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MAP MODEL DIVISION MAGAZINE

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Comment

THE 50th Model Engineer Exhibition proved to be the most successful for many years. The Aeromodelling section in particular attracted more entries than we have seen for a long time, presenting a really high standard, with many models truly outstanding.

R.T.P. flying — the active side of the aeromodelling representation was something of a mixture although Martin Tuck's magnificent multi engine BAe 146 aroused considerable interest from all areas, including T.V. We understand from Martin

that a programme is being produced on the full size airliner which will include him and his model. Martin has agreed to produce an article and plans to build this magnificent model in the near future — watch out for details.

It was also refreshing to have a young lady model flying in the Junior R.T.P. Patricia Sadler's model was flown for her by Derek Farman who is in fact, one of her teachers at Stalham High School for Girls. Derek has found aeromodelling to be very popular amongst his students who have built and flown various models including an A1 glider.

Another strong feature of the Show was

the movement towards Vintage flying models, rubber powered designs and vintage engine powered models perhaps emphasising a trend to get away from all the technology that surrounds us more and more these days, and go back to more basic designs and structure that can be produced from scratch by any modeller! It seems that the modern trend of prefabrication, requiring no more work than a bit of glue and fitting together a few pre formed components, has killed off the enthusiasm for many modellers to design and create models of their own. We sincerely hope this is not the case, and *Aeromodeller* will continue to encourage all aspects of our hobby.

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ON THE COVER

Clear, cold and crisp — the scene at Old Warden Airfield, Bedfordshire, on December 7 for Aeromodeller's International Coupe D'Hiver (Winter Cup) contests. Event drew excellent support. Inset: One of the Urt Rutan designed Quickie home built as seen at the 1980 EAA Fly In Oshkosh, USA. Craft is subject of this month's Aircraft Described feature.

NEXT MONTH

Aero Aces will review the Testors Ready to Fly Control line models. Aircraft described will show plan and details of the Bede BD 8 which would be an ideal subject for control line. Also in this issue will be a full pictorial report on the 50th Model Engineer Exhibition and a most interesting hot air airship for R.T.P. electric flight. On Sale March 20th.

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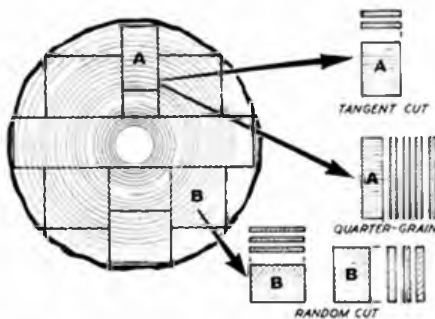
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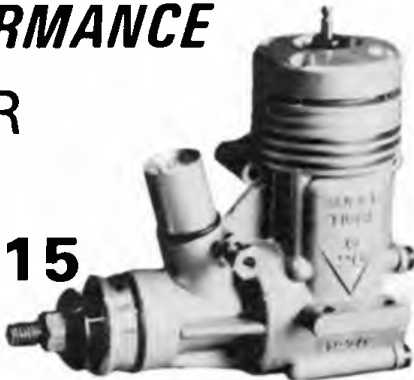
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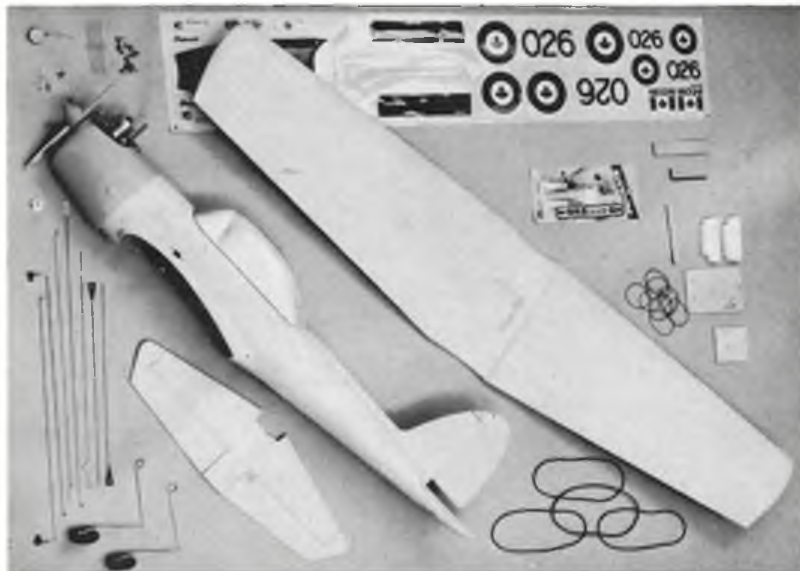


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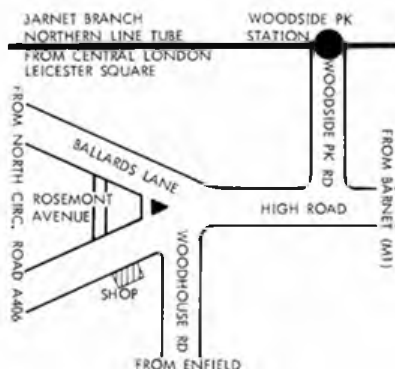
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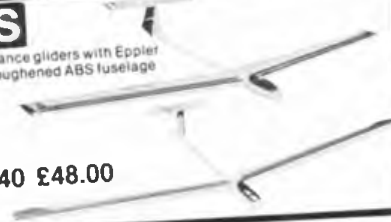
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FAI RULES REVISIONS

At the recent meeting in Paris attended by delegates from twenty nine countries, discussions took place that will affect the International Rules concerning aeromodelling worldwide. Britains representation included one delegate and six specialists (R/C Pylon, R/C Aerobatics, Scale, F/F, R/C Thermal Soaring and Control Line).

The meeting covered many topics in a complex 21 page agenda, some of the more pertinent points being as follows:

- 1) All rule changes accepted at this meeting with the exception of those of safety or clarification would become effective from 1st January 1982.
- 2) It was approved that Proxy flying would not be permitted at any International and Continental Championships.

3. Free Flight

Several proposals regarding F1C towline gliders were approved, concerning attempts under various specified conditions during launching.

4. Control Line

1. *Speed* conditions for use of supporters as helpers for incomplete teams were defined.
2. *Team Race* changes to redefine 'starting points' as 'pitting areas' were approved, also conditions for re-flying the finals race, and clarifications concerning mechanics and starting points. It was also clarified that all references to heats, should be changed to races so that the same rules apply to finals and semi-finals as well as preliminary races.
3. *Combat* a safety proposal package was approved, based on changing from three concentric circles to two; also for safety the rule referring to control handle dimensions was deleted while it was approved that no free ends of wire capable of entangling an opponent's lines would be allowed.

5. Radio Control

1. *Aerobatics* the subcommittee proposal for redefining the noise measurement procedure was approved. Also, the 1979 plenary meeting's changes regarding Classification, as defined by the April 1980 Bureau meeting minutes, was approved, as was the deletion of all references to size and distances in manoeuvres (since the judging 'box' effectively provides such limits).
2. *Thermal Soaring*. For safety, a minimum model nose radius of 7.5mm was approved. Also approved was a requirement for powered winches to be



provided with an *automatic* means to prevent unwinding during the launch; also a new diagram of course layout and new wording regarding sighting and judging apparatus. Incorporation of the Organisers Guide into the sporting code was approved; also transfer of motorgliders rules to new section F3G.

3. *Pylon Racing*. The previously provisional rules, with amendments, were approved as official.
4. *Helicopters*. The previously provisional rules, rewritten for clarification, were approved as official.
5. *Electroflight*. Changes to course layout and organisation were approved, also the number of points for completed laps, direction of flight through the gate, and a requirement for pilot announcement of motor switching on and off.
6. *Scale*. Changes to F4C (RC) rules were approved regarding flight options and jettisoning of parts. It was clarified that removal of parts for flight would be subject to disqualification and that the pilot would no longer have to remain in the centre of the circle for the Figure Eight (contradictory portions of the sporting code relating to manoeuvre positioning were deleted). Additional time was approved for non-aerobatic multi-motored models; also points for retractable monowheel models.
7. *Spacemodels*. All recommendations of the technical meeting pertaining to spacemodels rules proposals were approved.

COMBAT

British Two-Day FAI Combat International to be held at Dytchley 'Manor' country estate which is 20 miles from London on the 4-5th July, 1981. Entry includes full on site accommodation and facilities — bar, showers for competitors and supporters, an evening buffer Friday the 3rd, plus breakfast, packed lunch and evening meal on the 4th and 5th. For further details contact: Peter Jayes, Tel. No 01-226 1249 or Paul Vallens, Crayford (29) 53401. For full information and entry forms send large SAE to 'Combat International,' 89 Coldblow Crescent, Bexley, Kent. Closing date, May 1, 1981.

Years of dedicated service to the SMAE through his work with the South Eastern Area and as Vice Chairman and Chairman of the governing body for aeromodelling had their reward when Norman Couling received the Royal Aero Club Silver Medal from H. R. H. Prince Charles, the Prince of Wales.

This distinguished honour for one so deserving is also a respected mark of application for aeromodelling from the R.A.C.

Book Review

Aircraft of World War 2 by Bill Gunston. Published by Octopus Books Ltd., at £4.95. 208 pages and 600 full colour illustrations. Size 245mm x 295mm.

This beautifully illustrated book contains 40 different full colour profiles of aircraft that played a significant part in World War 2.

The subject include fighters, bombers, and transport, enemy and allied aircraft.

Each aircraft has a brief description plus an airbrush rendering in full colour, showing plan, side and front elevation.

This is followed by coloured line drawings of side elevations showing the various types of markings and modifications used. At £4.95 this book represents excellent value, and a superb reference for any scale modeller interested in this period of aircraft.

Basic Aeromodelling by R. H. Warring. Published by Argus Books Ltd., at £3.95. 176 pages paperback 263mm x 185mm.

This book was originally published in 1976 compiled from a series of articles Ron Warring wrote for Aeromodeller.

Now updated to cover all the latest building techniques, it represents one of the most concise introductions to the hobby of aeromodelling available.

There are 20 chapters which apart from showing all the various building methods, gives useful information on drawing your own plans, plotting aerofoil sections, and making jigs. Altogether an ideal book not only for the beginner, the experienced modeller will find plenty of useful information also.

Fly Navy by Brian Johnson. Published by David & Charles at £12.50. 383 pages hardback size 240mm x 160mm.

This history of maritime aviation starts back as early as 1910 when Eugene Ely flew a Curtiss biplane from a wooden ramp built on the fore-castle of the light cruiser, USS Birmingham and finishes with a chapter entitled 'Into the nuclear age'. Apart from giving an overall historical picture, Brian Johnson has included many detailed accounts of individual actions. These pioneer days are covered in the first chapter and the story moves quickly onto the more sophisticated experiments.

What's Happening?

EVENT

May 2nd
AERO SPACE AND VEHICLE CLUB — ANNUAL EXHIBITION Aircraft, military models, vicilian vehicles etc Venue The Clubhouse, Wombourne, just off the A449, four miles south of Wolverhampton Doors open at 10 30 a.m until 5 30 p.m Contact: N D Robinson, 50 Ballfour Rd., Blanford Mere, Kingswinford, Brierley Hill, West Midlands DY6 7DJ

March 1st
N A INDOOR MEETING EZB, 1HLG, SCALE 1 p.m — 7

p.m Venue Colne Valley Leisure Centre, Slaithwaite, Nr Huddersfield Contact: Bernard Hunt Tel Huddersfield 862353

March 8th
MIDLAND AREA INDOOR MEETING EZB, HLG, CO2, RUBBER SCALE 10 00 a.m - 6 00 p.m Venue Kelham Hall, Nr Newark, Notts. Hall dimensions 65ft x 65ft x 85ft high

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

April 18/20th
SMAE F, F 3rd TEAM TRIALS FOR WORLD CHAMPS — SATURDAY FIA 1st round 9 00 a.m 10 00 a.m SUNDAY FIB & FIC 1st round 9 00 a.m 10 00 a.m MONDAY FIA, FIB & FIC Timetable to be published on day Contact: Mike Coomes Tel 0949 42034 Venue to be announced

April 12th
PETERBOROUGH MODEL FLYING CLUB 1st ROUND

CLASS 'A' DIESEL COMBAT Venue The Embarkment, Peterborough Contact: Neil Gill, 4 Beech Road, Glington, Peterborough PE6 7LA Tel (0733) 252645

April 26th
NOTTINGHAM MAC INDOOR SCALE FLYING incorporating SMAE INDOOR SCALE NATIONALS — RUBBER SCALE, PEANUTE, CO2 Venue Derby Municipal Sports centre, Moor Lane, Derby 12-6 p.m. Flying fee £2 Seniors, £1 Juniors plus entry to Centre plus SMAE Competition fees Hall size 120' x 120' x 30' approx soft footwear essential Contact: Barrie Hotham Tel Mansfield 34127

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

FEDERATION AERONAUTIQUE INTERNATIONALE INTERNATIONAL AEROMODELLING SPORTING CALENDAR 1981

WORLD CHAMPIONSHIPS		July 10-12	CZECHOSLOVAKIA	International Competition F3A
Aug 7-13	SPAIN Villafria, Bungo	Free Flight F1A, F1B, F1C	Bratislava	
Oct 7-11	MEXICO Guadalajara	R/C Aerobatics F3A	SWITZERLAND Region Zurich	8th Int F3A Freundschaftsfliegen F3A
July 12-17	USA	Thermal Soaring F3C	CZECHOSLOVAKIA Brno	International Competition F1D
CONTINENTAL CHAMPIONSHIPS		July 17-19	AUSTRIA Weer/Triol	International Tirolwettbewerb RC/MS, F3A
July 7-11	BELGIUM Genk	18th Criterium of Aces F2A, F2B, F2C, F2D	AUSTRIA Leferer Alm	14th Kolibri-Pokal 1981, F1A, F1E
July 23-24	AUSTRIA Loferer Alm	Europameisterschaft F1E	HUNGARY Nyiregyaza	Nyirseg-Cup F2A, F2C, F3A
Aug 28-Sept 1	BULGARIA Jambol	European Space Modelling Championship S1A, S3A, S4C, S5C, S7, S8E	SWEDEN Hovby Airport, Lidkoping	Int Comp F4 Stand Off (FAI provisional rules)
'OPEN' INTERNATIONAL EVENTS		Aug 14-15	BELGIUM Genk	International Competition F2A, F2B, F2C
Feb 14-15	USA Taft, CA	FAI FF Annual F1A, F1B, F1C	CZECHOSLOVAKIA Brno	International Competition F2D
Apr 31-May 1	YUGOSLAVIA Vrsar	The 5th Vrsar Cup F3B	AUSTRIA Salzburg-Kraiwiesen	17th Int Igo Etrich Wanderpokalfliegen F3A, RC/MS
May 2-5	F. R. GERMANY Auf dem Augberg	4 Rhein-Ruhr Cup, F3E Electrolight, Gliding Aerobatics, Pylon racing C/L F2A, F2B, F2C, F2D	YUGOSLAVIA Mostar	The 21st Seko Cup, F1A, F1B, F1C
May 2-3	FRANCE Marville	International Competition F2D	FRANCE Marigny-la-Grand	Int Criterium F1A, F1B, F1C
May 16-17	BELGIUM Genk	F3B Multiple Task Oirschot F3B	F. R. GERMANY Dortmund	10. Ludwig-Kramer Cup F3B
May 11-17	NETHERLANDS Oirschot	F2A, F2B, F2C Three Sisters	FRANCE Thouars	Int F/F Days in Poitou F1A, F1B, F1C
May 23-24	ENGLAND Manchester	5th International Jura-Cup F2A, F2B, F2C	BELGIUM Flemalle	5th Indoor Competition, Indoor F1D
May 29-31	SWITZERLAND Breitenbach	8th Int. Military-Cup Pfaeffikon F3E Electro powered models Coppa Brunner, F3F	BELGIUM Verriers	International Competition F2A, F2B, F2C
May 29-31	SWITZERLAND Pfaeffikon	International Competition F3D	BULGARIA Sofia	Int Sofia-Cup, F2A, F2B, F2C, F2D
May 30-31 OR	ITALY Dosso Verona-Carano	Coppa Caproni di Taliedo Experimental, F3B Experimental	SPAIN Oviedo	International Competition F3A
June 27-28	ITALY Milano	Esbjerg International F3A	F. R. GERMANY Zulpich	13 Int. Eifel-Pokal F1A, F1B, F1C
May 31-June 1	DENMARK Esbjerg	International Competition F3A	BELGIUM Rixensoul	6th Int. Combat Meeting F2D
June 5-7	CZECHOSLOVAKIA Horin u Melnika	Trofeo Challenge OPS F3D/40-20	NETHERLANDS Mill	Benelux Electro Meeting
June 6-7	ITALY Milano	15th Int. Theintalpokal F3A RC/MS	SAN MARINO	Slope Soaring Cross Country Competition for R/C Gliders, F3B
June 6-8	AUSTRIA Koblach	Holland Int F/F F1A, F1B, F1C	BELGIUM Amay	5th Summer Soaring Criterium F3B Thermal Glider
June 7-8	NETHERLANDS Lelystad	Int. Comp for Space Models S3A, S6B, S4D, S7	SWITZERLAND Breitenbach	3rd Int. MBZB-Cup, F2A-D
June 11-14	CZECHOSLOVAKIA Dubnics nad Vahom	Eole Trophy (Europa Cup) F3B	ITALY Lugo de Romagna	Coppa d'oro F.A., F2C
June 12-14	FRANCE St-Andre de l'Eure	World Cup Vilvoorde F3C Helicopters	TURKEY Ankara	4th Balkan Championships for Aeromodels F1A, F1B, F1C, F2A, F2B, F2C, F3A, F3B
June 13-14	BELGIUM Vilvoorde	Criterium Midden Nederland F2A, F2B, F2C	TURKEY Ankara	4th Balkan Championships for Space Models S4D, S6A, S7 Oktobarfesti-Pokal F3B
June 13-14	NETHERLANDS Utrecht	Jura Cup 1981, F3E	F. R. GERMANY Munchen	16 International Control Line Competition, F2A, F2B, F2C
June 20-21	F. R. GERMANY Freystadt-Neumarkt	Int Criterium of Isle of France F2A, F2C, Speed and Team Racing RC Soar Together F3F	SWITZERLAND Bendern	20th Int. Freundschaftsfliegen F3A
June 20-21	FRANCE Le Bourget	5th Int. Criterium of Hainaut F3A Aerobatics	ITALY Treviso	Europa Cup, F1E
June 20-21	NORWAY Lillehammer		HUNGARY Salgotarjan	Nograd-Cup, F2B
July 4-5	BELGIUM Sivry Rance			

**Aero
Amodeller**

Coupe D'Hiver International 1980

OLD WARDEN
7th DECEMBER



Left: John O'Donnell with 'Chicken Coupe', which he flew proxy for Frank Monts and won the 80 gram event. Inset: Frank Monts



OLD WARDEN's fantastic record of fair weather was sustained with blue skies on December 7th, although there was tremendous turbulence at times making it very difficult to achieve a max. Despite the confines of this reserve venue, made available at short notice by the Shuttleworth Collection when it became impossible to obtain a larger airfield, attendance and performances were excellent. Unfortunately, France was represented by only two competitors this year, Robert Champion and F. Aimelet. Robert Champion flying proxy for F. Aimelet.

Robert managed to gain 10th place in the *Bernard Boutillier* event (100gr.) and 20th in the *Aeromodeller Trophy*, apart from flying F. Aimelet's model into 12th place in the 100gr.

But the meeting was noteworthy for the success of the old timers with that perpetual proxy flown for Frank Monts (USA) by John O'Donnell placing first in the 80gr. with 509 seconds and winning the *Aeromodeller Trophy*. We understand from John this model is 14 years old! Bruce Rowe of St. Albans chased hard for second



Jerry Essex of Leicester waiting for the bubbles to rise

Bottom left: Robert Champion, the only French modeller to attend, he also flew proxy for F. Aimelet of France. Centre: E. Hawthorne gained 9th place in the 80 gram with 416 seconds. Below Colin Shepherd who came 9th in the 100 gram.





Chris Blanche from Morthan Nr. Yarmouth had a good first flight, but couldn't find the lift for the other four and finally placed 13th in the 80 gram.

place with a 460 second total managing two maximums; in fact Roy Miller who came 16th in the 80gr. was the only other competitor to achieve two maximums. John Cooper came third, starting off nicely with a max, but having very bad luck with his fourth flight with only 21 seconds. M. R. Chilton was fourth gaining a total of 424 seconds.

The Bernard Boutillier 100gr. event was won by Len Ranson with his own design model which had a span of 44 inches and a fuselage with a built up front and tail boom made from a garden cane. The propeller is 19 inches diameter. The model was designed for calm high lift conditions, but nevertheless, performed very well under the very turbulent thermal free weather.

Len managed a max on his first flight ending with a total of 299 seconds.

John Cooper came second, also achieving a max on his third flight, ending with a total of 291 seconds.

Freshly returned ace of the lightweights of the 50s, Norman Marcus came third and Andy Crisp fourth and fifth. Both achieved a max each, while Ian Davitt being the only



Len Ranson winner of the 100 gram event with his own design model of 44 inch span.

other competitor in the event to do so.

It was a shame not to see more Junior entries, only four this year, Simon Billam being the only Junior to enter the 100gr. gaining a credible 15th place with 162 seconds.

The Junior 80gr. was won by Simon Dixon who also achieved a very good placing in the overall event, coming 27th out of the 54 flyers. Simon Billam was second, with Anthony Ball third, and Nigel Dixon 4th.

Out of a total of 119 entries there were only a very few maxes of 120 seconds registered which was fortunate in some respects, bearing in mind the downwind woods and dense undergrowth of the Shuttleworth estate!

Flying went on until light failed around 4 p.m. when we all adjourned to the cafeteria for the prize giving. Ron Moulton presented the trophies and various prizes which included, a beautiful winder donated by Tim Gray plus kits, balsa packs and many other goodies generously donated by leading model trade suppliers including Micro-Mold Ltd., Michaels Models, Morris & Ingram Ltd., Humbrol, Veron, Solarbo and Turnbridges Ltd. Our thanks go to them for their support — altogether an enjoyable day.

How about more of you juniors coming next year to show the old ones they can't have it all their own way!



Dixon won the Junior section, getting a creditable 27th place in the overall placings of the 80 gram event.

