new all-time high in duration, it did not produce a consensus about the best design. First place was with a biplane similar to but larger than, those Reg Parham (Great Britain) has flown. However, the top seven places were made by four biplanes and three monoplanes in alternating positions, so which configuration is better is still unsettled. The contest did show clearly that fixed wings are not necessary for good performance.

The Japanese models also showed that the 'snap' of fibrous paper is not necessary, although builders of models with tissue flapper coverings have long known that the direction of the tissue grain affected performance noticeably. It is plain that ornithopters still remain a fruitful area for experimentation.

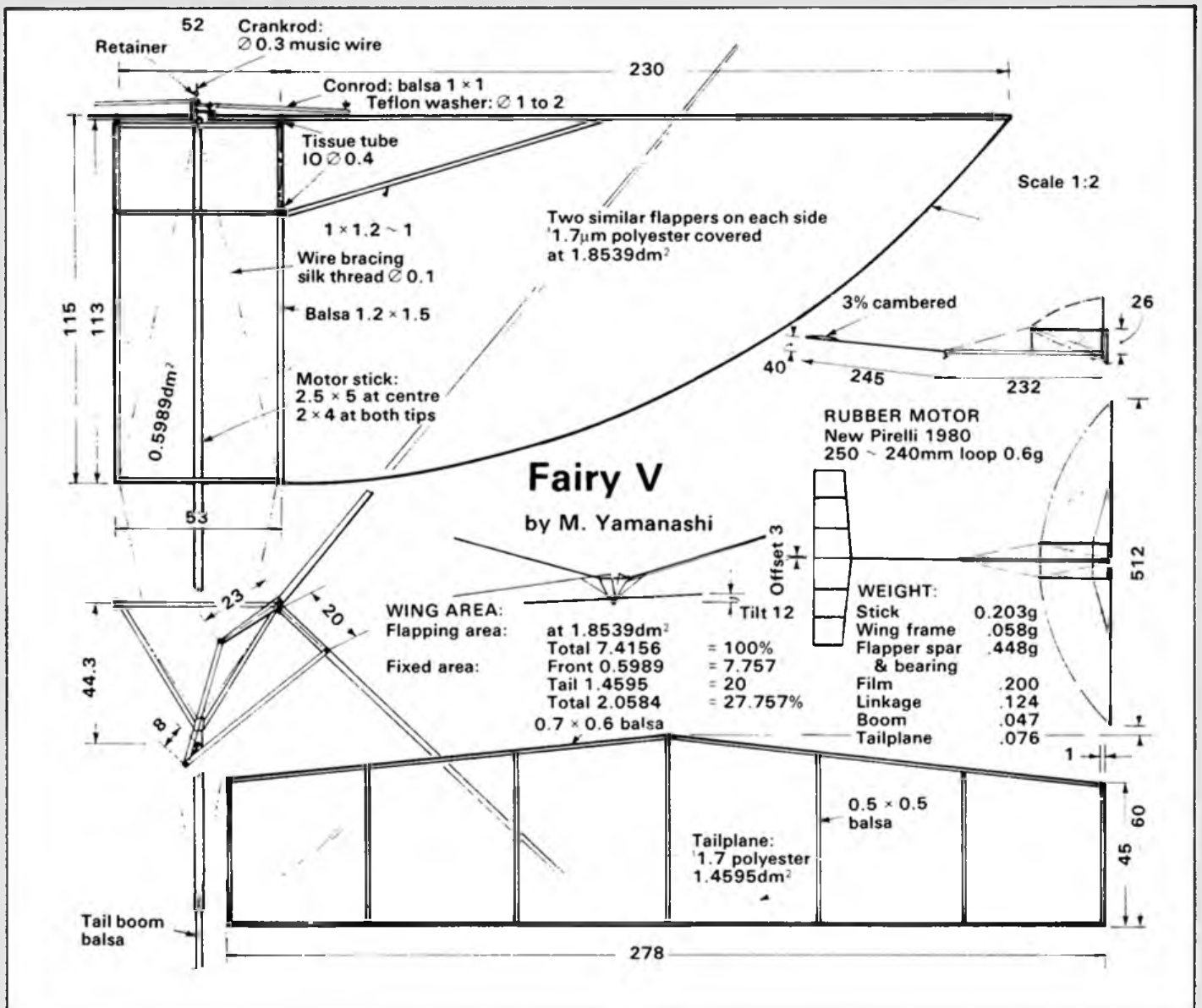
Nonaka has suggested that an international championship for ornithopters be held in the USA or Japan. It is an attractive idea if representatives of several countries could attend. If distances are too great, perhaps some models could be flown by proxy. One might hope that such a contest would see the first 10-minute ornithopter flight.

## Results

1. M. Yamanashi	6:30	Tokyo, Japan
2. K. Kihara	6:22	Kanagawa Prov., Japan
3. P. R. Watson	5:36	Victoria, Australia
4. N. Omata	5:14	Saitama Prov., Japan
J. Shibata	4:54	Tokyo, Japan
H. Oishi	4:23	Shizuoka Prov., Japan
7. P. Deshayé	3:53	Olympia, WA, USA
8. R. White	2:16	Catawissa, MO, USA
9. D. McRae	1:54	Winnipeg, MAN, Canada
10. Kevin R. Collins	1:53	Redmond, WA, USA







## More on Flappers by Reg Parham

The simple rubber powered model ornithopter monoplane concept has changed very little since it was evolved by Penaud over one hundred years ago. Its mechanism comprises a crankshaft rotated by the rubber, which in turn, operates the flapping wing spars via connecting rods. As the wings flap, the covering material which is unsupported at its trailing edge, assumes its own natural section and propels the machine forward in a similar manner to the action of the tail of a fish.

Whilst many successful examples of this type of 'flapper' have been built, it suffers the disadvantage of trying to shake itself to pieces under high torque conditions. The reason for this is that only one half of the energy stored in the motor is transmitted to operating the wings and the rest is wasted chiefly in producing vibration. The latter is caused by the speed of rotation of the crankshaft slowing down every time the wing flap reaches the extent of its motion. In addition, to overcome the effect of gravity, the down-stroke is lower than the up-stroke.

The overall result is the jerky action and the cracking sound characteristic of the simple model.

*Fairy V* is a fine example of a biplane ornithopter and owes much of its origins to the work of British modeller John S. White who, in the early 1950's studied the shortcomings of the simple flapper and evolved a series of highly successful outdoor models. Multi-winged machines had been built previously but the idea of two sets of superimposed wings working in opposition and coming together at a predetermined dihedral angle was something new and the improvement in performance quite remarkable. John went a stage further by arranging for a double crank system to operate one set of wings 90° out of phase with the other to more fully utilise the power of the motor and further reduce vibration.

I have built several indoor ornithopters based on John White's principles and, over the years, have demonstrated them to clubs, societies and at the ME Exhibition. The advantages of the biplane over the simple ornithopter are very apparent in that it is quiet and flies smoothly with little or no vibration. There is definitely additional thrust caused by the wings coming together which can be demonstrated by the model

being able to climb, nose up, vertically and even hover. It is of interest that in nature, birds and insects are known to clap wings on the upstroke.

The results of the postal contest show the honours between the monoplane and biplane ornithopters to be evenly divided. In spite of a possible weight disadvantage the double 'flapper' is more efficient and should go to the fore. Further contests for the much neglected ornithopter will stimulate further developments and use of new materials making the first 10 minute flight a reality within a year or two.

## International Ornithopter Postal Contest Regulations

**Event Definition:** An ornithopter is a freely flying model aircraft which derives its lift and propulsion from flapping its wings.

- Flights must be made indoors and launched within two metres of the floor.
- The total supporting surface must not exceed 1000cm<sup>2</sup>. The supporting surface includes all surfaces to obtain lift or pitch control. Areas are measured by traces around surfaces. The sum of the areas of any fixed supporting surfaces must not exceed one-half the area of the flapping surfaces.
- The model must be powered by strands of extensible rubber only. There is no restriction on the weight of the model, or on the weight of the rubber which is used.

# FROM THE HANDLE

CONTROL LINE NEWS

## Racing with Jim Woodside

### SAM 35 1/4 speaks

The main drawback in writing this column is that I already know what will appear in what used to be my own favourite part of the magazine. So what I now most enjoy is Vintage Corner with Alex Imrie. Like so many modellers I am, if not suffering from the vintage bug, at least nipped by a mild form. Those beautiful free-flight models like the 'Slickers' are just irresistible. By the late 1930s in the USA and the late 1940s here in the UK, free-flight models seemed to have achieved an excellence of performance and aesthetics. However, in the opinion of this writer the same cannot be said of racing control-line models. It is noticeable that very few C/L models appear in Alex's column. This seems to support my viewpoint that the majority of these early models lack visual appeal and their performance does not warrant a re-visit.

By this circuitous route I have finally worked around to the topic of 'vintage team-race': one which has cropped up in conversation several times in the last 12 months or so. Does this indicate enough interest to formulate a set of rules? As I mentioned earlier, the SAM cut-off date of January 1951 for eligible designs is too early for our purposes. I would suggest about 1962 as being an appropriate cut-off, as this would allow some attractive and competitively interesting models. Amongst these are the following, available in the APS range:

- a. Time Traveller : D. Edmonds CL642
- b. Footprint : P. Smith CL589
- c. Tigress : K. Long CL741
- d. Miss FAI : K. Rosenlund CL776
- e. Startiger : N. Bernard Dec. '59 A/M

Obviously it would have to be decided whether to follow FAI rules or the old SMAE Class A formula.

### Possible vintage TR rules:

- a. Model design to be to FAI specifications as current in 1962 — including tank capacity.
- b. Engine to have been commercially available in 1962.
- c. Mono-wheel may be substituted on models originally having two wheel landing gear.
- d. Line length and diameter to be to current FAI specification.
- e. Race conduct to current rules and interpretation.
- f. The degree of modern techniques allowed to be agreed by discussion e.g. re-fuel systems or the type and method of covering.

If you like the idea of a "vintage" TR event please give some thought to the constitution of rules. Your comments and ideas, either by post or at contests would be most welcome.

My thinking on engines very much mirrors that on models — anything available up to and including 1962 i.e. ETA's, Super Tigre G20, Oliver Mk III. By

the way, John Oliver Engineering have, in response to demand, re-commenced production of Mk III Tigers. Oliver Tiger Mk III costs £36 from: John Oliver Engineering, 250 Ringwood Road, Ferndown, Dorset.

Tigre Engines also have stock of the G20 D priced at £28.95.

### Should Team-Racers carry a government health warning? — a cautionary tale

In my report on the Grantham Grand Prix held back in February I mentioned that, due to the cold, my index finger was still numb two days after the event. As I write this, at least five other pitment are known to be similarly afflicted. However, John Schofield who wears a glove to protect his hand, suffered no ill effects. It seems that the surgical tape used to bind up the prop flicking finger caused reduced circulation with resultant symptoms of exposure. Although no permanent damage results, I am advised that full recovery takes several months.

The warning is clear. Do not tape your fingers in cold weather — wear a glove instead!

### USE 15 Mk II

Introduced in 1981/2 as a side exhaust engine with a drop-in liner, the Dutch made USE has quickly developed into a semi-rearward exhaust configuration in which the liner is of the integrally finned AAC pattern. By marrying the alloy liner to a shaft of 10mm dia. in a compact case the all-up weight is only 114gms — remarkable for an engine which has no titanium components. Power output is rated at 0.85hp at 19-22,000 rpm.

The engine has been primarily aimed at Combat flyers and also FF power. However, such an engine is attractive to Goodyear flyers in countries where the rules allow the use of glows (USA, Australia, etc.). The USE factory advise me that they will soon be manufacturing a special crankshaft so that the engine can be run as a diesel. At the moment they feel the crankshaft would not

take the strains imposed by compression ignition.

USE 15 G: Capacity — 2.47cc; Bore — 15mm; Stroke — 14mm; Liner — AAC, hard chrome with integral fins; Cost — 330 Dfl plus 15 Dfl postage from: USE, Floridadreef 17, 3565 AM Utrecht, Holland.

Having inspected one of these engines, I can report that it is very well made. In fact competition modellers seem to have more choice in engines than for some years past. The Nelson is available in a number of forms as well as the Cipolla, OPS and Rossi: I wonder who will be the first to try a USE 15D in FAI teamrace. It has been years since a front intake motor has featured in this particular event.

### Sheffield CLAMS Meeting — 25th March

The weather was quite chilly for this meeting held at Church Fenton and as competitors now have to carry their equipment over half a mile to the flying site, no shelter is available from the elements. However, most people seemed to enjoy the day. Thanks should be extended to Stuart Metcalfe and Alan Hill for organising the event and to the SCLAMS Club for providing the nice trophies for the first three places in the events offered.

