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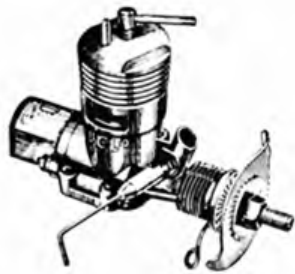
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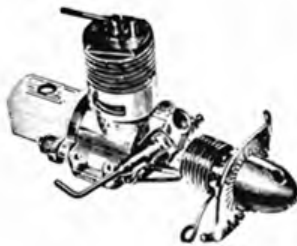
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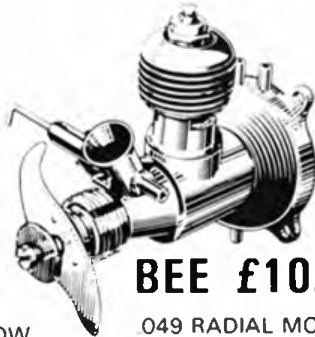


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Aero modeller

DECEMBER 1981

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MAP **MODEL DIVISION MAGAZINE**

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Comment

THIS YEAR has seen an uprise in vintage modelling. At this year's SAM annual general meeting it was even suggested by one member that perhaps the fast growing membership was too much to handle! I was very pleased that it was decided not to restrict the numbers wishing to enrol as I feel this is a major area where the craft of modelling is at its highest and also a grand way to introduce a newcomer to the hobby. The competition scene has also had a

healthy support over the past year and I hope with encouragement from all areas of our hobby, we can attract more new modellers in 1982. A good way to enthuse anyone interested in aeromodelling is a visit to the Model Engineers Exhibition. As regular readers will be aware, this starts on January 7, 1982 and from the feedback I hear there will be a superb show of models.

There will also be many illustrated lectures and films over the whole ten days of the show, which will include an 'Editorial Questions and Answers' event on the 8th and 9th. Lectures of particular interest to aeromodellers are: 'Vintage flying models' by David Baker on the 9th; 'Model Aircraft

for TV and film' by David Boddington on the 11th followed by a film 'I fly them, I break them, I fix them'; 'Vintage Models for RTP' by Derek Farman on the 11th; 'Getting started in Aeromodelling' by John Stroud on the 14th; 'Large Scale R/C Models' by Roy Leaver, and apart from many others, a History of Indoor Flying Models on the 15th by Reg Parham. The lecture and demonstrations of indoor models Reg gave last year was fascinating so don't miss this one.

Last but not least, all the Aeromodeller staff would like to wish all our readers a Merry Christmas and plenty of good flying in the New Year.

Editor

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On the cover

MG 049, one of the models that can be built from the free plan insert in this issue. The M stands for motor, G for glider and 049 for 049cc in engine. The young lady holding the model is Miss Stella Tomlin. Inset: finalists in the British C/L Championships Team Race and Bill Draper, winner of the Gold Trophy

Next Month

We have a revival of the Peacemaker by popular request and a full size plan to build a CO, powered model of the Parnell Racing Pixie. Free Flight, Control Line, Vintage and Engine News plus trade and book reviews. On Sale December 18

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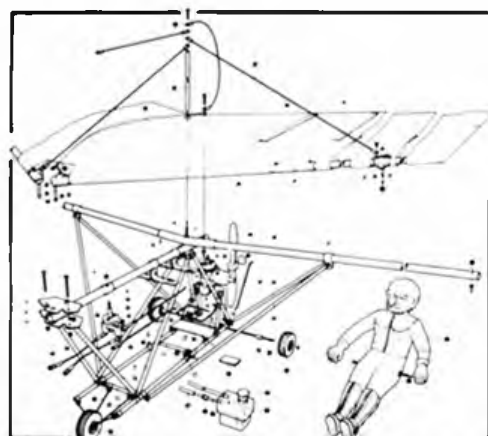
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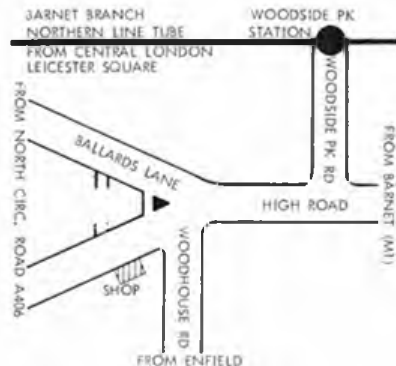


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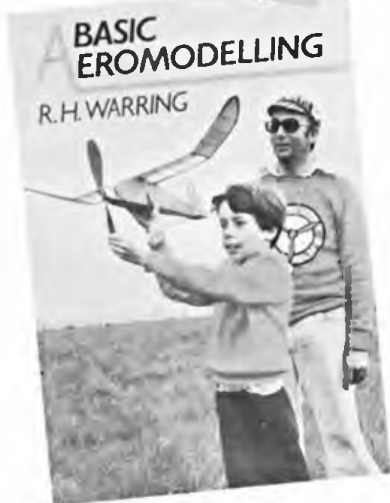
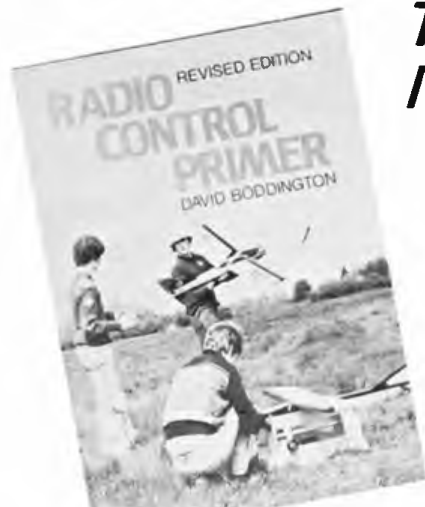


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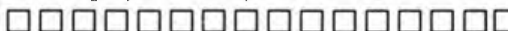
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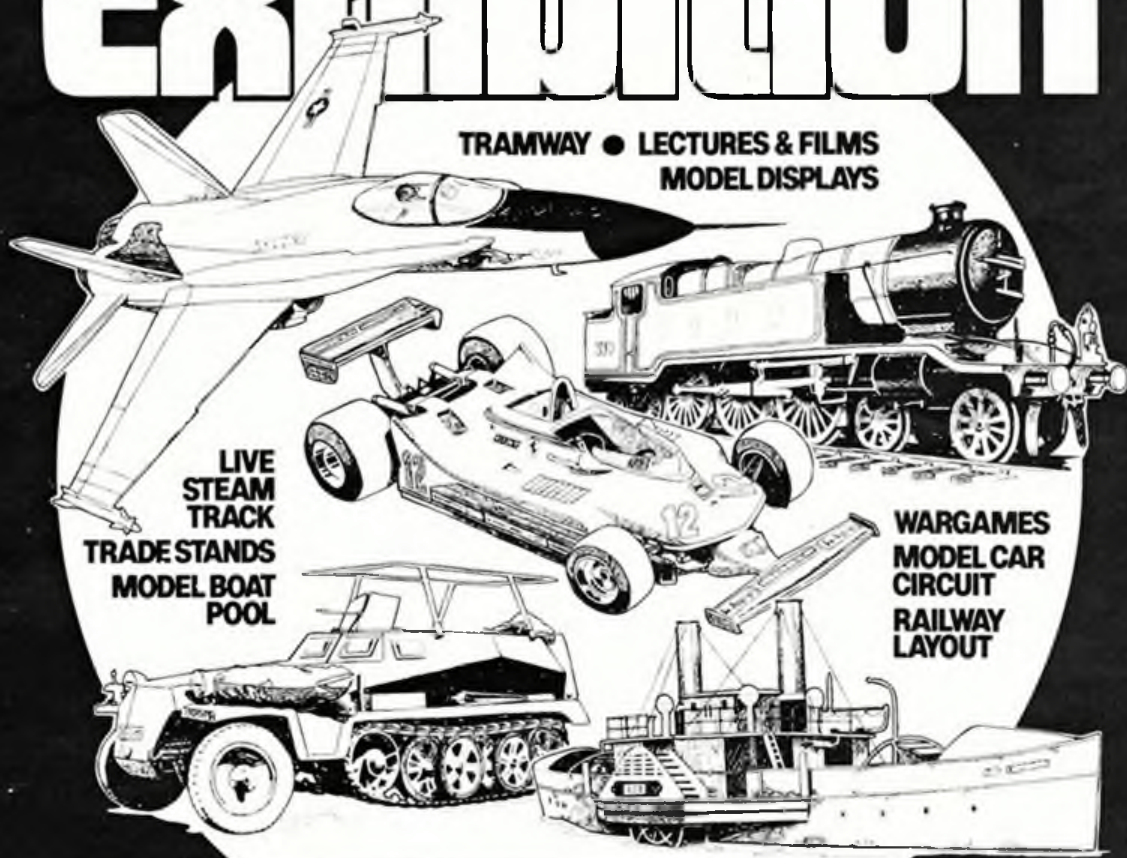
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Model Engineer Exhibition

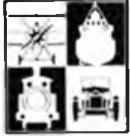


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7th-16th January 1982. 10am-7pm**

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To be opened by The Rt. Hon. Sir Harold Wilson KG OBE FRS MP

It is regretted that for safety reasons no prams or pushchairs can be admitted. However limited pram parking space is available.



**51st Model
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Wembley Conference Centre
7th — 16th January, 1982
(Including Sunday 10th)

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The Exhibition will open at 10.00 am each day (including Sunday 10th) and will close at 7.00 pm except on Thursday 14th, when the Exhibition will remain open until 9.00 p.m.

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Advance tickets are designed to help regular visitors to avoid waiting in the long queues which form on well attended days, particularly at weekends. While it is not possible to guarantee that holders of advance tickets will not have to wait at the special 'Advance Ticket' position for a short while, these tickets take precedence over non-ticket holders. Please use the coupon below to apply for your tickets.

Also, please note that there are special British Rail fare rates, including admission, that are advertised in some MAP magazines. Trains to and from Marylebone, on the Princes Risborough line, stop regularly at Wembley Complex Station, three minutes walk from the Conference Centre. Car parking for the day, currently 80p but subject to increase, is available for thousands of cars at the rear of the Conference Centre.

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One of the sections at Hamleys new store in Regent Street, London. The larger premises allows for a much better layout of the merchandise.



One of the photographs to be seen at London's Flying Start exhibition. A bemused looking A. V. Roe after crashing his Triplane at Wembley Park in December 1909. (Photo by Flight International)

HAMLEYS

The world famous toy shop in Regent Street, London has moved from its long established base at No. 200, just a couple of doors down the street to much larger premises, (once famous as *Gallerie Lafayette*). We had the pleasure of a preview on September 15 when the vast stocks had just been moved-in for the new opening. Gone is the old struggle up those classic stairways to the third floor. We are pleased to say that the model department is now on floor No. 1 where visitors can view famous Veron prototypes hanging from the ceiling and take their selection out of a vast range of model goods. Essentially a boxed item store, Hamleys has never pretended to be a traditional model (or should we say *muddle*) shop. It is slick, clean, designed for shoppers and tourists and its new look lives up to that aim completely. Moreover, it now has a splendidly furnished and efficient cafeteria on the top floor which is to be highly recommended for customers as a rendezvous point, or rest-a-while whenever 'up West.'

LONDON'S FLYING START

The Museum of London's major exhibition this winter will celebrate the achievements of pioneer London aviators. In these early days a relatively unknown handful of young enthusiasts, which included A. V. Roe, Tommy Sopwith, Geoffrey De Havilland, Claude Grahame-White, Frederick Handley Page and the Short Brothers, had just one aim — to build and fly their own aeroplanes. In later years these people found internationally famous companies which produced some of the finest aircraft ever built.

The exhibition will be arranged in three sections. The first will illustrate the initial phase of aircraft design in this country and will be centred around a full size replica of A. V. Roe's Triplane. The second section,

will deal with the great Aero Shows held at Olympia, where aircraft, engines and accessories were put on display for sale to the growing band of air-minded enthusiasts. The final section will evoke the tremendously popular air races and flying displays that were held at Hendon and Brooklands, and did so much to stimulate a widespread public interest in flying.

There will be many photographs and documents on display that have not previously been seen publicly, as well as a collection of early flying models.

The exhibition opens on November 14, 1981 and on February 28, 1982 Alwyn Greenhalgh will be flying models in the lecture theatre which is an added bonus for modellers.

MAP AND RASE LAUNCH NEW HOBBY SHOW NEXT SPRING

What will undoubtedly be the biggest specialist modelling and craft exhibition ever held in the Midlands takes place on May 22 and 23 when the joint MODEL, CRAFT & COUNTRY SHOW is staged in the grounds of the Royal Agricultural Society of England at Stoneleigh in Warwickshire.

The idea behind this new exhibition is to provide a multi-purpose event for the entire family in which each exhibition hall will specialise in a different aspect of all the modelling hobbies, woodworking, and all the craft hobbies.

Visitors will therefore not only be able to choose the halls they want to visit, but will also be able to select the many demonstrations of modelling in action that will be taking place throughout the spacious Royal Showground complex.

Seven Exhibition Halls are to be used to display model engineering, model boats, model aeroplanes, model railways, scale models, model cars, military modelling and wargames. Additionally, woodworking in all



One of the many models that will be on display at the London Museum exhibition, a Sopwith Schneider Seaplane. The model was built by Joseph Michie.

forms, a large variety of craft skills including the gem craft hobbies will each have their own halls. Trade support has been enthusiastic, and most of the trade stands have already been booked.

Modelling and craft clubs and societies and many national hobby associations will play a key role in making this exhibition rewarding for all its visitors. Invitations to participate in demonstrating all the hobbies and crafts in action have been warmly received by a host of clubs and associations who will be exhibiting the work of their members in all the sectors of the hobbies covered.

Additionally there will be several live steam tracks in action, model car races, control line flying demonstrations, model helicopters in action, model boats sailing on the small lake and of course the Echills Wood 7½ in. gauge track in full use.

The lecture theatre will be in use throughout the weekend with a packed programme of films and lectures.

Car parking is free — entry is £1.50 for adults and £1.00 for children and OAPs. There are restaurant and snack bars and of course the showground is ideal for picnics.



DUNLOP PITTS CONTEST

A Grand Dunlop Day is scheduled for July 4 at Old Warden when a specially arranged series of competitions take place for models of the Pitts S-1S in vivid Dunlop livery. Solo aerobatic demos by Brian Lecomber in the full size Pitts will complement the events for free flight, control line and radio control scale, plus static. Both S-1S and S-2 models will be eligible providing they all bear the red and yellow Dunlop colour scheme with the flying 'D' and trade name on the wings and fuselage. There are many kits and plans around to select a model and a most generous prize list plus trophies is sure to attract good support. A special drawing indicating the livery and other special details of the Dunlop Pitts is to be published in the January issue of our sister magazine SCALE MODELS.

Everyone who has seen the colour scheme has remarked on how the bright white base colour with the yellow/red outlines provides a stunning contrast to the traditional all-red scheme which has identified the type for earlier years.

Further details of the contest will be published in following issues. Meanwhile if you want to register for issue of special information, brochures illustrating the full-size machine in colour etc., send a 14p stamp with your request to the Editorial Offices.

COUPE D'HIVER 1981

Just a reminder that the Aeromodeller Coupe d'Hiver (Winter Cup) contest and Anglo-French Challenge, will take place at

"This is the latest thing in transmitters - it incorporates Citizens Band."

Cartoon by Sherry



RAF Henlow, Beds., on December 6. As in previous years, events will include the 80gm class Aeromodeller Cup and 100gm Bernard Boutillier Trophy.

All who attend must sign in at the main guardroom and collect their airfield passes before registration.

It will also be a great help to us if you write and let us know that you are intending to compete, so that we can prepare registration cards beforehand.

PERFORMANCE KITS

Performance kits who are in their 25th year of production, have produced a special PK 25/86 diesel engine to celebrate their Silver Jubilee. Only 112 engines have been made which are available at their stockists.

The 25/86 stands for 25 years in the model trade and 86 for 0.86cc. All of the engines are engraved and vapour blasted and have orange/gold anodised cylinder heads.

Stated revs are 10,000 on an 8 x 4, 15,000 on a 15 1/4 x 4 or 11,000 on a Tornado 7 x 4. The company hopes they will mostly be used for powering vintage type models.

COMPETITION SUCCESS

Dear Sir,

May I say how delighted I was to receive my prize of a Sanwa STAC-4 radio outfit as a result of my win in the 'Spot the Balance Point' contest in the September Aeromodeller.

Having been a lifelong aeromodeller, for several years now I have concentrated on multi R/C aircraft and latterly on scale aerobatic models, and my 12 year old son has taken up R/C flying this season, and I am pleased to say, is making excellent progress with an aileron trainer. This new equipment therefore, is a most welcome addition to our household!

This is the most valuable item I have ever won in my life as I am never lucky in raffles, 'win a car' newspaper contests, etc., so perhaps my luck has changed - I can't wait to check my football pools coupon tomorrow!

Many thanks again, and very best wishes to yourself and the 'Aeromodeller' staff.

David Face

Birstall, Leicester.



November 22

Mini Class Contest Cd'H. A/1, 1/2 A Power CO₂. Duration: SMAE rules to apply. Good prizes will be presented at the close of the event. Venue:

RAF Watton. Contact: Chris Blanch Tel: (0493) 740431.

December 6

1981 Aeromodeller Coupe D'Hiver 80gm Aeromodeller Cup and 100gm Bernard Boutillier Trophy. Venue: RAF Henlow, Beds.

December 13

Indoor Meeting EZB, HLG, SCALE 11.00 a.m.-6.00 p.m. Venue: Colne Valley Leisure Centre, Slaithwaite, Near Huddersfield. Contact: Dennis Davitt, Tel: Leeds 675433.

December 13

WIGAN 70 & HLG Venue: 3 Sisters Recreation Area, Wigan. Start 10.00 a.m. Contact: Dave Allman Tel: (0270) 627116.

December 27

WIGAN 70 & HLG Venue: 3 Sisters Recreation Area, Wigan. Start 10.00 a.m. Contact: Russell Peers Tel: (0270) 60893

January 10

Indoor Meeting EZB, HLG, scale, 11 a.m.-6.00 p.m. Venue: Colne Valley Leisure Centre, Slaithwaite, Near Huddersfield. Contact: Bernard Hunt, Tel: Huddersfield 862353

February 7

CRAWLEY INDOOR MEETING HLG, EZB, RUBBER AND CO₂, SCALE. Venue: Crawley Leisure Centre. 12.00-6.00 p.m. Contact: J. Dolding, 22 Loxwood Walk, Ifield, Crawley, Sussex RH11 0HY.



Norman Ashford's Crusader in slow flight for carrier.



Henk de Jong's (Holland) stunter.

BRITISH NATIONAL CHAMPIONSHIPS 81

RAF Barkston Heath
August 29-30-31



Colin Brown - now the fastest UK pitman.
Ron Truelove's C/L Scale Hampden touches down with its parachute mine held up in the bomb-bay! Model was dogged by electrical and undercarriage problems.

This is the largest European Model flying event of the year, and luckily for all, the weather held fine over the three day period. There were the usual trade stands situated in marquees, supplying the essential spares, fuel, etc. and the hangar was open for indoor flying.

Dave and Janine Rawlings of DPR Models were well established in the hangar, running their Build and Fly Workshop. Their range of clip together models has increased since last year and as always, they gave endless fun to the younger folks.

We would also like to thank the SMAE on behalf of all who attended, for their sterling efforts in organising this massive competition.

A group of happy young modellers at DPR Models Junior Workshop



GOODYEAR TEAMRACE (Daily Mail Trophy) by Jim Woodside

A good entry again for the second year under the 'diesel only' rule. While there has been no general advance in the heat times over last years', many more teams were flying heats in the range 3:35-4:40. A great many more teams were using models which featured built-up fuselages, tanks concealed within the fuselage and spatted wheels, all evidence that competitors are being innovative and concerned for speed while employed less horse power than previously.

Goodyear winners Kane/Doyle with Nelson 15 ABC powered Ole Blue.



GOODYEAR RACE

Open Contest	Best Heat	Semi	Final
1. Kane/Doyle	4:24.9	4:24.8	10:03
2. O'Neil/Boilen	4:27.1	4:32.8	10:25
3. Broadhead/Langworth	4:19.3	4:28.8	10:44
4. Andrews/Horwood	4:22.2	5:31.9	
5. Rudd/King	4:27.2	4:36.1	
6. Catlow/Jephcott	4:27.3	Rtd.	
7. Smith/Yeldham	4:28.7	5:22.6	
8. Hammersly/Horne	4:30.9	5:33.4	
9. Clarkson/Woodside	4:32.4	5:29.6	

Novice Final

1. Andrews/Horwood	10:04
2. Hammersly/Horne	10:23
3. Smith/Yeldham	10:45

Broadhead/Langworth placed third in Goodyear.



Goodyear Novice final winner Bob Horwood (left) with pitman David Andrews.



1/4 A Final - Don Haworth pitting.

1/2 A TEAM RACE (RAFMAA Trophy)

The big story at this year's contest was the appearance of Rob Metkemeijer with an FMV sleeved down to 1.5cc. As the engine is the same physical size as the 2.5 it was flown in an FAI model. Performance, especially when one considers the extra size and weight of the model, was very impressive. Rob is really interested in the long term possibilities of the FAI adopting 1.5cc as the standard engine size and was using the contest as a proving ground for his first foray into this size of engine.

Don Haworth's Special Schnuerle continued to nibble away at the heat record and he put in a nice 3:52.5 in the semis with a one stop race.

The Oliver Schnuerle Cub of the Heaton Woodside team showed good pace with two stops — recording a 3:57 best race. The model was fitted with a fuel system made by Paul Schippers in a size to suit 1/2 A models — very neat and compact. Details will appear in the racing column.

O'Neal/Bollen had the misfortune to damage their best Webra Speedy model just before the semis, an incident which cost them a possible finals place.

In the final the Visser-Metkemeijer team were never seriously challenged for the lead, Horton Haworth had a steady 50 lap range, while Heaton Woodside had to take extra stops to combat the seizing of a

slightly too tight engine, which had only been flown for the first time two days before the contest.

