



# **AERO**

## **MODELLER**



**STAR SHAPE  
FROM  
THE PAST**

**Orion Vintage Biplane**

**Nifty Nieuport: Build our  
French fighter for CO<sub>2</sub> or  
Electric Power**



**PERFORMANCE IN POLAND**  
**Junior Free Flight Championships**





# THE SHOP WITH THE STOCK

OPEN 9 a.m. — 6 p.m. FRIDAY 6.30 p.m. **ADDLESTONE MODELS LTD.**  
 CLOSED WEDNESDAY ALL DAY.

5 MINS FROM M25. 30 MINS FROM HEATHROW AIRPORT

63 Station Road,  
 Addlestone, Surrey  
 Tel: 0932 845440

24 HRS  
 ANSWER  
 PHONE



**5:4:3:2:1 THE COUNTDOWN HAS STARTED! MODEL ROCKETRY IS LAUNCHED IN BRITAIN THE ESTES RANGE FROM AMERICA.**

<b>SETS</b>	
Space Shuttle	29.25
Sizzler	27.50
Alpha III	25.75
Astrocram 110 (Aerial Camera with Delta II Launch Vehicle)	34.50
<b>ROCKETS</b>	
Big Bertha	6.80
Geo Sat LV	13.70
Space Shuttle Columbia	10.25
Blackbird SR 71	11.99
Nova	5.95
Stealth	6.80
Alpha III	5.95
Wizard	3.45
<b>ACCESSORIES &amp; ENGINES</b>	
Recovery Wadding	1.65
Parachute 12in	1.65
Parachute 18in	2.15
Ignitors	1.65
Launch Pad	11.99
Electron Beam Launcher	13.70
1/2 A6 - 2	2.58
A8 - 3	2.76
A8 - 5	2.76
B4 - 2	2.76
C5 - 3	2.93
B6 - 4	2.76

**THAT XMAS BOOX.** Inc P&P  
 How To Go Aeromodelling (Hard Back) 11.95  
 Aero Modellers Handbook 6.99  
 Fifty Years Of Aeromodeller 6.95  
 Model Flying The First 50 Years 7.95  
 Aircraft Plans Handbook 2.50  
 Ben Buckle Plans Book 2.50  
 Know Your Model Aero Engine 5.50  
 Introducing Model Aero Engines 6.95  
 Introducing Radio Control Model Aircraft 6.95  
 Getting Started In Radio Control 2.50

**XMAS PRESENTS**  
 Union - Superb Foam Kits  
 Electric Charge Planes  
 Complete with Charger pack & Motor. Fly very well.  
 Cessna 16.99  
 Bellanca Champion 16.99

**READY MADE COX CONTROL LINE.**  
 Top Gun - Complete with Engine 24.99  
 Airwolf Helicopter 29.99  
 Battery, Fuel, Clip, Fuel line for above 8.95  
 Rubber Power Foam Planes easy to make. Fly Boxing day  
 Zero 5.95  
 ME109E 5.95  
 Mustang 5.95  
 Spitfire 5.95  
 Staggerwing Bi Plane 9.50

Spirit Of St Louis 9.95  
 Skyboy 6.95  
 Skykid 8.50  
 Schweizer 27 1/2in 8.50

Try your hand at Radio Control Flying. Starter Glider Kit & Radio Caldercraft Fledgling Diecut parts in a good quality Kit 22.95  
 JR Max IV Radio Latest JR Radio supplied with 2 servos 99.95  
~~132.99~~

**XMAS PRICE £110.00**  
**RADIO CONTROL POWER AIRCRAFT**  
 MFA Yamamoto Trainer kit includes Foam Wings, Balsa Fuselage, ALL Hardware (no covering) 46.76  
 Enya40SS Engine 49.95  
 Futaba Challenger Radio 6 channel set supplied with 3 servos 122.45  
~~139.16~~

**XMAS PRICE 197.25**  
**BACK IN STOCK**  
 Colt Trainer Control Line Aeroplane 10.99  
 PAW 1.49 for above 21.85  
**JET X KITS KEIL KRAFT**  
 MIG 15 3.99  
 Sabree 3.99  
 Panther 3.99  
 Hawker Hunter 3.99  
 50 size Motor set 9.95  
 40 Pellets 8.10  
 2 Yds. Fuse 3.40  
 Spare Washers 1.30

**BEN BUCKLE KITS**  
 Diamond Demon 75cc-1cc 19.95  
 Slicker Mite 14.95  
 Southern Mite 14.95  
 Hepcat 19.95

**CONTROL LINE PLANES MODEL HOB**  
 Baron 29.95  
 Yayito 15.95  
 Mustang 18.95  
 Smousen 17.50  
 KK Ranger 11.99  
 KK Phantom 11.99  
 KK Champ 12.99  
 KK Marquis 15.99  
 Mercury Midge 8.99  
 Veron Nipper 8.99  
 Warlord 9.95  
 Mini Lord 8.95

**TOP FLIGHT are BACK**  
 Baby Flite Streak 049 to 1cc 9.99  
 Flite Streak 15 to 35 19.99  
 JR Nobbler 15 to 25 19.95

**ENGINES**  
 AE 1cc 22.95  
 AE 1.5cc 23.95  
 AM 10 27.59  
 AM 15 27.97  
 Mills 75 19.95  
 Teico CO 19.95

*This is only a small selection of our stock please phone for your requirements.*  
**HAPPY XMAS TO ALL OUR CUSTOMERS - AND HAPPY MODELLING IN 1989**

**NEW ITEMS**  
 LITESPAN - Iron-on tissue no doping needed - fuelproof. Yellow, Orange, Red, Blue, Antique, dark Green (W/W1) Silver (Ali). Black 36" x 20" 95p

**NEW BOOK**  
 Flying Models - Favourites of The Fifties - Vic Smeed 7.65

**PAW HIGH TORQUE**  
 Vintage 80 Classic BB 28.75  
 Vintage 80 Classic R/C 33.75

**GILLIWS BASAL RUBBER POWERED.**  
 Spirit Of St Louis 21.35  
 P40 Warhawk 6.00  
 BF 109 6.00  
 Avenger 6.00  
 Spitfire 6.00  
 Stuka 6.00  
 Hell Cat 6.00  
 FW 190 6.00  
 Rufe Float Plane 4.75  
 Mustang 4.75  
 DHC1 Chipmunk 4.75  
 T 28D 4.75  
 Skyraider 4.75  
 Cessna 180 4.75  
 Piper Cub 95 4.75  
 Javelin 4.75  
 Lancer 4.75

## BAGNALLS MODELS

OVER 50 YEARS IN MODELLING

SALTER ST. STAFFORD  
 0785 223349/50  
 CLOSED WED.

WOLVERHAMPTON ST. WALSALL, W. MIDLANDS  
 0922 23984  
 CLOSED THURS.

### LIFT OFF WITH MODEL ROCKETS!

**ALPHA III STARTER SET**  
 Easy to build kit with plastic fin unit and nose cone, parachute recovery, quick release engine mount, coloured parts. No painting required. Comes with launch pad, electronic beam launch controller and 3 rocket engines, recovery wadding and ignitors.  
**£25.99 Plus £2.50 P&P**

**SPACE SHUTTLE STARTER SET**  
 For the experienced modeller scale model of Americas Space Shuttle with plastic nose cones, die cast balsa fins and quick release engine mount. Comes with launch pad, electronic beam launch controller, 3 engines, recovery wadding and ignitors  
**£28.99 Plus £2.50 P&P**

**SIZZLER STARTER SET**  
 Easy to build kit with plastic nose cone, die cast balsa fins and quick release engine mounts - Comes with electronic beam, launch controller, launch pad, 3 engines, recovery wadding and ignitors.  
**£27.99 Plus £2.50 P&P**

**ROCKET KITS ONLY FOR BEGINNERS**

Yankee	3.50
Wizard	3.50
Alpha III	6.49
Big Bertha	6.99

**FOR EXPERIENCED MODELLERS**

Space Shuttle	10.49
Nova Payloader	6.49
Astro Cam with Camera	34.95

**FOR ADVANCED MODELLERS**

Stealth	6.99
SR71 Blackbird	11.99
Geostat LV	13.99

**ROCKET MOTORS**

A6 - 2	2.99
A8 - 3	2.99
A8 - 5	2.99
B4 - 2	2.99
C6 - 5	2.99
C6 - 7	2.99

**ACCESSORIES & SPARES**

Designer kit for making your own Rockets	28.95
Porta Launch Pad	11.99
Electron Beam Launcher	13.99
Ignitors (6 each)	1.99
Recovery Wadding	1.99
12" Parachute	1.75
18" Parachute	2.25

P&P Add £2.50 to all orders.  
 Over £50 P&P FREE.

MAIL ORDER TO STAFFORD ONLY PLEASE. CHEQUES TO BAGNALLS MODELS LTD.

# AERO

## MODELLER



p.6



p.25

<b>Editor</b>	<i>Geoff Clarke</i>
<b>Group Editor</b>	<i>Alec Gee</i>
<b>Editorial Director</b>	<i>Ron Moulton</i>
<b>Art Editor</b>	<i>Ron Cunnington</i>
<b>Design</b>	<i>Peter Kirby</i>
<b>Advertisement Manager</b>	<i>Paul Kavanagh</i>

**Cover:**

The imposing nine-foot wingspan Spencer Orion, powered by a 14.5cc Improved Atom Minor, was built in 1934 by Tommy Kennedy, and is now in public focus again. Alex Imrie tells the story in Vintage Corner on p.42. Photo by Frank Newbould.

<b>HANGAR DOORS</b>	News, views and a look ahead	<b>4</b>
<b>SCALE AND CONTROL LINE AT THE NATIONALS</b>	Full coverage of a breezy weekend	<b>6</b>
<b>LUTONIA</b>	John Wetters builds a shapely winner from the past	<b>13</b>
<b>HIGH POTENTIAL</b>	Electric motors for model use examined by Chris Coote	<b>16</b>
<b>SCALE MATTERS</b>	Bill Dennis rounds up results at the autumn Indoor meeting at Walsall	<b>20</b>
<b>FROM THE HANDLE</b>	Rules revision for '89 explained by Dave Clarkson	<b>23</b>
<b>NIEUPOORT II</b>	Full-size plans for David Causer's neat WWI fighter for CO <sub>2</sub> or electric power	<b>25</b>
<b>BALSA CUTTINGS</b>	Cyano de Bergerac's sharp look at aviation activities	<b>35</b>
<b>JUNIOR WORLD FREE FLIGHT CHAMPIONSHIPS</b>	Martin Dilly looks at youthful prowess in Poland	<b>36</b>
<b>VINTAGE CORNER</b>	A revived biplane from the past reviewed by Alex Imrie	<b>42</b>
<b>FREE FLIGHT SCENE</b>	Dave Hipperson's monthly look at competition affairs	<b>48</b>
<b>READERS' LETTERS</b>	Aeromodeller's aeromodelling soapbox	<b>52</b>
<b>ELECTROLIGHT</b>	A look at a bright biplane for indoor radio control	<b>53</b>
<b>WHAT'S ON</b>	Diary dates for all to note	<b>55</b>

**ARGUS  
PRESS  
GROUP**

P.O. Box 35, Wolsey House, Wolsey Road,  
Hemel Hempstead, Herts HP2 4SS



ISSN 0001-9232

The publishers cannot accept responsibility for unsolicited material. The contents of Aeromodeller including all articles, designs, plans, drawings, photographs and all copyright and other intellectual property therein belong to Argus Specialist Publications Ltd. All rights conferred by the Law of Copyright and other intellectual property rights and by the virtue of international copyright conventions are specifically reserved to Argus Specialist Publications Ltd., and any reproduction requires the consent of the Company. © 1988 Argus Specialist Publications Ltd. UK Distribution by SM Distribution Ltd, 6 Leigham Court Road, Streatham, London SW16 2PG Telephone: 01-677 8111; Telex: 261643; Fax: 01-677 0136.

**Advertisement Offices:** Argus Specialist Publications Ltd., Golden Square London W1R 3AB. Tel: 01-437-0626.

**Postmaster:** Send address changes to Aeromodeller, c/o Mercury Airfreight International Ltd Inc, 2323 Randolph Avenue, Avenel, NJ 07001, USA.

**Subscriptions:** Direct subscription rate including Index: Home £23.40, Europe £28.20, Middle East £28.40, Far East £30.20, Rest of the World £28.70 or US \$50.00. Airmail rates upon application from Infonet Ltd., 5 Riverpark Estate, Berkhamsted, Herts HP4 1HL. Tel: 0442 876661/4.

**Overseas Availability:** Second class postage paid at Rahway N.J. USA. Postmaster: send address corrections to Aeromodeller, c/o Mercury Airfreight International Ltd Inc, 10B Englehard Ave, Avenel, NJ 07001. Distribution to news stand sales by Eastern News Distributors Inc, 1130 Cleveland Road, Sandusky Ohio 44870. Distribution to North American hobby and craft stores, museums and bookshops by Bill Dean Books Ltd., 166-41 Powells Cove Blvd, Post Office Box 69 Whitestone NY 11357 USA Tel: 1(212) 767-6632. USA Subscription agent Joseph D Daileda, Wise Owl Worldwide Publications, 4314 West 238th Street, Torrance CA 90505



# HANGAR DOORS

## ME update

More news of aeromodelling endeavour at the Model Engineer Exhibition newly to be housed at the light, airy and spacious Alexandra Palace from 31st December to 8th January. As well as the now-additional DPR Model Flying Championships on 1st January, we can announce that Indoor wizard Reg Parham will again be demonstrating his craft in a compelling exposition of the history of Indoor model flight. Dates are 7-8th January. Don't miss it, Reg's gentle display is a real winner.

Late confirmation is of the BMFA Experts' Forum on 1st January, from 3.30 onwards in the Lonsborough Room. Latest techniques of building and flying will be presented by acknowledged experts in each facet of competition. Full details may be gleaned nearer the date by contacting the Aeromodeller office; or via the BMFA on 0533 518500.

## Juniors - where are you?

Elsewhere in this issue you will read Martin Dilly's account of the First Junior F/F Champs in Poland. Read it, enjoy the story of competition and anticipate technical details which we will publish shortly. But the major question is, certainly, why was there no UK participation? And will there be none next time? Now is the moment to set about announcing plans for full Junior F1A, F1B and F1C encouragement and Trials. We can do it, if we try hard enough. Now re-read the report, and be convinced - surely we must be represented in 1990. Let's see about it *now*.

## Mini Vintage on the way?

After discussion at Free Flight Tech. Committee level it has been decided to try out Mini-Vintage, as a class in its own right but not yet with SMAE/BMFA status in 1989.

An event will be run at the new SMAE Summer Mini Event in

July. If the response is good then due consideration will be given to 'official' inclusion on the 1990 calendar. Such models have already proven very popular, notably Rubber craft. For example, thirty flew at the last Oxford Rally. Dart Power - a class for this popular Quickstart motor - is keenly contested in the North of England; and the rules below should encourage the class as a suitable launch point for beginners to F/F. Given a suitable line length Gliders should be equally competitive. Mini-Vintage is subject to existing SMAE/BMFA Vintage rules, apart from the following:

a) Rubber models: flat span not to exceed 34in.

b) Gliders as per 'full size' Vintage

c) Power models as for 'full size' Vintage but excluding rule 3.17.4.

f) Instead, models must be powered by 0.76cc diesel or smaller. Engine runs to be 20 secs maximum whether vintage or modern motor is used.

d) Mini-Vintage is a combined event; the max shall be two minutes but subject to the adjustments possible under rule 3.1.4.1.

Sounds like a fine idea to us, so we expect to see the skies teeming with suitable models this season. We'll even publish one or two!

## Did you see...

...The much-vaunted series Piece of Cake on prime-time BBC television recently? Although a touch of compression might have sharpened the public-school allegory, and some details of plot and set were unconvincing, there was a feast of flying for all aviation enthusiasts in this fictional account of an early WWII fighter squadron. How splendid to see the Spitfire's elegance in, literally, full flight. All credit to those responsible for the airborne sequences; and look out for the Spitfire pair of Ray and Mark Hanna on the airshow circuit in '89. For close, tight



All eyes on Indoor aficionado Reg Parham as he prepares for yet another entrancing demonstration at last year's Model Engineer Exhibition. He'll be at Ally Pally in January - see text at left.

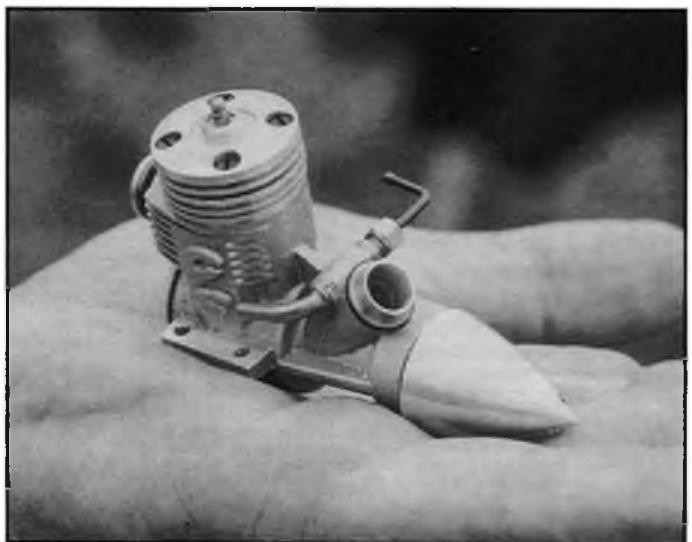
aerobatics and a full dose of nostalgia, you'll find it an act difficult to beat.

## ...and did you also see...

...the splendid BBC1 Monday-night series Reaching for the Sky? If not, you missed a feast of aviation entertainment, with much fresh archive material covering all aspects of the history of aviation. Perhaps some parts were better dealt with than others - but the standard was uniformly high. If anything, it was the unexpected that impressed; unique footage of Fokker V1 construction used simply to indicate German fighter production in WWI, for example, or a Defiant and Battle flying past, a *propos* of nothing more than a brief description of early WWII activity.

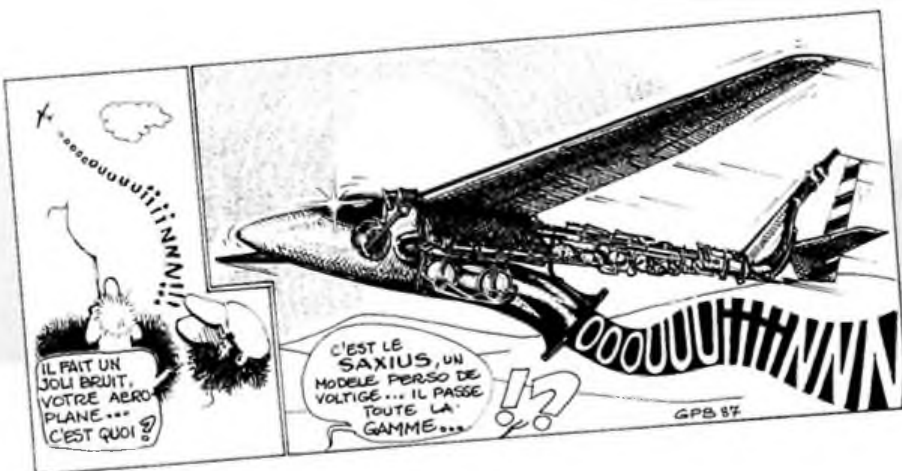
The highlight, though, surely, was a captivating account of vertical flight, a branch of aviation which has brought forth more oddball shapes than any other. Transitional flight and landing of the huge-contra-prop Convair Pogo tailsitter was breathtaking. Would you care to make a perpendicular return to earth by looking over your shoulder totally by feel, with all instruments at least 270 degrees from view? We'll even forgive the often fraudulent - unthinking, at least - use of sound; and no-one could ever be persuaded that a ditching Beaufighter was really a Me323...

Watch out for this series when it returns!



Recent mention of the Singapore-made CS engines has caused much comment. At the Nats we saw Martin Dilly's latest acquisition, this jewel-like .049. Perhaps we can hope for broad-based UK distribution?

Readers' Letters last month featured Ron Prentice's notion that aeromodellers are notably musical - here's reinforcement via the French publication MRA! Anyone fancy building a Saxius?



**You want it - we've got it**

We like to think that every Aeromodeller reader is able to put hands on his copy, every month, as soon as it hits the streets. Occasionally we hear of glitches. If - for any reason - you experience difficulties of availability please make the effort to call our Magazine Sales Department on 01-437 1526.

And did you know that a subscription to Aeromodeller guarantees your monthly copy at no extra cost? Perhaps you ought to think about it...

**Sid Miller**

Pioneer of the single channel precision flyer, and more to the point, the original 'super-finish' modeller in R/C, Sid Miller of Luton & DMAC passed away in late September. Best known for

his Bowden design which he called Blue Lady, and the subsequent 'Rohma', Sid was a medal winner at the Model Engineer Exhibition and has his name engraved on many SMAE Trophies. That gloss enamel finish (from a Woolworth's can!) was a trademark of his workmanship. In later years he took to walking his way around the UK and USA but never lost his interest in aeromodelling.

We are happy to publish in this issue John Watters' account of free-flight fun with Sid Miller's Lutonia high-wing power model.

**Team support in Argentina**

In past World Free Flight Championships the presence of supporters has been crucial to the British team, and those who come to enjoy a major event like this have the best of two worlds. Not only can they watch and

*More M.E. comment via Terry Rose's view, right. Below: Mike Whittard's Madcap, espied at Vintage Weekend, featured this compelling verse:*

*If out at play, I should stray/Far from my domain/Please phone my Dad and make him glad/Say you have found his plane./You'll be applauded and rewarded/Dad will be filled with glee/Ring soon as you like, just ask for Mike/Dursley Eight Six oh Seven Nine Three.*

*What else can we say? Remarkable...*



learn from the world's top flyers in action, but they can also help, if they wish, with the retrieving on one of the three contest days. The 1989 World Championships will run from 15-22nd May at a site about 100kms from Cordoba, Argentina. Food and lodging costs for supporters are very low by current standards, at 180 dollars; the organisers are investigating a special air fare, with the flight probably picking up at Frankfurt. On this basis the travel cost might be around £600, though the team Manager, Martin Dilly, is investigating al-

ternative fares. A final date for accepting supporters has not yet been announced, but with such an early date for the Championships, coinciding with autumn in a region at roughly the same southern latitude as Casablanca is north, get in touch now if you want the latest details and a place on the flight out with the team. Contact Martin Dilly at 20 Links Road, West Wickham, Kent BR4 0QW and please remember a stamped addressed envelope.

**K P 01**  
**RECHARGEABLE ELECTRIC FLIGHT UNIT**  
**KNIGHT & PRIDHAM LTD,**  
 Castle Road, Rowlands Castle, Hampshire.  
 0705 412172

SUITABLE FOR MODELS UP TO 750mm SPAN 120gm WEIGHT  
 WITH  
 2 PROPELLERS  
 STAINLESS STEEL  
 NUTS, BOLTS AND  
 WASHERS. REMOTE  
 BATTERY HOLDER,  
 MARKING TEMPLATE.  
**PRICE £19.50 PP 45p**  
 S.L.A. CHARGING BATTERY £12.50 PP £1.45  
 FLIGHT UNIT + PROP £17.00 PP 45p  
 SPEED CONTROL TRIMMER £1.50 PP 20p  
 SODASTREAM CO., ADAPTOR £16.50 PP 45p

ONE SECOND RUN BY AN AVERAGE PERSON  
 MAY RESULT IN A SHORT LIFE  
 SERVICE BATTERY ADAPTOR 1.5mm DIA  
 INTERNAL SWITCH  
 IN THE MODEL NATIONALITY F SCALE CO. LTD  
 100 THE TOWER BUILDING, 100 THE TOWER BUILDING, 100 THE TOWER BUILDING

**Be Quiet!**  
 Use an EFFECTIVE  
 silencer



## A breezy blast at

## Barkston Heath - over

## to our roving reporters

### Free Flight Scale Report by Bill Dennis

Conditions were fairly breezy throughout the weekend, but not sufficiently to cause serious trouble to the Scale enthusiasts, and much of the flying was of quite a high standard. Thanks to some intensive and well-paced judging, the static section was completed on the Saturday afternoon before any flying took place - always a popular arrangement with fliers, even if it means some fast work.

Overall standards in Superscale were very close apart from the the BE2e of Bill Dennis which led at this date (but no other!) by a large margin. Accuracy and realism were lower in the other classes, particularly rubber which has seen some fine models in the past.

### Superscale

As is often the case, the first two rounds on Saturday evening saw some ragged flying with only Coates, Manley and Smith qualifying. The new models by Kevin Wallace (Bristol M1D), Andrew Hewitt (Sopwith Triplane) and Dennis's BE were all off-trim in the breeze and suffered damage - the latter to its engine, which went unnoticed, eventually to put it out of the contest.

Sunday evening was much better, and for me, the best flight of the weekend was Mike Smith's Bristol F2b which at last managed an ROG. We have seen this large model many times but it has

never shown its true potential. This time its straight run and slow flying speed were just right. Another realistic sight was Andrew Hewitt's Triplane in Black Maria colours but a superb ROG flight was just short on time. A little more fuel could so easily have won it - a hard lesson indeed!

Kevin Wallace's Bristol M1D is his first power scale model and he must be very pleased with his efforts in both static and flying - the latter resulting in one of the highest scores ever seen in this competition. Following a good takeoff and climb out the model flew off downwind almost to Ancaster to test the judges' eyesight. These scores combined to give Kevin a surprise win, over Mike Smith, in his first go at the Superscale. Congratulations!

### Rubber

I only caught some of the flying here due to my tribulations in Super Scale, and I would have liked to have seen in action Mike Hetherington's Spitfire, featured on the September cover. I understand it performed a good ROG followed by a retracting undercarriage, which I assume compensated for the less-than-appropriate flying speed! Richard Granger observed that rubber flyers are over-wary of flying in wind and went on to prove it with a fine performance from his Fokker F11, zero dihedral and all. A good effort and a popular win. It was nice also to see Geoff Spencer back with his new FW Ta 152 - a good flight couldn't quite alleviate the hammering it received from the static judges though! Finally we mourn the demise of Paul Briggs' Hurricane which was badly damaged by its power source and was ceremonially danced upon...

### CO<sub>2</sub>/Electric

The qualifiers were equally split between CO<sub>2</sub> and electric power. Once again it was electric which came out on top. Doug Sheppard's winning Blackburn Bluebird is a very pretty and well-made

model. Kevin Wallace's smaller Bristol M1D came second, with Derek Knight's Tiger Moth third.

A lot of people have talked about building large electric models and some are actually doing so, but we have yet to see one in competition. Such a model would probably wipe the board in this class, and do well in Superscale too. The potential is there - so why not use it?

Thanks go to Charlie Newman and his team of judges for a very smoothly run event, in which everything happened at the scheduled time - a fact appreciated by competitors. Finally a special mention goes to Doug Sheppard for his well informed and unobtrusive commentary on R/C Scale throughout the Nats.

### Control-line Scale Report by John Roberts

Control-line Scale was scheduled for an early start on Sunday to allow for static judging in the afternoon. However, at the appointed time the rain was lashing down, so CD Margaret Staples decided on a postponement until - hopefully - better weather arrived. Eventually the rain stopped and flying began with a competent performance from Chris Bradford's little Nieuport 17. Next came John Roberts, making only the third ever flight with his new DH Chipmunk and scoring just below the 'thousand points' index. Three Kings stalwart Bernard Sexton played safe with his impressive Comper Swift, never before airborne in a breeze.

Scale and cont

Geoff Spencer's Focke-Wulf Ta 152 is an enlargement of Hal Cover's well-known design. Fine rubber-powered flyer but low on static.





**Above: Deserved winner in Rubber Scale was Richard Granger with this stable Fokker FII. Left: Another scale star - Ron Truelove's Heinkel 51B - a future winner?**

# 20 line AT THE NATIONALS

by choosing to omit some of his options, so it was unfortunate that his motor cut before he could carry out the taxi manoeuvre, giving a score (certain to be improved upon in future) of 601 points. Bernard Seale's Thulin, first seen last year, managed a brave battle with the wind to score 701. Next up was Bill Brown, all the way from Scotland with his APS plan-built Ansaldo SVA 1. Bill's piloting experience - he also flies F2B - helped to offset the difficulties posed by this relatively light, under-cambered-wing subject, but the throttle wasn't working as it ought and an attempt was called. Nevertheless a later flight resulted in a competent 536 points.

Efficient as ever, Wal Cordwell's pretty DH Dragonfly penetrated well, its options of flaps and landing lights (plus, of course, the two-engine bonus) helping to amass the leading score of the round. Fourteen-years-old Patrick Roberts was far from satisfied with a nervous performance, but his Miles Sparrowhawk is a reliable performer and better things were expected. Fresh back from the World Championships in Kiev, Ron Truelove flew his Heinkel He 51b - last month's cover subject - most decorously to score 930 points, although the wind flipped a wingtip and the model nosed over during the taxi. Nevertheless, the flight was a pleasure to watch, all manoeuvres being performed precisely and at scale speed throughout. Mick Staples was next with his attractive little Avro Avian monoplane, which coped surprisingly well despite its light weight. A poor engine run hampered Brian Cordwell's P-51D, resulting in undercarriage damage after a bad landing.

Bernard Sexton managed to chop his finger while fine-tuning the Merco in his Comper Swift. In the ensuing mayhem the prop cut his elbow too, an adventure that gave the first-aiders practice; but Bernard was sidelined for the rest of the competition.

In the second round Ron Truelove and Mick Staples elected not to fly because the wind was still strong. Chris Bradford ran out of time fixing his



**Above: Kevin Wallace's CO, Bristol M1D. Chipmunk by John Roberts; and F2B winner Tony Eifflaender.**



Nieuport's landing wires which had 'popped' after the first landing. Poor Bernard Sexton's hand was too painful for him to hold onto his Comper - but the others, apart from Bill Brown, all improved their scores. Patrick Roberts had moved forward the Sparrowhawk's centre of gravity, better to cope with conditions and raised his score to 866, the model circulating in fine style. Static judging took place in relatively pleasant weather, resulting overall in a well-deserved win for a delighted Chris Bradford whose Nieuport gained twenty points more than Wal Cordwell's sporty Dragonfly. It was good to see entries in double figures again!

## F2B Stunt Report by Glen Alison

This was a Nationals for the keen and experienced. The first two rounds on Saturday were almost unflyable, so strong was the wind. Many opted to wait, avoiding the risk of model damage, with the hope of better weather and higher scores on Sunday.

Peter Coates, a fine flier from years past, has returned to the competition scene with the Wharfedale Club. His very smart ST46-powered Maxi 46 features a removable cockpit cover to allow access to an adjustable flap horn, enabling adjustment of flap/elevator deflection ratio. Scotland's Ian Ward also sported a new model, the famous Les McDonald design Stiletto, which looked very different in its military-style camouflaged paint scheme. This craft was another powered by a ST46.

Overnight leaders were Ireland's John Hamilton flying his old Genesis, now with a ST60 up front, to a creditable 3729 points. Not far behind on 3706 was Tony Eifflaender with his Freebird (what else!) and PAW 40. Third so far was Peter Coates, whose excellent 3647 showed that he has lost none of his old skills. As expected - and hoped for - the third and fourth rounds on Sunday benefitted from a big improvement in the weather, much less wind generating increased confidence and higher scores from all fliers. However, your reporter moved away from the runway centre-line during take-off, removing a wing-tip from the Pace Spirit in the process and ending participation simultaneously!

Flyoff for the top ten was a fresh, three-round contest, the best two flights to count. In addition, Merco donated a special prize of the latest Stunt 61, for the highest-placed 'non-works' flier using a Merco engine. Bill Draper started proceedings



with a competent 2934. Next up, Barry Robinson, was unfortunate to lose a wheel spat after a heavy landing, thus cancelling his score. He had actually completed the flight and was rolling to a halt when the incident happened. An interesting interpretation of the rules by CD Mike Feaver.

The Freebird design (available from ASP) seems to cut happily through the wind, Tony Eifflaender making the most of this characteristic to lead the first round with 2953. By now conditions were deteriorating. Peter Coates struggled throughout his flight, eventually losing line tension in the clover-leaf manoeuvre with the inevitable result. Only Ian Ward and Nev Dickinson could improve their scores in the second round, but Tony Eifflaender achieved a superb 3029 in the final round to set a target that Bill Draper and Barry Robinson could not overtake, despite Barry making the 'over 3000' class with a splendid 3012. A look at the engines used by the flyoff contestants reveals that the most popular choice was the Super Tigre G21/46, now no longer available, with three ST 61s (now improved as the 60K) and single examples of the Enya 40 SS, Merco 61 and PAW 40 made up the rest of the field.

But where were the overseas fliers this year?

## Class 2 Stunt

This class has been rightly renamed from the old 'Novice' title, for the standard of models and flying quality are certainly out of the beginners' league these days. Support continues to grow; this year saw a healthy dozen entries.

Most of the models would be fully competitive in F2B, being notably established ASP designs such as Superhawk, Samba and Freebird (of which there were five examples, all glow-powered). Very few profile jobs to be seen these days!

The first of three rounds was held during the worst of Saturday's wind. Leader at the end of the day was fifteen-year-old Richard Handscombe from Northampton, flying a Samba, closely followed by Ted Lloyd and his Superhawk.

Most fliers improved their scores on Sunday. Closing the gap were Brian Temporal (Twister, OS 35), Jeff Smith (Freebird, Enya 40), Jim Major (Freebird, ST46) and John Wing (Crusader, ST46); but only Jeff Smith and Dave Bratton (Freebird, OS 40 FP) managed to do better in the third round, when conditions had deteriorated again. Final result was a convincing win for Richard Handscombe, who surely must be a star of the future. A year ago he couldn't even manage the complete schedule. This victory is a triumph for dedicated practice.

Message from the judges was that take-offs and landings need general improvement; and the quality of manoeuvres in any given flight tends to be variable. But roll on 1989!

## Old Time Stunt Report by Ron Prentice

At the appointed time on Saturday judges and competitors decided that as the wind was blowing at a steady 30-35mph, we should postpone the event until 1 pm Sunday.

Fortunately, the weather was more favourable then. First competitor was Brian Waterland with his Laurie Glover designed Devil Bat powered by an Enya 35. After starting well within the time limit the model took off for a very fast flight, thanks to a two-stroking engine. The square loop almost ended in disaster when the fourth corner almost hit the ground.

Next was Terry Taylor of Bristol, flying a Trixter Barnstormer powered by a Fox 35X. After an excellent start, it made a rather bumpy take off but a good flight, although most of the manoeuvres were rather large. Dave Day followed with his well-known Elfin 2.49 powered Ambassador. Unusually, Dave had some problems starting his motor, but when it eventually did burst into life, it sounded great. Take off run was all of six inches! Flying very fast the Ambassador went well until the loops when the motor went sick and stopped. The judges allowed him to refuel and try again. This time he managed to get as far as the second vertical eight before the Elfin cut again, the resultant arrival breaking the propeller.

Ron Prentice was next with his Merco 61 powered



**Top: Ready for pure noise - Martin Radcliffe about to start his Class VII Speed Craft. Above: Vintage T/R organiser John Noble (left) gets involved in processing. Below: Scots representatives Munro/Gordon, second in Class 2 Goodyear.**



**New Zealand enthusiasts Coglean/Williams fought valiantly in Goodyear and Team Race. See you next year, fellas!**



**Above: T/R correspondent Dave Campbell tunes up for Class B. Right: Happy in 1/2A victory - Derek Heaton and Bernie Langworth - the latter's home-built motor really sang!**

de Bolt Stuntwagon. Unfortunately he had problems trying to start, finally burning out five plugs and aborting the flight (he had been accidentally using 1.1/2 volt plugs with a newly charged two volt battery).

F2B flyer Glen Alison, a newcomer to the Old Time Stunt scene, was next with his Fox 59 powered Super Zilch which put in a smooth, medium speed flight. Maurice Doyle from Belfast followed with his Cyril Mayes Tycoon, powered by an Oliver Tiger. This model has been flown by Maurice for the last two or three seasons and is a good all-round performer. A first flick start from his already warmed-up motor was followed by a smooth takeoff. As with the other 'modern' fliers, Maurice started all his 'eight' figures with a loop, thus avoiding the need to practice two differing forms of eights. The flight was smooth and efficient.

Maurice Doyle's clubmate John Hamilton then flew his Fox 35 powered Trixter Barnstormer. John is another F2B flyer. He flew very smoothly with superbly-rounded manoeuvres (despite a first outside loop which almost touched the tarmac).

Perennial SAM 35 winner Mick Taylor followed next, with his Babcock Magician powered by another Oliver Tiger. There seems to be little doubt that the 'Olly' takes some beating amongst vintage diesels. Mick's model took full advantage of the SAM 35 rule giving 20 bonus points for an engine of up

to 2.5cc. He flew a fine, well-shaped schedule with no obvious errors. The final contestant was Steve Crawford with yet another Oliver Tiger powered craft. Left-handed fliers always look a bit unusual but he handled his very fast flying Ambassador very well indeed, and put in a competent, if not particularly smooth schedule.

The second round took place after a half-hour break to let the judges stretch their legs. The competitors flew in the same order as before. Brian Waterland experienced some difficulty in starting his motor, but after one final desperate whack of the propeller, it burst into life. At first flight was an improvement on that of the previous round, but bad luck overtook him on the horizontal eights, when he ploughed into the tarmac at the bottom of the second one. Apart from a mangled cylinder head, there was not much damage.

Terry Taylor's second round was a definite improvement on his first. Inside and outside loops were nicely formed, as were all his eights and the flight ended with a perfect landing.

Dave Day thought he had detected the cause of his poor motor run in the previous round - an unbalanced propeller. Unfortunately this did not prove to be so and he suffered a worse run than before. Nevertheless, he managed somehow to stagger round most of the schedule and received a big round of applause for his efforts.





Ron Prentice, having borrowed a battery, experienced no further trouble with plugs. A first flick start and a fast takeoff lead into a typical Stuntwagon schedule – fast and furious! However because of the loss of his first round flight, he stood no chance of making a good final result. Glen Alison put in a very smooth second flight with a good motor run. During the manoeuvres it was very noticeable that the wings were flexing badly and upon landing it was discovered that one of the mainspars had cracked. John Hamilton changed places with Maurice Doyle to give him a few more moments to collect both his model and his thoughts, as he had just flown in the Gold Trophy. John's second flight was, if possible, even better than his first. It was very polished, the Fox 35 running superbly; and it was obvious that he was going to be difficult to beat.

Having recovered his breath, Maurice Doyle flew very well, the Tycoon coping with the breeze in spite of its light weight. Mick Taylor flew next, his Magician performing as if by magic, with nice vertical climb, dive and wingover and smooth, well-positioned spherical manoeuvres and good landing.

Steve Crawford again had a blistering engine run with his Oliver Tiger powered Ambassador. The model appeared to fly remarkably fast. One cannot help but wonder at the reactions of its designer Alan Hewitt back in the 50s...

