

# AERO

## MODELLER

**FULL SIZE PLANS  
FOR NATIONALS 1/2A  
POWER WINNER**



**NORTHWIND**  
Barry Robinson's  
sleek stunt  
winner

**SPACE ODYSSEY**  
Euro Space Champs report

# IRVINE MILLS 75c.c.

## REPLICA DIESEL NOW IN PRODUCTION

THE PERFECTLY RELIABLE DIESEL FOR FREE FLIGHT • R/C  
 • SCALE • CONTROL  
 LINE • VINTAGE

EASY STARTING  
 POWERFUL & TRACTABLE  
 SUPERB LOW SPEED  
 IDLE.



AVAILABLE SOON:  
 LONG RANGE FUEL  
 TANK  
 AVAILABLE ONLY FROM GOOD  
 MODEL SHOPS

MANUFACTURED AND DISTRIBUTED BY: **IRVINE ENGINES LTD**

# MICHAELS

FINCHLEY BRANCH:  
 646-648 HIGH ROAD,  
 NORTH FINCHLEY,  
 LONDON N12 0NL  
 01-445-8531

MAIL ORDERS WELCOME  
 OVERSEAS CUSTOMERS DEDUCT 13%

### NEW ITEMS

#### BEN BUCKLE KITS

R/C or F/C	
Mercury Matador 47"	£29.95
Southerner Mite 32"	£14.95
Slicker Mite 32"	£14.95
Diamond Deamon 48"	£19.95
Southerner 60"	£37.60

#### DIESEL ENGINES (Replica)

Mills 75 from Irvine	
Engines	£29.95
AE 15 1.5cc diesels	
From (D.J. Allen	
stables)	£23.95

#### Powermax Jet X subject to availability.

MOTORSET JX-1 50 size	
16 Pellets, 2 yards	
Fusewick	£8.95
Pellets 40	£5.60
Fusewick 2 yards	£2.50

#### VINTAGE MODELS

Ben Buckle	
Junior 60 63"	£39.95
Buccaneer Std. 66	£39.95
Trenton Terror 72"	£38.50
Flying Quaker 88"	£54.95
Playboy Snr 88"	£39.95
Quaker Flash 67"	£35.60
Majestic Major 88"	£64.50
Red Zephyr 72"	£43.50
Fokker D8 57"	£42.95
Super 60 63"	£42.95
Super Scorpion 66"	£43.50
Heprat 48"	£19.95
Lanzo Record Breakers	
96"	£85.25
Falcon 96"	£94.50
Mercury Matador 47"	£29.95
Long Cabin 76"	£41.50

Radio Queen	£42.95
Southerner 60"	£37.60
Privateer 87"	£59.95
Slicker Mite	£14.95
Southerner Mite	£14.95
Diamond Demon 48"	£19.95
Golden Era	
Powerhouse 84"	£49.95
Scram 84"	£46.45
Mini Scram 55"	£23.95
Miss Tiny 45"	£22.95

#### P.A.W. Diesels

80 Std	£19.55
100 Std	£19.55
1 49 DS3	£21.85
1 49 Contest 3	£23.00
2 49 DS4	£24.15
2 49 Contest DS4	£25.30
19 DS4	£26.45
28 DS inc Sil	£29.10
135 DS inc Sil	£43.70
80 R/C	£24.15
100 R/C	£24.15
1 49 R/C inc Sil	£28.75
2 48 R/C inc Sil	£31.05
19 R/C inc Sil	£33.25
28 R/C inc Sil	£44.40
35 R/C inc Sil	£46.00

#### Aurora

Indian Mills 75	£18.95
-----------------	--------

#### TREXLER AIR WHEELS

Size 1 (1 1/2" - 1 3/4")	£3.95
Size 2 (1 3/4" - 1 7/8")	£3.95
Size 3 (1 7/8" - 1 7/8")	£4.65
Size 4 (2" - 2 1/4")	£4.65
Size 5 (2 1/4" - 2 3/4")	£5.75
Size 6 (2 3/4" - 2 3/4")	£5.75
Size 8 (2 3/4" - 2 3/4")	£10.95
Size 9 (3")	£10.95
Size 10 (3 1/2")	£12.50
Size 11 (4")	£13.95
Pump	£6.95
Size 1-6 suitable for free flight only	£6.95

#### COX

Pee Wee 020	£18.95
-------------	--------

#### POSTAGE

Kits 2.45	Engines 85p
Other Items 60p	

# MODELS



NEW!  
 Golden Era Kit  
 Power House Junior £23.95  
 (suit Mills 75c.c.)  
 RE..... £60.00

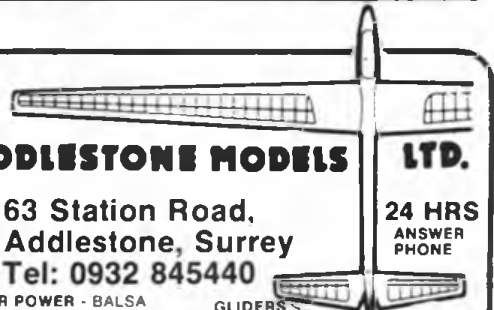
## THE SHOP WITH THE STOCK

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



POSTAGE	
Engine tools & kits under £15	1.50
Radios + kits over £15	2.50
Other items	1.00

#### IRVINE MILLS 75 PLEASE PHONE FOR AVAILABILITY.

#### PAW DIESEL

80 STD	19.55
100 STD	19.55
1 49 DS 3	21.85
2 49 DS 3	24.15
1 49 Contest 3	23.00
2 49 Contest 3	24.15
2 49 Contest 4	25.15
19 DS 4	26.45
29 DS + Silencer	39.10
35 R/C A/C	46.00
80 R/C	24.15
100 R/C	24.15
1 49 R/C + Silencer	28.75
2 49 R/C + Silencer	31.05
19 DS BR	37.95
249 R/C A/C BR	42.55
Indian Mills	18.25
Telco CO2	13.95

#### COX

Pee Wee 020	19.95
049 Black Widow	21.85
049 Babe Wee	19.95
049 Glowhead	2.85
Cox TD 049	34.95
SUNDRIES	
Arden Units	2.00
Speedy Winder	1.95
6 Minute Timer	7.95
30 Sec Timer	7.95

#### STILL GOT THAT SINGLE CHANNEL IN THE ATTIC? LOOK WHAT WE'VE FOUND!

ELMC	
Conquest escapement	99p
Compact	99p

#### NEW BOOK - MODEL FLYING THE FIRST FIFTY YEARS, VIC SMEED

	7.95
--	------

#### NEW BOOK - LIMITED EDITION. A PICTORIAL A TO Z OF VINTAGE AND CLASSIC MODEL AIRPLANE ENGINES. THIS SUPERB BOOK CONTAINS AROUND 1,000 PHOTOS. £16.95 INC. P&P.

#### OTHER BOOKS AVAILABLE

Aero Modellers Handbook	6.50
How to go Aeromodelling	11.95
Collectors Guide to Model Aero Engines	4.95
Fifty Years of Aeromodelling	5.95
Plans Handbook by Aero	1.75

#### TELCO CO. MOTORS

#### BEN BUCKLE KITS

Diamond Demon 75cc to 1cc	19.95
Slicker Mite	14.95
Southern Mite	14.95
Heprat 48"	19.95
Black Magic	27.90
Flair Junior 60	31.95
Mercury Matador	29.95
Southerner	37.50
Super Sixty	42.95
Super Scorpion	43.50
Red Zephyr	43.50
Quaker Flash	35.60
Flying Quaker	51.75
Playboy Senior	39.95
Fokker DVIII	39.95
Buccaneer	37.75
Trenton Terror	35.75
Utility S4	29.95
Long Cabin	39.95
Radio Queen	41.50

We stock all Accessories, Engines, Radio Equipment to complete these kits, please telephone your requirements through.

#### RUBBER POWER - Balsa

Ee Zz Built - Semi scale beginners models. Ready for flying in 10 easy stages.

Spitfire 16in	4.79
Hurricane 17 1/2 in	4.79
Mustang 16in	4.79

#### SUPERB KITS - DPR

Hyper Club Free flight rubber sports model or CO2 (Telco 6000)	14.95
Wingspan 750mm	14.95
Rare Bird Free flight towline launch or slope soarer.	9.95

#### KEIL KRAFT

Gipsy 40in	9.99
Senator	6.99
Competitor 32in	6.99
Robin 23in	4.79
Ace 30in	7.99
Gemini 21 1/2 in	4.79

#### MODELHOB

SESA Bi Plane 24"	12.95
FW 190 20 1/2"	12.95
Spitfire IX 21"	12.95

#### UNION

Super Chipmunk	13.99
Piper Cub	13.99
Aero Star	12.99
Try I	12.99
Piper J3 Yellow Cub	16.99
Cessna 150 Omni Flyer	19.99

#### RUBBER POWER FOAM CONSTRUCTION EASY TO MAKE FUN TO FLY.

Zero 20"	5.95
ME 109E 19"	5.95
Mustang 19"	5.95
Spitfire 19"	5.95
Staggerwing by plane	9.50
Spirit of St. Louis	9.95
Sky Boy 18in	6.95
Sky Kid 19in	8.50
Schweizer 27 1/2"	8.50

#### GLIDERS

Very easy to build Sheet Balsa Wings.

Chuckie 300mm	2.25
Boy 600mm	3.75
Winner 425mm	4.95

#### GREAT FUN - Easy to build catapult Gliders complete with glue and super stickers.

Concorde 170mm	3.95
Gnat 230mm	3.95
Tornado 145mm	3.95

#### KEIL KRAFT

Domnette - Solid fuselage, wing to be constructed	4.49
Kits to be completely construct all Balsa Wood, require Balsa Cement, Tissue Paste and Dope to finish.	
Dolphin 30in	3.99
Pioneer 28in	4.59
Conquest 30in	4.59
Invader 40 1/2 in	6.99
Caprice 51in	10.49
Soarer Baby 36in	6.39
Cheif	14.95

#### CONTROL - LINE

Champ	12.99
Phantom Mite	9.99
Colt Trainer	10.99
Nipper	8.99
Crusader	35.75
Mini Lord	8.95
War Lord	10.95

#### Adjustable Handle complete with Line 36m

Control Line N/W 3mm Dia 32m length	2.50
-------------------------------------	------

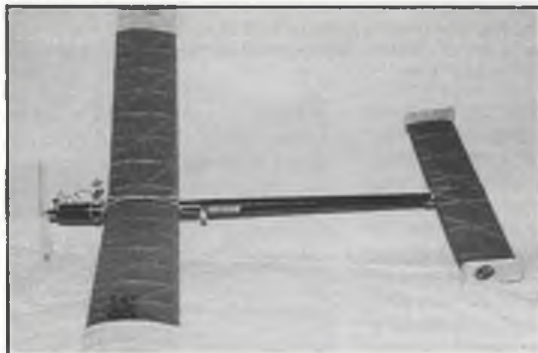
#### POWER DURATION

Cardinal 35"	10.49
Ladybird	12.99
Tiger Moth	14.99

# AERO MODELLER



p.70



p.78

<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 Cunningham</i>
<b>Sales Executive</b>	<i>Patrick Cree</i>

**COVER:** A happy Barry Robinson captured for the camera after the 1987 Gold Trophy competition at the Nationals. His pedigree stunter Northwind 7 is our Plans Service selection this month - see feature beginning on p.66

<b>HANGAR DOORS</b>	Aeromodelling news, views and what's on	<b>64</b>
<b>NORTHWIND 7</b>	Barry Robinson's super Aerobatic winner for 60 engines	<b>66</b>
<b>MOTOR MART</b>	Engines old and new examined in this revived overview	<b>69</b>
<b>SMALL TRICKS</b>	Genesis of John Pool's CO <sub>2</sub> competition models - all the hints for success	<b>70</b>
<b>ROCKET MEN!</b>	Stuart Lodge reports on the 1987 Space Modelling Championships	<b>78</b>
<b>READERS' LETTERS</b>	Aeromodeller's aeromodelling soapbox	<b>84</b>
<b>HIGH STEPPER</b>	Build a winner! Full-size plans and story of Pete Buskell's 1/2A Nationals Power winner	<b>85</b>
<b>SCALE MATTERS</b>	The SMAE Indoor Meeting at Alumwell - Bill Dennis was there with camera and pen	<b>96</b>
<b>VIEWPOINT</b>	Doug McHard's case for Vintage Scale aeromodelling	<b>99</b>
<b>VINTAGE CORNER</b>	Great days of The Model Aeroplane Club - and the Nash Monoplane - recalled by Alex Imrie	<b>100</b>
<b>FREE FLIGHT SCENE</b>	Competition news and a winning F1A described by Dave Hipperson	<b>106</b>
<b>FRED FOTO PAGE</b>	A selection of colour schemes for this attractive homebuilt	<b>112</b>
<b>FROM THE HANDLE</b>	Control-line stunt topics circulated by Claus Maikis	<b>113</b>

## ARGUS PRESS GROUP

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



ISSN 0001-9232

# HANGAR DOORS

## Changes ahead

Delegates from over 120 model flying clubs attended the 1987 SMAE AGM. Foremost in discussion was the question of safety, a topic particularly focussed after a serious accident involving an R/C model at Croydon a fortnight before. Despite initial doubts it is now clear that SMAE members' insurance cover will continue this year but as costs are higher the membership fees for 1988 have been increased to £9.50 for Seniors; Juniors (under-18) will pay £8.00.

The go-ahead was given to a most fundamental change - a new name for the Society to reflect the activity of model flying. At present the most popular choice is The British Model Flying Association; final selection by SMAE Council is imminent.

New SMAE Chairman is Kath Watson, previously the Society's long-serving competition secretary. We wish her well in her responsibilities.

An efficiently-managed prizegiving saw the Arthur Mullett Trophy for services to the SMAE awarded to Ray Favre for his powerful work on site liaison. The Ray Malmstrom Cup for services to aeromodelling outside the SMAE went to the editorial team of Free Flight News. Ian Kaynes and Paul Masterman collecting the trophy. Fellowships were given to retiring chairman Ron McCairn



*Above: Ron Kaptijn (the bearded one at the front of the Nats) with friends and associates of the Daedalus Club from Amsterdam. See Control Line Capers'. Below left: SAM-Italia and Bergamo Club decals offered for exchange. Brighten up your model box!*

and to Dennis Thumpston, chairman of the CIAM scale committee.

Full photo-report next month!

## Lift off!

After many years of confusion, debate and establishment obstruction model rocketry is about to become a reality in Great Britain (reports Paul Clark of the British Space Modelling Association). This is not before time; there are few 'advanced' countries on either side of the Iron Curtain that have not been enjoying the hobby for many years. Indeed, our report on the 1987 World Championships in this issue reflects the high level of interest elsewhere.

For many years the view of the authorities has been that such activity is illegal. The Home Office - and later the Health and Safety Executive - maintained a rigid interpretation of the 1875 Explosives Act which prohibited the flying of any type of model rocket. The BSMA, a small group of enthusiasts who have maintained allegiance to representing Great Britain in International competition, took legal advice and without recourse to the courts these long-standing objections were removed. Nevertheless, to import propellants meant testing

procedures beyond the means of the BSMA; but now an enthusiastic 'commercial' wholesaler has stepped in and the news is that some of the American Estes range of products will be available in this country in 1988.

It is ironic that at the very time that the government are backing out of a serious commitment to long-term space research one of the paths to a career in space sciences is being opened.

More details to follow in the pages of *Aeromodeller*...

## Control line capers

We were pleased to welcome Ron Kaptijn and the Daedalus Club from Amsterdam to the Combat circle at the '87 Nationals. Thanks to Frank Smart we now hear that this group are organising an Old Time Combat International at Genk, Belgium on 25-26th June to celebrate their 25th anniversary. Final rules are to be shaped but the following events will definitely be flown: 1/2A and Class A Combat (with balsa/nylon craft for preference in the latter competition, the better to enter into the spirit of things); one-hour Team Race and Goodyear (two half-hour heats); Aerobatics, including 1/2A; Speed, and Endurance. As if that were not

enough, there will be a 'Mad Goose' event, the aim of which is to get anything to fly for ten laps; so start thinking of those odd shapes - flying brooms, bikes, dustbins or whatever!

Interested? Contact Frank



## What's on

31st January  
SMAE S.E. AREA INDOOR FLYING MEETING

Venue: Leisure Centre, Haslett Avenue, Crawley, West Sussex. Mixture of indoor disciplines, regulated in time slots. Contact: John Doiding, Tel: 0293 510272.

6th March  
SAMS INDOOR FUN-FLY  
Venue: Watford Leisure Centre 11am-6pm. Contact: George Wallbridge, Tel: 076 388 384.

24th April  
SMAE INDOOR SCALE NATIONALS  
Venue: Alumwell Centre, Walsall (Junction 10, M6) Peanut and Open Rubber Scale plus CO<sub>2</sub>/Electric. Informal competitions for Team Racing and kit scale models, entry for

these on the day. Static exhibition of free-flight scale models, talks and demonstrations by leading scale modellers; really enjoyable day out for the family. Full details and entry forms (SAE please) from: Monks Park, Bristol, Avon BS7 0UT, Tel: 0272 697595

1st May  
SPRING KITE FESTIVAL  
Venue: Old Warden Airfield  
Contact: Aeromodeller Tel 0442 41221

1-2nd May  
HOLKER HALL RALLY  
Venue: Holker Hall and Gardens, Cartmel, Nr Grange over Sands.  
R/C Classes flown  
Contact: Mrs C Johnson Tel 044 853 328

Smart on 0452 416020 for up-to-date gen.

### SAM-Italia

Vintage flying is being treated to a spirited revival in Italy. A plentiful fund of that country's early designs is on record so there is plenty of incentive to build and fly; and the activities of the Italian chapter of the Society of Antique Modelers occupy an increasing proportion of space in the model press there. Indeed, our own Vintage Corner is happy to present their news from time to time.

Now we hear from Ivan Poloni, secretary of SAM-Italia, that the group would like to exchange club decals. The SAM-Italia decal is a colourful affair in national colours surmounted by a blue banner; also on offer is the Bergamo Club's flying horse emblem.

Fancy a swap? Send your own decals to Ivan at SAM-Italia, Via Innocenzo X1°, 4, 24100 Bergamo, Italy.

the hands of our treasurer Reg Hardman. Jim Birch, a gentle, unassuming person, was a very stabilizing chairman for a very long term.

The club flies on a piece of land which is part of a conservation area. It is just about flyable but the F/F boys complain about the trees; more are forever being planted - after all, it is a



*More combat: Paul Stanley, Class A Nats winner hooks up his Nelson-powered craft. Interesting model to be the subject of attention in next month's magazine...*

### Anniversary celebration

BMAS Chairman R. H. Cole tells us:

The Bolton Model Aircraft Society has just celebrated its 50th anniversary, marking the occasion with a buffet-style meal at our club room in the local YMCA. As many past and present members were gathered together as possible; the evening was intended mainly to reminisce and meet old friends.

Guests of honour were local boy Alwyn Greenhalgh, noted model aircraft historian, and his mother who, along with sadly departed husband Gilbert Greenhalgh, kept the local model shop and were instrumental in forming the Bolton Club. Alwyn, of course, was one of the founder members. Flowers were presented to Mrs Greenhalgh and in return that good lady donated a handsome cup to form a trophy for future competitions.

Competitions have played a large part in the club. Everything is catered for from HLG (Chuckie), Wigan 70, Open Glider and F/F Power to R/C Glider and R/C Power, with trophies for each category. The comps are not overly subscribed, but each section has its following. An interest in indoor flying has grown since we took rooms in the YMCA and were allowed use of the gymnasium.

Membership fluctuates around the thirty-five mark. Right from the early days the well being of the BMAS has been in

conservation area - but they usually happen to be downwind...

'As chairman for the last couple of years, I am pleased to have been associated with the BMAS since my youth and include all members when I extend a welcome to any flier in the area to visit us. We have few rules, mainly the sensible ones such as insurance cover, silencers, local permit to fly, responsible actions and so on; and if this style of flying continues the BMAS will see another fifty years.'

### Letter to Czechoslovakia

Enthusiast Peter Krejsa is keen to correspond with an aeromodeller in this country. He does not state particular interests so this is an ideal subject to raise in your first letter! Overseas pen-pals provide a rewarding chance to widen one's scope and to exchange magazines, plans and materials. Peter's address is: Dolni Zalezly 38, 40s Ol Okr. Usti nad Labem, Czechoslovakia.

### Aircraft Archives

Letters can be forwarded.

We often hear this one. 'All

*Left: Nice, eh? The Aeromodeller cap as sported by Debbie Wallace at the Nationals. Our Readers Services department can supply 'em in red, yellow, royal and navy blue for £4.75. Order now! Below: Terry Rose's view ...*



*'I still think you could have told Mum about that Microfilm in the bath...'*

# NORTHWIND 7



**Barry Robinson's outstanding stunter for .60 engines - the development story and plans**

**L**OOKING ACROSS our flying field one Sunday, I saw someone flying a control-line stunt model. This raised an old fancy of mine from years before, and after totalling my R/C trainer I wandered across to watch Nev Dickinson practicing the F2B schedule. A week later I borrowed the plan of Nimrod 5 from Nev and having some time off work completed a model in the next week - something I wish I could still achieve.

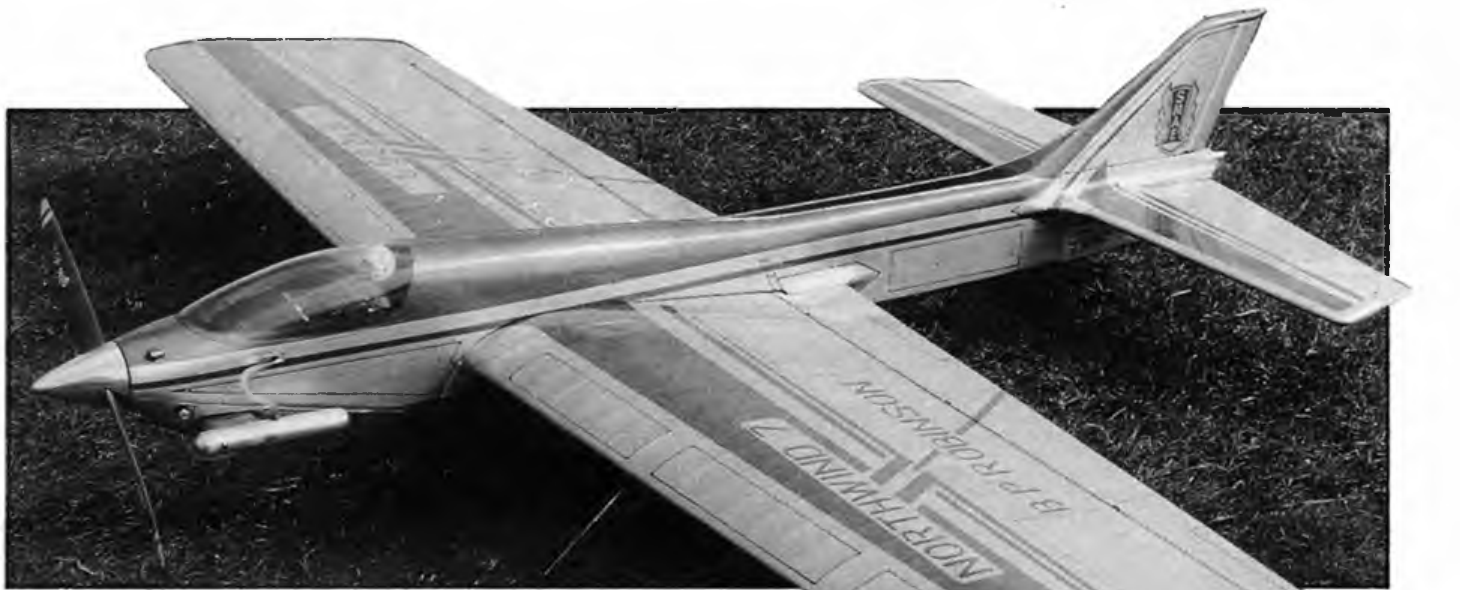
This started me off on a trail that has led to become National Champion three times and a British Team member continuously since 1979 with a best individual place of 6th in the European Champs 1985 and 8th

individual in Sweden 1987 where the F2B team took the first place team prize (for the first time since 1950, I'm told).

I built a Tindal Chipmonk for the 1978 season; and around this time myself and Nev were discussing the size and dimensions required for a Merco 49 model. I had also seen a small scale drawing of Luis Van Hout's Olympus which influenced Northwind, the first model of my own design. I took these two models to the first European Champs in 1979. I stayed with the Chipmonk up to the fly-off when a premature engine cut in the four leaf clover cost me the model. Changing to the Northwind (and some quick practice to

*Full-size plans of Northwind 7 are available from ASP Plans Service, 9 Hall Road, Maylands Wood Estate, Hemel Hempstead, Herts HP2 7BH. Price is £5.30 including postage; please quote AM 1565*





*Silver, red and blue scheme adds elegance to a sharp design. At the '87 Nationals Barry placed second in Aerobatics, just seven points behind Bill Draper.*

acclimatise myself to the different model) saw me achieve my best score of the contest and 7th place.

This was the start of the Northwind series of models with which I have had a lot of success over the years. Particular favourites are Northwind 3, my first Nationals winner, and Northwind 5, with which I won another two Nationals and was 6th place in the European Champs in Wigan in 1985. Northwind 6 was a very similar model to number 5, but with a slimmed fuselage; this too was flying very well with a win at the first centralised meeting of 1987, but it met its end in severe wind when an extra hard gust blew the model into the ground in the consecutive bunts...

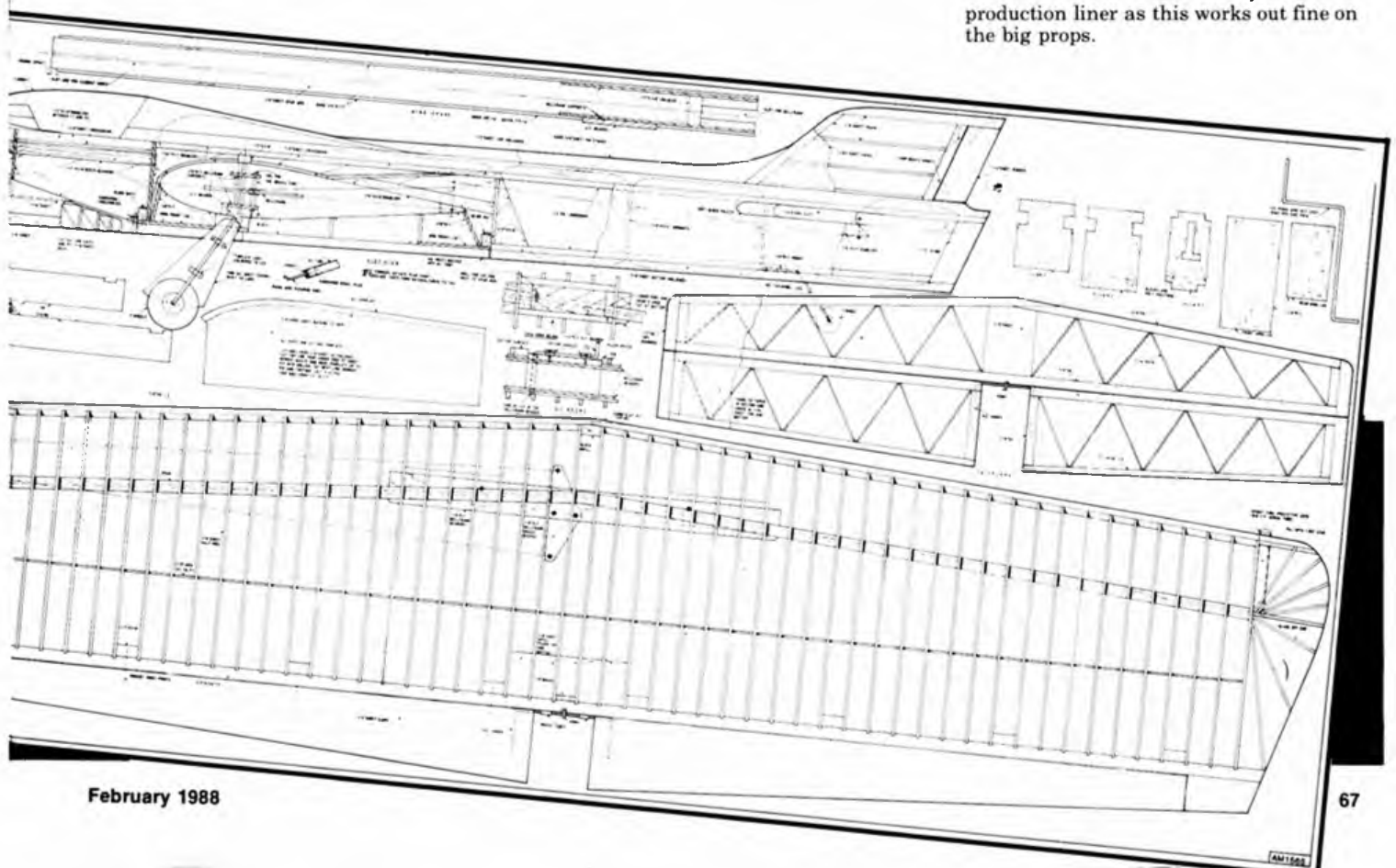
### Super Seven

The model drawn and presented here is Northwind 7 which was built for the World

Champs in Hungary in 1986; as can be seen from the design and photographs, it was built with smart appearance and finish as important criteria. As flown in Hungary the aeroplane had a Bob-Barron-type tailplane which would not let the model turn the very square corner I demand from my aeroplanes. Out came the balsa knife and a new tailplane was installed as shown on the plan. The change in the model was dramatic with an abundance of turn and improved level flight stability and I am still more than happy with the model's set up as shown. I very nearly won my fourth Nationals and placed 8th in the European Champs in Sweden with this version.

I have flown these models on motors ranging from the OS 45 Schneurle with a 13x6 Zinger, Merco 49s and, recently, the Merco 61SS which has proved an excellent motor requiring no modification for easy starting. It runs very consistently in all conditions and climates.

The only deviations from standard on my current engines are to open the choke out to 8mm (5/16in.) and alter the exhaust to a home made tube silencer 4in. long; again with an 8mm outlet. The propellor is a 14 x 7 Airflow cut down to 12in. diameter. Although this sounds 'over the top' to most fliers, this propellor gives me the best overall performance both in calm weather and in a breeze - something we almost always have at competitions. I have tried altering the inlet port timings on one engine but although it runs very well it is no better than a standard engine; so from now on I think I will just use the production liner as this works out fine on the big props.



# NORTHWIND

# 7

*The story so far: earlier branches on the Northwind family tree are (below) Northwind 1 from 1978, Northwind 2 (right); Northwind 3 (below left) and Northwind 5 (below right). Numbers 5 and 5A appear next down and at foot of panel.*



Recently I have also used suction as opposed to silencer pressure with success. If anyone requires a silencer to the pattern I use, Nev Dickinson will be glad to supply one.