A TEAM RACE

	Best Heat	Semi	Final
1. Visser / Metkemeijer	3:49.7	3:53	7:55
2. Horton / Haworth	3:56.4	3:52.5	8:30
3. Heaton / Woodside	3:57.9	4:00.5	8:50
4. Langworth / Broadhead	4:06.5	4:09	
5. Green / Malcolm	4:08.7	4:07.6	
6. O'Neal / Bollen	4:11.4	4:05.9	
7. Hill / Metcalf	4:15.5	DNF	
8. Smith / Yeldham	4:15.9	4:15.4	
9. Nixon / Campbell	4:17.2	4:43.6	

FAI TEAM RACE (Davies A Trophy) by Graham Bryant

33 teams pre-entered, and of these 24 recorded times in Round 1, and 21 in Round 2. Many of the fastest teams seemed just a shade below their full potential, which was rather surprising considering the perfect weather. Smith/Brown, winners for the past two years, recorded 3:40.75, but the fastest time in the heats went to Fry/Thorpe, also from Feltham, who made 3:35.85 in the very first heat. This was, in fact, the only sub-3:40 time in the whole contest. Foreign interest this year was limited to Holland's Visser/Metkemeijer, but surprisingly they failed to reach the semi's, due, probably, to flying second-string equipment. Pegg/Aberdeen (Hamilton) excelled with a 3:48.76 in Round 2, putting themselves into the semi's for the first time.

The only 'incident' in the heats came when Archer/Sladdin's model caught Tribe/Tribe's lines as they were coming in

for a stop. The Tribe Brothers argued that their wing-tip was firmly on the ground whilst they were refuelling their model, according to the rules, but unfortunately neither the Jury of Tony Harknett, Alan Cooper and Gerry Green, nor the Circle Marshall, clearly saw the incident, and a hot debate ensued. After various meetings, going on until the following day, it was ruled that the Jury's decision to disqualify Tribe/Tribe must be upheld, as they 'impeded the progress of another model'. A harsh decision, but all the same quite correct. It is often difficult to understand how, if a model's wing-tip is firmly on the ground, another model can catch the pitted model's lines. But it *has* happened before, and it was necessary, in this instance, for the SMAE Technical Committee to make a ruling.

The cut-off time for the semi-finals was 3:54.03, some 4 secs. faster than in 1980. Both rounds of semi's went off without any drama, apart from Thorpe/Fry's disqualification for whipping. This was a pity, as they obviously have a very potent Nelson, but Dave Fry's flying style doesn't often please juries.

The Final, therefore, consisted of Gray/Haycock, Smith/Brown, and Langworth/Broadhead, the latter two teams also competing in last year's F2C final. It promised to be fast, and it was, and completely without incident. Langworth/Broadhead's model was just slightly slower than the two Feltham teams, who had equal airspeed for most of the race. However, Gray/Haycock had one or two longish (by modern standards) stops, their Nelson proving a little reluctant to start. Smith/Brown, on the other hand, had no problems at all, and went on to win in the

1/2 A winners Rob Metkemeijer and Hans Visser from Holland.



FAI TEAM RACE

Team	Club	RD. 1	RD. 2	Semi 1	Semi 2	Final
1. Smith/Brown	Feltham	3:48.1	3:40.75	3:46.8	3:42.5	7:28.2
2. Langworth/Broadhead	Wharfedale	3:56.3	3:44.3	3:45.5	3:44.7	7:41.4
3. Gray/Haycock	Feltham	3:54.7	3:54.03	3:50.1	3:40.5	7:51.2
4. Fry/Thorpe	Feltham	3:35.85	—	3:47.75	Disq.	
5. Rudd/King	Feltham	3:47.2	3:49.02	3:56.25	3:50.26	
6. Smith/Yeldham	Elliotts	3:47.8	—	4:07.3	Retd.	
7. Pegg/Aberdeen	Hamilton	Retd.	3:48.76	4:42.55	4:05.9	
8. Wilson/Gardner	Tynemouth	4:01.5	3:50.7	4:08.8	3:56.3	
9. Heaton/Woodside	Norwest	4:00.3	3:53.77	4:20.28	3:53.5	

F2C winners for third year running Steve Smith and Colin Brown of Feltham Club.



magnificent time of 7:28.2, one of the fastest finals ever flown. After the race, it was commented that Bernie Langworth and John Gray did a marvellous 'job' on Stevie Smith, neither team wanting to come third, otherwise we may have seen a new UK record for the final.

All in all, an excellent Nats. as far as F2C was concerned, marred only by one incident in which it was necessary to apply the Rule Book to the letter. The Nelson engine is obviously now the universal choice, and as more teams learn how to get the best from it we will see further additions to the 'sub 4 minute' Club. On the other hand, it is hard to see how newcomers can be encouraged to the sport, as nowadays the cost of putting together two really competitive models must be approaching £300.

Speed

Jo Halman in the role of contest director organised all of the Speed events most efficiently, a job that required a great deal of involvement at all times. In general, speeds were down on last year's Nats, although Paul Eisner exceeded his winning speed of last year in Class 3 by 13.34mph.

Paul's model is powered by a Rossi .15 which has an exhaust period of 190° and is fitted with a Rossi tuned pipe, driving a 3 1/16 x 6.5 in. single blade propeller. The fuel was 50% nitro, 15% ML70 and methanol with timed crankcase pressure.

Speed class results

.049 — Class 1
 1. B. Meager 82.70mph
 2. C. Tribe (Junior) 64.28mph
 Four entries

.09 — Class 2
 1. J. Myszka 122.11mph
 Four entries

.15 — Class 3
 P. Eisner 177.83mph
 N. Meager 131.28mph
 Two entries

FAI — Class 4
 P. Halman 153.22mph
 B. Jackson 151.76mph
 D. McGladdery 135.58mph
 Three entries

.29 — Class 5
 M. Skinner (Junior) 164.73mph
 D. McGladdery 164.73mph
 Rose/Skinner 125.68mph
 Five entries

.40 — Class 6 No returned times

.60 — Class 7
 M. Billinton 190.88mph
 M. Radcliffe 166.32mph
 I. Skinner 131.36mph
 Five entries

F40 (Provisional Class 8)
 Morrissey/Lee 156.87mph
 Taylor/Jones 150.44mph
 J. Gibbs 147.46mph
 Five entries

21N (Provisional Class 9)
 T. Goodger 120.73mph
 One entry

Michael Skinner with broken model, but who cares when you have managed to make first place in Junior class five. Engine OPS 29 using 70 per cent nitro.

The FAI Class 4 was again won by Peter Halman, who also increased his speed from last year by 2.58mph, flying his Rossi powered metal wing asymmetric design. Peter used a home made pipe and straight fuel.

Mike Billinton failed to match his 200mph record speed of last year but was still way up front with 190.88mph, which gave him first place in Class 7.



Peter Halman with his FAI winning model. Rosie 15 powered using straight fuel and a home made pipe.



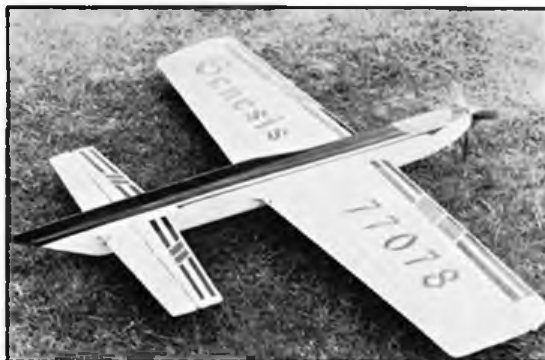
Ken Morrissey with his F40 winning OPS 40 powered model.



Joe Myszka's Webra .09 powered winner of Class Two

Handicap Speed Results

Name	Club	Class	Engine	Weight/oz	MPH	%	Placing
P. Halman	Sharston	FAI	Rossi 15	—	153.22	97.19	1
P. Eisner	Feltham	.15	Rossi 15	16	177.83	96.98	2
J. Myszka	Wolves	.09	Webra .09	12 1/2	122.11	96.40	3
B. Jackson	Sharston	FAI	Rossi 15	—	151.76	96.27	4
Morrissey/Lee	Sharston	F40	OPS 40	32	156.87	95.51	5
M. Billinton	Elliot	.60	OS 46	24	190.88	95.14	6
Taylor/Jones	Rolls Royce	F40	OPS 40	32	150.44	91.59	7
J. Gibbs	Bilston	F40	K&B 40	25 1/4	147.46	89.78	8
D. Miles	Feltham	F40	K&B 40	28	144.70	88.10	9
D. McGladdery	Feltham	FAI	Rossi 15	—	135.58	86.00	10
T. Goodger	Feltham	21N	—	16	120.73	85.11	11
M. Skinner	Christchurch	.29	OPS 29	27	164.73	84.54	12
D. McGladdery	Feltham	.29	OPS 29	28	164.01	84.16	13
M. Radcliffe	Feltham	.60	OS 60	40	166.32	82.90	14
B. Meager	Sharston	.049	Cox TD .049	5 1/2	82.70	80.96	15
N. Meager	Sharston	.15	Rossi 15	14	131.28	71.60	16
I. Skinner	Christchurch	.60	Rossi .61	41 1/2	131.36	65.47	17
Rose/Skinner	Christchurch	.29	TXA .29	24 1/2	125.68	64.49	18



GOLD TROPHY

by Glen Alison

Contest Director Peter Burgess assisted by Alan Church

Judges Reg Lowe, John Harley, Jim Lambert and Geoff James.

This year maintained the trend of increasing interest in stunt with an entry of 45 competitors. In order to give such a large entry at least four flights this year the event was run as a two circle, two day event for the first two rounds with the top fifteen progressing to a two round fly-off on the Monday. Each flier flew in each circle each day and the best score from each circle were added to give a result list. For those below fifteenth place that was their final position but for those in the fly-off the carry over score was added to the best of the final two flights in the one circle, four judges, fly-off circle. Is that clear?

Round 1 on Saturday was started at 9 am by Barry Robinson, the weather was overcast with a slight breeze, just about ideal stunt conditions. Not seen in England before were the two Dutchmen, Erik Janssen and Henk de Jong. It was very evident that they were both very good indeed and in strong contention for the winners rostrum. Also present from Europe was ever popular Claus Maikis with his beautiful 'Indigo' design (published in AERO MODELLER in August). Claus used a 3 blade 10 x 6 propeller made from Top Flight wooden blades, and the side mounted engine ran very well with the silencer neatly joining in underneath the fuselage. Another overseas visitor was Australian John Tidy flying a 'Miss Laura' with ST46. This is an American design with Pylon Racer styling and interestingly was the only model in the fly-off with a foam wing.

Computer technology has now reached the stunt circle as a Sinclair ZX81 computer was programmed to aid the scoring system where by the score for each manoeuvre is multiplied by the 'K' factor and then all added up to give the final flight score. It should ease the laborious task usually undertaken by 'volunteer' wives at stunt events.

Surprise high placing in the first round went to seventeen year old Barry Ensten of Dunstable flying a ST46 powered Nobler.

(Enough power there)!, to good effect. After many years of trying he is improving rapidly.

At the end of the first day then the leaders were emerging as Bill Draper, Jim Mannall and the two Dutchmen.

Round 2 on Sunday. The day dawned hot and sunny with virtually no wind at all which surprisingly caused some people line tension problems. Erik Janssen put in a very high score but late in the day whilst practising had the misfortune for somebody to walk into the circle and collide with the model as it was flying level. The intruder was relatively unhurt but the model appeared to be a write off with the star-board wing completely torn off and the fuselage broken in several pieces. The front of the fuselage including the engine area was only slightly damaged and to his credit Erik decided to try to repair the model overnight for Mondays fly-off. Armed with two sheets of balsa, some iron on film and a bottle of cyanoacrylate superglue he set to work on a table in the hangar, and six hours later had it repaired to a flyable state. A remarkable achievement as the model, the 'Flying Dutchmen' seemed to fly just as well and indeed good enough to secure second place.

Because the runway surface is very sensitive to any spilt fuel, flier were obliged to fuel up off the runway and then take off from a rubber mat to prevent any possibility of damage caused by fuel. Generally this caused no problems but one flier was unlucky. As Glen Sibley's model was about to take off a gust of wind got under the mat

Peter Adam's Genesis, winner of the Novice Stunt. This was only his third attempt at competition flying. Model powered by a Super Tigre 46 fitted with a home-made silencer and Tornado 10 x 6 three blade propeller. Centre: John Tidy with his Miss Laura ST46 powered model. John comes from NSW, Australia. Left: Erik Janesen with his model after the frantic repair job.

and lifted the tail of the model as it was released causing the propeller to touch the runway and reduce in diameter. Glen completed the flight bravely but was awarded a reflight.

Flyoff on Monday. The weather was much colder for the fly-off, overcast and the breeze freshened considerably making conditions much less pleasant than previously. For the fly-off all four judges scores counted. As the fly-off progressed it became clear that Bill Draper was most likely to be the winner but right up to the last two flights, there was always the possibility that either Jim Mannell or Barry Robinson could have put in an exceptional flight and piped him at the post. But it was not to be and Bill Draper flying his Super Hawk powered by an Enya 40 won the Gold Trophy at his thirteenth attempt! Congratulations.

NOVICE STUNT (Judge Audrey Tipper)

by Bill Draper

Novice class aerobatics was held over two days, Sunday and Monday, with one round flown each day. The contestants' highest score determined his position. 17 entries flew with a very high standard.

Most models were of the large proven design types with 35 to 46 power. The flying area at the end of the runway partly overflew the grass unless very short lines were used and this caused some landing and take-off problems.

Lee Bees club were very well represented with about half a dozen entries and

Results

Place	Flier	Score	Model	Engine	Propeller
1.	Bill Draper	8528	'Super Hawk' O/D	Enya 40	11 x 6 Tornado nylon
2.	Erik Janssen (NL)	8380	'Flying Dutchman' O/DST46		11 x 6 Zlinger wood
3.	Jim Mannall	8287	'Nimrod 5' O/D (APS)	Merco 35	10 x 5 wood
4.	Henk de Jong (NL)	8212	'Derringer'	ST46	11 x 6 Top Flight wood
5.	Barry Robinson	8135	'North Wind' O/D	Merco 49	12 x 6 Zinger wood
6.	Claus Maikis (G)	8105	'Indigo' O/D (APS)	ST46	10 x 6 3-blade wood
7.	John Newnham	8085	'Nobler'	Merco 35	10 x 6 wood
8.	Neville Dickinson	7958	'Nevisis' O/D	OS 40 FSR	11 x 6 wood
9.	John Tidy (A)	7604	'Miss Laura'	ST46	10 x 6 3-blade nylon
10.	Roger Quilter	7523	'No Name' O/D	ST 46	11 x 6 wood
11.	Terry Taylor	7428	'Sig Chipmonk'	Merco 35	10 x 6 wood
12.	Arthur Tipper	7404	'North Wind'	Merco 49	12 x 6 wood
13.	Ian Galt	7259	'Nobler'	Fox 35	10 x 6 wood
14.	Rob King	7219	'Chipmonk' APS	ST46	11 x 6 wood
15.	Barry Ensten	6784	'Nobler'	ST46	11½ x 6 wood

the opening flight on Sunday was by Lee Bees member Derek Mason with a Merco 35 powered 'Lariat.'

The ST46 powered 'Nimrod' of Barry Phillips was next away and his score was sufficient to hold third place in Round 1. Pete Adams' flight was cut short when his motor died after a good looking wingover due to a loose cowl which caused his fuel line to become detached. During a subsequent practice flight the motor again cut inverted and when landing on the grass, his plane struck a fence post, breaking the fuselage in half. Frantic repairs took place for the second round the following day.

Another fence post victim when landing inverted with a dead motor was Bob Simpkin, damaging a wing in the first round. Repairs were also executed for the following day.

Gerry Pearce took top spot in the first round with a 56 oz Stilleto Model featured detachable wing and 3T46 power. Barry Hartland of Wolves club was second with a sidemounted ST46 job, whilst Ken Reeves of Nottingham club held down fourth position using an Enya 45 powered 'Superhawk'. Wing is solarfilmed over lightweight tissue and the plane was very smooth.

Scores tended to rise in round 2, although W. Bessiant of Lee Bees slipped up badly by forgetting his square loops. Pete Adams at last succeeded in making a schedule, taking the lead with 480 points, and although Gerry Pearce improved his first round score, he was still 3 points short and had to be content with second place. Competition was very close and Barry Phillips pulled up to within one point of second place with Barry Hartlands big effort only another 4 points behind.

A big improvement in score by Alan Callaghan flying a Gieseke Nobler earned him a 5th spot leading R. White. Alan's model had the wing covered in jap silk over lightweight tissue and looked very attractive.

Novice Aerobatic (17 entries)

	Round 1	Round 2
1. P Adams	70	480
2. G Pearce	468	477
3. B Phillips	442	476
4. B Hartland	448	472
5. A Callaghan	405	467
6. R White	409	449
7. K N Reeves	438	446
8. E Sweetland	417	444
9. M Williams	113	431
10. T Bradley	413	160

Junior Aerobatics

1. R. Illingworth	419
2. M Williams	375
3. P. Cummings	349

JUNIOR AEROBATICS

Junior aerobatics was flown as a one round event on the Sunday after round 1 of the Novice event. It attracted only three entries, and two of these were also competing in novice.

Neither P. Cummings or M. Williams scored quite as high as their best novice flight and the winner proved to be young Richard Illingworth, using a kit built Sig 'Twister' powered by an OS 35. Sounds like powerful machinery with bigger things to come.

Judge — Audrey Tipper.

NAVY CARRIER

Open and Profile 40 Carrier were held over the Saturday and Sunday, 1 Round being held each day, the highest scoring flight in each event decided the competitors racing.

OPEN CARRIER

The 10 entries comprised four MO-1s, one each of Corsair F4U-1, Guardian, Vought Kingfisher and three Profile Models. The weather conditions remained fairly static over the Saturday with a light and variable breeze blowing.

Vaughan Miller of the Feltham club flying his MO-1 was first back on the deck, albeit with his landing wheels uppermost to be quickly followed by Brian Young's (Broadlands Guardian) who gave us an action replay. Problems with the scale models through either dropping into the sea, or their pilots misjudging the landings allowed, at the end of the first day, Profile Models to hold third and fourth places even though they did not qualify for the 100 Scale bonus points.

Sunday flying commenced in brilliant sunshine and flat calm considered by most to be perfect weather for carrier flying benefitting the fast and slow runs required. Scores improved by leaps and bounds with 8 of the 10 competitors scoring landing points, Brian Perry (Wolves) having the highest fast speed 88.2 mph, a good slow and a 100 point landing to emerge as open carrier winner.

40 PROFILE CARRIER

Although this is a Profile event, it was nice to see the majority of models finished in authentic Naval colour schemes and bearing a very strong resemblance to full-size Navy aircraft. The event is flown to provisional SMAE Rules which include a max. speed of 75 mph for the high speed run, that is any speed higher than this is reduced to 75 in the calculation of the flight score. This puts more emphasis on the slow speed part of the flight.

On the day, 11 entries were received. First to fly was Don Powell of the Witham Club with his much modified Dumas Corsair now sporting undercambered flaps and knock over rudder to aid slow flying and powered by a KB40 with which he achieved 67.64 mph fast, 21.97 mph slow and 100 landing points. Second to fly was his club mate, Peter O'Sullivan, who scored 72.55/17.96 but missed all four arrestor wires to land in the drink. Highest scoring flight of the Saturday was by Norman Ashford (Broadlands) who scored 75/20.45/100 to notch up 391 points. This did not last for long when in Sunday's superfine weather Peter O'Sullivan broke 75 mph and with 18.36 slow and a super smooth 100 point landing scored 402. Next Bryan Youngs (Broadlands) flew to record 74.04/17.71/100 to score 404. This was the score that everybody now tried to beat, notable flights being put in by Jeremy Peacock (Broadlands) at 75/19.77/100 for 395 and Phil Baldwin (Bilston) at 75/19.18. But who needed a second approach for his landing, thus scoring 95 points to give a total of 393. Norman Ashford then had his last flight and managed 74.04/18.44/100 to score 400 points which secured third place.



Broadland's provided the new carrier replacing the venerable prop-scarred HMS Flycatcher.



Brian Young's winner of the Profile 40 event. Model incorporates flaps and kick rudder. Peter O'Sullivan with his Irvine 40 powered Corsair. Inset: detail of Peter's adjustable line outlet on his Corsair.





Brian Perry winner of Open Carrier.

With scores as close as this first approach landings with perfect hookups are essential and with most models getting very near to or going through the 75 mph maximum speed a very slow run was essential to get a place. The winner's slow run averaged 14.5 secs per lap for 7 laps on 60ft lines.

Open Carrier	Club	Points
1 Brian Perry	Wolves	490
2 Vaughan Miller	Feltham	473
3 Phil Baldwin	Bilston	434
4 Jeremy Peacock	Broadlands	402
5 Peter O'Sullivan	Witham	400
6 Bryan Youngs	Broadlands	395
7 Norman Ashford	Broadlands	391
8 Derek Bird	Three Kings	371
9 Laurence Marks	Feltham	335
10 Alan Church	Witham	—

Profile 40 Carrier	Club	Points
1 Bryan Youngs	Broadlands	404
2 Peter O'Sullivan	Witham	402
3 Norman Ashford	Broadlands	400
4 Jeremy Peacock	Broadlands	395
5 Phil Baldwin	Bilston	393
6 Don Powell	Witham	387
7 Brian Cordwell	Three Kings	348
8 Vaughan Miller	Feltham	279
9 Laurence Marks	Feltham	254
10 Alan Church	Witham	—
11 Wal Cordwell	Three Kings	—

COMBAT

by John James

Entry for combat this year was even lower than usual, and, without any foreign entries to boost the numbers for the first time for many years, stood at only 34 which is a rather sad state of affairs for the National Championships of the best combat country in the world.

The contest was again run using the 'two life' system which simply means that each contestant can lose twice before being eliminated from the competition. This system continues until an eliminator round is held for the quarter finals at which point the competition reverts to the standard knockout.

Saturday was taken at a fairly leisurely pace and only the first round was flown. The weather was ideal for combat and as there was no real pressure, the standard of flying seemed far higher than is usual for a Nationals first round. Particularly notable was the bout between Tim Bartram and John James which Tim won by 5 cuts to 2 after four minutes of solid combat.

The second round was flown at a slightly more hectic pace and made for good agree-

sive combat as this was the first round in which people actually lost.

The best bout of the day, and perhaps of the competition, was that between Dave Wood and Richard Edwards. After four minutes of very close combat with both pilots attacking and defending all the way through the bout, they finished with 3 cuts each and equal ground time which meant a re-fly. Nobody expected the second bout to be anywhere near as good but we were in for a surprise as once again we were treated to some more skilful combat. However, this time, Dave Wood came out on top after a gruelling eight minutes of combat.

We started early on Monday with the eliminator round and first bout saw Pete Tribe drawn against Steve Smith. Steve was seen heating his fuel up on his car radiator even before the organisers arrived and he looked very well prepared. Unfortunately all his effort was in vain as Pete continued on his winning way and beat him by 2 cuts to 1.

The big surprise of the quarter finals was when Colin Straus in his first full year of FAI combat beat Vernon Hunt after Vernon ran out of models. Tribe, Sibbald and Wiseman were the other fliers who made it to the semi-finals.