## Handicap Speed Report by Dick McGladdery

Unlike fliers elsewhere, speed fliers can choose when they want to fly. When the weather is poor (wind is the biggest enemy, and Barkston Heath can lay on a nasty blow when in a bad mood) there's not much point in flying because speeds can be so badly affected that it may even be necessary to use lower-pitch propellers in order to avoid the motor being 'knocked off the pipe'. Accordingly, activity at the speed circle was fitful, but most people managed to get their fill of flying, and there was remarkably less attrition than you might expect from an entry who mostly have to rely on ten or so competitions a year to do all their flying; very few leave the luxury of a suitable flying site to develop and test their models.

One of the first to fly on Saturday was a refugee from Aerobatics; Tony Eifflaender no less. His entry was in the 0.8 cc class with a very special PAW 80 powered model. He flew when no-one else was willing to brave the damp, chilly breeze. 0.8 cc models are usually the first casualties in windy conditions, but the little diesel pulled strongly at all times and rewarded Tony with a best speed of 90.61 mph, giving him an eventual 9th place. This model/motor had had very little flying so far, and when propellers have been optimised there might be a challenge to the long-standing Class I record of 102 mph.

Late in Saturday afternoon, the weather improved somewhat and we saw some useful flying. Dave Smith turned in a solid 176.45 mph, a new Formula 21 record, scoring 101.10% to (eventually) win Handicap overall. Ian Mander had a chance of challenging this score with his Novice Irvine 21 model, but although a practice flight yielded a velocity in the region required, when he tried to do it officially the motor would not run properly, and he could only manage 160.27 mph, which still got him 4th place in the Handicap (it's tough at the top). In the same session, Peter Halman and Paul Eisner were beavering away with their FAIs, recording 175.76 and 167.94 mph respectively. Peter's performance earned him 3rd place, but Paul's later efforts (on Sunday) with his open 2.5 model transcended his FAI performance.

Sunday provided the longest weather window and saw some of the big stuff in action with Ray Cox, Martin Radcliffe and Dick Mills giving their Class VII (10cc) models a swing. Most spectacular was Ken Morrissey, turning in 208.13 mph with his OS 60 powered model on two-line control and groupers – a fearsome brute, but Ken still found enough strength to give it a big armful of whip before getting into the pylon.

On the same day, Dave Brewin got his Irvine 15 FAI craft sorted out to good effect, recording 166.69 mph for 6th Handicap place. Joining in the FAI were Paul Rietbergen and Rob Metkemeijer from Holland, bringing the total entry in this class to eight, the largest FAI entry for many a year. In Novice 21, Maurice Roberts put in a couple of good flights with his mini pipe/bladder Irvine 21 model and Des Ratcliffe did a personal best of 149.86 mph with a brand new, piped, suction, sidewinder OPS 21 powered model.

The intermediate classes (5cc and Formula 40) have their faithful disciples, and the best was Ian Skinner who managed 160.30 mph with his Class V (5cc) monoline model.

By Monday, the weather was going off again but activity persisted, with entrants using up their last few attempts. Paul Eisner had suffered various troubles with his Class III (Open 2.5cc) model the day before, but got it all together to record 191.39 mph, annexing second Handicap place in the process. Ken Morrissey gave his 10cc bullworker another throw, but the wind knocked it off a bit to just over 200 mph – still impressive, though!

## Midge Speed Report by Andy Brough

At the scheduled time for the start of the Midge event the weather was awful! Whilst the afternoon was very acceptable, even sunny, I was judging The Old Tyme Stunt and so could not run the event.

Monday, however, was fine although a little

breezy. As in 1987, the Mini Goodyear circle was commandeered for the two hours required. Many thanks to Gordon May and his helpers...

The bonus for vintage motors has been altered for this year, now comprising 10mph being added to the speed of a model powered by vintage motor (in production before December 31st, 1952) and 20mph being added for a Mills 1.3 powered model.

To get things under way your reporter put in the first flight with a reasonable 88.3. However any illusions about winning were shattered by Barrie Wade's 99.1 followed by his comment, 'I thought it was a bit slower than usual.'

Mick Taylor's first flight was an off-song 85mph. This was soon followed by a much improved 90.4 which was good for 2nd place. Some entrants suffered launch troubles, Mike's model performing several loops on occasion. He must have thought he was in the vintage stunt event! A simple waist high fling out of the circle is all that is required.

Bob Brock's Frog-powered Midge couldn't manage better than 85mph. The two remaining competitions, Alan Cotton and Ian Hewitt both used PAWs and ended with identical speeds of 74.4.

An enjoyable event, even though entries were down. Perhaps Old Warden and the Nats are too close together, enthusiasts preferring the Vintage Weekend meeting for Midge speed?

## 1/2A Team Race Reports by Dave Campbell

The combination of high winds and small engines resulted in this, normally the most pleasant to fly of the racing classes, turning into a battle for survival. Of the sixteen teams entered, thirteen braved the elements; and for some, broken models was their only reward. The high spot of the first round on Saturday was the magnificent 23:26.5 of Heaton/Haworth, the fastest time of the competition and close to the UK record. Flying at 18.5 seconds/10 laps (106mph) for over 50 laps range, this model – powered by Don Haworth's home made engine – is virtually unbeatable. Second spot was taken by those regular visitors to the British Nationals from Holland, Fred Meijer and Rob Metkemeijer who managed 3:37.2 from their FMV. The only other team to break four minutes was Langworth/Campbell with a one-step 3:58.1 using Bernie Langworth's unique side-exhaust Oliver Cub. This round was marred by a bad crash which wrote off the Sesqui 1.5 engine and badly damaged the model of New Zealand visitors Pete Williams and Paul Coughlan; a great shame as they were going very well at the time.

Round Two on Sunday saw no times under four minutes. At the end of the round the qualifying time for the semi-finals was a lowly 4:42.9. The last place in the semis went to the Kiwis, who had been up nearly all night rebuilding their shattered model, firstly in the beer tent (until thrown out at about 12.30) and finishing at 3.30am in your reporter's tent. Their efforts were to little avail as the borrowed Sesqui engine was not up to scratch, so a rummage around the British produced a model better able to keep them in the competition.

The semis on Monday were somewhat ragged with models crashing, running into the circle and generally misbehaving in the atrocious conditions. Only Heaton/Haworth had any real form with another sparkling performance resulting in 3:27.9 and pole position for the final. Fred and Rob could only make 4:09 with the FMV whilst Langworth/Campbell had problems in round one for a slow time. Their detachable undercarriage detached in flight for a disqualification in Round Two. Potential finalists Hill/Metcalf had damaged their model practising and so the last place in the final went to Kiwis Williams/Coughlan with 4:19.2 using their reserve model powered by an ABC Oliver Cub prepared by Bernie Langworth.

The final was a truly international affair. It promised to be fast and furious with the high-speed, long-range model of Heaton/Howard matched against the equally fast – but short-ranged – FMV model of the Dutch, with the New Zealanders hoping to benefit if the others made any mistakes. As it was, Williams/Coughlan retired when their



model ran in at the first pitstop leaving UK and Holland to battle it out to the finish. Don Howarth and Derek Heaton emerged as deserving victors with a new British record final time of 6:56, taking just three pit stops to complete the 200 laps; Meijer/Metkemeijer finishing ten laps behind.

## F2C Team Race

The state of the art F2C racer is a highly powered and efficient competition flying machine, usually little bothered by such outrageous weather conditions as were experienced over the weekend, so the time recorded in Round One on Saturday were generally disappointing. Of the twenty-one teams entered, which included foreign visitors from New Zealand, Uruguay and Holland, only four managed to break four minutes. Leading the pack were Meijer/Metkemeijer from Holland flying their FMV powered model to 3:39.9, closely followed by Smith/Brown (Cipolla) with 3:41.3 and Langworth/Campbell (Langworth/Burford) with 3:44.0. The only other team in the four-minute club was Sladdin/Gardiner with an off-form 3:55.7 from their rear-exhaust Nelson. Round Two saw Heaton/Woodside improve to 3:46.0 for a place in the semis using their Haworth Dragon engine; Meijer/Metkemeijer produced a super 3:33.1 with the three-stop FMV. Salisbury/Wharton, Fitzgerald/Thomason and Pegg/Short all beat four minutes, leaving the last place in the semis to be taken by Fry/Thorpe with 4:01.8. The semis started on Monday with the Dutch team leading with 3:42.2 and Langworth/Campbell, in the same race, making 3:58.5 with three stops and a compression adjustment. The event came alive in the next race when Steve Smith used his best engine to give a magnificent 3:27.5 with two immaculate stops from Colin Brown to stamp their undoubted supremacy on the competition. Round Two of the semis saw Fitzgerald/Thomason snatch third place in the final by just breaking the 3:50 barrier with the other teams suffering from wind (the non-medical variety) or other maladies to spoil their efforts.

The final therefore comprised the very fast 34-lap Cipolla of Smith/Brown, the fast 25 lapping FMV of Meijer/Metkemeijer and the not quite so fast 30-lap Nelson of Fitzgerald/Thomason. At the whistle all were smartly away and evenly matched for speed, the Nelson being right on song; the Cipolla and FMV cold but gradually warming up. At the

first stops it was anybody's race but Smith/Brown were edging in front due to its greater range over the FMV. Disaster struck Smith/Brown when the motor cut expectedly at 43 laps - Colin Brown quickly refuelled and was somewhat surprised when the needle valve ejected itself down the outboard wing, the needle having become unseparated from the valve body causing their retirement from the race. This left Holland versus Yorkshire (and Northern Ireland) to fight it out to the finish, which resulted in yet another British Nationals win for Fred Meijer and Rob Metkemeijer in 7:37.4, chased hard by Mike Fitzgerald and Mark Thomason just three laps behind.

## Class 'B' Team Race

Only four teams flew this year out of a total entry of six. The only new equipment seen was the Don Haworth-prepared pipe-timed OPS 29 engine of Fitzgerald/Thomason. Some further experiment is needed to get the best out of this motor which showed flashes of speeds over 140mph for 40 laps but with a voracious appetite for glowplugs and a somewhat variable setting. They failed to make the final which this year comprised of Steve Smith/Gordon Yeldham (OPS 29), Berine Langworth/Dave Campbell (OPS 29) and Dave Clarkson/Ed Needham (Picco 21). A good effort from Clarkson/Needham saw their total under four minutes for the first time, the best yet I think from a 21 powered model on 0.4mm lines. Rule changes for 1989 (if approved) should see the 21 models more competitive on 0.35mm lines which hopefully will encourage more entries in this, the most challenging of the C/L racing classes.

The final on Monday was the usual high-speed affair, free this year from major drama. Clarkson/Needham pulled out after half-distance having consumed two glowplugs - Dave Clarkson deciding that they had no real chance of winning and being truly gentlemanly in leaving the other two teams to dispute first place unencumbered by the slower 21 powered model. The result was settled when the wind caught Langworth/Campbell model on take off at their third stop which chipped the propeller and stopped the engine. A quick retrieve and restart got them back into the race but the damage was done, leaving Smith/Yeldham a clear lead which they maintained to the end to win in a fast 7:09.6.

## Vintage Class A Report by John Noble

Court/Simm were unlucky right away. They borrowed some rubber fuel tubing, which promptly split. Favourites Andrews/Horwood won the first heat, their Time Traveller actually posting the fastest time of the night at 4:20.3. Schofield/Miller's Gengangaren took heat 2 at 4:56, which included a lightning-fast prop change. A new KK Scout by Heaton/Heaton took second place. We had hoped to see Combat enthusiasts Paul Stanley and Vernon Hunt in action with a Mercury Spitfire, complete with beer-can cowl. Also it misbehaved, and was withdrawn. Kit instructions say it qualifies as a Team Racer. Did it ever fly in anger?

On Sunday conditions were breezier, but everyone turned out to do battle. The second heat was a real cracker; John Schofield taking the Gengangaren to 4:00.21 against Nigel Bower's 4:05. The Heaton's Scout developed wheel problems and was sidelined. Next year they threaten a Dooling-powered version for Class B! Heat 3 saw the fastest 'non-Oliver' time of the event; that Gengangaren clocking 5:37. Andrews/Horwood improved further to 3:58. Catastrophe struck in the fourth heat. Terry MacDonald 'lost-it' avoiding Frost/Taylor on takeoff. In the ensuing tangle, Terry's model and Ian Horne's Mac were written off. By the final heat (actually a re-run from Saturday) it was pouring with rain. It didn't take much assessment to realise that - once again - the Horwood/Andrews Time Traveller was victorious. Stirring stuff!

## Class B

Just one model recorded a time in the first heat, but Parker/Aldred's 4:30 with their Greenfly proved a fair target for the others. Nevertheless, Heat 2 saw 4:06.6, the night's best time, from the Bilston club's Skitt/Ward. Langworth/Pilgrim's Wrangler managed only 6:36, but this was far ahead of Court/Simm's Super Saint time of 9:00.

Remaining heats were 'two-up'. Tim Andrews clocked a fine 4:23, and Frost/Taylor ran out at 6:18, flying solo after the faithful Quest of Hunt/Gibbs had decided it was getting too old for this sort of thing, and began to shed components...

Two extra entries turned up on Sunday. In the spirit of things, and a couple of protests notwithstanding, they were allowed a couple of flights. Ian Hewitt was pitted by Ken Reeves and stunt

### Free Flight Scale Superscale

		Static	Flight	Total
1	K Wallace Bristol M1D	887	1170	2057
2	M Smith Bristol F2b	948	1047	1995
3	T Manley 1/4 Strutter	976	1004	1980
4	E Coates DH 9A	951	936	1187
5	D Knight Argus	931	857	1788
6	A Hewitt Sopwith Triplane	920	782	1702

### Rubber

1	R Granger Fokker FII	557	766	1323
2	G Spencer Ta 152	383	939	1322
3	M Hetherington Stinson	568	636	1204
4	M Hetherington Spitfire	413	786	1199

### CO.

1	D Sheppard Blackburn Bluebird	742	1004	1746
2	K Wallace Bristol M1D	631	1057	1688
3	D Knight Tiger Moth	756	915	1671
4	D Causer Nieuport 11	663	763	1426

### Handicap Speed

		mph	%
1	Dave Smith Formula 21	176.45	101.10
2	Paul Eisner Class III (Open 2.5cc)	191.39	99.40
3	Peter Halman Class IV (FAI-F2A)	175.76	99.06
4	Ian Mander Class IX (21N)	160.27	97.70
5	Ken Morrissey Class VII (10cc)	208.13	98.37
6	Dave Brewin Class IV (FAI-F2A)	166.69	93.86
7	Dick McGladdery Class IV (FAI-F2A)	164.39	92.65
8	Des Ratcliffe Class IX (21N)	149.86	91.35
9	Tony Eifflander Class I (0.8cc)	90.61	88.70
10	Rob Metkemeijer Class IV (FAI-F2A)	155.37	87.56
11	Ian Skinner Class V (5cc)	160.30	86.66
12	Gordon Isles Class IV (FAI-F2A)	152.30	85.84
13	Dick Miles Class VIII (F 40)	144.25	83.49
14	Ray Cox Class VII (10cc)	180.15	83.41
15	Paul Rietbergen Class VI (FAI-F2A)	146.71	82.68
16	Maurice Roberts Class IX (21N)	123.95	75.66
17	Brian Blackwell Class V (5cc)	125.48	67.80
18	Dick Roberts Class V (5cc)	120.55	66.14

### Control Line Scale

		Static	Flying	Total
1	C Bradford Nieuport	570	1106	1676
2	W Cordwell DH Dragonfly	518	1138	1656
3	R Truelove He51B	604.5	930	1534.5
4	J Roberts DHC1	501	1016	1517
5	P Roberts Miles Sparrowhawk	528	866	1394
6	B Seale Thulin	535.5	811	1346.5
7	M Staples Avro Avian Mono	593	633	1226
8	B Sexton Comper Swift	455.5	607	1062.5
9	B Brown Ansaldo SVA1	520	536	1056
10	B Cordwell P 51	429	319	748

### Old Time Stunt

1	J Hamilton Trixter Barnstormer	Fox 35	596
2	G Alison Super Zilch	Fox 59	585
3	M Doyle Tycoon	Oliver Tiger	558
4	M Taylor Magician	Oliver Tiger	550
5	T Taylor Trixter Barnstormer	Fox 35X	477
6	S Crawford Ambassador	Oliver Tiger	428
7	D Day Ambassador	Elfin 249	329
8	R Prentice Stuntwagon	Merco 61	314
9	B Waterland Devil Bat	Enya 35	308

### F2C Team Race

		Best Heat	Best Semi	Final	
1	Meijer/Metkemeijer	Netherlands	3:33.1	3:42.2	7:37.4
2	Fitzgerald/Thomason	W Dale/Sheffield	3:58.0	3:49.5	7:43.6
3	Smith/Brown	Feltham	3:41.3	3:27.5	Rtd
4	Langworth/Campbell	W Dale/Grantham	3:44.0	3:58.5	
5	Heaton/Woodside	3 Sisters	3:46.0	3:53.7	
6	Salisbury/Whorton	Feltham	3:54.5		Rtd
7	Sladdin/Gardiner		3:55.7	4:01.0	
8	Pegg/Short	Scotland/Feltham	3:59.0	4:09.8	
9	Fry/Thorpe	Feltham	4:01.8	3:59.8	

### Class 'B' Team Race

		Best Heat	Final	
1	Smith/Yeldham	Feltham/Elliott	3:21.0	7:09.6
2	Langworth/Campbell	W Dale/Grantham	3:31.2	7:31.2
3	Clarkson/Needham	Stockport	3:59.0	Rtd
4	Fitzgerald/Thomason	W Dale/Sheffield	4:15.2	

### Midge Speed

		mph	
1	B Wade	Elfin	99.1
2	M Taylor	Elfin	90.4
3	A Brough	Frog	88.3
4	B Brock	Frog	85.0
5	A Cottam	PAW	74.7
6	I Hewitt	PAW	74.4





**Left: Neil Gill takes time out from F2D preparation. Below left: F2C winners Fred Meijer (left) and Rob Metkemeijer look pleased with their efforts. Key behind-the-scenes man Bert Metkemeijer at right.**

aficionado Bill Draper, who set new sartorial standards by turning up in a gleaming white boiler suit! The other new entrant was Chas Taylor with his 1955 Razzamachas, which he had last flown in 'B' proper at the '74 Nats. The *Aeromodeller* report of that event begged Chas to build a new model; this time he had, but his Tantivy was sidelined in favour of the old faithful.

The first heat saw Andrews/Horwood improve to 4:15 against Taylor/Yeldham/Barnes' 4:59.8 and Ian Hewitt's 3:57.3 (young Ian coping very well in such distinguished company). But it was the third heat that was the sensation. Frost/Taylor managed 6:43, Langworth/Pilgrim 5:13, but Chas clocked a superb 3:42.3. The sound of that motor is still ringing in my ears! The final heat - at sunset - saw Skitt/Ward improve to 4:13.6, good enough for second place.

All in all, a fine event. Vintage T/R goes from strength to strength. Roll on next year!

### Open Goodyear Report by Dave Rudd

A blustery Saturday morning saw most competitors ready to fly. The competition had an International flavour with teams from New Zealand and Ireland besides over-the-border entrants from Scotland. Indeed, the Kiwi team of Coghlan/Williams were first away, but their 7:25 was below their potential. The next heat was a fast two-up between established Goodyear practitioners; Clarkson/Needham's 2:57 giving them victory over Catlow/Jephcott by just five seconds. Times in the next few heats, beset by retirements, were generally slow with the exception of McPeake/Jenkins (3:54) and Groome/Horne, who were leaders at the end of the day thanks to a very fast 3:48.

Heavy rain on Sunday morning delayed the start but most teams flew happily in the strong wind that persisted for most of the day. NZ fliers Coghlan/Williams were the only team to record a good time (3:57), for most failed to better their first-round efforts. Cut-off time for admission to the semi-finals was 4:16.

Monday's semis started at 9 am. The first heat was a 'two-up' affair because Simon Groome's pitman had overslept! The pressures of competition... Catlow/Jephcott retired at fifty laps, leaving Clarkson/Needham to return a faultless 3:57. By comparison, the next heat was slow, Lorimer/Ross best at 4:29. There was an improvement in Heat 3, Coghlan/Williams returning 3:55 and Andrews/Horwood slightly down at 4:18.

All teams needed to improve in the second round which took place after lunch, but Catlow/Jephcott could manage only 4:03, insufficient to qualify for the final, as Groome/Horne flew a very fast 3:50.

Beyond doubt the final would be fast and hectic. Regrettably, Groome/Horne retired early after their first pitstop caused model breakage. Clarkson/Needham and Coghlan/Williams continued to fight it out, but the diesel-converted Irvine .15, latest motor to benefit from the famous Needham 'fluence', was really singing towards a new National Record time of 7:31. The New Zealand pair fought valiantly, their 9:07 being honest enough reward for hard work over two days of competition.

### Class 2 Goodyear Report by Dave Rudd

Dominant engine in this event, flown over eighty laps, was the PAW 249. There were no surprises; experienced teams managed the fastest heat times, often thanks to withdrawal of the opposition. Notable were Daglish/Daglish on 4:25 and Munro/Gordon (4:34) but ahead after the first round were Catlow/Jephcott with 4:10. Clarkson/Needham and Andrews/Horwood were also in the running with 4:25 and 4:40 respectively.

The second round on Sunday morning was delayed thanks to that heavy rain and high wind. Although conditions improved slightly, several teams chose not to fly. Andrews/Horwood improved to 4:27 and Clarkson/Needham raised their pace with 4:15. Last to qualify for the semi-finals were Heaton/Heaton (4:46) and Barker/Tomkins (4:48).

The first round of the semi-finals on Monday saw Clarkson/Needham leading on 4:19 with Andrews/Horwood chasing hard with 4:27. Surprises came in the second round. Catlow/Jephcott were fastest with a splendid 4:15. The others all failed to improve.



## 1988 Scale and Control Line Nationals: Results

### F2A Class Results

Class	Place	Name	MPH	Handicap record (mph)
I (0.8cc)	1	Tony Eifflander	90.61	102.15
II (1.6cc)	No flights recorded			
III (Open 2.5cc)	1	Paul Eisner	191.39	192.52
IV (FAI-F2A)	1	Peter Halman	175.76	177.40
	2	Paul Eisner	167.94	177.40
	3	Dave Brewin	166.72	177.40
	4	Dick McGladdery	164.39	177.40
	5	Robert Metkemeijer (Hol)	155.37	177.40
	6	Gordon Isles	152.30	177.40
	7	Paul Rietbergen (Hol)	146.71	177.40
V (5cc)	1	Ian Skinner	160.30	185.03
	2	Brian Blackwell	125.48	185.03
	3	Dick Roberts	120.55	185.03
VI (Open 40)	No flights recorded			
VII (10cc)	1	Ken Morrissey	208.13	215.93
	2	Ray Cox	180.15	215.93
	3	Dick Miles	153.77	215.93
VIII (Formula 40)	1	Dick Miles	144.25	172.74
IX (Novice 21)	1	Ian Mander	160.27	164.00
	2	Des Ratcliffe	149.86	164.00
	3	Maurice Roberts	123.95	164.00
Formula 21	1	Dave Smith	176.45	174.49

### F2B Aerobatics

			Flyoff total:
1	A. Eifflander	Freebird	PAW 40
2	W. Draper	Superhawk	Enya 40SS
3	B. Robinson	Northwind	ST 60K
4	N. Dickinson	Tara	Merc 61
5	J. Hamilton	Genesis	ST61
6	M. Doyle	Aquarius	ST46
7	I. Ward	Stiletto	ST46
8	E. Sharp	Kestrel	ST46
9	D. Beesley	Classic	ST46
10	P. Coates	Maxi 46	ST46

### Class 2 Aerobatics

1	R. Handscombe	Samba	Enya 40SS	1920
2	T. Lloyd	Superhawk		1703
3	J. Smith	Freebird	OSOF 61	1611
4	B. Temporal	SIG Twister	OS35	1403
5	B. Sylvester	Freebird		1389

### Mini Goodyear

1	Broadhead/Worgan
2	Crawford/Vaughan
3	McPeake/Jenkins

### 1/2A Combat

1	Richard Herbert
2	Stuart Vickers

### Diesel A

#### Combat

1	Frank Smart
2	Chris Bishop

### F2D

#### Combat

1	John James
2	Martin Leeper

### Open Goodyear

	1st Heat	2nd Heat	1st Semi	2nd Semi	Final	
1	Clarkson/Needham	3:57.2	5:18.8	3:57.1	3:44.0	7:31.8
2	Williams/Coghlan	7:25.0	3:57.7	3:55.1	4:02.9	9:07.7
3	Groome/Horne	3:48.0	4:27.9	No fly	3:50.8	Ret Crash
4	McPeake/Jenkins	3:54.8	5:58.5	Ret	4:49.9	
5	Catlow/Jephcott	4:02.8	No fly	Ret	4:03.7	
6	Broadhead/Wogan	4:02.9	4:14.1	Ret	4:03.7	
7	Andrews/Horwood	4:10.2	No fly	4:18.3	Ret	
8	Crozier/McAlpine	4:13.7	4:30.8	4:44.6	Ret	
9	Lorimer/Ross	Ret	4:16.5	4:29.0	Disq	

### Class 2 Goodyear

	1st Heat	2nd Heat	1st Semi	2nd Semi	Final	
1	Clarkson/Needham	4:25.6	4:15.4	4:19.9	No fly	8:40.8
2	Munro/Gordon	4:34.6	4:35.1	4:32.2	4:15.5	8:53.7
3	Catlow/Jephcott	4:10.9	No fly	6:49.1	4:09.5	8:59.9
4	Daglish/Daglish	4:25.8	No fly	4:25.6	Ret	
5	Andrews/Horwood	4:40.1	4:27.3	4:27.1	4:33.0	
6	Vaughan/Cranford	63 laps	4:40.0	5:19.1	Rtd	
7	Morrissey/Ross	5:32.4	4:45.7	Disq	No fly	
8	Heaton/Heaton	4:59.5	4:46.2	4:46.0	4:44.8	
9	Barker/Tomkins	4:48.3	4:59.3	5:27.5	Ret	

### 1/2A Team Race

	Best Heat	Best Semi	Final	
1	Heaton/Haworth	3:26.5	3:27.9	6:56.0
2	Meijer/Metkemeijer	Netherlands	3:37.2	4:09.6
3	Williams/Coghlan	New Zealand	4:42.9	4:19.2
4	Hill/Metcalf	Sheffield	4:02.8	
5	Whorton/Short	Feltham	4:07.7	
6	Smith/Bollen	Elliott	4:12.1	
7	Crozier/McAlpine	W'Dale/Feltham	4:30.2	

### Vintage A Team Race

1	Andrews/Horwood	3:58.0
2	Schofield/Miller	4:00.2
3	Bower/Bower	4:05.0

Best non-Oliver: Miller/Schofield 5:37.0

### Vintage B Team Race

1	Taylor/Yeldham/Barnes	3:42.3
2	Skitt/Ward	4:06.0
3	Andrews/Horwood	4:14.0





**Top: Martin Leeper's Russian-style F2D wing prepares for battle. Martin lost to John James in the final after despatching fierce competition on the way. Above: Martin Kizsel (left) with merry band of 1/2A Combat helpers. Didn't quite make the semis despite brave fight.**

In an incident-free final Clarkson/Needham clocked 8:40 for victory. Scots runners-up Munro/Gordon were thirteen seconds behind.

The Novice final was a pedestrian affair. Vaughan/Crawford's 10:29 was sufficient to beat Morrissey/Ross; the Heaton father-and-son combine took third.

## Mini-Goodyear

With so much activity elsewhere all teams declined the opportunity to fly on Saturday. Perhaps some were hoping that the wind would drop on Sunday and make life easier for the novice pilots. Thanks to rain, flying did not start until 1.30 on Sunday. All teams were notified that they would be required to record both their heats on the day, to allow for semis on the Monday.

Bob Walker, that stalwart of Mini-Goodyear, had once again brought a strong force of lads from Allerton Grange School. The first heat comprised two such teams, Young/Walker and Taylor/Tear who in an uneventful race recorded 5:14 and 5:51 respectively.

Heat two saw an experienced Feltham all-junior team of Smith/Buckingham against Court/Court, a new team from 3 Sisters. Smith/Buckingham recorded 5:40 whilst Court/Court had the misfortune to break their prop at their second pit stop.

The much fancied teams of Tear/Walker and Thorpe/McAlpine battled the best race so far with only seven-tenths of a second separating them. Tear/Walker 4:43.8; Thorpe/McAlpine 4:31.1. Thorpe/McAlpine decided to stay in the circle where they were joined by Jones/Jones of South Bristol. This was a hard-fought race with both eager pilots picking up warnings for whipping. Heat five saw Wharfedale's Kopasz/Pickles matched with Court/Court. The former team ran calmly and smoothly for 5:54 but Court/Court managed only a 6:15 after four stops.

The Anglo - Scottish pairing of Heaton/Crozier ran against Kopasz/Pickles in Heat six. Although fast and exciting, Heaton/Crozier were not as

reliable as expected, running out of steam at 96 laps. Kopasz/Pickles improved by almost a minute to 5:09.

Whitehouse/Whitehouse (Harrogate) flew against Jones/Taylor (S.Bristol) in Heat seven. Both pilots were making their Nats debut and in the process provided the onlookers with more than a few exciting moments. Young Mr. Whitehouse's change of hands during a mixup halfway through the race brought a well-deserved round of applause, and both pilots were cheered at the finish. In a Heat eight rematch Jones/Taylor unfortunately crashed whilst Whitehouse/Whitehouse improved with a 6:23.

Heaton/Crozier then made their second run against Tear/Walker. Result: Heaton/Crozier 5:09; Tear/Walker 6:35.

Last year's winners, and number one seeds, Higgins/Horwood of South Bristol team apparently suffered from a blocked jet and could only record 7:07 whilst Taylor/Tear improved to 5:40. Smith/Buckingham then made their second attempt against the 3 Sisters duo of Ross/Ross. The Feltham team were unable to improve and Ross/Ross retired with a broken prop.

Higgins/Horwood then got their act together to record the fastest time of the day with 4:12. The two Hickman Brothers from South Bristol, both making their Nats debut, were drawn against each other. Leon was pitted by Tim Andrews and Ben by Gordon May. Unfortunately the race became a little confused and young Ben had to retire whilst Leon cruised home gently in 6:58. The weather had now turned cold and blustery, the hour was late and the contest director decided to let those teams with one heat left to make their runs on the following day.

Monday dawned sunny and breezy, and after the Midge speed chaps had cleared the circle the last couple of heats were run off. With the stiff breeze making flying difficult, Ben Hickman decided to withdraw, after making a few practice flights. Brother Leon paired with Gordon May to race against Ross/Ross who broke their model on a fast stop whilst Hickman/May failed to improve.

## Mini-Goodyear Semi-finals

Nine teams were drawn but unfortunately a couple had already left the site, homeward bound.

The first semi was run as 'three-up' with Tear/Walker, Jones/Jones and Thorpe/McAlpine. The race was hairy, to say the least, with all pilots pushing to the limit. At 75 laps Jones/Jones crashed and damaged their best model. Thorpe/McAlpine made an unscheduled stop which cost them 5:13 but Tear/Walker were quite happy with their 4:42. Thorpe/McAlpine stayed in the circle to fly against Heaton/Crozier and Smith/Buckingham. The latter team crashed at 60 laps, writing off the model, Thorpe/McAlpine recorded 4:50 and Heaton/Crozier 4:59.

Higgins/Horwood, Heaton/Crozier and Taylor/Tear then raced. Higgins/Horwood 4:23, Taylor/Tear 6:50; and Heaton/Crozier retired after a fretful race. The final thus comprised of Higgins/Horwood, Tear/Walker and Thorpe/McAlpine. The final started in great style but suffered from over-enthusiastic pilots who all received warnings for a variety of offences. Racing can be a tough business by the time teams reach the Mini Goodyear final at the Nats! The race had run half distance and was showing all the signs of being a great event when misfortune struck Tear/Walker. The motor gave out a horrible clatter and died of a broken con-rod...

Higgins/Horwood had by this time built up a lead of about ten laps when they made an unscheduled stop, which resulted in Bob Horwood having to gallop around the circle to get things going again. Thorpe/McAlpine thus pulled up to level with the South/Bristol team and a great race looked in prospect. Higgins/Horwood ran out of fuel at 180 laps but the model landed at the pitman's feet. The motor reared up thanks to no line tension and by the time Nigel Higgins had things under control he had fouled George Thorpe's model. The South Bristol model crashed and George flew on with the South/Bristol lines wrapping ever tighter around his chest. George Thorpe was forced to land and the race was stopped.

Thorpe/McAlpine, having passed Higgins/Horwood, were declared winners, Higgins/Horwood

were disqualified and placed 3rd, and the retired Tear/Walker put into second place. This was a sad end to a good weekend of racing and the first disappointing final for many years. Last year I was a trifle worried about the possible demise of Mini-Goodyear at the Nats as some of our pilots would soon be too old to compete. This year saw a crop of future racers in action or about to take up the racing handle in the near future. Great!

## Combat Report by Vernon Hunt

At the eleventh hour Ernie Burles, who had agreed to run 1/2A combat only, undertook to organise the other two events ('A' and FAI) with support from his wife Lynn, because as usual, nobody else wanted to know. To rely on, or expect, the same two or three people to run things year in and year out has to stop...

It is traditional that 1/2A is on Saturday, through to the finals, with 'A' Diesel down to its finals by Sunday lunchtime. As F2D is a 'two life' system it is essential to be in this position to have a hope of finishing by 5pm on Monday. As you will find out, this did not happen...

## 1/2A

Eighteen fliers took part, with three from the Netherlands. Loet Wakkerman was trying hard to retain the Nationals title he won last year. Equipment this year was of especially high standard - that of Wakkerman, Herbert and Harrison looking exceptional. There were upsets in the first round when Richard Herbert lost to Chris Bishop, but good wins for Mike Whillance, Loet Wakkerman and Dave Harrison, (who beat Monique Wakkerman). In the loser's round Martin Kizsel, Richard Herbert and Stuart Vickers (all future finalists, surely) battled through to Round Three, where the surprise was Dave Harrison losing 3-1 to Dave Holmes after losing all his streamer. After a reffly Mike Whillance put out Loet Wakkerman, last year's winner; and Richard Herbert won a thriller against Neil Gill by three cuts to two.

Seven competitors remained by Round Four, Stuart Vickers getting the bye. Ernie Burles put out Mike Whillance with a 1-1 score and less ground time. Richard Herbert beat Martin Kizsel 2-0 and Dave Holmes put out Monique Wakkerman, the last Dutch competitor.

Semi-final time! Stuart Vickers beat Dave Holmes 1-0 and the other semi saw a good victory for Richard Herbert over Ernie Burles. In a third and fourth fly-off Ernie Burles was victorious over Dave Holmes. The final, which was flown on Monday night, ended with a well-deserved victory for Richard Herbert.

## Diesel A

Rain on the Sunday morning delayed the start of the 'A' Diesel contest. This was unfortunate, as the class had its highest entry yet with thirty competitors. Paul Stanley, last year's winner, could not attend, but - notably - seven entrants had all chosen the new side-exhaust Nelson diesel. In the first round, old-timer Steve Malone beat Jeremy Bates and Pete Grange was well beaten by Dave Holmes.

After the losers' round twenty-two competitors still remained. Of particular interest was the fact that Frank Smart beat Dave Holmes; and Dave Harrison won well against Ken Miles. By this time we were well into Monday, so from Round Four the contest was run simultaneously with F2D, any unsuspecting passer-by being asked to score or to contribute to the event! Eleven competitors remained, with Thomason getting the bye. Steve Malone lost 2-1 to Richard Herbert, Martin Leeper went out to Frank Smart and Dave Harrison beat Mike Whillance. In an elimination round to get four semi-finalists from six, Burles lost to Thomason after the destruction of Ernie's model, and Dave Harrison went out to Chris Bishop. The first semi-final; after a mid-air and equal cuts Frank Smart beat Thomason. Then some good flying by Chris Bishop gave him victory by 3-2 over Richard Herbert. In the third and fourth place fly-off, Richard Herbert beat Thomason. The final took place at around 7pm, Frank Smart emerging victorious over Chris Bishop.

*Continued on page 19*

# LUTONIA

**W**HEN I was asked to build a replica of the late Sid Miller's Lutonia I had no idea what it looked like, although our editor assured me that it was a 'nice cabin model'. How true!

During conversations with vintage enthusiasts, it appeared that the Lutonia had quite an interesting background. I therefore set about researching all I could. Eventually I discovered that the original Lutonia began life back in 1948. Its debut was quite illustrious. Mr. Miller wrote in the 1949 February issue of *Model Aircraft*, where Lutonia was originally featured, that it was designed 'mainly for pleasure'; but he already had his sights set much higher.

## History...

The original model was built with a great deal of extra work beyond the basic needs of a flying model. This involved lightening the wing ribs and rear decking formers via a series of precision holes. These are only the features which Sid Miller actually mentions, so other extra work may have been carried out. It is known that he entered the model in the 1948 Northern Heights Gala Day at Langley. The cover of *Model Aircraft*, August 1948, shows HRH The Queen Mary (now the Queen Mother) holding the uncovered Lutonia and discussing its merits

with Dr. A. P. Thurston. On the day it was actually upstaged by a Black Magic. Later that year Mr. Miller was able to overturn that result when the Lutonia was entered for the 1948 Model Engineer Exhibition. Here it took the coveted Model Engineers' Cup.

I had no such high aims for my particular Lutonia; just the motive of bringing it to the attention of vintage and free flight modellers.

## Vintage stuff! John

## Watters revisits a

## classic 45in. sportster

## In the beginning...

The fuselage is of typical built-up rectangular box section, with sheeted sides and stringers top and bottom. Sounds simple, but there is quite a bit of work involved.

The plan shows the main cabin, formers cut from sheet, with large lightening holes. I changed this by building them up from strips and gussets. There is no reason why

you should not cut them from sheet, but they might be susceptible to crushing from side loads.

The undercarriage was another aspect which I changed. Ever since building my first Tomboy I have favoured a removable undercarriage, if only because it makes for easier storage and transport. Purists can of course build 'as designed' - the choice is yours.

I built the sides from longerons and spacers; Mr. Miller's original was constructed by gluing the longerons and spacers onto the sheet sides. The addition of the rear top decking formers and stringers produces a classic vintage shape. Here I found what is possibly a drawing error in the shape of former 'F'. As drawn, it is not wide enough to fit; but easily remedied. The nose area should not give any problems. The motor you choose will determine the location of engine bearers. The original model used a Frog 100, radially mounted, so no bearer positions are shown. Having decided to fit my model with an original Mills 1.3 (previously owned by the late Howard Boys), I had to arrange bearers to suit.

The Frog motor originally installed was fed by an external 'eye dropper' tank, but I decided to use the Mills tank. Filling is accomplished by a large hypodermic syringe, an extension tube being placed over the blunted needle.

