MODEL MAGAZINE
APRIL 1988 £1.85

AERO MODELLER

5..4..3..2..1...
IGNITION!
Blast-off for UK Model Rocketry

ROOM FOR MANOEUVRE
Indoor Radio Flying

SEEN EVERYTHING?
Build Bunfighter - Full-size Plans for our Flying Elephant

ARGUS SPECIALIST PUBLICATIONS

APRIL 1988
Volume 53
Issue 627

AERO MODELLER

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Cover:
Hard to believe that the first North American X-15 was built in 1958. Paul Clark's Bronze Medal winner at the last M.E. is one of a growing number of scale model rockets to be seen in this country. More on rocketry on p.182, further Exhibition coverage starts on p.210.

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HANGAR DOORS

Ralph is flying high!

HIGH flying youngster Ralph Gray has landed himself a top national model-making prize.

The 11 year-old took the annual junior championship title at a model aeroplane competition staged at Wembley Conference Centre in London.

Ralph, of St James' Crescent, Thrapston, had to cut a plane out of balsa wood, glue it together and then sandpaper it to have the right aerodynamics.

Together with 25 other children, Ralph then had to throw the model — and his stayed flying for the longest: 10 seconds.

The youngster said: "I have enjoyed making models out of balsa for several years. It was fantastic to take part in the contest, and even more exciting to win the junior 'Chuckie' championships."

The competition was organised by DPR Models of Shoeburyness in Essex which makes Chuckie models. Ralph was presented with a Riko radio-controlled car and a year's subscription to Radio Control Models and Electronics magazine.

He was among a party of children from Thrapston's King John School, where he is a pupil, who were on a trip to the championships.

In his spare time Ralph not only enjoys model-making, but also go-karting, riding his mini-motorcycle, racing radio-controlled cars and fishing.

His dad, also called Ralph, said: "He's a busy lad who only took 45 minutes to make his winning plane. He has done very well — we're proud of him."

Above: Calling Jim Colbourne! During Coupe retrieval at Old Warden in December, Dennis Bird rescued the well-treed remains of your Tiresias... Right: Congrats to Ralph Gray, Junior DPR Chuckie Champ at the M.E. Exhibition, whose achievement was featured in the Wellingborough and Rushden Leader on 14th January.

SMAE and safety in model flying

A well packaged SMAE news briefing at the Great Northern Hotel at Kings Cross, London on 3rd February underlined the Society's awareness of the need for improved safety standards in our pastime, even allowing for the high percentage of incident-free flying. It is, of course, a few serious – and well-publicised – incidents that have focussed attention upon the matter; and it is reassuring that the SMAE is happy to discuss model flight safety in all respects; from the points of view of individual builder and flyer, the model trade, and indeed the aeromodelling press.

We'll be devoting more space to this next month, but for now we should point out that the SMAE Members Handbook – which is free to all who join the Society – is much concerned with safety guidelines and is thus worth a good look. Meanwhile – what are you doing to promote safe flying? Make it a rule for '88 – cut out risks. This magazine treats its readers as adults with a grain or two of common sense so we won't bother to waste space pointing out particular examples. You all know what's meant.

Just take care. Please.

Supporters at Zrenjanin

Success or failure at a F/F Championships can often depend upon the level of Team support. Our nine-man team for the Eurochamps at Zrenjanin, near Belgrade in Yugoslavia, would be most grateful for your presence while they take on the world's best from 3rd-9th July. Group fly-drive fare would be about £218 per person (based on a pair sharing a Renault 4). Accommodation is in hotel or campsite – and if you wish to tack on a post-Champs holiday that too can be arranged.

Supporters must be included on the main entry form sent with team notification by the SMAE; so if you want to add your support, contact Team Manager Martin Dilly at 20 Links Road, West Wickham, Kent BR4 0QW. Closing date unconfirmed at press date but early April seems likely. Time is shorter than you think...

Easter Monday mini-event

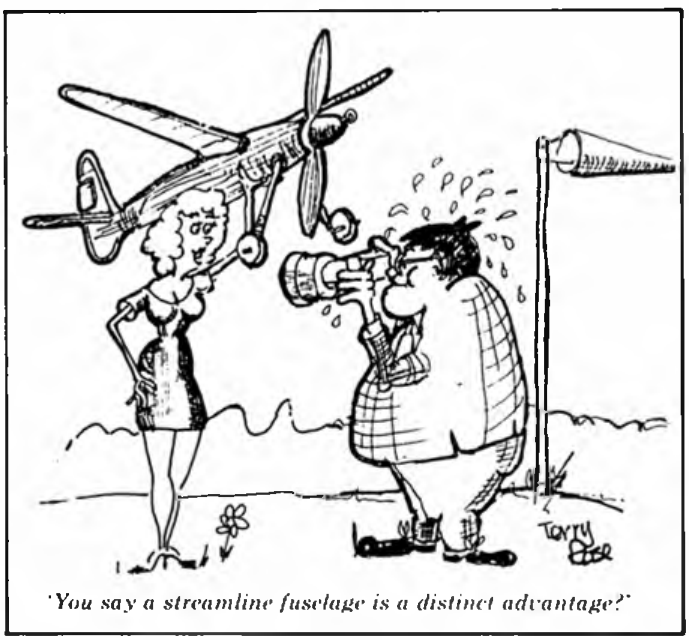
Hot news from Glenda Bracken, who has just telephoned to announce the SMAE London Area Mini-Event at Training Area 10 Salisbury Plan, on 4th April. Comps are for A/1 Coupe and 1/2A. Interested? Call Glenda on 01-263 9849.

Youth in the Air 1988

On 5th February the Royal Aero Club (parent body of the SMAE) launched Youth in the Air, a major new promotional scheme to foster air-mindedness in young people. The President's Rolex Trophy will be presented by HRH Duke of York to the individual or group between the ages of 14 and 21 who has managed the most outstanding achievement in an aviation-related context. There will be other awards. Obviously, aero-modelling is very much an included activity. Indeed, 19 year-old Steve Haley of the Teesside MFC represented young aeromodellers at the press launch. Steve placed fourth in last year's European R/C Soaring Champs as a member of the silver-medal-winning British Team. He was also national Open R/C Soaring Champ in '86 and F3B Champion last year.

Many organisations, not only from the aerospace industry and

Longer days approach, so let's have those model pics! Take note of Terry Rose's view, below...



'You say a streamline fuselage is a distinct advantage?'

air sporting clubs but from airports and travel companies will participate. Now, surely aeromodelling can muster substantial youth achievement, technical innovation, practical initiative and more besides; so give it thought and go ahead! The RAeC contact is Andrew Healey. Call him on 09905 6448 or write to Aviation Publicity, Fairoaks Airport, Chobham, Surrey GU24 8HX. There is also an Information Line on 09905 8670. And let us know at Aeromodeller!

Sandown again

The Elmbridge Model Club are all set to host their 1988 Sandown Park Symposium on 7-8th May. Apart from the extensive trade and club stands there will be a full programme of C/L and R/C flying (including demonstrations by Hanno Prettner). Entry is £3.50 (£1.50 for children and OAPs) with family tickets and discount travel on British Rail all part of the package. Parking is free. For more details contact G. Hazlewood on Ashford (Middlesex) 43022. We'll be there with a full range of books and magazines.

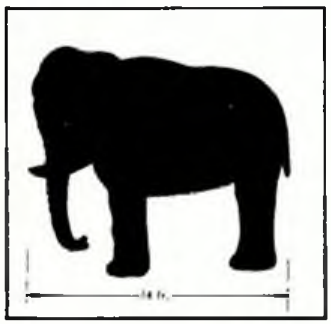
Come and join the fun - see you there!

Wharfedale date changes

Dave Smith advises us of the following alterations - so take note, you C/L buffs. The Wharfdale Open Aerobatic competition, originally scheduled for 19th June, is now on 22nd May; and the Mini-Goodyear event has moved from 26th June to 15th May. Get those lines ready!

Air racing again

Doug Sheppard tells us that the Indoor Scale Nationals at the Alumwell Centre, Walsall on 24th April (see What's On) will again features a 'fun' air race. To recap, any model that was originally an air-race machine (either as built, or when modified) is eligible. Span must be fifteen to twenty inches, and power may be rubber, CO_2 or electric. Documentation is essential; namely, a three-view and evidence of colour scheme. Heats consist of two laps anti-clockwise around two pylons fifteen feet apart. Only complete laps count but if the model falls short for any reason it may be retrieved and that lap attempted again. The four fastest qualify for a ten-lap final subject to a certain scale standard being attained.



Left: Our latest Plans Handbook No.3 for all Scale buffs - just £1.50. Above: A useful scale reference for two features this month...

Nats note

Just a brief note, really. Don't forget the SMAE F/F Nationals at RAF Barkston Heath on 28-30th May.

Full menu next month - get trimming now!

See you there...

Lift-off for model rocketry in the UK - countdown Paul Clark. . .

THE SKY'S THE LIMIT!

BACK IN 1957, at about the time the Russians electrified the world with the launch of Sputnik 1, the world's first artificial satellite, an American business man, Orville H. Carlisle became aware of a spate of accidents, some fatal, involving teenagers - the results of dangerous chemical experiments in the attempt to make propellants for model rockets. Mr Carlisle was a pyrotechnic expert who knew it should be possible to design a safe propellant system which would allow young, enthusiastic, would-be rocketeers to build and fly models without risk to life and limb. With G. Harry Stine, an aerospace engineer who was also aware of the toll of illicit 'basement bomber' experiments, a reliable propellant and recovery system was devised. Lightweight cardboard tube models were propelled by a black powder (gunpowder) fired mini rocket 'engine', which consisted of a rolled paper casing and a compressed clay nozzle for the venturi. They resembled ordinary firework rockets but possessed two extra features: a delay component after the initial propulsive phase, which allowed the model to coast for a specific time; and a subsequent expulsion charge which was designed to push-off the model's nose cone and deploy a parachute or streamer to allow the model to descend safely. The engines were electrically ignited from a safe distance. Their work led to the first commercially-available safe and reliable model rockets; and thus evolved an industry supplying a huge hobby demand. In American the National Association of Rocketry was formed in 1960 to oversee and regulate the hobby; and by 1980 there had been 20 million rocket launchings without a single serious accident.

Wider still and wider

This Space-age hobby was not confined to the USA. In the subsequent thirty years the hobby has spread, or has been independently invented, in many other countries such as Poland, France, Spain, Yugoslavia, West Germany, Canada, Czechoslovakia, and the USSR. It became an international aerospace sport with rules for competition supervised by the FAI; competitions are held every two years. Last year's event in Yugoslavia was reviewed in the February *Aeromodeller*. One country missing from the list is Great Britain. This was not for want of trying to join in. In fact the first model rocketry club in the world, namely 'The Paisley Rocketeers' Society' had been established in 1936 by enthusiast John Stewart at Paisley in Scotland. Using firework rockets as propellants the Paisley Rocketeers scored many 'firsts' that until relatively recently had been thought to be held by the Americans. For instance, in 1937 they flew what is believed to be the world's first successful three-stage rocket and as early as 1938 they were lofting cameras to take aerial photographs!

Unfortunately, World War II intervened and this was followed by a long spell in the doldrums, but in 1968 the Society was revived. A communication from Her Majesty's Inspectors of Explosives brought their pyrotechnic activities to a halt. The threat was of prosecution under the 1875 Explosives Act. Instead, enthusiasts turned to water powered 'Aquajet' rockets. This fate was one which befell many rocket enthusiasts at this time if their activities became known to the authorities, or should they have the temerity to ask if it was in order to fly models imported from the USA. This state of affairs led to many isolated individuals, spurred on by the wish to experiment, resorting to the very thing that had led to the birth of a safe hobby in the first place; that is, the illicit mixing of pyrotechnic propellants, an activity which I am sure led to many unpleasant accidents.