### FAI TR — 10 entries

Three rounds of races were run. Heat times were generally slow, although Stubbs/Needham were delighted to record a 3:55, personal bests for both.

1. Heaton Woodside	Sharston	7:34	Nelson
2. Sladdin Ross	Novos	7:59	Nelson
3. Stubbs Needham	Stockport	Disq.	Nelson

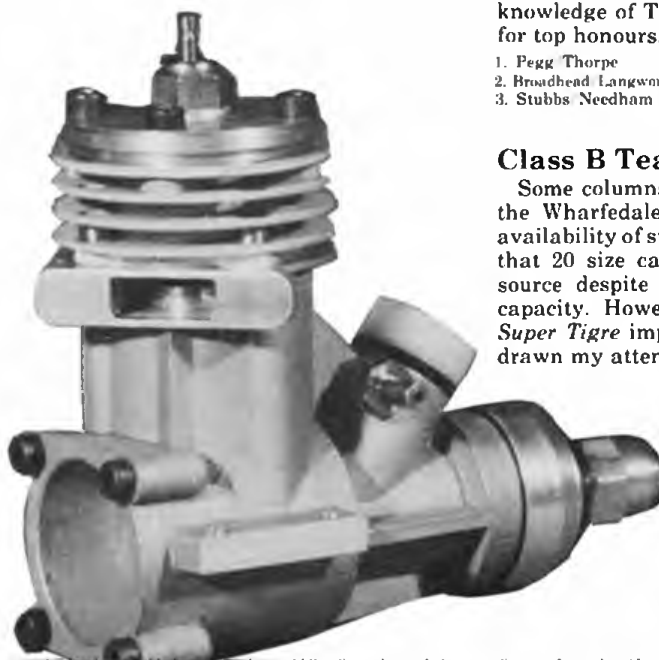
### Goodyear TR — 10 entries

Although the heats went ahead in the normal way, the final saw all teams earth-bound. As teams look for more and more performance from diesels by pressurisation systems there seems to be more potential for disaster. Ron Thorpe of the winning Team might stand as an object lesson in dedication. Three years ago he had no knowledge of TR — now he is challenging for top honours.

1. Pegg Thorpe	Hamilton	9:01	Nelson FI
2. Broadhead Langworth	Wharfedale	50 laps	Rossi
3. Stubbs Needham	Stockport	Disq.	Rossi

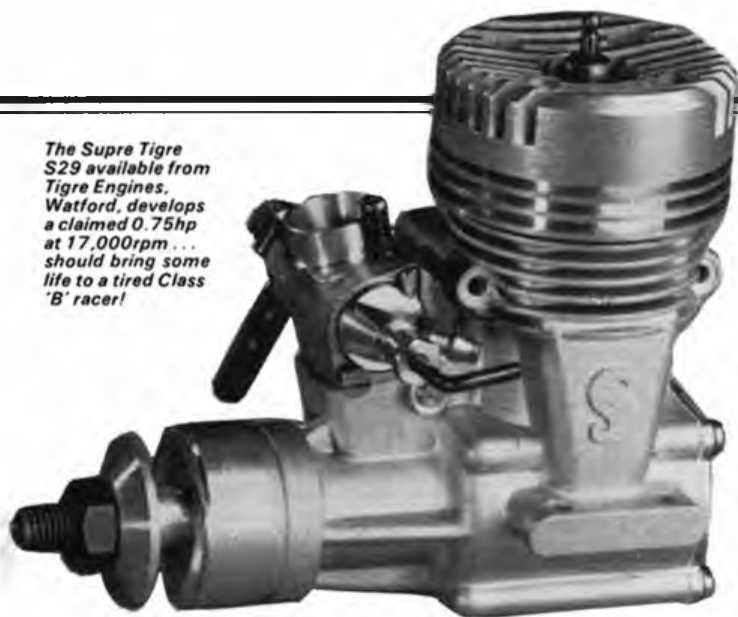
### Class B Team Race Motor

Some columns ago I wrote a piece about the Wharfedale '1000', Class B, and the availability of suitable motors. I did suggest that 20 size car racing would be a good source despite conceding nearly 1.5cc in capacity. However, Mick Wilshere of the Super Tigre importers, Tigre Engines, has drawn my attention to the recent S29. This



The USE 15 MkII from the Netherlands, a very light 2.5cc engine much favoured by combat fliers.

The *Supre Tigre* S29 available from Tigre Engines, Watford, develops a claimed 0.75hp at 17,000rpm... should bring some life to a tired Class 'B' racer!



Alcock (Bilston) and team with very neat mono-boom model mentioned last month.

particular motor is based on the 21 size case and is thus not only up to the maximum capacity but light in weight. Although normally sold only in R/C form, *Tigre Engines* will make up a C/I version in exchange for £38.00.

## 2nd SMAE Centralised Speed Meeting — Barkston — May 6th Results:

15 entries — 11 official flights.

1. Paul Eisner	FAI	Rossi	154.28mph	97.86%
		15		
2. Alcock Myszka	.09	Webra	125.3mph	95.83%
		Spcl.		
3. Dick Miles	F40	K&B	163.05mph	94.39%
		40		

The event was marred by a keen wind which was shown at an early stage to be a serious danger to any model whose flying characteristics were less than good. Dave Brewin had a very hairy attempt and considered himself lucky to get his model down without damage. Paul Eisner was not put off, however and made his winning flight after half a dozen test flights and a couple of official attempts. His speed of 154.28mph/97.86% was very good considering weather conditions and the fact that a recent misfortune destroyed the piston in his best motor. Paul flew his asymmetric sidewinder Rossi R15 Mk II model with a Peter Halman steel pipe and using a suction fuel system, all as usual. Second place was taken by Alcock/Myszka with their 09 model, with John Alcock having no apparent trouble flying this little model on monoline. The model is conventional, upright and symmetrical, the motor is a Webra 1.6 Speedy with a bored-down liner/piston set fitted with turned-down Rossi glow-heads, all engineered by Joe Myszka. John and Joe have this set-up very well organised, scorning the wind to make three out of three official flights, the only entrants to do so, their best being 125.3mph/95.83%.

Dick Miles gave his K&B F.40 but one flight but that was sufficient to take third place at 163.05mph/94.39%, well clear of Peter Halman who had to demonstrate dogged determination to shrug off many broken props to obtain 4th place with 143.86mph/91.25% with his FAI. 5th place was taken by Graham Bryant with his K&B F.21 model, making 139.55mph/90.95%. 6th place was taken by Taylor/Jones with a new F.40 model, OPS powered with mini-pipe and crankcase pressure fuel system, on its first outing, with 156.44mph/90.56% and

seventh and last were Alcock/Myszka again, this time flying their new *Super Tigre* X-29 (5cc) monoliner. This model is still in the sorting-out stage, and their best at this meeting was 160.48mph/86.75%.

So, a successful meeting despite weather and good performances that can be expected to be even better in more favourable conditions.

## SMAE 1st Centralised Three Sisters

A cool breezy day saw the biggest turn-out since last year's Nationals. It was good to see some new teams to boost the usual crop of familiar faces.

In FAI Smith/Brown turned in the best time of the day — a three stop 3:39 — using the *Cipolla* engine to which they have now committed themselves. However, the first ten teams all ran under 4 minutes. In common with GY, three rounds were run for all teams, a system proving popular at the moment. Three teams showed good consistency — Wilson/Gardner, Clarkson/Needham, and Hill Metcalfe. However, it was Fry/Thorpe who pulled out one quick time to make the final.

1. Smith Brown	3:39	7:28	Cipolla
2. Wilson Gardner	3:41	7:59	Nelson
3. Fry Thorpe	3:43	Rtd.	Nelson
4. Sladin Ross	3:47		Nelson
5. Clarkson Needham	3:50		Nelson

In comparison to the 19 entries in FAI, Goodyear only attracted nine teams. Clarkson-Needham were clearly in the lead with a heat time of 3:58 from their pressure fed Rossi. This performance gave them a new UK final record of 8:14.2.

1. Clarkson-Needham	3:58.9	8:14.2	Rossi
2. Andrews-Horwood	4:10	8:42	Nelson
3. Gardner-Archer	4:23	9:45	Rossi

## Scottish Team Race Contest

Thorpe's efforts to build up grass roots support and new faces at the Newhouse flying site seem to be paying off. At the first meeting in March; ½A, FAI, Class II and open GY were contested. Although the 'old hands' did the winning, it was more important to see the new names of Arnott Bhatti and Thorpe/Swinburne. Keep at it, lads.

### Winners

FAI	Wilson Gardner	7:26	Nelson
A	Clarkson Needham	8:08	Sesqui Sp.
GY	Crozier McAlpine	9:36	Rossi
Class II	Pegg Thorpe	12:40	PAW

## COMBAT with Brian Waterland

### Combat Championships 2nd Round — May 6th

When it was realised that the S.M.A.E. had scheduled a Diesel Combat event at the area centralised event on the same day that Peterborough M.F.C. had arranged the second round of the 1984 Diesel Combat Championships, it was decided to amalgamate the two events.

Thus it was that, for the first time ever, a round of championships was run away from Peterborough — 35 miles away in fact at Barkston Heath.

As usual the event was run by the members of Peterborough Model Flying Club, in particular Liz Gill and Carol Roy. These two ladies had barely recovered from the sleet and winds of the first round of the year and were looking forward to a warm sunny day. The promise of the preceding week soon went however and the competition was run in cold windy conditions. The wind and the hard ground, caused by a lack of rain, meant that few people returned home with intact models.

There were 25 entries, some of whom also flew in the F.A.I. Combat event run on the same day.

The first round held few surprises. Neil Gill, Mark Jarrett and Rob Roy (all of Peterborough M.F.C.), Vernon Hunt (Morton) and Pete Grange (Urmston) all winning their bouts. Young Martin Donald (Peterborough) also won his bout with P. Rowe (Urmston) by 1 cut to 0.

In the losers round Mervyn Jones (Wharfedale), Mike Willance (Urmston) and Dave Harrison (Cosmo) got back into the competition.

Many entrants used ex FAI models with tinplate tanks. Ernie Burles (Bath) used a balloon (unpressurised) in his pacifier pod, but had to give up in his bout with M. Jones when the balloon split (the effect of diesel fuel?).

B. Waterland, determined not to go out with broken elevator horns again had two fitted to each model's elevator (one working, one 'installed spare'). This time the horns

Continued on page 410



# FREE FLIGHT SCENE



Mike Warren at the Easter meeting, surprised that two minutes in the fly-off was enough to win!

## Dave Hipperson reports

### SMAE Easter Meeting — Barkston Heath, April 21st/22nd

The first days FAI 2:30 max seemed over-cautious. As it happened it stayed breezy until the finish. C.D. Phil Ball had appreciated this possibility and the problems inherent with formal FAI events when showers of models can aggravate down-wind farmers. In rubber and power thermistor anemometer thermal detection was much in evidence, but some of the lift although clearly definable, was difficult to centre into and many models were pushed about quite violently, often, out of patches of good air. By the fourth round only Hipperson and Duce had full scores. Harris had dropped a flight in F1C and it was looking very much like a two-horse race between Screen and Collins.

The fifth round changed nothing in Power, but Duce dropped badly in poor air after a fast if short climb in F1B. Fly-offs were therefore required only in Glider and Power. Club-mates Warren and Williams readied themselves a little after 6 pm in a lessening breeze ... Warren's choice of air was disappointing, but the model hung on encouragingly towards the end over some warm concrete which had been having quite an effect on lift all day. This little extra was enough to win it for him as Williams who released confidently a few minutes later knowing what he had to beat, was down in less than a minute and a half.

Collins and Screen both made comfortable 3 $\frac{1}{2}$  min. maxes on the first of the F1C rounds despite a few heart-stopping moments when Collins DT'd well up but 15 seconds early! The second fly-off round saw a 'safe' short run from Screen but Collins model losing height from a terrible tran-

sition. He had made a slight trim adjustment, obviously the wrong one ... his score of just under 2 $\frac{1}{2}$  min. eclipsed by Screens 3:45 ... into a tree just off the 'drome.

Open events the following day had a light northerly under thin overcast. Some had their flights in within an hour of the start of the contest and were well to do so, as all day drift increased until by mid-afternoon it was gusting to 15mph. Flights for rubber and power models in these conditions were a mere formality for those on trim — the real test would be the fly-offs. Full scores in glider came in steadily and at the close no less than 19 qualified for the fly-off.

By 6pm anoraks were replacing short-sleeved shirts. This was more like Easter weather! Glider fly-off away first ... an early launch by Martin Kinder followed quickly by fellow Falcon John Carter's big Open model showed there to be lift about as both models held for flights of well over three minutes. However it was much later launches by Mike Fantham, Pete Bayram and John Williams that found positive lift to exceed six minutes. Clearly the Glider results in both FAI and Open suggest that Richmond are a force to be reckoned with in this class at the moment.