M. Bird from Richmond winding on the turns with the help of Clubmate T. Bellow



M. R. Chilton came 4th in the 80 gram

COUPE d'HIVER INTERNATIONAL 1980 OFFICIAL RESULTS

80gr (Aeromodelleur Trophy) 72 entries, 56 flew

1 F Monts (proxy O'Donnell) (USA)	97	104	120	70	118	509
2 B V Rowe	120	110	120	55	56	460
3 J Cooper	120	61	115	21	110	427
4 M. R. Chilton	99	52	120	43	110	424
5 E Hawthorne	64	120	45	110	77	416
6 P Michel	46	113	67	85	103	414
7 Tim Gray	92	88	76	88	63	407
8 Ian Dowsett	95	120	82	50	42	389
9 P Carter	120	50	78	39	95	382
10 Philip Ball	94	120	94	58	12	378
11 D Neil 377, 12 M S Bull 374, 13 C H Blanch 370, 14 D C Roche 369, 15 N J Beaumont 367, 16 Roy Miller 359, 17 M Dilly 331, 18 A Crisp 330, 19 M Howick 327, 20 Ian Davitt 321, 21 R Champion (F) 322, 22 G Ferer 318, 23 A C Gibbs 311, 24 Digby 310, 25 M Dixon and Phil Bixby 307, 26 D S Taylor 268, 27 Simon Dixon (J) and Don Carter 263, 28 R Johnson 262, 29 J Billam 259, 30 S Billam (J) 258, 31 F Armelet (F) (proxy R Champion) 256, 32 R Elliott 253, 33 T Medley (USA) (proxy H Tubbs) and A Wells 252, 34 J R Cuthbert 249, 35 R Kenward 240, 36 M A Evatt 237, 37 H Rothera 235, 38 R Chilton 226, 39 D Dent 225, 40 M Bird 224, 41 F G Chilton 216, 42 Anthony Ball (J) 198, 43 Len Ranson 196, 44 B Lavis 189, 45 Nigel Dixon (J) 185, 46 P A Siddall 175, 47 J Bellow 157, 48 P J Carter 153, 49 A Moorhouse 152, 50 J B Newton 114, 51 T Brookes 80, 52 Dennis Davitt 68, 53 C Straus 62, 54 Ken Fordham 32						

100gr (B.B. Trophy) 49 entries, 35 flew

1 Len Ranson	120	73	106	299
2 J Cooper	98	73	120	291
3 N Marcus	120	65	70	255
4 A Crisp	73	55	120	248
5 A Crisp	60	100	87	247
6 S Savage (Can) (proxy Ian Dowsett)	88	45	96	229
7 Ian Davitt	48	120	45	213
8 Frank Monts (USA) (proxy J O'Donnell)	77	62	68	207
9 Colin Shephard	75	52	77	204
10 R Champion (F)	105	65	32	202
11 R Wells 201, 12 F Armelet (F) (proxy R Champion) 198, 13 Ian Davitt 195, 14 J E Billam 114, 15 S Billam (J) and Roy Miller 162, 16 R Moore 153, 17 G Ferer 144, 18 Dennis Davitt 142, 19 D C Roche 133, 20 M S Bull 127, 21 Don Carter 125, 22 S Billam (J) 124, 23 Ian Dowsett and M A Evatt 120, 24 B Platt and R Moore 115, 25 M R Chilton 113, 26 P J Carter 111, 27 Ian Dowsett 92, 28 J E Billam 83, 29 C H Blanch 61, 30 M A Evatt 40, 31 R Champion (F) 19, 32 C Straus 10				

Junior Event

80 gr 1st Simon Dixon, 2nd Simon Billam, 3rd Anthony Ball and 4th Nigel Dixon
100gr Only one entry — Simon Billam with 162

**AIRCRAFT
DESCRIBED**



Quickie

No. 246

by
A. A. P. Lloyd

NEAREST yet to a man-carrying model — or 'The Ultimate Adult Toy' are descriptions which have characterised this futuristic device from the U.S.A. In cold print these impressive definitions suit the tandem wing, tailless shape but to actually meet a Quickie in the flesh, is another matter. For a start, it's very small. The main (rear) wing is only 17 ft 2 ins span and its chord so narrow that it seems hardly likely to lift a man. Nor could it do so without the foreplane (or canard) which has a thicker section and actually contributes 60 per cent of the total lift, apart from offering a wide track under-carriage and carrying the elevators.

The tiny power unit and its little propeller

by a biplane racer created by Cumberford to take a Ford V-8. Certainly the racer had similarities with its angled lower wing and tipwheels but it carried a tail and would have generated unwelcome interference drag between the wings. Burt's Canard solution removed such a hazard in one move.

But if the shape is slow to accept, so too is the all plastic construction.

The late Ken Rand, a Californian modeller who developed more conventional 'minimum' airplanes using modelling techniques of foam wing construction, had pioneered foam infill to wooden structures.

Top: Airborne! First British Quickie takes off at Cranfield. Left: Humorous touch at Oshkosh with clockwork winder on nearest of 3 Quickies.

In the Quickie, designer Rutan conceived a simpler method by leaving out the wooden structure altogether, using a dense foam for the core, skinned both sides with fibreglass cloth.

Rutan replaces the conventional spars with shear webs which are formed integrally with the core. Layers at top and bottom of the webs return over surfaces of both wings to make a 'U' shape lying on its side, so forming an integral beam. Areas of local stiffening can be added as easily as another layer or two of fibreglass.

Undulations created by such local strengthening can be smoothed with fillers to give a glass-like skin, as well as knife sharp trailing edges. Wing and canard cores are cut using the familiar hot wire technique used on models except on a larger scale. The kit comes with rectangular blocks of selected material.

Outside fuselage contours are shaped with the blue foam 'unskinned' using knives, Surform plane and sandpaper. Protective clothing is an essential as foam dust penetrates everywhere! Plastic gloves and goggles even masks are needed when the major operation of glassing takes place — as Michael Sullivan and his group were to discover when making theirs. A workshop 'oven' has to be erected with sheet polystyrene to capture the heat of a paraffin blow heater for 'curing', otherwise the sticky mess is likely to remain permanent! It's critical too, for the assembly stages. Those wings are simply 'stuck' in place with fillets of epoxy laden glass cloth. When the



are closer to modelling practise than full-scale. Designer Burt Rutan quickly recognised the potential of an 18hp two cylinder Onan industrial unit. Once his fertile brain which has already created the Vari-Viggen and Vari-Eze got to work, this useful engine triggered off aerodynamic inspiration. Possibly Burt was influenced

E. A. Museum at Hales Corners, Wisconsin has N2WX on display, has a curved fin and Edo decal on nose.



whole airframe is surfaced, the final rub-down prior to painting the first coat of black (to exclude U.V. rays from the plastics) is the last of the 'dirty' jobs before the pleasures of fitting the Perspex canopy and novel control system.

Pilot's comfort has not been neglected in spite of the small exterior. The cockpit extends from firewall to main wing leading edge, large enough to accommodate up to 6ft 4in tall and 200 pounds weight. One advantage of the canard design is its wide C of G position tolerance so a small, light pilot will not pose a problem of balance.

A side stick controller combines elevator (foreplane) and ailerons (main wing) while some of the elevator control is used for flap effect. At low speeds, 'down' elevator

Plans for a radio controlled model 'Quickie' appear in R.C.M.&E. March edition now on sale.

Right: N77Q at Oshkosh, N88Q at rear. Below left: the angled canard is epoxied in position forming a wide track undercarriage. Right: Canadian Quickie C-GGLG by Leg-Air with opened canopy.



increases lift.

A pull-on hand brake slows both wheels, and steering is via the tail wheel/rudder pedal linkage. Incidentally the pilot is advised to touch down with the tail wheel first! Fuel is stored, sufficient for 600 miles ranges beneath the pilot's knees in an integral tank which is filled with anti-foam.

Since the prototype flew in November 1977, there are now some twenty-five examples completed, and many more building. Engine cylinder modifications have brought the power available up to 22hp, the unit returning some 90 mpg and a top speed of some 120 mph, with a ceiling of 12,000ft.

The first UK registered 'Quickie' G-BHUK was flight-tested by Bill Bailey on December 9th 1980 at Cranfield, and is the main subject of our drawings. Since then it has accumulated trouble free hours and has moved to Elstree.

Our thanks are due to Michael Sullivan and his team for their undivided attentions and tolerance during assembly at Acton where our sketches were made. G-BHUK is particularly well-equipped and complimented by a superb finish.

It was built from a kit as marketed by Quickie Aircraft Corporation of Hangar 68 Mojave Airport, California which comes complete with the 782cc engine, propeller, blocks of foam and explicit building instructions. The cost in the U.S.A., was said to be not much more than \$3,000 but inflation of the 80's and shipping costs will have taken their toll. Even so, the Quickie kit is aptly named. The prototype was built in 400 man hours and G-BHUK could not have taken much longer even allowing for time to experiment and adapt to the vagaries of the English climate. One has to work quickly with fast setting epoxy so much so that teamwork is essential and the workshop takes on the atmosphere of an operating theatre with each of the protected tech-

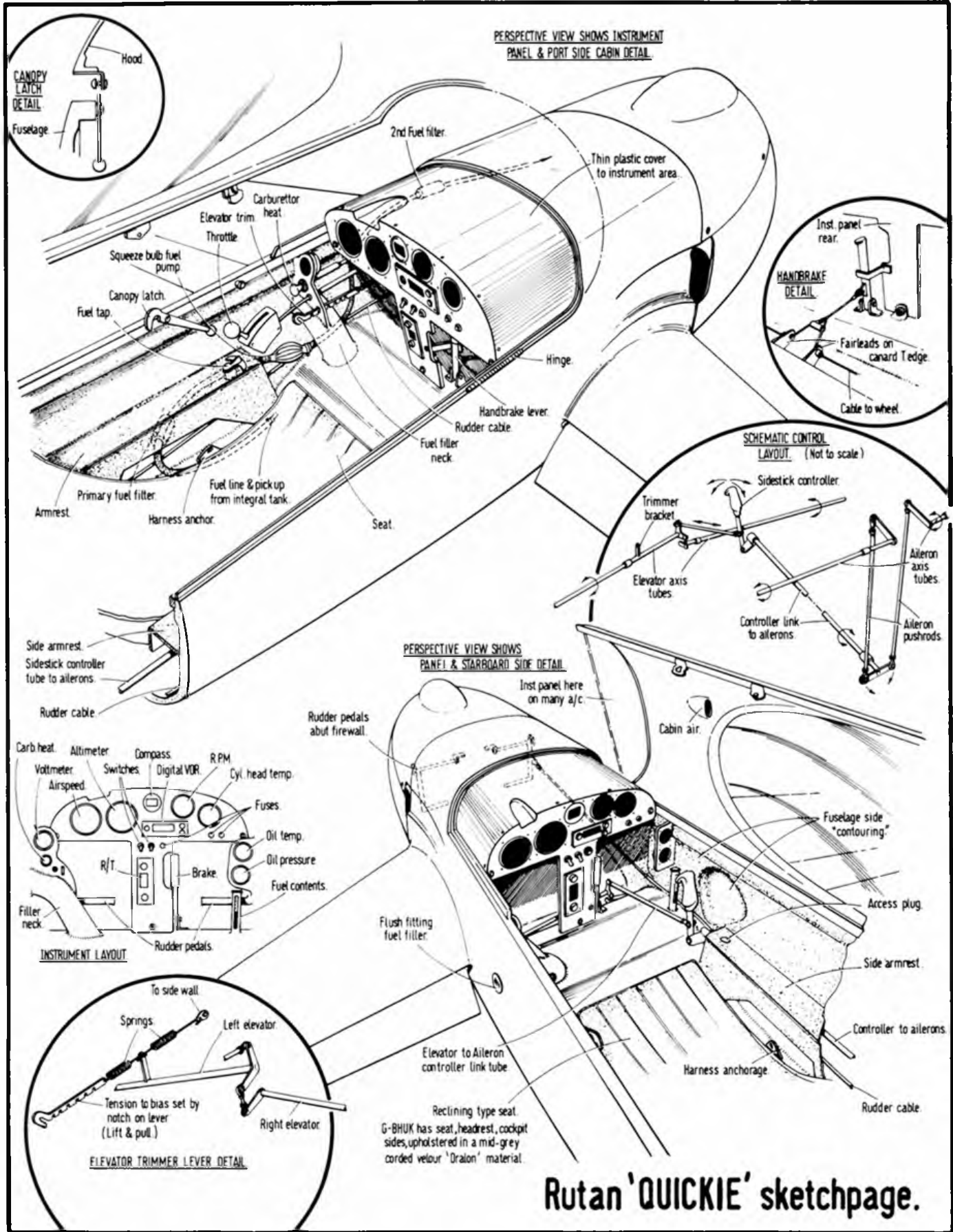
nicians fully briefed before going into action. Michael Sullivan had a team of 5 but as he is first to admit it's still an 'edgy, irritable business'. The fumes and dust generated create skin rashes and irritation of the eyes, so the benefits of quick results are tempered with a strong need to approach the task with caution.

For information on a R/C version see our sister publication R.C.M. & E., this month.

Main Wing Span	17' 2"
Canard Span	15' 1"
O/A Length	16' 1"
O/A Height	4' 2 1/2"
Engine	Onan 47.7cu ins.
Empty Weight	240lbs
Gross Weight	480lbs.

Left: Simple instrumentation on Canadian Quickie is attached to the hinged canopy. Right: The 'Works' a ready-to-go Onan unit, otherwise suitable for lawnmowing, couldn't be more simple for installation.





PERSPECTIVE VIEW SHOWS INSTRUMENT
PANEL & PORT SIDE CABIN DETAIL

SCHEMATIC CONTROL
LAYOUT. (Not to scale)

PERSPECTIVE VIEW SHOWS
PANEL & STARBOARD SIDE DETAIL

INSTRUMENT LAYOUT

ELEVATOR TRIMMER LEVER DETAIL

Rutan 'QUICKIE' sketchpage.

BURSAR

A SIMPLE TO BUILD GLIDER THAT HAS A PERFORMANCE GOOD ENOUGH TO REQUIRE AUTO-RUDDER AND A DE-THERMALISER

FLYING HIGH with Ian Barrett

THE PREVIOUS ARTICLES in this series have described the selection of a design and the preparation of a materials list to enable the modeller to construct a model aircraft directly from a plan, without recourse to the purchase of a kit of parts.

As an example of a model suitable to anyone progressing from kit building, we have designed a 'no frills' glider with simple lines, but with a performance good enough to require such devices as an automatic rudder and a de-thermaliser. An effort has been made to give as much information as possible on the plan itself, so that the model can be built by anyone with some previous

wire, although this is rather too weak for the tow hook itself.

Your building board should ideally be long enough to support the full length of the fuselage, i.e. about 950 mm (38 in.), but a shorter one is acceptable providing it will take one wing panel, 600 mm long (24 in.). The fuselage can always be built 'in the air', that is, assembled without having to pin it to the plan. Notice that the design is based on standard balsa-wood lengths of 915 mm (36 in.), so that, for instance, single strips are used for wing spars and leading and trailing edges. Similarly, the sheet sides of the fuselage can be cut from single sheets.

of which are less damaging to the plan than others. If you have a large enough piece of tracing paper, the outline can be traced onto it using a medium hardness pencil. Remove the tracing paper and turn it over, then position it on the sheet balsa. Note that one edge of the balsa can become the long straight bottom edge of the fuselage. Draw over the outline again with pencil, and a faint imprint of pencil lead will be transferred to the wood. The first side can now be cut out, and used as a template for the other sidepiece. An alternative method of transferring the outline to the wood is to use carbon paper under the plan and over the wood; you may experience difficulty in aligning the bottom of the fuselage outline with the edge of the wood because you are working blind. A third method is to prick through the plan with a pin, so putting a series of small holes into the wood, which can be joined up when cutting out. Both these latter methods can spoil the plan somewhat, particularly the last, as a large hole can appear in your plan if the perforations are too close together!

Similarly mark out the base strip for the fuselage, together with formers. Ensure that the grain direction in the smaller items is in the direction shown. The formers can then be glued to the base piece, being supported so that they set square to each other. When dry, the two side pieces can be attached, gluing the tail ends together and clamping with a clothes peg.

Tracing fuselage outline



Cutting out fuselage side



Fitting formers to fuselage base



experience of kits, without having to refer to these notes. A materials list has been prepared, but before rushing out to buy the lot, take a look in your scrap box to see whether you already have some of the material available. For example, the wire required for the tow hook and auto-rudder parts is minimal, but would require the purchase of a 915 mm (36 in.) length. You might even get away with using paper clip

Direction of the wood grain is indicated too; the fin is cut with the grain vertical, and can be cut from standard sheet.

Construction

Ready to start? Let us begin with the fuselage. The first task is to transfer the outline of the fuselage sides to two pieces of sheet balsa of the correct thickness. There are several ways of doing this, some

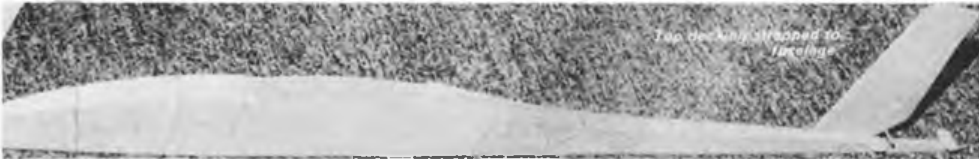
Upper decking pieces can be cut slightly oversize, and then trimmed down after they have been glued in position. The noseblock should be either made up from laminations of sheet balsa, or cut from hard balsa block. It will have to withstand the occasional collision with obstructions.

This completes the basic fuselage structure, and a little sanding will quickly remove the sharp corners. Wire components can now be added, and should be secured with a quick setting epoxy. Fit the tailplane support platforms, and ensure that they are square with the fuselage.

Fin and rudder

Cut out the fin and rudder, sanding the

Fin and rudder prepared to tracing





Tow line attached to two hook holding auto release ring.



Auto rudder stops in position.

wood to achieve a streamlined section. Hinge together with tape, making certain that the rudder is very free. The assembly can then be glued into the slot in the upper fuselage decking, checking that it stands vertically. At this stage, the fuselage can be put on one side, as the remaining work on the auto-rudder mechanism is best left until after the tissue covering has been applied.

Wing construction

This is straightforward, and should present no problems to anyone with any previous modelling experience. Transfer the rib outline to the balsa, and use this as the template for all the ribs; note that the wing centre section ribs are slightly different from the rest. Mark the rib

positions on the trailing edge section strips, and cut notches to accept the ribs. Build the two halves of the wing separately in the conventional way over the plan, that is, by locating the components with pins stuck through the plan into the building board. Do not push pins through the smaller sections of wood, and interpose a sheet of polythene between the wing structure and plan to prevent the two sticking together with excess glue. The wing section, by the way, is known as a Davis, used for many years as a reliable design for the average model.

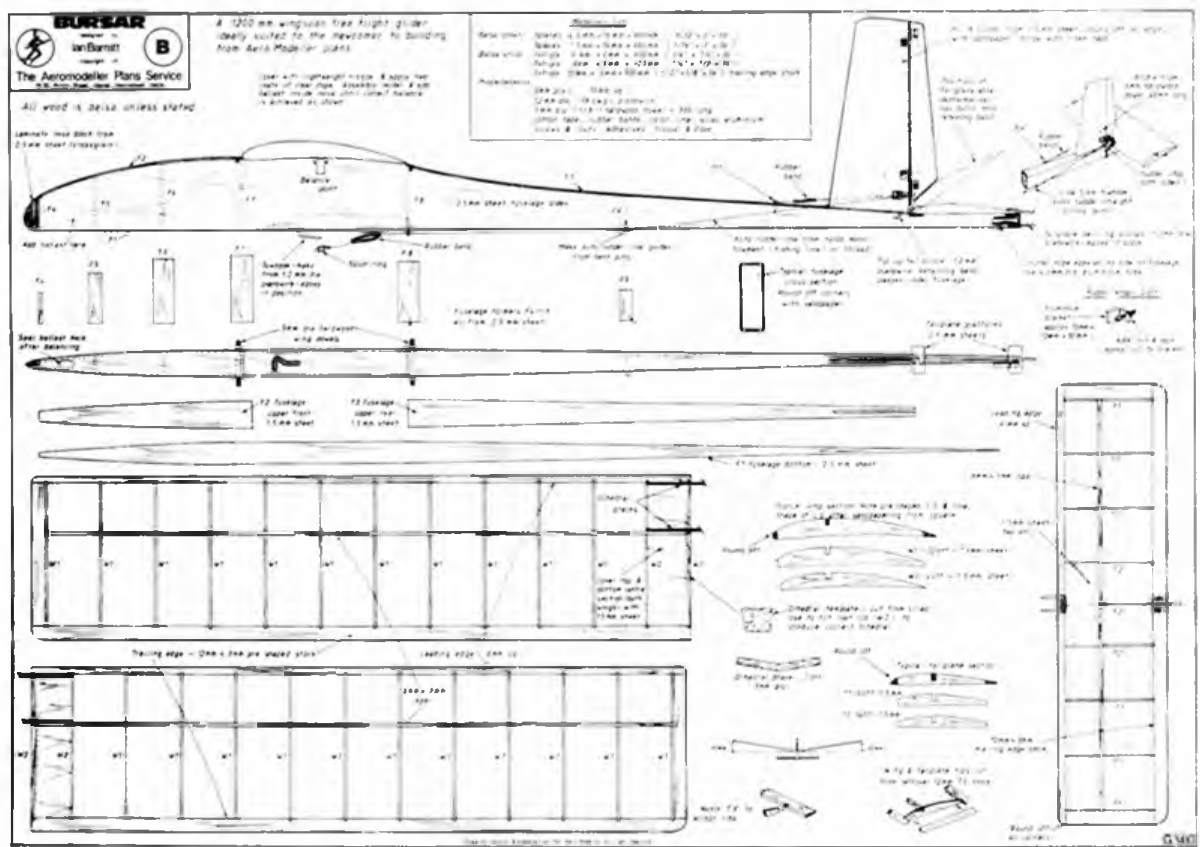
When the two wing halves are dry, join them together securely using the dihedral keepers, and cover the centre section with sheet balsa. This will prevent damage to the tissue covering by the rubber securing bands.

Tailplane construction is similar to the

wing, the section in this case being the old faithful Clark Y.



D/T snuffer tube detail.



Full size copies of the plan, reproduced here to 1/7th scale, are available as Plan G1410 price 95p plus 25p postage and packing. Export orders obtainable from appointed agents or direct from Aeromodeller Plans Service, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE.

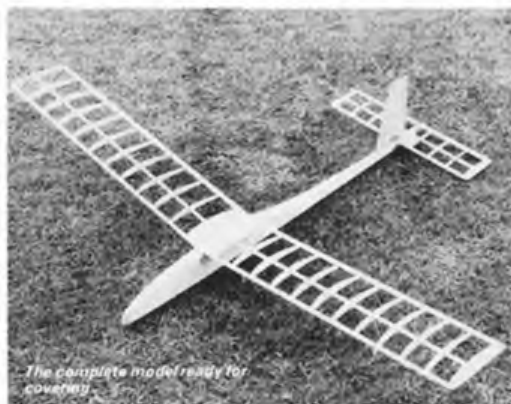
Covering

You now have all the components of the model ready for covering, the major part to watch out for being the undersurface of the wing. This is undercambered, and the tissue covering must be glued securely to each rib. Use dope, balsa cement or PVA adhesive for this job, otherwise when the tissue is shrunk, it will pull off the ribs, leaving a flat undersurface. The wing will then be much less efficient, and flight performance will suffer.

Water shrink the tissue on wings and tailplane, and apply two coats of thinned dope. Do not overdo the doping, as too much tightness in the tissue will induce



Jiggling up centre wing rib for dihedral.



The complete model ready for covering.



Bracket and adjusting screw stop for auto rudder.

warps in the relatively light structure.

Now you can add all the final accessories, such as the auto-rudder components and the dethermaliser snuffer tube. Assemble the model as it would be for flight, with the correct number of rubber bands; the fuse in position and everything operational, then add ballast to the nose until the model balances as shown on the plan. It is important to get this right, as the tow hook position is determined by the centre of gravity position, and if either is wrong, the model will be difficult to tow up safely.

Check all the flying surfaces for warps, and steam out if necessary. First test flights should be hand launched into wind, over

the proverbial long grass. Trim the model as described in the Aero Aces column for May 1980, adjusting the screw stops on the rudder to allow for a gentle turn. Adjust the other stop so that the rudder is pulled straight when the tow line is attached, then try a launch from a short line — about 20 metres or less. Make any further alterations to the trim or auto rudder stops as may be necessary, then try the model on a 50 metre line. Unless the air is dead calm with no lift, it is wise to light the dethermaliser fuse for each flight to prevent fly-aways.

This design, although simple, is capable of a good performance, and will float around the sky very easily. Why not try one?