First to fly were Pete Tribe and Colin Straus. Experience won though, as Pete won by 3 cuts to 2. Dave Wiseman also had his eyes fixed on the trophy and beat Ray Sibbald, the current European Champion.

So, we had a repeat of the 1979 final with Pete Tribe and Dave Wiseman as the two finalists. We were treated to a final that was as good as any seen for a while, considering the importance of the title. However, the result was the same as in 1979 with Pete Tribe taking two cuts to nil, to take his second title as British National Combat Champion.

Combat

1. Pete Tribe	COSMO
2. Dave Wiseman	Hunters
3. Ray Sibbald	COSMO
4. Colin Straus	Chelmsford MAC

1/2A COMBAT

by Barrie Wade

The trend in 1/2A Combat recently has been towards higher standards of both model performance and pilot skill, with an increasing number of experienced FAI pilots entering 1/2A as a second event. This year we had the current European Champion, the ex-World Champion and the 1980 British Champion, plus several more with excellent FAI records. Nevertheless, 1/2A remains a class where a competent (or better still, talented) pilot can take on anyone without needing expensive equipment, fleets of models and a well-trained pit crew. The better 1/2A bouts are highly entertaining and although much less spectacular than FAI, are easier for spectators to follow.

Nats weather this year was not too windy for our small models and only on Sunday were pilots dazzled by the sun, so it was almost ideal. The only real disappointment was the continued shortage of junior entries, although those who did appear made their presence felt from start to finish.

With 33 entries and using 'two lives' system it took five rounds to reach the



quarter finals. In the first quarter final bout, junior Tim Howell found Dave Willis a little too good for him and couldn't quite get to grips with Dave's streamer. The second bout was a win for Ray Sibbald over Mark Harrison, 404 to 370 — plenty of action in this one also. Dave Wiseman lost to Neil Gill when the handle was snatched from his hand (although 1/2A's don't pull hard, a line cross or mid-air can still jerk the lines; several pilots lost the handle over the weekend, so perhaps safety straps should be enforced in this class as well as FAI). In the last quarter final, Steve Malone lost to junior Adam Willis — largely due to a broken tail.

In the semi-finals, Dave Willis beat Neil Gill 440 to 274 and Adam Willis beat Ray Sibbald 340 to 230. At this stage the strain was beginning to show and some experienced campaigners were making surprising errors; Ray Sibbald was understandably peeved when his model was launched with no streamer — which was still in his mechanic's pocket — and I think it was Adam Willis who relaunched with one foot on the streamer.

As there were awards for the top two juniors, we flew a separate junior final. Adam Willis and Tim Howell had both reached the sixth round and Tim Beat Adam to take the junior trophy for the second year running. Jem Dale and Chris Cooper agreed to share the honour for third place — I think they were too tired to fly again after spending much of the weekend helping to marshal and score the event. (Thanks again, lads).

Neil Gill won the fly-off for the third place and we then had the novel sight of a father and son match, as Dave and Adam Willis settled the final. Adam made up for losing the junior final by winning the event overall, 440 to 332, and I think we all believed Dave's assertion that he was beaten fair and square. Certainly Adam's second cut, near the end of the bout, was no gift; he took it a split second after the models bounced apart from a mid-air.

A Combat

Junior Final 1.	Tim Howell, West Essex
2.	Adam Willis, Cosmo
Overall 1.	Adam Willis, Cosmo
2.	Dave Willis, Cosmo
3.	Neil Gill, Peterborough
4.	Ray Sibbald, Cosmo



Brian Phillips placed third in C/L Scale with this large Me109, featuring retractable U/C and flaps. Very smooth performer but bomb-drop mechanism failed to work.

CONTROL LINE SCALE

by Barrie Hotham

Superb weather and a delightful range of models combined with an enthusiastic bunch of competitors to make this possibly the best control line Scale Nationals for some years.

It was a privilege to help judge the competition and the small margin in the scores between Mick Staples with his fantastic Bristol Bulldog and Alan Callaghan with his delightful Miles Satyr underlined the quality of the whole event. Brian Phillips in his first Scale Nationals with a very realistic Me109 that flew superbly must be well pleased and if he can tidy up his documentation could increase his static score at future events. We thought Ron Truelove with his magnificent H.P. Hampden was unlucky as his last flight was spoiled by undercarriage problems. A real club effort by the 3 Kings lads was very well supported by Derek Bird with his S.A. Bulldog, that only model that did a really good taxi, and that strolling troubador of modelling Wal Cordwell, this year flying his Blenheim that had obviously had a lot of effort put into its building. Norman Ashford's Arado flew well but sketchy documentation pushed his static score down. Gerry Gibbons flew a very rugged Bristol F2B nicely and we thought that Mr. Stiles (I'm sorry I didn't get his Christian name) has chosen a delightful subject in the Dewoitine; if he can increase the number of options he can fly, he will improve his position at future events.

Surely this year's Nationals must show beyond all reasonable doubt that Control Line Scale in this country is very much alive and kicking. We look forward to the next one.

Control Line Scale

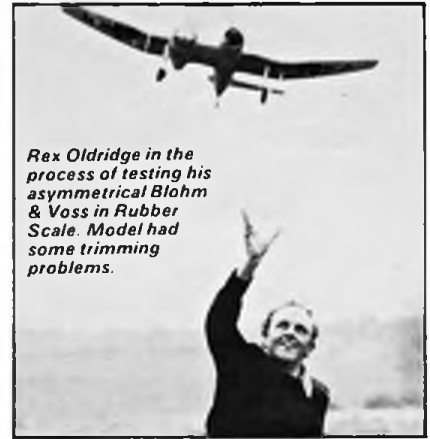
			Flt 1	Flt 2	Static Total
1. Mick Staples	3 Kings	Bristol Bulldog	730	839	1152 1991
2. Alan Callaghan	3 Kings	Miles Satyr	804	953	1026 1979
3. Brian Phillips	Lee Bees	Me 109	913	1004	890 1894
4. Ron Truelove	High Wycombe	H.P. Hampden	926	873	812 1738
5. Derek Bird	3 Kings	S.A. Bulldog	818	793	758 1576
6. Wal Cordwell	3 Kings	Bristol Blenheim	721	796	694 1490
7. Norman Ashford	Broadlands	Arado 66	817	855	454 1309
8. Gerry Gibbons	Grantham	Bristol F2B	621	421	434 1055
9. P. D. Stiles	South Bristol	Dewoitine	431	535	506 1041

RUBBER SCALE

by Barrie Hotham

The expected large entry for this event did not materialize and only six veteran campaigners took to the field.

Geoff Spencer eventually took the honours with his very nice Fieseler Storch that is flying extremely well. It was nice to see Chris Chapman taking second place with his Mustang certainly flying better than last year and for sheer consistency Doug Hunt is to be congratulated, again flying his Piper Cub. Both Mike Hetherington and Rex Oldridge arrived with models that had not been fully trimmed out and although Mike put his fabulous Mitsubishi Claude back in its box. Rex tried as hard as I did to qualify but without success, his Blohm & Voss just would not stay in the air long enough.



Rex Oldridge in the process of testing his asymmetrical Blohm & Voss in Rubber Scale. Model had some trimming problems.

Superscale

			Flt.	Static Total
1. Geoff Spencer	Walsall MAC	Fieseler Storch	960	805 1767
2. Chris Chapman	Nottingham MAC	P51 Mustang	808	950 1758
3. Doug Hunt	Nottingham MAC	Piper Cub	592	845 1437
4. Mike Hetherington		Mitsubishi Claude		1095
5. Barrie Hotham	Nottingham MAC	Heath Parasol		740
6. Rex Oldridge	Lee Bees	Blohm & Voss		650

F/F SUPERSCALE

by Bill Dennis

Eleven entries this year, seven of which managed qualifying flights. First place was taken by Eric Coates from Terry Manley — both with models nearly a decade old.

Henry Hartley had a new Tiger Moth which performed well, but needed slowing down a little. Superb flights by Michael Smith's Sopwith lifted him into 4th place. Bill Dennis (Blackburn Monoplane) was well suited by the calm early morning conditions but did badly in the static section.

A well deserved 3rd place was taken by Mike Hetherington's well-known Stosser which can fly as well as any power model with its geared motor and smooth take-off.

Not a vintage year by any means but if half the people who promised to turn up next year actually do so, we will have a very popular event.



Mike Hetherington's all-paper rubber-powered 'Claude.' Very attractive red/silver/black colour scheme drew much attention.

Rubber Scale

	Model	Flight	Static	Total
1. Eric Coates	DH9A	555	417	972
2. Terry Manley	DH4	549	419	968
3. Mike Hetherington	Stosser	489	321	810
4. Michael Smith	Sopwith 1½ Strutter	507	299	806
5. Bill Dennis	Blackburn Monoplane	459	268	727
6. Henry Hartley	Tiger Moth	449	228	677
7. Chris Chapman	Mustang	311	312	623

Bill Dennis's APS Blackburn Monoplane was built as a quickie to take part in the F/F Superscale event and flew very well. More people emulating this next year would be very welcome.



Find the balance point MODEL COMPETITION

The great
**Aero
modeller**
Give away
contest
£250 of
prizes must
be won



The October winners are:

Andrew Irwin, Dinnington, Newcastle upon Tyne Peter Buyers, South Shields, Tyne & Wear Michael Walsh, Irchester, Northants. Jeremy Rooke, Cosby, Leicester H. C. West, Southampton, Hants. I. J. Dent, Dereham, Norfolk. John Talbot, Alphen A/D Rijn, Zuid, Holland. Ian McNaught, Johnstone, Renfrewshire. M. A. Parker, Stratford-upon-Avon, Warwickshire. Peter J. Royle, Altincham, Cheshire. H. J. Dudley, Flaxton, York. D. F. Ketley, Crewe, Cheshire. G. Mackay, Blantyre, Malawi. David Longbottom, Huddersfield, W. Yorks. E. P. Edwards, Braintree, Essex. J. Frost, Wisbech, Cambs. S. Kocyan, Lindfield, W. Sussex. S. Finch, Brentwood, Essex. Cpl. M. Cook, RAF Wildenrath, Germany. J. W. Mountain, Wigan, Lancs.

RULES

1. The competition is FREE and open to all Aeromodeller readers.
2. The model has been erased from this picture. Use your skill and judgement to determine not just the position of the model in the picture, but its exact balance point.
3. The first ten entries with the centre of a cross nearest the correct balance point will be judged the winners of this month's prizes. If you prefer not to cut the picture from this page a same-size facsimile (photostat) is acceptable.
4. Any number of entries may be made, but each entry must be

accompanied by a separate entry coupon, clipped from the page. The coupon must be the original — photocopies are not accepted.

5. Only **five** crosses per entry.
6. Entries in this December edition competition close after first post on December 18, 1981. Results will appear in Aeromodeller February 1982 edition.
7. The Editor's decision is in all cases absolutely final and no correspondence will be entered into nor responsibility accepted for late, mislaid or lost entries.
8. Employees of MAP Ltd. and their families are not eligible.



THIS MONTH TEN PACKS OF Balsa MUST BE WON

Each pack of balsa will consist of 18 sheets of $\frac{1}{16}$ in., 16 sheets of $\frac{3}{32}$ in., 6 sheets of $\frac{1}{8}$ in., 4 sheets $\frac{3}{16}$ in., 4 sheets of $\frac{1}{4}$ in. and 4 sheets of $\frac{3}{8}$ in.

To Aeromodeller Magazine. Please accept my entry for your December 1981 "Find the Balance Point" competition. I understand the rules of the contest and accept the editor's decision as final.

Signed.....

MODEL COMPETITION, PO BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE

NAME

ADDRESS

.....

NB: Coupon must be original — not facsimile copy
Entry Coupon
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Find the Balance
Point Contest
'81



I WAS ONE of the people who got their hands on the Kyosho Sportavia when it was at the Aeromodeller offices for testing. The way the Cox Black Widow is able to pull a two channel model of nearly two metres span into a respectable climb never failed to amaze me. It also set me thinking that this is the kind of model I need for some nice, relaxed, Sunday afternoon flying. It will slope soar if I feel like it and operate out of a small field if I cannot be bothered to drive very far. After thumbing through some magazines on full size gliders, I had a firm

Three weeks later the prototype was ready to fly and I had burned a lot of midnight oil. What emerged is an attractive model which is not difficult to build or fly and is at home on a slope or a flat field.

Wing

The ribs for the straight taper wings are made by the sandwich method. Cut out a root rib and tip rib template from thin ply and sandwich the required number of balsa blanks. Remember the templates are 1.5mm smaller all round than the final

straight and true. When this is dry, pin the spar vertically onto the plan with a 1.5mm packing piece under the full length. Also pin onto the plan the bottom 1.5mm sheet piece of the trailing edge and glue on all the ribs. Using a straight edge or marking gauge cut out the vertical grain trailing edge webs and glue in place between each rib. Epoxy in the small rear wing joiner tubes. Add the top of the trailing edge plus the top spruce spar and leave to dry. Cut out the rear member of the leading edge from 3mm balsa sheet and sand the edges to fit into the rib outline. Glue on the trailing edge 3mm square cap and the rear member of the leading edge.

When dry sand to exact shape and epoxy in the main wing joiner tubes. Cut out the top and bottom leading edge sheeting. Damp the outside surface to encourage a curve and then glue and pin in place, or use contact adhesive.

Add capping strips top and bottom and the centre section sheeting. Carefully sand the leading edge absolutely flat. Add the 6mm sheet front piece of the LE to the rear member, and carve to shape. Add the tips and centre end plates. I glued mine on with the wings together to get an exact fit. Sand carefully all over using a fine paper on a fairly large piece of wood. Rough blocks or scraps can be put in at this stage to achieve the centre section fairing although the final shaping should be left to match the fuselage at a later stage. Finally, add the small 1mm ply segment shaped plates to the fair-

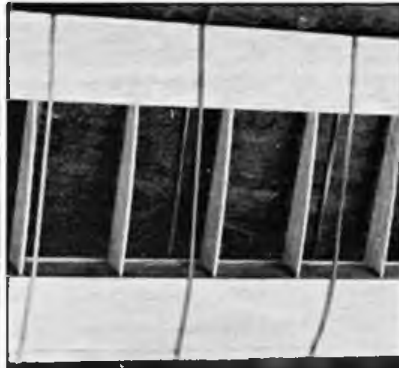


Full depth wing spar. The bottom spruce spar is glued to the vertical web before fitting the wing ribs.

idea in my mind of what sort of model would resemble a typical sailplane. For some reason or other I do not like the look of low wing glider designs although it is the practice for most full size motor gliders. A high wing design was therefore adopted for looks and stability.

The preliminary outline sketches began to look very attractive. I talked them over with the editor who gave me the benefit of his experience with similar models and then the ideas joined the 101 other projects I have not got round to doing.

A telephone call from the editor asking after progress and whether it could be ready for this issue lifted the project to the top of the pile and me into frantic action.



Use elastic bands to hold the leading and trailing edge in place while glue sets.

section due to the sheeting and capping going on later. Numbering the blanks before making up the block makes assembly easier. I prefer to make two, handed, sets of ribs at the same time.

Sanding down the same set of templates twice can result in wings of slightly different section. Using a small saw, cut out the spar knoches and leading edge flat. A small file is a useful tool for getting a good fit. Using the root and tip rib to mark the tapering depth of the 1.5mm balsa main spar, cut out two spars using a long straight edge. Mark off and cut out the rib knoches and use the template to cut the root rib angle. Glue on the bottom spruce spar only and leave to dry under weights to hold it



With the end plates fitted, join wings and mount on the fuselage. Shape soft balsa block to fair wing into fuselage form.

ing and trim to shape. The fairing shape enables the wing to twist and ride up on 'wing tip first' landing and the ply facings avoid damage during this manoeuvre.

Fuselage

Before making a start on the fuselage, spend some time making sure your engine and your radio will fit the version drawn.

The engine I used is a Cox Black Widow and the radio is a two channel Futaba Medallion 'M' series with 33M servos. Because the radio installation needs room to get the pack in and push it forward into the nose, the servos need to be side by side well back and out of the way. On the prototype they only just went in, too close for comfort,



Left: make sure that engine fixing screws are accessible and that the motor can be removed after fitting cowl. Right: epoxy engine fitting nuts to rear of bulkhead or solder to tin place which can then be epoxied to bulkhead.



Fuselage side with 1mm ply doubler in place. Make sure the doubler is glued over its whole surface.

and even then they needed to be slightly staggered. The plan shows a fuselage 3mm wider than the prototype so 33M's should fit nicely but check if you are using any other type. This plane asks quite a lot from an O49 so do not be tempted to fit anything clapped out or with significantly less power than the one I used.

A G-Mark O6 would be a good alternative but remember not to extend the beams back too far otherwise the radio gear cannot be pushed far enough forward to get the right centre of gravity. Select two similar pieces of 3mm sheet balsa and cut out the fuselage sides.

The 1mm ply doublers can be cut out next — note that they stop short of the 6mm sq balsa at the bottom. The rear triangular strengthening plate is also cut from 1mm ply. Glue the sides, plates and doublers together making absolutely certain you have made one left hand and one right hand fuselage side. Leave them to dry under substantial weights. Add the 6mm sq balsa along the bottom edge. I made mine out of two pieces of 3 x 6mm as it was easier to bend. Glue on the 3 x 6mm spruce braces. When the side assemblies are dry, set them up, upside down, on a flat board exactly vertical and exactly parallel. Glue in the spacers at the parallel part of the fuselage and leave to dry thoroughly. Trim the inside of the rear end so that it fits together neatly when pulled in. Make sure the sides pull in symmetrically around the centre line of the fuselage. Glue the rear end together and leave to dry.

Cut out the engine bulkhead and drill for the engine. Solder the engine mounting nuts to a tin plate and epoxy it to the rear of the bulkhead. Pull the front fuselage together and glue in the engine bulkhead.

Plank in the bottom of the front fuselage with 3mm sheet cross grain. Add strengthening fillets behind the bulkhead. Make up a mounting to suit your servos and fit them in place. Fit in the control rods, I used the plastic snake type. Connect up to the radio gear and make sure the controls operate in the correct mode. Make up a radio gear parcel of the battery pack and Rx. Mine is wrapped in foam carpet underlay. There is no foam on the sides as it is a tight fit. The parcel needs to be neatly made to be able to slide in and out. A loop of sellotape will provide a handle to pull back out of the nose.

Try your parcel in and out a few times before filling in the nose top because then it is too late if it gets stuck. Make sure you fit



the switch somewhere where it does not get in the way. Cut out the rear top deck formers and the piece of 1.5mm sheet to be rolled round.

I made mine very wet and rolled it slowly round a broom handle. When dry it can be eased on and trimmed quite easily. Fit in the vertical braces and glue the top formers in place. When dry, fit and glue on the sheet top (if you cannot get on with this rolled sheet idea, plank it with soft 2.5mm sheet).

Glue in the wing dowels and fill in the top of the nose. Trim the wing fairing to a good fit. Make up an engine cowl to suit your engine. Remember you need to be able to remove the engine — that's why both my

thin coats of a domestic polyurethane paint. Finally, a thin coat of hot fuel proofer was applied to the fuselage and over the trim and edges of the Solarfilm. Assemble the model and check that the centre of gravity is at the position shown on the plan. Reposition the radio gear or add ballast, if necessary. Carefully view the model from all angles to ensure it is square and true.

Flying

Choose a calm day for test flights and a sloping field with long grass if possible. Adjust the engine thrust line if there are significant trim changes between power-on and glide.



'cheeks' are removable — to be able to get at the screws. Trim and sand the whole fuselage to shape. (Go easy on that 1.5mm rear top deck sheeting). With the 6mm sq set in the bottom one can get a quite large radius. Trim a commercial canopy to fit or fashion one out of flat sheet. Do not glue it on yet.

Top deck made wet and rolled round broom handle.

Fin and tailplane

Cut the fin and rudder out of 4.5mm sheet (medium). Sand to shape and fit the hinges and horns. Glue the fin at right angles to the tailplane. Glue the assembly to the fuselage making sure it sits on squarely, add block to either side of fin and shape to match fuselage. Connect up the control system, line up the horns and make final adjustments to the control system.

The prototype was flight tested in rather blustery weather and proved rather lacking in elevator control. All the photographs are of this model although after the first flying session a larger, all sheet tailplane was fitted and this is shown on the plan. The larger tailplane did the trick and the model is no longer over sensitive. Remember it is a powered glider and steep turns must be avoided near the ground because the model almost invariably loses height. Flat, gentle turns are much easier to execute.

Marking the servo fixing holes. The plan allows more width in the fuselage than is shown here.

Finishing

Sandpaper the whole airframe structure very carefully and fill any mistakes with Polyfilla. On the prototype the wings, fin and tailplane are covered with iron-on film. The fuselage was covered with tissue and given three or four coats of dope and talcum powder. After rubbing down, I gave it three



Engine News

by Peter Chinn

Irvine 20 Black-Head is supplied complete with silencer. Engine is also available in R/C version with throttle type carburettor. It weighs 202g (7.12oz) or 240g (7.47oz) with silencer.



New Engines from Irvine

Twenty or so years ago, the UK was second only to the USA in the production of model aircraft engines. The immediate postwar period had seen the introduction of numerous new makes, but even after keen competition had weeded out the less successful manufacturers, there were upwards of a dozen British firms still producing engines.

Four of these companies were manufacturing engines in relatively large volume, but, in less than ten years, all but one (Davies-Charlton) had disappeared. Various factors contributed to the decline of the British model engine industry during this period but it has to be said that, to some extent, it was the result of too many UK producers being content to stick to outdated designs and continuing to produce only small diesels, at a time when all the signs pointed strongly in favour of larger glowplug motors for the more advanced types of models of the future.

Until the late 'fifties, the industry was protected from foreign competition in the domestic market by import controls and restrictions on the movement of foreign currency. Some relaxation of these regulations allowed limited imports of engines from about 1957 but it was not until the early 'sixties that all restrictions

were completely lifted. By this time, the radio-control boom was well under way and, while small diesels were still popular for beginners' models, the demand for more powerful glowplug engines was growing by leaps and bounds. So far as multi-channel radio-control was concerned, as in control-line stunt, only one make, Merco, stood in the way of complete market domination by imports from the United States, Japan and Italy.

From time to time, over the past dozen years or so, there have been attempts to provide some additional competition for the imported makes but, nowadays, starting from scratch to produce an engine range to take on the best of the established makes, is an extremely costly, if not hazardous, undertaking. There is always room for a limited-production specialist engine — a better team-racing diesel, for example — but ninety per cent of the total world market is now very much in the hands, not unjustifiably, of a few well-established manufacturers.