Julian Hopper released first in Power closely followed by Peers. Screen flew soon after and suffered a rough run which in turn induced a slow running timer, and the end product was an over-run. To add insult to injury the model was not found and the search area seemed a good deal down-wind of the winner's landing spot. Payne flew last after a rather impressive trio of maxes taken late in the afternoon. The model did not behave this time and was on its back for a pull-out that lost much altitude. Early flights by Peers and Hopper had the top two slots followed by Ray Monks with a new model.

It was nearly 7pm before the start of the rubber final. The breeze was easing and most qualifiers seemed content to wind and launch almost immediately. Derl Morley's 300 sq.in. plus flat-bottomed model made almost 7 $\frac{1}{2}$  minutes and John Carter topped

this with 7 $\frac{1}{2}$ , and tree'd his model some 1 $\frac{1}{2}$  miles from the point of launch. John O'Donnell and Phil Ball launched within a few seconds of each other after the latter had spent a good part of the round ensuring that his son Anthony got a good flight. Phil's luck was out this time, with a flight less than six minutes. O'Donnell on the other hand climbed impressively and looked like he could have placed with a similar distance flown to Carter. Last to fly — five minutes from the end, Hipperson launched in a short lull and was very high on the climb at the end of two minutes. The model descended rather slowly clearing the ridge on which the other long flights had landed. It was in sight for nearly nine minutes and this gave him a second win in the one week-end using the models exactly as published in *Aeromodeller* April 1983. A remark made in good spirit much later on in the evening that when Hipperson's luck comes, it comes in large lumps was borne out by the retrieval. After a number of people had helped search a down-wind village until quite late, the owner himself stumbled upon it three miles from the launch point in a large garden under a copse of trees through which it must have just fallen.

### Results

#### F1A (A2) - 48 Flew

1 M. Warren	Richmond	12:30 • 2:02
2 C. Williams	Richmond	12:30 • 1:29
3 T. Le Vey	NYFFG	11:58

#### F1B (Wakefield) - 26 Flew

1 D. Hipperson	Grantham	12:30
2 R. Miller	Croydon	12:27
3 J. O'Donnell	C M	12:15

#### F1C (Power) - 10 Flew

1 S. Screen	Birmingham	12:30 • 3:30 • 3:45
2 R. Collins	Anglia	12:30 • 3:30 • 2:29
3 P. Harris	Birmingham	12:15

#### Open Glider - 35 Flew

1 M. Fantham	Richmond	9:00 • 6:58
2 P. Bayram	Richmond	9:00 • 6:14
3 J. Williams	Freebird	9:00 • 6:01

#### Open Rubber - 26 Flew

1 D. Hipperson	Grantham	9:00 • 8:41
2 J. Carter	Falcons	9:00 • 7:48
3 D. Morley	C M	9:00 • 7:27

#### Open Power - 14 Flew

1 R. Peers	Falcons	9:00 • 5:48
2 J. Hopper	Freebird	9:00 • 5:41
3 R. Monks	Birmingham	9:00 • 4:50

### SMAE Spring Mini and Vintage Meeting — Barkston Heath, May 6th

Whilst entries might be on a gradual decline, the same certainly cannot be said of the standard of flying. Even in Mini classes, full scores for the top placings are now the rule and this was the case on May 6th despite very difficult conditions. A brisk cold northerly wind eventually breaking up the cloud cover by lunch-time, to give strong lift and some very windy and turbulent moments. This was down Barkston's main runway and into comparatively clear fields so retrieval was not a problem.

It appeared that  $\frac{1}{2}$ A power would be dominated by the usual names, but the results soon showed differently. Bob Wells had posted a competitive score early in the day. Stafford Screen had to be content with a place behind him leaving Peter Watson, a new name in Birmingham, to top the class with the only full score. He flew an APS 'Swift-Half.'

John Cooper was on form to top A1 whilst

runners-up totals were between 1½ and 2 minutes behind him — severe turbulence misleading many on the tow. Perhaps the most remarkable achievement of the day was Ian Davitt's total in CdH. Whilst most others were having appalling difficulties with ground level turbulence, Ian, down to his reserve model after a trimming mishap, rattled off five maxes most of which flew very smoothly. After surviving this, the model was then broken accidentally when safely back in his car!

The top two in Co2 would probably agree that there are about a dozen ways you can get it wrong in this class and that's before you start crashing the models. Both O'Donnell and Hipperson struggled with problems and consumed numerous attempts in their six flights (best of five count). Eventually the two recorded four maxes each, with John's best from his two worst comfortably clinching it at 1:37. The irrepressible Falcons' Martin Kinder only a few seconds behind in 3rd.

In the past, days involving only Mini classes have sometimes been rather poorly attended especially in bad weather. As a counter-measure Slow Open and Vintage had been added to this programme. They both attracted healthy entries, but times in Slow Open were a little down on the February meeting with John Carters last flight of slightly over two minutes being quite sufficient to win. Other scores tailed off quickly, perhaps reflecting untrimmed models. Participation and interest in this class is encouraging and we can only hope for more events next season. The only event requiring a fly-off was Vintage. As many had been predicting for some time this had become a one model contest, on this day at least. The 'Challenger' challenge having fizzled, it left the three 'Lanzo's' of Peers, Dilks and Hipperson with full scores and a fly-off a little after 6pm in the very chilly wind. Both Falcons launched quickly and their disappointing times could have allowed Hipperson to set a DT. He opted to stick to his usual plan which was to fly without, but made every effort to launch cleanly as these models are not easy to hold firmly in a strong wind. The model got away, climbed well and contacted lift as it left the aerodrome. The eventual estimate of nearly nine minutes was academic but the model was estimated to have been in sight for almost four miles! It was picked up 36 hours later eight miles away having flown over Grantham!

**John Carter's Open Rubber winner at Woodbury DT'd on this lady sunbather ... she looks familiar ...**



## Results

### A1 — 14 Flew

1 J. Cooper	Biggles	10:00
2 J. Carter	Falcons	8:28
3 J. O'Donnell	C M	8:09

### Coupe d'Hiver — 10 Flew

1 I. Davitt	Leeds	9:53
2 M. Dilly	Croydon	8:41
3 P. Siddal	Grantham	8:25

### 1/2 A Power — 10 Flew

1 P. Watson	Birmingham	10:00
2 B. Wells	Anglia	9:38
3 S. Screen	Birmingham	9:30

### H.I.G. — 12 Flew

1 M. Page	Peterborough	4:55
2 P. Ball	Grantham	4:25
3 G. Percival	Grantham	4:12

### Co2 — 8 Flew

1 J. O'Donnell	C M	9:37
2 D. Hipperson	Grantham	8:47
3 M. Kinder	Falcons	8:34

### Slow Open Power — 9 Flew

1 J. Carter	Falcons	8:03
2 S. Fielding	Morley	7:35
3 A. Crisp	Biggles	6:44

### Vintage — 9 Flew

1 D. Hipperson	Grantham	9:00 + 8:06
2 T. Dilks	Falcons	9:00 + 3:08
3 R. Peers	Falcons	9:00 + 2:19

## Bristol and West Woodbury Week-end — Woodbury Common, May 12th, 13th

Mild criticism levelled at Vintage enthusiasts suggests that they tend to be timid and over-cautious with their models. This was certainly not the case on the opening evening of the Woodbury Week-end. After trimming during the day in the 20mph wind they came out in force for the *Champagne Fly-off* and returned some of the best times. Despite turbulence and a stiff breeze Pete Michel topped the results with over 7 minutes from his 'Hi Ho' followed by another excellent score of 4 minutes plus from Ted Hopgoods all red 'Korda'. In this way Pete not only won Vintage outright but also collected the special award for the best Wakefield flight!

The only other class with spectacular flights was Open Rubber when local lads Davies and Chapman out-flew the field in both senses — Davies travelling a colossal distance for his over 8 minute flight. Power saw Andrew Chilton launch his 1/2 A into very helpful air just behind his Dad's flight. Andrews time was best by 1½ minutes and by D.T.'ing at the right moment he also recovered the model. The low Glider scores illustrate the severity of the ground level turbulence.

Much of the attraction of this event has to be the well managed social side centering as it does on the *Castle Brake Caravan Park* only a few yards from the contest area. Most competitors stayed here in fair luxury and very reduced rates. All that attended this meeting last year were impressed with this aspect of the event — this year it was even better! Both host club and camp proprietor Alan Parker, well known aeromodeller of the '60's deserve thanks. The barbecue was an added attraction to the first evenings prize-giving where sparkling wine and glasses; the rewards of the efforts earlier on the field, were presented down to 3rd place. Pete Michel finished up with almost more wine than he could drink but there were plenty on hand to help him out.

It was fortunate that this evening was so successful as we were in for big problems the

next day with the prevailing high wind playing a far larger part than anyone could have foreseen. Soon after 10am the following morning a small gorse fire started some way across and upwind of the contest area. The common being tinder dry the wind soon fanned this small beginning into a raging inferno which no amount of effort on behalf of a dozen or so fire tenders and numerous planes and helicopters could hope to contain.

By lunch-time the rapidly advancing line of fire had widened to half a mile and the dense smoke made even thicker by the hundreds of gallons of water now being played upon it soon over-lapped the flight-path of models. It was becoming impossible to see and more important it was getting decidedly dangerous to stick around. On the advice of the fire-fighters — the host club called a halt and vacated the area. The fire was now three quarters of a mile down-wind, the same across and advancing fast on precious woodland and various residences. The police closed the roads around the common to vehicles so that tenders could fight their last line of defence which was the main road itself. Once again the contest organisers made a positive decision quickly enough to allow the contestants the remainder of the day free. Awards were presented as the results stood. No winner had made more than two flights, hence the low scores and there was only a tie in Open Rubber. This termination was made less disastrous by the fact that everyone then had ample opportunity for a pleasant afternoon, many opting to stay at the park upwind of the smoke and swop stories until the bar opened. We heard of no models being burnt, although the fate of the few lost the evening before was in doubt.

The elements in all their forms had conspired to wreck this meeting, but the host club held it together as an event nonetheless. One year they will be blessed with calm and those not there will miss a tremendous contest, so keep coming. Remember the old law that says: 'It's always calm the week-end you stay away!'

## Results

### Champagne fly-off

#### Vintage — 10 Flew

1 P. Michel	Croydon	7:07
2 E. Hopgood	SAM	4:16
3 T. Dilks	Falcons	3:14

#### Open Glider — 4 Flew

1 T. Hall	SAM	2:39
2 J. Williams	Freebird	1:01
3 M. Gregorie	Freebird	0:54

#### Open Rubber — 6 Flew

1 P. Davies	B&W	8:12
2 C. Chapman	B&W	6:42
3 N. Marcus	Croydon	4:55

#### Open Power — 6 Flew

1 A. Chilton	Crookham	1:54
2 F. Chilton	Crookham	3:25
3 R. Peers	Falcons	3:14

### Sunday's events

#### All-in FA1 — 5 Flew

1 J. O'Donnell	C M	1:24
2 P. Davies	B&W	2:31

#### Open Glider — 2 Flew

1 J. Williams	Freebird	4:25
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#### Open Rubber — 4 Flew

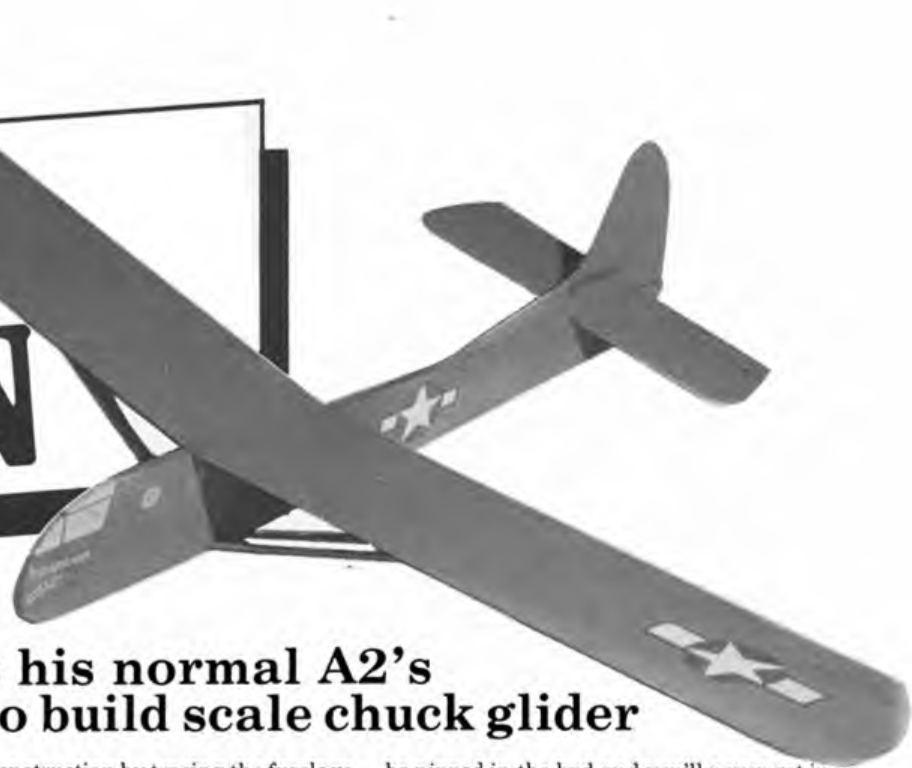
1 J. Carter	Falcons	5:00
2 C. Strachan	Biggles	5:00
3 D. Wain	B&W	2:30

#### Open Power — 3 Flew

1 R. Peers	Falcons	5:00
2 P. Lumsden	St Albans	3:15



# WACO HADRIAN



## Martin Dilly forsakes his normal A2's to bring you a simple to build scale chuck glider

THIS SIMPLE semi-scale glider is based on the Waco CG-4A Haig, built in the United States during World War II and known in RAF service as the 'Hadrian.' Produced between 1942 and 1945 by 16 contractors, many with no previous experience of aircraft construction, almost 14,000 of these troop-carrying gliders were used and made their first assault landing in Sicily in 1943. The 'Hadrian' could carry 15 fully equipped troops or two tonnes of cargo and was usually towed by the C-47, the military version of the 'Dakota'; one was even towed across the Atlantic in stages.