DESIGNED BY JACK ARNOULD

I DECIDED to build the Citabria because I was looking for a scale plane that could be flown in the small field behind my house. The Citabria turned out to be excellent for this, being one of the most stable and predictable fliers I have ever built. In a ten to fifteen m.p.h. wind the Citabria will climb almost straight up like a helicopter and land again near your feet. Still air flights of around a minute are common. Sorry to say I do not own the field in question, a new school is scheduled to be built there in a few years, so there goes another flying site. Meanwhile...

The overall construction is quite simple for anyone who has previously built similar models, but I will outline certain items peculiar to this model.

FUSELAGE

First cut the top longerons from $\frac{1}{16}$ sheet, note each side is made from two pieces, so that maximum strength is gained from

grain direction. Build two fuselage sides and instal the $\frac{1}{16}$ sq diagonal braces before gluing the $\frac{3}{32}$ sq. and $\frac{1}{16}$ sq. longerons in place. These run along the outside of the fuselage, so don't forget at this point to glue these longerons to make a left and a right fuselage side.

When both sides are dry, instal formers F-1, F-3, F-4 and cement tail posts together, making sure everything is true while drying. Next attach remaining formers and carve the nose block from medium hard balsa.

The undercart is made from two pieces of wire, 16SWG for the main legs, and 22SWG for the spreader bar. Although there is little give in this system, the model light enough to survive landings without damage in over two years of flying.

WING AND TAIL SURFACES

The wings and tail are quite straightforward in construction and need no special instructions. These surfaces along with the fuselage should be covered in lightweight tissue before assembling the model. The original was covered in white with a red tissue sun-ray pattern doped on. You have a choice of a multitude of colour schemes for the Citabria which can be seen in many of the flying magazines. Keep it light however, coloured dopes are not re-

commended for this model, but if you must use coloured dopes at least spray them on.

PROPELLER

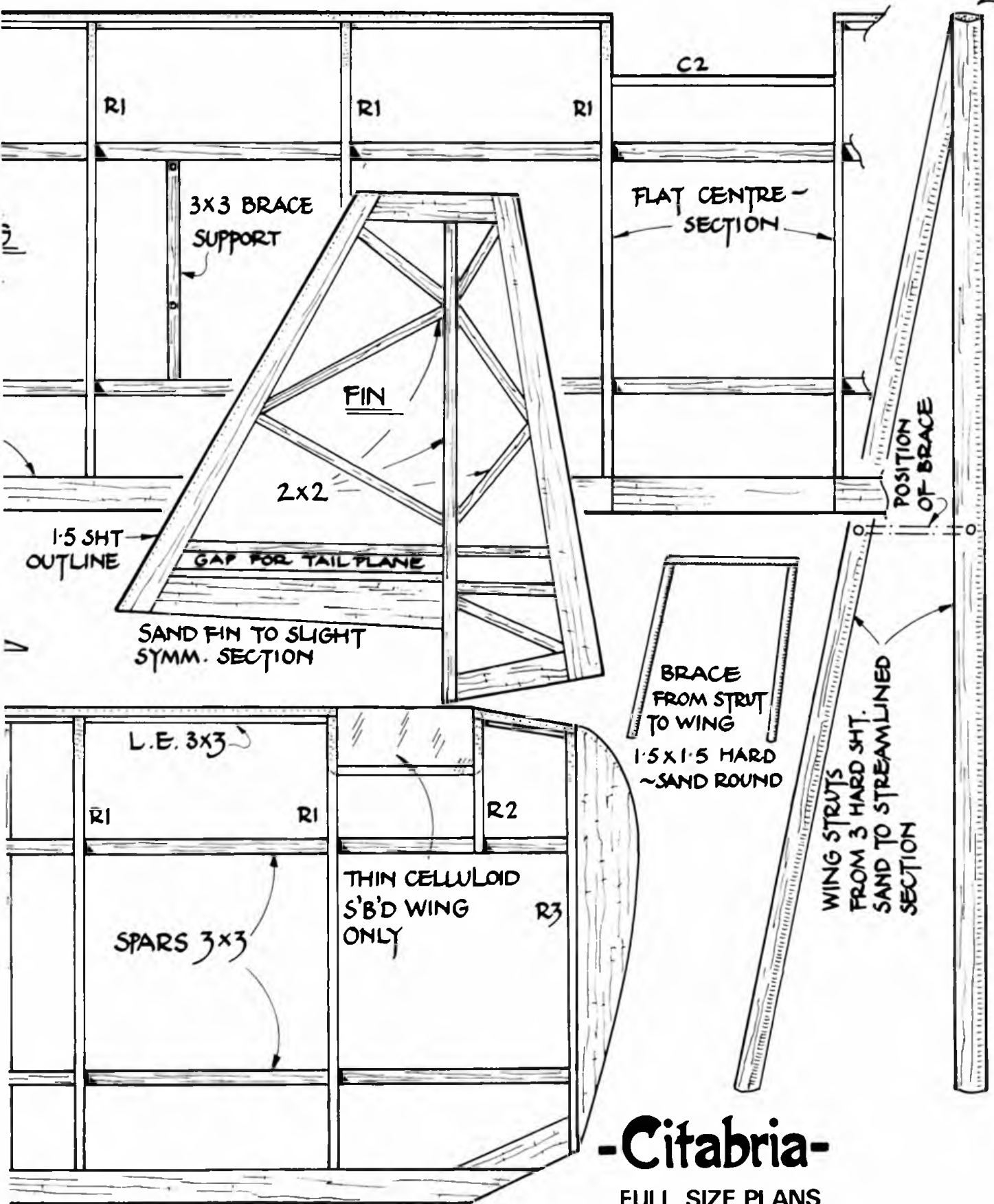
The prop is carved from hard balsa, or preferably American white wood or sugar pine. With all the effort required to carve, finish, and balance a prop the added durability of hardwood is well worth the slightly harder carving. I always use hardwood and the prop will usually outlast the model.

The model is powered with 8 strands of $\frac{1}{16}$ " x 12", which gives a steep climb from a hand-launch to about 30 feet altitude, then a more gradual climb until the power runs out. Different motor combinations will give a variety of flight patterns depending on your requirements and those of the flying site.

FLYING

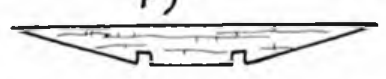
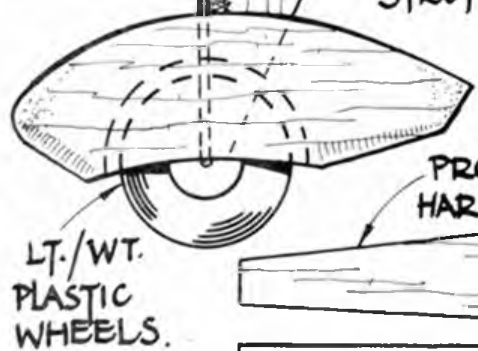
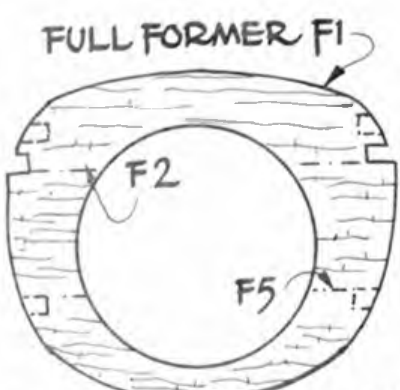
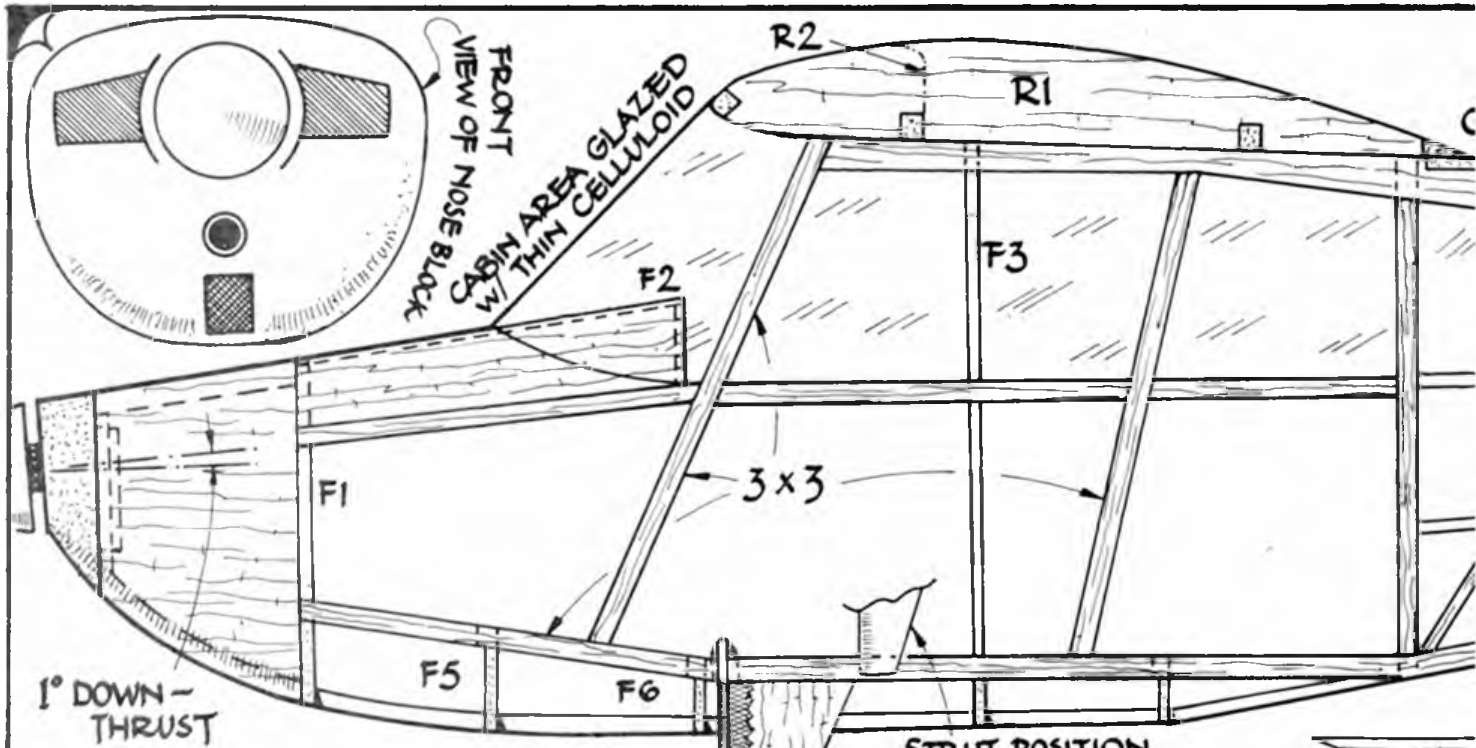
If the flying surfaces are warp-free, and the model correctly balanced, a straight fairly fast glide should result from a hand-launch. Then wind on approximately 50 turns, launch and observe the flight pattern. Make corrections by adding down-thrust or side-thrust as required in small increments while slowly increasing the number of turns wound on the motor. Exercise patience here, and avoid the temptation to wind on full turns and let her go to see what she can do. Nurse the model through its initial flight testing, which is the most dangerous time in any model's life and be assured of many hours of enjoyable flying from your Citabria.



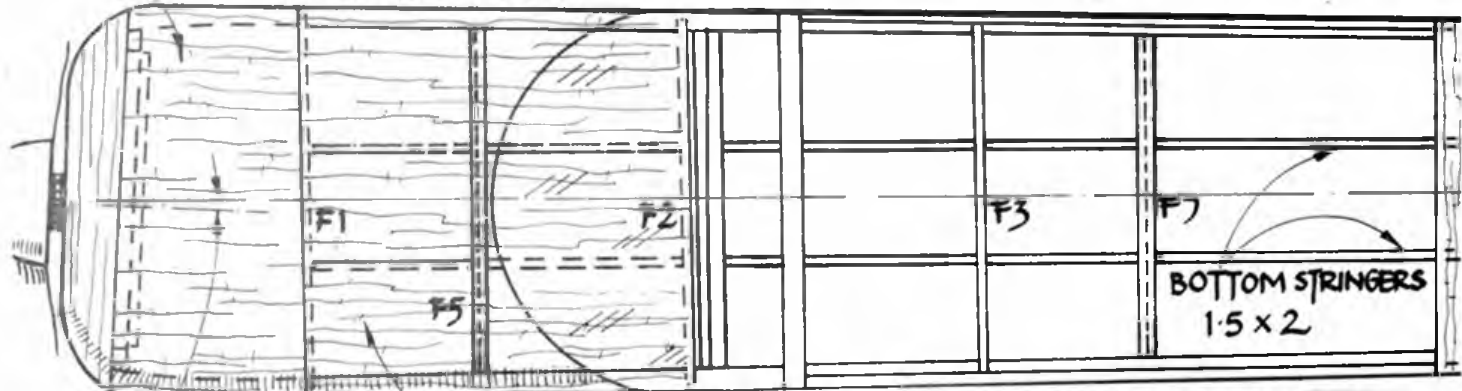


ETRES

-Citabria-
FULL SIZE PLANS



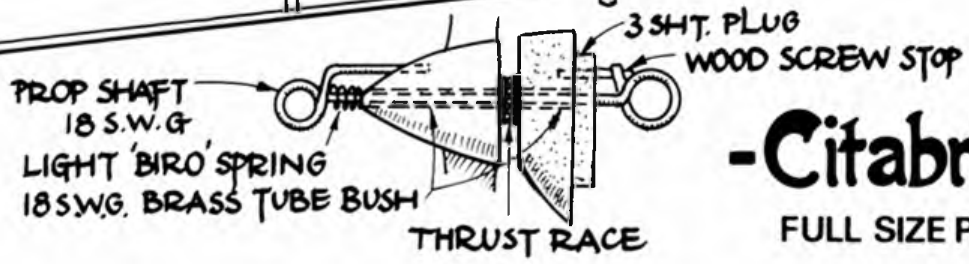
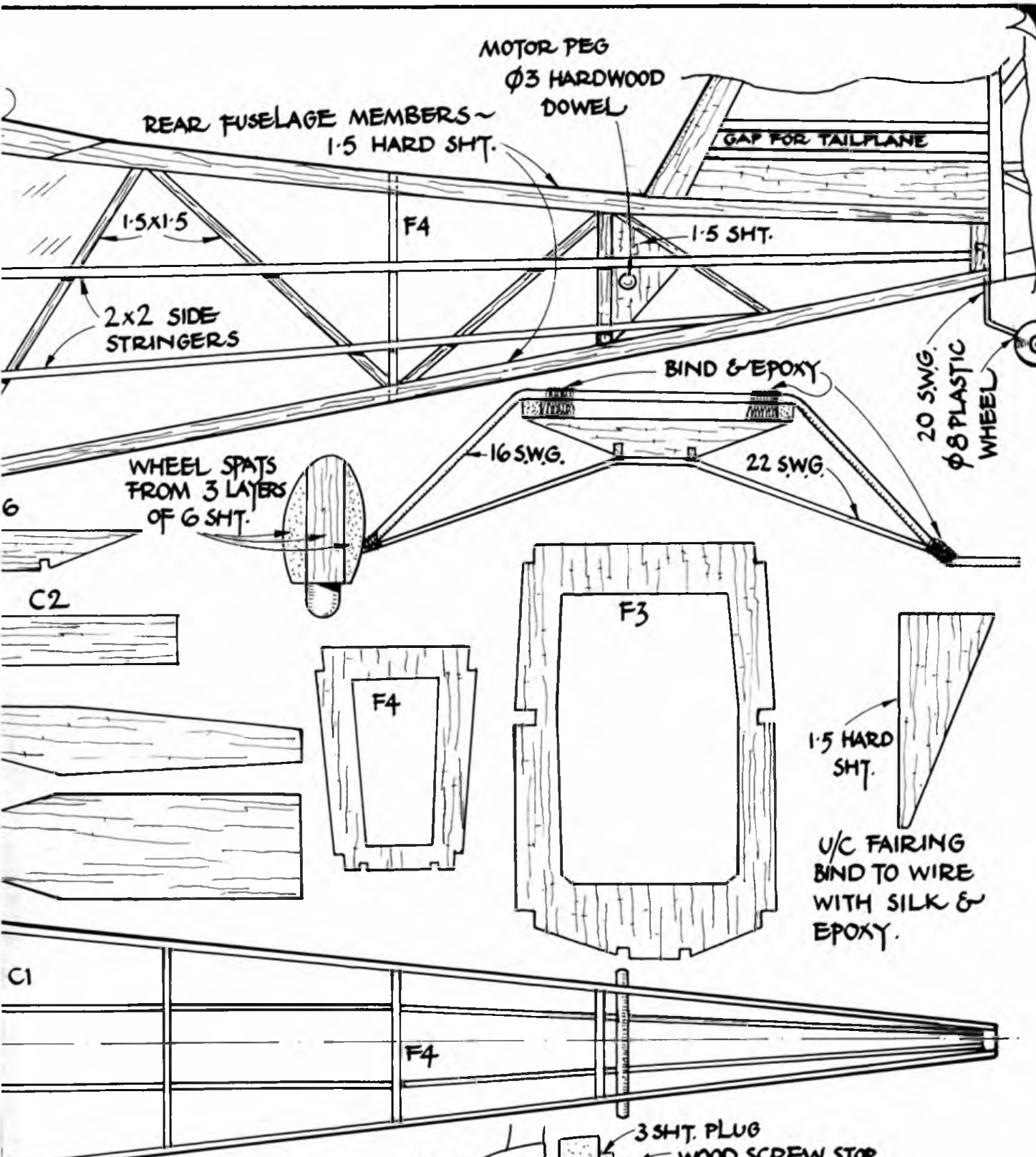
MAKE UP COWL & NOSE BLOCK FROM 3 SOFT SHT.



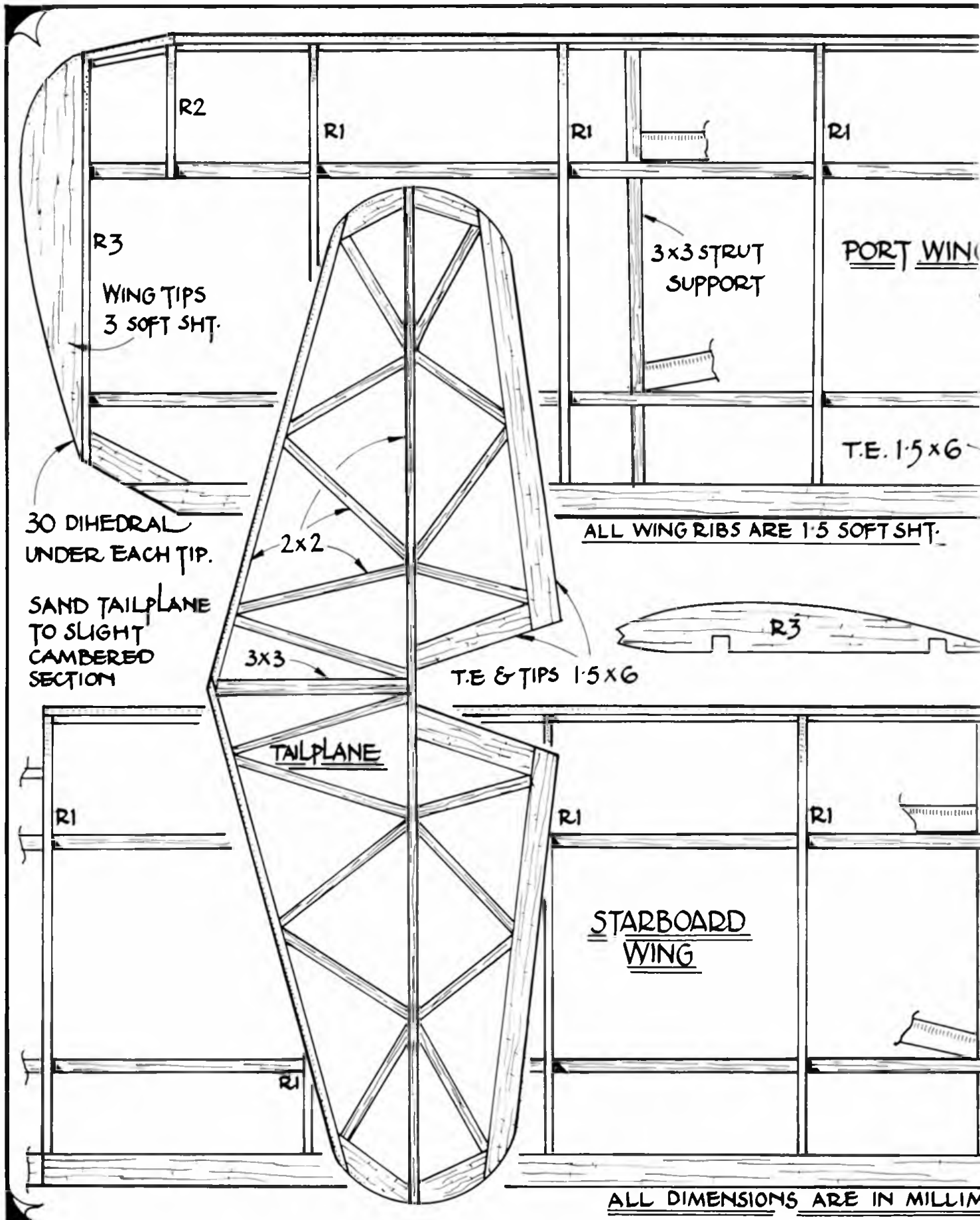
2° RIGHT THRUST TOP DECKING '8 SHT SOFT

POWER: 8 STRANDS 3x1 RUBBER, 300 LONG

ALL DIMENSIONS ARE IN MILLIMETRES



-Citabria-
 FULL SIZE PLANS



R2

R1

R1

R1

R3

WING TIPS
3 SOFT SHT.

3x3 STRUT
SUPPORT

PORT WING

T.E. 1.5x6

30 DIHEDRAL
UNDER EACH TIP.

SAND TAILPLANE
TO SLIGHT
CAMBERED
SECTION

ALL WING RIBS ARE 1.5 SOFT SHT.

2x2

3x3

T.E & TIPS 1.5x6

R3

TAILPLANE

R1

R1

R1

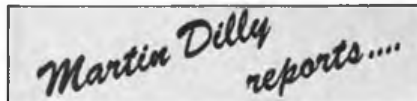
STARBOARD
WING

R1

ALL DIMENSIONS ARE IN MILLIMETERS

A Correction

In the graph on page 573 of the October 1980 Aero-modeller, which refers to tests on wire-braced wing spars, the labelling on the two curves should be exchanged, so that the un-braced spar does, in fact, deflect twice as much as the bare pine. Apologies to anyone who started to tear the wire off their Saper spars, and thanks to Phil Bell who spotted the error



PETER CARTER'S 1980 COUPE D'HIVER

Our three-view this month is of one of the more consistently successful F.1.G aircraft of recent years; Croydon member Peter Carter's Crown Agent is here shown in its 1980 form, and it or its antecedents have among their successes a win at the 1978 Nationals, a fourth at the 1978 International Coupe contest at Halton, a third at the 1980 Midland Gala, and a win at the 1980 Croydon Gala.

The wing on *Crown Agent* is stronger than many Coupes, due to its close rib spacing and its I-beam main-spar, webbed with 0.8mm balsa. Peter believes in light extremities, and the fin structure, with a 1.5 x 3 leading edge, 1.5 full depth mainspar, 0.8 ribs and trailing edge of 1.5 x 6 tapering to 3 is lighter than most. The aircraft uses a simple tension-sensing propeller stop, rather than the Monireal type of torque sensor, and a plain, rather than ball bearing to support the shaft, no downthrust is used, but 3° of right thrust is advised. The original 457 x 559 propeller was carved from solid, with slight undercamber and a maximum blade thickness of 2.5 mm; six strands of 1 x 6 Filati, bought from Henry J. Nicholls in 1978 gives a run of 45 seconds on 360-375 turns.