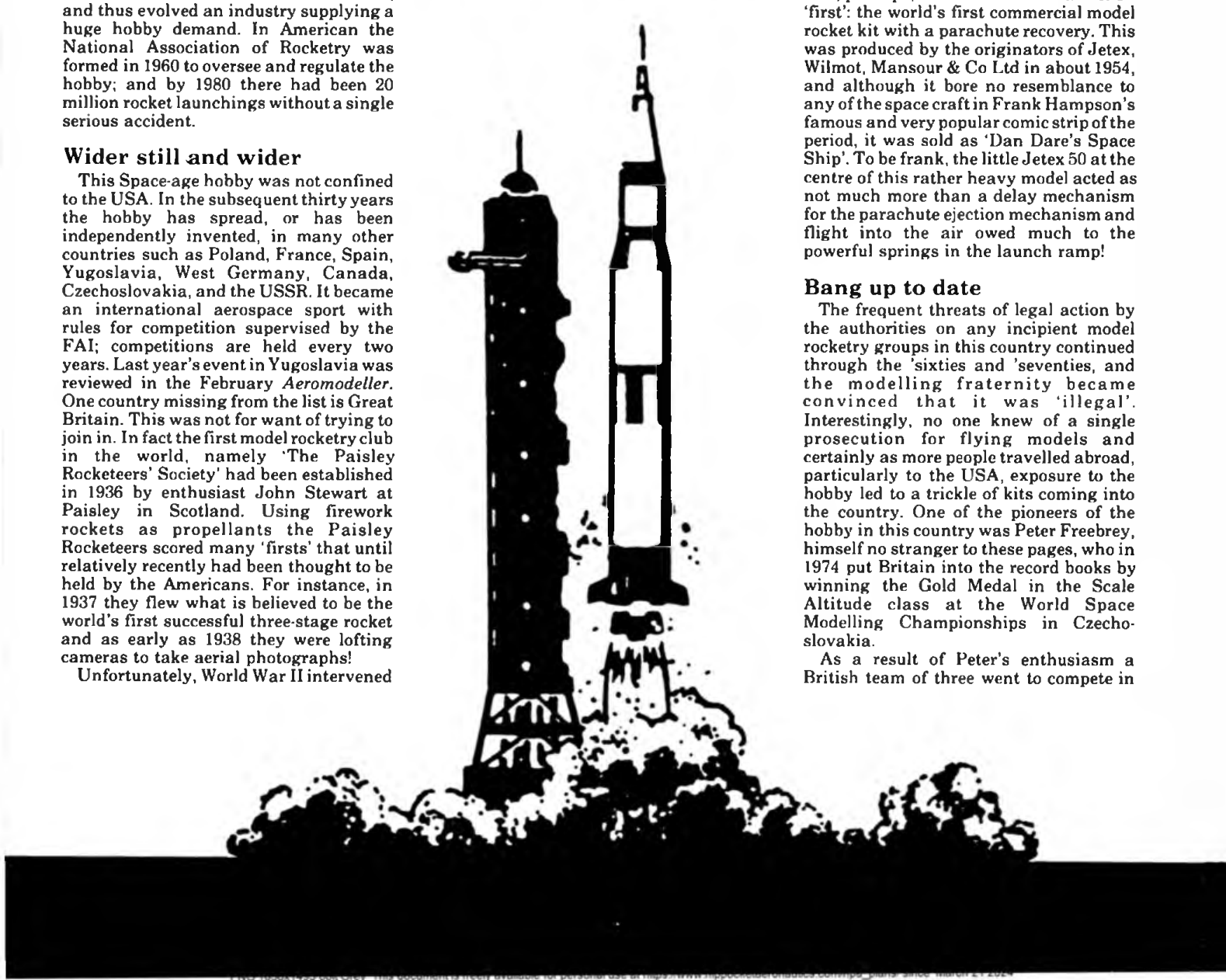
Jetex too

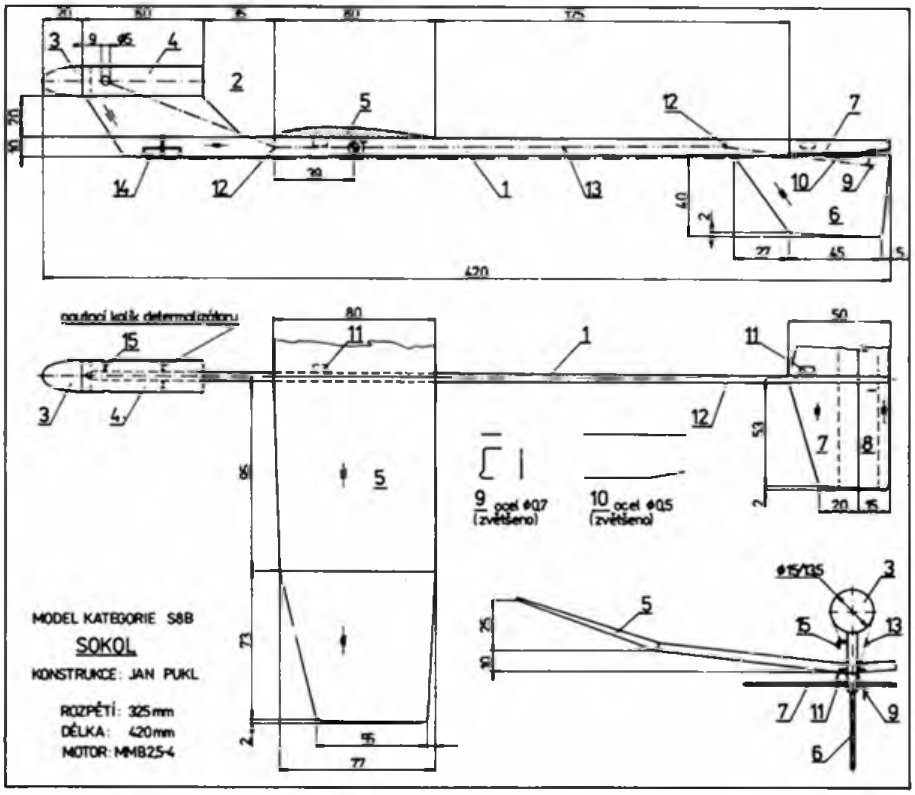
One British invention of the 1950s had absorbed some of this latent enthusiasm for fire and smoke; the famous Jetex system. The history of this alternative solution to model reaction power has been dealt with in these columns before (*Aeromodeller*, October 1985; and its recent revival was appraised in October 1986). Jetex was spared the long arm of the law, perhaps because of its puny power; but in principle it was a rocket and it could be reloaded. Associated with Jetex there was, perhaps, another claim for a British 'first': the world's first commercial model rocket kit with a parachute recovery. This was produced by the originators of Jetex, Wilmot, Mansour & Co Ltd in about 1954, and although it bore no resemblance to any of the space craft in Frank Hampson's famous and very popular comic strip of the period, it was sold as 'Dan Dare's Space Ship'. To be frank, the little Jetex 50 at the centre of this rather heavy model acted as not much more than a delay mechanism for the parachute ejection mechanism and flight into the air owed much to the powerful springs in the launch ramp!

Bang up to date

The frequent threats of legal action by the authorities on any incipient model rocketry groups in this country continued through the 'sixties and 'seventies, and the modelling fraternity became convinced that it was 'illegal'. Interestingly, no one knew of a single prosecution for flying models and certainly as more people travelled abroad, particularly to the USA, exposure to the hobby led to a trickle of kits coming into the country. One of the pioneers of the hobby in this country was Peter Freebrey, himself no stranger to these pages, who in 1974 put Britain into the record books by winning the Gold Medal in the Scale Altitude class at the World Space Modelling Championships in Czechoslovakia.

As a result of Peter's enthusiasm a British team of three went to compete in





Left: The famous - and sought-after - Jetex Dan Dare Space Ship showing recovery parachute. The '50' motor had to work hard! Below left: A taste of what we could be building soon - Jan Pukl's Sokol, an all-sheet rocket glider, was published in Modelar magazine.

the 1980 World Championships in Lakehurst, USA; John Wheddon, Ian Dowsett and myself. Fired by the uplifting experience of meeting and talking to other modellers from all over the world we realised that British aeromodellers, particularly young enthusiasts, had been missing out for too long. Subsequently, I founded the British Space Modelling Association in 1982. The main aim was to promote the hobby in Great Britain. In view of the attitude adopted by the Explosives Inspectorate we decided to take legal advice (which no-one seemed ever to have tried) on the cornerstone of their objection to model rocketry. This centred on the interpretation of the word 'manufacture' in the 1875 Explosives Act. The legal advice we obtained was that you could 'manufacture' only in a factory; placing a model rocket engine in a model rocket could not constitute this. The Health and Safety Executive then modified its stance and adopted a more receptive attitude to the hobby. However, we still had a problem. No British pyrotechnic manufacturer seemed interested in developing a suitable propellant for what was, admittedly, a very small existing market. Any foreign pyrotechnic device,however well proven it might be elsewhere, had to be tested and approved by the Health and Safety Executive. When we enquired about the possibility of doing this ourselves we were given an estimate for the testing costs which was way beyond the means of our very small organisation.

This was the state of affairs until last year, when Peter MacKensie, an importer, decided that he would take the plunge; he went out to America to obtain the UK rights for Estes products, the largest US model rocket kit manufacturer, and got their full co-operation in having the model engines tested. At the end of 1987 they were approved for importation, finally

Left: Scale models are quite feasible. Paul Clark's 1/12th Bachem Natter ready to go. Full-size craft was a semi-expendable, vertically-launched piloted missile; glide tests indicated fine manoeuvrability but the first manned vertical launch ended in disaster when the cockpit and headrest detached - the machine crashed... Centre: Victor Kovalev's 'flop-wing' rocket glider, winner of its class at the '87 World Champs. Right: Also at the World champs - this Soviet Soyuz model is prepared for launch.

paving the way, after years of frustration, to 'legal' Model Rocketry in Great Britain. Initially, a selection of the lower powered engines will be imported and a limited range of the Estes kits suitable for them will concentrate on 'starter' kits for beginners. They were shown publicly for the first time early in 1988 at the Harrogate Toy Fair and Earls Court International Toy Fair. Look for them in the shops by early Spring!

Your questions answered

What is model rocketry?

Basically, it is the flying of lightweight model rockets, constructed from card, balsa and plastic, propelled by small solid-fuelled rocket motors which are electrically ignited. Unlike a 'November 5th' firework rocket the models deploy a parachute or similar recovery device to enable the owner to regain their model. There are strict regulations concerning both the construction of the models and propellants and, combined with common sense in the conduct of the flyers, the sensible choice of launch sites has led to the hobby having a remarkable safety record.

How high do they go?

The inevitable question. All depends on the size and weight of the model and the power of the engine. The higher it goes, the less likely you are to get it back! Consequently many of the competitive events involve time of descent as a measure of skill. Many models are slim, sports craft weighing only a couple of ounces. Another area of skill involves the flying of accurate scale models of actual missiles, rockets or spacecraft. The class which comes closest to the traditional aeromodelling is that of Rocket Glider. These are gliders, often radio-controlled, launched vertically by rocket power; they require considerable skill to build and fly.

What is the law?

There is no specific law which prohibits the flying of model rockets any more than there is one to suppress the flying of model aircraft but as in the case of the latter, model rockets must be flown with responsibility and consideration for others. There are local authority byelaws which may limit the use of certain potential sites for both activities. What is certainly against the law is to attempt to make your own propellant mixtures of chemical. Hopefully, the availability of safe, commercially made propellants will remove the temptation to do this.

Can you be insured?