Built of wood, steel tubing and fabric-covered, the 'Hadrian' took off with a two-wheel undercarriage, which was then jettisoned to reduce weight and drag. For training the wheels were kept on but the glider normally landed on a pair of skids on the fuselage centre-line. For quick exit the nose could be raised and heavy cargo, such as a Jeep or 75mm howitzer, was loaded this way.

Start construction by tracing the fuselage shape carefully onto  $\frac{1}{16}$ in. (2.5mm) balsa; make sure that you include the difference in angles of incidence between the wing and the tailplane. If you have some harder balsa available, and there is a certainly a lot of *that* in the model shops now, use it for the fuselage rather than the wings. The original 'Hadrian' had a square section fuselage, so do not bother to round the corners of this, even though it is a profile one.

A few words on transferring shapes to your balsa might be helpful; one way is to simply put carbon paper between the plan in *Aeromodeller* and the balsa and go round the outline of the part with something like a non-working ball pen that will not dig into the paper or mark it. Another way is to use tracing paper to produce an accurate copy of the part on the plan and then stick this pattern directly onto the wood with rubber solution, balsa cement or gum. You can then cut straight through both paper and wood. When you are cutting balsa, don't try to cut

be nipped in the bud and you'll never get in the World Championships team!

Mark the wing and tailplane outlines onto lighter balsa if possible and cut these to outline. Lay them together root to root and mark one surface of both halves, to remind you not to cut two right or left hand wings. As a rough guide to carving, your mark could be a line ruled about one third of the wing chord (or width) back from the leading edge (or front); this will be the high point of the curved upper surface of the finished wing panels. Start the shaping by using a razor plane, if possible, to remove most of the surplus wood from the leading and trailing edge upper surfaces of the wing panels. Set the blade to take a very light cut but leave enough wood to do the final shaping with medium and then fine garnet paper, glued to a wooden block so the abrasive is flat, like a large file.

If you do not have a razor plane, you can try a sharp kitchen knife but again, take only light cuts with it. If all else is unobtainable, you can do all the shaping with your garnet paper sanding block. Remove any saw marks from the undersurface of the wing, because very little of the balsa you buy in the shops is actually smooth when you look at it closely. The extreme tips have the underneath part sanded up in a slight chamfer to meet the curved outline on top. Place the wings on a flat surface with the roots at the very edge of it. Prop up the tips with a book or something similar so that they are an inch above the flat surface they are resting on and use your sanding block to carefully bevel each root as shown on the plan.

Sand the tailplane to a thinner version of the same flat-bottomed airfoil section and take equal amounts off each side of the fin to give it a symmetrical section. Leave the bottom  $\frac{3}{16}$ in. (10mm) square to meet the rear of the dorsal fin.

If you are going to improve the scale appearance by including them, now is the time to make the wing bracing struts; cut strips of  $\frac{1}{16}$ in. (1.5mm) balsa to the right width but an inch or so overlength to allow for exact trimming later. Carefully sand them to a symmetrical section like a teardrop, round at the front and sharper at the rear to reduce the drag. When you sand any

*Continued on page 410*

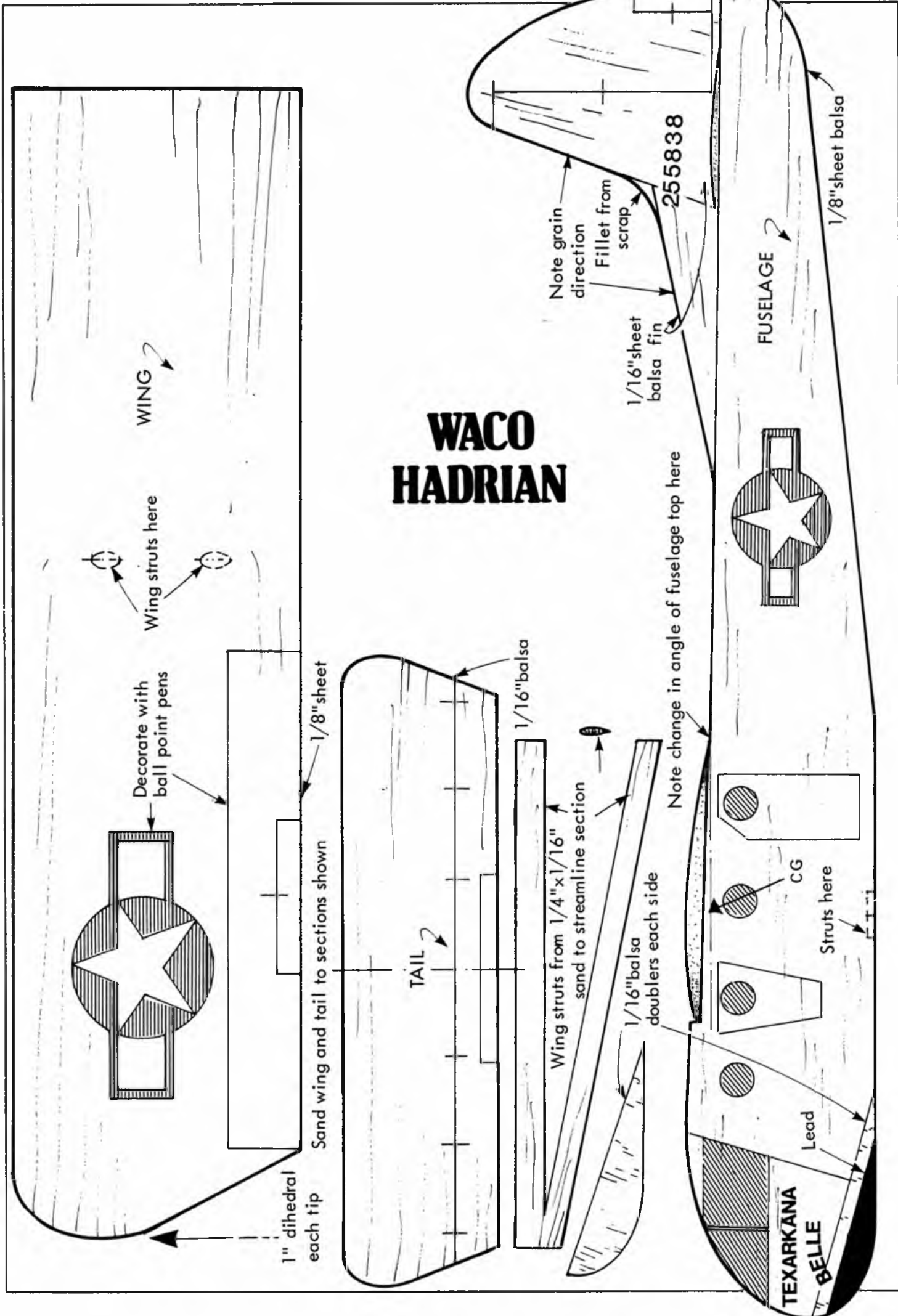


*This view of the Waco 'Hadrian' clearly shows the simplicity of construction - just take care with those wing struts! A felt tip pen and a few decals (transfers) will make all the difference to the final appearance.*

Our model is simplified a little but uses scale tail surfaces; the skids are omitted and you may decide to leave off the wing bracing struts, too. As with any aircraft, it is important to keep the weight down to improve performance, so try the pick light, pale-coloured balsa for the wing and tail; paint adds weight, of course, so I sprayed my 'Hadrian' very lightly with the appropriate coloured Humbrol matt enamel, *very much thinned*. More on that later, though.

through at one go; while with some experience you can use a razor blade, a sharp balsa knife or surgical scalpel is far easier at first and many experienced modellers use nothing else for cutting wood. Use several light passes along the line, letting the blade trail a little and always trying to hold it perpendicular to the wood you are cutting. Have a softish board underneath to preserve the blade's sharpness; do not use the dining room table or your model flying career may

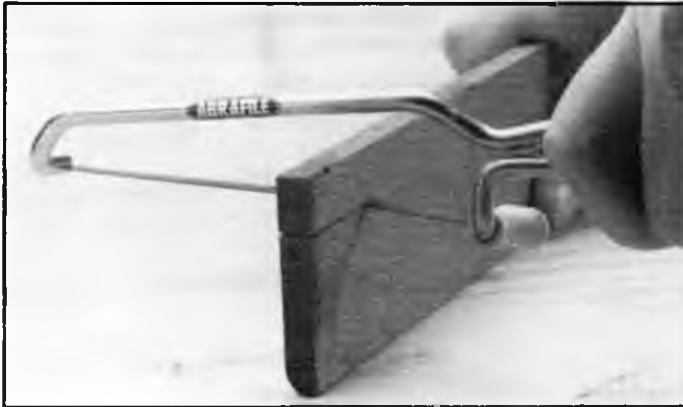
# WACO HADRIAN





# SHOP TALK

## NEW MODEL HOBBY PRODUCTS REVIEWED



The Abrafile 'Hi-Access Hacksaw' in action. Note overall slim lines and 90° 'set' of blade.

### Hacksaw variant

How many saws do you have in your workshop? As time passes one tends to collect quite a variety to cope with various different applications. Here then is another that may well prove useful on a number of occasions — the *Abrafile* 'Hi-Access Hacksaw'. This is a variation on the standard 'junior' hacksaw with the blade (it accepts standard 150mm/6in. blades) set at a 90 degree offset so enabling depth of cuts to be made that are greatly in excess to the frame size. Overall depth is reduced, so allowing access into quite confined openings. Fitted with *Abrafile* tension files, cuts may then readily be made in any direction. Not a saw that you will use everyday, but at about £1.80 well worth having in your workshop. Good tools will not make you a super craftsman, but they will certainly help you save time and eliminate frustration!

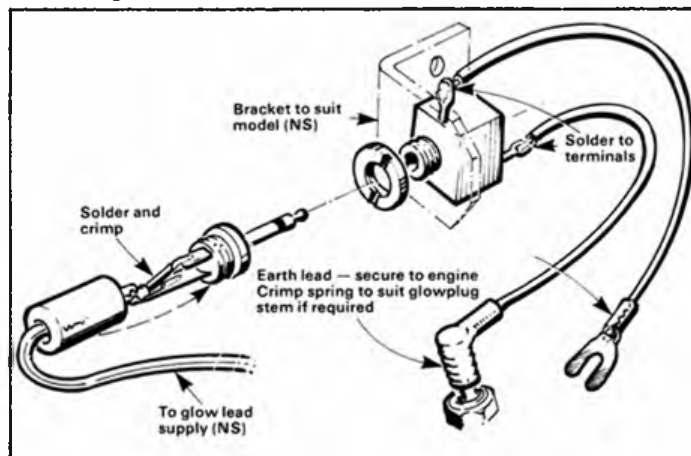
### Finger Saver . . .

*Flair Products* have amongst their many useful products a very neat system for remote connection to a glow-plug. If your engine is difficult to access to connect the glow leads, or if you are worried about losing the odd finger in trying to detach them once the engine is running then this is for you . . . The package consists of the necessary internal leads (7ins. long) to connect to the engine and a jack socket to mount on the fuselage somewhere, together with a jack plug to suit. Both socket and plug require soldering to the appropriate leads — twisting the wires on will not provide a sufficiently good and lasting contact. Price of £2.25 seems reasonable for the added convenience that the unit gives. Available from model shops or *Flair Products*, Holdcroft Works, Blunsdon, Wilts.