## Handy 'ints

I do not propose to go into a blow by blow account of building the model as it is definitely *not* for beginners, but anyone who is reasonably capable should be able to produce a model from the plan. The main thing is to produce the wing spar very carefully and accurately and use with jig system shown on the plan which will ensure a straight wing with minimum effort.

Another handy tip in building this type of wing is to cut 3ft sheets into 12in. lengths and butt joint them until you have a sheet long enough to cut all the ribs from. This saves a lot of waste. Also cut the first profile from the bottom of the sheet. This forms the bottom of the first rib and the scrap taken out can be glued to the rib template at 1/4in. spacing so all you need to do is cut a rib and move up the template until the profile glued to the template contacts the sheet; and cut again. In this way all the ribs end up with a high degree of accuracy.

I always cover my wings with lightweight tissue first and two coats of dope thinned '50/50'. I then apply a second



*Neat cowl conceals a Merco 61 operating on silencer pressure, although motor operates well on suction too.*

layer of heavyweight tissue or silk and another three or four coats of thinned dope. For the colour and trim I use car base coat paint which does not require any preparation to key the fuel proofer to the paint as it leaves a matt finish ready for a lacquer coat.

Most of my fuselages have been covered in heavyweight tissues and dope in the normal fashion and this has proved more than adequate over the years, but I recently tried 0.6oz. glass cloth and SG 113 epoxy and was most impressed with the results.

I hope the information has whetted your appetite to build one of these models as I am sure that once you have tried one of these big stunters you will be most impressed with its flying characteristics. I hope you enjoy many pleasurable hours with this design - as I have - and that you also enjoy much competition success.

Good luck!



# MOTOR MART

**L**ONG AWAITED - now it's here! After a year in which Irvine Mills .75 prototypes have been aired, tantalisingly, now and again at Old Warden and the Nationals, we can announce that the first production batch of six hundred has just been despatched to the model shops. A close look at the office sample reveals that here is a classy piece of work, very much the part with black crankcase and natural metal cylinder and carburettor. Mike Callaghan of Irvine's tells us that in the interests of even greater flexibility and longevity a few internal changes have been made which means that virtually nothing apart from the tank assembly is interchangeable with an original .75; the liner skirt has been modified for less critical alignment upon assembly; the conrod is of greater diameter and harder material, the crankshaft is twenty thou. up on thickness and the tank bowl is a screw-on item. Mills users who have had occasion to wrestle on the flying field with the original's bent-tab arrangement will know the reason for that last modification...

A follow-up batch of a thousand will be ready in March. You'll see them everywhere; Australia, New Zealand, the States and even Norway have placed orders. UK price is £29.95. Why the wait? you ask. Fact is, Irvine's have been overwhelmed with demand for their existing range of glow engines, says Mike, with the rising value of the yen making the New Southgate products particularly attractive value in the US. Now the Mills is off and running; and so, too, thanks to new machinery, is the massive '120' R/C glow - something of a contrast to the replica sideport diesel...

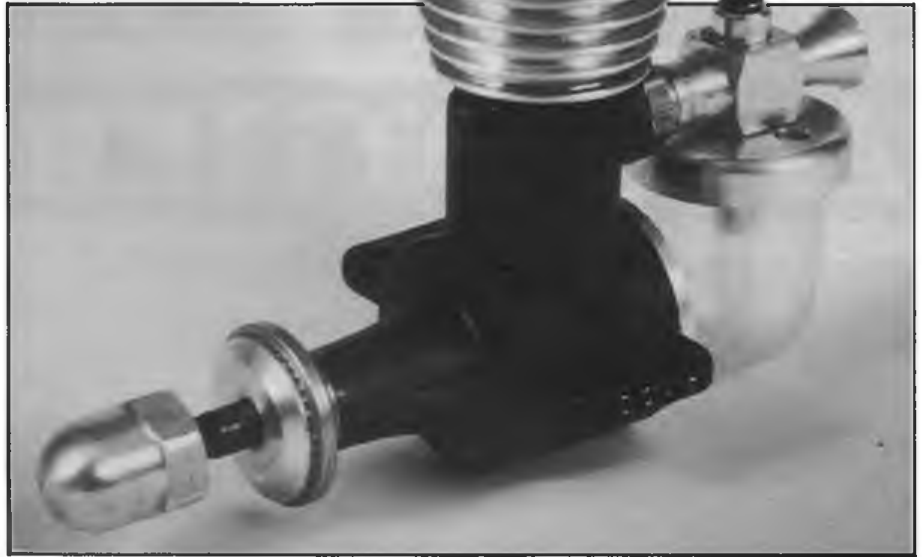
## Quickstart chat

Good news for glow users is that the DC Wasp and Bee 049s are back on the model shop shelves. They are fundamentally identical, but our photos show the main difference between the beam-mounted Wasp and its integral-tank brother whose four-point radial mounting is identical to the Cox Babe Bee and variants thereof, thus rendering it a handy UK alternative to the classic Stateside products. Prices are a competitive £18.45 for the Wasp; the Bee costs £19.95.

## Mysteries

The small petrol engine shown here defies identification. It passed into your Editor's hands about ten years ago. 'I have an old engine at home - would you like it?' interrupted a model enthusiast during a model-shop natter; and a nominal fiver later, possession was secured. There is vast contrast between the clean cylinder assembly and the rest; the cast and filed metal prop, which incorporates an eccentric cam for the make-and-break, is noteworthy. Capacity is under 1cc. Any ideas?

Much more is known about the larger diesel, which was built by one Mr Mace soon after the war. Designed specifically



*Heading: The Irvine Mills replica is now in the shops. Left: Massive Irvine 120 casting dwarfs a .20 diesel prototype and the Mills. Below: Back again - the DC Wasp (left) and Bee (centre). Right: The mystery engine referred to in text.*

*Bottom left: The Mace diesel. Centre: One of the last 'original' AM 15s, circa 1966. Note natural metal (not blue) head and brass in take insert. Bottom: A French Mills' - the Allouchery .7 from 1947. One for the replica makers?*



for a semi-scale 'Puss Moth'-type model, it has front rotary induction à la Westbury Kestrel and fuel is fed from a small brass tank suspended immediately below the intake. Prop rotation is clockwise; the twin inlet and four exhaust port oddity is

surprisingly powerful but rather fragile for the rough and tumble of the flying field. No bearer lugs, true; there is four-point mounting directly into the back of the hexagonal crankcase. An interesting one-off. Let's see yours!



# SMALL TRICKS

## AND OTHER HINTS



John Pool's guide to competition CO<sub>2</sub> flying with the Telco motor

**W**HAT HAS fuelled my love affair with CO<sub>2</sub> flying? Perhaps it's the little upsets...

Because it is a love affair I think the following notes may be considered constructive and should not give offence. All the problems so far have met easy solutions so to analyse them may help a few initiates over the first hurdle and into the seduction zone.

The elements of seduction? A decent flight with CO<sub>2</sub> must be the main one. It has all the charm of a rubber model flight, and is usually even smoother, with a long power run allowing the sense of elation to feed back into the system and amplify. And you don't have to grind 1,000 turns onto that knotted liquorice. Tom Chambers has referred to this class as 'the rubber flier's power model'. No kind of model can be flown more easily solo and in a small area, provided you use a gas charge and short D/T. At a more mundane

level, when you match the quality of the pleasure with the cost it is very cheap. A flier can become effective with CO<sub>2</sub> motor and model, for less than the price of a pound of weight of rubber; less than the cost of a towline, winch and timer; certainly less than the cost of a small i.c. engine. Flying can seem expensive when things are going wrong, but persistence pays off.

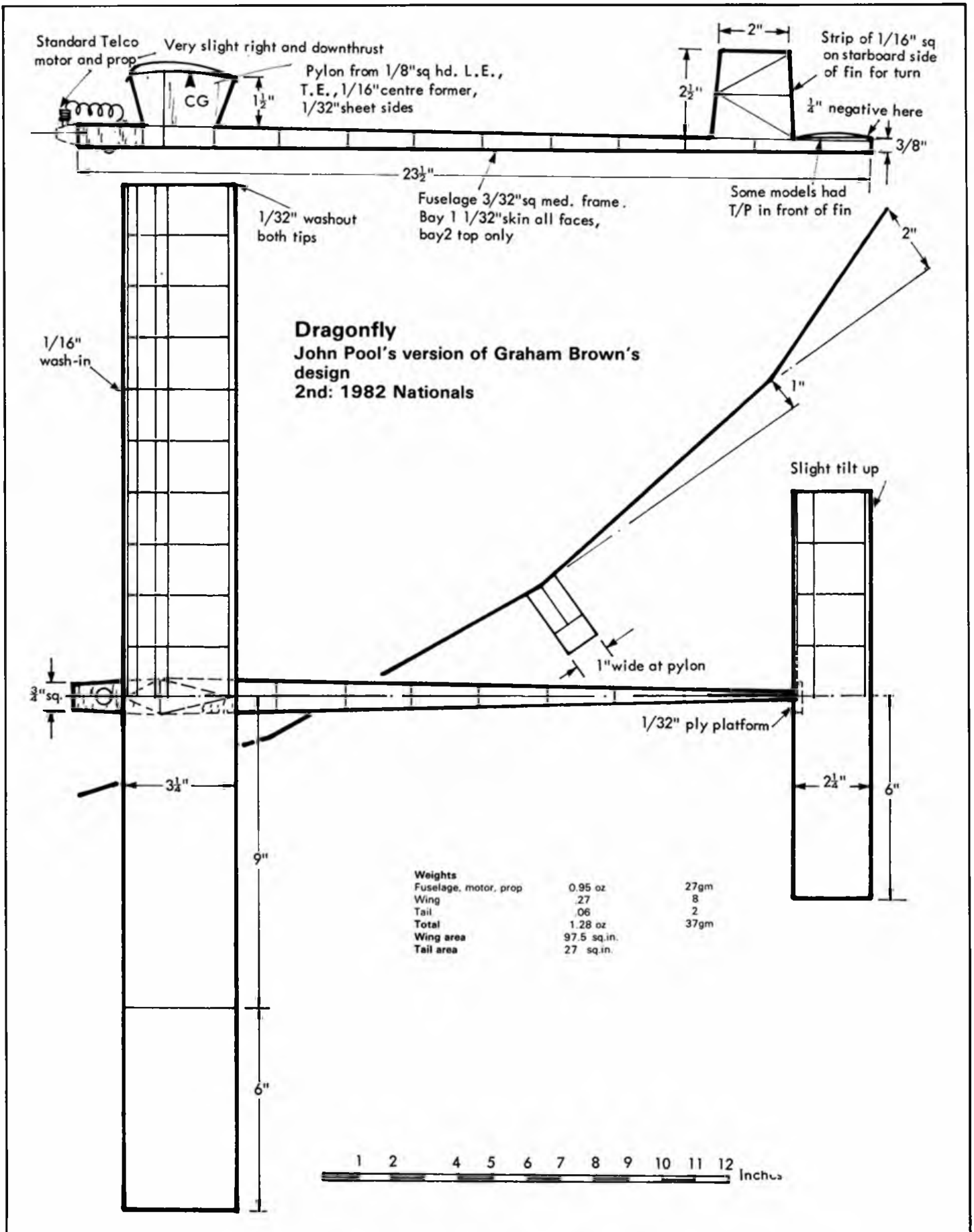
A further word on cheapness. Bear in mind that this is achieved by mass production and rapid assembly techniques. Remember the faults that are found in new cars (for example) and do not be surprised that a little work may be called for. It's a pleasure and an indulgence to be able to take the little gem to pieces. You can clean it, perhaps modify *à la* Steve Philpott (Hot Hints for CO<sub>2</sub>; July 1986 *Aeromodeller*) and remake the copper piping, all between washing up the evening meal pots and sinking the first pint of the evening.

It's not true that Telco engines are foolproof - but then, you are not a fool. It's

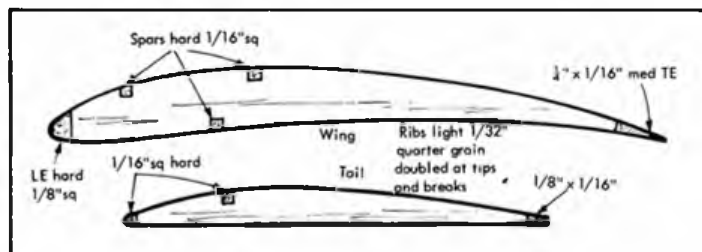
not true they are easy to operate. There is an ever-present, if minimal difficulty. Neither are they consistent. There is a little gremlin waiting in the wings to catch you out just as you are feeling cocky, usually when there is somebody watching. He is waiting on your rival too.

### Charge up!

So to the charger which is where it all starts and where most of the problems come from. Think where the swarf goes when you cut that nice round hole in the capsule top. Some of it may get onto the large seal inside the neck of the charger top when you extract a used capsule, especially if you let the spare gas rush out. As you screw down the top for the next flight there is a horrible noise and ice-cold gas comes rushing all over your hand. Temptation is to assume it was a bad capsule but you will waste another because even if the swarf has gone, the seal will have been damaged. Always check this before fitting a new capsule. New seals come in pairs very cheaply as a



John's first CO<sub>2</sub> competition model was the Dragonfly, drawn above to 1/4 scale with full-size ribs at right. Model was an all-weather performer and would climb on even a poor engine run.



spare part and are very easy to fit. If your local model shop won't supply write to Chart Telco System and ask for the spares price list and details of the Service Exchange Scheme while you're at it. Short engine runs can result from the spear in the charger not making a good hole in the top or the capsule. This may help to keep the swarf in place, and will give more flights per capsule, but is no good for a competition flight. A needle file on the spear point may help the situation. On one of my chargers I've epoxied a small foreign coin in the base of the charger body but I suppose this is only the same as screwing the top down further. To aid the latter process I've also eased the plastic thread on the charger top and lubricated it with a drop of rubber lubricant. The screwing-down needs a bit of empathy. Some chargers lose gas as soon as the seal is broken. Like an out of balance wheel there is then a choice; to go forward or back off a bit to cut off the escape. For the sake of that nice round hole in the capsule top it's best to move on but if this doesn't work, a quick reverse is called for. My best charger screws right down with only a pop in the nozzle as the ball seats in place to indicate that the capsule is pierced.

The ball in the nozzle is the next wear and tear area. Again there may be bits of

swarf or other foreign matter in the insert. The result is a nozzle that leaks. This may clear with the next charge. Incidentally, it may be only a small leak which to someone in a contest (and using only the second fill from each capsule) is no great loss. However, when you need to have the charger ready for a quick fill the moment that lift seems promising this won't do at all. The easy solution is to take advantage of the service replacement scheme where you send your old charger back with the fee and postage (last time round it was £4.10) and get a brand new one in its place. I used my new one about four weeks ago, charged two models into cooled tanks, made two simultaneous 3:00 flights and forgot to take the capsule out in the euphoria. There was still gas in a couple of days ago.

If you have decided to exchange your charger there is nothing to lose by looking at the charger before mailing it. The aluminium cone will screw off if it is tightly gripped in the 'nutcracker' part of a pair of pliers. The plastic insert in the cone can be pushed out from the front with a 10swg rod. Inside the ball appears to be held in by a tiny lip, but it also can be pushed out by a small rod. The two can be inspected with a magnifying glass, which is how I found the existence of swarf, and

they may be cleaned in a shallow bath of thinners. I've had successes by just cleaning and re-assembling. Mind you, it didn't work with the swarf-damaged one so I tried bedding the ball in with toothpaste as in 'Hot Hints' but this didn't work either... The final point to watch with a charger before changing a capsule is that the ball is in the neck of the insert. Sometimes it drops down the tube and although the first rush of gas will drive it up, there is a chance ice will have formed in the neck preventing the ball sealing, and thus wasting another capsule.

So make sure the ball is in place. A good shake will do the trick; make sure the rear seal area is clean and point the nozzle down as you screw in the charger top. In my experience, chargers don't last as long as engines, so a spare should be first on any extras list. Maybe this is less important if you fly in company and can share equipment.

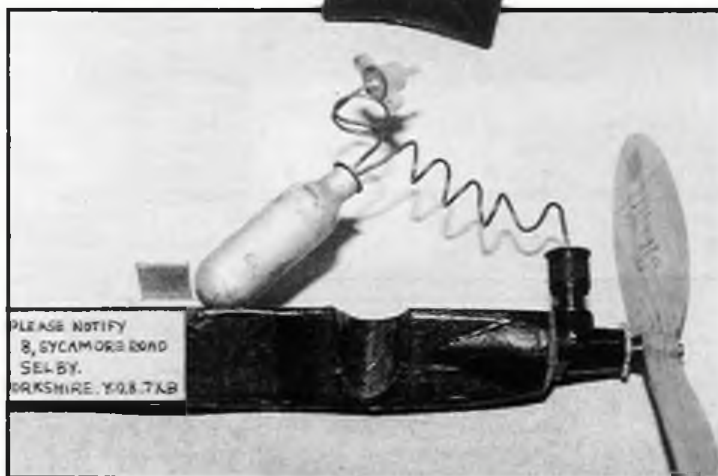
## Nozzle next

The engine filler nozzle presents three problem areas, but they are easier to cure. Gas can sometimes rush out of the nozzle immediately upon removing the charger. This may simply be caused by an out-of-position ball. It usually happens after a freewheeling run on the prop has completely emptied the system and a part-empty charger is being used. A gas charge will reseal the ball. A likely cause is dirt, perhaps more of that swarf, in the ball seat. A clean-up and/or charge of nozzle is then called for. The designers of the motor have anticipated wear and tear in the nozzle because it is a significant item in the spares kit; not surprising because bits of swarf, dirt in the charger nozzle and bits of flying field in the inlet nozzle all explode into the ball seal at each charging. I've a feeling that these foreign objects also slice flakes of plastic off the neck of the nozzle; they may stay attached to restrict the flow into the tank, giving short runs. It is possible to remove these flakes or bits of flash with a sharp knife and good eyesight.

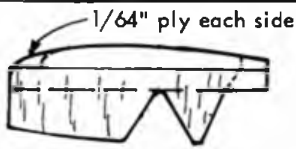
The rubber O-ring seal is another source of leakage, but only if there is dirt or small hairs or other debris breaking the seal, which can be removed. These little rings seem to last forever. A little saliva helps when removing or replacing. Thereby hangs a tale. I recently bought a spare tank cap, pipes, cylinder head and filler nozzle, all soldered-up for an ex-Turbotank engine. There was no obvious leakage but taking a tip from Peter Gibbons I dunked the whole unit, charged up, in water. It revealed a small gas escape from the nozzle O-ring. Tightening up a little had no effect. Dismantling revealed a nozzle full of fibrous fluff, a few strands of which were wrapped around the rubber ring. In place of the ball was a small cylindrical rubber plug as used in the Shark engine. Ressembled without the fluff, the nozzle worked fine. Time will tell if the little plug is better than the ball. The O-ring will also act as a safety valve. I discovered this on a recent warm morning. Just when I had charged up for a trim flight someone asked me to time a Coupe. As I bent to light a bit of fuse there was a little hiss; the O-ring was pushed out of place as the gas escaped. I unscrewed the nozzle a little, the ring slipped back into place and all was fine again after retightening.



Vee-dihedralled 86B shown above. Triangular-section fuselage is rigid and light.



CO<sub>2</sub> tank lifted out of position to show locating recess. No engine offset needed.

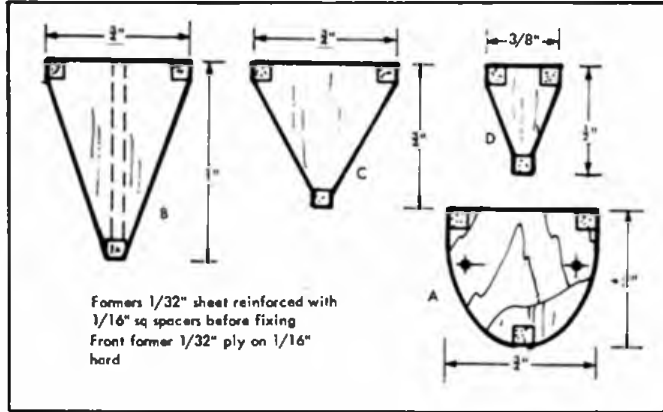
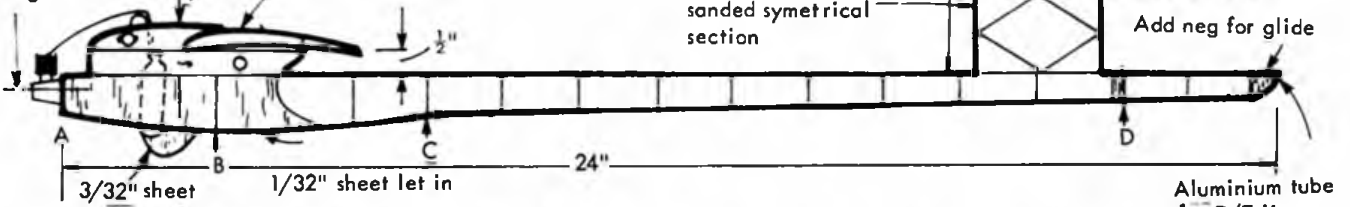
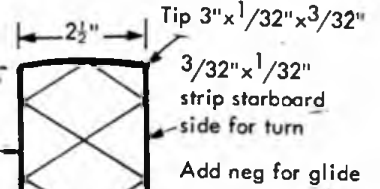


Pylon from hard 1/16" sheet  
trimmed back to dotted line  
after wing position found

Slight up and  
right thrust

1/16" positive incidence

Outline 3/32"x1/8"  
ribs . 3/32"x1/32"  
sanded symetrical  
section

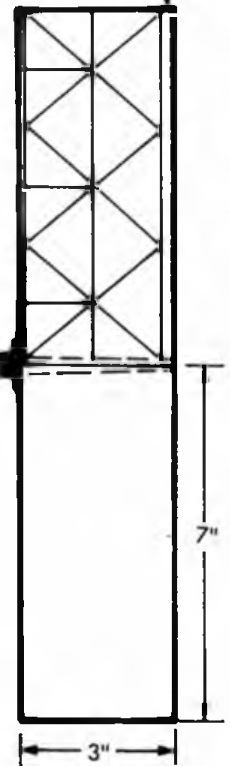


Formers 1/32" sheet reinforced with  
1/16" sq spacers before fixing  
Front former 1/32" ply on 1/16"  
hard

**1982 Competition model**  
3rd: 1984 Nationals  
5th: 1985 Nationals

Slight tilt up

Thread brace sewn in place



**Weights**

Fuselage, motor, prop	0.87oz.	25 gm
Wing	47	14
Tail	12	3.5
<b>total</b>	<b>1.46oz</b>	<b>42.5gm</b>

Wing area: 120 sq.in

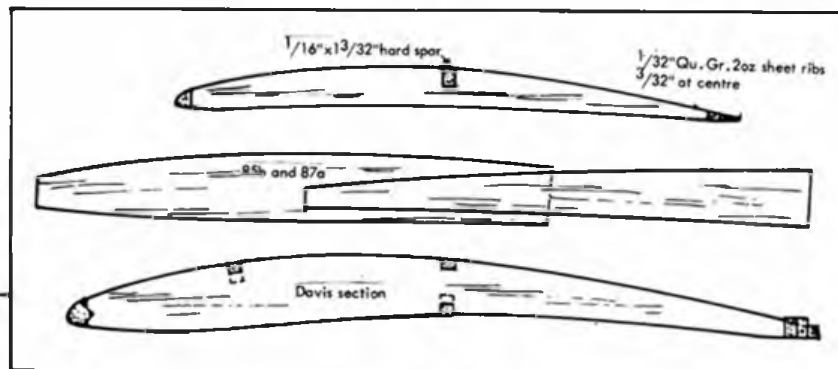
Tail area: 42 sq.in

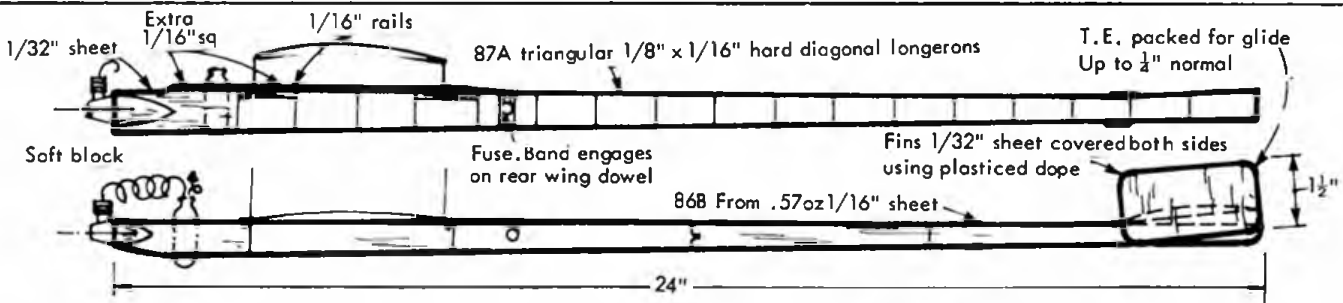
Prop: 6x6 hardwood to 'Hipperson' blank

Wing LE: 1/8sq. Spars: 1/16in. at panel ends. Dihedral: 7 degrees at each break.  
CG about 2.7in behind LE. Thread brace runs from TE, under fuselage to attach  
to small dowel.

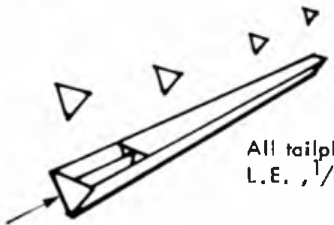
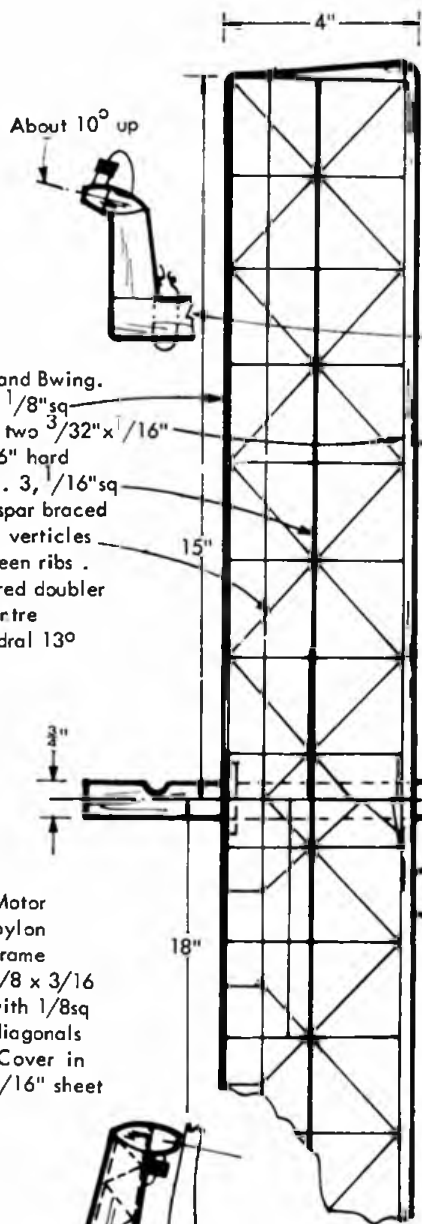
Fuselage longerons: 3/32sq. Spacers: 1/16sq.

Tail LE: 3/32sq Spar 1/32in x3/16in. TE: 1/16x3/32 (2 lam.)

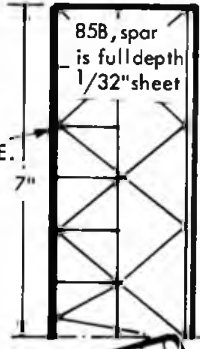




Total weights:  
 85B HTL Tractor: 1.38oz  
 86A VHTL Pusher: 1.39oz  
 86B Orthodox Tractor: 1.27oz  
 87A Large wing Orthodox: 1.3oz



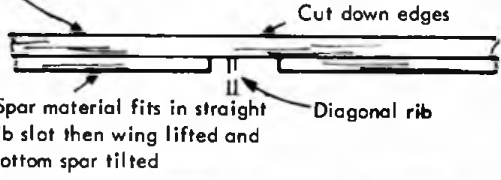
Two 24" sides tapered from 3/8" to 3/8" slightly chamfered and glued bottom edge. 60° triangles added plus front extra inner sheet. Top edges sanded and whole inverted over oversize top and cyanoed. Tank recess sanded in with sand paper round a tank. Recess lined with 1/32" sheet. H.T.L models have pylon fitted before top added and front pulled in like a boat.



