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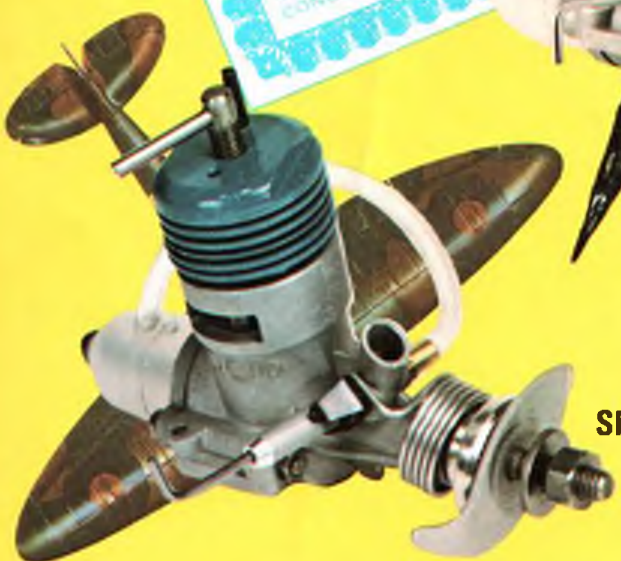

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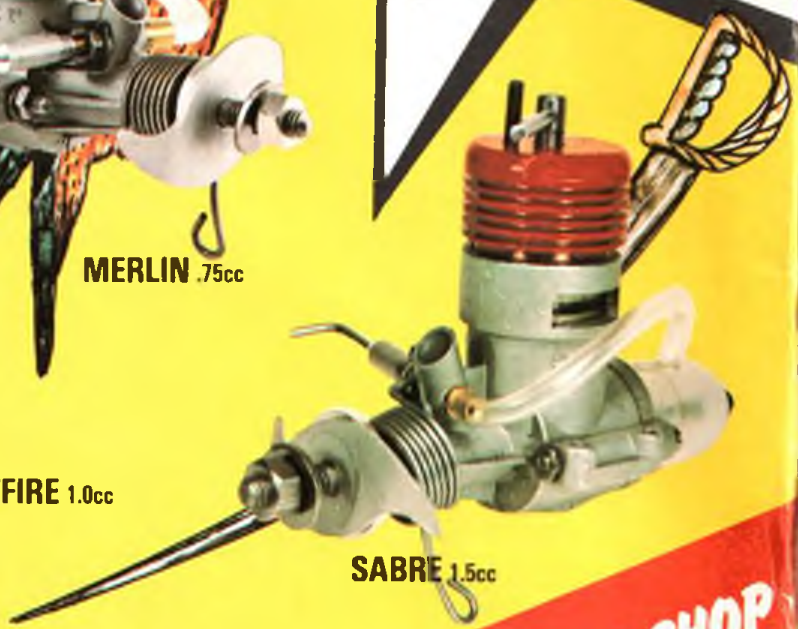

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Aeromodeller

APRIL 1981

MAP MODEL DIVISION MAGAZINE

Editorial Director TONY DOWDESWELL
EDITOR COLIN RATTRAY
Graphics LORNA CULLEN

Advertisement Director M. GRAY
Managing Director RON MOULTON

Comment

DURING the last few weeks, SMAE office has been inundated with queries on the subject of the 35MHz band allocation for radio control and the availability of Type Approved equipment.

Already a number of manufacturers have had their equipment tested in accordance with the SMAE/MHTF Type Approval Code of Practice and their equipment will now carry the Type Approved Label bearing a legend "SMAE 35/ERA/...../....", the last numbers being specific to the manufacturer's approval certificate.

Incidentally the Code of Practice has now been printed in booklet form and is available from the SMAE Office at Leicester — it is recommended reading for all clubs and interested bodies.

The SMAE has published the "35MHz specification" so that prospective users of 35MHz should be aware of the standards required — the specification is an inherent part of the Code of Practice but it can be summarised with the following salient points.

1. *Transmitter/Receiver operational bandwidth* = *10KHz*
2. *Max RF Power* *0.5W*
3. *Equivalent Radiated Power* *0.1W Max*
4. Maximum total DC Power input to all RF Stages 1.5W Max
5. Adjacent channel radiation measured outside ± *7.5 KHz point* *40dB Max*
6. *Frequence Stability* *± 1.5KHz*
7. Harmonic radiation in other frequencies outside 35MHz band —55 dB Max

Equipment that meets these requirements can be reasonably expected to operate at 10KHz spacing providing normal operating procedures are followed. The manufacturers assure us that the new FM equipment at 10KHz spacing is better than the old equipment at 25KHz spacing.

Probably the biggest danger for clubs and users to guard against is the 'backroom' conversions not capable of 10KHz operation which will pollute the new band. So take care and be sure the vendor states that any 35MHz R/C offered for sale is capable of operation at 10KHz channel spacing and has the Type Approved label.

Contents

 ISSN 0001-9232

Volume 46 Issue No. 543

ON THE COVER

Ron Truelove's magnificent control line Hawker Typhoon which won a Gold Medal in this year's Model Engineer Exhibition.

NEXT MONTH

The May issue of Aeromodeller will contain a **full-size plan** insert for a 55" span aerobatic two channel R/C slope soarer. This has been designed by Clive Smalley as a progression from his earlier design 'Orange Box', published in the March 1979 Aeromodeller.

There will also be a full size plan for a control line advanced trainer, which has been designed by John Stroud for .049 engines. We will of course, have all our usual features plus a look at what is happening in the Vintage scene. On sale April 17.

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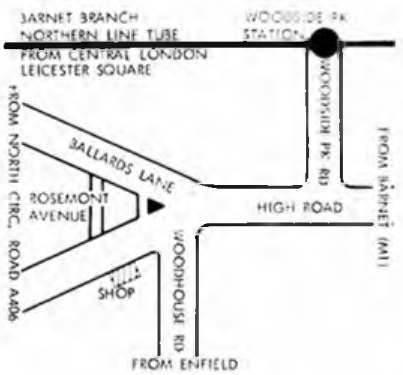

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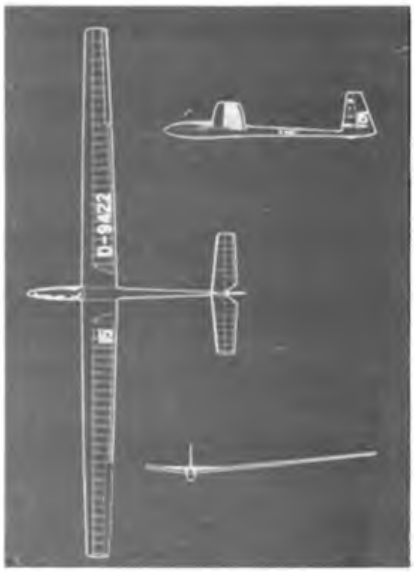

GLIDERS from Graupner

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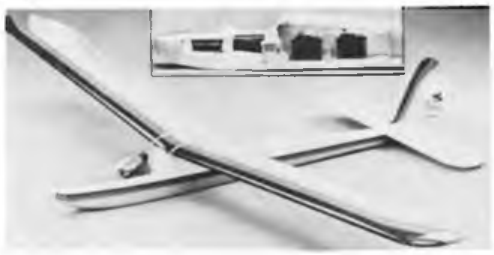
UHU Mark III span 48" £9.85
Another outstanding prefabricated kit with plastic fuselage shells and other parts, die-cut balsa ribs, etc., and complete with shaped wire parts for auto rudder and D/T.



The 59" span **PEPITO** is typical of Graupner quality — at a very modest price (**£28.50**). A true QUICKBUILD model with pre-shaped wood and moulded plastic parts and properly designed for EASY 2-channel radio installation. A scale pilot is available for realistic appearance (**£1.80**) — and PEPITO has an outstanding flight performance on rudder and elevator controls.

JUNIOR A1 class 53" span £13.80
Pre-shaped parts throughout including easy-to-assemble profiled high-aspect ratio balsa wing with tabulator for added lift. Fly it against the PILOT, NANCY or 45" span JOLLY (not illustrated). A1 class plus dethermaliser **£10.75**.

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Designed for radio

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NANCY A1 class 49" span £12.95
A classic Continental design with built-up wing and tail and featuring auto rudder and dethermaliser. Kit includes milled and slotted fuselage nose, stripwood, die-cut parts, etc.

LARGE SUPER SCALE R/C SAILPLANES

And SUPER is the right word! Super appearance. Super performance. And quite superb FREEFABRICATION and completeness of kit content. The 111" **CIRRUS 75** (**£103.00**) features moulded plastic fuselage, veneered foam wings and tail. Minimal assembly time! **MINI-NIMBUS** in two span sizes (130" — **£105.50** and 138" — **£149.50**) has epoxy GRP fuselage, other moulded parts and die-cut wood parts for built-up wing. 1/6th scale **CIRRUS** has injection moulded fuselage and built-up wings (**£55.95**).

KATY A2 class 67" span £24.60
Top performance in this contest class (though some say the 79" span AMIGO II (not illustrated) can beat it). Kit includes milled and die-cut balsa parts, formed parts, etc.

Check them out at RIPMAX stockists

Hangar Doors

SE AREA INDOOR MEETING

This was a well attended meeting held on Sunday, February 8 at the Crawley Leisure Centre. Although the hall was large, around 100ft × 100ft and 30ft high, Peanuts still managed to attack the ceiling and there were some good times recorded with Butch Hadland gaining first place with a total of 247.5 seconds, flying his Lacey. Butch also came first in the Open Rubber event.

CO_2 was won by R. James flying his Davis, totalling 59.5 seconds.

The hand launch glider competition was won by Ron Green, flying a flexi wing design and recording the best flight of the day with 39 seconds.

Next month we will have a more detailed report by Bob Bailey and Alan Callaghan.

AEROMODELLER 1980 INDEX

All subscribers will receive a copy of the AEROMODELLER 1980 index with their April issue. Non-subscribers can obtain their copy of the index for 75p including postage.

EUROPEAN C/L CHAMPIONSHIPS 1981

The event will be held at Genk (Belgium) from July 7-11, 1981 arriving on Tuesday, with the Final on the Saturday.

Competitors and supporters can be housed in a local technical school in Genk and there will also be a good camping site very close to the flying area. This contest site was used for the 'Criterium of Aces' in 1963 and 1969. The flying area has two fenced circles, two stunt circles and two

Left: models scene at the Crawley Indoor event. Top: J. Meaney's Curtis which came sixth in the CO. Below: J. Cooke's beautifully finished Stampe SV4 which gained seventh place in the Peanut Scale.

combat patches, plus several training circles.

All control line enthusiasts and supporters are invited to attend by the local model club 'Limburgse Vleugels.' Genk is situated in the eastern part of Belgium near the Dutch and German border and is very easy to find by taking the motorway E39 (Antwerp-Genk-Cologne).

The site will also be the venue for the 2nd International contest for Combat (F2D) on May 16 and 17, 1981. This year there will be three combat circles available, to enable more opportunity for training.

On the flying site there will be camping facilities for the competitors. Accommodation in local hotels can also be arranged at reasonable prices. Entry fee will be low. For further information contact: Fons Becker, Paalsesteenweg 10, 3950 Beringen, Belgium.

SIXTH SANDOWN PARK SYMPOSIUM EXHIBITION

Sandown Park Model Symposium will be at Sandown Park on Saturday 9 and Sunday 10 May.

With the introduction of 35MHz, it is now possible to increase the R/C flying side of the event by almost two hours each day, which will give the exhibitors far more time and permit a few more displays such as the 'Avon Cosmetics Display Team' which only performed last year on the Sunday. 27MHz will only be used by cars which will use the six standard frequency spots only and boats which will use 'splits'. The change also means that the cars and boats can operate all day.

Control line displays will once again be taking place on the parade ring, and for the younger element that have never had a chance to fly a powered model, we will once again be giving control line flights under instruction, on the parade ring.

DPR Models will be running a contest with their new range of scale type rubber models.

BIGGER! BRIGHTER! BETTER!

What is? The new look relaunched Radio Modeller. Yes, the April issue of this established magazine will appear in A4 size on March 27. Its 80 plus pages include articles aimed at the everyday sport modeller, whether his (or her) interest is in flying, boating or cars.

Radio Control is the fastest growing element of all hobbies and for over ten years Radio Modeller has supported and encouraged this growth. Lined up for April coverage: helicopters, large scale flying models, yachting, power boating, thermal and slope soaring, sport flying, radio control engine news and new products — plus a plan feature for a successful, crowd-pulling large (70ins span) demonstration plane, *Summer Breeze*, complete with waving pilot. RM predicts that the radio control craze of the early eighties is going to be off-road vehicles. The magazine's new look will reflect this trend and April leads off with a review of a four wheel drive ⅛th scale 20 powered buggy — the Land Jump 40.

Try it — we think you will like it — publication date March 27 — price 60p.

HAROLD TOWNER

Scale models have always attracted a special sort of attention, and particularly those which set standards of accomplishment beyond the reach of average mortals.

Along the path of modelling progress over the years of development from oiled silk to plastics there has been one name consistently attached to scale modelling quality. Alas, friend Harold Towner is no longer with us. He died after a brief illness on February 15 at a nursing home near Eastbourne, aged 84. First famed for his rubber powered Airspeed Envoy and Miles Kestrel which we still treasure as vintage designs in AM Plans Service, Harold went on to create the wartime series of 'Astral' kits out of Leeds. These ambitious models, epitomised by the Halifax which was made from a fat bundle of roughest cut 1 16in square and driven by ingenious arrangements of rubber drive to the four nacelles, served to keep aeromodelling going during the war years. With the boom of interest in '46 and '47 Harold was engaged as a manager of the most ambitiously sited model shop in Britain. It was prominent in Regent Street, West London and though ultimately closed as property values outgrew trading potential, Harold's shop will long be recalled as a haven for enthusiasts where scale models were almost exclusively the topic of conversion. Retirement to the coast at Eastbourne gave Harold the opportunity to enter the new fields of control-line and radio scale. His Lancaster and Tiger Moth became favourites, and other ambitious projects were ardently followed as news filtered out of his workshop and well kept garden where floatplanes and flying boats were tested on the ornamental pond.

To the last, he dedicated himself to the true scale flying model, a nearly finished Supermarine S6B remaining as his part of this year of Schneider Trophy memorial celebrations. His contribution was an inspiration for so many modellers who will join us in extending sympathy to his daughter in her loss.

WARREN HITCHCOX

Canada lost her spokesman on February 15 when Warren Hitchcox died at the early age of 56. It was the weekend of the MAAC annual general meeting in Toronto, which makes the loss all the more poignant, for Warren had just completed a record nine year run as President and FAI delegate for the Nation.

Successful in business to the extent that he had been able to retire early, Warren had dedicated himself to the hobby and its recognition. A true diplomat, his wise counsel served the vast country with its many divisions of opinion in the Provinces to the extent that Canada became host to a major International Supwith Trophy and a World Championship (R/C Scale) in 1980. As a practising competitor of world class in R/C aerobatics, an authoritative judge, a jurist and born administrator Warren was unique. He was also a natural humourist, able with one dry quip to dismiss the tensions that derive under pressure at the conference table or at a contest. Widely travelled, his friends span the world, for no major R/C event was ever complete without Warren and his charming wife, Shirley, to whom we extend our heartfelt sympathies.

What's Happening?

March 15
BATH MAC *F/F O/P, O/R, O/G All in FAI All in Miner CO2 and HLG C/L FAI COMBAT, ½A COMBAT, TEAM RACE FAI and ½A, POSSIBLY AEROBATICS* Venue Merryfield, Nr Ilminster, Somerset Contact E Burles Tel Bath 331126

April 5
BATH MAC *F/F O/P, O/R ALL IN FAI ALL IN MINOR CO2 and HLG C/L FAI COMBAT, ½A COMBAT TEAM RACE FAI and ½A, POSSIBLY AEROBATICS* Venue Celerne Nr Bath, Avon Contact E Burles. Tel Bath 331126

April 12
PETERBOROUGH MODEL FLYING CLUB 1st ROUND CLASS 'A' DIESEL COMBAT Venue The Embankment, Peterborough Contact Neil Gill, 4 Beech Road, Glinton, Peterborough PE6 7LA Tel P'boro (0733) 252645

April 18/20
SMAE F/F 3rd TEAM TRIALS FOR WORLD CHAMPS –
SATURDAY F1A 1st round 9.00am 10.00am
SUNDAY F1B and F1C 1st round 9.00am 10 am
MONDAY F1A, F1B and F1C Timetable to be published on day Contact Mike Coomes Tel 0949 42034 Venue to be announced

April 26
NOTTINGHAM MAC INDOOR SCALE FLY-IN incorporating *SMAE* INDOOR SCALE NATIONALS — *RUBBER SCALE, PEANUT CO2* Venue Derby Municipal Sports Centre, Moor Lane, Derby 12.00-6.00pm Flying fee £2 Seniors, £1 Juniors plus entry to Centre plus SMAE Competition fees hall size 120ft × 120ft × 30ft approx soft footwear essential Contact Barrie Hotham Tel Mansfield 34127

May 3
RAFMAA FREE FLIGHT AND 100S MEETING *O/G, O/R, O/P, F1A, F1B (Thurston Trophy), F1C, HLG and 100S R/C Gliders* All SMAE members welcome Pre-entry £2 £1 refund on day • SAE giving alternative solid and one split frequency Venue Barkston Heath, Lincs Contact F Sgt Norman Mitchell RAF Wattisham, Ipswich, Suffolk

May 3
WOLVES FLY IN (CONTROL LINE) *F2B • NOVICE and JUNIOR STUNT CLASS II SCALE, CARRIER - SMAE OPEN and '40 PROFILE MINI GOODYEAR SMAE RULES BUT NO AGE LIMITS, ½A COMBAT* Entry fee £1 Venue Lucas Aerospace Sports Field, Stafford Road (A449), Wolverhampton, West Midlands (Signposted on A449 north of Wolverhampton) Contact C S Elliott Tel Wolverhampton 76383

May 3
KITE SPRING FESTIVAL Venue Old Warden Airfield, Biggleswade, Beds

May 4
RAFMAA SUNRISE CONTEST F1A, F1B, F1C About 5.00-9.00am weather permitting Venue Barkston Heath Go/no go decision, based on weather forecast, will be made at Barkston Heath on May 3 Contact F Sgt Brian Baines, MSF, RAF LEUCHARS, FIFE Tel 033 483 471 Ext 420

May 10
BATH MAC *F/F O/P, O/R, O/G ALL IN FAI ALL IN MINOR CO2 AND HLG C/L FAI COMBAT, ½A COMBAT TEAM RACE FAI and ½A, POSSIBLY AEROBATICS* Venue Merryfield, Nr Ilminster, Somerset Contact E Burles Tel 331126

May 10
PETERBOROUGH MFC *2nd ROUND CLASS 'A' DIESEL COMBAT* Venue The Embankment, Peterborough Contact Neil Gill, 4 Beech Road, Glinton, Peterborough PE6 7LA Tel P'boro (0733) 252645

May 17
TYNEMOUTH MAC F/F RALLY *F1A (five rounds) O/R, O/P, COMBINED MINI HLG* Venue Albermerle Barracks (ex RAF Ouston) 15 miles west of Newcastle upon Tyne 10.00am start Contact Ron Pollard, 23 Ivy Road, Newcastle upon Tyne NE6 4PU Tel 0632 623737

May 17
40th ANNIVERSARY OF BRITISH JET FLIGHT FLYING IN Venue RAF Barkston Heath, 10.00am start Fliers must be SMAE members Spectators welcome, entrance free Contact Abingdon 21288 Ex 603 604 Flt Lt G E Whitehead

EVENTS

April 17/19
SOUTH MANCHESTER MODELS GROUP MODEL EXHIBITION Aircraft, Boats, Engineering, Railways Ships, Radio Control, Trams Venue Embassy Rooms, Sale 10.00am-9.00pm Admission Adults 60p, OAP and children 40p, family tickets at the door £1.50p Trade stands, refreshments

May 2
AERO SPACE AND VEHICLE CLUB — ANNUAL EXHIBITION Aircraft, military models, civilian vehicles etc Venue The Clubhouse, Wombourne, just off the A449, four miles south of Wolverhampton Doors open at 10.30am until 5.30pm Contact N D Robinson, 50 Balfour Road, Blanford Mere, Kingswinford, Briarley Hill, West Midlands DY6 7DJ

SMAE CONTESTS FOR 1981 (ALL VENUES TO BE CONFIRMED)

February 8th
Indoor Meeting
Venue South Eastern Area. Contact J A W Dolding, 22 Loxwood Walk, Ifield, Crawley Sussex

March 15th
F/F 1st Area Centralised
Venue Area. Contact: Dave Goodwin 0742 847894

March 22nd
R/C FAI Aerobatics
Venue Cottesmore. Contact Geoff Franklin 0533 54831

March 22nd
T/S F3B Soaring League
Venue Church Fenton. Contact Adrian Barker 0904-56368

March 22nd
R/R FAI Pylon
Venue Fulbeck Contact Keith Hutson 0462-81270

April 5th
F/F 2nd Area Centralised
Venue Area Contact Dave Goodwin 0742-847894

April 12th
C/L ½A and FAI TR, ½A Combat Speed, Carrier (Open and Profile) Aerobatics (Novice and F2B)
Venue RAF Cosford Contact C/L Tech Comm Chairman.

April 18/20th
F/F 3rd Team Trials and Open Event
Contact Dave Goodwin 0742 847894

April 26th
R/C FAI Aerobatics
Venue Wittering. Contact Geoff Franklin 0533 548313.

April 26th
Scale Indoor Nats CO2, O/R, Peanut
Venue Derby Leisure Centre Contact Roy Yates 01 868 5328

April 26th
R/C FAI Pylon
Venue Fulbeck Contact Keith Hutson 0462-81270.

May 3rd
Spring Gala
Venue Odiham Contact N F Couling 0323 53116.

May 2nd/4th
F/F RAFMAA Meeting

May 2nd/4th
T/S F3B W/C Team Trials 100 Soaring
Contact Geoff Dalimer 04626 78745

May 10th
C/L G/Y & FAI T/R FAI & ½A Combat Carrier (O & P) Aerobatics (N & F2B)
Venue Cottesmore. Contact C/L Tech Comm Chairman

May 10th
F/F 3rd Area Centralised
Venue Area Contact Dave Goodwin 0742 847894

May 10th
Scale R/C Stand Off C/L Superscale
Venue RAF Upwood Contact John Long 0480 6391

May 17th
R/C FAI Pylon
Venue Fulbeck Contact Keith Hutson 0462 81270.

May 24th/25th — INTERNATIONAL
C/L FAI, International F2A, F2B, F2C
Venue Three Sisters Contact C/L Tech. Comm Chairman.

May 23rd/25th — NATS.
F/F Nationals (timetable to be announced)
Venue Barkston Contact Dave Goodwin 0742 847894

June 7th
Scale R/C Stand Off
Venue Southern Area. Contact: Dick Hall 0705 593048

June 14th
C/L G/Y & FAI TR Aerobatic F2B, FAI Combat
Venue Three Sisters Contact C/L Tech. Comm Chairman

June 7th
F/F 4th Area Centralised
Venue Area Contact Dave Goodwin 0742 847894

June 21st
R/C FAI Aerobatics
Venue West Raynham Contact Geoff Franklin 0533 548313

June 21st
R/C FAI Pylon
Venue Fulbeck Contact Keith Hutson 0462 81270

June 28th
F/F Centralised Mini
Contact: Dave Goodwin 0742 847894

July 5th
Scale Fly In R/C, C/L, F/F
Venue Barkston Heath Contact Roy Yates 01 868 5328

July 12th
Scale R/C Stand Off
Venue RAF Wyton Contact Roy Yates 01 868 5328

July 11th/12th
F/F Two Day Open/FAI
Contact: Dave Goodwin 0742 847894

July 19th
R/C FAI Aerobatics
Venue Barkston Heath Contact Geoff Franklin 0533 548313

July 19th
F/F Western Area Rally
Venue Merryfield Contact George Lyn 0242 32732

July 26th
C/L ½A & FAI TR Speed ½A & FAI Combat Aerobatics N & F2B Carrier O & P
Venue Fairford.

