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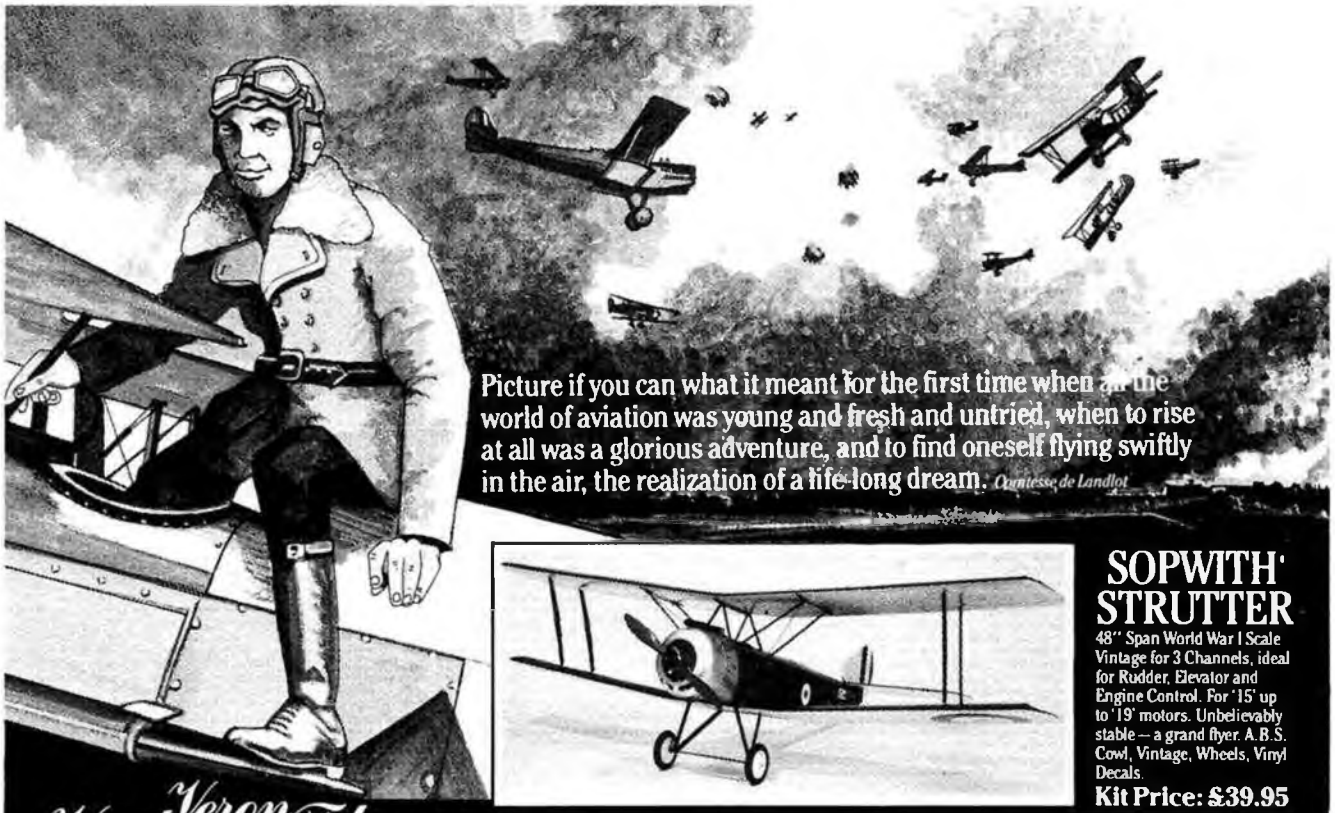

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Aeromodeller

MAP MODEL DIVISION MAGAZINE

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Graphics LORNA CULLEN

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Comment

One of the trends in the modelling scene of recent years has been the formation of specialist bodies. In some ways this could be viewed as a negative approach since we should all be modellers first and specialists second, and there can be little doubt that the 'blinkered' approach usually works to everyone's detriment.

However, we are usually dependent on volunteer labour for our modelling administration and in this respect, the specialist body had many advantages. After all, only the specialist has the knowledge required to administrate and organise.

The SMAE now recognises such specialist bodies, provided that their constitution meets with Society approval, and the Society is quite willing to delegate contest administration, etc. to them. Indeed it is fair to say that in *very* specialised fields, there would be no relevant SMAE contest programme without them.

So, everything *should* be fine, but is it?

We have recently witnessed the failure of at least two such bodies which have always been run on strictly democratic lines, while we can think of at least two others which are more autocratic but which continue to prosper. One of the failures could be attributed to divisive attitudes by individuals, whereas the successful bodies are usually dominated by one, or a handful, of individuals.

Whatever the system within a specialist body, the real key to success is a willingness among the membership to work together for the benefit of the whole group, irrespective of personal preferences. Without this willingness, the aims of all concerned are lost and with it, the competitive pleasure that all enjoy. It is a lesson for all of organised Aeromodelling to heed.

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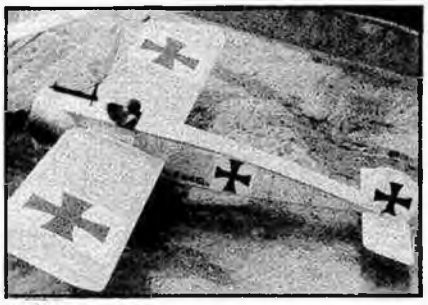

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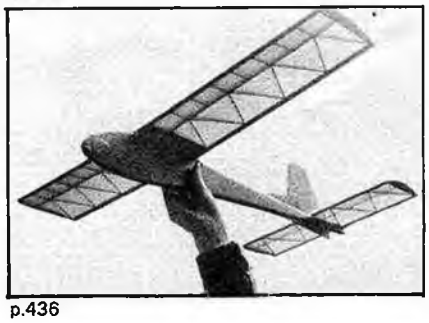

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On the Cover
Electrolight held by our graphic designer Lorna Cullen. This electric powered glider is in this issue as a full size plan, together with Speedster, a control line stunter which is also seen inset.

Next Month
Scale drawings of the Christen Eagle acrobatic biplane will be our 'Aircraft Described' feature. There will also be a full size plan for vintage competition power model, the Dwarf, which has been adapted for CO_2 power, with as always all the latest news from all areas of aeromodelling. On sale 17th September, price 70p.

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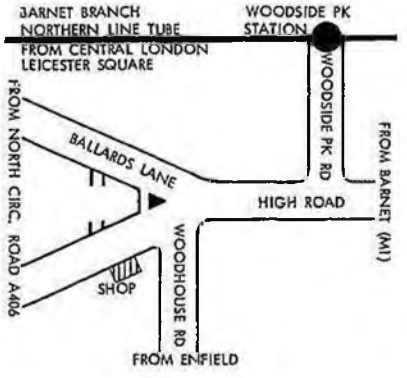

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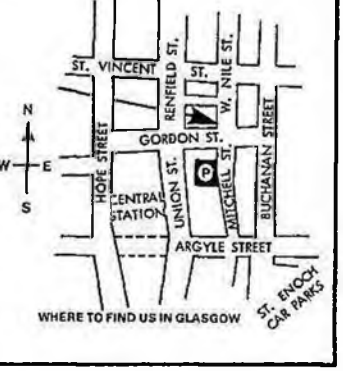

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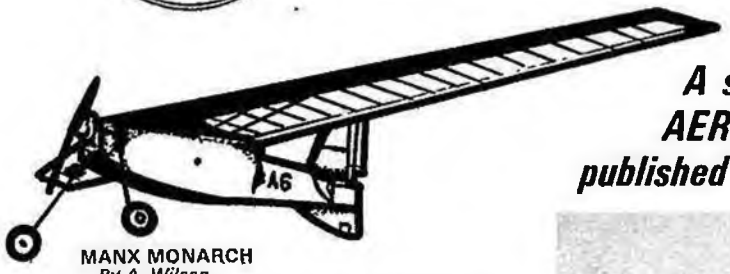

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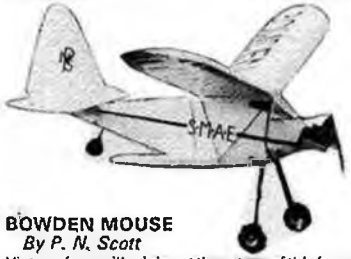

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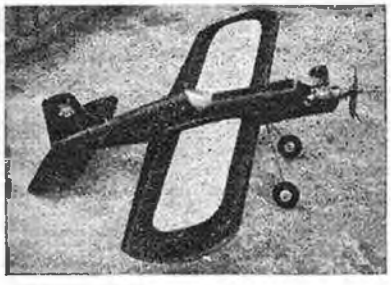

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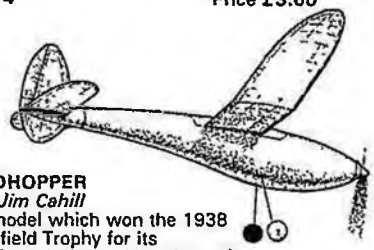

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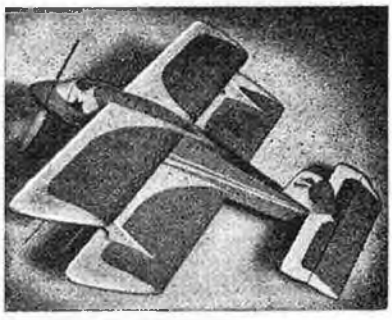

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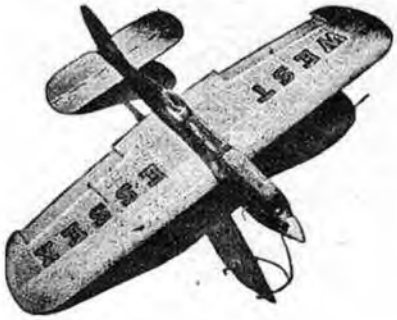

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Extensive prefabrication makes this larger R/C model easy to build. Rudder/elevator control.

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Another super kit for beginners.

GRAUPNER *SONNY* 27" span **£5.75**

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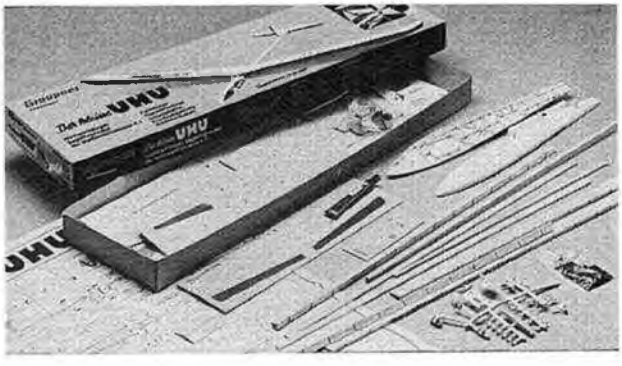
Kit includes many pre-shaped parts.



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TOP QUALITY
SHEET IN 3"&4" WIDTHS

Produced in Graupner's own mill on the spot in Ecuador where the balsa tree grows — and shipped direct to Ripmax in sealed containers for distribution to British modellers. Smooth, accurately machined selected balsa available in sheets only, in standard 36" length and 3" and 4" widths.

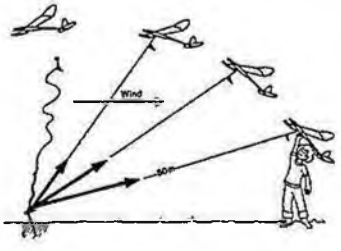
36 x 3 x 1/32"	36 x 4 x 1/32"
36 x 3 x 1/16"	36 x 4 x 1/16"
36 x 3 x 3/32"	36 x 4 x 3/32"
36 x 3 x 1/8"	36 x 4 x 1/8"
36 x 3 x 3/16"	36 x 4 x 3/16"
36 x 3 x 1/4"	36 x 4 x 1/4"
36 x 3 x 3/8"	36 x 4 x 3/8"
36 x 3 x 1/2"	36 x 4 x 1/2"

AVAILABLE AT ALL RIPMAX STOCKISTS

TOWLINE PULLEY £2.65
Makes running-tow launching simpler, more effective — especially with larger, heavier models — as it doubles the towing speed. Simple to use — and inexpensive.

TOW HANDLE AND LINE
The standard method for running-tow — only this handle is functionally designed for positive, comfortable grip and easy re-winding of the line onto the handle. Complete with pennant and over 150ft of line. **£1.20.**

Towlines also available separately on reel. Lightweight, (approx.) 100m long 47p; Medium weight (approx.) 200m **£1.35**; Heavyweight (approx.) 300m **£3.15**.



BUNGEE LAUNCHING saves you from running!
You do not need a helper, either. Just walk downwind to stretch the line, release the model dead into wind — and let the bungee do all the work. The best method for launching larger, heavier models!
Graupner's HI-START PACK is the answer here. A deluxe system COMPLETE with 'chute, towring, and bungee line on heavy-duty reel. Price **£33.25**. Braided bungee rubber also available separately, 30m (approx) **£13.45**. Also braided tow cord (approx. 500m reel) **£10.65**.

GLIDER TOW HOOKS. Pre-shaped, ready to fix. Small 50p (pkt 10); Large 63p (pkt 10) and special hi-duty type for large models 80p. **FLAT BRASS TUBE & STEEL STRIP.** Specially made for high strength, positively locating wing joiners, in matching sizes. All 1 metre length (approx.). Brass tube 10mm bore **£1.50**, 12mm **£1.65**, 14mm **£1.76**. Steel strip 10mm **£1.55**, 12mm **£1.55**, 14mm **£1.60**.

S A M S

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Europes leading specialist in Indoor Flying Materials now offering outdoor free flight goodies.....

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Green Label Film (Semi Slack) £3.15
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MX Cement fast £1.57
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Rubber Lube MX £1.12
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Pre-bent Prop Shafts 0.026 x 2" (4) 26p
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Magnesium Strip (to make bearings) 18" . £1.52
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Dual Bearing R/H (Easy Bee) 89p
Prop shaft wire either size 18" 45p
0.08, 0.09, 0.10, 0.12, 0.13+, 0.14, 0.15.
Plastic nose buttons 1/32 (5) .. 53p
Plastic nose buttons 3/64 (5) ...53p
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Flying Scale Washers 0.32 id £1.43
Brass Washers 72p
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Glue Gun (Great for Cyano) £3.54
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Tungsten Wire 0.001 (25') £1.51
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3/16, 1/4" 20' Length £1.45
MM sizes can also be provided.
Hank of Pirelli Rubber 1/2 Kilo approx. £10.75
Hank of F.A.I. Rubber 1lb. Box approx. £11.21

TISSUE
New Jap MX or equiv. 12" x 18" 0.032oz. per 100sq ins. Red, Orange, Yellow, White, Green, Blue. 25p sheet
Old Jap, MX, 0.030oz. per 100sq in. White, Yellow, Orange. Grain can be seen like old time tissue. 18" sq. 53p per sheet.
Early Bird Tissue. Looks like old doped linin. 0.029oz. per 100sq ins. 53p per sheet.

PECK POLYMER or equiv. Tissue 20" x 30" Black, Red, Orange, Silver Grey, White, Dark Yellow, Light Yellow, Green, Blue. 25p per sheet.

Easy Bee Indoor Kit £3.35
Parlor Mite Kit (3) (Indoor) £6.24

PEANUT KITS
MX Indoor Piper Cub 13" ..£3.99
MX Indoor Piper Vagabond .£3.99
MX Indoor Stinson 125 ..... £3.99
MX Outdoor Peanut Cub £3.99
MX Outdoot Vagabond £3.99
MX Outdoor Stinson 125 .. £3.99
MX Semi Scale Kits for rubber or Co2.
Stinson Voyager 22" £5.25
Taylorcraft 22" £5.25
PC-6 Turbo Porter 22" £5.25

PECK POLYMER PEANUT KITS
Pietenpol Air Camper 13" £5.49
Miles M18 12" £5.49
Druine Turbulent 12" £5.49
Clipped Piper 33 Cub 13" £5.49
Andreason BA4-B 12" £5.49
Nesmith Cougar 13" £5.49
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Zero 13" £5.25
Gypsy Moth 13" £5.49
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LEE HOBBY PEANUT KITS ALL 13"
Halberstadt D-11 ..... £3.95
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Lusac 11 ..... £3.95
Hanza-Brandenberg D-1 .....£3.95
Albatros D-11 ..... £3.95
Austin Ball A.F.B.1 ..... £3.95
Bristol Scout £3.95
Avro 504K £3.95
Fokker Do-1 ..... £3.95
Dornier D-1 ..... £3.95

NON-PEANUT KITS
Baby Ace (Rubber or Co2) 17 1/2" £5.99
Peck R.O.G. Ideal 1st Model £1.75
Prairie Bird (Rubber) 16" ...£5.49
One Nite 16 16" £5.49
One Nite 28 28" (P-30) £6.41
Stringless Wonder £4.56

PECK POLYMER PLASTIC PROPS
4 1/2" Rubber 18p
6" Rubber 23p
7" Rubber 27p
8" Rubber 32p
9 1/2" Rubber 46p

SLEEK STREAK (NORTH PACIFIC PROPS)
4" Rubber 23p
5 1/2" Rubber 23p
5 1/2" Inc. Bearing & mount 27p

KAYSUN PROPS (RUBBER)
4" 23p
5" 26p

WILLIAMS BROS./BROWN Co2 props
5 1/2" Rubber 36p
5 1/2" Co2 for Brown or Telco 36p
4 1/2" Co2 for Brown A-23

PECK PROP SHAFTS DIAMOND HOOK — PACK 5
2 1/2 x 1/32 ..... 45p
2 1/2 x 3/64 ..... 63p
6 x 3/64 ..... 90p

PECK PROP SHAFTS ROUND HOOK — PACK 5
1 1/2 x 1/32 ..... 40p
2 1/2 x 1/32 ..... 63p
3 1/2 x 3/64 ..... 63p

PECK NYLON NOSE BEARINGS PACK 4
1/32 Dia. Shaft 63p
3/64 Dia. Shaft 72p

BALL BEARING THRUST RACES
.045 (18swg) Hole 45p
.062 (1/16) Hole 45p

PECK POLYMER WHEELS
Black Balsa 5/8 Dia. Pair 25p
Black Plastic 1 1/16 Pair 23p
Black Plastic 3/4 Pair 45p

CLEAR PLASTIC VINTAGE
3/4" Pair 83p
1" Pair 96p
1 3/16" Pair £1.25
1 1/2" Pair £1.50

FULTON HUNGERFORD
Silk spoked ultra light wheels 3lb. loading. All same price £7.95*
Specify size.
1/2" x 1/16
5/8" x 1/16
7/8" x 3/16"
1" x 1/8"
1" x 3/16
1 1/8" x 1/8"
1 1/4" x 1/4"
1 1/2 x 3/16
1 1/2" x 1/4"

BROWN Co2 MOTORS
Campus A-23 Micro Co2 Motor £41.49*
Brown single Co2 Motor £38.17*
Brown Twin Co2 Motor . £52.29*
Charger (needed for any of the above) £10.75
2cc Tank for Co2 ..... £6.00*
3cc Tank for Co2 ..... £6.25*
6cc Co2 Tank £7.89*
10cc Co2 Tank £10.17*
20cc Co2 Tank £13.08*

Some Brown spares are available from stock, prices on application.

Copper tube for Co2 Motors per ft. £2.07
Clear Acetate sheet, very thin and light 27p
Woodprime (use as cyano preparation) £3.25
Sharpy, use to hone dull blades £1.75

AMBROID GLUE
Fast dry non-shrink free-running
Small 61p
Medium 85p
Large £1.25
Carbon Fibre Tows 3.000 Fil 12m £1.00
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Peck Polymer Rubber Packs 16ft.
1/16" £1.25
3/32 ..... £1.25
1/8" £1.25

BOOKS
Peanut Power £6.38
Indoor Scale Model Flying ..£4.57
Flying Scale Models of WW2 inc. 12 Plans £6.95
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Peanut Itoh Eaglett £1.36
Peanut Stinson Voyager £1.60
Flappin Fly Ornithopter £1.89
Flip-Flop Ornithopter £1.12

Walt Mooney Bag of Peanut Plans. Each bag contains approx. 14 plus hints and tips — all bags are £4.98

Bag 1: Gee Bee, Vagabond, P-6 Porter, Mr. Mulligan, Mayers, Andreason, Cold, Phokker, Druine, Pawnee, Ord-Hume, Huntington H-12, Laird, Fokker V-23, De Havilland DH6.

Bag 2: S.E.5, Speed Spitfire, Microplano Veloz, DH6, Miles Sparrowhawk, Renard R-17, Jungman, Volksplane VP2, Ford Flivver, Monocoupe, Culver Dart, Wickner Wicko, Waca SRE, Wittman V, Stahlwerk.

Bag 3: Bleriot 1V, Robin HR 100 Tiara, Bell XFL-1, Airobonita, 01 Ironsides, 1918 Hargt Monoplane, Avions Paul Arbert PA-20, Ole Tiger, Found FBA-2-A, Douglas Skyraider, B.A.T. Baboon, Davis DA-5A, Avero 536 C Racing Baby, Castaibert 1V, Lockheed — Little Dipper.

Bag 4: Impanema, Chiribiri, Siemens-Schuckert, Bellanca, Udet U-12a, Nakajima K-127a, Hanriot, Ophelia Bumps, Gloster Gannet, Bristol & Colonial MC1, Revere Speedster, Back Bay Ballanca and two others.

PEANUT AND FREE-FLIGHT PLANS — ALL £1.36 each
Sopwith Tabloid 21", Bristol Brownie 23", Avro 560 Ultralight 18", 1957 Waterman Aerobile 21", Sperry Monoplane Parasol 20", Osprey 18", Westland Widgeon 24", Vickers Bleriot 22", Caudron G3 1914 16", Fairchild-24C — B 20 3/4", Nieuport 15 3/4", Sam the Fleeing Fly (Helo), Ye Olde Twin Pusher 19", Manta Ray (Ornithopter) 19", Sommer Monoplane 16", 1909 Antionette 23", Kirby Cadet 30", Bleriot Canard 15", Deperdussin 14 3/4", Blackburn All Steel 21 1/2", The Soda Cracker, The Cutie Canard 21", Pietenpol Air Camper 16", Caudron G3 1914 Co2 16", 1911 Borel-Morane Mono 13", Paper Glider Co2 11", Farman F170 Jabiru 12", Opel Sander Rac 1 13", 1912 Breguet G3 18", Bristol Scout D, Farman Moustique 13", Waco SRE 13", Farman-Farman 13", Hungerford Trimotor, Flying Aces Fortress, Avro G. 15 1/2", Jodel Mascaret 12", Evans Volksplane 12", Whitmans Bonzo Racer 13", Fokker F2 13", Alco Sportplane 13", Demoiselle 10 3/4", Waterman Racer 12 3/4", Druine Turbulent 13", Miles M18 14", Pilatus-Turbo Porter 13", Douglas Skyraider 13", Pitts Special 12 3/8", Wright Model L 12", General Aristocrat 12", Farman 13", Tyro — Gyro Autogyro 13", Gyrette Indoor Autogyro 16 1/2", Little Juan Autogyro (0.049).

ANDREW MOORHOUSE PEANUT KITS
Currie Wot £3.00
Wittman Tailwind £3.00
Luton Minor £2.70
Comper Swift £2.70
For Co2
Puffin £4.80
Scram £4.80
Micro X 3 Views all 45p each
Piper Cub J3 P-6 Turbo Porter
Piper Vagabond Sopwith Triplane
Waco Biplane Bristol Scout
Indoor Balsa. Ultra £1.32. MX 67p per sheet. Size 18" x 1/8"
C grain 0.008 to 0 036 in 1 thou rises
C grain 0.060 to 0.095 in 1 thou rises
B grain 0.020 to 0.034 in 1 thou rises
B grain 0.065 to 0.095 in 1 thou rises
4, 4 1/2, 5, 5 1/2 lb. Please specify.

PECK POLYMER BALSA STRIP
1/20" x 3/32" 25p (10)
1/20" x 1/8" 25p (10)
1/16" x 1/8" 25p (10)
3/32" x 3/32" 21p (5)
3/32" x 3/16" 21p (10)
1/8" x 1/4" 21p (10)
Sheet ..... each 21p
1/40" and 1/20"
Sams C Grain balsa is now available in a large number of sizes and thickness, send for our mail order list for all the details.

Basswood all 52p per pack

0.012 x 1/32" .(6) 1/32" x 1/32" .(5)
0.012 x 3/64" (6) 1/32" x 3/64" .(5)
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0.020 x 1/32" .(6) 3/64" x 3/64" .(5)
0.020 x 3/64" .(6) 1/16" x 1/16" .(5)
0.020 x 1/16" .(5) Bamboo (Round) (4) Birch Dowl 1/16" x 6" 8p
20 swg plastic nose button ... 10p
18 swg plastic nose button ... 10p
18 swg plastic nose button threaded 20p
20 swg Cup washer 2p
18 swg Cup washer 2p
16 swg Cup washer 2p
14 swg Cup washer 2p
16 swg brass threaded nose bush 15p
18 swg brass threaded nose bush (4) 43p
P.P. Designers Kit small £1.75

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For unlimited and Wakefield
2" long, 1/4" wide, 1/2" Thick.
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1 5/8" long, 7/16" wide, 3/8" thick any size £2.25

Front End Assay
2mm for Wakefield and Unlimited
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Either size £3.81

Shaft Bushing Hard Alloy
Large 3/8" machined face with 1" shank Hole size 2mm or 1/16"
Either size 85p
Thrust Bearing 8 1/16" balls, bronze faces 1/16" 2mm 3/32"
Either size £2.25
Alloy Bobbins 1/8", 3/4", 3/8" ... 45p
Either size.
Thrust bearing races 1/16" or 0.45 45p each size
LI'L Eaglet 14" HLG £3.54
Eaglet 18" HLG £3.99
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POSTAGE RATES
UK – please add 20% to order total for 1st class mail or 15% for second. Europe – please add 20% to order total, plus £1 for overseas excess. Other – please add 20% to order total, plus £3 for overseas excess.
Items marked thus are sent for 50p plus and excess needed.

While we make efforts to maintain full stocks, any item not sent in the initial delivery will be sent on by 1st class post as soon as we receive it, unless rebate for non-available items is requested at the time of ordering.

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The passing of three Pioneers . . .

C. Rupert Moore, ARCA, FMGP, Companion RAeS

There was a time, in fact for over a decade, when the character identity of AEROMODELLER was established by its front cover paintings. They were halcyon days, now recalled with great fondness by Vintage enthusiasts, although at the time life was actually very much tougher than it is today. Those cover paintings were only one part of C. Rupert Moore's influence of aeromodelling. His innovative rubber driven scale and semi-scale designs are now revered for their unique quality. For this Diamond Jubilee Year of the SMAE, his 40 year old 'Jackdaw' was selected by SAM 35 as the perfect choice for a one-design contest on Vintage Day at Old Warden.

Regrettably Rupert did not live to see the event as he succumbed to a heart attack just a few days short of his 78th birthday. The world will be all the poorer for his passing, for beyond that stoic exterior which could stop an exuberant critic with one withering quip, there was a heart of gold which encouraged more than one youthful editor along the tree of success.

Aeromodellers knew of him for his art, his authority on camouflage and aircraft colours, his designs and inventions. There was far more to discover. Aeromodelling was his hobby, taken up from early years at Doncaster where he witnessed those historic flying meetings Claude Graham-White *et al*. His vocation which took him to the Royal Academy of Arts via Sheffield College was to be a designer of stained glass and an expert on heraldry. His windows are to be seen from Lincoln's Inn in London to the Cathedrals of Napier and Auckland in New Zealand, to S. Africa, the USA and Canada. There is one group of windows at Chequers, where each Prime Minister has been honoured with a coat of arms created by Rupert, not always with absolute enthusiasm, for he never made a secret of his views on political leaders!

His greatest pride was in the records he kept on aircraft colours, a dedicated task which took him to privileged visits for study of the 617 Squadron Lancasters, captured Luftwaffe aircraft at Farnborough and to the Fleet Air Arm. He was an advisor to the Science, Imperial War, FAA and RAF Museums. How well we recall his piping voice which penetrated a momentary silence at the opening of the first hangar at Yeovilton with *"They've painted it wrong!"* coming from below the Swordfish. It was unmistakably Rupert Moore, his trilby hat and bright nose joining in protest at some minor but inexcusable inexactitude. His memory lives on, and his standards will never be forgotten. Our deepest sympathies go to his so talented family, Gwen and the sons, Dick, Guy and Moreton in their loss.

Rupert Moore in his study, the Jackdaw and other prototypes alongside some of his innumerable paintings which graced the cover of AEROMODELLER.

Francis G. Boreham

Many modellers, especially those who were active in the 50s and 60s, will be sorry to learn of the sudden death of Francis G. Boreham. Francis specialised in free-flight helicopters and his name will live on as the designer of devices like Sycamore, Hoverfly and Buzzcopter that have featured as Aeromodeller plans over the years.