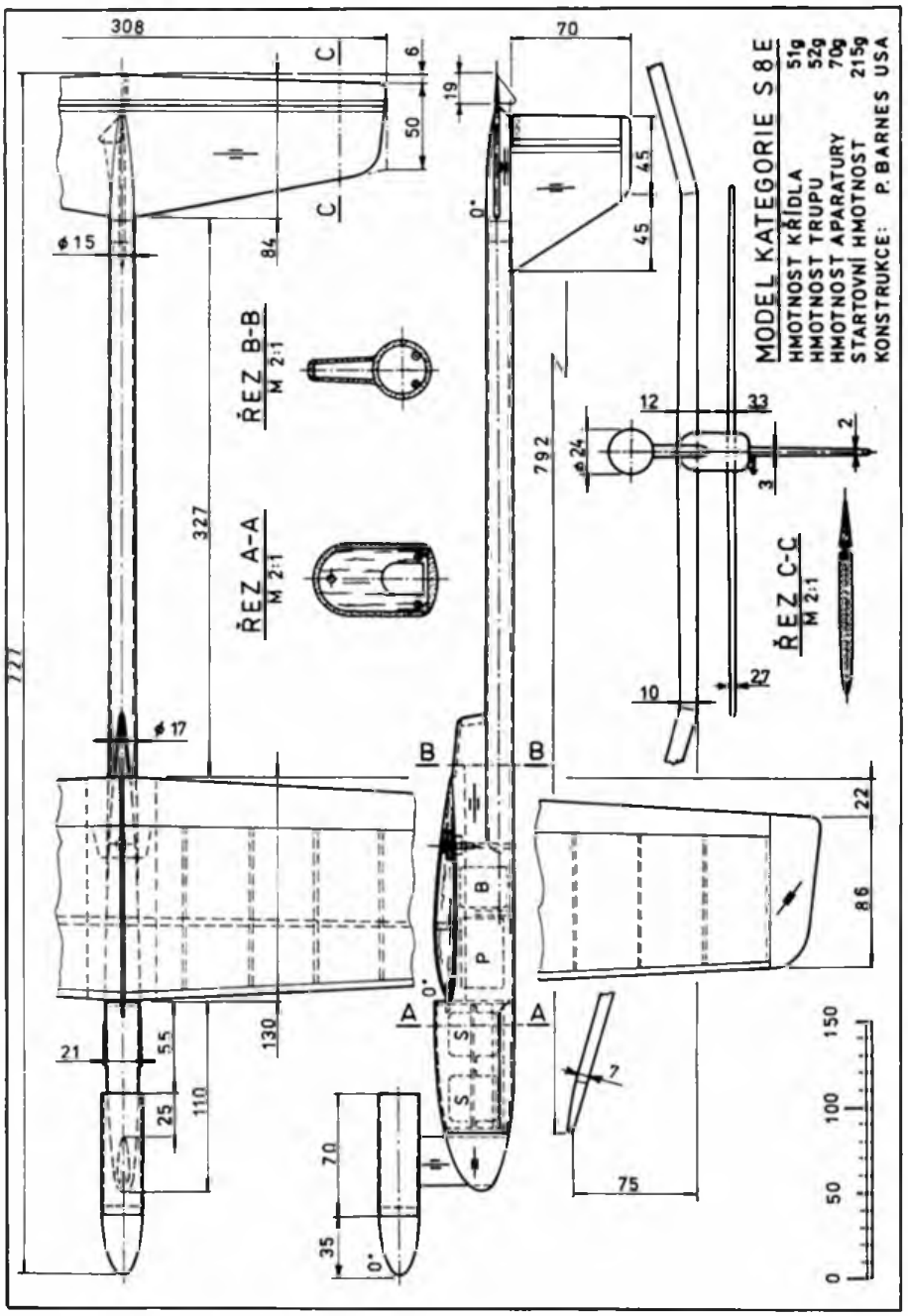
The same insurance cover available to aeromodellers who belong to the SMAE covers members of the BSMA as long as the Association's safety code is observed. The Health and Safety Executive have agreed a similar code of conduct with the importers of the American kits.

There's no excuse - so go and try it!

To the future...

The BSMA will watch developments with interest, for we certainly hope that a new generation of modellers will take up the challenge of this exciting hobby. We will promote the educational use of model rocketry, which children in many other countries have been enjoying for years, as it can well lead to stimulating an interest in the young in the Space Sciences, an essential for Britian if, despite Government reluctance, it is to have a role to play in the world of the 21st century.

If you would like more information please send an SAE to: BSMA, 179 Preston Drove, Brighton, Sussex, BN1 6FN.



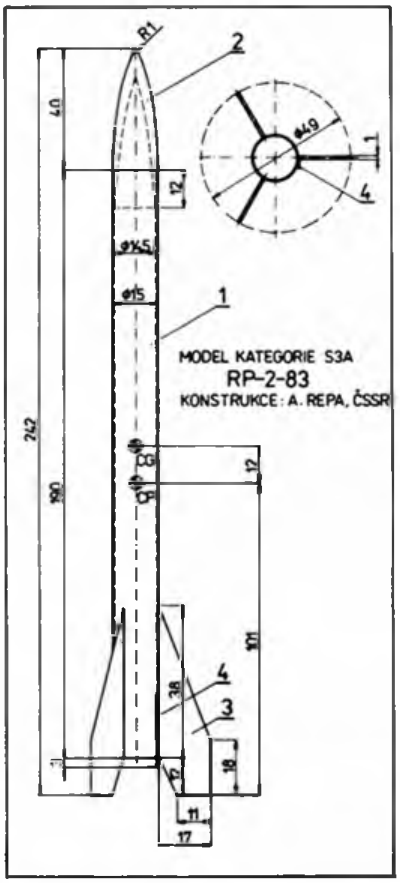
Above: A built-up wing is favoured by US competitor Phil Barnes for his rocket glider. Below: Easy does it! A Polish enthusiast places his immaculate Saturn 1B on the World Champs launch pad.

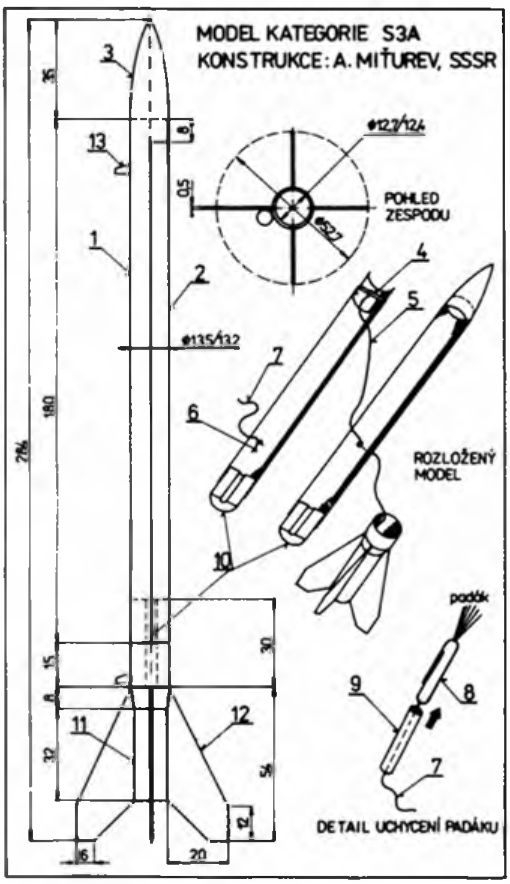
Books on model rocketry:

Basics of Model Rocketry by Douglas Pratt:
A well illustrated, slim volume that will provide a beginner with basic information.

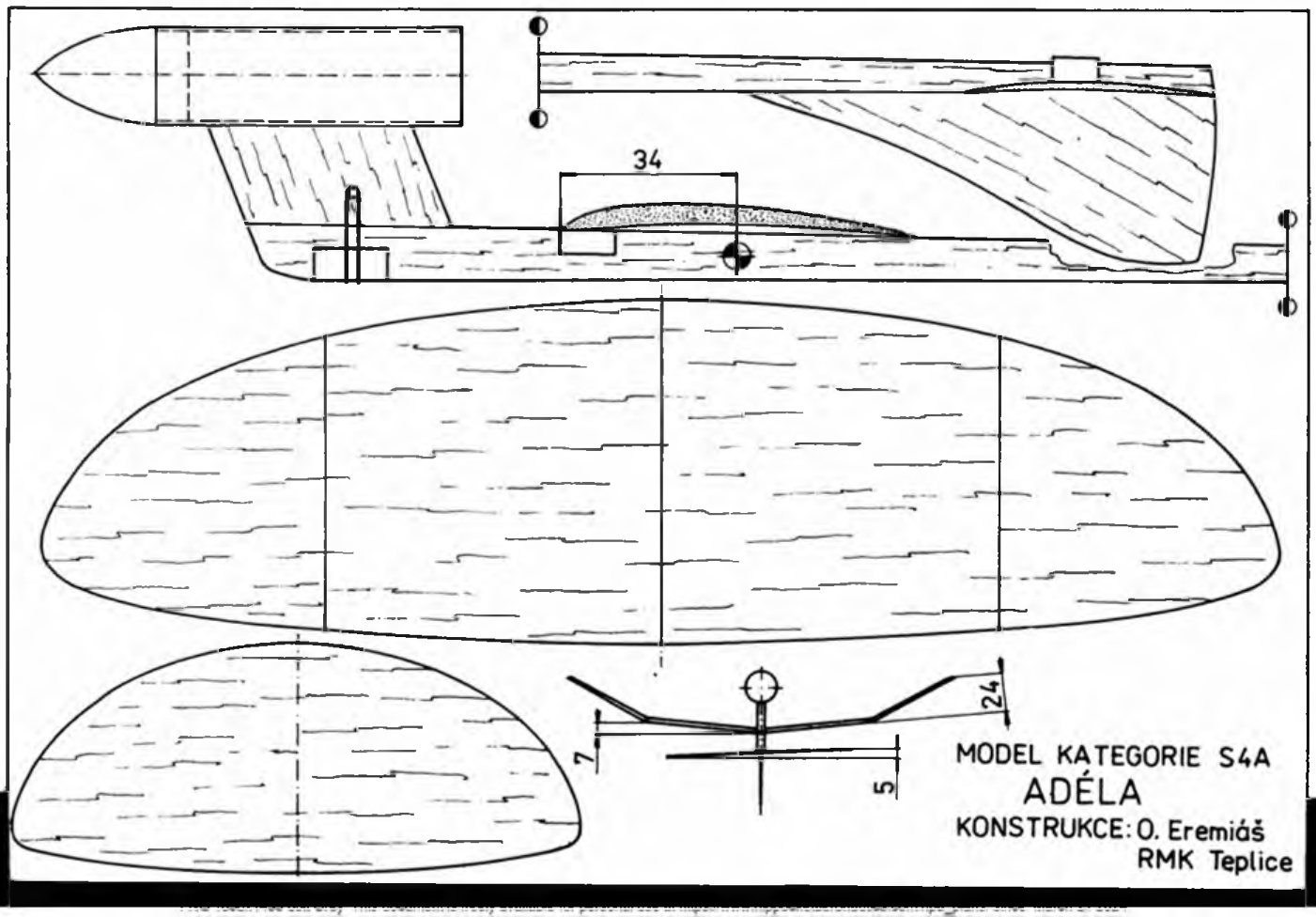
Advanced Model Rocketry - Second State by Michael Banks:
A sequel to the above for the experienced modeller. It includes six model rocketry programmes for home computers.

Both are obtainable from Albion Scott Ltd, at £4.95 and £6.95 respectively.





Left: Paul Clark's own 1/50th scale scratch-built Ariane 01. Centre: Two Czechoslovakian S3A (Parachute Duration) craft. Maximum weight in this class is 100gm. Below: A typically straightforward S4A (Boost/Glide) design. Boost Gliders are essentially model rockets with gliding recovery, as opposed to rocket gliders whose spiralling climb proves to the observer that the wings sustain the model during ascent. All drawings courtesy of Modelar magazine.



THE LONG TERM objective of these experiments is to fly a scale model indoors under radio control. Radio flying in winter is much more satisfactory indoors; it is warmer and there is no wind or turbulence. Small models are particularly sensitive to turbulence, which also detracts from scale realism.

In order to fly satisfactorily indoors, it is necessary to fly slowly and turn tightly. The latter requirement necessitates a small wingspan, which conflicts with the first requirement. The only way to satisfy both criteria is to reduce the weight. This factor is critical and is the key to success.

Radio equipment

The big step forward here was when half-ounce servos such as those from Fleet, Futaba and Harry Brooks became available. In my view, two servos are the bare minimum for satisfactory control. Reasonably light receivers have been available for some time, and one from Century Systems was selected as being light and offering good performance on 35 MHz. As with outdoor flying, the radio control system must be 100% reliable, as any malfunction is likely to cost the model. Lightweight receivers are available on 27 MHz, but this frequency is also used by cars which may be operating indoors. I feel much safer using the aircraft-only 35 MHz frequency.

I decided to assemble a lightweight two-channel flight pack to see how light it could be made. As weight-saving measures, the receiver case and the bottom halves of the servo cases were thrown away, and the servos were held together by wrapping with a single turn of sellotape. On installation, the receiver and servos were adequately protected with foam, as described later. The servos were wired directly into the receiver board using leads as short as possible.

This gave a two-channel flight pack weighing 40 grams, less battery. However, the choice of battery itself was a problem. I tried several different types of hearing aid and lithium batteries, since in general primary cells offer a lower weight for the same capacity; cost was a secondary consideration. However, none of these would supply the high pack current required for the servos. The voltage dropped to a volt or so immediately and the servos just jittered. The ideal solution would be to use a higher impedance servo motor. This would reduce the power and speed of the servo, but who needs a fast servo with twelve ounces of pull in a slow, four-ounce model? Sub-miniature servos appear to be designed to replace ordinary servos. They have about the same output torque, but seem to take about double the current. Rewinding the servo motor is one possible solution, but it is not a simple matter, and having no experience I decided not to try.