Having sorted out the motor fitting, the remainder of the fuselage can be completed. The rear 1/8in.sq. top stringers are shown on top of the formers, from the rear of the wing platform to former G. This area is not totally clear on the drawing. Some curved sheeting is also shown forward of former H. Taking some licence here, I sheeted the rear section over, as indicated, and continued the stringers up to this sheeting. Both sides of the fuselage are sheeted with 1/16 in sheet continuing up across the cabin area, with cut-outs for the glazing. The cabin top area is shown as sheet covered, also with large cut-outs.

How each person builds his or her model is a personal choice. I basically followed the design of the cabin top but again built it up from strips and gussets.





The nose area is a built-up sheet and block affair. I left a slot on either side of the undercarriage formers to allow removal. If a fixed undercarriage is used, the area in between the u/c wires can be sheeted in. With a removable undercarriage it is difficult to do this, as springing out the rear wires puts too much strain on the sheeting.

Remaining areas of the fuselage are self-explanatory and pose no problems.

### Spread the wings

Here we have a classic style, a graceful semi-elliptical outline. The wings are not complicated, but there is quite a lot of 1/32in sheeted areas, which requires some care during cutting out.

The trailing edge is a two-layer construction, with a 1/32in sheet base and a tapered trailing edge strip on top. Actually building the wings should not present any problems; construction is typical of the era.

A section through the wing tip would have been a useful addition to the plan. Here some licence had to be taken. As with the fuselage it will pay to check the same of the wing ribs against the wing plan. I found that ribs cut direct from the plan sizes did not always match up.

A curious point is that the two outermost ribs do not have any undercamber. This makes for a dip in the bottom spar as it goes out to the tip. I could not find any reason for flat-bottoming these ribs, although they do not detract from appearance.

The main outer panel was packed up to 3.1/4in at the tip. The inner centre section panel was then built. The dihedral angle is maintained by 1/32in ply plates on either side of the main spars. Fitting these plates involves cutting through the rib at the dihedral break. Some care was required here, as that particular rib needs to be carefully re-aligned. A possible better join would have been to place a 1/8in ply dihedral brace between the top and bottom spars..

Maintaining as much original construction as possible, I persevered with the 1/32in ply plate. In the end it all came out quite well.

The slots are formed after sheeting over the front of the wings. Slicing carefully through the sheeting at the slot position, the 1/32in sheeting can then be bent down onto the ribs up to the slot leading edge. Riblets are then added at the slot rib position, with the upper part of the slot former from 1/8in sheet. Once the capping strips above and below each rib have been added, the whole structure becomes very strong.

Wing halves are located by 1/8in dowels. After sitting the wing on top of the fuselage, the fairing between the top of the wing and the cabin top can be made from block or sheet.

It appears that the wings were intended to be held on by rubber bands passing through holes in the fairing pieces. I replaced this method by bands over the wings onto the dowels through the cabin. A small hook is provided under each wing centre section to tie both wings together. I found no need for these hooks as the dowels in the wings and the bands provide sufficient location.

### Tail feathers

The tailplane construction follows closely that of the wings. Although the ribs are capped, this is only stated as a 'note' and could be missed by the unwary. A balsa block is shown containing a paper tube as a support for the fin. I noticed that the position of this pivot tube, when matched to the fin pivot dowel did not locate the trailing edge of the



*Rather more elegant than your average 'forties power job; Lutonia displays elegance — and slots.*



fin at the trailing edge of tailplane. I ended up modifying the position of the pivot tube to set both trailing edges together; this is not indicated on the plan. A small bamboo peg is shown, located in the underside of the fin at the trailing edge. This is used to locate in a small ply plate on the tailplane as a fin offset stop. Not having any bamboo my choice of substitute was a piece of 22swg wire. A small wire hook is used at the rear of the fin as a band locator. No other form of fixture is apparent for holding the fin onto the tailplane. Up to now this seems quite sufficient, although everything depends upon the fit of the fin pivot.

### Covering and finishing

According to Mr. Miller's article, he covered his original model in Jap silk, gave it two coats of Cellon, glider dope, followed by two coats of Cellon filler, topping all this off with a further two coats of Woolworth Enamelite. As he notes this does put the weight up. His model is quoted as weighing 19oz with a Frog 100. My finished model, fitted with a Mills 1.3, weighs in a bit lighter.

True vintage fans may find the type of covering material I used for my version of the Lutonia almost sacrilege. Having obtained some of the new Solartex Litespan tissue part way through building this model, it seemed the ideal opportunity to use this covering.

Having up to then been a dope and tissue user, the move into using this new material, was taken with a little trepidation. The final results, I must say, turned out very well, and must admit that I am now quite hooked.

The choice of covering material must be a personal one. Silk or tissue will also be obviously suitable. There is no reference in the original article, or from any other source I have researched, that states the model's original colours. Other than, that part of the body and sheeted areas of all the flying surfaces were darker than the remainder.





Left: Mills 1.3 power is ample; anything from 1-1.5cc will suit. Below: Construction is straightforward; little extra work needed to create distinctive lines.

### Flying!

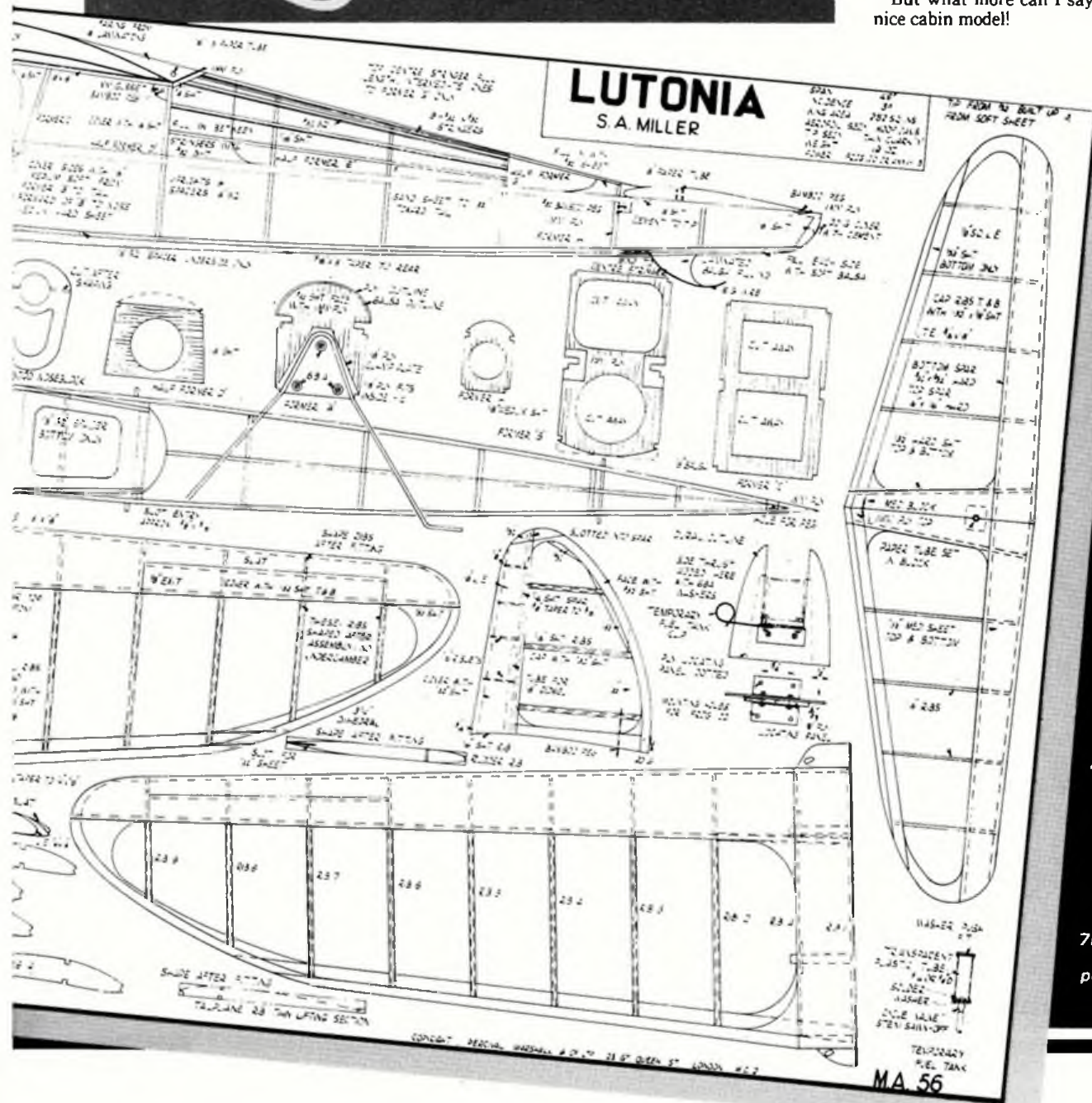
Just like with any model, balance was first established. Some weight being required at the rear. Test glides indicated a slight dive, eventually cured by 1/16in packing. What also became immediately apparent was the model's stability as it almost floated along on the breeze.

Running up the Mills was no problem, although judging the amount of fuel put into the tank was. I eventually resorted to counting the number of drops going into the tank from the syringe. The rudder was set to give maximum left offset.

The popping engine note was music to the old ears, as Lutonia was launched into wind. The model flew straight and level, but as flying speed increased, it rose steadily but with apparently no increase in its flying angle. Turn was smooth, although the amount of offset required is small. Transition to the glide was hardly discernable and she came to rest on her wheels.

After the flying session, taking stock of the model revealed that the undercarriage was bent slightly. This results from the rear wires making the undercarriage quite stiff. As the front legs are in a slot they can slide within the slot and bend on the slot edge.

But what more can I say; it's, yes, a very nice cabin model!



Plans of Lutonia are available from ASP Plans Service at 9 Hall Road, Maylands Wood Industrial Estate, Hemel Hempstead, Herts HP2 7DH. for £4.25 plus 60p postage. Quote MA56 when ordering.



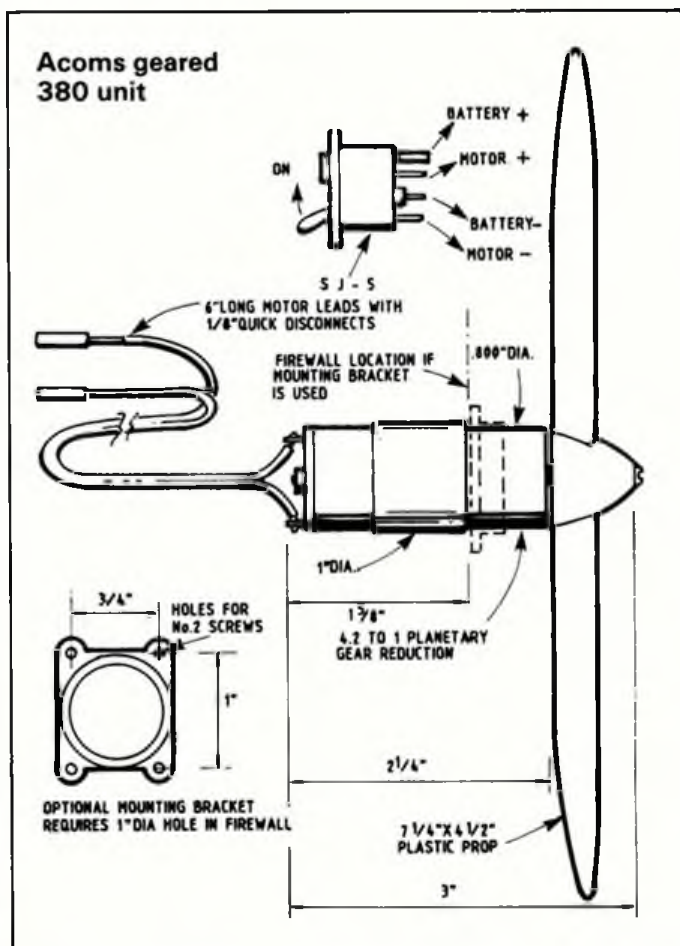
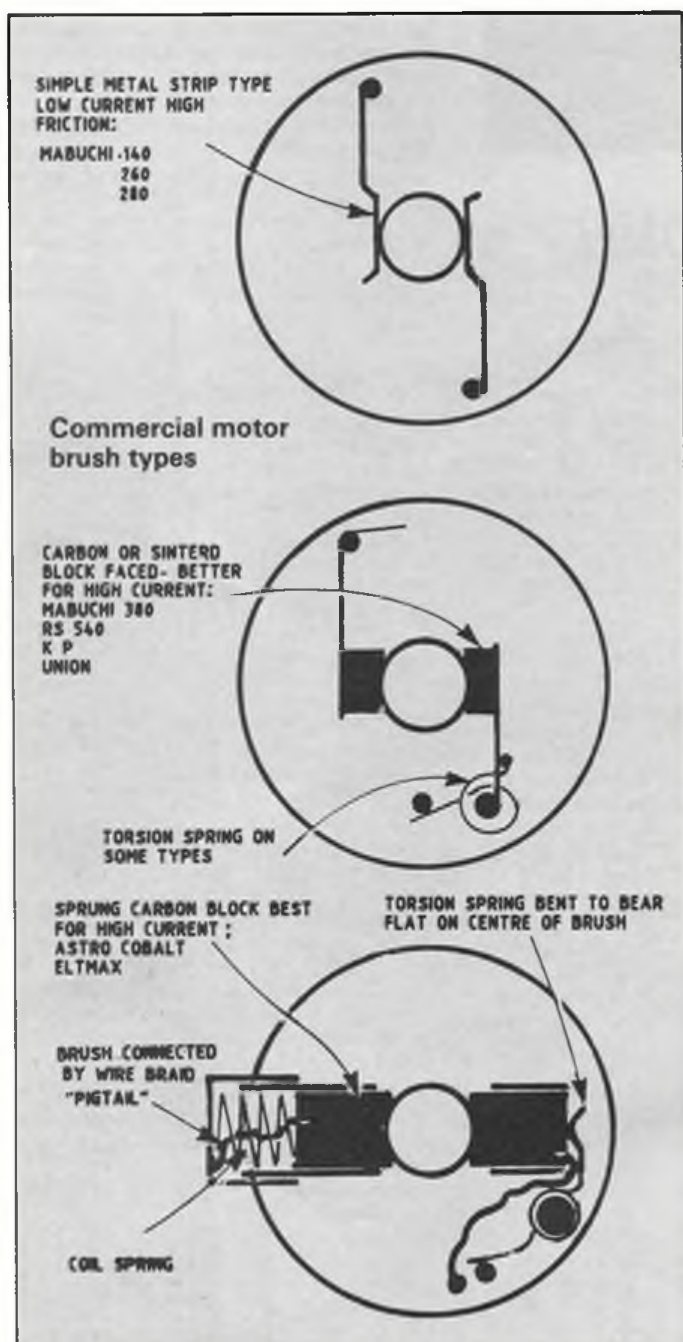
# High

# potential

## In Part Three Chris Coote takes a close look at electric motors

AS YET there are very few standard motors available for electric F/F. However, this situation will surely not last long once manufacturers have realised the potential of this form of power. But let's examine what we can buy. The first easily-obtainable item is the small KP unit reviewed briefly in a previous issue of this magazine. This is, I think, the smallest and lightest practical unit that is likely to be conceived. It is suitable for Indoor and outdoor models up to 120gm weight. The very neat, geared motor is mated to a plastic tubular battery holder that can

be screwed to the back of the motor mount, or fixed remotely in conventional fashion. Three 50 mah cells provide good power for about 40 seconds via a specially moulded 5.1/2in. prop. These props are available separately and make an excellent choice for the home experimenter - say, when directly driven by RE140 or 260 motors from MFA. A particularly neat and useful feature is the integral on/off switch, which gives good crash protection because the batteries are disconnected by the action of the prop shaft moving rearwards, as happens in a crash or



Left: The Acorns geared 380 flight unit, shown above in diagrammatic form.

hard landing. A charging battery with special volt-dropping resistor incorporated is available, which makes the whole system almost foolproof. Speed control resistors are also available, as are spare 50 mah cells and battery holders. Altogether a very enterprising and welcome UK development.

I am sure that Roy Ashby's series of articles must have enthused many of you experimentally-minded types out there, so it's worth repeating that the RE range of motors is available from MFA at fairly low prices (see photo and specification sheet). The smallest RE140 will drive the KP prop (which is a neat push fit on the shaft) for 45 seconds or so at 3000-3500 rpm using direct drive from three 50 mah cells. This set-up will fly a lightly loaded sports rubber model up to 30in span and 80gm all up weight. (Note that motor battery and prop will account for about 45 grams of this!). As a comparison, the much more efficient KP unit will drive the same prop at 4000 rpm plus for an all up weight of only 30 grams or so. The main limitation with these 'cheap' motors is the very simple strip-type brushes and low melting point plastic commutator which limits the maximum current that can be passed before failure occurs. Such high currents arise when trying to direct drive too large a prop - so I would suggest that 5 or 5.1/2in is the maximum diameter used, combined with a fine pitch.

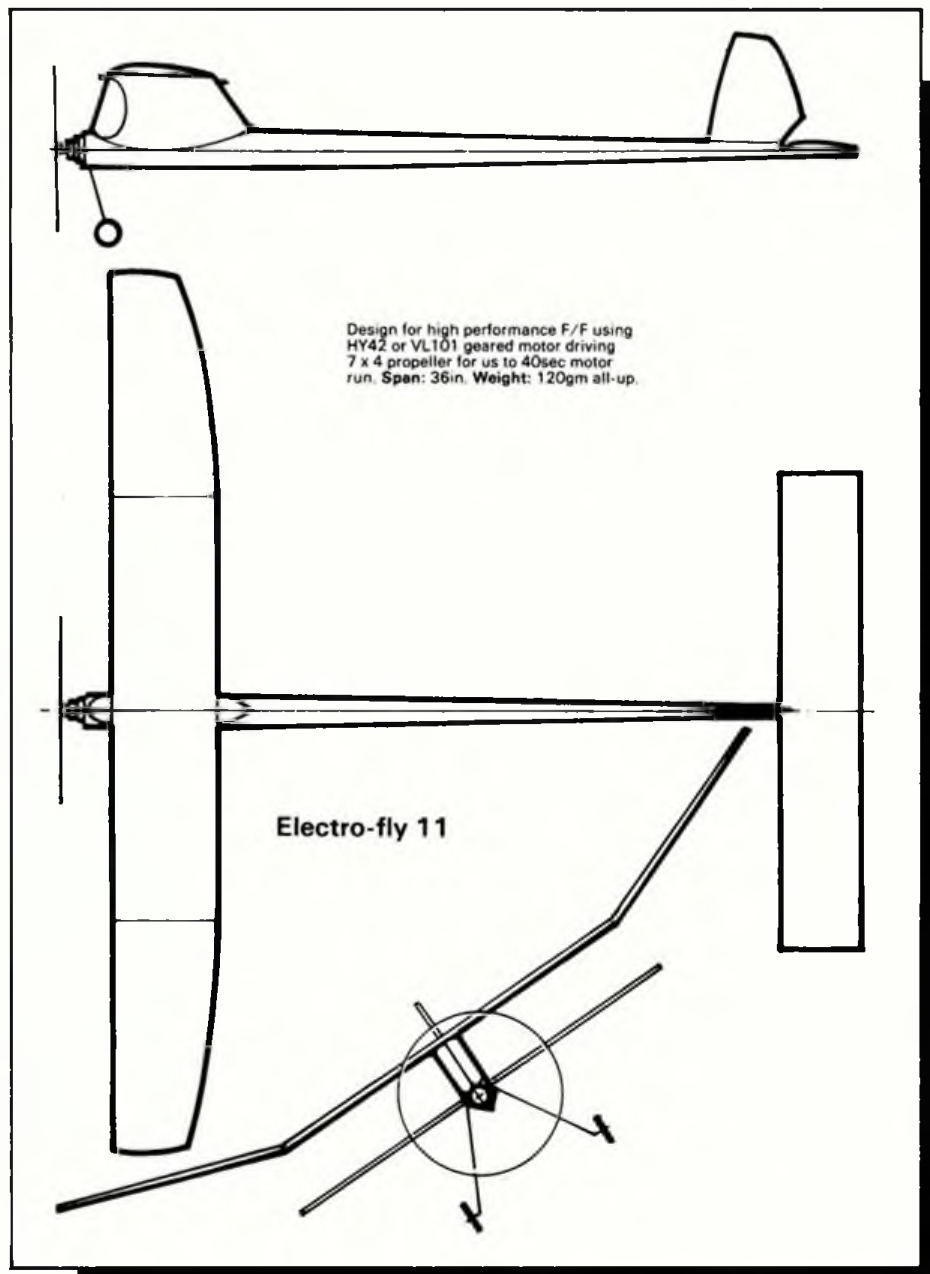
### Bigger stuff...

Going up the scale the RE260 is a useful size, the larger diameter armature giving a useful increase in torque for only another nine grams weight penalty. Once again, three 50mah cells can be used, but the extra power available means that extra payload can be carried and up to 120mah cells used for longer duration. Once again the brush gear is of crude strip type, thus limiting maximum performance.

The next size up is the RE 280, which has the same armature diameter as the 260 but possesses a longer case and thus greater length of wire turns on the armature. More torque results. As standard this motor is double the weight of the RE140 at 42gm, and will turn the KP prop at a steady 5000 rpm on three cells, but will take more, and can be used with four, or even five-cell battery packs if allowed to 'rev' well. A four-cell 180mah pack direct driving a 6in Peck rubber prop is about the limit; it will fly a 'lazyish' sports model up to 150gm all-up weight. This motor responds well to rewinding since it has the length of armature to benefit from it. Try using 28swg (.015in) wire, about 55 turns per pole for lots of power on three cells, but beware of molten commutators if you overload with a big prop! Also, with these larger diameter case motors, the clearance between magnets and armature is often excessive. Some benefits can be gained by shimming the magnets inwards in the case to give a clearance of .04 to .006in. I used thin steel shim of .001 and .002 thickness to do this; the material can be obtained from local engineering tool suppliers, or failing this from KR Whiston, Union Mills, Stockport, Cheshire. See also last month's feature.

### Smaller, too

The smallest (and lightest) motor in the RE range (with carbon block brush gear to handle high currents) is the RE360. This is the same size as the very popular American Astro 02 unit, but unfortunately comes from



MFA with a fine wire winding totally useless for twelve-volt operation. I have purchased the same motors from my local electronic shop as 'surplus' items for 75p, and they certainly do respond well to rewinding with 24, 26, 28 or 30 swg wire. This same motor goes under the designation M3 in some catalogues, and is the same diameter as the very popular 380 unit, but the case is shorter by 3/8in. (10mm). I even have a version wound with 27 turns of 20 swg wire per pole, which gives a fierce performance on only two cells (450mah), but at the expense of current consumption in the region of 10amps! This one has a modified commutator with crimped connections for reliability and a heat-proof fibre centre. It will turn a prop up to 8 x 4 on direct drive - and shows what is possible for flying 12-15oz models up to 50in. wingspan with ease using 2 x 500mah pencil type batteries.

### More power still!

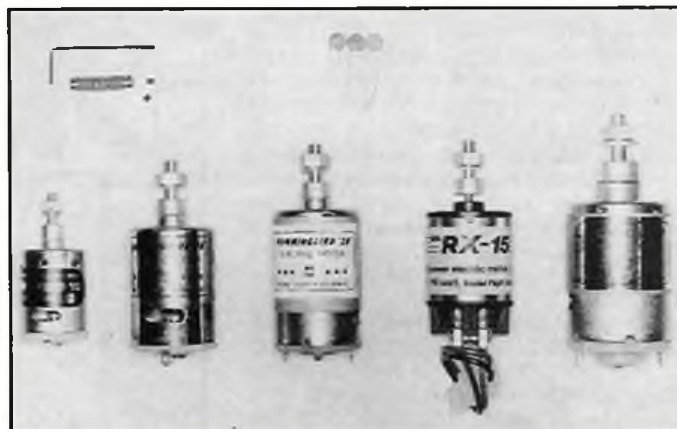
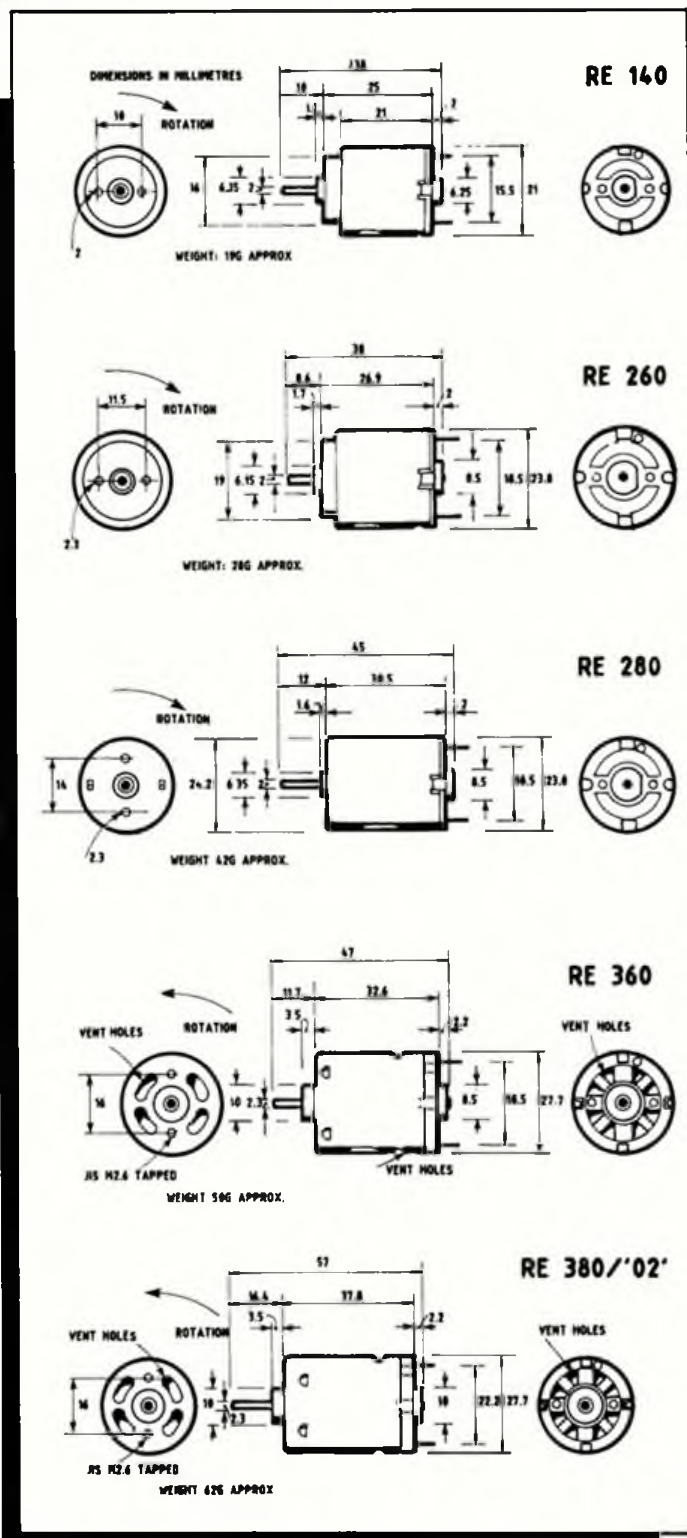
The largest of the RE motor series that I shall consider is the RE380/02 from the MFA range. This is a very popular size which may be found in most model shops since it is widely used in boat and car models. It is a fairly hefty 62 gram motor capable of direct drive to a 5 x 3 power prop at some 12-13,000 mrp. Actual power output is probably equivalent to an average .049 glow motor or

good Cox .020. MFA sell this motor as the 02 electric flight pack for F/F, complete with matching battery pack and switch harness for around £20 (part number 288).

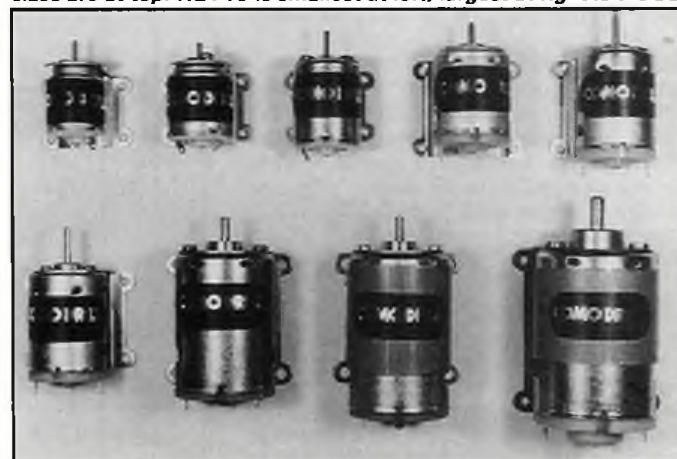
This makes it very easy for a novice to start in electric F/F by installing the unit in any of the numerous sport F/F designs aimed at 0.5-1cc motors. A Veron Cardinal or similar would be an ideal choice, giving fairly fast, easy-to-use sports-type performance. The standard 02 pack comes with a five-cell 600 mah battery pack, which is intended to give a substantial power run of several minutes. The whole combination weighs in at a hefty 260gm (10oz nearly!).

Although this can be used as described I have obtained better F/F performance using a six-cell 225 mah battery pack. This gives more power (extra volts) and an adequate F/F power-on duration of 60 seconds or so when using direct drive on a 5.1/4 x 3 Top Flite nylon prop. This battery pack weighs in at 70gm giving a total flight pack weight of about 160gm (6oz) complete with prop and adaptor. This is a more realistic payload for the smaller sports models such as the Cardinal, and results in a model only three or so ounces above the weight of a conventionally - powered equivalent. I have also flown on just four 180mah cells, which still gives good power on props up to 7 x 4 for over 60 secs.





Above: MFA electric flight motors: left to right are the Hummingbird 02, followed by the 15, 20, high-power RX-15 and 30. Below: The complete 'cheap' MFA range. Most useful sizes are at top: RE140 is smallest at left; largest at right is the 380.



Doug Sheppard (of Indoor Scale Nats fame) has a Blackburn Dart biplane of some 36in span, weighing in at 17oz ready to fly and fitted with one of these units. Initial trials have shown that the six-cell battery pack gives far too much power, and experiments are proceeding with only four or five 200mah cells. The Acorns gearbox assembly is commendably light, adding only about 20gm (less than one ounce) to the total weight of a 380 motor/prop combination. Note that the same 380 motor is also available as a ready-gear unit, meant from Graupner for marine applications. This unit is equally at home in aircraft, but you will have to find a suitable prop and a means of attaching it to the output shaft! Suggested prop size in the range 8 x 6 up to 10 x 6 as standard power types.

Left: Will they fit? Full dimensions of MFA motors as described in text. Performance data appears on opposite page.

The use of such higher power motors and power model type props at high rpm means that it is not possible just to push the prop onto the motor shafts. Luckily MFA can supply neat alloy adaptors which may be secured to the motor shafts via a grub screw, and leave a conventional threaded part for the prop. See the MFA catalogue for full details (part number 203).

### Get the gear

Running small props at high rpm is not a very efficient way of producing the thrust required for a slow-flying, 'draggy' scale model. A better bet is to use gearing to enable the motor to turn a larger, more efficient prop at less rpm. Fortunately commercial interests have also seen to this, and the popular 380 motor, as above, is available in a convenient geared package. Produced by Acorns, this is intended as a spare for their ARTF foam

electric R/C models. The last one I bought cost £16. (See diagram).

What you get for your money is a standard 380 motor with a press-fit brass pinion on the shaft. A plastic gearbox is supplied into which the motor plugs; it is secured with two small M3 screws. A fine pitch 9.1/2in. diameter plastic propeller (looking rather like a high-speed rubber model prop) is also included, and this screws directly onto the threaded output shafts of the gearbox. A wiring harness completes the outfit. This consists of a main motor switch and standard Tamiya-type battery connector which mates directly with the plug supplied with the standard 600 mah battery pack (also available as spares). Such a combination will fly a model of up to 30oz, and if used with smaller, lighter battery packs is eminently suited to powering those popular F/F scale designs aimed at .75 to 1.5cc engines.

### Transatlantic favourite

Last but by no means least in this brief review of commercial products is the geared Hytorc HY-42, produced by the American company VL Electronics. This has been very well-established for more than ten years. It consists of a high-quality version of the RE260 type motor mated to a neat epicyclic gearbox, giving a reduction of approximately 4.1/2 to 1. The motor has carbon block brushes and crimped armature winding connections to a heatproof commutator. The motor is designed to run on three or four 100mah cell battery packs turning a specially designed power model type prop, nominally 7.1/2 x 4.1/2, at 4000-4500 rpm. The manufacturer states that the basic motor unit is available from them for \$13.95 plus airmail post and packing charges. This probably means that it will cost you up to £20 by the time you have paid customs duty and so on. However, this is a very worthwhile and easy

to use unit, having the advantage of light weight (48gm) and good reliable power output. It is roughly equivalent to the old Mabuchi A1 motor, but in a geared setup. My old A1, modified to gears, now lifts Doug Sheppard's 26in span 170 gm scale Blackburn Bluebird to such good effect that he won the Spring SMAE F/F Scale event with it, thanks in no small part to the excellent flight score.

Also shown here is a drawing for a 36in span contest type F/F model meant for this unit. Claims have been made for a VTO type performance if overall weight is kept to below six ounces, though personally I doubt this. However, my geared A1 completely transformed the performance of my old KK Senator when used in geared mode on only two 100mah cells. On direct drive to a 4-1/2in. prop, max altitude was about 30 feet after a very careful launch (trying not to stall the model after the relatively hefty heave needed to get it up to flying speed!). After changing to a 5:1 geared set-up driving a Topflite 7 x 4 nylon prop, again on two cells, the climb became similar to that of the rubber job, but was steadily maintained for 45 seconds. Lots of retrieving was required, following the tight spiral climb!

The H7-42 is a slightly larger unit with perhaps twice the power output of the A1, so it should give the sketched duration model even more performance. I have one of these units on order, so should be able to report at first hand in the near future. The same company have recently sent me some updated information on their latest products, which include a very small geared motor similar to

the KP unit, and some interesting light weight R/C speed control equipment to match the H7-42. It was stated that these units would be available later in 1988, so if you are interested I suggest you contact them direct at:

V.L. Products, 7871 Alabama Ave. 16 Canoga Park, Calif. 91304 USA.

My original VL motor (know as a 101 in those days) was unfortunately bent and burnt out in a C/L model, but more of that anon...

Another very successful American unit is the Astro-Flight 02. This is a RE 360 - size motor with carbon brushes and excellent quality magnets. For F/F applications it is supplied with a four cell 200 mah battery pack, but it can accept up to six cells for very high performance. In America it is commonly used in kits intended for .049 glo-motors. Once again this is a simple direct drive unit with a 5 x 3 prop turning at anything up to 15,000rpm. The annual electric flight championships sponsored by Astro-Flight over the years have usually included classes for F/F scale and C/L scale. Both these events have been dominated by the sort of 'combination F/F and C/L' kits produced by Sterling and Guillou for .020 to .049 glo motors. Thus, direct conversion of the numerous ASP Plans (particularly for F/F scale) for such motor sizes would be perfectly suited to this power unit. Astro-Flight in the UK used to be distributed by MFA but these products are not listed in the latest catalogue. I would suggest contacting one of the larger R/C specialists for supplies of these high-quality units.

## Back to Britain

Finally, I must mention briefly the products of Mole Technology Ltd. This company is involved in commercial aspects of electric/electronic power controls, but as an offshoot it produces a very useful range of aeromodelling items for electric power enthusiasts. Their catalogue is an extremely informative booklist covering many aspects of electric power. Unfortunately for F/F enthusiasts, the smallest motor they produce is equivalent to a Mabuchi RE540 in size and weight. This is the sort of very commonly found in R/C 1/10 scale electric buggies and similar R/C cars. The Mole motor is of much better quality than the typical buggy motor, with an armature winding and magnet setup well suited to electric flight. Of course, this size of motor is used in R/C models, and when geared is quite sufficient to lift, say, a Junior 60 off the deck. If your inclination is towards large vintage free-flyers then this may be the answer for you. The total flight package is likely to weigh over one pound (500 gm).

Other Mole products include heavy duty connectors, cable, batteries and R/C speed controllers, in addition to kits for R/C electric trainers, battery chargers, motors, excellent gearboxes and prop adaptors. Altogether a most useful product line up. I have included their address in the previous list of useful suppliers, but repeat it here for clarity:

Mole Technology Ltd., The Sidings, Cammock Lane, Settle, N. Yorkshire BD24 9RP. Tel: 07292 2092.

## PERFORMANCE DATA

MODEL BRUSH TYPE	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY						STALL	
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	EFF	TORQUE	
			rpm	A	rpm	A	oz-in	g-cm	W	%	oz-in	g-cm
RE 140	15 30	3.0V CONSTANT	14000	0.230	11300	0.96	1.444	10.4	1.210	42.0	0.750	54.0
STANDARD	15 30	1.5V CONSTANT	8200	0.190	6250	0.62	0.089	6.4	0.400	44.2	0.375	27.0
RE 260	15 30	1.5V CONSTANT	6300	0.170	5000	0.65	0.135	9.7	0.50	50.9	0.653	47.0
STANDARD	15 30	3.0V CONSTANT	12500	0.230	10250	1.03	0.222	16.0	1.68	54.11	1.222	88.0
RE 280	15 30	1.5V CONSTANT	4600	0.120	3750	0.53	0.160	11.53	0.44	56.2	0.86	62.0
STANDARD	15 30	3.0V CONSTANT	9200	0.155	7800	0.85	0.278	20.00	1.60	62.3	1.81	130.0
RE 360	6.0 15.0	1.2V CONSTANT	11600	0.140	9800	0.76	0.757	54.5	5.48	60.3	4.86	35.0
CARBON BRUSH												
RE 380/02	3.0 7.2	7.2V CONSTANT	26000	1.000	19000	6.000	5.000	375.00	42.00	47.0	30.000	2160.0
CARBON BRUSH												

## Scale and Control Line Nationals continued from page 12

### F2D

The premier Combat event started on Sunday afternoon. The first match saw Dave Harrison against Nick Perlaki. Sometimes performance can be a disadvantage: Dave removed all the streamer allowing Nick to win by two cuts to one. John James won 3-1 over Mick Tiernan and Mike Whillance beat Monique Wakkerman. Paul Stanley lost to T. Frost on the two-minute starting rule. Both Paul and Vernon Hunt were using Russian equipment but not without problems. The major surprise was Neil Gill losing to Chris Ryder and his Nelson diesel powered model. A most enjoyable match at the end of round one saw Loet Wakkerman removing all of Vernon Hunt's streamer, Vernon then getting the two cuts required for victory.

Neil Gill redeemed himself in round two by beating Nick Perlaki. Martin Leeper beat Mick

Tiernan for a second time to put him out, and a similar fate befell Frank Smart, who lost to Dave Harrison. Frank had lost to Mervyn Jones in the first round. There were also wins for Loet Wakkerman over Mike Whillance (3-1) and a narrow victory for Monique Wakkerman over Paul Stanley with a score of 2-2, ground time being the decider.