Over Francis' long life, from hearing, as a youngster, his father read from the paper of Bleriot's Channel crossing through to the first Moon landing around his 70th birthday, he was actively involved with flying, models and fullsize. His rotary wing connections began when he worked with Juan de la Cierva at Hanworth and finished with Bristols and Westland helicopters. His hearing difficulties in later years he often attributed to the flying he did in noisey experimental machines like the Air Horse.

Francis moved back to the Norfolk area a few years ago and his local recreation ground won't seem the same without his test flights of aerial creations varying from helicopter to kite, ornithopter to electric RTP. Many of his models looked very eccentric lash ups but they nearly all passed that acid test — they flew! Francis was as active, mentally and physically, as many modellers 30 years his junior. He will be sorely missed.

Jim King

With very great regret we have to announce the passing of a friend and colleague. Jim King. There can be very few model boaters and model engineers who did not know Jim, either personally or through his written words in the MPBA, Naviga and the modelling press.

For over 30 years he served the model boat fraternity, always aiming to further the cause of all types of model boating, Nationally and Internationally, without bias to any group, regardless of personal opinions.

In the 1930s Jim was keen on, and successful at, road and track cycling. He built his first models, an aircraft and an O Gauge locomotive, in 1928, and since then was very active with model boats and live steam locomotives, plus interests in still and cine photography, railways and shipping, American riverboats and collecting stamps featuring ships.

Jim's working life was spent in the Post Office and immediately following his retirement as Executive Engineer, Telecommunications, in 1975, it was typical of the man that he spent the first six months of his retirement in masterminding the best European Naviga Championship ever, at Welwyn Garden City, in August of that year.

Immediately after this he was snapped up by Model and Allied Publications to take over the organisation of the Model Engineer Exhibition. This task would have daunted many a younger man, but 'King' Jim as he was affectionately known to his many friends, took it all in his stride. During this period, he underwent a major operation, moved house, continued Naviga and MPBA business and managed to write a new monthly column on steam boats for *Model Boats,* in addition to his regular monthly MPBA news slot which has been published for over 13 years.

Apart from all this he was involved with the popular Modellers' Holiday Festivals, and acted as Chief Judge at events in many parts of the world as well as at home.

Jim's second retirement, in 1978, left a little room to pursue his enormous range of activities, particularly into a world-wide organisation. This has now happened and due recognition of Jim's very important role in helping to bring harmony to Naviga was reflected at Duisburg in 1979 when he was elected as one of the two Vice-Presidents of Naviga — a very high honour.

He will be enormously missed throughout the entire world of modelling and his thousands of friends and acquaintances will mourn the passing of this most likeable and enthusiastic man. The sympathy of us all is extended to his family.

British National Championships 1982 August 28-30

RADIO CONTROL — BARKSTON HEATH

Aerobatics — 09.00-—16.00 Sat.; 08.00-12.00 & 16.00-19.00 Sun.; 14.00-15.00 Mon. (Finals).
Club 20 — 10.00-16.00 Sat.; 15.00-19.00 Sun.; 12.00-13.00 Mon. (Finals).
FAI Pylon — 08.00-15.00 Sun.; 08.00-12.00 Mon.; 13.00-14.00 Mon. (Finals).
Helicopter — 16.00-19.00 Sat.; 12.00-16.00 Sun.; 09.00-13.00 Mon.
Scale — 08.00-19.00 Sat. (practice only); 10.00-18.00 Sun.; 10.00-15.30 Mon.
Transmitter checking — 19.00-20.00 Fri.; 07.00-08.00 & 18.30-20.30 Sat.; 07.00-08.00 Sun.; 07.00-08.00 Mon. (helicopters only).

Radio Control Thermal — Cranwell

Open — 08.00-18.00 Sat.
F3B — 08.00-18.00 Sun.
Scale — 08.00-18.00 Sun.
100S — 08.00-17.00 Mon.

Control Line — Barkston Heath

Speed — 10.00-17.00 Sat.; 09.00-17.00 Sun.; 09.00-15.00 Mon.
F2B Aerobatic — 09.00-19.00 Sat.; 09.00-19.00 Sun.; 09.00-11.30 & 12.30-15.30 Mon.

FAI Combat — 10.00-19.00 Sat.; 10.00-19.00 Sun.; 10.00-11.00, 12.00-12.30 & 15.15 Mon. (Final).
½A Combat — 10.00-17.00 Sat.; 10.00-18.00 Sun.; 10.45-11.30 & 14.00 Mon. (Final).
FAI Team Race — 11.00-15.00 Sat.; 15.00-18.30 Sun.; 10.00-10.45, 13.00-13.45 & 15.30 Mon. (Final).
Class 'B' T/R — Times depend on entry.
Goodyear — 15.00-18.30 Sat.; 08-00-11.30 Sun.; 11.30-12.15 & 14.20 (Novice Final) & 14.40 (Final) Mon.
½ T/R — 08.00-11.30 Sat.; 11.30-14.30 Sun.; 10.45-11.30 & 14.00 (Final) Mon.
Open Carrier — 12.00-18.00 Sat.; 12.00-18.00 Sun; 09.00-14.00 Mon.
Mini-Goodyear, Novice Aerobatic, Junior Aerobatic and Profile Carrier Events will be held on Saturday and Sunday. Field entry on Saturday. No registration fee.

FREE FLIGHT SCALE — BARKSTON HEATH

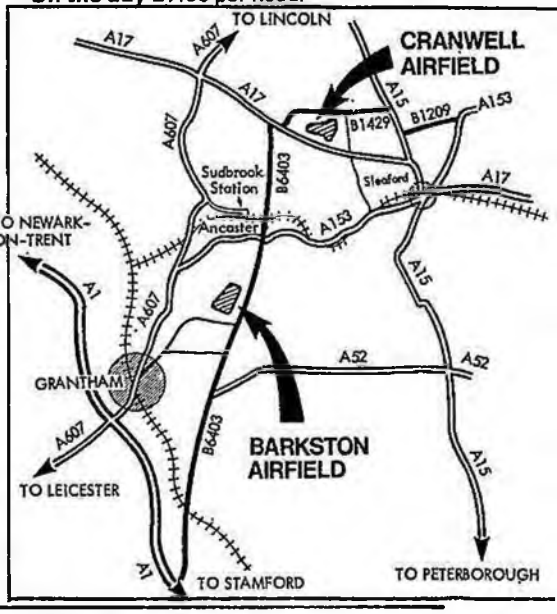
Superscale — 18.30-20.30 Sat. OR 07.00-09.00 Sun.
18.30-20.30 Sun. OR 07.00-09.00 Mon.
Static judging on Sunday and Monday from 10.00.
Open Rubber Scale — as above.

CONTROL LINE SCALE — BARKSTON HEATH

Superscale — 10.00-13.00 Sun. OR 16.00-19.00 Sun. OR 10.00-13.00 Mon.
Static judging Sunday and/or Monday from 13.00.

CAMPING — BARKSTON HEATH

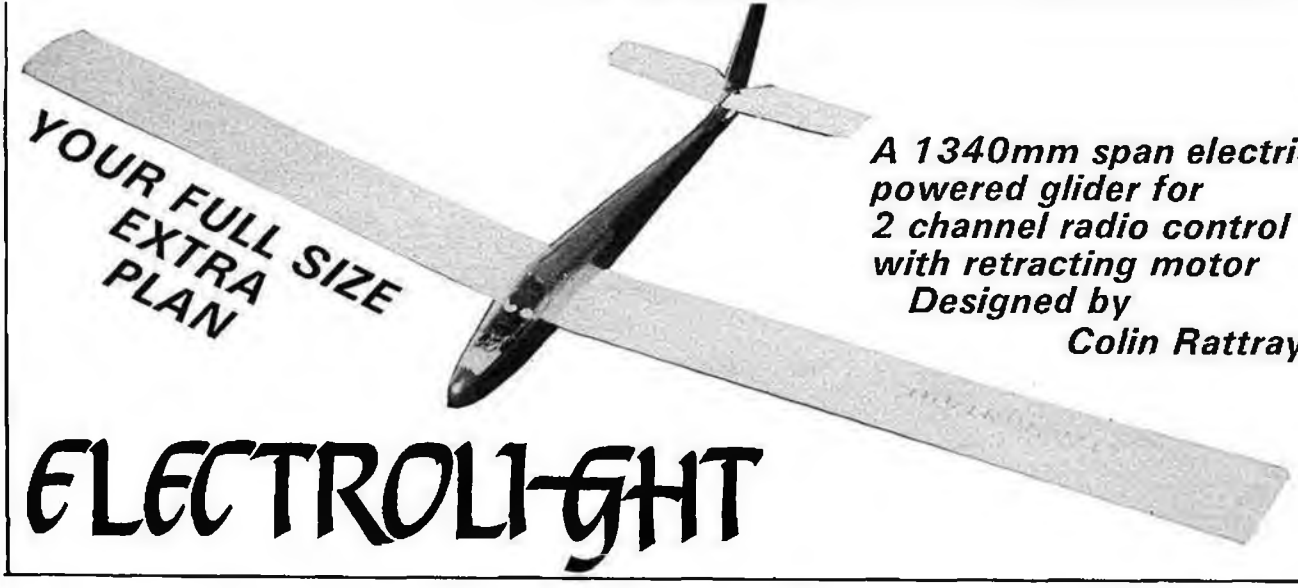
Advance booking for the weekend: £4.50 competitors; £6.00 supporters.
On the day £7.00 per head.



What's Happening?

August 28
R/C and C/L Nationals, RAF Barkston Heath, Lincs.
August 28/29
INDOOR NATIONALS, *CO_2 DURATION FINAL PLUS 35cm MICROFILM, EZB FINAL ROUND OF EXPERT NOVICE PAIRS CONTEST, PLUS INDIVIDUAL CONTEST FOR HOULBERG SILVER TROPHY, FA1, F1D MICROFILM FOR AEROMODELLER TROPHY, OPEN MICROFILM (FLIGHTS FOR THIS AND ANY OTHER CONTEST ELIGIBLE FOR HUMBROL LONGEST FLIGHT SILVER PLATE).* Venue: Cardington. Contact: L. Barr. Tel: 0628 25595.
August 29
IRISH CLUB 20 NATS. Venue to be announced. Contact: K. Townend, Beechwood, Church Lane, Greystones, Co. Wicklow.
September 5
SMAE 5TH AREA CENTRALISED. *TEAM POWER – KEIL TROPHY + PLUGGE PTS. F1B – GUTTERIDGE TROPHY + A1 – Area Venues.*
September 5
AUTUMN MODEL AIRCRAFT RALLY & FLY IN — Best All-round Model, Best Scale Model, Best Sports Model, Best Biplane, Best Helicopter, Best Multi-engined Model, 'Tree Tops' award. Venue: Holker Hall and Park, Cark-in-Cartmell, Grangeover Sands, Cumbria. Contact Tel: (044-853) 328.
September 5
SMAE NORTHERN AREA *SCALE DAY SEMI COMPETITIVE ONLY.* Venue: Church Fenton. SMAE members only. Contact: D. Kerswell. Tel: 0653 2580.
September 5
PETERBOROUGH MFC COMPETITION *4TH ROUND CLASS A BRITISH DIESEL COMBAT CHAMPS.* Venue: Peterborough Embankment. Contact: Brian Waterland. Tel: Market Deeping 343722.
September 5
SMAE SOUTHERN AREA *ROARING TWENTIES NOVELTY FLY IN AT BEAULIEU (FIREBUDS).* Anything goes if they did it in the 1920s. Contact: Pete Willis, 72 Witt Road, Fair Oak, Eastleigh, Hants. Tel: Eastleigh 695111.
September 11
ULSTER C/L CHAMPS Venue Nutts Corner, Co. Antrim. Contact: J. Molloy, 57 Auburn Road, Dun Ladre, Co. Dublin.
September 11/12
IRISH RADIO CONTROL NATIONALS. Venue to be announced. Contact K. Townend, Beechwood, Church Lane, Grestones, Co. Wicklow.
September 12
SMAE SOUTHERN AREA *OPEN R/C GLIDER TO BARCS RULES (BASINGSTOKE).* Pre-entry required. Contact: C. Learwood, 19 Derwent Road, Basingstoke, Hants.
September 12
SMAE NORTHERN GALA *C/L, ½A, FAI, C/L B, O/G – CMA CUP, O/R – CATON TROPHY, O/P – HAMLEY TROPHY PLUS A1, CD'H, AND VINTAGE. PLUS OTHER NON SMAE TROPHY EVENTS FOR R/C.* Jointly organised by Northern and North Western Areas, SMAE members only. Venue: Church Fenton. Contact: D. Kerswell. Tel: 0653 2580.
September 12
INDOOR Venue: Cardington. Contact: L. Bart. Tel: 0628 25595. Programme to be announced.
September 18/19
1ST FREE FLIGHT TRIALS *F1A, F1B, F1C* — 10.00am start. Venue: Barkston Heath.
September 19
2ND ELLIOTT RALLY *FAI TEAMRACE, 'B' TEAMRACE, GOODYEAR TEAMRACE, CARRIER, AEROBATICS, SPEED.* Venue: Marconi Avionics, Rochester, Kent. Contact: Peter O'Neill, Tel: Sevenoaks 57899.
September 25
SMAE SOUTHERN AREA *INDOOR FLYING AT COLLEGE OF FURTHER EDUCATION, SOUTHAMPTON.* Gym shoes must be worn. Contact: Howard Metcalf, Brook Cottage, Winters Hill, Durley, Hants. Tel: Durley 447.
September 26
SMAE 6TH AREA CENTRALISED *TEAM RUBBER – FARRON SHIELD + PLUGGE POINTS. F1A – SMAE CUP + ½A POWER.* Area venues.
September 26
SMAE SOUTHERN AREA *CLUB 20 FLY-IN AT BOURNEMOUTH* (PHOENIX). Contact: Roger Webber, 88 Farnham Road, Poole, Dorset.
September 26
SMAE SOUTHERN AREA, *CENTRALISED F/F & TEAM R, ½A, F1A, P.30.* Contact: Barbara Tyson, 19 Wilverly Avenue, Strooden Park, Bournemouth, BH8 0HT.
October 3
SMAE SOUTH MIDLAND AREA VINTAGE RALLY *R/C ASSIST, C/L F/F.* SMAE members only. Venue: Henlow. 50p per head, 10p entry. Contact: R. Truelove, Tel: 049481 5300.
October 3
SMAE SOUTHERN GALA *O/P – SHORT CUP, O/R – FLIGHT CUP, O/G – PILCHER CUP, ½A POWER – QUICK-START TROPHY, CD'H, HLG + C/L.* SMAE members only. Venue: Odiham. Contact: Norman Couling, 7 The Green Walk, Wilingdon, Eastbourne, E. Sussex BN22 0RB.
October 10
Dave Bishop of DB Sound and John Blackman of GB R/C AA *MODEL RADIO CONTROLLED SHOW* – Many well-known display teams plus Pete Neate's Junkers 52, Roy Scott's B-17 Junkers 88, BeeGee Racer, World Famous Dutch Pulse Jets. Venue: Plumpton Racecourse, Nr. Brighton, Sussex.
October 10
14TH TOWNER TROPHY FOR THERMAL SOARING (BARCS RULES). Organised by SE Area, SMAE. Venue: Golden Cross, East Sussex. Contact: N. F. Couling, 7 The Green Walk.
October 10
SMAE SOUTHERN AREA *BEAULIEU FLY FOR FUN.* Contact: Dick Hall, 21 Peak Road, Clanfield, Hants. Tel: Hornean 593048.
October 10
THREE KINGS AEROMODELLERS *ALL SCALE DAY.* Venue: Old Croydon Aerodrome. Contact: Wal Cordwell 01 764 1661.
October 10
NORTHERN AREA MODEL FLYING RALLY *ALL CLASSES F/F, C/L, R/C.* Venue: Church Fenton. SMAE members only. Contact: 0653 2580.
October 16 (Saturday)
WITCHFORD MEETING. F1A, F1B, F1C + A1 GLIDER, Cd'H, ½A Power. FAI classes in rounds, starting 9.30, with two flights completed before midday. See Hangar Doors for further details. Contact: M. Dilly, 20 Links Road, West Wickham, Kent BR4 0QW.
October 17
COTSWOLD RCS END OF SEASON SCALE RALLY TO *SMAE 'STAND-OFF SCALE' RULES. INCLUDES REDIFUSION CLUB 20 SCALE TROPHY.* Venue: Aston Down Airfield on A419 Stroud Cirencester Road. Start 10.30am. £1.50 pre-entry, £2 on the day. SAE to Contact: Mike Whittard, 2 Cotswold Terrace, Nympsfield, Stonehouse, Glos. Tel: Dursley 860793.
October 17
NORTHERN AREA FAI MEETING *F/F FIA, B&C, C/L F2 B&C R/C F3A&B, SCALE CLASS I.* F/F 2 flights before 1pm. Venue: Church Fenton. SMAE members only. Contact: D. Kerswell. Tel: 0653 2580.
October 17
INDOOR Venue: Cardington. Contact: L. Barr, Tel: 0628 25595. Programme to be announced.

YOUR FULL SIZE EXTRA PLAN



A 1340mm span electric powered glider for 2 channel radio control with retracting motor

Designed by Colin Rattray

ELECTROLI-GHT

THE IDEA of a glider with a retractable power plant is not new, in fact some modern full-size gliders are designed this way. There are problems of course; how do you make the propeller stop in the correct position? Should the motor retract and be able to come up again? The small propeller required to fit in the fuselage is less efficient than a large folding type?

Well all these things were considered and the final result was Electrolight. The design objective was to have a clean aerodynamic shape in the glide mode, use 6 500mAh size A.A. quick charge cells, the Astro 020 or similar size motor, and just enough power to gain a height that thermals could be encountered. Well if it has grabbed your interest, how about building one?

Fuselage

Cut out the sides from 2.5mm medium balsa and also the 1mm ply doublers. Lay the fuselage sides with the inner face upwards on your building board and glue the lower 4.5mm square longeron in place with balsa cement. Now fit the ply doublers using PVA white glue and make sure these butt neatly against the side of the lower longeron. Use weight to ensure good contact while the glue sets. The next stage is to steam a slight curve in the sides forward of former F2, making sure both are equal. Cut out formers F1, F2, F3 and F4. Mark the positions of the formers on the fuselage sides, then with the sides inverted on a flat surface, glue F2 in place and at the same time, glue the rear end of the sides together. I used quick setting epoxy for this part, holding the sides against F2 with a clamp and the rear end together with pegs.

When set, fit all the other formers, then steam the sides over the half round top formers. The best way to do this is to hold the area requiring curving over a steaming kettle and use a piece of hard wood to force the sides into a curve. The sides do not cover the top deck completely; this area is completed using 1.5mm sheet balsa. Before completing the bottom sheeting, fit the snake outer casings in place for elevator, rudder and the aerial.

Note the bottom sheeting is cross grain. Before completing the soft block areas of the fuselage, fit the fin in place making sure it is square to the fuselage. The motor doors are made from 1.5mm balsa steamed to shape. I found a few dabs of cyano on the inside of the sheet ensured the doors kept their shape. Use thin nylon hinges along the complete length of each door. Drill the holes for the wing dowel tubes and epoxy brass tubes in place.

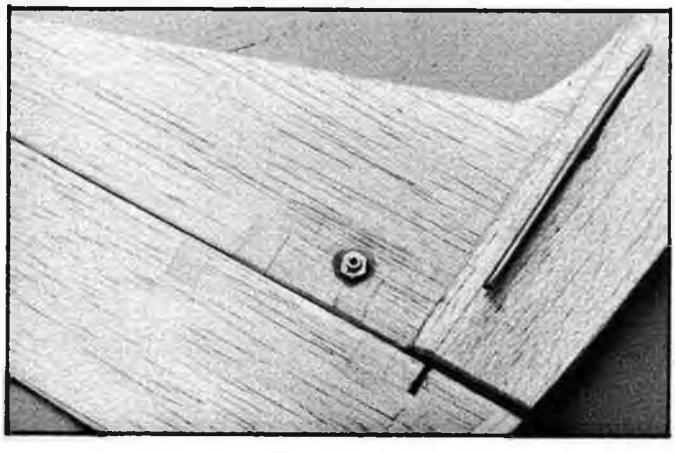
Motor

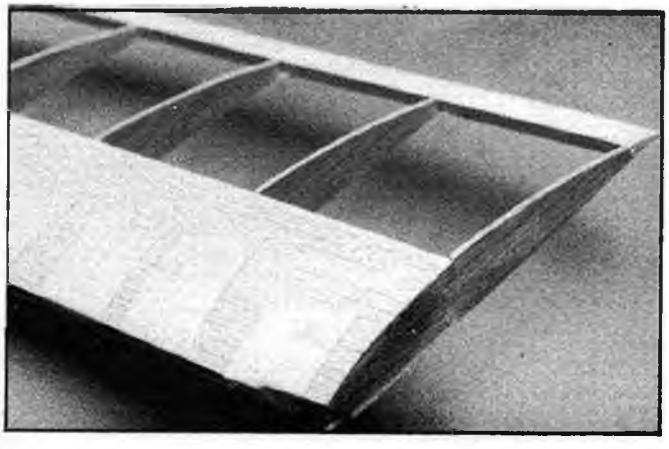
Make the aluminium motor mount as shown on the plan and fit the motor and on-off switch as indicated. The actual fitting of the motor mount, propeller stop bracket/switch activator is best done by a trial dry fitting, as it will vary depending on the motor and size of switch to be used. It is important to ensure that the motor and mount will drop freely into the fuselage when power drops off with enough force to operate the switch to off position.

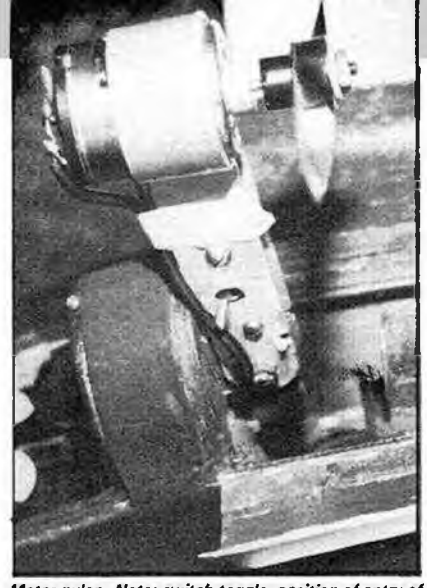
Many ideas were tried to flip the doors in place after the motor retracted and although a little fiddly, the method shown proved the most reliable.

Drill holes into F2 either side of the motor pod pivot point for the battery connecting wires. The wire should be multi-stranded

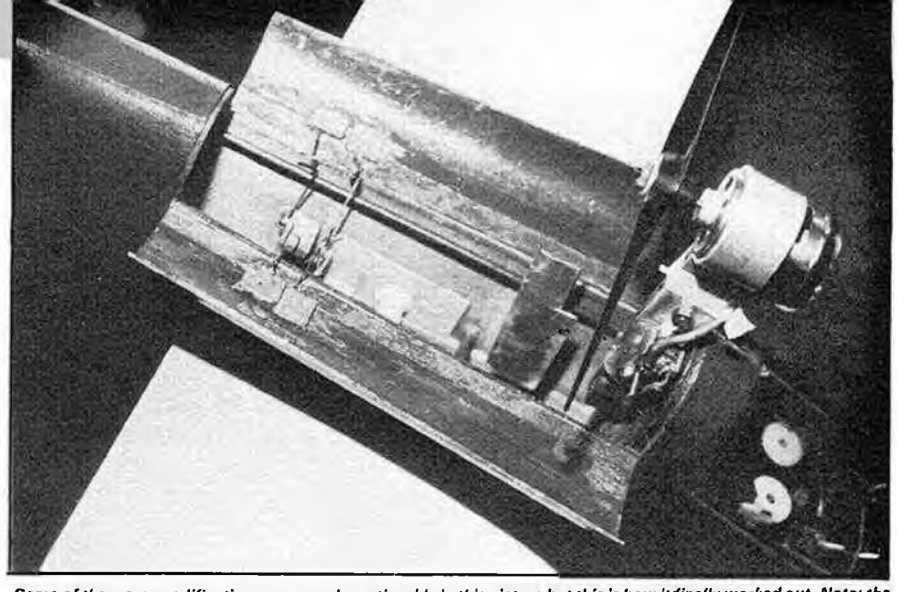
Fin and rudder detail showing tailplane pivot bush, rudder leadout, snake outer casing and slot for rudder horn. Note: tape hinges, old-fahioned but still effective giving very little friction. Use masking tape to hold leading edge sheeting in place while glue sets.







Motor pylon. Note: switch toggle, position of entry of the motor battery lead through F2 and propeller stop/ switch activator.



Some of the many modification scars may be noticeable in this picture but this is how it finally worked out. Note: the position of the snake outer casing, this should be glued to the fuselage side along the length of the door opening.

10amp plastic covered, as flexible as possible. The motor battery pack is made up from individual AA size 500mA vented Nicad cells which have solder tags. Four of the cells fit onto the floor of the fuselage in a cutout about 3mm deep and are held in place with double-sided tape. The other two fit in front of F2 as shown on the plan. A charging socket is not necessary; simply attach crocodile clips to one side of the motor and the line tag of the single pole toggle switch but keep them apart!

Wing

This is very straightforward conventional construction, the only point to watch is fitting the brass tubes for the wing dowels. Place the wings minus the centre and top leading edge sheeting on a flat surface. Locate the brass dowel tubes and two 10swg wire dowels into W2 (W1 fitted after dowels). Note: the dowels for setting the dihedral angle should be less the fuselage width to allow the wings to butt face. Prop up each wing under the tips by 80mm ensuring the dowels remain parallel to the building board. When you are sure everything is accurately set up, epoxy the brass tubes in place.

Tailplane assembly

The tailplane is made from medium soft sheet and only requires the dowel tubes to be epoxied in place. Mark the position on the fin of the tailplane pivot bearing; drill and fit a 16swg thread brass bush. I drilled out a 4BA brass screw, but a rubber propeller shaft brass bush would be ideal. Bolt the bush onto the fin and run a liberal amount of cyano glue around the area each side of the fin. Finally, file the bush and nut down to about 2.5mm from the side of the fin. I still like cloth hinges which I used for the rudder. Make up the top hat wire tailplane joiner and assemble to check alignment with wings, etc. Control horns are fitted after covering.

Finishing

The complete model is covered with heavy-weight tissue and given three coats of clear dope. I sprayed the wings with Humbrol enamel on the top surface only and the fuselage with cellulose, rubbing down between coats.

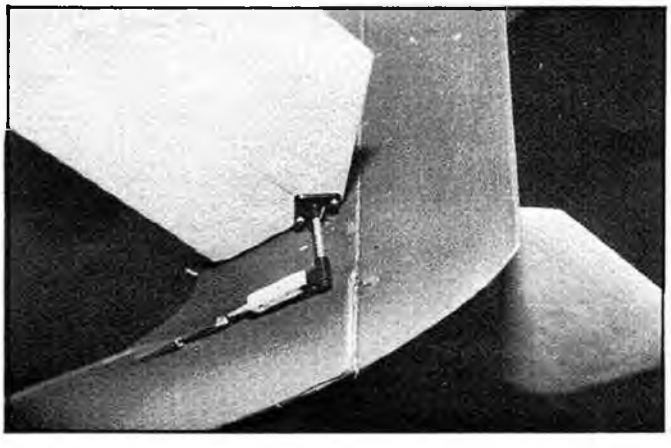
Radio installation

The prototype was fitted with Futaba 2-channel radio with miniature Simprop servos, although there is room for standard size servos to be fitted. A 150mA battery pack was used which gave an all-up radio installation of 4½ozs. The servos are mounted on hardwood bearers which are glued to the fuselage sides. Before doing this I fit all control linkages and adjust the position of the servos to give neutral on rudder and elevator; this ensures that there is plenty of thread on the clevis connectors for adjustments.

Flying

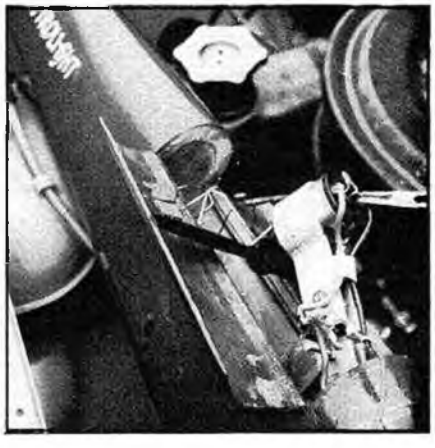
Be sure to make a final check of all control modes and the centre of balance.