August 2nd
T/S F3B UK International
Contact Geoff Dalimer 04626 78745

August 2nd
F/F Centralised Mini
Contact Dave Goodwin 0742 847894

August 9th
T/S F3B Soaring League
Venue Swindon Contact Geoff Dalimar 04626 78745

August 9th
R/C FAI Pylon
Venue Fulbeck Contact Keith Hutson 0462 81270

August 29th/31st — NATS.
Scale R/C, C/L, T/S, Nationals
Venue Barkston Heath, Cranwell Contact Kath Watson 0533 412368

August 29th/31st
F/F 29 Open Events 30/31 Contest Club Champs
Contact Dave Goodwin 0742 847894

September 6th
R/C FAI Aerobatics
Venue Gloucester Contact Geoff Franklin 0533 548313.

September 13th
C/L ALL FAI Classes (invitation only)
Venue Three Sisters Contact C/L Tech Comm Chairman

September 13th
F/F 5th Area Centralised
Venue Area Contact Dave Goodwin 0742 847894

September 20th
T/S F3B Soaring League
Venue Maidstone Contact Geoff Dalimer 04626 78745

September 27th
R/C FAI Pylon
Venue Fulbeck Contact Keith Hutson 0462 81270.

September 27th
C/L F2C
Venue Elliotts Contact C/L Tech Comm Chairman

September 7th
F/F 6th Area Centralised
Venue Area Contact Dave Goodwin 0742 847894.

October 4th
R/C FAI Aerobatics
Venue Bulford Camp Contact Geoff Franklin 0533 548313

October 4th
SMAE Southern Gala
Venue Odiham Contact N F Couling 0323 53116

October 11th
SMAE Northern Gala
Venue Church Fenton Contact Jim Moseley 0532 823811

October 11th
R/C Fly for Fun
Contact Dick Hall 0705 593048

October 11th
T/S F3B Soaring League
Venue Church Fenton Contact Geoff Dalimer 04626 78745

October 11th
F/F Rubber
Venue Barkston Heath Contact Mike Coomes 0949 42034

October 18th
Scale Autumn Meeting R/C Stand Off C/L Superscale
Venue RAF Upwood. Contact: John Long

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AVRO LANCASTER
by H. J. Towner
This 52in (1321mm) span scale control line model of the famous Avro Lancaster is aimed at the ardent scale enthusiast. Very detailed plan giving colour and cockpit details. For .09 cu. in. (1.49cc) engines (4).
Plan CL/1081. Price £4.10.

CLAPTRAP
The winning model in the recent Control Line Aerobatic Pilots Association Novice Stunt design contest, Chris Pinn's CLAPTRAP combines quick construction all-sheet profile fuselage and tail, with rugged crash damage resistant wings. Designed for 2.5cc-3.5cc motors this 950mm span C/L Stunter is sure to prove a winner for all would-be aerobatic pilots learning to fly 'the book'.
Plan CL/1397. Price £2.00.

TOMBOY *by Vic Smeed*
Most popular beginner's sport free flight model in A.P.S. Simple cabin power model designed especially for the beginner. Either 36in (914mm) or 44in (1118mm) span, both on plan. Seaplane version also given.
Plan PET/398. Price £2.00.

BUCKER JUNGMEISTER
by W. Lister and W. Newman
An easy to build 26½in (679mm) span free flight scale model for .5-.8cc engines. This is the In-Line engined version of the aircraft, considered to be one of the finest aerobatic mounts available.
Plan FSP/807. Price £2.00.

TELSTAR *by M. Pressnell*
An easy to build A/1 glider of 49in (1245mm) wingspan with an excellent performance.
Plan G/1006. Price 95p.

D.H. TIGER MOTH
by A.M. Staff
A magnificent 44in (1118mm) span free flight scale model of one of the best known aircraft ever. Flies extremely well with magnificent air of realism. ¼th scale. For 1-1.5cc engines.
Plan FSP/555. Price £2.40.

KETCHUP
by R. Walden
Profile fuselage stunt trainer with simplest possible construction ideal novice model. Span 28in (711mm) 1.5cc engine.
Plan CL/886. Price £1.70.

MINI STINGER AND SWEE'PEE *by C. Coote*
A pair of Mini Goodyear class profile-fuselage team racers of all sheet simple construction. Designed for 0.8-1.5cc engines, they provide a perfect means of introducing Juniors to C/L racing. Both span around 19in (483mm).
Plan CL/1297. Price 95p.

BLACKBURN 1912 MONOPLANE
by A.M. Finucane
Perfect ¼th scale, free flight 48in (1219mm) span model of a pioneer monoplane, this "old-timer" will fly as well as any of its modern counterparts with 0.8-1cc motor.
Plan FSP/567. Price £2.40.

S.E.5a *by J. D. Mcnard*
Mick Mannock's famous fighter in full detail on specially-printed plan with copious instructions, ten photo illustrations. Fine free flight performer with tough construction. Span 27in (686mm). Also suitable for R/C. Use 0.5-0.8cc motors.
Plan FSP/682. Price £2.00.

SPIROGYRA *by R. J. Evans*
A simple sturdy model for 1.5-2cc engines, and designed especially to teach the beginner the basics of control line aerobatics. Strong enough to withstand those first errors! 30in (762mm) wing span. Fine for .A combat.
Plan CL/1162. Price 95p.

PROFILE SCALE TWIN ENGINED RTP MODELS
by I. Peacock
Very simple all sheet designs for semi-scale versions of the Cessna 310 and P38 Lightning, designed especially for electric round-the-pole flying. Easy to build and fly. Approximately 20in (508mm) wingspan.
Plan RTP/1277. Price £2.00.

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BEDE BD-8

By A. A. P. Lloyd

JIM BEDE'S FLAIR for line in his series of light aircraft has inspired the aviation fraternity, but their commercial prospects have been somewhat clouded. One of his earliest designs progressed through take-overs to become well known in flying training schools as the Grumman — American AA5. But, after the acceptance of the BD-4 as a home-builder's equivalent of the Cessna 172, his revolutionary BD-5 high-speed pusher was to become the disaster which collapsed the financial empire. In its way, it was the demise of the BD-5 which has given rise to the BD-8 in this feature.

A half-built prototype on view at a Sheriff's auction of Bede assets in '78 caught Mike Huffman's eye. He had gone to Kansas to bid for the part-built BD-7, a larger and more adventurous prototype which had come to nought. Outbid on that score, Mike took late interest in the single-seater but lost the purchase to another enthusiast. The partially skinned prototype, complete with brand new 200bhp Lycoming engine and constant speed propeller went for a staggering 260 dollars! However, the spark of interest was kindled and Mike hunted down the 2nd prototype which was made by Delmar Hostetler on a neighbouring farm. Within the month he struck a deal with the other purchaser and thus became the owner of both machines. Little more was heard until Oshkosh 1980 when Mike arrived in the BD-8 he had at last completed. It was a sensation, not so much perhaps among other home builders, but certainly among the modellers. They recognised that in one airframe, here is a combination of all the desirable modelling features for aerobatics, either R/C or Control-line.

When Jim Bede first sketched out the '8' he set out to be 'different'. In 1974, the high point manoeuvres in international aerobatic championships were those in the vertical plane and recognising this fact Bede outlined an airframe which would hang on to a huge geared propeller and keep going vertically under all conditions. To overcome control problems at slow vertical speeds, he created a tail system that would function ordinarily for pitch control and yet could move differentially in conjunction with the ailerons, in other words, 'tailerons'. The wings would have spoilers to augment the standard aileron control, but the ailerons themselves were supposed to produce an airflow change over the wing/aileron gap to create a suction in that chamber. This was expected to produce a servo effect as was originally tried on the Boeing B47 Bomber. While the factory-built prototype incorporated these unusual tail controls, Hostetler had worked on a more conventional system of all moving tailplane. It was this machine which Mike Huffman chose to complete, using the finished wing from the original Bede aircraft. Lost amid progress over the years, was the original intent of the large airscrew, geared down from the powerful engine. Even so, as Mike told us after over 100 hours on the aircraft, it is hitting a top speed of over 185 miles per hout at 500ft and cruises on 75% power at 175 m.p.h., with a climb performance in excess of 2,000ft. per minute. So it's no slouch even though there's lots of cleaning up yet to be done in the form of canopy sealing and wheel spats. Roll rate is 190° per second and it stalls at 65 m.p.h. all of which adds up to a good prospect for aerobatics, though perhaps not in the international competition class at this stage.

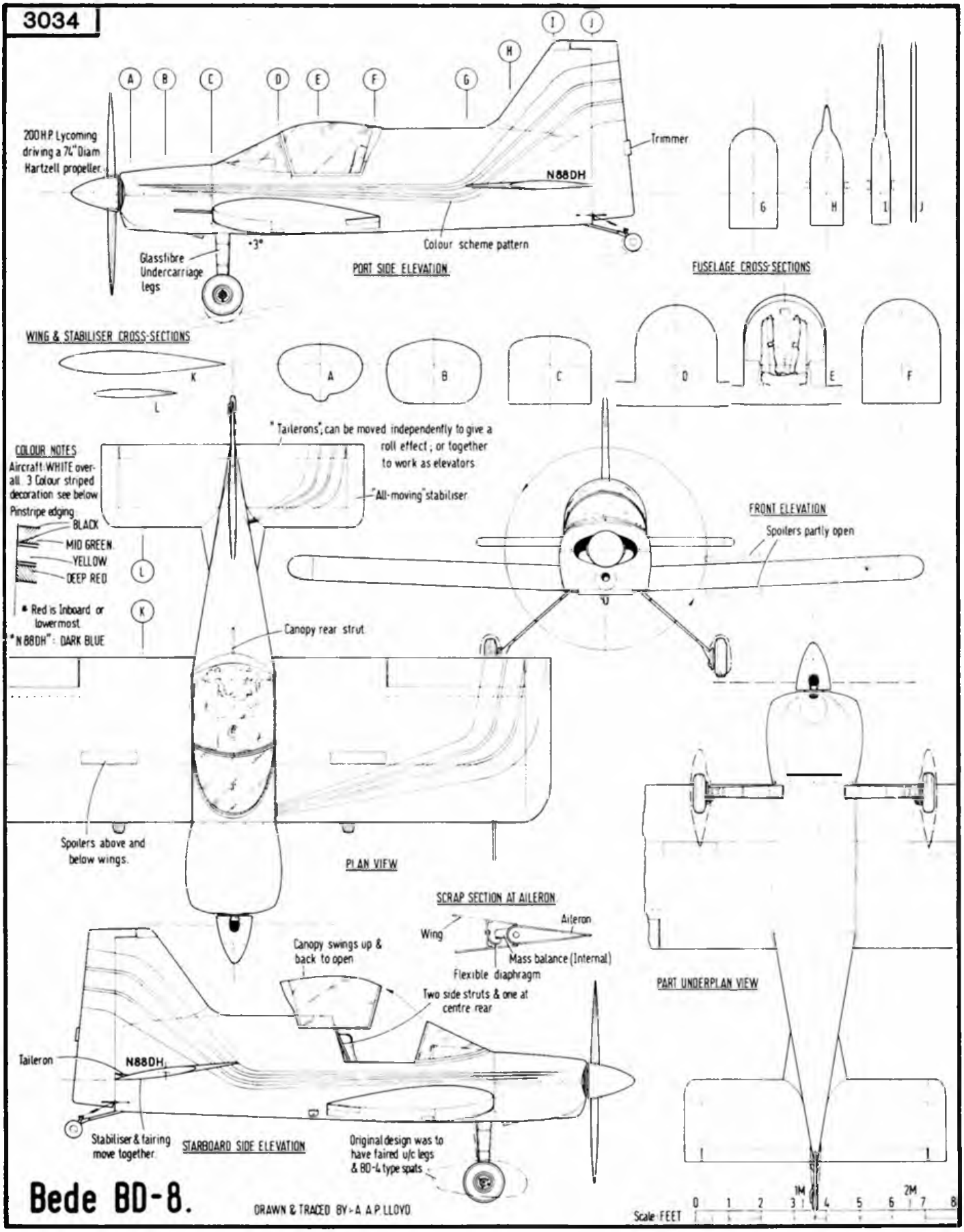
Bede designs have the common feature of a large diameter tubular spar, and the BD-8 is no exception. It also has the 'Meccano' assembly form of bolt together longerons and spacers for the fuselage side frames, making it extraordinarily simple to put together. Rivet-free flying surfaces are extremely clean and enhanced by Mike's choice of colour scheme to make the short coupled aeroplane most attractive. (Incidentally, Mike reports that until he added the fine black stripe lines on the edges of the three colour bands, it looked terrible!)

In flight the '8' is susceptible to gusts, as might be expected from the short-coupled layout and that large vertical tail surface still allows a wag or two in crosswinds.

The cockpit is big by any standard, and even permits arm rests in the sides, while visibility is superb.

Jim Bede's misfortunes have turned to Mike Huffman's advantage. He owns a unique pair of aircraft. (The 2nd is to be completed as the aerobatic version) which will be modelled everywhere now that we've the opportunity of publishing these scale drawings.

3034



Bede BD-8.

DRAWN & TRACED BY A. A.P. LLOYD

Flamingo

HOT AIR ELECTRIC POWERED AIRSHIP

DESIGNED BY RAY MORSE

NO DOUBT A FEW eyebrows will be raised on viewing this 'rara avis". However, though large, it is basically quite simple to construct and material demand is small. Since the total weight only amounts to 6ozs, including the electric motor, the drain on ones pocket is negligible. As it is a bulky model, this project is more suitable for hall, classroom or club as it is intended for indoor operation, so look into this question of space before deciding to construct, as well as whether to adapt the ship folding for storage and transport as shown on the plans. Outdoor flying is not recommended due to the low flying speed with the attendant problem of controlling so bulky a model in anything but a flat calm.

TEMPLATE AND ENVELOPE

Having mustered your array of material requirements, let battle commence by tackling the template for the envelope. This may be cut from any stiff material such as ply, hardboard, cardboard salvaged from empty boxes, or even from a length of old lino up in the attic! For the polythene envelope itself, you will need a good smooth flat worktop on which to work, a small electric plastic sealing tool with a fine bit or, failing this, a small electric soldering iron for welding the seams. Envelopes may be assembled with adhesive tape, but welding makes a strong and much lighter job.

Should you be unfamiliar with the technique of welding polythene, I have described this in the April, 1980, issue of 'Model Maker'. Therefore, your best plan would be to obtain a back number or a photo-copy of Project 3, Hot-Air Balloon, from the MAP offices.

Assuming you are now ready to build the envelope, start by cutting six rectangles of polythene, allowing an inch or two extra on length and breadth, then crease each panel down the centre longitudinally to aid positioning of the template later.

You are now ready to commence welding. Simply lay two panels, or gores as they are known, flat on your worktop. Place the template on top, locating the centre line with the polythene crease, then holding the pile or by the use of weights, proceed to draw the heated iron steadily along the curvature of the template, cutting and welding as you go, forming a small bead from bow to stern and thus joining the two sections together. Try a few welds on odd scraps of material first, before tackling the actual job so as to get familiar with the temperature and speed required in forming the weld. Repeat the welding operation on the other two remaining pairs of polythene rectangles and finally assemble and weld all three pairs together, taking care to flip over the finished seams out of the way as you proceed, also leaving the last seam open from bow to stern to enable the keel structure to be installed at a latter date.

THE KEEL STRUCTURE

You can next focus your attention on the keel structure built of balsa wood. Firstly, consider the two alternative schemes, either hinged for portability or rigid the whole length if you have sufficient storage space.

Construct the centre section first, making the gussetted V frames as indicated on plans, assembling upside-down on a flat surface, finally adding laminated curved strips at bow and stern and the necessary V frames to support them. Note that keel longitudinals meet at 11 and then only a single laminated spar continues from 11-12 (stern).

ENGINE CARS AND RUDDER

Next, cut out silhouette pattern engine cars from $\frac{1}{8}$" thick sheet balsa and also a $\frac{3}{16}$" thick expanded polystyrene rudder which is attached to the keel with white glue. Do not use a cellulose glue as this will dissolve the polystyrene. Incidentally, be sparse with the glue tube generally as you have to consider the weight factor.

BURNER UNIT

Obtain a suitable pastry cup for the burner and wire onto the keel spar securely between frames 6 and 7 after binding the spar with baking foil to fire proof. Do test

the burner first before installing to MAKE SURE there are no leaks. Be wise before the event, and also adhere to burner dimensions accurately, since too fierce a heat could melt the top of the envelope if the burner is too large.

ELECTRIC MOTOR AND PROPELLERS

A 3" diameter free-wheeling propeller may be fitted to the aft car. This has two blades cut from card, twisted to a fine pitch and bushed with a short length of aluminium tube. A pin with large head keeps it in place. It certainly looks well revolving in the slipstream from the power prop.

For power I thoroughly recommend one of Harry Butlers 12v DC RTP Electric Motors supplied complete with matching 3" diameter fine-pitch plastic propeller. These units are obtainable at most model shops distributed by Keil Kraft, it is advisable to obtain insulated twin leads for this motor to enable you to hook up the ship to the RTP masthead.

ASSEMBLY OF ENVELOPE TO KEEL

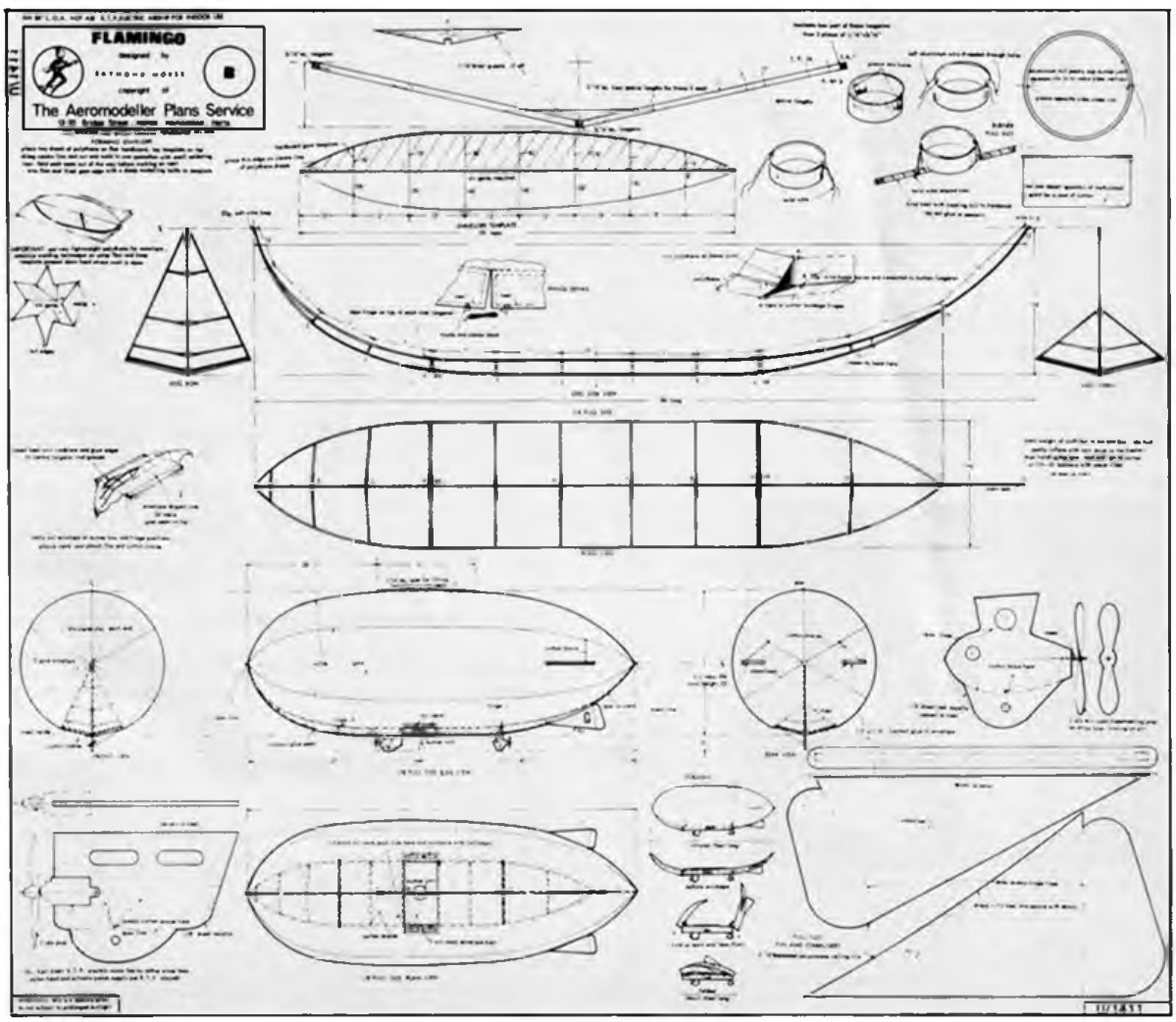
With all the components securely attached to the keel and small wire loops bound and glued to extreme ends of keel structure, proceed to marry the keel to envelope — rather a tricky operation, but fairly readily mastered as follows. Drape the envelope over a table-top with the open unjoined seam uppermost. The table should be approximately 3' across, allowing ends of envelope to hang over sides. Next, taking the keel structure carefully, insert the envelope upside-down, so that again the curvature each end hangs over the table sides. After carefully positioning, taking care to get bow and stern in correct relationship, smooth out the wrinkles and temporarily secure the polythene to the keel with the aid of modelling pins. Then, gently lifting the polythene away from the frame with a ruler or strip of wood held in one hand, a section at a time, apply a little Evo-Stik with an old brush to the frame with the other hand and carefully lower the polythene onto the glue, making sure the envelope join mates up exactly along the central spar of the keel. It's best to glue the whole length one side first bow to stern, then the other side, finallly cutting away the polythene between frames 6 and 7 where the burner is located.

STABILIZERS AND BRACING

When all is secure, brace the two engine cars to the keel using needle and cotton, then finally cut out and fit the two polystyrene stabilizers as shown, using white glue to fix the polystyrene to balsa, and Evo-Stik to fix balsa to polythene, each stabilizer being supported by cotton braces.