86A and B wing.  
 L.E. 1/8"sq  
 T.E. two 3/32" x 1/16"  
 + 1/16" hard  
 Spars. 3, 1/16"sq  
 mainspar braced  
 small verticles  
 between ribs.  
 Tapered doubler  
 at centre  
 Dihedral 13°

### 1985/86/87 Collection

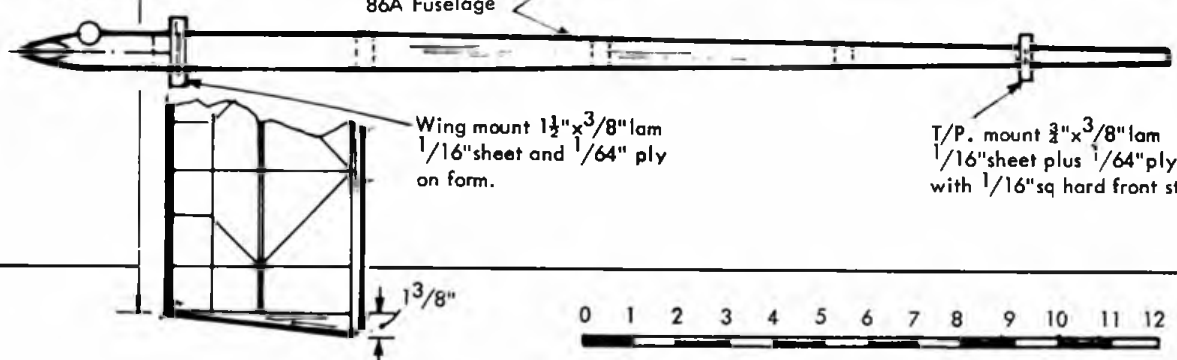
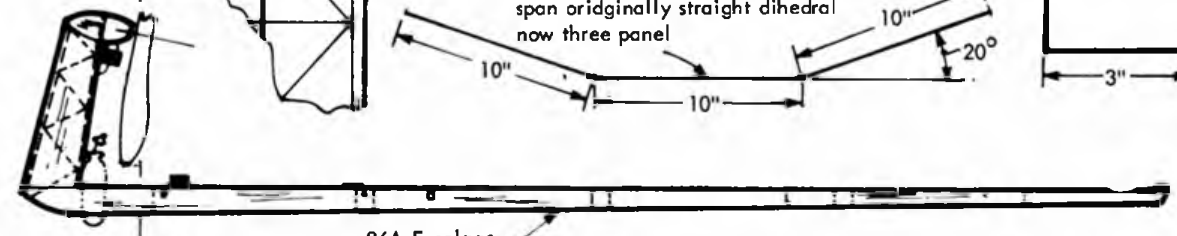
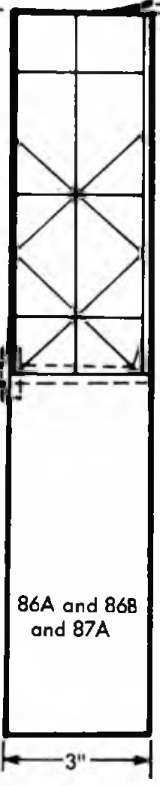
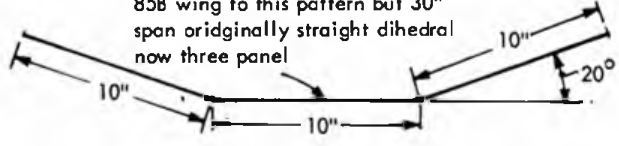
This wing is easier than it looks. L.E. and T.E. and straight ribs assembled, then rear diagonals, top main spar and front diagonals. Spar slot in front diagonals cut with 1/8" x 1/16"

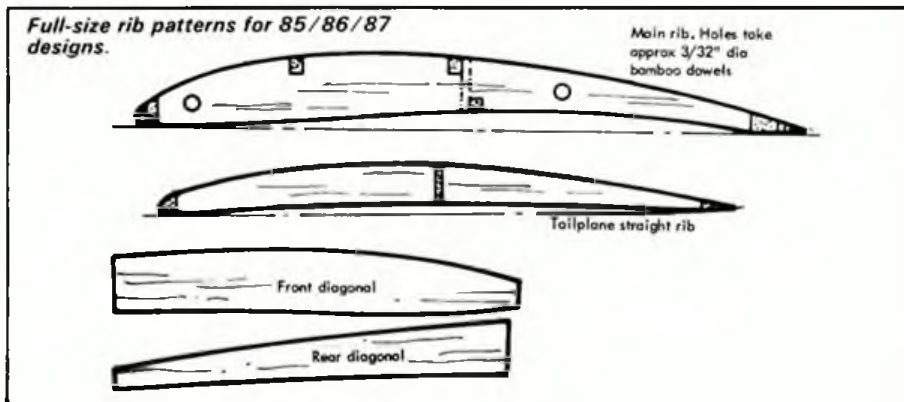


87a wing. 1st NYFFG Mini Meet July 87  
 L.E. 1/8"sq. Front top spar hard 1/8" x 1/16"  
 Rear lowest spar 3/32" x 1/16" hard  
 T.E. 3/32" x 1/4" Extra root spar 1/8" x 1/16" hard

All wings have 1/32" packing inserted under starboard tip L.E. and port tip T.E. after straight ribs in but before diagonals diagonals are fitted

85B wing to this pattern but 30" span originally straight dihedral now three panel

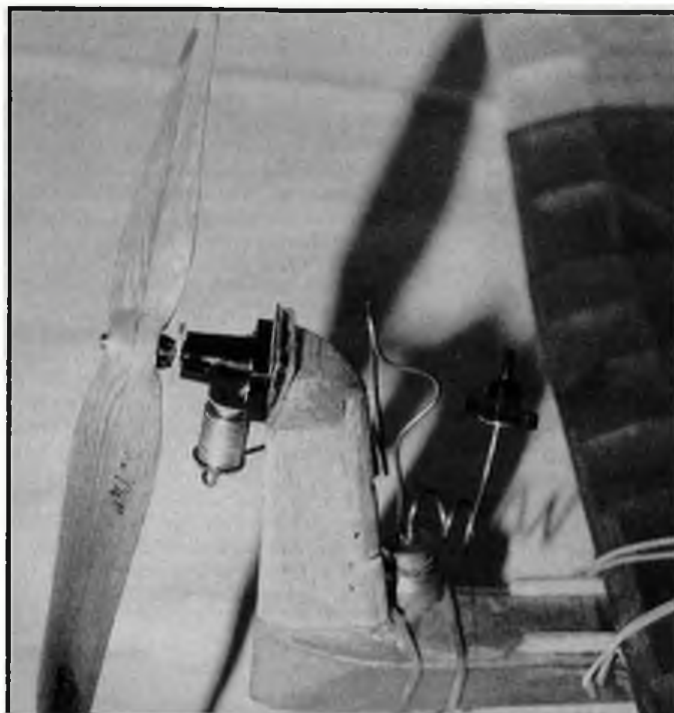
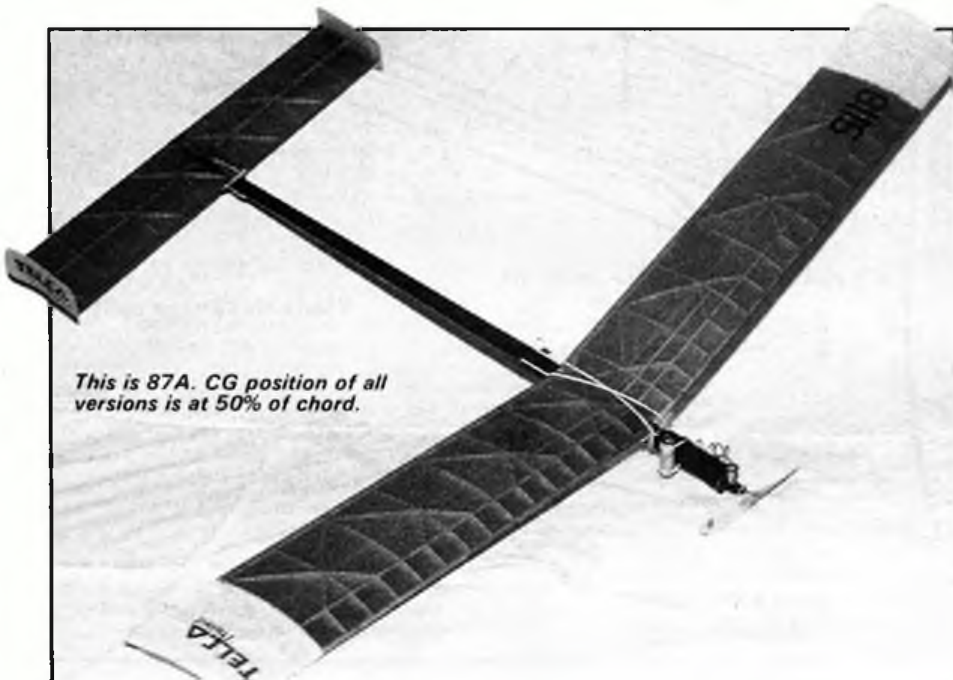




My 1978 engine reached the free stage (i.e. the prop would freewheel) after about two years' flying. In retrospect, I realize it was not a very good engine, giving a run of about 1:45 at a low speed with the gas charged into a tank cooled by running-off a previous charge. Nevertheless, it was very reliable. I didn't alter the speed

setting for about two years until just before the '82 Nationals fly-off. Subsequently the reliability fell and it went into reserve. At that time I didn't know about spares, nor did I have the courage to investigate. The next motor, purchased in 1983, would run for two minutes at much higher revs. It went into

the late '82 'calm-weather and fly-off design. It was a tight engine with a rasping exhaust note, but it remained totally untouched for about two years and gave every satisfaction until it was fitted to a Philpott-inspired VHTL pusher. At this it turned into a monster: hissing, spitting and baulking. If it ran at all it was in the wrong direction. I stripped and examined it, but all I could find was a tiny ridge of what appeared to be flash on part of the lower edge of the valve seat aperture. I cut this off and very slightly coned the seat. At the same time, with Steve Philpott's article at my side, I toothpasted the piston, pared the pip and lapped the crankshaft with grinding paste. By the way, the prop-driver can be eased off the crankshaft with a small screwdriver; push gently from the rear and work round a little at a time. I failed with the valve seat and substituted another. Once re-assembled, the engine ran much more smoothly in both directions. By now I had discovered freezer spray and was able to get runs of over three minutes on flyable revs. Another engine bought very shortly after - and possessed of very similar characteristics - served through the very early HTL experience and after more than its share of shaft runs, reached the freewheeling stage and positively rattled - but it continued to run nevertheless. This motor has been treated to a new crankshaft and eccentric bearing; a new piston was 'toothpasted'. It now runs adequately and sounds better. I also bought a Turbotank 3000 a few years ago. Initially (with the crankshaft bush mark at the bottom) it ran much too quickly. It was a long time before it dawned on me to screw out the cylinder a little, which meant adjusting the feed pipe, but this restored the speed control. The tank proved frustrating. At first I had a safety valve that leaked every time I got a good charge; then I got a replacement that didn't leak but wouldn't take a decent charge at all. In fact the Turbotanks have now been withdrawn but the engine, treated to an ordinary tank and pipework and with only the piston pared (everything else being fine) is performing best of all.



Nose details of VHTL 85B. Note tank banded in recess, boat-hull fuselage and substantial pylon.

## Techniques and tips

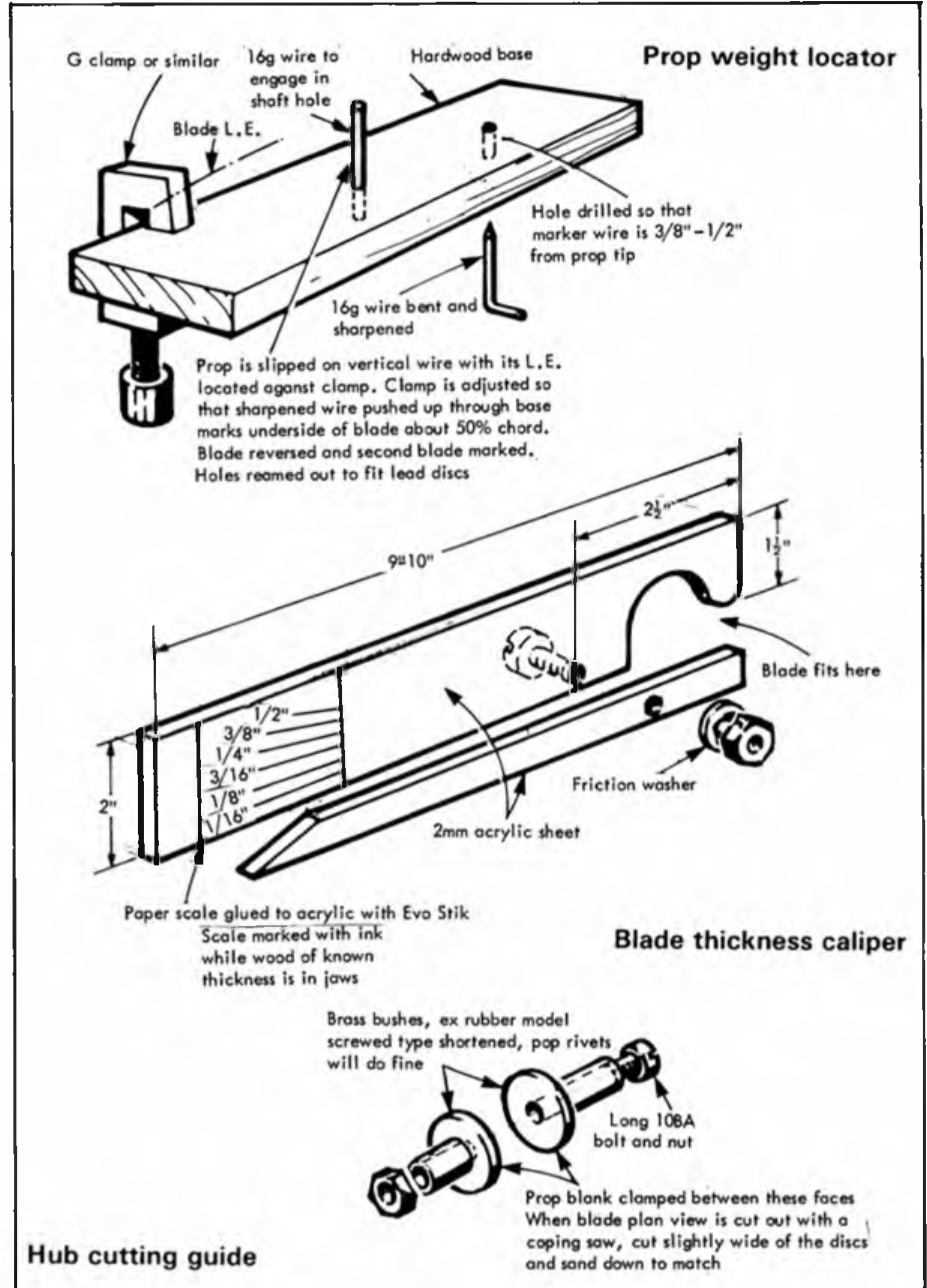
I aim to charge warm into a cold tank. Sit on the capsule or charger with capsule in it; holding it under the armpit will also warm it satisfactorily. Cooling can be effected by running-off a first charge in the stationary engine, and running-off the spare gas in that capsule you've just used for a contest flight will also help. To do this, fill the engine and start in the usual manner. As it slows re-apply the charger and hold until the engine nearly stops. Follow this with a quick change of capsule, run off the first charge with a warm charger and quickly fill for the flight. It is much less complicated to use a freezer spray, sold for use with electronic components or as chewing-gum remover. I don't find such a lot of difference between the first, second or third charges in the workshop and you rarely get chance to make comparisons in the air. If the charger nozzle is leaking at all I prefer to fly on the first.

Spare gas can be gainfully used on that model that requires trimming or in that engine that can stand more running-in. Motors do seem to get better with work. If

unscrewing the charger cap to let spare gas escape rapidly rearwards, beware. The combination of swarf and ice is ideal for damaging or merely displacing the rear seal, storing up a nasty shock for when you screw down on the next capsule.

I usually set up an engine in the workshop to run smoothly at its very slowest. The nutcracker part of a pair of 5in. square pliers is better for precise adjustment than the little spanner provided. Support the engine by the cylinder while doing this. Screwing the cylinder up or down a little will also give a very delicate speed control, but watch the feed pipe. With this set-up the engine will run very slowly for up to 30secs but then it gradually speeds up so that it will be running quite quickly for the last 15secs of what may be a run in excess of 3:00. I try to make a trim flight at this setting. If the model doesn't touch down fairly quickly this will turn into a gas-charge, ground-hugging flight of half-a-minute, with the model climbing away at the end to about twice launch height. A little tweak will then produce a very slight climb from the hand. To save a number of heart-stopping circles a further increase in speed is desirable in wind.

The Telco propeller usually comes way out of balance, most of which can be restored by scraping off the brand name. A balance rig can be quickly made by epoxying two single edge blades about 3/4in. apart on a flat base. Razor-plane blades, hair trimmer comb blades or even Stanley knife blades suffice. A short length of 16swg wire pushed through the shaft hole will do as a pivot. After balancing the prop will weigh about 2.8gm. I found such a prop would freewheel on my well-worn engine but not on the newer, better but unmodified ones. A 6x6.1/2in. Hipperson-type wooden prop carved from DIY-shop softwood wouldn't freewheel on either motor. In the air on a small model (a Dragonfly) there was little to choose between the two props, any gain on the climb with the wood prop being lost on the glide. The wooden prop came into its own on a slightly larger model (the 1982 design) which did offer to glide even with the prop stationary. This prop was later fitted to the first VHTL pusher. At the time I wasn't aware of the significance of upthrust in this layout and on installation the prop tips fouled the fuselage. I reduced the diameter on the field leaving the tips squared off. At this the model put its nose up but didn't go anywhere. I remodelled the tips back to their previous elliptical shape and the improvement was noticeable. When I finally got to modifying engines I found the props would freewheel on an uncharged engine but not at the end of a run. Often one flick of the prop would release the rest of the gas and allow the prop to freewheel. This focussed my attention on the weight of the props. A nice spruce one (laminated from strips of 1/8th sheet) weighed 1.8gm. Another from shop softwood was about 2gm. I added small weights to a Telco prop and found I got smoother running on low revs with the last burst of gas flicking the prop into the freewheel mode. This prop weighed 3.8gm. I've tried to find suitable timber to produce a heavier prop but they all vary within small fractions of 2gm (with weights, about 3.1/2gm). The best one is carved from ramin, which was nice to work, and weighs 3.7gm with weights.



I've now got some mahogany...

The weights were made by wrapping and gluing paper, with PVA, around a pencil, then withdrawing the pencil an inch or so. The pencil is held upright in a vice and lead poured in the mould thus created. Korda fliers will recognise the technique. This produces a cylindrical piece of lead from which 3/32in. slices weighing one gram can be cut with a Junior hacksaw, or better still a razor-saw. They don't have to be very accurate. These will weigh about 1gm each. I have a little jig to mark a hole in exactly the same place on each blade which is then reamed out with file tangs or a similar tool so that the lead disc will just slip in. The reamer gives a slightly dished effect to the hole on each side. The lead is then fitted flush with the underside and held with a drop of cyano. Then it is filed down to conform with the top surface. All this takes less time than it does to write about it. A very light series of taps with a small hammer will then rivet the lead in place; final finishing can be done at the same time as restoring the balance.

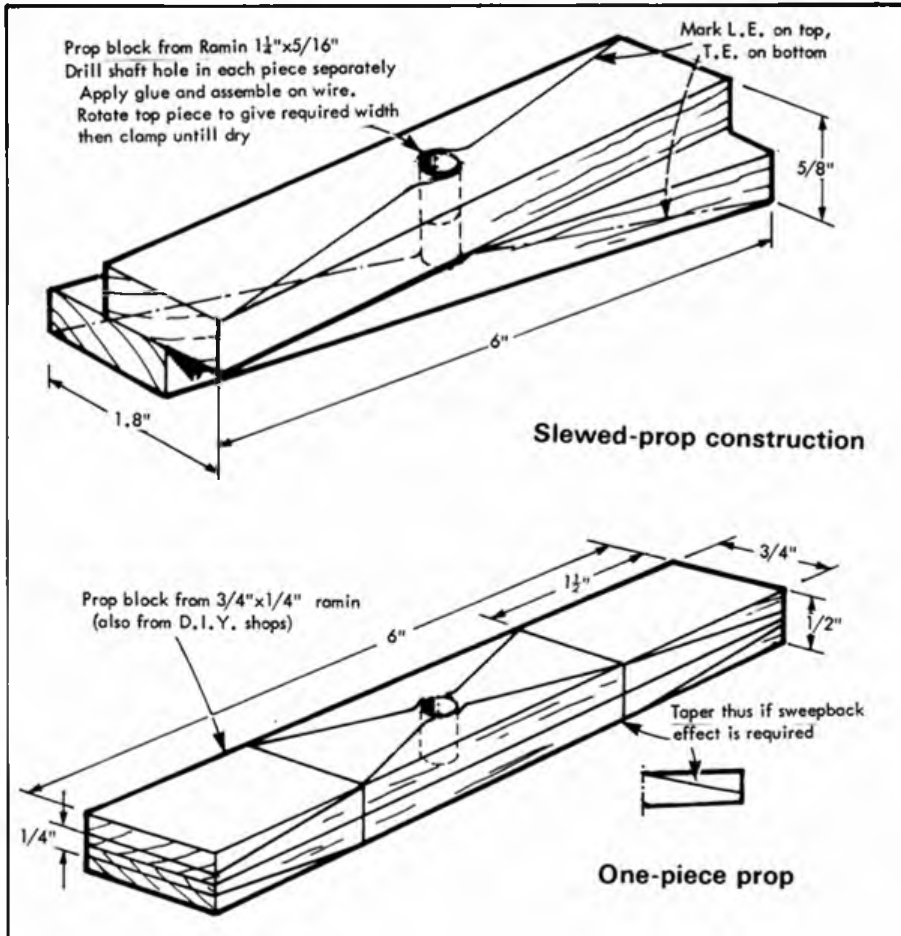
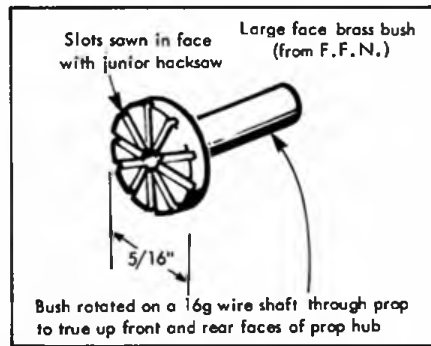
## More on props

I've normally made props from an 'X-block', typically 1.8x5/8in. at the three-inch radius. The vertical shaft hole needs drilling first. I use the little device shown in the sketch to mark out and cut the centre boss. Having carved and sanded the backs flat I carve and sand the top surfaces so that they are parallel with the bottom and a little less than 1/8in. thick. With the help of a home-made caliper I start at the tip and bring this down to 3/32in. from the tip to the half radius point. The blade shape is then cut into the outer halves of the blade. A line is marked on the upper surface at the one-third chord point and flats sanded in from here to the L.E. and T.E. Then the tip is blended and the curved surface of the blade introduced as the line disappears. The inner halves of the blade should be blended smoothly to the hub, this having to take precedence over the creation of a true aerofoil section. The thickness of the hub can be reduced to about 3/8in. but because of the fragility of the prop screw it is important that the faces are at absolute right angles to the



prop shaft or the prop will be pulled out of track. See diagram. My blades are about 3/4in. wide at their widest (about 1in. from the tip).

At the recent NYFFG Mini-Meeting I had the chance to closely observe Peter Gibbons flying a very small model using a large Peck plastic prop. I don't know if he used the seven or eight-inch version but it was only a bad fill due to a faulty filler nozzle (unfortunately in a three-minute round) that put him out of the lead. The setup was very satisfactory, giving a run of up to four minutes. He has since tried one



of my props with less satisfactory results, echoing my own experience with a small model. I tried a Peck prop myself a few years ago but it was extremely out of balance. The heavy blade was the shorter, and after extensive scraping on one side and adding lead to the other I failed to achieve a smooth run. I must try again.

### Model genesis

Graham Brown, at the time a prominent Junior flier, kindly supplied plans of his Dragonfly which became my first CO<sub>2</sub> model. He had a lot of success with it and we both made the 1982 Nats Fly-off. This design has a square, built-up fuselage with pylon, a 30in. 97sq.in. wing and a weight of 37gm. ready to fly.

I still had the Dragonfly when I built the next model, so it was designed for calm weather and fly offs (1982 CO<sub>2</sub>). Both span and chord were increased to give 120sq.in. area. The long, 24in. fuselage was retained but became triangular and a bigger tailplane was employed in the hope that this would help to give the extra stability

required for the first few ground-hopping circles of a competition flight. The fin was mounted on top of the fuselage ahead of the tailplane, as on the Dragonfly. The model spent its contest life flying in unpleasant conditions with which it coped very well.

I replaced the Dragonfly with a VHTL pusher. The design incorporated a round, sheeted fuselage and a 30in. straight-dihedral wing of 4in. chord. The tailplane was identical to the 1982 CO<sub>2</sub> model and the fin was mounted on top. It took me a long time to learn this fin layout with VHTL doesn't work. By the time the penny dropped the model had spent a windy weekend in a tree, out of which it was eventually blown, damaging the fuselage. A 1/32in. sheet triangular fuselage was then made, with a not-quite-so-high thrustline tractor set-up, a small underfin and end-plates on the tailplane. This model ('85B) flew very well in the wind at the 1986 Nats but I only had time for three flights, having spent too long with the engine that wouldn't push.

By now Steve Philpott's article had been

published and with a new curiosity I set out to try and compare the VHTL and the orthodox tractor set-up. Two basically identical triangular fuselages were made from very light 1/16in. sheet which turned out to be no heavier than previous built-up ones. One, given a VHTL pusher pylon was that much heavier than its twin which had the engine mounted directly on the nose. Both fuselages shared the same 30x4in. straight-dihedralled, Davis-sectioned wing mounted directly on the fuselage. A 45sq.in. tailplane with 1.1/2x3in. twin endplates completed the model. With the front-mounted engine the model weighed in at 37gm; and with the engine pylon it was 3gm. more. This high-thrust model with its engine now willing to push flew very well indeed as assembled. It looked very good in ground turbulence even with a low speed setting. Flying in calm air and at low throttle openings the tractor model climbed faster and higher, but it didn't like turbulence. When the engine was opened out it developed a very tight, power-wasting right turn which required very careful sidethrust adjustment. Another identical wing and tail were built to give two complete models and the VHTL model, with engine speeded up, became the preferred one. It maxed at the '87 Nats and was lost in the fly-off.

The Turbo tank model which had an identical tailplane but an extended, 36in. version of the 85B wing was now given a built-up diagonal-longeron fuselage. The engine, now with a plain tank was mounted tractor-fashion on the nose. It was an instant success, able to fly in wide or tight right circles without banking or loss of height. This model won the CO<sub>2</sub> event at the NYFFG Mini event on York racecourse. This was an interesting event with advertised variable maxes which turned out to be four two-minute rounds and three 'three-minute'.

### Conclusions

Most improvement is likely to come from ensuring the charger and filling nozzle are in good order, and from practising charging. To quote Steve Philpott 'The more I practice the luckier I get' (*isn't this a Jack Nicklaus original? GC*). Leaking engines can be easily put right. My original 1978 engine, now re-pistonned, is first class. Stiff engines will improve and may be modified with ease. Engines thrive from being stripped, cleaned and re-oiled. I use sewing machine oil. An engine going well will fly a bigger model and help your timekeeper. The cost of flying will get less as the technique improves. A little extra investment respect of spares will keep you flying.

### Useful addresses:

- Chart-Telco: Chart House, Station Road, East Preston, Littlehampton, West Sussex BN16 3AG. (Telco engines and spares).
- SAMS: The Chapel, Roe Green, Sandon, Royston, Herts (William props, wood and tissue for lightweight models).
- Ballards: 54 Grosvenor Road, Tunbridge Well, Kent TN1 2AS (many 'indoor' components).



**The premier Space Modelling event was held during a week in Belgrade. British Team member Stuart Lodge reports**

**T**HE 7TH World Space Modelling Championships, held in Belgrade on the 7-13th September attracted participants from twelve nations and enjoyed perfect weather conditions - hot, windless and clear skies. Model rocketry at World level is dominated by Eastern Bloc states and with over half the competing countries in the shadow of the Iron Curtain it appeared the pattern would continue despite a strong representation of experts from the USA.

For the first time in many years the British Space Modelling Association provided a team to represent Great Britain, consisting of Paul Clark, Ian Dowsett, Jonathan Lane, Stuart Lodge, and John Wheddon as Team Manager. The team was able to compete in six of the seven disciplines flown at the meeting and thanks are due to the 19 Decembar Sounding Rocket organisation from Titograd who sponsored the efforts of the British and were always on hand to provide technical assistance - indeed, without their supply of high performance rocket motors we could not have taken part.

**Corn as high as an elephant's..**

Coaches arrived at the Hotel Slavija to whisk the competitors to the venue on the practice day and it was here that the first shocks unfolded; the airfield was bounded on all sides - and between the cut grass runways - by eight-foot-high maize crops. It was apparent that recovery prospects were nightmarish and all teams approached practice flying with some diffidence. Largely in order to test the 19 Decembar motors in unproven duration designs Ian Dowsett and Stuart Lodge lost models but not before it became apparent that the 5Ns motors were more than a match for most of the field even if the models were a little heavier;

*Britain's Paul Clark displays his ill-fated Ball X-15, overweight in S7 Super Scale...*



equally, good work was done in optimising streamer material/dimensions for the next day's event.

Most entertaining on the practice day was the sight of S8E R/C Rocket Glider models being launched for trimming purposes. These models fly in much the same way as F1C power models but are radio controlled during the glide phase. Until recently this class had been the major suit of the Americans and it seemed that this might continue with experts like George Gassaway and Phil Barnes in the field until the Russians unveiled their secret weapons - Victor Kovalev, Vladimir Minakov and Juri Palaguta who produced wonder models with wings that folded during the climb phase; their performance was as astounding as their looks and the US Team Manager was heard to comment 'We've got one hell of an event here!' Prof. Gerry Gregorek proved to be a sound seer!

## Flags of all Nations....

The time for practice passed quickly and coaches arrived to take the participants to the Opening Ceremony; always a fetish in the Eastern Bloc. This came well up to expectations with a grand parade around a sporting arena packed with spectators with counter-attractions of skydivers and model aircraft and rocket displays. A humorous aside was the mobbing that went on as the competitors repaired to the transport; the Americans suffered particularly and more than one Star Spangled Banner was ripped from their Team jackets! Dinner came as a welcome respite and an evening's model preparations forestalled the essentials of sleep for the bulk of the entry.

## Day One: 9th September

A busy day ahead for all with two duration classes, parachute (S3A) and streamer (S6A) to be contested. Ante-post favourites in the former appeared to be the Bulgarians with Andrei Jankov, son of the legend, Angel, being much in the ascendant; also respected were Rumanians Ion Catargiu and Nicolae Radu.

These events are flown similarly to free-flight model aircraft competitions employing a three-round system with an increasing (240-300-360 sec) max. format. The competition rules permit two models only for the opening rounds and in the case of parachute duration recovery from the corn was going to prove a major factor in the results. The British had Stuart Lodge, Ian Dowsett and John Wheddon in the hunt. Excitement was at a peak as the maroon fired for the opening round. Ian christened 'rampa ossam' - launch pad No. 8 - with a fine max; Stuart Lodge had a bad 'chute deployment for only 47 seconds and John Wheddon had his model fall out of good air for 150 seconds. The Americans on an adjacent 'rampa' had their problems with Dan Wining's disqualified flight spoiling their team chances.

Round 2 saw Ian continue the good work with a second max to give him a fly-off opportunity in the last round. Stuart Lodge slayed the gremlins with a maximum leaving John Wheddon's bad luck to spoil the perfect score. The field was polarising now, the aces maxing with ease and using small enough parachutes to optimise recovery prospects. There were many who couldn't start in Round 3 having sacrificed models to the Corn Gods in the first two rounds.

Those with a model left could now take risks with recovery prospects with bigger parachutes being loaded for the high max requirements in round 3; however, this was not without its hazards as Ian Dowsett discovered, his megacanopy not shaking itself open following deployment for a 155 sec. flight. Stuart Lodge maxed again but John Wheddon could find no better than 186 secs. The drama heightened as favourites fell by the wayside leaving Ion Catargiu, Andrei Jankov, Evgeny Christov, Kenny Mizoi, Anton Repa and Dimitar Mustakov to contest the fly-offs. Eventual winner was Jankov with Christov second and the other four in joint third. British placings were: Stuart Lodge, 13th; Ian Dowsett, 15th and John Wheddon, 24th.