The first flight is best made from a slope; this will give ample time to trim the model and avoid a hard landing. This model is designed to fly and will not withstand too many prangs. It is also worthwhile holding the doors and the motor pod in their flying positions by rubber bands, as until trimmed it is difficult to launch the model smoothly enough to avoid premature retraction of the motor. Although a low wing layout, the model is very stable and has a good glide angle. Don't forget you require vented Nicad cells and these should be allowed to completely discharge before recharging. I charge mine for just under 20 minutes at 1½ amps.



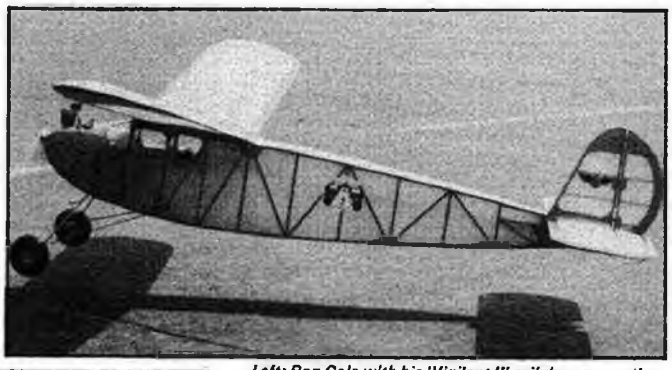
Elevator horn and clevis is available from Micro-Mold. 18swg piano wire was used for the push-pull snake inner with an 8BA screw soldered to the end for connecting to the clevis.

The model is shown here resting inside the bonnet of the car while being charged. Note position of crocodile clips.



Vintage Corner

By Alex Imrie



A four-stroke powered version of 'The Privateer' leaving the ground at Barkston Heath, builder unknown. Original model was designed by Thracy Petrides of the New York Aeronuts and used the immortal Brown Junior engine. Described in Model Airplane News, September, 1938.

Fly for Fun at Nationals

Our editor, Colin Rattray, attended the Nationals at Barkston Heath on May 29/31 and has compiled the following report on what he found in the vintage camp:

"Although SAM 35 ran off some competitions at this meeting the bulk of their action was fly for fun. A completely different atmosphere prevailed amongst the vintage enthusiasts which was in direct contrast to that present in the tense scene on the SMAE competition line were winning was obviously the main criteria. Headed by a shirtless Dave Baker the vintage fellows had great delight and sufficient kick out of the business just to see their creations leave the ground.

There were two main flying groups, one consisting of free flight and the other of radio assist.

At the start of each day there was plenty of crosstalk between modellers as they brought out and assembled their models. It was on one of these occasions that I met up with Vic Dubery. A regular contributor to Aeromodeller in the '50s, and also a member of the 1954 Wakefield team, Vic has only just come back to the hobby, having been seduced away for some years by fullsize power and glider flying. In fact he told me that 1947 was the last Nats he had attended.

Well he hasn't lost his skills with the long lay-off, as he managed to place fourth in this year's SMAE Vintage contest against the strong opposition, flying a 1936 Wakefield winner designed by Bert Judge. Not only was Bert's design to be seen in number but he was also on the field timing flights for the vintage flyers — how about competing yourself next year Bert?

Perhaps the most impressive models to be seen were the two large Valkyries built by Mr. and Mrs. Jack Humphries. Jack is another modeller who has recently made a come-back and he told me how it happened. His wife apparently found a photograph of him with a model and didn't believe he had made it! So Jack set to work to prove the point. The end result was, that she also became hooked and in fact built her Valkyrie before Jack's!

Jack also had recently made two compressed air motors and these attracted the attention of Peter Martin, who has made a trophy for this class of model which he is presenting to SAM 35.

Peter works at Birmingham University and described how he had given the students a project of constructing a compressed air tank from aluminium beer cans. Apparently with epoxy joints, the tank will take up to 120psi before the epoxy joints break. Perhaps next year we will see some models contending for Peter's Trophy.

Another interesting item made by Phil Cox was an electronic ignition system, still in a bread-board state but Phil hopes to produce a few for friends and maybe commercially if things work out O.K. Phil also had a range of beautifully built home-made engines, the smallest being only .02cc!

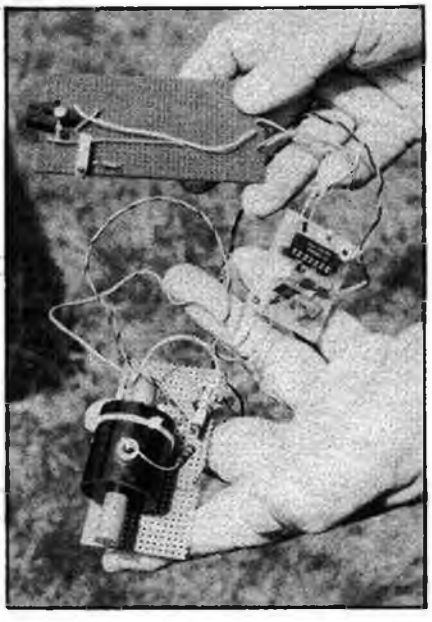
Left: Reg Cole with his 'Vigilant II' sailplane, a one time holder of the British Class B (FAI) record at 11 minutes 32.1 seconds. Reg built this machine from plans in 'The Model Aeronautical Digest' 1944. Below: Beautifully finished KGS by John Wilding of Walsall. OS/30 powered Futaba radio operating an all moving stabiliser plus rudder and throttle. This Henry Stuck design was originally described in 'Model Airplane News' February/March 1940 and could use engines from Ohlsson 23 to Brown Junior.

Below: Bread board state of Phil Cox's electronic ignition, now being improved upon and should be in use soon.

I came across Cliff Billington early Sunday morning assembling a range of true Vintage replicas which included an elliptical dihedral power model designed by Leon Shulman in 1938 Cliff said he had been put off building the model for some years due to the elliptical dihedral, but in fact it proved to be an easy task. He placed two books on the centre section with the tips supported and let the doped covering do the job. There were endless tips and stories of past events to be heard amongst the group, which I will save for another day.

Although the radio assisted vintage competition was not an official event, it attracted a lot of competitors. The object was for each flyer (who was given an 8 minute slot) to get the longest duration with the shortest engine run. The processing of the marks included a formula to give a balance between high and low power-to-weight ratio models. In the event, no one seemed to mind who won that much, the object was to enjoy the flying. A model that interested me very much was a Manx Monarch built by Richard Philips. A perspective drawing of this model was published in the June issue of Aeromodeller. Richard had fitted elevons and rudder control with a Fox 40 up front. Unfortunately the wind was a bit strong for its maiden flight, so as soon as you get it going Richard, let me know how it flies.

Although the wind was a bit strong on



Left: Mario Gandolfi with his Eta 5 powered Cloud Airmaster, and all-weather performer at most of our meetings. Below right: Dave Baker (the shirtless one) helping Peter Michel to tie a broken strand in the motor of his Liberty, designed by Denmark's John M. Larsen.

Above: Jack Humphries decided to cover the structural beauty shown in our July column with the result seen here. Below: Vic Dubery putting on the turns on his 'Condor Clipper', note winding tube, spectacles at the ready and prop in mouth!

occasions the weather stayed hot and sunny for the whole three days and the good turn out of models and modellers combined to make this one of the best Nationals for Vintage enthusiasts for some years."

Balsa Wood

The introduction of balsa wood as a modelling material in this country, in the 30s brought about major changes in the hobby, and it is thought that a brief look at the extent of these may be of interest especially to the younger reader.

Models of flying machines had been built since before the turn of the century, and these were mainly stick or spar models made from wire, spruce, birch and three-ply wood covered with silk often of the oiled variety applied without the benefit of dope. One of the most popular designs to establish itself was the 'A' frame twin-pusher, which, being a canard or tail-first machine gave excellent flights even in the hands of a novice. As late as 1926 it was quite common to see modellers turn up at Hendon aerodrome or Wimbledon Common with a twin-pusher under one arm and an egg-whisk converted into a double motor winder under the other.

At this time it was unusual to have models with enclosed fuselages, if such a model managed to fly for more than 15 seconds it was considered to be a pretty 'hot-stuff' machine. By careful use of the existing materials and cunning construction, during the late 20s, some modellers were able to reduce the weight of their machines and in consequence increase the length of their durations.

In the USA modellers were making increasing use of a very light wood from Central and South America that had been introduced into industry in the United States as early as 1911, Francis A. Collins writing at this time in 'The Second Boy's Book of Model Aeroplanes' states: "In a search for strong, light wood the builders of aeroplanes have searched the tropics. One of their discoveries has been balsic wood, which is of a feather weight. It is exceedingly soft and easily worked, but has the drawback of being rather pithy and easily split. A severe jar is likely to discover some weak point. It will be found valuable, however, for the shorter members of the model. Some model builders use balsic wood as a filling for hollow sticks. The wood may be strengthened by covering with cloth glued firmly about it. It is also used as a filling for thin aluminium tubing."

This wood had been used by the ancient Incas and Indians for making extremely buoyant sea-going rafts and they had named these Balzas. This is the name (Balsa) by which the Ochromo trees Lagopus and Piscatoria are commonly known. The best grade came from Ecuador, where, in tropical swamplands the trees grew to a height of 36ft. in a very few years, it was this rapid growth that gave the wood a peculiar cellular structure resulting in extreme lightness.

'Searching the tropics' mentioned above conjures up visions of a scientific approach by model builders discovering the presence of balsa, this it not true, and its introduction into the hobby was purely accidental. One of the most skilfull builders of the New York Model Aero Club, John Caresi was working near the Long Island City Docks in 1911 when he happened to see a worker in a boat factory chopping very large chips of wood from a log with his axe. On closer investigation Caresi found that this wood was soft and extremely light in weight. He asked for a sample and was given a log about the size of a railway sleeper. Caresi easily carried this away on his shoulder, much to the surprise of onlookers who doubtless thought that he was advertising some strong man act. It is said that wood from this log was the first balsa used in model aircraft construction.

During the 20s all-balsa models were becoming common in the United States where fuselage type designs now began to appear, these being known as commercial models, although they were not scale model aircraft they at least bore more resemblance to fullsize machines than did the previous spar tractors and twin-pushers. These models were covered with tissue paper, the best grades of which originated in Japan, and soon began to put up remarkable performances.

These duration times were treated with disbelief by some British modellers, and the bulk of them hung onto birch, spruce, three-ply and silk. The major part of the blame for the slow transition to balsa wood in this country lay with the reluctance of the model supply houses to accept this new

Above: Tony Froggatt readies his Webra 40 engined Powerhouse made from one of the vintage kits currently available. The plan for his Ethereal Lady in the foreground, designed by Vic Smeed is available from the MAP Plans Service Code PET/291, this model was originally described in these pages 34 years ago, (Aeromodeller, June 1948)! Right: Cliff Billington with his Ohlsson 60 powered New Ruler, a 74in. span beautifully designed by Henry Stuck, that was described in the April 1940 issue of Air Trails.

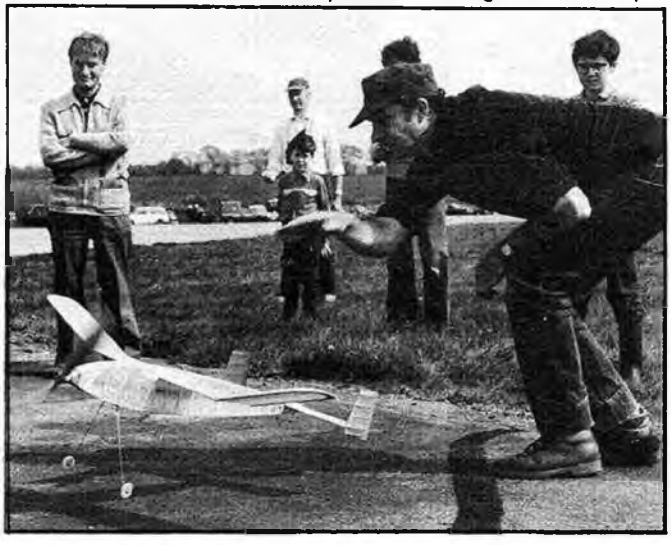
material, it was, they said, 'completely unsuitble for our climate!' James Pelly-Fry (now Group Captain, DSO, RAF, Rtd.) was a leading modeller at this time and was consistently obtaining flights of 40 seconds duration with an 'under three ounce' model made of conventional materials, and he has kindly related the story of his first encounter with balsa wood. One day in 1928 he was in A. E. Jones' shop in New Oxford Street when: "Mr. Jones opened a drawer under the counter, produced an object, and threw it on the counter with a disdainful 'Have a look at this bit of rubbish that has just arrived from America'. I asked him what it was, having picked it up and noting that it was very light and had a soft, satin-like feeling, the object by the way, was something like 8in. × 2in. × 1in. 'Balsa wood' said Mr. Jones, 'It's supposed to be good for model aeroplanes, but who in their right senses would use such soft stuff?' I tentatively asked him if I could take that bit of balsa away, to experiment with. 'Of course,' he said, 'no good to me, keep it'."

Pelly-Fry used this balsa first for wheel and tail cone fairings on his low wing model 'Heron' and he later wrote:

"Well, I tried the wood myself, found that it worked very well, and becoming more confident, used it more and more. Still it held together, and my durations were improving a lot. After a while others who had been working on parallel lines got the same results. But do you think we could convince the rest of the merits of balsa wood construction? Not we! Well, the inevitable happened, as I guessed it would sooner or later. The Americans came over here in 1930 to compete for the Wakefield Cup, produced their balsa and tissue paper models once again and ended up by walking off with the first place to the tune of 155 seconds ROG. That made us sit up and take notice. So much so, in fact, that I am quite sure that it was the loss of the Wakefield Cup that year (1930) that really convinced the English aero-modellists that there was something in balsa wood after all."

Despite this, a leading British model aeroplane authority writing in a 1931 handbook stated: "The lightest known wood is balsa which weighs only 7½lb. per cu. ft., about half the weight of cork. Unfortunately it has no strength and can only be

Left: James Pelly-Fry releasing his low wing 'Flamingo' possibly at RAF Halton in 1930. The official SMAE timekeeper, Richard Langley can be seen in the background with pipe, stopwatch and beret! This model and its immediate forerunner, the Heron, used some of that very first piece of balsa mentioned in the text. Below left: SMAE Vintage winner Gerry Ferer with his Lanzo Stick Class D. Below right: Mike Komp gets his Swedish Blomgren Wakefield away on a nice ROG at the Odiham meeting in April.



used for unimportant parts."

Although composite construction was to be common for some years, an increase in the number of models made from balsa was noticeable from 1932 and some three years later all-balsa machines were the rule rather than the exception with rubber-driven designs. Power models were by this time beginning to emerge and for a number of years the diehards were able to press the use of the old materials for many parts of these large petrol-engined models. Then eventually the Americans showed us that all balsa, tissue covered power models were perfectly feasible and British modellers were not slow to 'take the hint' and abandoned their birch, spruce and plywood structures, only resorting to the use of hardwood for engine bulkheads, motor mounts or very occasional main spars.

Nowadays new materials are being accepted whose advantages in some cases actually outweigh the once revolutionary balsa wood, but it is not considered that these will make much impact on the vintage scene.

VINTAGE REVIVAL

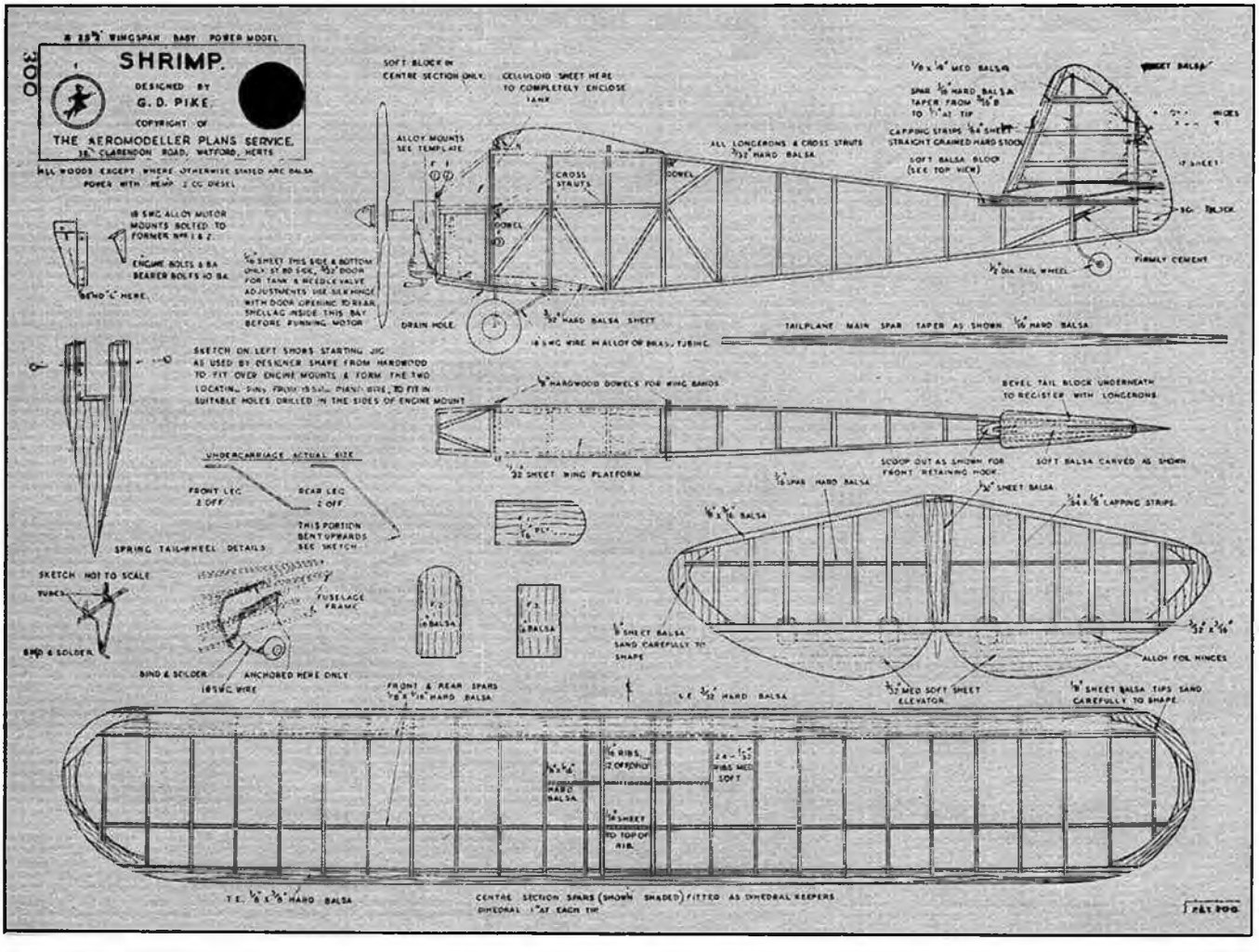
"The Shrimp"

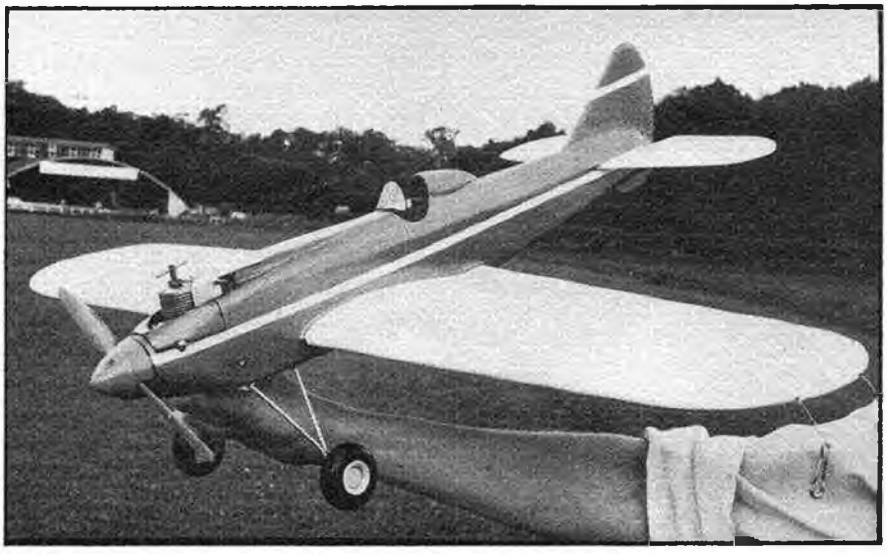
Designed by G. A. Pike (1948)

THIS GOOD LOOKING 25½in. span cabin model was first published in Aeromodeller September 1948. Designed around the Kemp 0.2cc diesel a popular power unit of the day. The lightweight construction and layout makes it an ideal vintage project for a modern CO_2 motor such as the Telco Turbotank. Construction is straightforward, hard balsa being recommended for the fuselage longerons. A door was fitted, starboard side, to give access to the Kemp diesel tank and throttle, which could be useful if using a standard Telco unit, to give access to the charge nozzle.

There are a few anomalies in relation to the original text and the instructions on the plan. The plan does not state the centre of balance, although the text instructs it should balance at the main spar. We feel this is a little far forward, but as the model is a high wing layout, trimming should not be much of a problem.

The plan number is PET/300X and is priced at £1.50 plus 45p postage and packing from Aeromodeller Plans Service, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts. HP1 1EE.





SPEEDSTER

YOUR EXTRA FULL SIZE PLAN

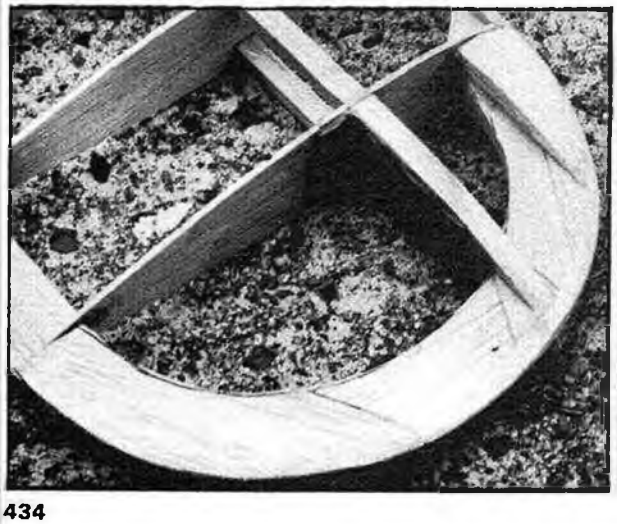
Sport control line stunter designed by John Stroud

Speedster was born whilst driving home from the Stoneleigh model exhibition this year. At the last moment I was asked to give a few demonstration control-line flights. The only aircraft I had were old 'Unlimited' and a 'Peacemaker'. In the event 'Peacemaker' sprung a tank leak and I was left with poor, old 'Unlimited'. Whilst the old chap is tough and fun to fly I noticed the crowd was not impressed. 'What is it?' and 'Is that all there is?' 'How does it fly?' were typical remarks. What I needed was a rather fast flying stunter which strongly resembled a real aeroplane and would easily fit into the boot of the car. The PAW149 with Schnuerle type porting was removed from poor old 'Unlimited' and design work started. The nose section, cowling and general fuselage outline have been on the board for some time for a racy R/C model which can perhaps now be 'Speedster 2'. Full-size aircraft with this style of upright engine installation were produced in the 1930s although 'Speedster I' is a freelance design. A removable undercarriage is used as I often fly over long grass and with an undercarriage fitted tend to damage my aircraft with nose-overs.

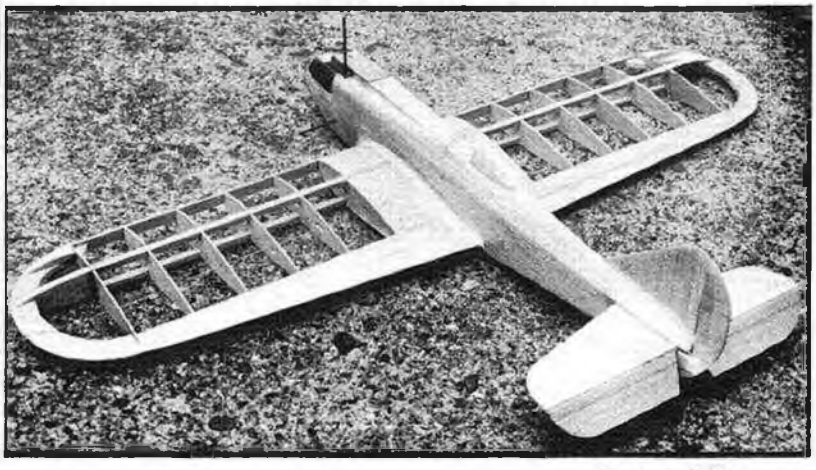
Wing construction

Cut out 14 ribs to the template shown on the plan. Make them 'full' to begin with, no notches or cutouts. Pin the ribs together in a block and sand to a smooth shape. Using a small saw, carefully cut out the spars, trailing edge and leading edge. Select 4 ribs to make into W2s and remove 1.5mm all

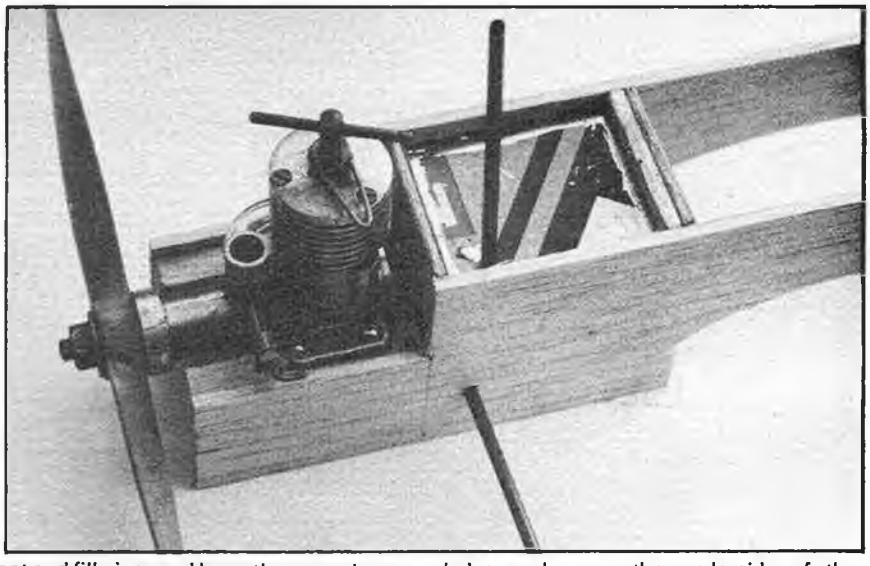
Wing tip detail. Note grain direction of individual segments and tapered main spar.



Make sure the leadout wires do not rub against the sides of the holes in the wing ribs when under tension and when moved through full extent of bellcrank movement.



PAW 1.49 installation. Note over length tank pipes. These are bent and cut to length after completing fuselage.



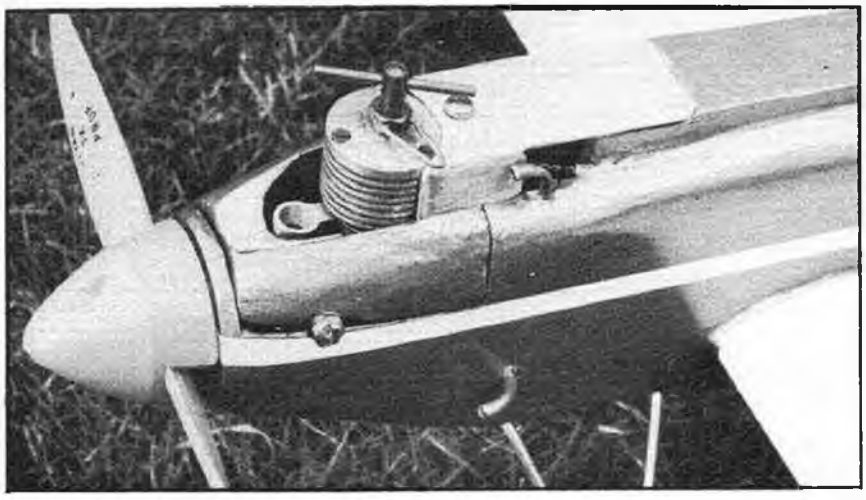
round to allow for the sheeting. Take the ribs intended for the inboard wing and cut out the holes necessary for the leadout wires as shown. I build my wings on the trailing edge in this way. Cut out two pieces of 1.5mm x 18mm sheet 66cm long for the TE and pin one down to the plan. (Using the printed plan one must build the wing as follows — alternatively draw out the full wing). Pin and glue the inboard ribs to the lower TE and place a piece of packing strip under the ribs for support.