I also tried taking apart a PP9 SAFT rechargeable battery and using four of the cells - they are 110 mAh nicads. However, this still would not supply enough current. At last I came across a new type of Nicad battery designed to be mounted on a printed circuit board as a back-up supply. These are nominally 4.8V, 110mAh, and weigh 19 grams. They will supply enough current to drive two servos for up to five or ten minutes. This was far from ideal, but it did at least allow me to get some flying.

CO_2 indoors - under radio control? Robin James set about turning the dream into reality...

Turn To Port-A

Motor choice

The two most suitable types of motor are CO_2 and electric. In very approximate terms, a CO_2 motor will fly a model of three or four times its own weight, whereas an electric motor with batteries will fly a model of only twice its weight. To put it another way a CO_2 motor might make up 25% or 30% of the weight of the aircraft, whereas an electric unit would comprise 50%. Of course these are only very broad generalisations, and there are other factors to be taken into consideration such as flight time and motor and propeller efficiency. CO_2 motors of the right size and weight are available and they are well matched to large, coarse pitched propellers which are more efficient. It was therefore decided to use a CO_2 motor...

Aircraft design

The target weight breakdown was now looking like this.

Motor: 1oz
Radio: 2oz
Airframe: 1oz
Total: 4oz

The unanswered questions were:

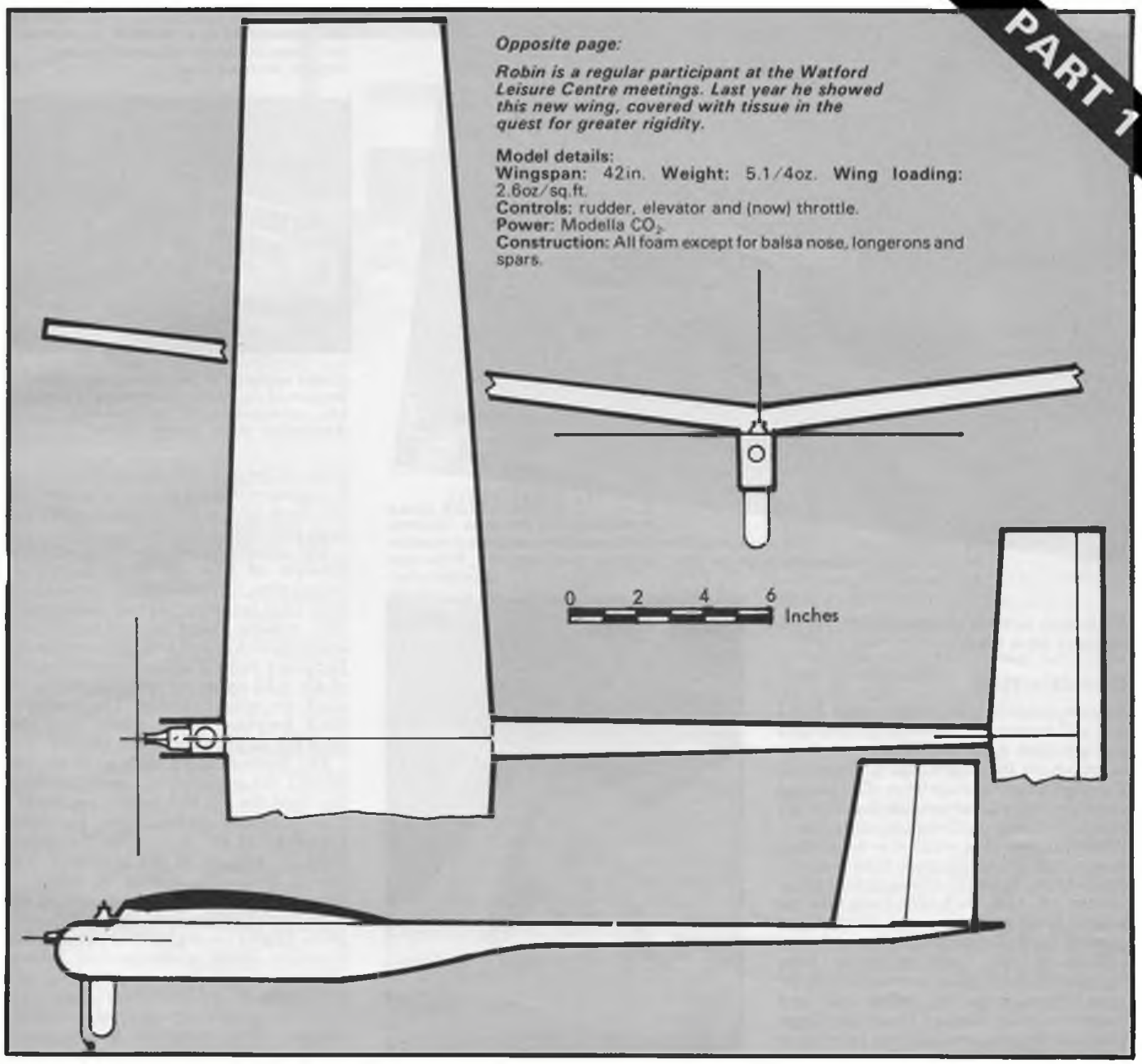
(a) Was four ounces all-up-weight too heavy for the size of our indoor flying sites?

(b) What size should it be? Would it be slow enough and manoeuvrable enough?

(c) Could I build an airframe that was strong enough and robust enough down to one ounce?

Not knowing where to start, I selected a wing loading of 2oz/sq.ft. which gave a flying speed of about 10ft. per second with

PART 1



Opposite page:

Robin is a regular participant at the Watford Leisure Centre meetings. Last year he showed this new wing, covered with tissue in the quest for greater rigidity.

Model details:
Wingspan: 42in. **Weight:** 5.1/4oz. **Wing loading:** 2.6oz/sq.ft.
Controls: rudder, elevator and (now) throttle.
Power: Modella CO_2.
Construction: All foam except for balsa nose, longerons and spars.

nd Mind The Lights...

Typical wing section: a computerised cross between Eppler E471 and Selig 3010.

a cambered wing section. Although high aspect ratio wings are theoretically more efficient, they make for a less manoeuvrable model, and weigh more for the same wing area, so an aspect ratio of about six was thought to be about the right place to start. This gave a wing of 42in. span and 7in. chord; I actually chose a root chord of 8in., tapering to 6in. at the tip.

As far as I know there are no wing sections available that are specifically designed for this type of model. Sections designed for R/C models have adequate thickness for the spar, but are designed to operate at higher Reynolds numbers, generally above 100,000. This model operates at around Rn40,000 at which these sections will not work at all well. Sections designed for free-flight models do function at the right Reynolds numbers but they have insufficient thickness to accommodate the spar. I decided that what was needed was something between a free flight section with plenty of camber, such as E471, and a low-speed R/C glider section with more thickness, such as the Selig 3010. The computer obligingly threw

Below: Two views of the inverted Modella. Throttle control is effected by pushrod-actuated rotation of cylinder barrel (the full story next month!). Wire skid is prominent.

out a cross between the two, and this is the section I have used.

Construction

As this aircraft was experimental and I was still very much at the learning stage, I thought that a few 'arrivals' were to be expected, so the model had to be tough. Traditional model structures of balsa and tissue have the disadvantage that they are very brittle; not at all what is wanted here. When damage does occur, it is not easy to repair, and anything more than a minor accident might result in the airframe being written off. Also, such structures take too long to build and repair, so I decided that another type of structure had to be found.

Most of the model is made from polystyrene foam, with balsa used only for wing spars and the front end and longerons of the fuselage. I have used 2mm foam for covering, as it is easy to use; it is half the weight of 1/32in. balsa sheet for a given area; it is not brittle; it goes on without any wrinkles and requires no finishing.

The wing spar was obviously a major structural item, so I decided to carry out a few tests to see how light I could build it. '3G' was considered the minimum for safe flying, so at a fuselage weight of 3.1/2 ounces, the wing would be applying a force of 10.1/2 ounces to the fuselage. The spar needs to be strong enough to sustain a moment of half of this force acting ten inches out from the fuselage. This calculation is only true for the centre point of the wing, but since that is the weakest point of the spar, it is sufficient. I made up a few spars and tested them, the spars being fairly light balsa (6lb/cu.ft) with a solid Rohacell webbing. What came out of these tests was that a foam webbing always failed first, so I have used a vertical grain balsa webbing for the first few inches, then Rohacell 31 for the rest of the spar. A spar size of 2 x 7mm was found to be adequate, with the spar having a total depth of 17mm. The spars were cut with a straight taper down to 4mm, and then the last four or so inches were tapered to a point. This was to try to eliminate the weak

Left: It flies! Robin's CO_2 R/C model is best described as a 'flexible' performer but foam structure absorbs landing impact without fuss.

Robin enjoys F/F fun flying too. Best known of his many curiosities is probably this quintuplane for Telco power. Amazingly slow, draggy flight!

point at the end of the spar, since the last three inches of wing has no spar. The balsa and foam for this spar together weigh only 5gm; less than I expected.

The remainder of the wing structure consists of ribs cut from polystyrene ceiling tiles, top and bottom surface being from 2mm polystyrene sheet (wall veneer). The trailing edge is reinforced with sellotape at top and bottom to enable it to be cut to a point. The leading edge is a strip of air mail paper curved to a radius and stuck on with Copydex. The completed wing weighted 30gm, which was more than the target weight, but not overly so.

The fuselage is a simple structure built around the equipment it must house. At the front the top and bottom are made of 1.5mm sheet balsa. The top sheet continues to the rear while the bottom sheet is replaced at the rear by a 3mm square longeron, giving a triangular structure. Formers are from ceiling tile, with fuselage sides from 2mm polystyrene foam. The servos are built into the fuselage structure. Each is sandwiched between two ceiling tile formers and held with double-sided self-adhesive tape. The formers run between the fuselage top and bottom. This structure is adequately strong and rigid, and absorbs energy in the event of an accident. The receiver is similarly protected by ceiling tile formers. Tailplane and fin are single surface 2mm foam with balsa leading and trailing edges.

Motor power requirements were estimated as follows. Suppose the model has a power-off sink rate of two feet per second possibly slightly pessimistic, for such a figure would give a glide angle of 1 in 5). A four ounce model at this sinking speed is using up potential energy at the rate of 2 x 4in./16 = 0.5ft/lb per sec. A propeller delivering this much power should maintain level flight, and doubling this to 1ft/lb per second or 1.3 watts approximately should give an adequate climb. The shaft output from the motor would have to be higher than this figure to allow for propeller inefficiency; say 1.5 to 2 watts. Telco quote a maximum power of 3.5 watts, so thinking no further I fitted a standard Telco motor, a 10cc tank and a Modella prop.

The all up weight was 4.1/4 ounces; not too far from the design figure. The airframe and radio were over the target weight, and the motor was under...

Continued next month...

FAI affairs

Martin Dilly reports on December's CIAM meeting in Paris

THE BUREAU meeting of the FAI's model flying committe (CIAM) has the task of checking the final arrangements for the forthcoming year's World and Continental Championships, sorting and checking the many proposals from national aero clubs for the agenda of the plenary meeting in April, approving the details of events submitted for the FAI's international sporting calendar, and co-ordinating the running of our sport worldwide via the various technical committees.

Meeting in the FAI's Paris headquarters in December, the Bureau also heard from the Director-General, Dr. Cenek Kepak, on the FAI's future policy on financing, especially regarding major air sport events. The FAI is, of course, responsible for the other aviation disciplines - gliding, parachuting, ballooning and so on - as well as model flying, and these have been affected by cuts in government funding and sometimes by more sponsor interference. While the latter is not something that we in model flying have yet found to be a problem, some FAI World Championships have been advertised primarily as, for example, a motor car manufacturer's promotion, so some balance is needed here. As they speak for the airsport with the largest worldwide participation, model flying organisations will be contacting sponsors at an early stage before offering to run future major Championships. The FAI is now negotiating a contract with a major British marketing association, with the aim of promoting all air sports to potential sponsors, but Dr. Kepak stressed the need to make the various disciplines simpler for the general public and the press to understand. This could perhaps be achieved by structuring events to have a clear climax, rather than protracted calculations of scores and consideration of protests that sometimes delay final announcement of winners by days. Acceptance by the public is vital, said Dr. Kepak, and this is even more so for model flying.

The FAI was recognised in 1985 as an Olympic sports federation, and demonstrations of parachuting and gliding will take place during the Seoul Olympics: this is a preliminary to full Olympic status for any sport, and the IOC are at present keeping an open mind on ballooning and model flying.

Championships...