*Equipe Great Britain: from left to right are reporter Stuart Lodge, Jonathan Lane, Team Manager John Wheddon, Ian Dowsett and Paul Clark.*

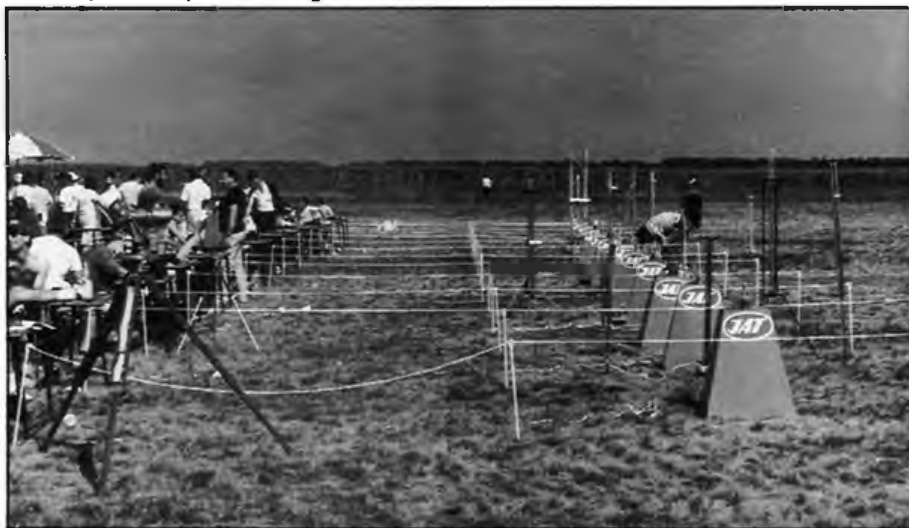
By any standards the British team's sixth place may be judged a good performance, beating the Americans and Poles.

S6A, Streamer Duration followed during the post-prandial session. This was an event more suited to the limitations of the field; the models tend not to drift too far under a streamer. The three-round format mimics S3A but the maxes are stacked 120-180-240 seconds in the qualification series. Big names were in evidence; Jiri Taborsky (Czech), Yuri Firsov (USSR), Jan Pukl (Czech), Djulian Spasov (Bulgaria) and Art Rose (USA). The British contingent comprised Stuart Lodge, Paul Clark and Ian Dowsett. It was felt that their traditionally-made cardboard models might be shown up unfavourably against the micro-light GRP and carbon fibre models of the major nations; indeed, launch weights of just under 20gm were typical in the British camp against the typical 10gm of the American designs! Although Stuart Lodge was able to find a max in the opening round to raise British hopes Ian Dowsett and Paul Clark could not. Round One ended with a covey of maxes across the board from the competing nations. Round 2 got underway under perfect thermal



*Right: Super Scale! Business-end detail of Anatoly Klochov's Soyuz which not only looked good but flew well too.*

*Below: Day One, with launchers and timekeepers ready and waiting...*



conditions and well over a third of the field were able to max. Stuart Lodge of the British was unfortunate with 109 secs. Round 3 promised the prospect of a bumper bundle in the fly-off but the pressures, gremlins and cooling air dashed many hopes, leaving but three to contest the medals with the results being: First, Djulian Spasov (Bulgaria); second, Yuri Firsov (USSR); and in third place, Atanas Marinov of Bulgaria.

The British had to be content with lower placings this time. Stuart Lodge was 20th, Ian Dowsett 32nd and Paul Clark 31st; team place was a poor 10th.

## Day Two: 10th September

Classes S1A (Altitude) and S4B (Boost Glider) provided the menu for another splendid day. Speculation abounded that this was going to be the Yugoslavians' day, with talk of magical composite motors being issued to them by 19 Decembar; indeed Marjan Cuden, Bogo Stepihar and Miroslav Stancevic seemed very confident. However, the Americans looked the dark horses, choosing the two-stage approach along with several others. Matt Steele and Charles Weiss expressed some doubt as to whether the trackers would be able to keep pace with the smokeless composite top stage portions of their entries.

## Illness in the British camp!

The day started very badly for the British with Ian Dowsett having to be taken off to a nearby clinic for treatment to an unpleasant urinary problem - only to find that the clinic director was also the chairman of the local model rocketry club! Notwithstanding this, the team travelled to the competition worried and in poor spirits, this being compounded when it was found that vital equipment had been left at the hotel with Ian's kit.

Luck did not improve as the contest began. Although it was possible to proxy-fly Ian's model it was apparent that the British would be outclassed - cardboard models are just too heavy to be entered at competitive World level. The

event proceeded to a cacophony of cheers from the Yugoslavian pad, with Cuden, Stepihar and Stancevic bending the sky flight after flight. In the end these three lifted the Gold, Silver and Bronze respectively. The West did very poorly with only Charles Weiss and Jeffrey Vincent (USA) breaking into the top ten... a situation not helped by the trackers missing a couple of higher American attempts - the same thing happened to the British contingent. However, it is hard to be too critical when models of this type are only about seven inches tall; the winning model had a best flight of 948 metres (over 3000 feet!)

## Boost - Glider (S4B)

... or just how big a floppy, silver hang-glider can you fold up and roll into a rocket tube? Yes, this event has changed from the old days when power-pod equipped chuck-gliders were popular. The Czech-conceived mylar-covered rogallo gliders are *de rigueur* today.

The 'big-names' were on site. The great Jiri Taborsky represented the Czechs. He and Andrei Jankov (Bulgaria) and Victor Juzmin (USSR) were but three of the potential medallists. John Wheddon was the lone Briton in this class now that Ian Dowsett was *hors de combat*.

In common with one or two other Space Modelling classes (parachute duration is another obvious example) Boost-Glider is an event that appears to have been overtaken by the performance now available. Two-thirds of the entry maxed in Round One and even in the flat calm conditions models with dethermalisers fitted were flying away in plenty. American hopes centred on George Gassaway who was looking good until he had a trim problem in Round Two. John Wheddon set aside loneliness and had his best showing of the meeting so far putting in marginally sub-max flights in the first two rounds; a too-tight glide turn was over-corrected to fly straight through the thermal before he got it right in round three to say goodbye to the model with a spectacularly high max.

Not to take part was disappointing for Ian Dowsett as Boost-Glider was one of his strongest suits and he had genuine hopes of a top ten placing at this event.

After three fly-off rounds the medals were decided as follows: Andrei Jankov, Bulgaria: Gold; Stefan Gerencer, Czech: Silver; and Evgeny Christov, USSR: Bronze.

## Rumours and controversy

Upon return to the Hotel Slavija the British were glad to see Ian back to something like his cheerful self. More ominously, unpleasant rumours were circulating that at least one of the British Bristol AeroJet Skuas had been disqualified after the static judging. Jonathan Lane's A4/V2 seemed to have fared well enough but it proved impossible to root out the truth on the subject of Ian Dowsett's and Stuart Lodge's models. We were to have Friday, the official rest day, to ruminate on our prospects.

## The Foundry and picnic - or escape?

The organisers of events such as the World Space Modelling Championships in Eastern Europe seems always to provide entertainment in the form of a visit to some prominent bastion of Socialist success. Such was the case here. It is unfortunate to recount that the Western presence in the tour of the Kikinda Foundry and Engineering works was decidedly thin on the ground. A quiet day perusing the sights and sounds of Belgrade seemed much more in order to many people who enjoyed the *al fresco* delights of Turkish coffee and vignac between the architectural views.

The city is one of contrasts. Buildings range from very old and ramshackle to present-day pre-stressed concrete horrors, with churches possibly the most attractive. Modern problems seem everywhere with conspicuous warnings on the hazards of SIDA (guessed it yet?) - possibly very wise in a country where sex-shows are widely advertised on posters. Surprisingly,

Below left: Klochov's Soyuz climbs out impressively. Below right: It went up in one piece! Alexandr Korchagin's Soyuz returns under a plethora of canopies - he returned under the mantle of World Super Scale Champion. Top right: Skuas by Ian Dowsett and Stuart Lodge; Stuart's rests on the offending documentation (see report...). Below right: Victor Kovalev with his S8E 'folder' which was good enough for Gold. Top centre: S8E Rocket Glider medallists.



beggars were to be found in the streets as were the occasional winos - more disturbingly, aerosol slogans seemed to have Anglo-Saxon origin...

The shops were unusual to Western eyes, selling interesting combinations of products. For instance, in Britain you would not find a toy shop with tobacco and spirits in the window display. Equally, professional photographers of many standards exist all over - possibly business is brisk in countries where the populus must carry identity cards. Prices to British eyes seemed cheap (maybe the £ is a major currency after all!) but undoubtedly the Yugoslavs are somewhat worse off than the West, although the gulf is closing. Interestingly, visible from the hotel was a site earmarked by Ronald McDonald!

### Day Three: 12th September

Scale Altitude (S5C) and Rocket Glider (S8E) provided the events for the penultimate day of these World Championships. The former is a long established and very popular class combining the meticulous work of the scale modeller with a stunning flight performance. Naturally, as in all scale model classes the choice of model is a major factor and the types flown tend to be sounding rockets which are long and thin - and hence easy to build light as well as being aerodynamically desirable. They also possess enough surface detail to attract the judge's eye. Typical prototypes are the Nike Smoke, Nike Apache - a two stage design - and the Australian Aeolus.

In theory it is a wide open event; very detailed models that gain approbation from the judges tend towards obesity and fly to lower altitudes, whereas simpler, lighter models may be astounding flyers but their advantage can be nullified once the scores are tallied. In Yugoslavia the trend was to quite small models as far as the rules would allow (which meant 18mm diameter for at least 20% of the overall length) with very good surface detail.

As far as the British were concerned the day

started badly. The rumours proved to be true; Ian Dowsett was disqualified and there was a question-mark over Stuart Lodge's entry. The problems were that most full-size Skua's were fired with a separating booster and both British entries were to fly single-staged. On the face of it a clear breach of the rules; however, Ian had documentation to the effect that Skuas had been launched sans booster. The judges eventually conceded this point and Ian was reinstated after some firm litigation from Team Manager John Wheddon. A little more common sense might have been applied to these problems had the judges chosen to recall that a single-staged Skua flown by Peter Freebrey had become World Champion in 1974; a very clear precedent! Stuart Lodge was less lucky. The powers that he had taken a dislike to the scale documentation provided and his Skua remained sidelined leaving Ian and Jonathan Lane with the A4 V2 to represent Great Britain in the event.

By this stage the sensible money was going on Eastern European entries in everything, although the Americans had fine entries in Art Rose (1985 World Champion) with a Nike Apache and Matt Steele with an Aeolus. The former had scored the highest in static judging but for some perverse reason chose not to fly. Matt Steele had problems with vertical climbs with his two-stager which hampered his prospects. From the start it looked as though Jan Kotuha possessed the right cocktail of static marks and flight performance and so it proved, but the event was notable for a series of super flights from all concerned.

Ian Dowsett's Skua flew magnificently on 19 December 20Ns motor to place 14th overall. He might have done better had not a fin been wiped off at ejection precluding further flights. Jonathan Lane's V2 was a little too heavy and a little too fat for spectacular flight performance but applause was impressive as it left the pad to a modest altitude; sadly the second flight ended in disaster when the device crashed (realistically?). Winner was Jan Kotuha (Czechoslovakia) from Russians Sergei Ilyin

and Yuri Firsov. Ian Dowsett was the highest Western entrant.

### Rocket-Glider (S8E)

There were no British entrants in this event and so it was possible to observe the trends and personalities closely. The Americans had hitherto dominated this class with experts like Phil Barnes, George Reibesehl and George Gassaway; all looked capable of putting in a strong challenge this time. Nevertheless Iron Curtain countries are becoming very well versed in Radio Control techniques; they have always had a tradition of superb free-flight modelling and from the evidence of practice day they looked to be right on the cutting edge of the technology.

### Folding wings

The Russians Victor Kovalev, Vladimir Minakov and Yuri Palaguta all flew models with wings that folded inwards at the polyhedral break for the climb phase which made for higher boost and better controllability under fierce acceleration. Jiri Taborsky (Czechoslovakia) flying a conventional type looked competent as did Svetozar Rusev (Bulgaria). It seemed probable that unreliability and mistakes would be the deciding factors in the event. The opening rounds are flown like duration rocket classes and free flight model aircraft competitions; that is, a three-round format with an increasing max (300-360-420 seconds); fly-off contenders then fly another series of ever increasing maxima.

As the competition got under way it was apparent that there were differences in piloting skill (and model launch trim). Some boost phases were very hairy indeed. In the case of Arthur Hunziker (Swiss) and Marin Georgiev (Bulgaria) the G-forces developed in eccentric climbs resulted in spectacular mid-air disintegrations.

### Master soarers

In the hunt by the fly-off stages were a highly accomplished elite of modellers with subtle



Above left: George Gassaway's Rocket Glider soars away to the heavens. An impressive sight! Above: Kovalev's Rocket Glider ready to go. Note the piston launcher. Left: A super Soyuz for Super Scale - Anatoly Kluchov's Medal winner. Boosters and stages are discarded and the capsule is deployed during flight.

flying skills and well-trimmed, reliable models. Fly-off attrition saw the end of Withold Tendera (Poland), Henryk Szendzielorz (Poland), Vladimir Hadac (Czechoslovakia), George Reibesehl (USA) and Jiri Taborski (Czechoslovakia), leaving the metal to be decided by the popular American, George Gassaway, Victor Kovalev (USSR) and Svetozar Rusev of Bulgaria. Two more extended fly-offs were needed before top honours went to Kovalev. Second was Rusev and third Gassaway. The Czechoslovakians won the team award.

## Day Four: 13th September

The last day in the 7th World Space Modelling Championships was for the last word in models - class S7 Super Scale. The World's greatest model rocketeers flying large scale models of the World's best known rockets...

Choice of models is again of paramount importance. Prototype complexity, degrees of difficulty and special effects all combine to fight for the judge's approval and typical models include Ariane, Saturn 1B and V and the Soviet Soyuz series. The Russians always put in a strong showing in S7. This time they had a trio of Soyuz produced by Alexander Korchagin, Anatoly Klochov and Arnjs Batsa. The Czechs and Bulgarians with Saturn 1Bs and Soyuz types also looked good but the Americans seemed light; only Robert Beidron with a Nike Apache was in the frame. Paul Clark had the most original model at the meeting - his Bell X-15 attracted much comment.

After static appraisal the Russian models were real favourites for honours, being very near the top of the marks table. Everyone knew that flights would be reliable and packed with special effects. The Yugoslavians Georgi Georgeski and Zoran Gurevic had attractive models of the Western Ariane which impressed but with few special flight effects they were downgraded accordingly.

Soyuz models offer plenty of scope for in-flight effects. Discarding boosters, staging and capsule deployment are all possible. The flight of Alexander Korchagin's example drew gasps from the crowd that by now included Soviet cosmonaut Victor Popovich; Korchagin's flight framed his mantle as World Champion beautifully - he was a worthy winner and a true gentleman.

Paul Clark was unfortunate to have the X-15 adjudged overweight, but he elected to fly anyway to entertain spectators. The launch was fast and spectacular, but it appeared to shed its canopy and recovery system during the climb; this was confirmed when the model fell unretarded back to earth, impaling with a sickening crunch! Alexandr Korcagin (USSR) took the Gold ahead of fellow Russian Anatoly Klochov and Stefan Gerencer of Czechoslovakia. Unsurprisingly, the Soviet Union took the team Gold.

## Reflections

A marvellous, sunny and educational week flying with the Eagles; performing at a World Championships is mind-stretching. From the British point of view it was a pity not to return home with an award although we did much better than the other Western European countries. Teams must travel to these events more often despite the expense, as this is the only way to enjoy the hobby to the full. Hopefully, next time a slightly larger team could be taken; it was very hard work with only five on board. 1988 could present an opportunity with a proposed meeting in West Germany and a European Championships in Romania; so who's interested?

## Acknowledgements

Thanks are due to many, for example Messrs. Radovic and Zedovic and the lovely Helena Zinovic of the 19 Decembar organisation whose motors were the epitome of reliability and their

hospitality was without peer. Ian Dowsett, who designed clothing and stickers and who organised the air transport cannot be thanked enough. Yugoslavian Aero Transport (JAT) sponsored the event providing welcome sustenance at mid-day - it kept us going, as did the Gatorade isotonic health drink that kept up mineral salt levels - important when the temperatures are around the 90s. Gratitude is also due to the FAI Jury under Howard Kuhn who fielded the hassles with aplomb. It was heaven!

*Right: The mylar weaves its magic as Messrs. Gassaway, Mizoi and 'Dr.G' - Gerry Gregorek - talk prospects. Centre right: Neat packaging by Britain's Stuart Lodge - a very important part of International travelling. That case is courtesy of the Army...*

*Far right: Jonathan Lane looks on as his V2 leaves the pad in the Scale Altitude event. Below that: Sign of the times - warnings of the hazards of SIDA (AIDS) were everywhere in Belgrade. Final photo: Soviet cosmonaut Victor Popovich enjoyed the meeting and presented some medals too.*



# 7th World Space Modelling Championship

## S3A Parachute

Individual Results: top five and GB places: 34 flew

1	A. Jankov	Bulgaria	240	300	360	420	480	540	2340
2	I. Cateargui	Romania	240	300	360	420	480	319	2119
3	E. Christov	USSR	240	300	360	420	480		1800
	K. Mizoi	USA	240	300	360	420	480		1800
	A. Repa	Czechoslovakia (World Champ)	240	300	360	420	480		1800
	D. Mustakov	Bulgaria	240	300	360	420	480		1800
13	S. Lodge	GB	47	300	360				707
15	I. Dowsett	GB	240	300	155				695
24	J. Wheddon	GB	150	221	186				557

## Team Results

1	Bulgaria	2460
2	Czechoslovakia	2393
3	USSR	2325
4	Yugoslavia	2063
5	Romania	2053
6	GB	959

## S8E Rocket Glider

Individual Results: top five and GB places: 25 flew

1	V. Kovalev	USSR	300	360	420	480	540	600	645	3345
2	S. Rusev	Bulgaria	300	360	420	480	540	600	540	3240
3	G. Gassaway	USA	300	360	420	480	540	600	525	3225
4	J. Taborsky	Czechoslovakia	300	360	420	480	376			1936
5	G. Reibesehl	USA	300	360	420	480	360			1920
17	I. Dowsett	GB								Did not f
	J. Wheddon	GB								

## Team Results

1	Czechoslovakia
2	USA
3	USSR
4	Poland
5	Bulgaria
6	Switzerland
7	GB
	Romania
	W Germany

## S7 Super Scale

Individual Results: top five and GB places: 21 flew

1	A. Korchagin	USSR	204		777		981
2	A. Klochov	USSR	198		779		977
3	S. Gerencer	Czechoslovakia	129		808		937
4	A. Baisa	USSR	150		776		926
5	J. Kotuha	Czechoslovakia	119		791		910
20	P. Clark	GB			507		502
21	J. Lane	GB					

## Team Results

1	USSR	2884
2	Czechoslovakia	2721
3	Bulgaria	2620
4	Romania	1840
5	Poland	1750
6	Yugoslavia	1562
7	USA	624
8	GB	502



### S5C Scale Altitude

Individual Results: top five and GB places: 27 flew

1	J. Kotuha	Czechoslovakia	740	-	-	660	1400
2	S. Illyin	USSR	772	-	-	581	1353
4	P. Horacek	Czechoslovakia	721	-	-	593	1314
6	A. Lyzniak	Poland	701	-	-	593	1294
14	I. Dowsett	GB	504	-	-	561	1065
22	J. Lane	GB	139	-	-	462	601
25	S. Lodge	GB	-	-	-	-	-

### Team Results

1	USSR	4005
2	Czechoslovakia	3879
3	Poland	3582
4	Bulgaria	3324
8	GB	1666

### S1A Altitude

Individual Results: top five and GB places: 34 flew

1	M. Cuden	Yugoslavia	758	948	843	948
2	B. Stempihar	Yugoslavia	919	843	943	943
3	M. Stancevic	Yugoslavia	763	851	703	861
4	M. Steele	USA	612	-	844	844
5	T. Taborski	Czechoslovakia	623	761	771	771
25	I. Dowsett	GB	-	407	-	407
30	S. Lodge	GB	-	269	-	269
32	J. Wheddon	GB	-	-	-	-

### Team Results

1	Yugoslavia
2	USA
3	USSR
4	Czechoslovakia
5	Romania
11	GB

### S4B Boost Glider

Individual Results: top five and GB places: 34 flew

1	A. Jankov	Bulgaria	180	240	300	360	420	480	1980
	S. Gerencer	Czechoslovakia	180	240	300	360	420	480	1980
	E. Chistov	USSR	180	240	300	360	420	480	1980
4	Y. Firsov	USSR	180	240	300	360	420	1500	
5	V. Kuzmin	USA (World Champ)	180	240	300	360	75	1156	
15	J. Wheddon	GB	104	175	300	-	-	579	
31	S. Lodge	GB	-	-	-	-	-	-	
	I. Dowsett	GB	-	-	-	-	-	-	

### Team Results

1	USSR	2126
2	Czechoslovakia	1860
3	Romania	1834
4	Bulgaria	1780
6	Poland	1743
9	GB	679

### S6A Streamer

Individual Results: top five and GB places: 34 flew

1	D. Spasov	Bulgaria	120	180	240	242	782
2	F. Yuri	USSR	120	180	240	220	760
3	A. Marinov	Bulgaria	120	180	240	186	726
4	J. Taborsky	Czechoslovakia	120	165	240	-	625
5	V. Kuzmin	USSR	120	150	240	-	510
20	S. Lodge	GB	120	109	118	-	347
31	P. Clark	GB	78	96	-	-	174
32	I. Dowsett	GB	82	83	-	-	185

### Team Results

1	Bulgaria	1560
2	USSR	1485
3	Czechoslovakia	1441
4	Poland	1272
5	USA	1187
10	GB	686



# READERS' LETTERS

## More on the Chilton DW1...

Dear Sir,

I acquired Chilton G-AFGI in 1972 in a distressed state after it had sat in the Skyfame Museum for several years. Initially I intended to rebuild it myself but pressure of other work did not allow this.

However, the machine has been rebuilt over the last three years by Joe Austin, the noted restorer, in his workshop at White Waltham. The airframe is now complete and awaits the installation of its Walter Mikron engine. When I first obtained the aeroplane it was fitted with a very corroded 55hp Lycoming engine installed on the original Carden Ford wooden engine mounts. Although I eventually got a 1939 built 55hp Lycoming engine in 'as new' condition from Harold Penrose, Chief Test Pilot for Westland, who had stored it in his garage since 1945, the flat-four layout to my mind spoiled the lines of this fine aeroplane. However, I eventually obtained a Walter Mikron (ex-G-AFSV) from Roy Nerou and this engine is being rebuilt by Roy Mills (ex-PFA Chairman), although currently we still require the rear half of the propeller driving hub.

Since the previous owner had warned that the aircraft was prone to dropping a wing during landing, during the rebuild the previously deleted wing top slots have been incorporated, made from original drawings. Planned colour scheme will be all-black with white registration letters.

Capt. J. McDonald Maidenhead, Berks

## ...and the DH 53

Dear Sir,

I must admit I was pleasantly surprised to see someone taking an interest in my DH Humming Bird. As a follower of Eddie Riding and John Greenland, and being (mainly) a civil vintage buff, I had been interested in building a Humming Bird for a long time, choosing the Tomtit powered BRW from A.J. Jackson's 'British Civil Aircraft'. The model (which is still in existence but stored away) was drawn-up from the APS 1/72 three view to about 48 in. span to take a Mk1 ED Bee. It was initially fitted with a pendulum controlled rudder but I later changed this to a normal, fixed type to save weight.

This was the first time I had been that bit more ambitious with scale detail, such as separate control surfaces, control runs, cockpit detail and so on, and together with the fairly robust construction, the model came out rather on the heavy side.

I'm afraid I never really got it trimmed out properly. I think I was getting somewhere near when I became more involved in 'non-scale' vintage, which had always been another love, and found myself enjoying building and flying such models as the T-Beam and Quaker Flash. This was a long time before all the current vintage kits became available and researching rare subjects and scaling-up

from old magazine drawings was all part of the enjoyment, as with Scale.

Geoff Hardwicke Birmingham

## A designer replies

Dear Sir,

I was very pleased to read M. Longhurst's article Terry Tailless Never Forgets in the October issue, regarding Terry 1. I was fifteen when I submitted this to Aeromodeller, and concur that, whilst amazing under power, its glide made recovery much easier! I only hope my subsequent designs over the last ten years have given as much pleasure.

David Binns Notton, W. Yorks

## A dream of aeromodelling

Dear Sir,

I have really enjoyed the various Viewpoint articles put forward of late in Aeromodeller. The ideas epitomise the free expression and searching for value that is the hallmark of most modellers, and must seem laudable to readers of whatever nationality.

I too have a dream; one that is woven with reality and unreality intermixed. Reality is the memory of a hot August in Sazena, Czechoslovakia; of devouring cans of sweet, Greek orange juice, and sweating with Team Manager Basil Moore to push-start the rented Moskva motor car. That was in 1967 at the World Free Flight Championships, where I was lucky enough to represent my country and fly against the best free-flight competitors in the world.

Reality is not being on the outside, watching, not taking part; not rocking the International boat by accepting token invitations which would not, for circumstances outside modellers' control, be honoured. So unreality sets in, fullfilment is postponed. The models are completed, trimmed, flown, pranged; yet seem never to be flown in International contests. The ritual goes on, creativity is there in abundance, but the competitive edge is gone. Yet... I cannot shake off those mental pictures, the cerebral spark that still shows a vision of George French's Night Train power model spearing up into the late afternoon sky, truly as if held on rails... or the laid back visual of Mikko Sulkala doing a perfect four-minute fly-off flight to win the Wakefield Cup. It may be that many of today's International competitors will not know whom I am talking about, but (in my eyes anyway) those winners were just as skilled as the winners today.

Perhaps one answer is that the outside modelling world has moved on; 'progressed' if you like, leaving free-flight modellers here in South Africa to live on their memories. If that is so then why are we still active; why is there a resurgence of 'stick and tissue' rubber powered models and gliders? I don't know the answer, I only know... I have a dream...!

Sean McCullagh Diep River, Republic of South Africa



## Powder power

In Model Flying - the First Fifty Years there is a brief excerpt from a 1934 Practical Mechanics discussing an American 5-cylinder Lockheed radial engine installed in a 24in Lockheed Vega and deriving its power from 'an ignited stick of fuel placed in a sealed chamber in the fuselage'. The combustion chamber (right at the tail end) and the motor and prop weighed a total of 8oz. but few other hard facts were given. Compiler Vic Smeed asked if anyone had heard of it and almost immediately Bill Hannan, veteran US modeller and columnist in Model Builder, came up with some information in a letter, part of which we take the liberty of reproducing here.

Many years ago, the late Russ Barrera and I attended a talk by the late Ira Hassad, builder of model racing engines. Among the entertaining and enlightening incidents he related was a partial story of 'that' engine. If I recall correctly, it operated on a mixture of gunpowder and spruce wood dust, which generated pressure to run the powerplant, which was equipped with a safety valve to prevent build-up of excessive pressure.

Apparently Ira was quite young at the time, but already an accomplished aeromodeller, who became associated with the manufacturers of the engine. In casting about for finances, they attracted the attention of famed American publisher William Randolph Hearst, who felt there might be an opportunity to help promote his newspapers in some way by attracting air-minded youth (several newspapers then in the US featured model-building columns, as you are doubtless aware).

In any case, a demonstration of the powder-powered engine in a model was arranged, attended by photographers and various publishing VIPs. Although, according to Ira, the model flew quite impressively in previous tests, it was decided at the last minute to adjust the safety valve to permit more power to be generated. Unfortunately the results were predictable... the model exploded in front of the audience (happily with no casualties); however, effectively killing the project!

Bill Hannan California, USA



# HIGH STEPPER

BUILD FROM OUR  
**FULL SIZE**  
PLANS!



**M**Y MAIN interest has always been F1C but by the mid 1970s I reluctantly had to admit that I could not put in sufficient effort to be internationally competitive against State supported 'professionals' from the Communist countries. It seemed better to diversify into other classes and forget about the Trials, so I chose 1/2A rather than Open Power because 2min. maxes are more suitable for ageing legs than nine-minute fly-offs.

Before building anything I watched at a number of 1/2A contests, studied the winning models and talked to a lot of people.

There was a general consensus of opinion that a good 1/2A should be light, even to the extent of having no gadgets, and of fairly low aspect ratio. I drew up such a model, but could not bring myself to start building it for a number of reasons. (a) It looked old-fashioned to an F1C man. (b) Although many of the models seen were most impressive there was seldom a 'full house' in the results. F1C passed through a similar phase before variable-incidence came in. High power meant a very rearward CG and such models have a low restoring force when displaced from the trimmed state. In the turbulent air surrounding a thermal they often mush their way to the ground for a low score.

I therefore decided to go for a full variable-incidence model aiming at least to try and max out.

(c) I find it hard to get enough trimming time so I need a model that can be taken out and flown in a competition without check flights.

Therefore I decided on a full geodetic structure although this would mean increased weight.

(d) When the weight was increased by 50% in F1C in an attempt to reduce performance the opposite happened.

The extra weight permitted the building of higher aspect ratio sheet-covered wings which put up performance substantially.

I thought the same should happen in 1/2A. As a fully-sheeted wing would

The story behind Pete

Buskell's Nationals

1/2A Power winner

put up the weight quite a bit I decided to sheet only the top surface as this would give most of the performance increase without too much weight penalty, albeit at the cost of an asymmetric structure.

(e) When entering a new class there is a tendency to copy the current winning models; but in fact you are unlikely to be able to beat the established experts using their formulae as they have had more experience with it.

There is something to be said for a layout with higher performance potential even if there are problems to be overcome. My No.1 1/2A therefore came out with a distinctly F1C look about it. It was identical to the one shown on this plan except for a 2in. shorter moment arm (and consequently a shorter nose length) and it used a thicker wing section with maximum camber further forward.

Button-thread turbulators were used at the leading edge and at maximum camber, as indicated by some wind tunnel tests of F1C wings carried out by Mike Gaster and myself which showed that separation occurred at about 70% chord on the top surface of most sheet wings, a condition which could be cured by the addition of a maximum-camber turbulator. Mk.1 flew well straight away and gained a number of 2nd and 3rd places. It usually maxed-out OK but got beaten in the fly-off, its deficiency being a tendency to stall for quite a long time after poor transition in calm air; a sure sign of separation problems on the wing.

Mk.2 benefitted from experience gained in flying chuck gliders, a type of model which also suffers separation problems. The section used on 'chuckies' had a sharp entry and a high point turbulator formed by letting a strip of ply into the surface. This high point turbulator did not always work properly.

A natural progression was to cut wood away behind the ply strip thus forming a step to give improved turbulation. It worked so well on the 'chuckies' that there was a strong urge to try it on the 1/2A. Results were just as good. Mk.2 was first used in the 1978 6th Area meeting competition which it won with a 3:30 fly-off in pretty flat air.

Mk.3, the version shown here, was built in '83. It had a longer moment arm to improve directional stability at launch (something that is never brilliant with a forward-fin model) and also to give a more consistent power pattern. It also employed a section with sharper entry and the maximum camber (and the step) moved back to 38% chord. Glide performance and stability were improved over Mk.2.

Mk.3's contest record so far is:

1st London Area Gala	1984
1st 6th Area Meeting	1984
3rd Nationals	1984
2nd 6th Area Meeting	1986
1st Nationals	1987

## Start with the wing!

Build the wing in four panels, pinning down the false leading and trailing edges and adding the straight ribs, followed by the oversize geodetic rib blanks.