Wing warps are as follows, left tip flat, left inner panel 1.5 wash-out, right inner panel 1.5 wash-in, right tip 3 wash-out. Flying surfaces are covered with Japanese tissue, and fuselage uses Modelspan.

TISSUE WEIGHTS

We recently had some weight details from Mike Woodhouse concerning the Japanese tissue he sells; it would be interesting to see typical weights for the same tissues doped sufficiently to seal the pores.

Lightweight Japanese Tissue	11.84gms/metre ²
Medium Japanese Tissue	17.11g/m ²
Heavyweight Japanese Tissue	23.97g/m ²
Heavyweight Modelspan	23.36g/m ²
Light Modelspan	13.33g/m ²

Details of this tissue and other free-flight items from Mike were published in the October 1980 Free-Flight Scene, his address is 12, Marston Lane, Eaton, Norwich, Norfolk NR4 6LZ.

CO₂ MOTOR DEVELOPMENTS

In spite of several articles on CO₂ Motors in the model press recently we have not seen a lot about the principles involved; the new Telco TurboTank 3000 motor does actually have a rather higher performance potential than previous motors and an article in the magazine Chartered Engineer, which Richard Cedar showed me recently, shed some light on what actually goes on inside.

One of the chief causes of the decline in power output during the run of a CO₂ motor is falling pressure of the gas as it leaves the tank; this drop is in turn caused by the temperature reduction of the gas as it evaporates in the tank. The more you try to increase the power output and revs of the motor the worse the effect becomes.

The TurboTank motor gets over this problem to some extent by 'buffering' the liquid gas in the tank from the air outside it; the buffer can be in the form of a foam jacket round the tank, soaked in water, which freezes when the



gas starts to leave the tank. This ice barrier prevents the expanding gas attempting, if you like to think of it this way, to freeze the entire atmosphere round the tank, and instead allows the latent energy contained in the compressed gas to move the piston.

Another problem that can beset carbon dioxide motors is that the gas can pass to the solid state as it expands at low temperatures in the cylinder of the motor; this can produce dry ice crystals which can damage the piston, often a nylon or similar plastic moulding. To further super-heat the CO₂ on its route from liquid captivity in the tank to gaseous freedom as it leaves the exhaust, another buffer is used between the tank and the motor; this can consist of a labyrinth of narrow-bore tubing running through a chamber of another buffer liquid with a melting point considerably higher than water. A labyrinth like this can also help motor speed stabilisation by causing a pressure reduction.

As well as motors for model aircraft, the CO₂ motor can be used in larger sizes for such applications as starter motors for lawn mowers and for power tools; maybe a starter for F.1.C models that does not involve lugging a battery around or cranking a handle is not so far off.

THE END OF SIN?

For many years one of the world's best specialist free-flight newsletters has come from New Zealand, in the form of South Island News, produced by Paul Lagan. It has contained a great deal of in-depth material on our sport, much of it originated by Paul and a few other Kiwi flyers who manage to find the time to think and write as well as they fly, much of what I think of as 'foundation material' has come from SIN, for example articles on the design philosophy of Wakefields and A2s, circle towing techniques and surveys of international trends, in short the sort of reading that we haven't seen in the major model flying magazines in the English language for far too long.

Now we hear that Paul Lagan, who has been an officer in the New Zealand Air Force for some time, is transferring to the Royal Australian Air Force and the publication of SIN will cease with the September 1980 issue; it will be missed internationally as much as I am sure Paul himself will be in New Zealand. We can now only hope that he will find time to produce something similar from his new home across the Tasman Sea, and that a new dynamo will keep the very active contest free-flight community thriving through FFONZ, the special interest group Paul Lagan helped to found in New Zealand.

ALUMINIUM FOIL COVERING

Those of you who have been trying to prise loose the aluminium foil covering from helicopter rotor blades so as to use it for F.1.C wings can stop. Graham Bryant, who uses it on his team racers, has passed on the address of a source in Britain. Foam-Foil can be had from 37, Slead Avenue, Brighouse, West Yorks., HD6 2JE, and comes in two thicknesses: 0.1 and 0.06 mm are both 600mm wide and cost 75p a metre. Graham says that the 0.06 is best for team race wings, and he uses 3M's Fast-Bond contact adhesive, but mentions that Foam-Foil also supply their own adhesive. Terms are cash with order, plus 75p for postage and packing in the U.K. only.

A SOUTH AFRICAN FREE-FLIGHT NEWSLETTER

Free Flight (the logo looks suspiciously as if it has been borrowed from NFFS) is edited by Sean McCullagh, P.O. Box 11, Diep River, 7856, Republic of South Africa, and carries details of F/F activities in that part of the world. In his editorial, Sean mentions the importance of the characteristics fostered by free-flight in growing youngsters, and mentions dexterity, diligence and determination; the importance of capturing the imagination of adolescents.

as well as adults, with an activity like ours is obviously realised by people of very different political persuasions. Maybe one day we will catch on ourselves in Britain.

ANOTHER SOURCE OF TIMERS

Browsing through a drugstore recently I noticed Photax camera timers in the inevitable plastic bubble packs, hanging on a rack with £4.50 price tags on them. Thanks to the bubble packs it was impossible to check the performance of the contents, so a lost sale was the result, but typically these run for about 10-12 seconds unmodified and are quite powerful enough to operate engine brakes, auto-surfaces and so on. With the addition of a weaker but much longer-running drive spring they might be worth investigation for other purposes; after all in the 1950s we used converted Autoknips timers (costing about £1.10).

FREE-FLIGHT RECORDS

As you probably know, the FAI recognise world records in various categories of model flying in which performance, rather than opinion, is the criterion of achievement. The editorial in the Nov./Dec. issue of the SMAE journal Model Flyer mentions both record achievements and contest results, and pleads lack of space as a reason for little coverage of either. Some of you may feel as I do that, when someone pays £1.00 per entry, plus his £9.50 SMAE membership fee then he can with some justification feel aggrieved when asked to supply 6 or 8 stamped addressed envelopes at a cost of another pound or so for the elementary right to discover where he placed and how his fellow flyers fared. In the days when the Society's newsletter was a duplicated affair, and far less slick than it now is, full results of all contests the SMAE ran appeared, and for the less experienced flyers it was encouraging to see that they placed 125th and still beat a World Champ team member on an off day. It gave an incentive to do better next time and also showed that the national body set sufficient store in the contests they are responsible for to ensure all the members knew who flew in them, and how well. This magazine, too, published every month the top dozen or so names and times in SMAE events.

Free-flight records can be of several types; FAI records are of the 'find an enormous thermal, launch into it and follow the model across the Steppes' type, and have exotic variants like rubber seaplane speed, helicopter altitude and glider distance. For example, the rubber distance record is currently 371 kilometres! Apart from not having a lot to do with actual competition flying, records like this require a great deal of expensive support in the way of radar tracking, aircraft in which to follow the model, and man-power. Britain holds none of them.

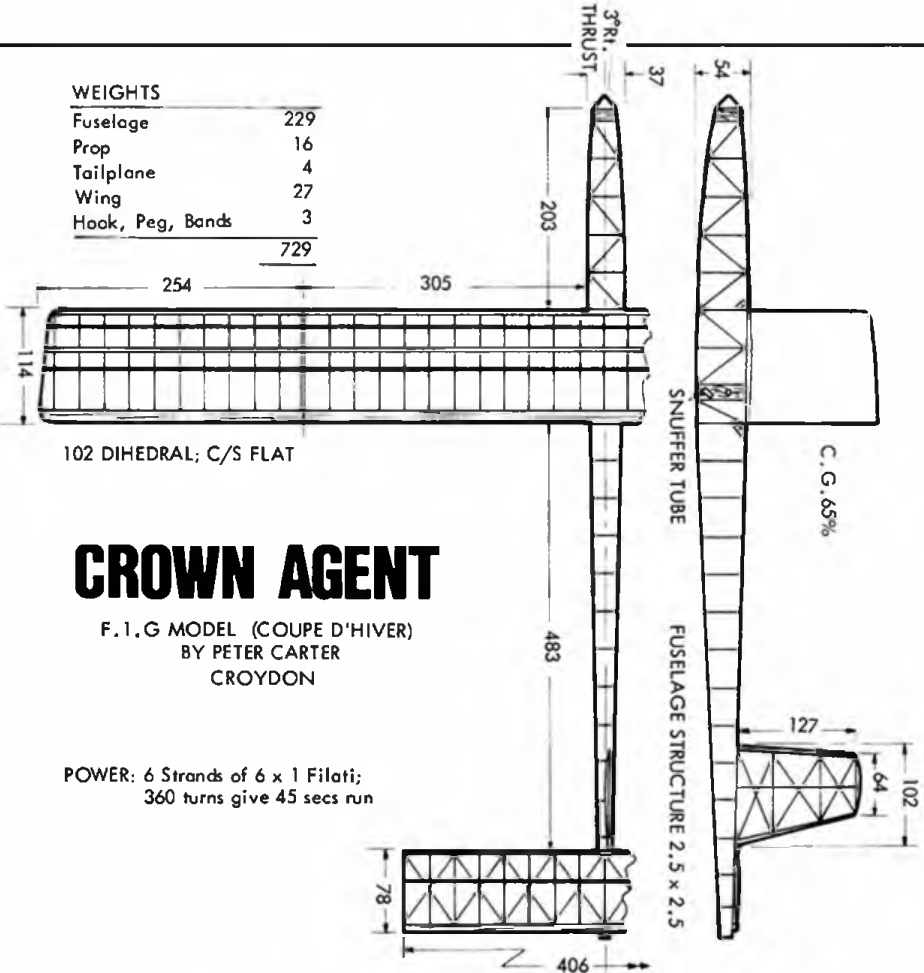
In the United States, however, AMA records are based on competition flying and revolve mainly around consecutive maxes or progressive maxes. Might this be the way for us to go in Britain? In the days when the SMAE published a yearbook, in the late 1940s, this used to include a list of current records (as well as a page each per forthcoming contest, last year's winner and a grid to fill in with the results, and, of course the venue, booked a year or so ahead), but these were of the single flight variety. I believe the AMA had a system by which records only stood for a limited time before being scrapped.

If you have any opinions regarding the institution of free-flight records, please write to the SMAE office at Leicester, where letters can be passed to the technical committee chairman if, on the other hand, you feel contest results should be included in full in the SMAE journal, then I am sure David Parker would welcome your letters, he edits it and can, again, be reached via the SMAE, Kimberley House, Vaughan Way, Leicester. Regarding space, it is amazing how small a typeface can be used and still retain legibility; last year's National results, for instance, were a one quarter reduction, by Xerox, of a standard typewriter face.



WEIGHTS

Fuselage	229
Prop	16
Tailplane	4
Wing	27
Hook, Peg, Bands	3
Total	729

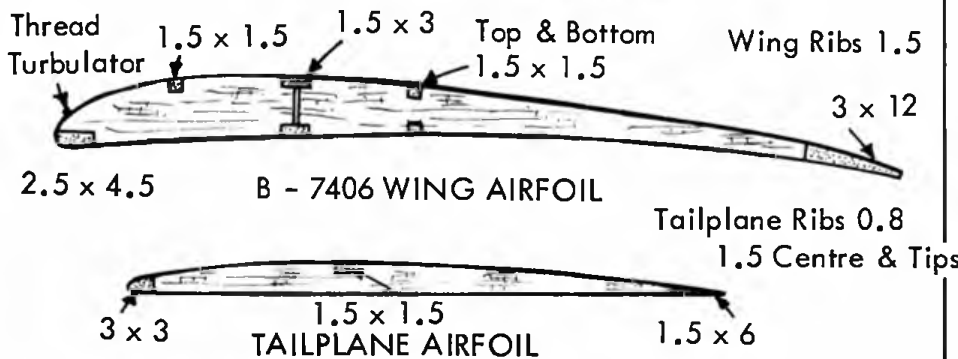


102 DIHEDRAL; C/S FLAT

CROWN AGENT

F.1.G MODEL (COUPE D'HIVER)
BY PETER CARTER
CROYDON

POWER: 6 Strands of 6 x 1 Filati;
360 turns give 45 secs run



models looked somewhat odd! After you have covered your next model take all the flat tissue scraps uselessly small for covering again. They can be folded up and held with thumb and forefinger against a coin of whatever size you require and a medium grade garnet/sand paper will rub through the paper layers to the edge of the coin. By using many layers up to 20 patches can be produced in as many seconds. What is more if a good number of sheets are used then at least the top few circles will have a slightly feathered edge which assists the patch to lie flat when stuck on with dope. A large collection of patches of various sizes and colours can be kept in a suitable box for fast field repairs.

How do you make a large diameter round hole in a piece of thin ply. A drill is the instant way to a splintery disaster unless the work is held against another piece of wood. Try using a pair of scissors — or rather one blade of a pair of scissors. Push it through and gently rotate and a surprisingly neat and round hole can be achieved in seconds. Ideal for ply reinforcement around wing dowel positions and rear anchorage peg holes in rubber models. The size of the hole being determined by how far up the scissor blade you go.

If you use nylon lines then you have probably already rumbled the fact that knots don't work very well and it is quicker and neater to use short pieces of small diameter aluminium tube crimped down onto the nylon. However how do you produce the pieces of tube quickly and in large numbers? Hacksaw, razor saw or files all work but none of these ways is the quickest. Simply use a modelling knife or razor blade and cut down and roll the tube along slightly at the same time. It is surprising how little pressure is required and how small a burr is left.

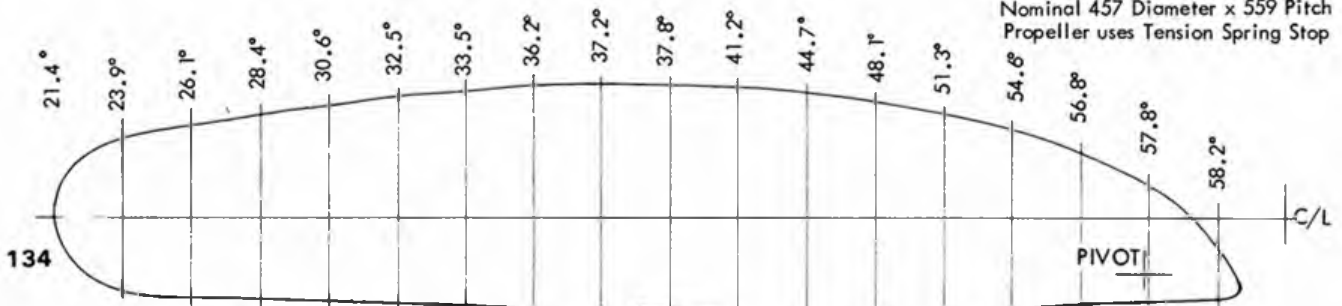
Bamboo is a pleasant material to work with and ideal for such items as leading edge reinforcement to HLGs, fine diameter wing hold down pegs and of course tip laminations on various Vintage models. However have you seen any in a model shop for the past 20 years? Probably not so you strip down garden canes. This is poor quality, knotty and rarely straight. Much better supplies are to be found in the same gardening shops but sold as 'green sticks' for reinforcement of small plants. They are usually 460mm (18in.) long and 3-4.5mm (1/8in.-3/16in.) diameter and as their name implies are caerosoted green. They can be stripped down easily and are invariably very straight grained — they are also extraordinarily cheap. If you need pieces longer than 460mm (18in.) then just what are you building?

For persuading tissue to follow compound contours — most likely propeller blades — although I learnt this trick from a scale builder who used it to cover cowings and complicated fuselage shapes — the tissue should be applied wet. I hasten to add that only modelspan can be treated in this way as light weight jap has zero strength immediately it is wet and becomes unmanageable. Tissue pieces should be cut oversize in the normal way and immersed in water, removed, then screwed up and squeezed to remove the excess water. They can be left in this screwed up condition until needed at least for an hour or so. Each one can be opened out and applied to the surface with thin dope and stretched easily around the most extraordinary contours without breaking or wrinkling. When dry some milkyness will be apparent as is always the case when water meets wet dope but the next coat of dope will take this away.

Still on the subject of tissue and, this time using that property of 'japs' to collapse completely when wet. If you have had trouble turning the edges of tissue over trailing and leading edges or around the corners of a fuselage may be you just cut it off flush and hope for the best. Very tidy results can be obtained by leaving a little to overlap and simply wetting just this protruding margin. It will now fold around easily and practically stick without dope. To wet this overlap accurately I usually lick it but if you want to avoid a doped tongue then maybe a small brush would be better.

CROWN AGENT F.1.G PROPELLER

Nominal 457 Diameter x 559 Pitch
Propeller uses Tension Spring Stop



Dave Hipperson reports....

BUILDING HINTS

As this is the time traditionally reserved for building next years models here are some simple building dodges I have either been using for some time or picked up com-

paratively recently. If you have any others similar we would always be interested in hearing about them, as it came as quite a surprise to me when talking to modellers during the year how few of even the experienced flyers knew of the tips below.

I am regularly asked how I achieve those round patches for tissue repairs. They are simply sanded around coins, a ruse first showed me by Mike Burrows famed glider flyer of the 60s who incidentally never used the same colour twice therefore after a seasons flying at Chobham his

TOPICAL TWISTS

by Pylonius

illustrated by Sherry

SECONDS OUT!

Power models have never really hooked me, at least not the big ones with all those bulging cubic centimetres up front. I have always been rather suspicious about the way the larger motors have their needle adjustments within finger slicing distance of the whirring propeller. They are either designed by people who never have to use their own products, or people who do not think a full ten digit approach to be necessary to a successful model flying career. Then, having fearfully watched the manic development of the power duration model over the years from comparatively gentle, twenty second ascents over Fairlop's field to the modern practice of using a model plane as a rocket; something for which it is patently ill suited, I can only admire the high degree of technology involved, but deplore the style. Now, it seems, that all that super technology has over-reached itself, and the only way to keep the whole rocket and glide game going is to cut down the engine run to a point where computer timing becomes necessary. Trouble is, though, they only have the old fashioned manual stop watches to work with.

It may be that the whole rocketry approach will have to be re-thought, which might mean that I could venture on to the flying field with less trepidation than I do at present. When you switch on the television to hear the announcer give a warning to the effect that the next programme is not suited to people of a nervous disposition he is talking to me, old jelly legs himself. So, when I see the power projectiles menacingly rearing their sharpened spinners on the flying field I feel I am entitled to some similar sort of advisement. I may be reputed not to have a great deal between my ears, but I have no wish for the space to be taken up by whatever piece of machinery is currently whacking out 20,000 plus revs per minute.

Un-nerving, too, is the unmuffled noise. Only a person living in a hut on Heathrow could have any idea of the intensity at which the human ear can be vibrated. Try winding up a rubber motor with the equivalent of twenty pneumatic drills whamming away within feet of your auricular orifices. Not that the operator himself is all that distressed — he is wearing ear muffs.

It seems to me that one c.c. of engine power is quite enough for anyone, and anything that improves on three entries per contest is worth a try.

PLASTIC PROP-OSITION

I have received a pamphlet enjoining me to build the latest thing in competition models. A jet powered helicopter? A new type of Thermal Soarer? No, nothing more technically advanced than a 2½ ounce rubber powered model, equipped with a commercial plastic propeller. Now, I know that we, in this wind swept isle, are none too progressive in our design ideas, and being a bit bemused by a surfeit of space films, I checked out on my Vintage Plane Calendar that we were actually in the Year of the Silicon Chip, 1981, and had not drifted back in time on a space warp. Had, I thought met up with a modeller of the 1920s and introduced him to all the exciting wonders of present day model flying he would have undoubtedly thought that



"I don't understand all this talk about us British being backward in model design, do you?"

with this obsession for primitive rubber powered we were all round the twist.

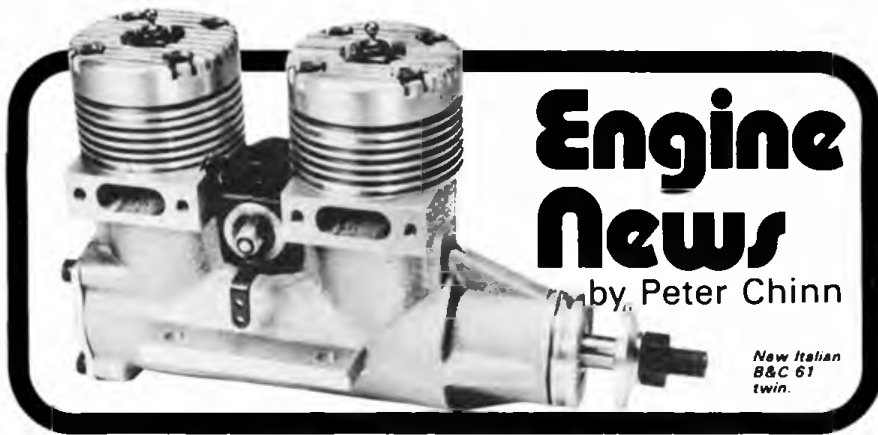
Yet it makes sense, really. It is all very well being burdened with technology, but it can be a bit of a drag once the novelty has worn off you are left with a sprouting of grey hairs and that scourge of our modern materialistic world, Functional Anxiety. You are so careworn and nervous over all the possible failures, oversights and accidents inherent in all the complex systems that you only enjoy your model flying in the negative hope that nothing goes wrong, and the most joyful sound of the day is the sigh of relief when the model makes a safe landing. Most model flyers cannot stand the tension of it all, which is why when you visit the flying field of a club with a high radio membership the only people seen to be flying models will be some carefree free flihters.

Another thing that puts us back to square number one in the space age game is the Incredible Shrinking Model Field. Greedy for more and more success we model flyers have developed models which not only outfly the largest flying field but most of what's left of the countryside as well. And, as the models have been flying further and further the flying fields have become fewer and fewer, so all that we are left with are the parks and small commons where all the model flying began with small rubber powered models. So there we are, right back where we started, with the only bit of modern technology in sight, a plastic prop.

YESTERDAY'S MEN

It does seem rather cruel, after the longest spell of unabating wind we have experienced in these isles for many a breezy year, to be told that we are way behind the continentals in model design. There is not much inducement to producing a *rara avis*, a model of refined and marginal design, if it is doomed to terminate its fragile existence in some ghastly piece of turbulence. Better to stick to something a bit more robust and survivable, even if it is some twenty years out of date. Given that all the signs are propitious: the mylar film aspiring, the bubbles soaring and the thermistor a-boiling, the years will simply drop away as it cleaves through the turbulence to notch up an easy max.

That's our excuse, anyway. But there is another side to it. We British are not only a conservative lot, we are a sentimental bunch, too. Having built a model we are apt to grow attached to it. We like the feel of something well tried and dependable. Even when we do build a new model it is just another one in a series and not some radical departure in design. Not much has changed over the years, and this is best illustrated by the competition flyer who recently returned to the fold after a 25 year absence, and was able to start again from very much where he left off. It was mainly a question of making up a few rubber motors and oiling up the old retrieving bike.



B&C 61 Twin

THE ITALIAN B&C 61 inline twin-cylinder 10cc engine is the outcome of the combined interests of engine designer/builder G. Bertella and his friend, ducted fan control-line model enthusiast Giuseppe Cassamali. An inline twin is a logical choice for a ducted fan model since it enables greater engine capacity to be accommodated within a given duct/fuselage diameter and the effectiveness of the engine has been well proved in Cassamali's original F-86 Sabre, which weighs nearly 8lb, as well as in his more recent and livelier 6.6lb F-15. The B&C 61 engine is now being produced commercially and we have just been having a quick look at one of the new 1981 models prior to trying it out.