From the original 20 entries, sixteen remained for Round Three. Mike Whillance beat Vernon Hunt but Monique Wakkerman lost for a second time, beaten by Dave Harrison, to go out. Neil Gill was eliminated from the competition by Ernie Burles while Martin Leeper, who may not always have the best equipment, but uses it well, sent Loet Wakkerman home.

Of the nine remaining in Round Four, John James got the bye. Vernon Hunt went out to Dave Harrison by three cuts to two and Martin lost his first match against Mervyn Jones. Other victories were Mike

Whillance over Ernie Burles and Tony Frost, who beat Tom Van Mourik of the Netherlands.

At the start of Round Five the only pilot without a pass was John James. John put out last year's winner, Mike Whillance, and Mervyn Jones beat Tony Frost. Dave Harrison eliminated Ernie Burles and - yet again - Martin Leeper sent out the last Dutchman, Tom Van Mourik.

At this point rounds can get complicated, depending upon who has won or lost. In this case, however, life was made easy, for John James beat Dave Harrison by two cuts to one and, likewise, Martin Leeper was victorious over Mervyn Jones by an identical score. In the third and fourth fly-off Mervyn beat Dave Harrison, who was well supported in a back-up model using his Nelson diesel. In the final the performance advantage John James had over Martin Leeper could have been an embarrassment, with scores at 2-2 and a model change for Martin Leeper. John came through to win a well-deserved first Nationals without a loss in the event. This takes some doing!



# SCALE MATTERS

Bill Dennis waltzes up to Walsall for the Autumn Indoor do...

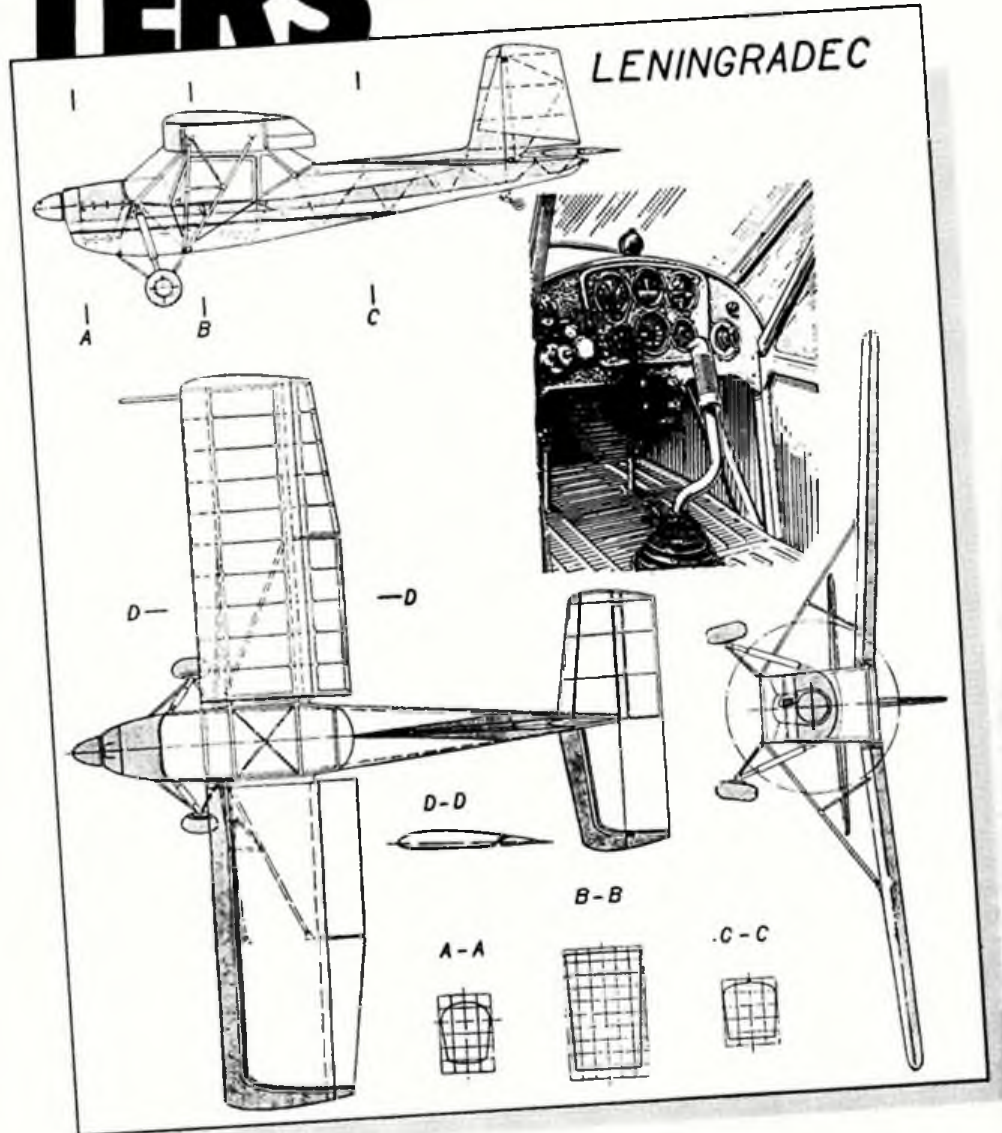
THE SMAE Autumn Indoor meeting was held a little earlier this year, which may account for the reduced attendance. Several regulars were known to be on holiday. Nevertheless the meeting broke even financially, which is always a major concern at these events, and a good time was had by all. Few new models were present - these are usually reserved for the Nationals in April - but there was plenty of interest...

## Rubber Scale

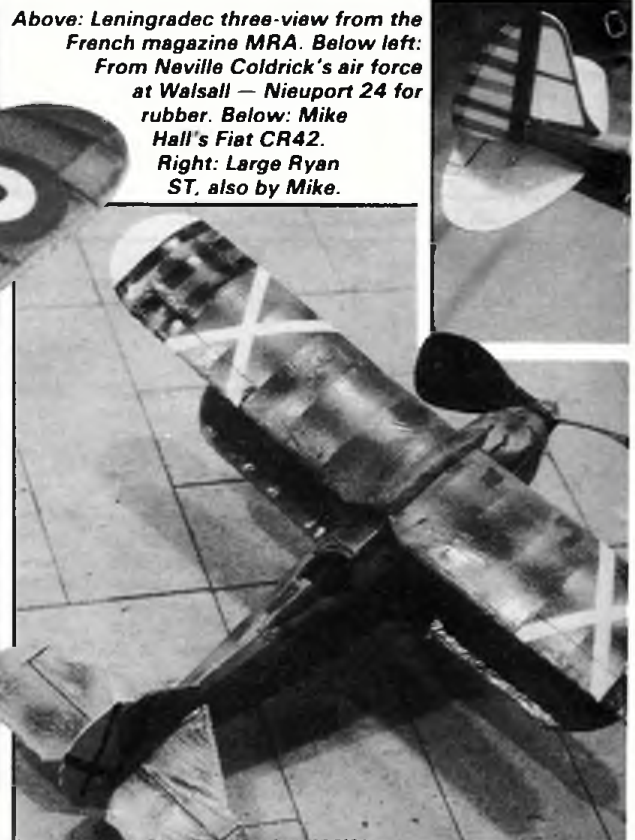
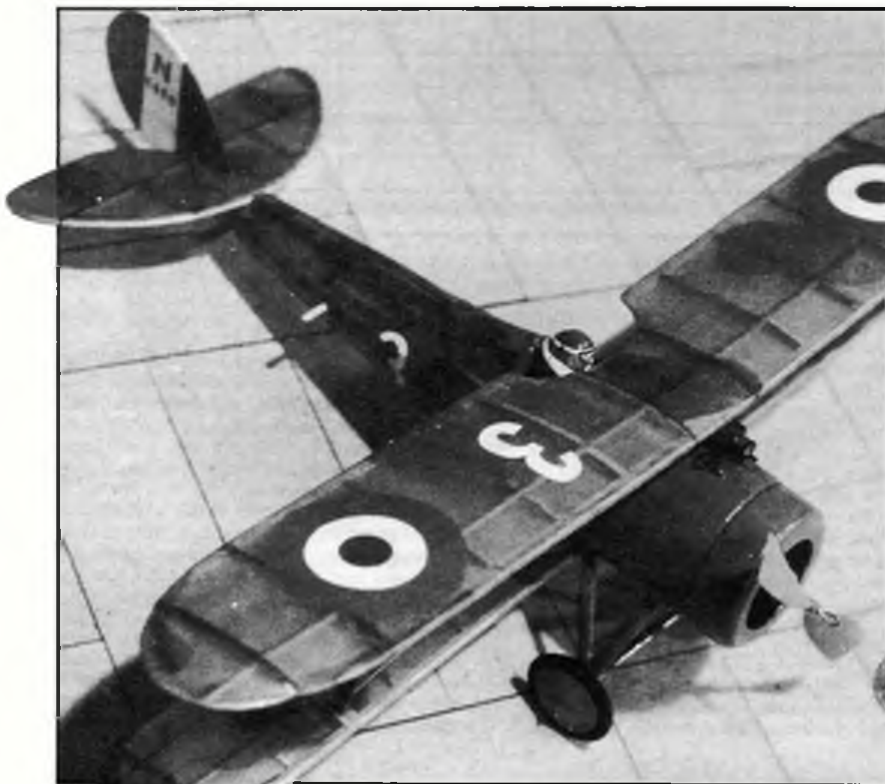
This was handsomely won by Ray Johnson's Svenska biplane (last month's *Aeromodeller* full-size plan) thanks to a flight performance in a class of its own because it flew at scale speed throughout.

Most of the other models described fast, tight circles, using only half the hall width. Such a flight pattern inevitably means that the take-off will be rapid and anything but straight.

One interesting new type seen was Mike Green's Leningradec, which is an attractive Russian homebuilt, if you please. It has ideal proportions but the documentation seemed



Above: Leningradec three-view from the French magazine MRA. Below left: From Neville Coldrick's air force at Walsall - Nieuport 24 for rubber. Below: Mike Hall's Fiat CR42. Right: Large Ryan ST, also by Mike.





## Autumn Indoor Meeting, Alumwell, 16th October

### Open Rubber

			Static	Best Flight	Total
1	R Johnson	C/M			
2	A Sephton	RAAFMA	858	1040	1898
3	P Lee	Basingstoke	993	638	1631
4	R Boor	Wigan	724.5	796	1520.6
5	M Green	Croydon	681	347	1028
6	M Allen	C/M	467	551	1018
7	K Bates	Cleamac	651.5	358	1009.5
			792	166	948

### CO<sub>2</sub>/Electric

1	D Hanks	Bristol			
2	A Sephton	RAAFMA	889	1062	1951
3	C Newman	Oxford	901	862	1763
4	R Johnson	C/M	793	795	1588
5	H Perrans	Walsall	744	764	1508
6	G Spencer	Walsall	753	630	1383
7	M Allen	C/M	1010	318	1328
8	G M Hannah	Impington	822	592	1214
9	K Wallace	Impington	610	509	1119
			618	478	1096

### Peanut

			Class	Appearance Mark	Static Place	Flight Score	Flight Place	Contest Score
1	A Sephton	RAAFMA	Lacey	44.5	3	117.76	1	4
2	P Lee	Basingstoke	Homebuilt	41	6	105.92	2	8
3	K Bates	Cleamac	Widgeon	44.5	3	47.76	5	8
4	L Smith	RAAFMA	Martin MS	62.5	1	21.72	8	9
5	G M Hannah	Impington	Vosin	53	2	25.45	7	6
6	M H Green	Croydon	Leningradec	30.5	7	84.87	3	10
7	R Porter	C/M	Fokker Spinne	41.5	5	46.15	6	11
8	F E Jackson	C/M	Tailwind	25.5	8	66.56	4	12

### Air Race

		Heat Time: Sec	Final Time: Sec
1	B Harvey	Comper Swift	7.3
2	C Newman	Comper Swift	6.94
			4.6
			6.26

flimsy, as one might imagine – and was written in Russian to boot. (We have unearthed a three-view published in France, just to add to the cosmopolitan flavour. GC).

### CO<sub>2</sub>/Electric

Dave Hanks is a name as yet unfamiliar to most of us but he would be instantly recognised as the resident timekeeper and flight organiser of Doug Sheppard's team. His model of the Eastbourne Monoplane was beautifully made, and its home-made electric power system flew it with superb realism. Again, I am afraid a lot of the other models charged around at speeds which would have torn the wings off the full size machines...

The most unusual entry was another Russian type, an SZ2 quadruplane by Simon Rogers. In failing to qualify it seemed just too big for its power – but immediately after the contest it was seen to fly like a bird!

### Peanut

Peanut rules have been tinkered with many times over the years, but a Lacey always wins, unless Mark Hinton's 14 bis is there, of course. On this occasion two interesting Peanuts were present. One was a beautifully made and very complex Fokker Spinne by Rob Porter. It came nowhere but that is no disgrace in this class. The other was Mike Green's Fiat CR32. This is an attractive subject which makes an unusual sight in the air with its W-strut braced wings. It has an ideal layout for F/F; and there is copious documentation. Strangely, the only other model of this type I know of is Cesare Milani's C/L version of some thirty years ago.

### Air Racing

This is now an official class; tactics for success are still developing! All the models were rubber powered; CO<sub>2</sub> is not really

suitable and 'electric' poses the problem of recharging unless quickly-replaceable batteries are used. Having said that, I would have thought that the potential duration of a model powered by the Knight and Pridham motor would be sufficient to complete the course in one go.

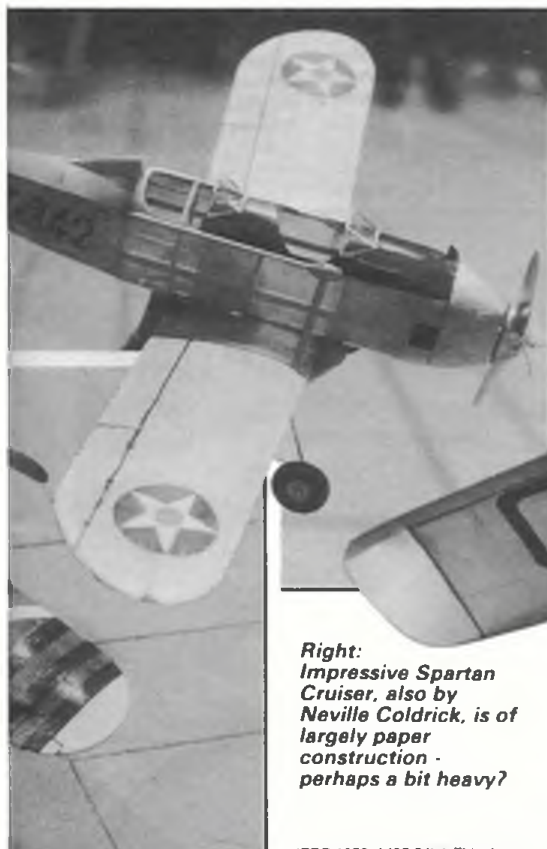
Unfortunately several flights were terminated early by models striking other flyers, assistants or timekeepers, so I think in future models will have to be wound at the sides of the hall and brought to the centre for launch.

### Kit scale mass launch

This fun event remains popular but inevitably is becoming dominated by the simpler, high-wing types. Originally, models for Indoor mass launch were required to weigh a minimum of 25 grams but the rule has lapsed recently. Perhaps it will be restored next year... so buy some plasticene.

### International Indoor Scale

It was very interesting to hear that Doug Sheppard is taking initial steps to get Indoor



Right: Impressive Spartan Cruiser, also by Neville Coldrick, is of largely paper construction - perhaps a bit heavy?



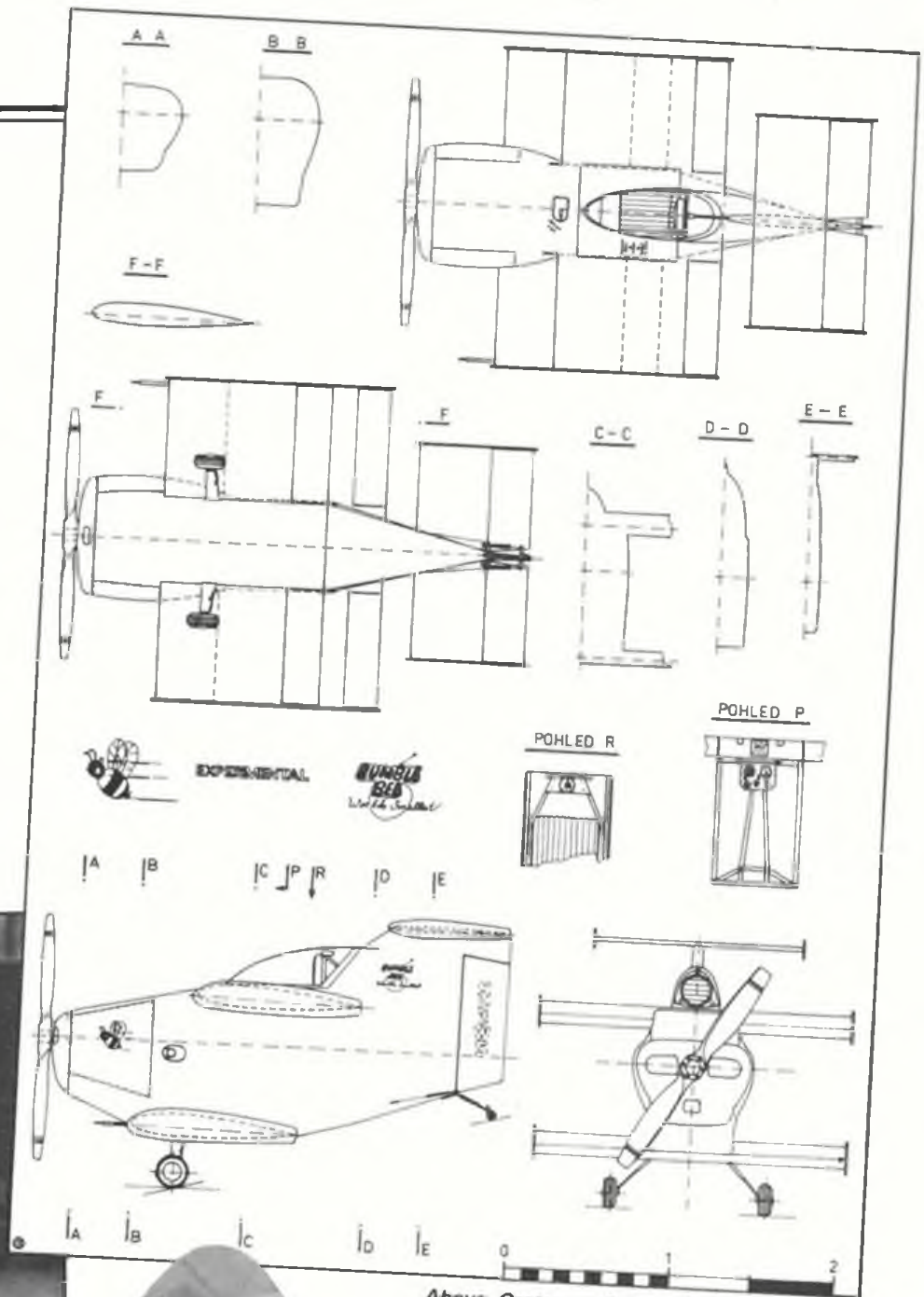


Scale on the International map. It has long been a surprise to me that this hasn't developed before, given the great popularity of Indoor in this country.

The first stage is to canvas all the other European countries via the FAI to gauge the existing activity in Indoor scale and the potential interest in International events, which would most likely include Rubber, CO<sub>2</sub>/Electric and Peanut.

As far as I can gather there are few, if any countries which fly the first two classes in a form comparable to ours, so we would be starting from scratch. It seems sensible to use the SMAE rules which are in any case directly related to the FAI scale rules. Peanut is a different matter since it is flown in many countries with almost as many sets of rules. Which rules are ultimately used is probably not very important as they are all a dog's breakfast anyway...

Unlike at the Woodvale F/F International ten years ago, proxy flying would not be allowed, but at the very least a superb Indoor meeting would be had; and after all, if C/L can still support a World Champs, why not Indoor? (This is a first-class idea which must succeed. GC).



Above: Grotesque Bumble Bee homebuilt - a challenge for control line? American subject was recently featured in Modeler magazine. International stuff!



Above: Simon Rogers always has an eye for the unusual. This is his SZ2 - a Russian quadruplane... Below: Mike Green's Leningradec; and right: Neville Coldrick's Albatros DV. Walsall visitors all.



# FROM THE HANDLE

Great fun, this Diesel A Combat!  
Tony Frost prepares for John James at the Nats...

## Dave Clarkson looks at rules revision for 1989

**A**T THE BMFA Control Line Technical Committee meeting on 7th October several important rule changes were implemented. Here we summarise them. Energy spent in discussion at the Goodyear and 'B' Team Race symposia at the Nationals has effected the following changes...

### Open Goodyear

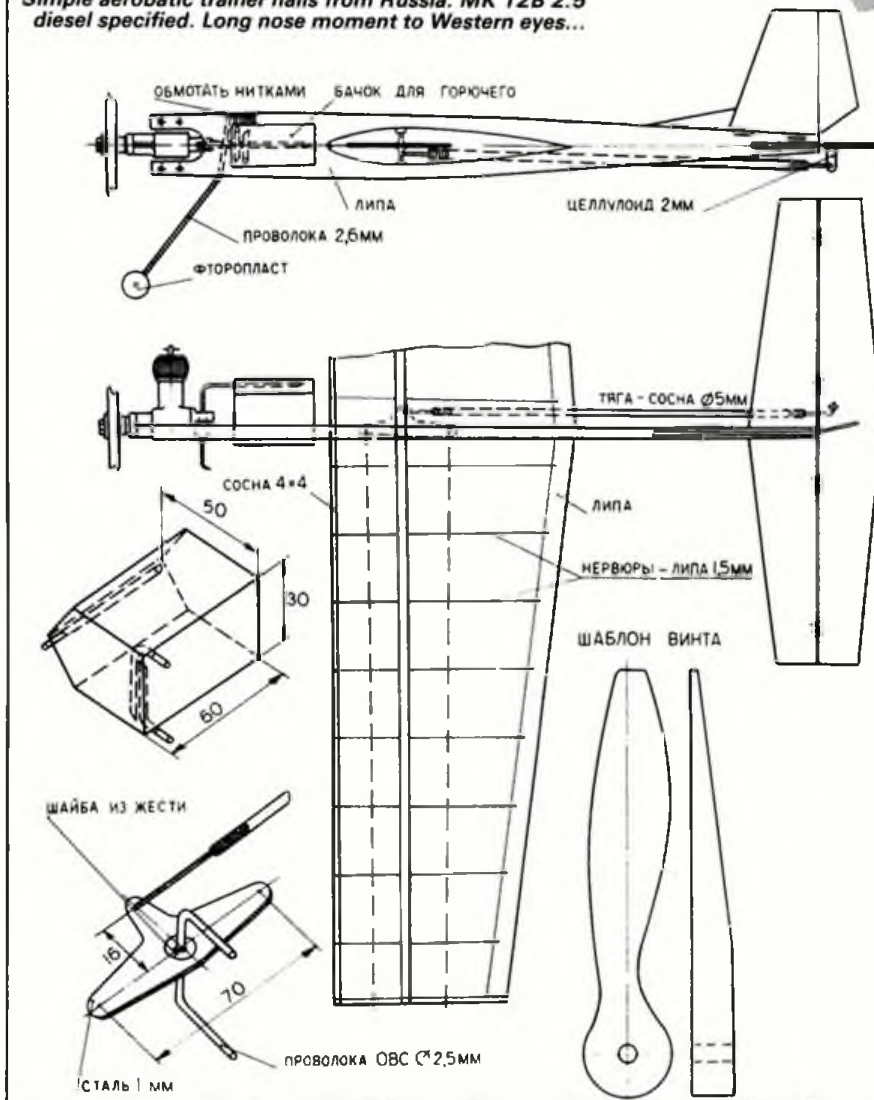
Line length will be increased to 17.69 metres (currently 15.92m) and radius of pitting circle correspondingly increased to 21.20 metres (at present 19.60m). This is to reduce rotational and pull stresses by 10-15%, thus contributing to safety and - hopefully - encouraging new pilots. The current heat and final distances of 10 and 20km will be retained by adjusting the required number of laps to 90 and 180 respectively. Line diameter remains unchanged. Obviously, model requirements are unaffected so existing models will still be competitive.

### British Goodyear

This will replace Class 2 Goodyear. Rules of this provisional class have been set by the Tech. Committee, and permit a wider range of engines to be used; namely, any motor built as a diesel in the UK. Any mark or version of the following is allowed:



Simple aerobatic trainer hails from Russia. MK 12B 2.5 diesel specified. Long nose moment to Western eyes...



The sound and fury of 'B' combat was present - unofficially - at the Nats. ST 40 powered Aerostar was one of a merry trio to cleave the air...

AM25, DC Rapier, Elfin 249, ETA 15 and Elite, Frog 24g, Oliver Tiger, PAW 249 and Rivers Silver Streak.

- Only permitted modifications are as follows:
- optional replacement of parts as (or similar to) those originally manufactured
  - optional removal of metal from any part
  - compulsory fitting of safety spinner nut
  - compulsory fitting of a key-operated compression screw.

Now that ball-raced motors are permitted, higher speeds will be achieved (in the range 26 to 28 sec/ten laps) which means pilots will find an easier transition to Open Goodyear, for the difference in pilot rotational speed between each class will be almost halved.

No other changes to Goodyear rules means



that, for example, by replacing the plain-bearing PAW 249 with the identically-mounted ball-raced version (currently under £50) your model will be a fully competitive British Goodyear racer.

### B Team Race

The great expense and poor availability of tuned-pipe 5cc motors for B T/R - and, to a certain extent, high model weight - has starved this class almost to death. Nevertheless, after forty years, it is the oldest form of Team Racing still in existence, so to change the motor capacity limit would be an unpardonable break with tradition. Besides - if 5cc motors were banned, the class would certainly expire. So to encourage use of cheaper, lighter and more readily available 3.5cc motors (for the 'B' rules permit motors of 2.51-5cc), models fitted with engines of under 5cc will be allowed to compete if fitted with lines of 0.35mm minimum diameter. If equipped with a tuned-pipe 3.5cc motor, a suitable 'B' racer should weigh, at the most, 70 per cent of a 5cc model, so safety should not be prejudiced. The nett result is expected to be more entries in the class for 1989.

### Speed Rules changes

To eliminate the present non-uniform, complex rules on the line diameter in Speed a comprehensive change to the rules is under way. However, note that the F2A rules (traditional FAI Speed) are unchanged.



**Gotcha!** Ed Needham makes a clean grab on the way to an Open Goodyear record at the Nats; pilot, Dave Clarkson (who else?).

### What's Happening in Control Line

1989 BMFA events are as follows:

19th March

#### FIRST CENTRALISED EVENT

Venue: 3 Sisters. F2B, Class 2 Aerobatics, F2C, Open Goodyear, British Goodyear, Diesel A Combat, 1/2A Combat

2nd April

#### SECOND CENTRALISED EVENT

Venue: 3 Sisters. F2B, Class 2 Aerobatics, F2C Team Trials, F2D

7th May

#### THIRD CENTRALISED EVENT

Venue: Hullavington. F2B, Class 2 Aerobatics, F2C, Open Goodyear, British Goodyear, 'B' T/R, 12D

2nd July (provisional date only)

#### FOURTH CENTRALISED EVENT

Venue: To be announced. F2B, Class 2 Aerobatics, F2C, Open Goodyear, British Goodyear, F2D

25th-30th July

#### CONTROL LINE EUROCHAMPS

Venue: 3 Sisters. F2A, F2B, F2C, F2D.

26th- 28th August

#### BMFA NATIONALS: Control Line, Scale and R/C

Venue: Barkton Heath. All C/L classes.

17th September

#### FIFTH CENTRALISED EVENT

Venue: Hullavington. Speed (events to be announced), F2B, Class 2 Aerobatics, F2C, Open Goodyear, British Goodyear, 1/2A T/R, F2D

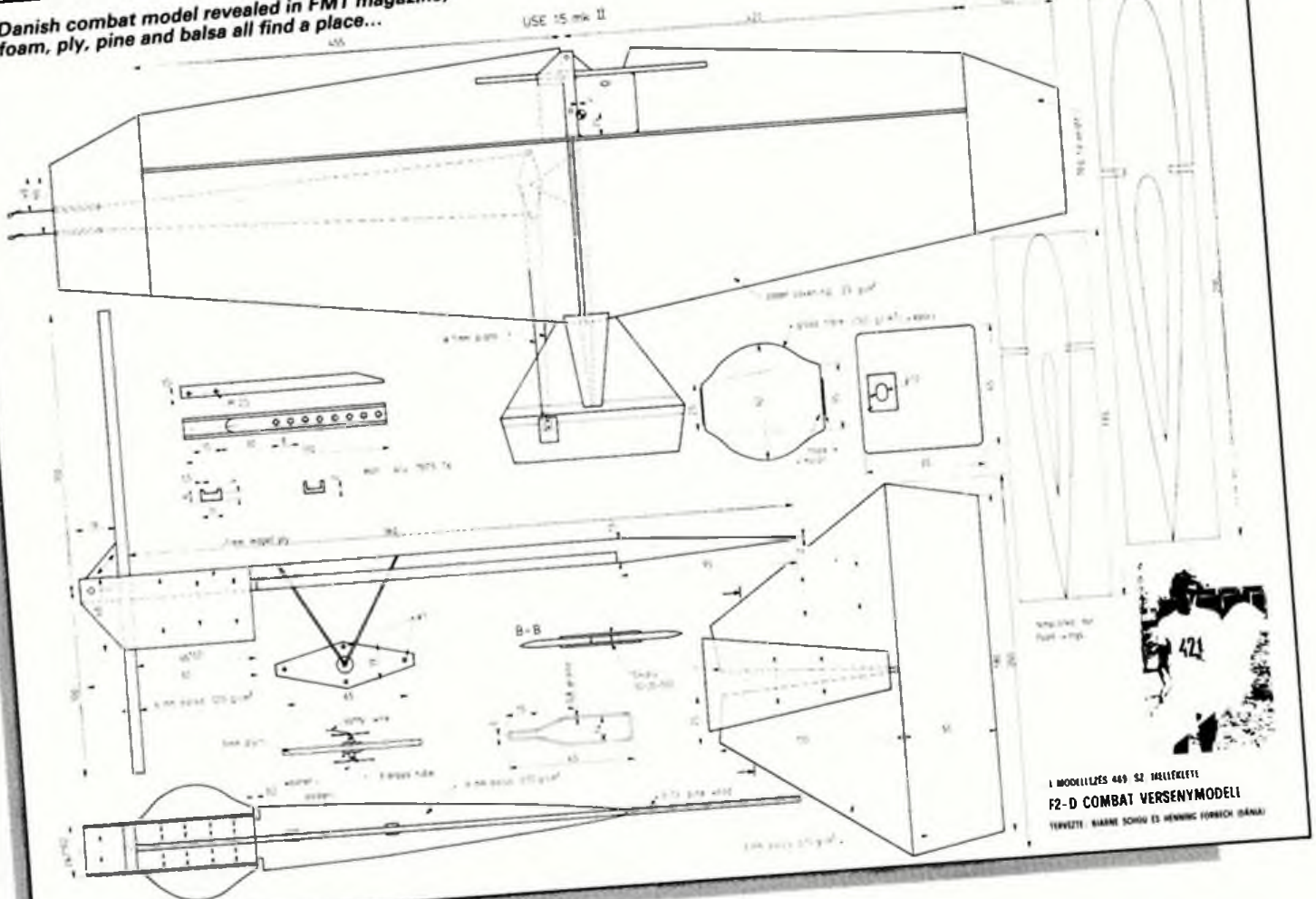
16th October

#### SIXTH CENTRALISED EVENT

Venue: 3 Sisters. Speed (events to be announced), F2B, Class 2 Aerobatics, F2C, Open Goodyear, Diesel A Combat, 1/2A Combat

Additional Speed contests to be announced. It is noted that volunteers are needed to run these events - and a warning; no volunteers mean no organisation - which means no event!

Danish combat model revealed in FMT magazine; foam, ply, pine and balsa all find a place...



1 MOODELLZES 469 SZ BELLÉLETE  
F2-D COMBAT VERSENYMODELL  
TERVEZTE: HÁRNÉ SCHAU ÉS HENNING FORSICH (HÁNY)

BUILD  
FROM OUR  
**FULL SIZE**  
PLANS!



# NIEUPOORT II

**T**HE NIEUPOORT II first saw service in 1915 with the British and French air forces. It was also used extensively by the Italians and Russians. A popular aircraft, thanks to its manoeuvrability and rate of climb, it did have an unfortunate habit of losing its lower wings. The Nieuport was armed with a stripped Lewis gun mounted on top of the upper centre section, firing clear of the airscrew arc.

The aircraft depicted by this model served with the Escadrille Americaine, more commonly known as the Lafayette Escadrille, and the Indian Chief insignia provides a colourful finish to this attractive aeroplane.

The Nieuport II was chosen as my first attempt at designing a CO<sub>2</sub> scale model because of its relatively simple outlines and sections and good proportions. The dihedral on the lower wings compensates for the absence of any on the upper wings; indeed, the model flies stably in tight, left-hand circles at small indoor venues. The turn can be opened out for a more realistic flight pattern outdoors on calm days.

Construction is straightforward, but as always, it is imperative to build lightly, particularly the tailplane and fin. The tail surfaces could even be built out of 1/20in. wood.

## Start work...

Basic construction follows the time-honoured method of building two sides over the plan using 1/20in.sq. for the basic framework. 1/20in. wood is about two-thirds the weight of 1/16in, but as there is no rubber motor torque to withstand, it is of ample strength. Do not omit the sheet infill on the first bay of the fuselage, the diagonals in the rear fuselage bays (spring in the curved lower longeron would distort the straight, unstressed upper longeron) or the 22 swg front cabane struts wire. Make up F4 and F1 (ensuring motor mount positions are marked) and join fuselage sides. Add remainder of spacers, sheet infills and top decking formers. Sheet the top decking from F1A to F3A, cutting out the cockpit when

dry, and add rear stringers, ensuring that they are parallel to each other. Before adding the cowl and engine mount, cut a hole in F1 and F1A to allow the pre-bent CO<sub>2</sub> tank and filler nozzle assembly to be fed through from the front. Thus the whole power unit is accessible for maintenance when the model is completed.

The cowl sides may be formed from soft 1/16in. sheet or two laminations of 1/32in. with the grain running fore-and-aft. Subsequent assembly is easier if the cowl is formed wet around a suitable former and allowed to dry. C3 and C4 are joined as shown by three pieces of 1/16 x 1/18in. strip. When dry the

built in. Insert a short length of 22 swg wire into the apex of the rear struts and secure with cyano.

## Wings next

The wings are of straightforward construction, but the following points should be noted. The wing tips are laminated out of two strips of 1/32 x 1/4in. strip. Once assembled most of this is trimmed away, leaving a shape following the camber line of the tip aerofoil section.

Note the packing required under the top rear spar and the lower wing spar. The outboard upper wing ribs are all cut to the R1 profile and trimmed and cut as required. This builds in a measure of washout to the ailerons. Add reinforcing gussets where shown, but do not cut through wing tips at aileron locations until after covering and doping. Add short lengths of aluminium tube at strut locations and secure with cyano, ensuring tubes do not become blocked. Add pieces of 1/32in. sheet around the aileron crank locations and sand to follow aerofoil contours. Carefully insert and glue the fuse wire aileron hinges. Don't glue the aileron to the rear spar! Add the lower wing locating dowels; mark the position of the receiving tubes on the fuselage sides with template to guarantee equal incidence. Tilt the root ribs for dihedral. The sweep angle of the lower wing root ribs does not quite match the taper of the front fuselage. As drawn it should ensure that the interplane strut location is correctly positioned due to the effects of incidence and sweepback angles. My prototype needed extra packing on the root ribs to correct this!

## Tail feathers

The tailplane structure is straightforward, but do use light wood. I used 1/20in. balsa. Extra care is then required when fitting the elevator hinges. The rudder outline is laminated; thicker fusewire should be used to hinge it for the relatively large surface is easily deflected if the model cartwheels on landing.

## Dave Causer's 1/16

### WWI fighter is just

### right for CO<sub>2</sub> power

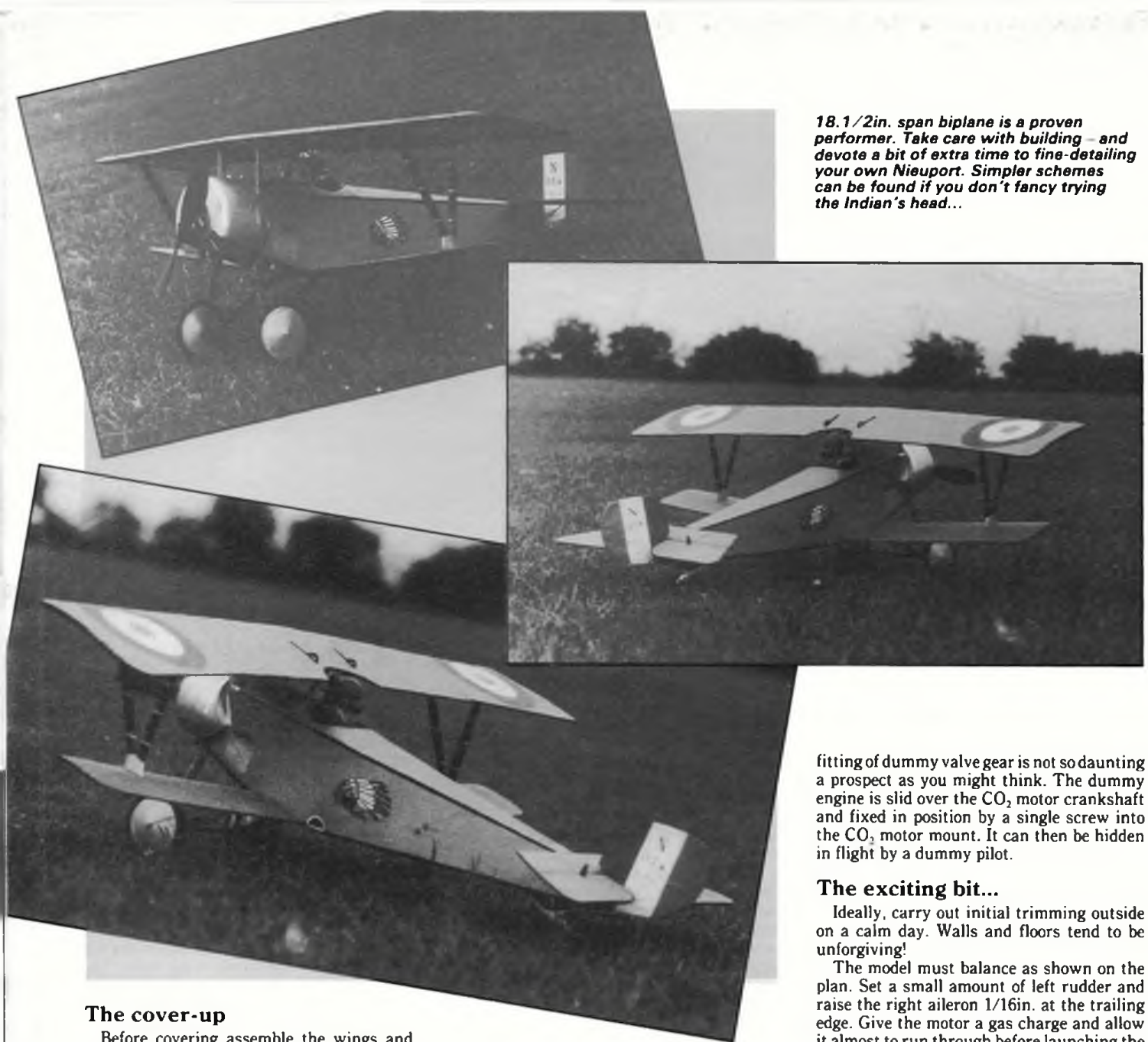
cowl sides are glued on. Make up the motor mount, ensuring the 1/16in. sheet mount supports are cut accurately to give correct down and side thrust. Note how the mounting holes in the 1/32in. ply mount are offset so the propeller hub is in the centre of the cowl. C1 and C3 can be added to the cowl and the complete assembly glued in place. Sand the front of the cowl to the correct shape and trim the lower edges of the sides to match the lower fuselage contour and the shape of C1.