All of which makes the achievement of Irvine Engines Ltd., in managing to produce and successfully market a complete range of engines — now numbering nearly twenty models in five different displacements — all the more remarkable. Ron Irvine started in the model business in

1968 by importing and distributing American K&B motors. Many other engine distributorships were subsequently acquired, followed by agencies for accessories, radio-control equipment, kits, etc. In 1980, in cooperation with the Japanese O.S. Company, an associate company, O.S. Products Ltd., was set up to take over the importation and sole distribution of O.S. engines in the U.K. Ron Irvine's ambition, however, had long been to manufacture his own engine and, five years after launching Irvine Engines, he began working on a 40 cu.in. twin ball-bearing Schnuerle-scavenged motor. A number of prototypes were built, culminating in the Irvine Sport 40 engine that was put into small scale production in 1976. By this time, Irvine Engines had grown large enough to support a well-equipped manufacturing facility and, of course, there were no problems with marketing the engine since Irvine Engines already had its own extensive dealer network.

In due course, the shaft-valve Sport 40 was updated with a larger crankshaft and bigger bearings. It was also joined by a rear rotary-valve version and by a rear exhaust model. Already in production, by this time, there were 20 and 30 cu.in. motors. In 1980 a 10cc unit was introduced, the Irvine 61.

Several of these engines are offered in a choice of R/C or standard versions for C/L stunt, etc. and this also applies to two new models that should be of particular interest to AERO MODELLER readers: the Sport 25 and the 20 Blackhead.

Both these latest additions to the range are based on the existing Sport 20 model and each shares certain parts with it. In the case of the Sport 25, an increase in cylinder bore, from 0.650 in. to 0.705 in. has raised swept volume from just under 3.5cc to nearly 4.1cc to bring the engine in line with '25' size engines from other manufacturers, such as Enya, Fox, O.S. and Super-Tigre. In design and construction, the 25 is identical to the Sport 20: it uses a Dykes-ringed aluminium piston and has its crankshaft supported in two ball bearings; a $\frac{1}{4} \times \frac{5}{8}$ in. bearing at the front and a 12×24 mm at the rear.

The 20 Blackhead, by contrast, has a lapped (ringless) cast-iron piston and no ball-bearings; the crankshaft running directly in the crankcase material. The purpose of these simplifications is to bring an Irvine engine within the reach of a larger number of modellers, including those younger enthusiasts who are now ready to graduate to something larger and more powerful than a beginner's diesel. Prior to the introduction of the 20 Blackhead, the cheapest engine in the range was the Sport 20, the current recommended retail price of which is £29.95 in its standard or stunt version, or £34.95 as an R/C model. The 20 Blackhead undercuts the Sport 20 by some £6.00.

Like all Irvine motors, the Blackhead has



Parts of standard Irvine 20 Black-Head. Unlike other Irvine engines, Black-Head has plain main bearing and lapped cast-iron piston.

Aeromodeller

an investment cast aluminium alloy crankcase and this embodies a full length finned cylinder casing as well as the front housing. The cylinder liner, again like all other current Irvine engines with steel liners, is also an investment casting and uses Irvine's multiple-port Schnuerle scavenging system in which the angled ports are cast in. The flat-crown cast-iron piston is fitted with a hefty $\frac{3}{16}$ in. dia. fully-floating tubular gudgeon-pin with PTFE pads and the conrod is forged, with bronze bushes at both ends. The cylinder-head has the now familiar bowl-and-squishband combustion chamber shape and uses a 5 thou. copper gasket.

The crankshaft has a full-length 12mm dia. journal, bored $\frac{5}{16}$ in. for the gas passage, and a full circle crankdisc with crescent counterweight and an integral $\frac{3}{16}$ in. dia. crankpin. Ahead of the main bearing, the shaft steps down to $\frac{1}{4}$ in. dia. for the propshaft length and is fitted with a steel thrust washer to take the end loading that is imposed if an electric starter is used or if the engine is run as a pusher. The crankcase backplate is a glass-reinforced nylon moulding.

As already noted, the 20 Blackhead is available with either an Irvine throttle type carburettor for R/C or third-line C/L use, or with a plain intake venturi and needle-valve for C/L stunt, etc. The two can be quickly interchanged to convert the engine from standard to R/C use or vice-versa, by simply slackening two grub screws in the intake boss. The standard 20 Blackhead venturi has a (measured) choke bore of 4.6mm. Intrusion by the jet assembly is negligible so that the effective choke area is approximately 16.5 sq.mm.

The Sport 25, in its standard version, has the same type of venturi and jet assembly as the 20, but has its choke bore increased to 5mm. Both engines are supplied complete with the standard Irvine 20 type expansion chamber silencer which has a volume of 39 ml and an outlet area of 38 sq.mm which should not restrict output unduly.

These are well made engines of modern design and are most welcome additions to the Irvine range.

Washburn 3-cylinder Radial

From time to time, these columns include details of home-made engines, but it is not very often that drawings are available that will enable amateur machinists to produce replicas. We are glad, therefore, to have the opportunity of bringing to readers' notice an interesting little three-cylinder two-stroke from America for which sets of drawings and complete machining instructions are obtainable from the designer, Robert Washburn.

The engine, known as the 'Triscamp 059', is a geared unit. That is to say, instead of using a single crankshaft with all three connecting rods coupled to a single crankpin (an arrangement which, as the crankcase cannot be used as a charging pump, would mean the addition of a blower), each cylinder has its own crankshaft operating in a separate crank chamber, the three crankshafts being geared to a central output shaft. This is basically the same layout as is used for the Japanese 5-cylinder G-Mark radial except that, whereas the G-Mark has a single carburettor feeding the five crank chambers, in turn, through a rotary valve driven from the rear of the output shaft, the Triscamp uses individual intakes and reed-valves to each crank chamber. While this means that the operator has the chore of adjusting three needle-valves, instead of one, it does have the advantage that the output shaft does not have to revolve at crankshaft speed and that the gearing can therefore be used to perform the additional (and very desirable) function of increasing torque, enabling a bigger, more efficient prop to be used.

Construction of the Triscamp has been simplified by the adoption of certain Cox parts. The engine is built around a large machined aluminium central housing or 'trankcase', as the designer has dubbed it, containing the three crank chambers (with lightening holes between them) and into these are fitted three Cox 'Pee-Wee' cylinders, glowheads and piston/conrod assemblies. The cylinders have their fins turned off, converting them into sleeves, which are then encased in special machine

aluminium finned jackets. These also serve as exhaust collectors, each being equipped with two flange-fitting outlet pipes; one curved rearward forming a normal exhaust stub, while the other is used to divert the remainder of the oily exhaust gases through a length of silicone tube to the gear housing.

The crankshafts are stock Cox 'Pee-Wee' and are fitted with 18-tooth steel spur gears, which mesh with a 24-tooth gear on the main shaft. The latter is supported in a $\frac{1}{4} \times \frac{1}{2}$ in. ball journal bearing, housed in the machine aluminium front plate and aligned by a $\frac{1}{8} \times \frac{1}{4}$ in. ball journal in the 'trankcase'. The induction assembly features modified Cox 'Pee-Wee' reed-valve units held in place by the backplate and fitted with Cox TD .020 venturi and needle-valve units.

When we tested the Cox 'Pee-Wee' engine for the AERO MODELLER Engine Test series a while back, an output of .035 bhp at 18 500 rpm was recorded. It would not be unreasonable to suppose, therefore, that the performance of the Triscamp, since it uses Pee-Wee piston/cylinder/head assemblies, crankshafts and reed-valves, would bear some relationship to this, less a small percentage for gearing losses. However, a somewhat larger power loss must be allowed for because, instead of having open exhaust ports, the Triscamp cylinders exhaust into collector chambers which, since the piston skirts rise above the bottom edges of the exhaust port at the top of the stroke, must cause some dilution of the crankcase charge with exhaust gases.

Taking these various factors into account, we should guess that the Triscamp's peaking speed would be reduced to a crankshaft speed of around 16,000 rpm, which means that, via the built-in 1.33:1 reduction drive, the maximum practical prop speed would be approximately 12,000 rpm or, say, 11,000 rpm static.

The three sheets of drawings, together with a 16-page set of machining and assembly instructions to build the Triscamp, are available from Robert A. Washburn, 25204 45th Avenue South, Kent, Washington 98031, U.S.A., price 35 U.S. dollars.

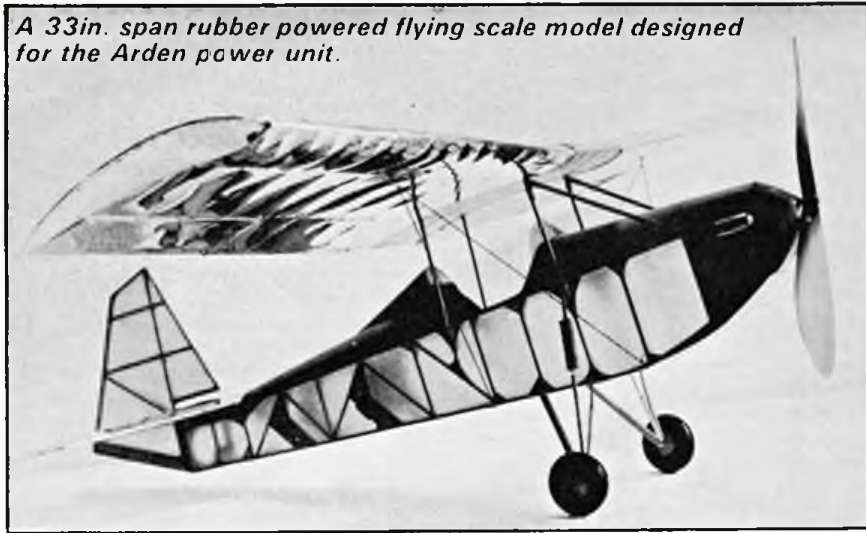
Left Robert Washburn's Triscamp is based on Cox 'Pee-Wee' .020 cylinders, has a total capacity of 0.980cc and weighs 163g (5.75oz) Technopower 19.385cc four-stroke radial shown for comparison.

Backplate removed to show reed-valve assemblies. Special cylinder jackets act as exhaust collectors.

Front plate removed to show gears.



A 33in. span rubber powered flying scale model designed for the Arden power unit.



FRED

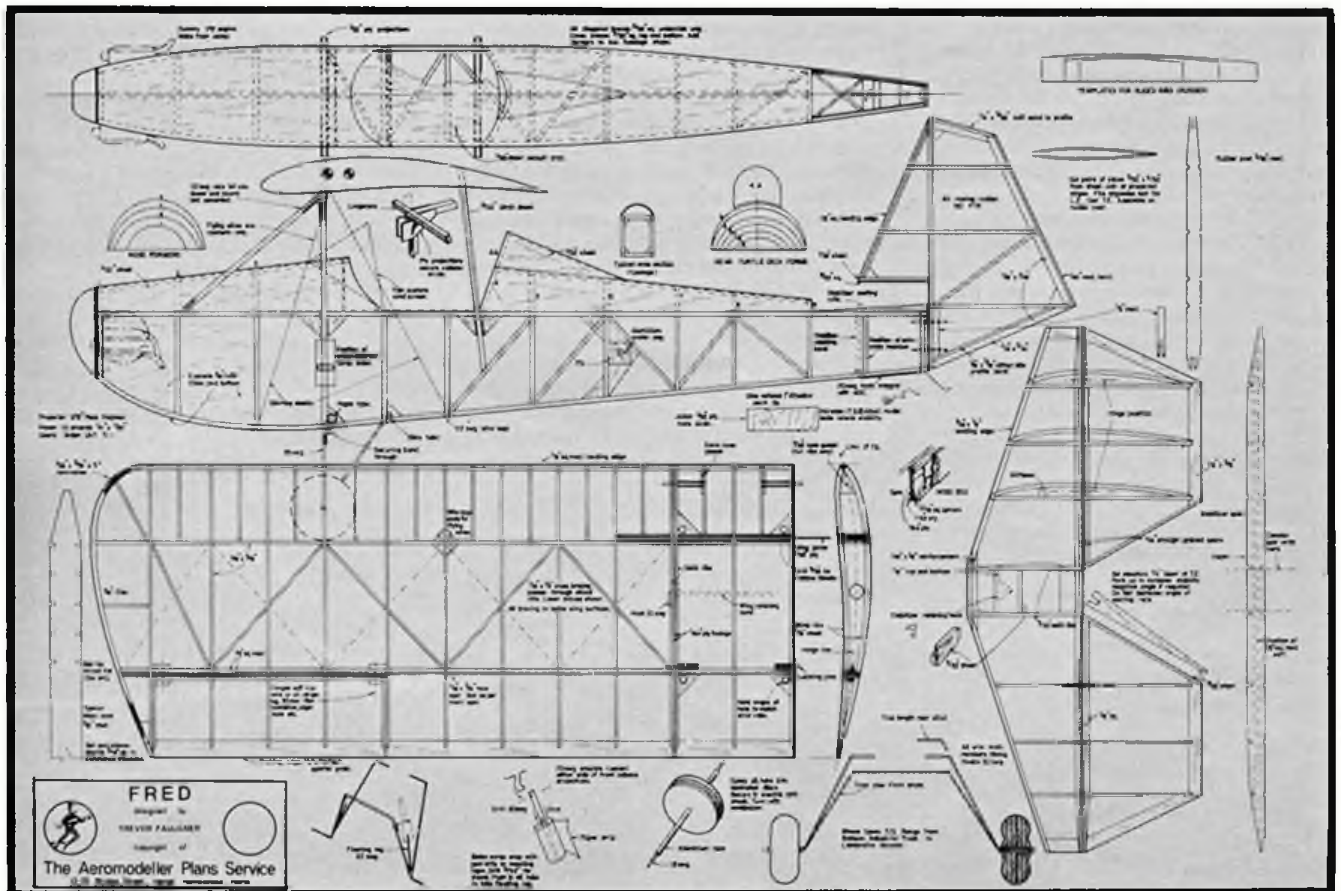
Designed by Trevor Faulkner

FRED'S EXISTENCE WAS revealed long ago via the pages of the *Aeromodeller* annual 1968-69. A 1/72nd scale drawing of the Flying Runabout Experimental Design by Messrs. Clutton and Sherry showed a delightfully pugnacious-looking light plane with a low aspect-ratio/constant chord wing using an undercambered Gottingen section, a large-ish tailplane rather too close to the wing T.E. for (model) comfort, and a simple 'boxy' fuselage with semi-circular top decks front and rear.

I decided to build to a scale which would produce a model of about 36in. span, as the trim adjustments would not be too taxing for my limited skills in that direction. The only other scale model I'd ever built was an own-design 'Kania' of some 2/3 this size, and this had shown that a reasonable size models could survive my rough handling, a much greater threat to my models than their return to terra firma.

Because of the short moment-arm, a decision was made to produce movable control surfaces which could, in theory, provide washout in the mode of a crude flying wing via the ailerons, and a powerful stab section, (i.e. highly cambered), by means of the elevators. As the stabiliser angle was only to be settled after testing, I thought it likely that the variables of camber and incidence would give me considerable latitude when this stage was

Full size copies of the plan reproduced here to 1/5th scale are available as Plan No. FSR 1426 price £1.85 plus 40p postage and packing from our Plans Service, PO Box 35, Bridge Street, Hemel Hempstead, Herts. HP1 1EE.





Wing centre section and cabane structure. Before gluing the centre section to the cabane struts, ensure that you have the correct angle of incidence and the wing is square to the fuselage and tailplane assembly.

reached, and, if stability was still suspect, then as much up-aileron (on both sides) as was required would solve the problem.

Gears

Sharp eyed readers will probably note that a number of changes in the structure are visible. These were the result of correspondence with the designers of the full size FRED, and their great help concerning details. For one thing, thrust-lines on FRED replicas tended to vary a bit according to the power plants employed. As I'm very keen on the use of gear-boxes for scale models because they help to avoid excessively large props, two gear-boxes were built from old clock gears; then a casual visit to the local hobby store revealed the existence of a nicely made, pre-packaged unit with nice gears, prop and an instruction sheet which demonstrated that the manufacturer had more than a rubbing contact with model aircraft. This unit, (the Arden), had a 5:1 ratio gear. In other words, for one revolution of the rubber motor, the prop turned five times. It also offered the possibility of using other prop sizes, but data did state that it was suitable for models up to 26in. span. FRED's 33in. did seem rather reminiscent of my local council's rate increase by comparison with the Arden's recommendation, but the soundness of the unit's fabrication encouraged me to take the risk. After all, two other more conventional gear units had been produced and could be employed if required.

A 9½in. dia. plastic prop was bought as an alternative to the 7in. job in the Arden pack simply as an insurance against under-propping, a considerable snag with rubber scale as past experience had indicated. (Prop-swaps are easy on the Arden unit, by the way.)

I discovered that the Arden unit would fit

very neatly into the nose block of the model. (a smaller FRED wouldn't have provided the required clearance), but the design now meant that the original intention of building a radial engine version wasn't feasible. The nose was modified to suit, and the motor-peg moved forward in anticipation of a reduced nose weight with the abandonment of the heavy brass gears.

Construction

Wings. These are three-piece, consisting of outboard panels and a centre section. It would be easier and lighter to make them as a single unit, but my intention was to allow for variations in dihedral by alternative wing-joiners with altered geometry. A knock-off system was planned, but a conventional 'banded-on' system can be used with slight alterations to the cabane unit.

Sliced ribs are employed as being more economical with balsa, and are much closer to scale. The original rib spacing is followed, but half-ribs are used rather than a sheeted leading edge to minimise weight.

Sliced ribs are very easy to cut. The sheet must be accurately marked to give constant depth, and a smooth template prepared. I always use a nose gusset at the leading edge for greater gluing area, and core template which, together with profile templates, allows the made-up ribs to be sanded as a block in the conventional manner.

Spars must be very accurately marked and cut as they act as an assembly jig into which the ribs are slotted. Main and rear spars should be matched for congruence by comparing the slots. With the three-piece wing, the wing-joiner boxes must now be built. They can be a loose fit front to rear on the joiners, but should be only 'easy' top to bottom. (This will permit the joiners to bend or break in the event of striking an obstacle, thus saving the wing). Note the vertical

grain of the joiners.

Laminated tips are formed round a piece of shaped polystyrene tile from ¼³²in. strips and white glue.

To assemble the ribs and spars, all ribs for a panel are slipped along the main spar, fitted into matching slots and lined up to admit the rear spar. This is positioned and engaged with the ribs, and adjusted so that the whole assembly is warp-free before being glued with PVA 'White' adhesive. Aileron sub-spars are similarly fitted, and the end ribs for these units cemented in place with a small clearance at each side.

At this stage, neither LE nor TE have been fitted. The entire component should be allowed to dry thoroughly using blocking strips underneath each of the spars, these strips and the component then conforming to the plane of the building board.

Trailing edge slots are marked, checked against their opposite numbers on each spar, and assembled with the wing panel UPSIDE DOWN on the board. (Because of the under camber, there is no support for the ribs if assembly is attempted 'right way up'). Finally, leading edge slots are checked for alignment by sighting from one end. Correct slight deviations by easing with a razor blade, marking each treated rib to indicate the need for a sliver of packing when gluing up.

When everything is dry and true, (and if it isn't true, steam the frame and pin down as before to cure), the cross bracing may be fitted. Take care not to induce strains into the frame at this point. If the wings are on a flat base, the upper layer of braces can be fitted with the assurance that all will remain true. Then the lower set can be added with the component free of the board, only being returned for final drying. Use PVA (white) glue for all wing assembly work.

Fuselage

This is very conventional with the exception of the cabane assembly. Each ¼³²in. dowel passing from fuselage to the centre section is secured outside the longerons by means of two ply projections which sandwich the appropriate vertical spaced and cross-member. (As these are all ¼³²in. stock, the ply acts as a sug 'clip' on the dowels and allows dry assembly, adjustment and marking before they are glued in place). This assembly is left until all covering is completed: there is then no problem of fitting tissue panels around awkward bits of the structure.

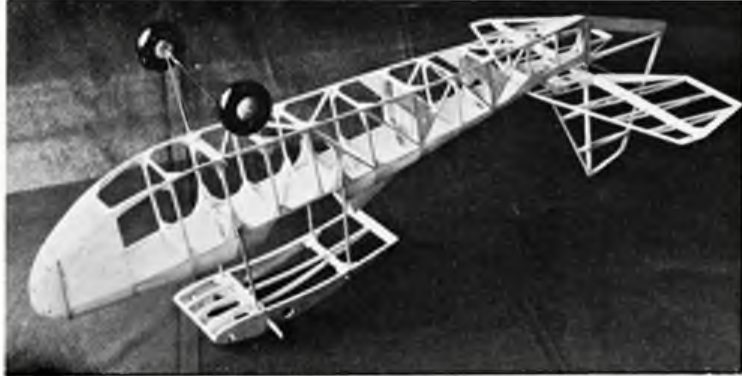
The front dowel braces are bound to wires projecting from a supplementary cross-member, and are also assembled after covering.

The gussets shown are very helpful in increasing structural rigidity and together with the cross-bracing produce a



Right: wing ribs and laminated ribs. In the foreground, polystyrene former for laminating the 1/32nd tips around. Left: pin the trailing edge down on the building board while gluing ribs and ensure leading edge is parallel to the trailing edge.





framework robust enough to withstand motor and handling stresses.

Tailplane

The stabiliser is an easier version of the wing; its lack of undercamber means that it can be completed on the board.

The rudder unit can be built 'in the air', glued and then allowed to set after blocking and pinning to a board.

Undercarriage

Wheels are made by producing a sandwich of discs to which a length of alloy tube is epoxied. A wire is passed into the tube, and the projecting tube and wire held firmly in the chuck of an electric drill. The drill is clamped in a vise, and allows the wheels to be 'turned' faceplate-fashion using sandpaper as the cutting tool. After doping, the excess tube is removed.

The undercart is clipped into the tube which is cemented and sewn to the cross-member, and held in place at its front with the small band which passes through the paper tube. The 'shock absorbers' are non-working, simply hiding the ends of the floating struts from the axles, and pivoting on the small wire hinge below the strut attachment projections. The undercarriage should move backwards under impact, the rubber band needs only to hold the unit up to the fuselage sufficiently firmly to prevent its yielding excessively.

Gearbox / Noseblock

The Arden unit gearbox assembly is used without the motor tube supplied. Some slight individual modifications to the noseblock shown could allow the part to be attached forward of the ply noseblock former. Where it is joined to the rear of this part, (as shown), small bolts should be passed through the former, and secured with washers and nuts to prevent the tension in the motor pulling the gearbox away from the block. **DO NOT RELY ON WOODSCREWS FOR THIS.** The small pinion is adjusted on the propshaft to give the clearance recommended in the instruction sheet, (sufficient for the free-wheel action to operate). The Allen screw must be tightened with care, enough to prevent the pinion slipping on the shaft, but not so as to strip its thread.