The Soviet delegate Albert Nazarov was at the meeting to present details and answer questions on plans for the 1988 World C/L Championships at Kiev, which includes C/L Scale for the first time. Already 17 nations have entered a total of 320 flyers, but significantly invitations have not been sent to Chile or South Africa. As an indication of the importance attached to model flying by the Soviet government, the head of the contest organising committee is the president of the Council of Ministers of the Ukrainian Republic. The whole C/L complex at Kiev is being reconstructed to allow all the five events to be run simultaneously, as well as having in addition one grass and six asphalt practice circles. The hotel where teams will be housed is 2.1/2 kms. from the flying site and there will be mini-buses to transport flyers and aircraft. No vehicle rental will be possible, but a circular will shortly be going to national aero clubs with recommended routes for those bringing their own cars to Kiev. There will be no restrictions on walkie-talkies, which will be good news to team managers trying to keep in touch with their flyers on four separate circles at once. Electronic scoreboards will be run for all classes. Local methanol, castor oil and nitromethane will be available, but there may be a problem in bringing fuels on Aeroflot aircraft; more details on this will be available at the April plenary meeting of the aeromodelling committee of the FAI. The entry fee is $250 per team member. An innovation is the Soyuz Cup, to be awarded to the winning team in F2A,B,C and D combined, as is now the case with the Challenge France in free-flight.

The World Indoor Championships will be at Johnson City, Tennessee, about 300 miles south-west of Washington, DC, from 28th May - 1st June. It will be followed by an international F1D event plus a

Peter Freebrey, UK delegate and First Vice-President, CIAM, concentrates whilst standing as business is discussed.

national multi-class indoor event, which, though not on the FAI calendar, will, I am sure, be open to foreign flyers. The flying site is the Mini-Dome of East Tennessee State University, 116 feet high, 420 feet long and 208 feet wide. Entry fee for team members will be $350 which of course includes accommodation and food.

The dates for the R/C Electric World Championships at St. Louis, also in the USA, are 14th-19th August, though the full entry fee of $410 includes *nine* nights, accommodation, suggesting that more than just the F3E World Championships may be included in this. While it is common to add an open international before or after a world championships, as with the F1D event above, the F3E championships could well see a drop in teams entering if national aero clubs are being asked to fund considerably longer stays than are actually needed for the event's World Championships contest flying.

...and for Juniors

Probably the most significant FAI Championships of the year, or even the decade, is the first for juniors under 18. It is for all the outdoor free-flight classes, Wakefield, glider and F1C power, and it will take place at the Polish National Gliding Centre at Leszno, about 200 miles west-south-west of Warsaw, from 8th-15th August. The entry fee is $260 or $300, depending on the lodging option taken, and already 13 nations have entered teams, with another eight expected. However, Britain is not among them, in spite of having the world's longest-established model flying organisation. It may well be that there are not sufficient under-18s flying F1A,B or C in Britain to make a full team, but for the SMAE's free-flight technical committee and Council not to even make a budget allocation so that the Society at least would be able to meet the entry fees makes it almost certain that no young British model flyers will be representing their country in this important and forward-looking new Championships. Such negative thinking

Top: From left to right are Dennis Thumpston (UK), John Worth (USA; Secretary, CIAM), Tony Aarts (Netherlands), Dr Cenek Kepak (Czechoslovakia; Director-General, FAI), Sandy Pimenoff (Finland; President, CIAM) and Werner Groth (W. Germany; Second V.P. CIAM). Above: Soviet delegate Albert Nazarov explains (via his interpreter at left) the plans for the next World C/L Champs at Kiev.

by those who should be promoting model flying, rather than stifling it, shows, I think, a sad lack of vision and displays a pinchpenny attitude that does Britain no credit.

More dates

The R/C Scale World Championships date was confirmed as being 3-11th September at Gorizia, Italy.

One of the *raisons d'être* (well, the meeting *was* in Paris ..) for the FAI and its various committees is to keep down the cost of taking part in our sport. As an example of such application, a Swedish offer to run the R/C aerobatic European championships was not approved because of the very high costs; team members were asked to pay 4000 Swedish kronor (about £370) for entry and accommodation, which is considerably higher than the norm at present. The organisers are being asked to re-cost the event.

The F1E magnet-steering European Championships will be at Banska Bystrica in eastern Czechoslovakia from 21-24th September. Entry fees will be $150 for accommodation in chalets or $250 for local hotels.

Future affairs

The agenda for the 1988 plenary meeting of the FAI model flying committee will be going to national aero clubs around the end of January, which means UK delegate Peter Freebrey will be sending copies to the SMAE technical committee chairmen soon after. One of the reasons these committees exist is to brief our FAI delegate on just how to vote on each proposal, some of which can have a far-reaching effect on our sport. The people we elect (your club did vote, I hope...) each year to serve on tech. committees need your opinions in order to support or reject new ideas from all over the world; this is especially so when some of our committee members' sphere of interest is primarily Open, i.e. non-FAI classes, or when a committee covers four or five sub-disciplines, as with C/L or R/C power. Time is short between the publication of the agenda and the April meeting in Paris, so talk to your technical committee members now to hear what is proposed and to tell them what you think of it so our delegate gets a true picture of British flyers' opinions.

Now available from the FAI, or in Britain from the SMAE office in Leicester, are the new cloth FAI badges for your track suit or flight jacket at £1.00 each, as well as triangular FAI stickers for car or model box. Another FAI item of more specialised interest is the organisers' guide, aimed at aero clubs planning a World or Continental Championships, but also packed with useful timetables, check-lists, systems and advice, born from years of worldwide experience, that will head off problems before they occur when you are planning more modest events.

The 1988 plenary meeting will also welcome for the first time members of the international model press; the world's 74 model flying magazines have each been invited to send a representative to Paris to report first-hand on the meeting for their readers.

FROM THE HANDLE

Connect up! This month we hand over to Ian Horne for his advice on wire loops...

I HAVE never used swivel connectors on control-line models for the following reasons.

(a) In my early C/L days (1963 or thereabouts) I crashed and broke a model when the central shank pulled out of the bob weight. However, it must be said that both John James and John Hammersley use them on their F2D models without any problems. They both use quite large connectors permanently fixed to both ends of each control wire.

(b) There is potential for a control jam with closely spaced lead-outs when two swivels, with all their 'twiddly bits', snag together.

(c) There seems to be no logical reason why wires should be allowed to rotate independently. If both wires are run out separately from the model before connection to the handle, then they are in an unstressed state and will lay approximately straight. What happens in flight to govern how the wires might curl is irrelevant as they ought to be under tension!

In my opinion the best control line connector is the Sullivan 'Pylon' type. This is available in two sizes but unfortunately it is difficult to obtain, so much so that I usually buy the entire stock if I see them in a shop. Perhaps some enterprising mail order shop could be persuaded to stock them and advertise the fact?

Slightly inferior in quality but similar in design is the wire connection which can be removed from some large swivel connectors. (See photo, top right, third from left on p.16, Jan 1988 *Aeromodeller*.) The worst connector I have experience of is that shown in the same article (photo, top left, p.16). This type has a sliding keeper which can easily be displaced (especially on closely spaced leadouts) and once one end of the connector is free, the wire loop opens and straightens when subjected to line tension. Ask vintage T/R enthusiast Les Pilgrim, with whom I fly, about what he thinks of this type of connector. He managed to destroy his Class A Voodoo and damage a Mk3 Oliver when the up-line connector on his handle straightened at a recent Three Sisters Meeting...

For interest and to show an alternative method to that of Claus Maikis (long may he continue writing!) here is the method I prefer. I claim no originality for the method but it is tried and tested and has not failed me since I started control-line again in 1975. I have also used this method to prepare tensile-test specimens for the single-strand wire that I stock. All of the fifteen samples tested failed at the straight run of wire rather than at an end connection.

The copper tube can be obtained by post from Whistons, New Mills, Derbyshire or from other model engineer suppliers.

The heat-shrink tube is available from some R/C model shops and electronic component suppliers. Incidentally, I now use black and yellow tubing since the latter colour is easier to obtain than white.

Don't put an end to your model

During the years that I have flown control-line models, I have been horrified at the standard of the lines attached to most of the models that I have seen. It would appear that most control-line modellers are prepared to risk damage to third parties, their models and their

The British F2B Team for 1988 at 3 Sisters after the final 'selection' event. From left to right: Nev Dickinson, Bill Draper and Barry Robinson. Barry's Northwind 7 was our Plans Service feature in February.

engines simply because they are too lazy or ignorant of a better way of finishing the line ends. Now read on...

Line length

Before making the line-ends you must decide on line length. If you fly several different classes of control-line model you may spend many hours (or pounds) on a set of lines to suit each, unless you apply a little brain power.

By making the leadout length identical for all models of a given capacity then one set of lines will suit all classes of model using that size of engine: e.g. one set of lines to suit 1/2A Combat and Mini-Goodyear.

Most of my club members fly 1.5cc and 2.5cc powered models, so I will confine my ideas to these classes, as shown in the chart below.

Standard line length system for engines up to 2.5cc

Control system component length in millimetres	Engine up to 1.5cc	Engine up to 2.5cc
Model leadout length	510	580
Axis of engine crankshaft to inside end of leadout loops		
Line connector	25	25
Sullivan, Fox or link from large fishing swivel		
Control Line	12.150	15.250
Inside end of loop to inside end of loop		
Line connector	25	25
As above		
Control line handle	40	40
Keil Kraft, D.C., Mercury distance from connector holes to finger grip		
Total line length	12.750	15.920

Left: A trio of Gold Trophy winners! Around the cup itself are (clockwise, from left) Tony Eifflaender's Freebird, Bill Draper's Superhawk 32 - the current holder - and Barry Robinson's Northwind 7.

Space out

Note that the specified leadout lengths will make them suitable for the smallest and largest models in each capacity class. Having decided on what length line to use, select a suitable stretch of flat ground free of obstructions and place two 150mm round-headed nails in the ground at the required spacing.

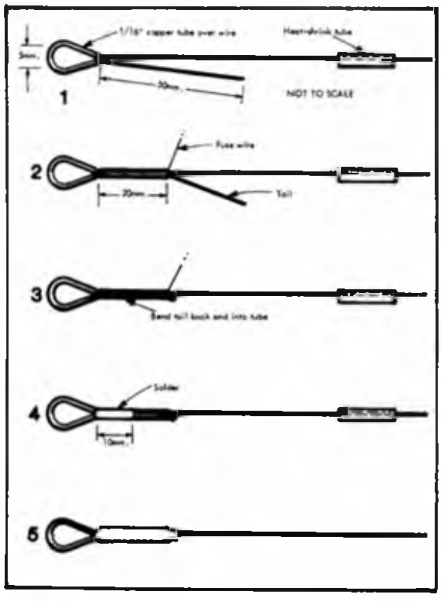
It will now be possible to make the line ends.