Prop up the LE of the right inner panel at the outer panel joint by  $3/32$ in. to give wash-in. Other panels are built flat. Use five-minute epoxy for wing and tail construction as this helps to prevent subsequent structure changes. When the basic panels are dry, remove from the plan and add the top and bottom spars, notching the geodetic ribs as you go.

These geodetic ribs are then pared down using the straight ribs as a guide. I find a half-inch wood chisel the best tool for this. Leave ribs slightly oversize initially and then sand off the remainder, laying a steel rule across the straight ribs as a guide. Join wing panels together next, complete the braces and add the  $1/8$ in. joint ribs.

Add the  $1/32$ in. sheet covering at the rear of the wing (all panels) followed by the  $1/32$ in. sheet covering at the front, the latter being stuck on the top of the rear sheet to form the step. Stick in a few pins to serve as a guide when positioning the front sheet. Use one-hour epoxy. Add leading and trailing edges and carve to shape but leave the trailing edge  $1/16$ in. thick at this stage. (As the structure is asymmetric there may be movement of the TE when the wing is covered and doped).

After sanding and priming the structure with thinned dope cover the wing with Jap tissue using dope as the adhesive. The top surface including the step can be covered in one piece for each wing panel.

Position the tissue and dope on a one-inch strip all along the panel just behind the step. Extend this strip forward up to, but not beyond, the step and press the tissue right into the step using your fingernail or the edge of a blunt knife. Leave to dry for a few minutes and continue covering rearwards in bands about one inch wide. Stop the tissue at the false TE point; that is, do not cover the actual TE with tissue as this can give trouble with the TE curling down in time. Fold the tissue down over the front of the section and crease along the line of the step using the back of the finger-nail. Continue doping-on forwards in 1in. bands until the LE is reached. Because of the asymmetric structure don't overdope the underside of the wing - three coats of thinned dope should be enough. To strengthen the tissue underside and to minimise holes give it a second coat of fuel proofer.

### Onto the tail...

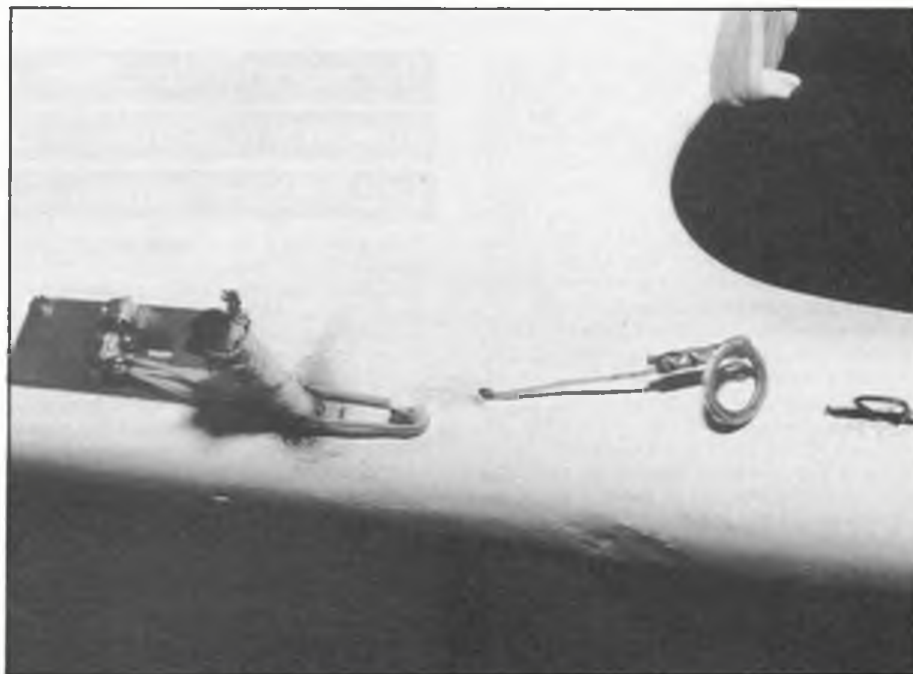
This is built similarly to a wing panel, in conventional fashion. The oversize geodetic ribs again require paring and sanding down to shape using a steel rule and the straight ribs as a guide. Tail weight needs to be watched very carefully so use only selected light wood for all components.

### ...and the fuselage

Refer to the construction notes on the plan.

This will cause gasps of horror amongst 'with it' F1C men as it contains no laminated plastic. I must confess that it owes less to logic than to an inherent mean streak.

I was left a large pile of rough-sawn balsa block when a friend died and I had a job trying to find ways of using it up. As quite a bit of it was in  $2 \times 1$ in.  $\times$  4ft long form, one idea was to try to use it for fuselages.



I was not convinced when I made the first one, thinking it would be hard to make and would be overweight and liable to 'carroty' breaks. In fact it was quick to make, was two ounces lighter than a built-up structure and proved very strong in practice. For those who don't fancy this method, a traditional square box made from  $3/32$ in. sheet thinned to  $1/16$ in. at the rear and strengthened on the corners should be quite satisfactory provided the outline shown is used.

The advantage of the 'block' method is that very little glue is used, wood being carved away rather than stuck on. Within the constraints of leaving flat surfaces where timers, pylon, tail mounts and so on are to be fitted, the rest can be carved to whatever shape pleases you, and graded strength provided by adjustment of wall thickness.

For timer fixing  $3/16$ in. lengths of 4BA dural bolt drilled and tapped 10BA and with a screwdriver slot cut on one end can be screwed and expoxied into the block.

### Trimming

Before starting check the following:

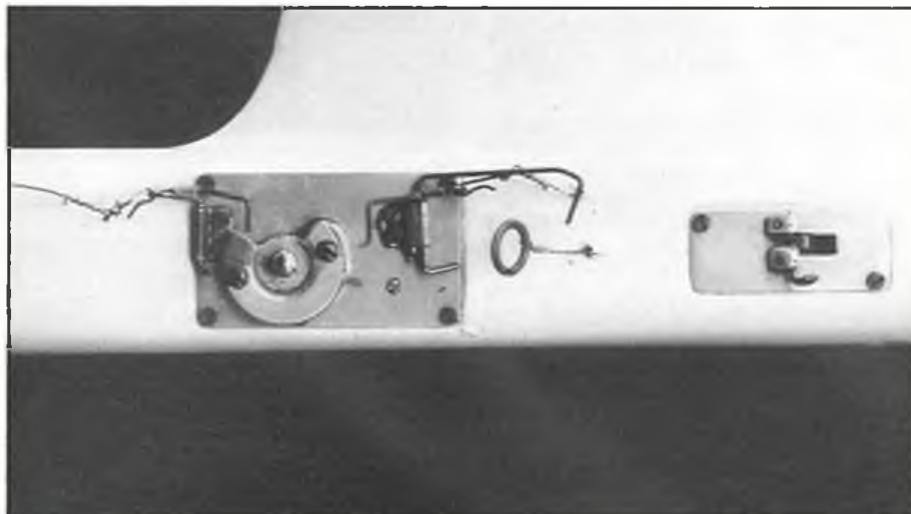
- (a) The CG should be in the range of 1.1/4 to 1.1/2in. from the wing trailing edge.
- (b) Wash-in on the right wing panel should be between  $1/16$  and  $1/8$ in. Ideally, get it to  $3/32$ in!
- (c) Incidence difference on power setting is +0.8 degrees or slightly higher (say 1 degree maximum).
- (d) Set glide change to  $1/8$ in.
- (e) Set autorudder to  $1/16$ in. 'right' for power and  $3/16$ in. 'right' for glide.
- (f) Set the speed tab central to start with.
- (g) Set autorudder overlap to  $1/2$ sec. before the motor cuts by bending the wire arms.
- (h) Set the delay before 'change to glide' to the maximum that can be obtained in the gate space. This is usually about three seconds.

The trim pattern is a steep climb just turning right and giving about half a turn



# HIGH STEPPER

*Opposite page: Tail and D/T line detail; the latter not yet hooked up. Autorudder in 'glide' position. Separated fixed sections are for fine trim. Below: Straightforward timer layout. All details on plan.*



in 7secs. with the autorudder flicking it right at the end. Glide circle is about 100-150ft. diameter.

It is not easy to throttle back a TD 051 without risk of it cutting so my normal procedure is to run flat out on 25% nitro fuel and start with 3sec. run, D/Ting off the top. Forward-fin models nose-up slightly in the first 2secs., so don't launch too steeply. Try for about 75 to 80 degrees.

Adjust incidence and autorudder settings to get a steep climb which just turns right. When this has been achieved on 3secs., slowly increase the run, re-adjusting as necessary.

The most likely deficiency is that the power turn will vary through the motor run. This is usually due to the amount of warp on the right wing. If there is too much warp the power turn will slowly open out and it may go left at the end. Too little warp will cause the turn to tighten up on power and probably go flat as well.

The speed tab is used to correct these faults but it can only cope with a certain

range of error.

If the model is opening out 'left', use 'right' speed tab up to a maximum of 1/8in. offset.

If tightening-up to the right use 'left' speed tab up to 1/8in. offset.

If these adjustments won't pull it in, it is usually quicker to re-set the wing warps, and it is preferable to strip off part of the tissue covering on the underside, re-setting the warps by steaming, and recover afterwards.

## Cox tuning

The 049 and 051 Cox TDs can be tricky to handle in the model. Some are better than others. Excessive tuning usually just makes them touchier. The following can be done without much affecting handling.

(a) Open intake slightly to 5/32in. (removing the gauze).

(b) The inside of the transfer port is rough near the top of the ports, appearing to be machined by two bites of a cutter.

Handling is usually improved by smoothing out by grinding with a pear-shaped mounted point. The top edge of the port can be raised slightly to within 1/64in. of the exhaust and may be rounded, the transfer port cross-section being increased slightly all the way down and flared at the bottom to improve entry. De-flash all port edges with an oil stone slip. In use, do not operate at too high revs. The peak according to *Aeromodeller* tests is at 22,000, so correct revs on the ground are around 20-21,000. If operated beyond 21,000 on the ground, handling becomes much more touchy.

(c) The 051 heads give fair performance but are inclined to burn out after one flight in hot weather. The GloBee sport head gives good performance but requires a good battery as it takes very high current. It provides better handling, however. If machining facilities are available the Rossi No.2 head turned down and used with a GloBee clamp ring gives very good performance and handling; it will last almost indefinitely. Use of the fine control needle with 128 threads/inch marketed by Kustom Kraft, PO Box 2699, Laguna Hills, CA 92653, USA, helps considerably with handling. The same firm markets other performance-raising goodies if you have the money to spare.

(d) Don't use the high pressure outlet provided on the motor for tank pressurisation as this in particular makes needle setting difficult. Instead take the pressure outlet from the middle of the backplate.

## Design appraisal and future trends

All marks have proved very reliable and rugged in use. It has been possible just to take it out of the box and fly in a competition without trim flights.

Contest failures have been due to operator error; flying at the wrong time. On a number of occasions it has still managed to max despite this, an asset which I believe to be due to the improved stability provided by the stepped wing.

In very dead air fly-offs it can lose out to the much lighter tissue-wing models which climb higher.

For the future I am continuing the same line of development and am just finishing a much higher-aspect-ratio version with thinner wing section...

# SCALE MATTERS

**N**OW IN ITS third year, this has become a well-established and popular event, offering not just three official classes but also the occasional experiment. In fact one of these - the KK/Veron kit scale mass launch - seems already to have become a fixture, but this year's innovation - indoor pylon racing - would seem likely to take over in terms of popularity in the not too distant future.

I will deal with the main events first. Not too many new models; perhaps it is a little too early in the season, or are next year's masterpieces being kept under wraps for the Nationals? I had the privilege, along with Vic Willson, of judging the flying of the Rubber and CO<sub>2</sub>/Electric models. This year - as another experiment - the attempt rule was abandoned, allowing each competitor just four flights. No howls of anguish were heard and I felt that things went along more quickly and enjoyably. I think it fair to say that if a model cannot score well in four flights it is unlikely to become a place contender if given four more, certainly indoors.

Perhaps I should mention at this point that the proposal by the Scale Technical Committee to increase the maximum permitted weight of these models was rejected by Council on the grounds of safety. Maybe the proposed increase was too great but I am surprised a compromise could not have been reached allowing a maximum of, say, 120 grams.

Back to the contests. Winner of CO<sub>2</sub>/Electric was Charlie Newman's now-well-known Avro 504N, plans of which are available from SAMS. A good static score compensated for a middling flight, the early part of which was much too fast. The reverse was the case with Mike Allen's Bristol F2B, which looks as though it may be from the *Aeromodeller* rubber scale plan. I have seen this model many times at Indoor meetings but I don't recall it having been entered before. The F2B flew extremely well - indeed, the latter part of the flight was well-nigh perfect.

Geoff Spencer produced another gem for the tiny Brown CO<sub>2</sub> motor - a Gypsy Moth. Unfortunately and inexplicably it seemed very unstable, actually performing a roll at one stage. Andy Sephton flew a Lacey in CO<sub>2</sub>/Electric and Rubber events; an identical pattern in each case was obvious. All Laceys that I have seen possess the same problem; because of low or zero wing incidence they fly permanently nose-up. Maybe the full-size machine does the same but in the absence of first-hand experience the models look rather unrealistic.

There is still a great deal of room for improvement in flying performance. Almost all models fly much too fast. The obvious reason is that wing loadings are too high. This in turn leads to all sorts of problems at take-off with models hurtling round on a wing tip before zooming upwards because an excess of power is



## Bill Dennis takes a look at the latest Walsall Indoor meeting

needed to get them off the ground. Flight paths become erratic and power drops off rapidly at the end of the run, resulting in abrupt arrivals. If you are not a natural builder of light models the answer is to choose subjects with a lot of wing area or the minimum of structure. Once you have a model that will fly slowly throughout the flight it may be trimmed to make effective use of the size of hall; again, many of the

entry at Walsall were careering round in a steep bank, using less than half of the available width.

If you thought mass launches were crazy, just wait until you see indoor pylon racing! Given the relatively short notice and the fact that new models had to be built, the level of interest at this first attempt was remarkably high. The rules are simple: models have to be replicas of

*Heading: Outdoors, true - but how could we resist this Nationals shot of Geoff Burkett's Merco 61 powered SE 5A? Below: One of the Indoor Racers at Walsall was this neat Unlimited Mustang Dago Red - didn't feature in the results though.*





full-size racing machines; they have to complete a number of laps around two 'pylons' (actually helium balloons, courtesy of Richard Granger). Rewinding or recharging is permitted - in fact, this is essential. Sounds easy? Don't you believe it!

The first part of the contest was the heats where only two timed laps had to be completed. The fastest four qualifiers then had to survive a basic 'accuracy' test against documentation before going on to the ten-lap final. A glance at the times recorded will give some idea of the difficulties encountered. One model quickly scratched but the remaining trio were still neck-and-neck after about four minutes, having completed two laps each! At this point Malcolm Allen's Peanut Miles Sparrowhawk put in about six or seven tight laps to establish a convincing lead; and after a tense couple of minutes this model completed the course to win. Andy Sephton and Lindsey Smith were left to battle it out with their Hot Canary and Caudron respectively. The latter was very fast but not particularly airworthy!

As a first attempt I thought the event

went very well. Perhaps the difference in the number of laps to be achieved in heats and finals was too great, in that the heats favoured fast models that were perhaps not the most reliable performers. If the final had been reached with a model that could fly even five laps (the official events are full of them!) it would have walked it. (*Flown it? GC*). Come to think of it, why have heats at all? Twelve models flying at once would be really spectacular... This contest will be held again at the Nationals so I suggest you build something for it. Great fun!

As usual there were several impressive models at Walsall that were not entered in any of the contests. One such was Peter Smart's AW Argosy which was equipped with rubber drive to the central prop only. This model was of similar size to Reg Boor's; indeed, it was of the same aeroplane, G-EBLF in all-silver scheme. The Argosy was very neatly made but Peter has increased the tail area approximately twofold, a move which I think is probably unnecessary. The model made a few tentative hops but it will be happier if re-trimmed to fly to the right.



Golden Age racing plane looks sharp but doesn't make the grade this time.

Top: A happy Charlie Newman - out of luck with his Cosmic Wind racer but CO<sub>2</sub>/Electric winner at Walsall. Below that: Lindsey Smith's Caudron C460 was fast... Above: Winning Miles Sparrowhawk by Malcom Allen. Below: Derek Knight's Miles M2L.



### Walsall Indoor Meeting

#### Open Rubber (11 entries)

			Static	Best Flight	Total
1	P. Briggs	Bleriot	1144.5	590	1734
2	A. Sephton	Lacey M10	924	782	1706
3	B. Pursglove	Bellanca CF	828	614	1442
4	R. Granger	Fokker FII	715	726	1441
5	R. Johnson	Curtiss Seagull	606.5	448	1054.5

#### CO<sub>2</sub>/Electric (9 entries)

			Static	Best Flight	Total
1	C. Newman	Avro 504N	916	660	1576
2	M. Allen	Bristol F2B	612	790	1402
3	A. Sephton	Lacey M10	874	512	1386
4	D. Knight	Avro 560	849	520	1369
5	P. Smart	BE 2c	566	464	1030

#### Air Race

1	M. Allen	Miles Sparrowhawk
2	A. Sephton	Hot Canary
3	L. Smith	Caudron

#### Peanut (11 entries)

1	A. Sephton	Lacey M10	
Best Golden Age		R. Johnson	Westland Woodpigeon
Best Pioneer		L. Smith	Voisin Canard
Best Postwar		G. Dimes	Piper Vagabond
Best WWI		D. Wolstenholme	Wright Type M
Best WWII		I. Pallister	Miles M18

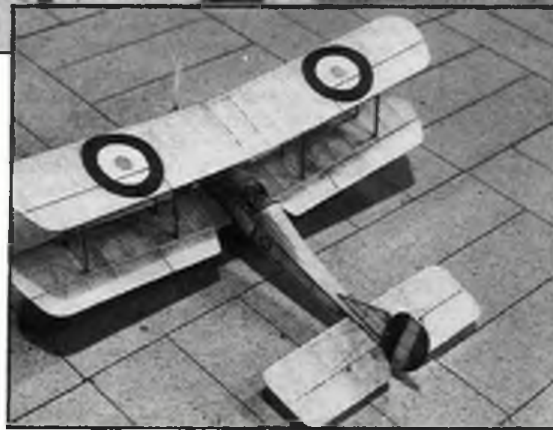
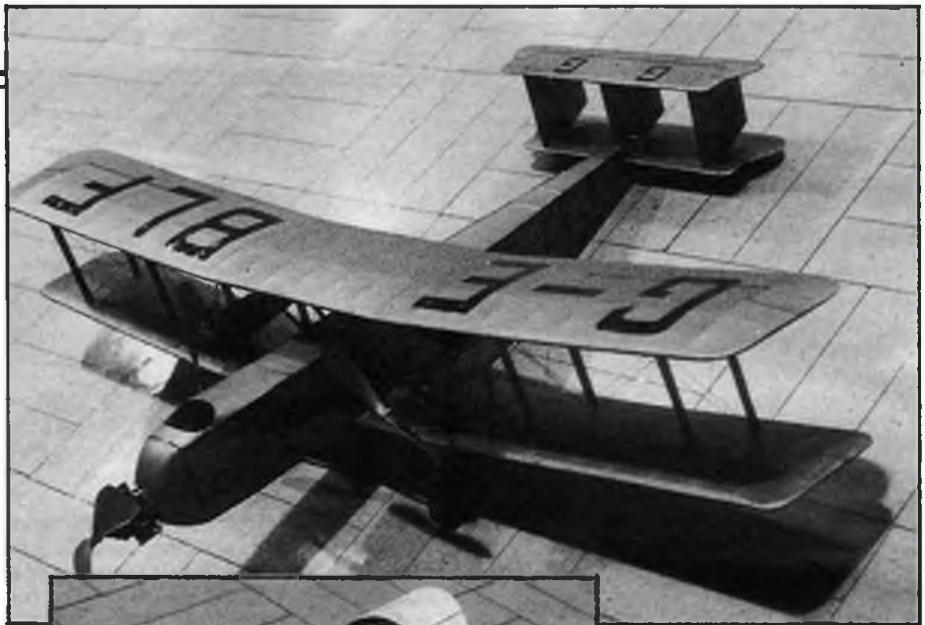
Another ambitious choice was Barry Clay's DH Dragon. Maybe this aeroplane is not so attractive as the Rapide but it does not possess those sharply-tapered tips. Barry's Dragon was fitted with original Frog twin-skein gearboxes; by all accounts it is a stable, if brief, performer outdoors. It is quite heavy with extensive sheeting to permit rapid building of what is a flying test-bed for a larger successor.

Derek Knight brought along a superb - but unfinished - Miles Hawk Speed Six which had been built for the air racing event. Derek had developed a system of interchangeable battery packs for rapid recharging. There were no concessions to accuracy on this one; it is fully sheeted and has a perfectly moulded canopy and spats. The other side of the coin, of course, is that it is a little heavy...

Finally, I should mention that the computer has arrived on the scale modelling scene. Throughout the contest Reg Boor was to be seen, head down over keyboard and screen entering scores as fast as the judges could supply them. The result was a very rapid generation of the final placings. The next step will be to supply an 'on the spot' printout of the results for all contestants; this may well be the case at the Nationals in May. Reg cannot have seen much of the action but as far as everyone else was concerned it was a most welcome development. Perhaps one day we will be able to feed model and documentation into one end of a computer and get the score out of the other...

### Goodies department

SAMS have a new range of tissue on their list. Called Superlite, it costs 20p per sheet and comes in a very wide range of colours indeed. It looks very much like the familiar, modern Jap tissue; I haven't tried it yet but so far I have heard nothing but good reports. George at SAMS is getting many repeat orders.



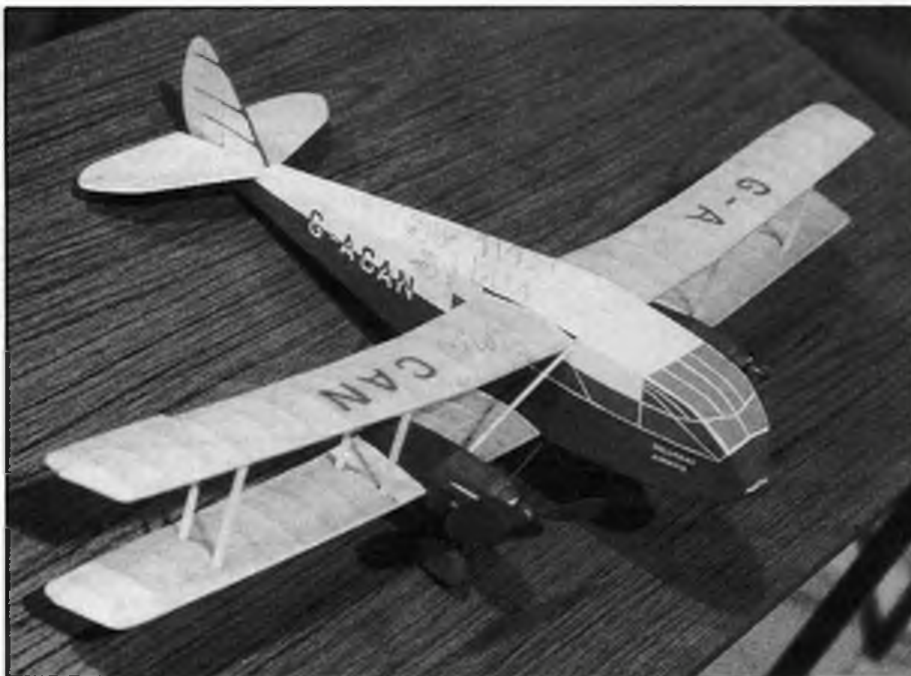
*Above: Peter Smart's AW Argosy, which awaits final trimming, is an ambitious Rubber subject. Left: Peter's Be 2C was also aired at Walsall.*

If you wish to save every scrap of weight there is a useful range of khakis, light and dark greys, buffs, and so on. Personally, I would no more be seen with an unpainted scale model than wear flared trousers but I know many enthusiasts do not agree with me on this. At the other end of the spectrum there are some very attractive bright colours to interest the duration modeller. I realised the usefulness of distinctive colours at the F/F Nats when looking through binoculars at a number of models in distant fields and trees!

At the Walsall meeting I met a chap

called Peter Richardson who had on display a vast range of scale pilots. Sizes go from 'very small' up to 1/3 scale; all are made from rubber latex. Small ones are hollow for lightness; larger ones are foam-filled to give rigidity. Quality - and realism - is high, and many components (heads, torsos, arms and so on) are interchangeable. Every period is represented from the 'hat-on-backwards' pioneer to the present-day jet pilot. At the moment there seems to be a gap in those periods of particular interest to the outdoor F/F enthusiast, namely WWI and inter-war in 1/8 to 1/12 scale, but I understand that this is to be filled.

Perhaps of most interest were the actual representations of individual pilots such as Ball, Boelcke, Bader and so on; but all have character, in contrast to those usually seen which generally resemble Thunderbirds puppets. Keep an eye out for this display at the Indoor Nationals and at Old Warden Scale Weekend. If you can't wait, contact Peter at 45 Lichfield Road, Stafford ST17 4LL.



*Left: Barry Clay's twin-rubber DH Dragon. Below: Back to the Nats as Michael Smith refits the ED 246 to his F2B after an 'incident'...*



# VIEWPOINT

**F**REEDOM OF choice? No, not an election address, but a response to the editorial invitation to comment upon Bill Dennis' remarks under the heading 'A touch of Vitriol' (Scale Matters, November *Aeromodeller*).

In the first place I question the accuracy of the assertion that 'an increasing number of gifted scale modellers have stopped creating new models'. A single visit to a Scale Day at Old Warden must surely cast doubt upon the soundness of this opinion. I continue to be amazed at the high standards of both original design and construction evident at today's meetings.

The creativity comes in many cases from 'new' or 'different' modellers, which must surely be healthy for our hobby; and although the accent is frequently biased towards Radio Control which is not my own first love (nor, I suspect, that of your columnist) originality in design exists nevertheless in substantial measure. The standards of construction and accuracy would have turned many of the 'gifted scale modellers' of yore green with envy!

Not so many years ago, those of my own modelling generation would in the Clubhouse bar, over a pint of ale, daydream about the future day, which we never expected to come in our lifetime, when perhaps someone would actually build a true-to-scale Spitfire, or even a Lancaster! Perhaps it would even have a retractable undercarriage, and maybe even sound a bit closer to the real thing than the open-ported 10,000rpm two-stroke scream; all this, in our wild ramblings would be under radio control.

What would those 'great designers' of the past have made of a present day meeting where models like this - and more - are an almost commonplace sight? Are

## 'Freedom of Choice!' is Doug McHard's battlecry in defence of Vintage Scale

we all becoming a bit blasé about the current state of perfection that is now regarded as the norm?

Away from R/C, a glance through the pages of international model magazines for the past year or two gives me enormous encouragement. There is a lot of great scale model designing talent around. It is both creative and active, in spite of the considerable venue restrictions now endured that were never the same problem for modellers of the 40s, 50s and 60s.

Aeromodelling, and particularly scale aeromodelling is frequently a very solitary pursuit. There has always been great difficulty in drumming up sufficient entries to run scale contests. Many scale modellers do not regard the winning of a competition as the ultimate goal; I share this view. Unlike other branches of our hobby, where models are specifically designed and continuously refined solely with the aim of outperforming the opposition, the scale modeller's challenge is completely different. It is a personal one.

It is the challenge of making a difficult, or much-loved subject fly successfully, not necessarily for a great length of time, but in a stable, true-to-type manner. It is the challenge of refining one's own designing, building and flying techniques to do better next time, not against someone else, but against one's own achievements, and

against the limitations imposed by the design of the original prototype.

I believe this philosophy reveals the reason for the current interest in models from the past. Sure, in many cases they were not superscale miniatures, but when we were younger, and these designs were contemporary, we tried to build them and had a lot of fun trying to make them fly. Our skills frequently fell short of those required and now we want to try again, and hopefully do better. To see these designs which were a very important part of our early modelling days perform part their designers intended. Relatively crude they may often have been, but who can deny their hypnotic charm? Is it not also interesting that many of them fly much better than those more detail-loaded creations of the much lauded 'experts' of the past?

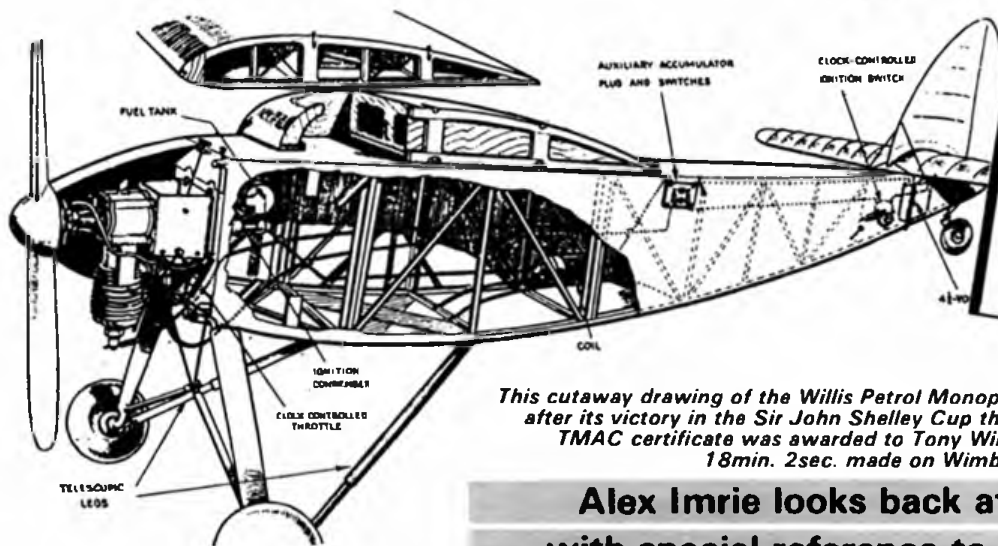
Yer pays yer money and yer takes yer pick. I personally derive great pleasure and satisfaction from building and flying these old time scale models. They have a unique charm, all their own. I also still design new models, and these too give me a charge when they are successfully flown. Sometimes, I forego performance for detail if the particular design seems to warrant it, and all of these different approaches are in their particular ways equally satisfying.

Let's face it, on the whole we do not choose the models we build with the object of impressing the neighbours. We choose them to satisfy our own wishes, and if the re-creation of earlier designs provides us with personal satisfaction, which in any case it most certainly does, then who has the right to criticize? Surely there is room for all tastes in this wonderful world of aeromodelling, and long may it be so.