The shrouding flange of the unit which is designed to engage with the discarded motor tube is cut away to allow easier access to the double-bobbin arrangement. (If individual models with highly detailed finishes and increased weight are produced, it would be best to use a conventional plastic bobbin with a double hook bent for the reverse rotational direction of the motor by comparison with normal 'direct drive' models. This is

Complete fuselage and tail structure.

Right: front end of the Arden power unit mounted in nose block, with prop, locking key and winding handle in the foreground.



because the nose of the model must be held securely when using the winding crank).

Prototype weights

Fuselage and centre section	2.00oz.
Undercart	0.50oz.
Noseblock and prop	0.75oz.
Rubber	0.75oz.
Wing panels	1.20oz.
Stab. rudder	0.30oz.
Total	5.50oz.

The prototype is covered in aluminised Melinex on flying surfaces, with light Jap tissue on fuselage and rudder. Not quite like Eric's prototype in WWI German colours (Aeromodeller May 1976 Cover) but lozenge camouflage is hard to paint.

Flying

The model was balanced at the main spar as the scale areas and short tail nose-moment were assumed to be rather marginal in their stabilising effect. In addition, the elevators were both bent slightly 'down', thus giving a highly cambered section to the stab. (Measured at the T.E. this checked out at $\frac{1}{4}$ in. down elevator).

The left aileron was given $\frac{3}{16}$ in. 'up', the right set at $\frac{1}{16}$ in. 'up'. The thinking behind this was that the washout so induced would further aid stability, the differential between the two helping to keep the right wing up on the right hand turn which it was anticipated would be the normal trim.

After a few test glides, the rudder/fin unit, (all-moving on the model as on the prototype), was set to give a hint of a 'lean' into a right turn. The nose-block was packed to give $\frac{3}{32}$ in. right side thrust at the edge of the nose former.

First flights with the right/right trim looked promising. The stab. seemed extremely efficient in the way it tended to lift the tail whenever the stall threatened. On 100 turns on the Arden unit, (equal to 500 on the prop), the model was flying round me in right hand circles of some 20 yards diameter. The only snag was that at the end of the power run, with the prop free wheeling the glide was tightening, and, although nowhere near a spiral, just wasn't nice to look at.

An attempt to fly right/left by moving the fin/rudder unit produced an absolutely straight flight under power with a hint of left glide; this had eliminated the tight glide, but the power run was now off key. By

degrees, the nose packing was reduced, $\frac{1}{32}$ in. at a time. This got the result that I had been seeking, even though I'd never flown left/left before. On 120 winder turns, (equal to 600 on the prop) she was away, no hint of transition problems, easy landing with the prop free-wheeling, and a spot of realistic flare-out as the ground effect came in. The maximum turns, (stretch-wound) are in the region of 200-220. On 120 turns the model averages 35 seconds very easily.

One very significant point came to mind regarding the Arden unit. I have never flown a rubber-powered model with so little paraphernalia in my life! All I carried was the winding crank, and though this did not allow any form of stretch winding, the ease with which the model was prepared for each flight was remarkable. The motor used was 12 strands as against the Arden's designed eight. The prop. was far larger than that for which the system was designed, and yet there were no problems with gear slip, this indicates that the unit is more than adequately robust for its designed use in much smaller models. I found that the driving 'step' on the Peck Polymer airscrew was not as positive as I liked when some bench tests were carried out. The prop. was modified by fitting a small wire clutch of the type commonly used in P-30 models. This locks the prop positively on 'drive', and freewheels reliably.

The dihedral brace/wing fixing system also works well, remaining secure in flight, but displacing easily with any impact. My only criticism of the model is that because of the forward CG and related wheel position, surface resistance in the form of tufts of grass and other obstructions will cause it to nose over gracefully. On the credit side, ROG is facilitated so long as the surface is smooth.

Finally, I can recommend FRED as a model likely to respond to careful trimming, but capable of being made to fly by the relatively inexperienced. The expert will be able to reduce the weight of the model by at least 30% I feel sure, as the model shown was built of very ordinary 'off the shelf' balsa. The Melinex covering is a little heavier than Jap. tissue, and the alternative rear motor anchorage shown in the photographs (but not in the drawing) is unnecessary. As $\frac{3}{8}$ oz. of nose weight was added to give the CG shown a reduction in total weight should give an even better performance.



VH.147

NIPPER

Trainer

(Free Plan)

Designed by J. van Hattum

THIS MUST BE the writer's tenth design of a model which might help the beginner on the way to become familiar with towline glider technique. Some have been a bit too functional and lacked eye-appeal, while others proved somewhat too complicated. The model shown here was built some years ago as another attempt to produce a small flying object which had to be very simple, cheap in materials and still look reasonably attractive. As to the latter it is up to the reader to pronounce a verdict, but the designer can frankly say that after all that time the model still pleases him.

Since the design was intended for use in restricted spaces it is no Thermal-Catcher, although one can never know what surprises Mother Nature may have in stock and the builder should put his name, address, etc. on his model, a habit to be followed with any model he may fly in future.

There are many kits in the shops containing pre-fabricated parts which just 'click' together, needing just a little trimming and glue. That may be very nice, but hardly teaches the builder the basics of the work. Building a model from scratch also creates that sense of achievement and real ownership which no money can buy. If the reader has decided to take it the 'hard way', let us inspect the plan and sketches more closely.

A General View

It will be seen that the 'Nipper' has what is called a 'profile' type fuselage, that is it is flat and possesses no formers or bulkheads. This greatly simplifies the construction without detracting much of appearance. The fuselage consists of a 'pod' which even shows the cockpit in which a pilot might be seated, provided he were sufficiently starved to be able to squeeze into it. Since a normal wing obstinately refuses to be stable by itself, we

must ensure stability by placing a horizontal tailplane behind the wing. That distance may vary considerably, as can be seen in pictures of models in this journal. The job of the tailplane is to exert a 'moment', which is roughly the product of the air forces on the tail and the distance from the wing, but we need not go into details here. It is enough if one realises that a tailplane placed a great distance behind the wing can be made much smaller than one close to the wing. In our case that distance is not great, so the area of the tail is a generous proportion of that of the wing. You could, of course, place the tailplane ahead of the wing (that is called a 'canard') and that can make a very pleasant model as well as full-size aircraft. So we now have 'longitudinal stability', that is the tendency of the model to return to its proper flight path after meeting a disturbance in the air through which it flies. But that is not all; it must also have an in-built sense of direction. This 'directional stability' can be assured by placing a fin at the end of the fuselage. Finally we must also have 'lateral stability'. The air through which the model flies is never at rest, with the result that one wing may easily drop, so we want it to be raised up again. That will happen when we build the wing in the shape of an open 'V' when seen head-on. Another form is a straight inner portion with upturned tips and this was chosen for the present model to simplify the construction of the wing; it is seen that the greater part of the wing is quite flat and only small 'ears', set at large angle, provide this 'dihedral', or open 'V'. So we need not worry about stability. After some small adjustments during flight-testing the model should be 'automatically stable' and remain so, provided it balances correctly at the place indicated on the plan.

Layout

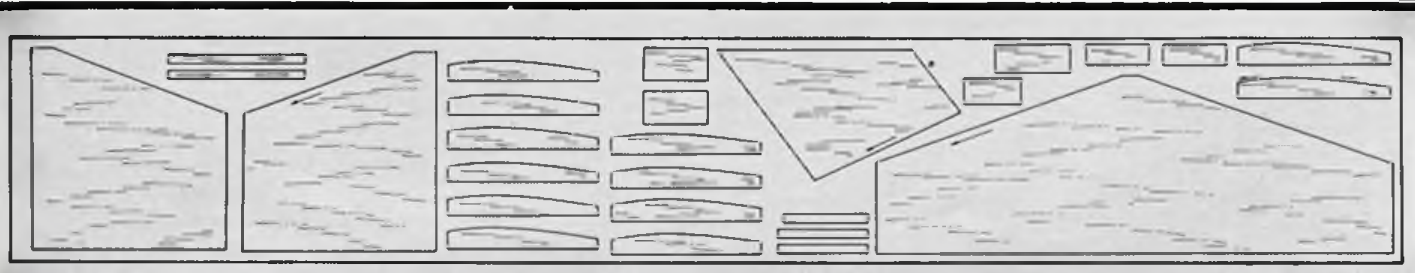
We have seen that the basic fuselage consists of a pod which carries the wing. The tail surfaces are fixed to an outrigger or 'tailboom' some way behind the wing and that is really all there is to it. Compared to many models the number of parts is quite small. Only very few operations may seem a bit demanding, but if the instructions are followed carefully, they will not prove difficult to carry out. Always remember that every job deserves full attention and care. Give plenty of time to study the plan and sketches, so you know exactly how it should be done and why. Too often a job is botched because a builder starts with a rush without preliminary planning, thus wasting material and spoiling the fun. This does not only apply to 'Nipper', but to any model you may build later. In the aircraft industry product planning is a most important department and we might as well adopt the system, even for such a small model.

The Fuselage

We like to work on a generous slab of soft board, which is cheap and will not damage the soft balsa wood.

This is not difficult to make. The 'pod' is cut from a slab of 1/2 in. (12mm) thick balsa as accurately as you can, following the shape from the plan. If you have a fretsaw this is an easy job, but keep a little outside the line drawn on the wood. Finish with coarse and fine sandpaper. Fasten the sandpaper on a block of wood. The main thing to watch is the flat part where the pod is joined to the tailboom. This should be accurate to obtain a firm glued joint. The edges of the pod can be lightly rounded using fine sandpaper. Cut out the oval hole

This diagram gives the most economical layout of the wing and tail components, using a sheet of medium-hard balsa, 1.5mm (1/16 in.) x 100mm (4 in.) x 625mm (25 in.) long. A xerox copy of the components can be ironed faced down onto the sheet which should leave a good image. With certain types of prints this method will not work, so either use the pin pricking through the plan method, or place carbon paper under the plan and trace through.



which will eventually contain the ballast to balance the model correctly. The sketches (see plan) show how the parts are put together. The tailboom, cross-section $\frac{1}{2}$ in. \times $\frac{1}{2}$ in. (12mm \times 12mm) only needs some tapering at the tail-end and adding the top of the 'cabin' and the platform for the wing. These consist of two layers of $\frac{1}{16}$ in. (1.5mm) sheet, glued together. We could, of course, use $\frac{1}{8}$ in. (3mm) sheet, but that would mean another special size of material which we want to avoid. It is here that we should study the suggested layout of parts on the $\frac{1}{16}$ in. sheet which may be of help to limit waste of material. It is recommended to shape the front end of the tailboom, forming the cabin top, before joining it to the fuselage. Check if the joint is true and straight. The writer uses white wood glue, preferably of the waterproof kind, as this does not dry too quickly and becomes practically invisible. Excess glue should be removed quickly. After the joint has set firmly a hole is drilled or fretted to take the hardwood dowel (from a lolly-stick?) which is lightly glued in place. The hook at the bottom of the pod, which will serve to take the towline, can be bent from a non-rusting paperclip. One prong is pushed firmly into the pod and the part safely secured by a strip of fabric or gauze, well covered with glue as shown.

Tail Unit

This is the most simple operation and consists only of transferring the shape of the tailplane and fin onto the $\frac{1}{16}$ in. sheet, as shown in the arrangement of parts, noting the direction of the grain in the case of the fin. Cutting should not be done freehand, but with the hobby-knife along a steel rule. The drawing shows the correct direction of cutting: if the knife should tend to follow the grain it will run outside the cutting line and not damage the job. Thin strips are glued to the tips as reinforcements and to keep the thin sheet from developing warps which would later upset the trim of the model or lead to splitting along the grain. Lightly sandpaper the outlines to remove rough spots, except the side where the fin is glued to the tailboom.

Assembly

The tailplane can now be glued to the end of the tailboom. Push some sharp modelling pins through the sheet to hold it in place. When the joint has set the fin can be added and glued ahead of the tailplane. Here we must take good care that it runs accurately along the centre-line of the boom and makes a right angle with the tailplane, since a crooked fin may induce an unwanted tendency to turn. After thorough inspection the lot can be given two coats of thinned clear dope. Dope is highly inflammable, so keep the work away from open fire, electric heater and don't smoke! Doping should be done at room temperature, but the fumes are toxic and the place should be well ventilated. Sandpaper lightly between coats to remove rough spots.

Wing

This is the most important part of any model. It must supply the 'lift' to keep it in the air as long as possible and all the other parts only serve to help the wing to do its job properly. So care and attention should be

given to its construction, but care should now have become second nature to the builder. This wing is somewhat unusual as it is actually built onto a strip of $\frac{1}{16}$ in. sheet which serves as a base. Cut this base accurately, using steel rule and hobbyknife, mark the locations of the front spar of $\frac{3}{8}$ in. square (9 \times 9 mm) (which is generally called the 'leading edge') and the rear member of $\frac{1}{8}$ in. \times $\frac{1}{2}$ in. (3 \times 12 mm), called the 'trailing edge'. These strange terms date from the pioneer days of aviation when the front edge of the wing was fairly rigid, but the rear edge was quite flabby with the fabric covering sewn around a cord or steel wire connected to the ribs, so it somehow 'trailed' through the air. Also carefully mark the locations of the twelve ribs, noting the smaller distance between the innermost two where the wing will rest on the fuselage. Glue the leading and trailing edge to the base, working fairly quickly in order that the glue will not set too soon. You can ensure good contact by pushing modelling pins from underneath the base into the spars, taking care that they are not displaced. The next job will be the manufacture of the ribs, following the shape shown on the plan. The easiest way to do this is to make one to serve as a template for the others. On the arrangement of parts they are shown distributed amongst the other bits. Again cut in such a direction that a slip of the knife will not make it run into the rib. Sand them all to equal shape, using the template as a check. Trim them to fit snugly between the leading and trailing edges. They should not have to be forced between them. Between the two inner ribs there are two spanwise uprights which serve to take the strain of the elastic rubber bands used to keep the wing to the fuselage and take the strain from the covering. Now comes the only job which may seem a bit demanding but will not prove too difficult if carried out with care and patience. The wing tips run at an angle of 45 degrees and there are fortunately spars with a section that just suits our purpose (or we would have to think up a different way to obtain dihedral!) We glue suitable lengths of this at each wing tip, taking care that they do contact the base as well as the ribs. When thoroughly set we start on some wood carving; carefully cutting away material in small portions until the exact shape of rib is obtained. During this process the tip will assume the curved shape as shown on the plan and in the sketch. Finally sandpaper it to a smooth surface. You can now deal with the leading edge of $\frac{3}{8}$ in. (9 \times 9 mm) square, another somewhat tedious job, but you either want a model or you don't. Try to approach the shape shown on the plan as closely as possible. A small razor-plane, such as a Exactor, carefully handled, will be very useful, finishing the job with coarse and

fine sandpaper. The section of the leading edge should merge smoothly into the shape of the ribs. Finally cut the 'ears', using the same procedure as used for the tail surfaces, and glue them to the tips, with pins to hold them in place while the glue sets. This leaves the covering of the wing with light modelling paper. Covering is often regarded as a difficult chore, but in this case it is a relatively simple matter, as we only have to cover the upper surface.

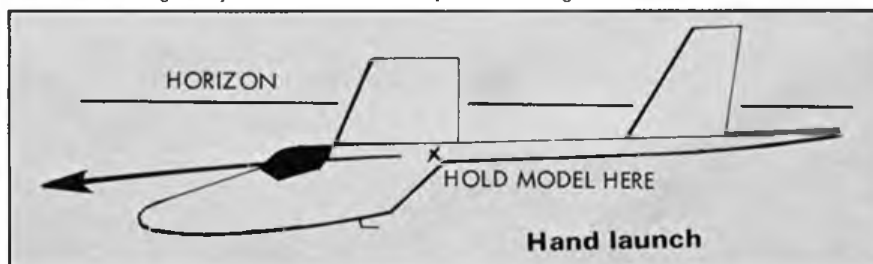
Covering

Cut a rectangle with an overlap of about one inch (2.5cm) on all sides. Trim one end so that it follows the contour where the 'ear' joins the wing and stick it down at the maximum camber of the rib. The writer often uses white office paste which is easily handled, but it can also be done with dope. When the tissue has stuck properly, stretch it well to the opposite tip and repeat the operation. Next work the tissue smoothly onto both tips, stretching it to remove wrinkles. When properly set the covering can be stuck to leading and trailing edges, stretching it moderately to avoid sag between the ribs. Finally trim off any excess material. Now lightly spray the covering with water, but do not be alarmed when you see it sag horribly as it will gradually tighten nicely as the water evaporates. Give the entire wing two coats of thinned clear dope.

Finishing and trimming

Your model is now finished and you are free to enjoy the result of your efforts. However, to make it into a proper flying machine, it must be trimmed with the 'centre of gravity' (c.g. for short) at the proper location, as shown by the arrow on the plan. Cover one side of the ballast hold with a disc of thin cardboard, do the same with the other side, but that disc should have a hole to take the pellets or lead shot. Test the balance by supporting the model under the wing until the proper location of the c.g. is obtained, that is with the tailboom horizontal. Cover the hole with tape which enables you to add or remove ballast as required, but with the c.g. in the right place this will hardly be necessary, but no two models built from the same plan are exactly alike!

You might like to improve the looks of your 'Nipper' by giving it a spot of colour such as coloured tissue. Our model had the pod painted light blue, with the 'cockpit' left blank. A similar coat was also given to the wingtips and the fin. A bright colour can be useful to help spot the model in tall grass. The cockpit can be picked out in white or black when the pod is painted a light colour, say canary yellow. You can use model paint, coloured dope or one of the standard household paints, provided it is waterproof. Do not paint the whole model as it adds too much weight.



Test-flying

First thoroughly check the model. Some models may show slight twist of the wing, but this one is almost impossible to deform — apart from being immensely strong! — but it may not be seated quite parallel with the tailplane, which leads to a tendency to turn. Slip four elastic office bands over the pod and stretch them in pairs crosswise over the wing and the peg. Now look at the model from the front: if the wing and tailplane are not parallel glue a strip of stiff paper or thin cardboard on one side of the platform. The model is now ready to taste the air for the first time, but a few preparations are indispensable. First you need a light line to tow the model up into the air, say 100ft. (30m) of fishing line or strong string. One end of the line is tied to a wooden block which you will hold in your hand during towing. At the free end you tie a ring with a light fabric vane. The ring is slipped over the towhook and the purpose of the vane is twofold. It helps to make the ring leave the model when you ease up on the towing and also enables you to note when the model is flying freely. Take some spare shot as well as some strips of cardboard to alter the angle of the wing relative to the tailplane. Gliders are simple but one needs a helper to get them up in the air. This should be someone who is keen and patient enough to share any troubles you may have and he — or she? — should carefully observe the antics of your model, so these can be discussed critically. Arrange for clear signals between the two of you which will exclude misunderstanding: testing a new model is always a business which raises the pulse-rate and two see more than one. If you can induce an experienced modeller that would be all the better. Suggested signals: raise arm = ready to go; arm dropped = release model.

The flying ground should be carefully chosen and be free from obstacles on the upwind side, like trees and houses which will cause disturbance of the air and upset the model. Although it is now clear to us and the birds that the start should be dead into wind, the pioneer aviators often failed to realise this simple fact. Choose a day with a modest breeze. Before we hook the model on the line, a few handlaunches should show whether the trim is about right. The model is started with a gentle and easy sweep of the arm while one tries to

'feel' whether there is enough lift to make the model fly. A hand launch may show three flight patterns: a gentle, straight descent and smooth landing; a tendency to dive and a tendency to lift the nose, followed by a steep dive. In the last two cases we may have launched too slowly or too fast, so try again. If this makes no difference, the dive may be corrected by placing a strip of cardboard under the front of the wing, while the 'stall' is avoided by doing the same with the rear. Once a good trim is obtained glue the strip into place. An unwanted tendency to turn can be corrected by gluing a strip of cardboard to the rear of the fin and bending it so the turn stops. Only in desperate cases should ballast be added or removed as the c.g. has been determined for the prototype. Nor should the location of the towhook ever be changed. Check the rubber bands and position of the wing after each landing. Now for the real test. Unwind some 50ft. of the towline, slip the ring with vane over the towhook and let your helper hold the model with the nose slightly raised. With the line into wind give your starting signal. The helper should take a few paces with the model until he feels it being pulled from his hand. It is important that during the start the wing is truly level. The starter should run briskly at first, but gradually reduce speed and keep his eye on the model all the time. Observe its behaviour carefully: when the model tends to veer off to one side try to pull it straight by moving at a right angle to your original path, but do not insist too long. Better to unwind more line or have a surplus ready in your hand so you can slacken the tension and let the ring slip off the hook. Correct the turning tendency with

the trim-tab on the rudder. The model may still show a slight dive or stall (undulating path), which will demand a change in the angle of the wing with the tailplane. Practise until a straight tow is achieved and follow up with a longer line. On no account rush the model into the air at breakneck speed, a mistake often made by beginners who fear the model will not climb. If the line drops off too soon, you can always try again. No panic and you and your model will share many fine flights together!

LIST OF TOOLS AND MATERIALS

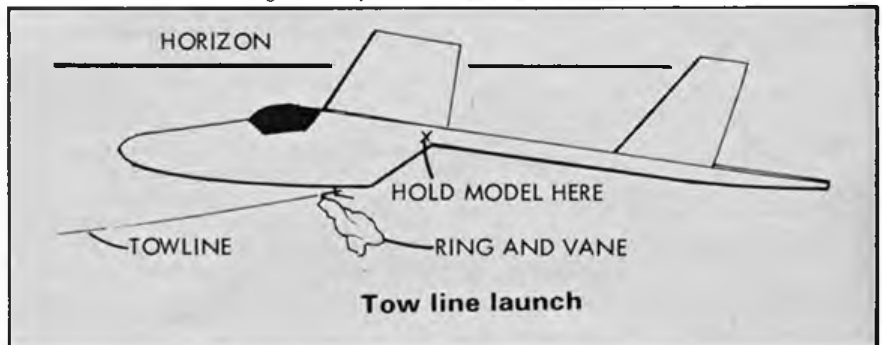
Hobby knife, fretsaw, file, small Exactor razor-plane, pair of small pliers. Sandpaper, fine and medium, grades and fastened to sanding block.