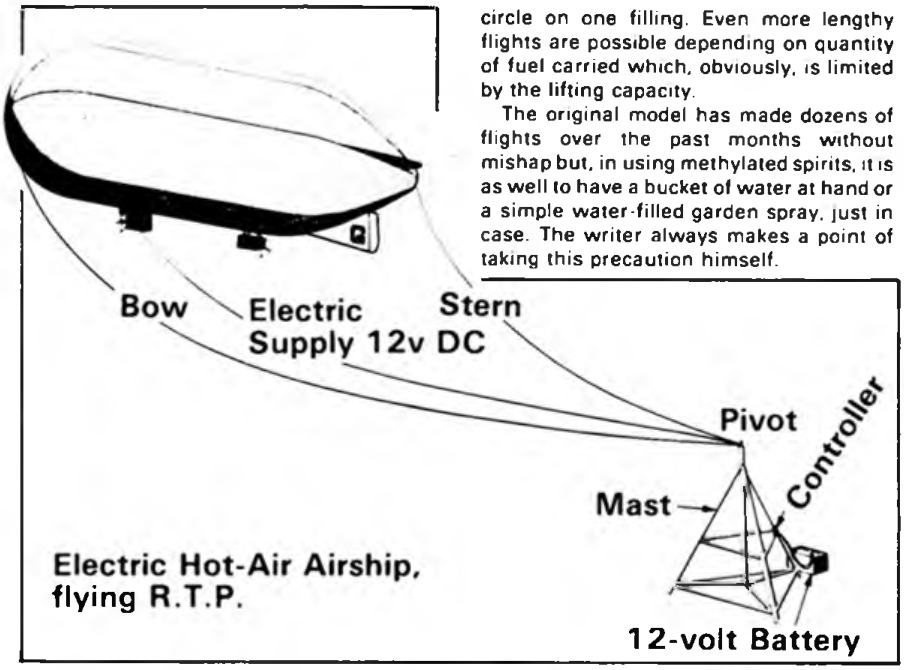
FLYING

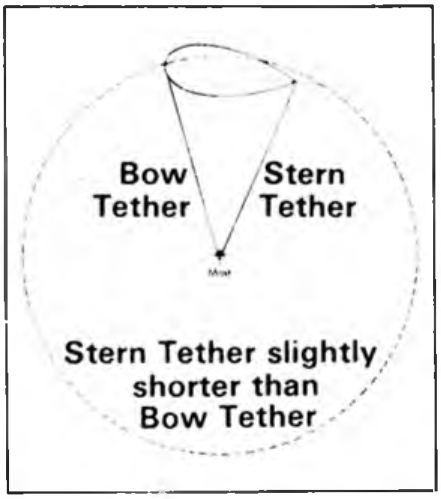
Assuming you have your RTP masthead pick-up, insulated leads and 12 volt battery at the ready, attach the ship by cotton lines from bow and stern to masthead with the electric supply wires hanging a little slack between ship and mast. For a preliminary test, be content with a static lift-off before



Full-size copies of this plan, reproduced here to 1/5th scale, are available as Plan U/1411, price 95p plus 25p postage and packing. Export orders obtainable from appointed agents, or direct from Plans Service, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts., HP1 1EE.

attempting forward flight under power. Get a friend to hold the model off the floor by the top spar while you pour a dessertspoonful of methylated spirits on to a little pad of wool or tissue at the bottom of the burner cup. Wait a few seconds for the pad to absorb the fuel, making sure none has split on the keel then, looking to make certain the envelope is well away from the top of the burner, light the fuel with a match. With your helper still holding the top spar, the envelope will gradually assume the characteristic airship shape. At this stage, but with the airship still a little heavy, your assistant should stand the model gently on the floor as lift builds up. The moment of truth has arrived — will your creation fly or will it remain stubbornly earthbound? Yes, we have lift-off! Watch for two things, speed of ascent and trim. If lift is too strong with fast ascent, clip weights to keel near burner to allow a steady rise only. Bulldog clips are ideal for this purpose. If ship is not floating on even keel, attach small bulldog clips or even paper clips to loops at bow or stern according to need. The burner should remain alight for approx. two or three minutes on one filling but make sure flame is out after descent before envelope collapses.





You are now ready for your first circuit and the thrill of controlling your ship from the mast where, I pressume, you have fitted a rheostat to control your power output.

Proceed with inflation as before, but this time get your helper to stand the model on the approximate flying circle with the lines just a little slack. Go to the controller and await the ascent. Directly the cars leave the surface apply power and away your ship will go, rising as forward speed is gained but checked by the two lines which should tauten. Do not use excessive power because the bow will rise due to the up-couple effect, so aim to maintain a level course. The writer has repeatedly obtained 10 to 14 circuits on an 18' diameter flying circle on one filling. Even more lengthy flights are possible depending on quantity of fuel carried which, obviously, is limited by the lifting capacity.

The original model has made dozens of flights over the past months without mishap but, in using methylated spirits, it is as well to have a bucket of water at hand or a simple water-filled garden spray, just in case. The writer always makes a point of taking this precaution himself.

Airships can be very exciting to fly and a lot can be learned about their behaviour. Provided care is taken during initial tests, performance is quite reliable and consistent, particularly in a stable indoor atmosphere with a steady temperature but, in a cold room, more ballast will be needed than in hot conditions.

I leave you now to taste the joys of airshipping, don't forget to send in any good photographs of your work to our Editor. Also, let him have your views and comments on design and construction as well as on flying techniques, as these may appear in the correspondence columns, thereby helping others in their efforts.

NOTE: Suitable lightweight polythene in a good range of colours may be obtained from: Saffery Model Balloons, 1, Lansdown Terrace, Lansdown Road, Bath, BA1 5EF.

WIGAN 70/HLG DEC. 28th 1980
by Lawrence Gray

DESPITE the cold and the wet (and the seasonal spirit) the competition attracted a reasonable turnout and proved enjoyable and competitive for all.

Initially conditions were calm and misty. Russell Peers (as ever) was the first to fly in Wigan 70 with another new rubber model and completed his three maxes in three flights, despite some concern about visibility. John Carter who is making a comeback in the sport, also made use of the calm air, flying a rubber model. It had generally been thought that the rubber models had a definite advantage in the cold air, however, Roy Roberts with a new low aspect-ratio glider successfully proved that a glider could perform well in these conditions and finally forced Russell Peers to a fly-off.

It seems that the HLG flyers must have something of a masochistic streak, as nearly all waited until conditions had become very breary and turbulent (thus presenting the hardest launching conditions and longest retrieval runs!). However competition was very intense, 22 seconds separating the first and second places. With the surge of late flying final results were uncertain to the end. However finally W. Murray and Dave Allman emerged as first and second respectively, the latter by only one second.

Meanwhile, Wigan 70 activity had also intensified, the turbulence not dampening the enthusiasm of the flyers. However, it did catch one or two out, including John O'Donnell, who rather unexpectedly failed to reach the fly-off by ten seconds.

By fly-off time, conditions had become blustery. Russell Peers produced an apparently humiliating 42 seconds, however he had just witnessed Roy Roberts having the misfortune (in true glider fashion) to find that the large area wings developed more lift than the spar was prepared to take, and disastrously the wings folded during towing. Well that's Russell's excuse and he's sticking to it!

The turnout showed that enthusiasm for the class is mounting, and competitions are already organised for later this year.

Results

Wigan 70. 1 30 min max best three from four flights.
Eleven entries.

1 Russell Peers, Falcons	4.30 + 0.42 1 o
2 Roy Roberts, Wigan	4.30 + 0.00
3 John O'Donnell, Whitefield	4.20
4 Pete Farrimond, Wigan	3.40

HLG

Eleven entries

1st W. Murray, Bolton	3.05
2nd Dave Allman, Nantwich	2.52
3rd Roy Roberts, Wigan	2.51
4th Lawrence Gray, Falcons	2.47

Dave Hipperson reports....

WING LOADING — WHAT IS THE OPTIMUM?

IT has been assumed for as long as I can recall that a free flight model should be as light as possible for maximum performance — at least when a formula doesn't demand otherwise. We assume that the lower wing loading the higher a model will climb and the longer it will glide. It appears now that maybe this is true only up to a point. Obviously if you tie ½lb of lead to your Coupe d'Hiver you are going to reduce its performance but if you could build it one half or even one quarter of its weight (hypothetical of course because in this case the rules don't allow it) how much better would it fly? It would obviously climb higher because of the immediate increase in the power to weight ratio but how much better would it glide — half the sink rate — less than half? Would it? Or might it in fact glide worse?

For a long time A2 flyers have known that building right down to weight is not as important as the model's thermal trim, stability and tow consistency factors. It is generally agreed that an A2 of half the weight would glide little better even in still air. Streamlined FAI power stylings are following closely the successful path trodden some years ago by full size glider designers albeit for different reasons. They are producing lower sink rates than many of their far lighter loaded open counterparts. I have mentioned before that 'classic' winning models are rarely super-lightweights often through use and age, they tend to become heavyweights. Phil Ball's large Open Rubber model is a good deal heavier now than when the weights were quoted in this magazine — it's still a fantastic performer. Then there was that 9oz (255g) ½A Ramrod flown in the late 60's that on paper should have been a clunker and was anything but. It won regularly and not just in rough conditions either!

At the other end of the scale we see Bob Bailey producing a replica of his extraordinary open model of the sixties but with over an ounce (28.3g) off the all up weight — surely a formula for success. However on both contest outings so far it has dropped comp flights and by large margins too. Obviously downdraughts as in dead or gently bouyant air the model looks unbeatable — but why does it misbehave itself in rougher conditions. I have a half weight 300sq in. (18cm²) open rubber model which climbs well by way of its superior power to weight ratio but for all the effort the glide is no better, in fact it looks to be mushy — worse! I can remember my .049 Payload models built to about 6oz (170gm) for their 250sq in (15dm²) wings being trimmed without ballast and, then when loaded with 5oz (140g) cargo would require only a little more incidence on climb and glide to perform only slightly less well than when empty. Certainly nowhere nearly as badly as would be expected from a nearly 100 per cent weight increase.

My experience of Co2 duration both indoors and out is interesting too. A 300sq in (18dm²) model in Cardington and weighing only 1oz (28gm) will glide down from the centre catwalk in 2 minutes, 30 seconds dead stick. That is 150 feet in 150 seconds — a foot a second, yet a good HLG would probably be able to do the same if anyone could get one that high! It is astounding when one considers that the HLG would be of a similar weight and probably little more than one third of the wing area thus three times the wing loading and with the scale effect working against it.

Outdoors very lightly loaded Co2 models (half the loading of a 100 gram Coupe d'Hiver) are blown about in a very unaerodynamic fashion and great inconsistency often results. Mine glide fine as long as the prop keeps turning no matter how gently — but once the dead stick situation arrives the glide is ruined.

Any given configuration of wing section, area and set-up must have an ideal gliding weight which in many cases may not be lighter than we can build at all. It would be interesting to have some more data on this co-relation. It certainly points to drag being a major factor but is that the only reason? Why does it seem to affect a light slow flying model more adversely than a heavy fast flying one. This is contrary to everything we know about drag becoming a bigger factor the higher the speed.

WEIGHTS

If the forgoing hasn't put you off bothering to build light anymore then some of this data may be of interest. It concerns a new Open Rubber model structure just finished and as time was no object I took the trouble to weigh everything as I went. The table bottom left concerns a 'practical' 310sq in (18sm²) wing and a 60in (1524mm) long fuselage of 2¼in (57mm) square.

I won't bore you with prop and tail — suffice it to say tissue seems to be the heavy commodity nowadays and glue not so much the big offender as it is often made out to be. Balsa cement was used for basic joints but many were strengthened locally with cyno after lifting from the board. That 1g worth of diagonals in the fuselage pays for itself in vastly increased torsional stiffness although you would have to say that it was also responsible for 0.75g of glue. We take so much care over the selection of wood — it's a shame there is so little scope for selection of the heaviest single commodity — tissue!

OPEN RUBBER MODEL AIRFRAME WEIGHTS

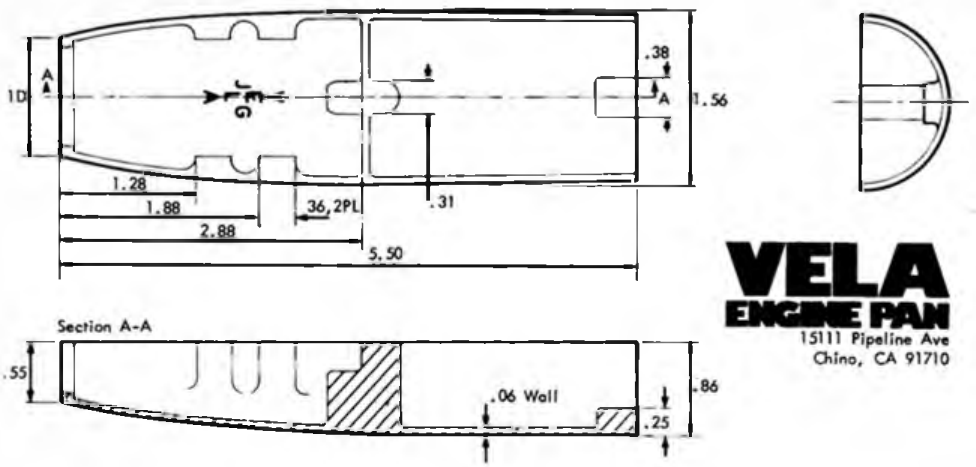
Fuselage		
Longerons (3/32in or 2.5mm sq)	7.8g	
Spacers (1/8in or 1.5mm sq)	4.0g	
Diagonals (1/32in × 1/16in or 0.8 × 2.5mm)	1.0g	
Fuselage assembled	15.0g	(2.2g of glue)
Fuse sanded	12.5g	(2.5g of dust over workshop)
Fuse covered (Black Jap)	19.5g	(7g tissue and dope to stick it on)
Fin structure	1.5g	
Fin covered (white jap)	2.0g	(½g tissue)
Fuse and fin therefore	21.5g	
Fuse and fin water shrunk plus one coat dope (thin)	24.0g	(2.5g of dope)
Fuse and fin two coats (thin again)	25.0g	(1g dope more evaporation on second coat)
Wing pylon, name and address and rear peg added total now	31g	(Light but still over twice the weight of the original wood!)
Wing		
Assembled separate panels uncarved	19g	
Carved sanded and dihedral glued	17g	(3g dust plus 1g glue)
Covered	26g	(7g tissue and dope to stick it on)
Covered, watershrunk and one thin coat of dope	26.5g	(1.5g dope)
Covered two coats of thin dope	27g	(0.5g dope more evaporation on second coat)

Martin Dilly reports....

TEAM SELECTION

So far the 1981 World Champs team selection trials have not been exactly blessed with good weather, this time a new system was to have been tried, with three two-day weekend meetings giving a total of 21 flights for each of the three FAI classes. The first day, for F1A, was favoured with the tag end of lows in the Atlantic left over from hurricane Derek and was cancelled, with windspeeds gusting to around 12 metres/sec, day two, when F1B and C were scheduled marginally lower wind speeds and four rounds of each of the two classes were completed. Protests were made that to continue the team selection trials in such conditions was both likely to jeopardise the use of the airfield, with flights landing well outside it, and was also an unsuitable way to select a team to fly in Spain the following August, when winds of two metres/sec or less were likely. On the glider day no objections were raised to this, but one voice, John O'Donnell's, was heard to object strongly to stopping the second day's flying for similar reasons. A jury was empannalled and decided that the reasons for suspending flying were overwhelming, not least, I suspect being that the aim was to pick a team, rather than finding survivors among those prepared to spread highly sophisticated Rossi models all over Norfolk.

The next two-day weekend had almost ideal weather for the first day of glider flying, with quite difficult conditions and little wind, so that only Mike Fantham and Pete Williams of Richmond and Maurice Gilmore of Grantham had seven maxes. However, the second day brought poor visibility and stiffish wind, so again flying was cancelled. The encouraging thing to me about all this is that people are at last seeming to realise what the Trials are all about — selecting the three people with the best chance of winning the World Championships. A team place is surely not some sort of prize for risking models and airfields, or demonstrating that one's personal idea of what conditions are flyable includes winds likely to wreck some of the country's most internationally competitive aircraft.



VELA ENGINE PAN
15111 Pipeline Ave
Chino, CA 91710

I personally think that we should plan to allow more flexibility on a given day, if, for instance we knew that rounds might take place between dawn and dusk each day, then people would be there at dawn if they wanted to compete. If the ever-voiced question of hotel breakfasts or early starts from home is too massive a problem to get round for a few days every two years, then of course that is a decision for each of us hoping to make the team. But it would at least allow any calm periods to be used as they occur, and also give us the possibility of having much shorter rounds, as happens in practice for individuals at the Championships. Perhaps we should consider 20 minute rounds and one hour gaps, although if the weather was really calm retrieving time could be cut down too.

While there are doubtless some objections, particularly in conditions of high wind, the system of having glider on its own on one day, with Wakefield and F1C together on another day, seems sensible, the traditional method of laminated rounds running throughout two days can lead to problems of one's 'personal' timekeeper, almost invariably a flyer in a different class, having recovery problems and not being on hand at the start of a round. My own feeling is that our F. F technical committee are to be congratulated on trying a new system, and on responding sensibly to actual conditions, rather than to loud noises.

F.1.C MOTOR PANS

U S West Coast power flyer Al Vela has developed a half pan for 2 5cc engines that is sandcast in Tensaloy, which is a self-ageing light alloy that reaches high strength without heat treatment, and drills and taps better than the usual soft alloys. The untouched pan weighs 62 grams, but weight can be expected to drop to around 52 grams depending on individual mounting and finishing requirements.

Pan price is $20 00 plus $1 50 air shipping cost, and Al Vela and Jack Greening who produce them can be reached at 15111, Pipeline Ave., Chino, CA 91710, U S A.

WORLD CHAMPIONSHIP HISTORY

A publication which will probably soon become a sought after item for anyone with any sort of interest in the background and development of our sport is the first of the Vol Libre World Championship Specials, which covers the period 1927 54. Editor, graphics originator and general dynamo for the Vol Libre series is Andre Schandel from Strasbourg, France and he is now working on the follow-up, dealing with the years between 1955 and 1963. He probably still has copies of this classic A4 format and almost a quarter of an inch thick, so do write to him for details and for a subscription to the quarterly Vol Libre itself, which is an excellent 40 francs worth. His address is 16, Chemin de Beulenwoerth, 67000 Strasbourg-Robertsau, France.

LOW-SPEED AERODYNAMICS

Another overseas publication, far more modest than Vol Libre, but filling an obvious local need is The Calcuttan, edited by A/2 flyer Prasanta Banerjee. Although aimed primarily at members of the Calcutta Model Aero Club, it is also available at a subscription of 15 rupees per annum. The most recent issue carries an interesting piece on the reports of the Low Speed Aerodynamics Research Association, which flourished for about ten years after the War and was based on the Royal Aircraft Establishment at Farnborough. Prasanta lists very thoroughly the reports that he has located in the records of the All-India Aeromodelling Association, together with various technical notes and papers presented at the first LSARA conference, among the authors appears one T.W. Smith, with a paper on the development of vertical climb models.

The 1971 NFFS Symposium Report carried an outline of the work of the LSARA, but this find of Prasanta's will be a useful source for anyone wanting to discover more of the research already done, at the time some doubt was cast on the results of some of their members, but at least in those days somebody in Britain was actually doing something in the way of low Reynolds number work, and both the magazines here published reports of it. Prasanta's address is 16, Surjya Sen Street, Calcutta 12, India, modelling materials are in short supply there, so do consider some sort of exchange if you ask for any copies of the material he has.

CUSTOM-BUILT RUBBER WINDERS

Free Flight News Bulk Purchasing can arrange to have a rubber winder like the Tim Gray one shown on page 574 of the October Aeromodeller made to your order. Built by Dave Stapleton, who is a skilled machinist as well as the SMAE's records officer, the custom winder includes a counter and employs an angular thrust bearing to take the motor tension and ease strain during winding. It will be engraved with your name and telephone number, and will cost you £20 + postage. Free Flight News subscribers however, get theirs post free. To subscribe to Britain's only specialist F. F publication, write to Ian Kaynes, 8 Blenheim Court, Farnborough, Hants, GU14 7DS.

OVER-THE-COUNTER THERMAL DETECTORS

A device that looks worth investigating is a thermo-anemometer made by the Finnish firm of Alnor Oy, and distributed in Britain by Wallac (Newbury) Ltd., 112 Bartholomew Street, Newbury, Berks. Intended for flow and temperature measurements in the heating and ventilating industry, the GGA-23S measures airflows of from 2·30 metres/second and temperatures from -30°C to +180° in three ranges. Another model, the GGA35, is a microprocessor-based calculating thermoanemometer and measures from 0 to 30 m/s air-flow rates and temperatures in two ranges. The unit is hand held and costs £280 + VAT.

1980 NFFS SYMPOSIUM REPORT

One of the best Symposium Reports for some time is now available from Free-Flight News Bulk Purchasing.

As well as historical articles, there are others on spiral, longitudinal, static and dynamic stability, on the Eggleston and Surry glider airfoils, on computer analysis of bending stresses in glider wings under high G loads, and on high strength/weight wing spars. There is a table of US Nats winners since 1922 and, for scale enthusiastics, an extensive and useful article on rubber scale the Model of the Year Awards include drawings and data on nine of the world's most successful free-flight aircraft, including Mike Fantham's Robin A/2 and the Stoy brothers' indoor hand launched glider with multi-folding wings. The 16 articles and the rest of the material make the Report a must for anyone with an interest in model flying today.

RUDDER HINGING MATERIAL

Mike Woodhouse has available polyester film coated on both sides with a thermo-setting adhesive. I have used the material for years to hinge rudders, and I believe Tom Koster used it to make air-tight hinges on his F.1.C flappers. My fin and rudder assemblies are a sandwich of four pieces of 1/16 quarter grain balsa (two for the fin and two for the rudder, with the adhesive film as the filling. I also incorporate two pre-bend torsion bars for rudder bias; two bulldog clips hold the parts together while they laid on a pad of newspaper and an iron at about linen setting is pressed on top to melt the adhesive and bond the lot together. Sometimes the balsa goes a bit singed-looking, but the bond is effected when the film changes from milky to clear. Hold things flat for a few seconds after removing the heat and pressure, and then sand to airfoil section.

Price of the material is £1 per square foot, from Mike at 12, Marston Lane, Eaton, Norwich, Norfolk, NR4 6LZ.

BUZZERS AND BLEEPERS

Several people in Britain are realising the usefulness of an audio system for model location, either this or a longer range radio beacon has been used for some time now by many Continental flyers and even a short-range buzzer can be heard from sufficient distance to make finding a model in tall grass or in dense foliage much easier.

A couple of sources of the main component, the audio transducer, may encourage people to install something similar in their own aircraft, typical weights certainly make it feasible for F.1.A gliders and F.1.C or Open power models. A few years ago Klaus Salzer had a neat and loud buzzer for sale at around the equivalent of £2, together with fast-charge sintered nickel-cadmium cells to power it; total weight of both was 16 grams. Klaus's address is Darmstadter Strasse 46, D6053 Obertshausen, West Germany, but find out from him the present price and availability first.

In Britain a couple of likely noise sources are marketed by Messrs. A. P. Besson, Ltd., St. Joseph's Close, Hove, Sussex, BN3 7EZ. The Buzztone weighs under 10 grams, runs on 6 volts and consumes 25mA to give 75dBA at 25cm when mounted on a rigid base, unit cost is £1.14, but there are, of course, reductions for five or more. The same company also produce the Mini-Bleeptone 525, which weighs 18 grams and has a choice of either 800 Hz or 4 kHz outputs, at a price of £5 88 for the 6 volt version which draws around 10mA.

From experience these buzzers and bleepers are more noticeable against ambient background noise levels, like rustling grass and your own clothing swishing, if they are modulated in a series of short bleeps, so as to contrast as much as possible with existing sounds, rather like an audio version of Dayglow orange paint.

Bob Bailey reports....

CARDINGTON 1981

It is good to be able to report some good news from time to time! We have recently managed to re-negotiate the use of No. 1 shed at Cardington at much more favourable terms than we had only a month or so ago — the cost has been reduced from £20/hour to £12/hour, a rate which we can afford — just. The word just means that we need your support in coming to Cardington to enable us to continue using this unique venue. No support — no Cardington, it's as simple as that.