Materials to be used:

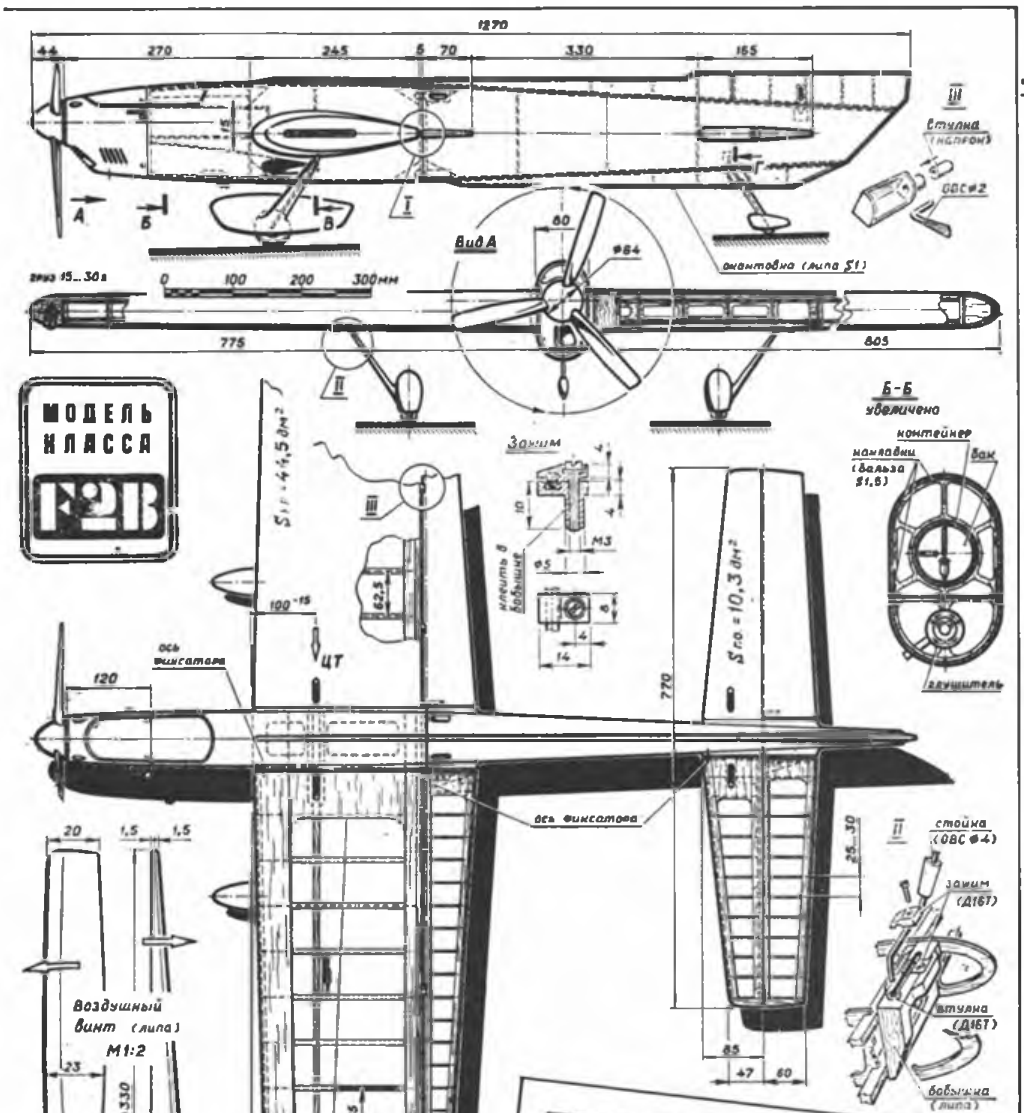
Approx. 2 metres of 5 amp fusewire
Four 25mm lengths of 1.6mm O.D. (1/16in.) thin wall copper tube
Two 20mm lengths of 2.4mm I.D. (3/32in. black heat-shrink tube
Two 20mm lengths of 2.4mm I.D. (3/32in.) white or yellow heat-shrink tube.

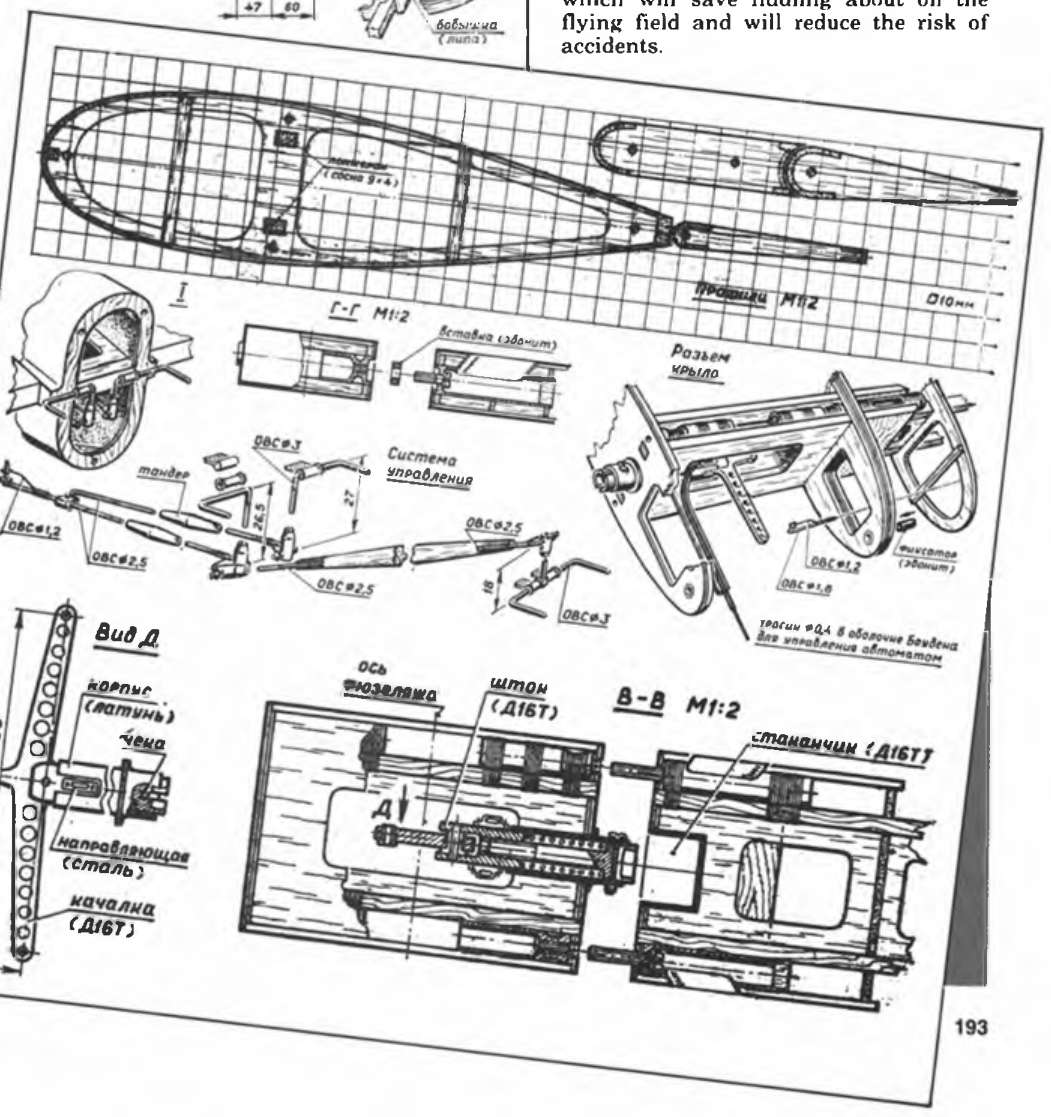
Deburr the ends of the copper tubes and then soften them by annealing. This is done by heating each tube separately to dull red heat in a gas flame while it is supported on a length of 20swg wire. Immediately the whole tube is dull red, plunge it into clean cold water, remove and dry thoroughly.

Pass the control-line wire through a length of black heat-shrink tube and a length of copper tube until a tail of about 50mm protrudes. Bend the copper tube (with the line inside it) around one of the nails to form a loop. See Fig. 1. Remove the assembly from the nail and place the nail near its hole in the ground. Take approximately half a metre of fusewire and place one end of it inside either end of the copper tube. Closely bind the two



Above: Control-line loop sequence: see text. Right: Seen at the Nats - Harry Leyland's ST.46 powered Nimrod flew well.





In February we raised the topic of engine cut-out for F2B models. A search has revealed the details (right) of the Russian system used by Valentin Salonek in 1986. High-G pull actuates fuel cut-off. Model, above, is interesting for other reasons too - look at that wing section! Power was a homebuilt 9.9cc two-stroke.

adjacent runs of line together for 20mm (Fig. 2).

Bend back the loose tail of line and shorten it until it will enter either end of the copper tube to lie flat against the first layer of binding. (Fig. 3).

Closely bind the tail to the first layer working towards the copper tube, complete with a knot and snip off the surplus fusewire. Solder only the 10mm of binding using non-acid flux. Do not solder the line to the copper tube. (Fig. 4).

Finally slide the heat-shrink tube over the binding and shrink into place using the heat of a soldering iron.

Replace the completed end on the nail and replace the nail in the ground. Stretch the control-line wire to the second nail and snip off, allowing some extra for completing the next end.

Repeat procedure using the second length of black heat-shrink tube. Note that once the second length of copper tube has been bent around its nail, the line pulled taut and nipped between thumb and forefinger, it should be possible to remove the nail from the second loop without disturbing the line length. Check this after completing the first layer of binding and rectify if necessary.

Repeat this complete operation for the second line using white heat shrink tube at each end. Hopefully you will then have a pair of well matched colour coded lines (black for up, white or yellow for down) which will save fiddling about on the flying field and will reduce the risk of accidents.

... and there's lots of racing news from Dave Clarkson, including the latest Horty Charts

ON 3rd JANUARY the new SMAE C/L Committee met for the first time. Of particular interest is confirmation that the 1988 C/L World Championships will be held from 5-12th August in Kiev. The cheapest return air fare is approximately £250 and entry fee will probably be in the region of US $200. More event details are awaited but Britain's arrangements include Vernon Hunt as Chief of the F2D Jury; Derek Heaton is Reserve F2C Juryman. Our reporter Dave Clarkson is Team Manager; and representing the country will be the following:

F2A: Pete Halman, Dick McGladdery, Gordon Isles.
F2B: Bill Draper, Barry Robinson, Nev Dickinson.
F2C: Smith/Brown, Fry/Thorpe, Fitzgerald/Thomason.
F2D: Neil Gill, Mick Whillance, Ernie Burles; mechanics are John James and John Hammersley.

... and the '89 Eurochamps

At the April CIAM meeting in Paris there will be a proposal from the SMAE to organise the 1989 C/L Eurochamps at 3 Sisters. To deal with this a Steering Committee has been formed; any help will be gratefully taken on board so interested parties should contact Derek Heaton at 42 Cinnamon Lane, Fearnhead, Warrington, Cheshire. Teams for F2A and F2B will be selected by a points system like that operated for the '88 World Champs Team; a slightly modified arrangement comes into force for F2D, as follows:

First place at Centralised meetings gains 10 pts x No. of rounds flown.
Second place gains 7 pts x No. of rounds flown.
Third place gains 5 pts x No. of rounds flown.
Fourth place gains 3 pts x No. of rounds flown.

Other matters

It was decided by the C/L Committee that a list of banned fuel chemicals would be issued. Also, the SMAE Council has asked that 'B' Team Race rules should be studied in depth for implementation in the '89 season. Symposia for this class and for Goodyear (where controversy exists) will be organised at the Nationals in August.

1987 Horty Charts

Since 1970 John Horton has been compiling his league lists based upon a contest results-based points system. He started with Goodyear which was then in its first full season. In 1972 he added 'B' T/R and in 1975 included FAI and 1/2A Team Race. Now his league lists cover all the racing classes following his addition of Class 2 Goodyear in 1983. This 18 years of effort has been of great benefit to us for not only has it added extra spice to each season as we battle for league points, but it is the best historical recording system we have ever had.

At the end of the 1987 season, following major surgery earlier last year, John announced his retirement from competitive flying. If you read the individual year shields on the magnificent shield awarded by the Wharfedale Club each year to the winner of the Wharfedale '1000' B Team Race marathon, you will see John's name amongst the winners in the early 1960s. Now after 34 years of competitive control-line racing we lose a loved and valued competitor. I hope that his league system will continue and ask that all contest organisers send the results to: John Horton, 10 Lawn Lane, Burley-in-Wharfedale, Ilkley, Yorks LS29 7ET. John will not be present at meetings to collect them himself.

Now to the 1987 end-of-season league tables. I only wish space permitted the reproduction of the complete tables for they are works of art in themselves and my efforts at precis have inevitably resulted in the loss of much information.

Before reviewing the individual class lists we come to the overall classification which John has based on the five classes raced on a total of 39 occasions last season. A much more comprehensive assessment than that made by the SMAE to award the Knokke No. 1 Trophy to its control-line Champion, if I may say...

Individual Team Overall Racing Classification

			Points
1.	Clarkson/Needham	(3 Sisters)	92 1/2
2.	Cotterall/Worgan	(S. Bristol)	32 1/2
3.	Fitzgerald/Thomason	(Wharfedale)	32
4.	Langworth/Broadhead	(Wharfedale)	30
5.	Smith/Brown	(Feltham)	28

Close you might say, except at the top.

Overall Racing Classification by Club

			Points
1.	3 Sisters	(Northwest)	102 1/2
2.	Hamilton	(Scotland)	99
3.	Feltham	(London)	63
4.	Wharfedale	(W. Yorks)	57
5.	S. Bristol	(Southwest)	50

Wow! They almost got their revenge for Colloden. Surprisingly, our Scottish colleagues have no democratic participation in the SMAE except for the AGM.

After this overview of the 'Northwest is Best' syndrome, the individual class league lists will come as no surprise. For each class I give the total number of different competitors as teams who flew and the total number of competitions flown as well as the top three teams in each class.