The B&C 61 is, of course, an alternate-firing two-stroke, which means that each cylinder has its own separately charged and sealed crank chamber. There are various ways in which the latter can be achieved — for example by having a sealed bearing in the centre and reed valves in the crankcase walls with single or twin carburettors, or rotary valves at each end with separate carbs, or, as in the case of the B&C, a dual ported rotary-valve between the two crank chambers fed from a single carburettor.

The B&C Twin is built around a substantial one-piece sand-cast barrel type crankcase with an integral front housing, plus the lower halves of the cylinder casings, each of which is internally milled for the transfer passages to the Schnuerle-plus-third-port scavenging system.

The crankshaft is made in three parts. The front component is separate. It runs in a 7 × 19mm ball journal outer bearing and a

12 × 28mm ball journal inner bearing and has an integral 6mm dia. crankpin which is extended to engage a hole in the drive disc that is part of the centre shaft assembly.

The latter consists of a 15mm o.d. centre journal with integral rear crankweb and crankpin, mounted in two 15 × 28mm ball journal bearings and has the drive disc pressed onto its front end to make a permanent assembly. Two diametrically opposed rotary-valve ports are incorporated in the centre journal and these, separated of course, supply the front and rear crank chambers in turn from the single carburettor mounted vertically between the two cylinders. Between the two ball bearings and surrounding the centre journal there is a machined alloy crank chamber divider which incorporates the intake port. Incidentally, there are some modifications to the rotary valve in this latest version of the B&C 61. The valve ports are now timed to open 5 deg. earlier at 39 deg. ABDC and to close 5 deg. later at 53 deg. ATDC. Also, the gas passages through the shaft have been increased in bore from 9mm to 10.5mm.

Ringless, cast-iron, flat-crowned pistons are used and run in hardened, ground and lapped, nickel-chrome steel cylinder liners. The liners are generously ported, each with a large exhaust port flanked by two angled transfer ports to direct gas flow towards the opposite side of the cylinder where it is joined by an upward flow from a fairly wide third port. The connecting-rods are machined from high duty aluminium alloy and have bronze bushed big-ends and oil holes at both ends. The tubular gudgeon pins are 5mm o.d. and are retained by wire circlips. They are placed high in the pistons,

enabling relatively long connecting-rods (34mm between centres or 1.94 × stroke) to be used to reduce rod angularity and piston side thrust.

The cylinder heads are of machined aluminium. They have a conventional bowl shaped combustion chamber surrounded by a 3.5mm wide, sloped squish band and four long 4mm Allen head cap screws tie each complete cylinder assembly to the crankcase.

Originally, the B&C 61 was fitted with a Kavan carburettor, but current production models are equipped with a modified Perry carb. Sig. Bertella told us that, in the latest model, the venturi has been opened up from 8mm to 8.7mm. In fact, in our motor, it has been increased to 9.5mm, giving an effective choke area of approximately 63sq.mm. This is very large indeed for a throttle equipped engine with a cylinder displacement on each suction stroke of only 5cc, but not unacceptably so when it is remembered that the engine is intended mainly for ducted fan use where operational rpm tends to be maintained (as in a C/L speed motor) at around the bhp peak and where a low idling speed is not called for. The engine is, in fact, provided with a nipple in the backplate to enable a crankcase-pressurized fuel system to be used.

The B&C 61 has a bore and stroke of 19 × 17.5mm, and a total swept volume of 9.924cc or 0.6056cu.in. The checked weight of the example examined was 530 grammes (18.7oz). Alternate firing engines do, of course, have a rather high-pitched exhaust note and Sig. Bertella therefore commissioned Erich Jung, manufacturer of the well-known Minivox silencers, to produce a special version of his 'Super-Silent' muffler for the B&C 61.

There is a possibility that the B&C 61 may become available from a supplier in the U.K. this year. In the meantime, anyone interested in acquiring one of these motors may do so by communicating with the manufacturer: G. Bertella, Via Matteotti 248, 25063 Gardone Val Trompia, (Brescia) Italy.

Collectors' Corner

There's no doubt about it: AERO-MODELLER, through its world-wide circulation, is the ideal medium for identify-

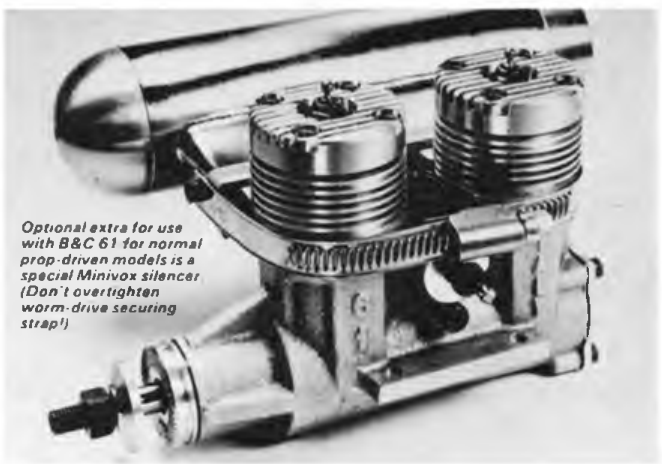
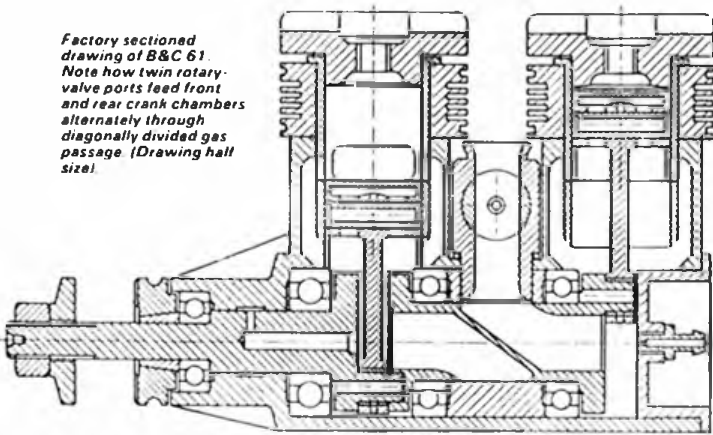


B&C 61 uses lapped cast-iron pistons running in steel liners. Carburettor is much-modified Perry

B&C 61's unusual shaft setup features permanently assembled centre unit comprising crankcase divider, twin ball bearings and dual rotary valve ports in centre journal



Factory sectioned drawing of B&C 61. Note how twin rotary valve ports feed front and rear crank chambers alternately through diagonally divided gas passage (Drawing half size).



Optional extra for use with B&C 61 for normal prop-driven models is a special Minivox silencer (Don't overtighten worm-drive securing strap!)

ing obscure engines! In the December issue we published a photo sent to us by a New Zealand reader, John Ensoll, of a vintage spark-ignition engine that had come into his possession. He had been unable to get it identified locally, so took it to the World Free Flight Championships in the hope that some visiting enthusiast might be able to put a name to it. He met with no success and we had to admit that we could not identify it either but, as it employed die-castings and had, therefore, quite obviously, been a production engine, somewhere, at some time, we decided to publish one of John Ensoll's photos in the hope that someone would come forward and solve this mystery for us.

Within a week or so of the photo being published, the answer came, but from a totally unexpected quarter, namely from Mr. Hiroshi Sawada, an executive director of the O.S. company in Japan. Most of the staff at O.S. are modellers or ex-modellers and Mr. Sawada, who has been with the company for some thirty years, is no exception. He began building models as a schoolboy and is still an active designer, builder and flyer. It turns out that the engine shown in our photo is a Japanese motor made about forty years ago. Mr. Sawada provided the following comments:

"This was the very first engine I possessed. At the time I was about eleven or twelve years old. I recall that I enjoyed running it (but with some trouble!) on the bench, rather than flying. The engine was called a Shiyoei 'Sakura'. (Sakura means 'Cherry'.) It was made, to the best of my recollection, between 1941 and 1943. Its displacement was 4.58cc, bore and stroke

being 18 mm x 18 mm.

Commenting on the engine's construction, Mr. Sawada mentions that this was probably the first engine made in Japan to use pressure die castings. He recalls that the cylinder consisted of a steel liner with integral head and boss for the sparking plug, the whole unit being cast into a one-piece finned aluminium jacket that was flanged at its base for attachment to the crankcase. As previously noted, the engine had a number of unorthodox features. The exhaust was at the front with a flange mounting for a T-shaped outlet stub that discharged the exhaust gases to both sides (in the photo, one attachment screw is missing which has allowed the stub to drop down on one side) and the intake assembly and fuel tank, also aluminium pressure castings with an unusual 'T' inlet, were flange mounted at the rear of the cylinder.

The pressure cast crankcase had a bronze bearing to support the crankshaft which had a journal diameter of approximately 8mm. The baffled piston was of cast-iron and was very unusual in that the gudgeon-pin was threaded at one end and screwed into a tapped blind hole in one of the piston bosses. The connecting-rod was another aluminium pressure casting.

Mr. Sawada remembers that the engine (less ignition coil, condenser, battery, etc.) weighed about 180g (6.3 oz) and that its starting qualities were not too good (you could say the same for some other engines of that period) and that the claimed output was '1/10 hp'. His particular engine turned up about 4,500 rpm on a prop of 23-24 cm dia. and 13 cm pitch — i.e. just over 9 x 5.

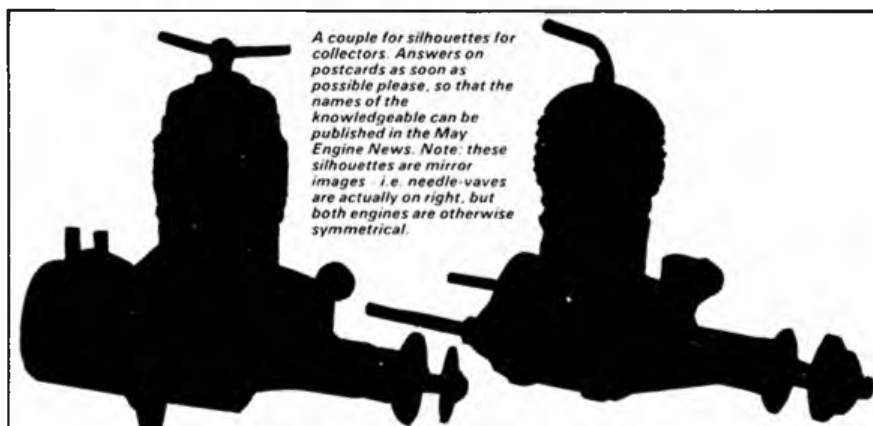
The motor was actually sold in three different forms: as a complete engine; as a kit of ready-to-assemble parts and as a set of unfinished castings and materials. Mr. Sawada confesses that he no longer has his example of the Sakura, having given it to an Indian modeller just after the war, and says that not very many of these motors were produced — which undoubtedly accounts for the fact that Mr. Ensoll's example was the first one to come to our notice.

Dave Smith 1.5

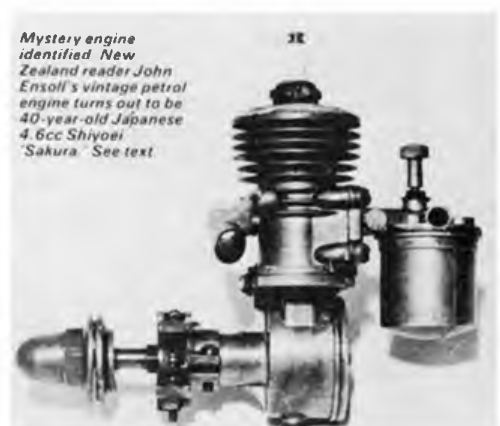
In the December issue we published pictures and details of two versions of a 1.5cc contest engine designed and built by Dave Smith of Basildon. Dave Smith has now advised us that he is considering going into small scale production with the engine. Most of the development work, so far, has gone into the diesel version which he and Gordon Yeldham entered in a number of Half-A team-racing events last season, with some encouraging results. These included first place in the Elliotts Spring Gala, eleventh in the Nats, fourth in the Elliotts Autumn Gala and fifth in the Northern Area Gala. The engine is consistently making 52 laps while clocking 10-lap times of 21.5 to 22.5 seconds.

Lack of time has excluded any serious flying with the front rotary valve glow motor, but it has been running at around 26,000 on the bench and the best speed to date in Dave's open 1.5cc sidwinder is 114 mph.

We wish Dave Smith the best of luck with this interesting project.



A couple for silhouettes for collectors. Answers on postcards as soon as possible please, so that the names of the knowledgeable can be published in the May Engine News. Note: these silhouettes are mirror images i.e. needle-valves are actually on right, but both engines are otherwise symmetrical.



Mystery engine identified. New Zealand reader John Ensoll's vintage petrol engine turns out to be 40-year-old Japanese 4.6cc Shiyoei 'Sakura'. See text.

IT IS REASONABLE to assume that any readers who have been following this series are now proficient at take-offs, safe controlled flight patterns, and landings. The series so far has studiously ignored the subject of ailerons, but this month we will examine their effect, installation, and use in some detail.

First and foremost it is preferable to use a four-channel radio set. Whilst it is possible to dispense with rudder control in favour of ailerons if you are hand launching, then it is inadvisable. Take-offs without rudder control can be very 'hairy' to say the least. Glider pilots will of course only need three functions.

Why fit ailerons at all? The reason is that they give you better control over the rolling axis of your model. It is quite possible to roll a suitably designed rudder and elevator controlled model, but the manoeuvre will tend to be 'barrelly' and some of the more complex aerobatics are well nigh impossible.

Ailerons are fitted to each wing panel

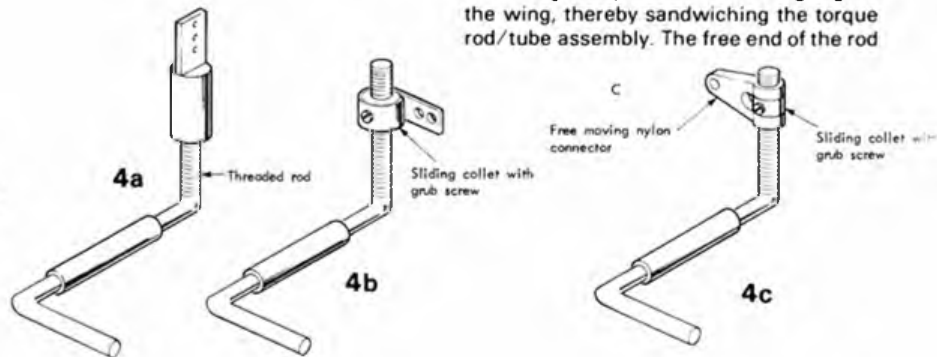
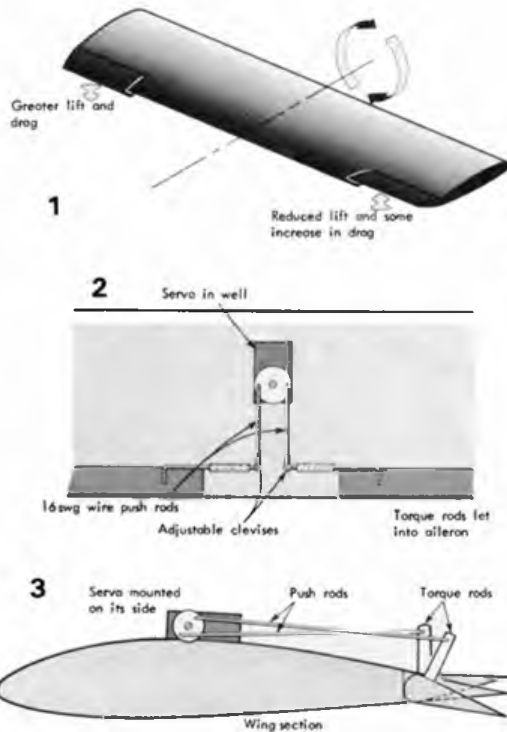
**THIS MONTH:
INSTALLATION OF
AILERONS, THEIR
EFFECT AND USE**

**R/C Sport
Flyer**
by Chris
Pinchback



about 10% of the total wing area of a model; this figure may be slightly less for a bi-plane. The area is important since if your model does not roll very well, you cannot improve matters dramatically by simply making the ailerons move more as this will build up the drag to an unacceptable level. Again as a rule of thumb, the following deflections should not be exceeded, 30° up and 20° down.

dummy trailing edge of the wing thus allowing the rod itself to rotate. If there is no trailing edge centre section, the bond between tube and wing should be reinforced with either binding or a bandage. When a trailing edge is fitted it is channelled out to accept the bearing tube, as is the trailing edge of the wing. The torque rod should then be smeared with Vaseline before using epoxy to bond the trailing edge to the wing, thereby sandwiching the torque rod/tube assembly. The free end of the rod



There are two basic types of aileron: Strip and inset. Strip ailerons extend virtually the total length of the trailing edge and by definition (10% of total wing area) tend to be quite narrow. They are easier to install than inset ailerons since generally they do not need linkages routed through the wing itself. The wing can be completely built before they are attached and they usually comprise of a piece of trailing edge stock section. From Fig. 2 it can be seen that they are operated by torque rods which must be in the same plane as the hinges. For this reason they are usually centre hinged. The servo is normally mounted in a well in the wing centre section and connected to the torque rods by short push rods. It is important to ensure that this assembly does not foul any other part of the installation in the radio bay. Where thin section wings are used, it is sometimes preferable to mount the servo on its side with crossing push rods as shown in Fig. 3. The push rods must be adjustable for length, to alter the centring of each aileron, and the torque rods should have a connector which is adjustable in height to control the degree of deflection. Fig. 4. Of the types shown I prefer type C which is all moving and fully adjustable. A length of tubing is slipped onto the torque rod and this is firmly fixed to the

is of course glued into a pre-drilled hole in the aileron.

Inset ailerons are as per full size practice and are normally situated towards the wing tips. They tend to have a wider chord than strip ailerons and can be top or centre hinged. They are operated from a servo which is usually buried flush with the wing surface, through a system of push rods and bell cranks or tube and cable 'snakes'. I personally prefer the former since I feel that it gives a more positive stop-free system. However some kits with foam wings have

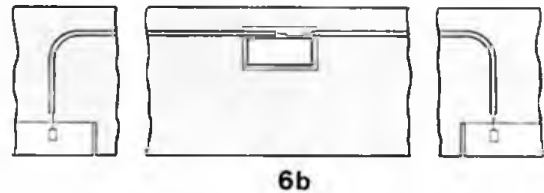
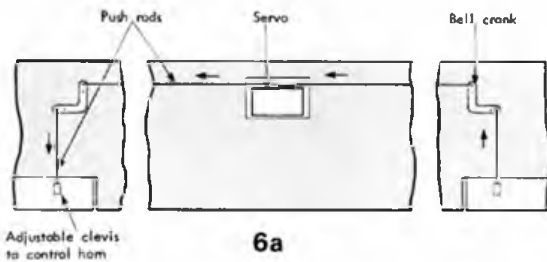
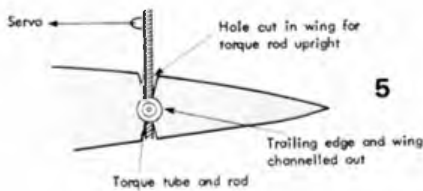
(although some specially designed pylon racers only have one), and as one moves upwards, the other moves downwards losing lift and gaining lift respectively. (See Fig. 1). This causes the wing, and therefore the model, to rotate or roll about its axis. The wing halves with the downward aileron to rise and vice versa. There is also an increased amount of drag in both cases, but more especially against the down-going aileron. Later we will look at a method of reducing the drag on the downward aileron to make it's lift even more effective.

As a rough guide, ailerons should be



tubes already buried inside and it really is more sensible to use 'snakes' in this case. A typical set up is shown in Fig. 6. It can be seen that as the servo moves, it pushes one aileron and pulls the other.

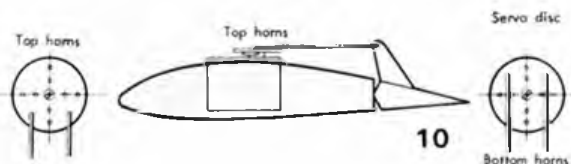
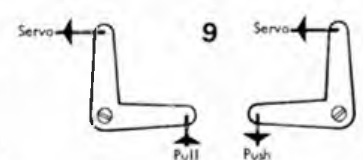
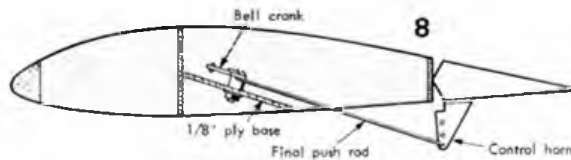
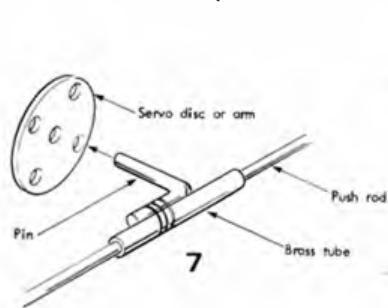
The servo well should be lined for strength with $\frac{1}{8}$ " balsa or $\frac{1}{16}$ " ply and the servo mounted using either a proprietary bracket or a piece of $1" \times 1" \times \frac{1}{8}"$ dural angle suitably cut and drilled. Double-sided sticky tape can be used, but this makes removal of the servo difficult. However if this method is used, the bottom of the well should be liberally smeared with balsa cement to provide a smooth impervious surface and the side of the servo case thoroughly cleaned to ensure a good bond. There are commercially available connectors for aileron push rods or cables, but in the case of the former, they can be joined by a brass tube, a pin



made up, and the whole assembly bound and soldered together (Fig. 7). 16swg piano wire can be used for the push rods throughout, but it must be well supported where it passes through the wing ribs. Although it is possible to make up paxolin bell cranks, I would recommend the use of commercial nylon mouldings. These mouldings have a number of holes on the output arms, rather like servos, and it is therefore possible to adjust the amount of movement by connecting the push rods to whichever hole gives the desired travel. It is usual to mount the bell cranks on $\frac{1}{8}$ " ply and angle them so that the final push rod exit from the

while considering a little extra effort to obtain differential aileron movement. By varying the geometry of the linkage system, this allows for the up-going aileron to move a greater distance (thus increasing its drag) and for the down-going aileron to travel less (thus decreasing its drag).

With strip ailerons, this can either be done by connecting the push rods off centre or by raking the torque rod ends. Fig. 10. It is a little more difficult with inset ailerons, but here again the control horns can be raked or either 60° or 120° angled bell cranks can be used.



We mentioned the fact at the beginning that a four-channel system is necessary to obtain the use of both rudder and ailerons. Although somewhat out of fashion these days, it is possible to couple aileron and rudder (C.A.R.) movements to one servo. This is done in such a way that right bank/roll will also give right rudder. The methods are numerous, but a simple way is to take another push rod off the servo disc through a push rod to the rudder. This is easy with a one-piece model, but since most models have removable wings it is necessary to make up an easy to assemble

linkage which can be made up as the wings are fitted. The disadvantages of this system are mainly in the rolling manoeuvres when it is often necessary to use a touch of opposite rudder to keep the nose level. Take-offs and landings are straightforward provided the model is kept head to wind; if not there is a danger of a wing dropping due to over correction.

Well that's it for this month. Next issue we will look at some of the model plans available from the MAP range of aircraft suitable as first aileron models and also discuss various points about engines.

SHOP TALK

The latest in products for the modelling scene

MICRO-MOLD

New items from Micro-Mold Ltd., Station Road, East Preston, Littlehampton, W. Sussex BN16 3AG.



The **D-N111** ball joint link for connecting from control surfaces, is moulded in plastic and has a brass ball insert. The pack of two costs 47p and also includes 8BA nuts, bolts and washers for fixing to the control horn.