### Soldering on . . .

Do you have a complicated structure to solder? Perhaps you want to make a scale electricity pylon — no? Well how about some of those rather involved undercarriages found on some early biplanes. You solder the first few joints — O.K. — apply soldering iron to the next and 'splatt' off falls one of the previous joints. If you have the facilities to silver solder then you could use different melting point solders — now a range of five lead/tin based solders are readily available from *Slaters Plastikard Ltd.*, with melting points of 145°C, 179°C, 221°C, 232°C and 296°C. For 75p (+15p postage and packing) you will get about 10 grams of solder (approx. 6 feet!). Obviously temperature controlled irons make life still easier but, 'normal' soldering irons may be used satisfactorily. 'Normal' solder melts at about 184°C and 'normal' soldering irons have a tip temperature of about 375°C. *Slater's Plastikard Ltd.* address is: Royal Bank Buildings, Temple Road, Matlock Bath, Matlock, Derbyshire DG4 3PG.

*Flair Products* 'Remote Glow System' - general arrangement of items and basic fitting instructions.



### New Toolmail Catalogue

The new 1984 *Toolmail* 160-page full colour Catalogue is now available offering better value than ever before. With over 1,000 new items and more than 3,500 tools illustrated, the product range available is larger than any specialist tool shop. Prices are still really competitive and all items are available for immediate delivery through *Toolmail's* efficient nationwide mail order service.

The range of tools is really enormous with many specialised and hard to find items for the modeller.

The *Toolmail* catalogue costs £1.50 including postage and contains £5 worth of discount vouchers which can be redeemed against orders over £20.

Send a cheque or postal order to: *Toolmail (1982) Ltd.*, PO Box 46, Maidstone, Kent. ME15 8EQ.

### Electric Flight

The 'Hummingbird 02' miniature electric flight system has been designed for converted free-flight scale models or converted single-channel scale models (or non-scale!) using the latest micro radio control units. The outfit only requires a propeller and charger to go . . . (perhaps a plane would be useful tool). Bearing in mind our article this month on 'Electric Control Line', the Hummingbird '02' might well be considered for this application as well. Total installation weight is approximately 248gm (8½ ozs.) and recommended model flying weight is 450 - 470gm (1-1¼ lb.).

Stated power duration in the air is about 4 minutes and static thrust is quoted as 22kg (8ozs.). The power pack supplied is five cell (6v) with 600mAh capacity, vented, so may be rapidly

charged on the field. The pack includes on/off switch already wired in together with connectors to motor and battery pack. The installation instructions are quite clear but for a couple of points: although a fuse and fuse-holder are supplied no mention is made on how to connect this item — most sensible modellers would work out where the screw connector contacts should fit but . . . also *Model Flight Accessories* presume you will use one of their 'Charging Monitors' and refer you to the charging rates supplied only with these items. Now, we can heartily recommend the *MFA* 'Charging Monitor' (pt. No. 202), but it would have been nice to include any charging comments with the power pack itself!

Cost of the 'Hummingbird 02' is £18.95 either from your model shop or from *Model Flight Accessories*, The Mill, Mill Lane, Worth, Deal, Kent. CT14 OPA.

### Old soldiers never die . . .



Functional looking combat motor? The long lived Super Tigre G20/15 Diesel available from Tigre Engines of Watford, Herts.

With the renewed interest in diesel engines in control-line combat circles, *Tigre Engines* have reintroduced, found, dug-up or assembled with loving care, that well known work-horse of a few years back the *Super Tigre* G20/15 Diesel. *Super Tigre* need hardly any mention as to quality or spares availability, both have always been of the highest order. The *Super Tigre* G20/15 Diesel costs £28.95 and is available from *Tigre Engines*, Unit 10, Paramount Estate, Sandown Road, Watford, Herts WD2 4NV. The silencer to fit this engine is the S15C at £5.36.

# Going Solo

## Part 5 Rubber Models

a practical approach for the beginner  
with Trevor Faulkner

**I**N PART THREE we mentioned the application of power to the model, in some form or other, in order to increase its altitude after launch. The system of line-launching was described and the bungee method recommended.

A well-established alternative mode of gaining or maintaining height is that in which a number of rubber strips are connected to an airscrew.

The energy required is stored in the strip rubber and is released via the airscrew.

The revolving airscrew produces something which you'll hear referred to quite often . . . *thrust*. This is, very loosely, the stored energy from the rubber motor creating a force — which moves the model forward at a speed in excess of its 'natural' glide speed and so gets it to produce excess lift from its wings: as a result, the model climbs or 'cruises' (that is, it maintains a steady height).

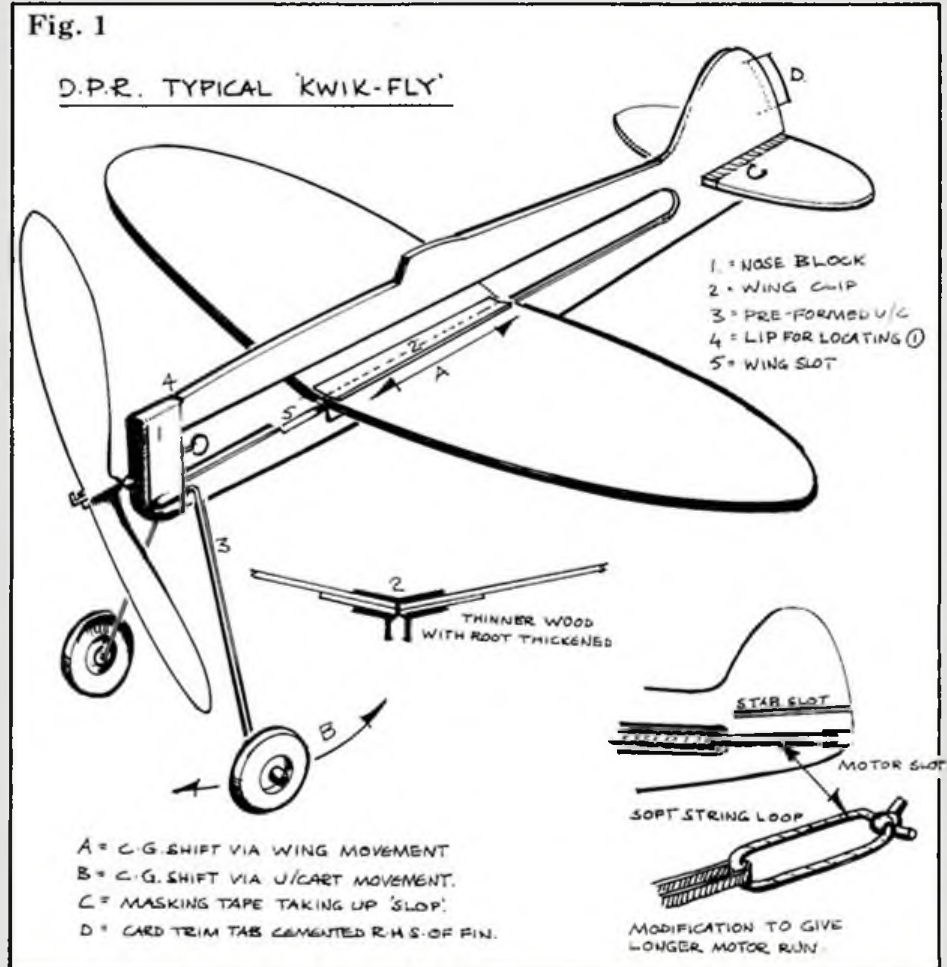
In its simplest form, powering a model in this way has many advantages. It is cheap, long-lasting, unlikely to 'bite' the unskilled operator and needs only simple equipment to apply. (At the top-end of competition work, the characteristics of one batch of rubber compared with another, its storage, preparation and use, are all studied carefully in order to extract the best possible performance from this apparently simple material).

From our point of view, the subject is best approached in a less sophisticated way. In fact the writer would suggest that 'playing' with a simple model is an ideal introduction to the art of rubber-model flying. If the beginner will apply a few simple principles to even a very basic model the rewards in terms of success and satisfaction will lead on to more demanding projects. On the other hand, failure with a more complex creation has the opposite effect!

We'll follow the simple assembly of a *DPR Models 'Kwik-Fly'* (Fig. 1) kit and then begin to examine a few of the why's and where-for's involved. (Other similarly simple kits may be available in your area, so don't put off having a go if this particular range is not stocked by your local dealer).

First, read the instructions, look at all the illustrations and be sure you understand the whole sequence of processes before starting. Clear a space on which to work (a tray with a raised border is handy as bits won't get lost) and ease the die-cut parts from the parent sheet. (They may even have detached themselves in the carton already).

Where balsa is concerned, no two kits are identical. Manufacturers of any repute control the quality of materials closely but sometimes certain 'fits' are a bit looser or



tighter than others. If your first efforts to push pieces such as wing halves into plastic clips or 'joiners' seem unsuccessful, *don't persist*. Try sanding just a *little* off the wood at the edges which first enter the clip . . . or try sliding the panel in from one end.

Sometimes you can 'ease' a clip by sliding a spoon handle along its length . . . the whole point is that if something's not going as easily as you suspect it might, have a quick think. (Aeromodelling's a great pastime for exercising the brain).

By contrast, the occasional loose fit should be taken up to prevent 'slop'. A sliver of masking tape can help here and is easy to apply.

Generally, make a point of examining every fitted component to make sure it's fully 'home'. There's usually a lip or shoulder to indicate just how far components have to be pressed together. Hold each balsa part being fitted as close to the

joint as you can. This helps prevent damage.

All the 'Kwik-fly' models tested went together very easily. The plastic parts (the airscrew in particular) are all extremely well-moulded. The wood used was sturdy enough to withstand handling and was very cleanly die-cut. One tailplane was a bit loose but the masking-tape strip cured that problem.

Before flying any sort of model, it's always a good idea to look around and ensure that there are no warps. If you do spot one, try bending the part gently or twisting in the opposite direction and by the same amount as the warp. After a few seconds, the surface will start to take up the correct shape, and will probably stay corrected. If a warp persists, warm or steam the piece, holding as described until cold/dry. If you have the habit of checking warps each flying session, it will stand you in good stead throughout your modelling



Fig. 2

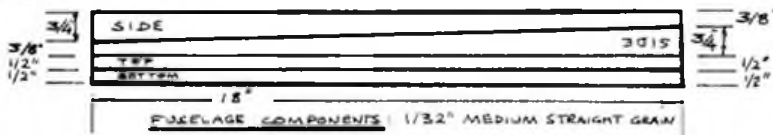
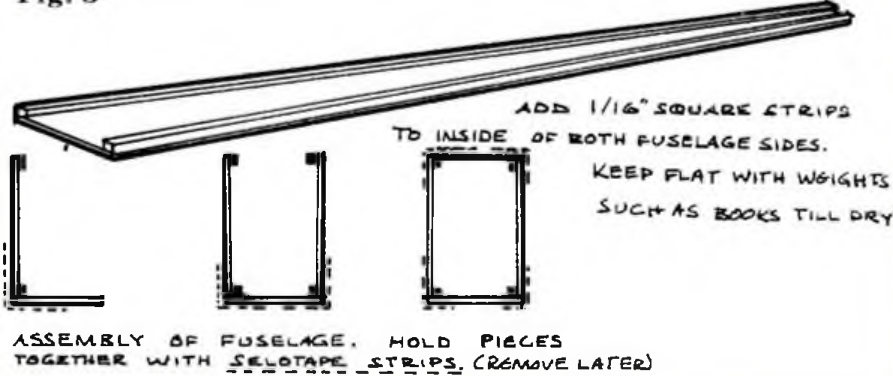


Fig. 3



career. (Sometimes a warp can be helpful ... but at this stage, aim for warp-free models).

If you recall our first little model, the 'Trim Trainer', you will remember that we were able to alter rudder, elevators and wing position. The 'Kwik Fly' has a fixed stabiliser (note its negative incidence) and the rudder is very tough and not designed to change. This makes only one trimming adjustment (the position of the wing) available at first sight. The more experienced among you will spot the undercarriage as a further variable, as by bending it slightly forward, its new position acts in just the same way as adding a little extra nose-weight to our glider.

Once you've assembled and flown a model of this type, you will soon feel the urge to do one if not two things. First there will be a very commendable urge to 'improve' things. With clip-together models this is not difficult, as the bits likely to respond are, fortunately, the easiest bits to duplicate.

The performance of any rubber job will depend very much on its weight, and most A.R.T.F. (almost-ready-to-fly) models are built to withstand the attentions of absolute beginners.