Open Goodyear
14 contest; 25 competitors

			1 2 3	No. off Points
1.	Clarkson/Needham	(3 Sisters)	8 1 1	53
2.	Cotterall/Worgan	(S. Bristol)	0 4 2	25 1/2
3.	Pegg/Thorpe	(Hamilton)	0 3 2	23

Sladdin/Gardner have maintained their competitiveness; here Ian Gardner flicks hard in the Nats F2C semis.

Maybe Vintage T/R will be a future 'Horty' subject? Simon Groome and Ian Horne fielded this superb Mercury Mac at the Nats - they've promised us a feature, too...

Talk about total domination! Is there anyone out there who can beat us?

FAI Team Race

6 contests; 21 competitors		1 2 3	Points
1. Smith/Brown	(Feltham)	4 0 1	28
2. Fry/Thorpe	(Feltham)	2 2 0	19 1/2
3. Fitzgerald/ Thomason	(Wharfedale)	0 0 2	12

It will be no surprise that these teams have been selected to represent the UK at this year's World Championships in Kiev. Dave Fry spent much of the year out of action after a fork-lift truck fell on him at work...

Class 2 Goodyear

8 contest; 17 competitors		1 2 3	Points
1. Clarkson/ Needham	(3 Sisters)	5 1 2	18
2. Andrews/Horwood	(S Bristol)	1 2 0	7
+ Cotterall/Worgan	(3 Sisters)	1 2 2	7
+ Lilley/Daglish	(3 Sisters)	1 2 0	7

The only novices amongst this lot are the last-named with pilot Ralph Lilley in his first season. All the rest have been in Goodyear for years and years. Maybe experts should not compete in Class 2 and give the newcomers a chance?

1/2A Team Race

6 contests; 13 competitors		1 2 3	Points
1. Clarkson/ Needham	(3 Sisters)	1 0 1	12
2. Langworth/ Broadhead	(Wharfedale)	2 1 0	11 1/2
3. Lipowski/Arnott	(Hamilton)	0 2 1	11

Horton/Haworth hardly campaigned their formidable toy this year otherwise the story would have been very different. 1988 will be different too for our Not-a-Sesqui powered Witblitz has found a new home south of the equator.

B Team Race

3 contests; 10 competitors		1 2 3	Points
1. Fitzgerald/ Thomason	(Wharfedale)	3 0 0	15
2. Clarkson/ Needham	(3 Sisters)	0 1 1	9
3. Sladdin/Campbell	(Grantham)	0 0 2	6

A clean sweep for the Yorkie Bars; but only three contests. Is this the end for Class B? The SMAE Council has refused to ban pipes so is there another way to make 'Bs' manageable?

For your truly this has been my most successful year ever - thanks to Ed Needham for putting up with me and providing fast, reliable motors and an infinity of magic pit-stops. To be top of the heap is nice but the pleasure is reduced because it is such a small heap. John Horton's records show that the average entry in FAI team race events in 1987 was just eight teams. What are we to do about this sorry situation? If you have any ideas, please let the new SMAE control line committee chairman, Richard King, know what you think. His address is: 55 Longford Avenue, Bedfont, Feltham, Middlesex TW14 9TH. The new SMAE control line committee (for whom I am PRO) want to hear any ideas, no matter how scatty, before it is too late.

Now for the last of John Horton's compilations; that of the top three 'All Time Greats' as at the end of the 1987 season. These compilations are based on the total number of points scored by teams that have competed as tesms since John started recording results. For each class I give the maximum number of contests recorded in a year. Compare these with the numbers for 1987 reported above - maybe this is another subject for you to write to the SMAE Control Line Committee about.

All Time Greats

Class		Team	Year Active	Points
FAI T/R (19 contests in 1976)	1.	Smith/Brown	1978 to present	315
	2.	Wilson/ Gardner	1975 to 1984	246
	3.	Langworth/ Broadhead	1978 to present	195
Goodyear (19 contests in 1975 & 1984	1.	Clarkson/ Needham	1983 to present	231
	2.	Catlow/ Jephcott	1978 to present	192
	3.	Horton/ Haworth	1974 to 1981	183

Just a sample of John Horton's all-embracing C/L analysis. The style is unmistakable; the workload prodigious. A marvellous effort.

1/2A TR (10 contests in 1984)	1.	Horton/ Haworth	1976 to 1987	187 1/2
	2.	Langworth/ Broadhead	1978 to present	104 1/2
	3.	Hill/Metcalfe	1980 to present	82
B TR (8 contests in 1975)	1.	Wilson/ Gardner	1974 to 1984	162
	2.	Nixon/ Campbell	1976 to 1982	84
	3.	Horton/ Haworth	1972 to 1987	74 1/2

Bear in mind the years reported above in which John started collating results for each class before you shout 'what about Turner/Hughes in 1/2A?' and 'What about Heaton/Ross in FAI?' If anyone out there does have complete records for the years earlier than those in which John started his efforts, please let him know. I am sure that John, our greatest historian, would love to track back and produce a truly authorative list of All Time Greats.

Once again I say: thanks, John. I am sure all of you join me in saying that. We hope that we will still see you around...

Still top in Goodyear are columnist Dave Clarkson and wizard pitman Ed Needham. This is their record-breaking Moki-powered Open model.

Dave Campbell and Derek Heaton, constant campaigners in the class, were second in 1/2A T/R at the Nats with this pretty Oliver Cub model.

WORLD NEWS

Fresh back from the New Zealand Nationals, David Ackery reports...

THE NATIONALS this year returned to Carterton. Geographically central and with good facilities for Free Flight, Control Line, Radio Control and Indoor, it is a popular venue.

This year did not give us the warm, sunny conditions that we have become used to. It was cool and windy with occasional rain. For the first few days, this caused some R/C and C/L events to be

Above: Paul Loghlan warms up his Super Tigre diesel. Older combat designs are still flown in New Zealand by enthusiasts who don't mind being a bit less competitive. It's a lot more fun, too! Right: The aforementioned Paul Loghlan prepares to launch for Richard Dalziel as the opposition waits to pounce...

Top: F/F Contest Director Malcolm Sexton holds Chris Murphy's Expendable Open Rubber model (from John Pool's Aeromodeller plan). Chris placed second with an eight-minute flight which demanded a long search! Model was recovered nevertheless. Above: Brent Yates, Nats Junior Champ, won Open Glider with his Vintage design Sheilagh (still available as Model Aircraft plan MA 60). Brent was helped by his grandfather Aub Haines - a good family effort.

postponed and rescheduled later. There was some pressure on competitors and organisers but all events were completed before the end of the Nats!

Undoubtedly the award that attracts most interest at the Nats is the HMV Trophy for the Champion Club. As the results are posted people eagerly check to see how their club is doing. Would it be the previous winner, Roskill Modellers from Auckland; the Christchurch Club led by veteran trophy collectors John Polleti and Paul Lagan; or perhaps the Wellington MAC? There was always the chance of a dark horse like the Auckland Free Flight Club; formed only eight months ago they were making a serious bid for top honours. At first it seemed that home-town advantage had told, and Wellington MAC had apparently pipped the AFFC by the remarkably small margin of just four points; but an unofficial event, 1/2A Combat, had inadvertently been counted. The AFFC are thus NZ's Champion Club.

New Zealand Nationals

Free Flight Champion	Paul Lagan
Scale Champion	John Poletti
Control Line Champion	Paul Loghlan
Radio Control Champion	John Shaw
Junior Champion	Brent Yates
Champ of Champs	Paul Lagan

We can't let this account pass without mentioning Fly Paper, the superb daily Nationals newsletter and results sheet put together by Sharyn Willance. Apparently the New Year was celebrated in traditional style with 'music, a bonfire and damaged models and the unforgettable sight and sound of the Willard jet' - yes, C/L jet flying to usher in '88! Good media support was noted, with a radio chat each morning and several accounts in local and National papers. Splendid stuff...

Above: Alan Barnes fuels his second-place FAI Speed model. Besides tuning engines for others (and building his own pistons and liners) Alan enjoys flying Wakefield; he has represented NZ many times in both F/F and C/L. Left: Tony Taylor's Lanzo Stick is finished in a Stateside Stars and Stripes scheme. Unbeatable design took the first four places in Vintage Rubber.

Above: Mark Elder and Rod Brown, winners of 1/2A Team Race. The engine is a Sesuqi from Australial Speed and T/R were flown from a car park in Masterton, only 10km from Nats HQ.

Below: Ron Magill lights the fuse for Terry Magee's Bo-Jess (another Aeromodeller Plan). Terry was unfortunate to miss his last max in Open Rubber after the model landed in a duck pond on its second flight, filling the fuselage with water.

SPECIAL

SCALE MATTERS

'Annibal antics! This month we hand over to Stan Newton, designer of the APS HP42, for a look back at some unusual flight trials

RAF STOKE HEATH had a model club and I was invited to go with them to the 1953 RAFMAA UK Championships at RAF St. Athan. I decided to take the Hannibal, having bought an Allbon Dart 0.5cc diesel engine and having been loaned another, to enter the Scale Model Free-flight Contest.

Everybody who was anybody in the aeromodelling world seemed to be at RAF St Athan that weekend of the 25th and 26th of July. The list of judges read like a page from an aeromodelling Who's Who. The Chairman was Group Captain J.D. Rutherford and the members were G. Lewis, C.S. Rushbrooke, Harry Hundleby, Bill Dean, Eddie Keil, Max Coote and Eddie Cosh.

The Hannibal presented me with some difficulties in mounting the engines which, by the time they were resolved, left no time for a test flight before the contest. Being a model of a four-engined biplane airliner, mountings for four diesel engines were provided but only the two on the top wing were to be used. Because of the high thrust line, I did not think that down thrust would be necessary.

On starting the engines for the first time, I found it was easier to synchronise the speeds than I had expected. The combined sounds of the exhausts resonated quite noticeably at differing speeds and it was simply a matter of adjusting the compression and needle valve of the second engine to increase its speed to that of the first engine. Synchronisation was indicated when the frequency of resonance decreased to the point of ceasing.

With the last minutes of the contest ticking away, I crossed my fingers and released the model into wind, which was blowing across the main runway. Hannibal rolled nicely over the smooth tarmac in an undeviating line, the tail came up, and, after quite a short take-off run for a 65in. model powered by a total of only 1cc, it climbed steadily away.

It soon became apparent that the lack of sufficient down-thrust had given the Hannibal a nose-up trim and a gentle powered stall resulted, followed by two more. These stalls caused the model to lose altitude until it touched down gently in the long grass.

There was no time to alter the thrust line before the contest time limit expired, and my one flight was not good enough to obtain a place.

Now take your string...

The following day, Sunday, the wind blew strongly off the Bristol Channel and showed no sign of abating. I decided not to risk the Hannibal by making a second flight and retired to the hangar allocated to the Championships, where most of the other competitors were sheltering. They were congregated by the main doors adjacent to the airfield and the rest of the hangar was quite empty.

Above: From our files — a previously unpublished shot of Stan Newton's original 65in. Hannibal, held by a fair helper. Model is fitted with one Allbon Dart and a Spitfire; that is, in C/L mode. Plan is available as FSP615, price £6.35 including postage. Opposite page, small photo: A poor shot - but proof that the Hannibal flew! Far right: The early 50s brought other HP42 models, including Basil Brooks' quadruple - ED Bee powered version, seen at the 1952 All Herts Rally. J. Newton (no relation to the APS Hannibal designer) showed his remarkable Heracles at the same meeting, complete with scale paraphernalia steps and ensign. Four ED Hunters powered this one, which was 'not flown pending the M.E. Exhibition.' Actually we can find no record of it at that M.E. Was it ever aired? Drawing at centre, from the Putnam book Handley Page Aircraft, shows a sister craft, the little-known HP43. Looks a good 'un for F/F, we'd say.

Because of the wind, four of the hangar doors were shut and only the two centre doors were slightly ajar. Inside the hangar the air was still. The sight of the huge expanse of smooth concrete floor gave me an idea for flying the Hannibal to check out the altered thrust lines and trim settings.

I had read many years before in the *Aeromodeller* that somebody, possibly D.A. Russell, had tried out his model by tying a line to the tail and allowing it to take off. By running after it and then pulling on the string to slow it up, he was able to make it land again. *(Allegedly. GC).*

A long length of string was soon obtained and tied to the tailwheel struts at the extreme rear of the fuselage; the engines were started and the model released. It was not difficult to keep up with the Hannibal as it gathered speed down the length of the hangar and lifted off in stately fashion. Then, by slackening my pace, the string was gently tightened and the Hannibal smoothly settled back on to the floor.