Balsa, medium hard

$\frac{1}{8}$ in. (1.5mm) \times 4in. \times 21in.: Wing base;
 $\frac{1}{8}$ in. (1.5mm) \times 4in. \times 26in.: Various parts,
 $\frac{3}{8}$ in. \times $\frac{3}{8}$ in. (9mm \times 9mm) \times 21in. Wing leading edge;
 $\frac{1}{8}$ in. \times $\frac{1}{2}$ in. (3 \times 12 mm) \times 21in. Wing trailing edge;
 $\frac{1}{2}$ in. \times $\frac{1}{2}$ in. (12 \times 12 mm) \times 17in. Tail-boom;
 $\frac{1}{4}$ in. \times 2in. \times 9in. (12 \times 50 \times 175 mm): Fuselage pod

Sundry parts

$\frac{1}{8}$ in. \times 1 $\frac{1}{4}$ in. (3mm dia.) Hardwood dowel;
 1 Rustless paperclip.
 Ballast pellets or lead shot;
 1 small bottle of white (waterproof) wood glue;
 1 small tin of clear dope + thinners,
 (If required, small tin of coloured dope or some paint);
 One quarter sheet of white or coloured medium light tissue;
 Some 100ft. (30m) of light towline, plus $\frac{1}{2}$ in. dia. ring, and small light vane



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Vintage Corner

By Alex Imrie

Dave Baker gets his double-sized Porlock Puffin away. Model was powered by Merco 49 and was unfortunately written-off on Easter Sunday at the St. Albans Old Timer meeting.

SAM 35 SPEAKS

The current issue of the SAM Newsletter includes full instructions and drawings for building the 9 feet span Willis Petrol Monoplane, plans for Bob Copland's GB3 streamline rubber model, hints on tube winding rubber motors and there is an entertaining ghost story by A. E. D. Miles.

The clock is turned back some 45 years in a flash, on reading Brian Hewitt's account of his early days which touches on long forgotten aspects of the hobby. Remembered are the out-of-date Flying Aces that came across the Atlantic as ship's ballast to be sold at local markets for 3d each, and one can only guess at the numbers of this magazine that must have been imported in this way. It seems funny now to think that there should ever have been any mystery about an American commodity called 'cement', but there was, and its initial non-availability in this country meant that many early balsa models were made with tube glue from Woolworths.

But, enough of this nostalgia! A Brown Junior engine being offered as a prize in an unusual contest is bound to result in plenty of contenders, and the intention of running Texaco style competitions next year should entice SAM's to start cutting wood right away. All in all, a good and varied rendering that all vintage enthusiasts should read.

VINTAGE GET-TOGETHER

This meeting was a great success and more than 80 enthusiasts, some from as far away as Lancashire, foregathered at the Downs Farm Youth Centre in Hatfield on 13

Right: the writer's Miss Philadelphia V powered by a Brown Junior Model 'B'. Luitman and Brown of the Model Shop at Newcastle were responsible for a number of excellent semi-scale designs including this 'Wasp' powered by Mills 75 diesel, seen here being launched by Derek Camps at Old Warden.



September to chinwag the afternoon away. Full marks to Malcolm Baird for his behind-the-scenes activities in signposting the route from the Comet roundabout on the A1, setting-up the display tables, projector and chairs for the film show, boiling the tea urn and producing a never ending number of 'eats', and of course, for suggesting the get-together in the first place.

A number of models were on show and these included Dave Baker's 8 feet span Buhl Pup, Sid Sutherland's replica of Don Foote's Westerner powered by an Ohlsson 60, Brian Ferrett's version of Covert's 1938 Berryloid Winner, and the writer's Brown Junior powered Miss Philadelphia V. Interest was shown in the model films, the refreshment counter was well patronised and engine spares and old magazines were freely exchanged in the Swap Shop, but the most popular pursuit was obviously just rubbing shoulders and chewing the fat with fellow enthusiasts, which was of course, the main idea of the gathering. The popularity of the meeting confirmed the prediction made, that this event looks like becoming a regular happening, and the next get-together at the same venue is earmarked for Sunday 6 December at the slightly earlier time of 1300 hours. All are welcome, so don't miss it, come along and join the fun.

ORIGINAL AVION ORIOLE

It is always good to hear of true restoration work on original models, and to coax 40 year old airframes into their natural elements again is a most rewarding aspect of vintage modelling. However, it is not an easy task. Apart from the failure of glued joints, which is probably the most common problem, sometimes the whole structure of the wood has changed with the passage of time. Hard balsa can become super soft for reasons that are not clear and must be replaced. The writer encountered wood in this condition during the 1975 restoration of a Cloud Airmaster that had been built in 1939, and remembers the separation of plywood areas in the wing centre section that revealed numerous spiders' nests inside! This is the sort of work that Danny Shields of Maryland, U.S.A., presently finds himself engaged in, having recently become the proud owner of no less a machine than the original Avion Oriole, which was designed and built by the late A. C. Pothier who also designed and made the Avion Mercury engine. This is the self same model that was used in the first advertisement for the type in April 1938 Model Airplane News.

The Oriole, a ten feet span high wing cabin beauty was sold as a "Deluxe Prefab-



Aeromodeller



ricated Gas Model Kit' and was intended for radio control in the days when radio gear was large and heavy, hence the size of the machine. The weight ready to fly, presumably without the radio gear, was almost 12lbs. It was powered by the first model Avion Mercury engine of around 25cc capacity swinging a 20 inch diameter propeller.

Danny Sheelds was fortunate in obtaining the optional extra of a set of high lift section gull wings with the span increased to 11 feet when he acquired this model. He has a mammoth job on his hands, but there might be less deterioration in Danny's acquisition than usual, since the construction of this machine was of full size aircraft grade sitka spruce and plywood. He plans to completely refurbish the Oriole and intends to fly it complete with Avion Mercury engine in the R/C Assist Class at next year's SAM Championships in Massachusetts.

Probably best known to UK vintage fans for his kind presentation to SAM 35 of the 'A' frame pusher trophy for annual competition, Danny Sheelds was building gas models long before he became a B-29 navigator in WW2 and has been building them ever since. He naturally became a great fan of the products of the old Burd Model Airplane Company from his native Baltimore and has built King Burds in various sizes. Recently Danny compiled a book titled 'Antique and Old Timer Model Aircraft' which is an illustrated catalogue of gas models from 1935 to 1942. This publication is available from Danny at 3 Cinnamon Circle, Apartment 1C, Randallstown, MD 21133 USA for \$12.00 post paid.

VIPER II

This is a very appealing design, and when the plan was re-released in December 1979 after having been unobtainable for



*Above original Avion Oriole built in 1937. '38 now being restored by Danny Sheelds (see text).
Vic Dubery holds the Larsen 'Victory' while builder Peter Michel piles on the turns. Vintage Day Old Warden, August 16, 1981*



almost 30 years, there was such a rush for copies that the Viper II became the highest selling plan sold by MAP that month. Although obviously a popular design, not many modellers appear to have built Viper, possibly less than half a dozen examples were ever illustrated in AEROMODELLER from 1937 to the present day. None of the powered versions that were said to be in existence have ever been seen by the writer, but illustrations are known of the petrol model based on a double-sized Viper which was flown before the war by a modeller from Romford. Where then have all the Vipers gone? Did the enthusiasm of others receive the same damping effect that the writer experienced once they set about the actual construction?

The Viper II had always been high on the list of models that I wanted to build, I had seen the original machine hanging up in Mr C. Rupert Moore's studio and I had also seen film of this model in flight. These 16mm action shots, possibly taken by the late Eddie Riding, showed high speed excursions into the atmosphere where the 24 ounce model, propelled by 6½ ounces of brown rubber arranged in 4 skeins (one could almost hear the whirr of the brass gears) caused the 15 inch diameter by 15 inch pitch satin walnut propeller to dissolve into a disc of spinning light! This was motivation indeed, and I just could not wait to get started.

The drawing did not state size and type of

material in many cases, and it was only by referring to a complete list of Viper materials that work could go ahead. Bulkheads were cut from 1mm ply and spruce was used for the stringers since birch was unobtainable. Despite using the vertical plywood spacers and steaming the top and bottom spines as per the original building instructions, I decided to use a simple jig for fuselage construction. The bottom side outline was cut out in a one inch thick wood plank and the fuselage was stringered in situ, thus ensuring that when the glue dried the fuselage would retain its proper shape.

It was now that some discrepancies in the drawing came to light. In all fairness to Mr. C. Rupert Moore, it is understood that the drawing was made by a draftsman who measured the original model, and the blame for the perpetuation of the errors found, must rest with the original AERO-



Left as far as the writer has progressed, with his Viper II fuselage. Note the paper mache wheels (see text).

Bob Hodgkins gives the final contra-piston adjustment before releasing his red Peerless Panther on one of its many ROG take-offs at Old Warden on SVAS Day 1981.



Terry King launching his Haulberg 'Isis' at Old Warden on SVAS Day, July 19, 1981

MODELLER staff. Most drawings contain some inaccuracies or anomalies, that the builder spots and corrects as he builds his model, and the corrective action mentioned below is given in the hope that my experience might be of assistance to other would-be Viper builders.

The slots on the bulkheads gave the stringers large departures from their desired direction, and bulkheads number 5 and number 6 were too narrow, this gave the fuselage a waisted shape, not at all in keeping with the lovely form that the top view of the fuselage possessed on the drawing. It was necessary to split these bulkheads at the bottom spine and splay them out to get the necessary width, this of course, reduced their height, so packing was necessary where they joined the wing

rests. The stringers were re-positioned and stiffened by cementing $\frac{1}{16}$ th inch square balsa behind each stringer, and the ply bulkheads were re-scalloped by means of a small emerywheel in the electric drill.

The basic undercarriage frame looked decidedly lanky, and it was found that the true length of the front leg should have been $4\frac{3}{4}$ inches long not 6 inches as given on the plan. Although balsa and ply built-up wheels were shown on the plan, it was decided to use the paper mache wheels and these were made as per instructions in Part 10 of the Flying Scale Model series in June 1949 AEROMODELLER. The wheel size varied on the drawing from $3\frac{1}{8}$ inch

diameter in the side view to $2\frac{15}{16}$ inch on the top view, and although this $\frac{7}{16}$ inch difference might not seem much, it is sufficient to alter the appearance of the model. The newspaper pressings took an age to dry, but eventually the four wheel halves were assembled with balsa block distance pieces at the centres and a screwed brass bush was fitted to either side of the hubs. My wheels were slightly smaller than they should have been due to insufficient allowance for shrinkage, but the diameter was built up with strips of newspaper and the black silk bias binding finish tape. The wheels now looked the right size and shape but were not as light as Mr Rupert Moore's originals.

No doubt a replica Viper could be built using all balsa construction on the 'Keel-bild' principle, but the purists who want to build a model like the prototype will want to adhere to original methods and materials, and they are advised to follow the building instructions that were given in October and November 1937 AEROMODELLER, they will also find much information of use on the back cover of December 1937 AEROMODELLER in the materials list.

Viper builders are asked to send in black and white photographs of their models and to tell us about their flights. As a matter of interest, the best Viper performance was possibly the 72.5 seconds flight obtained before the war on Hackney Marshes by a Mr Leonard Taylor.



"This new fuel certainly clears the field."

Although we have not had a Caption Contest in the past two issues, we shall be continuing in the new year. Apologies for the delay in publishing September's captions.

September Captions

The winner was: M. J. White of Reading, Berks. Runners-up were: S. Felmingham of Melton Constable, Norfolk with "COME ON, I KNOW YOU'VE GOT MY THUMB IN THERE SOMEWHERE"; from G. Moss of Snaith, North Humberside — "BLASTED COWPATSI!"; and



"These Mothercare sponsored events do have their drawbacks."

"I'VE JUST DISCOVERED ONE DIFFICULTY WITH 'SUPERGLUE'." from John Howard, Hitchin, Herts., and "GO ON SPIT IT OUT. HOW MANY TIMES HAVE I TOLD YOU BEFORE — NO RACING FUEL FOR A YOUNG LAD LIKE YOU" from S. Sarroob, Hastings, E. Sussex.

October Captions

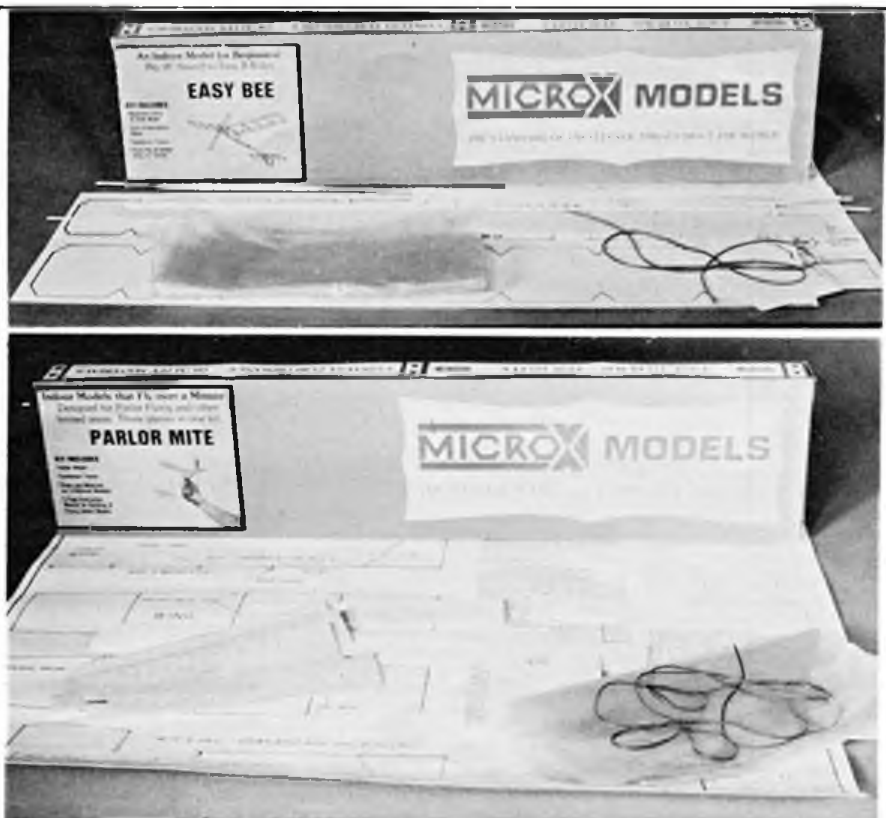
The winner was: J. J. Baghurst of Ilfracombe, N. Devon. Runners-up were: Tony Brookes of Radcliffe-on-Trent, Nottingham, with "DAMMIT, THEY DROPPED ME IN THE CART AGAIN." and P. J. Smith of Dover, Kent with "ME AND MY BIG MOUTH! MOTOR'S BROKE" AND ARE MY SHORTS ELASTICATED?"

SHOP TALK

The latest in products for the modelling scene

ANEMOMETER

This hand held digital anemometer is available from R. W. Munro Ltd., Cline Road, Bounds Green, London N11 2LY. It has a two digit liquid-crystal display which is back lit to aid reading in poor light. The anemometer is completely portable being only 238mm in length and weighing 265 grammes. It uses one 9v PP3 battery and is operated by a push button switch. The display holds for ten seconds before switching off. An accuracy of plus and minus one digit is claimed. The anemometer is available reading wind speeds either in knots mph or metres/seconds. Price £66.65 + VAT, available from the above address.



MICRO X INDOOR MODELS

The two kits illustrated were supplied to us by Sam's Model Shop, St. Albans. The **Easy Bee** model follows A.M.A. and Easy B rules and is a suitable design for a beginner to this side of our hobby.

The kit contains condenser paper, fine sheet balsa wood and cardboard templates to aid in the construction. The best type of

glue for making this type of model is cyanoacrylate; this is not included in the kit. Price £2.15.

The **Parlor Mites** kit contains enough material to build three small models capable of flying for over one minute in your own house. Obviously to build any model of this delicacy and size, requires a steady hand and patience, but the end result can be most rewarding. Price £3.99.



TATONE MANIFOLDS

Now available from Henry J. Nicholls & Sons Ltd., are these Cox Muffler/Manifolds. Tyre EM-9 is suitable for all of the 09 range of motors. The muffler is made from cast aluminium and consists of two parts held together by two screws. Each half of the muffler is simply bolted around the cylinder and locked in place with a screw. Price £5.95.

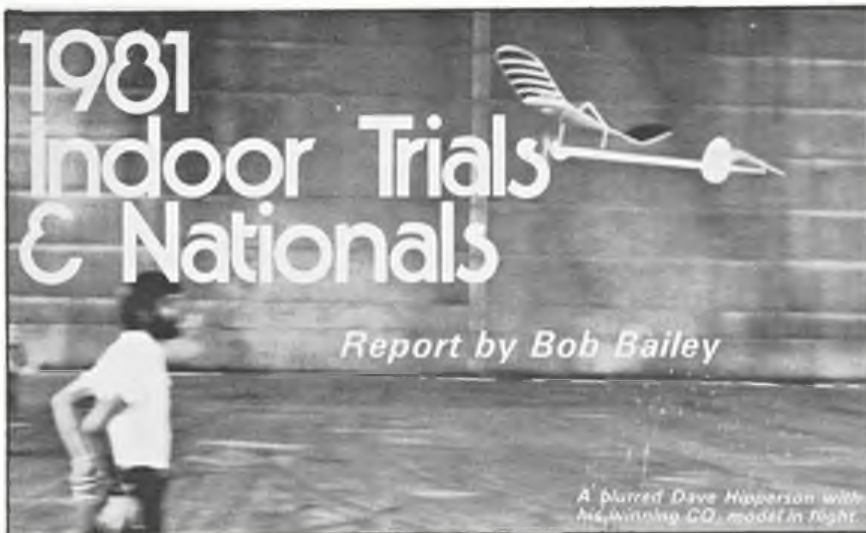
Type 300A is suitable for all Cox 1/2A engines. The cast aluminium unit incorporates an integral expansion chamber. It is fitted by removing the cylinder, placing a cup washer above and below the muffler and replacing the cylinder barrel. Price £5.75.

SCALE EXHAUST SYSTEM

Mick Reeves Models produce a manifold with a choice of two different size silencers, all suitable for engines between 40 — 90 cu.in. The manifold consists of a 37mm diameter tube 15mm deep with a flat dural plate to locate over the engine exhaust stack. This is held on by a 'U' strap around the cylinder. It incorporates a pressure tapping and an inlet that can be rotated through 360°.

Both silencers are identical in construction, being made of alloy tube with a central baffle outlet pipe. A blanking plug is also included enabling the exhaust to come out at either end or at the side of the silencer. Connection is made between the manifold and silencer by silicon tube. This arrangement allows the silencer to be completely housed within the fuselage.

Price Universal Scale Manifold L-MR105 £3.95. Slimline Custom Silencer L-MR106 £3.95 and Dumpy Custom Silencer £3.95. All these items are available through Ripmax stockists.



1981 Indoor Trials & Nationals

Report by Bob Bailey

A blurred Dave Hipperson with his winning CO model in flight.

Indoor Trials 1st Day July 5th

For the first time, the Indoor Trials were held on two separate days, whereas on all previous occasions that I have attended, August Bank Holiday weekend was used. Generally, the Saturday was used for practice with three flights each on the succeeding two days; this is the usual format for the World Championships when held at Cardington.

The object of the exercise is to pick the best team, so it is logical to allow a flier to survive a disaster on the first day and still have a chance on the second day.

The weather was pretty windy with showers of rain early on; this gave rise to so much drift that the start of the contest was delayed; the Indoor Technical Committee was prepared to abandon the contest for the day — shades of the Free Flight Trials! However the weather improved somewhat so that at 3 p.m. the contest started with one hour for each round. Although the intent was for it not to be a 'steering comp', it is an unfortunate fact that unless the flier is a good steerer of the model, the chance of getting a good flight at Cardington seems to be small (for me anyway). So it turned out — the first round showed a continuation of what had been found in practising beforehand — a vicious jetstream *towards* the main doors — this usually only happens when the weather is bad. Derl Morley had a practice flight in which the model was right up at the top at 18 minutes and got blown into the doors but miraculously survived.

Not so fortunate were Ray Monks and I who got into the jetstream, and left it just a little too late to steer. The standard occurrence is that the model rapidly accelerates into trouble and the difficult part is in deciding when to try and catch it! We both suffered broken models as a result of being

unable to catch them — a collision with a girder and bad change of direction did nothing to help my cause any. Dave Pymm and Bernard Hunt managed to steer their models in time and good times around 36 minutes to put them both well in contention. Nick Aikman showed he was a man to watch with 31.38. The second round saw a poor set of scores for a variety of reasons, the only person clearing 30 minutes being Laurie Barr.

However, the conditions were improving. Ron Green put in a nicely judged 35.24, my rebuilt model stalled all over the place after apparently being OK on a test flight. Laurie Barr started to get the range of his new model layout which was so successful in Switzerland and nearly so at West Baden, and produced 38.50 to put him firmly in the lead. I was so busy trying to sort out my own problems that I never found out why Bernard Aslett as well as I did not have any score worth mentioning on the board. Anyway, there was six weeks to prepare for the second day of the trials.

2nd Day Sept. 6th

This time the weather turned up trumps as it had done at the Indoor Nats the previous weekend. The scheduled start this time was 1.30 p.m. with 1½ hour rounds — a more leisurely schedule. Ron Green and Bernard Aslett both suffered hang ups — these were to play a vitally

important part in the final outcome. Drift was mercifully low, being gently away from the main doors. Laurie Barr consolidated his lead with a very useful 38.27 to increase his score by a large margin. I put myself in contention with 39.17, and Dave Pymm improved his score with 38.08. Bernard Hunt was pegging away with a steady 35.06 to maintain 3rd. Nick Aikman showed his steady improvement with 33.13 to go with his 31.38 in the first round the previous session.

The second round saw the whole event split wide open when Bernard Aslett produced an excellent 39.25 to put him in contention as well. This clearly showed that nobody was safe! I had the misfortune of a hang up at 21 minutes close to the side when still at maximum altitude and enough turns to clear 40 minutes comfortably — the model had never appeared to be in any danger. Laurie Barr had been knocking at the 40 minutes barrier for a long time with two 39 minute flights at the Nats (see later) and finally cracked it with a superb 41.11 which he didn't have to touch! — a new British record and surely he must be safe now. Ron Green never got the model high enough and still (like Bernard and I) had a lot to do. Graham Davitt was flying well with two flights over 30 — not bad for first bash at the Trials. Dave Pymm showed super consistency with a faultless 38.57 to consolidate his 2nd place.

The last flight saw Bernard Hunt still in a very vulnerable 3rd place, overcook things and hang up at 6:10 — not even he could reasonably expect to get away with that! I got caught by a bit of dreaded sideways drift that seemed to appear from nowhere and again a girder collision prevented me from steering it and the inevitable hang up occurred. Again, enough turns were available for a big flight. Bernard Aslett was desperately unlucky when at 18½ minutes his model was under the centre catwalk (Position A), suddenly climbed 5ft+ (no way should that happen) and hung at 18.43. Ron Green still couldn't get things right — 37 minutes which is well within his capability, would have given him 3rd. So Bernard Hunt maintained 3rd place with a total of 71.02 at the end of a superb contest with some tremendous flying and an atmosphere to match — the outcome was undecided until the last minute since neither 2nd or 3rd could be regarded as being settled!