Add the rear fairing blocks to the cowl, noting that the upper surface is rounded, whilst the lower part is a flat surface, simulating an air exit on the prototype.

The front centre section strut fairings are now added, followed by the rear inverted 'V' struts. Make sure the correct incidence is



**18.1/2in. span biplane is a proven performer. Take care with building – and devote a bit of extra time to fine-detailing your own Nieuport. Simpler schemes can be found if you don't fancy trying the Indian's head...**



fitting of dummy valve gear is not so daunting a prospect as you might think. The dummy engine is slid over the CO<sub>2</sub> motor crankshaft and fixed in position by a single screw into the CO<sub>2</sub> motor mount. It can then be hidden in flight by a dummy pilot.

### The exciting bit...

Ideally, carry out initial trimming outside on a calm day. Walls and floors tend to be unforgiving!

The model must balance as shown on the plan. Set a small amount of left rudder and raise the right aileron 1/16in. at the trailing edge. Give the motor a gas charge and allow it almost to run through before launching the model in a powered glide over the traditional long grass. Correct trim in pitch with the elevators and adjust turn with rudder. The rudder deflection should be checked before every flight by sighting along it and noting where it lines up along the upper wing centre-section. Increase the motor power gradually, ensuring that a consistent left turn results. Any tendency to overbank can be corrected by raising further the right aileron. However, if the left turn opens out as the power reduces, more tight thrust will have to be added and the rudder re-adjusted. The wide track undercarriage ensures smooth, realistic take-offs with no ground looping. The model is stable in flight, if a trifle on the fast side for scale speed, but it flies consistently for 30-45 seconds on a medium Telco motor power setting.

### References and bits

Model Airplane News, No. 1951; 1/48 scale drawings by Joseph Nieto.  
 Fighter Aircraft of the 1914-1918 War, Harleyford Publications Ltd.  
 SAMS (indoor wood, tissue, cement).  
 Hannants, 56 London Road North, Lowestoft, Suffolk (decal film and other accessories).  
 accessories).  
 Small Scale Custom Services (Vac-formed pilot).

### The cover-up

Before covering assemble the wings and interplane struts, checking for accurate locations and correct dihedral and incidences. It is easier to remedy errors at this stage.

I covered the entire model with silver-grey tissue (obtainable from SAMS Model Supplies), water shrunk and doped with non-shrinking banana oil to minimise warping. All surfaces (except rudder) were lightly sprayed with Humbrol aluminium enamel, but the rounded positions were masked off with discs of masking film. This latter point is important, as metallic paints have a tendency to leach through if subsequently painted over. Roundels were drawn using a lining pen fitted into a pair of compasses to create outlines, the colours being painted on when dry. The 'Indian's Head' insignia was traced on to a sheet of clear waterslide transfer film and the colours filled in. Note the Indian faces forwards on each fuselage side.

The perimeter of the flying surfaces and the fuselage longerons were outlined in a 1/16in. wide strip of black paint, again using a lining pen and ruler with a careful free hand on the curves. (*And steady nerves. GC*).

### Get it together!

The model can now be assembled and rigged with fine nylon monofilament thread attached to small aluminium strip lugs

inserted into the structure at the strut locations. The undercarriage is then bent in halves and cyanoed directly to the lower fuselage. Bend the wire so it is naturally set for a slightly wider track than indicated; it is then pulled into the correct position by the bracing wires. This ensures a rigid structure. The wheels are constructed from rubber tubing around a central disc of 1/8in. hard sheet. They are bushed with aluminium tube and notepaper cones added. Fair the axle with 1/16in. balsa to the shape shown and insert into guide in the undercarriage struts, ensuring a sliding fit. Attach the axle keepers and spring the axle with shirring elastic 'bungees'. The tail skid is constructed from soft 1/8in. balsa and a small strip of thin spring steel. I cut mine from a razor blade using a carborundum disc in a mini drill.

The aileron cranks, rudder and elevator control horns are from 1/64in. ply glued into position. The control wires are fixed into the fuselage covering at the positions shown and attached to the control horns, ensuring the covering is not distorted. Carefully slit the tailplane covering for the upper elevator control wire.

The dummy engine is constructed as shown on the plan. On the prototype only four complete cylinders are visible, so the



# BALSA CUTTINGS

Cyano de Bergerac's nose around aeronautical affairs...

## Good moaning!

Beneath their blue and yellow flag (which unfortunately was sometimes flying straight out) the strong Swedish contingent camping at the Old Warden Vintage Weekend emphasised the ever-growing international appeal of this event. Even the charcoal on our barbecue was French - at least, they said it was charcoal, although it burned like bad-tempered dynamite and cremated a pound and a half of porky bangers before you could turn round. Our German friends instructed us as to the proper toast for aeromodellers, which is 'Holm und Leistenbrüch' (May you break your spar and ribs) whilst they for their part finally grasped that the correct response to 'I looks towards yer' should be 'I catches yer eye.' We were going to teach them 'Suck in, chaps!' as well, but gave it up as a bad job.

Mind you, whilst friendship between aeromods knows no frontiers, it doesn't do to be silly about it, and when the same Germans produced a large, long, flavoursome knockwurst, we British unhesitatingly said 'Allo allo! It is clearly our duty to search this sausage thoroughly in case it contains a stolen painting by Van Klomp of the Fallen Madonna with the forward C of G.' It didn't, so we ate it.

## Perhaps St. Francis didn't fly gliders

It doesn't do a lot of harm to mention radio control now and again. After all, it may very well be here to stay; indeed there are those amongst us who demonstrably can't fly any other way. By contrast there are those whose influence on the flight of their models is best kept to a minimum - your Columnist currently has a quite undisguisable limp due to his having rather publicly refined spot-landing to the point where he flew a heavyish model straight up his own trouser-leg. In time of war, probably a court-martial offence. These problems attack you from all directions, as the following report shows.

It was gusting something disgusting, and the happy band of pilgrims slope-soaring into the sunset hadn't a lot of time to spare for throwing the bits of wood that his dog kept dropping at their feet. An alsatian would doubtless have sat patiently by. A Pekinese could have been placed under a large slab of granite until required again. But this nippy little collie - you couldn't do a lot about her. All the modellers would throw were their gliders, and she couldn't follow those. Danger struck from an unexpected quarter when the accumulation of canine frustration thus engendered suddenly manifested itself in a good hard hang-on bite of an ankle just as its owner launched off into the wing-bending cliff-top turbulence. The sight of him dancing about in pain, trying to hop out of the jaws

of the still-menacing dog whilst keeping his model out of the Atlantic in a whistling Westerly, all without going over the 300-foot drop, was pitiful to behold, and when unbelievably the dog took another lump out of the same flyer from the same ankle on his next launch, most of the witnesses were so overcome with sympathy that they had to be carried from the scene.

## Doesn't it make you sick!

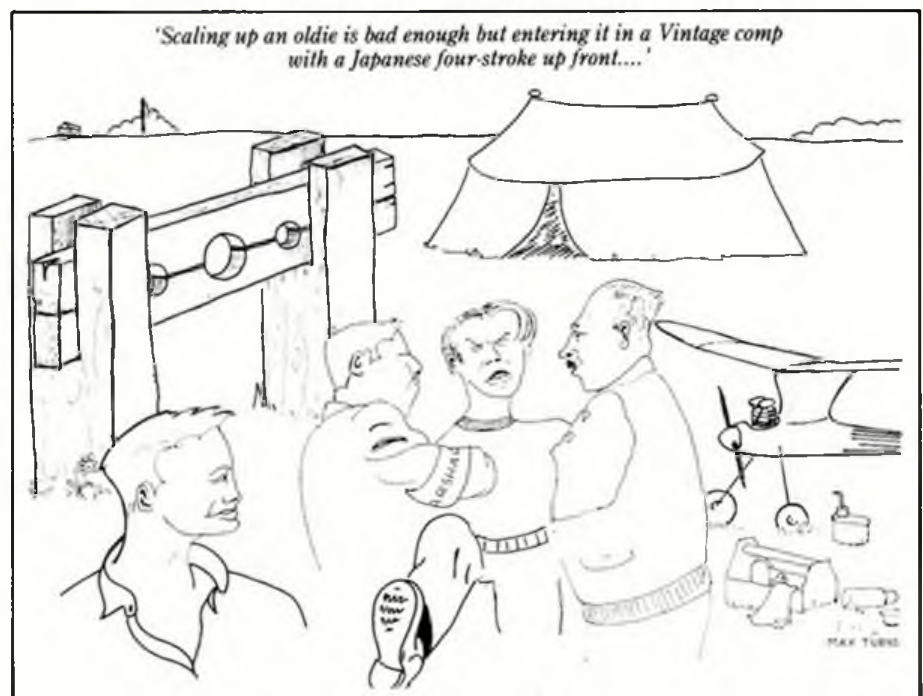
You may be all right at treasure hunts, but it's only when the treasure comes hunting for you that you know you've really got the hang of it. Whilst still at school this Warwickshire lad knocked up a pretty dreadful Premier Lion and when recently he dug it out of the loft it proved to be even worse than he remembered it. The wings were now the colour of camels' teeth and the fuselage was that filthy horrible shade of purplish brown which comes of getting just too clever when you're mixing paint. The varnishy, clapped old knocker at the sharp end would only just about almost run - walk, really - and the whole shebang was ready, as our quaint old Air Force was wont to say, to be struck off charge and reduced to produce. Still, it looked genuinely elderly and he took it down to the field, thinking it would be good for a few fancy-thats and well-I-nevers if nothing else. However, the only reaction he got was from his club chairman, who said that if he was proposing to fly that thing free-flight behind that crummy old Majesco would he please get the Safety Officer to check it *thoroughly* first.

It was a real awayday - not the British Rail kind, but the aeromodeller's variety; an up, up and awayday. Like that sunny Sunday

afternoon by the Isle of Sheppey when Peter Michel's Cruiser Pup suffered an almost biblical bodily assumption, and went straight up, never to be seen again - although they do say as how it's still up there, waiting for him. (You all know Peter Michel, the Cruiser Luiser). Afterwards, they fired the stubble in the upwind field, and the resultant thermals nearly took the clubhouse too. Anyway, when the motor cut this old Lion began to wheel ponderously and then gradually, frivolously, actually began to ascend, causing several persons present to write to the Guinness B of R and others to swear off drinking at lunchtime. The upshot (good word in the circs) was that the poor old thing was lost sight of, the owner bearing the loss with equanimity until he remembered that his name and address were still in the cabin. The most valuable item being the one unpunctured airwheel, say about five bob, his vision of a cash-hungry finder bringing the wreckage back over several score miles in the belief that it was worth hundreds of quid, was daunting. And on his return home from work just three days later, there on the mat was a Note. No address, no signature; this must be a ransom demand.

*'Your model aeroplane landed on our lawn and startled my wife... (Oh, Lord!)... wondering if you could provide a good home for some little engines our son brought back from the United States after the war. In this hope I will place them with your machine for one of our van drivers to drop off for you.'*

There at the side door was the Lion, more or less all right, and Oh! - the little boxes beside it! No-one calls his motors crummy any more. And him, they call 'Sir.'





# First Junior Wo

**T**HE FIRST World Free-Flight Championships for Juniors looked like being a well-run event from the moment I stepped off the Tupolev 154M at Warsaw airport, where I was met by Kazimierz Kapinski of the Polish Aeroklub and interpreter Grazyna Slowikowska. A twenty-minute drive in the club minibus and we were at a sport flying airfield, where we found an array of An-2 biplanes, some Dromader cropdusters and several PZL Wilgas. It was one of the 4-seat Wilgas (three of which took the top three places in the 1988 World Precision Flying Championships in Britain) that flew us down to the national gliding centre at Leszno, two-and-a-half hours' flying time away. Flying at 800 feet - just above the factory chimneys - and over the vast forests and strip-cultivated fields of the Polish countryside was fascinating, as were the low-level tight turns over the baroque centre of the town of Leszno.

After landing at the grass airfield (about the size of Barkston Heath), there followed a meeting with some of the contest organisers and the local mayor, along with fellow FAI jury members Pavel Wlodarczyk of Poland and Pierre Chaussebourg of France. A short chauffeur-driven Volga ride away was the accommodation we shared with some of the teams, a converted 18th century baroque palace that had belonged to the Polish royal family. A slight change from the usual B&B at Grantham, if only because of the moat, the flags and the ballroom with the painted ceiling. In fact two palaces were used for the teams, the organisers being based at the flying site itself.

The all-grass field allowed the Jantar-towing glider tugs to take-off in any direction, and this they did from time to time during the practice days, though with no conflict with the model flying. The main hazard seemed to be a pine forest on the south-west side of the field, reportedly 4km deep, though judicious shifting of the launch line during the contest avoided most problems here. The local people were very helpful with lost models and we heard that they were even asked to return models by the priests at Mass the previous Sunday at the local churches.

## Airport pre-planning

It was soon clear that model flying in Poland is seen officially as an important integral part of airport, and a great deal of careful pre-planning had been done to ensure that the Championships ran smoothly. A considerable number of representatives of various official bodies had been involved in the organising committee, and 37 of them were listed in the programme. They included local mayors, youth, sports and industry officials and of course aero club personnel; they were supported by nineteen others handling specific jobs like finance, press, timekeeping and accommodation. Additionally, the nineteen launch poles each had one Polish and one foreign timekeeper.

As a jury member I saw perhaps more of the organisation than most people competing at Leszno. One of the aspects unfamiliar to the Brits was the series of official dinners each evening - sometimes

**Martin Dilly reports on youthful achievement in Leszno, Poland**



two per night. As well as being enjoyable events, these usually involved a couple of dozen mayors, generals, ministers and youth leaders, and ensured that these people felt both involved and appreciated by the model flyers. Speeches were numerous and toasts many, mostly accompanied by the Polish version of 'Bottoms Up', which somehow seemed far more imperative when uttered by a medal ribbon-bedecked general and drunk in vodka.

The opening ceremony started with a march past of teams. Representatives of the contestants and timekeepers took oaths to uphold the standards of sportsmanship. A very comprehensive airshow followed. Gliders were aerotowed three at a time by a Gawron, and in pairs by Wilgas, and then flew some very smooth formation aerobatics. Solo glider aerobatics in a Kobuz 3 were flown by the Polish World Champion. Next came microlights, a home-built, parachutists, power aerobatics in a Zlin 50L and a Zlin 536, hot air balloons and model rockets. These included three impressive R/C boost gliders. All disciplines of model flying followed, including vintage, represented by an original A-frame pusher and a Wakefield that flew at the 1938 Championships at Guyancourt and had survived the war by being bricked up in a disused bread oven.

It was interesting to see that early models are seen in Poland not as a separate species as is the tendency here, but as an integral part of the development of the sport as it is today. Several elder statesmen of Polish model flying were guests at the Championships and were keenly interested in current developments. In the hall where processing was done a frieze of photographs traced model flying's progress from about 1920, and instead of

**Heading: Youngest flier on the field was thirteen-year-old Emil Bober (Bulgaria), here launching in F1B. Top right: F1A winner was Maarten van Dijk of the Netherlands, seen at start of fly-off. Right: Pak Jim Chol, fourth in F1A for Korea, walks out to the flight line.**



stopping in the early 1950s, they followed through to the present. Many had been taken by Jan Michalski, who, as well as being one of Poland's leading pre-war model flyers, had also been a combat photographer at Cassino.

## Present and correct

Nineteen nations sent teams. The fact that Britain was not among them seems to me to be a result of negative thinking, poor domestic pre-planning (the Championships date was known in April 1987) and a sad lack of imagination and



# World F/F Champs



to the ground for one of them, just like Mike Fantham's heart-breaker at Zrenjanin the month before. Meanwhile Sergei Kozyrenko of the USSR was patiently parked downwind till the lift reached him. He then catapulted smartly into the circling flock, topped by now by one of the distinctive North Korean gliders in red, white and blue national colours. Certainly some sort of easily-spotted colour scheme or pattern common to all models in a team very much helps the retrievers. Dare one suggest that our own teams could try to add distinctive markings, maybe like the black and white invasion stripes used on Allied aircraft in 1944?

Flying second in the same round for the Soviet team was Toomas Lepp. He showed you can't keep a good glider family down by towing on his own and going away for a comfortable max after finding an exclusive patch of air that would have delighted his father Andres back home in Estonia. His TL-07 was one of several models using audio buzzers, left on throughout the flight instead of being triggered by the D/T. His 130 gram wing used no carbon, but had an egg-box rib structure inside the leading edge D-box to increase the torsional stiffness, and 1mm Korean spruce ribs in the rear. His tailplane used a full depth 1.1mm balsa spar with thin carbon on the narrow upper and lower faces. A 4-function hook was set with a 3.5 kg unlatch load, and held slightly more than zoom deflection on the rudder for two seconds after release.

At the end of the first round 41 of the 53 flyers had maxes on the board. The next round saw eleven of them drop, including Ilker Polat of Turkey who was using a fuse D/T and a straight towhook. Another dropper was Jeno Vörös who had one of the more interesting aircraft, in addition to his foam-and-glass-winged one. It used a rectangular section carbon tube for both wing spars and fuselage boom; this was about 1/2 x 5/16in, tapering to about 1/4in. square, with walls about 1/32in. thick. The trailing edge had three tows of carbon on top and bottom and carbon-capped ribs butted onto the front and rear of the spar; there were small strips of glass cloth about 1 x 1/8in. bridging across the spar onto the rib halves, and the wing was fully tapered and covered with what appeared to be translucent R/C covering film. Spar weight was 27 grams and the very stiff wing was 160 grams. It had tips covered with aluminised Mylar with criss-cross carbon filaments at about 1.1/2in pitch laid over the outside. As yet I am unsure of the adhesive used to bond the carbon to the Mylar.

By lunchtime at the end of round 4 there were still 22 with four maxes. Only the Soviet team was clean, with Poland a second behind and N.Korea a second behind them; Sweden and France were close, tying at fourth, five seconds under the full score. But the wind was increasing and the launch line was moved 400 yards to avoid a downwind village. Round 5 saw Martin Pelatowski, the only one of the two US flyers to have a clean score, come unstuck with a disastrous 94 seconds. There was drama for Toomas Lepp. One of his timekeepers lost the model and the other seemed unsure whether he had timed the right one, which had a sub-max score. The Soviet team was certain it had maxed and the jury was asked for a decision. The ruling was a re-flight; with only three minutes left in the round Lepp used a reserve model and towed for a couple of minutes before finding a good patch of air shortly before the red rocket marked the end of the round.

The US team seemed to be having some trouble with radio discipline and their battery life must have been quickly eroded with the chatter and unnecessary CB jargon. The Hungarians sported a neat line in hands-off communications equipment; they used US-built 49 MHz Easy-Talk units. These



trainers and team managers; Benedini from Argentina, Kubes from Czechoslovakia, Nyhegn from Denmark, Kilpalainen, Oschatz, Ben Itzhak, Zsengeller, Breeman, Kapinski and Siffleet were all there. A glance down the flyer list showed some more familiar names, but at Leszno it was the sons and daughters, not the fathers, who were representing their countries. Among the chips off the old balsa block were Melinda Anderson of the USA, Ran Herzberg of Israel, the USSR's Toomas Lepp, France's Stephanie Reverault and Stephane Landeau, Hungary's Jeno Vörös, Jens Nyhegn of Denmark, Maarten van Dijk from Holland and Vladimir Kubes from Czechoslovakia.

## F1A first...

The first day's contest flying was for F1A. Here the US team was at a big disadvantage. Matthew Gagliano's model box had somehow got wrongly tagged. Left to the mercies of the baggage handlers it disappeared, reportedly ending up at Istanbul instead of Warsaw. Despite telexes and searches lasting almost three days Matthew's aeroplanes reached Warsaw only the day after the contest.

As the Verey light went to signal the start of round one there was still a little mist around the edge of the airfield and an understandable reluctance to risk problems with visibility. However the first good patch of air saw thirteen gliders launched into it. One Czech flyer did a neat downwind tow to reach the well-marked lift, after a downwind launch. On practice day Vörös of Hungary had been practicing a rather impressive technique; he stretched his towline maybe eight to ten feet, the glider still being held by his helper, who then released it downwind, resulting in an almost F3B-like catapult climb to reach near the top of the line in what seemed like six or seven seconds. His wing was of glass-skinned blue foam with carbon spars, well able to take the high launch loads without twisting or fluttering, but I did not see him use this launch method in the contest.

But back to the round. A collision between a Dutch and Soviet model produced a flat spin down

initiative. We now have about two years in which to promote the fact that Britain plans to send a team in 1990, and to encourage young model flyers to work towards being picked for it. This also implies that we would not only run a Trials for the junior team, but also pre-announce the fact. Surely this would be a fine opportunity for the more enterprising sections of the model trade to show their support for those who will be keeping model flying alive in the future - perhaps by contributing to their travel costs to the Championships...

Several well-known free-flyers acted as





**Above: US F1C flier Melinda Anderson dropped a single flight to place fifth. Below: Fourth in F1C, Mariusz Gasiorowski (Poland) checks his motor setting.**



**Third place in F1C went to the DDR's Matthias Nogga with this distinctive design.**



**This photo: World Junior F1C champion - Pak Song Gyu of North Korea. Below left: 1938 Wakefield flown at Guyancourt by Jan Bury. Model was bricked-up to survive the war - flew again during the opening ceremony at Leszno.**





comprised a headset with integral receiver and aerial on one earphone, and a short voice-operated boom microphone on the other; they looked specially handy for the runner that some teams use to accompany A/2 flyers while they tow.

The last round saw Erik Lindgren of Sweden and Georgi Rizo of the USSR both drop, leaving eight of these under-18s in the fly-off. But the weather looked threatening, with squalls of rain visible in the distance. The smooth organisation started the fly-off as soon as all flyers were ready, to try and miss the likely rain. The only local, Korzeniecki, had an attempt and managed only 65 seconds on his second try. But it was Maarten van Dijk of the Netherlands who made the most of pretty dead-looking air, to win from Li Sung Chol of N.Korea, with Toomas Lepp a close third. Maarten's model used a Mylar-covered tailplane and a wing with D-box leading edge all the way to the tips; the latter were tapered at leading and trailing edges and had egg-box ribs. It looked a windy weather model; featuring a turbulator about 1/8in. back from the leading edge, with an invigorator at the high point and four more further back. The Korean model had a spruce trailing edge and spar to its tailplane and a balsa and spruce leading edge; judging by the Korean's reaction when they spotted that the Dutch had a few small sheets of balsa for repairs in their boxes after the contest, it is a material in short supply there, probably due to currency exchange problems, though I did hear that the Cubans are now growing their own balsa. A neat touch on some of the Korean gliders was the recessing of the timer face-plates so they were flush with the surface of the fuselage, though I doubt if the saving in drag would be detectable.

The glider prizегiving for individuals immediately followed the fly-off, and was backed by distant thunder, as the rostrum was mounted, the flags raised and the Dutch national anthem played. On returning to 'our' palace about six miles away the ground was wet with recent rain, so it had been a close shave.

## F1C next

For the start of F1C the following day the ground was wet from overnight rain and a few spots still fell from a grey overcast. Seven nations had teams and it was clear from the start that the Koreans were going to be hard to beat. They were using metal-skinned wings that looked very well-flown, with considerable scuffing, but their flyers clearly were very experienced with them. Their launch technique featured a lot of throw energy and a kick forward with the right leg, possibly as a counter-balance for the vertical motion of the aircraft. It was often accompanied by what was presumably Korean for 'Go, aeroplane, go', or words to that effect. At least one used a flapper, with about a centimetre deflection of the trailing edge, and about 2-3mm. less incidence on the right wing in the glide setting. Motors were either Rossis or ADO-15s.

By contrast the German Democratic Republic team's models were sheet balsa-skinned, and several used the distinctive planform with elliptical tips in which the axis is displaced rearwards that they used in the 1970s. These were reinforced with carbon filaments at about 3in. pitch laid on criss-cross. Some used rolled balsa booms and aluminium-skinned all-moving fins. A favourite motor was produced by the Berliner Vergasser Fabrik, which presumably also makes carburettors; a little like a Cox .15, they had three fore-and-aft cooling fins on the crankshaft housing of a grey-finished casting.

At the start of the first round the US team had not moved to the launch line but when they did it was obvious that the one to watch was Melinda Anderson. With the late Doc Anderson for a grandfather she has model flying in her blood and was very much at home with both her model and motor, a very fast-sounding Rossi that has had some attention paid to its insides. Her starting routine was very businesslike with a check made on the optical tachometer on top of the starter box before launching and a hard shake of the model to spot any fuel surge problems, followed by a careful wind check and hard launch. The US team were using a thermistor, read by team manager Bob Siffleet and at times a very neat bubble generator that is sold virtually ready-to-go in K-Mart's; it is a toy

caricature car engine in which bubbles shoot out of the spark plug holes and costs about eight dollars. It has a variable speed and a 4-loop bubble dipper operated by a nylon Geneva mechanism.

The standard of F1C flying did not seem as good as the gliders, but about half the field had maxed up at the end of the first round, and the sky still looked grey. The Soviet team seemed to be having problems; Valery Klimakov's motor cut at three seconds and the model bunted in, but without damage. Nikolai Zagorianski from the Ukraine had a very loopy pattern and finished the climb at about half the height he reached a couple of seconds before, but both maxed. Team mate Gennadi Dobrovolski's motor had sounded less than happy on his first flight which was a sub-max and this time it still seemed rough, but maxed.

The Americans too were having problems, which stayed with them for the rest of the day. Over-runs kept happening, in spite of ground checks, and poor Mike Keller had two, losing him a score for the round. They were using Seelig timers and the two boys had not flown much F1C at home, but did seem to need some team help to sort their problems out, and at times this seemed lacking. The GDR's team, despite the fact that only Matthias Nogga kept maxing, were obviously well used to the models and rallied round to help when problems arose. In fact, the US F1C team was the only one not from one of the socialist countries.

By the start of the next round the sun was out and the air was warming; a stork glided over a few yards from the flight line, oblivious of the rows of Rossis waiting just below. Keller continued to have double over-runs in both this round and the next, while some of his team sat eating watermelons, though to be fair it did seem that the timer problem was beyond solution; perhaps Pete Allnutt's flat rock treatment was needed... Two of the Danish glider flyers were by now helping the US team by using the Henning Nyhegn chase motorbike. Meanwhile the N.Koreans continued to max, along with two of the three Soviet flyers, Matthias Nogga and Melinda Anderson. There had been a US tendency to concentrate too much on the thermistor and not enough on airborne models; in round 4 this was nearly their undoing. The model was down low but some enthusiastic multi-national flapping worked, demonstrating the folly of the 'no flapping, but no attributable guilt' rule that, on paper at least, held for 1988. As at Zrenjanin, the jury had ruled at the team managers' meeting that no action would be taken as long as such flapping was not done by motor vehicles; in the final round local boy Mariusz Gasiorowski's model was down low when 22 people, including three pairs of blanket flappers, arrived under it and succeeded to the extent that the model D/T'd ten feet up at 3:01 to wild applause from the locals.

In Round 5 Che Gum Chol was down at 2:02 and Melinda Anderson at 2:24, after flying in poor air with no other models in obvious lift. Mike Keller's timer problems finally won and he ceased flying; meanwhile a Wilga took off at one side of the field to carry out a search for lost models. As a possible note for engine collectors, I spotted a motor that might be of interest; the Bulgarians were using the locally-made Poson 2.5, but the ones I heard sounded as if Henry Nelson does not yet have much to worry about.

Round 6 seemed to be getting trickier; only half the leading ten flyers maxed, Nogga dropping two seconds and Zagorianski from the USSR returning a disastrous 2:01 that dropped him to seventh.

With Nogga lying third at the start of the final round he had an almost knock-out flight of 19.6, doubtless making him thankful it was not yet 1989, when the under 20-second attempt disappears. On his second attempt he maxed safely, assuring him the bronze medal. His model had an unusual wing fixing method. On top of the flat-topped pylon was a projecting centre wing rib from ply of about 3/16in. with a forward-facing slot about 1.1/2in long running forward to break out of the leading edge. This was deep enough to accept the wire wing joiner. The assembly method was to slip the wing

halves onto the joiner, leaving a gap in the centre, slide the joiner into the slot, and then put spanwise rubber bands on between hooks on each leading and trailing edge.

Gasiorowski's flapping-assisted flight mentioned earlier came about five minutes before the final signal rocket was fired into the greying sky. With the likelihood of rain soon, the organisers decided to start the two-way all-Korean fly-off five minutes after the end of the seventh round. The two flyers had a problem. To keep down their baggage weight they had brought only one hand-cranked starter for the team, but the Americans saw the difficulty and Tony Hutchins lent them his, so both could fly together if they wished. To round off the international co-operation Henning Nyhegn put his chase bike at the Koreans' disposal and headed off after each model with a Korean on the pillion.

Both comfortably made the four minute flight, but Pak Song Gyu spotted a slight buckle in the lower rear of his light alloy front end when the model came back; machined from solid, it had a 0.25 mm wall thickness in the damaged region. Perhaps a heavy D/Td landing had distorted this for a change in longitudinal dihedral could have resulted, so between fly-offs he did a check flight using a two-second motor run to make sure all was well for the five-minute round. It was, and both again maxed, so it was not till the six-minute round that Pak finally won, in a close finish just nine seconds ahead of his team-mate. It became clear that being a successful Korean is a tougher job than we had imagined; for the second evening a Korean medal winner was tossed happily skywards by his team, and, for the second evening, dropped after a few launches. Maybe it's normal!

Five minutes after the end of the fly-off thunder arrived and a few spots of rain fell as the winners received their FAI medals at the prizегiving. As we left the field we heard that local people had found eight lost models and brought them back during the day.

## ...and F1B

Wakefield day dawned breezier, with five to seven knots showing on the anemometer; this was as forecast. Throughout the contest a Polish Air Force mobile weather unit was parked on the edge of the field, with its aeriels and satellite dish prominent. The resulting satellite weather maps and other data were available to all teams.

One jury ruling simplified matters for team managers and organisers. In the past things like pre-loading rubber cartridges, taking rubber, fuel or towlines from the timekeepers' impound box

**Marcell Smeisser of the German Democratic waits to launch. The team used no thermistors.**





# First Junior World F/F Champs



Top left: The winner's box! Vladimir Kubes took F1B for Czechoslovakia. Top right: Roger Ruppert of Switzerland placed eighth in F1B. Model features prop delay, carbon spars and Kevlar motor tube. Above: Third in F1B - North Korea's Pak Song Guk. Left: The technically most advanced model was Stephane Langdeau's. Below: Andras Kovacs of Hungary flew this F1B with VIT, KSB timer mounted nose; wound in stooze with dial gauge torque meter. Right: Llan Melamed was one of three with a full house in Wakefield until a disastrous seventh-round flight.

before the start of a round or preparing more than one model at a time had led to timekeepers putting their own interpretations on the legality of such practices. This could lead to a waste of valuable round time till team managers could sort it out with the jury or the organisers on a *ad hoc* basis. At Leszno the jury suggested and the organisers accepted that, unless the rules specifically prohibited something, then it was allowed, and the timekeepers were advised of this.

Rather than a round by round account of F1B day it is interesting to look at some of the aircraft. One of the most interesting was Stephane Landeau's. This had Rohacell propeller blades covered with glass tissue and reinforced with carbon tissue for about 3in. round the roots. A prop delay system was used, and the motor tube was Kevlar with spiral carbon filament reinforcement; carborundum launch grips ensured a slip-free







throw. The wing was also from Rohacell, but the centre panels were skinned with F1C-type light alloy, producing a very stiff structure. The wing slid aft by about an inch during the power run and as it moved back over the pylon, its incidence increased to re-trim the aircraft for the latter part of the power run - and to allow the prop blades to clear the wing leading edge as they folded. The tailplane was cut from open cell foam, had balsa tip ribs and a carbon spar to about two thirds of its span. A fuse D/T was used. Stéphane used an unusual winder with a padded and angled grip that fitted under his arm. Instead of a full winding tube, unnecessary because of the presumably unburstable nature of the Kevlar motor tube, he employed a bell-mouthed stub tube about three inches long, with foam rubber round the outside to locate it in the sharp-edged nose of the fuselage, to prevent rubber fraying while winding.

Sixteen year old Jimmy Buxton of the USA has been flying in contests for three years, but had built his first Wakefield just three months before he came to Leszno. One of his models had twin fins made from McDonalds food box foam about 1/8in. thick. On round 4 his climb and glide turned seemed very tight, and to add insult to injury his fuse D/T popped very early to give him an 88 second score. Team-mate Adam Tracey started with four straight maxes, but then had a prop blade hang up on the wing leading edge as it folded, spinning in for 64 seconds. One got the impression that less attention was being paid to other models in the air than to the team's thermistor, but from the outside and with hindsight it is easier to have the answer than when one is actually waiting with a wound model or trying to advise the person who is.

The Israeli Wakefields used rolled Kevlar motor tubes, usually with a diamond section rear boom of balsa. Wings were covered in clear Mylar over an extensively carbon-reinforced structure, with a D-box leading edge, carbon rib caps and upper and lower trailing edge stiffening. Ilan Melamed used a delayed prop start and an all-moving fin. He had quite a tough Championships, too; after six maxes he had damaged his prime model when it D/T'd in the village downwind, lost his second and was down to the third for the final round, in which he, Roger Ruppert of Switzerland and the Hungarian Istvan Nagy all had full scores. He was not happy with the model and waited for around ten minutes while he and team manager Itzhak Ben Itzhak studied their single thermistor for signs of thermal activity. With no model left to wind he had the problem of tiring rubber to counterbalance against the urge to wait for better air; when he flew it was clear he had no help from the air and did a disappointing 98 seconds which dropped him to tenth.

The Koreans used a very neat prop protector when winding. Made from light alloy, it was extensively drilled for lightness, and clipped onto the nose-block with two spring-loaded squeeze grips that released with finger pressure. Their propellers were from Korean pine and narrow-bladed; some had a turbulator about 1/8in. behind the leading edge. Several times I saw one of their flyers wind a second model while an assistant held the earlier wound one, to ensure that when the air did get good he had as fresh a motor as possible to climb into it. Pak Song Guk's prop delay was less than half a second, so as to avoid any risk of the initial throw momentum dropping off or the nose of the aircraft angling down from the near-vertical.

With some competitors as young as 13, and not exactly built like weightlifters, winding a 40 gram Wakefield motor can assume major proportions. Kallias-Steiner of West Germany, in spite of insistent vocal urging from his helper - a parent, the team trainer or maybe a Bundeswehr drill instructor? - was clearly at the limit of his strength when still a couple of feet out from his model during one wind, and just stopped. At times like that helpers are grateful for belt hooks to restrain winders. Another flyer and his helper had a different approach; the flyer wound and stayed rooted on one spot, while his helper moved towards him with

the model as full turns were approached. 13 year old Emil Bober from Bulgaria was dwarfed by his model but at least did one max in the tricky conditions at Leszno.

Several flyers were using the Polish-built DVMK three-function timer, which was based on a camera self-timer, presumably from a Zorki or a Kiev body.

The wind increased during the morning and after round 4 it was showing 13 metres a second on the anemometer, so round 5 was delayed by an hour. At 3.15 the windspeed was lower and the round was re-started; ten minutes later it was clear that the lull was only temporary and, as nobody had flown, the jury agreed that the round could be stopped, to be re-started yet again as a full round. This eventually happened, and the order among the top ten changed: Kubes moved into fifth place, just eight seconds short of five maxes and Tracy dropped to eighteenth. Valdemar Falk from Sweden, flying a kit Tilka with slight modifications, moved up a place to seventh. The following round saw the local favourite Waldemar Zlotnik drop from equal top to tenth after a 2:08 flight. Kubes and Peter Mozes from Hungary were eight and ten seconds behind the leading three flyers, still with a full score.

For Roger Ruppert the last round was his undoing; flying immaculate models that were carried in a well-stuffed box that looked almost surgically clean, he, like many of his compatriots, favoured extensive anodising on every bit of light alloy; in this case red. His propellers used carbon spars, the wing was of Kevlar-covered foam, with a carbon spar on top, about 3/16in. wide tapering to 1/16in. square at the tip. An all-moving fin was operated by a Seelig timer which also triggered a delayed prop start.

But it was in the last round that the real upsets happened; all three leaders dropped flights and their chance of a medal, but Kubes, Peter and all three Koreans maxed, to resolve the first World Wakefield Championships for Juniors without the need for a fly-off.

## Close of Champs

The Championships closed with a floodlit display of folk dancing, performed by a very enthusiastic troupe of children; a stage had been erected at the front of 'our' palace, rows of seats installed and even scaffolding in use for some wall repairs had been tastefully draped with blue and white cloth so it did not cause a jarring visual note to the ceremony. Waves of dancers advanced on us, all with permanent joyous smiles, between each of the team prize presentations, and a few speeches were made and translated. Pierre Chaussebourg, as President of the FAI jury, closed the Championships with a few heartfelt words, and then onto the balcony stepped a baroque chamber music group; its conductor introduced each item at some length, and their contribution closed with Handel's Music for the Royal Fireworks, with - you've guessed - fireworks, which rent the sky over the small Polish village across the moat. The festivities had taken two and a half hours, not including the disco which followed, but the competitors fraternised away in the warm night air till exhaustion took over. I know; it was under my bedroom window!

So ended a very successful Championships, on which a great deal of effort had been expended by the Polish Aero Club's model section. It seemed that nothing had been left to chance, and the contest was run enthusiastically and efficiently by personnel who were model flyers themselves. Wearing my CIAM Information and Education Committee chairman's hat, I consider it to be probably the most important event on the international sporting calendar. It is an excellent means of raising the profile of model flying among young people, always presuming that their domestic magazines publicise it and national model flying organisations promote it. Without these vital first moves it is certain that countries will continue to have few young flyers, and will thus think there is no source on which to draw for future teams. The Poles have shown the way; the rest is up to the rest of us.