*Doug still designs originals too. This is his Peanut Scale Arado Ar198, a machine dubbed the Flying Aquarium by the Germans on account of its extensive glazing.*

# VINTAGE CORNER



*This cutaway drawing of the Willis Petrol Monoplane was published in Flight in 1933 after its victory in the Sir John Shelley Cup that year (via Aeroplane Monthly). The TMAC certificate was awarded to Tony Willis after the record-breaking flight of 18min. 2sec. made on Wimbledon Common on 12th June 1932.*

## Alex Imrie looks back at some TMAC giants with special reference to a newly-revived pre-war design

**I**N PREVIOUS Vintage Corners I have referred to The Model Aircraft Club (TMAC) which was born out of the old Parliament Hill Model Aeroplane Club in 1929. This club was one of the most active of its day and numbered amongst the very enthusiastic first class modellers who formed its nucleus were people like C J Burchell, M R Knight, D A Pavely, W Rigby, R J Trevithick, T H Newell and A T Willis.

The activities of TMAC have always seemed to have been relegated to the shadow of the SMAE, but their story deserves to be told and it is planned to do this in the future. For the present, and to provide a background to the origin of the Nash Monoplane we must confine ourselves to a brief look at some of the participants who made TMAC an organisation to be reckoned with, especially Mr E N Bray, a switchgear manufacturer from Walthamstow; A T Willis, a craftsman engraver; and his son A M (Tony) Willis.

E N Bray was a gentleman in the truest sense of the word; an avid modeller of means who because he was unmarried was able to help TMAC financially, saying that the monies given would otherwise have been spent on a wife and family! He donated cash prizes to further the club's activities and also fostered the development of original designs by holding a Bray Competition each year. His promotion of TMAC included paying for additional space at the annual Model Engineer Exhibition, thus doubling the area normally allotted to such an organisation. Although he never built a power model himself, with the coming of small petrol engines he purchased examples and awarded them to whom he judged 'deserving cases'. In 1934 he gave to Tony Willis one of the first commercially produced 14.3cc Atom Minors sold by A E Jones Ltd enabling the dreamed-of large Willis Petrol Monoplane to become a

reality. It was Bray who gave Brown Junior No. B290 to Bert Nash, as mentioned in Vintage Extravaganza (November 1987 *Aeromodeller*). On the occasion of the 1936 ME Exhibition he made available a Baby Cyclone to be awarded for the best TMAC exhibit. Thus The Model Aircraft Club owed a great deal to E N Bray, whose petrol model interest was doubtless inspired by the pioneering efforts of Founder Member H H Dowsett with his 1929 Hawk-Special as has been recounted in Vintage Corner (August 1987). Although he steadfastly declined at first, eventually he accepted the position of President of TMAC on 19th September 1936.

The Willis family had been engaged in model activities from the 1920s but the

name first really came to modellers' attention during the 1930 competition season. On the occasion of the Pilcher Cup, even Mrs A Willis had a go, but retired after one flight; while her husband, A T Willis finished third after three very consistent flights of 65, 64.5 and 68.6 seconds. Nor was 14-year-old Tony to be left out of the limelight. Growing up in a modelling family, it is not surprising that he became a 'natural'. Flying against the country's best modellers at this time, not only did he secure a place on the 1930 Wakefield Team, but broke the Fuselage ROG Record on 29th May with an

*Below: This action shot of A T and Tony Willis flying on a windy Wimbledon Common was taken by a press photographer on 5th October 1929.*



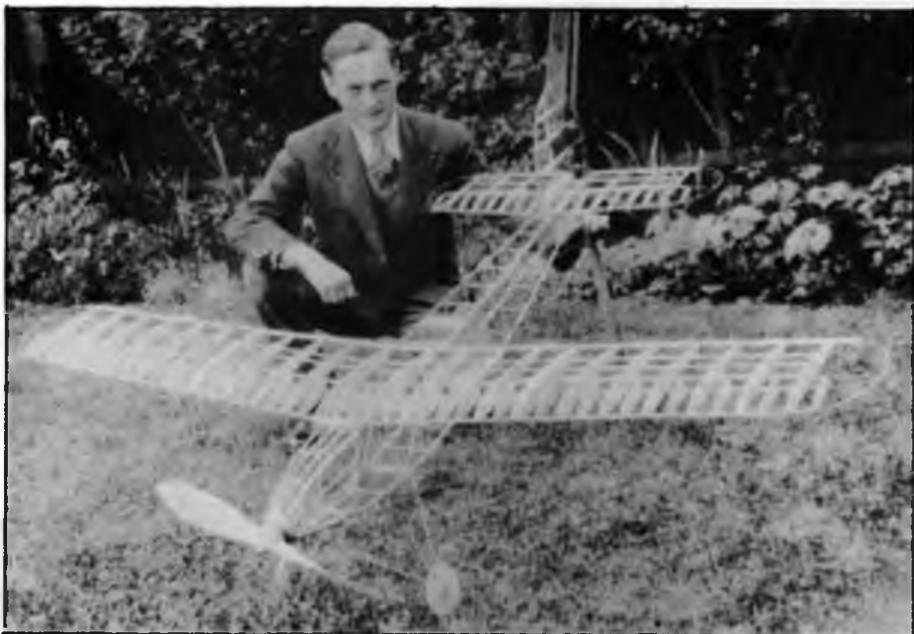
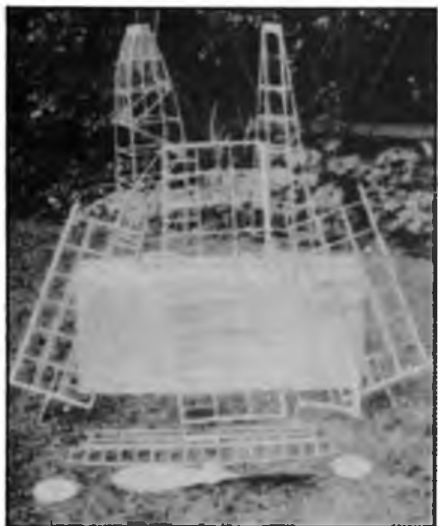


excellent 97.8sec flight to win the Flight Cup Handicap Competition. In the Wakefield event held at Halton on 19th July he finished fifth in a field of 13 entries, and he won third place in the Weston Cup Competition for load-carrying models. A look at the official list of SMAE prize winners for 1931 shows how formidable the Willis team had become, confirming the SMAE comment that Tony had '...rapidly developed into a model flying star of the first magnitude.'

Garage Cup	1st A T Willis	
Flicher Cup	1st A T Willis	3rd A M Willis
"Flight" Cup	1st A T Willis	
Weston Cup	1st A M Willis	2nd A T Willis
Lady Shelley Cup	1st A M Willis	
Civil Service Supply Association Cup	1st A T Willis	2nd A M Willis

### Sky Rover

These above successes were associated with an outstanding model design by A T Willis which provided the basis for variations built in different sizes, leading eventually to the 9ft. span petrol engined monoplane. This was a 'fuselage' high-



*In flight - the highly efficient Sky Rover by A T Willis, progenitor of many successful designs in the 1930s.*

*Below: E N Bray at Faireybs in 1936 sitting on the running board of his hired Daimler with Bert Nash. Tony Willis looks on at left. Note the petrol model to the rear of the car.*

wing monoplane named Sky Rover, which although of standard appearance obviously possessed the right proportions to deliver high performance. It was 46in. span, 34.1/2in. long and weighed ten ounces. Like the majority of British models around 1930 the original was of hardwood construction, covered in silk; but later versions used balsa in varying degrees. (This material was just coming into use by British modellers). Sky Rover was geared, of course, and possessed what at that time was called a 'terrific' climb that rapidly took it to sufficient altitude for durations of up to 75 seconds. The design was also noted for its extremely flat, floating glide, a feature helped by a clever device that stopped the motor while it still had approximately 50 turns on it; thus the skeins of rubber were still under tension and as a result the centre of gravity in gliding configuration did not vary. Later a 36in. span version known as the Sky Rover Junior appeared. This proved to be a highly popular design (working drawings were available from A E Jones Ltd.). Some of Tony's variations with which he enjoyed competition successes were partly of balsa construction, but despite the obvious advantages of this new material, including Ehrhardt's win in the 1930 Wakefield, many senior British modellers still considered such models to be freaks, not really suitable for UK conditions.

The Bray Prize already mentioned was to discourage the ultra-lightweight model that was beginning to appear in the early 1930s, and points were awarded for novel designs, methods of construction, portability and consistent flying. In 1933 Willis father and son combined forces and entered this competition with an enlarged Sky Rover that took them a full nine months to design and build. It was a magnificent piece of work that incorporated many unusual features. The model's six-foot wing tapered from 11 inches chord at the root to nine inches chord at the tips, providing 5.1/2 sq.ft. of lifting surface. The fuselage, which was 48 inches long carried half-a-pound of rubber to drive an 18in. diameter propeller. The complete model weighed about two pounds; on tests its best flight was over 100 seconds. The reason for this outsize model was to take advantage of the duration rules in the competition which produced points by multiplying the time in seconds by the weight in drachms. But the Willis duo had another ace up their sleeves which would gain them maximum points from the portability clause; this large model dismantled (fuselage into two equal length parts whereby the rear half fitted inside the front half, wings into three parts of equal length and all other components detached) and fitted into a box whose inside measurements were two feet by one foot by approximately nine inches! Needless to say this fine model won the Bray Prize for that year by a handsome margin. It is not known how

*Left: Tony Willis with his 1933 Bray Prize Winner, a 6ft. version of the Sky Rover that could be dismantled to be carried in a suitcase-sized box (as shown above). Note the streamlined nose.*



much flying this model actually did, but having served the purpose for which it was built it was disposed of by sale. No doubt the badly needed money went towards materials for what was to be the Willis' biggest project; however, the rubber model was to turn up again in what must be one of the strangest coincidences related to any model aeroplane...

### Willis Petrol Monoplane

With the Atom Minor available as a power unit it was natural for AT Willis and Tony to base a suitable model for it on the large rubber powered Bray Prize winner just completed. The model that emerged bore striking resemblance to the earlier machine. Enlarged by fifty per cent, the span was nine feet. Although regarded as a scaled-up version of the Sky Rover, its structure was much different, being necessarily heavier to withstand engine vibration. The fuselage longerons were 1/4in. square whitewood moulding; formers spaced six inches apart were made of spruce and were bound, glued and pinned to the longerons, each bay being braced with a spruce diagonal. The wing used an aerofoil section similar to Clark Y (long a modellers' favourite) but of more



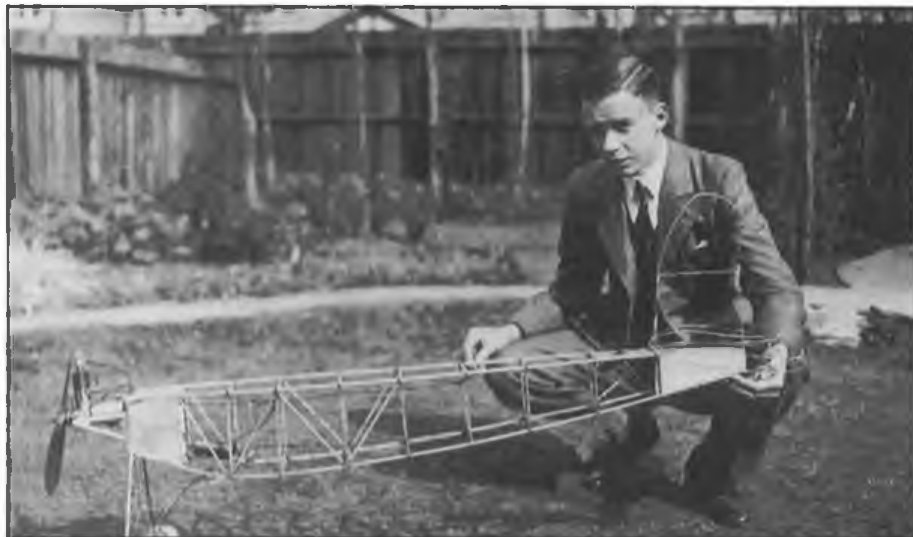
*The Willis petrol model taking off from Fairey's Great West Aerodrome for one of its successful flights in the 1935 Sir John Shelley Cup competition, closely watched by Tony Willis.*

layout, with its slightly tapered wing and rectangular section fuselage, the attractiveness of this model lay in its pleasing proportions and superlative workmanship, and, of course, in its performance since the meteoric climb and prolonged glide of the Sky Rover were present in like degree on this beautiful model. It was no surprise when it won the Sir John Shelley Cup at Fairey's Great West Aerodrome (now under Heathrow's concrete) on 7th July 1935.

### Nash Monoplane

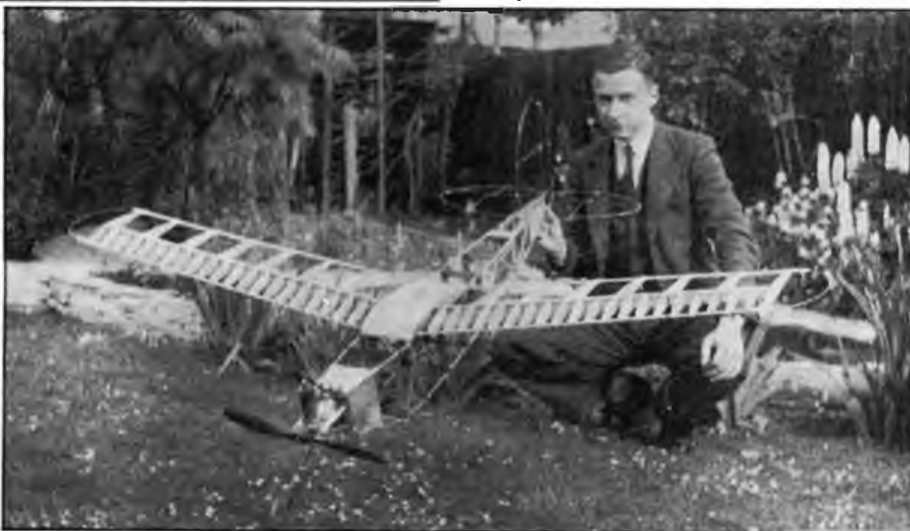
H E Nash, who had been a keen aeromodeller since the early 1930s knew Tony Willis well for they had attended the

same school. With his brother, K A Nash, he followed Tony's modelling successes keenly, both eventually joining TMAC. As explained, E N Bray and Tony Willis were firm friends and it was natural that Bert should be accepted into this association. Bray, obviously impressed with Bert's enthusiasm and modelling ability, then made him a gift of the Brown Junior knowing that before long it would be put to its proper use in a model aeroplane. Bert's excitement can be better imagined than described! After some bench running, a suitable model began to take shape. Having built the Sky Rover Junior, he decided to double-up this 36in. design, working on the assumption that if a 15cc capacity engine was suited for a nine foot span model (i.e. the Willis) then a six-foot model would be about right for the Brown Junior. However, there were problems with this concept in both fuselage and tail unit. The fuselage members lacked rigidity and considerable beefing-up was required to cope with the stresses and vibration of the engine. A 4.5 volt flat torch battery for engine ignition was carried in the rear of the fuselage while a



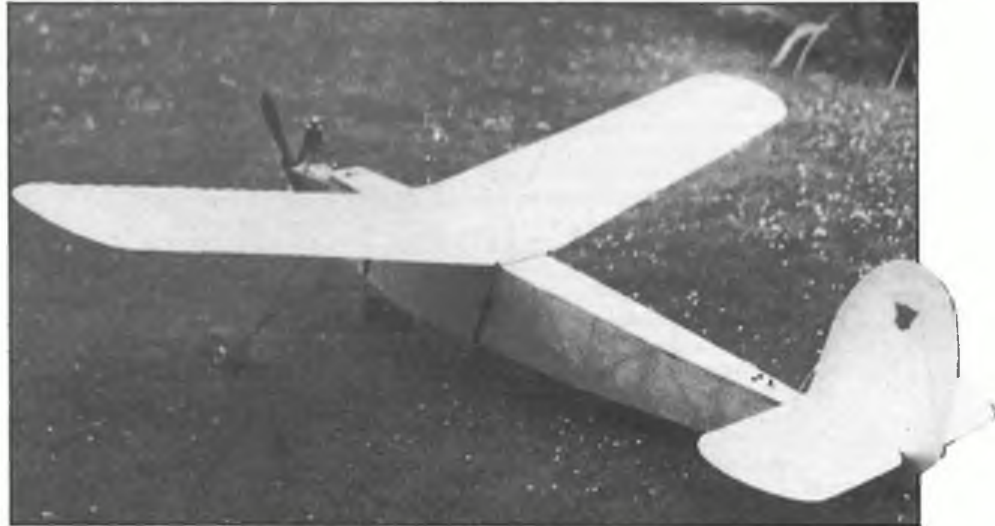
*Left: H E Bert Nash with the original fuselage of his power model in 1936 before it was beefed-up. Note the overhang of the Brown Junior, caused by using the maker's tank. The modified clock timer with its fan brake can be seen ahead of the wire tail unit. Below: Bert with his model ready for covering. The fuselage now sports framed formers at all uprights and all bays are diagonally braced. Tail unit is of typical Sky Rover shape with cambered tailplane ribs.*

depth. Spruce was used for leading edges, trailing edges and spars, and except for the root and tip ribs, which were plywood, the ribs were 1/8in. balsa. There was one riblet between each full rib. Wing tips were of piano wire. The tailplane also employed spruce longitudinals and piano wire tips, all the ribs being of 1/16in. plywood. The aerofoil used was RAF 15 and the undercamber of this section was retained by sewing the covering to individual ribs. A wire outline with balsa ribs was used on the fin. Covered in silk (medium weight on the fuselage) the model was finished with six coats of aluminium dope and had an all-up-weight of eight pounds which gave a wing loading of 14 ounces per square foot. Two clockwork devices were fitted to control the engine. One throttled the engine back to 'climbing' power after take-off while the other cut the ignition to terminate the power flight. Orthodox in



small clock modified and fitted with a fan brake and electrical contacts were installed in the top of the fuselage immediately in front of the tail unit. This weight aft had the desired effect of keeping the centre of gravity in the right place because of the weight of the engine and the length of the nose. The coil and condenser were housed in the belly of the fuselage and all wiring including the high tension lead to the sparking plug were fed through the front bulkhead via three brass studs. While this system can work satisfactorily with low tension current it was unsuitable for high-tension especially if any moisture or oil was present on the bulkhead. Needless to say the erratic nature of the ignition demanded modification and major changes in the siting of electrical components meant that this fuselage was eventually scrapped.

The new fuselage had an outline of even taper on both top and bottom longerons around the centre line which allowed the required incidence angles for both wing and tailplane to be built-in. Battery and timer location was moved forward to the second fuselage bay aft of the wing; the modified clock was discarded and a German Autoknips camera timer working a slide contact was fitted instead. Access to this bay was provided by means of a hinged top retained by a spring clip. Longerons of 3/16in. square spruce and rectangular formers built up from strips of balsa 3/4 x 1/8in. with plain overlap joints at the corners for longeron location slots



*The Nash Monoplane covered in silk and doped aluminium with the TMAC transfer on the single-surface wire fin. The final, double-surfaced tailplane is fitted and airwheels have replaced the original rubber-model type wheels.*

comprised the basic fuselage structure. Diagonals of 3/16 x 1/8in. spruce on the fuselage sides only were used except on the front three bays where a key structural member of 3/16in. plywood with suitable lightening holes extending along the bottom longerons provided strength for the undercarriage attachment points; it then ran diagonally upwards to brace the third fuselage bay. A nose stringer raised above the line of the longerons in the

centre of the forward fuselage gave a pleasing line that led into a wrap around .020in. sheet aluminium cowling. The engine was lowered to the bottom of the nose contour (remember that this was done at the time when inverting a petrol engine was thought to be a sure way of giving yourself endless trouble with wet plugs) and it was carried on hefty beech bearers having built-in downthrust fitted into two 3/16in. three-ply bulkheads. This area also provided the location for the coil and condenser and allowed the use of a normal length HT lead thus eliminating the trouble previously mentioned.

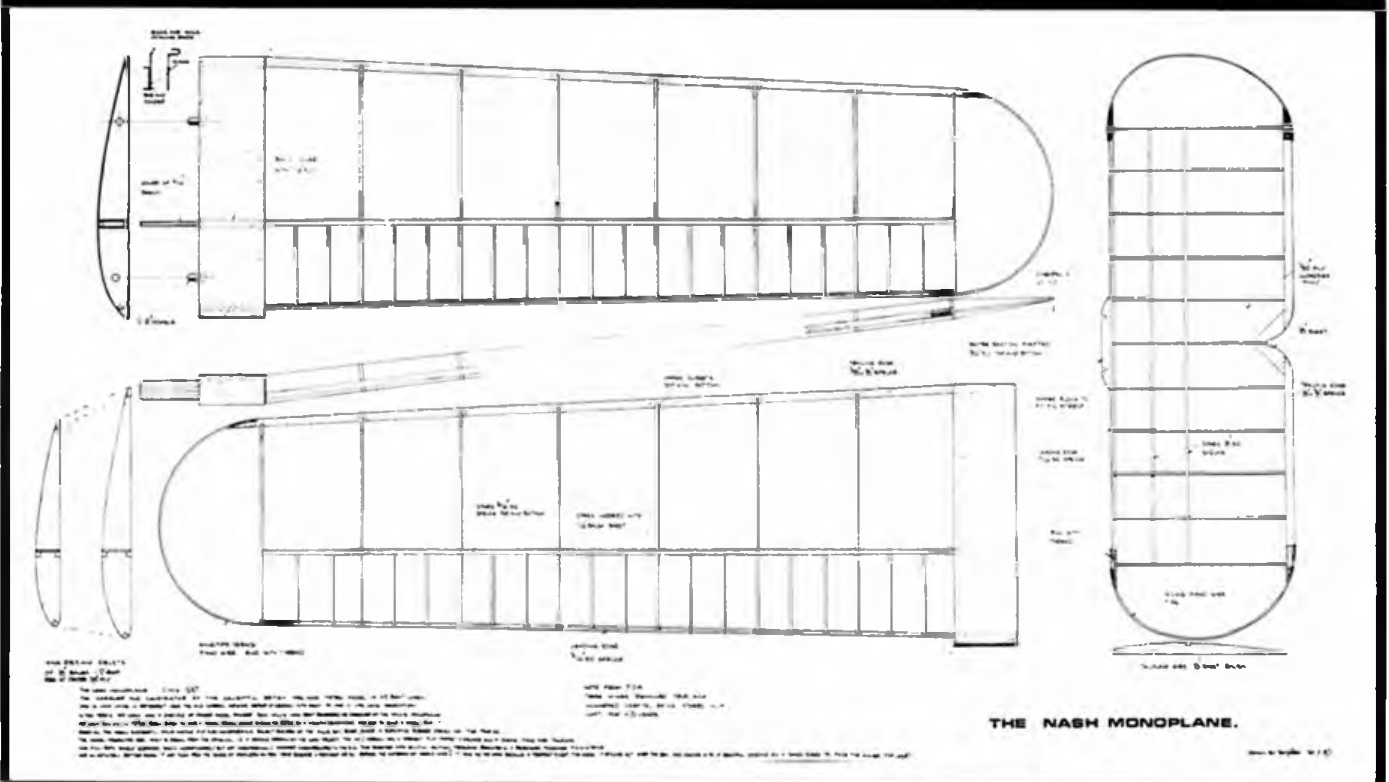
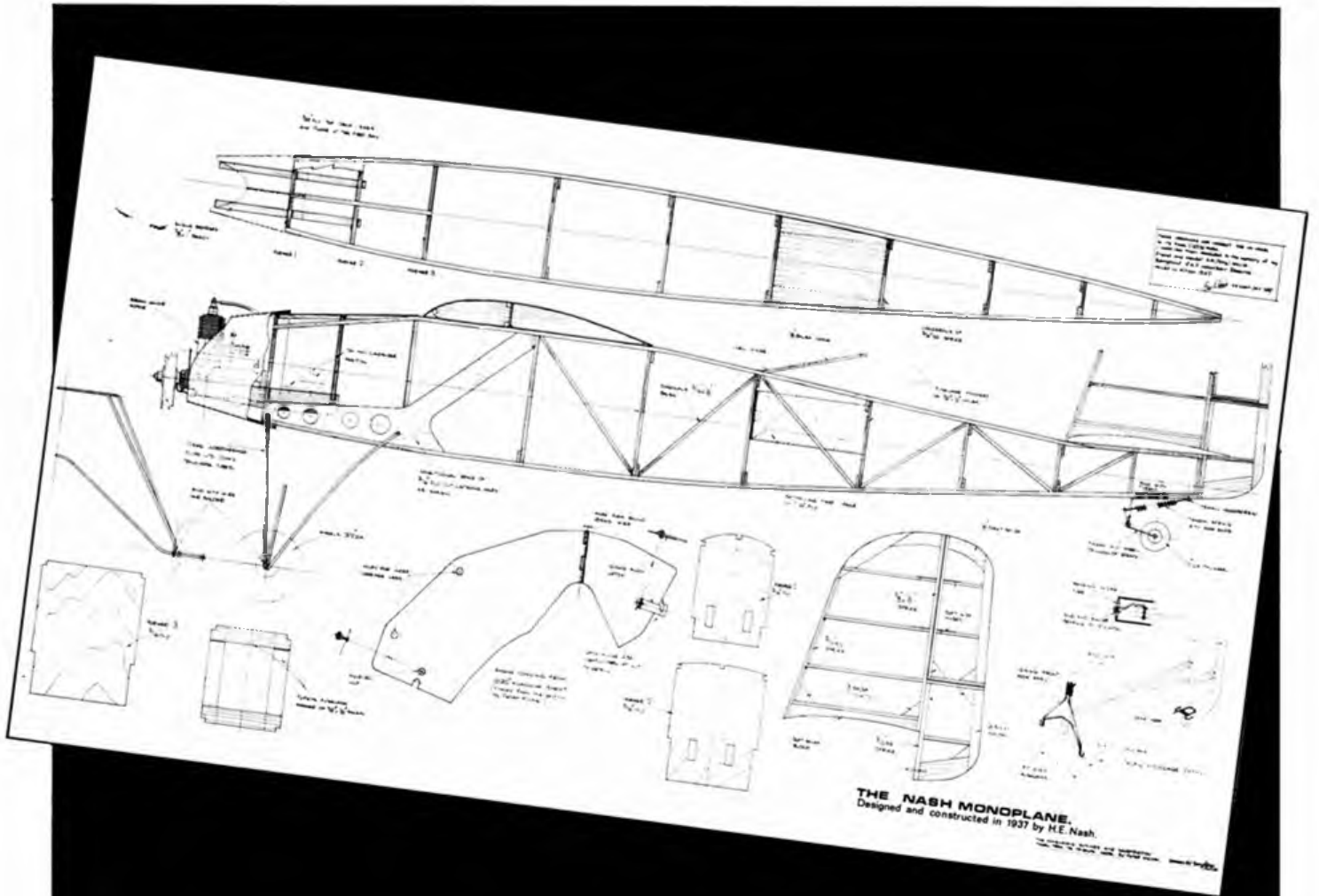
The tail unit was made entirely from 16swg piano wire and was, of course, single surfaced although camber was bent into the tailplane ribs. This type of construction is unstable enough on small or medium sized models even if undoped, but in the size required on Bert's machine it 'warped uncontrollably in the sun'. A new tail unit was eventually made of spruce and balsa with 16swg piano wire tailplane tips, but the vertical surface was found to have too much area and about two inches were later removed from the tip.

The wing, which was divided on the centre-line, possessed spruce leading edges, trailing edges and spars with 1/16in. vertical balsa webs over the spars. Tips were of 16SWG piano wire. Ribs with two riblets between the full ribs were of 1/8in. balsa, while the centre section was covered with 1/32in. birch plywood. This wing was not only 'right' from the start, giving no trouble with warping during the flying life of the model, but on the model's renovation last year after almost fifty years in storage, the wing structure was found to be still completely true and warp free.

It should be appreciated that the modification outlined above and others

*Bert Nash with his model in the early summer of 1986 after retrieving it from the loft and before giving the model into Peter Michel's care for restoration. Note re-designed fuselage.*





Two large full-size working drawings of the Nash Monoplane are available from Terry Rose, Heathfield, Chelmsford Road, Hatfield Heath, Bishop's Stortford, Herts CM22 7BG.



*The renovated Nash Monoplane at the 1987 Old Warden Vintage Weekend. It now has the final double-surfaced fin (with rudder tab). Peter Michel's 'period' restoration incorporates a brushed silver finish.*

not mentioned were a gradual process between 1936 when construction began and 1939. Terry Rose's fine drawings (now available) show the model in its final state and are completely authentic, the measurements and outlines of components having been meticulously recorded by Peter Michel from the original model during his restoration work. The renovated model ready for flight weighs 4.1 pounds giving a wing loading of 12 ounces per square foot.

During this process of development, the model's flying performance steadily improved, but as might be expected, its weight also increased. Hand launched glide tests in its final form were catapult-assisted by means of a long length of elastic attached to the model and anchored well ahead. Bert used to offset the rudder tab about 1/16in. to the right to counteract the torque of the Brown Junior, but since individual models are slightly differently built anyway, the amount of adjustment will vary and it is best to incorporate an allowance during construction by tilting the engine axis slightly to the right.

### Tony Willis

It has not been possible in this article to mention all the achievements of this outstanding 1930s modeller such as his competition successes, details of his model designs or the story of the 1cc Brown Junior miniature that he made for his metal working examination at Shoreditch

Technical College when he passed out as a handicrafts teacher, but it is hoped that this can be done in a future Vintage Corner. It is fitting here to mention his reunion with an old friend in 1942 'somewhere in Wales'. Many TMAC members joined the armed forces from the outbreak of war and from then onwards club activities were greatly reduced. Tony joined the RAF, at first on ground duties, but soon he volunteered for aircrew and was eventually posted to Wales on an air gunnery course. One day when off duty he happened to pass a second-hand shop (they were not called antique shops then) the location of which is not known whereupon he was brought up short by the sight of his Bray Prize Winner in the shop

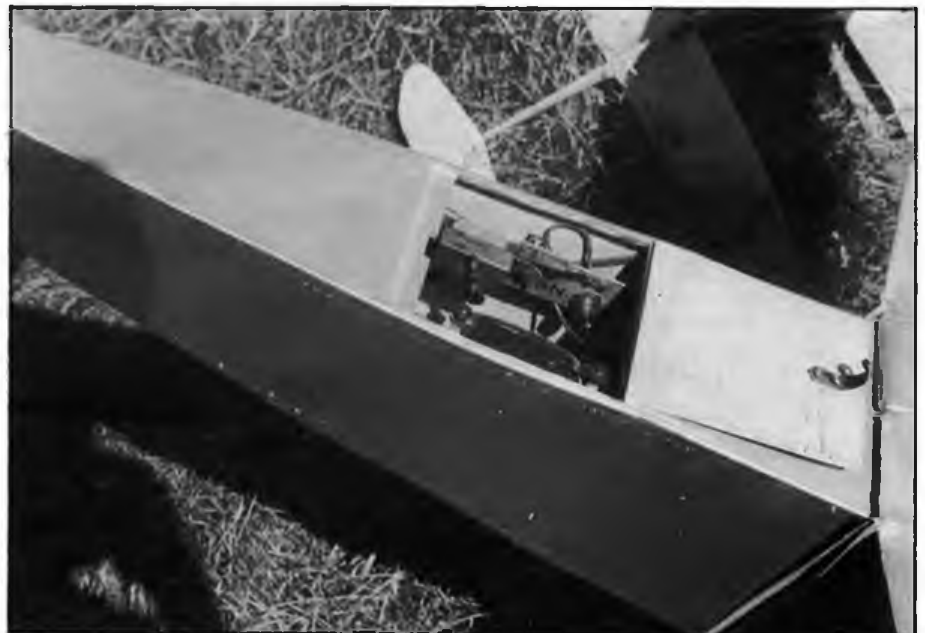
window! He was unable to find out how it had got there, but naturally he bought it, and in his last letter to Bert Nash who was in the meantime serving in the Middle East in the Surrey Yeomanry he recounted this fantastic coincidence and told him of his keen anticipation to fly the model again. Whether he did or not is not known, since shortly after this Tony, operating as a crew member of a Halifax in Bomber Command was shot down and killed over Hamburg...