When this is dry, remove and reposition over the plan to achieve accurate spacing for the outboard ribs. Glue and pin the outboard ribs. When these have dried, remove the structure from the board and glue and fit in one of the main spars. Make certain the ribs are set accurately and leave under weights to dry. Add the other spar, vertical TE webs and top piece of TE. Using a sanding block or balsa plane, shape the 12 x 6mm leading edge as much as possible before glueing in place. Cut out the 6mm sheet tip pieces and glue them together, off the wing, over the plan. When dry, line them up very carefully and glue in place. Fill in between the main spars at the tip with 6mm sheet and carve to shape. Glue in the 3mm ply bellcrank mount and fit the control wires. The longest bicycle spoke I could find is a little too short so I soldered in a piece of brass tube. Drill the inboard tip and epoxy in the line guide tubes. Sheet in the centre section. Sand all over when dry, and epoxy a 20gm weight into the outboard wingtip.

Fuselage and Tailplane

First check that your engine fits into the fuselage. Bearer spacing shown for the PAW19. If it does not, then modify to accomodate your engine. Cut out two F2 formers from 3mm ply and drill a fuel feed-pipe hole in the front one as shown. Note extra cut out if u/c is being fitted. Cut two 9mm sq. bearers to size and drill to take engine bolts. Mount engine onto bearers and glue front F2 in place. Lightly clamp assembly in a vice to ensure bearers set parallel. Make-up or buy a suitable stunt tank of about 30cc. I use soft copper for the vent and fill pipes and leave them very long. This makes building and covering easier and they can be bent to shape round a former later. Epoxy the tank in place and glue in the rear F2 and the undercarriage mounting blocks if being used.

Cut out two 3mm balsa fuselage sides and ensure they will slide over the wing. Mark the centre of the LE and TE on these sides to help position the wings later. Glue the fuselage sides to the engine bay. Slide wing into place and *very* carefully line up before glueing in place. Hold the fuselage together at the rear and make two formers for the position shown to keep the sides upright and following the natural and equal bend of the wood. Cut out the fin and tailplane parts from 3mm balsa. Epoxy in elevator joiner and hinge elevator to tailplane. Glue tailplane in place and connect up control system. Ensure it is completely free to move. Pin and glue fin (note offset) and tail skid in place. Carve fuselage top from soft balsa. I found it easier to make the engine fairing from a separate piece. Notice that this fairing is cut to a 'v' in the front which is then covered by the aluminium part of the engine cowling. If you are not keen on sheet metal, then make the cowling up using 1.5mm ply and balsa instead. Fill in under the engine with scrap balsa and cover the underside of the fuselage with 1.5mm balsa placed cross grain. Use 1.5mm ply to reinforce the area of the undercarriage mount if it is being used. Epoxy in the spoke to retain the cowling and add the screen and head fairing. Cut out the two tapering 3mm balsa TE pieces and glue in place. Fill in any mistakes with filler and sand the whole plane carefully using a block.



Finishing

The prototype is covered with iron-on film but tissue can be used. I think nylon would prove a little heavy unless one is very careful. The iron-on film should be fuel-proofed around any joints likely to be covered with fuel. If tissue is being used, paint the whole structure with a dope/talcum mixture and sand to a smooth finish. Apply the tissue with wallpaper paste and allow to dry. Covering the wings with wet tissue makes for a good tight skin. Give the whole model two coats of dope and put on as little coloured paint as your artistic temperament will allow. Paint the model with fuel-proofer and leave to dry thoroughly. Make up the undercarriage if desired and screw into place using the saddle clamp sold for R/C models. Check the centre of gravity is as shown, if not use ballast to obtain the correct position.

Flying

Choose a calm day for your test flights and fly on 40ft-45ft lightweight lines. Do not be tempted to do aerobatics until you have a good fast smooth engine run. The prototype flew perfectly with good line tension and performed loops, wingovers and inverted flight. A sluggish performance either means you are not getting enough power from the engine or the model is nose heavy. A tail heavy model gives a jumpy control response and is difficult to keep straight and level. I wonder if anyone will ask me to fly at a demonstration again?

Note: metal cowl held in place by spoke nipple and the bends in fuel pipes. The optional undercarriage can just be seen.

Peerless

A simple to build performance glider designed to the WIGAN 70 rules by Vic Smeed

THIS LITTLE model, designed to the Wigan 70 class, is straightforward to build and fly and offers an economic introduction to the sort of semi-geodetic construction which creates surprisingly rigid and warp-free flying surfaces. It also gives an opportunity of using up lots of the odd bits in the scrap-box, especially 1/16in. sheet oddments!

With a rule limiting only span and length, it seems worth going for area, as the greater the chord of an aerofoil, the more efficient it should be. However, the greater the chord for a fixed span, i.e. the lower the aspect ratio, the higher tip losses and induced drag become as a proportion of overall drag, so there is obviously a point at which increased aerofoil efficiency is cancelled out. Experience with small gliders suggests that an aspect ratio of 5½-6 is as low as can be used with advantage, giving in this instance the quite respectable chord of about 5ins.

A large (comparatively!) wing area allows a useful size tailplane, but even with a respectably long moment it is not necessary to use all the maximum length permitted, unless the minimum weight allowed (2.47oz.) is intended. This design aims for slightly more than the minimum, and uses a deep, narrow fuselage, the first purpose of which is to give reasonable side area for better visibility at a distance. The rule stipulates that the fuselage must be of all-sheet construction, so ours is simply cut from a length of *soft* 1/8in. sheet; it should be soft, white balsa of the type that easily takes a thumbnail impression. This is easier to work and can be quite as light as a built-up sheeted structure.

Another reason for a lot of side area is that it helps during towing. If a glider can be towed up easily and straight, but will circle as required on the glide without an auto-rudder, why fiddle about with bits of cotton and rubber bands? Side area, a little sweep-back on the wing and a slightly offset tow-hook will allow a model to be towed straight even with a permanently set turn trim. What isn't included can't go wrong.

In the same way, bent wires or thread stops for a dethermaliser tailplane are complications which can be avoided by using the fin as a stop. It is not difficult to pare away a little, or patch a scrap back, to get the right angle on the tail. If a rubber band is taken from the front dowel, over the tailplane, under its wire hook and back forward to the other end of the dowel, the tailplane will pop satisfactorily and all that is then needed is a small band between the wire hooks at the back to hold it down. This makes fitting a DT fuse and a snuffer tube very simple.

Materials

If materials have to be bought, there will be quite a lot left over. In fact, if two leading edges and two mainspars were bought, there would be enough material in the following list for two models. One economy would be to buy a 2in. sheet of 3/8in. and join the fuselage on the line shown on the plan; if two fuselages are needed, these could be squeezed-out of one 3in. sheet, so two builders splitting the cost of the timber would minimise outlay.

Besides the 1/8 in. sheet, you will need:

1 1/4 x 1/4 x 27in. wing LE, medium to hard.
1 3/32 x 3/8 x 27in. wing TE, medium (or cut from sheet).
1 1/16 x 1/2 x 27in. wing mainspar, hard balsa or obechi (trimmed).
1 3/16 x 3/16 x 12¾ tailplane LE, medium.
1 3/32 x 5/16 x 12¾ tailplane TE, medium (cut from sheet or 3/32 x 3/8).
1 1/16 x 3/16 x 12¾ tail spar, medium (cut from sheet or 3/32 x 3/8).
1 1/16 x 2 x 36 ribs, fin, etc., medium (or 1/16 x 3 x 18).
Scraps of 1/8in. sheet and 1/32in. sheet.

Wing Construction

All the 3/32in. parts could be cut from half a length of 3/32 x 1in. if available, or two pre-shaped 3/32 x 3/8in. trailing edges could be bought and one trimmed down for the tailplane. The 1/16 x 1/2in. wing main spar will have to be cut 3/32in. narrower, but is specified to save buying a whole sheet of hard balsa or obechi.

Sanding a trailing edge from flat sheet is not difficult, but it must be sanded on both sides, as sanding on one side only will cause it to curve upwards at the ends. Hold the strip flush with the edge of the building board and sand in one direction only, away from where it is held. Turn over and sand the opposite face every few strokes to keep the strip unbowed.

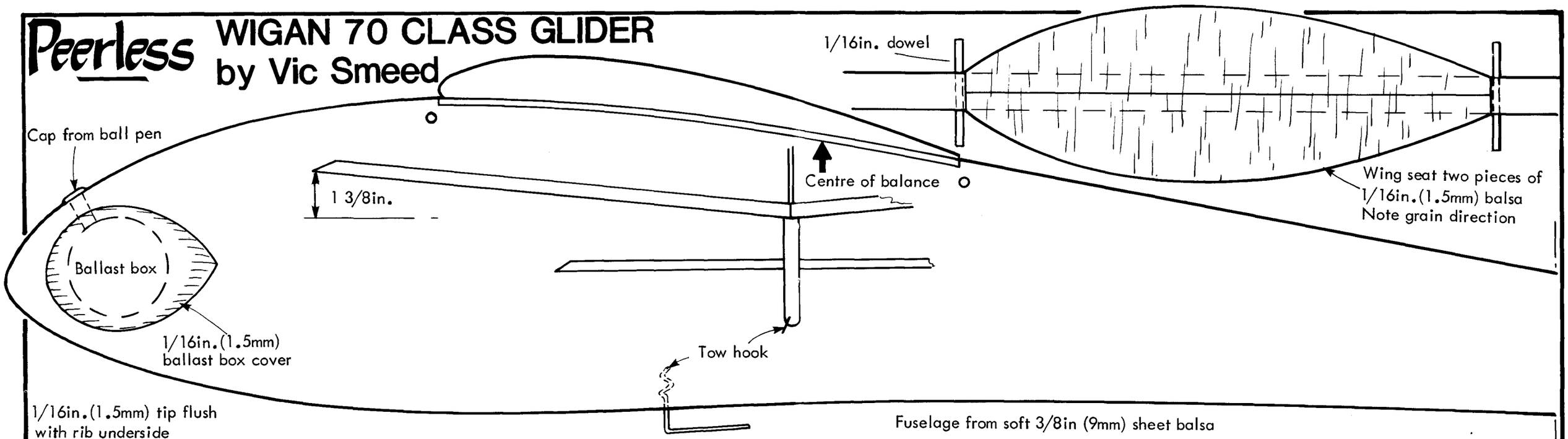
Trace and cut a template from card or .8mm ply for each piece of rib and use it to cut the necessary ribs. Pin one half of the wing main spar over the drawing, with small scraps of 1/8in. packing every couple of inches beneath it. Pin the LE in place, checking spacing with a W1 rib at each end. Cement in all the W1 ribs. Lay the TE on the drawing and mark the notch positions, nick out the notches and pin the strip down with scraps of 1/32in. balsa, ply, or thick card just caught under its forward edge but with the rear edge touching the board. Fit and cement the W2, W3 and W4 ribs. Take care with all ribs that they are flush with the spars on top. Leave to dry thoroughly.

Check that the spars are trimmed correctly at the root end before unpinning. Pin down the mainspar (with packing) and LE for the second wing half and cement the ends of the first half spars to them, propping the first half so that the tip is 2¾in. above the building board. Complete the second half and allow to dry. Then lift and cut and fit a piece of hard 1/8in. balsa sheet across the mainspar joint. Fit the 1/8in. centre rib W1/W2, trimming the W2 piece to allow for the 1/8in. dihedral brace just fitted.

The prototype's centre section was then sheeted top and bottom with 1/32in. sheet, feathered away with fine glasspaper at the edges when dry to avoid any steps in the covering. An alternative would be to cement in three short pieces of about 1/16 x 1/8in. each side and top and bottom between the centre rib and the 'straight' ones either side. The object is to stop the rubber retaining bands on top, or the wing seat underneath, from damaging the tissue.

Cut the wingtip pieces a fraction long and roll them under a pencil to put in a curve matching the underside of the tip ribs, then trim and cement in place. Now sand the entire wing top and bottom; if any ribs are a shade proud, borrow an emery board from a manicure outfit (or buy a packet of them — they're useful!) and use the tip to smooth

Peerless WIGAN 70 CLASS GLIDER
by Vic Smeed



3/16in. sq. (4.5mm sq.)
Leading edge

1/16in. x 1/8in. (1.5mm x 3mm)

1/16in. x 3/16in.
(1.5mm x 4.5mm)

T1

T2

T1

1/16in. (1.5mm)
tip flush with rib bottom

3/32in. x 5/16in.
(2.5mm x 7.5mm)

T1 (3 off)

T2 (8 off)

1/16in. (1.5mm) sheet balsa

Wirehook cemented on after covering

Centre rib
1/8in. (3mm)

Soft wire cemented on
fin, bend to trim

All ribs 1/16in. (1.5mm)
except 1 centre rib

W3 (8 1/16in.)

W1 (18 1/16in.
1 1/8in.)

W2 (4 1/16in., 1 1/8in.)

W4 (8 1/16in.)

Fuse snuffer tube

Cement fin in groove

Dowel

1/8in. (3mm) sheet balsa

away the bump and fade it into the rib. A smooth curve which departs a little from true section is better than a bump or irregularity.

Tailplane

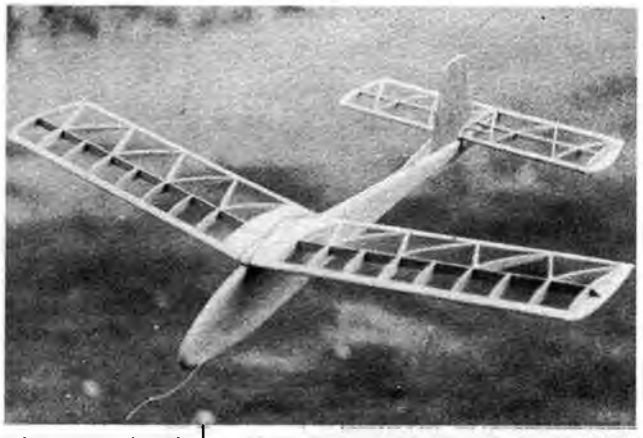
This is similar in construction but simpler as it is flat-bottomed with flat tips. Notch the three centre ribs after assembly for the little sub-spar, which again is only to stop the rubber band from wrinkling the tissue. Note that the wire hook is fixed in place after covering and doping.

Fuselage

Trace and cut the fuselage profile including the hole (about 1" diameter) at the nose. Mark the wing and tail seatings, then sand the edges everywhere else to a smooth curve. Cut about 1/16in. deep along the centre line of the wing seat, then pare out a shallow V notch. Trace and cut the wing platform (in port and starboard halves — note grain direction) and fit to the V notch, using the wing to ensure that the angle is correct and that the wing will sit square to the fuselage.

Cut a piece of ply or obechi about 3/8x1 1/4in and recess into the extreme tail to form a steady for the tailplane. Drill a hole for a stub of aluminium tube to form the snuffer tube and drill for and cement in the dowels. These can be lengths of cocktail stick if there are no bits of 1/16 or 1/8in. dowel in the scrap-box. Cut a panel to cover each side of the hole in the nose, which is the ballast box. Cement one side in place, then add a couple of 3/8in. wide curls of lead sheet inside so that the fuselage balances when you hold it an inch or so forward of the rear wing dowel, then cement on the other side. Drill a hole into the ballast box for adding the rest of the ballast later, and sand the side panels to blend in with the fuselage. Make sure that the hole into the ballast box is not obstructed by the lead already in there, incidentally, and salvage the plastic cap from a hexagonal Bic ball-point pen to form a plug for the filling hole.

Cut a central shallow groove for the fin, trace, cut out and sand the fin and cement in place. Also fit the underfin. A piece of thin soft iron or brass wire cemented to the fin allows a gentle bend across the grain to be made for trimming. Mark the towhook position carefully and push a fine screwdriver blade in at a slight angle (see head-on view). The hook, from 20g wire (or even a paperclip) should have a couple of wiggles bent into its stem so that when coated with cement (or epoxy, if you have some) and pushed into the hole made by the screwdriver, it will set firmly in place without twisting.



The straightforward rigid construction can be seen in this uncovered picture of the model.

Covering

The fuselage may be tissue covered or simply given two coats of sanding sealer, rubbed well down with fine glasspaper, followed by a *thin* coat of colour dope or Humbrol enamel. Wing and tail can be covered with lightweight tissue, Jap type, or for greater durability lightweight Modelspan. Smooth covering is not difficult with the gentle curves and relatively small areas involved, but use dope or a waterproof adhesive to stick the tissue to the wing undercamber. Shrinking should offer few problems since both the wing and tail structures are very stiff and warp-resistant. Add the tailplane wire. You may like to attach a smooth panel of kitchen foil to each side of the fuselage nose (it could represent a cockpit cover?) using contact adhesive and polishing it carefully; often flashes from such a panel can help to follow a long flight.

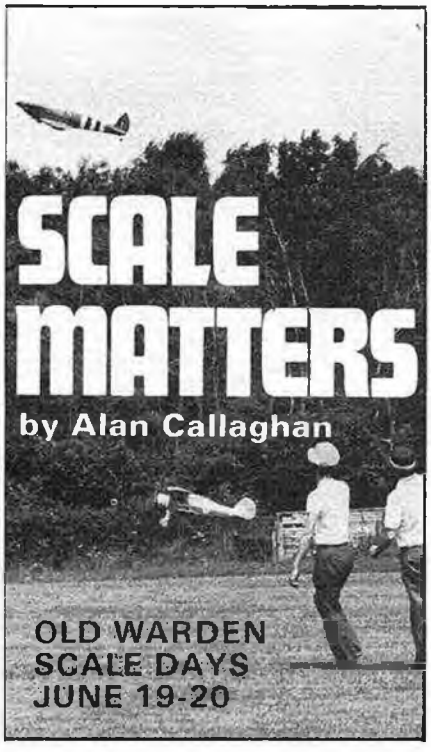
Trimming and Flying

Assemble the model, hooking the tailplane bands as previously described and using two crossed bands for the wing. Check that the tailplane sits squarely with the wing from above and ahead, and that the fin is at 90 degrees to the tailplane. Add lead shot or similar to the ballast box until the model balances level or slightly nose down when supported by the fingertips about 5/8-3/4in. behind the mainspar *at the wingtips.*

More accurate balancing is not particularly helpful since if, for example, your tailplane ribs have been sanded differently from the prototype's, the balance point will be fractionally different. If a fair amount of ballast is needed (probably your fuselage sheet was too hard!), drill 1/8in. holes horizontally under the ballast box and slip in a length or so of 1/8in. solder. No attempt was made to keep the prototype especially light and the weight when trimmed came out at 3.7ozs; probably another 1/2oz. on this would not be too serious.

Glide test in the time-honoured way, aiming at a point on the ground 30-40ft away and launching smoothly. Use more or less ballast, or up to 1/16in. packing under the tailplane leading edge, to get a steady glide. The original would cover 60ft. or so easily in still air.

Use about 50ft. of line for the first tow, and be prepared to sprint a few steps to start the model moving up in a flat calm. Let it settle before release and trim for one complete right-hand circle from this length of line. Provided you start your tow dead into wind (slacken the line and check that it hangs absolutely vertical between you and the model) you will find straight and stable tows virtually automatic. Flying speed is slightly faster than a floater, but not so fast as to fly straight through a thermal; you will need your name and address on the model and, on a full line, the DT should be used. The prototype, plain bright red overall, looks extremely attractive and satisfying as it circles steadily overhead and, although only proving flights have so far been made, the potential is definitely there.

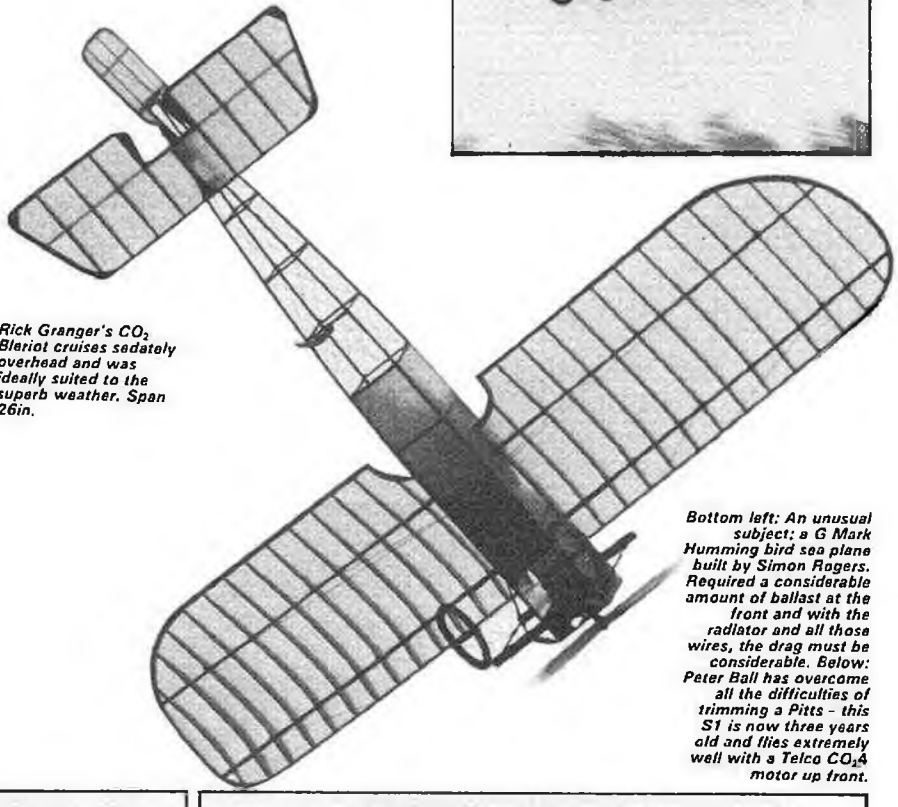


Heading shot: Geoff Burkett and Vic Willson put in some formation flying with their Gladiator and Spitfire models. Above: David Hope-Cross (New Zealand) flew his DH 83 Fox Moth with great success. Right: John Scrivener's V.S. Walrus was first flown off land at the Scale Days by Richard Hawke, having been tested off the Bodensee in Germany. The following weekend, John took it to Calshot where it was given a generous taste of sea water. John is an Australian, living in Austria, he took 8 years to research and make this beauty.

EARLY MORNING weather as seen from the South London area did not look too promising for the Sunday's flying at the Scale Weekend at Old Warden, especially when the previous day had been quite awful. In fact those who made the journey to Shuttleworth will remember it as being one of the best flying days ever seen at this venue as far as the weather is concerned.

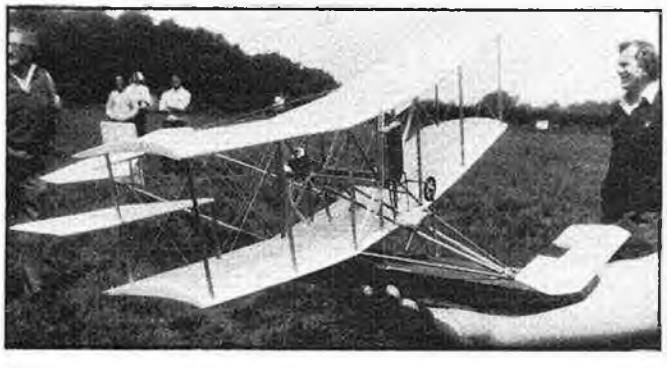
By late morning the doubts had disappeared; a very light to minimum breeze, warm air, and a small amount of cloud cover to provide occasional relief from the strong sunlight for both models and modellers, all combined to make a most memorable day.

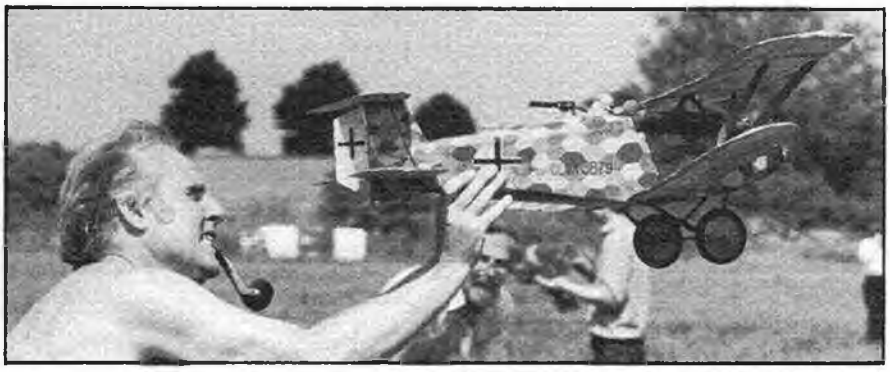
What wind there was blew away from the free-flight area towards the radio control fliers, and car park, but so light was the drift that few models were in trouble as a result of this. The free flight area bordered on the east/west mown grass strip either side of the runway crossing and most people set up base between this and the road.

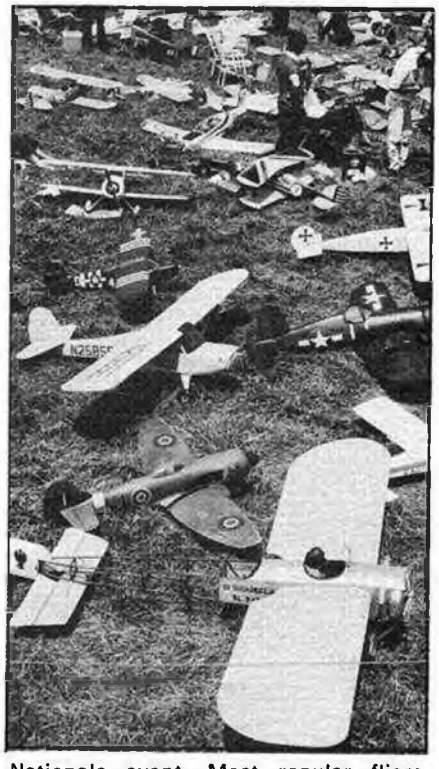


Rick Granger's CO_2 Bleriot cruises sedately overhead and was ideally suited to the superb weather. Span 26in.

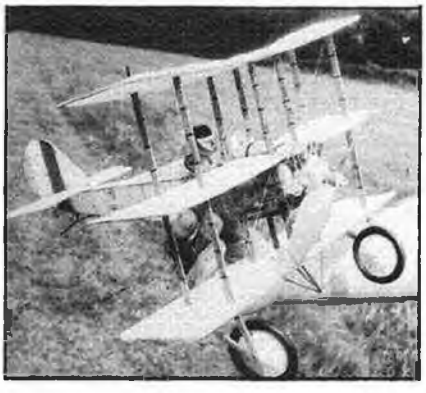
Bottom left: An unusual subject: a G Mark Humming bird sea plane built by Simon Rogers. Required a considerable amount of ballast at the front and with the radiator and all those wires, the drag must be considerable. Below: Peter Ball has overcome all the difficulties of trimming a Pitts - this S1 is now three years old and flies extremely well with a Telco $CO_2$4 motor up front.







Above: One of the few large Free Flight scale models. Mike Hall's O.D. Hannover CL III is 1:10 scale, 3 years old, 45in. span, 2lb. and powered by a Wabra 1.5. Made one sortie over the trees before returning safely to the field. (Photo by Alan Callaghan). Far right: Just a corner of the model park, midday Sunday June 20th at Old Warden with models ranging from 1/12th to 1/2 scale, covering over 70 years of flight. (Photo by Ron Moulton). Right: This Italian Breda Rensuti built by John Blagg to 1/12th scale was intended to be made in large quantities to fly soldiers to the front in the 1914-18 World War.

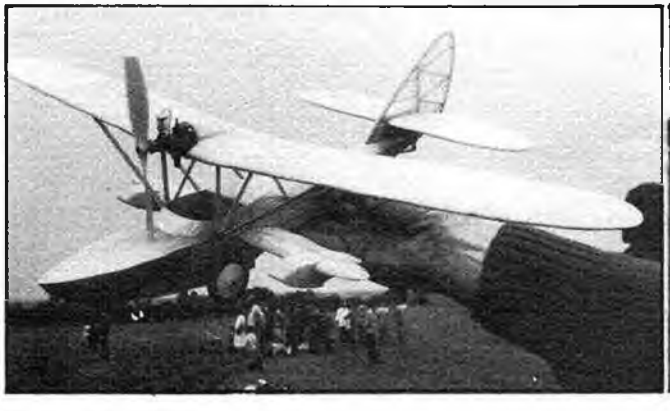


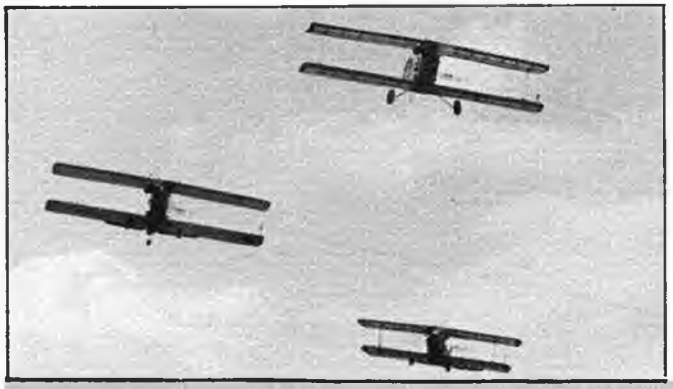
As is often the case at Old Warden, very few superscale free-flight models were in attendance.