D-P59 heavy duty cable to link adaptor is made for use with the **D-N95** heavy duty clevis. These have M3 thread at one end, and are drilled to accept the standard cable. Supplied as a pack of two at 79p.



D-N112 is a set of heavy duty wing fixing bolts. The pack consists of two nylon 1/4 Whit bolts 43 mm long, two nylon seatings and two steel blind nuts. Cost 65p per pack.

Last but not least is a new balsa stripper made by Master Airscrew and being distributed by Micro-Mold. The unit is moulded in a plastic and incorporates a threaded adjustment which will give a range of up to 20mm wide strips. A most useful tool that although designed to accept the Xacto No. 11 blade will also accept most other modes of a similar size. Price £3.95.



LATEST FROM RIPMAX

If you want an almost ready to fly R/C scale job, the Kyosho Chipmunk imported from Japan could be your answer! Fuselage, wing and tailplane are all moulded in styrofoam and finished with a bright yellow paint job. The engine, supplied and fitted in the fuselage with a clunk tank, is an Enya .09BB. This only leaves the fitting of a 3 or 4 channel R/C gear and the undercarriage plus a little use of epoxy where necessary (included in the kit) to complete the model. If four channel radio is being used, it is necessary to cut out the ailerons and attach the hinges supplied.

Additional to all the linkages for the servos, there is a good set of decals included in the kit which helps to finish off this most handsome model. Price of the complete model including engine is £74.50.



NEW ITEMS FROM H. J. NICHOLLS

Henry J. Nicholls & Son Ltd., 308 Holloway Road, London N.7 have just received a new range of Merati kits from Italy. The range includes R/C trainers, aerobatic, and gliders. All of the kits feature veneered foam wings, with either ready-built wooden or glassfibre fuselages.

The 'Ghibli' shown here is designed for 3 channel radio and also has provision for a nose mounted 1.5cc motor. The span is 247cm. Price £59.95.

NEW 5 MINUTE EPOXY KIT

Devcon, the adhesive division of ITW, have appointed Ripmax Models, to distribute their new 5 minute and slow setting epoxy kits.

Both kits contain two 9oz plastic dispensers, one of epoxy and the other hardener. For first hand reaction to this product, Devcon has given each member of the Feltham & District Model Aeroplane Club a kit to try out! So we should see some very strong C/L models flying this year. Price 5 minute kit £6.05, slow setting kit £5.57.





PECK-POLYMERS

Peck-Polymers, Box 2498, La Nesa, California 92041, produce a large range of products for the rubber power enthusiast. These products are distributed in this country by The Modellers Den Ltd., 2 Lower Borough Walls, Bath BA1 1QR, Avon.

Keeping a sharp knife is essential for any modeller; the 'Sharp' is a stone designed especially for this job and costs £1.35.



The latest peanut scale kit to the Peck-Polymer range is the Lacey M-10. It has a span of 13 in. and all surfaces are exact scale. The aircraft was designed by Butch Hadland and is the model, he won the British Peanut Scale Championships with. The kit is complete apart from glue and paint and includes step-by-step pictures of the construction. Price £2.65



A complementary item to the above or for any small rubber powered model is the 5-1 winder. The winder has a rugged nylon case and features an anti-reverse lock so that you cannot wind the motor in the wrong direction. Price £1.85.

NEW KWIK FLYERS FROM D.P.R.

D.P.R. Models of 351 Fairfax Drive, West-cliff-on-Sea, Essex, now well established for their range of simple to build and fly models for the younger modeller, have introduced their new range for 1981.

There are three models in the super fighters series, a Spitfire, Mustang and



M.E. 109. These are rubber powered models and are made from die-cut printed balsa parts and require only slotting together. Price £1.25 each.

The other new range are chuck gliders based upon popular commercial airliners. There is a Jumbo Jet, Skytrain and an Executive Jet, all made from pre-decorated balsa sheet, and include a plastic nose moulding and wing clip that can be adjusted for stunts. The price is 75p each.

KITS FROM GUILLOWS

This range of all balsa flying scale models of built up construction are manufactured by Paul K. Guillows in the USA and distributed in this country by Keilkraft.

The Series 900 for 10 year old upwards, includes six models to choose from, a Trojan, Bird-Dog, Chipmunk, Skyraider, Mustang and a Typhoon, all to a scale of 1/2 in. = 1 ft.



Each kit contains all the materials for building the model apart from dope and balsa cement.

One of the best features of the kit we received (which was the DeHavilland Chipmunk) was the well illustrated plan. Apart from the very clear illustrated instructions on how to build the model, there is also an exploded line drawing of the complete model which is of immense value to the beginner.

Most of the die-cut parts came away cleanly, although in our sample kit, one sheet of balsa was rather soft and care was required not to break the components. As suggested on the plan a knife or sharp blade

should be used to free any piece that will not push out easily. Also included in the kits are a moulded plastic nose cone, plastic propeller and a large sheet of insignia. These kits make a good introduction to the more advanced methods of aeromodelling construction. Price £1.95.



A little more advanced in construction is the Aeronca Champion 85. This has a span of 24 inches and is designed for rubber power or a 020 glow engine such as the Cox Pee Wee. This kit also has a well illustrated plan plus a separate instruction sheet on the construction which gives tips on covering and finishing the model.

All the components are die-cut and clearly marked, the only criticism we had was that some of the sheet wood was rather hard which would tend to make the model rather heavy, although strong.

There are also six other scale models in the series 300 to choose from, all designed for rubber or 0.20 power. Price £3.65 each.



The series 400 are classed as multi-purpose models, suitable for free flight or control line. We received the Zero and F4U-4 Corsair kits which are to the scale of 3/4 in. = 1 ft., giving a span of 37 3/4 in. for the Zero and 30 3/4 in. for the Corsair. Both kits include a plastic propeller, rubber and also a control line handle, lines and bellcrank for the control line version. As with the other Guillows kits, all parts are die-cut including the plywood components.

There are also several vacuum formed plastic parts which in the case of the Corsair, include a dummy engine, pilot, bombs, landing gear etc.

Apart from being able to fly, they would make up into very good display models. Price £7.70.

All the above kits are available through your local Keilkraft stockist.



DAVE HIPPERSON TESTS THE TELCO TURBOTANK 3000

A FEW MONTHS ago Micro Mold, who have taken over the manufacture of the Telco Co. unit, sent me their Turbo Tank 3000 version — by now they will be quite freely available in the model shops. It is obvious that Micro Mold intend to sell this unit in large numbers and no effort has been spared to transform a tricky power source into one which is both easy to use and much more consistent. Packaging and literature are along the same lines as that supplied with the TD Cox series of engines from the USA. That is to say the kit is complete with prop, spanner mounting screws etc., and very detailed instructions in four languages. There has obviously been much experimentation by the manufacturers along the lines that we duration flyers have been following for the past few years as filling instructions for maximum performance leave nothing to chance.

The engine/tank assembly is totally self contained with a mere inch or so of pipe most of which is out of site anyway. For this reason it immediately becomes a readily interchangeable item for use in a variety of models in one day without the fiddling about that was inherent in the intricate plumbing system of its predecessor. It is a little heavier, 22.5 grams with prop as



A simple balsa tube with an inside diameter of the tank, makes an ideal lightweight fuselage for this motor.

against 16 grams for the old assembly but the graphs that accompany the motor indicate that up to double the power is available by way of the somewhat complicated inards of the tank accepting more than twice the weight of CO_2 per charge as compared with the old tank of the same volume. The filler is situated between the engine and tank and above this a safety valve which blasts off if the charge heats up before you launch when the pressures might become dangerous and liable to flood and stop the motor.

This seemed just too good to believe so the unit was test flown immediately in the rather over large 240 sq inch 65 gram model that had proven rather too much for a standard Telco. It was quite easy to obtain a climb and still air flights of around 3 minutes seemed the order of the day. Certainly there was a marked power increase for any given run length and this, with an untried motor which upon testing on the bench later was found to be only average.

On closer inspection the engine is identical to before and can be removed easily from the tank. Hence it is possible to use an existing motor on a Turbo tank if you thought you already had one better than the one supplied. This is exactly what I did next and with my best motor, runs between 10 and 15 minutes were easily obtained from a single charge.

Actually to say the motor is identical to before is only partly true. I noticed the piston was black and now has a groove running around it half way down but actually these black pistons were introduced a little before the Turbo Tank itself as I have a couple in other motors too. Generally in the last 12 months or so there has been an improvement in average piston to cylinder fit resulting in a useable contest engine more often than not. Obviously there will always be good and bad motors but the Turbo Tank tends to level them out

more. Another advantage of this compact arrangement is that all the weight is up the front allowing duration models to adopt the more conventional configuration of power models. The downward pointing filler is rather exposed and would not enjoy being ground along a runway so a robust skid is essential. It was not entirely clear whether the safety valve is adjustable. One of mine started spitting when it shouldn't have done and I cured it by tightening down the Allen screw inside the valve.

Altogether the new Telco Turbo is a professional attempt at making a viceless CO_2 power plant and from the attitude of the manufacturers it is obvious that they are not finished improving it yet. It would be useful to be able to purchase the Turbo Tank separately to update existing Telco motors and the standard prop is poor. Virtually any commercial plastic one gives a performance improvement but these are small points.

Top Valve problems

I have encountered some 'problems recently with the ball and socket valves in the cylinder heads leaking. I didn't think this mattered particularly until the other day when contest flying in the very cold and dry (worst possible) conditions standard units refused to run smoothly. Of course any leak no matter how tiny from the top valve wastes gas throughout the entire stroke and worse than that creates back pressure on the piston as it moves up the cylinder. What is more the constant leak tends to freeze the motor faster than would otherwise occur. Hence it is wise no matter whether you fly a standard or Turbo unit to invest in plenty of spare valve seats and balls and change them over until you can hear no gas escaping when the piston is at the bottom of the stroke. A used sparklets bulb will have sufficient charge left for a number of tests so you don't have to use a new bulb every time.



The engine installed in a pylon model. Note the skid which is to stop any damage occurring to the downward pointing filler.

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FROM THE HANDLE

RACING Jim Woodside

OLIVER TIGER ENGINES

At this year's National's, a competitor remarked that he thought Oliver engines were no longer produced. While it is true that Oliver Engineering have not advertised in the commercial magazines for some time, the production of engines continues and are available direct from the factory.

It is sad to report the recent death of Mrs John Oliver after a long illness. I am sure that you join me in extending our sympathies to the family. Oliver Engineering has always been a small family business and the relatively small volume of production has of late suffered because of the difficult circumstances just mentioned. However Mr John Oliver has indicated that he expects normal schedules to be re-established.

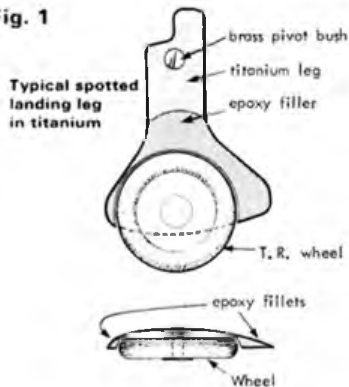
TIGER CUB SCHNUERLE 1.5cc DIESEL

The new schnuerle ported Cub made its appearance last year and is now beginning to establish itself in 1/2A team race. Essentially the motor is a developed MkII in that it uses the complete case and bottom end from the radial port engine. Three transfer ports are now machined into the case. A full depth finned jacket holds the liner and incorporates some of the transfer ports. The split case is held together with four steel bolts. The crankshaft is now 1/2" diameter at the front end and takes the extended prop driver from the MkIV Tiger. This should mean that more elegant nose profiles can be built onto 1/2A models. As the engine is rear exhaust, a close cowling system as used on Nelson models may prove to be the best cooling system. Time and experiment will tell.

Recent reports have indicated that the Schnuerle Cub has moderate speed of about 23-10 but is high on laps — up to 75 per tank. No doubt engine buffs will try to trade off some range for speed by changing the engine porting. If high lapage proves to be a design trait, then perhaps Oliver's may consider design changes during future production runs.

Modellers interested in this engine and other units should contact John Oliver Engineering Ltd., 248 Ringwood Road, Ferndown, Dorset. Phone Ferndown (0202) 872379. Current list includes Standard MkII Cub £28.

Fig. 1



Schnuerle Cub £35. MkIV Tiger 2.5cc £29.50. Tiger Major 3.5cc new production run in 1981.

TITANIUM

The advantages of titanium as a material are easy to appreciate. It is very strong and lighter than stainless steel. It does however, murder normal drills and hacksaw blades.

For some years now I have been making the landing legs on my team racers from titanium and have never suffered any of the failures or bending associated with piano wire or steel.

Titanium has not been readily available as most factories do not stock the metal or have very high minimum order charges. However several sources are now open to us modellers.

Maple Models 1.6mm sheet at 49p per square inch plus a 50p cutting charge per order.

Michael's Models 1/4" strip at £1 per inch run.

Glenn Lee Speed flyer Glenn Lee has been supplying strip and sheet for some years \$10-15 usually brings a usable selection. Also supplies nicely made poly carbonate wheels for racing models.

Shadow Racing 1/4" strip in .020", .032", .040" at 1100 S.E. 28th St. Ocala, Florida 32670. U.S.A.

MAKING A LANDING LEG IN TITANIUM

The simplest answer is to use a strip of Titanium about 1/2" (12mm) wide, mount the wheel using an axle bolt and suspend in the fuselage. This can be in a rubber packed box to give some degree of shock absorption or sewn and epoxied to a plywood plate.

If you want a spatted type to give a degree of streamlining, proceed as follows. Obtain a piece of material about 2 1/2" x 2". 1. Mark out the centres and mark out the outline of the leg. 2. Drill holes and cut out the blank using files and hacksaws. 3. Now bend the 'ears' of the spat to meet the centre line of the wheel. 4. File away the outer faces of the ears on either side of the centre section to a thin profile. 5. Roughen inner face and mount wheel in place. Wrap the rim of the wheel with thin polythene. Fill in the adjacent areas with epoxy filler. 6. When set, carve and sand the filler to a smooth profile. 7. Check that the wheel is free to rotate.

A clean spatted wheel can give a measurable increase in airspeed of about 3/10th of a second in ten laps. Three seconds in a race can make all the difference to your final result. However you should be careful to mount the wheel along the fuselage axis or you could end up creating more, not less, drag. (See Fig 1)

SMAE CONTROL LINE TECHNICAL SUB-COMMITTEE

The new committee held its first meeting on December 8th. Arthur Eves was elected as the new Committee Chairman. Most of you will know Arthur as a keen aerobatics pilot who competes despite the loss of both of his legs. Let us wish the committee a successful period of office. Enquiries should be directed to Arthur Eves, 51 Grosvenor St., Cheltenham, Gloucester. Phone 0242 518097.

THREE SISTERS INTERNATIONAL C/L EVENT

I am glad to be able to report that the C.I.A.M. of the FAI has confirmed the date for the first British International event. Proposed classes are F2A, F2C, F2B. Dates 23rd and 24th May, 1981. Entry forms have already been sent out, but if you have not received details, contact Gordon Isles, 'Shalom', Hawkins Lane, Rainow, Macclesfield, Cheshire, England.

TRIBE RACING PROPS

Ron Tribe, the maker of the well known range of glass and carbon team racing props has moved house. Customers old and new should contact Ron Tribe, 19 Shelbury Close, Sidcup, Kent. Phone 01 302 3884.

The present range of props includes 1/2A, Goodyear, F.A.I. in glass and a limited quantity of the new Meikemeier prop made in carbon. All are well made, as I can personally endorse.

ODDY RACING PROPS

For those who live in far-flung places like Australia and New Zealand, there is a source of FAI props nearer to hand than Europe or the USA. Hutton Oddy produces some very good quality products at very reasonable prices (£2.50 per

prop last year). I have used these myself on our Nelson models and have found them to be very competitive. Orders can of course be posted overseas. Well worth investigating. Details from Hutton Oddy, 16 Nymboida Crescent, Campbelltown 2560, N.S.W., Australia.

SMAE NORTHERN GALA CHURCH FENTON — 26th OCTOBER, 1980

Last year ill-feeling spoilt the Northern Gala, I am glad to report that the only fault this year was a lack of daylight! The event should be re-timed for 1981 to fall within the period of British Summer Time. Failing light and the need for a mid-day curfew meant that semis in FAI and 1/2A had to be discarded which is disappointing for potential semi-finalists who had travelled many miles to attend.

FAI and 1/2A were both run by John Horton and Don Haworth.

FAI TR WHARFEDALE TROPHY

13 entrants	Heat	Final
1 Langworth/Broadhead	3.56	7.53
2 Nixon/Campbell	3.49	8.00
3 Wilson/Gardner	3.45	8.53

1/2A TR BUDAPEST TROPHY

13 entrants
1/2A continues its upwards surge of interest with new models and engines to be seen as well as ever faster overall heat times. Taffy O'Neil's Webra Speedy joined the under-4s with a 3.58. However the 'on form' Langworth/Broadhead took the final in a new record time using a side exhaust version of the Cub Schnuerle (the design has now settled on rear exhaust — see elsewhere in this column).

	Heat	Final
1 Langworth/Broadhead	4.09	7.51.4*
2 O'Neil/Bollen	3.58	8.22
3 Nixon/Campbell	4.18	9.13

* New final record.

GOODYEAR TEAM RACE

17 entrants
Run by members of Norwest and Wakefield, there were sufficient personnel to run heats, semis and two finals — but only just.

The new model of Stubbs/Schofield, a Ross R.V. powered 'Deerly' was very impressive, showing 22.5/10 air-speed. A new record heat came their way and they think that a few more seconds can be pared from this time.

As a by-line I might add that I flew my first ever competitive race as a pilot in this event — an experience I found very educational!! Nuf said.

	Best Heat	Semi	Final
1 Stubbs/Schofield	4.13.2*	4.14	8.59
2 Catlow/Jephcott	4.26	4.28	9.25
3 Woodside/Ross	4.42	4.32	9.33

* new record.

Novice Final

1 Leeman/Hardwick	9.48
2 Hammersley/Horne	11.30
3 Smith/Rudge	Rtd

Class B' TR E.T.A. Trophy

Six entrants
Wilson/Gardner continued their Nationals winning way in this event. It is however interesting to note that the third place team of Toogood/Ward were using a K&B 21 and were conceding very little to the 29s. I think that this gives a lead to those who feel the weight of piped-silenced 29s is too high for comfort. Certainly there must be many 3.5cc class aroud from last year's Goodyear rules.

1 Wilson/Gardner	8.24
2 Sladdin/Laurie	9.26
3 Toogood/Ward	DNF

1980 WHARFEDALE 1000 (RUFFORTH 1000) NOVEMBER 2nd 1980 RAF DISHFORTH

This year's event was the 21st of its kind. The traditional home of the 1000 lap race for class B' models was RAF Rufforth, but the loss of this venue has brought about a change of title. Interest in B' this year has not been high and so it was perhaps not unsurprising, that only four teams turned up. Organiser, John Horton, ironically points out that 1968 was much worse — only two teams actually flew a race.

Wilson/Gardner/Archer had a trouble-free race to record a near record time of 41.45 secs (40.44 record). Their OPS 29R V required no plug changes. Good range meant only 14 pit stops.

Second place team of Jarvis/Needham followed an old play in using a large diesel — in this case a converted K&B

21 However they did not find economy in operation as they had no less than 26 pit stops

NORWEST CONTROL LINE RACING CLUB

NORWEST was formed under the guidance of Derek Heaton, over the winter of 1972/3. It brought together under one banner the racing teams belonging principally to the Leigh, Stockport and Chester clubs. That the amalgamation was successful is a matter of history. NORWEST had a large measure of record breakers and U.K. International team members. Several SMAE officials have come from the club. Various other club members, particularly John Daly, produced and marketed many of the items essential to the construction of competitive racing models.

However nothing is for ever. Over the years founder members have retired from the sport, emigrated or left to join other clubs. Affiliations in 1980 totalled only five. On 27th November, 1980 the remaining members decided to disband and join more local clubs. Some club funds remained and this will be used to purchase two trophies.

1. A substantial item for the winner of FAI TR at the Three Sisters International.
2. A smaller award to be given at the popular Friday evening FAI event, which it is hoped will continue.

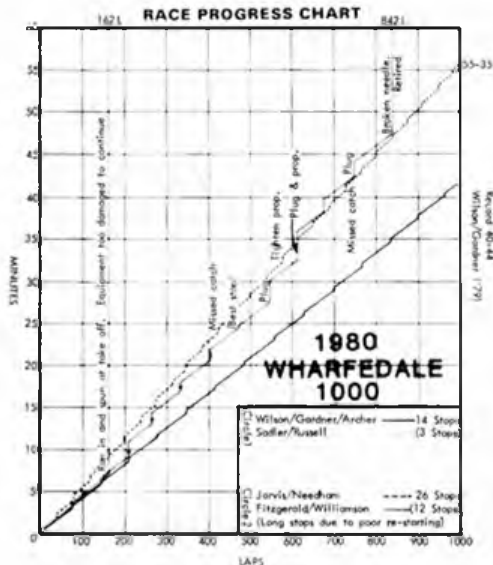
THE FUTURE

Although disbanded under amicable circumstances, it was nonetheless sad to witness the demise of a club with which I was so closely associated. Interest in serious control line racing is numerically small and the loss of a major club raises the prospect of yet less personnel to organise large events — particularly the centralised meetings and the Nationals. This brings me to a topic which has been on my mind for some time, I think that we need a National body to provide ground services. We already have the leadership in the SMAE technical committee. I know from experience that what is lacking is the willing body of organisers and helpers. The SMAE cannot now look to the 'big' clubs like Wharfedale and Feltham as they are themselves lower in numbers than previously.

Many of you will perhaps recall the Racing Symposium of 1979 at which the SMAE and competitors met in an forum at a Birmingham motel. The time is right for another such meeting in my opinion. Your response and ideas can be channelled through the editor or better still, to the Chairman of the SMAE Control Line Technical Committee. **Stop Press:** Bob Horwood of the C/L sub-committee has provisionally fixed a symposium date for Sunday, March 29, to be held in Birmingham. Please ring Bristol 48769 for further details.

C/L CLASS B RACE RESULTS

1st Wilson/Gardner/Archer, Club Tynemouth, Model Susie Wong Mk 28, Eng. QPS29RV, Prop Irbe, Sarogue, Time 41.45
 2nd Jarvis/Needham/Fitzgerald, Club Stockport, Model Revised 1st Quicke, Eng. XB21 (Diesel), Prop Fry 7" x 6", Time 55.35
 3rd Fitzgerald/Williamson/Davies, Club Wharfedale, Model Yellow Peril, Eng. QPS29RV, Prop Gray 8" x 7", Time 84.2 Laps
 4th Sadler/Russell/Hammond, Club Feltham, Model Has Bean, Eng. ST G21.29 RV, Prop Gray 8" x 7", Time 162 Laps



March 1981

STUNT Glen Alison

ANNUAL GENERAL MEETING OF CLAPA

The Control Line Aerobatics Pilots Association, announced the 1980 League Table positions. The results of all stunt competitions are collated and points given for positions on a flier's best seven events in the year on a basis of 50 for first place, 49 for second, etc. The results give a basis on which a flier can judge his relative performance from year to year. The top five this year are:

Club	
Pete Tindal	349 Bretons
Bill Draper	346 Nottingham
Neville Dickinson	332 Newton Aycliffe
John Lynch	330 Bretons
Rob Etherton	325 Cosmo

CLAPA publish a bi-monthly newsletter which is full of stunt news, competition details, letters and "avantgarde" features of the "state of the art". You can join by sending £3 annual subscription to CLAPA Membership Secretary, Jim Mannal, 27 Kestrel Road, Bedford. No serious stunt flier should be without it!