So ... why not duplicate the wings and stab of your model using lighter (or even thinner) balsa, adding a second strip to thicken the joint areas?

Attention to the rear motor 'hook' as shown in Fig. 1 could get an extra inch of rubber motor available, so taking a few more turns ... and a *trim tab* could be added to the rudder to control turn.

If your original model had flown correctly with the wing in its most forward position, the substitution of a lighter stab would give a nose-heavy effect. To counteract this, you either add more tail-weight (not a good idea as we've just got rid of some!) - or the wing can be shifted further forward by carefully elongating the slot into which the wing-joiner fits.

By now, you are probably spotting parallels with what we did with the 'trim trainer'; this little chap is a great help if used with intelligence and care and its movable wing position and the results of wing shifts are a deliberate preparation for other subjects.

Because your 'clip-together' model is likely to have a fairly tough life, take the precaution of marking wing positions and checking that they're constant for all your flights once established.

After you've built replacement parts for a model, just try weighing them against the originals. If they turn out lighter (as they should), you're on the right track for an improvement in performance.

Now just a word about motors, making them last and keeping them 'good'.

Sunlight is the enemy of rubber strip and so is heat. Store motors in a cool dark place. (May I suggest a plastic bag in a corner of the 'fridge').

Next, wound strip rubber produces friction because of the knotting which occurs. This friction can be lessened by lubrication (as you'd expect). A suitable rubber 'lube' can be bought already made up, or you can buy a small bottle of castor-oil from your local chemist (the same stuff used for plasticising dope).

Either of these substances is rubbed into the strip by squeezing or pouring a little into the palm of one hand and 'washing' your two hands with the rubber in between.

Finally, 'breaking-in' rubber; this term is used to describe a process which occurs inevitably as rubber motors are wound, unwound, rewound and so on, 'breaking-in' does the job in one go.

Your rubber loop is held by your two thumbs and stretched until it is tight. (Don't be afraid to give it a good pull). Hold it there for a couple of minutes, then slowly release it. If you measured the loop before you started and then re-measured it after stretching, you would find it to be longer by about 1/4 in. (It's also proportionately thinner). If the loop isn't longer, try again with a more determined effort.

The prepared motor is going to take more turns and behave more consistently than the raw version but at some time, prolonged use is going to result in breakage. For small motors, repair is not worth the bother, so it's wise to have a few feet of the same size strip (made up into loops and ready 'broken-in' and 'lubed' in a plastic bag with your field repair kit. When you buy strip rubber, it has to be tied very tightly before lubrication to form a loop. Quite complex knots are used by some people, but for low-power simple motors any basic knot seems to work, provided it is pulled tightly before lubricating. (I always lick/spit on the knot before pulling it really tight ... this temporary lubrication helps get a good knot and protects the rubber from friction damage ... Ed.). For extra insurance, a 'granny' knot in the two loose ends (after tying the first knot of course), is practically 100% sure.

Should a lubricated loop come undone,

Fig. 4

GLUE 1/32" PLY TO FRONT OF FUSELAGE.

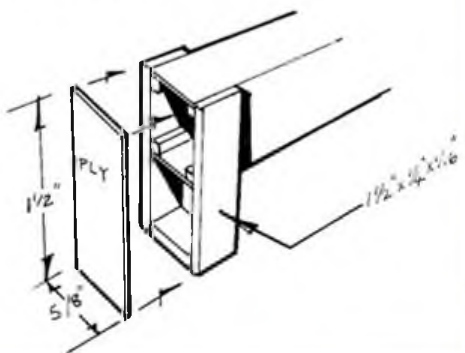


Fig. 5

DRILL HOLES IN PLY AFTER GLUE IS SET. JOIN HOLES WITH KNIFE

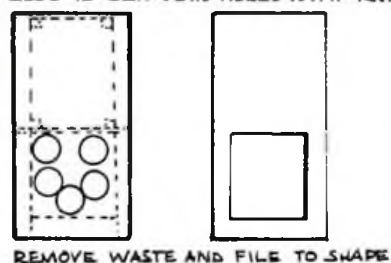
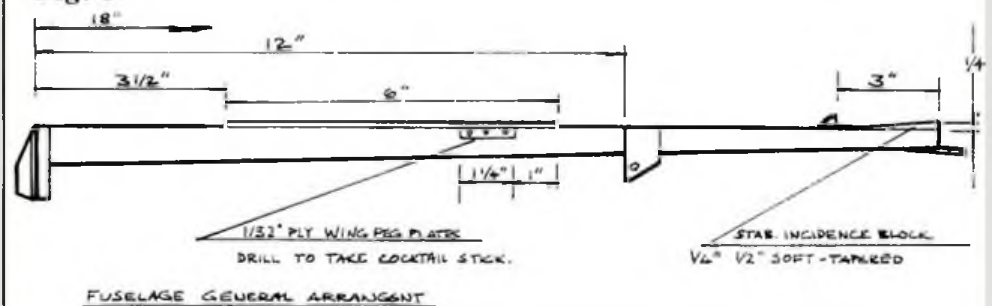


Fig. 6



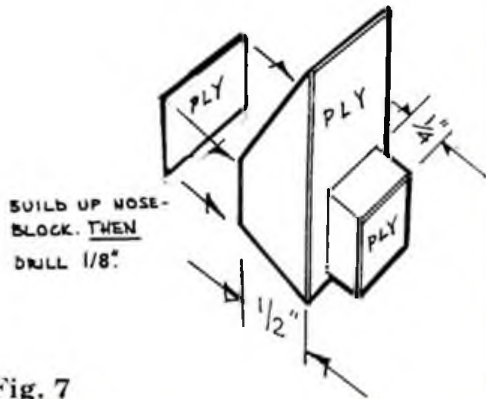


Fig. 7

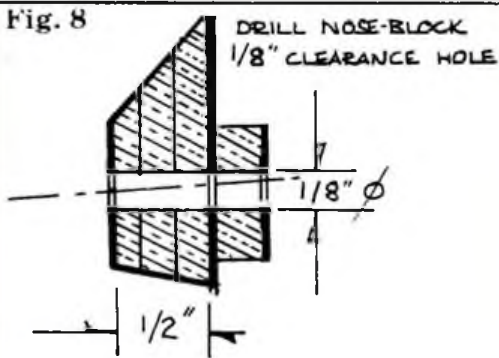


Fig. 8

always suck and spit the lube away before re-tying. It doesn't taste good but it's a great incentive to get you tying better knots!

So much for the 'improvement' aspect of your introduction to rubber models. The other thing you will probably be tempted to do, is to build a model with a greater inherent potential. The experience of flying a model with a better performance really is unforgettable. In the first place, the glide comes as quite a surprise. Compared with the real beginners slot-together job, it will seem to go on and on, *once properly trimmed*.

Because it will be lighter in proportion to its size, the powered part of the flight will be more exciting (and a bit more difficult to handle).

Using the building techniques already introduced in 'Solo I' and the built-up construction described in the last instalment, the suggested model ('Solo II') is an up-dated version of the venerable 'stick' models which were common in the early days of model flying.

To avoid repetition of previous published instructions, only the newly introduced features will be described in detail.

**Fuselage:** Choose an 18in. length of straight grained medium sheet, mark out and cut as shown as in Fig. 2. Add the 1/16in. strips to the inside of the sides, being careful to get one left and one right. Ensure that the strips are up to the edges of the sides (Fig. 3). Use PVA glue and weight the drying components onto a flat surface to get good joints. *Do not try to pin 1/16in. sq. strips down . . . they will split.*

When the glue is set, check the sides against each other. If necessary, hold them together and sand carefully to produce identical but *opposite* sides. Follow the sequence for adding top and bottom strips (Fig. 3).

At the front of the fuselage a 'former' is constructed to secure the nose block (Fig. 4) and when this is dry, its front surface is carefully sanded flat to accept a matching

rectangle of ply. (PVA or balsa cement may be used).

A square hole to take the nose-block is cut by first drilling a few holes and then with knife and file removing the surplus. Do this with great care as the more accurate this is, the better your noseblock will fit (Fig. 5).

Refer to the drawing of the fuselage (Fig. 6) to see where the 3/16in. sq. wing mount rails and the other fittings go. With all these bits assembled and the glue dry, give the job two coats of your thinned plasticised dope. **Nose block:** From either a piece of 1 1/2in. x 3/4in. x 1/2in. balsa or a lamination of scrap, add a ply rectangle which matches

washers, the 7in. plastic prop and shaft (Fig. 9). A pair of round nosed pliers helps when bending shafts but a triangular hook works just as well. Keep the hook small-ish as it must not foul the underside of the fuselage. Cut off and bend the shaft enough to work the free-wheel and retain the prop (Fig. 9). The rubber motor is attached at the other end of the fuselage at the rear motor peg holder (Fig. 12), 12in. behind the nose block. The 1/2in. dowel (or aluminium tube) is *not* cemented into the holder — so that you may change motors easily.

**Wing:** The plans for the wing (and stabiliser) are drawn as explained last month

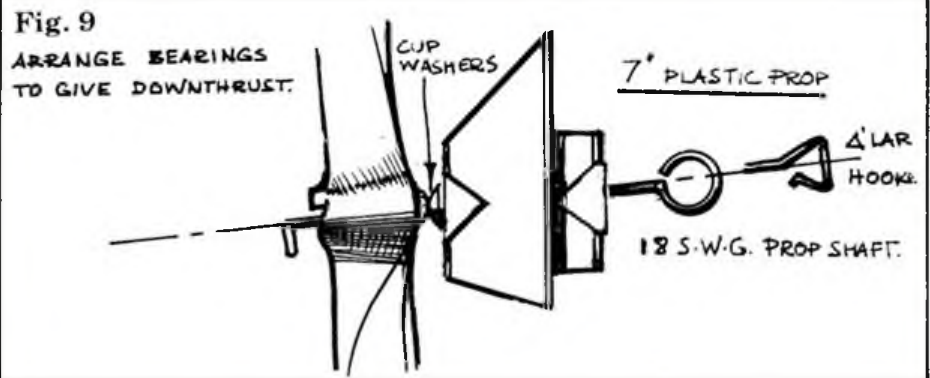


Fig. 9

the front former at the rear of the block (Fig. 7), then a small square of balsa, 1/4in. thick, to fit neatly *into* the nose former. Ply sheets fit as shown to take the bearings. Check Figs. 8 and 9 to be sure that you understand the reason for the 1/8in. diameter hole in the block.

**Bearings:** With either tin-snips or *old* scissors cut shapes as shown (Fig. 10) to fit front and rear of the block, punch holes in the tinplate before cutting shapes (Fig. 11). Good tin-plate can be taken from a used food can. Mark it carefully before cutting. (If you don't have a scribe, cover the tin with masking tape and draw on that with a sharp pencil).

The folded pointed flaps fit into small recesses cut as shown (Fig. 10). Cement well or use epoxy. If using cement, apply a smear of adhesive over the tin-plate and surrounding wood and stick a piece of tissue over both. This will make the bearings secure. If you've followed the drawings, you'll find that a piece of wire passed through holes in front and back bearings will point down slightly at the front. If this doesn't happen, lift off one of the bearings and re-position. Dip the nose-block in dope, shake off the surplus into the dope can and dry.

Do this once more, then fit the cup

(Fig. 13). Full size parts are shown in Fig. 14. The construction follows that of last instalment's model with the exception of the dihedral joint (Fig. 15). Use a sharp razor blade to shave bits from the top spar until the dihedral angle is correct.

When all the dihedral braces are fitted,

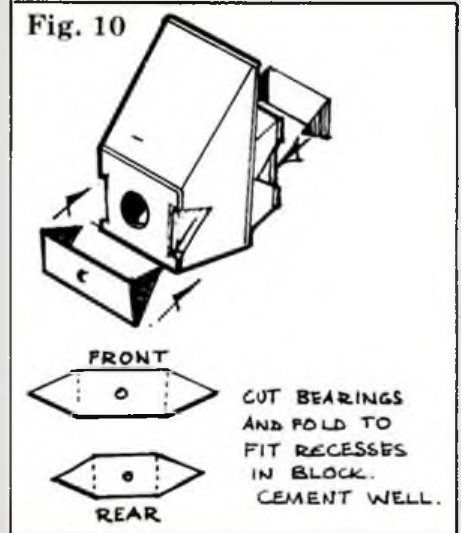
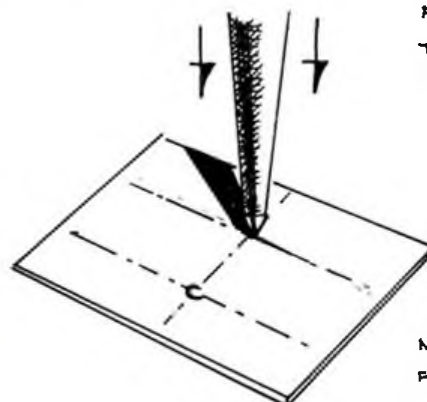


Fig. 10

Fig. 11



PUNCH A DEPRESSION, FILE OFF TIP FAR ENOUGH TO ACCEPT 18 SWG SHAFT.