For this very reason, the Indoor Technical Committee, of which Laurie Barr has taken over the Chairmanship again, has substantially modified the contest calendar to allow as many people as possible to come and fly. Provisionally, the calendar is as follows:

17th May HLG (Sweepette Trophy) CO, (Sparklets Trophy) Manhattan & EZB
14th June As above
28th June Scale, Manhattan, EZB & FAI Microfilm
12th July FAI Team Trials, 1st 3 flights Microfilm only
29th & 31st August Indoor Nats: all classes including Sweepette, Sparklets, Aeromodeller Trophy for FAI micro-

film and Houlberg Silver for EZB.
6th September FAI Team Trials 2nd 3 flights Microfilm only.
20th September CO_2 & HLG Finals for Sweepette & Sparklets Trophies.

As a departure from the usual practice, SMAE plaques will be handed out at the prizegiving at the end of each day's flying. In addition we are negotiating for other prizes in the form of modelling goodies to be distributed each day.

Regrettably there is a bit of not so good news to include — it will cost £4 each flier/day to come and fly. Non flying modellers will be charged £1 entry fee. This may sound horrendous, but if you compare this cost with that of petrol to go to the average comp, it doesn't dominate. If you play golf, you know that in Southern England at least, the cost of joining most clubs is around £150/year with green fees of £2-£3 on top of that. For your £4 you will get 6 hours flying time in this magnificent and well maintained shed.

So please come and help keep indoor flying alive; you will know that free flight is having a rough time with at least two Areas — London and North West — which have *no venue* for area contests this year. I have a bit more to say about this later.

MODELLING GOODIES

For all you indoor HLG enthusiasts, SAMS of St Albans is now stocking that commodity which is usually as scarce in England as hen's teeth — 4lb/ft³ quarter grain ¼" sheet — yes, the real thing! this wood has not come from the usual source but has been cut specially for HLG and similar applications requiring the lightest and stiffest grade of sheet.

In addition, SAMS also now has specially imported from the States one of the best balsa cements available, particularly for indoor — Ambroid. It is extremely tough and does not shrink, an important consideration for indoor. Humbrol, and an important consideration for indoor whether it be duration or Peanut scale. However, Humbrol is very quick drying which is very handy for that quick repair when your batch of cyano develops that irritating habit of not going off.

FREE FLIGHT AIRFIELDS

As I mentioned earlier, the London Area has no venue for free flight contests. Jon Fletcher of the St. Albans club is the new London Area Competition Secretary, he has been actively combing a large area north of London looking for possible venues. He has so far visited 40+ airfields, most of which unfortunately are either mostly non-existent or down for crops, but there are a few which look to show possibilities. The major problem is in getting agreement to use the airfields from the powers that be — for MOD land that means the PSA — Property Services Agency. In general, when an application for free flight use is made, the easiest (and usual) reply is an uncompromising no — end of problem as far as the organisation is concerned. This has happened already for one of the putative London Area sites. It isn't what you know but who you know!

This problem of getting flying sites is a very difficult one — can you help? Please contact me either direct or via the Aeromodeller offices.

I know that I am not alone in feeling that unless something constructive is done to improve the flying field situation, free flight in Great Britain will be slowly, surely and steadily strangled to death. SMAE has a duty to do something to help. Undoubtedly the best long term solution is to buy an airfield. Impossible? Not necessarily. A triangular field 1 mile by 1 mile is 320 acres; if the price of agricultural land of £500/acre is realistic, we are talking of about £160,000 which I would have thought not to be beyond the realms of possibility.

WIGAN 70

In the meantime we have to cut our coats according to the cloth, hence a small field event.

Although the P30 rubber class has been around for quite a long time, its popularity in this country seems to have been overtaken by the Wigan 70 class which has a wider appeal. It was originally conceived as a 70cm wingspan 70cm total length, weight 70g, entry fee 70p which included a can of beer! The original formula became dominated last year by the rubber model but some changes have been introduced to compensate for this.

The glider towline length was increased to 50 metres from 100', and mechanical timers are now permitted for the 7 sec. engine run, it having been found very difficult to get 7 secs with just a bit of fuel tubing!

From my own experience with a model so far (a glider) it seems that the weight compared with wing span, demands a relatively low aspect ratio like FAI microfilm. My model with a 4in wing chord doesn't glide as well as I would expect. I would recommend at least 4½" chord. The other main feature I found was the extreme sensitivity of the tow to rudder setting, so watch this one if you build a glider.

Max is usually 1½ minutes, best two out of four to count. It is a class which can be flown as a nice relaxation but leaves considerable scope for development.

The St. Albans club is hoping to run some Wigan 70 events on an informal basis during the summer, the Wigan club originators are believed to have said that they will make the long trip down South if a comp is run. There's dedication and enthusiasm for you!

GRAHAM DAVITT'S IHLG

This has undoubtedly been the most successful model in the Northern Indoor circuit this winter, winning virtually every event. Regular readers will remember Mike and Stan Stoy's *Coot*, full size plan P201, April 1978 *Aeromodeller*. Although having great potential, the test of time has shown that consistency is not among the *Coot's* virtues. Graham's model is just the opposite, I haven't seen it do a really bad flight yet.

Graham writes: *"This is my most successful version which has only had minor modifications such as nose length or tail shape. The model is not at all critical, unlike the 'Coot,' and the only component requiring extra attention is the fin, since this controls the roll out from launch.*

I have found that for low ceiling IHLGs, reducing the fin area makes the model roll out sooner, to stop the model losing height before rolling out. Similarly increasing the fin area will make the model roll out later i.e. stop the model stalling at the top no matter how much bank is used on the throw.

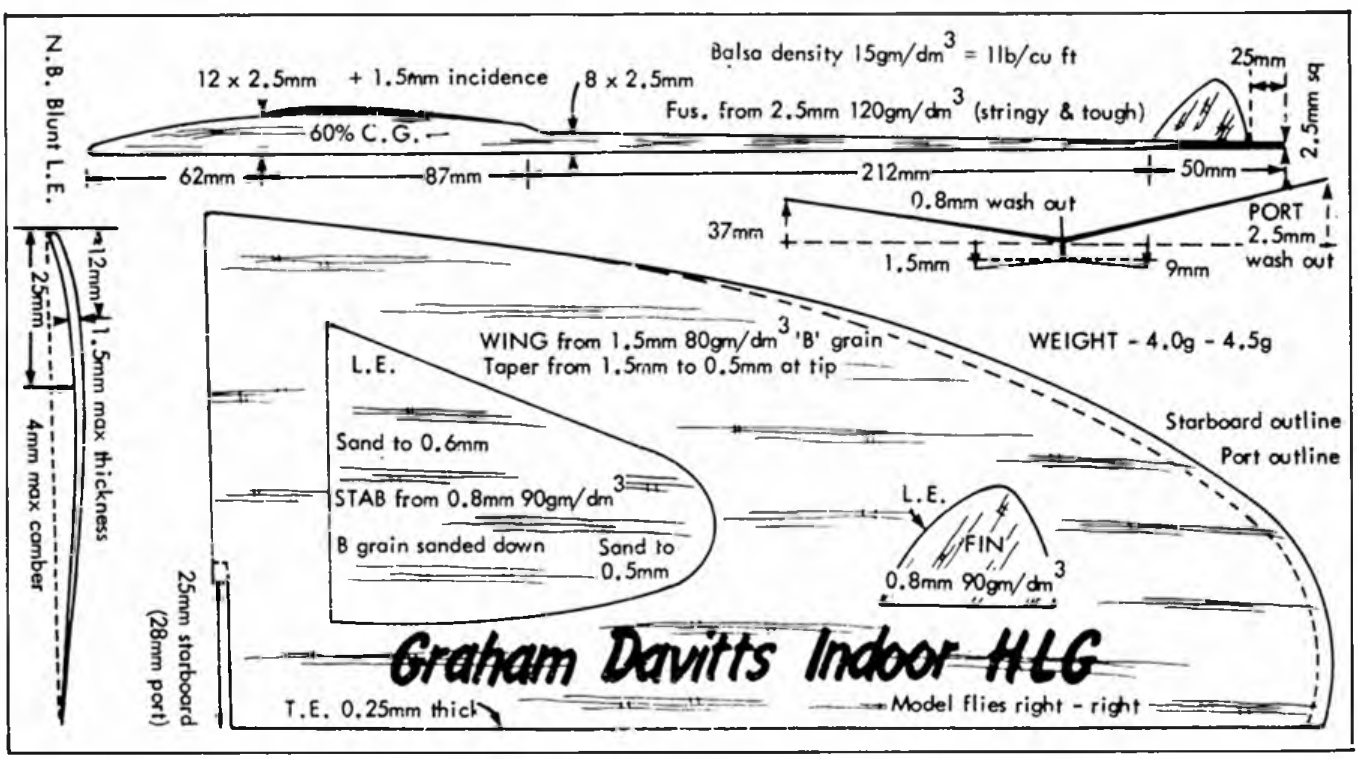
The correct fin area varies with each model due to variations in flap stiffness, warps etc. so it is better to start with too large a fin and trim it until good roll outs are achieved with a good throw. I launch my models at a fairly high angle and this may influence things."

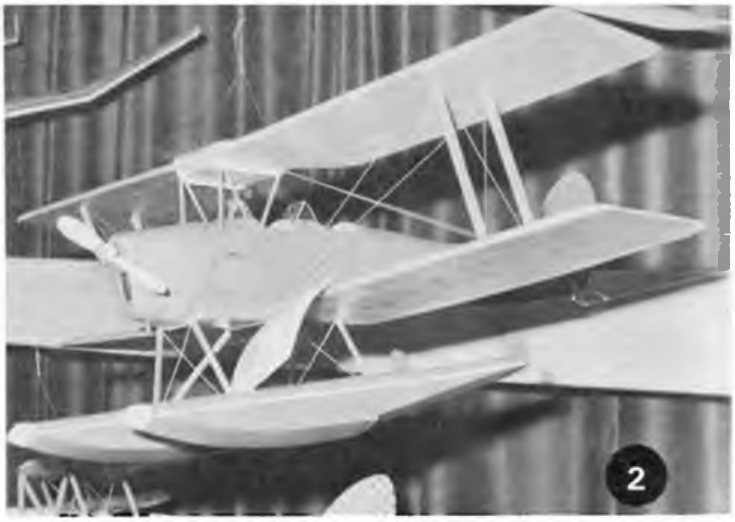
Graham's model climbs in a fairly tight spiral, indicating good roll response - a characteristic not easy to achieve. If an HLG (particularly an outdoor version) fails to roll, then good pull outs are extremely difficult to achieve with any consistency.

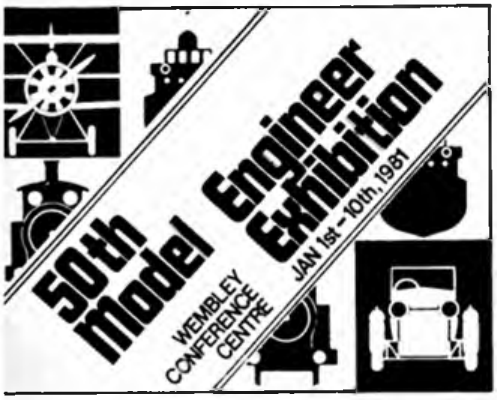
Contest Record: 1st Spennymoor, Oct '79 (flown by Dave Goodwin), 1st Slaithwaite, Nov '79, 27.6 • 29.5, 1st Spennymoor, Dec '79 32.0 • 32.1, 1st Slaithwaite, Jan '80, 29.0 • 29.1, 1st Spennymoor, Mar '80, 33.0 • 33.2.

Slaithwaite has a 27ft ceiling height, Spennymoor theoretically has 40ft but in practice it has about 35ft of clear space.

Have any of our readers any comments to add on roll pull out with HLG's and their methods of achieving this? Comments to us at *Aeromodeller* please!

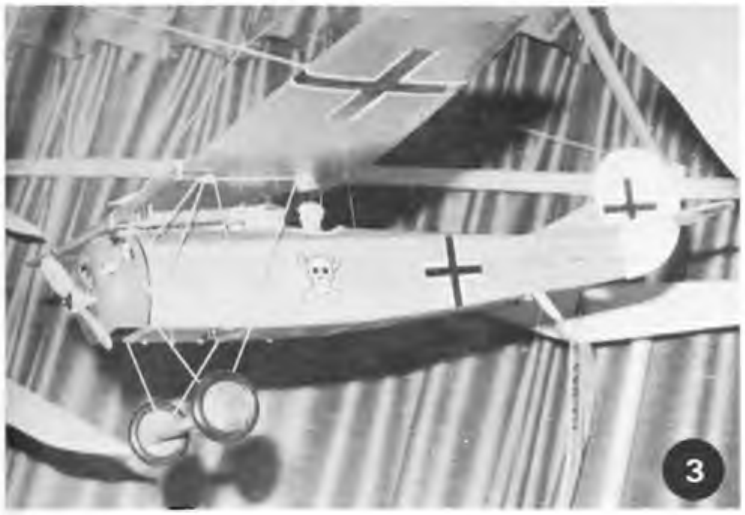






The Model Engineer Exhibition attracts more visitors each year, 1981 breaking all previous records with over 81,000 attending! All areas were well supported, including the aircraft section. This selection of photographs gives an idea of the range of models that were on display. In future issues of Aeromodeller, we will publish an article and plans for Martin Tuck's BA 146 and also a reprint of the 1938 plans of the Heston Phoenix built by Dan Knight.

1 Bill Forrester has turned to R/C Scale with his magnificent Voisin made to 1/6th scale for a pusher Fox 61. Flight trials are eagerly awaited for this Silver Medallist. 2 C. Morley's free-flight D.H. Sea Tiger Moth should be good for grass or water take-offs. 3 Fokker D.VIII was another free-flight scale entry, by I. Tatton. 4 Mrs. Anne Humphries has already made her mark with the huge Goldberg 'Valkyrie' and its Brown Jr. engine. 5 R.C.M.&E. Editor, Bill Burkinshaw, showed his 1/7th scale R/C North American P51D Mustang. 6 Always a vintage favourite, Doc Forster's Mermaid Flying Boat was built by Mike Whittard of Gloucester. 7 Cover subject this month and winner of the Gold Medal, Ron Truelove's exceptional C/L Scale Hawker Typhoon Ib. 8 Popular lecturer Reg Parham had his audience spellbound with indoor flying demonstrations. Other lectures and films were on continuously over the ten days, ranging from vintage flying to space models. 9 Ron Chivrall emerged from the past (remember the Skytale?) and won the Championship cup



with his magnificent D H Tiger Moth complete in every detail except it has a single cylinder 4 stroke engine! 10 Martin Tuck's Scale R/P winner a BAe 146 flown long before the real thing! 11 Big Fort This Boeing B 17 was one of many scale R/P models operated by Bill Brock originated as a Sterling kit 12 Action on the R/P lines as a Harry Butler kit model BN Islander zooms off the stage Support for Round the Pole flying was not so great this year will someone please tell us why? 13 Vintage models from the SAM group were plentiful The rubber driven Heston Phoenix came from June 1938 (!) Aeromodeller full size plans and was made by D Knight who inspires us to republish this fine design In the background is a Bowden Puffin of similar period by D Chester 14 Martyn Pressnell's well built version of Bob Copland's Wakefield earned him a Gold Medal plus the Aeromodeller Cup 15 Another beautiful Wakefield shape from the past was Ed Stoffel's cabin fuselage Aristocrat built by R Woodruffe and shown as a framework

TOPICAL TWISTS

by Pylonius
illustrated by Sherry

"Is this the local airfield, or the 1:1 Scale Model Flying Club?"

SPLIT FREQUENCY

It seems that an enterprising lady in the States has obtained a divorce from her husband on account of his obsession with model aircraft. From this we can assume that the celebrated seven year itch has now become the seven year switch. Hubby, bored with the predictability of marital routine, is itching to get his hands on a radio control unit. As is usual in these cases when a model flyer is foolish enough to believe that his seemingly pro model fiance, will remain just as tolerant of his model flying foibles when they are married, he is in for something of a shock. He will find that one of the more rigid principles of the new regime is a complete model prohibition.

When, in the course of time, he begins to assert himself as an individual, much to wife's displeasure, he tries to pick up the threads of his youthful interests. Wifey at first is resentful but conceding, having been advised by the women's mag agony columnist that every hubby should have a hobby, unless it happens to be female and around 18, but when she finds that the old love nest has become a production centre and storehouse for model aircraft, and that the bloke she catches a glimpse of around the place now and again is her now not so beloved hubby, she might feel inclined to get rid of the hobby centre and its proprietor with it.

Probably hubby is unaware that anything is amiss until he receives the divorce papers although he may have noticed a strange quiet around the hobby centre, an absence of slamming doors, and not much of that old body filler, food, about. And perhaps the bed a mite cold.

JUST GASSING

One of the burning questions of our time is whether large vintage gassies should be permitted the luxury of modern radio control. Not the whole multi what not lot, mind you, but merely a judicious spot of rudder waggle — just enough to keep the beast in check without offending too much against the mystique of vintagism.

But will a discreet amount of radio control allow the model to be flown as in the days of yaw? Some people like to think so, but, generally, in this country, the big gassies were just a bit too rampaging, like a Formula One racing car on a go-kart track. They may have found fulfilment on the wide open prairies or the fly-on-forever wilderness but, usually, in our cramped little island the gasping gassie would terminate its lumbering, space hogging flight by hitting something solid. This limited the flight schedule to once every six months, which was quite enough, really, since the gassies came within an ace of being banned in the States altogether just for bumping the odd bison.

PACKING IT IN

We have lately been asked to forget about all that theory stuff and to go strictly by practical experience on the flying field. I do not disagree with that, for over a long period of time I have been trying to break the deeply rooted belief that a wing generates lift because of its upper camber, pointing out that those exceedingly flat kites do not seem to have heard of that particular theory. What does take me aback, though, is being told that all that fiddling around I have been doing with bits of downthrust over the years has been an utter and complete waste of time. It is all very distressing, not least the thought of all those sheets and sheets of balsa I must have splintered up to provide packing pieces for this futile experience. I have only one consolation, and I suppose it's due to luck more than anything else — it must be — but I must say a bit of downthrust has worked wonders on occasion.

ABSENT FRIENDS

The gods have spoken: proxy flying is out. A time-honoured institution is no more. Sad in a way, because proxy flying has its origins way back in those far off days when each model had its own unique identity — and they even had names to prove it. It could well have had three wings, a cranked fuselage or some other contest winning feature unknown to the world at large. Since that time all the exciting variations have been ironed out of model design, so that give or take the odd hump or bump here and there, they are pretty well identical, although perhaps not all that pretty. To keep deviations down to the minimum and everyone in conformity, from Alaska to Timbuctoo, identikit design drawings are circulated on a world wide basis. By such means Hank Taftboomer's new super Wakefield differs from the crafty craft of Po Sit only in the fact that the fuselage sides are slightly flattened at the CG point, the better to obtain a good chucking grip.

And it is only in recent years that building practices have become standard throughout the world. At one time an oriental would not have known what to do with a stick of balsa wood, apart from using it as a chopstick, and many were the stories of quaint and unusual materials used around the world. When balsa wood was considered a decadent, western influence other more national means had to be sought. Thus Flyeroff's 'Calfski IV' was made from the Siberian Bullrush. Now no-one around our rapidly shrinking globe would dream of using anything but the best in lightweight, alloy fuselages and the most select, quarter grain balsa wood.

What has made the whole proxy flying business even more preposterous is the emergence of the fly anything character who can wring contest winning performances out of the sort of model you and I would be jumping on out of sheer frustration. The triumphant flyer who can trim out a sheet of newspaper well enough to put your best model in the shade, and who seems to be on nodding terms with some of the hottest thermals around.

All in all, the end of proxy flying is a triumph of man over machine. In fact the defeat is so crushing that the model plane could soon be on the list of endangered species, brought to this state by man's inhumanity to model. It may well be that the international contestant of the future will not be required to bring along a model of his own but will be handed a standard, plastic, self timing machine, made of course, in Japan. What a prospect.

HORNET

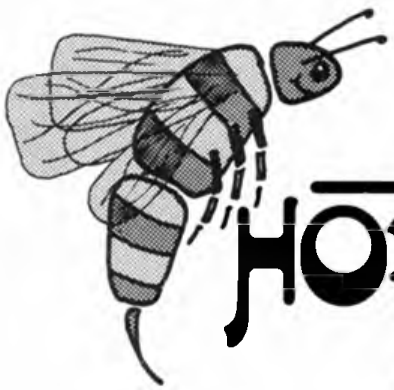
A REALISTIC LOOKING CHUCK GLIDER BY JACK HEADLEY

ANY NEW AEROPLANE nowadays arrives in a blaze of publicity. Most of this publicity starts with the insertion of the number one rivet in the structure, usually being made by some poor riveter, in a nice new shop coat, and watched over by the managing director and his entourage, trying to look intelligent for the photographers.

After this we see the prototype flying, and eventually the aircraft goes into production.

The F-18 Hornet has reached about the half way mark in this story. We have had the prototype development, conversion of the F-17 into the F-18, all the usual stories about the aeroplane being overweight, overcost, unsafe, not required, etc. But now the programme appears to be in full swing, with several prototypes, or pre-production aircraft as they are called now, in flight test. I've seen many plastic kits around for the Hornet, and some R/C versions, both powered and slope soarers, so I thought that it was about time for a chuck glider version.

Hand launched scale gliders seem to have vanished from the modelling scene these days, so why not try one?



CONSTRUCTION

The best approach is to cut out *all* the pieces first. There should be a little thought given to wood grades before actually applying razor blade to balsa. You'll need *two* fuselage sides to the shape shown on the plans, and these are cut from medium hard 3/32" sheet balsa. If you throw chuck gliders like I do, they often end up hitting the ground rather hard, (from a vertical dive!) hence the need for tough wood for the sharp end. The fins, (two required), and the tailplane are cut from medium 1/16" sheet, and, initially are sanded around the edges. A medium hard piece of 3/16" sheet is required for the wing and leading edge extensions. The tip missile launch rails are 1/8" × 1/4" hard balsa, and the missiles themselves are made from 3/16" square balsa.

Begin assembly with the basic body. Cut away the area above the wing and the slot for the tailplane first.

The fins are cemented to the fuselage sides while they are separate items, so bevel the inside edges of the fins as per plan, before fitting. The top of the fin is canted out 3/4" from the vertical, so check the bevel angle before actually cementing the fins in place.

The two fuselage halves can now be joined.

Bevel the lower edge of the body pieces, using the sections drawn on the plan as a guide, then cement the sides together, with the two triangular frames in place of A & B. Put this on one side to dry, and sand the wing, (still in one piece) to the aerofoil section. Don't cut the notch in the leading edge until the wing is fully sanded, otherwise it will probably break off.

Cement the launch rails to the wing tips while the wing is still flat. These items are left with a rectangular cross section, and are just rounded off at the front end. Cut the wing in half next, sand the centre joint at an angle, then epoxy together at the correct dihedral angle, (if one side is pinned flat to the board, then the other tip is raised 2 1/4 inches). When dry, the wing can be fitted to the Vee shaped body, and epoxied into place. Cover the gap above the wings with the pieces you cut away initially, suitably modified for the wing shape. The leading edge extensions at the roof can now be added. The plan shows the correct curvature for the strakes, but the other edges will require trimming away to fit the wing and body contours.