Even if it were available exclusively for free-flight fliers, the aerodrome is simply not large enough to contain the flying of the larger type of powered models seen at our Nationals event. Most regular fliers realise this and so the F/F models brought for the day tend to be small, robust, and plentiful. The advent of the modern CO_2 motor has ensured that the scale fliers can still make the most of a small field such as this, and a good spread of similar-sized rubber models made up their share of a contribution to the peaceful side of scale flying! We even had some vintage scale models on hand to add to the atmosphere.

On a mild note of discontent, several well-known fliers voiced concern at the abundance of purely sport F/F models being flown in and around the many groups of scale models. I felt sure that most of these same modellers have flown and still enjoy flying sport models for their own sake, but on such a small airfield, on a day specifically set aside for scale flying, no

A nice lightweight Avro G own design by 13 year old Meredith Evans from Andover made several impressively stable flights during the day. Junior Winner. (Photo by Alan Callaghan). Bottom left: Out of the large range of scale subjects to be seen was this Savrov S2 Russian designed aircraft, which was built to his own design by Arthur Evans. Bottom right: Nicely made 1928 Buhl Sport Air Sedan powered by a Modella CO_2 motor.





Above left: A very professional display was put on by Norman Ashford, Jeremy Peacock and Brian Young with these modified semi-scale APS Duchess designs. All from Broadlands M.F.C. Above right: Ron Truelove's superb Typhoon, from inside the circle. The specially built scale U/C worked very well. Below: Ken Westmuckett's enormous C/L Handley-Page Hurrow in its third season, flew very well on this flight with both motors on full song. (Photos by Allan Callaghan).

matter how tempting the weather, it does seem rather selfish of some to bring along models that are decidedly non-scale and fly them indiscriminately.

By their nature, free-flight models can land anywhere and the many large groups of small scale models make up easy targets. Some would argue that it is all model flying fun really, well at least it is until *your* nice new scale model gets crunched by something that makes no pretentions to scale at all. Strict control ensures that a non-scale model not get anywhere near the R/C flight line, in control-line it is usually easy to find a corner somewhere to fly and they pose little risk to others anyway. As for free-flight, it can only ever be a matter of self-discipline. There are other occasions at Old Warden suitable for flying sports models so is it really too much to expect the scale day to be kept for scale models, fellows?

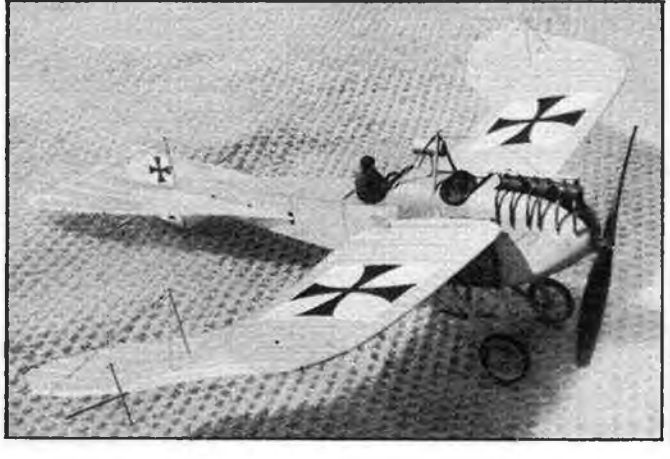
Life for the scale flier can be difficult enough as it is on a crowded field as demonstrated by a friend who called it a day after his well-tried and trimmed power model had made three flights. The first hit someone in the crowd, the second hit another in the air, and the third hit a traffic cone at the edge of the runway. The model was undamaged but enthusiasm was dented somewhat!

Despite such problems with model flying, Old Warden remains perhaps the most pleasant airfield flying site in the country. For those who have never been there, a special trip is well worthwhile. Unlike many museums, the Shuttleworth Collection houses essentially *working* exhibits and the aircraft on show are changed quite frequently.

Entry to the field on model days covers entry to the museum and the workshops are open for display with several projects to be seen including the refurbishing of the Bristol Fighter, together with the long painstaking reconstruction of the DH88 Comet racer, which is all clearly laid out for close inspection.

With a shop, restaurant, and now a modest amount of model trade support, most needs are catered for to make up a pleasant day's outing.

As for models, perhaps these are best left to speak for themselves.



Left: Top place free flight model, a 1913 Rumpler Taube of 1/24th scale built by John Blagg. Below: 'Mr. Mulligan', now six years old, built by Dave Day for a kit review, published in Aeromodeller, November 1977.

KIT REVIEW

by
Dave Day

acoms =Cessna= SKYHAWK 172

ON JUNE 30th, 1957 Col. H. J. Taplin made the first recorded flight of an electric powered R/C model, this fact being announced in the September 'Aeromodeller' of that year (see page 460 in this issue).

This being the 25th anniversary of that announcement, we decided to take a look at the present state of the art in the shape of the Acoms *Cessna 172*. Comparisons are interesting since the complete *Cessna* weighs little more than the motor used in Col. Taplin's 'Radio Queen' while the Acoms model costs little more than the cost of the drive batteries from the earlier model. In real money terms there is no comparison.

The Kit

All major components are of moulded foam. The fuselage halves are ready assembled with the front bulkhead in place, and the tail surfaces have moulded-in hinges. Wire parts are ready formed and the undercarriage has the wheels fitted to the axles.

There are three large sheets of self-adhesive vinyl decals for the windows, colour trim, etc.

In addition to motor, motor mount, plastic cowl, propeller, etc., there is a complete set of linkages, servo mount, and a comprehensive instruction booklet.

Construction

This is about as simple as it could be. The wing halves are joined with epoxy and reinforced with the pre-shaped ply dihedral brace, some coloured trim is added from the decal sheet and the wing is finished!

More epoxy attaches the tail surfaces, cowling screw reinforcement and undercarriage support to the fuselage and the rest simply needs a screwdriver. One screw attaches the nosewheel to the bulkhead, the main undercarriage snaps into place as do the rudder and elevator horns, four screws retain the motor mount and two more retain the cowl. The motor is held to the mount by rubber bands to give some shock absorption.

If you are using Acoms radio all you now need do is to mount two servos on the ready shaped tray, epoxy it in position, add the ready shaped pushrods, bolt the switch in the ready formed hole, stuff receiver and battery pack in as per instructions and you are almost ready to go. Actually the rudder pushrod needs a slight joggle added where it leaves the fuselage.

Add the remaining stickers and the drive battery supports (the battery is retained by rubber bands) and in around three hours total work you have a ready-to-fly R/C model.

Flying

Initial results were a little disappointing, but it soon became apparent that the battery supplied was well below par since flight time was only 2-2½ minutes when I had seen other examples flying for much longer than this.

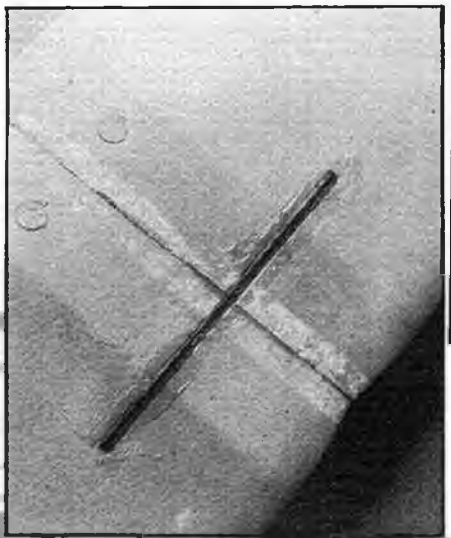
While being easy to fly, I would have reservations in recommending the model to the beginner to R/C. If slowed down too much the result is a half snap roll to the left into the inverted position followed by a vertical dive. This despite plenty of washout in each wing.

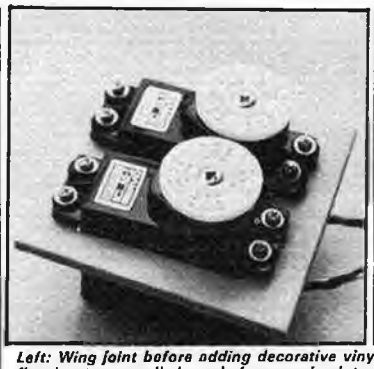
The experienced flier can thoroughly enjoy himself with loops, spins (very fast) and a limited amount of inverted being possible.

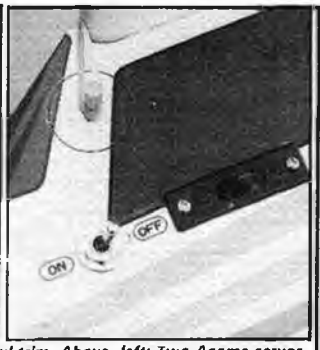
With a healthy battery and the Acoms fast charger used as instructed, flight time is around four minutes. However, it is obvious that the battery is not being fully charged and recourse to more exotic charging methods (consult your local electric R/C car club on this) can increase flying time by at least 50%.

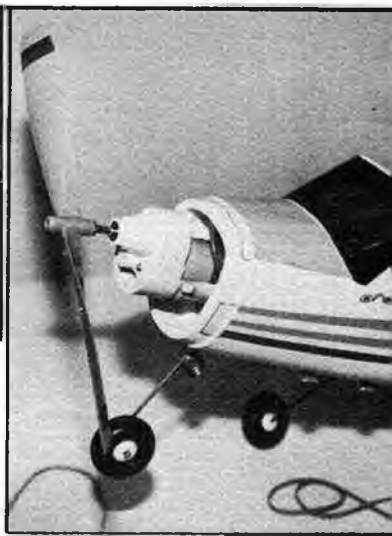
Conclusions

A practical electric R/C model with *substantially* better performance than Col Taplin's pioneering effort.









Left: Wing joint before adding decorative vinyl trim. Above, left: Two Acoms servos fitted to tray supplied, ready for epoxying into fuselage. Above, right: Motor and R/C switches installed in lefthand fuselage side. Note wing dowel reinforcement. Right: Front fuselage with cowl removed to show motor and gear box.

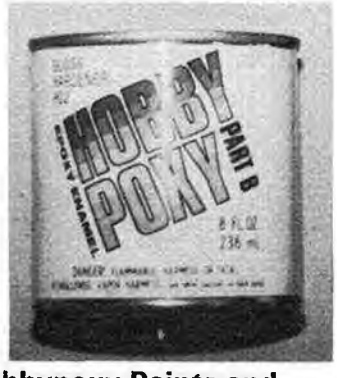
Acoms Cessna 172 *Manufacturers:* Asahi Corporation, Tokyo, Japan. *Distributors:* Riko Ltd., 13-15a High Street, Hemel Hempstead, Herts. Price £39.99. Battery pack £14.70. Fast charger £15.99.

DAY'S SHOP TALK

The latest in products for the modelling scene

SIG Winder

A very useful device for flyers of small rubber models is the Sig Winder. Moulded in black nylon with a ratio of 6 to 1 it costs £2.73 from H. J. Nicholls & Son.



Hobbypoxy Paints and Adhesives

Unavailable for a long time in this country, Hobbypoxy, the original epoxy glue and paint for modelling purposes, is now being imported by Pegasus Models.

Epoxy glues are available in three types having working times of 4, 15 or 45 minutes. Prices: Formula 1 (15min.) £1.25 per 1oz. pack; Formula 2 (45min.) £2.95 per 8oz. pack; Formula 4 (4min.) £1.75 per 2oz. pack, £4.95 per 8oz. pack. All these in fluid ounces.

Paints are in two parts; Part 'A' containing the pigment and Part 'B' being the hardener. Equal parts of each must be mixed together before use. Both gloss and matt hardeners are available. Prices Part 'A', £1.50 per U.S. ¼-pint; Part 'B' (Gloss or Matt), £2.50 per U.S. ½-pint.

Also available are thinners at £1.60 per U.S. pint, £2.50 per U.S. Quart and Filler at £2.50 per U.S. ½-pint.

A free colour chart and instruction booklet is available from Pegasus Models, Caston, Attleborough, Norfolk NR17 1DG., in exchange for a S.A.E.

Slicker 50 kit

If you are old enough to remember the KeilKraft 'Slicker' and have spent your modelling allowance for this month, then I suggest that you stay away from your local model shop for a while. Some may say that 'nostalgia isn't what it used to be' but one look inside the box of Vintage Hobby Scene's replica 'Slicker 50' kit will awaken most peculiar feelings. It's all there, the correct cream coloured box with orange, white and black label; the plan and printed wood inscribed by Bill Dean's own fair hand: the folded instruction leaflet; the cardboard box with tube of KeilKraft cement; tissue paste; plastic streamlined wheels, etc., etc. Price £18.75.

Simprop Wheels

If you are looking for large sized pneumatic wheels for your vintage model, *Micro-Mold* are now importing Simprop wheels which have nylon hubs and moulded rubber tyres with integral inflation valve. Sizes with price *per wheel* are as follows: 3½in. dia. (£2.64 each); 4¼in. dia. (£3.47 each); 5½in. dia. (£4.19 each) and 7in. dia. (£8.74 each).

These should be available from any good model shop.

Coverite Micafilm and Balsarite

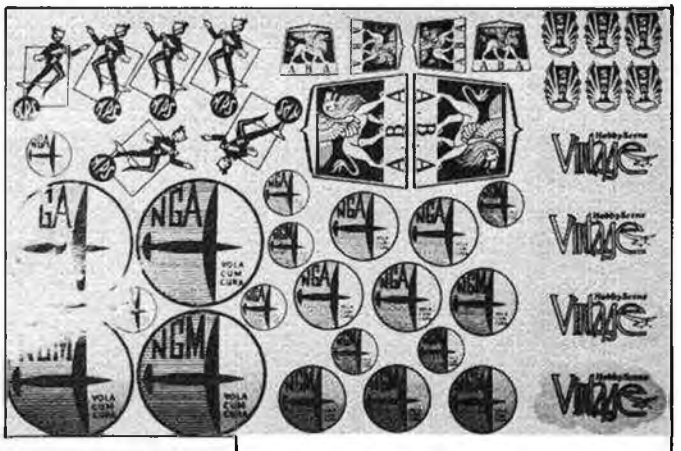
Not just another iron-on film, but one that could be useful for F/F models, Micafilm has a texture like well doped tissue. You can apply it with the glossy side out and leave it at that or with the matt side out and then dope or paint it. Two types are available with claimed weights of ¾oz. or 1½oz. per square yard. It is, of course, heat shrinkable and has excellent tear resistance. Available in rolls 29in. wide × 65in. long in clear, white, red, blue, yellow. Price: Clear, (¾oz.) £4.35 per roll, colours (1½oz.) £5·10 per roll. Also available in 16ft. 4in. rolls at £12.35 and £14.50.

Micafilm does not have its own adhesive (due to its reversible nature) and the recommended adhesive is Balsarite. This is a heat activated glue similar to that normally found on iron-on films and is applied to the uncovered structure with a brush. When it is dry, Micafilm or any similar covering can be ironed into position. Price £2.25 per U.S.½-pint tin. Micafilm and Balsarite are distributed by Flair Products and available from model shops.

MFA chargers

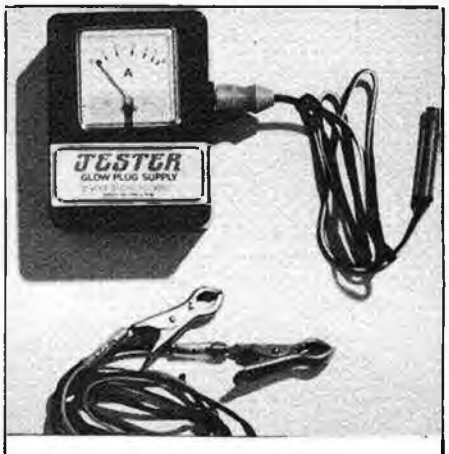
MFA produce a variety of useful chargers. If you use a 2 volt starting battery, there is a mains powered 2 volt charger with a ½amp fused output which costs £7.95 or for £9.95 there is a similar charger with a switched output to give 2, 6 or 12 volts.

For electric powered aircraft, the Mark 5 Charging Monitor has a metered switched output for fast charging 5, 6, 7 or 8 cells from a 12 volt battery via a 0-30 min. timer. After the timed period the unit automatically switches to a trickle charge. Price £14.95. All these units include full instructions and a pair of crocodile clips. Available from model shops.



Vintage transfers

To help decorate your new vintage model, Vintage Hobby Scene have produced a transfer sheet containing replica NGM, NGA, ABA, APS and SMAE transfers. Price £2.00 per sheet from model shops.

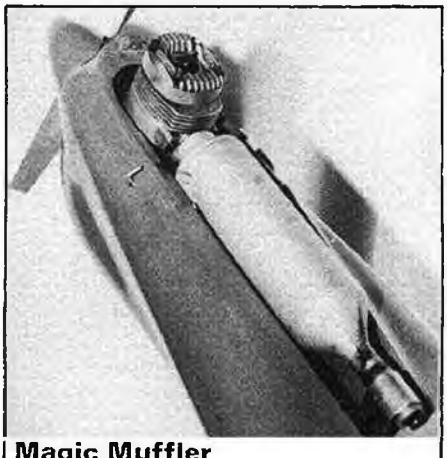


Glo-Plug power supply

A self-contained Glo-Plug supply with metered output is available from Jester Products via model shops for £11.95. The unit utilises a sealed lead/acid 2.5amp hour 'Cyclon' cell and comes complete with charging lead for direct connection to a 12 volt battery and connecting lead complete with Glo-clip. Notes are included covering charging from other sources.

U/A woodworking glue

A new PVA glue which is claimed to be highly water resistant is being produced by United Adhesives, PO Box 58, Mosley Road, Trafford Park, Manchester 17. Supplied in resealable bottles of 30, 50 and 111 ml at 52p, 75p and £1.16, it is also claimed to be fast setting and easy to sand.

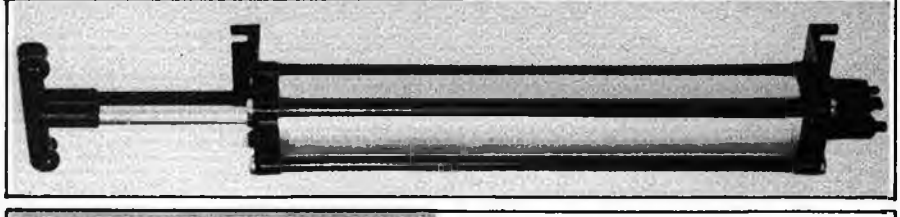


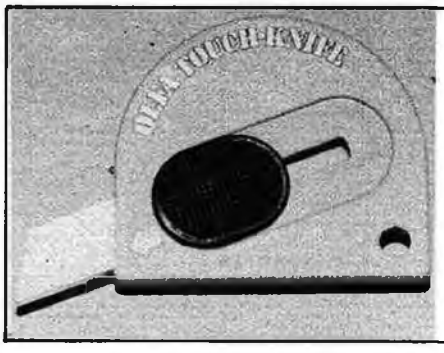
Magic Muffler

Manufactured in Australia by Phelan Competition Products, the Magic Muffler is available in 4 types to suit .21cu. in. (£21.50); .40cu. in. rear exhaust (£23.35); .40-.60 cu. in. general purpose (£23.35) and .60cu. in. rear exhaust (£24.25) motors. It employs an unusual, double tuned, acoustic principal and while relatively expensive gives similar results to tuned, acoustic principal and gives similar results to a tuned pipe in a much smaller unit. An in-depth test on the 40 sized unit can be found in the May issue of our sister publication, RCM&E. Available from H. J. Nicholls & Son Ltd.

SLEC fuel pump

One simple way of transferring fuel from can to squeeze bottle or direct from can to model is to use this manual fuel pump manufactured by Sun Lane Engineering Co. Principle is similar to a bicycle pump but with two one-way valves so that fuel is drawn in through one nozzle and expelled through another. Can also be used to empty your tank. Price £6.55 from model shops.



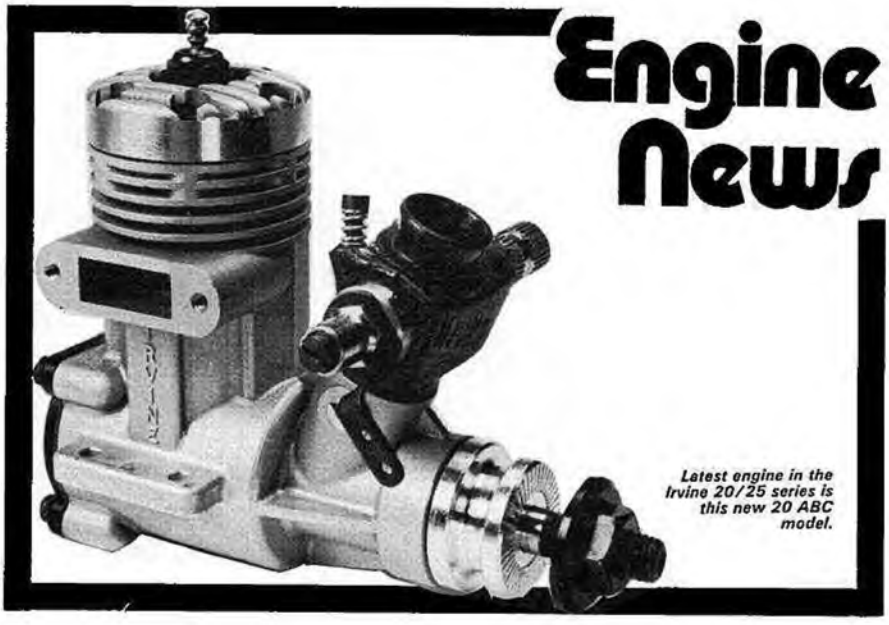


Olfa Knives

Two new knives of interest to modellers are the Olfa 'Touch Knife' which features a retractable blade, and is ideal for field box or pocket at 50p and the Olfa 'Maru-Cutter' which has a circular blade which can be rotated to find a new edge. This latter is ideal for trimming tissue or nylon and costs £1.55.

Olfa knives are distributed by Microflame and available from model shops. The review examples came from H. J. Nicholls & Son Ltd.

Engine News



Latest engine in the Irvine 20/25 series is this new 20 ABC model.

Irvine 20 ABC

Outwardly, this new British addition to the engine market looks exactly the same as the standard Irvine Sport 20. However, a glance into the exhaust duct will reveal that it has a brass cylinder liner, showing it to be of the ABC type. It is, in fact, the first production model Irvine motor to use a ringless aluminium piston running in a brass cylinder liner with chromium plated bore. All other production Irvine motors, except one, use steel cylinder liners with Dykes ringed aluminium pistons; the sole exception being the lowest priced model, the Blackhead 20, which has a lapped cast-iron piston.

Taking a look at the component parts, we discover other modifications. The piston has an appreciably thicker skirt and its fully floating gudgeon-pin has PTFE pads instead of being retained by wire clips. Cylinder porting is essentially the same (but with slightly different timing) and the crankshaft has a larger valve port that extends the valve timing to 200 deg. of crank angle with closure at 60 deg. ATDC. Features of the Sport 20 that are retained include the substantial one-piece investment cast body unit, twin ball-bearings, a machine finished cylinder head with bowl and squishband combustion chamber and a forged conrod with bronze-bushed big-end.

For the model aircraft enthusiast, the Irvine 20 ABC is being offered in two versions, the R/C model illustrated and a standard model without throttle. Each costs £4 more than the equivalent Sport 20 model but should give a worthwhile increase in performance.

O.S. Geared Engines

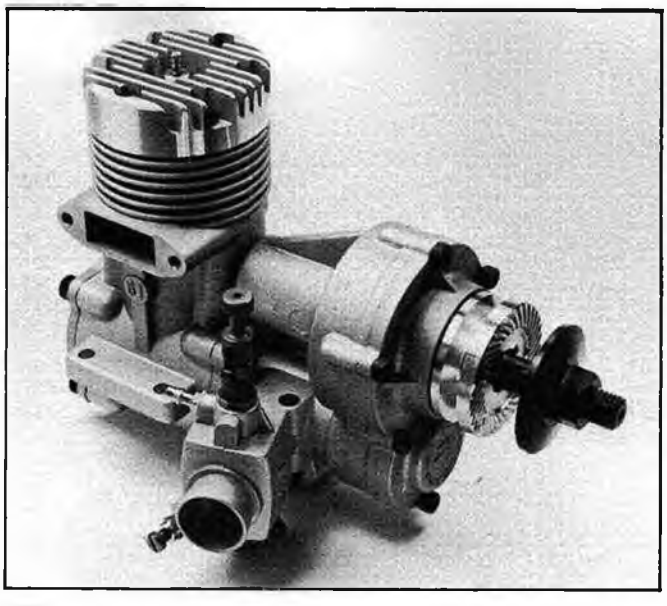
Geared engines are not new but, in the past, have tended to be regarded as a mere novelty. Back in the late Fifties, an American free-flight enthusiast, Martin Zugel, demonstrated that, with the addition of a 2:1 reduction gear, a K&B powered FAI power model was capable of climbing at least 15 per cent faster (despite increased power and wing loadings due to the weight of the reduction gear assembly and heavier prop which almost doubled the weight of the power unit) but it is only recently that manufacturers have begun to take seriously the idea of producing geared motors commercially.

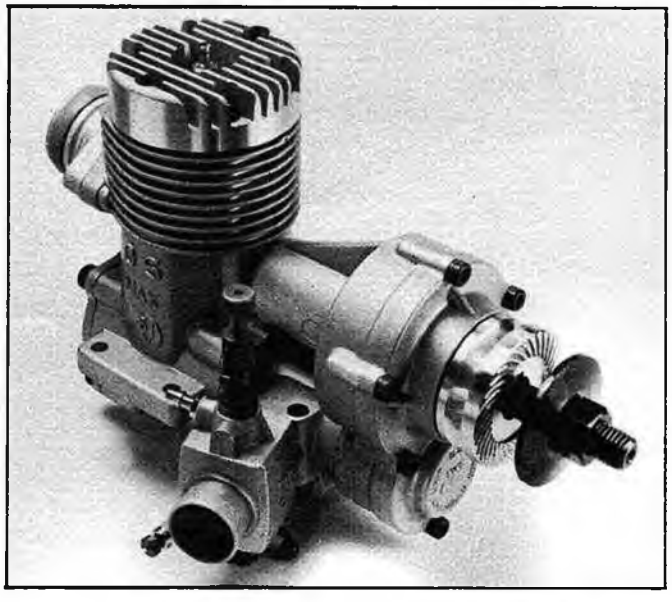
In the United States, Robert Kress of Kress Technology Inc., best known for his Axiflo ducted fan units, is currently manufacturing an add-on 2.13:1 reduction drive unit for the little Cox Pee-Wee .020 (0.327cc) engine, enabling it to turn a much more efficient 7 x 4 or 8 x 4 prop instead of the standard direct-drive 4½ x 2. With an 8 x4 Top-Flite, static thrust is increased from 4oz. to 5.8oz. Because the Pee-Wee is a reed-valve engine, it runs equally well in the reverse direction, which rules out the need for engine modifications or a special prop.

At the other end of the scale, the O.S. company, in Japan, has begun producing a range of geared reduction units for O.S. front rotary-valve .61cu.in. (10cc) engines.

Reduction gears are particularly appropriate for '60' size two-stroke R/C aircraft engines. 10cc is, of course, the maximum size allowed for aerobatic models under

O.S. Max-61FSR GS A-2. Intended mainly for FAI Scale, it has a 1.9:1 reduction gear. Six different reduction units fit both 61FSR and 61VF engines to give very wide range of options. Below right: O.S. Max-61VF GS A-1. Featuring a rear exhaust and 1.4:1 reduction gear, it is aimed at the R/C aerobatics expert.





national and international regulations. It is also the largest capacity permitted, under such rules, for radio-controlled and control-line scale models powered by two-stroke engines. (A 15cc capacity is now permitted in FAI Scale for four-stroke engines since these have rather lower specific outputs and power-weight ratios.)

As we all know, the 10cc capacity limit has led to the modern .60 R/C engine being steadily developed to produce higher and higher specific power output. Unfortunately, however, as high performance, in an internal combustion engine, is inseparable from a high crankshaft speed, it has not been possible to absorb this power with a larger, more efficient airscrew. Instead, props have remained small (11 inch diameter for FAI aerobatic models, 12-14in. dia. for FAI Scale models) and the extra power has simply been absorbed in higher operating rpm. This is not the way to produce the greater thrust necessary to get a thirteen-pound scale model off the ground; or pull an aerobatic model through a succession of tight manoeuvres.