Congratulations to the fortunate three — same team as last time. Will the Champs be in Slanic (not easy) or maybe at Cardington (not easy either)? We shall see.

Our grateful thanks are due to George Lynn and Butch Hadland who acted as Contest Director on the 1st and 2nd days respectively.

Results

1. L. Barr	26.52	30.27	38.50	38.27	41.11	13.37	= 80.01
2. D. Pymm	36.00	29.31	11.50	38.08	38.57	33.13	= 77.05
3. B. Hunt	35.56	26.28	32.43	35.06	18.13	6.10	= 71.02
4. R. Green	29.25	10.25	35.24	9.12	32.08	32.34	= 67.58
5. B. Aslett	26.46	27.27	20.54	10.15	39.25	18.43	= 66.52
6. N. Aikman	31.38	20.29	28.20	33.13	29.20	29.37	= 64.51
7. R. Bailey	18.47	23.35	8.00	39.17	21.18	16.49	= 62.52
8. G. Davitt(J)	30.53	27.23	—	28.49	31.34	30.13	= 62.27
9. R. Parham	—	—	—	19.25	32.00	28.35	= 60.35
10. R. Monks	18.45	25.04	30.57	—	—	—	= 56.01
11. D. Morley	34.10	16.23	17.28	—	—	—	= 51.38

Phil Ball and son with winning HLG.



Dave Pymm's expression improved his time! New National record of 21.05.



Aeromodeller



Mick Page with his folding wing HLG which is based on an American design by Stan Stoys. Detail of Mick Page's folder. The wing is held in place by a hook, which in turn holds the wing folded through the launch by means of an air pressure vane. Theoretically this releases the wings at the top of the launch.



Indoor Nationals 29th/31st August 1st Day 29th August

This weekend was blessed with beautiful weather — it really does make a difference to the quality and enjoyment of a model flying event indoors or out. Events for this day were the third day in the Sweepette for HLG and the Sparklets Trophy for CO₂. Best two flights from six (CO₂) and ten (HLG) count for each session; best three sessions from the four count for overall placing.

Dave Hipperson was comfortably in the lead after the first two sessions over his old adversary Ian Dowsett. Although the conditions were excellent for the rubber powered classes, Dave reckoned it wasn't right for CO₂, being too hot! The problem is then how to get sufficient charge into the tank for a long run. Dave runs through at least two charges to cool the tank down and hence get more charge into the tank, and sets the throttle on the Telco for a run of 3-3½ minutes, which usually gets the model up close to the centre catwalk. Most models will glide for three minutes plus from this height, so this method certainly helps consistency.

The other approach which Ian has often favoured is to run on the lowest throttle setting possible to get the longest run. Experience has shown over the years that although this method will produce the longest flight if everything goes OK, consistency suffers.

To 'make up the numbers' Mike Colling flew with a small model of 28in span with, like Ian Dowsett, a Brown Junior. Performance was somewhat hampered by the small size and high wing loading but at least Mike entered and beat all those who didn't!

HLG has declined in popularity for two possible reasons (1) a good athletic build and fitness is a prime requirement for success as Phil Ball amply demonstrated last year with 80+ sec flights! and (2) one bad throw in Cardington and one is liable to end up with an instant kit!

However a few new faces put in a very welcome appearance; Mike Page as the most faithful of the regulars won using a 12in. model and excellent times of 48 and 49 seconds and was closely pursued by M. Benns (a junior making his first appearance at Cardington). Let us hope for more comers.

Results

CO₂ Entries

1 D Hipperson	5:43 + 6:26 = 12:09
2 I Dowsett	4:46 + 5:04 = 9:50
3 M. Colling	2:06 + 2:17 = 4:23

HLG 5 Entries

1 M. Page	48.0 + 49.0 = 97.00
2 M. Benns(J)	38.5 + 42.0 = 50.5
3 C. Camper	38.5 + 37.0 = 75.5

2nd Day 30th August

Report by John Lenderman

Unfortunately I was laid low by a very painful bout of sciatica and was unable to attend. John Lenderman who is an ex-US Wakefield team member was over in Europe for the World Champs and instead of doing the full European Free Flight tour, decided to come over for the Indoor Nats. The conditions were described as being the best for at least five years since that magnificent summer of 1976. Thanks to John for

the following information.

Much testing of all sorts was in evidence, the chance being taken to try out new propellers, etc. Dave Pymm showed immediately what might be possible with 18 31 in EZB. Bernard Aslett came very close to cracking the American record in 35cm microfilm with a 26 minute flight, the highest time that I know of in the UK. Both flights landed deadstick. Bernard Hunt replied with a 19 03 with 3000+ turns on the motor. Dave put on a thinner motor for 19 12.

Dennis Davitt was unfortunate in getting a bunch on the prop shaft which stopped the prop and the model hung in the side. Bernard Hunt's next flight turned right due to the motor stick flexing, ballooned it to the centre and released for 19 10 with 300 turns left. At 2 40 p.m. the air seemed to cool a bit, making good flights harder to come by — for the moment the air seemed to warm up again and Dave put in a faultless 20 08. Dennis Davitt got his best flight yet of 18 32, so was feeling well pleased with his only EZB!

Henry Tubbs flew a very useful 8 19 with his 4g Manhattan while Laurie Barr climbed almost to the roof with his 6g Manhattan for 7 20. Bernard Aslett launched his Manhattan and was left holding half of the prop — an attempt. Dave Pymm improved further with 20 31 and then the *coup de grace* with 21 05. By this time the conditions were almost unbelievably good. Bernard Hunt demonstrated the natural law with a 20 38 after completing his contest flights. Denis Davitt was improving his 1 25g model which flirted with a barrage balloon for 19 14. This, along with the previous 19 16, edged Bernard Hunt narrowly into 3rd place. Ron Green blew his only good motor, Dave Pymm lent him one which took the model into the roof at five minutes for an unfortunate hang up at 8 11. Dave mentioned to Ron that this motor weighed 0 8g whereas Ron had been using 1 2g and not reached the roof. I believe Dave's model weighs about 1 1g so the ratio of rubber weight to motor weight is remarkably low. I have used motors of 0 8-0 85g for a model weighing 0 95g.

Everyone agreed this was an excellent contest held under great conditions with high performance well flown models.

Results

Manhattan 5 entries

1. L. Barr	7:20 + 7:10 = 14:10
2. H. Tubbs	6:47 + 7:08 = 13:55
3. K. Bates	3:15 + 3:22 = 6:37

EZB 7 Entries

1. D Pym	20:31 + 21:05 = 41:36
2. D Davitt	19:61 + 19:14 = 38:30
3. B. Hunt	19:03 + 19:10 = 38:13

2nd Day 31st August F1D & 35cm

Again a very good day. 35cm attracted only one entrant — Bernard Aslett who made two respectable flights of just under 20 minutes but didn't approach the potential of the previous day. He didn't leave enough time to fly F1D as well, only putting in one flight. Unless everything goes well, it is seldom possible to fly successfully more than one microfilm class on one day of 6-7 hours.

F1D attracted plenty of activity. I had suffered in previous sessions with much breakage so didn't have a decent stock of models, a situation I

attempted to improve for the following weekend (Trials) I didn't risk more carnage by entering the contest.

A lot of good flying took place. Graham Davitt showed his steady improvement with a personal best of 34 39. Backed up with a 33 16 this was very good going. Brian Kenny joined the 30 minute club in this his first season of flying — an excellent achievement due in some measure to Bernard Hunt's help and encouragement.

Of the regulars, Laurie Barr proved that he is back in form with two superb flights of 39 15 and 39 56 — he was choked at missing the magic 40 by so small a margin! His model features a large constant chord wing reminiscent of Jim Richmond's Cat Walker, to get maximum area. The design has had outstanding success, winning in Switzerland and 2nd in Brno with a new hall record for each. This performance was enough to give him 1st place by a considerable margin. Dave Pymm flew well with a best of 38 09 to take 2nd and Bernard Hunt 3rd with a best of 36 26. Consistency is a vital feature of a World Champs team — it will be noted that the Trials and the Indoor Nats produced precisely the same first three placings! Keep it up for the W/Champs lads — the chance of a team win must be good!

Ron Green has not been so active as usual this year but practice was showing some dividends when he place 4th, not far behind Bernard Hunt, with 34 26 and 34 13.

All in all, a great contest with some noteworthy achievements.

Results

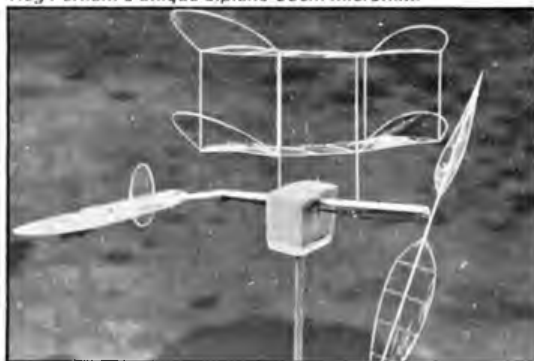
35cm 1 entry

B. Aslett	19 46 + 19 52 = 39 38
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F1D 9 entries

1. L. Barr	39.15 + 39.56 = 79.11
2. D. Pymm	38.09 + 35.31 = 73.40
3. B. Hunt	34.51 + 36.26 = 71.17

Reg Parham's unique biplane 35cm microfilm.



Free Flight Scene

Martin Dilly reports....

A Model for the Modela

The Modela CO₂ motor is about double the capacity of the Telco motor usually favoured in British contests, and so far we do not have much idea of its potential. However, in Czechoslovakia, where it is manufactured, a contest was held last year in which all contestants used the Modela, and the absolute winner was a junior flyer, Vitězslav Zdeněk, who showed the other 80 flyers how to do it, with a five flight total of 548 secs, and an interesting approach to wing construction. The contest, the Jiří Smola Memorial, was named in honour of the late editor of the Czech magazine Modelář, whose special interest was in junior contest classes, for which CO₂ is surely ideal.

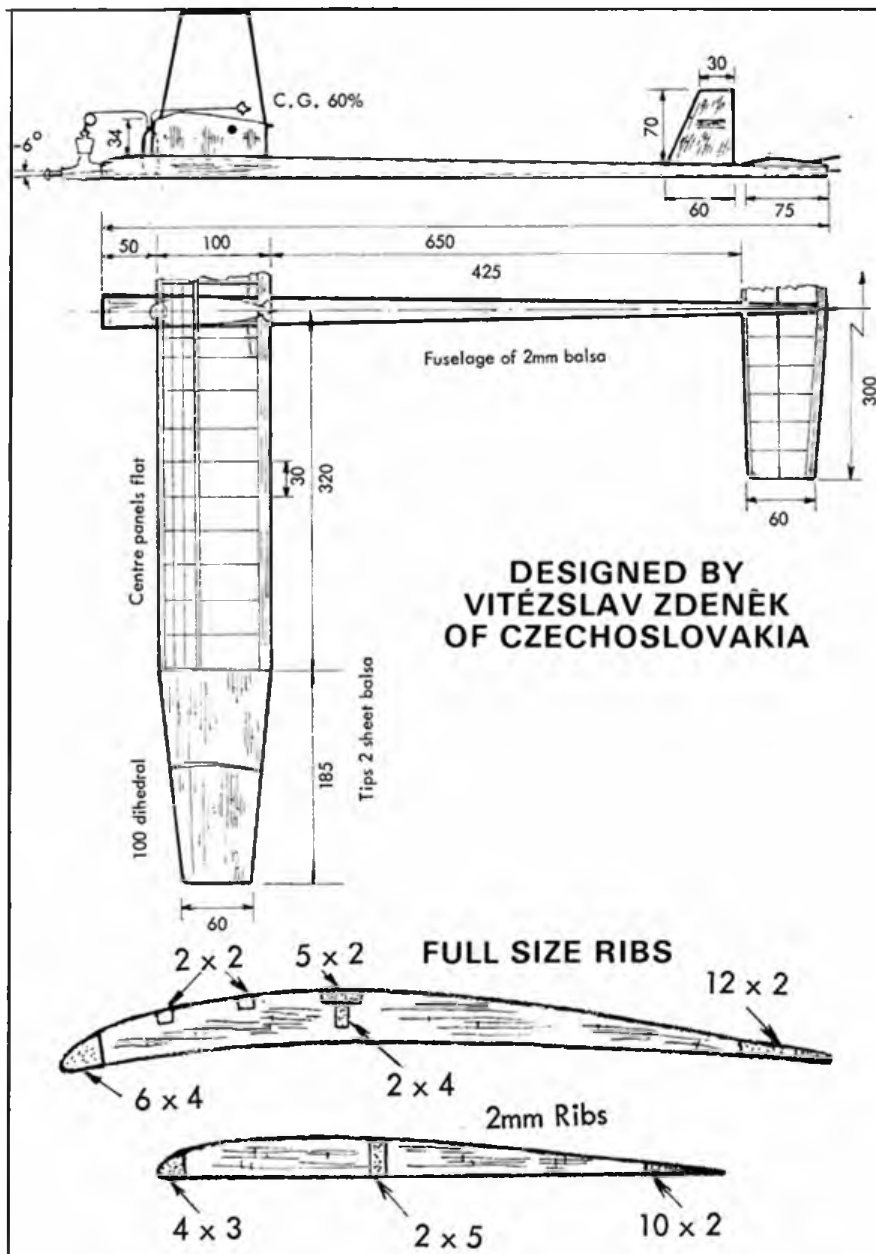
The standard Modela propeller is a rather efficient-looking one of 180mm diameter and 200mm pitch, and most contestants used it. The winning model has the gas tank built into the forward edge of the pylon and weighs 68 gms; wing area is 9.36 dm², while the tailplane totals 2.05 dm².

Fast field repairs

Having been one of many suffering from the poor conditions at the World Championships in Spain (in this case I refer only to the weather), fast repair techniques are a topic fairly close to my heart at present. A mid-air strike by a 'rotoscythe' towing French glider at Poitou five minutes before the start of the first round led to some fast work by Roy Collins and Paul Bond on the two-piece fuselage on my Vega. The techniques shown to me, may be useful to you too.

At Burgos the New Zealand team, with which I sang my swan song as an F1A proxy, had no F1C flyers. The Hungarians had F1Cs but no Wakefields or A-2s, so a bit of international co-operation resulted, with the Hungarians working hard on chasing and repairing on the first two days and the Kiwis having a far easier time of it when the wind calmed down a bit for the final F1C day. Incidentally, having arranged the loan of a pair of walkie-talkies from the Czech team to use during Andras Meczner's fly-off flights, I am convinced that future British teams must have this equipment. It is far less fatiguing for the downwind recovery team to be able to relax and just listen for a radio call, than to have to peer intently through binoculars to try to spot which of a couple of dozen or so aircraft is the one they are after. I am sure the British team, who also had a pair borrowed from the French, will agree.

However, back to the repairs. The Hungarians, who did a lot of the repair work on Peter Wheeler's glider, used lightweight glass cloth and fast epoxy to good effect. If you use the 15gm/m² material you will know that it is pretty floppy stuff, and hard to handle in the sort of winds we had at the Champs. However, theirs had been given a light coat of dope, which transforms it into a tractable material that can be held in one hand and is still stiff enough to be cut with scissors without going fuzzy, or having the warp and welt skewing out of square. Five minute epoxy and some high-tack tape, plus the Meczner-Maczko-Szecsényi-Ree co-operative, had the Wheeler wing back in one piece in time for me to get off the topline with 0.3 seconds to spare and scrape a max. I forgot to ask what sort of dope they had used to bind the cloth; cloth sizings are very carefully chosen to be compatible with the type of resin to be used in a lamination, and



DESIGNED BY
VITĚZSLAV ZDENĚK
OF CZECHOSLOVAKIA

doubtless it would be possible to get it wrong and effectively insulate the glass fibres against resin penetration and effective bonding. When I returned home I laid some cloth on a sheet of plate glass and brushed on a coat of thinned Humbrol clear dope. When it was dry the cloth could be lifted off the glass by carefully knifeing under one edge and then peeling it away.

A couple of weeks later the F1C-flying half of our particular car load of competitors at the Poitou International, showed me what must surely be the fastest possible way of repairing damage on the flying field. Assemble the damaged parts and hold with tape if necessary. Cut a piece of light glass cloth to reinforce the area, spread a few drops of cyanoacrylate onto the cloth and rub with a piece of polythene. The flexible square-section top of the outer container of the low viscosity Vistite 18-MQ is ideal as you can get a finger inside it to help it to follow any surface curvature. The air-removing pressure of the polythene lets the adhesive harden in less time than it takes to read this and any voids can be filled by further applications of cyanoacrylate and a little more

rubbing. The low viscosity adhesive 'wicks' into the glass by capillary action and the resulting heat as it hardens anaerobically also sets off the surplus that has soaked into the wood. Any comments from readers with professional knowledge of the chemistry of adhesives and laminating techniques would be welcome, but the method works like a charm. As a final but untried thought, how about brushing the glass cloth with gum arabic instead of dope? This would let it be stuck in place with a spot of spit, and the resulting slight dampness would also accelerate the cyanoacrylate's hardening.

Fourth Poitou International August 29/30

After a lapse of a year, this well-organised and highly-enjoyable contest attracted 29 British entries, several of them including it in a month-long trip that started with the horrors of Burgos and included the Pierre Trebod and a certain amount of French food and wine inspection on the way. As one flyer said to me, "Going to a good



Left: a timer-driven drum operates the pop-up wing D/T on Jacques Valery's A/2, flown at the Poitou International. Right: Jean-Claude Chenaux flew this ultra high aspect ratio Wakefield on the early calm air rounds at Poitou. Solid balsa wing has 3-D turbulence, and the tailplane is on a wire pylon.



contest gives a point to a holiday, and makes lying about on a beach seem pretty tame. I had to come home for a few days' work in the middle of it all, but four of us going on a Sealink Five Day Break made it sensible economically, especially when you consider that three days in a comfortable French hotel plus two excellent four-course dinners and wine cost a massive £17 each!

The 1981 flying site was similar to the previous one — a huge area of treeless, hedgeless stubble, with occasional maize, sunflower and melon fields some way downwind. There was a prominent and up-to-date score board, and bilingual loudspeaker announcements of time to run in every round, thanks to Pierre Chaussebourg's wife Josette. These came as a welcome change to those of us who had suffered the confusion of Burgos. Weather tended to be calm and dead unit about 11.30, when a breeze and some strong lift developed until about 4.00 when the conditions calmed again; though circle towing was quite feasible for the glider flyers. Although the Wakefield and F1C day was rather less breezy and the sun shone rather less brightly, it was only the glide flyers who needed a fly-off to determine the top places.

For the glider flyers the dead conditions of the first couple of rounds made a good zoom height gain importance and with six or seven flyers per launch point there was little rush to fly at the start of the round, only 19 of the 87 entrants maxed, including Steffan Jensen of Denmark, who had included the contest in a cycling tour of the Loire Valley, and finished in third place. Among the models I noticed was George Matherat's, using a tailplane that looked like his Coupe ones, and weighed only five grams; his wing structure used no trailing edge gussets to support the rib joint but instead had full depth diagonals of 1.5mm balsa where the hypotenuse of a gusset would normally be. All-rounder Jacques Valery favours somewhat unorthodox aircraft and his A/2 featured a dog-tooth leading edge where the tips joined the centre wing panels, as well as a solid balsa tailplane on a tubular stub that plugged into the fuselage boom. No tip-up facility was needed at the rear because the D/T is via a tip-up wing; an internally mounted timer drives a drum, rather like a tin can lid about 40mm in diameter, with a slot in the rim. A wire peg at the front of the wing mount is held captive by this rim until exposed by the slot, when the wing pop-up spring lifts it clear.

The fifth round saw both Martin Gregorie and Alan Jack go away in very strong lift; Martin's distinctive short tail moment aircraft with its highly visible black and Dayglo orange colour scheme was going up almost as fast as a power model after a couple of minutes. Alan's also looked good for the first minute and a half, then started to tighten up and spiral in, only to recover its senses at about 50ft, and contact some more good air that took it safely away for a max. The fly-off saw six flyers with seven threes, none of whom quite managed the four minute target.

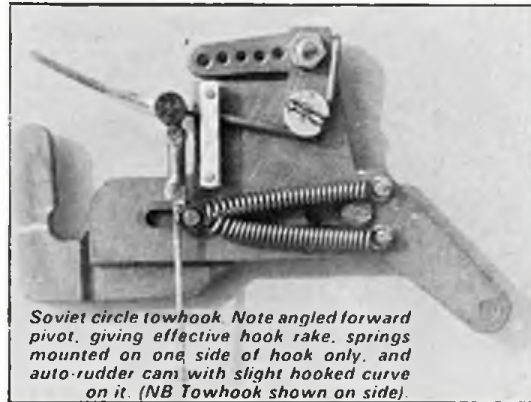
A Junior category, held within the main event, attracted 14 entrants, the winner being Thierry Schandel, son of the editor of Vol Libre.

Day Two saw a high overcast and generally less strong lift than the gliders had. Steve Marriott, on leave from Saudi Arabia, maintained the Biggles standard, flying a model that had spent the past year in its box in Britain. After replacing one of its damaged twin rudders, Steve flew it in the first round with no trim flights and went on to place third. Phil Uden from Crookham had spent the previous week re-trimming his Wakefield after it flew poorly at the Pierre Trebod; adding a turbulator on the tailplane and moving the cg forward five per cent worked wonders and he only dropped a single flight when air that looked good for the first half decayed and put him down for 2.07 and ninth place. Croydon's Ian Kaynes, looking well despite having served on the FAI jury at Burgos, maxed until round six, when his single wire wing joiner rotated on launch, giving him asymmetric dihedral, a very tight power pattern and a 2.42 time.

Dutch A/2 flyer Arno Hacken was flying Wakefield for a change after a disappointing score in glider, while Canadian Mike Segrave, now resident in Britain, also made Poitou part of a cycling holiday that also took in the World Champs. His four Wakefields fitted into a carrying case about 2ft. by 6in. square! Winner of the loudest location buzzer contest was Alain Brancard whose Wakefield had one taken from an electric alarm, weight was 20 grams with a single Mallory pencil, cost is about £2 and the buzzer and battery are mounted externally on top of the fuselage just forward of the wing.