Trim the tailplane to fit the fuselage, then cement this into place.

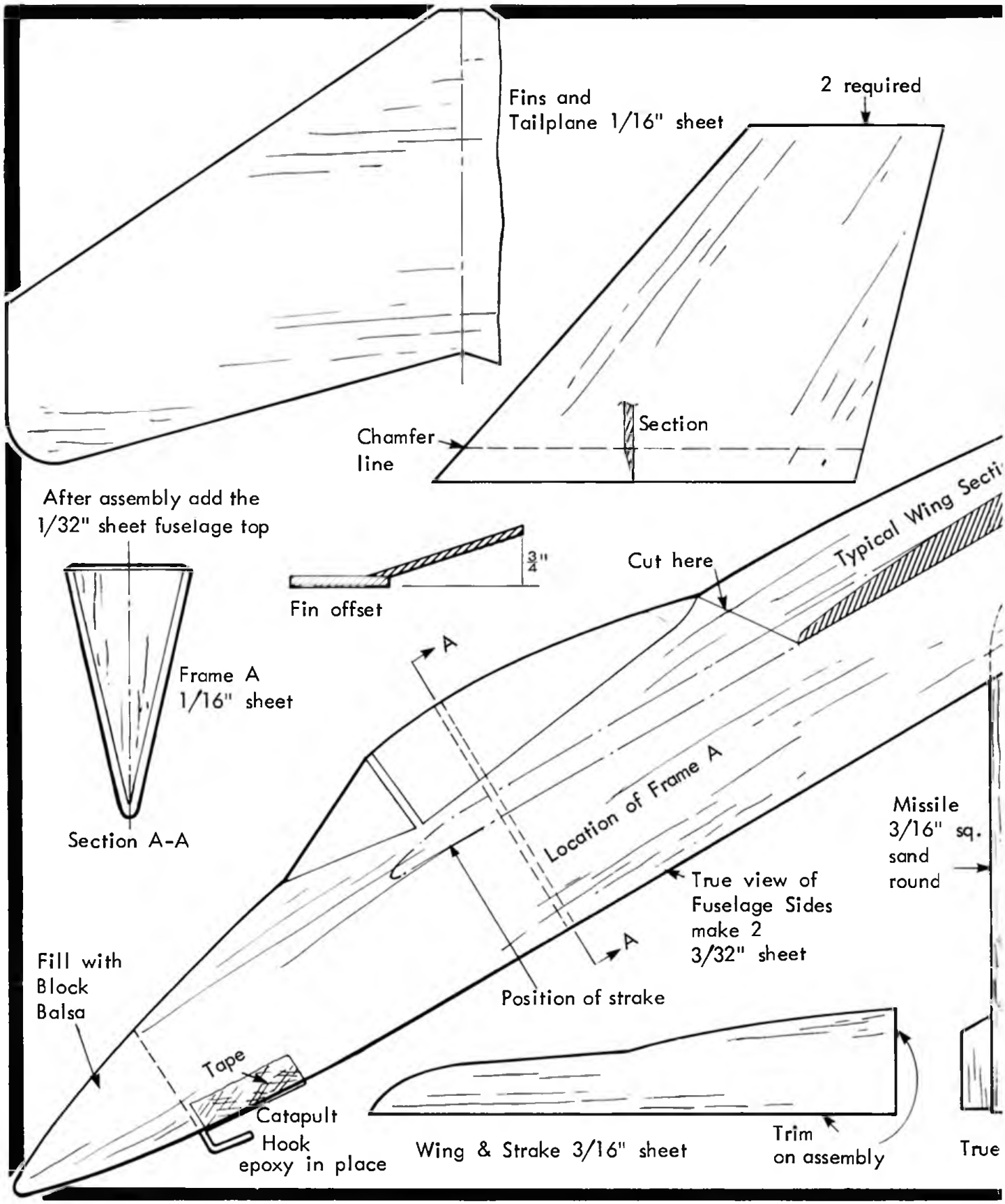
All that remains is to add the nose block, 1/32" sheet fuselage top, and the catapult hook.

FINISHING

I chose the colour scheme, which was on the front cover of June 1980 Scale Models, this has blue and gold stripes, plus all the assorted logos, numerals, warnings, emblems, stencillings, etc. that modern aircraft seem to be adorned with.

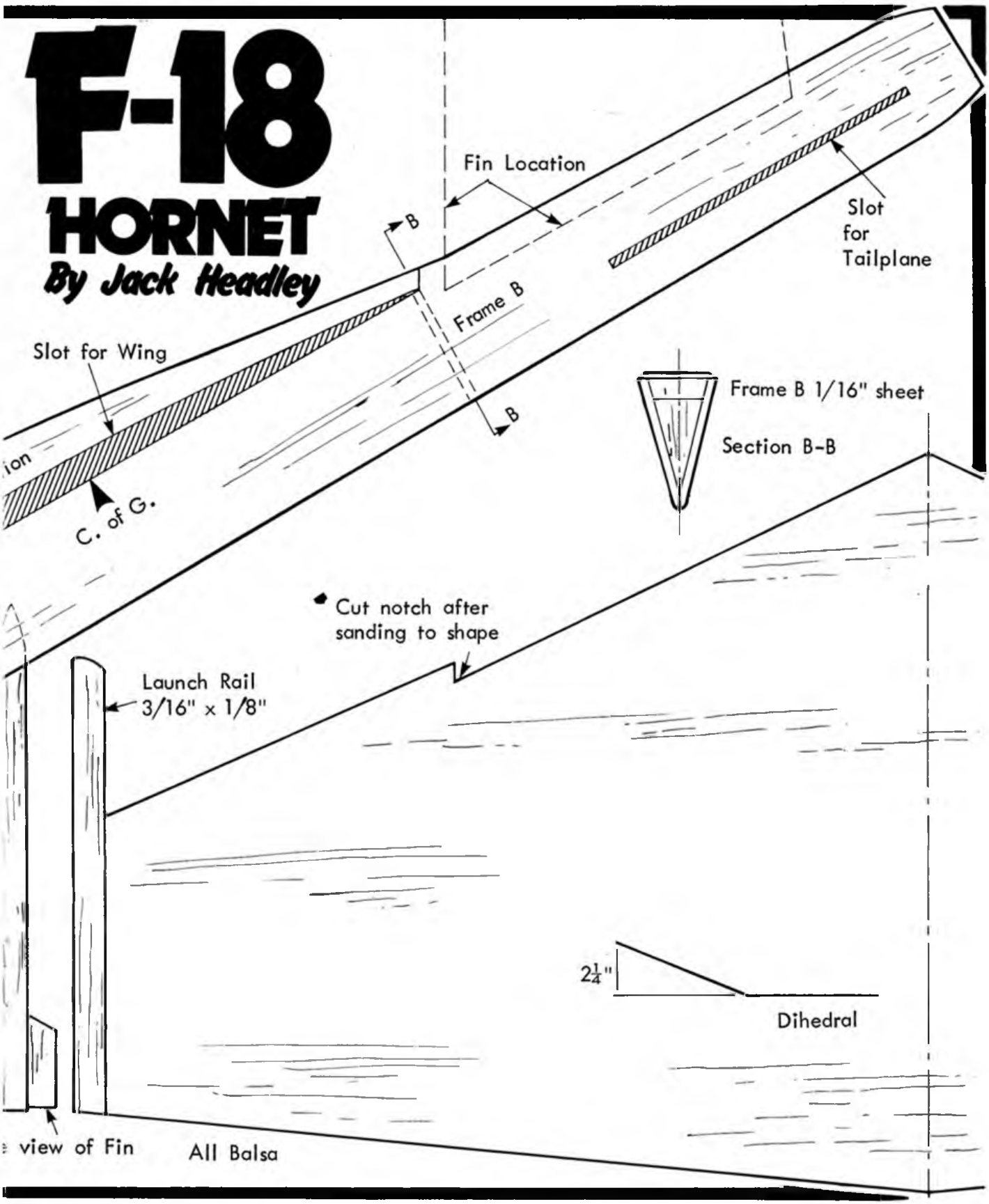
Whatever scheme you choose, first give the model two coats of balsa filler, sanding between coats. Apply the overal colour next, then finish off to suit. I didn't duplicate all the 'graffiti' of the aeroplane, just enough to make it look OK when flying.

As can be seen from the photographs, appearance is greatly enhanced by the addition of decals and a colour scheme



F-18 HORNET

By Jack Headley



FROM THE HANDLE

CONTROL-LINE FLYING IN IRELAND by Robin Kane

IN RECENT TIMES control-line flying in Ireland has enjoyed a strong following although not all are competition minded. There are quite a number of small club events but the significant competitions introduced many years ago are the provincial Nationals held in each of the provinces of Ireland, namely, Ulster, Munster, Leinster and Connaught. In addition to these is the main Irish Nationals held North and South on alternate years. Regrettably the Ulster, Leinster and Irish Nationals are the only events to retain C/L classes, the remainder are now exclusively radio control.

Further interest is generated in the Nationals as they are the qualifying events for the C/L Champion of Ireland, which in 1980 was won by Mitchell Shaw of the Belfast club.

Historically, flying standards have tended to be low no doubt due to the isolated situation and lack of involvement in competitions outside Ireland, however, I am pleased to report that there have been significant changes over the past couple of years. Many factors are responsible but a few deserve special mention such as the participation at the 1978 World Championships at Woodvale and whilst it constituted "jumping in at the deep end" it has created long lasting motivation and inspiration. Attendance at other major competitions such as the British Nationals is now a regular occurence.

On the personal level the serious competitive flyers are making a real effort with extensive building and practice all year round and certainly the lads concerned are very appreciative of the help, guidance and encouragement given by many SMAE members. Very valuable help has also been given by the Sports Council in the form of grant aid towards travelling expenses to events.

Looking ahead, the future of C/L is assured with the continuing enthusiasm and effort being directed towards more effective participation at major events.

Returning to the present the following reports give an outline of the important Irish events held during 1980. Finally for details of club activities and forthcoming events enquiries should be directed to either — Ray Johnson, 11 Aylesbury Crescent, Belfast or Stu Holland, 16 Carrick hill Drive, Portmarnock, Dublin. Where first class attention is assured.

IRISH C/L NATIONALS June 1980, Nutts Corner

After a poor start to the flying season, weather-wise, it was hoped that the Irish would be blessed with good weather and thankfully we were not disappointed although a couple of heavy showers marred an otherwise perfect flying day.

STUNT

Two new models appeared in the usual line-up both having their competition debuts. John Hamilton flew a beautiful new ST46 powered Genesis and Brian McDonnell with a Nomad. At the end of Round 1 John Hamilton topped the results sheet a position he wasn't to lose. Mitch Shaw and Stu Holland improved their Round 2 scores to displace Maurice Doyle from 2nd to 4th place. Further down the field Brian McDonnell was flying well until a premature engine cut at an awkward moment put the model into the tarmac sustaining serious damage in the process. Ernie Foster took the Novice award with a small 1.5cc model.

COMBAT

The less complicated and cheaper technology of the "A" class is proving very attractive to the combat brigade resulting in increased entries at most competitions. The Irish Nats was no exception with "A" attracting over twice the FA1 entries. Flying was to a high standard with the younger generation well to the fore and in particular Arron McIlvenny who battled very competently through to the final and very young Jason Holland who with more experience and height will surely follow in dad's footsteps. Stu, not unexpectedly, dominated both classes proving once again that he is still top combat flyer in Ireland.

GOODYEAR

With the disappearance of the big glows Goodyear was wide open as last years top teams found themselves struggling to come to terms with the 2.5cc diesels. Of the engines in use the MVVS produced the best speed followed by Rossi then Nelson. Completion of Round 1 saw the best three teams separated by 15 seconds and despite strenuous efforts in Round 2 this line-up didn't change for the final. With FTD under their belt Wylie Purnell were favourites to win, however, engine problems eventually delayed them leaving Kane Doyle and Shaw Hamilton to battle it out. Kane Doyle proved marginally quicker and they gradually pulled ahead to retain the Goodyear Trophy for the fourth year.

FA1 STUNT	FA1 COMBAT	"A" COMBAT
1 J. Hamilton	1 S. Holland	1 S. Holland
2 M. Shaw	2 E. Healy	2 A. McIlvenny
3 S. Holland	3 M. Doyle	3 M. Doyle

GOODYEAR

1 Kane Doyle	5 23 10 55
2 Shaw Hamilton	5 39 12 00
3 Wylie Purnell	5 21 15 00

Top left John Hamilton top Irish FAI stunt flyer. Top right Mitchell Shaw 1980 C/L Champion. Left L/D/R Jason and Stu Holland combat present and future! Right Robin Kane left, with Maurice Doyle winners of all major Irish Goodyear events in 1980.

ULSTER NATIONALS September 1980

The 1980 event will certainly be memorable in that it was a test to see who would succumb to the miserable rain. So ended a run of five good weather Ulster Nats.

STUNT

The early stunt rounds were graced by the only dryish period of the day of which the flyers took full advantage scores reflecting an overall high standard. The only drama occured when Maurice Doyle terminated his flight when his aircraft gently touched the ground during the inverted section of the wingover. The second and much wetter round saw John Hamilton repeat his winning score whilst Mitch Shaw dropped points with line tension problems. Stu Holland was the dark horse but omitted manoeuvres dropped him from contention. Sadly Maurice Doyle still had gremlins on board as a premature engine stoppage cut short an otherwise excellent flight. Alan Hanna deservedly took the Novice Award.

GOODYEAR

Despite the rain most teams returned times albeit slower than usual with Round 1 having Kane/Doyle in front followed by Shaw/Hamilton and then Wright/Black out of retirement for the day. Round 2 saw no change in the pecking order but Kane and temporary pilot Wright lopped off 7 secs and Wright/Black also improvised by 15 secs. The final produced no real drama with Kane/Doyle taking an early lead which they held to the finish.

COMBAT

Regrettably abandoned due to wet weather.

FA1 STUNT

1. J. Hamilton
2. M. Shaw
3. S. Holland

GOODYEAR

1. Kane/Doyle	5 07 10 09
2. Shaw/Hamilton	5 27 12 02
3. Wright/Black	5 51 13 49

LEINSTER NATIONALS June & October 1980

The very pleasant grounds of Blackrock College was the venue of the Leinster Nats 1980 and an appreciative audience were treated to some excellent displays and competitive flying between the very heavy showers that punctuated the day.

FA1 STUNT

A slightly sloping grass stunt circle created minor difficulties for most especially Maurice Doyle who flew into the slope after executing an excellent low level manoeuvre. John Hamilton was not spared anxious moments in Round 1 when his new Genesis cut prematurely and although the problem didn't re-appear his second flight suffered a slight loss of precision. Mitch Shaw flew an accurate schedule to head the results just two points in front of John Hamilton. Stu Holland and Eanna Healy again demonstrated their potential to fly stunt but lack of practice and poor 45 degree height placing lost them points.

COMBAT (FA1 and ½A)

Once again the smaller ½A class proved more attractive than the more difficult techniques of FAI. Both classes were again dominated by the maestro Stu, although he had to work hard for the ½A victory with a re-run in the final against Maurice Doyle. Overall the combat was to a good standard with up and coming youngsters Aaron McIlvenny and Jason Holland continuing to give the old timers a hard time. In the FA1 class Stu and Eanna demonstrated, once again, top proficiency with the other flyers suffering from lack of model performance or operating problems. John Black still prefers to keep quite successfully to the diesel model but in a real confrontation he is outpaced and out turned by the powerful glow foamies.

GOODYEAR

Due to site problems the racing event was held over and flown at Nutts Corner during October. The early heats produced the first ever Irish sub 5 min. diesel time by Kane/Doyle at 4 54 followed by Wyllie/Purnell at 5 24 with Shaw/Hamilton a close third. The second round placings remained unchanged by Wyllie/Purnell gave Kane/Doyle anxious moments when they too got under 5 mins.

The final proved to be a close affair with all teams very close in airspeed, perhaps occasional discreet pilot assistance? The lead changed many times until T. Purnell encountered engine problems at about 170 laps leaving Kane/Doyle to forge ahead to the finish with a 10 min. time achieved says pitman Kane by the use of a Nelson ABC and pressure re-fuelling.

FA1 STUNT	FAI COMBAT	½A COMBAT
1. M. Shaw	1. S. Holland	1. S. Holland
2. J. Hamilton	2. E. Healy	2. M. Doyle
3. S. Holland	3. J. Black	3. A. McIlvenny

GOODYEAR

1. Kane/Doyle	4 54 10 02
2. Shaw/Hamilton	5 28 11 07
3. Wyllie/Purnell	4 55 11 47

Reading from left to right: Purnell/Wyllie, Shaw/Hamilton, Wane/Doyle - Irish and Leinster National finalists.

STUNT
Dave Day

FILM COVERING FOR STUNT MODELS

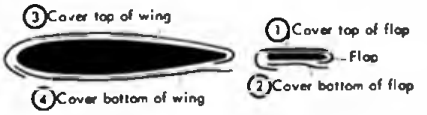
Some three years ago, I was contemplating the completed structure of a modified Nobler and wondering whether I could cover, finish, test fly and trim it in the two weeks remaining before the Nationals. For years I had been covering R/C models with iron-on film with generally satisfactory results, but I was not sure whether it was durable enough for covering stunt models. There was only one way to find out!

Film covering is fairly straightforward and, in many ways, similar to covering with tissue, using dope. Apart from the obvious difference of using an electric iron rather than a dope brush, the film is much less critical regarding the elimination of wrinkles and getting an even tension over the whole surface. When shrunk, the film exerts far less tension than shrinking tissue and is less likely to introduce warps.

Where possible, all overlaps should be trailing, i.e. the bare edge of the film towards the tail of the model. On the Nobler wing, the flaps were covered before attaching to the wing, with the top surface covering being taken round the trailing edge and overlapped by the lower covering. Similarly, the top covering was also taken round the leading edge, but this time overlapping the lower covering.

The wing top surface was then covered allowing a generous overlap around the trailing edge and with the leading edge free for the moment. After attaching the flaps (via the uncovered underside of the wing) the lower surface of the wing was covered, finally overlapping the leading edge film which was previously left free.

No doubt this sounds very complicated. Hopefully the following sketch will make it all clear.



Incidentally, I use wire and tube hinges, which I find far superior to any other type (more details in the near future). The tailplane and elevator was covered in a similar manner. If you decide to try film covering, you will have to decide when you reach the fuselage whether you want to be adventurous and tackle it too or use more conventional methods. With pre-planning and practice, it *is* possible to cover a complete fuselage with one piece of film. Being a coward, I used three pieces, one for each side and a piece under the wing. If you are not sure of covering the fuselage, I suggest that you start with the cowl which *can* be covered with one piece.

The technique on compound curves is to pull the film over the curve while smoothing down with the iron. Just like doping tissue on — as previously stated. For the correct heat setting of the iron, you will have to experiment. My iron has two 'warm' settings and the correct point is towards the hotter end of this range. For shrinking the film, a *slightly* warmer setting is required. It is advisable to iron the film down to the wood wherever possible, and not to use the common technique of tacking down at the edges and shrinking the film into position. For this reason, I have never used a heat gun or found one to be necessary.

Some people think it advisable to seal the edges of the film with epoxy etc. If joints are made to trail as described above, it is not necessary as long as you use good quality film (Solarfilm, Quickcote, etc.).

The only spot where trouble can arise is if you have to cut the film in such a way as to produce a sharp point or corner (i.e. where two straight cuts meet at an angle of less than 90°). The simplest solution is to apply a small drop of cyanoacrylate glue to seal the film at this point.

After sealing the inside of the tank and engine compartments with epoxy and adding engine, tank, wheels, etc., the all up weight of the model was 39½oz!

Since that time the model has amassed some 130 flights and several contest successes and the weight has risen to 43oz., mainly due to oil soakage. The film is still intact and unless examined very closely, the overall appearance is still very good. In fact when I pointed out to Pete Tindal that the model was film covered, he expressed some surprise and said that he had always thought that it had an epoxy finish! (I have since completed a similar model with an epoxy finish and it weighs 52oz.)

One part of the model which has not weathered quite so well is the wing/fuselage joint which has a considerable amount of fuel soakage. Attempts to reseal the film at this point by reheating, result only in bubbles being formed by the fuel evaporating. This situation can be dealt with in several ways if you are prepared to re-cover. The fuel can be extracted from the wood by laying pieces of toilet tissue over the affected parts and repeatedly ironing with a hot iron (after removing the film — of course). You will find that the tissue will absorb the fuel and after several applications, no more will be drawn out. At this point, fresh film can be successfully ironed into position.

Another method of removing fuel is to apply dry cleaning fluid. When this had dried, a white powder will have formed. Brushing this off will reveal dry wood. If badly soaked, two applications may be necessary.

One other thing which I have discovered about iron-on film is the property to adhere very firmly to epoxy. It would seem that if the wing/fuselage joint and the area around it were to be sealed with epoxy glue before covering, then the problems in this area could be solved.

During the last year, the original Nobler has had a couple of accidents which require some rebuilding. While doing this it is my intention to re-cover the entire model using the above method of oil removal and sealing before recovering. I also intend to try a few fairly drastic modifications to the control geometry in the hope of curing the well known Nobler fault of turning much tighter on inside manoeuvres than outside ones. My report and findings on these will follow at a later date.

AEROBATICS 3 SISTERS INTERNATIONAL ON THE 23rd/24th MAY

As the organisers of this event cannot accept more than 30 entries in Aerobatics because of the time schedule set by the event, it is anticipated that priority will be given to foreign competitors and that the balance of the remaining places will be allotted to U.K. fliers. Pre-entry is advised and further details can be obtained from Arthur Eves — Cheltenham 518097.

READY TO FLY CONTROL LINERS

JOHN STROUD REVIEWS THE RANGE OF TESTOR'S CONTROL LINE MODELS

ANYONE WHO TAKES this magazine regularly will know that, over the past few years, I have been trying to help beginners take up control line flying. To get one's first plane into the air and fly out a tank full of fuel is a thrill that is rarely forgotten. The problem is that the first flights are the most difficult ones to achieve — especially without the help of a more experienced modeller. Let me list just a few of the pitfalls. Being given or buying a worn out motor. Using the wrong size propeller, or unsuitable fuel. Trying to make a kit that is too difficult and above all, not being able to start the engine. Buying a ready-to-fly plastic model has always been a good way of getting over most of these early difficulties. I remember as a small boy, testing the E. D. Bee powered 'Challenger' for this magazine 30 years ago! It flew quite well and was fairly crashproof but the little E. D. Bee engine could be reluctant to get going in the hands of a beginner. Since then 'automatic' starters have appeared on a number of engines up to 1.5cc. Most consist of a spring which is engaged when the propeller is wound backwards. When released the engine turns over once or twice as the spring unwinds, and then disengages.

The Testor version of this type of device known as the Rotamatic, is fully enclosed, fully automatic and by far the best I have used. However, five of the eight Testor models I was given to try out have a new and as far as I know unique, type of starter. The limitation of the spring starter is that it will only turn the engine over once or twice. Electric starters are better but they cost £40 or more! Testor have come up with the ZIP STICK starter which is so simple and effective it must be the work of a genius. Push the stick in the opening, pull it out sharply and the engine turns over half a dozen times very smartly. It makes starting (almost) childs play.

In order to properly try out the ZIP system, I gave one of the outfits to a young modeller, Mark Skipper, who has just started aeromodelling. I think Testor have also chalked up another first by including in their outfit not only a well written and illustrated set of instructions, but also a 33⅓ rpm record of very precise and clear instructions.