NOSE-BLOCK BEARINGS FROM SCRAP TIN-PLATE.



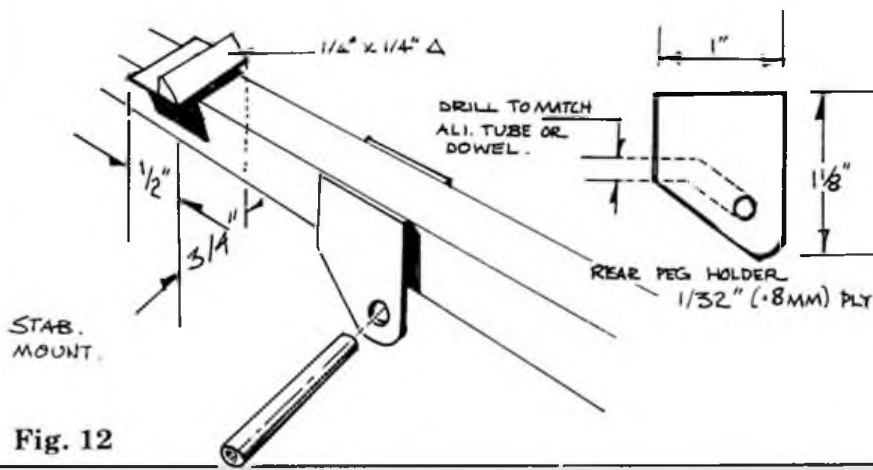


Fig. 12

Fig. 13

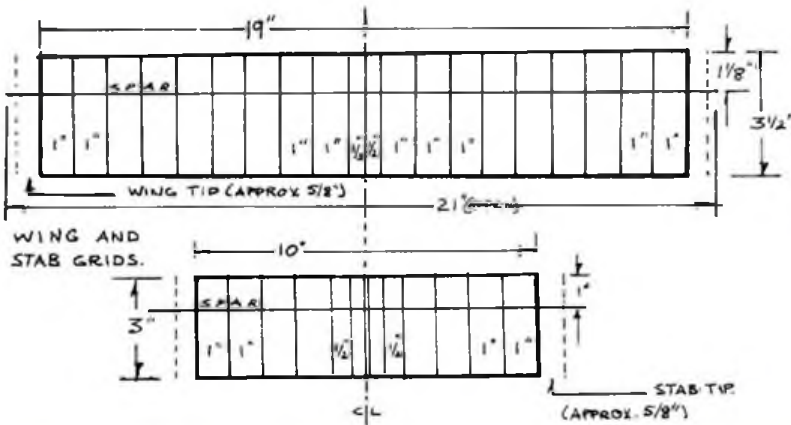


Fig. 14

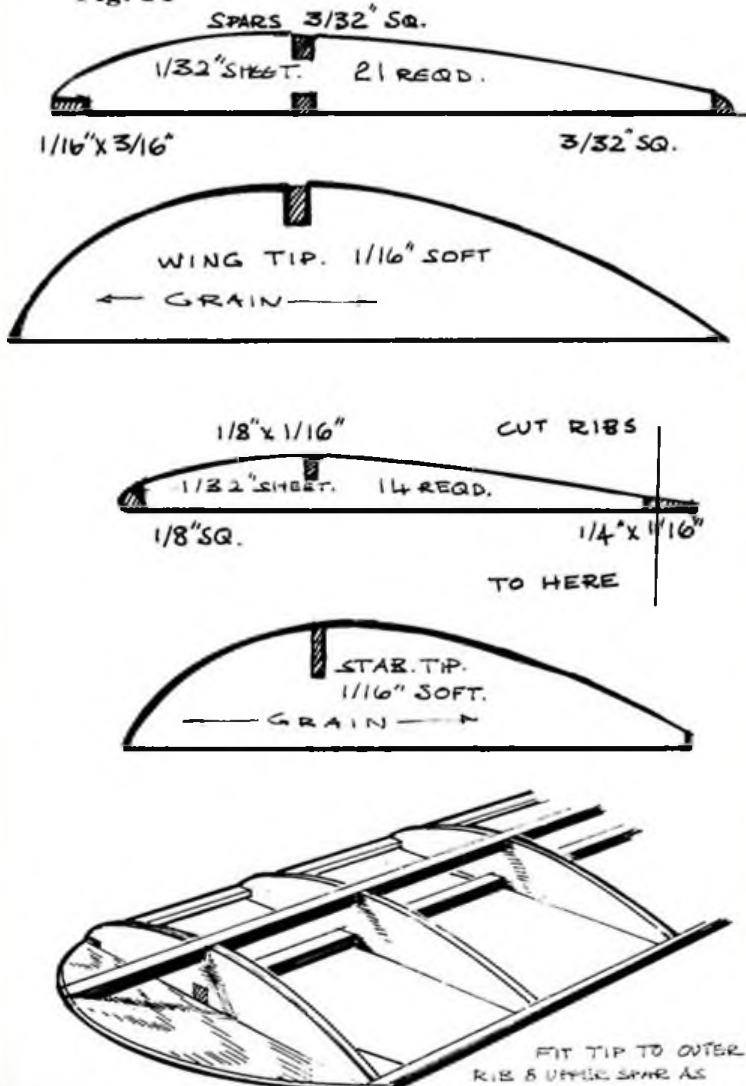


Fig. 15

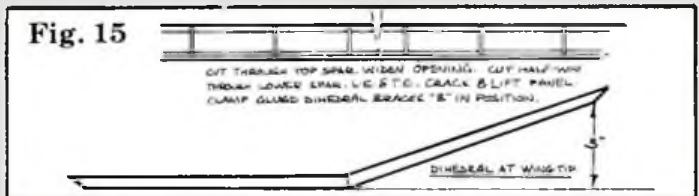


Fig. 16

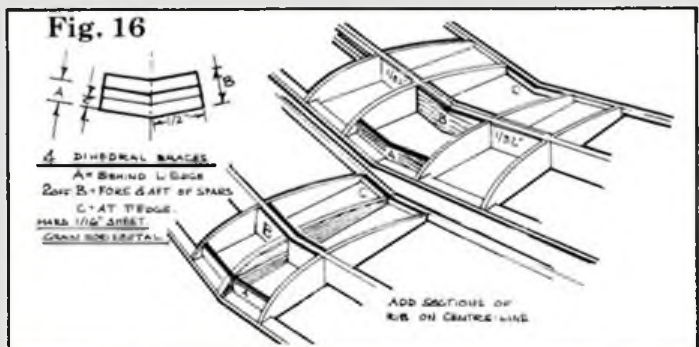
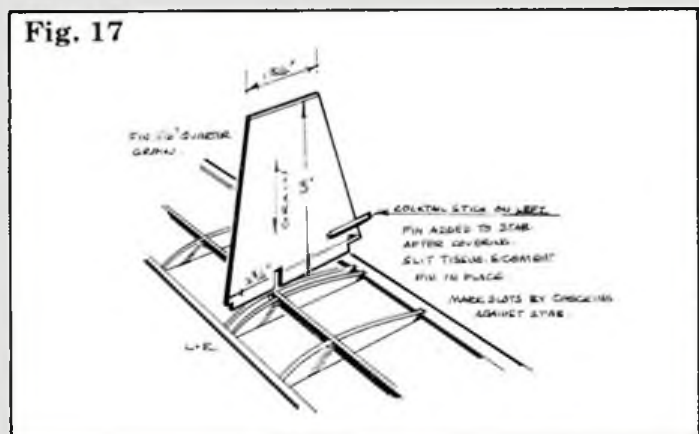


Fig. 17



the spare rib is cut to give the centre rib (Fig. 16) sections fitted as shown. Cover as described earlier in the series.

**Stab and Fin:** Two central ribs  $\frac{1}{16}$  in. apart are used to hold the fin upright. Check their position before the glue is dry by inserting the  $\frac{1}{16}$  in. quarter grain sheet fin to gauge the fit (Fig. 17). Cover and dope the stab using dope as the adhesive for preference (plenty of Castor Oil) and then cut away the sliver of paper covering the centre ribs to admit the fin. Cement in place using as little cement as possible. Dope the fin again with plasticised dope and add a stub of cocktail stick to locate the hold-down bands.

**Undercarriage:** This has the single job of keeping the rubber from the dirt but a pair of light wheels would improve appearances. The groove and D/T band hold it in place (Fig. 18).

**Assembly:** A single loop of  $\frac{1}{4}$  in. flat rubber (i.e. two strands) is required. Two feet of rubber in all. Knot the loose ends and attach to propeller hook and rear peg. Add the stab and balance the motor stick complete with prop, noseblock and stab and motor to find the point of balance. Measure  $1\frac{1}{2}$  in. rearwards from the balance point and use the nearest hole in the wing peg plate for the wing peg (a cocktail stick, cut short — Fig. 19).

Take off the motor and noseblock assembly and attach the wing. Sight along the fuselage to check for tilt of wing — with reference to the stab. You'll see how import-

ant it is to get the wing in exactly the right position on the 'rails' to prevent tilt. You may have to add a strip of wood ( $\frac{1}{32}$  in. x  $\frac{1}{2}$  in. x 6 in.) to the top of a rail to lift the wing, or a spot of sanding will lower the higher panel. Mark the position of the centre rib (once you are satisfied that it's all square) with a  $\frac{1}{2}$  in. strip of balsa  $\frac{1}{8}$  in. square cemented to point at this rib. Similarly, make a biro mark on the stab leading edge stop on the platform (Fig. 20).

**Trimming:** This model proved easy to trim, needing a tiny bit of balsa to be cut from the stab incidence block and a strip of  $\frac{1}{32}$  in. ply at the left of the nose former.

Explained simply, the model's trim is established by gliding it (prop. should free-wheel) to get rid of any stall or dive (i.e. cutting a bit off or adding a bit to the incidence block). Then with about 50 turns on the prop (clockwise) launch the model level and watch. With these turns and with the down-thrust shown built in, the model should climb slightly, then glide downwards to give you a chance to see the extended glide from greater height. Continue to trim the glide up to about 100 turns on the motor, when you may start getting a 'power stall'. This can usually be stopped by adding either down-thrust or right side-thrust (Fig. 21).

Once you have controlled the power add a few more turns for a succession of flights each with a resulting longer glide as the height reached increases.

It's a good idea to have the model circle on glide to avoid long down-wind flights. A right-hand turn is usually easy to deal with and if you slip a little packing between the stab leading edge and the front of its mount as shown, the right-hand side of the stab will go slightly forward and the fin will also incline that way. (Both these adjustments assist in a right-hand turn).

You could as an alternative, cement a strip of  $\frac{1}{32}$  in. sq. balsa on the fin at its trailing edge. Add more strip if the turn isn't sharp enough; take some off if it's too tight.

Recalling the 'Trim Trainer', we know that a turn usually needs a bit of extra negative incidence on the stab to get the best glide, so be prepared to balance your turn with stab packing.

You'll notice that we've not mentioned lubrication for the rubber yet. Run 'dry' the motor will not pick up grit, grass seeds or other foreign matter and you'll be doing a lot of low power flights at first.

Once you have the model sorted out, you'll want to begin increasing turns and for this, lubrication is essential. This is as described for the 'Kwik Fly'. If you find the power stall coming back when turns are increased, then don't add more side-thrust. (Excessive side-thrust can lead to a tight spiral into the ground). Rather — add a bit of down-thrust which is much safer. One of the problems of adding packing to the nose-block is that it may cause a wobble, so prevent any such movement by taking off the nose-block and sanding the packing to give a flat surface, angled the way you want it. (All packing should be cemented in, of course).

This little model is an ideal trainer for rubber flying. Build it carefully, fly it thoughtfully, and you'll learn a lot.