Whether or not geared engines really catch on, for FAI Scale and aerobatic models, remains to be seen. The O.S. people apparently think that there is a market for them. They could be right. Six years ago, they believed the time was ripe for the quantity manufacture of four-stroke motors and introduced the O.S. FS-60. The enthusiasm for four-strokes that has followed has justified that belief.

To make a geared engine acceptable to a sufficient number of modellers obviously requires that it should be suitable for a reasonably wide variety of model types. To this end, O.S. are not offering just one model but, in effect, eighteen! Strictly speaking, there are six variants of the basic geared front end assembly and these are available for each of the three current O.S. 10cc front induction R/C engines; the side-exhaust Max 61FSR and 61FSR-ABC and the rear-exhaust Max 61VF.

There is a choice of two reduction ratios (nominally 1.4:1 and 1.9:1), two output shaft positions (above or below the crankshaft) and two carburettor positions (below the crankshaft or at the side). Add to this the fact that the basic engines give a choice of side or rear exhaust and that they can be installed with the cylinder upright, inverted or horizontal, and it is evident that, no matter what shaped front end your model has, there will be a combination to fit in. One thing that cannot be done, of course, is to rotate the reduction unit to a different position on the crankcase, since this would upset the rotary valve timing.

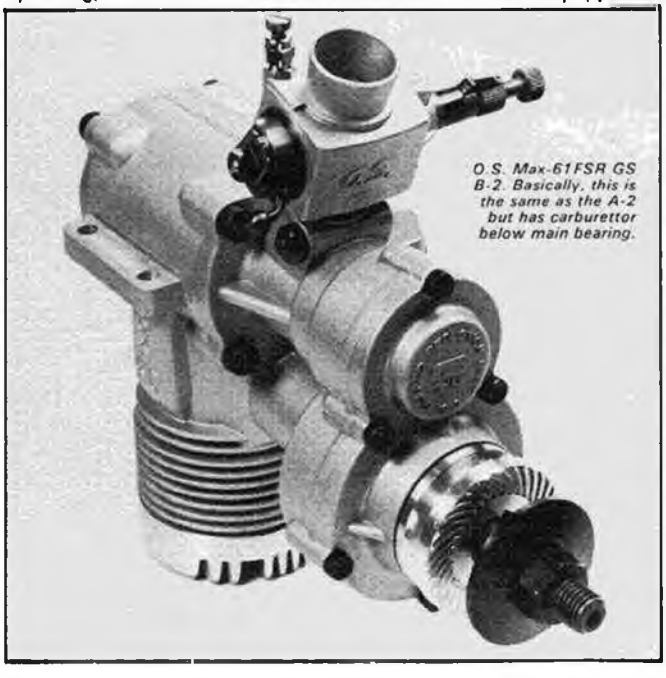
Each reduction drive unit consists of a neat pressure die-cast replacement front housing containing a new crankshaft having the same large (17mm) main journal and twin ball-bearings, but ported for opposite rotation and fitted, by means of a Woodruff key, with a helical pinion. The output shaft has a diameter of 10mm and is made in one piece with the helical output gear. At the rear, the output shaft is carried in a caged needle-roller bearing mounted in the back of the housing while, at the front, it is supported in a 10 x 26mm ball journal bearing housed in the detachable front cover-plate. To suit the large diameter props made possible with the reduction drive unit, the prop driver diameter is increased to 32mm.

As noted, nominal gear ratios are 1.4:1 or 1.9:1. Actual numbers of teeth are 32/23 and 36/19, giving ratios of 1.391:1 and 1.895:1. The resultant torque multiplication is sufficient that FAI aerobatic models equipped with the 1.4 ratio can use 13 or 14in. props of 7 to 9in. pitch, instead of an 11 x 7 or 11 x 7½, while the recommended size for the 1.9 ratio (intended mainly for scale models) is an 18 x 6 or 18x8. Larger sizes can, of course, be used if necessary.

The reduction units increase the weights of the 61VF and 61FSR engines by between 8 and 8½oz. This will probably not matter too much with scale models, especially. The units will be available as complete replacement front end assemblies for customers' existing engines, but certain models will be obtainable as ready assembled engines. We understand that, initially, so far as the latter are concerned, the U.K. distributors will concentrate on the rear exhaust Max-61VF with the A-1 unit and the side exhaust Max-61FSR with A-2 unit.

Briefly, the complete range is as follows:

GS A-1 1.4:1 ratio. Output shaft above c/shaft. Carb. right side.
GS B-1 1.4:1 ratio. Output shaft above c/shaft. Carb. below c/shaft.
GS C-1 1.4:1 ratio. Output shaft below c/shaft. Carb. left side.
GS A-2 1.9:1 ratio. Output shaft above c/shaft. Carb. right side.
GS B-2 1.9:1 ratio. Output shaft above c/shaft. Carb. below c/shaft.
GS C-2 1.9:1 ratio. Output shaft below c/shaft. Carb. left side.



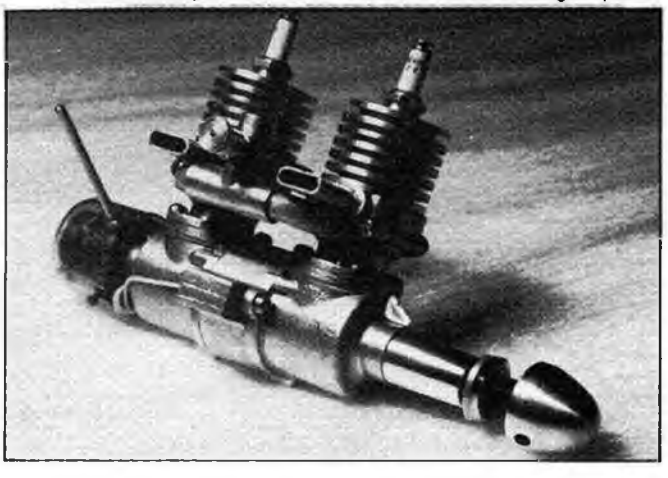
O.S. Max-61FSR GS B-2. Basically, this is the same as the A-2 but has carburettor below main bearing.

COLLECTORS' CORNER
Dragon 32 Twin

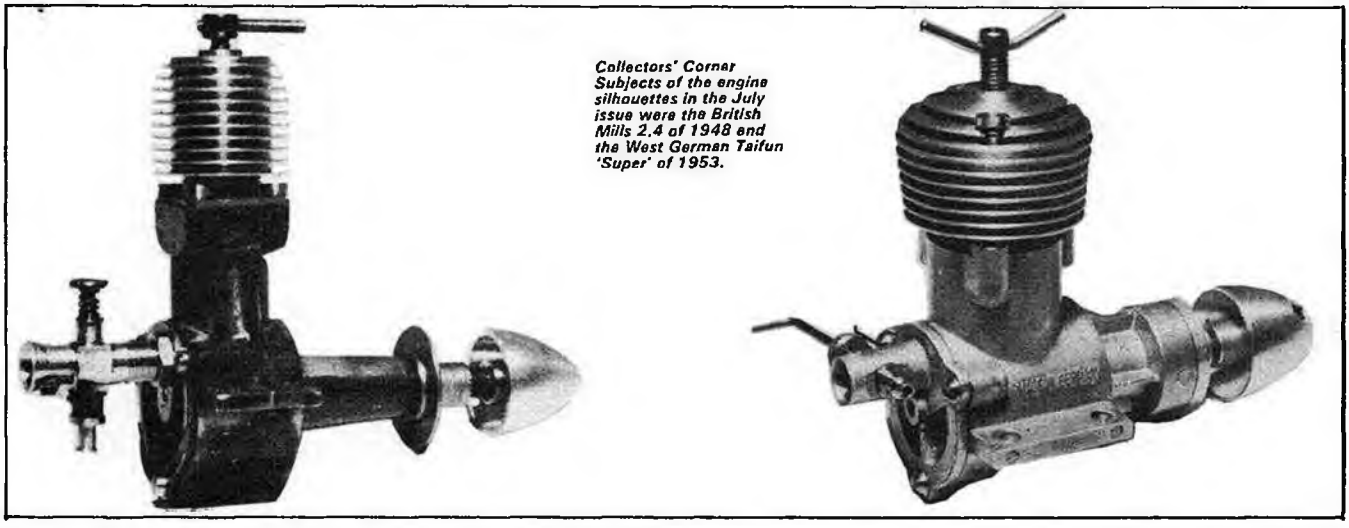
This unique engine, the only one of its kind, was constructed in Toronto by Mike Thomas, whose home-made Nova-I 4.5cc diesel, built to a 1943 Dutch design, was featured in the June 1980 *Engine News*. The original Dragon was a little-known single cylinder side-port petrol engine, made in England by M. E. Bastable Ltd. Mike Thomas explains:

"I have not been idle since you published my 'Nova-I' photo in your June 1980 column. Thanks to your mention, I subsequently received plans of an early Danish diesel very similar to the Swiss 'Dyno' which I have now completed.

"Here is another 'different' engine photo



Mike Thomas' one-of-a-kind 'Dragon 32' inline twin was built from parts of two Dragon 16 petrol engines placed back-to-back and coupled by a centre shaft and bearing assembly. Note inlet manifold and enclosed adjustable contact breaker assembly.



Collectors' Corner Subjects of the engine silhouettes in the July issue were the British Mills 2.4 of 1948 and the West German Taifun 'Super' of 1953.

for your 'Engine News', the Dragon 32 Inline Twin. In partnership with Arthur Polson of Winnipeg, the last remaining spares of the English vintage 'Dragon 16' were rounded up. I cast a new intake manifold, to connect the two original pipes, and a new centre bearing journal for the new double-throw centre shaft which connects the original crankshafts, front and back. The timer (contact breaker) was modified to a double point system and placed at the rear; the front shoulder being covered by a tapered sleeve."

Well done, Mike. How does it go?

Mills 2.4 & Taifun 'Super'

These were the two rear induction diesels featured in the 'Silhouette' quiz in the July *Engine News*. As one expected, those vintagents who were prepared to hazard a guess, instantly recognised the distinctive shape of the Mills 2.4 but only one, J. Shaw of Oldham, identified the German made Taifun 'Super' as well.

The Mills 2.4 was introduced at the end of 1948. Like other Mills engines of the time (the *original* type .75 and the 1.3 Mk.II) it was an 'all-machined' engine, including its chromate treated magnesium alloy crankcase, but was different in one important respect in that it featured disc valve induction. It was the only Mills ever to have a rotary-valve. Typical of Mills design, it had a high stroke/bore ratio (1.5:1) which gave it a rather spindly appearance, but it was pleasant enough to handle and performed tolerably well. Nominal bore and stroke were 0.500 x 0.750in., giving a swept volume of 0.1473cu.in. or 2.413cc. Like the 1.3, it included a spring-loaded cutout on the carburettor. On test, ours managed an output of 0.146bhp at 8,800rpm, which may seem a bit feeble today, but, by 1948 diesel standards, was not bad. John Noble of Bolton M.A.S. and SAM 35, recalls that he actually won a team race with his in 1950 at *"a rollicking top speed of 43 mph. . ."* and explains his success with: *"Unlike the Frog and McCoy opposition, it would, however, start!"* We well remember that very first year of team-racing . . . Pitting could be a real shambles, so, very much a case of tortoise-and-hare, slow long-range diesels, sometimes needing only one pitstop, were frequently competing a ten-mile race quicker than the fast 5cc glowplug engined models handicapped by four or five refuelling stops and frenetic ground handling.

The Mills 2.4 was in production for only a couple of years and not a lot of them were sold but John Noble mentions that his served him faithfully from 1949 until the late Sixties. In case its present owner (?) happens to read this, it had the serial number 45437.

The West German Taifun engines, distributed exclusively through the Johannes Graupner organisation, first appeared in 1953. They were made for Graupner by Hans Hörnlein of Vöhringen who, in more recent years, manufactured the Profi glowplug motors. The 3.5cc 'Super' was the top model in a range of seven engines. It had a bore and stroke of 16.7 x 15.7mm, giving a swept volume of 3.439cc and was of quite pleasing appearance with rather better quality diecasting than was generally seen at that time. The engine featured a twin ball-bearing crankshaft, a rear rotary disc valve and, as was usual with diesels by this time, circumferential cylinder porting. This was a layout similar to that of the popular British made E.D. 2.46 'Racer' of the period and Hörnlein did, in fact, also manufacture a 2.5cc version known as the Taifun 'Meteor' but it did not quite match the E.D. for performance. As we recall, our 'Super' ended up mounted on a friend's 11ft. span sailplane in the mid-Fifties, an early example of the motor-assisted glider.

FROM THE HANDLE

Three Sisters International — 22/23rd May 1982.

Reports from Albert Atherton, Ken Morrissey, Dave Wiseman and Jim Woodside.

Starting with the good news, entries were slightly up on last year's and Combat was successfully run for the first time. The editor said kind words about the flying site in his July editorial and it is true to say that owing to the work still being put in by the 'hard core', improvements continue to be made to the facilities.

The bad news? Entries continue to be below expectations, especially in aerobatics. The contest certainly ranks with the Nationals in terms of organisation and facilities so domestic competitors — please come and sample the atmosphere. Continental entries remain very low. The organisers realise that it will take some years for the contest to establish itself on the calendar. However, if some continental readers would care to write saying why they *did not* attend, we would welcome these comments. While the organisers cannot do anything about the cost of petrol and ferries, they can retime the event if another time of year seems to be more attractive. Also, what do we have to do to have the 'Big Sky Pilot' send us some good weather? This year's dose of cold winds and rain were all the more disappointing as the week-ends before and after the contest days were bathed in hot sunshine. Perhaps C/L is out of favour up there.

We would like to especially thank the following:

Wigan M.B.C. for providing support, tents, programmes and posters.

Councillor Wilf Brogan, chairman of the Recreation and Leisure committee for presenting the prizes.

The hobby Trade for advertising and donations towards prizes.

The Warden, colleagues and friends for professional help and services.

'Aeromodeller'.

Local modellers who helped out.

Irvine Engines.

De-Lux Materials Ltd.

Solarfilm Ltd.

F2A — Speed

Contest Director: Ken Morrissey. Entries: 7.

Speed model above all others, restricted as they are to methanol only fuels, are most affected by cold weather. Despite this the times were quite good.

Round 1 saw long time enthusiast Brian Jackson away with a clean 149.14mph with the rest seaching for a needle-CFS setting. In the re-flights Pete Halman put in a 152.39mph flight, only to see Gordon Isles equal his UK record on the next flight with 156.54mph.

In Round 2 Brian Jackson found another 3mph to clinch 3rd place and new man Bob Gibbs (a famous name in Speed) took fourth place with 136.82mph.

Dick McGladdery and Nicholas Meager worked away but without solid reward.

All the competitors used assymetric type models, Rossi engines, and nearly all used single blade C.F. props.

1. Gordon Isles 156.54mph
2. Pete Halman 152.39mph
3. Brian Jackson 152.18mph

F2B — Aerobatics

Contest Director: Albert Atherton. **Judges:** Reg. Lowe, Percy Criddle. Entries: 15.

Despite circulation on the Continent and the widespread publicity in the UK, there were only 15 entries which were reduced to 12 on the day, Arthur Eves and the two Berringers being prevented from attending by the strike-bound French ports.

One unfortunate incident marred the event, the loss (Theft) of Arthur Tipper's flight box. This robbed Arthur of not only his custom made, beloved handle, but his final flight, as all the proferred replacements were unsuitable.

Lesson to be learned — when the public have access to the flying area, lock your precious gear away.

The event was run, because of the low entry, with each competitor having three flights, the two highest scores counting for final positions.

Round 1

Commenced on Saturday afternoon with a warm up flight by Bill Draper for judges Percy Criddle and Reg Lowe. It was obvious from this flight by 'Mr. Consistency' that all fliers would be troubled by the variable wind conditions.

Walter Woods was first to fly, loosing his Wingover points having missed one of the preceeding six laps. Dave Copeland and Tony Eifflaender had reasonable flights, but lost landing points because of engine overuns.

Peter Coates recorded, for him, a comparatively low score, no doubt due to the lack of practise with his second string plane, number one having crashed at an earlier session at his club.

Despite good flights by Barry Robinson, Nev Dickinson and Arthur Tipper the Round went to Bill Draper who mastered the conditions with concentration and application to his task.

Round 2

As Wally Woods had opted out, Dave Copeland and Pete Arkley started the day, after Barry Robinson's Warm-Up flight. Leadened skies turned to rain as Pete Arkely completed his flight. An hour later, after very heavy rain the event restarted with overall scoring lower than round one; no doubt an after effect of the Saturday night Hot Pot Supper, when the Spanish contingent plied one and all with their 'duty free mixture'.

The scores would indicate that Nev Dickinson and Bill Draper had recovered better than the other fliers!

Round 3

Started by Nev Dickinson, in much better conditions, with a flight to 'warm-up' the judges. Everyone except Terry Taylor improving on their previous flights. Then after the break Barry Robinson put in the highest scoring flight of the competition which place him in the lead with his combined score. As Jim Woodside had scratched, Bill Draper flew next to record his highest score which placed him first, with Nev Dickinson still to fly.

Nev, with his 'Genesis Smoothie' had a great flight to push Barry into third place on the combined scores.

The scorers were just about to finalise the placings when Tony Eifflaender put in a 'blinder' with his small (Gig influenced) diesel powered model, to take fourth place.

My thanks to competitors for their co-operation and to the Widnes club for their invaluable assistance in running the event. I must not forget the judges who, for most of the time, were dressed as if taking part in Jack Charlton's Fishing competition. Last but not least, Mrs. P. Coates and Mrs. P. Criddle who, if their flying ability were to equal their computing of score sheets, would be pushing for the top three placings.

A most enjoyable event, and excellent Hot Pot and magnificent prizes, who could ask for more? An entry of 25! Spread the Gospel for 1983.

F2C Teamrace

Contest Directors: Tom Millar and John Schofield. **Jury:** Bob Horwood, Graham Bryant, Mark Jarvis. **Entries:** 14.

Round 1 got under way at 2.0 pm in cool breezy conditions and continued without real incident. Happy teams were Langworth/Broadhead with 3:43; Hill/Metcalf 3:45; Heaton/Woodside 3:48 and Horton/Haworth 3:54. Sad teams were Smith/Brown going like a train with their Cipolla powered model until the last few laps when a near seize resulted in a 3:52 rather than a 3:30 something. Fry/Thorpe recorded only 67 laps when a tip-up broke the prop.

Round 2 saw Smith/Brown and Fry/Thorpe record 3:40s to be comfortable semi-finalists. Heaton/Woodside however

F2B Results

Competitor	Round 1	Round 2	Round 3	Total	Position
C. W. Draper	1974	1901	1992	3966	1
N. Dickinson	1853	1930	2016	3946	2
B. Robinson	1903	1790	2033	3936	3
A. Eifflaender	1638	1750	1921	3671	4
P. Coates	1787	1779	1804	3591	5
A. Tipper	1837	1739	—	3576	6
D. Copeland	1527	1654	1680	3334	7
T. Taylor	1504	1677	1635	3312	8
P. Arkley	1474	1382	1572	3046	9
K. N. Reves	1341	1415	1427	2842	10
J. Woodside	1359	1409	—	2768	11
W. Wood	1288	—	—	—	12

opened a sack of woe which continued through broken models, broken pans and blued big ends to record no further times in the next three races.

Conditions improved for the semis which helped with one or two brisk times. However, no teams really came near the times of the finalists.

The final was a most enjoyable affair. Colin Brown slipped a catch which cost a possible UK record but this apart, all pit stops by all three were impressive. In the early stages the pilots struggled a little for position but by 100 laps the die was cast as Langworth's model lost a little pace and Smith continued unabated.

The jury were glad of the near completed jury tower as it gave protection from the wind and rain. The jury tower will shortly be equipped with a light warnings system to clearly signal infringements.

Thanks are due to Messrs. Millar and Schofield and all those who helped with timekeeping.

1. Smith/Brown 7:25.5
2. Fry/Thorpe 7:47.5
3. Langworth/Broadhead 7:54

F2D Combat

Contest Director: Dave Wiseman. **Entries:** 16.

While it was mostly northern clubs who provided the entries it was pleasing to welcome the German Combat fliers. The contest director looked back to the golden days of 120+ entries in Combat — well, don't we all! The contest was flown to the two life system as far as the quarter finals.

The first round saw some very good flying despite the wind which however, did help the MVVS diesels of the German team. Both Burles and Whillance lost in this round.

Round 2 eliminated only two fliers as everyone else who lost in Round 1 scored a win. Hence a full day's flying saw 14 ready for the second day.

Sunday started wet — possibly the worst condition for Combat as wet steamers have no positive remedy. However, eliminating rounds got under way at 12.30 to find the last 8, at which point tempers flared and some 'heavy' tactics were brought into play as victory was sensed.

Best bout of the quarter finals was perhaps Whillance v. Wiseman which went to a re-fly of four full minutes and a win to Whillance three cuts to two.

The semis were thus Whillance, Hunt, James and newcomer Frost. Whillance beat Frost, who had some engine trouble and Hunt, aided by the power of his new Nelsons, ousted James.

As is so often the case, the final is something of an anti-climax as the strain begins to show. Vernon Hunt took Mike Whillance's streamer in one and despite dummying Whillance into the ground, conceded two cuts later in the bout.

The models were the now established large area foam or foam-balsa constructions. The most popular engine remained the ST20/15 but others were present. The Germans flew MVVS diesels which had been lightened, and they seemed very competitive on their thin blade carbon-fibre props. Hunt and Wiseman flew Nelson 15Gs. They are impressive engines — docile to handle but with lots of power.

1. M Whillance
2. V. Hunt
3. T. Frost
4. J. James

Jim Woodside On Engines . . .

Some months ago I published a photograph of part of Jim Plant's engine collection. I recently had a letter from Jim pointing out an error in the write-up. The Krasnorutski engine was of course used to win the 1970 Champs, not 1966. My apologies. However, Jim also raised some interesting points in relation to the engines of this era — and the effects which they have exerted up to the present day.

Herb Stockton and Don Jehlik won the 1966 Champs using a much modified ETA Mk. II. Details of the engine were published in the August 1967 edition of Aeromodeller. For those of you with access to a copy, it still makes most interesting reading. I was lucky enough to handle this engine 15 years on, when staying with Don Jehlik in the summer of '81. I would say that, despite the use of the ETA's cylinder and crankcase, the engine should be rated as 'a special' or 'own design', because the level of modification is so very high.

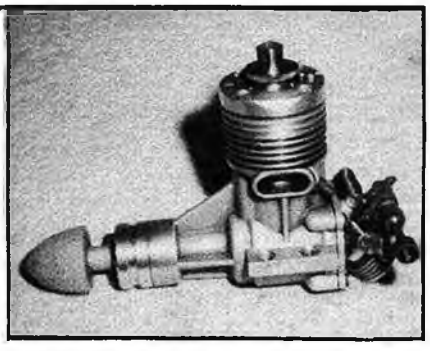
For the 1968 Champs, Stockton-Jehlik changed to the then new Paul Bugl designed HP15D and again won the Champs. It should be noted though, that this engine was fitted with the now familiar, reverse drum system a la K&B rather than the original bell valve system. How many HP15Ds were produced is not clear. Fifty is an oft quoted figure — certainly not many. However the influence of the HP design is still with us in the guise of the early FMVs, OMBs, TMAs and the like.

The year 1970 saw the start of the Soviet dominated era beginning and ending with Krasnorutski designed engines — the 1970 World Champs and the 1977 European Champs. In this latter period both the Bugl and Nelson engines have coms within an ace of winning the big one. The 1980 winning BG must, in my opinion, be classed in the same category as the HP — produced but only in very small numbers, and therefore a 'special'.

Having rambled on, time to reach some point. Can a production engine ever win the World Championships? The answer must be a qualified yes. Those with the ability to win will almost by definition have the skill to tune their engines in some way which makes them non-standard (c.f. the 1968 HP15). The 'systems' approach of teams like Albritton-Perkins remains interesting. They concentrate on making airframes which will produce the very best from a given engine. Smith-Brown, I think, also follow this route and the results can be most impressive, as the results show.

So perhaps it does remain almost impossible to defeat the 'super' motors in ultimate competition. However their influence has certainly raised standards all over the globe and provided the stuff on which dreams are made. While it is always great to win, I suspect that if victory was the only goal, there would be fewer team-racers around. Pleasure in the sport remains an ingredient, perhaps the most important ingredient of all. The constant search for horse-power and success, only becomes a tiresome burden if the fun derived from T.R. has been lost. If you have any opinions you might like to express on these matters, perhaps you could write in.

Krasnorutski's 1970 winning T.R. engine - ushered in the modern designs, a credit also deserved by the H.P.15D.



Balsa wood fuel tanks!

Sounds like something out of 'Alice in Wonderland' but they do work. A more accurate description would be foil lined balsa tanks. The main advantage is weight saving. The completed example in the photograph weighs only 2 grams. The lightest metal tanks I have made using 0.004in. tinplate has been 7 grams — so a most useful gain. I also think that they are easier to build, especially after the former has been made. Main drawbacks are the larger overall dimensions if you are tight for space, difficult to adjust the capacity if you get it oversize and possible fragility. The Dutch, who have long used balsa tanks, carry several spares. Obviously the tanks are really only suited to engine mounted filler systems.

You will need:

1. scraps of 1/16in. balsa sheet (light).
2. small lengths of alloy tubing — 1/8in. and 3/32in. dia. are typical.
3. some smooth kitchen foil.
4. epoxy glue — rapid set seems O.K.
5. cyano glue and baking powder.
6. Wood for the former (e.g. pine) and a piece of dowel.

Method

1. Decide on the shape and dimensions of the tank, remembering to allow an amount for tubing and the filler valve — 6.6cc is a typical tank capacity for an FA1 tank.

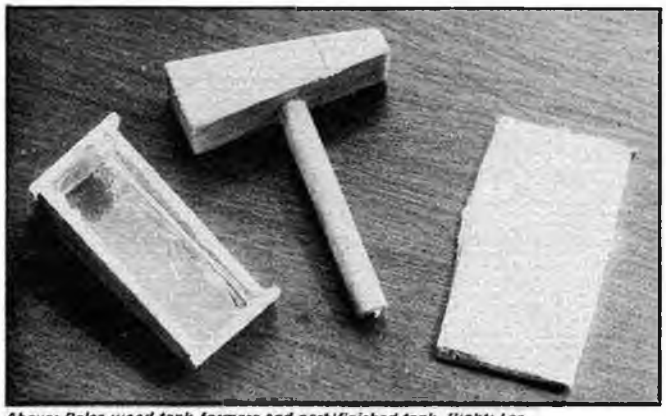
2. Shape a block of wood to these dimensions. Decide on which face you will insert the piece of dowel used to withdraw the former. I used the in-board face but it could be the front face — perhaps with advantage.

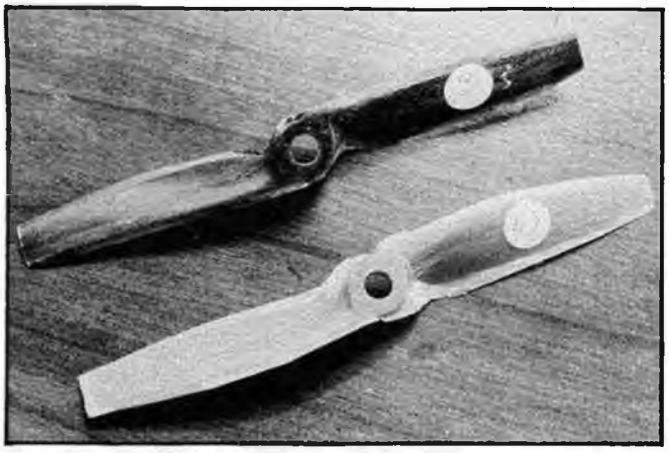
3. Give the former a couple of coats of dope to seal the surface.

4. Now the tricky bit. Draw a piece of aluminium cooking foil over the former — smoothing it carefully. Trim off the surplus and seal any seams with a smear of epoxy.

5. Cut the 1/16in. balsa dides to size. Epoxy should be spread on the wood to avoid any chance of tearing the foil. I worked in this sequence. (a) top and bottom, (b) front and rear faces, (c) outer face. Care should be taken to keep pressure on the faces while the epoxy goes off. This will ensure that the tank maintains its dimensions.

6. Withdraw the former (be careful





Above: Balsa wood tank formers and part finished tank. Right: Les Bollenhagen's FAI props.

during construction not to let any epoxy contact the former).

7. Drill holes for the pipework. Aluminium was used on the original for lightness. If clean fitting holes are made, cyano will form a good bond. Fillets were formed around the pipes using baking powder and cyano. Actually I fitted the vent as the last operation to facilitate sanding the outside of tank.

8. Having previously glued foil to 1/16in. balsa, epoxy the last side in place.

9. Sand the outside of the tank and run cyano over all joints. Give the outside a couple of coats of dope.

10. Test for leaks under water — you should not have any, of course.

11. Test for capacity using water as this will not foul the tank. If it is oversize, either reduce the former and start again, or slice off the rear of the tank and epoxy on a new tail cover.