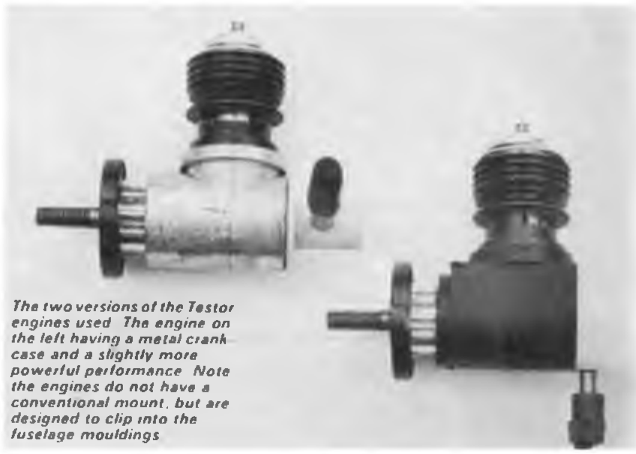
As well as the basic kit, Mark needed the Starter Kit which consists of a 'Duracell' battery, battery clip and fuel. Two days later Mark telephoned me sounding very pleased with himself to say he had read the instructions, listened to the record and started the engine on the fourth pull. That must be good for someone who had never started a glow engine before in his life.

The five ZIP starting models I had to test fall into two categories. Three were World War Two fighters of about 14" wingspan and two were larger 16" span models, a Cosmic Wind and Silver Wind. The P-40 Warhawk, P-51 Mustang and Spitfire weigh about 5½ ozs and look quite a lot smaller than the 9½ oz Winds. Detail and authenticity of the models draws praise from everyone who sees them. Each model is slightly different in detail but consists of no more than about six or seven pieces of pastic held together by three or four screws; that includes the control system. Even the engine just clips in. As part of the examination, each model was dismantled and this proved to be a useful exercise. Mass produced plastic mouldings are rarely perfect and the fit of a number of parts was greatly improved by trimming and removing unwanted material. All the props seemed a bit loose and one of the control systems had become disconnected. At this stage I noticed the two 'Wind' engines had metal crank cases but the other three had plastic ones. I have an aversion to stripping engines unnecessarily, so later 'phoned Roy Lever at Harden Associates to find out if there is any difference in the engines. He told me the metal version is the slightly more powerful of the two but did not know exactly what the difference is inside.

When making up the lines supplied, I was slightly surprised how short they were but decided Testor must know best, so pressed on. For some models they even suggest lines can be cut down from 15 feet to 10 feet. The shortest I have ever flown an 049 on is 25 feet! Our normal flying field is rough grass, but to test these properly needs a smooth take-off area. This is where the short lines proved a blessing because I found we could fly them in half a tennis court. The cold weather kept the players away and we had the local courts to ourselves. They are not

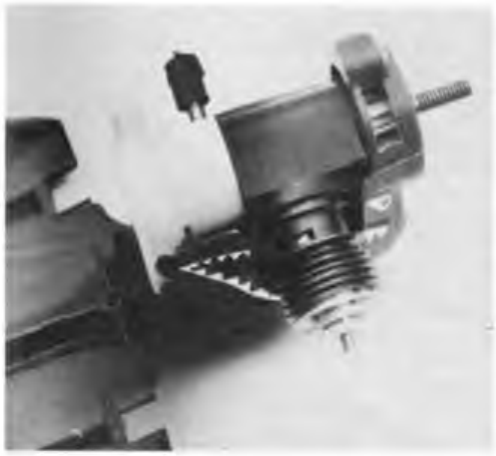

The Spitfire front end with propeller removed. The spinner clips on to lugs moulded on the propeller hub


Zip start cup and propeller back plate


The two versions of the Testor engines used. The engine on the left having a metal crank case and a slightly more powerful performance. Note the engines do not have a conventional mount, but are designed to clip into the fuselage mouldings

too near any houses so I just fitted the little silencer on one model to try it out. Following the instructions explicitly, with no bright ideas of my own, we were soon airbourne with the Warhawk. I had four helpers and we soon had flights with all five models. The smaller models were flown first on the 15ft nylon cord lines. The instructions say set the engine rich and this is what we did. The motor leans out a little as it runs along the ground and takes off in about a ⅓rd of a lap. Control response is not very dramatic and the plane burbles round with a marked nose-up attitude. On its last lap it leans out, picks up speed, then cuts and drops like a brick. The resulting heavy landings do not look, or sound, very good but the aircraft stays the right way up without damage.

Top left: some of the Testors propellers, note the lugs for locating the spinner and the blunt blade tips for safety. Nose of the Cosmic Wind top right with the front part of the cowl removed. The Zip starter stick locates the cog behind the propeller and is held engaged while starting by the front cowl moulding. Right: the leadout wires on the Silver Wind. Below left: the engine installation. The very simple, but effective battery clip for Duracell batteries is shown below right, and in use, centre



Later we set the fuel ¼ turn leaner (screwed in) and this gave a slightly faster flight with a more realistic flying attitude. The general opinion was that these little control liners make excellent trainers for first time flyers. The engines are easy to start, do not need to be tuned to perfection to get it airborne and above all, they are easy to fly. A full crash test has not been given to these three and the only damage has been two broken props on the Spitfire. Roy Lever tells me only I seem to be able to break these props!

Next we wheeled out the larger 'Winds' — one fitted with a muffler. With the wheel spats fitted, these models look very racey. Although larger and heavier, the winds seem to fly quite a bit faster and certainly glide surprisingly well when the engine cuts. The controls are much more responsive and it is possible to get into serious trouble much more quickly than with the smaller models. Unless the engine is running at least fairly well, the plane will only fly with a nose-up and semi stalled attitude. Over control with a good engine run will result in wing-overs from which it is difficult to pull out. This time we did do some crash testing! Vertically into tarmac. Although it flew apart in a most spectacular way, no damage resulted other than a cracked spinner. It was flying again in a couple of minutes. The general opinion this time was that the 'Winds' are much more of a handful to fly and for us, much more interesting. The spats are part of a Racing Kit which also includes a different propeller. When fitted with this prop it is very quick indeed and could do with longer lines than the ones supplied. However, it is still a good trainer and if flown on the standard propeller it appears capable of withstanding punishment until the pilot gets it right.

We had had a good afternoon's flying before trying to start the engine fitted with a muffler. As with most types of silencers, this ring type muffler makes the engine difficult to prime through the exhaust port. So much so in fact that we gave up trying, perhaps the Duracells were getting flat (we had used 3) but in the prevailing cold we

The photographs left and right show the way to operate the Zip starter. Right: the Silver Wind at take-off.

soon gave up. I decided to look into the problem in the comfort of my own home.

This test programme is the first time I have tried using Duracells for starting glow plug engines. They are probably the handiest and cheapest way to start glow-plug engines. If you take up flying seriously and regularly then there are more cost effective ways of doing it but they involve far more outlay in the first place. One word of warning. At about 70p each you will need to be very quick and crafty to get starts at about 1p each. It is not the number of starts that wears out the cell but how long it is clipped on for. We used 2 new Duracells in the afternoon and one seemed to give far more starts than the other. (Harden Associates hope soon to put on the market a Ni-cad and charger for starting engines).

In conclusion, these are a great set of little planes which represent first class value for money. If you are trying to encourage a youngster to take up aero-modelling, they must be a 'best buy'. Obviously an enormous amount of thought has gone into the preparation of this product. Short of giving free lessons it is difficult to think what else a manufacturer can do to help ensure the purchaser gets successful flights. Of course, they are aimed at the toy market rather than the model one, but there is always a good chance the flyer will be sufficiently encouraged to join our hobby and go on to build his own. The only real criticism I have is about the control handle. Why such an odd little, nasty thing is provided I cannot think. The Kiel Kraft one at about 25p is infinately better to use even though the line adjustment is more difficult than the 'plug' system on the Testor handle. If you are tempted to make your own handle, remember to keep the line attachment the same distance apart for all your early flights as it affects the control sensitivity.

I expect you will have noticed I said I was given eight models to test but have, as yet, only mentioned five. The other three, which are more unusual than these conventional planes, will be tested ready for next month. I will also report on what we have done to hot up the performance of the ones tested in standard form this month.

P-40 Warhawk

P-51 Mustang

Spitfire

Cosmic Wind

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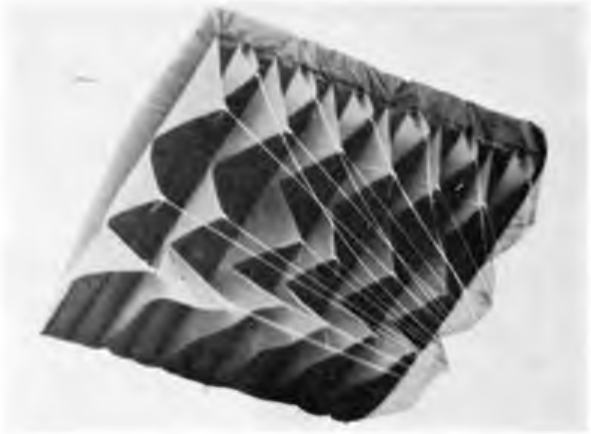

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SCALE MATTERS

by Alan Callaghan

ONCE AGAIN SCALE enthusiasts can be most grateful to Ing. Lubomir Koutny of Brno, for sending another large selection of photographs together with a detailed report on the latest flying scale model developments in Czechoslovakia. These occasional reports have appeared several times in *Scale Matters* and from this latest one it seems that this small group of flyers continue to concentrate on the rubber scale model. Whether this is due to the lack of availability of other forms of propulsion in Czechoslovakia such as the small diesel, glow, or CO_2 motor, or whether the rubber model is a particularly traditional type, has never been fully explained. Certainly it seems that this small group of flyers are still developing the rubber scale model to a high state of the art with great success.

One aspect of the contest element is unique in that outdoor competitions are devised for models built to a constant scale of 1:20. This does not appear to limit the choice of prototype in any way as the photographs clearly show. The models, even complex ones such as twins, seem all to be just about the 'right' size when examined in terms of weight, wing area, power requirements, and 'handleability'. Very small scale models such as Peanuts are only enjoyable to fly outdoors on very calm days, and though they might stay in the air for a long time on a breezy day, they are always much more satisfying to watch cruising around smoothly and steadily as they can only best perform, indoors. The very large rubber scale model i.e. 1000mm and above in wingspan, is not a project for the faint-hearted — not so much in the actual building of the model, but in the confident handling of hefty (and these days, expensive!) rubber motors if consistent flight performances are to be achieved. The Czech models all seem to be in the region of 500-800mm wingspan, and if the claimed flight times are anything to go by, then it seems that the instigators of the 1:20 scale formula got the recipe right first time.

Although in past reports Ing. Koutny has mentioned that the climate in this part of the world can give extremely pleasant conditions in Summer, with warm days and very calm weather being quite common, 1980 proved to be an exception and they appear to have had a good dose of the best of typical British 'weather' on numerous occasions. In one photo the jolly old brolly is much in evidence, and although only four 1:20 scale competitions were staged during the year on the usual dates, it rained at every one of them. Sounds familiar.

The most successful contestant was Antonin Alfery, whose stable includes a Canadair-VTOL twin, a Bristol Fighter, and an unnamed canard. The Canadair can perform a vertical take-off, the wings then alter incidence to take the model into a horizontal flight pattern, a payload is released and then the undercarriage retracts! It will come as no surprise therefore, to learn that Mr. Alfery is an aircraft engineer. Ing. Koutny himself placed second on three occasions with his own D. H. Hornet featured in the past in this column. All four Junior competitions were won by Lubomir's son Peter, with his Moynet Jupiter twin push-pull model — also previously featured in this column. Still in the Junior section is another but new model in the form of a MiG 3D which, to quote, flew like a 'heavy flat iron' (we know, we know!) and which is now to go on display at the Kbely Air Museum.

The all too familiar wrangles over the scale rules are not entirely unknown in this otherwise harmonious setting. It transpires that beginners, as such, have marks given in their favour in contests, and using a simple model they can have a distinct advantage over the experienced modeller who may be trying a more challenging subject. This is fine for attracting new blood, but naturally does not exactly boost the morale of the more ambitious builder. The rules are therefore being reconsidered and, in passing, Lubomir suggests that some international rules may be worth aiming for.

Peanut contests were more numerous in 1980 than in previous years, but the response to them was poor on the whole. There are not enough large halls for people to practice in, and ultralight models built especially for small low-ceiling venues do not go so well when the opportunity arises to fly them in larger spaces. Suitable trim changes can be difficult and are rather time-consuming. One interesting variation is the flying of Peanut models at a swimming pool with a 5 metre ceiling, and one special freelance design cabin model did 41 seconds from a 2 metre take-off run on the water. Several other models are

Heading shot Ing Zdenek Veure's model of a Yak-4, flys for up to 40 seconds. Left Mr Kunert and his Armstrong Whitworth FK8. Right Ing Koutny's Sablatnig SF-4 and Antonin Alfery's Bristol F2B

almost as good but one accurate scale Vought Kingfisher with polystyrene floats simply cannot break the surface tension and achieve lift-off. The scale models are also flown in other contests against normal Peanuts, where their floatplane configuration helps to gain those extra points in static judging. A particular contest is for own designs to Peanut dimensions, where no static points are awarded, and the final score is the aggregate of a handlaunch and a R.O.W. take-off. Sounds interesting. One photo shows a line-up of these 'mini-hydroplanes', as they are called, and some interesting configurations have been tried. Nestling among them is a neat Wittman Tailwind on twin polystyrene floats, but no performance details are given. One in-flight shot taken outdoors of a Voisin canard shows the work of Michael Karpfel who is only eleven years old. The model is reminiscent of a Santos-Dumont 14 bis without the biplane foreplane but with a tri-float landing gear.

Returning to the outdoor 1:20 scale brigade, a few descriptions of particular models will give some idea of the variety of subjects that the more experienced modellers have tackled recently. There is not enough space to show all of them in photos, but where the names are unfamiliar your own favourite recognition manuals can be dusted off and perused.

Amongst WWI subjects we have an all-sheet balsa Sopwith Triplane by a Mr. Jahelke. Fully detailed with inked rib-lines and RNAS markings, it seems to follow construction methods popularised by Ken McDonough in this country several years ago.

Remaining with British subjects we have Mr. Alfery's superb Bristol F2B Fighter which is of exact scale built-up structure, and is good for flights of fifty seconds and more. A perfect stablemate for this is an Armstrong Whitworth FK8 built by Mr. Kunert. This model is complete with four bladed prop and an intricately detailed pair of Lewis guns adorn the rear cockpit. Completing a trio of olive drab types is a fine flying SE5a featuring some rather detailed squadron markings by a Junior, Mr.

Antonin Alfery's Miles Libellula.

Mikulastik. Without wishing to be too irreverent, it is tempting to suggest that with a subject like this and a name like that, one can't go wrong!

A very striking but possibly partly posed photograph shows Ing. Koutny's own German Sablatnig SF-4 in formation with Alfery's Bristol. The resulting picture is certainly effective, anyone who has ever tried to photograph only one model really well in flight will have some idea of the difficulties involved. Posed or not, the result is fine.

Progressing to WW2 subjects brings us to a fine brace of F.W. Ta 152H's by Messrs Lubomir Salmson and Charles Ludovik. The first is entirely of polystyrene construction, whilst the latter employs traditional building techniques. Both fly extremely well, but the foam model certainly has the edge in realistic appearance. Another WW2 type, but in much more recent markings, is a N.A. P51 D Mustang by Paul Stranik which weighs 50 grams and can fly over a minute or so. Certain details about the model such as the moulded canopy, the spinner, and the overall size, suggest that it could be from the Sterling kit, but the well proportioned 4 bladed prop and the all up weight achieved, makes it seem most unlikely that it is a straightforward kit model.

An unusual but less successful model is the Bloch 152 by George Merte. Though not such a good flyer, the model looks very business-like in full camouflage and markings. The colour scheme looks to be extremely thin paint over tissue, and all panel lines have been ruled in. George likes French aircraft and his second model is a military Caudron which turns out to be a very fine performer. A safer choice of subject was built from a plan drawn and published by Ing. Koutny again by Paul Stranik. This is the Heinkel He126 complete with full desert camouflage markings and close attention to fine detail. Here again a very business-like 3 bladed prop is featured. This parasol type clearly has many attributes as a rubber scale model. Perhaps the most really interesting types are the multi-engined subjects. Paul's German Berlin B9 is quite new to me as an aircraft and reminiscent of a Focke Wulf Moskito. The model is rather crude in construction but the photo shows it to be flying rather well. Much more refined is the quite superb Yak-4 by Sdenek Vaure which has beautifully stringered long engine nacelles and fuselage. An in-flight shot of the model shows damage from a motor breakage on the upper starboard nacelle, but the handsome clean lines and good proportions are shown off well to advantage. It is capable of 40 second flights, spans 700mm, and again weight is claimed to be 50 grams. The props used are large 3 bladers with very coarse pitch and they contra-rotate towards the fuselage.

Junior Peter Mikulastik's N.A. OV-10 is not quite up to the standard of the Yak — the large bulbous canopy is difficult to build without moulding equipment — and although the Bronco has a lot going for it as a rubber scale twin, this one can only do 25 seconds. One last little gem is a 1:20 Miles Libellula by Antonin Alfery. The model looks quite accurate from the photo, with a detailed undercarriage and full colour scheme. Sadly the flying performance is too much like the real aircraft and it is not a reliable performer.

Mr. Lubomir Sampson with his own Ta-152H built from polystyrene and Ing Charles Ludvik with his Fw Ta-152H built from wood. Both models fly well.

1981 INDOOR SCALE NATIONALS — STOP PRESS

This event is scheduled for the 26th April at Derby Municipal Sports Centre. Peanut CO_2, and Open Rubber Scale will be flown. For full details contact Barrie Hotham. Tel: Mansfield 34127.

SHOP TALK

The latest in products for the modelling scene

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Pursuing their policy of continual research to supply all the modeller's needs, Humbrol have re-formulated their range of Modelling Spray Enamel Aerosols to give an even better finish.

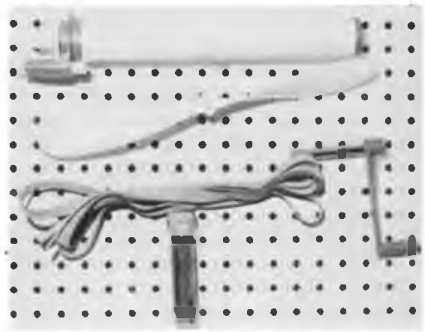
The packaging has been re-designed so that the colour coding is now clearly visible on the front of the cans, by means of a colour panel and by the wording. The range of colours has been extended to give a total of 27, 11 Gloss Colours; 11 Matt Colours; 5 Metallic Colours — all matched to the Humbrol Standard Enamel range, so you can mix spraying and brushing, confident that the same colour finish will result.

Humbrol Modelling Spray Enamel is rapid drying; non-toxic; suitable for rigid polystyrene, wood and metal and is packed with a 113g (4oz) fill. The new formulation results in a smooth, even, professional finish, with all the convenience of aerosol application and is recommended for cars, ships, aircraft and all forms of modelling. Price per 4oz tin £1.30.

WEN PENCIL ENGRAVER

This useful electric engraving tool is made by W.E.N. Products Ltd., Marshall House, 468-472 Purley Way, Croydon, Surrey CR9 4BL.

The tool works by creating a series of dots that to the eye give an impression of a line. The weight of the line can be varied by turning a knob, located on the back of the instrument. The engraver operates from 210-240 A.C. mains and costs £8.00 plus VAT.



KEILKRAFT

A new rubber power; the 'Arden' propulsion unit manufactured by Knight and Pridham and distributed by Keilkraft.

The motor consists of a plastic tube with a 5-1 gear at the front driving a 7¼in. plastic propeller. Power is supplied by a 2ft. length of ⅛ flat rubber made up into 8 strands. Included with the unit is an allen key for tightening the drive gear to the propeller shaft, rubber lubricating liquid, and a winding key. The motor will run for about 30 seconds and will fly models up to 26in. span. Price £5.99.

PECK POLYMERS

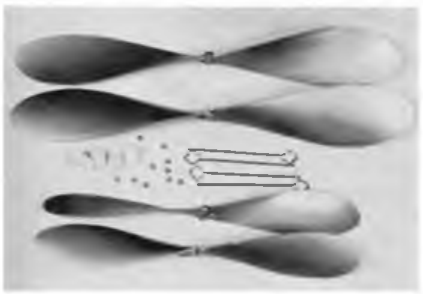
For the Peanut Scale or Indoor Scale enthusiast, Peck-Polymers produce a superb range of wheels, which are distributed by the Modellers Den, 2 Lower Borough Walls, Bath BA1 1QR. The most expensive in the range have 36 spokes made from silk, and woven under tension into balsa wood tyres and rims. The tyres look more like rubber than rubber itself, but are painted only with Floquil paint (not fuel-proof).

There are 10 diameters available from ½-in. to 1½in. with various tyre widths in all but the ½in., 9/16in., ⅝ and ¾in. diameters. Price per pair is £4.26.

Less expensive are the clear, vintage wheels which have rubber tyres, diameters ¾in., 1in., 1 1/16in. and 1½in. cost 55p, 65p, 75p and 80p, per pair. There is also a range at the same price and sizes which have white plastic hubs. Smooth contour wheels ref. No. P.A.-106 are ¾-in. diameter and cost 75p per pair, and finally there are ⅝in. diameter plastic wheels ref. No. P.A.-95 at 15p per pair.

The scale dummy cylinders are made in 3 sizes — ⅜in., ½in. and ¾in. and are sold in packs of 5 at 55p, 80p and 90p.

Designers kit for small rubber models contains well moulded propellers, nylon hubs, thrust washers and shafts. Ref. No. P.A.2, cost 95p.



PILOT

We have just received a range of 'Pilot' Control Line kits, which are imported from Japan by Irvine Engines Ltd., Unit 2, Brunswick Industrial Park, Brunswick Way, New Southgate, London W11 1JL.

'Fast' is designed as a trainer using an 09-15 glow engine and is rather unusual as all of the construction is from hard wood. The fuselage is constructed from 3mm ply sheet, as are the wing ribs and tailplane. All of the components are die-cut and only require pushing out and cleaning up with sandpaper. Covering tissue and glue are not included in the kit. Price £4.80.

The 'Piper Cherokee' is constructed also from hard wood, and is designed for 09-15 size engines. The kit includes a two-page plan and pre-bent undercarriage, bell-crank, nuts and bolts, etc., but excludes glue, tank and covering material. Price £4.80.

The 'Spitfire' is constructed from ply and balsa and is also designed for 09-15 glow engines. The construction of this model is a little more involved than the previous two mentioned, but still within the beginners range. A good set of decals, bubble canopy, exhaust mouldings, and pre-bent undercarriage and bell-crank hardware are included in the kit. Price £10.50.

The 'Cobra Z' is a combat model built again from hard wood and would make an ideal tough model as a start to this area of control-line flying. Price £3.99.

EDWARD ROLAND

Two useful items being produced by Edward Roland Ltd., 215 Putney Bridge Road, London SW15 2NT, are these multi-compartment storage cases.

Case No. 14 is moulded in a beige plastic with a clear plastic hinged lid. The size is 13¾in. × 9½in. × 2in., and it has 14 various-sized compartments. Price £5.75.

Case No. 10 is similar in construction and has 10 equal size compartments. The case

dimensions are 10½in. × 5½in. × 1¼in. Price £2.40.