### Replica thoughts

The Nash Monoplane is an attractive historic British model, and we look forward to seeing replicas of it at Old Warden during this year's Vintage Weekend in August. Michael Barton of Enfield will doubtless bring his fine replica of the Willis Petrol Monoplane which we enjoyed seeing last year (photo in Vintage Corner, October 1987) and others might be tempted to join him since full constructional details are given in The New Model Aeroplane Manual, several copies of which are in the hands of vintage enthusiasts.

Does any reader have any constructional information on the Sky Rover? Drawings, photographs, or even components regardless of condition from the A E Jones ready-to-fly version would all help to resurrect this famous design. It is important to British aeromodelling history and should be preserved. Finally - what happened to the original Willis Petrol Monoplane, the Bray Prize Winner and the 1cc Brown Junior miniature made by Tony Willis? It is inconceivable that such works of art would be wantonly destroyed: might they exist still in some dusty attic, forlorn and forgotten awaiting rediscovery - just like Bert Nash's old monoplane?

*This close-up of the electric's bay reveals the brass terminals on the battery contact strips, master switch, slide switch and Autoknips camera timer mounted on a thin plywood panel.*



# FREE FLIGHT SCENE

A top F1A, the Team Trials and other events reported by Dave Hipperson

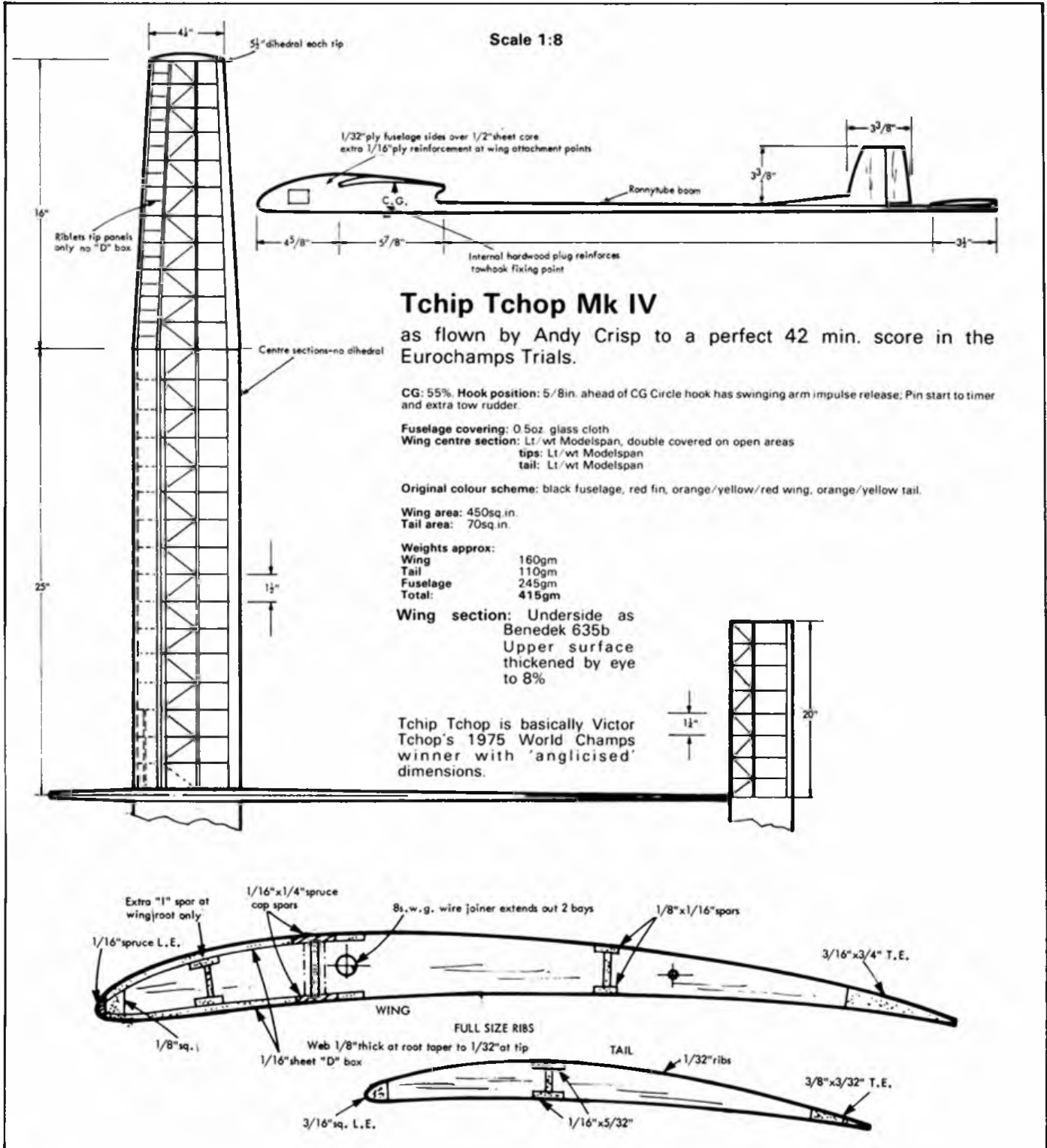
## Tchip Tchop Mk.4

When he won the European Team Trials late last year Andy Crisp became the first person ever to do so with a perfect 42-minute score. He used this model on all but one flight. Andy described it as an

Anglicised version of Victor Tchop's 1975 World Champs winner - the very best possible pedigree. In our forthcoming F1A comparison table we will convert dimensions to metric for easy cross-reference but the plan here is left in

imperial as submitted.

Andy was adamant that the model paid a very large part in this historic success but one can't help thinking that his athletic enthusiasm, including occasional acts of stripping to the waist and flapping



his shirt under a couple of marginal flights despite low 40°F temperatures might have had some effect too.

We are particularly grateful to Andy for this drawing as he actually took time off from Trials preparation to provide it. If you ever thought that to do consistently well in major A/2 events one had to specialise then Andy's example will perhaps give you hope. Apart from his aeromodelling, which covers all classes, and the all-too-necessary matter of earning a living which in Andy's case is by teaching, he also runs in the occasional marathon, is an active fisherman when that sport is in season, is currently renovating a cottage in Cornwall to become the 'Crisp Country Retreat' and still finds the time and late nights to play drums in a Jazz combo. Maybe he sings too as just prior to his final Trials max he was heard giving a short rendition from Gilbert and Sullivan. We wish him the very best of luck in the Yugoslavian European Champs in July.

### Second Team Trials: Sculthorpe, 7-8th November

The calm weather returned for these final five flights giving those who had performed well in the Trials the previous fortnight the best chances of continuing at the top. It was quite cold and misty on both days but visibility was sufficient to allow power flights. The erratic breeze prompted Glenda Bracken, CD for the weekend, to allow timekeepers to follow the models. Even if not strictly necessary this was a sensible step that ensured timekeepers could reposition themselves if their view was obstructed by any buildings - a number of which came into play even on this enormous site. It also defused, in advance, any possible timekeeper problems, either real or imaginary, that might have been used later as excuses!

The limited light restricted the first day to three rounds in F1B and F1C but four in F1A. The glider leaders continued maxing although Andy Crisp's third required some enthusiastic flapping. During the fourth round Baines' and Warren's models had a coming-together; time was tight if Baines was to re-fly and hold onto his high place. His launch was safely a minute or so inside the hooter after what seemed a very brief tow. The air was hardly-moving but it was buoyant enough for the model to max comfortably. For glider it was all to be decided on a single flight the following day.

Two flights had changed little at the top in F1B although Derl Morley was careless and dropped a few seconds right away. Lift was gentle, slow moving and often widespread. The undoing began on the third flight. Flyers were now very wary of launching on their own and despite a neat max by Woodhouse right at the start of the round most waited for at least 20 minutes, some unwinding and then rewinding another motor, and a few taking the more relaxed option of not winding at all until the thermal had been marked! When eventually they launched, leader Gaunt was sweating with a mediocre climb and



*Top left: Gary Madelin pictured while things were still going well for him at the First Trials. Top right: Colin Sharman's latest F1A held here by wife Sue. Centre: Ivan Taylor before things went so dramatically wrong at the Second Trials. Above: Mike Chilton, second in F1B packs away in his thoughtfully designed model box.*

glide. The flight path was directly towards a huge hangar that by rights should have been crosswind. As the sinking model approached this obstruction it seemed to ride a gentle patch of artificial ridge life generated just upwind. The model still had to negotiate the obstacle itself. By a miracle it landed on the roof at exactly three minutes but it was impossible to retrieve; the stage was set for Peter's disastrous final day. Quite a few dropped time here and the top scores were closing together. The telltale signs of doom for Ivan Taylor had started on the previous round when check flying his best model. A D/T failure had coincided with positive lift and taken the model - and, incidentally, one of Alan Jack's F1Cs in the same predicament - off the drome and high into the murk. In this final round Ivan too had unwound and wound again but with only three minutes to the end of the period he was leaving it very late. When he flew it was almost 90 degrees crosswind - for he had been fooled by the wind shift - and rather flat. The model rolled left into the upwind concrete. There were many pieces. Just over two minutes to go and Ivan had no spare model ready. For a moment it looked as if he wasn't going to try to fly another until the command 'Move!' shouted with considerable authority and not a little volume by his able second Ian Allan galvanised him into action and they started scrambling for another model. Apart from his close clubmates who were now working furiously to assemble the craft, the field of contestants watched motionless and almost silently as everyone of them willed him to make it before the hooter. The model was assembled, the motor put in and wound all in 2.1/4 minutes according to Bernard Aslett who had the presence of mind to time the exercise for posterity.

The model was launched and was literally millimetres from Ivan's hand when the hooter blew. There was a great cheer as the pattern looked fine this time -

then total disaster struck. Preparing the model in such a short time had indeed been a great achievement but he had required a couple of seconds more - the time it takes to attach the D/T line. Although the model was in perfect trim for the power burst the tail went straight through to the D/T position upon VIT release and the model helicoptered down helplessly! No-one could witness this and not feel sick. Power flyers in particular must have had great sympathy for this is a mistake they so often make. Ivan's contest was over; words of consolation were tried but remembering equivalent disasters of my own I found it almost impossible to speak at all for quite a while.

Of the power leaders only Dick Johnson, having problems controlling a spin on pull-out, dropped time. He lost some 15secs on this round.

Two flights for power and rubber and just the final decider for glider were left for the following day. There was worry when the CD arrived only minutes before the 10am start. F1B contestants in particular were hopping up and down wanting to know where to plant their winding stooges. Glenda could be forgiven as it had not been a happy weekend for the Bracken team either. The evening they had arrived before the contest a freak engine fire on board the control caravan's tow vehicle had threatened to destroy everything, score sheets, flight cards; the lot. A fire extinguisher checked what could have been total disaster but not before many hundreds of pounds worth of damage had been done to hoses, wiring and paint work. One hardly sleeps easy after such an incident - indeed, lesser folk may well have had to hand over the job.

With Taylor to all intents and purposes out, but courageously still flying after being cheered by a successful search for the previous day's flyaway, everyone in F1B was one place higher. There were no other order changes at the top. The first flight saw some close shaves and dropped time for Pollard. Then Gaunt himself

dropped his first flight of the contest. Now using a reserve, his real problem turned out to be last-minute failure of his thermistor set-up. He was on his own for guidance and his model lost some twenty seconds. The order stayed the same but the following pack closed up still more. Watson, Screen and Jack were still making no mistakes in power. The stage was set for the final glider flight. If any of the top men dropped then many others were in with a shout, so tight were the scores. Tragedy struck immediately. Gary Madelin was flying his faithful Soft Machine 19 which has an unblemished record of straight maxes in this country since he qualified for the last team, and he was determined to find his own lift after piggy-backing techniques went wrong at the World Champs; he dropped a huge chunk on his last flight! Brian Baines, probably now knowing that he stood a chance, also dropped time. He lost thirty seconds at this crucial stage when a flight that looked good off the line descended faster and faster towards the end. Waiting in the wings a very 'on form' John Cuthbert seized this opportunity, maxed and put himself into the top three and on his first team.

After much towing Crisp and Fantham eventually found the same patch of good air and were also away to maxes. In so doing Andy Crisp became the first person ever to record a perfect score in a fourteen-flight British A/2 Trials.

It looked all wrapped up in F1B too with the air very chilly but stable. The top models could max just about any time. Surely nothing could change the results in

*Below left: The beautifully detailed tail end of Dave Greaves' F1B. Note the tiny spider at the centre of the tailplane - thousands of these were floating in the air at the First Trials! Below centre: About to let go - Roger Baggott was just out of the F1C Team this time. Below: Pete Watson's very casual launch style proved successful enough for he topped the results in F1C.*





such calm weather. The pack waited a while and most of them launched together but in poor air. Many were not maxing but no-one could be sure whose were whose. Now Gaunt's fabulous performance was to end spectacularly. He launched and his timer release button stuck in! The model charged around flat with the tail down nearly a quarter of an inch... The irony was that he had picked up a good patch of air because normally the model in such trim would have bunted in! The glide dived pretty steeply after the prop folded at little altitude and the resultant heartbreaking 90 sec flight dropped him to 6th after he had looked set to win for so long. Suddenly with team places in the offing Peers and Hipperson at joint 5th were very careful and made sure with clear maxes. However, the Gaunt disaster had only let Pollard into the top three so Hipperson and Peers had to be content with a tie for 4th. Derl Morley had won with steady flying right through the two weekends after a slight clang very early on and Mike Chilton, despite a little dropped time on his final day was close in second place - and this on his first team after starting free flight only five years ago.

In power the three leaders made sure with positive flights. Watson's and Screen's were rather better than strictly necessary so we had a power team with a full score and a three-way tie. In the past some F1C flyers have been reluctant to go on to a flyoff after a Trials particularly when neither places nor a trophy has been at stake. It was good to see that on this occasion there was some competitive spirit left. The CD also asked the fourth-placers in F1B to flyoff in case a reserve was needed at a later date. An unprecedented occurrence! So it was that three power flyers and two Wakefield men prepared for a crack at the 4-minute max after the end of the actual team selection proceedings.

Hipperson launched quickly and climbed well enough to prompt the three power flyers to go. Screen had a stuttering run - later traced to an over-compressed engine in a virtually untried model. The poor climb lead to a worse pull out and then stalls - the air didn't look so good either. Watson was doing better, somewhat higher and off to the left; and Alan Jack over-ran. Alan re-flew and over-ran again! Either flight could well have done the max but he was out with a zero. It appeared that Watson would comfortably out-fly Screen until the model D/T'd early! What were these chaps playing at? His height advantage was still enough however and he topped his first Trials after two weekends of very consistent effort.

During all this Peers was blowing motors preparing his answer to Hipperson's 3-minute-plus F1B flight. Third time lucky, he got away at the end of the period in good air to climb well and descend slowly for nearly four minutes and hence clear fourth position. He still says power excites him more - but his F1B flight was better than even the F1C's could manage!

Understandably in such tense and important situations nerves fray and



patience is pushed to its limits. It is reasonable that the CD gets some complaints but those voicing their opinions about the shortness of rounds or the unfairness of not having enough models should make their suggestions through the proper channels and at the right time. It's too late to start complaining on the field. Although not perfect we have workable rules for Trials now and they were properly implemented on both weekends.

Timekeepers might also like to remind themselves that when they take on this duty they become officials. As such they are expected to see that launching rules are enforced as well as actually timing flights. They should remind their charges if they look about to infringe the launch line rule for instance. In the heat of the last F1B round no less than four competitors released from further than five metres from the line - one in particular about 25 yards away! Remember also that the rules remind us that when dispensation is given for timekeepers to follow models it has to be done on foot. This is even in capitals in the rule book! The top power scores would look very different if those of us had not turned a blind eye who had witnessed a timekeeper who should have known



*Top: Our F1C Eurochamps Team, Stafford Screen, Pete Watson and Alan Jack. Above: Jim Baguley competed in the Glider and Rubber Trials. This Van Leuven F1B performed very well.*

better, cycling after his charge with binoculars and a tripod slung over his shoulder.

Trials are long and important events; it's easy to be sportsmanlike when you place but it's a lot harder to take disasters. We should look towards those contestants Taylor, Madelin and Gaunt who took their disappointments in good spirit. In many ways such people are the real winners for by behaving thus they win our respect and become examples for all of us when we suffer defeats. Not only that guys, but your stories will give us something to talk about for years!

### Falcons Rally: Driffield, 15th November

Once again the host club laid on lavish prizes which must have been partly responsible for attracting the large

#### European Trials Final Results Maximum score for 14 flights: 2520 secs F1A

1	A. Crisp	2520
2	M. Fentham	2510
3	J. Cuthbert	2480
4	B. Baines	2472
5	G. Madelin	2459
6	D. Bartle	2444

#### F1B

1	D. Morley	2493
2	M. Chilton	2491
3	R. Pollard	2468
4	R. Peers	2431 + 234
5	D. Hipperson	2431 + 191
6	P. Gaunt	2412

#### F1C

1	P. Watson	2520 + 229
2	S. Screen	2520 + 213
3	A. Jack	2520 +
4	R. Baggott	double over-run 2513 + 000
5	R. Johnson	2520 + 000
6	R. Moore	2484 + 000

attendance after such a dismal weather forecast. Terrible visibility made things virtually unflyable until lunch time when the wind eased greatly, the rain stopped and the air warmed up. With a 3pm finish this left precious little time for competitors to squeeze in three flights. Many were still struggling back after last maxes when the flyoffs began.

John Carter's winning total in glider was composed of two perfect flights and ten seconds dropped from the third. He had strange luck in Open Rubber; along with Phil Ball in the same class he suffered a mysterious quick-running Tomy timer to D/T disastrously early. Both were eliminated. Perhaps moisture had loosened the governor weights? On the other hand Peers made sure in power with a full house, started when he could be sure visibility was sufficient even for somewhat curtailed motor runs. A full score took this class easily when most of the Birmingham contingent who would normally have been expected to give him a run for his money declined to risk their models. They all sportingly entered anyway to support the venture.

Only Vintage and Open Rubber required flyoffs. Both Davitt, Horsley and O'Donnell were tight for time after difficulties retrieving their last flights. However, Pete Gaunt had gained when one of his early rubber flights had actually glided up-wind for the entire 2:30 thus saving him considerable leg work and time. He damaged the same model on the next launch so had to resort to a Wakefield for his final max. His thermistor was working again and this helped others into the flyoff too! His open model was patched up for the flyoff and he picked the best lift and the slowest drift to stay in sight for a little over five for a possible 6.1/2 minute flight but the model was not found that night.

The only complaints seemed to be over the adjustment of the timekeeping rule for the flyoff. Attempts were not allowed but following the models was! This latter fact may not have been made clear to all contestants and it might have affected the result.

Prizes were sensational. The Falcons Club underwrote the proceedings to the

tune of £100 of actual trophies and £30 of wine. Additional electrical products were donated by Finlux UK Ltd.

### Ted Evans Memorial Meeting: Barkston Heath, 1st November

It was wet and breezy the day before and hopelessly foggy the day after, but the Sunday of the Ted Evans event was blessed with almost no wind, above average temperatures and a murky low cloud base that although always threatening never became a nuisance. Chris Hawke's management of this meeting has flair and good humour in the same vein as Bob Wells used to run it. However, his presentation is geared more to the casual approach of the Vintage enthusiast which is probably how it should be. Indeed, I believe his occasional outrageous disregard for formal rules is only to goad those of use who take things



*Above: John Carter's own-design '51 Rules Wakefield which was out of luck on one flight and missed the flyoff at the Ted Evans Day. Below: The wonderful Lanzo 4oz; this one didn't place but the design is a classic. Note the sectioned fin for 'left' glide turn. Below that: Stan Fairless flew this unusual, genuine Vintage model early on at Barkston.*



Falcons Rally		
<b>Open Glider: 10 flew</b>		
1	J. Carter	7 20
2	J. Flynn	7 07
3	D. Barrie	6 13
<b>Open Rubber: 9 flew</b>		
1	P. Gaunt	7:30 + 5:12
2	T. Dobson	7:30 + 4:52
3	J. O'Donnell	7:30 + 4:28
4	B. Horsley	7:30 + 0:06
<b>Open Power: 4 flew</b>		
1	R. Peere	7 30
2	M. Hargreaves	7 08
<b>Vintage: 7 flew</b>		
1	T. Dilks	Challenger 7:30 + 3:30
2	J. Leach	Banshee 7:30 + 3:00
3	D. Davitt	7:30 + 2:52

too seriously! Actually his flight card system bore all the hallmarks of a great deal of advance work with model classes and round times printed on each, and every contestant allotted a number in each classification!

It was encouraging to see more people flying in the 8oz. class than modern F1B, and it seemed the general consensus that a more formal award for the highest genuine vintage model would encourage even more. For instance, it seemed a pity that Chris Strachan's excellent performance with his Yankee IV went unrewarded. The other slight oddity is why '8oz.' is still more popular than the older 4oz. class when these pre '37 models have so much greater potential. Indeed, a 4oz. model was the only vintage model that qualified for the flyoff against all the 'own-designs'. As always these dominated the main event with only Michel's geared Spirit of '36 breaking up the routine of similar looking designs.

The three-minute max had contained flyoffs to a manageable level. There was only one full score in 'pre '37'; that of John Godden's capably flown Leshner. His score was chased by the Lanzos of Michel and Hipperson who each had one slightly below-par flight.

With a mere 10-minute flyoff period most of the seven qualifiers were airborne quickly and they patterned close together in the cool and rapidly darkening sky. With the drift of no more than 5mph the top two were seen down onto the edge of the drome but it was touch and go. John O'Donnell's model had looked the best of the bunch during the day even when in sink. On one flight it outflew Hipperson's in the same air so the flyoff result was fair. John had quite a tight glide turn to damp any possible stall compared to the next

**A look at the top F1B model at the Trials. Derl Morley has stayed faithful to this layout for quite a few years now. Glide is particularly impressive.**



February 1988

two who both risked very large circles to get the most from their glides. Further down the list John Godden's 4oz. model had done enough to oust at least one 'own-design'. Stan Fairless' model sported a natty cover over the wing to bring the model up to cross section area but this flipped up in flight, effecting quite a good D/T action and ruining his score. Chester Lanzo actually used such a D/T on one of his Wakes - now we know it works!

It was decidedly late by the time of the F1B flyoff. The four qualifiers had little time to spare but there was no mass launch and, thankfully no mid-air collisions this year. Morley's early flight held up well on the glide; Hipperson, who followed with his latest 'delay-prop' model did not get quite such a good climb as during the day but nevertheless found useful and slow moving air. The latter two launched after another minute or so and drifted slightly faster. They were all very respectable times, reflecting just how fast F1B standards are.

#### Ted Evans Trophy Meeting

##### Pre '37 4oz. Wakefields: 8 flew

1	J Godden	Leshner	9:00	3:31
2	P Michel	Lanzo	8:44	0:00
3	D Hipperson	Lanzo	8:42	0:00

##### Pre '51 8oz. Wakefields including own-designs: 23 flew

1	J O'Donnell	O/D	9:00	6:05
2	D Hipperson	O/D	9:00	5:09
3	P Ball	O/D	9:00	4:58
4	P Michel	O/D Geared	9:00	4:32
5	J Godden	Leshner	9:00	3:31
6	S Fairless	O/D	9:00	2:29
7	J Pool			8:00

##### Modern F1B Wakefields:

##### Four flights: 17 flew

1	D Hipperson	12:00	3:59
2	R Pollard	12:00	3:57
3	D Neil	12:00	3:49
4	D Morley	12:00	3:25
5	P Gaunt	11:59	0:00

Best British 4oz. Wake Chris Strachan's Copland  
Best British 8oz. Wake Mike Kemp's Hereward

Usually two or three inches of strip in the can is sufficient. The top is popped on over the rubber and the canister is shaken. This covers the ends of the rubber thoroughly; more talc will stick if the rubber has been lubed a little first. Now both the lube and the talc will lubricate slightly when tying tight knots, preventing the edges of the rubber from chafing. However the talc should absorb the lube actually inside the knot and offer a slight 'groul' to resist the ingress of further liquid lube into the knot itself.

Of course this will work just as well when repairing strands in old motors. Simply dip the end in the canister and shake - result: no waste of talcum and no mess. Very useful for field motor repairs too. The great enemy is water. Wipe as much surplus lube off by all means - it doesn't matter what sort of lube you use - but don't wash the ends or even lick them. If the ends are the slightest bit wet then the capillary action of the lube along the wet surface of the rubber will allow it to penetrate the knots and they will quickly come undone. Any type of rubber can be treated in this way. In other words it works for Pirelli if you are lucky enough to have any left...

**Serious stuff, this competition F/FI Jolly duo Dave Hipperson and Chris Strachan after the last Morley-Finlux meeting. Photo supplied without your columnist's knowledge by Sue Hipperson...**



## Tying rubber

Ever since the advent of smooth-surfaced rubber strip like FAI Supplies or Champion, the tying of knots in it, particularly when it has been lubricated, has been a problem. For a time I even switched over to castor oil as a lubricant because as it didn't lubricate quite so well as other choices it made knotting easier. With the turns that we put on these motors nowadays, particularly in F1B and CdH, this can hardly be regarded as an efficient answer.

I had found some time ago that a healthy sprinkling of talcum powder on the end of the rubber strip greatly assists knots to grip. Recently I have taken this principle one step further and I believe I have the problem licked. I actually deliberately lube all rubber around the knot area before tying even new motors. The ends are then stuffed into an old 35mm canister half-filled with talc.

## What's Happening

Jan 24th: 1st Area centralised SMAE Free Flight Meeting. F1A for the KMAA Cup plus Plugge points for individuals Open Rubber - no trophy. Open Power for Frog Senior Trophy. Area Venues. Contact either Area Comp Secs for Venues or SMAE Comp Sec. via 0533 518500.

Feb 14th: SMAE Winter Open Meeting, Bottesford, Open Glider, Rubber Power. Vintage & Slow Open Power. Contact Free Flight Tech. Committee. P Ball. 0332 665361.

# FRED-FOTO-PAGE

It must be the time of year! A number of readers are searching colour schemes for the FRED homebuilt. Here's a selection...



*Above: Seen at the PFA Rally at Cranfield last Summer, complete with coupe cabin, is red-and-white G-BKAF. Rudder emblem is two oblongs, white above pale blue with a thin red division. Rear cabin window is tinted blue.*



*Above: G-RONW has a dark green fuselage with white wing and tail. Cowling and forward decking is aluminium. Location is Cranfield in 1983. Right: Silver and red G-OLVR boasts thin black trim lines and forward decking, various cowling bumps and stringered rear fuselage (1986 PFA Rally).*



*Left: Sleek, bespatted G-BKZT sparkles in red-and-white. Neatly cowed powerplant is fitted with a beautifully laminated prop. All photos: Peter Kirby. Plans of our 33in. lightweight rubber scale Clutton Fred, designed by Trevor Faulkner, are available as FSR 1426 for £3.05 including postage. Ex-patriot aeromodeller Eric Clutton, now resident in the States, was primarily responsible for the full-size machine... FRED? Flying Runabout Experimental Design!*

# FROM THE HANDLE

**Claus Maikis**

**examines cut-outs for**

**F2B motors and**

**wings**

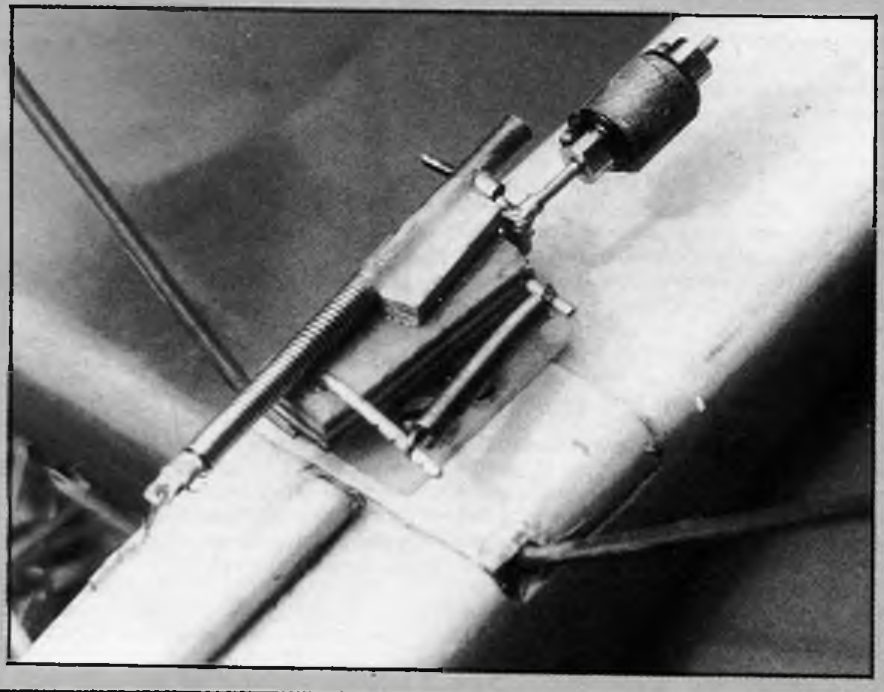
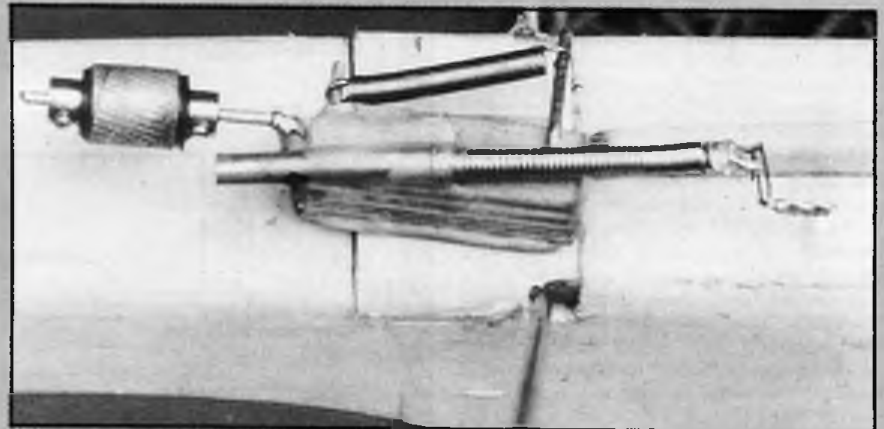
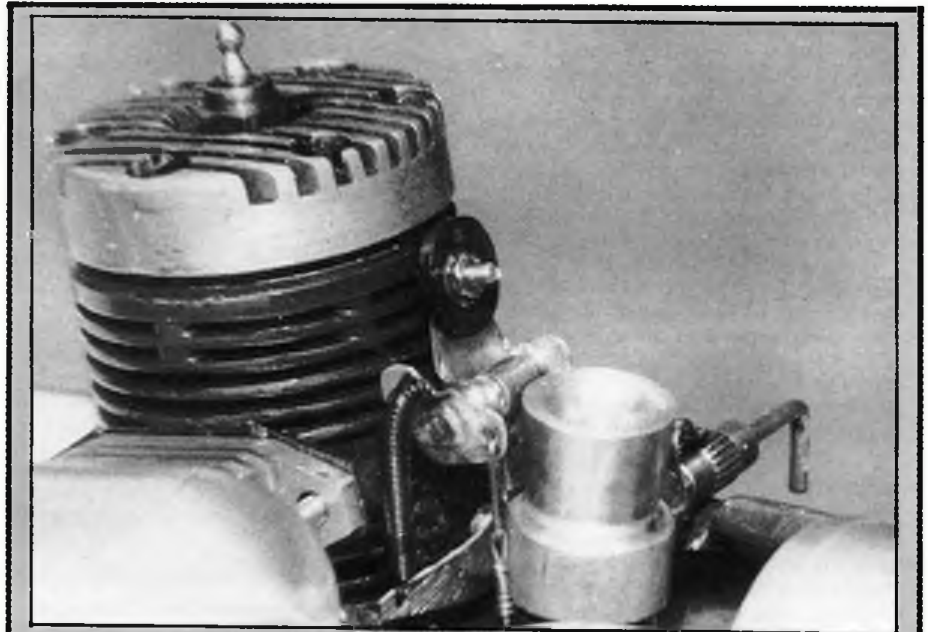
## Stop the world

Much thought has been spent on devices to stop the engine in aerobatic models. I've met many who have tried it by some means or another. So far I haven't found a practical solution. One construction was prohibited by the rules; the other was not reliable. Some very simple solutions are self-prohibiting. I have a special aversion to the 'full-down-elevator' flick *à la* team race - our airplanes react much better!