Wakefield winner Lionel Braud of France flew a neat model with fibreglass motor tube and tailboom, and a rather complex-looking wing structure to resist warps; he used a latch to hold the propeller locked until the model was actually free of the hand, and only dropped one second on the first round. The top of the leader board changed quite excitingly towards the end of the contest, with Koppitz of France dropping his final round flight after having the only full score for the first six. Alain Landeau repeated his second place at Burgos when he came down 12 seconds short of the three minutes in the fifth round.

F1C saw eight of the 16 entries from Britain, and Ken Faux was top Brit in fourth place after damaging a model the week before and therefore having only one left for Poitou. All went well till round five, when his model went down in head high maize fields; when he had still not appeared again for the next round Mike Fantham went off on a search-and-rescue mission and eventually Ken and the model were back with 15 minutes left of the round. His bunt-into-glide model, which had been forgiving of minor launch inconsistencies till then, stalled off the top of the climb and



Soviet circle towhook. Note angled forward pivot, giving effective hook rake, springs mounted on one side of hook only, and auto-rudder cam with slight hooked curve on it. (NB Towhook shown on side).

kept stalling till the model was down for 2.12, the cause was a stripped but unspotted thread on the glide setting screw. Fixing the trouble with cyanoacrylate had the glide back to its normal superb, aided by the Verbitsky-made folding carbon fibre propeller.

That left only Michel Iribarne of AeroSpatiale and Bill Hartill of SCAT with unspoiled scores, but an unaccountable four second run by the Frenchman left it all up to Bill. He, too, spent a long time in the downwind maize. (Luckily sewn wide enough to allow searching without crop damage, as the organisers pointed out). Well over half the final round had gone before he came back with wife Inza and the elliptical-dihedralised Nelson-powered model. A quick dose of restoring Gatorade, and a calming sit on the camp chair had them better again, and a faultless climb gave Bill Hartill the trophy and Henry Nelson his first international F1C win, with the only perfect score of the contest.

One of the notable things about the weekend was the obvious interest from local people and organisations, from newspapers to banks; the mayoress presented the prizes (and Steve Marriott, I suspect, committed a breach of protocol by giving her the regulation four kisses on the cheek, as well as the young lady who handed him flowers and the perpetual trophy). There was quite a crowd of spectators from the local villages, and a very hard-working Frenchman who was helping people to look for models in the maize and sunflowers turned out to be the farmer. Let there be no confusion, this is what Flying For Fun is all about. A l'annee prochaine!

Results Fourth Journées Internationales de Vol Libre en Poitou

F1A	
1. A Galichet, France	1260 + 230
2. G Nocquq, France	1260 + 189
3. S. Jensen, Denmark	1260 + 183
6. M. Fantham, GB	1260 + 124

F1B	1. L. Braud, France	1259
	2. A. Landeau, France	1248
	3. S. Marriott, GB	1243
	4. I. Kaynes, Croydon	1242

F1C	1. W. Hartill, USA	1260
	2. R. Simpson, USA	1252
	3. A. Roux, France	1247
	4. K. Faux, Freebirds	1212



Mike Chilton uses this APS Artoo to win Nationals and 4th Area SMAE event. Here he displays his shield awarded for topping Combined Mini at the Midland Rally.

Dave Hipperson reports....

Northern Rally — Church Fenton — 6.9.81 — Dave Hipperson

Just how calm is it going to have to be before we can use a sensible max again at Church Fenton? The Northern Rally began with light drift and if anything improved yet again when the organisation turned up — half an hour after the advertised time start — they set a rather unimaginative 2.30 max in Open and FAI. In the face of an enforced early finish and prompt clearance of the drome it was anticipated that the flyoffs would be exciting and in a way that was probably not intended. From the literature distributed at the gate it was evident that Church Fenton is a sensitive site and crops and out of bounds residential areas were quickly given as the reason for the reduced max but hardly any flights went anywhere near sensitive perimeters. There had been contradictory advice from the control desk as to whether cards had to be returned between flights but fortunately no-one seemed to fall foul of this idiosyncrasy.

The Open Power flyoff was away first and J. K. Smith in the air early had it wrapped up immediately more by way of an excellent pattern than good air. He got it very much in the groove whilst the other two of his family team were wildly off pattern. Ray Monks shed a blade on the ground and had no time for the repair and Pete Harris had a stuttery run. Screen, Baggott and Hargreaves had good climbs and placed in that order some way behind Smith.

Vintage had three qualifiers and the betting very much on Davitt's Lanzo Stick. However he was not without problems having blown a motor and damaged the fuselage before the last flight and had hasty repairs and a borrowed motor for

the last max and the flyoff. What was more the organisation after having allowed his tail-on-the-ground ROGs all day, changed the rules and insisted on an undercarriage for the flyoff — most peculiar but then it was that sort of day. He obliged and was rewarded with a smooth 3.24 win over Wolstenholme's similarly fine three minutes with a different model from the same designer!

Combined Mini and combined FAI were flown off together — a dozen qualifiers and pandemonium. Although light was good the clearance time of 7pm looked rather optimistic by now. A stable patch of air coincided with this flyoff and it was interesting to see that in the same air as a good A2 could do 2.46 a Coupe did 2.48. Mini was taken comfortably by a fine high climbing $\frac{1}{2}$ A flight from Doug Scott followed by the aforementioned Coupe of Hipperson. Inexplicably the organisation then dropped the idea of the K factor in the flyoff after applying it all day! Although this made no difference to the top two it should have affected third and fourth where the results would have been reversed. Not only that but had fourth place man Peers known of the withdrawal of the K factor he may well have opted to fly his $\frac{1}{2}$ A rather than a Coupe — his lucky break was still to come and anyway his last flight actually factored up to make 1.59.9 so he shouldn't have been there anyway! Flyoffs were being flown to ten minute periods or rather a nominal ten minute period as punctuation with car horn and shouts were neither loud, long enough, nor particularly punctual. For instance this FAI/Mini round went nearly 12 minutes when the CD was distracted by a competitor who became confused over the line cross rule.

Open Glider was next, presumably giving at least Cordes and Cuthbert a rather busy time as they were in both this and FAI. Tony Cordes found an even better patch this time to win again in the space of a few minutes — most impressive.

Virtually the entire entry had qualified for the Open Rubber flyoff, the light drift all day making the 2.30 more a waste of rubber than a waste of time as models were going nowhere. Most got away after about five minutes when there was quite a good patch of air — Pollard going for 8.25 with the same model which he had used to win the Gamage Cup earlier in the year. Hipperson and Ball were last to fly and although in more neutral air drifted sufficiently slower to be seen right down, Phil's model hanging on at the end for well over nine minutes. Immediately these two flights were disallowed by the organisation as being after the flyoff period. They refused to reconsider this despite the production of stop-watches used for checking the flyoff period only and clocked off on launch and under ten minutes. What is more both Ball and Hipperson's timekeepers, although some distance apart, agreed that the final hooter had been sounded 1½ minutes early. In the face of this evidence and with no protest to the contrary the CD would not accept the winning and third place times.

The impression gained was that clearing the drome was of more importance than the result of the largest flyoff. This was further illustrated upon return from downwind at a few minutes before 7, when there was no sign of the organisation — there had been no prizegiving — they had just rushed off. If continued use of the drome was such a finely balanced issue as we were to assume from the 2.30 max, then why did not some member of the NA Committee bother to stay to ensure that the flyers left on time or at least

form a buffer between them and the RAF police who arrived promptly and looked most annoyed that vehicles were still on the drome. A disastrous finish to a bewildering day. As a happy footnote — Phil Ball's open model managed to land in the back garden of the very man that had found it after last year's Northern Gala loss in the rain!

Midland Rally — Barkston Heath — 19/9/81

Had the weather of the previous night persisted then undoubtedly there would have been no flying at all at this year's Midland Rally. As it was the rain ceased and the wind abated to a mere gale and quite a few braved it but entries were well down on what might have been, given more seasonal conditions. Reduced maxes kept the chasing down but didn't stop Peers losing at least two models in Open Rubber whilst completing the only full score of the day. Most popular event of all by far was Combined Mini dominated by Coupes with Chilton taking his third convincing win this year with his APS Artoo and collecting the Shield as a consequence. Vintage winner Hipperson appeared rather late due to having already competed elsewhere that day! His Bazookas found two bad patches and then a max.

The idea of a Champagne Flyoff suggests lazy calm Summer evenings. However this novelty worked better than one would have expected. It certainly kept people from going home and did at least coincide with the least windy part of the day — probably only 15 mph by this time.

Mark Groome reversed the earlier Open Rubber result and topped a fine flight by Russell Peers with an incredible one. His enormous and long running model climbing away as if there were no wind. In Glider, Parry consolidated his good form by winning this flyoff as well as the days event and with a respectable 2.36 in the sort of air that had one rubber model down in less than 2 minutes!

It was interesting to note that although there was an Open Power event and Combined Mini included of course 1/2A power, not a single entry for a power model was received all day nor, some say, did any power model fly! Organisation from Gerry Ferrer and Mike Coombes was confident and good humoured — they deserved better weather.

Pierre Trebod — France — August 23-24 — Dave Hipperson

British A2 fliers could have been forgiven for thinking they were back in England when for the first two rounds at this year's Pierre Trebod it uncharacteristically 'chucked it down'. Those that managed above average flights at this time were

Midland Rally		
Open Glider (all open 2.30 max)		
1. C. Parry	Biggles	6.58
2. J. Cooper	Biggles	6.19
3. D. Hearn	Edinburgh	3.03
Open Rubber		
1. R. Peers	Falcons	7.30
2. M. Groome	C/M	6.50
3. D. Hipperson	Croydon	4.43
Vintage		
1. D. Hipperson	Croydon	4.43
2. C. Hawk	Timperley	4.08
Combined Mini (1.45 max)		
1. M. Chilton	EPS	8.20
2. M. Dilly	Croydon	6.45
3. D. Raylor	Richmond	6.30
HLG		
1. D. Barnes	Liverpool	4.47
2. M. Page	Peterborough	4.00
3. C. Camden	Peterborough	3.46
CO₂		
1. J. Ashmole	Grantham	4.59
Champagne Flyoffs		
Open Glider		
1. C. Parry	Biggles	2.36
2. M. Page	Peterborough	2.19
3. J. Cooper	Biggles	2.18
Open Rubber		
1. M. Groome	C/M	7.31
2. R. Peers	Falcons	5.20
3. M. Chilton	EPS	2.40

Combined FAI		
1. A. Cordes, Whitefield	12.30 + 2.46	
2. G. Beal	12.30 + 2.25	
3. M. Cook, North Yorks	12.30 + 2.05	
Combined Mini		
1. D. Scott, $\frac{1}{2}$ A, Morely	10 + 3.14	
2. D. Hipperson, CdH, Croydon	10.00 + 2.48	
3. P. Harris, $\frac{1}{2}$ A, Birmingham	10.00 + 2.37	
Vintage		
1. D. Davitt, Leeds	7.30 + 3.24	
2. D. Wolstenholme, East Lincs	7.30 + 3.02	
3. C. Plant, Darlington	7.30 + 2.15	
CO		
1. G. Brown, Wharfedale	7.59	
2. S. Fielding	7.52	

Open Glider		
1. A. Cordes, Whitefield	7.30 + 3.43	
2. D. Bartle	7.30 + 3.05	
3. J. Cuthbert, Grantham	7.30 + 2.31	
Open Rubber		
1. P. Ball, Grantham	7.30 + 9.30*	
2. R. Pollard, Tynemouth	7.30 + 8.25.1	
3. D. Hipperson, Croydon	7.30 + 7.38*	
4. R. Peers, Falcons	7.30 + 7.26.2	
5. A. Wells, Anglia	7.30.3	
*These two flights were disallowed)		
Open Power		
1. J. K. Smith, BAC	7.30 + 6.32	
2. S. Screen, Birmingham	7.30 + 5.41	
3. R. Baggott, Birmingham	7.30	

therefore at an advantage for the rest of the day when things improved. However Elton Drew threw a good start away in the third round with a disastrous 25 second flight and Brain Barnes' good run ended with a line tangle followed by a line break in the fourth round to return a zero when a max — which incidentally the model did on 'circle' trim — would have totalled him enough for third. As it was, British honour was upheld by John Cooper who although dropping a little over 40 seconds on his first two flights, maxed out for the rest of the day when only Hacken, the winner, returned a full score. As far as the calibre of the event goes, suffice it to say many of the World Team were there in full strength and from nearly two dozen nations there was a staggering entry of 152 individuals.

The second day devoted to power and Wakefield was much more the sort of conditions expected. Dry, sunny intervals and a wind varying between zero and 12mph. Despite more F1C entries from GB than any other country and more incidentally than for any British FAI event this year, the actual British turn out on the day was ten but this represented nearly a third of the total field nevertheless. In conditions that lent themselves to surface thermal picking it was reasonable to expect flyoffs but there were fewer in F1C than the standard on display would have had us expect. Unlucky was Ken Faux who had an engine stutter on the third flight and some debris to clear up after it cut in again when pointing vertically downwards immediately over the flight line! His reserve not only dropped the re-flight but impaled itself on a downwind fence. Most successful of the British Power Flyers was Pete Buskell who dropped just 43 seconds in the fourth round.

Wakefield saw 88 flyers, the most ever at this event and almost as many British as French! The recently on form Foster and Howick both showing early promise but getting it wrong on just one flight each. Ivan Taylor was very much on form with his new high aspect ratio layout looking at home in the conditions. An impossibly unlucky 2.59 on his fourth flight robbed him of a chance in the flyoff. By the end of the day there were only five in the power flyoff and seven in Wake including one Briton — Dave Hipperson who had evoked considerable comment throughout the day by flying a model with tapered surfaces after virtually no design changes for ten years.

There was some delay before the flyoffs got

under way and when they did they were hardly publicised and certainly not in anything that resembled English. Wake was away first and Hipperson wound early to be sure of being ready with a model. Gaensli flew first into a superb patch and a few minutes later others released to all sorts of trouble. One came in and another had the delay prop stick leaving the model to execute a convincing HLG type flight from just the throw! Lepage and Hipperson's then flew to catch the back edge of Gaensli's air but those that followed missed it and were down well short. Two of those with trouble on the first launch were allowed re-flies including the Italian Zeri who caught a good patch this time to max easily and push Gaensli to another flight. Hipperson glided in at 3.39 with Lepage just nine seconds ahead.

While the Wakefields were retrieved the first wave of F1C got away and four out of the five maxed although not without trouble. Only Roger Simpson dropped. The final Wakefield flight saw a close finish with Gaensli flying first and climbing well to record just short of four and the Italian then flying in what looked to be worse air but improving during the glide to take first by just six seconds.

All four survivors of the first F1C round Stetz, Zito, Koster and Sugden did the five as well although Koster pulled out badly and Sugden overran on a beautiful climb and had to switch to his reserve which had not been flown that day. It produced the goods to order. There was then some delay until all had returned to the line for another bash and Stetz and Zito went away first chasing the six minute max. Although Zito had a loop off the top of the climb his glide was excellent and flew only a second short of five minutes. This left Koster and Sugden waiting as the evening cool gave way to a little low level sun to light the final moments. Here was the mighty Koster displaying the most complex and sophisticated free flight model ever with computer control and metalised surfaces — a masterpiece — matched against the equal might and even greater experience of Dave Sugden who behaved so calmly that onlookers could have been forgiven for thinking he was out on an evening trimming session.

Koster was away first whilst Sugden dealt with a flooded engine. Koster's flight lost a little off the top again by over-bunting and when he flew, Sugden did a little stall on transition; however his excellent glide held him aloft for just three

seconds longer than Koster — a very close finish. Important though the individual results were, the real story was that this was the last Pierre Trebod, a rumour confirmed by the presentation to every contestant of a very handsome illustrated book of the entire series. The organisation had produced dozens of timekeepers now well versed and experienced in their technique — a colossal control with running scoreboard and constant PA announcements and a very comprehensive folder of information, stickers and literature presented to every contestant at main control on his arrival and with the correct change for those that had rounded up the entry fee for convenience! Thus with the memory of such a disastrously run World Champs still fresh in the mind, it seems a tragedy that this organisational talent might go to waste. Surely another French club benefiting from the example already set will step in to continue the tradition next year. Whatever happens aeromodellers of the world still always be indebted to Jean Mangniette, his wife, Yves Ollard and the hard workers of the Aero Club of Pierre Trebod for showing us how it should and can be done — 17 times. Thanks

Pierre Trebod		
F1A		
1	A Hacken, NL	1260
2	E Donero, RA	1223
3	J Cooper, GB	1211
4	H Dulout, F	1183
5	R Champion, F	1171
6	W Simms, GB	1167
8	D Greaves, GB	1151
9	R Elliot, GB	1141
F1B		
1	A Zeri, I	1260 + 240 + 242
2	F Gaensli, CH	1260 + 240 + 236
3	P Lepage, F	1260 + 228
4	D Hipperson, GB	1260 + 219
5	A Koppitz, F	1260 + 140
6	A Rummel, D	1260 + 118
7	L Braud, F	1260 + 60
8	I Taylor, GB	1259
F1C		
1	D Sugden, CDN	1260 + 240 + 300 + 316
2	T Koster, DK	1260 + 240 + 300 + 313
3	M Zito, RA	1260 + 240 + 300 + 259
4	H Stetz, D	1260 + 240 + 300 + 236
5	R Simpson, USA	1260 + 203
9	P Buskell, GB	1217

SMAE 2nd Area Centralised ... 5.4.81			SMAE 4th Area — 7.6.81						
Open Glider — no trophy			Model Engineer Trophy — Open Glider Individual and Plugge Points						
1	R Pollard	Tynemouth	9 00 + 4 59	1	P Stewart	Crookham	9 00 + 3 39	100	
2	B Baines	RAFMAA	9 00 + 4 30	2	D Cox	Crookham	9 00 + 2 45	98	
3	P Moate	Tynemouth	9 00 + 1 56	3	J Bailey	Biggles	9 00 + 2 27	96	
4	J Walker (J)	Birmingham	9 00 + 1 35	4	K Smith	Croydon	9 00 + 2 10	94	
5	M Duce	Liverpool	8 58	Coupe d'Hiver — no trophy					
Open Rubber Gamage Cup			1 M Chilton EPS 10 00 + 2 34						
1	R Pollard	Tynemouth	9 00 + 17 21	2 D Hipperson Croydon 10 00 + 2 28					
2	A Jack	Tynemouth	9 00 + 15 01	3 P Ball Grantham 10 00 + 2 20					
3	T Chambers	Darlington	9 00 + 8 50	4 J Brookes C M 10 00 + 1 13					
3	P Ball	Grantham	9 00 + 8 50	5 G. Ferer Leicester 9 29					
5	D Davitt	Leeds	9 00 + 7 05	Model Engineer Trophy — Team Glider — Team Results					
FAI Power — Halifax Trophy — Plugge Points			1 Crookham Stewart/Cox Tyson 31 52						
1	S Screen	Birmingham	15 00 + 5 17	2 Biggles B Bailey/Cooper/Bates 24 31					
2	P Harris	Birmingham	14 56	3 E Grinstead Taylor/Lee/Howick 23 00					
3	D Reader	Birmingham	14 45	Plugge Points after four events					
4	J Bailey	Gibbles	14 20	Birmingham 861					
5	R Monks	Birmingham	14 09	Biggles 828					
SMAE — 3rd Area — 10.5.81			Grantham 762						
Open Glider — no trophy			Crookham 613						
1	P Ball	Grantham	9 00 + 5 52	B and W 545					
2	M Howick	E. Grinstead	9 00 + 3 51	E. Grinstead 443					
3	T Fairgreave	Grantham	9 00 + 3 20	NYFFG 429					
4	J Cooper	Biggles	9 00 + 3 08	Watton 380					
5	P Lettice (j)	Grantham	9 00 + 3 02	Croydon 364					
Wakefield — FIB — Weston Cup plus Plugge points			Tynemouth 329						
1	D Hipperson	Croydon	15 00 + 2 25	FAI Power — Astral Trophy					
2	J Barnes	Liverpool	15 00 + 1 40	1 T Payne Biggles 12 58					
3	J Billam	Grantham	14 52	2 R Moore Biggles 12 26					
4	P Ball	Grantham	14 50	3 R Taylor E. Grinstead 12 01					
5	R Monks	Birmingham	14 36						
Open Power — White Cup									
1	D Cash	E Grinstead	9 00 + 7 02						
2	J Hopper	Stanstead	9 00 + 6 50						
3	T Payne	Biggles	9 00 + 4 48						
4	D Reader	Birmingham	9 00 + 4 42						
5	R Taylor	E Grinstead	9 00 + 4 27						



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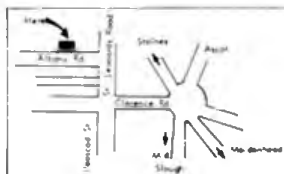
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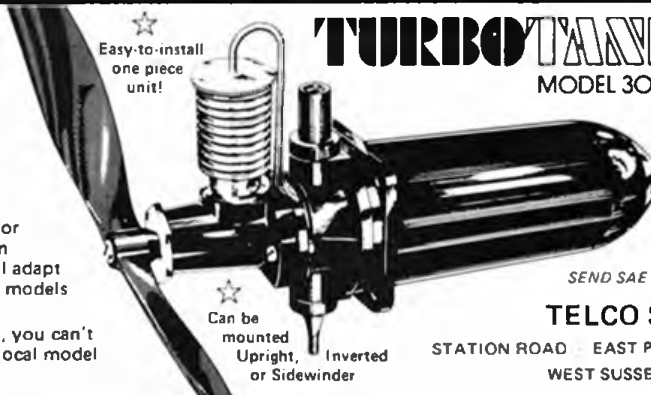
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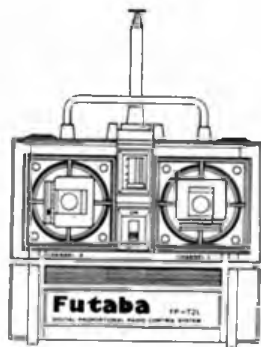
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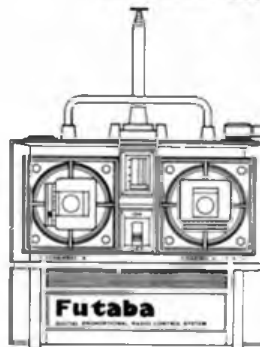


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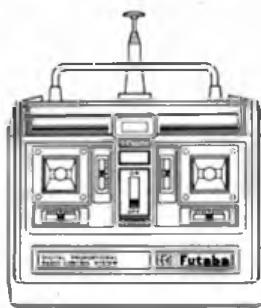


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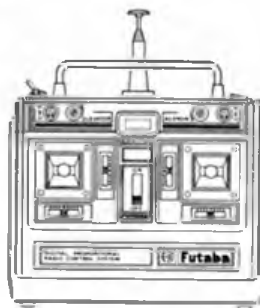


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