There is also a cabinet available, size 11¾in. × 5½in. × 5¾in. that has three rows of drawers in see-through green plastic. Price £7.75.

All of the items mentioned are available by post from the above address.

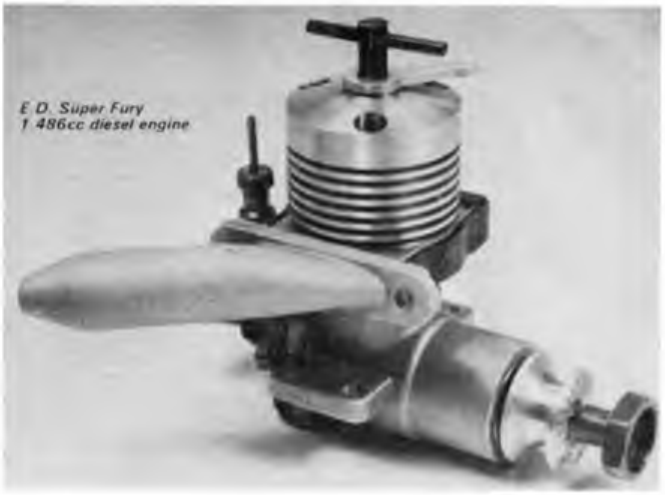
WHITTLE

Whittle Aviation, P.O. Box 79 Nottingham WG2 7RS, are offering a range of polyester ties with aircraft motifs. The selection shown here are the Concorde all over pattern in blue, V.C.10 Tanker in maroon, B.A.C. 1-11 in navy blue and the Cessna-Skyhawk, also in navy blue. All these are available at the special price of £4 from the above address.

Engine Test Review

by Peter Chinn

Two British 1.5cc diesel engines that have been around for a considerable time, but still represent excellent value where they are to be found on shop shelves.



E.D. Super Fury 1.486cc diesel engine

E.D. SUPER FURY

Country of Origin: U.K.
Type: Compression-ignition, disc rotary-valve with twin ball bearings.
Bore: 0.500in. (12.7mm)
Stroke: 0.462in. (11.73mm)
Swept Volume: 0.0907cu.in. (1.486cc)
Weight: 123 grammes (4.34oz) less silencer
136 grammes (4.80oz) with silencer

• • •

As with so many small diesels, the history of the E.D. Super Fury dates back quite a long way. The original Fury, designed as long ago as 1956, was put into production in 1958. Two years later it was superseded by the first of the much more powerful Super Fury series but then, as a result of a change of ownership in the original E.D. company, it was withdrawn from production in favour of a cheaper, plain bearing engine, the E.D. Hawk, which was actually made in West Germany. A further change of company ownership was followed by a total withdrawal from the model market and it was only the subsequent action of Ken Day who, in 1965, stepped in and took over their manufacture and distribution, that E.D. engines were saved from total extinction. At first, production was mainly concentrated on the larger E.D. marine engines but, in the winter of 1969-70, the Super-Fury, with some modification, was revived.

This final version, the subject of a full Engine Test report in the May 1970 issue of AERO MODELLER, was in production for more than ten years until 1980. Unfortunately, it has now had to be withdrawn from E.D.'s product list because of the loss, by the firm responsible for producing the engine's castings, of the original dies. We have, nevertheless, thought it worthwhile including the Super-Fury in this series for two reasons. (a) a fair number of these engines are still in circulation, and (b) there are some remaining stocks of new engines still available. (In regard to the latter, no more aircooled engines are available from factory stocks but E.D. do have some marine Super-Furies and, while these last, any purchaser of a marine Super-Fury who wishes to do so, may obtain, free of charge, the necessary parts (prop drive assembly, finned cylinder jacket, etc.) to enable his engine to be used for both aircraft and marine applications.)

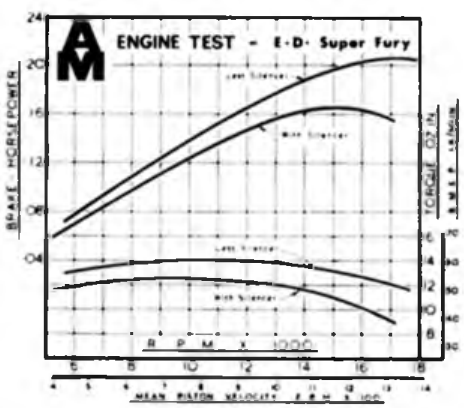
In contrast to all the small engines previously dealt with in this series of condensed reports, the Super-Fury has such 'big engine' features as a twin ball bearing mounted crankshaft and rear rotary disc valve induction. It has a diecast aluminium alloy crankcase with an integral twin outlet exhaust duct. The case houses one ¼ × ¾in. inner and one ¼ × ⅝in. outer, ball journal bearings to support the crankshaft. The shaft is made in one piece with a full disc web and a 5/32 in. dia. solid crankpin.

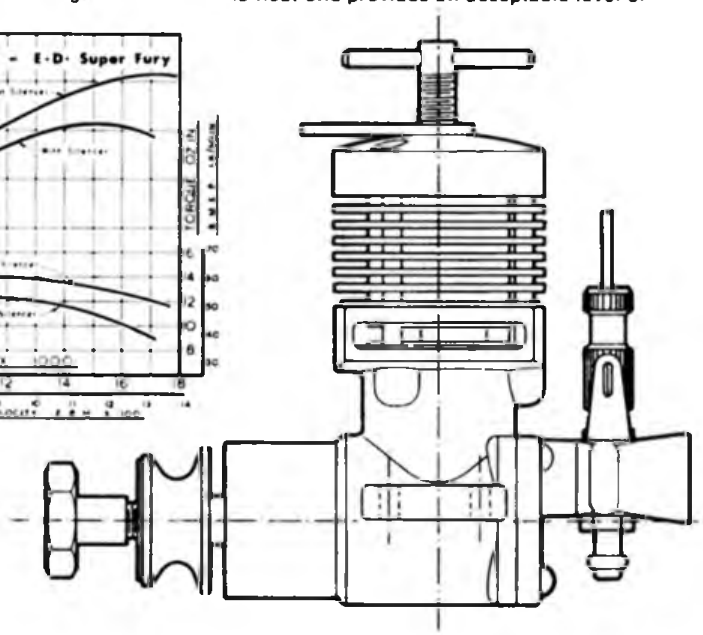
The radially ported steel cylinder is located in the crankcase by a flange at the exhaust belt, above which it is encased in a finned aluminium cooling jacket, the complete assembly being tied to the crankcase with three long screws. The lapped cast-iron piston is fitted with a fully-floating ⅛in. dia. solid gudgeon-pin and the connecting-rod is of forged duralumin.

The rotary-valve is of moulded nylon mounted on a ⅛in. dia. steel pin. The pin rotates directly in the crankcase backplate which is also a nylon moulding. The backplate, complete with integral air intake, is secured to the crankcase with four screws.

Tested first without the optional E.D. silencer, our Super-Fury recorded a maximum torque of 14oz.in. at between 10,000 and 12,000 rpm and a peak output of nearly 0.21 bhp at just over 17,000 rpm, which is very good indeed for a regular production type 1½cc diesel.

Adding the silencer cut peak bhp by approximately 20 per cent to 0.165 bhp at 15,000 rpm. The silencer assembly, as shown in the illustration of the engine, consists of a small volume expansion chamber with a 3.7mm dia. outlet that can be clamped to either side of the engine's rectangular exhaust duct, the other side being blanked off with the steel cover plate that forms part of the silencer fixing. Obviously, the free flow of exhaust gases, from the radial cylinder ports, is somewhat spoiled by the blanking off of one side and, since the Super-Fury retains a few degrees of sub-piston induction at the top of the stroke, some dilution of the crankcase charge, with exhaust gases, is bound to occur when the silencer is used, hence the power loss indicated. However, the silencer is neat and provides an acceptable level of





FULL SIZE DRAWING

noise suppression and it is worth noting that the Super-Fury's maximum power output *with* the silencer fitted was as good as (if not better than) most other 1½cc diesels *without* silencers.

Typical prop rpm recorded on test, with the silencer, included 8,700 rpm on an 8 × 6 Power Prop (standard), 9,700 on an 8 × 5 Power Prop (standard), 9,900 on an 8 × 4 Top Flite nylon, 11,200 on an 8 × 3½ Top Flite (standard), 13,600 on a 7 × 4 Top Flite (standard) and 14,600 on a 7 × 3 P.A.W. Trucut wood.

Handling and running qualities were good. The Super-Fury started readily, hot or cold, and the response to both needle-valve and compression adjustment was positive. The contra piston moved smoothly and did not seize in the bore when the engine was hot. There was a tendency for the compression screw to run back when the engine was loaded for very high speeds (i.e. on 7 × 3 and 7 × 4 props) but this was easily checked by means of the compression locking lever fitted.

P.A.W. 1.49

Country of Origin: U.K.
Type: Compression-ignition, shaft rotary-valve with cast-iron bushed main bearing.
Bore: 0.500in. (12.70mm)
Stroke: 0.460in. (11.68mm)
Swept Volume: 0.0903cu.in. (1.480cc)
Weight: 99 grammes (3.50oz.)

* * *

Progress Aero Works of Macclesfield, makers of P.A.W. diesels, have been producing model motors since the 1950s, having graduated to manufacturing after many years of repairing and making replacement parts for other makes of engines. Only three basic models, the '1.49', '2.49' and '19' have been produced over the past twenty years or so, but these engines were among the best of their kind when they were introduced and they remain very competitive today, especially as regards value for money.

The 1½cc class P.A.W. 1.49 was introduced in 1959 and was the subject of a *Model Aircraft* test report shortly afterwards. Our test sample performed extremely well and, as the performance curves show, its power output is still above average and well in excess of the levels reached by beginners' or 'sport' type 1.5cc diesels.

The engine is basically a scaled-down version of the P.A.W. 2.49 competition diesel that preceded it. It uses a gravity diecast crankcase with a cast-iron bush supporting the generously proportioned counter-balanced crankshaft. The shaft has an $^{11}/_{32}$in. diameter journal, a $^{13}/_{64}$in. diameter crankpin and $^{7}/_{32}$in. bore gas passage. The latter is fed from a long valve port which registers with a long parallel-sided port in the main bearing.

The cylinder assembly consists of a hardened steel liner, a cast-iron contra-piston and a turned, finned aluminium jacket, with compression-screw, the whole being tied to the crankcase with three screws. Below its three radial exhaust ports, the liner drops into the crankcase and is located by a narrow annular seat. The cylinder liner has a relatively thick wall (.092in. or 2.3mm) enabling generously dimensioned and well proportioned internal flute type transfer ports to be used.

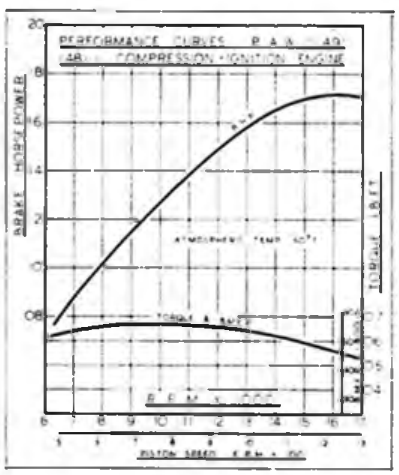
The lapped cast-iron piston has a conical crown (the underside of the contra-piston is shaped to match it) and is fitted with a full-floating 0.125in.dia. solid gudgeon-pin. The connecting-rod is machined from high-duty aluminium alloy.

At the time when the 1.49 was introduced, exhaust silencers were not widely used and our engine was therefore tested only in the open exhaust condition. A simple ring type muffler was, however, subsequently introduced.

The test engine had approximately three hours running time before tests were undertaken. Impressions of it were favourable from the beginning. It started easily from cold after merely choking the intake, no port priming being required. Warm restarts were equally good.

On test, the 1.49 delivered its best torque at approximately 10,000 rpm and torque declined quite slowly as load was reduced. As a result of this, a peak power output of 0.172 bhp at just over 16,000 rpm was plotted from the torque and rpm readings obtained. At the time of the original test, this was the highest power output that had been recorded for a 1.5cc motor and it is still very good by today's standards.

Prop revolutions recorded at the time are not too appropriate in the present context,

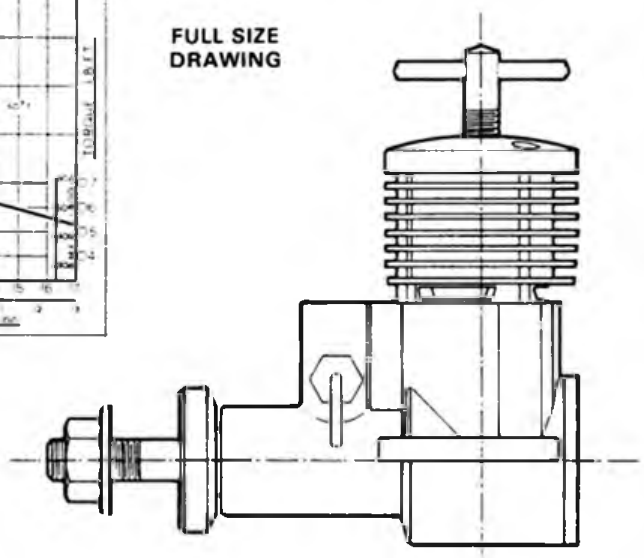



P.A.W. 1.480cc diesel engine.

as the makes and types of props then in use have now been superseded. However, the most useful sizes are likely to be in the 7-8 inch diameter, 3-4 inch pitch range. Checking the engine's torque curve against the known torque absorption of typical examples of current props, it can be calculated that our test motor would have enough power to turn a typical example of a 7 × 4 Zinger maple prop at around 12,500 rpm while a Power Prop maple of the same nominal size should reach about 13,700 rpm. A 7 × 3 would be needed to get the engine up to near its peak output in the air. As regards bigger sizes, our test P.A.W. 1.49 could be expected to turn a Cox 8 × 4 grey nylon at about 11,400 and an 8½ × 4 Zinger maple at 9,600. All these figures relate to static rpm and with the engine running without a silencer.

The running and handling qualities of our original test model P.A.W. 1.49 were good. The engine ran evenly over a wide range of load speeds and control sensitivity was just right.

FULL SIZE DRAWING



R/C Sport Flyer

by Chris Pinchbeck

IN AN EARLIER ARTICLE, it was suggested that you should look at the MAP Plans Handbook Number 4 to find suitable plans for building a model. This month a selection is offered for your consideration. They are not presented in any particular order of preference but none of them should present any difficulty in building if you have constructed at least one, and preferably a couple of commercial kits. Each one has a proven flying performance and one of the selection parameters was that flight characteristics should be generally stable and forgiving — provided that the model is built as per plan with the correct centre of gravity.

BAT RC 1349

Another design by David Boddington specifically aimed at the newcomer. The plan shows two wings, one with dihedral for the complete novice, the other with ailerons as an aerobatic trainer. This enables you to train on the one wing then when the necessary skills are gained, the aileron version can be constructed. This gives you a great psychological advantage since you can build up confidence in the model before being faced with the problem of an additional or alternative control.

The model is simple to build and requires a .20cu.in. engine. A box fuselage with all sheet tail and control surfaces is used. The wings have a constant chord and are straightforward to build. The sketches and instructions contained on the plan will be of assistance to the builder of a first 'plan only' model.

KINGFISHER RC 1191

A 51½in. wing span slope soarer designed by D. Williamson which can be built with interchangeable wings either as a pylon racer or as an aerobatic model. Both wings are shown on the plan, only the rib profiles being different. Spruce main spars are sued and since the rib stations are quite close together, a very strong but quite light wing will result. Full span ailerons are shown with the aileron servo mounted inside the fuselage and connected to torque rods by push rods which exit just under the wing seat.

The fuselage is constructed from 3/32 and 1/16 sheet with full length 1/32 ply doublers. A fuselage within a fuselage. The tail features are a combination of sheet and build up open construction.

This model is quick to build, very strong, and has a lively performance.

EKKO RC 1198

This near scale sports model was designed by Hoh Fang Chin and is a low winger for .40cu.in. engines. It has attractive yet simple lines typical of many full size sport aircraft with a large bubble canopy.

Construction is basically an ⅛in. sheet box fuselage with planked turtle decking. Planking always looks simple but it can easily lead the unwary into trouble. Care should be taken to accurately measure the width of the planks where they pass over formers, and chamfer the edges so that they butt join correctly. Ensure that the glue used can be sanded; balsa cement is ideal whereas some PVA white glues are too 'rubbery' and will not sand down properly. The fin could be simplified by carving from a piece of soft ½in. sheet with lightening holes if necessary, rather than building up with tapered horizontal ribs and subsequently sheeting. The canopy is shown as a hollowed out balsa block but the appearance would be improved if a commercially available clear canopy were used.

There is no materials list given but the plan is clear enough for the builder to easily make up his own shopping list.

TAURI RC 857

One of the older plans in the range, this design by Ed Kazmirski is nevertheless one of the most popular plans for beginners.

The basic box fuselage has ½in. sheet top decking which is carved and rounded to shape to blend in with the shoulder mounted wing. A bubble canopy gives the vague air of a 1960s jet aircraft.

The wing ribs are shown with integral building jigs so the semi symmetrical wing can easily be built without recourse to blocking up ribs and/or bottom spars with scraps of wood.

This was in fact my first radio control model; I built two of them — wonder why. Having gained the basic skills and built up my confidence I built a second wing with one extra rib bay in each panel, full depth inter spar webbing, dihedral reduced to 1in. each side, and strip ailerons. I found it responsive without being 'twitchy' and if the rolls were not fast, at least there was a feeling of safety which is so important to the tyro aerobatic pilot.

As mentioned above, there are many more plans available in the MAP range and if none of the above appeal to you I would suggest that you send for a copy of Planbook 4 so that you can make your own choice.

Turning now to engines, I offer a few comments and pointers which will hopefully obviate the need for you to use the dreaded phrase 'deadstick landing' for reasons other than shortage or lack of fuel.

GLOW PLUGS

Perhaps one of the most abused and misunderstood items. Think if you will of a finely drawn wire subjected to perhaps 12,000 explosions per minute trying to glow red or even white hot whilst being sprayed with a liquid, which in itself is a very efficient coolant, and at the same time being vibrated as a result of poor engine mounting. It is surprising that plugs do not fail more often.

In operation a glow plug engine relies upon compression of the fuel/air mixture being ignited by the plug which is then kept glowing by successive ignitions. The choice of element wire is critical as is its construction and the normal material used is an alloy of platinum. Since engines have different compression ratios and 'breathing' systems, it follows that one plug will not necessarily operate efficiently in all engines

The first division of type is for the smaller engines where the glow element is built into the cylinder head. Rossi also use this system. In these cases there is no choice of 'plug' type since the element comes with the cylinder head.

The next consideration is for a long or short reach plug. This relates to the length of the threaded section of the plug. Most engine manufacturers design around a long reach plug, K&B being the major exception.

Plugs may be either 2 volt or 1.5 volt rated, normally 1.5 volt plugs are used with dry batteries but 2 volt plugs must be coupled to a wet cell or Ni-Cad battery. Many of the 1.5 volt plugs will take 2 volts but if you are in doubt, use an extended plug lead and measure the voltage at the end of the lead.

The final obvious difference is between a normal plug and one fitted with an idle bar. This is usually a piece of soft metal across the element which retains heat and evaporates neat fuel which is often present in the combustion chamber during tick over. Its function is to prevent fuel dousing the glow of the plug at low rpm when the mixture is rich, thereby assisting slow running.

One of the main differences between engines, and therefore, the selection of plugs, is in compression ratio. An engine with high compression ratio may inherently suffer from advanced ignition. A 'hot' plug (one that retains it's glow longer than others) will ignite the mixture at an early stage leading to premature ignition with resultant damage to engine and plug. The plug damage will be shown by distorted or even broken element wire. In this case a 'cold' plug or preferably straight fuel (no nitro methane) should be used. The converse is true for the lower compression engines.

Having mentioned nitro methane, it should be said that 5-10% addition will not usually have an adverse effect. Indeed there are definite advantages to be gained in easier starting and idling.

To gain the optimum plug life then, here are a few do's and don't's.

1. Avoid flooding the engine on starting.
2. Keep to fuels with a maximum of 10% nitro methane.
3. Avoid running the engine too lean to avoid overheating.
4. Ensure the engine mount is firm.
5. Filter your fuel into the engine so that the element is not bombarded with bits of foreign matter.
6. Do not use excessive voltages.

Unfortunately there is no simple way to find the best plug for your engine, apart from the manufacturers recommendations (when given). Try a number of different plugs until you feel you have the best for your engine. I personally would recommend the use of an idle bar plug and a 5% nitro fuel. Last but not least, do not dump your spare plugs in the bottom of your field box to rattle around in the dirt. Treat them with respect and they should give you better service.

PROPELLERS

Just a brief word on choice and preparation. Any engine will turn a variety of propeller sizes and once again experimentation will allow you to choose the best for your particular engine/model combination. It will be appreciated that for a given diameter a finer pitch (low number) will allow the engine to turn faster with less loading than a coarse pitch. The balance really is to get the desired thrust with the minimum of engine strain. Diameter is often controlled by the degree of blanketing effect from a towl or nose block; ensure that at least 60% of the blade is in 'clear' air.

The following table is offered as a guide or starting point.

Engine size (cu.ins.)	Diameter (ins.)		Pitch (ins. per rev.)
.10	7	×	4
.15	7	×	4
.20	7	×	6
.25	8	×	6
.40	9	×	6
.60	10	×	6

Always use as rigid a propeller as possible; wood is ideal followed by glass filled nylon. Some of the nylon propellers available are so flexible that they give rise to unacceptable and unnecessary vibration. The central hole should be reamered out very carefully so that it is a very snug fit on the engine shaft, and balancing of the propeller is essential. A few minutes work will repay you a thousand fold in terms of reduced vibration.

FUEL TANKS

It is normal to use a clunk tank in an RC aircraft. This has a weighted pick up on a flexible tube so that no matter what attitude the model is, the pick up will follow the fuel.

It is essential that the tank is installed properly with it's centre line level with the spray bar of the carburettor. It is better to mount lower than higher if there are constrictions on proper mounting. If it is too high there is danger of the engine flooding and if too low, the engine may be starved.

To ensure a consistent supply of fuel to the engine, it is best to provide a pressure feed from the silencer to the tank through the third vent. Most silencers these days are fitted with pressure nipples but many model shops will arrange to fit one for you. Failing this you can drill a No. 34 hole about three quarters the way down the silencer and tap it 4BA. Using a hand drill and a 1/16 in. bit, drill a hole (with some difficulty) through the centre of a 4BA bolt. Cut off the head, screw the drilled bolt into the hole, and lock off with a nut. This gives a perfectly acceptable pressure nipple.

Some engines are fitted with crankcase pressure nipples, use this in the absence of all else but remember that this pressure will be quite high and although ideal for competitive flying, may prove awkward for the Sport Flyer to set up. I have known crankcase pressure blow a clunk tank leaving the inside of the model awash!

Always use a filter when filling the tank, and also one in the fuel line to the engine. It is not sufficient to fit and forget. The object is to filter the fuel and they should be cleaned periodically. If any doubting Thomas questions the need for fuel filters, let him see the sludge when you clean your filters. Sludge in the hand is better than in the engine!

I well remember an occasion some years ago when after a particularly heavy arrival, the engine of my model would not restart. All the normal checks were made and everything appeared to be well. The problem was finally tracked down to a clunk tube which had doubled back on itself thereby sealing the fuel off completely. A simple check for this is to hold the model up and shake it. You should hear the clunk knocking against the tank side.