Sounds complicated but in practice it is rather quick and I think easier than all the fiddly work cutting and folding tin plate. Time for the first essay, including making the former was just over one hour. N.B. Tanks made in this way using epoxy would not be suitable for use with glow fuels as methanol softens epoxy.

Goodies Directory

Les Bollenhagen Props

About this time last year the production of props seemed healthy. Subject to confirmation I have heard the Jurgen Bartels and Hutton Oddy have ceased production. Ron Tribe is not in full production since moving house. However the times bring forth the man — in this case Les Bollenhagen of South Australia. Les sent me a couple of examples of his handicraft — one glass, one carbon — and both seem to be of a good standard. The range of different props is impressive and not restricted to T.R. In the FA1 props, Les' recommendation is the No. 3 — a deep cuff variety. As far as I am aware, I do not think the range includes a 1980 type Metkemeijer, currently so popular but perhaps this can be covered later. Also of interest is the production of carbon spares for use in wing strengthening. Those interested should contact Les Bollenhagen at Flat 6, 1 William Street, Kilburn 5085, S.A., Australia.

Range — prices include postage, and quoted in Australian dollars.

Team Race: FA1 — Nos. 3, 4, 42, 5, 6, 7. All types in glass$5, in carbon $6. ½A: Glass $4. Goodyear: 1 Glass $5, 2 Carbon $6. Mouserace 5in. × 5in. — glass only $3. R/C: 20×10 $18, 16×6 pusher $18, 11¼×7¾ $8, 10×6 $7, all in glass only. Carbon wing spars 24in. × 6mm × 0.8mm $6.

J. E. Albritton Multi-function Valve

'J.E.' is the handle end of Albritton-Perkins F2C team from the USA. Walt Perkins is of course, well known for his 'Shadow Racing' products. For some time 'J.E.' has been producing valves at his Virginia machine shop to the well known Australian design.

Although based on familiar principles, the Albritton version incorporates several neat features which can be seen in the photograph.

(a) a female acceptance on the slider — this means that the valve can be flush with the fuselage when in the 'in-flight' position.

(b) a positive adjustable prime needle.

(c) perhaps most significant — the unit seems to employ the Cox TD 09 venturi which means the nylon body is drilled 5/16in. As T.R. engines will now be using larger diameter carbs. (4.00mm plus) the larger venturis will retain a good shaped profile.

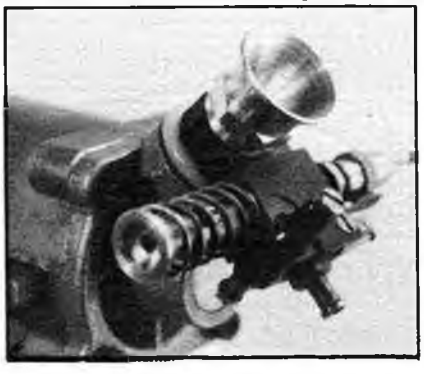
The milled slot above the exhaust stack would normally accept a length of micro-bore tubing linking to the prime needle to provide the exhaust prime.

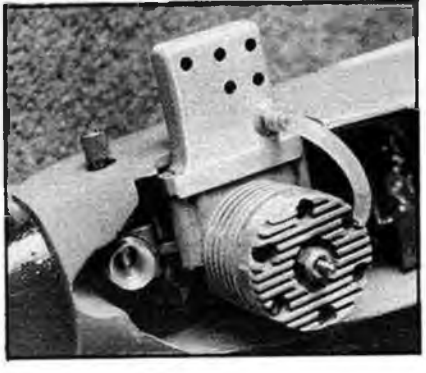
The price of this well made unit is US$60 plus postage appropriate to bring the item to your home address. Contact: J. E. Albritton, 503 Orrin St., Vienna, VA.22180, USA.

Bill Daniells Silencers

At the 1978 World Champs I was amazed to see for the first time the minute silencers used by the USA stunt teams — no more than an exhaust stack extension into which a couple of ranks of holes had been drilled. Les McDonald had even blocked some of these with self-tapping screws! Last year I got to try one of these silencers on my ST.46 and have been impressed with it. Nose reduction is on a par with a conventional expansion chamber type and this is achieved at a fraction of the weight. Any fears of overheating have not materialised. Furthermore the amount of back-pressure is easily adjusted with those self-tappers and so a steady engine run is readily achieved if a silencer pressure system is employed.

By the way I was able to nearly halve the weight of my silencer with nothing more than a file — the wall thickness is a generous 3mm. Units available for ST46, OS35 and Fox 35. Price £2.50 each. Contact: Bill Daniells, 25 Francis Road, Braintree, Essex.

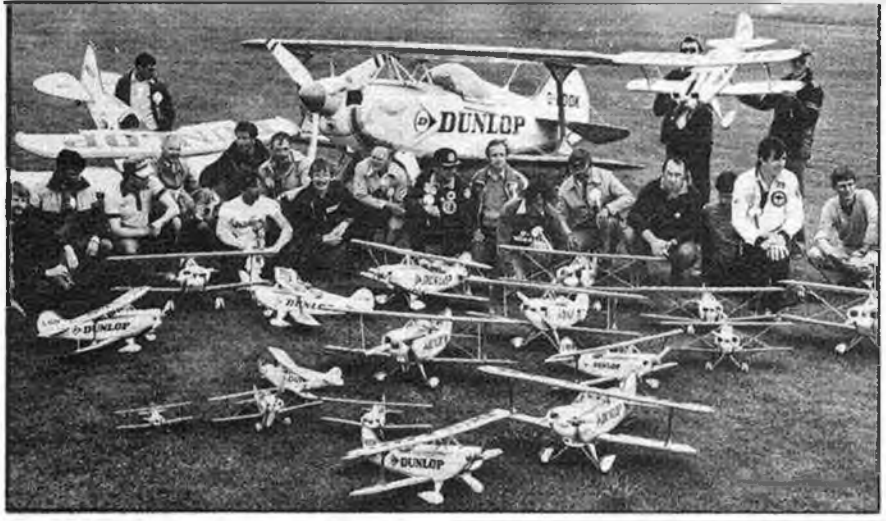




Bottom left: J. E. Albritton multi function valve. Above right: Shot of Bill Daniell's silencer from above. Bottom right: Silencer from below - engine is ST46. Note; silence pressure connected to tank.

DUNLOP Pitts DAY

OLD WARDEN
July 4th, 1980



The Idea for this competition came from the Dunlop Company who are promoting their products with aerobatic displays using a Pitts S1S flown by Brian Lecomber.

This event was unusual insofar as it was the first occasion that we had organised a combined full size flying and model competition for a single type, namely the Pitts.

As was expected, the majority of models were radio controlled although there were a few control line, free flight and static models. Unfortunately the wind was far too strong for free flight but nevertheless, Laurie Fisher and Peter Coulson had a go. Laurie's first flight started well with a good climb but then dropped a wing in the turn and hit the deck under power. The only damage was a cracked engine bearer but wisely Laurie decided to call it a day. Peter suffered engine trouble and only managed one attempt. Ken Fordham had made a very nice lightweight rubber powered Pitts of 1/12th scale but there was no way he could have flown in the strong wind, which was a pity as it would have no doubt given a good performance.

The control line models were more successful, John Howarth and Geoffrey Burkett both achieving their allotted two flights. Roger Ford's model was rather underpowered but did manage to get off for a few circuits.

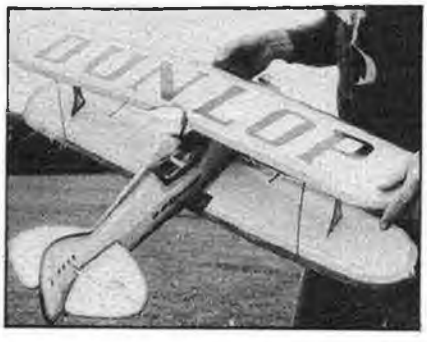
The radio controlled models put on some lively displays although one or two were quite 'hairy'.

The full size display was something not to be missed. Brian Lecomber performed pretty well every stunt in the book and in a space not much greater than the large R/C models were taking. There is no doubt, as a model the Pitts is a challenging subject but can fly well as proved by Ray Brown, seen at the rear right of our heading picture with his 1/3rd scale R/C model.

Thanks go to Brian Downham and Alan Callaghan for judging control line and free flight, Ian Peacock and Dave Day radio control and the Dunlop Promotion team for presenting the generous prizes.

Results

Control Line:	Points
1. J. R. Howarth	81
2. G. Burkett	68
3. R. Ford	58
Free-Flight:	
1. L. R. Fisher	129
2. K. Fordham	110
3. P. R. Coulson	105
Static	
1. V. Cook	145
2. M. L. Elms	144
3. P. Miller	136
Radio Control	
1. R. Brown	187
2. T. Airey	150
3. J. Evans	145



Heading photo shows the varied sizes of the models entered from 1/2 Scale down to 1/16th. Above left, Geoffrey Burkett's second placed control-line entry. Above right, John Howarth's model placed 1st in control line. Left: Beautifully built rubber powered Pitts by Ken Fordham. Right: The two brave free flighters, left, Peter Coulson, and right, free flight winner, Laurie Fisher.

Free Flight Scene

REPORT FROM MARTIN DILLY

1982 Holland International

This year's Holland International started off at a disadvantage; due to an oversight by the Royal Dutch Aero Club it never made it onto the CIAM calendar of FAI Open Internationals, and a number of potential flyers probably did not know of its existence. Certainly many Dutch flyers decided not to pre-enter, and were clearly deterred by the weather forecast. Luckily for those who did go to Almere, including Mike Fantham, Dave Oldfield and Martin Dilly from Britain, the weather on the glider day was not at all what the Dutch weather man prescribed for the newly-reclaimed polder land about half an hour's drive east of Amsterdam. Moderate winds over the large and very flat area of sandy ground produced virtually zero turbulence at towline height, due to the lack of vortex-producing ground obstructions upwind, and to maintain altitude it was necessary to tow upwind on most rounds.

In fairly tricky lift-spotting conditions nobody maxed out and Tony van Eldik, winner for the past two years, scored several times around the minute-and-a-half mark, leaving Fritz Wilkening of West Germany in top spot, ten years after his first Holland International win. One of the aircraft he used featured a flat-plate tailplane about 3mm thick.

The British flyers fared less well; Oldfield had problems on tow on several flights, Fantham had the frustration of marking a good patch of air for Wilkening but then seeing his own model come out of it, and Dilly dropped a couple of early flights and then tore a calf muscle while accelerating the model for launch on the final round, finishing the launch on the hop, but at least maxing.

Although Wakefield on the first day had a low entry, Anselmo Zeri's aircraft was interesting and immaculately engineered. He used a location buzzer powered by a single 1.2 volt button cell, and weighing about 16 grams, which enabled it to be used in a model also carrying a Seelig timer. Anselmo also had a very neat snap-on coupling to join the boom to the motor tube; he uses a rear winding system, with the tailboom removed. The rear motor peg locates in a couple of slots in a light alloy collar at the rear of the motor tub, held in by motor tension; this collar has a rounded annular ridge machined on its inner surface. At the matching front end of the fibreglassed rolled balsa boom is a machined nylon fitting, like a multi-petalled tulip. This pushes into the rear of the motor tube, locates exactly onto the rear motor peg and keeps the boom on through its own springiness, via a circumferential groove machine round it, to locate onto the ridge inside the motor tube collar. The system allows the boom to pop off under high impact loads.

Holland International Results — May 22-23rd

F1A

1. F. Wilkening	West Germany	1167
2. P. de Boer	Netherlands	1155
3. M. Dilly	Great Britain	1126

6. M. Fantham 988; 12. D. Oldfield 762.

F1B

1. P. Ruyter	Netherlands	685
2. A. Hacken	Netherlands	581
3. G. de Kruyff	Netherlands	226

Only 5 rounds flown.

F1C

J. Moust	Netherlands	180
B. Huyben	Netherlands	180

Contest abandoned after one round.

An Electronic F1C Timer

One of the major technical innovations at the 1981 World Championships was Tom Køster's electronic timer for power models. While an earlier version had been seen several years ago, the timers Tom used at Burgos were advanced prototypes and allowed up to six functions to be programmed into them from a control box that was plugged in whenever an alteration to the sequence was needed. With many advanced F1C aircraft this is typically engine flood-off, engine brake, tailplane down for the bunt, auto-rudder, tailplane up for the glide, and finally dethermaliser.

Now this timer is available for power flyers who worry about the sensitivity to dust, temperature, vibration and varying engine rpm of clockwork timers. For a cost of $190 (about £108) you get the timer itself, the servo, faceplate with latches, and the opto-switch that starts the system the instant the aircraft is released; the control box, which is not an airborne unit, costs $230 (£130), and rechargeable nickel-cadmium batteries are purchased separately. There is a one year guarantee.

One control box can, of course, be used to programme a number of timers, so several flyers could share the use of the unit, which can store up to nine time settings. As well as operational reliability, a timer like the Køster one has other advantages; alterations of fractions of a second can quickly be made to the various functions in the knowledge that they will repeat exactly in the air. In fly-offs that go to several progressive rounds, the increasing D/T times can be punched into the model's timer memory without any need to wait for five minutes to check that the tailplane does pop-up at, say, 5:03. It will, and this can make all the difference when time is short between rounds.

Two different battery packs can be used, giving either 16 or 24 hours continuous operation. To avoid problems no on-off switch is fitted, and the batteries are removed after a day's flying for recharging. Unit weights are 24gm for the timer, 25gm for the servo and faceplate, and either 17 or 28 grams for the batteries. I have a few copies of Tom's very comprehensive information brochure for those at British contests; otherwise write to Tom Køster at Postbox 54, DK-3400 Hillerød, Denmark. An F1A glider timer will be available during July 1982.

Although the cost may appear high, it compares favourably with R/C equipment; some cynics — or realists — have suggested that the very fact that radio models often cost considerably more to put into the air than free-flight ones gives them more 'financial macho' appeal to some sections of the model flying community. With Nelson 15s at around £100, Køster timers at £238 and the material cost for an F1C model around £30, perhaps we can soon expect a flood of converts from the 'expensive must mean fun' ranks.

Glass Cloth

Lightweight glass cloth is becoming a much sought-after commodity at present. Wakefield propellers are covered with it, F1C wings are skinned with it, D-boxes on glider wings use it to increase torsional stiffness and people are finding it a useful rapid repair medium with cyanoacrylates. Now 0.6oz. (about 20gm/M²) glass cloth can be had from John Leigh, 18 Stonehill Drive, Rochdale, Lancs., at £2.50 a square yard. 1, 2, or 3 yard packs are available, and the cloth has been specially sized to hold together while being used on compound curves.

Thermal Generation

A few points on the production of thermals may be helpful, as you pant across the flying field with a slack towline connecting you to your circling glider, or stand on the launch line with a cooking rubber motor.

First, the fact that the sun is out is no indication of the presence of a thermal at ground level. On a clear day the sun's energy does not significantly warm the atmosphere as it passes through; the necessary temperature increase for thermal developmanet comes from the heating of the ground. Cloud shadowing of course interrupts this heating process, as does dust and industrial smog. The angle of incidence at which the sun's rays meet the ground also affects the heating effect; at noon this is greatest, when the sun is nearest to vertical, and a given amount of energy is applied to the smallest area of ground. At sunrise and sunset this angle is at its most oblique and the heating effect is least.

The type of vegetation on the ground affects the surface heating, as does the surface moisture; green plants evaporate water, which requires large amounts of heat,and thus reduces that available to heat the surface of the ground. A large tree in the summer, for instance, will consume 3 *tons* of water on a warm day, and evaporating that lot takes a lot of heat. The drier

Far left: Winding with wings detached, Russell Peers of Falcons uses the shelter of his top-hinged tailgate to keep the wind off his Open Rubber model, held by Pete Farrimond of Wigan.

Left: The results of a sheared propeller blade at launch, demonstrated by Phil Ball and Open Rubber model at Hemswell Easter meeting. Note both blades detached, and fuselage failures behind wing and in front of tailplane, as 1,000 or so turns try and rund down with no propeller to absorb the energy.

Below: Terry Dilks lights the fuse on Russell Peers' Open Rubber model as Pete Farrimond steadies the fuselage in the lee of the Volvo tailgate in strong winds at Barkston Heath.

the plant the better the surface heating; evergreen woodlands produce better thermals than deciduous ones, for instance. The reflectance of the surface also affects its heat absorption; you only need to feel the temperature of a light-coloured car and compare it wth a dark one on a hot day to demonstrate that. That is the chief reason for painting your model box white, too; it reflects the heat and keeps the models inside cooler than a dark box.

Wind affects the heating of surface air, both by mixing it with cooler, higher layers and by itself cooling the surface. Thus large thermals are rare in windy conditions. Where the air close to the ground is protected, by standing corn, grassland or heather, for instance, the temperature between the stems of vegetation can be several degrees higher than that a foot above their tops. Depressions in the ground, and the lee side of slopes can also be a good area for thermal propagation.

Glider pilots sometimes make a mental stroll on the ground they are flying over, and imagine how they would feel while walking on the various areas. Something similar can help us in model flying, too; instead of just pounding off at random when towing a glider, try to have some idea of where the thermal-producing areas of the flying site might be. Tom Køster obviously had given a bit of thought to this during the F1A fly-off at the '79 World Championships at Taft; after a hot day in the semi-desert he towed towards a group of metal-skinned buses parked with running engines, and picked up enough lift from them in the evening air to win.

The practice of 'flapping' to induce the departure of a thermal bubble from hot ground in still conditions is a controversial one, but it can certainly work. Such air needs to be triggered into breaking away, but once the bubble starts to rise it can get enormous masses of air moving upwards with it. Static triggering points can also start off a thermal, pericularly in an otherwise flat area and calm air; a small airfield building, a tree, a bonfire or the junctions between different surfaces can all distrub the microclimate near the ground enough for it to be worth our feeling them out as thermal sources.

A clean Open Rubber launch by Dave Hipperson of Grantham at Hemswell Easter meeting.

1983 World Championships

At the April Bureau meeting of the CIAM in Paris it was learned that Austria would be unable to stand by its offer to hold the 1983 World Championships, which had been described by their delegate as 'definite'. While being a major disappointment to the model flying community, many of whom regard Wiener Neustadt, along with Mostar in Yugoslavia, as the best two free-flight sites in the world, this also means that time is very short for making decisions and planning for a Champs about a year away.

At the Plenary CIAM meeting in December the voting was 20 for Austria, 10 for Israel and 2 for Australia, with the Argentine offer being withdrawn until 1985. Normally a decision on a World Championships venue can only be taken at a Plenary meeting at which all national aero clubs' delegates can vote, but because of the urgency of getting the organisation under way, a postal vote either approving or disapproving Israel as next year's host, with a Negev Desert venue, is being taken. By the time you read this the result might even be known.

One's sympathies are very much with the Australians, whose initial offer was made back in December 1980. I wonder what would have been decided by CIAM had the only offers been Israel's and Australia's; at this late date there is little chance of the Aussie offer being reactivated, for it was planned for Spring 1983. Ideally perhaps the Championships should rotate between Northern and Southern hemispheres, but undoubtedly stark financial considerations would make the 40 or so nations represented at CIAM vote for a venue relatively cheap to get their teams to (which ruled out Australia for many) and politically acceptable (which ruled out Israel for some). Austria has the advantage of being neutral politically, and central for the majority of nations geographically.

At home, we still have no venue confirmed for the Team Trials. The dates set are September 18/19th and October 23/24th, with a fall-back date of November 6/7th in case of weather problems; for the latest information, please call Mike Woodhouse of the SMAE's F/F technical committee *after* August 14th, on 0603-57754. Incidentally, you can enter the Team Trials even if you are not an SMAE member, but of course at a higher fee; whatever your status, remember to pre-enter by August 27th at the latest.

REPORT FROM DAVE HIPPERSON

SMAE 4th Area Centralised Event — 13 June 1982

Generally speaking the further North you were the colder and nastier it was for this one. At Albermarle there were no contest flights until 4.30 p.m. and then precious few. Driffield had the cold breeze problem compounded by very close and dangerously high grown crops; Davitt doing well to record what he did in Coupe and only a handful of Glider flyers risked being swallowed. A fair turnout at Barkston had generally a poor standard in Team Glider and the constant worry of high green corn sometimes only two minutes away. All the more surprising then that the eventual winner of Glider flew here, Bamford's fly-off being taken with Dilks a little past six when conditions really had improved. Otherwise it was a cool breezy day with small patches of weak lift. Even last year's Coupe winner ran into difficulties and found his 9 minute plus total only good enough for 5th.

Crawley had the Team glider buttoned up in slightly more encouraging weather at Ashford with two of their only team in the flyoff. Their third man, Knight, swung it over Biggles with his useful 8.07 total. Everleigh was the place to be however. No crops and generally calm and warm with the most entrants — nearly 40. No surprise that top place in FA1 went to Stafford Screen here with a high standard topping a meagre low scoring field. In Coupe the only full house in the country came from Peter Carter and he added to this like Stafford, a 3 minute plus fly-off he didn't need. Actually the top three in Coupe all came from Everleigh as did Elton Drew's 2nd in Glider and Roger Baggott's 2nd in FA1 Power. Fred Chilton's total in this class, flown at Beaulieu, comprised four maxes and a 38 second flight. This bad one being Fred's first! Bet he is glad he continued. FA1 Power is crying out for more people with a 'competitive' approach to give Screen a run for his money.

After all this, Biggles hold onto their top slot in the Plugge with Birmingham second by a little under 200 points — a margin they could just make up at Team Power in September if they put together the kind of total of which they are capable. East Grinstead oust Grantham from the top three and Croydon come up dramatically again after a good showing in the individual Glider results: their top man being in a team of his own — what a waste!

Results

Open Glider (Individual) 84 flew.

1 T G Bamford	Barkston	9 00-6 00
2. E. Drew	Everleigh	9 00-5 51
3. A Cameron	Ashdown	9 00-5 49
4 J. Williams	Everleigh	9:00-5:35
5 T Dilks	Barkston	9:00+4:07

Open Glider (Teams) Model Engineer Trophy. 28 teams flew.

1. Crawley	Cameron, Cameron, Knight	26 07
2 Biggles A	Parry, Cooper, Bailey	25 32
3. Falcons	Dilks, Peers, Carter	24 40

Coupe d'Hiver — no trophy (25 flew).

1 P Carter	Everleigh	10.00+3 44
2. D. Greaves	Everleigh	9 43
3 M Dilly	Everleigh	9 41
4 J. Cooper	Luffenham	9 38

FA1 Power — Astral Trophy. (10 flew).

1 S Screen	Everleigh	15 00-3 25
2 R. Baggott	Everleigh	13 56
3 F. Chilton	Crookham	12 38

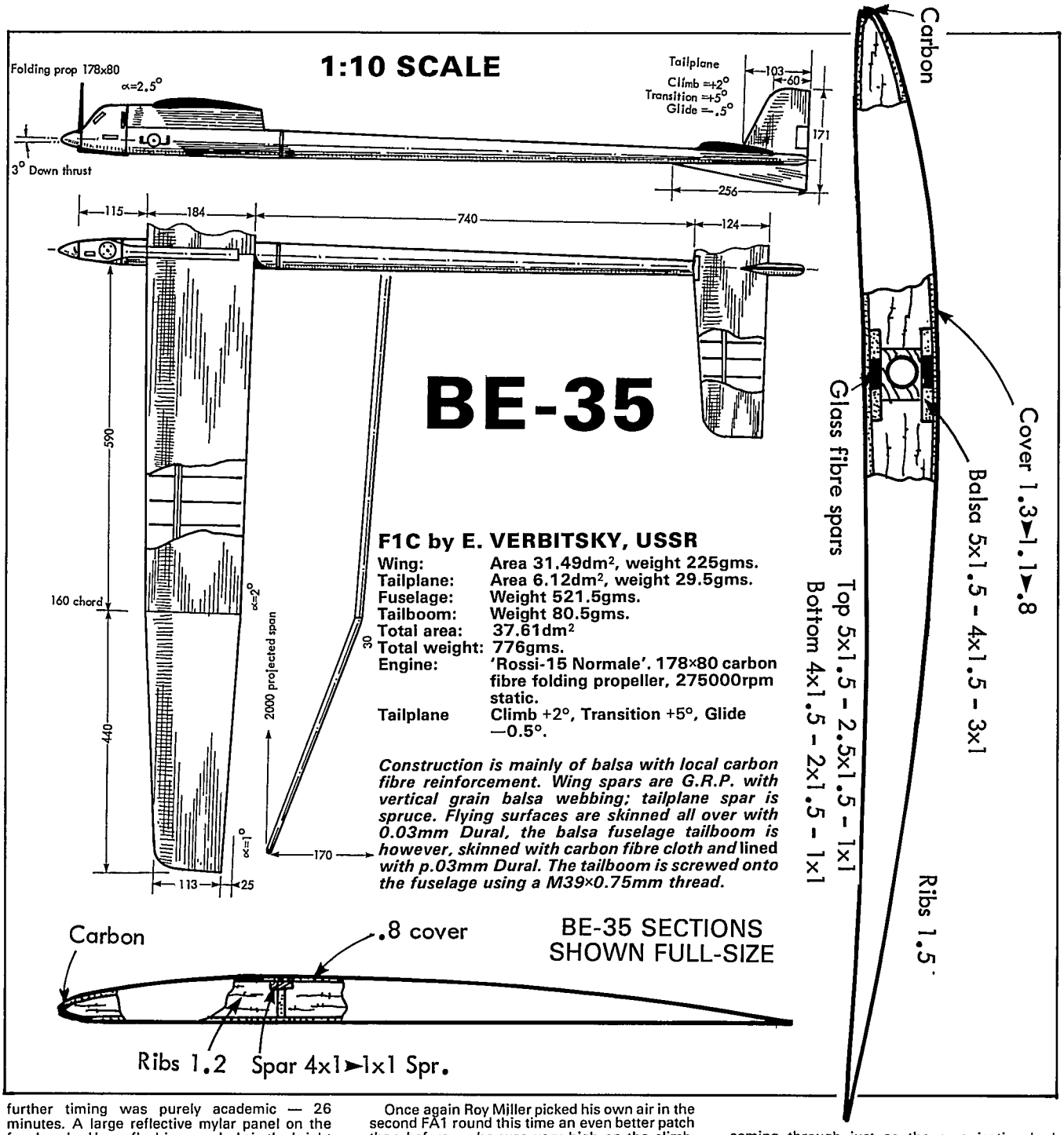
(Central column refers to venue not club)

The Crookham Gala — Beaulieu — 20 June 1982

Because of the way it is conducted and its regularity, not to mention the weather it has attracted for the past three years, the Crookham Gala is now one of the most prestigious events outside the SMAE circuit. This year the forecast had been fair but the weather that turned up was ridiculous. Almost total calm for the first half of the day with regular sun and then occasional breezy bits later. The Udens, running the event as usual, set the max in Power and Rubber at a sensible 4 minutes and although this eventually made little difference to the outcome, it was still the correct thing to do. Best entered event was combined FA1 which surprisingly sported no Power models despite a number of top protagonists being present.

By the close quite a few long comp flights were hopelessly lost in the enormous 25 square miles of New Forest directly down wind. The hoped for wind swing never came and there was much discussion around the subject of whether the fly-offs, timed to start at a little past 5.00 p.m., should be put back. Although the slight drift might have died away the CD insisted that at 8.00 p.m. the thermals would be much the same as they were now. This sounded difficult to believe but he was proved to be quite right — the lift was still there right up to dark!

There were fly-offs in all events. There would be no returning from the Forest and those that flew without a fuse knew the risk they were taking. FA1 was straight off at 5.15 p.m. to a progressive max starting at 5 minutes and involving five A2s and a Wakefield. Roy Miller's Wake was away first and he had picked good air to max easily. Mike Fantham also maxed as did the Williams's, Pete and John, (no relation) the latter losing his one and only model. Distances were rather more than had been expected and still in the worst direction. Power went next when it was estimated that perhaps nine minutes could be squeezed in before the woods. John Hook — of whom we see little nowadays — was first off and into good air leaving Hopper and Peers 40 models to take pot luck right at the end of the period. They flew together — neither were in lift. In the Rubber fly-off a number actually managed to miss the lift — not easy! Marcus flew early in good air but before the body of the thermal. Chapman and Davies hit the centre of it and Hipperson caught the tail end. Chapman's model was OOS a little over 10 minutes still high. Hipperson toped that with a flight that was watched down about a mile into the forest. A long time later Davies' time-keepers were still watching their charge. He was clocked off when it became obvious that any



further timing was purely academic — 26 minutes. A large reflective mylar panel on the fuselage had been flashing regularly in the bright evening sun and binoculars were at some 20 degrees at the end. After such a duration in 3-5 mph drift it would suggest an altitude of nearly a mile! There was much grinning by the victor for sometime afterwards.