Fig. 18

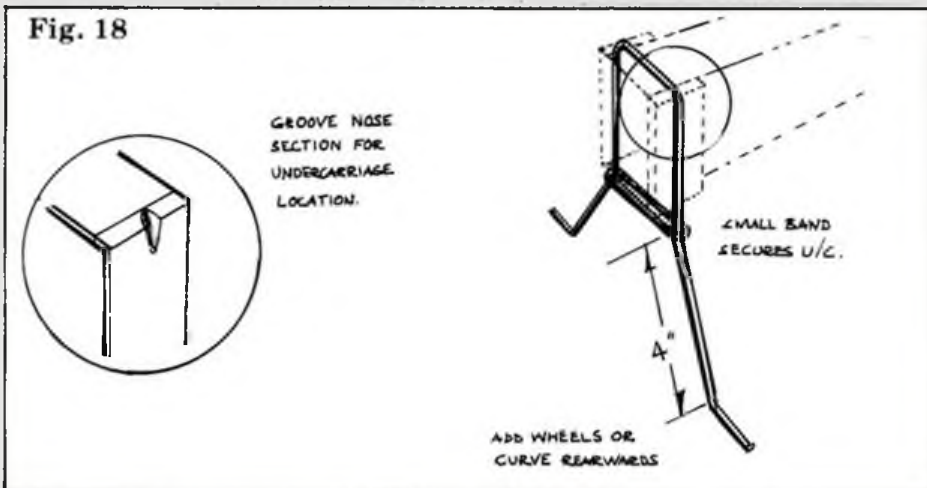


Fig. 19

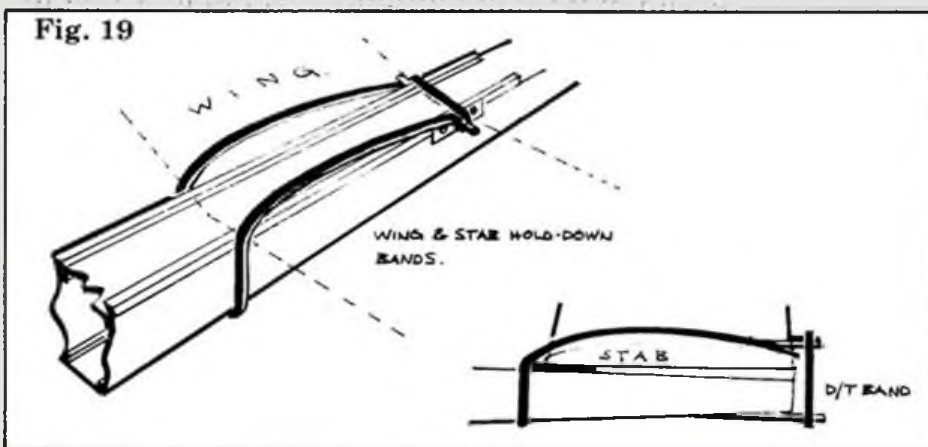


Fig. 20

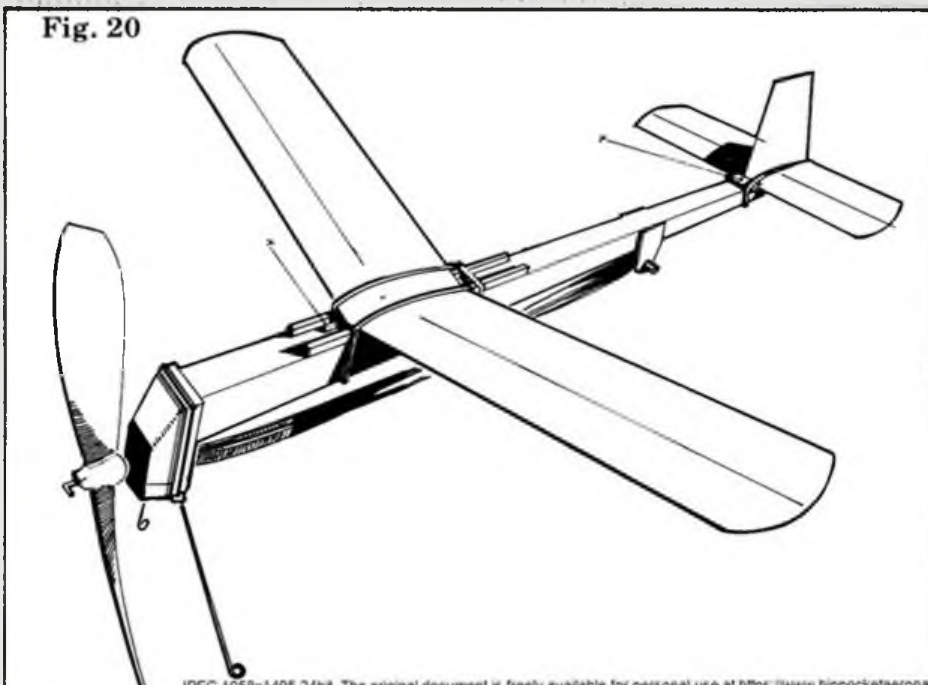
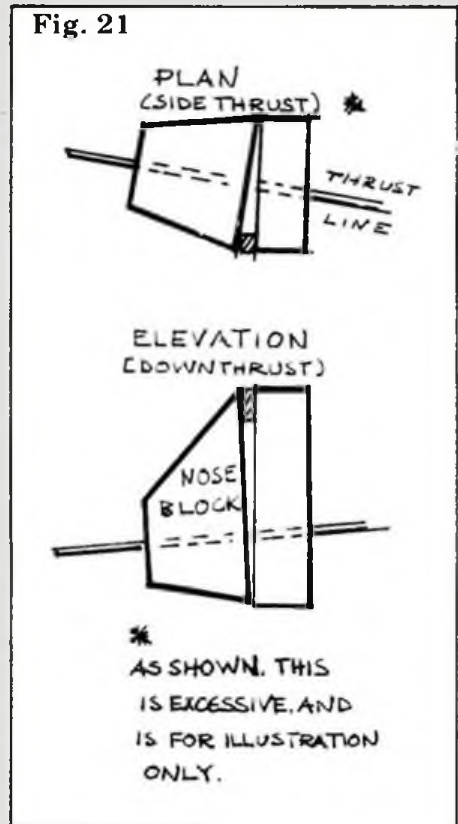


Fig. 21





## The Waco Hadrian — continued from page 403

small section strip of wood always move the abrasive away from the place where you are holding the strip to prevent the wood from buckling.

It will be necessary to add some nose-weight to balance the model and it helps to go some of the way towards this at this stage. The best way is to use a little sheet lead on the bottom of the nose. A piece about the size shown on the plan should be right; being very soft, it can be cut to outline with scissors. Sand a piece of  $\frac{1}{16}$  in. (1.5mm) balsa to a wedge section and use this to make a couple of doublers to stick each side of the lead, overlapping onto the fuselage. Cement the lead onto the nose between the doublers, with a bulldog clip or clothespeg to hold the lot together while the cement dries.

### Finishing

Decide whether you want to finish the 'Hadrian' in correct colours; if so give the separate pieces two coats of sanding sealer and carefully sand smooth after each. This will fill the grain of the balsa and will do no harm even if you intend leaving the model in natural wood finish, as it strengthens and waterproofs the wood. I used matt silver enamel sprayed onto the cockpit and window areas and also sprayed a patch of matt white in the areas of the US markings on fuselage sides and left top and right lower surface of the wings. Cut pieces of masking tape or paper to the shapes of the windows and the US markings and stick them in place; mask the cockpit too and then spray

or paint all the parts with Humbrol olive drab enamel, well thinned. I used cellulose thinners and sprayed on a couple of coats to just cover the wood colour. Remove the masking and then paint the blue part of the markings freehand, or else use transfers, in which case you do not need to mask the areas they will cover. Use black drawing ink to mark the door and control surface positions and the fin number. As well as the yellow name, 'Texarkana Belle,' this actual Hadrian had various other markings on the fuselage and when flown on the Rhine crossing operation in 1945 seems to have been largely inhabited by Texans. If you want to make yours authentic have a look at Kenneth Munson's *American Aircraft of World War II in Colour*, published by Blandford; this shows the full details in colour. You should find this and a lot of other aviation and model aviation books in your local library, shelved at 629.133 or thereabouts.

### Final assembly

When the paint is dry cement the two wing halves together, with one half laid flat on the board and the other propped up so the tip is 2in. (10cms) high; lay a piece of polythene or greaseproof paper under the joint so it does not stick to the bench surface. Cement the fin to the tailplane, marking the centre-line first to get it placed symmetrically; make sure the fin dries squarely and vertically. Then cement the fin and tailplane assembly to the fuselage, using a bulldog clip and some scrap packing to keep it

aligned properly while the cement dries; then add the dorsal fin. Glue the wing; in place on top of the fuselage but make sure there is no enamel on the part it seats onto, as this may prevent a good joint. If you decide to omit the wing struts it will be worth adding some reinforcements to the wing/fuselage joint. Cut a  $\frac{1}{8}$  in. (2.5mm) strip and sand it to a triangular section; spray the hypotenuse (wide edge!) olive drab and glue this strip against the joint under the wing. You may need to adjust the angle with the sanding block to get a tight joint here.

### Almost ready to fly

If you use the struts, sand a shallow bevel into the outer ends of a pair and hold them in place on the wings; mark exactly where the fuselage comes and cut this length at a slight angle to match. Cement them in place and your 'Hadrian' is complete.

For it to fly well it is vital to balance it so the centre of gravity (CG) is in the position shown on the plan; make a light pencil mark on the wing tips and support the model here on pins. Add plasticene to the nose till your 'Hadrian' rests horizontally.

Choose a calm day and find some longish grass for the first test glides. Launch the 'Hadrian' slightly nose down and into wind firmly but not too fast; it should land about 20-30 feet away, without stalling or dropping its nose sharply. You and your friends can hold competitions for either distance or duration; after all, that's what your digital multi-function watch is for, isn't it? Good flying.

## From the Handle — continued from page 399

remained intact but the models were written off.

In the eliminators Dave Benfield (Peterborough) and his MVVS 'Phlan Phlinger' lost to Dave Harrison, while Mick Willance went out to Mervyn Jones and his *Oliver Tiger* powered model.

Round 2 saw some 'names' disappear. Mark Jarrett went out to Dave Harrison when his spruce pushrod broke, while Rob Roy lost to Vernon Hunt. Neil Gill saw his chance of coming first evaporate when, in his bout with M. Lord (flying an MVVS powered 'Laser'), Neil's engine and pod came off his 'Slow Panic'. Mervyn Jones retired (out of models?) after re-flying his

bout with Jeremy Willows (Lincoln/Barkston).

By this time quality (and the availability of flyable models) was beginning to tell. Andy Cox (Peterborough) flying an *Oliver Tiger* powered 'Slow Panic' was beaten by Dave Harrison and his *Oliver* powered 'Titan' while Vernon Hunt won his bout with Pete Grange. Pete had trouble with his elevator and his pitcrew (they forget to let go of his streamer on take-off!).

Steve Turner (Peterborough) flying an *Oliver* powered 'Blasta' lost to M. Lord and local flyer Jeremy Willows lost to P. Rowe (Urmston).

In the semi-finals, M. Lord beat P. Rowe

while Dave Harrison lost to Vernon Hunt by 1 cut to 0. Vernon 'ran away' for an exhausting three minutes, flying low inverted and running around the circumference of the centre circle.

Dave Harrison went on to win the fly-off for third place against P. Rowe by 1 cut to 0.

In a good final Vernon Hunt met M. Lord. Both took all their opponent's streamer, but then Vernon got the knot to emerge the victor.

### Results

1st	Vernon Hunt	(Murton)
2nd	M. Lord	(Urmston)
3rd	D. Harrison	(Cosmo)
4th	P. Rowe	(Urmston)

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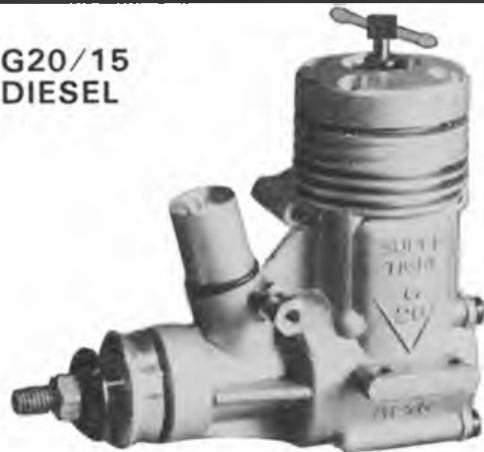
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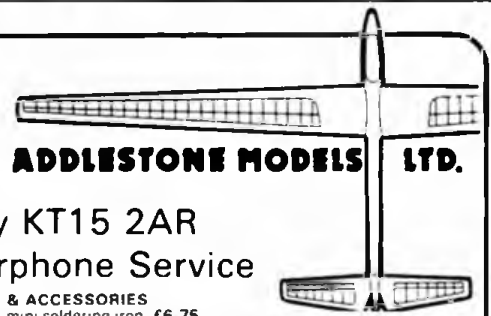
  

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## APPENDIX - LINKS TO PLANS

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### Albatross CIII by John Watters

FF Power Scale

[https://outerzone.co.uk/plan\\_details.asp?ID=1162 ...](https://outerzone.co.uk/plan_details.asp?ID=1162...)

Page: [22](#)

### Waco Hadrian by Martin Dilly

FF Scale chuck glider

Page: [30](#)

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