TRENDS FOR 1981 — WHAT ARE THE TOP STUNT FLIERS DOING THIS YEAR

I recently spoke to six of the country's most successful competitors and asked them about their plans for 1981. The result showed one or two surprises.

Peter Tindal

Long famous for his APS Chipmunk, powered mostly by ST46s and the occasional Fox 40, he has a fresh start in both design and engine. The new model is also semi-scale, the French lightweight aerobatic CAP20. It has a wing span of 65in (1650mm) and wing area of 890 in² (55dm²), and will be powered by a Ron Checkfield tuned Merco 49, probably with a 13" x 5" propeller. Not content with this, Pete has also started work on a sister design, the CAP 21, which is slightly smaller, and has a straight tapered wing instead of the semi-elliptical of the CAP20, this will also be powered by a Merco 49. He is using novel construction techniques for these models, a combination of balsa and polystyrene foam for both wing and fuselage. The wing utilises a 'D' box leading edge of balsa veneered foam, but with the construction behind this point conventional. (See February 'From the Handle')

Barry Robinson

Barry has a Mark III version of his 'North Wind' design completed. Smaller than the previous models at 650in² (50dm²), he has forsaken the Merco with which he won this year's Nats, in favour of the Irvine 40 which he has been helping to develop in conjunction with Pete Halman of Irvine Engines. By modification to the venturi and cylinder liner, they have produced a motor which is much less 'peaky' than before and gives a good solid 4-stroke power and acceptable fuel consumption. He reports 8000rpm on a 12 x 6 wood prop which gives a lap time of 5.2 secs with the new model, which weighs 52oz (1500g). Incidentally, Barry is trying a very thick wing section which is 2 1/2 in at the root, 2 1/4 in at the tip and is very pleased with the results so far.

Jim Mannal

Jim has been flying a Merco 35 powered Nimrod of various marks for as long as most people can remember, so it will come as a surprise to hear of his plans this year, although not very drastic. He has built a new Nimrod which is enlarged approximately 10% over the APS version, but with a much more 'modern' approach to the styling to 'bring it into the eighties'. Wing section is still a constant 17% but the flap size is much increased. Powered now by an ST 46 using a clunk tank, Jim should stand a good chance of gaining a top position after a rather disappointing season last year.

John Lynch

John is designing a new model in the same general style as his 'Eagles' of the past, but with slight enlargement overall. Engines with the STX45 rear exhaust that he experimented with last year, or an ST Como 51 if he can get one, as they are only available in the USA at the moment. The only problem John had with his X45 was excessive fuel consumption which he hopes to cure by fitting a smaller venturi. He didn't have room for an 8oz tank in his fuselage. John is also stripping off and re-covering last year's ST46 model.

Brian Dyke

Brian has been very busy this winter with two projects, firstly he has built a Genesis utilising built-up construction and a detachable wing. The wing is particularly interesting in that whilst the leading edge section is a sheet balsa 'D' box structure, Brian has made the rear section perfectly straight by using strips of 6mm x 2mm balsa instead of sheet wing ribs, this also helps to make the wing cheap to build. In addition to this, he has cross braced the strip diagonally to produce a geodetic or "Union Jack" pattern which has had an amazing effect on the torsional stiffness of the wing. This not only helps to prevent warps developing during the covering process but eliminates the temporary twisting which can occur during sharp manoeuvres. Engine is an old and trusted Merco 49.



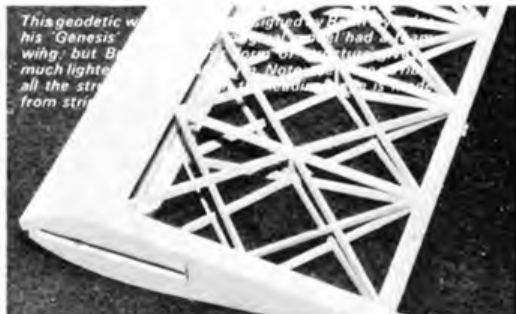
Geared Webra 61 installed in Brian Dyke's Westland Wyvern stunt model.

Secondly and certainly more spectacularly, Brian is installing a geared Webra 61 — into his well known Westland Wyvern semi-scale stunter which has previously powered by a Merco 61. This as the photographs show, has involved extensive modifications to the nose of the aircraft, firstly removing the old engine bearers and then installing a new purpose-made radial type to suit the unusual geometry of the Webra. This is because the gear-box on the front of the engine has the effect of moving the thrust line up and over to one side by about 30mm and thus if the propeller is to be in the correct place, then the engine has to move. The reason for the change in the quest for more power and the ability to drive a large four-bladed propeller. Because the new engine is much heavier than before, Brian has had to move the fuel tank right back near the CG position and rely on a Robert fuel pump and pressure regulator to deliver the fuel. There are many unknowns here as to how the whole system will perform, but is certainly an exciting project, and I cannot wait for the first flight!

Bill Draper

Very little change for Bill, he will continue to use his Hawk with Enya 35 and Super Hawk which is about 6% larger with an Enya 40. Bill prefers the smaller model in windy conditions as it has a thinner wing and penetrates better.

Are you doing anything new or exciting in stunt this year? If so, please tell us about it.



This geodetic wing is his 'Genesis' wing, but it's much lighter than the 'Union Jack' all the strips from string.



mistakes can be easily corrected.

The first coat applied to the model was the white base coat for the top of the fuselage and either side of the fin. For this an aerosol can of 'Carplan' Arctic White was used. These car paints have very good covering power, dry quickly, are easy to apply and light in weight. The rest of the aircraft apart from the top surfaces of the upper wing and the tailplane, is silver. After leaving the white to harden thoroughly for a couple of days these areas were masked off and four thin coats of Humbrol silver dope applied by spraygun. This also has excellent covering power and does not affect the 'Carplan' paint in any way.

The red checkers and the black registration letters were applied in Humbrol Matt Enamel. This was chosen because it remains rather soft for approximately twenty-four hours after application, and does not really bond completely onto either of the other paints. The great advantage of this is that it allows any small runs or bubbles that have crept under the masking to be removed very easily by gently scraping them away with a brand new scalpel blade without damaging the paint underneath. This is far more effective than touching-in such small errors by hand afterwards.

In order to keep all masking down to a minimum the enamel was applied by hand with a small artists paintbrush. Spraying would have required the masking of the entire model, whereas by using a brush the paint goes precisely where it's required. The bright red matt enamel has very good covering power over a white base, and very slightly thinned with white spirit to help it to flow only two coats were needed. The squares were masked each using four strips of 6 mm wide Sellotape in alternate bands around the fuselage so that no two squares with any corners touching were painted at the same time, i.e. bands 1, 3, 5, 7, etc. were masked, painted, then allowed to dry, the masking was removed and then bands 2, 4, 6, 8, etc. were masked and then completed. At the same time a number of shaped cut-outs in the red squares forming the white outlined background for the letters had to be masked individually and carefully located.

Each group of registration letters on either side of the fuselage had to be scaled up separately since the typographic errors in the formation of the letters on the full-size aircraft were quite prominent after careful study. The exact enlargement of this kind of detail is best achieved by photographing the letters as a complete group, and this can easily be done from a magazine photo using a SLR camera with either a macro lens or with extension tubes used together with a standard lens. A black and white negative is all that is required which is then put into a standard slide mount or film strip projector, and projected to the exact size required onto a sheet of white paper. Each letter with its own peculiarities is then carefully traced off in pencil ready to be transferred to the

NEWS FROM 2FSA

The latest get-together of the Free Flight Scale group took place on December 13th at Guildford ATC Headquarters of 261 Squadron through the organisation of John Coker and Cedric de la Nougerede. The meeting was well-supported with many new faces present which we all hope to see again on the flying fields during 1981. The usual mixture of model talk, model display, food, and drink, was well maintained with the latter part of the evening being given over to a slide show. The slides were an interesting cross-section from the collections of Fred Longbon and Butch Hadland with Fred doing all the honours with a marathon stint at the single slide change projector. His own showed a selection of vintage F/F Scale models, each with its own little story to be told with great relish, whilst Butch's slides covered part of his RAF service in the Middle East and included some very unusual aircraft to be seen in desert surroundings.

The building board has been kept fully occupied of late if Fred's other contributions are considered. These included a very handsome *Stearman C38* from the American Flyline kit in maroon and silver livery and powered by a DC Merlin, and a quite unique *De Havilland Hawk Moth* for CO2 power. This silver and blue model was built to exact scale with no modifications to tail areas, etc., and at approximately 600mm span seemed nicely suited to the Telco powerplant.

Another two CO2 models were brought by David Deadman, each again being an original choice of subject in the *Hawker Tempest II* to 1:24th scale, and a *Percival Mew Gull* built (scale unknown) to app. 480mm span. The *Gull* is fully sheet covered as per the full-size aircraft and is well up to scratch as a static display should the weight prove too much for good flight performance. With twin tanks in the fuselage and knock-off wings the model is not

exactly a lightweight at around 80 grams, but nevertheless a very elegant machine.

Also from the *De Havilland* stable and also in the unusual category were two further *Moths* built by Derek Knight and Cedric for Peanut Scale. Cedric's accurate *Tiger* now sports nothing less than a female wing-walker, and apparently still flies reasonably well! Derek's is a *Gipsy Moth* in RAF silver livery and like the other one features rib-for-rib construction with great attention to fine detail.

Without the space to mention every new model present I would like to note a new *Sopwith Tabloid* built to ultralight weight for Indoor Twin Brown Junior CO2 by Nick Peppiatt. At approximately 575mm span this model has an exceptionally low wing loading, and ought to be well in contention during the 1981 flying season.

A COMPLICATED COLOUR SCHEME

In a previous column I mentioned the somewhat complex checkerboard colour scheme used on the *Miles Satyr* (featured on p. 29, January 'Aeromodeller'), and the chosen method of painting this particular scheme may be of interest. The pattern on the fuselage is additionally complicated by the superimposed registration letters, which, in themselves being partially outlined in white, led me to doubt the sanity of the designer of the original scheme more than once during the painting sessions!

Having tried many different masking materials in recent years such as Sellotape, masking tape, film, fluid, Fablon, iron-on films, etc., and finding none except the first to be totally predictable in use, I decided to try a combination of different kinds of paint to minimise the amount of masking required as well as the risk of difficult to hide mistakes. The idea was to use one paint on top of another with which it will not form a wholly complete bond in a short space of time, so that any little runs or



Nick Pappalatt launches his N.A. Mustang at Milton Keynes. This rubber model takes off and flies quite superbly.

masking medium. The fact that the projection is only in negative is not important since it is only the exact outline of the letter, badge, or whatever, which is of concern.

After completing the full red/white checkerboard pattern on the fuselage and fin, the top surfaces of the upper wing and tailplane were brushed painted again in matt enamel using a very soft 10mm wide flat sable-haired artist's paint brush. A good brush such as this will cost several pounds but is worth having to make the best of the smooth-flowing quality of the matt enamel without leaving brush marks.

The black registration letters were applied as follows: A postcard template was made of each individual letter, and the outlines traced onto the model using a Rotring draughtsman's pen. The templates were cut slightly undersize to allow for the thickness of the pen; in this case a 0.3 nib was used for the 25mm high letters on the fuselage, and a 0.6 nib for the much larger letters on the wings. Once the ink was dry the body of each letter was filled in by brush



Fred Longbon's impressive and accurate De Havilland Hawk Moth is Telco powered and looks well in blue/silver scheme.

using matt black enamel and on the larger letters two coats were required. Cutting out each stencil may seem rather laborious but the advantage is that each letter can be refined until it is *exactly* right before being committed to the model, and the process is quite simple really.

Having tidied up all the minor details and sharpened up all the edges the model was allowed to stand for three days to allow the enamel to harden as much as possible. The entire model was then sprayed with three coats of Tufcote fuel-proofer as per instructions on the pack. The first coat was the heaviest and gave a glossy finish, but each subsequent coat was applied with the spraygun being held progressively further away from the model. By working in this way the degree of gloss achieved can be very carefully controlled — the further from the model the gun is held, the duller the surface becomes — but one is safe in the knowledge that the initial strong coat provides the really durable base protection against fuel. This proofer had no adverse effect at all on the matt enamel, I have *not* tried it over gloss!, and the final result is quite subtle. One sure thing is that both the white and the silver will show signs of yellowing with age in due course, but this seems unavoidable with *any* kind of clear over-proofing lacquer. The two-part epoxy-based paints are best at avoiding this, since each colour is fuel-proof in its own right, but one really very good spraying facilities to take best advantage of these, and one has to get masking perfectly right first time. As it turned out it was possible to sit and carefully brush paint *all* the difficult parts of the *Sa* in domestic surroundings without the need for breathing apparatus and without ghastly smells filling the air!

INDOOR SCALE AT MILTON KEYNES

A number of gaps in my own continuity in writing 'Scale Matters' has meant that some news of this meeting is now somewhat out of date, but I think that a note of appreciation to the Indoor Committee on acquiring this superb site and inviting Scale enthusiasts along to share it still needs to be made. Located at Middleton Hall in the Milton Keynes Shopping Centre, the flying took place in rather damp conditions but in quite splendid surroundings. The Hall is approximately 200ft x 150ft. with a 45ft. ceiling making it much larger than the average sports hall, and ideally suited to the flying of CO2 Scale. Corridors at each end of the Hall are open to the outside air some distance away, which in the late October climate meant that tissue and rubber remained rather limp for most of the flying sessions. Over eight hours of flying were available, which made the trip well worthwhile for long-distance visitors. Contests were run and plaques awarded for all events, and entries were well up to the usual levels in quality and quantity. Notable amongst the Scale fliers were the 90 second + flights by Mark Hinton's Peanut *Santos-Dumont*, the number of all-foam models by many builders, and the pair of *Bowers Fly Baby Biplanes*, one Peanut and one CO2 Scale by Harry French. This aircraft has ideal proportions for a flying model, and these two versions in their identical brown and yellow schemes were most attractive. Apparently it will be possible to hold further meetings at this venue in future, hopefully during some warmer weather, but should only one yearly fixture become established, then the indoor scene will be much the better for it.



These beautifully-painted CO2 models, a Hawker Tempest II and Percival Men Gull were built by David Deadman. Each features knock-off wings and the Gull is covered in 1/4" in sheet balsa.



Seen at Milton Keynes is the larger of Harry French's two Bowers Fly Baby biplanes. The larger is CO2 powered and

Club News...

IT IS WELL at times, in this age of instant everything, to bear in mind that aeromodelling is as much a constructional hobby as it is a flying one, however much the emphasis may be on the latter aspect. What we see on the flying field is often the result of much hard — but let us hope, congenial — work that has gone on in the home workshop, kitchen, lounge, or wherever the aeromodeller may be plying his skills. This was borne upon me the other week when I decided to build a tapered wing. Back in the old days, before the advent of the super kit and the cored wing, the production of a tapered wing was considered quite a feat. Even now there is a strong feeling of satisfaction in turning out such an elegant piece of structure.

We begin this month with a report from a club with an unusual title. It comes from John Morris, P.R.O. of the 'Hill or Ridge Soaring Enthusiasts', or — wait for it — 'HORSE' for short. They could have called it the Aeromodellers Soaring Society, or 'ASS' for short, but this may not have been so poetic. Anyway, the club, situated in the Stoke on Trent area, has been in existence for two years, in which time membership, as well as leg muscles, has expanded considerably, being now around the hundred mark. Mr. Morris tells us that all types of models are catered for — except those that make a noise, and that the club operates in a number of publicly owned areas — presumably on the flat as well as the uplands. Anyone interested in joining this form of mountain cavalry (Horse) will require MAP insurance, and the ability to fly models with due consideration for other people, although tuition in flying skills and courteous procedures is provided. The Enthusiasts meet on the third Wednesday in the month at the RAF Association, William Clowes Street, Burslem, Stoke on Trent. Normally meetings start around 8.30 and there is an open invitation for members to bring along wives, girlfriends and even mistresses, with possibly the Chairman's job for anyone bringing all three on the same night. John Morris's address is 128 Eaton Street, Hanley, Stoke on Trent.

N. H. Goodman, who is P.R.O. of the **Coventry & D.A.M.C.**, writes to thank us for the coverage we have given to the club over the past two years. Apart from the satisfaction of having the club's activities widely publicised it has brought tangible benefit in the way of new members. May we, on our part, thank Mr. Goodman for sending in reports and newsletters so regularly. Unfortunately, a change in circumstances means that the club newsletter, 'Wings and Fins' can no longer be produced. It may be, though, that other P.R.O.s may know of some inexpensive ways of keeping club magazines in circulation, and could help in this matter. On the active side of things the club's first season in outside free flight contests did not meet with a great deal of success, but much valuable experience was gained. Meanwhile a few of the members are keeping their hand in with visits to various winter mini-galas. What is out, though, for the winter months, is the Bramcote hangar for indoor flying: the Army having pushed up the charge to an impossible £6 per hour for the use of this empty shed, with lighting as the only facility. Not such a dire loss, though, as the draughts simply howled through. But anything for a quiet life — and this was amply — though not amplified — demonstrated in the club's Quiet Model and Landing Competition. Various devices were used to reduce the decibel output, but most effective was a combination of extended exhaust and larger prop. P.R.O.: **N. H. Goodman, 23 Berwyn Way, Stockingford, Nuneaton CV10 8QW.**

Featured in 'Flying In-formation', the newsletter of the **Northampton M.A.C.**, is a report on the club's Annual Social and Prize Giving. Held at the Casuals Rugby Club, it proved to be a well attended evening, though not a scrimmage. Dave Boddington was there with his wife as guest of honour to present the Club Championship Trophy to Phil Roseblade. In his speech he commended the club on providing a series of competitions to cover all aspects of model flying. In this regard it is interesting to note that Phil Roseblade took part in Chuck Glider, CO2, R/C Glider, Control Line and Scramble. Other notable all rounders were second man Trevor Heasman, and also Lionel Mayes. Roger Brown, the newsletter editor, has run his

own obituary column for the loss of three radio models within three weeks. He is sticking to model flying though, as he is unable to find a vacancy in a Golf Club. **Secretary: Roger Brow, Warwick House, Church End Road, Northants.**

Looking back over 1980 in the newsletter of the **Leicester M.A.C.**, the Chairman's report reveals that the club membership remains above the 200 mark (But what if they all turned up on the flying field at once?) Half the membership is affiliated to the S.M.A.E., and there is plenty of participation in all branches of the hobby, particularly in the many and various club events. Big last minute shock of the season was the loss of Arnesby, where the club had been operating so successfully throughout the year. Let us hope that other possibilities open up. Going great guns, though, is the Glider Group, establishing a club record during the season with a Thermal Competition entry of an amazing 23. But why are not more people interested in free flight? Despite the evident attractions of controlled flight, free flight has still much to offer, in scope for experimentation as well as cheapness. Even so, the small Leicester F/F contingent has made its presence felt (and, in their red team sweatshirts, seen) on the contest circuit. On the 1979 results Gerry Ferar was rated number eight out of the top 30 free fliers. The free flight section may be proportionally small, but by general club standards a turn out of 7 competitors for the last round of the Winter Club league is not all that bad. John Birch topped out as the 1980 Free Flight Champion. **Secretary: I. McKeggie, 12 Ponchin Drive, Burnhill Park, Market Harborough, Leics.**

Since vintage contest flying has its dubious aspects, someone writing in **Northern Area News** suggests instead a Geriatric contest, in which to compete you have to be born before 1929. Too late, though, I would say to him: such contests are already well established, at least down south where the grey heads outnumber those of natural tint. Quite an amusing piece on the subject. Both the November and December issues of N.A.N. are taken up with contest reports, with little of general interest to comment upon.

Dipping into 'High Flyin', the newsletter of the **Anglia M.F.C.**, my eye fell upon the following remark, "The rain is lashing down, it is blowing a force six and it is cold outside. Yes, folks, it's Sunday!" How true. I have been flying for more years than I care to remember but I have never experienced such a long, continuous spell of rough weekends. Obviously this has been having a depressing effect on model flying generally, although it has come at the tail end of what has been a good year for the club, particularly in Thermal Soaring where members have excelled both in performance and in the mounting of successful open contests. Look out, though, for the 1981 Scale

CAPTION CONTEST



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Event, details of which are still being worked out. In free flight there are active stirrings from the doldrums of the past couple of years, not least of which comes from the re-appearance of Bob Wells on the flying field. He is also reporting again in the newsletter. Coupe D'Hiver continues to be a particular forte of the free flight section, with Derek Neil winning at the Devon Rally and ultra-veteran Len Ranson taking the Boutillier Trophy at the Aeromodeller International. **Secretary: C. J. Goodley, Chase Farm, Woodham, Nr. Timer, Waldon, Essex.**

I was pleased to learn that the youth orientated **Mitchell Model Club** of Stoke on Trent is still going strong. The Chairman, Mr. A. Edwards, has sent along a report in which he reminds us that the club is now into its 5th year, and also that the eponymous hero of its title is the creator of the famous Spitfire. Round the Pole flying has a special appeal to young people, involving little expense and even less travelling. Needless to say it is popular in the club, and recently the staff and pupils of Horley High School were entertained with the 55th in a series of displays to be given at the school. The delighted Headmaster expressed his gratitude by sending the club a cheque for £5 to cover transport costs. The local press looked in upon the occasion, and took photographs of the plane that never was, the Mitchell Bomber. The model was built and flown by club doyen, Fred Ford, a youthful 74 and still as keen a model flyer as ever. Under his tutelage the school pupils are to build a model Spitfire to grace the school entrance, and he is also giving them instruction in the building of r.t.p. models. The club has associations with the HORSE slope soaring club mentioned earlier in these columns. **Secretary: David Leigh, 20 Darnley Street, Shelton, Stoke on Trent, Staffs.**

Yet another club to succumb to the lure of the self-aid cum togetherness symbol, the Tee shirt emblazoned with the club logo, is the **Loughborough M.F.C.** The shirts are of a unisex kind, the male embracing, as in grammar, the female.

Membership appears to be on the increase in the **Chelmsford M.F.A.**, in total disregard of all that anti-flying weather we have been experiencing. It is suggested that a limit be imposed when it reaches the 100 level, as it is thought that anything above that would be too much for the average committee to handle. Again, notwithstanding the weather, outdoor flying proceeded both in Combat and Power Radio. More comfortable indoors, though, where in the small club hall, times are being progressively improved in the EZB class, pushing up towards the two minute target. The 1980 Club Championship was decided over six events: A Combat, CO2 Scramble and Duration, Mini Goodyear, PG 7.5 and Indoor Duration. All rounder, Colin Straus, deservedly won with a score in

each of the contests. **Secretary: R. Satterthwaite, 20 Golden Square, Hathern, Loughborough, Leics.**

We rarely hear what is going on in the **East Anglian Area**, but we have had a brief newsletter from P.R.O. Barrie Wade, who hopes to expand into something more substantial in the future. There are a number of clubs in this large, but not overpopulated area, three of which are known to us: **Ipswich, Norwich and Chelmsford.** Most activity is centred upon Watton, where the free flight area meetings have been held for a number of years. It could be that the Area may come more into the centre of things now that Bassingbourn is no longer available.

The newsletter of the **Watford Wayfarers R/C Club** reminds us that winter is the time to overhaul your stock of models; repairing, refurbishing and generally checking over.

News from the **Enfield M.F.C.**, newsletter is the hope of moving to a new and better clubroom at a local football club. It has a bar and is spacious enough for a spot of r.t.p. flying, adding up to a bit of indoor cheer to all that model battering weather that put paid to the club competition. Another cheering item is that the club is now affiliated to the S.M.A.E. A short article on Radio Control brings home to us just how fortunate we are to have the modern compact proportional radio gear at our disposal when but a few short years ago it was all just bang bang rudder stuff, bulky and unreliable. If today's equipment is so sophisticated, and the rate of progress so rapid, what can we look forward to in the future? Perhaps a video look out from the pilot seat of the model. Who knows?