Fantham had qualified for Open Glider as well as FA1 — he was having a busy time. Despite using only one model for all these flights he had it returned from the FA1 fly-off in time to log another excellent 6.30 thermal flight which looked all set to take Open when it was noticed that Cox's timekeepers were still busy. Cox's model had played with lift across the width of the heath and finally gone up at the end and then down again into the dreaded wood — he had done well over 10 minutes.

Once again Roy Miller picked his own air in the second FA1 round this time an even better patch than before — he was very high on the climb. Williams launched his A2 a few seconds later and chased along in the tail end of it low down for some time before catching Miller's model and beginning to rise. I held on and maxed, but Miller didn't due to a fast running and unchecked timer. He dt'd at 5.30 and was down just two seconds short of the 6 mins. Thirty seconds before the hooter Fantham, still towing way upwind, was off into super air and hardly drifting. More than three minutes had passed before the model was back over the spectators. An accurate 6.10 dt and the model was down only a few yards away.

Before the A2s went again, a Champagne Wakefield fly-off was programmed. This was well entered but, in retrospect, was the silliest part of the evening. Enormous patches of lift were still coming through just as the organisation had promised — notwithstanding the late hour — 7.30 p.m. Therefore the single calm air comparison flight was not about to occur. Three early flights caught horrible air and the rest went straight into a huge patch of lift and fell out on DT at various times, leaving Ian Kayes with an extender disc to judge it perfectly and pop just off the floor after nearly 11 minutes. He travelled the full width of the site but was in no danger.

In the final FA1 bout to a 7 minute max it was rumoured that the finalists had synchronised their DTs to as close to 6 as possible. Whatever they had done was of no consequence as the lift had faded momentarily and Fantham found none to drop down in 2.40 leaving Wlliams 4.10 to take it easily. It all ended at about 8.00 p.m. with a

CONTINUED ON PAGE 460

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CONTINUED FROM PAGE 457

prizegiving at which most of the recipients were present either because they had had time to recover their models or because that had gone such enormous distances that they hadn't bothered to chase at all. It had been a costly loss of models but as a direct result of the extraordinary conditions rather than any fault of the organisation. Apart from the excellent trophies and keepsakes, substantial cash prozes were distributed presumably as a result of the re-entry facility of which many made use. This contest is worth travelling a considerable distance for — try and make it next year.

Results

Open Glider (19 flew — 5 in fly-off).

1 D. Cox	Crookham	9:00+10.35
2 M. Fantham	Richmond	9:00+6:30
3 G. Madelin	C./M	9:00-5:55

Open Rubber (9 flew — 6 in fly-off).

1 P. Davies	B&W	12:00+26:00
2 D. Hipperson	Grantham	12:00+12.05
3 C. Chapman	B&W	12:00+10:15

Open Power (5 flew — 4 in fly-off).

1 J. Hook	Southampton	12:00+7.29
2 J. Hopper	Freebird	12:00+5:26
3 P. Harris	Birmingham	12:00+3:28
4 R. Peers	Falcons	12:00+3:28

Champagne Fly-off — F1B Wakefields only (9 flew).

1 I. Kaynes	Croydon	10:43
2 P. Uden	Crookham	8:59
3 I. Taylor	Falcons	7:06
4 R. Miller	Croydon	6:01

Combined FA1 (21 flew — 6 in flyoff).

1 C. P. Williams (A2)	Richmond	15:00+5:00+6:00+4:10
2 M. Fantham (A2)	Richmond	15:00+5:00+6:00+2:40
3 R. Miller (Wake)	Croydon	15:00+5:00+5:58 (dr'd)
4 J. Williams (A2)	Freebird	15:00+5:00 lost model

SMAE Mini — Beaulieu — 27 June 1982

REPORT FROM DAVE HIPPERSON

Rather more typical Beaulieu weather caught up with us for this, the first of a pair of centralised SMAE Mini events designed to coincide with the crop season. Still very mild, 15 to 20 mph gust and rain squalls made it very turbulent at low level and a long chase for high thermal flights. John O'Donnell lead the way impressively to a full score in A1 and considering the strength of some of the lift was lucky to retrieve the model on all occasions. The turbulence had least effect on the power fliers who held pattern surprisingly well although looking at the field this was certainly the cream of the crop. Pete Harris, after a rather difficult season so far, topped ½A with almost a perfect total. Just a few seconds dropped on his first flight. Buskell also flew steadily and dropped just a little more time on his fourth flight. Stafford Screen after looking set with three maxes was away a long time after the third and returned eventually without his favourite orange model. He had to attempt the last flights with a new design and a none too happy sounding motor. The stuttery run had the model diving into the ground in an underelevated arc and the damage too complicated to be attempted on the field. For the first time this year Stafford found himself out of the results and with a lost model.

Dave Greaves lost a model too — this on his third Coupe d'Hiver flight in a breezy thermal after his two previous flights had been sucked down fast on the glide despite high and stable climbs. His reserve piled in and left him with too little time for the repairs. Certainly Coupe was the worst affected by the turbulence. Even models launched in lift were hurled around. In fact in a number of instances this seemed the worst moment to launch. Roy Miller managed four consecutive sub-minute flights! Hipperson avoided any terrible flights by picking the smooth patches but real lift only once. Greaves and Hipperson were the only people to max in Coupe and then only once each!

HLG gave Julian Hopper victory quite late in the day after having little success with A1 or Coupe. His total included three maxes. The day's entertainment was rounded off nicely by John O'Donnell who produced his CO_2 model for a 'fly over' win as he was the only entrant. However he rather overdid it as his model contacted strong lift and was at many hundreds of feet before the prop stopped. It is doubtful if the model was recovered, the last we saw was of him hectically giving chase. He was not back in time for the prizegiving.

Results

A1 (9 flew).

1 J. O'Donnell		
O'Donnell	Whitefield	10.00
2 C. Pudney	Southampton	8:41
3 G. Madelin	C./M	8:34

Coupe d'Hiver (7 flew).

1 D. Hipperson	Grantham	8:00
2 D. Greaves	B&W	5:00
3 D. Taylor	Richmond	4:45

1/2A Power (7 flew).

1 P. Harris	Birmingham	9:54
2 P. Puskell	Crookham	9:39
3 T. Payne	Biggles	8:34

HLG (3 flew).

1 J. Hopper	Freebird	4:19
2 J. Buskell	Crookham	3:40
3 J. Bailey	Biggles	2:50

CO_2 (1 flew).

1 J. O'Donnell	Whitefield	2:00

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25 YEARS AGO IN AEROMODELLER

By Dave Day

The subject of the editorial was the Reader Query Service (whatever happened to that?) and concluded with the following: "Finally, we must mention the chestnut that turns up time after time. Following a showing of 'The Dambusters' it goes something like this: "I intend building an eight foot span radio-controlled scale Lancaster with rudder, elevator and aileron controls, and engine control on all four motors. Can you please send me suitable calculations for wing area and details of suitable servo equipment for the controls?" We usually feel like replying: "Yes, if you do not mind going without next month's Aeromodeller, and even then it will not be a practical flying proposition."

Strange that the answer to the 'chestnut' has been published many times over in the succeeding years and has produced some quite practical models. Perhaps we should have done without the October issue!

Possibly the most important feature of this issue was news of the first recorded flight by an electic powered aircraft model, and R/C too! On June 30th, Col. H. J. Taplin flew his modified 'Radio Queen' (in fact, the *original* 'Queen' airframe which was already 7 years old!) at Chalgrove Aerodrome. Power was supplied by 20 Venner silver-zinc cells (at 25/-d. each — sorry £1.25), with an additional five cells for take-off power. All-up weight was 8lb. of which 1lb. 14oz. was for the motor and 1lb. 12⅛oz. for the cells. It was stated that the model *would* take-off from a smooth enough surface, but after first attempts failed, the model was hand-launched. Maximum height reached was about 40 feet and the flight was terminated by an approaching thunderstorm.

Following the established idea of co-ordinated features, this was a 'Stuka' issue. The cover photo was of Doug McHard's 17in. span rubber model which appeared as a full-size two-page plan, while 'Aeroplanes in Outline' No. 51 featured the Junkers Ju87 'Stuka' to 1/72nd scale described and drawn by — J. D. McHard!

Both of the Plans Service introductions came from Finland, these being a 39in. span C/L Lockheed 'Lightning' for two 2.5cc motors by Bengt A. Troberg and 'Finnair', a 51¼in. span A/1 glider by Ilpo Haahtela.

Yet more co-ordination came from 'Fokker Pilot' by Peter Gray, a story about Ernst Udet, and 'Aircraft Described' No. 87 featuring the Fokker DVII described by — yes, P. L. Gray!

Radio Control Notes had more information on the revolutionary new transistor and contained a small scale drawing of a radio controlled slope soarer, 'Thursday's Child', by D. Illsley (was this another first?). It looks very dated by present standards and was 134in. span for single channel! However, it did hold the British record of the time at no less than 2 hours 23 mins. 19 secs.

'Aeromodelling Step-by-Step' dealt with control hinges and makes interesting reading when compared with the present plethora of ready-made items, listing only thread, fabric and wire and tube types, all of which are still superior for C/L models.

'Engine Analysis No. 39' featured the DC 'Spitfire' Mkll, tested by Ron Warring. Maximum power was .0725 BHP at 12,400 rpm and the price £2.12.7d. (£2.63p).

'Round the Rallies', 'World News' and 'Model News' all contained lots of happy people posing in brilliant sunshine — what a carefree world it was in those days!

'Know your engine' part 12 continued the feature on propellers and explained how to measure the pitch.

Finally, a few samples from the classified ads:

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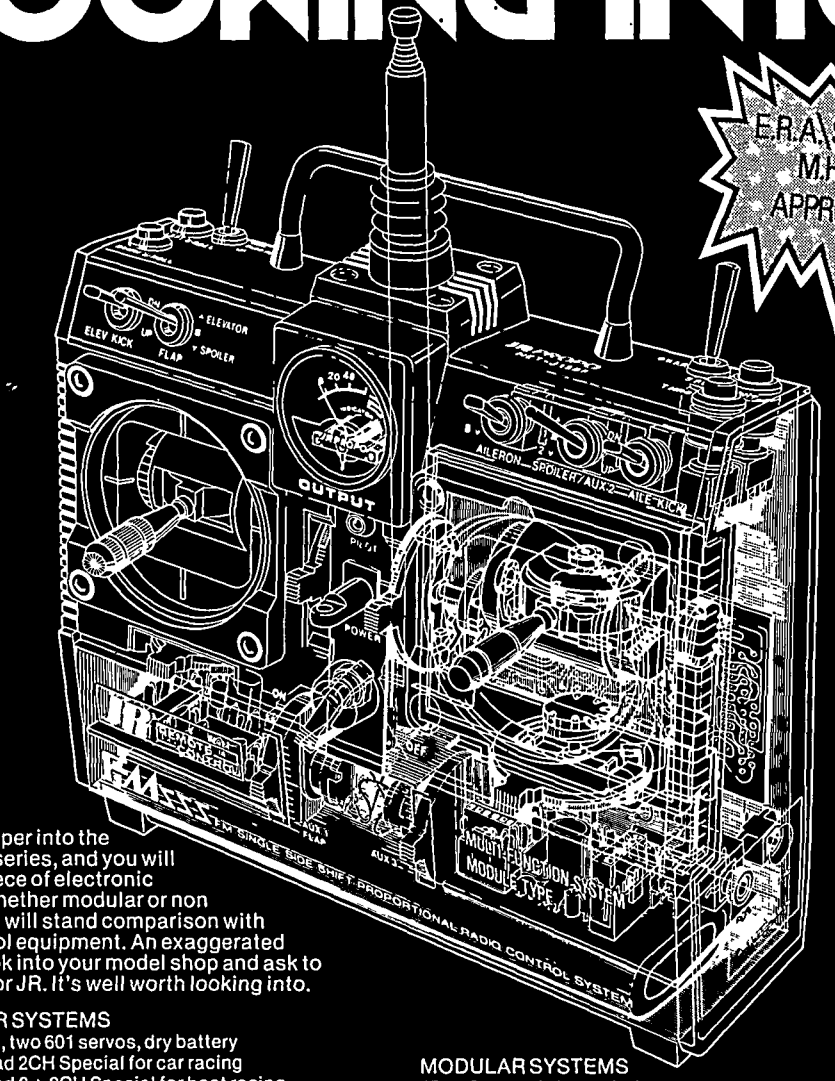

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J5C-4SV	5 channel with rates and servo reversing
J6C-4SF	6 channel aerobatic with rates, servo reversing and Flap/Elevator mixing
J8C-4SF	8 channel "Universal" for aerobatics & gliders
J8C-4SH	8 channel "Specialist" for Helicopters with flight inversion facility.

AVAILABLE FROM ALL GOOD MODEL SHOPS SEND SAE FOR MORE INFORMATION

MacGregor

MACGREGOR INDUSTRIES LTD., CANAL ESTATE, LANGLEY, SLOUGH, BERKSHIRE.
TELEPHONE: SLOUGH 49111 & 42251

Ⓢ

FORD F150 RANGER XLT

RADIO CONTROL PICK-UP TRUCK IN 1:10 SCALE

Leap Ahead With Tamiya!

- Designed for 6V or 7.2V operation
- Splash-proof box keeps dirt and water away from vital radio parts and batteries
- Outstanding high speed performance for "off-road" racing!
- All-round independent suspension:
  Front — trailing arms
  Rear — swinging arms
- Chunky block patterned tyres provide maximum road-holding under most conditions

TAMIYA

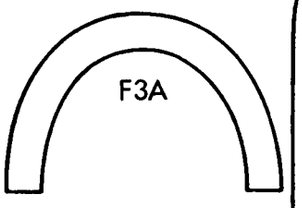
- Can be made splash-proof by using a sealant
- Superbly engineered kit contains many high quality die-cast aluminium components
- Oil-filled shock absorbers on all four wheels
- Highly detailed Ranger body

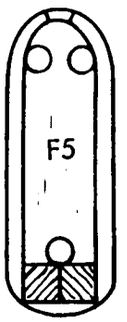
- "Off-Roaders" require a robust radio!
- Acoms for quality and reliability!
- Acoms designed specifically for Tamiya vehicles!

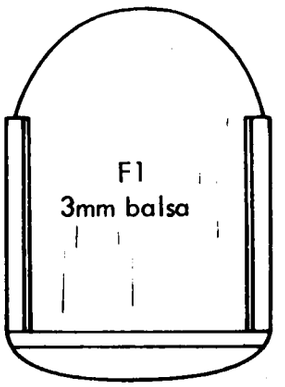
RIKO **RICHARD KOHNSTAM LIMITED**
13-15a High Street, Hemel Hempstead, Herts.

ELECTROLI-GHT

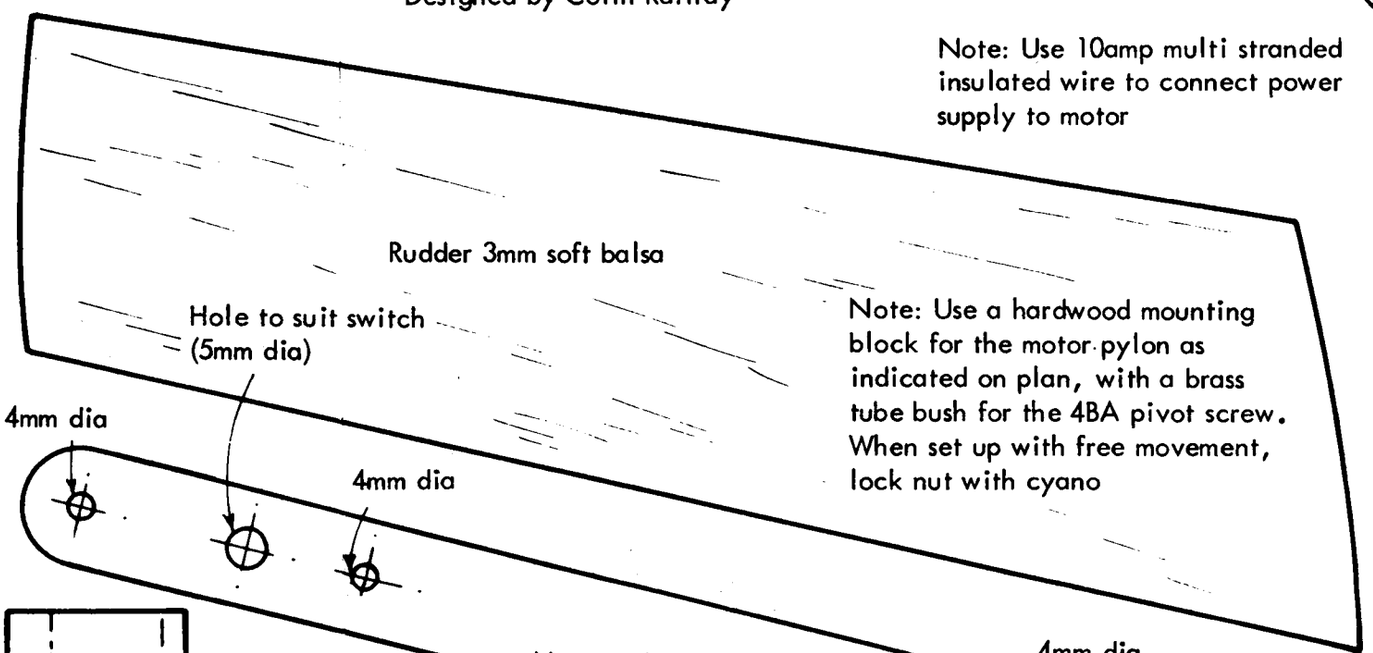
1340mm span electric powered glider for 2 channel R/C. Motor: 'Astro' 020 or similar. Power pack: six 500 mA quick charge A.A. size Nicads. Designed by Colin Rattray



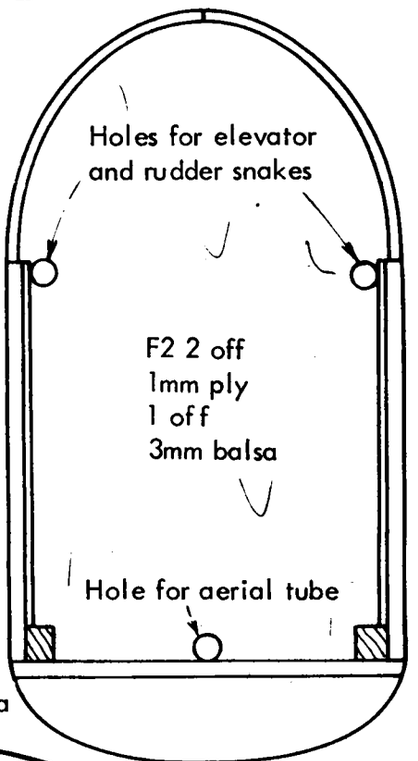


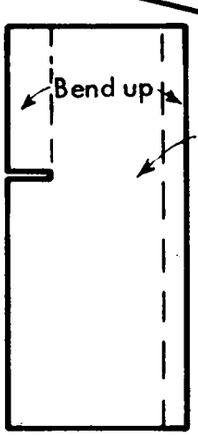


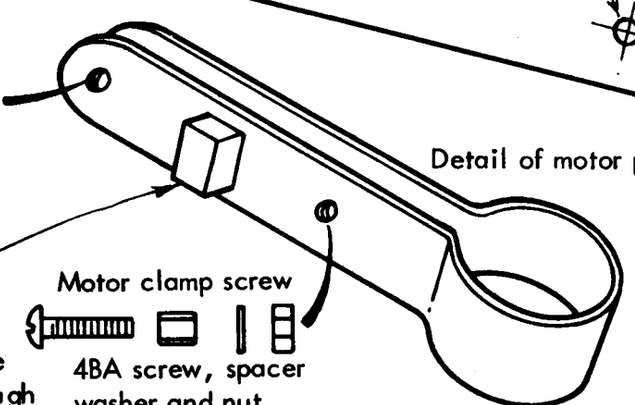
Note: Use 10amp multi stranded insulated wire to connect power supply to motor



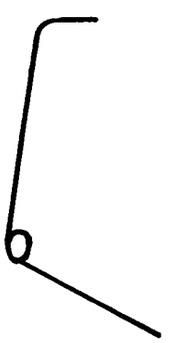
Note: Use a hardwood mounting block for the motor pylon as indicated on plan, with a brass tube bush for the 4BA pivot screw. When set up with free movement, lock nut with cyano

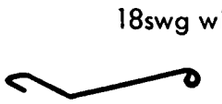


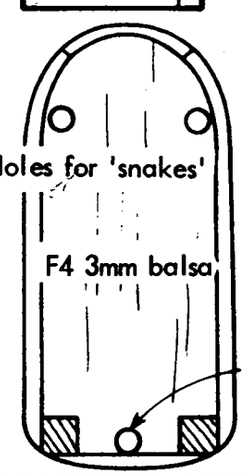


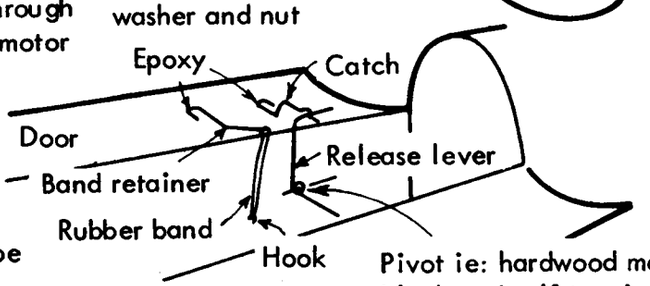


Miniature single pole toggle switch. Toggle leaver protrudes through hole other side of motor pylon

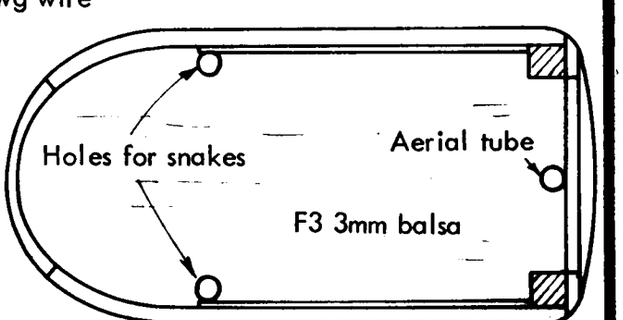


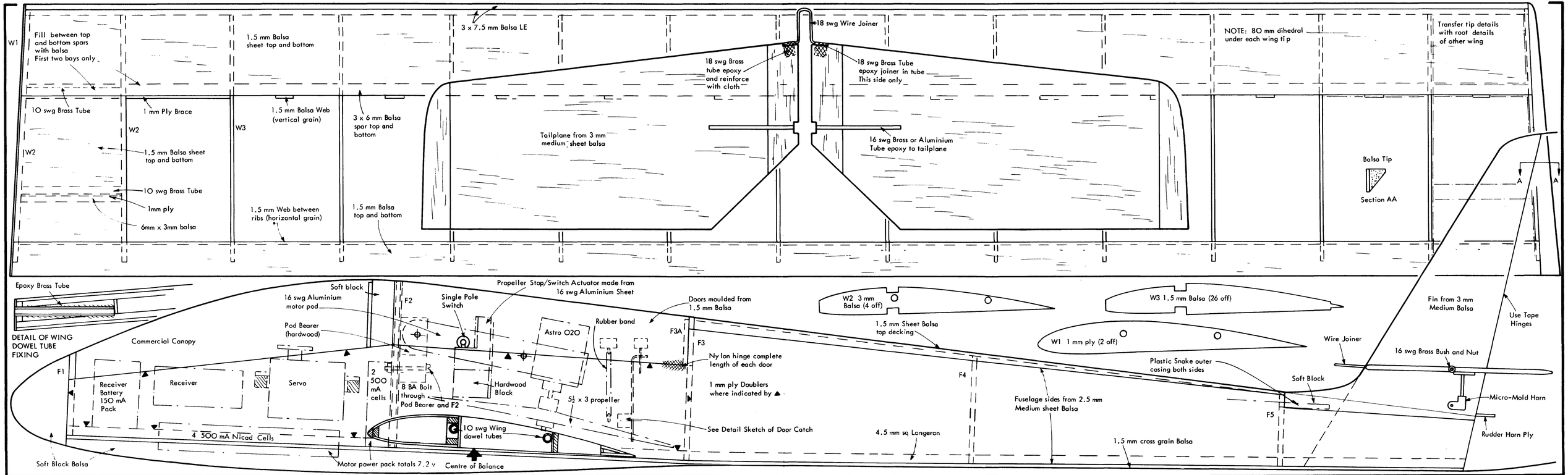






Detail of door catch




W1
Fill between top and bottom spars with balsa First two bays only
1.5 mm Balsa sheet top and bottom
3 x 7.5 mm Balsa LE
18 swg Wire Joiner
NOTE: 80 mm dihedral under each wing tip
Transfer tip details with root details of other wing
18 swg Brass tube epoxy and reinforce with cloth
18 swg Brass Tube epoxy joiner in tube This side only
10 swg Brass Tube
1 mm Ply Brace
1.5 mm Balsa Web (vertical grain)
3 x 6 mm Balsa spar top and bottom
W2
W3
Tailplane from 3 mm medium sheet balsa
16 swg Brass or Aluminium Tube epoxy to tailplane
Balsa Tip
Section AA
A
A
1.5 mm Balsa sheet top and bottom
10 swg Brass Tube
1mm ply
6mm x 3mm balsa
1.5 mm Web between ribs (horizontal grain)
1.5 mm Balsa top and bottom
Epoxy Brass Tube
DETAIL OF WING DOWEL TUBE FIXING
Soft block
16 swg Aluminium motor pod
Pod Bearer (hardwood)
F2
Single Pole Switch
Propeller Stop/Switch Actuator made from 16 swg Aluminium Sheet
Doors moulded from 1.5 mm Balsa
Rubber band
F3A
F3
Ny lon hinge complete length of each door
Astro 020
Commercial Canopy
F1
Receiver Battery 150 mA Pack
Receiver
Servo
2 500 mA cells
8 BA Bolt through Pod Bearer and F2
Hardwood Block
5½ x 3 propeller
1 mm ply Doublers where indicated by ▲
See Detail Sketch of Door Catch
10 swg Wing dowel tubes
4 500 mA Nicad Cells
Soft Block Balsa
Motor power pack totals 7.2 v
Centre of Balance
W2 3 mm Balsa (4 off)
1.5 mm Sheet Balsa top decking
W3 1.5 mm Balsa (26 off)
W1 1 mm ply (2 off)
F4
F5
Fuselage sides from 2.5 mm Medium sheet Balsa
4.5 mm sq Langeron
1.5 mm cross grain Balsa
Fin from 3 mm Medium Balsa
Use Tape Hinges
Wire Joiner
16 swg Brass Bush and Nut
Plastic Snake outer casing both sides
Soft Block
Micro-Mold Horn
Rudder Horn Ply

SPEEDSTER

A fast flying 810mm span C/L stunter for 1.5cc engines
Designed by John Stroud

Fly on light 12m lines

12mmx6mm balsa leading edge

Aluminium leadout tube

Heavyweight Laystrate leadouts

Commercial bellcrank

6mm sq.balsa top and bottom

Epoxy 20gm weight to outboard wing tip

W1

W2

W2

Sewn hinge

Tailplane 3mm medium balsa

3mm ply bellctank mounting plate

Aluminium leadout tube Epoxy to tip

Epoxy wire elevator joiner to elevator

Commercial horn

6mm sheet balsa tips

1.5mmx18mm top and bottom

1.5mm balsa webs (vertical grain)

Soft block balsa

F2 2 off 3mm ply

Tank feed pipe

9mm square hardwood engine bearers

Section A

F1 3mm ply

Optional undercarriage. Mounting blocks 9mm sq. hardwood

W1 10 off to this line

W2 4 off to this line

Raccolta disegni costruttivi

GABRIELE MACRI'

PAW 1.49 fitted to original

Spoke epoxied to F2 Use spoke nipple to hold on cowl

Note: Cover with tissue or iron on film. Use PVA wood glue

Cooling air outlet

A

18swg aluminium sheet cowl

Acetate screen

3mm sheet balsa

fuselage sides

Push pull rod. Original used spoke extended by soldering in a piece of brass tube

3mm balsa fin

4° offset

Needle valve

Air outlet

Soft block balsa top

30°

30°

Cowl to suit engine used

Standard commercial stunt tank

3mm balsa fuselage sides

Formers to suit natural bend of fuselage

44mm dia spinner

F2

F1

Fill with scrap balsa

Optional u/c mounting blocks

Balance point

1.5mm balsa bottom cross grain

3mm ply skid

Drain hole

Note: If fitting an undercarriage, make from 12swg wire and screw to mounting blocks using saddle clamps