Another problem can be a perished or split pick up tube from the clunk. The result is insufficient fuel reaching the engine which leads to constant adjustment of the needle valve. Check all fuel tubes periodically and replace if there is any doubt.

CARBURETTOR ADJUSTMENT

The function of the carburettor is to present a properly mixed blend of fuel and air to the crankcase for transmission to the combustion chamber. This mixture should be correct for the full operating range of the engine. There are perhaps as many different carburettors as there are engines but they may be split into the following main types.

1. Fixed air bleed on idle with adjustable needle valve for full speed.
2. Adjustable air bleed on idle with adjustable needle valve for full speed.
3. Automatic mixture control (no air bleed) where the fuel flow is controllable at both idle and full speeds.

Having started the engine and adjusted the main needle valve to give maximum rpm, hold the model in a nose up attitude (at least 45°) and if the engine falters, open up the needle valve a quarter turn. Repeat this operation until the engine runs smoothly in the climbing attitude.

To check for slow running, close the throttle until the engine has a smooth idle. If it dies, you should watch carefully for the way in which it stops. If it speeds up initially before cutting, a too weak idle mixture is indicated. If however, it continues to run, but roughly, with much exhaust smoke before spluttering to a stop, then the idle mixture is too rich. If when the throttle is closed the engine idles, then open up and observe. Once again if the engine initially picks up but then dies, the mixture is too weak, or if it splutters and smokes before clearing itself, then the mixture is too rich.

For fixed air bleed carburettors the only adjustment can be made with the main needle valve, so you should aim for the best compromise.

The adjustable air bleed variety is probably the most popular and in this case if the idle mixture is too weak, screw in the air bleed screw a quarter turn at a time until you have achieved a smooth idle on close down and a clean pick up when opening the throttle to maximum revs. Make these adjustments carefully and in a controlled methodical way. When complete, recheck the throttle stop screw setting to obtain the optimum slowest tick over.

For automatic mixture control carburettors which do not have air bleed, the idle mixture control should be screwed in (clockwise) to weaken the mixture or unscrewed to allow the flow of more fuel to richen the idle mixture.

Some carburettors have automatic mixture control plus air bleed adjustment. The automatic mixture control (AMC) is used to obtain optimum settings at half throttle and the air bleed for slow running.

Perry carburettors have a main needle valve adjustment for full speed setting and a friction locked flange marked + and — against a datum line for slow speed running. Moving the flange in the + direction richens the idle mixture and vice versa.

In summary then the steps to proper adjustment are as follows:

1. Adjust full speed operation
2. Observe idle mixture and adjust as necessary
3. Continue to adjust idle mixture until a clean pick up is established.
4. Check that any adjustment to throttle stop screw does not strain servo and linkage.

Finally do not adjust idle mixture with main needle valve unless a fixed air bleed is fitted.

Spend some time on these adjustments and you need not worry about your engine cutting on the landing approach when a consistent idle is so important.

Club News...
Club News...
Club News...

TWO WIDELY DISPARATE aspects of model flying gave me pause for thought the other week. First was the sight of a ready to fly, all plastic radio model, and second was an article on aerodynamics. The first demonstrated just how easy it is to get something flying, and the other that what you do get flying is something more than just an object in the sky — a piece of aeronautical science, in fact. This may suggest that it is all to easy to become an aeromodeller in these days of instant everything, that trying to run even before you have learned how to crawl is a sure recipe for a none too happy come-down. It also may suggest that, in model flying, a little knowledge is far from a dangerous thing — quite the reverse.

We open with a report on the **Stockport & D.M.A.C.,** sent in by P.R.O., Andy Snowdowne. This is yet another mainly all control line club — the premier one in the U.K., according to Andy. It is quite amazing how C/L continues to hold its own in spite of the more wide ranging appeal of radio. One drawback to C/L flying, as far as many clubs are concerned, is the requirement of a suitable tarmac site, but the Stockport club has hopes of being well served in this respect, for plans have been passed for a tarmac circle for Stunt models and for two grass circles for Combat and Sport. (But where does the club fly team race?) There is also the possibility of a clubroom and a car park. Ah, but from whence will come the future operatives on these lush amenities? Well, the club passed a hopeful resolution at the A.G.M., for the encouragement of more young people into the club. At the same A.G.M., Derek Leigh, winner of the Arthur Mullett Trophy for services to aeromodelling, was given a further term as Chairman. It is hoped to demonstrate the club's C/L interest through a number of comps to be staged at the local club field. These will include Combat, Goodyear and Rat. If you are interested in competing contact Andy Snowdowne, 4, Blaven Close, Davenport, Stockport, Cheshire.

Featured in 'Hot Air', newsletter of the **Grantham & D.M.A.S.,** is the free flight contest calendar for the coming season. Barkston Heath, the club flying ground, features prominently, both as the Area meeting venue and the site of the Nationals. Area meetings may be boosted by visitors from the London Area now that Bassingbourn is no longer available. Among other lists appearing in the newsletter is one analysing the respective performances of the leading F/F exponents during 1980. No surprise to find the name of Mr. Free Flight himself, Phil Ball, topping the list on the strength of five firsts, three seconds and one third in 25 entered events. Obviously, we find his name heading the club Championship, too. Merit in this event is based upon Plugge points earned at the Area meetings. No less than 13 names appear on the score board, saying much for the free flight strength of the club. But F/F models are not the only kind to grace the air over Barkston Heath for, according to the radio write up in the newsletter, there has been a spate of ¼ scale heavies doing dramatic things over the field. One such, an Aeronca Champ, produced by an avuncular character called Fred, was a superb piece of work, nine feet in span and powered by a 32cc Quadra engine. Splendid as it was it was utterly surpassed in magnificence and dramatic impact by another Uncle Ted masterpiece, a ¼ scale Sopwith Pup. It is full of amazing realistic detail, like live ammo, and is powered by a 56cc chain saw motor. (Who shouted 'Timber!')

Much of the December issue of the 'Bourne Flyer' newsletter of the **Sittingbourne & D.M.A.C.,** is taken up with a gourmet preview of proposed menus for the club's annual nosh up. All very haute cuisine — a far cry from the sausages and mash of my early club days (Such noshtalgia). Something on a platter, though, could give ideas for the club unorthodox event in which anything flying is permissible. The more outrageous the better.

Roger R. Brown, P.R.O., of the **Northampton M.A.C.,** sends along the latest issue of the club newsletter 'Flying In-formation', of which he is Editor. Main story is of club members going along to an S.M.A.E. Achievement Scheme event put on by the Upton Model Group. There were six examiners on hand to cope with a long list of some sixty flyers. Eight Northampton members took part in the tests, earning passes in both A & B groups. The awards are of particular interest to the club because they are based upon a safety code, an essential part of the test being the pre-flight check out. This can be carried out in a very short space of time and should be an essential procedure in these safety conscious days. Noted in the newsletter is the number of times the name of Howard Boys has been mentioned in this journal in recent months, feeling proud of the amount of activity generated by their 75 year old doyen.

Paul Wilson is the Secretary of that Surrey club famous for its annual radio symposia, the **Elmbridge Model Club.** He is also editor of the club newsletter, 'Airwaves', which goes out to the club's 100 plus members. Seems the club is not hard up for a bob or two, thanks to a large membership and all those fund boosting symposia. But what does it benefit a club to have all that wealth and nowhere to fly? For the one essential this otherwise well endowed club seems to lack is a flying field. Not a cause for despair, though, there is every confidence in soon obtaining a suitable piece of pasturage for their eager radio flyers. Pro tem they could equip their models with floats and operate off the club boating pond, for Elmbridge is rather more comprehensive in scope than a mere model flying club. All of which adds to the burden of administration, something which is discussed in the Chairman's annual report. It is often too much to expect from the key officials on a voluntary basis, particularly with the high finances involved. One answer is to award honour ariums to the hard working officials, but a better solution, perhaps, is to employ a full time secretary. Well worth while, but only if there is a healthy balance between the quantity of paper work and the amount of flying field activity.

More problems discussed in the **Leicester M.A.C.,** Bulletin is the sort of commitment expected of the club flyer in supporting the competitions laid on for his benefit. The problem has become acute over the past months because grotty weather and competitions are like oil and water. Some flyers only visit the flying field when the weather is too gentle to damage a feather, and there are those prepared to have a go in anything like reasonable conditions, but what if the weather is

Why not try winning yourself a year's subscription to Aeromodeller by entering this month's Caption Challenge — just send your entries to Aeromodeller, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE. Results May issue.

injurious to model health? Do you have a go just out of loyalty? Could be nasty at Wymesold where landing space is on the tight side. All very vexatious but the atrocious weather must change sometime — before the next ice age at least. Adding to the depression is the non-availability of Arnesby. Best bet is to stay indoors and build (models if not hope) in preparation for the celebrated Winter Building Competition. First stage (uncovered) was to be held in February. Results awaited.

Still keeping out of those blasting winds, the **South Bristol M.A.C.'s** newsletter opens with a homily on Indoor flying. Club site for this snook to the weather flying is Hope Chapel where on a wing and a prayer a number of EZB competitions have been held. In an atmosphere of ever increasing expertise times have been creeping up with the 5 minute mark well secured and Chris Coote putting up a remarkable 6.30 in winning the Dave Martin Trophy. As pointed out in the newsletter, indoor flying is as fascinating as it is challenging, both in the building of the delicate craft as in the feather touch trimming. And it is a good, get-together interest for the highly diversified club. Outdoor wise, a discussion in the newsletter of the season's free flight possibilities seems to centre much on the small field model such as CO2 duration, P30 Rubber, and Wigan 70 All-in. But small models can have lots of flight potential, and one such, a la Norman Marcus, is featured in a plan view. Big advantage is the small section of rubber motor required, but those $^1/_{16}$th square fuselage spacers!

Pointed out in the 'Informer', the newsletter of the **Long Eaton M.A.C.,** is one particular benefit that will come from the new frequency allocation, and that is the more confident feeling that will pertain at public displays. Seems the possibility of C.B. interference has been a nagging thought when the Hooray Henries were ranting on the airways and a clear frequency is a great relief. But to fly radio these days you need more than a clear frequency — you need an uninhabited desert island, for when it comes to noise complaints it seems that distance is no object. The nearest resident to the club field lives a mile distant, but he appears to be a bloke with jack rabbit ears for he has lodged a noise complaint and is being backed up by even more distant residents, no doubt Sonar equipped. But the club realises that the best way to beat noise complaints is to eliminate the noise. There is only one place for a noisy model — and that is on the ground.

At least someone has been out there flying. From the newsletter of the **Loughborough M.F.C.,** comes a report of a Mini Goodyear event held in January. Uncharacteristically for this blighted winter the wind speed was under twenty knots. After an exciting and enjoyable day's flying John Catlow and Peter Jephcott came lapping home to win not only that event but the club's Goodyear trophy for topping the league. The newsletter features a nice black and white study of an EZB Indoor model being launched by Paul O'Conner at a recent indoor meeting at Burleigh College. The hall is available to the club on a fortnightly basis during the Winter. Just the right sort of incentive to attract recruits to the Indoor scene. As pointed out in the newsletter the cost of the specialised indoor materials is high, but as you need such miniscule amounts the cost is not likely to break you. What you need to learn, though, is breathe quietly and move very slowly. One sudden movement can wreck a whole evening's work.

Al Jolson and Frankie Vaughan have come to the fore in the captions submitted for February, with our final choice going to **Peter Adams, Newbury, Berks.** *Runners-up were: "SO WHAT'S SPECIAL ABOUT THE NEW 35 MEG BLUES FREQUENCY MR. JOLSON?" Ken Wakefield, Stafford; "WHEN THERE ARE GREY SKIES – YOU MAKE THEM BLUE, SONNY BOY" S. Ford, Newbury, Berks.; "MAMMY! MAMMY! WE'VE COME A MILLION MILES AND FORGOTTEN THE FLIGHT BOX!" Ron Wilson, Stockport, Cheshire; "YOU SHOULD HAVE SEEN THE ONE THAT GOT AWAY!" John Schofield, Abingdon, Oxon.; "JUST LIKE THAT!" Isobel Michael, Faringdon, Oxon.*

A cause for concern, expressed in the **Three Kings Aeromodellers'** 'Court Circular's' we have to hand, is the depressingly low level of use of the famous Croydon patch. The Three Kings is basically a control line club so that the exceptionally windy weather we have had over the past year should not have had such a deterring influence —at least not as much as it would to free flighters. Even so, the hobby all round is greatly affected by the weather. The high periods of model flying, the late thirties and the late forties, coincided with long spells of good flying weather, and the mid sixties and early seventies also saw some good, model boosting spates of balmy weather. I am sure, given a reasonable 1981 season, that activity on the patch and elsewhere to show a return to normal. Meanwhile quite a few members have been enjoying the less rigorous delights of Indoor RTP flying, imparting some of that scale expertise for which the club is renowned to the small, electric powered craft. An event held over Christmas brought out a fine array of models, mostly built from rubber power kits, to make for a colourful evenings flying. Brian Sexton flew a Stearman C3M into first place, top both in static and flying, followed closely by D. Chaplin with a Pitts Special. Considering the many facilities the club has to offer fees are extremely modest, remaining at £5 for Seniors and £1 for Juniors. During the year the club intends to run a number of Open Days. The general standard of such events is now very high, particularly in the matter of prizes, but the Three Kings hope to keep in the forefront in this area of activity.

The **Breton Model Flying Club,** operating somewhere on the Essex fringes of London, is quite a sizeable affair with a quite sizeable newsletter — and a very lively one, too, full of pictures, cartoons and stories. Needless to say it is very much a Radio club, with a huge membership and a strong line in helicopters. The club magazine is even running a cartoon competition. Quite funny, though Sherry can sleep easily in his bed. There is also a write up on the club's 2nd successful Scale Helicopter Fly-In. It is such events that poor old action man gets such a rough ride, but I would have liked to have seen that Wallis Autogyro in full flight. The club field, if it is the same one that I have in mind, is a nice piece of flat acreage somehow missed by the general urban sprawl. One or two other attractive events were held on the field during 1980, and no doubt this year will have its moments.

Not much to glean from 'Seadog', the newsletter of the **South Eastern Area** — mostly information of local interest. The 1981 programme is well stacked though, with Ashdown free flight meetings and sundry Soaring events well in evidence.

A prominent part of the South Eastern Area is the Maidstone Free Flight Group, very much involved at Ashdown and all the major free flight events. The newsletter includes the S.E. Area Championship table. John Foster took second place — he was first the year before.

Just a note to say that the **Newton R/C Model Society** has signed a lease with the local council for a flying site on Wigg Island, Runcorn, exclusive to members. This is in addition to the private gliding site on Nelsby Hill.

Another lively newsletter from the **Banbridge Aeromodelling Club** of Northern Ireland. Very much a radio club they are cock a hoop over the new frequency allocations. Only snag is that a lot of equipment is going to become absolescent, if not obsolete.

Finally, we have a well set out magazine from the **Scottish Aeromodellers Association.** Nicely printed, with excellent photos, it gives a good cross section view of flying over the border.

Keep those reports and newsletters rolling.

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PLAISTOW Tel 01-472 2471
A G HERMITE *
633 BARKING ROAD, E13
Open 9 am 6 pm
Closed all day Thursday

MIDDLESEX

HARLINGTON Tel 01-897 2326
RADIO CONTROL MODEL *
CENTRE
214 HIGH STREET
Mon, Tues, Thurs & Sat 9 15 am-6 pm, Fri 9 15 am-7 30 pm
Closed Wednesday

HARROW Tel 01-863 9788
THE MODEL SHOP
190-194 STATION ROAD
Mon-Sat 9 30-6 00
Wednesday 9 30-5 00

ISLEWORTH Tel 01-560 0473
RADIO CONTROL SUPPLIES *
581 LONDON ROAD
Open 9 am-6 pm Fri 9 am-8 pm

MIDDLESEX

WEMBLEY Tel 01-902 4823
WALLY KILMISTER LTD
6 & 7 NEELD PARADE
Mon Sat 9-5 30
Closed Wednesday

NORFOLK

KINGS LYNN Tel 63164
BARNEY'S MODEL SHOP
SOUTH EVERARD STREET
Open 9 am-6 pm

NORWICH Tel 0603 42515
GALAXY MODELS *
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NORTHAMPTON Tel 31223
THE MODEL SHOP *
230 WELLINGBOROUGH ROAD
Open 9 am-6 pm
Half day Thursday

NORTHAMPTON Tel 35718
STAGG MODELS *
22 BRIDGE STREET
Open 9 am-5 30 pm
Early closing 2 pm Thursday
Late night opening Friday until 7 pm

NORTHAMPTON Tel 27726
TAYLOR & McKENNA LTD
41-43 PRINCES WALK
GROSVENOR CENTRE
Mon-Thurs 9 am-5 30 pm
Fri-Sat 9 am-6 pm

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NEWCASTLE UPON TYNE
Tel 22016
THE MODEL SHOP *
18 BLENHEIM STREET
Mon-Fri 9 am 5 30 pm
Sat 9 am-6 pm

NOTTINGHAMSHIRE

NOTTINGHAM Tel 50273
GEE DEE MODELS LTD *
19-21 HEATHCOTE STREET
OFF GOOSEGATE
Open 9 30 am-5 30 pm
Early closing Thursday

WORKSOP Tel (09091) 472855
RUSSELL MODELS *
MODEL CENTRE, RYTON STREET
Open Mon-Sat 9 30 am-5 30 pm
Thursday 9 30 am-1 pm

OXFORDSHIRE

OXFORD Tel 42407
HOWES MODEL SHOP *
9-10 BROAD STREET
Open 8 45 am-5 30 pm
6 day week

SCOTLAND

GLASGOW Tel 041 339 0994
U-CONTROL MODELS *
171 BYRES ROAD
Open Mon., Wed to Sat. 9.00am-6.00pm Closed all day Tuesday

PAISLEY Tel 041 840 1381
DUNNS MODELS *
26 GLASGOW ROAD
Mon.-Sat. 9.00-5.30
Tuesdays closed

PERTH Tel 24540
DUNNS MODELS *
29 SCOTT STREET
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Wednesday Closed

STAFFORDSHIRE

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J. & N. MODELS
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Closed Wednesday

STAFFORD Tel 3420
JOHN W. BAGNALL LTD *
18 SALTER STREET
9 am-5.30 pm
Closed all day Wednesday

STOKE-ON-TRENT Tel 263574
JOHN W. BAGNALL LTD
30 PICCADILLY, HANLEY
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Closed all day Thursday

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WOLVERHAMPTON *
MODELS & HOBBIES
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Early closing Thursday

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BOWMANS OF IPSWICH *
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Open 9 am-5.30 pm Mon.-Sat.
Early closing Wednesday

IPSWICH Tel 79279
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160 FELIXSTOWE ROAD
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SUDBURY Tel (0787) 76825
THE MODEL CENTRE *
51 GAINSBOROUGH STREET
CO10 1ET
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ADDLESTONE Tel WEYBRIDGE 45440
ADDLESTONE MODELS LTD *
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Open 9 am-6 pm
Closed all day Wednesday
Late night Friday 6.30 pm

NEW MALDEN Tel 01-942 0012
MICK CHARLES MODELS
33 COOMBE ROAD
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Fri 9.30-8.00
Closed all day Wednesday

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WOKING MODELS *
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Closed all day Wednesday

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SOUTH EASTERN MODELS
5 THE PARADE
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Closed Wednesdays

WORTHING Tel 207525
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Monday to Saturday

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SOUTH GLAMORGAN
CF1 2BW
9 am-5.30 pm
Early closing Wed 9 am-1 pm

CARDIFF Tel 31367
R. & W. RADIO MODELS *
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Closed Wednesday

WALES

NEWPORT Tel 65061
MAKE A MODEL
123 COMMERCIAL STREET
Mon. to Sat. 9 am-5.30 pm
Late Friday 8 pm

SWANSEA Tel (0792) 52877
SWANSEA MODELS & HOBBIES LTD *
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Late night Fri 6 pm

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Early closing Wed 1.30 pm

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COVENTRY Tel 0203 76409
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Late night Thurs 8 pm

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MELKSHAM Tel 0225 703311
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Sat 9 am-6 pm
Closed all day Wednesday

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DON VALLEY SPORTS *
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BRADFORD 8 Tel 26186
MODELDROME *
182 MANNINGHAM LANE
9.30 am-5.45 pm
Closed Wednesday

DONCASTER Tel 62524
B. CURTISS & SONS
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Closed all day Thursday

DONCASTER Tel 27255
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Sun 8 am-1 pm

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FLYING MODELS
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6-channel RADIO costs from £150–£250

Depending on whether it is the AM or FM version, and the number and type of Servos chosen for a complete outfit. A professional-standard, professional-quality outfit that not only has fully proven performance but fabulous reliability. The outfit ANY modeller would naturally choose — if he could afford it!

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2-ch

That's the price of the 'L' Series 2-channel Drycell Tx-Rx Combo. Add just one servo as a 'Starter' outfit (e.g. for rudder only) and a **COMPLETE OUTFIT COSTS ONLY £33.** Even with TWO Servos (for rudder and elevator, or ailerons), your COMPLETE OUTFIT need only cost £44. And being RIPMAX-FUTABA it's top-quality, top-reliability radio. Even at these prices!

3-ch

3-ch COMBO £30.00

The one to choose for 'full house' on gliders, or to match most R/C Trainers (rudder, elevator, throttle). Here a COMPLETE outfit price with 3 SERVOS works out at £63.

4-ch

4-ch COMBO £44.50

Recommended, with future models in mind! Remember, you can add the number of servos you NEED for a start. Get others later. So with 3 Servos for a start a COMPLETE OUTFIT costs only £77.50. (Cost with 4 Servos £88.50).

5-ch

5-ch COMBO £55.50

Recommended for the serious modeller! An extra channel for retracts, flaps, etc. and with the bonus of DUAL RATE SWITCHING on two main functions. Again, start with the number of servos you need.

Prices quoted are for AM Drycell Combos, which include Tx and Rx battery boxes, 1 pair of crystals and complete wiring harness. Dry batteries are extra. Combo prices do not include Servos. Complete outfit prices are based on FD32M or FD33M Servos.

★ Each 'L' Series Tx-Rx Combo is readily convertible to All-Nicad working. A complete Conversion kit (which can be easily fitted in a few minutes) costs £24.

★ All 'L' Series Combos will work with ANY 'M' Series Servos (12 different types available). Nicad Conversion recommended when using certain Servos. Your local model shop can advise you.

★ Each 'L' Series Combo is also available in FM VERSIONS. Ask your model shop for details of prices and the advantages of FM working in your area.

RIPMAX-FUTABA AT YOUR MODEL SHOP

F-18 HORNET

By Jack Headley

Fins and Tailplane 1/16" sheet

2 required

Chamfer line

Section

Fin Location

Slot for Tailplane

B

Frame B

Slot for Wing

Typical Wing Section

C. of G.

Frame B 1/16" sheet

Section B-B

After assembly add the 1/32" sheet fuselage top

Fin offset

3/4"

Cut here

Cut notch after sanding to shape

Frame A 1/16" sheet

Section A-A

A

Location of Frame A

Launch Rail 3/16" x 1/8"

Missile 3/16" sq. sand round

True view of Fuselage Sides make 2 3/32" sheet

Position of strake

Fill with Block Balsa

Tape

Catapult Hook epoxy in place

Wing & Strake 3/16" sheet

Trim on assembly

True view of Fin

All Balsa

2 1/4"

Dihedral