The first practical solution was seen at the world championships in Pecs. A Russian airplane featured a spring-loaded bellcrank which would move sideways on excessive line pull. This movement actuated a fuel switch. A soft bending of the arm, then a quick release with subsequent quick pulling produced enough line tension to actuate the system. Obviously it worked reliably. I suppose, however, that construction of such a system might be beyond the scope of the average modeller. During a recent contest a flyer from Austria showed me his design. Walter Weineisen hasn't flown control line for a long time, yet he has some truly clever ideas in his airplane which has detachable wing halves. Perhaps inspired by the Russian idea Walter has produced a system which he has mounted to the fuselage bottom of his airplane. Construction is very simple, and materials are scrap pieces found in every modeller's workshop. No special tools are required nor are special skills. It's these ingenious ideas which sometimes make us wonder why we didn't think of it before.

The basic principle is a moving weight which swings round a pivot point. The weight is spring loaded. Spring loading can be changed by hanging up the spring in different notches, thus changing the moment arm. Additionally the weight slides on a rod and its position can be adjusted. On the weight arm there's a pin.

*Walter Wieneisen's engine cut-out system. Spring-loaded choke is shown at top; linkage is actuated by outward swinging movement of beneath-fuselage pendulum, shown in 'on' and 'off' positions, and tripped by a sharp pull on the lines.*



The pin works as a prop for a spring-loaded rod which slides in a brass tube. When the weight swings outward the rod is freed and it pulls a line. This line is connected to a gadget mounted to the venturi. A flap with a rubber disc rides on an axle. A see-saw is mounted to this axle.

A spring is connected to the see-saw and this holds the flap in the 'open' as well as in the 'closed' position. The pulling line doesn't close the flap, it just works the 'switch'.

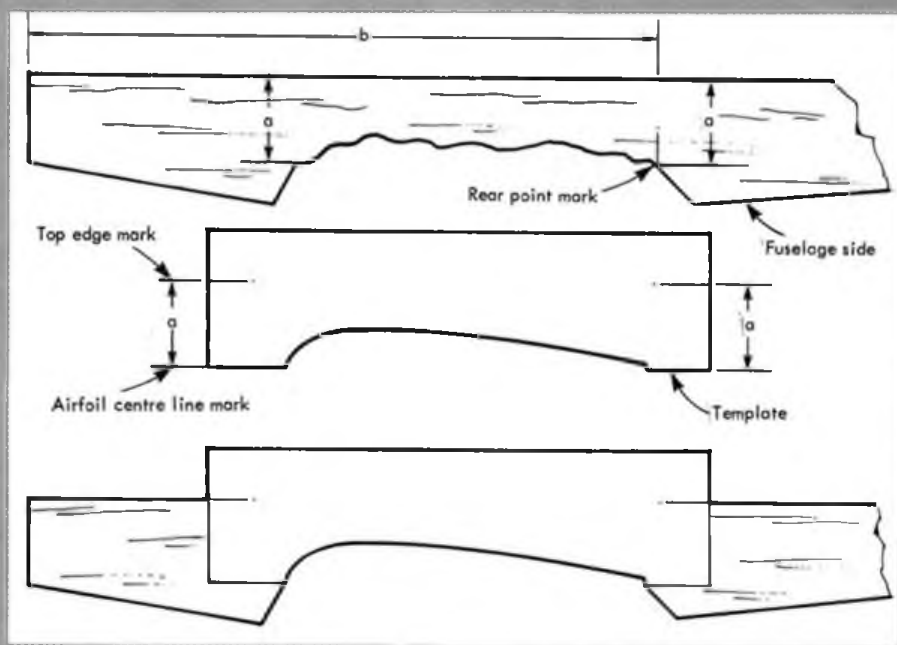
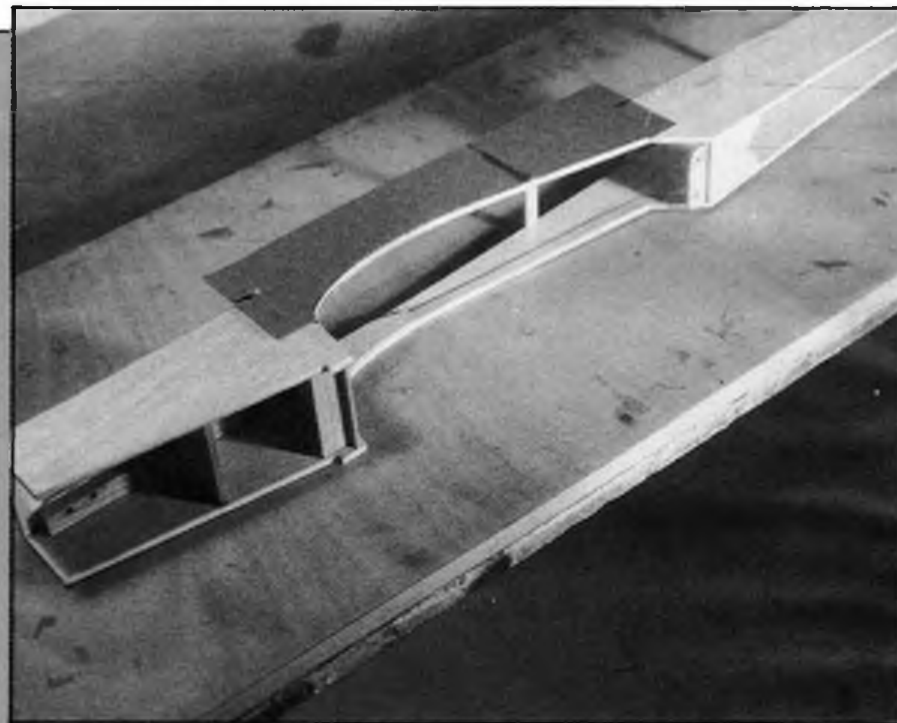
I've seen Walter use his system in the contest. I've also flown his airplane and tried the system. A short jerk with the arm and - flap - the engine stops. Just great! The whole gadget looks a little crude, but this is a prototype. Future versions will be made in a more pleasing shape - or even built into the fuselage. As can be seen, construction is very simple. To get it to work takes some time since you have to tune all parts and adjustments very carefully. Walter has not yet sorted all the gremlins since on his second flight the engine stopped right on take off!

### Join up!

During construction there are some phases which don't pose any problem. But there are others which are a real pain. I usually start these when I'm in a good mood because this mood rapidly fades away glue drop after glue drop, and I'm glad when all is over. One of those parts is the fuselage/wing joint. Even with one-piece airplanes - the more so with detachable wings - this should be executed with special care. The lifetime of the model depends on an exact fit here.

For years I traced the fuselage side view - with the wing cutout - as carefully as possible on the side sheets - to no avail. Where fitting the wing there was always this gap, short or long, narrow or wide (mostly wide!) and usually on the outboard side of the fuselage. Intensive brooding brought the realisation that my workmanship just wasn't sufficient and needed improvement. First, my method of building the wing caused one fault. From the rib stack I use the first, third, fifth rib and so on for the inboard panel; ribs number two, four, six and the rest of the even numbers for the outboard panel. Now - the ribs with the even numbers are always a little shorter than their inboard counterparts. Thus the wing panel has a slightly smaller chord - usually about 1mm less - thus causing my problem. Secondly, even with a huge effort I couldn't achieve a perfect wing centre built from the plans - somehow the airfoil always deviates a few co-ordinates from NACA's recommendations. A cure was needed. I found the following method gave satisfying results.

The cutouts in the fuselage sides are made roughly undersize. Now I take exact dimensions, from the plan, at the most rearward point of the airfoil. This point is measured from the side sheet front edge and top edge as reference lines. It can be measured exactly, without the inaccuracy of tracing. At the leading edge I don't make a point, but instead draw a line which is the exact location of the airfoil centre line, measured from the side sheet top edge. Next, I mark a line on the wing where the fuselage sides sit on the wing. Taking measurements from the partly built fuselage, this is not difficult. Now



*Accurate wing cut-outs in fuselage sides; template in position at top is used according to method described in text and shown in diagrams above.*

comes the hardest part. From cardboard I cut two templates, one for each fuselage side, *exactly* to the contour of the upper wing airfoil. I really mean exact; and I'm really pedantic here. If I make a wrong cut I don't hesitate to cut a second template, or a third, or... It takes me quite some time to do this, but it pays.

The bottom edge of the template is the airfoil centre line; the top edge can be the line of the side sheet top edge. If the template is wider (which I prefer) the location of the sheet top edge must be

marked on the template.

From now on it's real fun. With pins and double-sided adhesive tape I fix the templates to the fuselage sides, carefully watching the exact location at the rear reference point, airfoil centre line and side sheet top edge. A fine line is drawn along the template on the sheet, or better yet, the wing contour is worked out with the template right on the fuselage. When finished, remove the template and immediately hold the wing in place to see the result.

# ***SUBSCRIPTIONS SENSATIONS! AT COVER PRICE ONLY!***

**Any of the magazines from the list below can be delivered to your door  
with :           NO handling charge           NO postage costs**

A&B Computing	£18.00
Aeromodeller	£22.20
Citizens Band	£16.20
Clocks	£27.00
Commodore Disk User	£15.00
Disk User	£17.70
Electronics Digest	£11.00
Electronics Today International	£16.80
Ham Radio Today	£15.60
Military Modelling	£15.60
Model Boats	£15.60
Model Engineer	£26.40
Photography	£15.00
Photoplay	£12.00
Popular Crafts	£16.20
Radio Control Model Cars	£16.20
Radio Control Boat Modeller	£7.50
RCM&E	£14.40
Radio Control Scale Aircraft Quarterly	£9.00
Radio Modeller	£14.40
Sea Classic International	£11.70
Scale Models International	£15.00
Video Today	£15.00
Which Video?	£15.00
Woodworker	£15.60
Your Commodore	£14.40
Model Railways	£13.20
Practical Wargamer	£7.80

## **The Above Prices Refer to U.K. Subscriptions Only**

This offer is also open to existing U.K. subscribers who  
may wish to extend their current subscriptions.

Please commence my subscription(s) To.....with the..... Issue  
I enclose my cheque/money order for £.....made payable to Argus Specialist Publications Ltd.  
or debit £.....from my Access/Barclaycard No.

valid from.....to.....Signature.....  
Name.....  
Address.....



Send this form with your remittance to:  
**INFONET LTD. (N.R.S. 88) 5 River Park Estate,  
Berkhamsted, Herts. HP4 1HL.**



# Model Shop

## THE COMPREHENSIVE MODEL MAKERS GUIDE.

**Directory**  
Classified Advertising  
Tel.no. 01-437 0626

Readers please note that due to soaring postal charges many retailers are unable to answer postal enquiries unless accompanied by an S.A.E. Mail Order Welcome.

**Rates:- £10.50 for 12 series  
£11.50 for 6 series (exclusive VAT)**

### LONDON

**CORNER THE MARKET**  
**01-437 0699**

**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.

### MIDDLESEX

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

### SUSSEX

**BRIGHTON** Tel: 0273 430751  
**HARRY BROOKS** (3 lines)  
15 VICTORIA ROAD \*  
**PORTSLADE**  
Open every day except Sun.  
9am - 6pm (no half day).

### ESSEX

**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

### LONDON

**LONDON** Tel: 01-205 0817  
**AEROMODELMART** \*  
165 CHURCH LANE  
LONDON NW9  
Open 7 days a week Mon-Thu 9-5  
Fri-Sat 9-6 Sun 9-3 Access - Visa  
Instant Credit - American Express

### WEST MIDLANDS

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

### SUSSEX

**BRIGHTON** Tel: 0273 430751  
**MODEL AERODROME** (3 lines)  
37 WEST STREET, BN1 2RE \*  
Open Mon-Fri 9am-6pm  
Sat 9am-6pm  
We Accept Am. Ex. Access. Barclaycard

**JOIN THE ENTHUSIASTS!**  
**ADVERTISE IN AEROMODELLER**

### 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.

### MIDLANDS

**BIRMINGHAM** Tel: 021-443 3529  
**KING'S HEATH MODEL AIRCRAFT**  
25 ASHBURTON ROAD B14 6JA  
Mon-Fri 11-6 Sat 10-6  
Late night Thursday to 8pm  
Closed all day Wednesday

### 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.

### HAMPSHIRE

**PORTSMOUTH** Tel: 0705 825049  
**RAY BROWN MODELS** \*  
10 KINGSTON ROAD  
Closed on Wednesday  
Open 9.30am - 5.30pm

### LONDON

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

### MIDLANDS

**BIRMINGHAM** Tel: 021 359  
**JIM DAVIS MODELS** 0828  
UNIT 4, PARKWAY  
HENEAGE STREET B7 4LY  
Open. Mon-Sat 9.00-6.00  
Mail Order

### YORKSHIRE

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

### KENT

**ASHFORD** Tel: (0233) 39184  
**ASHFORD MODELS** \*  
68 KENT AVENUE  
Open Mon-Fri 9.45am - 6.00pm  
Sat 5.30pm. Closed 1.00pm Wed.  
Late night Thursday until 8.00pm.

### MERSEYSIDE

**LIVERPOOL** Tel: (051 709) 8039  
**STAN CATCHPOLES** \*  
**MODEL WORLD** \*  
85 BOLD STREET  
9.30 am-5.30 pm. Six days.

### 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.

### SCOTLAND

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

### KENT

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

### MERSEYSIDE

**ST. HELENS** Tel: 0744 22294/  
**MODEL ENGINEERING** 53634  
**SUPPLIES AND SERVICES**  
175-177 PARR STOCKS RD.  
Open Mon-Sat 9am-5pm  
Late night Weds 8pm

### SURREY

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

### AUSTRALIA

**MELBOURNE 3000** Tel: (03) 662  
**RIVERSIDE HOBBY CENTRE** 3250  
15 LITTLE LATROBE ST  
9am - 5.30pm Mon-Fri  
9am - 12noon Sat

### LONDON

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

**ALL THOSE SHOPS WITH AN ASTERISK HAVE MAIL ORDER SERVICE**

### SURREY

**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.

### 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

**DON'T MISS OUT ON THIS COMPETITIVE MARKET — FORMULATE YOUR HIGH FLYING ADVERTISING PLAN — PHONE SHARON STAINFORTH ON (01) 4370626 FOR DETAILS OF SERIES DISCOUNTS.**





# 2 issues FREE

When you take out a subscription to any of these magazines

	EUROPE	MIDDLE EAST	FAR EAST	REST OF THE WORLD
A&B Computing	£27.30	£27.60	£31.10	£28.30
Aeromodeller	£27.00	£27.20	£29.00	£27.50
Citizens Band	£20.10	£20.30	£21.80	£20.50
Clocks	£32.40	£32.60	£34.70	£33.00
Commodore Disk User	£18.00	£18.20	£19.30	£18.40
Disk User	£21.60	£21.70	£23.20	£22.00
Electronics Digest	£12.90	£13.00	£13.70	£13.10
Electronics Today International	£21.00	£21.20	£22.80	£21.50
Ham Radio Today	£20.10	£20.30	£22.00	£20.60
Military Modelling	£22.40	£22.60	£25.20	£23.10
Model Boats	£20.00	£20.10	£21.80	£20.40
Model Engineer	£35.40	£35.70	£39.00	£36.30
Photography	£22.00	£22.30	£25.00	£22.80
Photoplay	£16.70	£16.90	£18.70	£17.20
Popular Crafts	£21.40	£21.60	£23.60	£22.00
Radio Control Model Cars	£21.10	£21.30	£23.10	£21.60
Radio Control Boat Modeller	£10.00	£10.20	£11.10	£10.30
RCM&E	£20.40	£20.60	£22.90	£21.00
Radio Control Scale Aircraft Quarterly	£11.10	£11.20	£12.00	£11.30
Radio Modeller	£20.00	£20.20	£22.40	£20.60
Sea Classic International	£10.70	£10.80	£12.00	£11.00
Scale Models International	£19.60	£19.80	£21.50	£20.10
Video Today	£20.20	£20.40	£22.30	£20.70
Which Video?	£19.40	£19.50	£21.20	£19.80
Woodworker	£22.80	£23.00	£25.70	£23.50
Your Commodore	£22.00	£22.30	£25.20	£22.80
Model Railways	£19.10	£19.30	£21.50	£19.70
Practical Wargamer	£7.10	£7.20	£8.00	£7.40

**The Above Offer Applies to Overseas Subscriptions Only**

This offer is also open to existing subscribers who may wish to extend their current subscriptions.

Please commence my subscription(s) To..... with the..... Issue  
 I enclose my cheque/money order for £..... made payable to Argus Specialist Publications Ltd.  
 or debit £..... from my Access/Barclaycard No.   
 valid from..... to..... Signature.....  
 Name.....  
 Address.....



Send this form with your remittance to:

**INFONET LTD. (S.O. 88) 5 River Park Estate,  
 Berkhamsted, Herts. HP4 1HL.**



# CLASSIFIED advertisements



We accept  
Access/Barclaycard



Private and trade rate 50p per word, VAT inclusive, minimum £7.50. Display box rate £8.85 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 under, **INCLUDING YOUR NAME AND ADDRESS** and send to: **AEROMODELLER, CLASSIFIED ADVERTISEMENT DEPARTMENT, ARGUS SPECIALIST PUBLICATIONS LTD., 1 GOLDEN SQUARE, LONDON W1R 3AB. Tel: 01-437 0699.**

## FOR SALE

### THE PEATOL LATHE



£120 including 3 or 4 jaw chuck Milling attachment and other accessories available Centre height 2" distance between centres 3"  
Please send SAE for full details  
Peatol Machine Tools, A.M. 19 Keightlow Road, Harborne, Birmingham B17 8PS Price inc. VAT

### SMALL SCALE CUSTOM SERVICES

New Transfers of UK 'C' type Roundels RB, RWB, YRWB and fin stripes in three scales  
SAE for list.

The Red House, Oxborough, Kings Lynn, Norfolk PE33 9PS. Telephone 036621 431

## GLIDING

### GLIDING HOLIDAYS

**SLOPE SOARING - TRY YOURSELF!**  
Five-day holiday course for beginners and early solo pilots May to September Beautiful Peak District Tuition and full board £195 - £215 incl. No hidden extras  
Apply  
Course Secretary (AM) Derby & Lincs. Gliding Club, 116 Chorley Road, Sheffield S10 3RL.  
Tel: 0742 301831 (7pm - 10pm)

### 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 67616

## VIDEO

### FARNBOROUGH

*the glorious years*  
**ORIGINAL ARCHIVE FILM IN SOUND AND COLOUR**

Tape 1: 1956/57 £19.95 each + pp  
Tape 2: 1958/59 (p&p per tape £1  
Tape 3: 1960/61 in UK/£6 overseas)  
Tape 4: 1962 £15.95 + pp

**COLLECTORS SET OF 4 VIDEOS £60 (inc of pp)**  
State VHS or BETA and allow 28 days for delivery

Send cheque po to:-

**HOW VIDEO, KIRBY HILL, BOROUGHBIRD, N. YORKS, YO5 9DS**

## SERVICES

**REBORE SERVICE.** Give that worn vintage engine a new lease of life with a Rebores parts made pattern. Rebuilds undertaken Ring or write for quotation 0652 57754. John Codd, 3 Burnside, Broughton, Nr Brigg, South Humberside DN20 0HT.

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

**IDEAS, INVENTIONS** Wanted. Call ISC 01 434 1272 or write Dept (ASP) 99 Regent St. London W1

**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

### SAMS

**Indoor, Free Flight, Vintage NEW FREE '87 Grey Catalogue**  
9 x 7 26p SAE to

### SAMS

The Chapel, Roe Green, Sandon, Nr Buntingford, Herts SG8 0QJ  
Telephone (078) 388 384

Available also in french Overseas send 4 Postal Coupons sorry no callers

## BOOKS & PUBLICATIONS

### AMERICAN

### AERO-MODELLING MAGS

R/C Modeller prices inc postage £3.30

M.A.N £2.60

Flying Models £2.35

Scale R.C Modeller £2.90

Model Builder £3.00

Current and some back issues available

**THE AVIATION BOOKSHOP**  
656 Holloway Road, London N19 3PD

## COURSES

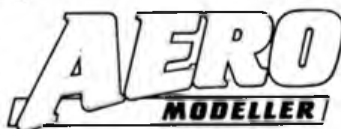


### COME FLY WITH US!

We can teach you to soar the Cotswolds. From the air you will be thrilled at the splendour of the West Country. We have a residential clubhouse, bar and professional instructors, complete with a friendly atmosphere. Holiday courses commence April 13th until the 9th October. Full details from:  
**THE HOLIDAY MANAGER,**  
BRISTOL & GLOUCESTER GLIDING CLUB, NYMPHFIELD, STONEHOUSE, GLOUCE. GL10 3TX TEL 0453 860060

## WORLD WAR II ON VIDEO

All the British and American wartime classic documentaries available price £24.95 per cassette (VHS or Beta); including Viewing Notes on the making of each film.  
Send for complete list to:  
**AFTER THE BATTLE,**  
Church House, Church Street, London E15 3JA  
Telephone: 01-534 8833



Private and trade rate 50p per word inclusive of VAT, (minimum 7.50). Display box rate £8.85 per single column centimetre (minimum size 2.5cm £22). Please add 15% vat for display. Write your advert in **BLOCK CAPITALS** in the grid below, ticking the section you wish it to appear under, **INCLUDING YOUR NAME AND ADDRESS IN THE WORD COUNT** and send it to: **AEROMODELLER CLASSIFIED ADVERTISEMENT DEPARTMENT, NO: 1 GOLDEN SQUARE, LONDON W1R 3AB.**

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


## CLASSIFIED COUPON

**ALL CLASSIFIED ADVERTISEMENTS MUST BE PRE-PAID. THERE ARE NO REIMBURSEMENTS FOR CANCELLATIONS.**

I enclose my Cheque/Postal Order for £..... for..... insertions, made payable to Argus Specialist Publications.

(\* Delete as necessary) or

PLEASE DEBIT MY ACCESS/BARCLAYCARD NO. ....

EXPIRY DATE



Name .....

Address .....

Post code .....

Daytime Tel. No: .....

Signature .....

Date .....

£..... for..... insertions

IF YOU DO NOT WISH TO CUT YOUR MAGAZINE, PHOTOCOPY THIS FORM



# £1,000,000

**MODELLERS  
ACCIDENT  
PROTECTION**

Double The Cover — No increase in price.  
Standard (Aircraft, Boats and Cars) £4.00  
Passenger (Live steam operations) £5.00  
Fly, Drive, Sail or Steam under our protection  
with a Public Liability  
Insurance tailored to  
suit modellers needs.

**NOW  
COVERS  
Large  
Models**

— no limit on Aircraft, Car or Boat scale, just an engine size limit of 40cc — full MOD cover.  
Traction engine up to 1/4 scale, locos up to 7 1/2 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 £5.00

Standard £4.00

Please make cheques payable to ASP Ltd.

AERO


## SCOTLAND

FOR YOUR ESSENTIAL  
AEROMODELLING SUPPLIES  
YOUR *FIRST* REQUIREMENT

VISIT

## DUNN'S MODELS


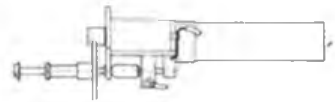
3 WEST NILE STREET  
GLASGOW G1 2PR  
Tel: 041-221 0484



**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**  
SEALED LEAD ACID CHARGING  
BATTERY READY TO USE £12.50 PP £1.35  
SODASTREAM CO<sub>2</sub> ADAPTOR £16.00 PP 45p

SEE LISTINGS EARLY AT AN AVERAGE FROM 100gm weight with MODELLED PROPELLERS AND REMOTE BATTERY HOLDER. INTERIOR SWITCH. SEE THE NATIONALS AT SCALE COLLECTOR & THE INTERNATIONALS AT SCALE COLLECTOR



## PLANS SERVICE

**£1.50**

Plus 35p  
Postage &  
packing

# Plans Handbooks GREAT MONEY BACK OFFER No 3



Early aviation, WW1, Golden Era, World War II, Modern Jets, specials — hundreds of accurate 3 view drawings to help you produce a top class scale model.

Many include photos and description.

To: Plans Service, Argus Specialist Publications Ltd., 9 Hall Road, Maylands Wood Estate, Hemel Hempstead, Herts. HP2 7BH  
Please send Copies of Plans Handbooks No.3 at £1.50

Postage at 35p per copy

I enclose my Cheque or Postal Order Payable to ASP Ltd., for Total  
Please debit my Access/Barclaycard Account No.

Name .....

Address .....

## INDOOR FLYING

There are no difficult noisy engines to start. No expensive fuel to buy and its quiet and pollution free. You can start for as little as £15.50. All enquiries S.A.E. Trade enquiries welcome. Mail order catalogue and guide send £1 in stamps (UK) or 5 reply coupons (overseas) inc. P&P.



### BALLARD'S R.T.P.

54 Grosvenor Road, Tunbridge Wells, Kent. TN1 2AS. Tel: 0892 31803

## FOR THE ATTENTION OF ALL ENTHUSIASTS!

**CONNOISSEUR MODELBOOKS CATALOGUE 1988.** Our new catalogue has 120 pages of up-to-date information on aviation, modelling, maritime and military books. For modellers and book collectors it is the most complete guide available and should not be missed. Send £1.00 to Albion Scott Ltd., 51 York Road, Brentford, Middlesex TW8 0QP.

**CONNOISSEUR MODELBOOKS IN WAKEFIELD.** Opened on October the first - our newest branch at The Eagle Press Bookshop, 18 Wood Street, Wakefield, W. Yorks. Open six days a week - all our books on display. Reached with ease from all major industrial areas in the North

**NATIONAL BOOK SALE.** The 1988 NBS runs from January 2-30, with many books reduced for this period only. Find them at any of our branches and buy while these reductions are in force! We shall also be holding "open house" at our main showroom, 51 York Road, Brentford, during the weekend of January 16/17, as part of this sale. If you have books to sell at this time, then please bring them along. You will find we have bargains galore, plus many unusual titles - and light refreshments. An event which all book-lovers and hobbyists should attend.

**CONNOISSEUR MODELBOOKS IN LONDON.** Find us at 1st floor above Oppenheim's Booksellers, 7-9 Exhibition Road SW7 (2 mins S. Kensington tube) Open 7 days a week - the ideal venue for those who live in the capital or are visiting!

# KEIL KRAFT

FLYING SCALE

BALSA FLYING MODEL AEROPLANE KITS



KK0045 **MUSTANG**  
18½" wingspan (47cm)

KK0040 **SPITFIRE**  
18" wingspan (46cm)

All models in the Keil Kraft flying scale series have real airframes, built up from balsa sheet and strip parts, covered with lightweight model aircraft tissue.

This lightweight construction ensures the best possible flying performance. Flying scale models contain clearly printed sheet parts and strip wood in aircraft quality Solarbo balsa, ready-to-fit propeller, wheels, nosebutton in moulded plastic, clear plastic cockpit canopy (or equivalent glazing material), undercarriage and prop shaft wire, covering tissue, rubber motor, and full-size plan with detailed building and flying instructions.



KK0040 **SPITFIRE**  
18" wingspan (46cm)



KK0039 **FOKKER D-8**  
16" wingspan (41cm)



KK0041 **HURRICANE**  
19½" wingspan (50cm)



KK0044 **FW190**  
17½" wingspan (44cm)



KK0043 **STUKA**  
20" wingspan (51cm)



KK0037 **NIEUPORT**  
15½" wingspan (39cm)



KK0036 **SE5A**  
16" wingspan (41cm)



KK0042 **LYSANDER**  
18" wingspan (46cm)



KK0046 **ME109**  
17" wingspan (43cm)



KK0045 **MUSTANG**  
18½" wingspan (47cm)



KK0047 **FAIREY GANNET**  
20" wingspan (51cm)



KK0038 **SOPWITH CAMEL**  
16" wingspan (41cm)

Available from all good toy, hobby and model shops

Where imagination takes shape!  
**Amerang**

Commerce Way Lancing  
West Sussex BN15 8TE

**KEIL KRAFT**

## Appendix - Links to the plans

**NORTHWIND 7 by Barry Robinson**

CL Stunt

No free plan found

[Document Page: 6](#)

**HIGH STEPPER by Pete Buskell**

FF Power 1/2A

[https://outerzone.co.uk/plan\\_details.asp?ID=9145 ...](https://outerzone.co.uk/plan_details.asp?ID=9145...)

[Document Page: 25](#)

**NORTHWIND**  
Barry Robinson's  
sleek stunt  
winner

**SPACE ODYSSEY**  
Two Space Champs report