Things look to be rather quiet on the Croydon patch, too, according to the latest issue of the **Three Kings Aeromodellers** "Court Circular". What is extensively discussed in the newsletter is the C/L fourth dimension or fourth line. It is all a matter of beaming electronic signals down the lines to actuate those parts the old bell-crank cannot reach, such as retracts, flaps, etc., all to add realism to circulatory scale flying. All very complex but worth a shot if you are a bit of a whizz with the soldering iron. What flying that has been going on has been mainly around the pole, where some eye catching little models have been doing their stuff. Spots of excitement, too, such as a Spitfire appropriately landing on top of a Stuka. A nice combative touch, but ruinous to the models. **Secretary: D. Woods, 133 Ravensbury Road, Southfields, London.**

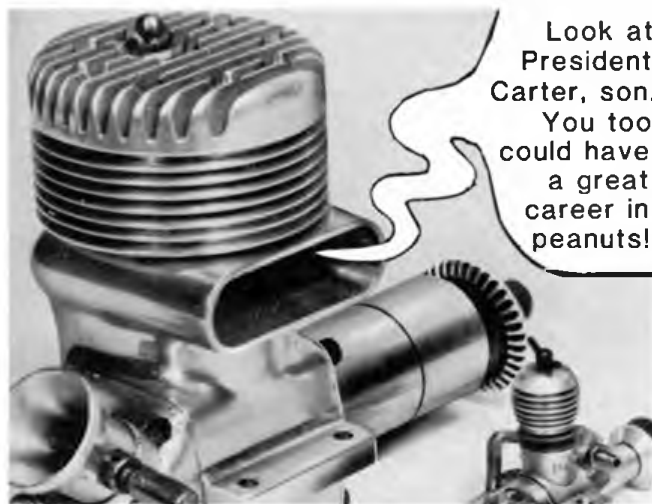
"Aeolus", the newsletter of the **Northern Ireland Club**, the Banbridge A.C., gives us a word of thanks for the publicity we have given the club through the past year during a summing up of what is considered a good year for the club. Away from the club's two 'secret' flying fields, always well activated, some members have been exploring the wonders of Ye Olde English Modelle Shoppe (Well, some have been going a few years). The largest of these emporia are whole Aladdins Caves full of all manner of aeromodelling goodies. You could browse around for hours.

"Nitro", the newsletter of the **Belfast M.F.C.**, reveals the club as C/L orientated as ever, with reasonably sized entries for their Mini Goodyear, Combat and other events. Featured in the club programme are construction and covering demonstrations — most useful.

Jeff Smith, writing in the newsletter of the **Wharfedale & D.M.A.C.**, complains of the lack of coverage given to Control line in this journal. Nothing unusual about that; the free fliers have the same sort of beef. I am sure, though, that our esteemed Editor tries to give a fair crack of the whip to all interests, as indeed I do in my limited way. I admire Jeff for the zeal with which he publicises his particular control line interests, but he should appreciate that these are very specialised areas of model flying.

Many thanks to all our New Zealand friends who send in their newsletters such as **'Free Flight Down Under', South Island News, Torque and New Zealand Newsletter.** Free flight still commands a large following in the lush islands, and what better use to make of the local flora than to put it to good model purposes. It seems that in the swamps grow bull rushes full of feathery seep pods. They make good thermal spotters, floating up on the least suggestion of lift, and requiring no dispersal apparatus beyond a plucking finger. Acknowledged, too, **'Model Aviation Canada'** and the newsletter of the **Zimbabwe N.A.A.**

That's all for this month.



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We had a tremendous response to the January Caption Contest. Runners up included "Didn't I warn you that ether sniffing would stunt your growth?" from J. Beatham, Kent, and G. Symes of Surrey with "Hya baby, I could really glow for you." and from T. Brooks of Nottingham, a piece of prose: "Used to be as young as you, but life was not much fun. They gave me castor oil, it's true. They knew it made me run." And finally S. McEwan from Annan, Scotland, informs us, "Big Brother's watching you."

The photograph was originally used in 'Hangar Doors' June 1954, and was a mystery engine sent for identification, and named the following month as a 10cc racing engine made by Mr. S. N. Bibby. The smaller engine is the Albion Bambi 15cc.

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Tues-Sat 10 00-6 00
Sun 10 00-1 00
Monday closed all day

BIGGLESWADE Tel 313840
IVEL MODELS & HOBBIES *
94-96 SHORTMEAD STREET
Mon-Sat 9 00-6 00
Wed closed
Friday 9 00-9 00

LEIGHTON BUZZARD
Tel 0525-376134
D H MODELKRAFT *
106 NORTH STREET, LU7 7ET
Tues-Sat 9 00-6 30
Friday 9 00-8 00
Half day Monday

LUTON Tel 36218
TAYLOR & MCKENNA
73 ARNDAL
Open 9 am-5:30 pm Mon to Thurs
9 am-6 pm Fri and Sat

BERKSHIRE

READING Tel 51558
READING MODELS *
5 CHATHAM STREET
9 am-5:30 pm each weekday

BUCKINGHAMSHIRE

AYLESBURY Tel 85752
TAYLOR & MCKENNA LTD
46 FRIARS SQUARE
Mon-Thurs 9 am-5:30 pm
Fri-Sat 9 am-6 pm

BLETCHLEY Tel MILTON
TAYLOR & KEYNES 70478
MCKENNA LTD
16 THE CONCOURSE
BRUNEL CENTRE
Mon-Thurs 9 am-5:30 pm
Fri-Sat 9 am-6 pm

CAMBRIDGESHIRE

CAMBRIDGE Tel 59620
MODEL MANIA *
17 KING STREET
Open 9:30 am-5:30 pm
Mon-Sat Inc Lunchtime

CHESHIRE

MACCLESFIELD Tel 0625 29467
HOBBYCRAFTS
(IMACCLESFIELD) LTD
PARK MILL
HOBSON STREET
Open 9:30-5:30 Mon-Sat.

SALE Tel 061 962 4561
HOBBYWORLD *
200A MARSLAND ROAD
Mon-Sat 9:30-6:00
Wed early closing

STOCKPORT Tel 061 480 5478
THE MODEL SHOP
280 WELLINGTON ROAD SOUTH
Open Mon-Sat 9 a.m.-5:30 p.m.
Closed Tuesday

CLEVELAND

MIDDLESBROUGH Tel 211212
HOBBYDROME
283 LINTHORPE ROAD
Open 9:30 am-5:45 pm
Late night Friday 8 pm
Closed Wed

DERBYSHIRE

DERBY Tel 0332 46579
THE BALSAL TREE *
16/18 HOWE STREET
DE3 3ER
Open Mon-Sat 9 am-8 pm
Tues 4 pm-8 pm

DEVON

EXMOUTH Tel 72540
EXMOUTH MODELS
78 EXETER ROAD
Mon-Sat 9 00-6 00

PLYMOUTH Tel 0752 21851
PLYMOUTH MODEL CENTRE
11 OLD TOWN STREET
9 am-5:30 pm Mon-Sat
Late night Friday 6:30 pm

PLYMOUTH Tel (0752) 53330
RUNWAY SOUTHWEST *
16 DEVENPORT ROAD
STOKE, PLYMOUTH
Mon-Sat 9 am 6 pm
(Late night Friday 8 pm)

TORBAY Tel 0803 521767
MANSEL'S MODELS *
PALACE AVENUE, PAIGNTON
Open 9 15 am-5 30 pm
Mon-Sat inclusive
Half day Wed
Late night Fri. 7 pm

DORSET

BOURNEMOUTH Tel 424038
R F AUSTIN - MODEL SHOP *
156 SEABOURNE ROAD
SOUTHBOURNE BH5 2JA
Open 9 am-5:30 pm Mon-Sat
Closed 6 pm Thurs-Fri.
Half day Wed

BOURNEMOUTH Tel 517032
J & H MODELS *
823 WIMBOURNE ROAD
MOORDOWN, BH9 2BA
Mon-Thurs 9 am-5:30 pm
Fri 9 am-6:30 pm Sat 9 am-6 pm

BOURNEMOUTH Tel 763480
WESTBOURNE MODEL *
CENTRE
59 SEAMOOR ROAD
WESTBOURNE
Open 9 am-5:30 pm Mon-Sat

ESSEX

BRENTWOOD Tel BRENTWOOD
ARNOLD'S GIFT CENTRE 226787
4 HIGH STREET
Open: 9 am-6 pm
Half day Thursday

CHELMSFORD Tel 352553
CHELMSFORD MODEL CO LTD
204 MOULSHAM STREET
Open Mon-Sat 9 am-5:30 pm
Wednesday 9 am-2:30 pm

HARLOW Tel 21697 & 418817
K & C MODELS *
PARDON MILL
PARDON MILL LANE
Mon-Sat 9:30-6:30
Sunday 10:00-12:00

ESSEX

HORNCHURCH Tel 40016
RADIO ACTIVE *
94 ARDLEIGH GREEN ROAD
Open Mon., Tues., Thurs & Sat
9 am-6 pm, Fri 9 am-7 pm
Half day Wednesday

WICKFORD Tel (037 44) 2621
WICKFORD MODEL EXCHANGE *
ST PETER'S TERRACE
LONDON ROAD
Open 9:30 am-6 pm Mon
Fri-Sat Late night Thurs 7 pm
Closed Tues and Weds
Sun 10 am-1 pm

HAMPSHIRE

FAREHAM Tel 234136
G M H BUNCE & CO LTD *
206 WEST STREET
Open 9 am-5:30 pm. Closed Wed

PORTSMOUTH Tel 25049
RAY BROWN MODELS *
10 KINGSTON ROAD
Open 10 am-5:30 pm
Lunch 1 pm-2:30 pm
Closed all day Wed

PORTSMOUTH Tel 733208
SOUTHSEA MODELS *
35 HIGHLAND ROAD
SOUTHSEA
Open Mon-Sat 10 00-6 00

SOUTHAMPTON Tel
EASTLEIGH MODEL EASTLEIGH
CENTRE 617849
2e HIGH STREET, EASTLEIGH
Open 9 am-6 pm Half day Wed

SOUTHAMPTON Tel 25919
HOBBY LOBBY LTD *
52 COMMERCIAL ROAD
Open 9:30 am-5:30 pm Mon-Fri
Sat 9:30 am-5 pm

HERTFORDSHIRE

HATFIELD Tel 63404
DESIGN & HOBBIES
5 MANOR PARADE
Tuesday-Friday 9:30 am-6 pm
Closed 2-3 pm for lunch
Saturday 9:30 am-5:30 pm
Closed all day Monday

HEMEL HEMPSTEAD Tel 53691
TAYLOR & MCKENNA LTD
203 MARLOWES
Mon-Thurs 9 am-5:30 pm
Fri-Sat 9 am-6 pm

ST ALBANS Tel 53954
S A M S
12 HATFIELD ROAD
Mon-Fri 9 am-6 pm
Sat 9 am-5:30 pm

HONG KONG

HONG KONG Tel 3-680507
RADAR CO LTD *
3 OBSERVATORY ROAD
TSIMSHATSUI, KOWLOON
Open 10 am-7 pm Closed Sundays

HONG KONG Tel 3-684184
WINNING MODEL & HOBBY
SUPPLIES *
2a AUSTIN AVENUE
KOWLOON, HONG KONG
Open 10 am-7 pm Closed Sundays

ISLE OF WIGHT

RYDE Tel RYDE 64051
WIGHT MODELS *
84 HIGH STREET, PO33 2SU
Open 9 am-6 pm Mon-Sat

KENT

BEXLEY Tel: CRAYFORD 522308
BEXLEY MODEL CENTRE *
18 BOURNE ROAD
Mon-Sat 9-5.30
Thursday closed all day

BROMLEY Tel: 01-460 0818
AVICRAFT LTD *
15 CHATTERTON ROAD
Open 10 am-6 pm
(not closed for lunch)
except Wed 10 am-1 pm

CANTERBURY Tel 69888
THE MODEL SHOP *
83 NORTHGATE CT1 1BA
Open 9 am-5.30 pm inc. Sat
Closed all day Thursday

MAIDSTONE Tel 51719
THE MODEL SHOP *
19-23 UPPER STONE STREET
Open 9.30 am-1 pm, 2.30 pm-
5.30 pm. Closed all day Wed

TUNBRIDGE WELLS Tel 31803
BALLARDS *
54 GROSVENOR ROAD
Mon-Sat 9.15-1.00, 2.15-5.30
Wednesday 9.30-12.30

TUNBRIDGE WELLS Tel 36689
E M MODELS *
42 CAMDEN ROAD
Mon-Sat 9 am-5.30 pm
Closed Wed

LANCASHIRE

FARNWORTH Tel 0204-74688
JOYCRRAFT *
3 BOLTON ROAD, MOSES GATE
Open Mon-Sat 9 am-6.30 pm
Closed all day Wednesday

LANCASHIRE

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

MANCHESTER Tel 061-834 3972
THE MODEL SHOP *
(MANCHESTER)
209 DEANS GATE
Mon-Fri 9.30 am-6 pm
Sat 9 am-5 pm

PRESTON Tel 51243
PRESTON MODEL CENTRE *
LTD
(Opposite Polytech.)
2 FYLDE ROAD
Open 9.30 am-6 pm Mon-Sat

WIGAN Tel 45683
G FORSHAW & SON *
58 MARKET STREET
Open 9.15 am-5.45 pm
Early Closing Wednesday

LEICESTERSHIRE

HINCKLEY Tel 30952
PUNCTILIO MODEL SPOT *
6 WATERLOO ROAD
Mon 9.15 am-7 pm
Tues, Wed, Thurs 2 pm-7 pm
Fri 9.15 am-7 pm
Sat 9.15 am-5 pm

LEICESTER Tel 666363
THE LEICESTER MODEL *
CENTRE LTD
STAFFORD STREET CORNER
MELTON ROAD
Mon-Sat 9.00-6.00

LINCOLNSHIRE

STAMFORD Tel 4524
SPORTS & HOBBIES *
4 ALL SAINTS STREET
Open 9 am-5.30 pm
Half day Thursday

LONDON CENTRAL

FULHAM Tel 01-385 9864
PATRICK MODELS *
107-111 LILLIE ROAD, SW6
Mon-Sat 9.00-5.30
Thurs 9.00-1.00

BISHOPSGATE E1 Tel 01 283 9870
HADLEY HOBBIES *
131 MIDDLESEX STREET
Sun 9.30 am-2 pm
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Very close to Liverpool Street
Station

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

LONDON NORTH WEST

MILL HILL Tel 01 959 2877
H A BLUNT & SONS LTD *
133 THE BROADWAY
NW7 4RN
Open 9 am-6.30 pm Mon-Fri
9 am-6 pm Saturday

LONDON SOUTH

ELTHAM Tel 01 850 4324
ELTHAM MODELS *
54 WELL HALL ROAD SE9
Mon-Sat 10 am-5.30 pm
Closed Thursday

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

LONDON Tel 01 653 4943
NORWOOD JUNCTION
MODELS LTD *
3 ORTON BUILDINGS
PORTLAND ROAD, SE25 4UD
Open 9.30 am 1.30 pm -
2.30-6 pm Mon-Sat
Early closing Wednesday 1 pm

LONDON Tel 01-228 6319
E F RUSS *
BATTERSEA RISE, SW11
Open Fri. till 7 pm
Other days 9 am-6 pm
Early closing Wednesday 1 pm

LONDON EAST

LONDON Tel 01-520 7397
ARNOLD'S GIFT CENTRE *
132-134 HOE STREET, E17
Open 9 am-6 pm Mon-Sat
Closed Wednesday

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 NEEDLE 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 *
88 CATTON GROVE ROAD
Open 6 days a week

NORTHANTS

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

NORTHUMBERLAND

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 (0909) 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. 041-632 8326
 RIDDEL BROS *
 61 MOUNT ANNAN DRIVE
 Mon.-Sat. 9.00-1.00, 2.15-6.00
 Tuesday closed all day

GLASGOW Tel. 041 339 0994
 U-CONTROL MODELS *
 171 BYRES ROAD
 Open 6 days a week 9 am-6 pm

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
 Mon.-Sat. 9.00-5.30
 Wednesday Closed

STAFFORDSHIRE

BURTON-ON-TRENT Tel. 64240
 J & N MODELS *
 22 DERBY STREET
 Open 9 am-5.30 pm
 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
 9 am-5.30 pm
 Closed all day Thursday

WOLVERHAMPTON Tel. 26709
 WOLVERHAMPTON *
 MODELS & HOBBIES
 BELL ST., MANDERS CENTRE
 9 am-5.30 pm Mon.-Sat.
 Early closing Thursday

SUFFOLK

IPSWICH Tel. 51195
 BOWMANS OF IPSWICH *
 37-39 UPPER ORWELL STREET
 Open 9 am-5.30 pm Mon.-Sat.
 Early closing Wednesday

IPSWICH Tel. 79279
 GALAXY MODELS *
 160 FELIXSTOWE ROAD
 Open 6 days a week

SURREY

ADDLESTONE Tel. WEYBRIDGE
 45440
 ADDLESTONE MODELS LTD *
 63 STATION ROAD
 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
 Mon., Tues., Thur., Sat. 9.30-5.30
 Fri. 9.30-8.00
 Closed all day Wednesday

WEST CROYDON
 DEREK FOXWILL RADIO MODELS
 STATION ROAD *
 Open Mon. 12.00-7.00, Tues., Wed.
 9.30-5.30, Fri. 9.30-7.30, Sat.
 9.30-5.00 Closed Thursday

SUSSEX

WOKING Tel. 66493
 WOKING MODELS *
 9 GOLDSWORTH ROAD
 Open 9 am-5.30 pm Mon.-Sat.
 Closed Wednesday afternoon

BRIGHTON Tel. 418225
 HARRY BROOKS *
 15 VICTORIA ROAD
 PORTSLADE
 Open every day except Sun
 8.30 am-5.45 pm (no half day)

CRAWLEY Tel. 21921
 HEATHER CRAFT *
 60 HIGH STREET
 Open 9 am-5.30 pm Mon.-Sat.
 Closed all day Wednesday

EAST GRINSTEAD Tel. 21750
 SOUTH EASTERN MODELS
 5 THE PARADE
 LONDON ROAD, FELBRIDGE
 Open Mon.-Sat. 9.30 am-5.30 pm
 Closed Wednesdays

WORTHING Tel. 207525
 SUSSEX MODEL CENTRE *
 10 TEVILLE GATE
 9 am-5.30 pm. Open six days a week
 Monday to Saturday

WALES

CARDIFF Tel. 29065
 BUD MORGAN *
 22 CASTLE ARCADE
 SOUTH GLAMORGAN
 CF1 2BW
 9 am-5.30 pm
 Early closing Wed. 9 am-1 pm

CARDIFF Tel. 31367
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 34 LLANDAFF ROAD
 Open 9 am-12.30 pm, 1.30 pm-
 5.30 pm, Monday 8 pm-
 Closed Wednesday

WALES

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

SWANSEA Tel. (0792) 52877
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 HOBBIES LTD *
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 SA1 3QQ
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 Late night Fri. 6 pm

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BIRMINGHAM 10
 Tel. 021-772 4917
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 021-373 3535
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 311-313 MARSH LANE
 ERDINGTON
 Mon.-Sat. 9.30 am-6.30 pm

COVENTRY Tel. 0203 76409
 MODEL CRAFT *
 61 SPON END
 Open Mon.-Fri. 10 am-5.30 pm
 Sat. 9 am-5.30 pm
 Closed Wednesday

SOLIHUL Tel. 021-744 3374
 SHIRLEY MODEL SUPPLIES *
 62 STRATFORD ROAD
 Open Tues.-Sat. 9 am-2 pm & 3-6 pm
 Late night Thurs. 8 pm

WALSALL Tel. 23984
 GEOFF PARKER MODELS *
 123 WOLVERHAMPTON STREET
 Mon.-Sat. 9.00-5.30

WILTSHIRE

MELKSHAM Tel. 0225 703311
 MELKSHAM MODELS *
 19 BATH ROAD
 MELKSHAM
 Open Mon.-Sat. 9.00 am-5.30 pm
 Wednesday 9.00 am-1.00 pm
 Free car park opposite

SWINDON Tel. 26878
 SWINDON MODEL CENTRE *
 2 CIVIC CENTRE
 THEATRE SQUARE
 (Next to Wyvern Theatre)
 Open daily 9 am-5.30 pm
 Open all day Wednesday

WORCESTERSHIRE

KIDDERMINSTER Tel. 2179
 P & R MODELS *
 103 COVENTRY STREET
 Open: Mon., Tues., Thurs., Fri.
 9.45 am-5.30 pm
 Sat. 9 am-6 pm
 Closed all day Wednesday

YORKSHIRE

BARNLEY Tel. 43561
 DON VALLEY SPORTS *
 28 NEW STREET
 Open 9 am-5.30 pm Mon.-Sat.
 Closed Thursday

BRADFORD 8 Tel. 26186
 MODEL DROME *
 182 MANNINGHAM LANE
 9.30 am-5.45 pm
 Closed Wednesday

DONCASTER Tel. 62524
 B. CURTISS & SONS
 40 DUKE STREET
 Open 9 am-5.30 pm
 Closed all day Thursday

DONCASTER Tel. 27255
 EVANS VALLEY CENTRE
 D. C. EVANS & CO
 (HOLDINGS) LTD
 65 SILVER STREET
 Open Mon.-Sat. 9 am-5.30 pm
 Closed all day Thursday

KEIGHLEY Tel. 0535 65662
 AIREDALE MODELS *
 156 STATION BRIDGE
 BRADFORD ROAD, KEIGHLEY
 WEST YORKS
 Mon.-Sat. 9.30 am-6 pm Tues.
 closed Thur. 9.30 am-7 pm

LEEDS Tel. 646117
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 88 CROSSGATES ROAD
 CROSSGATES
 Mon.-Sat. 6 am-6 pm
 Sun. 8 am-1 pm

LEEDS 17 Tel. (0532) 684809
 JUST MODELS *
 120 GLEDHOW VALLEY ROAD
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 Closed all day Tuesday
 Sun. 9.30 am-12.30 pm

NORTHALLERTON
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 T & F M GROVER LTD
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 Open 6 days a week
 8.30 am-5.30 pm

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 FLYING MODELS
 57 GAY LANE
 Mon.-Sat. 6 am-6 pm

YORK Tel. 0904-34281
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*Nicad Conversion necessary when using these servos.

2-, 3-, 4- or 5-channel
AM or FM



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2-ch



2 ch AM COMBO . . . £22.00

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3-ch



3 ch AM COMBO . . . £30.00

Definitely a 'best buy' for gliders and sailplanes with ailerons — and R/C Trainers (rudder-elevator-throttle). With THREE Servos a COMPLETE OUTFIT only costs £63.00. And you have a system which will serve you for years. Outlast many models. Also you can easily up-rate it to all Nicad working.

4-ch



4 ch AM COMBO . . . £44.50

Definitely the set to choose for high performance, high reliability 'full house' coverage (rudder, elevator, ailerons, throttle) with LOW INITIAL COST. COMPLETE OUTFIT price with FOUR Servos is only £88.50 (you can pay more for an R/C engine!). For extended working, add Nicad conversion.

5-ch



5 ch NICAD COMBO . . . £79.50

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Spitfire	12.95
BD5	17.99
Cosmic Wind	13.99
Mustang	12.95
Warhawk	12.95
Galax IV	19.95

Galax IV and IX
and BD5 do not
have the ZIP
starter

All these models have the Testor 049 glow engine

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