## Junior World F/F Championships Leszno, Poland: August 1988

### F1A

1	M. Van Dijk	Netherlands
2	Li Sung Chol	N. Korea
3	T. Lepp	USSR
4	Pak Jin Chol	N. Korea

### F1B

1	V. Kubes	Czechoslovakia
2	M. Peter	Hungary
3	Pak Song Guk	N. Korea
4	Han Myong San	N. Korea

### F1C

1	Pak Song Gyu	N. Korea
2	Kim Yong Nam	N. Korea
3	M. Nogga	DDR
4	M. Gaisrowski	Poland



# VINTAGE CORNER

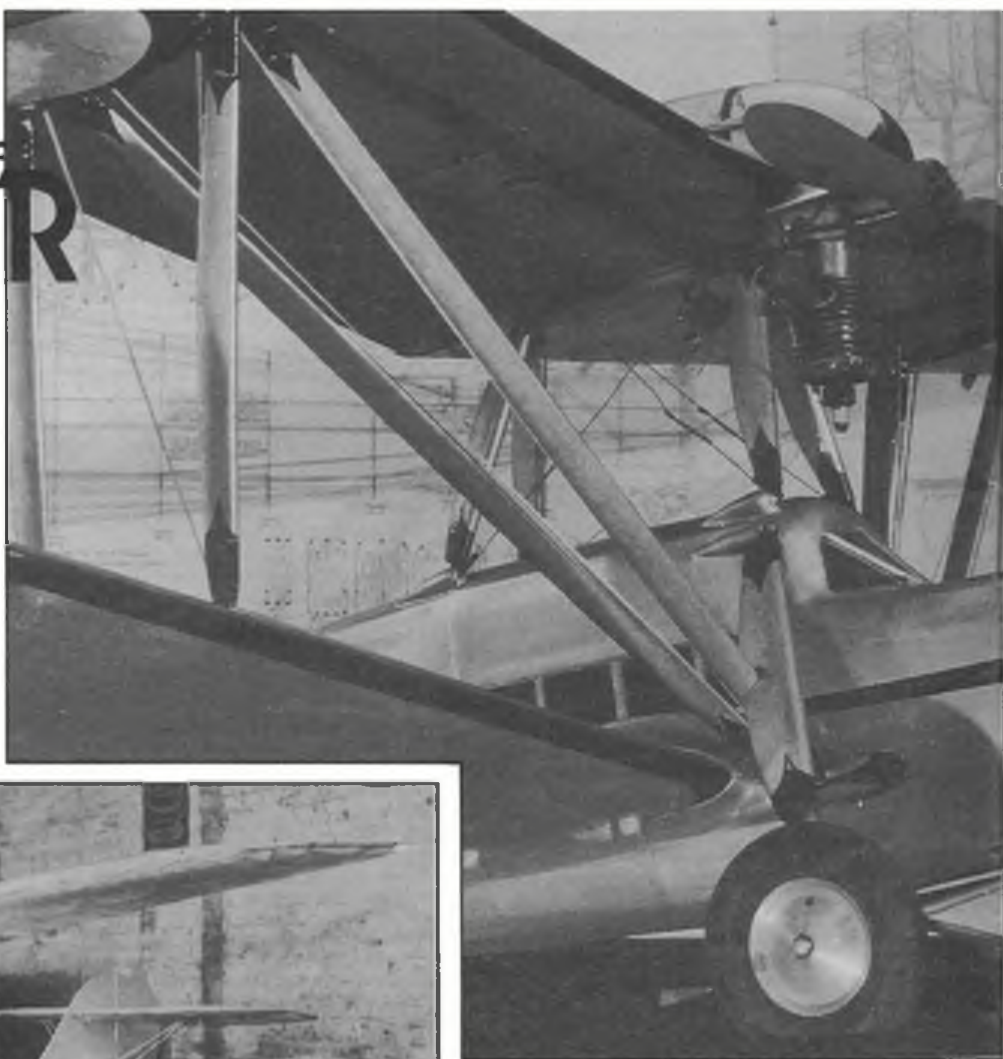
No longer eclipsed:

Details of the little-

known Spencer Orion

hunted down by

Alex Imrie



A NOTABLE news item appeared in November's Hangar Doors. Chris Topp from Thirsk wrote in with a close-up photograph of a large petrol-engined biplane that he had recently acquired. This was the first intimation that the writer had received that this masterpiece of design and construction had survived the intervening years since it was built in 1934. I knew of the model and its origin, and I had long intended to compile an article on it; so publication of the photo caused 'when?' to become 'now!' But first, let's go back a little way in time...



*The Orion on show at the Newcastle MAC exhibition.*

## Airships and aircraft

Richard Percy Spencer was a Vickers aeronautical engineer who, after work on various aeroplanes (including the twin-engined Vimy flown by Alcock and Brown) was associated with the Airship Guarantee Company, a Vickers subsidiary, in the construction of the large rigid airship R 100 at Howden near Hull in the late 1920s. That ship was reduced to produce, despite her successful transatlantic flight, when airship development in this country was abandoned after the tragic loss of the government-built R 101, whereupon Spencer left the aircraft industry and devoted himself full-time to a business that he had started in 1927.



# ..Special



Above: Neat engine nacelle and fairing are evident. Covering has been stripped from port upper wing.

Heading: The Spencer Orion, remarkably well preserved thanks to 55 years of storage in its wooden case. Top left: Early days; engine yet to be installed. Centre left: Tommy Kennedy at work on the framework in his upstairs workshop at Queen's Square Garage. Original parasol wing was almost 12ft span.

He was the owner of Queen's Square Garage and Engineering Works in Saville Row, Newcastle-upon-Tyne, and was the designing and consulting engineer of its Model and Experimental Department. But the aviation bug bites deep. Before long he had embarked upon the design of a two-seater light aeroplane. This machine was to be built in the vast loft of his home at Greenside, and Spencer engaged T R Kennedy, a young aviation enthusiast and a skilled model maker, on a contract basis to draw-up and build a large prototype model of the projected

light plane. An engine that was apparently intended to power the model under consideration was purchased late in 1933, this being an Improved Atom Minor two-stroke of 14.5cc capacity.

Edgar T Westbury had made the original Atom Minor at C E Bowden's request in 1932 following the use of the 28cc Wall engine in the Kanga biplane. At the time, an engine of half the size of the Wall would have been considered small, but it was still a hefty lump of motor, weighing 17. 1/2 ounces including the fifteen inch Elektron propeller which it swung at 3500 rpm (this being considered quite a respectable performance in 1932). Westbury made two more Atom Minors for CEB, after which the engine was taken over by the well-known model supply house, Messrs A E Jones Ltd of New Oxford Street, who incorporated several minor modifications in the engine's design including the use of Hoffman or Skefko ball races for the crankshaft journal bearings. The result was known as the Improved Atom Minor. It was not cheap at ten guineas (£10.50) although a set of castings and working drawings were available for enthusiasts who wished to make their own engine.

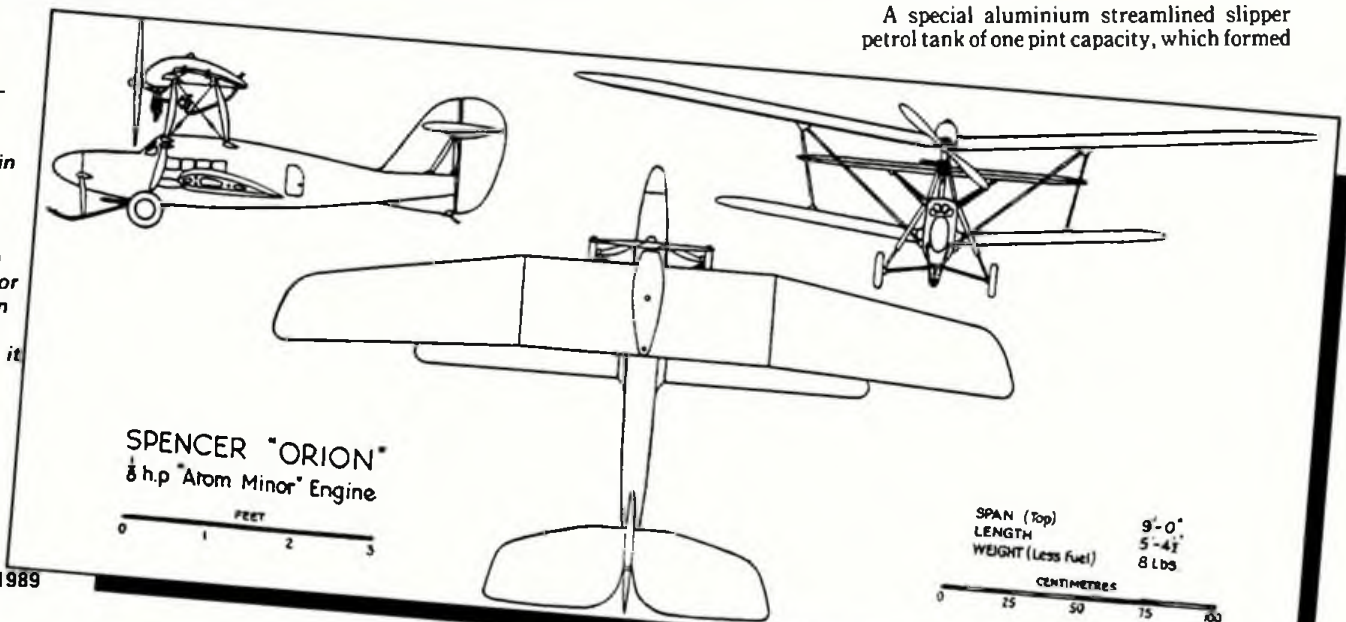
## First designs — and change

Doubts about the suitability of flying such a large scale model with this engine caused

Spencer to design what he considered to be a more stable flying model. At this time his full-size ambitions were dropped. A parasol cabin monoplane layout of nine feet wingspan evolved. Protection of the engine and the propeller was a prime consideration, and knowing of Tommy Kennedy's skill at the drafting table, Spencer asked him to convert his rough constructional sketches and design calculations into full-size working drawings, and then to build the prototype model. Tommy's self-acquired ability with pen and pencil was a natural gift, for he never had any schooling in mechanical drawing - a fact that professional evaluation of his original work to-day finds almost unbelievable. He was no less skilful in model construction, and immaculately crafted Spencer's structural design, which was based on current full-size aeronautical practice in many respects. While still unfinished, the model was exhibited at the Newcastle Model Aero Club's exhibition during the summer in the Chronicle Hall, but soon afterwards the machine was converted to biplane configuration by adding short-span lower wings and interplane struts. Some items on the model were contracted-out; for example, Dunlop, who had already made special wheels of different sizes for C E Bowden, made a pair of five inches diameter to the order for Mr Spencer.

A special aluminium streamlined slipper petrol tank of one pint capacity, which formed

This three-view drawing appeared in Flight magazine. Thanks to Aeroplane Monthly for permission to reproduce it here.



January 1989



the rear fairing of the engine nacelle on the top wing, was made for the model by a local tinsmith; and an 18 in. left-hand-tractor propeller was designed and made especially suited to the one-fifth horsepower engine and design parameters. Although quickly-detachable fittings with good knock-off-ability were used throughout, to provide protection to the main airframe components in the event of a crash or heavy landing, a duplicate set of wings was also built as a precaution.

### Beautiful creation

When the model, now named Orion, was finished late in 1934 it was a beautiful creation resplendent in aluminium dope with black trim. It certainly fulfilled Richard Spencer's resolve in making the model as a compliment to the manufacturers of the Improved Atom Minor, '...that the ultimate result should be a model, which, if possible, would set a higher standard in the design of power-driven model aircraft...'

One can understand that there might have been some reluctance to fly it immediately, especially during the poor weather at that time of year. The engine was run several times in the airframe but was eventually

removed the following year to power an equally large canard monoplane with a triangular cross-section fuselage which had been designed by Spencer and built by Tommy Kennedy. This model was flown successfully on Newcastle Town Moor, and the engine was later re-installed in the biplane, but sadly there is no evidence that the Orion was ever flown.

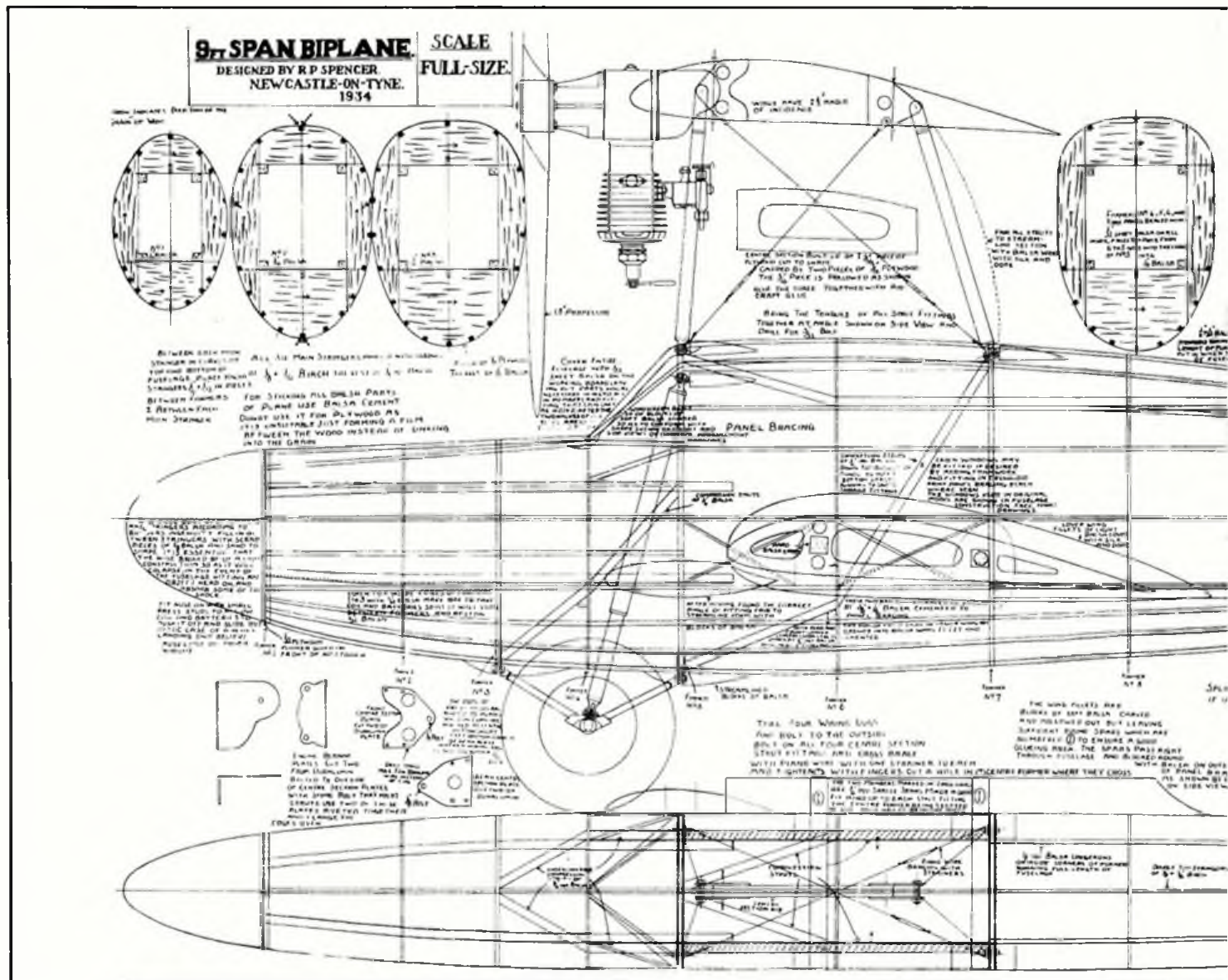
Mr Spencer's concentration on his business affairs indicate that his modelling work declined at this time, and as related in Vintage Corner in the June 1986 *Aeromodeller*, Tommy Kennedy, by then out of work, obtained full-time employment with Mr C W Lutman of The Model Shop in that concern's workshop in Handysides Arcade in Percy Street, and he eventually lost contact with Mr Spencer.

### Resurrection

Time passed...in fact over half a century before the Orion re-emerged onto the modelling scene. Mr Spencer maintained a wide model engineering interest until his death in 1961. A number of his models were retained by the family but it was decided to dispose of the big biplane. Sold at Christie's Auction Rooms in May 1988, it was complete in the

stout wooden carrying case that Tommy Kennedy had made for it, with spare wings, photographs, and Tommy Kennedy's original tracing paper inked drawings on five sheets. The silk covering shows the ravages of time, but the airframe is intact. This, plus the lack of any oil soakage around the engine seems to indicate that the model probably never did fly in the interim. There were no runways in the mid-1930s and the power needed to get the model off even short grass with those wheels must have been considerable. The Improved Atom Minor, swinging what appears to be quite a coarse pitch eighteen-inch propeller would have its work cut out to fly the 8lb Orion with all the drag of biplane wings and struts. Possibly the model did not fly at the time because it was incapable of doing so, due to being drastically underpowered, or maybe I underrate the power output of the Improved Atom Minor!

There was much soul searching done when Joe Bentley of Harrogate, the present owner, obtained the model. Should it be restored to flying condition and flown with radio control? Or should the model be preserved unaltered and a replica built for R/C? At present the latter scheme is being put into effect. Hopefully the original model will form the







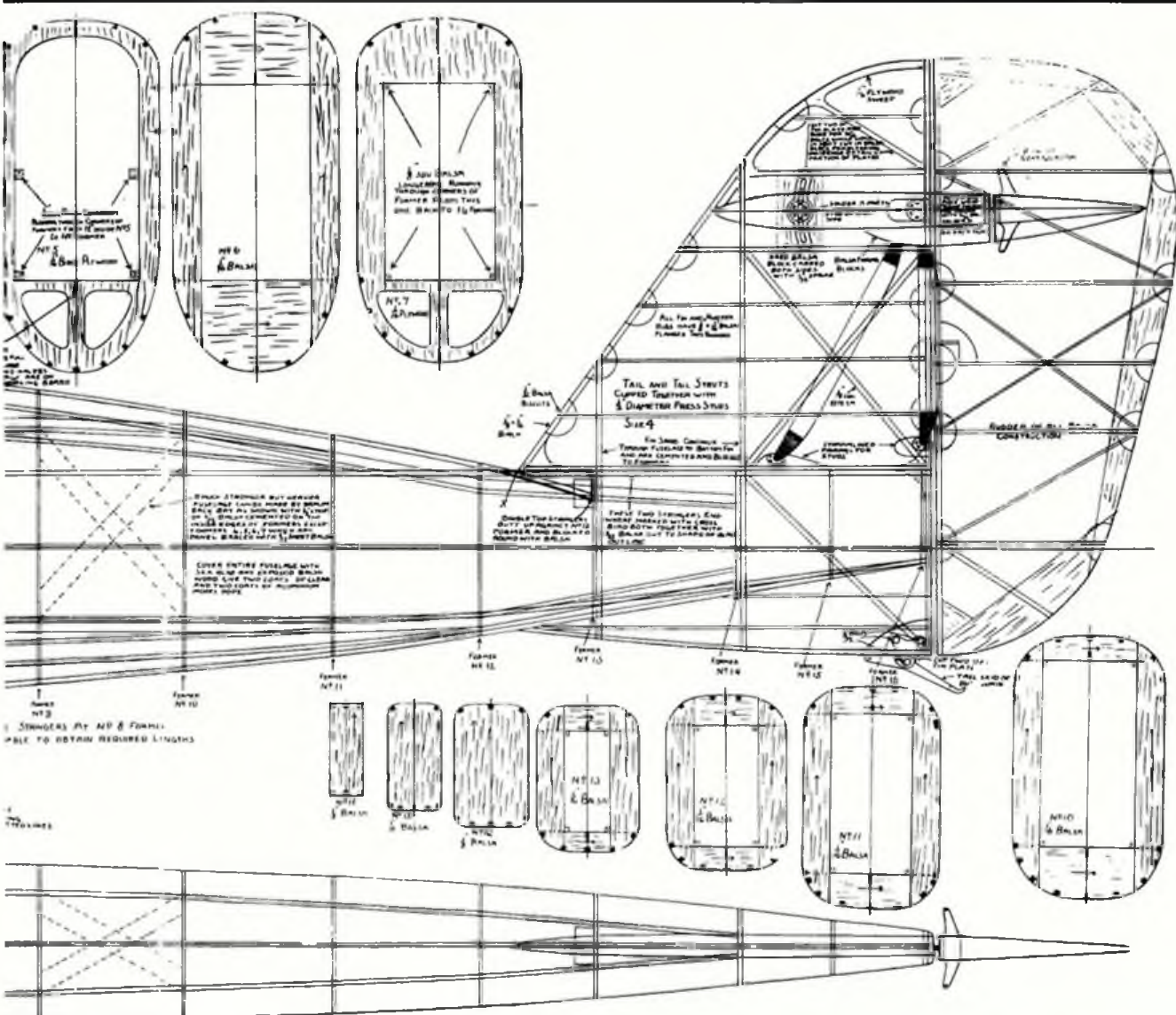
**Left: Fuselage is massive. Plan detail shown below. Painted-on door is a nice touch! Note lower wing trailing-edge undulations despite its birch construction.**

central part of a travelling display to the major model meetings, thus ensuring that as many enthusiasts as possible can see this vision from the past. The large model enthusiasts from Harrogate are also planning to get cracking right away on a flying replica that will utilise the original duplicate set of wings, and this should be ready for flight later in the year, an event that will be eagerly anticipated by all vintage enthusiasts. So the replica will be seen in the air, Orion's natural element, apparently so long denied the original model for reasons that might yet come to light.

### All the gen

Main dimensions: Wingspan (top): 9ft 0in.; (bottom) 5ft.5in. Maximum wing chord: 12.1/2in. Length (overall): 5ft.4in. Tailplane span: 3ft.6in. Maximum tailplane chord: 12in. Weight of complete model, ready to fly (less fuel): 8lbs.

Six main stringers of 1/8 in. sq. birch with





intermediate balsa stringers give the fuselage its shape. The main fuselage formers or transverse frames under the centre section strut locations are fretted from 1/16 in. plywood, other formers being built-up from 1/16 in. balsa. At the corners of the square or oblong openings in the formers, 1/4 in. sq. balsa longerons on the forward fuselage reduce to 1/8 in. sq. at the rear. Formers in the rear fuselage are diagonally braced with strips of half-inch wide 1/32 in. balsa. Steel plates are fitted to the plywood fuselage formers with lugs at strut attachment points. Top and bottom of the fuselage are rounded in section; these areas, and the oval cross-section fuselage nose portion are covered with 1/32 in. balsa sheet, then covered with Japanese tissue and silk doped on. A nose cowling, detachable via press studs, gives access to a sliding tray in the forward fuselage which contains the ignition coil and two 4.5 volt flat torch batteries connected in parallel as a flight battery. This heavy unit is installed so that it is free to travel forward through the lightly-made nose cowling in the event of a crash or very heavy landing. The frangibility of the nose cowling is meant to absorb the shock of impact; it could be moulded from rubber or other yielding material to obtain the same result. On the drawing the style of construction of this item is left to the individual builder's choice.

### ...and the wings

The top wing panels, which have pronounced sweepback on their outer leading edges, are attached to the main centre section rib which is built-up from plywood and carries sheet metal plate fittings to take the centre section strut fork-ends and the engine mounting. The bottom wings are without sweepback; they join the fuselage sides via balsa fillets and have half-inch-square hard balsa spars running completely through the fuselage. Special fittings for the mainplane root ends allow complete detachability of these components in the event of a crash; these are fabricated from heavy duty commercial press studs with a slotted head and a wood screw shank, being of the type used to attach waterproof hoods to motor cycle sidecars and baby carriages. The front and rear spars of all wings are built-up and have 1/8 in. sq. birch flanges with 1/32 in. balsa webs. All ribs are made from 1/16 in. balsa except the root ribs which are from 1/8 in. balsa - and are spaced three inches apart. Intermediate riblets are of the same material. The leading edge is of 1/4 in. sq. balsa; inter-spar drag bracing is 1/32 in. balsa of full spar depth. The small-cross-section trailing edge is made from 3/16 x 1/16 in. birch capped on either side with 1/32 in. balsa. All ribs are capped with 1/4 x 1/16 in. balsa, while the riblets have flanges of 1/8 x 1/16 in. birch running aft to a false trailing edge.

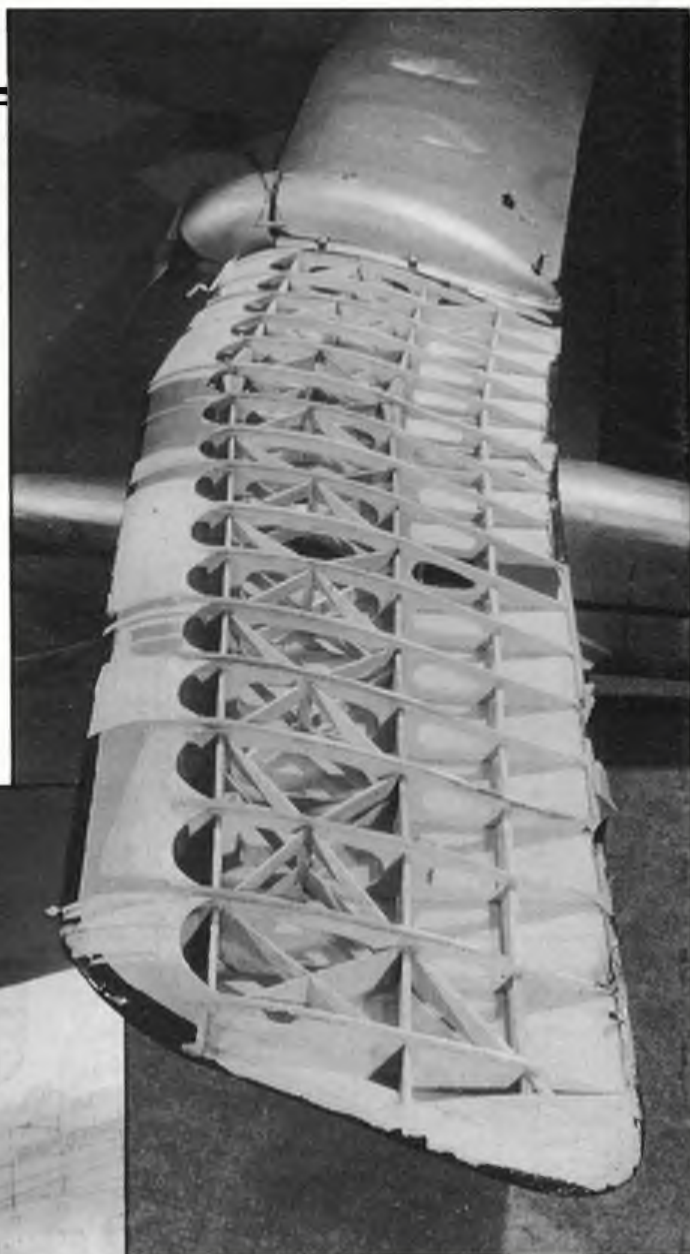
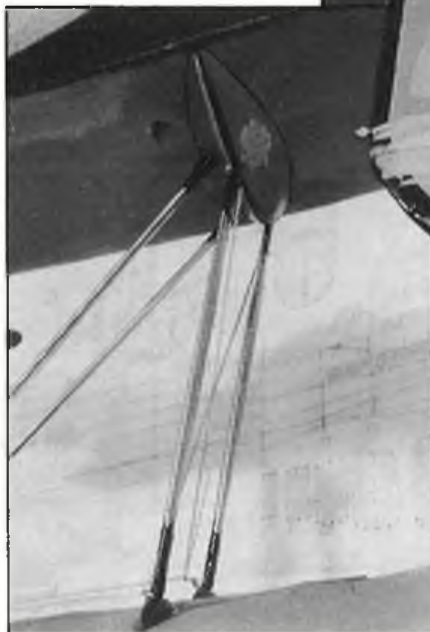
To preserve the aerofoil section the leading edge is covered with 1/32 in. balsa sheet from a false spar on the undersurface to the front spar top. Washout is built into the top wing outer panels by raising the tails of the ribs progressively by 2 mm each to give 24 mm (15/16 in.) washout at the tips. The two sets of mainplanes that accompany the model are of different styles of construction; one set is

**Right: 'Lightweight' wing structure is all-balsa apart from trailing edge.**

**Alternative, part plywood 'heavyweight' design also featured 1/32 in full-depth drag bracing. Far right:**

**Much struttery - all functional, with dural fittings and steel bolts.**

**Nose skid was meant to absorb landing shocks by compressing longitudinal coil spring in tube; engine was switched off simultaneously. Below: strut detail. Press-stud fitting used in conjunction with rubber bands, as described in text.**



but no evidence appears today. The drawings also detail the lightweight tailplane of all balsa construction without separate elevators but retaining the variable incidence adjustment mentioned; and it is a tail-unit of this type that is fitted to the model at present.

### Struts and things

All undercarriage and centre-section struts are made of duralumin tube faired with balsa, then wrapped with doped silk. The centre-section trestle is braced with piano wire tensioned by small turnbuckles. This system of bracing is also employed inside the fuselage between the strut end anchorage points. The undercarriage is sprung vertically by a compression spring working in a 1/2 in. diameter 22g. tube. The piston tube is 3/8 in. diameter. End fittings, which are a press fit in the tubes, provide for attachment to the fuselage and the radius rod-ends. Two radius rods of 3/16 in diameter, 20g. tube are fitted to each side. These have duralumin fork-ends attached to the lugs of the sheet steel fittings bolted to the plywood fuselage formers by steel bolts.

Their other ends terminate in holes drilled in a triangular block of duralumin whence they are retained by split pins. This block is attached to the bottom of the telescopic compression strut and is drilled and tapped

as described, while the other is built in a lighter form being all balsa except for the birch trailing edge. These differences are detailed on the drawings where the latter are referred to as lightweight wings.

The tailplane also possesses complete knock-off-ability. With the exception of the 1/8 x 1/16 in. fin leading edge and the 1/8 x 3/4 in birch, fin spar the construction of the tail unit is all balsa. Inter-spar drag bracing of 1/32 in. balsa to full one-inch spar depth is used on the tailplane, whose leading edge is covered with 1/32 in. balsa sheet scalloped for lightness at its aft extremity. The strut-braced tailplane is placed near the top of the fin and is adjustable for incidence pivoting at the rear spar attachment, the front spar attachment working in a curved slot retained by friction plates.

Separate elevators are shown on the drawing with 1/16 in. plywood operating horns and it is assumed that control wires from these led to an adjustable locking device on the top of the fuselage between the root ends of the rear centre-section struts. This method was also to be used on the rudder





provides thrust line adjustment. On the drawings these brackets are shown made from duralumin, which would obviously prove unsuitable. An extended induction pipe is fitted but not depicted on the plans. This moves the floatless carburettor aft, clear of the front centre section struts, thus improving accessibility – an essential point, for the mixing valve device tends to be erratic. During starting it could require close attention to the three controls; namely, needle valve, air lever and the mixing valve spindle. The carburettor is fed via a copper pipe from the needle valve fuel shut-off at the extreme aft end of the streamlined petrol tank which forms the rear part of the engine fairing, the front of which is carved from balsa and covers the crankcase and engine mounting. To complete the installation a large diameter spinner was originally fitted over the propeller boss.

A clockwork timer is fitted at the same location on the top of the fuselage as the fine adjustment locking device for the rudder and elevator control wires. This closes the throttle lever on the carburettor through a suitable linkage to a slow-running position after a pre-determined time of flight. As already mentioned, the switch operated by the skid stops the engine on landing. A similar system was used by C E Bowden on his Kanga and other early models. Unfortunately the clock timer, linkages and the skid operated switch (as well as the propeller spinner) are missing from the model today. The complete machine is covered in Japanese silk, clear doped then finished in aluminium with black trim on all flying surface outlines, strut ends, and in a tapering cheat line on the side fuselage centre line.

The layout might look odd to our eyes today, but the biplane configuration with a high thrust line was in fact used on a number of small full-size aeroplanes during the late 1920s. Some of these were landplanes; others were flying boat or amphibian types for which this configuration was particularly suitable.

It may have been knowledge of these aircraft that caused Richard Spencer to adopt this layout. It was intended that Tommy Kennedy's full-size working drawings were to be made available from Messrs A E Jones Ltd, but the writer has been unable to confirm that this was ever done. If so, one would be tempted to think that there might be other Orions in dusty attics awaiting discovery, but personally I doubt it, for in the rapidly developing power-driven model aeroplane scene in this country from 1935 onwards, the emphasis was on simple, easy to build models, and there were few modellers who could have afforded to build an 'aeroplane in miniature' like the Spencer Orion. And of course, it really needed the skill and devotionism of a Tommy Kennedy to accomplish!

## Acknowledgements

Thanks are due to a number of sources in the above compilation, notably Tommy Kennedy, Joe Bentley, Major Peter Spencer and Flight magazine. Special acknowledgement must be made to Zorex Design Technology who prepared exact copies of the original drawings using their 3080 AO Production Printer.

2 BA for the stub axles made from motor car wheel spokes. The special wheels have already been mentioned. The hubs are turned in two parts from duralumin. The inside plate is flat; only the outer disc is dished. They have half rims at their peripheries, and when joined together and fitted with a brass bush for the axle, full curved rims are formed to take the rubber tyres, which are not inflatable, but are of thick hard rubber, hollow like car tyres, with a rubberised fabric seal attached internally to trap the air inside at atmospheric pressure once the tyre snugs home on the rims. An unusual part of the landing gear is the large ash toothpick skid – spindled out according to the drawings, but the one on the model is without this refinement. It is pivoted on a bipod strut arrangement at the fuselage nose and its backwards movement causes a collar sliding along a 3/16 in. 22g. duralumin tube to compress a spiral spring for shock absorption. This movement triggers a switch to cut the engine ignition both on take-off and on landing if the machine attains an extreme tail-high attitude.

The main undercarriage wheels are not sprung fore and aft, but the skid touching the ground first would tend to impart a change of attitude to the gliding model, and since this would occur immediately the engine cuts, it is just possible that smooth, tail-down landings could be made without undue strain

on the solidly installed radius rods. The main lift and drag wing struts are built-up from birch and balsa, while the tailplane bracing struts and interplane struts are all balsa. The ends of all struts have the press-stud fittings, heavy-duty commercial types on the lift struts (as mentioned) but interplane struts, and tail-unit bracing struts use 1/2 in. diameter 'No 4' size. The opposite halves of all press-studs are soldered to tinplate brackets that are bolted to the structure, and recessed into streamlined balsa fairings at these locations. Small piano wire hooks are provided at all press-stud attachment points and the connection is re-inforced with stretched rubber bands. As a safety measure the bands used for this purpose at the lift and drag strut fittings and on the tail unit are extended to points on the fuselage. Those on the interplane struts are carried diagonally across the wing gap to resemble incidence bracing wires.

## Motor matters

The Improved Atom Minor is installed inverted with its thrust line aligned with the top plane leading edge, and is radially mounted on sheet steel plates that are bent at 90 degrees to form two lugs held by the single 1/8 in. steel bolt that also attaches the apex of the front centre section struts to the centre rib. Tilting the engine about this bolt



# FREE FLIGHT SCENE

## Dave Hipperson looks at a Power winner and rounds up results

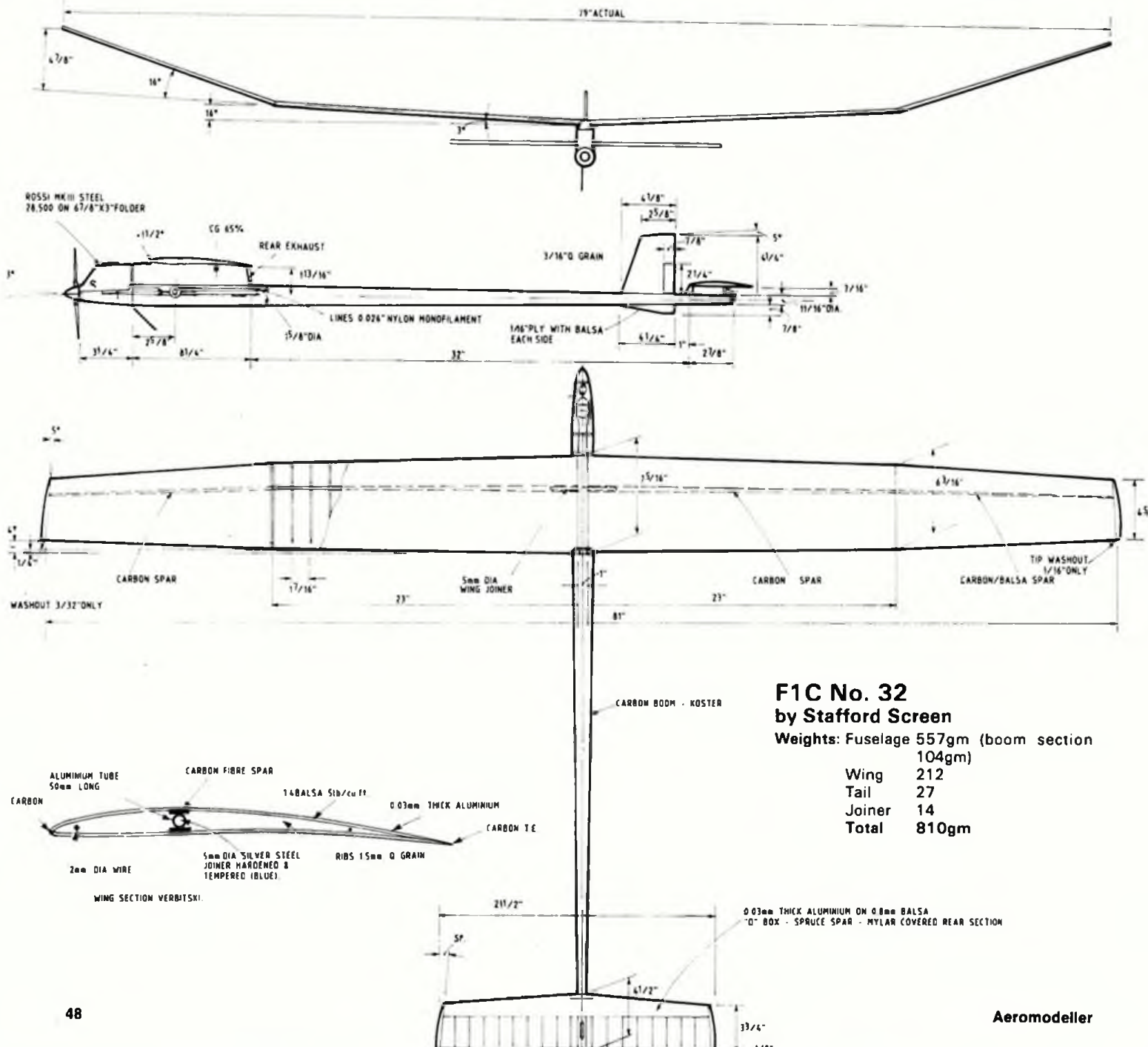
IT WOULD be fair to say that Stafford Screen has now reached the enviable position - in this country at least - of being as close to invincible in a class as it is possible to get. Any FAI power flyers that disagree only have to prove it with contest results. He is gifted with no sixth sense. Neither does he have more time than any other modeller to

spend on his hobby; unlike some FAI flyers he dissipates quite a lot of his energy into the Open classes - that's when he's not playing football or cricket.

No. He has reached this position - a tough one to maintain, even when a good few of your competitors give up when they see you coming - simply by steady improvements to his design and a methodical approach to flying. His preparation is meticulous, of course, with as much potential trouble sorted out in advance as possible; but perhaps more than anything else he has not been tempted down the road of change for change's sake, cosmetic reasons or to follow fashion.

Design changes made a few years ago (Stafford went over to metal-skinned two-piece wings and round fuselages) were the result of much of soul-searching. He's still

not entirely happy with the round fuselages. The same would be said of the high-tension tail-hold-down line system so essential with the Russian-style bunt mechanisms; they stress the fuselage so much that it has to be more rigid than ever. Stafford is now contemplating metal-skinned fuselages, although the design here still uses a Koster carbon fibre boom. Another addition has been the very fancy nine-minute Russian timer. Lines have to be connected before each flight, for their movement is too much to allow the old system of permanently-connected triggers. Here is a source of error that would certainly worry me - with the best will in the world the lines could be connected up in the wrong order with horrible consequences, particularly considering that the model employs some 6mm of positive incidence at the tail for the bunt transition.



**F1C No. 32**  
**by Stafford Screen**

**Weights:** Fuselage 557gm (boom section 104gm)

Wing	212
Tail	27
Joiner	14
<b>Total</b>	<b>810gm</b>





**Top: Stafford Screen's F1C bunt mechanism. Below: Russian nine-minute timer used on 'No. 32' model. Note also finger grips on boom.**

The three degrees of downthrust is still a mystery. The Russians have used it for some time; more, it would appear, for convenience of porting the engine exhaust above the front fuselage tube than for aerodynamic effect. However, with the bunt transition system it may have a beneficial effect. When the motor stops the model is still moving forward at high speed, but the nose-down force induced by the downthrust is suddenly released. It should follow that before the model slows down there should be a slight looping tendency. A model rigged in this way goes through some interesting force reversals at the top of the climb. My theory is that this may make the bunt adjustments easier, for there is an opposite force to work against.

### Final Trials for Argentina

It was Barkston at its very least hospitable for the final flights of Trials to decide the Teams for Argentina. Although though not actually very windy - maybe around 20 mph at the start and from the south-west - it certainly felt much worse with an 8am temperature of little more than 45 degrees. The forecast was worse; stronger winds and rain. The day before had produced 45 mph gales so the prospects were dismal. The Power flyers were asked to start proceedings as they still had five flights to make, against Glider's three and Rubber's four. The turnout in this class particularly was hardly inspiring; only five thought they were in with a chance. All patterns suffered from the blustery conditions - and early-morning nerves. Higher - climbing flights travelled a considerable distance (perhaps one-and-a-half

miles) illustrating that the wind at altitude was fierce. On reflection, this was a clue to the problems suffered later; but even after three decades Barkston Heath aerodrome still seems to have lessons it wants to teach us.

Power was followed by a few more participants in Glider. No-one exceeded two minutes! Models that looked well away were quickly sucked down and some were quite violently upset. Fantham made the best flight of 1:59. This was depressing!

Wakefield was, in some ways, worse. Hipperson launched crosswind, fooled by a sudden wind-shift to the south, and eradicated his lead immediately with a flight of little more than 90 seconds. Peers and Gaunt made respectable climbs, drifted to the edge of the drome but were back on the ground in little over two minutes. Ivan Taylor had a similar disaster to Hipperson. Only Newham Beaumont maxed. Proxy flying for Peter King, he was in fifth place until that moment. This rocketed him to the lead. Turbulence to considerable altitude was doing the damage, rather than pure wind speed on the ground. In fact, shortly after the second round there was a relatively calm patch of 10 mph which must have lasted nearly half-an-hour - most of the period being taken up with a flight line move. Madelin's max in the second round seemed - unexpectedly - hardly to drift at all. It certainly stayed on the drome thanks to a D/T fifteen seconds early but Carter launched before the fill-in and went nowhere at all for little over a minute. This was probably the best round for the F1B flyers with most of them launching in the tail of a well marked thermal. In the main there was very little 'conventional' lift during the day. Most of the good air tended simply to be upward-moving turbulence, and it usually decayed, or became very boisterous, before flights terminated. Hipperson's model fell out of this patch and

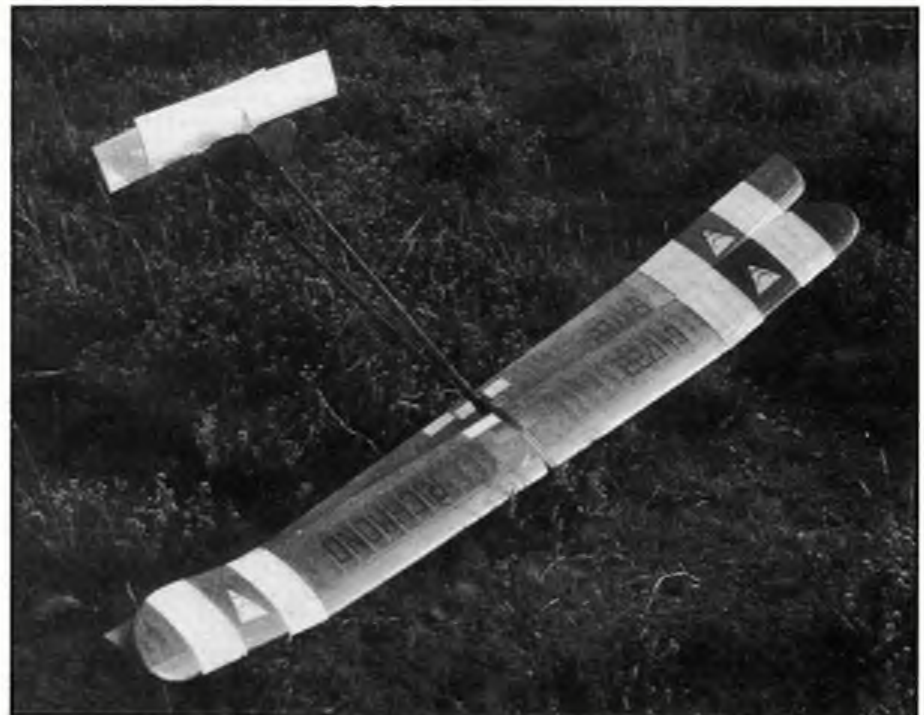
was bowled along for a minute just inches above the compound perimeter fence. Sadly, much of this was out of his timekeeper's sight. After a 2.1/2 minute flight on the first round, Faux, the Power leader, elected to fly no more! This was not the end of the extraordinary antics of the power flyers...

By the final Glider round Fantham was in the enviable position of having to make only a few seconds to guarantee a team place, and just 1:31 to win! His max was one of the few flights I saw that seemed to be in genuine, although still quite weak, thermal lift. Third place was still tight; neither Carter nor Colledge had managed to max so far. Carter needed 2:43 to be sure of a place. Off the line it certainly looked all set but (as had happened so many times) the lift decayed after two minutes and the model was scraping around. Nevertheless, it did enough - by three seconds!

Screen had maxed on his first two flights but dropped a little on the third. Watson, his nearest rival, had not done so well, dropping seriously on a very blustery first flight. So with Faux out, Screen was ahead by a slim margin. He must have thought it was his lucky day when the Watson and Johnson suggested they all call a halt!

This left only F1B which still had a fourth round to make. After Beaumont's promising start, King's number one model was damaged on a fence and the rather flimsier calm-air reserve couldn't handle the wind. Although Newham tried his best, his efforts ended in a double crash in round three. The wind had increased again - gusts were coming through at around 30 mph and with a temperature in the low 50s it was certainly cold, even for this time of the year. The top four times were very close indeed, but despite these contestants having a bad day they still forged ahead of the remainder of the field. They would still be top no matter what happened

**The two F1As used by Mike Fantham to win at Crookham and the Trials. Will we see more like the taper-wing model before Argentina?**





## Final Trials

### F1A

1	M. Fantham	30:13 + 1:59	3:00	3:00	38:12
2	G. Madelin	29:33 + 1:10	3:00	3:00	36:43
3	J. Carter	29:18 + 1:48	1:16	2:46	35:06
4	W. Colledge	28:40 + 0:44	2:39	3:00	35:03
5	D. Barrie	29:55 + 0:39	0:28		3:00

### F1B

1	R. Peers	28:32 + 2:13	3:00	2:07	3:00	38:52
2	P. Gaunt	27:55 + 2:05	2:38	3:00	3:00	38:38
3	D. Hipperson	28:59 + 1:35	2:13	2:13	3:00	38:00

4	I. Taylor	27:48 + 1:31	3:00	3:00	2:24	37:43
5	J. Baguley	26:01 + 0:52	3:00	1:43	3:00	34:36

### F1C

1	S. Screen	26:17 + 3:00	3:00	2:49	-	35:06
2	P. Watson	26:46 + 2:18	3:00	3:00	-	35:04
3	R. Johnson	26:04 + 3:00	2:41	2:50	-	34:35
4	K. Faux	26:59 + 2:28	-	-	-	29:27
5	R. Baggott	20:35 + 2:13	2:13	3:00	-	28:01

on this last flight - but in what order?

Peers and Gaunt wound and waited. Taylor readied too but Hipperson, who was now fourth, did nothing bar opting to see what sort of target he would have to shoot at if one of the others dropped. Peers flew first, judging the air himself (which, to his credit, he had done most of the day). It looked good enough to take Gaunt and Taylor but the latter's model went off flat again. This time it didn't find the good air that saved it before and he was down in less than 2. 1/2 minutes. It was easier for Hipperson to be cool when he was safe and could only improve. His first max of the day - still very 'up and down' during parts of the glide - was enough to promote him to third.

It is unprecedented that those in the F1C running should decide to stop before all flights were completed. True, the team was virtually decided by then but this belittles the event as a contest and suggests the contenders were not interested in winning. If we are to assume that a team place is not the prize in itself, just a means to an end (that end being a crack at the World Championship), then our Power flyers should be made aware that if they hope to win a World Champs one day then they are going to have to beat Stafford Screen first!

What is more, if they continue to show this almost passing interest in what must be the most prestigious SMAE FAI event on the calendar then they may find a future reduction in the number of events the SMAE are willing to run for this class. Already one has gone.

There would be many more venues available for contests if we didn't have to consider Power models. It will improve not only the flying but the breed generally if Power fliers shake off the attitude that suggests 'it's hopeless; Stafford's ahead - let's give up!'

## Crookham Gala, 1st-2nd October

The very settled, calm, sunny weather which covered most of the South for the entire weekend took this opportunity to hiccup slightly. Beaulieu was left under cloud, accompanied by a chilly, southerly breeze on Saturday afternoon. Nevertheless, this was a very satisfactory Mini contest. Serious lift was dampened and there was plenty of room for long flights with the minimum of ground-level turbulence. Coupe d'Hiver became the only event of the weekend not to require a flyoff. Ferer and Hipperson dropped a little on two flights. On the other hand, Martin Stagg lost only a second - and won - with a model showing distinct Sharp influence, particularly in the wing.

Flyoffs in Glider and Power, which involved three people each, were very sensibly run to a progressive max. In 1/2A Power, Peers had a rather stuttering run but contacted air good enough to make the max. Harris, with a better climb, sank fast in a bad patch. Peter Watson mis-set his timer so had a considerable over-run after a slightly 'left' launch. Fortunately the model cut before any damage was done, but it was going groundwards fast by then!

Glider was a virtuoso display. All three -

Sharman, Carter and Cuthbert - made the first max of three minutes very easily. Their flights would have been flyaways had the max been unlimited. After respite to retrieve (and in Colin Sharman's case, to repair tissue tears) the air was decidedly chilly; but the drift was reducing. It had rarely been above 10 mph all day. Now it was down to almost half that. Sharman launched first and looked well set for a fair flight of maybe plus three minutes. Cuthbert towed for a while longer and released into gentle lift air that Carter had also spotted. The two models floated away with Carter's model making the better of it all the way across the heath, and particularly towards the end.

Beautiful summer weather dawned for the Open and FAI events next day. Clear sky and hardly a breath of wind. Although the prediction was that it might freshen, it didn't; but just got warmer and stayed very nearly calm all day. This brought forth hordes of competitors, and with the now rather quaint practice of allowing re-entry it also produced enormous flyoffs! Only three failed to score full houses in glider. Many flew in two classes. By the end of the day a couple of dozen A/2 flyers had flyoffs to make - some of them two or three!

Conditions during the day had been absolutely fairytale. There were numerous tales of 'D/T failure' flights drifting along and coming back to land well within the field for times of anything up to half an hour. Julian Hopper had a classic. After all manner of trouble with a slow running timer he put his model way on top of a thermal marked by a cloud of gliders with an engine run of something like twelve seconds. That was bad enough but then the D/T failed! Such a big model was easily visible without binoculars, but after half an hour, when it seemed that

Julian really might have seen the last of it, the lift kicked it a little, causing it to stall. The stall increased more than expected, and it became obvious that the D/T failure had been caused by the hold-down line gumming up somewhere - and it was now coming loose. A few more stalls and it was free. To cheers from the gathering party of onlookers the model promptly D/T'd down on the heath! With excursions like this and the odd 'trimmer' between flights Julian managed to take virtually the whole day to do his three maxes in Power.

The competition closed in the late afternoon in continuing calm conditions. After a conflag with various contestants Ted Tyson decided to delay the Open flyoff, but the FAI flyoffs were under way. Once again these were to a progressive max. This probably saved the loss of at least two models; maybe three. Apart from numerous gliders two FAI Power models and two F1Bs were involved. During this first round the good air passed through right at the start. Andy Crisp, who had stationed himself downwind a little - we were not flying from a line although we had done so for the Mini event the previous day - managed to pick off the thermal as it came past. His was the first glider in the air, and would obviously max. Fantham, who was nearby, also spotted the thermal, towed down into it and also went away. These models were well into their glide before anyone else flew, but it was only Peter Williams who managed to work his way downwind to catch the good air. The Power models that flew a little later (both well upwind) scored around 3:40 with no help. The F1Bs of Pink and Grey - the latter back after a few years layoff, and in the Open Rubber flyoff too - found no help either. Gerry Pink found distinct hindrance in the form of a

*Below left: The irrepressible John White, whose low-aspect-ratio super-light Open Rubber job floated around at the Crookham Gala - but a bit tail-heavy for the competition itself. Below right: Ray Pavely prepares his 1/2A. Out of luck at Crookham despite a full score the previous weekend at the SMAE do.*





collision with a glider after a minute-and-half; and so close to the end of the round that no time was available to fly again. All the remaining models were gliders. Try as they might no one found any help. Models were landing at 2:30. This was to be repeated later in Open.

It was thus left to the three who had flown early to take the event into a seventh round. It was cooler now, and towing was hard in calm. Both Williams and Crisp seemed in good air at launch, but it was Fantham – again towing further away from the control area than most had flown all day – who picked the best air. This time the others were too far way to piggy back. Nearly four-and-half minutes was a good flight, which almost certainly signified the last of the real lift.

Up till now there had been some doubt about just when the Open flyoffs would be run. A number of contestants were still smarting from the effects of Northern Gala, when they were held much too early. Here we had the chance of a real model test if we could hold off long enough. CD Ted Tyson timed it dead right, sailing as close to the dark as possible. In fact, I must admit that a few moments before it was my turn to fly I thought he may have timed it just a fraction too late! As it was, the Open flyoffs began at around 6.10; it would be dark by 7pm. Ted sensibly chose short ten-minute slots with five-minute gaps between. Power was first. Hopper was first to launch, followed by Harris and Faux a hundred yards away. Nearly a minute later Peers flew from a similar point to Hopper. Hopper's model was undoubtedly the highest, but after a very good pattern Harris's model looked to be in the best air. Hopper's model drifted over to join it, and despite a tighter glide turn than would probably have been ideal Julian's model slowed down quite a bit. On the other hand, Peers had a perfect glide – and was very high too. The open turn really began to pay off. After seven minutes the models were only 200 yards away from the launch point. Hooper's extra altitude won it for him. Peers had outglided Harris after the latter's came out of the good air, and Ken Faux scored over



John Hooks holds as John Cuthbert prepares for the Crookham A/1 flyoff. Placed top!

5.1/2 minutes flying an FAI Model (those in the FAI flyoff please note!). Hopper's flight clocked nearly nine minutes – certainly worth the day's effort.

The glider men had real trouble in this now almost 'dead' situation. There was much huffing and puffing as nineteen fliers struggled to find lift that just wasn't there. Rod Audley's 2:43 topped a cast that slipped away through the two-and-a-half and two minutes, and showed more clearly than usual what glider 'still air' times actually are. Audley flew almost at the end of the round. In his desperation to reach the model, which he could see was in good air, John Cuthbert tangled the free end of his line in a bush. It was captured, and eventually broke. Given that John uses 80lb breaking strain nylon monofilament, one can see why this operation left two of his fingers cut to the bone by the line. Not only that but the shock of its breaking sent him flying backwards down a ditch, and into a gorse bush. He cut his leg and his back was peppered with poison needles. He was still being patched up as darkness fell around the prizegiving. Not a good day for John. Earlier he had suffered from an obnoxious Radio flyer who thought he was too near the pylon race area. (Full-blown racing takes place at Beaulieu; it's public

and they worry about the damage free flieders might do).

The Rubber flyers still had to go. This event had been less supported, probably because a huge flyoff had been expected. As it was, the air was as close to dead both vertically and horizontally as possible. Stagg flew first with a very respectable climb, but his moderately-sized model, built for all weathers, was hardly going to glide much. Trevor Grey was also away early with a slightly smaller design now showing its age. John White, who had made a flyoff again, used a bigger than usual model, but it did not climb well enough and scored little over three minutes. In the last part of the period and in distinctly dusk conditions Hipperson released his all-too-rarely-used 550sq in SST1 for the last flight of the weekend. It climbed to some altitude on its three-minute-plus run, then glided very slowly for nearly five-and-a-half more, winning by a clear three-minute margin.

Ted Tyson then presented the prizes in the complete dark. It was reminiscent of a fireworks party where you have to get right up to people before you recognize them! Challenge trophies for the four events were augmented with balsawood and plaques for other placings. Few would argue that Ted had made the contest with his expert timing of the flyoffs. A masterpiece.

### Crookham Gala Mini Meeting:

#### 1st October

##### A/1 Glider (15 flew)

1	J. Carter	10:00+3:00+3:37
2	J. Cuthbert	15:00+4:00+3:04
3	C. Sharmen	15:00+4:00+2:28

##### CDH (7 flew)

1	M. Stagg	9:59
2	D. Hipperson	9:21
3	G. Farer	9:08

##### 1/2A Power (6 flew)

1	R. Peers	10:00+3:00
2	P. Harris	10:00+1:46
3	P. Watson	10:00+over-run

### Open and FAI Day:

#### 2nd October

##### Open Glider (22 flew; 19 in flyoff)

1	R. Audley	9:00+2:43
2	B. Lavis	9:00+2:43
3	M. Warren	9:00+2:38

##### Open Rubber (9 flew; 6 in flyoff)

1	D. Hipperson	9:00+8:21
2	M. Stagg	9:00+4:14
3	T. Grey	9:00+4:14

##### Open Power (13 flew; 8 in flyoff)

1	J. Hopper	9:00+8:42
2	R. Peers	9:00+7:57
3	P. Harris	9:00+7:26
4	K. Faux	9:00+6:38

##### Combined FAI (32 flew; 17 in flyoff)

1	M. Fantham	15:00+4:00+3:37
2	C. P. Williams	15:00+4:00+3:29
3	A. Crisp	15:00+4:00+2:57

Pete Harris gets ready for the 1/2A flyoff at Crookham. Second to Russell Peers.





# READERS' LETTERS

## Pics from the past

Dear Sir,

For your interest I enclose photographs of activity at our model aircraft club, established at RAF Indura from 1941 to 1944. The Mayo, powered by an Ohlsson petrol engine, won a



first prize for the whole of the Rhodesian Training Group. Atop it is a Baby Gnome, produced by Model Aircraft Supplies from the Old Kent Road in London. I built several and lost them all in thermals...

Thanks for a great magazine.

Sutton Coldfield

Len Bracey

## It's not what you do...

Dear Sir,

Having returned from the National C/L and R/C Championships, for the tenth, or is it the twelfth successive year, I started to reflect on how our premier model aircraft meeting has changed.

Remember the good old days, when free flight, control line and embryonic radio control planes occupied the same airfield at the same time? The almost carnival atmosphere that prevailed in the evening after a good day's competition flying?

A touch of the rose coloured specs maybe?

Yet such nostalgic thoughts did pose the question. What are the reasons for holding the National Championships, and why has the presentation changed?

(a) Is it simply to choose the elite to represent our country in the world champs?

(b) Is it a way of showing Mr. 'Average Modeller' what the experts can do?

(c) Is it a means of introducing Joe, and hopefully Josephine Public to the sport/hobby of aeromodelling?

(d) Can it be a means of boosting the Society's funds?

I suspect the prime aim must be (a) with

a desire to accomplish (d), by using somewhat shamelessly (b and c)...?

Assuming that the organizers are reasonably satisfied with the results of (a) and (d), what can be done to improve the lot of those in (b) and (c)? It seems, while radio control provides potential model flying for the masses, it has drastically reduced the number of models at the Nats. With the technical complexity of R/C competitions and models, the amount of sky they devour has increased out of all proportion. However, a far more important fact emerges. Due to the ever increasing potential danger from this heavy, fast flying machinery, models, operators and spectators have to be kept well apart.

Just four classes of R/C models take up nearly 90% of the airfield! Even then, the flight envelopes overlap. Let us hike the mile down the thinly populated flight line with an interested, but un-informed member of the public. According to his programme, those tiny specks are large scale model aircraft.

Really? Little Johnny's instant plastic chuck glider, just purchased from the trade area is just as impressive. Anyway, they are so far away they must be taking part in another meeting.

Further on down the line something looks more interesting; there are more people! Closer inspection reveals quite a number of sleek models.

Pity they are a hundred yards away and protected from closer scrutiny by a rope that disappears into the far distance. Still those planes and people must be there for a reason. A voice from a loud speaker summons a handful of them.

Putting on brightly coloured safety helmets, picking up planes and boxes of assorted bits and pieces, they start to walk over to the other side of the airfield.

No! They stop just before the horizon close to some queer tin boxes, similar to portable toilets, only covered with wire mesh and filled with people holding a variety of coloured flags.

Suddenly - action! Four aircraft leap into the air, cavorting noisily around. It must be upsetting the people out there; they are waving the flags at the screaming aircraft. Ha! Two planes have collided: is that what they are supposed to do? Pity the man on the loudspeaker couldn't tell us what's happening, but he is busy sorting out more names. I wonder if they are to replace the two that have crashed?

I will travel no further with our 'Mr. Un-Informed Public', because the same scenario could apply to all R/C classes.

As informed modellers, we know why the aircraft need to be far away; public safety. We know the problem of providing a skilled presenter, fed with a constant flow of information from the flight line, who can make sense of the proceedings at such a distance. Yet without such a service the whole competition becomes meaningless to the general spectator.

As for R/C aerobatics: unless one is blessed with telescopic eyesight, and with an expert to explain in layman's terms the finer points of the art, it is as interesting to the uninformed as a 747 at cruising altitude. Now wander down to the remaining part of the airfield.

Here is the bustle, excitement and action! Lots of aircraft, flying on steel wires; drama to behold!

This applies especially to the team race fraternity, expertly directed by judges and marshals who would be a credit to any sport.

The CD takes time off to explain to Mr. Average the rules and personalities involved in the contest. No, Mr Expert, it's not what you do, it's the way you do it! The FAI class A team race final had a large crowd leaping up and down as the drama unfolded.

The expert from overseas displaying excellent sportmanship: battling it out, lap after lap with the home team. Who can forget the pitman grinning his pleasure at the yelling crowd as he started his charge with one tremendous 30,000 rpm flick time after time; only to be beaten by a slightly faster aircraft.

The genuine warmth of congratulations between the contestants after a hard-fought race.

This is the action that TV sport thrives on. Further, there are enough classes for all levels of ability, down to eight and nine year-olds, flying hand launched 0.8cc racers. Another highlight of the Nats, fortunately still with us, is the grand flyoff of odds and ends and weirdos minutes before the sun goes down. Shades of the spirit of the combined Nats of years gone by!

A note of caution however, regarding the gloaming fliers. A SMAE official armed with a speaker, backed by the authority that goes with the R/C A and B Proficiency Certificates should be on hand gently to chide the one or two maniacs who insist on launching into the nearest crowd of onlookers.

One action that did disappoint me, was to reduce the entries for the R/C fly-for-fun to zero by slapping on the A and B Proficiency requirement.

A lot of clubs at the moment haven't the mechanism to arrange such examinations, but they still ensure that their members fly safely and responsibly. Why not set up a competition based on the R/C proficiency certificate? Appoint a BMFA Director of Flying with trained people standing by to take over from any tyro fliers who get into difficulties. Maybe Mr. Long could have been available to present 'A' Certificates to deserving competitors? What a boost for his proficiency scheme; and everyone could have enjoyed it. This would have impressed the value of Society membership. It may have also shown the roving eye of the CAA we take practical steps to achieve safety.

As chairman for many years of a small but active club (mainly R/C) I recognise the problem of organising such an event at our premier meeting. Yet the long term viability of our sport - or hobby - depends on introducing our society to as many newcomers as possible, and assist them to fly safely.

Where better to start than at the Nats?

Burton-on-Trent, Brian Springall  
Staffs.

(Behind Brian Springall's sometimes tongue-in-cheek look at the Nationals are some serious points. Perhaps we should be clearer about the perceived motives behind this meeting. But fundamentally, the Nats has always been the national competition to decide individual championships. World Champs selection is another matter altogether. GC).



**M**Y ORIGINAL intention was to build a three-channel electric-powered biplane. The controls were to be motor, elevator and coupled ailerons and rudder. I was optimistic that if high enough power could be obtained it should be possible to carry out mild aerobatics. Weight breakdown was expected to be:

Motor:	1oz
Batteries:	3oz
R/C gear:	2.1/2oz
Airframe:	1.1/2oz
Total:	8oz

### It's the speed, I tell you...

The radio control gear I already possessed, but what I did not have were the electric motor and speed controller. (I had already found that flying without motor control was unsatisfactory). Using a servo and micro-switch would have added at least 3/4oz in weight, which was unacceptable. I asked as many manufacturers as I could find but none of them made a speed controller weighing less than one ounce, and some of them would not operate from fewer than six cells. I felt sure it should be possible to make an electronic speed controller weighing much less than one ounce. Eventually a friend came up with an American circuit design which would operate from two cells upwards. I lightened the unit by halving the size of the board and by reducing the number of output devices from four (in parallel) to one. This was possible because the original design was rated up to 20 amps and I did not expect to use more than 5 amps. The finished controller weighed nine grams, or just under 1/3oz.

## Latest developments

### from Indoor R/C buff

**Robin James:**

### twin-wing fun...

I estimated that a motor of the right power would weigh about one ounce. The motor unit from Knight and Pridham is very good, but it weighs about 1/2oz and delivers only about half the power I thought I would need. Motors available from the USA are either similar to the Knight and Pridham unit or too large and heavy.

I contacted Derek Knight who very generously offered to loan me an experimental unit which utilises two of the standard motors geared to a common shaft.

TURN  
ON TO

# ELECTROLIGHT



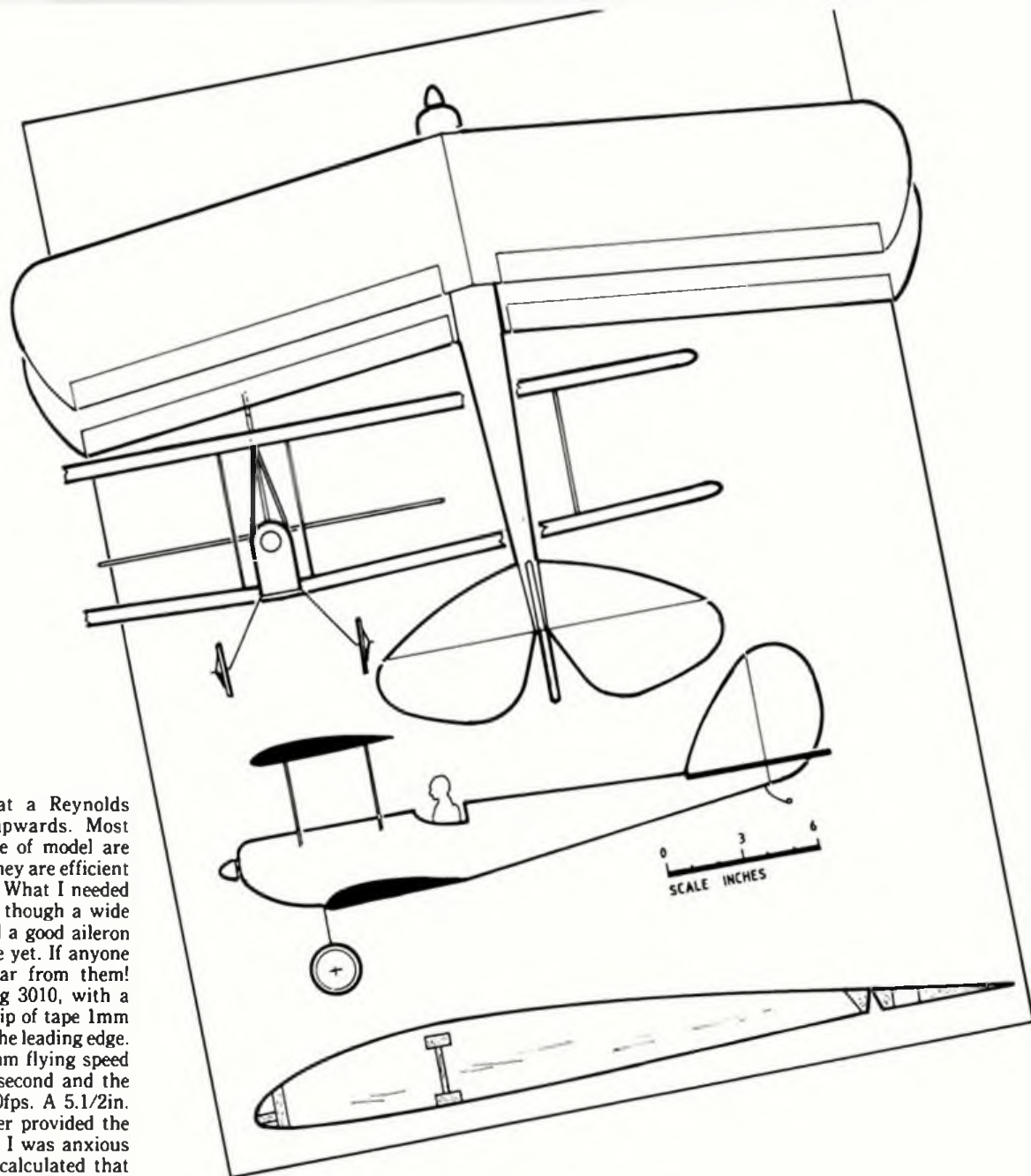
### Props and power

I needed to match a propeller to the motor so the first thing I did was to bench test the unit. I found that 5 amps was the maximum continuous current without the motor overheating. I tested 3.6 volts and again at 4.8 volts. There was a useful increase in output power. These tests were carried out using propellers for which I had previously measured the torque versus rpm relationship, as described in *Aeromodeller*, May 1988. I decided to operate at 4.8 volts and 5 amps, which gave an output of 6.5 watts at 5600 rpm. The efficiency of 27% (after the gears) sounds low but is probably typical for a motor of this size.

According to my approximate calculations 6.5 watts is at least four times as much power as I needed to fly my first CO<sub>2</sub> powered model. With all this available I decided the model should be able to carry one extra servo to give proper 'full house' four channel control; ailerons, elevator, rudder and throttle. The use of an electronic speed controller drawing only 4 milliamps, rather than an extra servo also meant that I could still use the 50 mah receiver batteries. With four servos it would probably be necessary to use a larger size. A wingspan of 36in. with aspect ratio of six gave a wing area of three square feet, and, it was hoped, a wing loading of less than three ounces per square foot. The rest of the semi-scale design is fairly conventional, but the fuselage is slightly 'undersize' in an effort to reduce weight. Strip ailerons on both wings were used to give a high roll rate. Control surfaces and throws are as in conventional R/C model practice.



**Electroflight outlines will guide others who may care to try this fascinating branch of aeromodelling. Wingspan is 36 inches; all-up-weight, nine ounces; power, four 270mAh cells driving four function (ailerons, elevator, rudder and electronic throttle).**



### Wings and things

The wing is operating at a Reynolds number of about 40,000 upwards. Most aerofoil sections for this size of model are 'one speed' sections, that is, they are efficient only at high lift coefficients. What I needed was a section with low drag though a wide range of lift coefficients, and a good aileron response. I haven't found one yet. If anyone has, I would be glad to hear from them! Finally I decided to use Selig 3010, with a turbulator consisting of a strip of tape 1mm wide about 20mm back from the leading edge. I now knew that the minimum flying speed would be about 15 feet per second and the maximum probably about 30fps. A 5.1/2in. Knight and Pridham propeller provided the right load for the motor, but I was anxious to maximise efficiency, and calculated that a 6.1/4 x 4.1/4 should be slightly better. The Knight and Pridham propeller is very efficient but is optimised for the KP-01 motor with an average model. I was using more power at higher revolutions, which is why I needed a larger diameter and finer pitch.

The structure of the model is mainly conventional balsa and tissue. All of the radio equipment is mounted on polystyrene foam ceiling tile, which I have found has the right blend of rigidity, robustness, and lightness as well as acting as packing material, providing protection in the event of an 'arrival'. I did consider bracing the wing with external wires, but the wing spar then has to resist a much larger compression load and a smaller bending load, so the saving in weight for the spar was small. Bracing wires also add drag and complexity. The spars are 3/16 x 3/32 in. balsa with a 1/16in. vertical grain webbing.

Using 4 channels rather than three added more than just the weight of an extra servo: the extra wing spars and pushrods all add to the *avoirdupois*. In addition, my estimate of two ounces for the weight of the structure was over-optimistic. The wings weigh almost one ounce each although they are covered with Early Bird tissue. Consequently the all-up weight came out to nine ounces. The undercarriage weighs only 4 grams. The final weight breakdown is as follows:

R/C equipment with 3 servos	2.3oz
Motor speed controller	0.3oz
Motor and propeller	1.2oz
Batteries + leads	2.2oz
Airframe	3.0oz
<b>Total</b>	<b>9 ounces</b>

This model is very exhilarating to fly. It will take off and land happily, as well as perform very tight turns, figures of eight, touch-and-goes and loops. It also achieved rolls, stall turns and as much as five seconds inverted flight. It will not roll within a small hall such as Watford - this is the next challenge!

**Cheer up, Robin! Such experiments as yours are inspirational - go to it!**





# WHAT'S ON

## 31st December-8th January 1989 MODEL ENGINEER EXHIBITION

Come to the First M.E. Exhibition at Alexandra Palace! The light, airy splendour is absolutely right for displaying model aeroplanes. Plenty of room for all and don't miss the DPR Model Flying Championships. Usual support expected from BMFA, SAM 35, BSMA and clubs. More information from Argus Specialist Exhibitions on 0442 41221

## 19th February BMFA WINTER OPEN EVENT FF

Venue: Botesford, O/G, O/R, O/P, SOP, Vintage.  
Contact: BMFA.

## 19th March BMFA AREA CENTRALISED EVENT FF

Venue: Areas F1A for KMAA and Plugge points, O/R and O/P for Frog Senior. Contact: BMFA.

## 19th March BMFA FIRST CENTRALISED EVENT C/L

Venue: 3 Sisters, F2B, F2C, Open GY and British GY.  
Diesel A and 1/2A Combat. Contact: BMFA.

## 25-26th March BMFA EASTER MEETING FF

Venue: Salisbury Plain Training Area 10.  
Saturday: F1A, F1B, F1C (F1B for Duce Trophy) - first four rounds Sunday F1A, F1B, F1C - final three rounds: O/G, O/R, O/P.  
Contact: BMFA.

## 2nd April BMFA SECOND CENTRALISED MEETING CL

Venue: 3 Sisters, F2B, F2D, F2C Team Trials for 1989.  
Eurochamps (invitation only). Contact: BMFA.

## 9th April BMFA SECOND AREA CENTRALISED EVENT FF

Venue: Areas, F1C for Halifax Trophy and Plugge points, O/G and O/R for Gamage Cup.

## 23rd April SPRING MINI AND VINTAGE MEETING FF

Power, HLG, Vintage, SOP. Contact: BMFA.

## 29-30th April, 1st May BRISTOL AND WEST WOODBURY WEEKEND FF

Venue: Woodbury Common, Saturday: Champagne Flyoffs in O/G, O/R, O/P, also Vintage, Sunday: O/G, O/R, O/P, Vintage to SMAE rules, Monday: Five-round combined FA1: Vintage to South Bristol rules. Contact: Elton Drew. Tel: 0454 415092.

## 7th May THIRD AREA CENTRALISED MEETINGS FF

Venue: Areas, F1B for Weston Cup and Plugge points; O/P for White Cup, O/G. Contact: BMFA.

## 7th May THIRD BMFA CENTRALISED MEETING CL

Venue: Hullavington, F2B, F2C, Open GY, British GY, B T/R, F2D, Handicap Speed. Contact: BMFA.

## 27-29th May BMFA BRITISH NATIONALS FF

Saturday, A/1 for British Airways Trophy, CDH for 308 Trophy, 1/2A Power for Hales Trophy, HLG for HLG Trophy CO<sub>2</sub> for Sparklets Trophy.  
Sunday: O/G for Thurston Trophy, O/R for Model Aircraft Trophy, O/P for Sir John Shelley Trophy, Vintage for Jubilee Trophy, Woman's Cup, Junior Open for Frog Junior Trophy.  
Monday: F1A for Ronytube Trophy, F1B for Boxall Trophy, F1C for Eddie Cosh Trophy, FA1 events start at 6am, SOP for Falcons Trophy, Tailless for Lady Shelley Trophy.

3-4th June  
**3 SISTERS GALA CL**  
Venue: 3 Sisters, Open Speed, F2B and Class 2 Aerobatics, F2C, Open GY, British GY, A Combat, F2D Vintage A and B T/R, OTS, Midge Speed. Contact: John Noble. Tel: 061-790-4056.

## 11th June FOURTH AREA CENTRALISED MEETING FF

Venue: Areas, SOP for Astral Trophy, O/G for Plugge points and Model Engineer Trophy for teams, CDH. Contact: BMFA.

## 18th June F1E TRIALS

Venue: Sheffield. Contact: BMFA.

## 2nd July FOURTH BMFA CENTRALISED (PROVISIONAL) CL

Venue: TBA, F1B, F2C, Open GY, British GY, F2D, Handicap Speed. Contact: BMFA.

## 9th July BMFA SUMMER MINI MEETING FF

Venue: Barkston Heath, A/1, CDH, HLG, 1/2A Power, Experiment Mini Vintage (small cash prizes) not plaques; does not count towards Senior Champs points. Contact: BMFA.

## 22-23rd July BMFA SHOW (PROVISIONAL)

Venue: Middle Wallop. Contact: BMFA.

## 25-30th July 1989 CONTROL LINE EUROCHAMPS CL

Venue: 3 Sisters. Contact: BMFA.

## 27-29th August BMFA RADIO CONTROL, CONTROL LINE AND SCALE NATIONALS (PROVISIONAL)

Venue: Barkston Heath. Details to follow. Contact: BMFA.

## 30th July BMFA CLUB CHAMPS FF

Venue: Driffild, O/G, O/R, O/P for Club Champs. Contact: BMFA.

## 1st September (Friday) BMFA SOUTHERN GALA FF

Venue: Little Rissington, O/G for Pitcher Trophy, O/R for Flight Cup, O/P for Short Cup, 1/2A for Quickstart Trophy, CDH, HLG. Contact: BMFA.

## 10th September BMFA FIFTH AREA CENTRALISED EVENT FF

Venue: Areas, O/P for Plugge points and Keil Trophy for Teams, F1B for Gutteridge Trophy, A/1. Contact: BMFA.

## 17th September BMFA NORTHERN GALA FF

Venue: Driffild, O/G for CMA Trophy, O/R for Caton Trophy, O/P for Hamley Trophy. Contact: BMFA.

## 17th September BMFA FIFTH CENTRALISED EVENT CL

Venue: Hullavington, F2B, F2C, Open GY, British GY, 1/2A, T/R, F2D. Contact: BMFA.

## 24th September BMFA SIXTH AREA CENTRALISED EVENT FF

Venue: Areas, O/R for Plugge points and Farrow Shield for Teams, F1A for SMAE Cup, 1/2A Power. Contact: BMFA.

## 7-8th October BMFA FIRST EUROCHAMPS TRIALS CL

Venue: ?????, F1A, F1B, F1C, No trophies. Possible Bam start. Contact: BMFA.

## 15th October F1E EVENT SHEFFIELD FF

Venue: Sheffield, F1E for CMC Trophy. Contact: BMFA.

## 15th October BMFA SIXTH CENTRALISED EVENT CL

Venue: 3 Sisters, F2B, F2C, Open GY, A and 1/2A Combat, Handicap Speed. Contact: BMFA.

## 21-22nd October BMFA SECOND EUROCHAMPS TRIALS

Venue: TBA, F1A, F1B, F1C. Contact: BMFA.

FF suffix to event title indicates a free-flight contest; CL indicates control line. BMFA contacts are: Ian Bracken on 01-263 9849 (FF) and Richard King on 01-890-4504 (CL). For more details check with Free Flight Scene and From the Handle columns where frequently updated information will appear.

**Swann-Morton**  
GIVE YOURSELF THE  
**EDGE**

Whenever you need the sharpest, most reliable blade, you know you can trust Swann-Morton. Our blades have a reputation for quality that is as keen as their edge.

Every blade is produced on high precision machines under strict quality control. And every one is carefully inspected both before and after packing.

There's a Swann-Morton blade and tool designed for all studio and craft work. So when you're looking for the finest cut, give yourself the edge. Insist on Swann-Morton.

**Swann-Morton Limited**  
Penn Works, Owlerton Green  
Sheffield S6 2BJ, England  
Tel: (0742) 344231  
Telex: 547538

## MICHAELS

**MAIL ORDER HOTLINE 01-445 6531**

POSTAGE Kits 2.45 Engines 85p  
Other items 60p

**FINCHLEY BRANCH:**  
646-648 HIGH ROAD,  
NORTH FINCHLEY,  
LONDON N12 0NL  
MON-FRI 9-6  
SAT 9-5.30

# MODELS

---

<p><b>NEW From PAW, Ball Raced.</b></p> <p>High Torque Easy Start Vintage 80 Classic £28.75 Vintage 80 Classic R/C £33.35 PAW 80 MK2 BR £27.60 PAW 80 MK2 BR RC £32.20 PAW 100 MK2 BR £27.60 PAW 100 MK2 BR £32.20 Exhaust Manifold £3.45 For 80-100 size</p> <p><b>JUST RECEIVED LIMITED QUANTITY MODELLA. 27cc CO. MOTOR £26.50</b></p> <p><b>BEN BUCKLE VINTAGE AIRCRAFT KITS</b></p> <p>A-BB1 Junior 80 83' £42.50 A-BB2 Buccaneer Std 66 £42.25 A-BB3 Trenton Terror 72' £39.95 A-BB4 Flying Quaker 88' £57.95 A-BB5 Playboy Senior £42.50 A-BB6 Quaker Flash 67' £37.50 A-BB7 Majestic Major 88' £87.95 A-BB8 Red Zephyr 72' £45.25 A-BB9 Fokker D8 57' £44.95 A-BB10 Super 80 83' £44.95 A-BB11 Super Scorpion £44.95 A-BB12 Hepcat 48' £21.95 A-BB14 Lanzo Record Breaker 96' £87.50 A-BB15 Falcon by Ben Shereslaw £98.50 A-BB16 Liberty 54' £32.25 A-BB17 Mercury Madador £32.25 A-BB18 Long Cabin 76' £45.25 A-BB19 Radio Queen 82' £46.50 A-BB20 Southerner 60' £39.95 A-BB21 Privateer 87' £68.50 A-BB22 Slicker Mite £42.50 for free flight with 5 to 75cc engines. Especially suitable for the Irvine Mills 75 £15.75 A-BB23 Southerner Mite - for free flight with 5 to 75cc engines. Especially suitable for the Irvine Mills 75 £15.75 A-BB24 Diamond Demon 48' 1936 design for free flight or modern 2 channel R/C 75 to 15cc engines £21.95 A-BB26 Double Diamond Demon 96' wingspan. Two piece wing £71.95</p>	<p>Some of the old faithful Diesels back again.</p> <p>AM 10 1cc £27.50 AM 15 1.5cc £27.95 Indian Mills 75cc £19.95 Indian Mills 1.33c £21.95 Indian K 1.5cc £9.95 DC Dart 5cc £21.99 DC Merlin 75cc £17.99 DC Spitfire 1cc £18.50 DC Saber 1.5cc £19.50</p> <p><b>Fox Connectors</b> Large per 10 £9.99 Small per 10 £9.99</p> <p><b>AE from DJ ALLAN</b> AE 1cc £22.95 AE 1.5cc £23.95</p> <p><b>IRVINE ENGINES.</b> Ring for availability. Replica Mills .75 £34.95 Irvine 15 Speed &amp; Pipe £96.50 Irvine 15 F/F - Combat £79.50 Golden Era £83.75 Powerhouse 84' £49.95 Scram 84' £46.45 Mini Scram 55' £23.95 Miss Tiny 45' £22.95 P-34W Diesels</p> <p>100 Std £19.55 1.49 DS3 £19.55 1.49 Contest 3 £21.00 2.49 DS4 £24.15 1.49 Contest DS4 £26.45 29 DS inc Sil £39.10 35 DS inc Sil £43.70 80 R/C £24.15 100 R/C £24.15 1.49 R/C inc Sil £28.75 2.49 R/C inc Sil £31.05 19 R/C inc Sil £33.25 29 R/C inc Sil £41.40 35 R/C inc Sil £46.00 PAW Balled Raced Version £35.65 PAW 249 DSBR £37.95 PAW 19 DSBR £42.55 PAW 249 R/C A/C BR £44.85 PAW 19 R/C A/C BR £4.99</p>	<p><b>TOP FLIGHT</b> £19.95</p> <p><b>08 STUNT MOTORS</b></p> <p>10 FP - S Plain Bearing £26.95 15 FP - S Plain Bearing £34.50 20 FP - S Plain Bearing £38.95 25 FP - S Plain Bearing £38.80 35 FP - S Plain Bearing £44.95 40 FP - S Plain Bearing £47.25</p> <p><i>The Countdown has begun. Get the long awaited ESTES Model Rockets. Send see for leaflet.</i></p> <p><b>COMPLETE ROCKET KITS</b></p> <p>Alpha III Starter Set £25.50 Space Shuttle Starter Set £28.50 Sizzler Starter Set £27.50</p> <p><b>ROCKETS ONLY</b></p> <p>Yankee £3.25 Wizard £3.50 Alpha III £8.50 Blackburn SR71 £11.99 Geo Stal LV £13.50 Helicopter £11.99 Eggspress £11.99 Nova Payloader £8.99 Big Bertha £8.99 Sixth £8.99</p> <p><b>ROCKET ENGINES</b></p> <p>A8 - 3 (Pack of 3) £2.99 A+ - 5 (Pack of 3) £2.99 C6 - 5 (Pack of 3) £2.99</p> <p><b>ACCESSORIES</b></p> <p>Porta Launch Pad £11.75 Ignitors (Pack of 8) £1.75 Recovery Wadding £1.75</p> <p><b>TREXLER AIR WHEELS</b></p> <p>Size 1 (1 1/2" - 1 1/2") £3.95 Size 2 (1 1/2" - 1 5/8") £3.95 Size 3 (1 3/4" - 1 7/8") £4.65 Size 4 (2" - 2 1/8") £4.65 Size 5 (2 1/4" - 2 1/2") £5.75 Size 6 (2 1/2" - 2 3/4") £5.75 Size 8 (3" - 3 1/4") £9.50 Size 9 (3 1/2") £10.95 Size 10 (3 3/4") £12.50 Size 11 (4") £13.95 Pump £8.95 Size 1-6 suitable for free flight only.</p> <p><b>WE BUY - EXCHANGE - SELL VINTAGE ENGINES</b></p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



# ASP READERS SERVICES

A S.P. Readers Services, 9 Hall Road, Marylands Wood Estate, Hemel Hempstead, Herts. HP2 7BH. Tel: 0442 41221

## HI-TECH ADHESIVES

YOUR CHANCE TO TRY OUT A RANGE OF MODERN ADHESIVES AT BARGAIN PRICES

**HI-TECH ADHESIVES TRIAL PACK OF 5 TYPES AT BARGAIN PRICE £9.95 + P&P**



**THIN CYANOACRYLATE**  
Low viscosity 'instant' adhesive bonds rubber plastic metal wood etc 20 gram bottle.

**THICK CYANOACRYLATE**  
Higher viscosity 'instant' glue, good gap filling properties 15-20 second setting time 20 gram bottle.

**FLEXI EPOXY**  
Totally new type of adhesive, has good vibration absorbing properties and just a little give 40 gram twin pack.

**RAPID EPOXY**  
Class C fast set (10-15C min.) epoxy, tough easy to use general purpose adhesive 40 gram twin pack.

**THREADLOCK**  
General purpose threadlock compound, prevents screws nuts etc loosening under vibration 20 gram bottle.

To: A.S.P. Readers Services, 9 Hall Road, Maylands Wood Estate, Hemel Hempstead, Herts. HP2 7BH. Telephone: 0442 41221

Please send me Adhesive Packs ADH @ £9.95

U.K. Inland Postage 50p

I enclose cheque/P.O. payable to A S P Ltd. TOTAL \_\_\_\_\_  
Please debit my Barclaycard/Access Account Number \_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

# ASP READERS SERVICES

A.S.P. Readers Services, 9 Hall Road, Marylands Wood Estate, Hemel Hempstead, Herts. HP2 7BH. Tel: 0442-41221

**LOOK SHARP**



**A QUALITY ARKANSAS STONE SHARPENER - SIMPLY HONE SCALPERS & HOBBY KNIVES TO A RAZOR FINE EDGE.**

Each EDJER is supplied with - MEDIUM, FINE & EXTRA FINE NATURAL ARKANSAS STONE PA 320 EXTRA FINE MAN-MADE STONES. FINE ABRASIVE MAN-MADE (For re-grinding before honing) 1 PROEDGE SOLID ALUMINIUM ALLOY SCAPEL (inc. blade) FULL INSTRUCTIONS. **ORDER CODE ROEJ Price £11.95**



**SAVE POUNDS IN BLADES FOR YEARS TO COME.**

To: A.S.P. Readers Services, 9 Hall Road, Maylands Wood Estate, Hemel Hempstead, Herts. HP2 7BH. Telephone: 0442 41221

Please send me \_\_\_\_\_ EDJER ROEJ at £11.95

U.K. Inland Postage: 50p

I enclose cheque/P.O. payable to A S P Ltd. TOTAL \_\_\_\_\_  
Please debit my Barclaycard/Access Account Number \_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

# £1,000,000

**MODELLERS ACCIDENT PROTECTION**

Double The Cover —  
Standard (Aircraft, Boats and Cars) £5.00  
Passenger (Live steam operations) £6.00  
Fly, Drive, Sail or Steam under our protection with a Public Liability Insurance tailored to suit modellers needs.



— no limit on Aircraft, car or Boat scale, just an engine size limit of 40cc —  
Traction engine up to 1/4 scale, locos up to 7 1/4 gauge. Send an SAE for full details or simply fill in the form below to receive your certificate, smart plastic wallet and decals.

To: Insurance Office, Argus Specialist Publications Ltd., P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS.

Name (In full) \_\_\_\_\_

Address \_\_\_\_\_

Please tick class of insurance required:-

Passenger £6.00

Standard £5.00

Please make cheques payable to ASP Ltd.

AERO

## AUTHENTIC SCALE

Flying Scale Model Plans by H.J. Towner

### FREE FLIGHT POWER

Savoia Marchetti S55X W/S 49.8"	£2.75
Fairey Seafox W/S 34"	£2.10
Airspeed Oxford W/S 34"	£2.10
Avro Anson W/S 36"	£2.10
Grumman Duck 2 Sheet Plan W/S 39"	£4.50
Gloster Gamecock W/S 30"	£1.50
Bristol Bull Dog W/S 28"	£1.45
Fokker DR1 W/S 23 1/2"	£1.35

### RUBBER POWER

Boeing B17 G W/S 37"	£1.70
Short Stirling 2 Sheet Plan W/S 37"	£2.10
Fairey Albacore W/S 43"	£2.30
Bell Airacobra W/S 25"	£1.45
Republic Thunderbolt W/S 27 3/4"	£1.45

For a complete list of Plans send S.A.E. for Plans only 40p P&P British Currency only accepted from overseas.

### AUTHENTIC SCALE.

238, Kings Drive, Eastbourne BN21 2XE. East Sussex.

# SUPERLINE

THE ULTIMATE CONTROL LINE WIRE

## JANUARY SALE

★ 1000 metre reels at 1/2 price ★

choose from:-

0.3mm dia Single Strand	r.r.p. £30	only £15.00
0.33mm dia 3 Strand	} r.r.p. £35	only £17.50
0.4mm dia 3 Strand		
0.4mm dia 7 Strand	} r.r.p. £45	only £22.50
0.45mm dia 7 Strand		

C.W.O. please add £2.50 p&p per reel.

**MODELEC** 19 FELIX AVENUE TEL 01 341 3171 CROUCH END, LONDON N8 9TL



# Model Shop Directory

## THE COMPREHENSIVE MODEL MAKERS GUIDE

Rates: £11.30 for 12 series  
£12.35 for 6 series (exclusive VAT)

Classified Advertising Tel.no.01-437 0626

### SUSSEX

**BRIGHTON** Tel: 0273 26790  
MODEL AERODROME  
37 WEST STREET, BN1 2RE \*  
Open Mon-Fri 9am-5.30pm  
Sat 9am-6pm  
We Accept Am Ex. Access. Barclaycard

**MODEL & CRAFT SHOP**  
12 THE ARCADE Tel: (0243)  
BOGNOR REGIS 860316  
W. SUSSEX  
PO21 1LH  
Open Mon - sat 9.30am - 5.30pm

### ADVERTISER

**FOR MORE DETAILS OF ADVERTISING**  
TEL: 01-437 0626

**MODELLERS WORLD**   
3 BELL LANE Tel: 0753  
ETON WICK. 830260  
Open 9am-5.30pm Mon - Sat  
Closed Thursdays  
(Mail Order) Access/Barclaycard.

### BUCKINGHAMSHIRE

**AYLESBURY** Tel: 0296 83529  
MID-BUCKS MODELS \*  
34 LOWER FRIARS SQUARE  
BUCKS HP20 2TH  
Open Mon - Sat 9 - 5.30pm  
Thurs 9 - 1.00pm

### CAMBRIDGESHIRE

**CAMBRIDGE** Tel: (0223) 845477  
CAMBRIDGE MODEL CENTRE \*  
40 HIGH STREET  
TRUMPINGTON  
Open Mon - Fri 9.30am-5.30pm  
Saturday 9.30am-6.00pm

### DERBYSHIRE

**ILKESTON** Tel: (0602) 440095  
ILKESTON MODEL CENTRE \*  
163 BATH STREET  
Open 10am-5.30pm Mon-Tues  
Thurs 10-7.30pm. Fri 10-6pm. Sat 10-5pm.  
Open 6 days Access

### ESSEX

**HAINAULT** Tel: 500 3891  
MODELAND  
219 NEW NORTHE ROAD,  
IG6 3AG  
Open Mon. Tues. Wed. Sat. 9-6pm  
Thurs - 9-1pm. Fri - 9-7.30pm  
24 hour mail order specialists

**CHELMSFORD** Tel: (0245) 442164  
RADIO ACTIVE (MODELS)  
100 MAIN ROAD  
BROOMFIELD  
Mon, Tue, Wed, Thur, Sat 9-6  
Barclaycard & Access

**UPMINSTER** Tel: (040 22) 50272  
RADIO ACTIVE (MODEL & LEISURE CENTRE),  
54 ST MARY'S LANE,  
UPMINSTER. Open Mon. Tue. Wed.  
Thur. Sat 9am-6pm  
ESSEX. Fri 9am-7pm

**L & M EUROMODELS** Tel: (0268)  
61 STATION AVANUE 769505  
WICKFORD SS11 7AS  
Open Mon-Fri 9am-7pm  
Sat 9-6pm  
Access - Barclaycard

### HAMPSHIRE

**PORTSMOUTH** Tel: 0705 825049  
RAY BROWN MODELS \*  
10 KINGSTON ROAD  
Monday - Saturday 9am - 6pm

### KENT

**MODEL AERODROME**  
UNIT 223 Tel: 0622 691184  
STONEBOROUGH CENTRE \*  
MAIDSTONE, KENT  
Open Mon - sat 9am - 6pm  
American Express Barclaycard Access

**ASHFORD** Tel: (0233) 39184  
ASHFORD MODELS \*  
68 KENT AVENUE  
Monday - Saturday 9am - 6pm

**SWANSCOMBE** Tel: 0322 843182  
SWANSCOMBE MODELS  
2 THE PARADE  
Open Mon. Tues. Fri. Sat 9.30am-6pm  
Wed 9.30am-1pm Thurs 9.30am-8pm  
Access - Barclaycard

**CANTERBURY** Tel: (0227) 453896  
CANTERBURY MODEL SHOP \*  
4 BUTCHERY LANE  
Open: Mon - Sat 9am - 5.30pm

**ROMNEY MARSH MODELS**  
KEMSFIELD Tel: 023 373 3662  
POUNDHURST ROAD,  
RUCKINGE  
ASHFORD  
Open: Mon - Sat 9 - 5.30pm

### LANCASHIRE

**WINDMILL MODELS** Tel: 0282  
150/152 ST JAMES ST. 52577  
BURNLEY LANCASHIRE  
BB11 1NR  
Open 9.30am - 5.30pm Mon - Sat (Closed  
Tuesday)  
manufacturers of Letricar Products

### LONDON

**LONDON** Tel: 01-228 6319  
E F RUSS  
BATTERSEA RISE SW11  
Open 9 am-6 pm  
Early closing Wednesday 1 pm.

**CAMDEN TOWN** Tel: 01-485  
AERONAUTICAL MODELS 1818  
39 PARKWAY NW1 \*  
9.15 am-5.30 pm Tues.-Fri.  
9.15 am-5 pm Sat  
Closed all day Monday

**LONDON** Tel: 01-205 0817  
AEROMODELMART \*  
165 CHURCH LANE  
LONDON NW9  
Open 7 days a week Mon-Thur 9-5  
Fri-Sat 9-6 We are now closed on Sundays  
Instant Credit - American Express

### LONDON

**LONDON** Tel: 01-703 4562  
MODEL AIRCRAFT SUPPLIES LTD \*  
207 CAMBERWELL ROAD SE5 \*  
Open: Mon.-Sat. 10 am-6 pm.  
Fri. 10 am-7.30 pm.  
Closed all day Thursday

**LONDON** Tel: 01-607 4272  
HENRY J. NICHOLLS & SON LTD. \*  
308 HOLLOWAY ROAD N7  
Open: Mon.-Sat. 9 am-5.30 pm

### MIDDLESEX

**HARROW** Tel: 01-863 9788  
THE MODEL SHOP  
190-194 STATION ROAD  
Mon.-Sat. 9.30-6.00  
Wednesday 9.30-5.00

### WEST MIDLANDS

**WOLVERHAMPTON** 0902 26709  
WOLVERHAMPTON MODELS +  
HOBBIES 1 MEADOW ST  
CHAPEL ASH  
Open Mon-Sat 9 - 5.30  
Mail Order Welcome

### NOTTINGHAMSHIRE

**NOTTINGHAM** Tel: (0602)  
GEE DEE MODELS LTD 412211  
19-21 HEATHCOTE STREET \*  
OFF GOOSEGATE  
Open 9.30 am-5.30 pm  
Early closing Thursday.

### SURREY

**MODEL AERODROME**  
UNIT 30 Tel: 0483 578682  
THE FRIARY \*  
GUILDFORD  
Open Mon-Sat 9am-6pm  
American Express Visa Access

**NEW MALDEN** Tel: 01-942  
MICK CHARLES MODELS 0012  
33 COOMBE ROAD  
Open Mon-Sat 9.30am - 6pm  
Late night Fri 7.00pm  
Closed all day Thurs & Sun

### SUSSEX

**BRIGHTON** Tel: 0273 430751  
HARRY BROOKS (3 lines) \*  
15 VICTORIA ROAD  
PORTSLADE  
Monday - Saturday 9am - 6pm

**MODEL AERODROME LTD**  
4 SUSANS ROAD Tel: (0323)  
EASTBOURNE 644001  
E SUSSEX BN21 3HA  
Barclaycard, Amex. Access

### SUSSEX

**CRAWLEY** Tel: 0793 540331  
MODEL AERODROME \*  
36 THE BOULEVARD  
W. SUSSEX RH10 1XP  
Open Mon - Sat 9.00 - 6.00pm  
American Express

### SOMERSET

**SOMERSET** Tel: 0963 50433  
SOMERSET MODELS  
THE TRIANGLE  
CASTLE CARY  
SOMERSET  
Open Monday - Saturday 9 - 5.30  
(Lunch 1 - 2)

**ILMINSTER** Tel: (0460) 57740  
SOMERSET TECHNICAL CRAFTS  
16/18 WEST STREET.  
Modelling supplies Books & Tools  
Agent for ASP Plans  
Tues - Fri 8.30 - 1.00 Sat 8.30 - 12.30

### SHROPSHIRE

**MODEL WORLD** Tel: 0691 655560  
103, BEATRICE STREET  
OSWESTRY \*  
SHROPSHIRE SY11 1HL  
Open: Mon-Sat 9.30-5.30  
Fri 9.30-8pm

### TYNE AND WEAR

**NEWCASTLE UPON TYNE**  
Tel: 091 232 2016  
THE MODEL SHOP Mail order  
18 BLENHEIM STREET invited.  
Mon.-Sat. 9 am-5.30 pm \*  
Open 6 days a week.

### YORKSHIRE

**LEEDS** Tel: (0532) 646117  
FLYING MODELS \*  
88 CROSSGATES ROAD  
CROSSGATES  
Mon.-Sat. 6 am-6 pm.  
Sun. 8 am-1 pm.

**BRADFORD** Tel: (0274) 726186  
MODEL DROME  
217 MANNINGHAM LANE  
BRADFORD, BD8 7HH  
Open 9.30am - 5.45pm  
Closed all day Wednesday

### SCOTLAND

**GLASGOW** Tel: (041 221) 0484  
DUNNS MODELS \*  
3 WEST NILE STREET  
Open: Mon.-Sat. 9.00 am-5.15 pm.

**ALL SHOPS MARKED WITH AN ASTERIX PROVIDE MAIL ORDER SERVICE**

### HONG KONG

**HONG KONG**  
RADAR CO LTD. SHOP No 245 \*  
OCEAN GALLERIES, HARBOUR  
CITY, CANTON ROAD.  
TSIMSHATSUI Tel: 3-680507  
Open 10am-6pm Closed Sundays

**TO ADVERTISE RING**  
01-437 0626

Kindly mention AEROMODELLER when replying to advertisements

# CLASSIFIED advertisements



We accept  
Access/Barclaycard



Private and trade 54p per word, VAT inclusive, minimum £8.10. Display box rate £9.50 per single column centimetre (minimum size 2.5cm). All advertisements are inserted in the first available issue, unless specified otherwise.

Write your advert in **BLOCK CAPITALS** indicating the section you wish it to appear in, **INCLUDING YOUR NAME AND ADDRESS** and send it to **AEROMODELLER, CLASSIFIED ADVERTISEMENT DEPARTMENT, ARGUS SPECIALIST PUBLICATIONS LTD., 1 GOLDEN SQUARE, LONDON W1R 3AB.** Darren Paterson Tel: 01-437 0699.

## FOR SALE

### THE PEATOL LATHE



£120 including 3 on 4 jaw chuck Milling attachment and other accessories available Centre height 2' distance between centres 9"

Please send SAE for full details  
Patrol Machine Tools, A.M. 19 Knightlow Road, Harborne, Birmingham B17 8PS Price inc. VAT

**VINTAGE** and collectable model engines. Call in to Godalming RC Models, 3, & 3A Bridge Street, Godalming. Shop hours 10.30am - 5.30pm Mon - Sat. The Shop with the stock.

### SAMS

Indoor, Free Flight, Vintage  
**FREE 88 Grey catalogue**  
9 x 7 28p SAE to  
**SAMS**

The Chapel, Roe Green, Sandon,  
Nr Buntingford, Herts SG9 0QJ  
Telephone (076) 388 384

Available also in french. Overseas send 4  
Postal Coupons. Sorry no callers.

**F1A FUSELAGE** rod blanks.  
Tchop-size 900mm by 17mm,  
lapping to 10mm. Carbon fibre  
(18gms) £9. Glass fibre (22gms)  
£6. P&P £2. Tel. 0724 845427.

**FOR SALE.** Aeromodeller  
magazine 1945 - 1985 in perfect  
mint condition. Offers. Tel: 01 221  
1809 or wk 01 283 8566. Mr  
Patrick.

**TO ADVERTISE  
TELEPHONE 01-437  
0626 OR USE THE  
COUPON BELOW**

## GLIDING HOLIDAYS

### Now you've built a model

Why not build a full size aeroplane? Join the Popular Amateur Aircraft industry with the Popular Flying Association and learn how to build your own flying machine. Send 75p for information pack.

**POPULAR FLYING ASSOCIATION**  
Terminal Building, Shoreham Airport,  
Shoreham by Sea, Sussex, England.  
Tel Shoreham by Sea 61616

### MIDLAND GLIDING CLUB The Long Mynd



#### Glider pilots do it quietly!

5 day holiday courses at our beautiful hill top site.  
Prices inclusive of all flying and instruction in modern two-seater gliders, on-site accommodation and meals—from £185.

Details from—  
Roy Dalling  
Club Manager,  
Midland Gliding Club,  
Long Mynd,  
Church Street,  
Shropshire SY6 6TA.  
Tel: Linley (058861) 206

## WANTED

**Wanted** — Ready-built model aircraft, boats, yachts, cars, steam-driven models, also engines, kits, radio control equipment etc. If you are selling up. Tel: Godalming 21425. T/C

**SUPER TIGRE 46 Stunt Engine** for Control Line Model. Top price paid for engine in good condition. Phone 0895 634428 (Ruislip, Middlesex).

## AVIATION TOURS



### 1989 AVIATION TOURS

#### Include:

EUROPE: Paris airshow from most UK airports.  
USAF Ramstein, Swiss AF show, Madrid, Norway 50th Anniversary Show Finland etc.  
USA: Florida/West Indies for 'Sun 'n Fun'. EAA Oshkosh and Alaska, Reno Air races and B24 celebrations, Confederate airforce - Texas & Arizona - Davis Monthan AFB.  
Send SAE for brochure  
**GEORGE PICK AEROTOURS**  
Dept. AMO, 83A London Road,  
Leicester LE2 0PF.  
Telephone (0533) 540588

## SERVICES

**COX, E.D.,** P.A.W. Motors, Spares and service and Quickstart, John D. Haytree, The Haven, Rixey Park, Chudleigh, Devon. TQ13 0AN. Tel (0626) 852330 Access. Visa.

- ★ FOR SALE
- ★ SERVICES
- ★ WANTED
- ★ GLIDING HOLIDAYS

**AEROMODELLER  
ADVERTISERS  
EVERYTHING ITS  
READERS WANT.**

## VIDEOS

### FARNBOROUGH

#### Historic Films in Colour and Sound

1. 1956/57 Fairey Delta to English Electric P1 and lots more ..... £19.95 + p&p  
2. 1958/59 Featuring Fairey Rotodyne, Vulcan Comet, Victor, Valiant, first hovercraft SRN1 and many more ..... £19.95 + p&p  
3. 1960/81 SBAC Shows 21st Birth-day, Argosy Avro 784, Beagle, Hunters etc. .... £19.95 + p&p  
4. 1962 P1127 (Harrier) T118, VC10, Handley Page 115 ..... £15.95 + p&p  
Note: P&P is £1.00 for single order. £2.00 for two or more. Overseas add £8.00 per order.

Collectors/Complete set of 4 videos £80 (inc. p&p)

Please state VHS or BETA when ordering, and allow 28 days for delivery. Cheques/ P.O. 10.

HOW VIDEO, Dept. RCMAE, Kirby House, Kirby Hill, Boroughbridge, N. Yorkshire YO5 9DS.

## TERMS AND CONDITIONS

### CLASSIFIED ADVERTISING TERMS & CONDITIONS

Our terms for new advertisers (semi-display and lineal) are strictly pro-forma payments until satisfactory reference can be taken up (excluding recognised advertising agencies). Cheques PO's should be crossed and made payable to:

ARGUS SPECIALIST PUBLICATIONS LTD.,

and send together with the advertisement to:  
THE CLASSIFIED DEPT., L.H.  
NO. 1 GOLDEN SQUARE, LONDON W1R 3AB.

There are no reimbursements for cancellations. Advertisements arriving too late for a particular issue will be inserted in the following issue unless accompanied by instructions to the contrary.

All advertising sales are subject to Government regulations concerning VAT. Advertisers are responsible for complying with the various legal requirements in force eg: The Trade Description Act, Sex Discrimination Act & The Business Advertisements (Disclosure) Order 1977. Video Recordings Act 1984.

ADVERTISING AVAILABLE ON REQUEST

## CLASSIFIED COUPON

AERO MODELLER, CLASSIFIED ADVERTISEMENT DEPT,  
NO 1 GOLDEN SQUARE, LONDON W1R 3AB  
PLEASE DEBIT MY ACCESS/BARCLAYCARD NO.

\_\_\_\_\_

FOR SALE  WANTED  GENERAL  CLUBS  BOOKS/PUBLICATIONS  OTHER (Please state)


Rates: Lineage 54p per word (VAT inc) minimum £8.10 (15 words).  
Display Box Rate £9.50 per single column cm (minimum size 2.5cm). No reimbursements for cancellations. All ads must be pre-aptd.

Name .....

Address .....

..... Daytime Tel. No: .....

Signature ..... Date .....





# FREE ISSUES

A subscription to your favourite magazine is the best way of making sure you never miss an issue.

And from now until 28th February 1989 you can get extra copies **ABSOLUTELY FREE**, by taking advantage of our special Christmas subscription offer. With a monthly title for example, this means you get 15 issues for the usual price of 12.

Order your subscription today using the coupon below and you will receive the best in reading entertainment right into the 1990's! This offer is also open to subscribers wishing to extend/renew their current subscriptions.

## Standard subscription rates ▶▶▶

Monthly titles (15 for the price of 12)	UK	Europe	Middle East	Far East	Rest of World
A & B Computing	£18.00	£27.30	£27.60	£31.10	£28.30
Aeromodeller	£23.40	£28.20	£28.40	£30.20	£28.70
Antique Clocks	£27.00	£32.40	£32.60	£34.70	£33.00
Citizens Band	£16.80	£20.70	£20.85	£22.35	£21.10
Electronics Today International	£18.00	£22.20	£22.40	£24.00	£22.70
Ham Radio Today	£16.80	£21.30	£21.50	£23.20	£21.80
Military Modelling	£16.80	£23.60	£23.85	£26.45	£24.30
Model Boats	£16.80	£21.20	£21.30	£23.00	£21.60
Model Railways	£15.00	£20.90	£21.10	£23.30	£21.50
Photography	£15.00	£22.00	£22.30	£25.00	£22.80
Photoplay	£13.20	£17.90	£18.10	£19.90	£18.40
Popular Crafts	£18.00	£23.30	£23.50	£25.40	£23.80
Radio Control Model Cars	£16.20	£21.10	£21.30	£23.10	£21.60
RCM&E	£15.60	£21.60	£21.80	£24.00	£22.20
Radio Modeller	£15.60	£21.20	£21.40	£23.60	£21.80
Scale Models International	£16.20	£20.80	£21.00	£22.70	£21.30
Video Today	£15.00	£20.20	£20.40	£22.30	£20.70
Which Video?	£15.00	£19.40	£19.50	£21.20	£19.80
Woodworker	£16.80	£24.00	£24.20	£26.90	£24.70
Your Commodore	£15.60	£23.25	£23.50	£26.40	£24.00

## Quarterly titles (5 for the price of 4)

Practical Wargamer	£ 7.80	£ 9.90	£10.00	£10.70	£10.10
Radio Control Scale Aircraft	£ 9.00	£11.10	£11.20	£12.00	£11.30

## Alternate monthly titles (8 for the price of 6)

Commodore Disk User	£15.00	£18.00	£18.20	£19.30	£18.40
Radio Control Boat Modeller	£ 8.10	£10.70	£10.80	£11.70	£10.90
Your Amiga	£ 9.00	£11.80	£11.90	£13.00	£12.10

## Fortnightly title (28 for the price of 24)

Model Engineer	£28.80	£37.80	£38.00	£41.50	£38.70
----------------	--------	--------	--------	--------	--------

Please commence my subscription to ..... with the ..... issue.

I enclose my cheque/money order for £..... made payable to ARGUS SPECIALIST PUBLICATIONS

or debit my Access/Barclaycard number  Card expiry date .....

Signature ..... Name .....

Address .....

..... Postcode .....

Please return this coupon with your remittance to:  
 Infonet Ltd. (AMFI/1) 5 River Park Estate, Billet Lane, BERKHAMSTED, Herts. HP4 1HL

# ALEXANDRA PALACE

WOOD GREEN LONDON N22

A SUPERB NEW HOME FOR THE

## Model Engineer Exhibition

31st DECEMBER - 8th JANUARY

### COMPETITION MODELS

Wonderful displays of models by modellers from all over the U.K.

### CLUB AND SOCIETY STANDS

More model displays and information on club and society activities.

### RADIO CONTROL CAR RACING

Competitions and demonstrations of all kinds of Radio Control Cars.

### INDOOR BOAT POOL

Model boats in action on the pool.



The London Woodworker Show housed in the Great Hall of the Palace.

### LIVE STEAM TRACK

Take a nostalgic ride on a model steam train, organised by S.M.E.E. who are celebrating their 90th Anniversary.

### DPR MODEL FLYING

January 1st is a special day for model flyers, join in the competitions and the fun.

### LECTURES AND FILMS

### TRADE EXHIBITORS

A great opportunity to visit and buy from the many companies exhibiting.



*Young*  
**TECHNOLOGIST**

of the year

The Meccano Young Technologist of the year award will be made at The Model Engineer Exhibition. This is a National Schools Competition designed as a challenge to the ingenuity skill and imagination of school children. Regional finals were held in November, winning models will be displayed and judged at the Exhibition.

**ADMISSION:** Adults £4.00  
Senior Citizens £2.75  
Children £2.00

**OPENING TIMES:** 10.00am - 7.00pm daily - 10.00am - 6.00pm final day  
Late night Thursday 5th January 'till 9.00pm.  
CATALOGUE ON SALE FRIDAY DECEMBER 9th

### FREE CAR PARKING

FREE SHUTTLE BUS - from the car parks and stations.

The Palace is easy to get to - travel by British Rail to Alexandra Palace Station and then by free shuttle service or W3 bus.



### LOCATION

Alexandra Palace & Park is situated in North London, between Muswell Hill and Wood Green. It is well served by all forms of public transport and easy to reach by road. With the improved motorway links via the M25, access from major airports at Heathrow, Gatwick, Luton and Stanstead is excellent.

- 9 minutes by Rail from King's Cross to Alexandra Palace's own British Rail Station
- 15 minutes by road from Junction 25 of the M25
- 25 minutes by Underground from Oxford Circus

### ROAD

Major roads and motorways round London link with Alexandra Palace and are well signposted to the venue.

### BUSES

In addition to the numerous bus routes converging on Alexandra Palace, the W3 bus service provides a station to station link running to the Palace from Wood Green and Finsbury park. Alexandra Palace also provides a speedy shuttle service to and from Alexandra Palace station and car parks.

Further information available from Argus Specialist Exhibitions, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS. Tel: 0442 41221



# Appendix - Links to the plans

The issue comes with a free plan (Nieuport II) printed front/back on a pull out banner of four sheets. The banner is not included in the document.

## LUTONIA by SA Miller

FF Power semiscale. Revisited from Model Aircraft February 1949, by John Watters

<https://outerzone.co.uk/search/results.asp?keyword ...>

[Document Page: 13](#)

## NIEUPOINT II by Dave Causer

Scale Model for Electric or CO2 power.

[https://outerzone.co.uk/plan\\_details.asp?ID=1811 ...](https://outerzone.co.uk/plan_details.asp?ID=1811 ...)

[Document Page: 25](#)

## Orion Biplane by R.P. Spencer

FF power revisited by Alex Imrie in VINTAGE CORNER

[Document Page: 36](#)

Nifty Nieuport: Build our French fighter for CO<sub>2</sub> or Electric Power

Orion Vintage Biplane

# PERFORMANCE IN POLAND

## Junior Free Flight Championships

ARGUS SPECIALIST PUBLICATIONS