Having proved the method, the model was returned to the starting point and a more ambitious flight was essayed. The model again performed an impressive take-off and was, this time, allowed to climb higher but I misjudged my pulling on the string which suddenly went tight and snapped. The Hannibal carried on irresistibly, flying beautifully down the length of the hangar until, finally, it crashed into the closed doors.

The model suffered surprisingly superficial damage, due mainly to the slow flying speed. The balsa block construction of the nose absorbed most of the shock of the impact. A couple of wing struts needed replacing, the nose was glued together

again and the Hannibal was ready to fly once more.

A further flight was contemplated but in a less dangerous fashion. Why not tie a 60ft. length of line to the undercarriage and let it fly around me? With the pendulum-controlled ailerons locked and with a touch of right rudder to keep the line tight, it was worth a try, I thought.

Round and round - and round

Willing hands started the engines while I stood in the middle and held the string. At a signal from me, the model was released and gathered speed in an anti-clockwise circuit. It had travelled about 120ft., and I began to doubt that it would get airborne when, for some reason best known to itself, the Hannibal lifted off and commenced a slow climb to about 15 feet where it stayed, circulating in majestic flight.

Due to centrifugal force, the single fuel tank in the top wing supplied extra fuel to the starboard which kept it running for some twenty seconds longer than the port engine. This was a lucky turn of events that I hadn't expected, for with one engine still running as the flight terminated, the model let down gently on to the hard concrete. Without power, the glide of the Hannibal was only slight improvement on that of a brick.

I was told to stay in the centre holding the string while the Hannibal was tanked up and sent off again by my volunteer ground crew, and again and again, until I was quite dizzy.

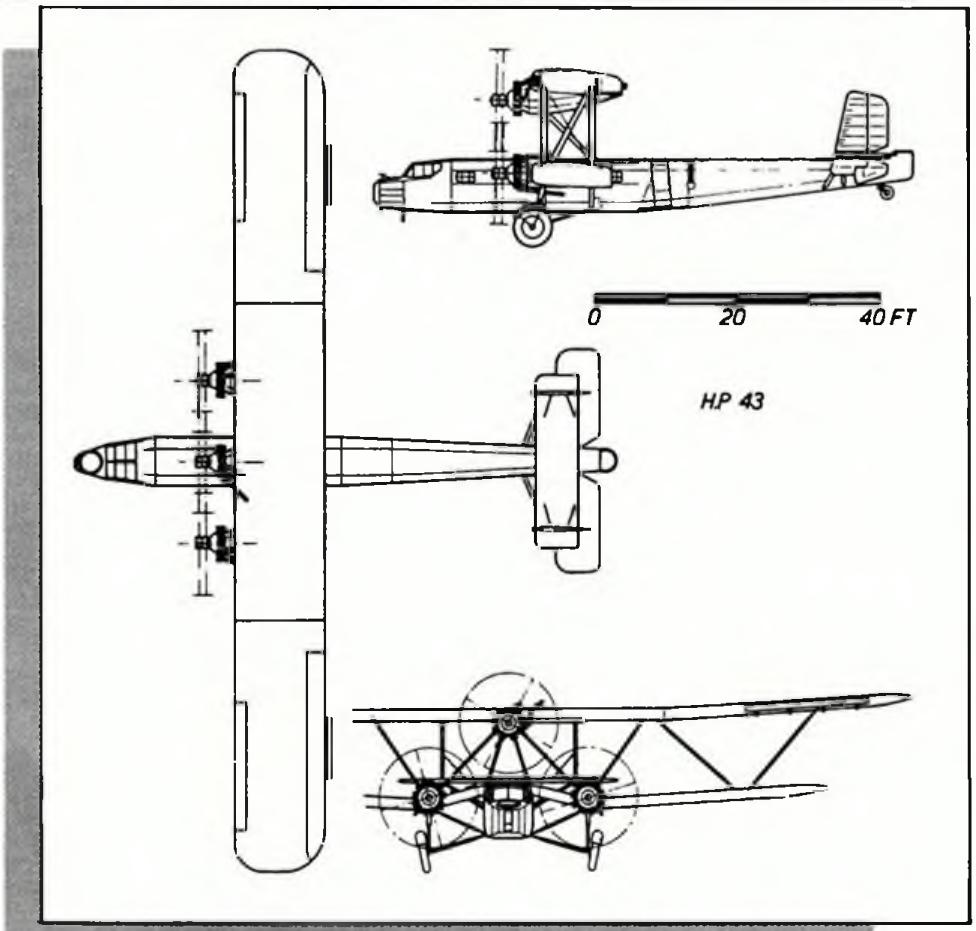
I finally managed to persuade somebody else to stand in the circle for one flight so I too could stand on the circle for a better view. 'No skill required, old son. Just stand there and don't let go of the string! The plane will look after itself'.

Standing under the flight path, the spectacle of its stately progress with wings rocking gently as it passed through turbulent air by the hangar doors, made all the effort worthwhile.

During further flights I found it was possible to vary the routine by running down the centre of the hangar level with the Hannibal as it flew parallel to the hangar wall to the other end, where I stopped to swing it round and allow it to return in an oval-shaped flight path.

Holding the string, I stood for a full hour while other people used their own diesel fuel to keep the Hannibal airborne and, in doing so, to help it earn a place in the Aeromodeller Plans Service.

Entertaining stuff, eh? Now let's hear your multi-engined experiences. And who remembers the F/F Bristol Superfreighter powered by two Mills 1·3s, apparently flown without synchronisation problems at Tangmere in 1960? GC.



BUILD FROM OUR FULL SIZE PLANS!

BUNFIGHTER

Howdah you like this? Try Peter Hall's elephantine extravagance for Telco power

THERE SEEMS to be a menagerie of unorthodox sport models filling the skies at flying meetings throughout the country. After being completely overwhelmed by Rick Granger's Bumble Bee at a recent indoor event, I decided it was time for me to join the clan!

All I had to do was find a subject that would satisfy my inane desire. The problem was solved when my father Mike, a keen scale modeller, was toying with what to do for his project. 'I quite fancy the Martinsyde Elephant', he said. Eureka!

The more I thought about it, the more the idea of a full-bodied flying elephant appealed to me, so pen was put to paper. Wings were simple enough - just use big ears, but the body presented a few problems. I wasn't going to be satisfied with a silhouette fuselage so I was looking for a fairly simple construction technique which would accommodate very compound curves. Styrene would have done this job, but because the motor had to be mounted at the end of a long nose, I felt that weight would be needed aft of the centre of gravity - so balsa it was.

Body and legs

The fuselage is built on a profile crutch cut from 1/8in. balsa sheet and pinned to the plan before adding the 'left-hand' half formers. The plan view outline can then be cut from 1/16in. sheet (minus the very last bay - that is, the bum!) steamed to fit the notches in the formers and glued in position. When dry, lift from the plan and add the other half of F1A; bend the piping to suit the position of tank, filler and engine (taking care to avoid kinks) and bolt it onto F1 with 10BA bolts. The assembly can now be epoxied to F1A and the remainder of the formers and other stringer added. Next glue H1 in position and bend the tail boom from 18 swg piano wire. It can then be bound to the main crutch and epoxied. Add the balsa cladding.

The belly stringers can now be added. All stringers will need to be cut from 1/16in. sheet, if many hours of steaming strip to shape over a kettle is to be avoided.

To get the approximate shape of the belly stringers use the same profile as given on the belly of the main crutch between F5 and F8. All stringers should be cut approximately 1/16in. square. Next, add the 1/16in. sheet infills for the leg supports.

The top of the body is fashioned in the same manner between F6 and F8. The aft part is built from radii cut from 1/16in. sheet to give a section of around 1/16 x 1/8in. The rest of the stringers up to F3 will need to be cut from 1/16in. sheet one bay at a time - these should be quite deep pieces (approx. 3/4in.) around the neck and cheek line. They are shaped after gluing in position. The stringers forward of F3 can be cut from 1/16in. sheet to give 1/16 x 1/16in. section; the 1/16in. sheet infill is then added. Note: the elephant's forehead should be sheeted to accommodate the wing dowels and to support the tissue around the filler pipe. Once completed carefully sand the assembly to shape.

Cut two leg shapes from soft 1/8in. sheet (including locating tabs) to each plan and add the half ribs each side as indicated. The leading edges of the legs are from 1/16in. sheet sanded to shape.

Tailplane and fin

First cut out a cardboard template to use as a former for laminating and cut two strips of 1/32 x 1/16in.. These can be wetted and glued together using PVA and should be formed around the template while still wet. The join on the tailplane laminations should be staggered to give a strong joint. When dry remove the template and add the ribs. Similarly, when the fin outline is dry remove the template and add the spacers.

Elephant wings

First laminate the leading edges and inboard trailing edges around templates with four laminations of 1/4 x 1/32in. Next cut out the ribs. On a wing such as this the section and length of each rib varies considerably and I found that the best way of ensuring an even wing section was to start with the largest rib (R6) and adjust the other ribs to suit, keeping a note of the deepest point of the wing as indicated on the plan. I would suggest you don't notch the ribs for spar positions until you are ready to glue the ribs in position. Outboard trailing edges are cut from 1/8in. sheet and pinned over the plan. Cut the leading edges through at the dihedral break at R4; the outboard wing panels are completed by pinning the leading edges in position, adding the ribs (R4B must be angled using the template) and finally adding top spars and gussets. (The spars may need to be cracked to take the wing shape as shown on the plan).

Build the inboard panels in the same manner. When dry add the dihedral braces. Build up the centre panel (that is, the top of the elephant's head) from soft 1/8in. sheet, glue the outboard panels into position and sand. Cover using Esaki or similar tissue. I covered the wings dry as the section is undercambered, spraying them after the tissue past was dry. Tailplane should also be covered dry. Do not water shrink or dope. Alternatively, use lightweight clingfilm. The tail-boom should be bound in tissue.

Cover the legs and fuselage with wet tissue. The fuselage will need to be covered in several strips as it is very curvaceous!

Fly it - if you have the nerve

Give the whole structure two coats of 50/50 dope and thinners (except tail and fin). Add wing dowels, cut locating holes for the legs in the fuselage and the legs. Eyes, mouth, goggles, helmet and toes can be painted on using thinned enamel or acrylic paints.

Band the wings on and glue the tailplane and fin in position carefully aligning them to the wings. The CG should be where the first wing spar reaches the wing tips - if necessary add ballast. Check your incidence angles and you're ready to go. The elephant is remarkably stable and is a real eye catcher - happy flying!

Let's hear from more flying creature enthusiasts!

Peter pictured with the pretty proboscidean at Old Warden last year. (Note: this model is emphatically not John Pool's Never Forget. It has a tail).

BALSA CUTTINGS

Cyano de Bergerac noses amongst more aeronautical matters of moment

The Winter's Tale

You know those beautiful calm clear winter days when the rubber unwinds steadily, the low sun shines through the tissue and you think 'Who needs summer?' One such day tempted a bunch of fliers to linger well into the gloaming, when suddenly the temperature fell like a ton of hardcore, the light was gone and the day was done. Blowing on cold fingers, they loaded the models into their cars, now sparkling with frost. The club chairman scrabbled about on the parcels shelf, found the little can, and proceeded to spray the windscreen. Generously, as befitted a man who didn't do things by halves. Then he remembered that he'd used all the de-icer yesterday. He did have an aerosol of touch-up paint, but he'd used all the de-icer yesterday...

Canadian capers

Whilst they don't go to the length of sporting car and model-box stickers proclaiming that 'Traditionalists Do It The Old-Fashioned Way' there is a body of aeromodellers who like to plod along Life's highway at a pace less demanding than that adopted by the leaders. (What a nice way of putting it!). Those who favour the more leisured approach must have felt the surge of superiority over the press release of bumph relating to the electric-powered flight of a Canadian Government model aeroplane which gains altitude by on-board battery urge, then hums around indefinitely on DC power derived from beamed-up microwaves 'similar to those in an oven.' A photograph shows the 5-metre span thing being hand-launched. Unless the appearance of the undercarriage is gravely misleading, the resolution to chuck rather than ROG this wondrous piece of technology must rank amongst the most sensible decisions the Canadian - or any other government - has ever take. The main idea is to provide a cheapo signal satellite, and the Communications Minister, Miss Flora MacDonald, claimed it was ' a breakthrough comparable to the Wright Brothers' first flight.' Izzat so? Oh, deary deary me, Miss Flora MacDonald, Communications Minister to the Government of Canada, you have about as much clue on the Wright Brothers' achievement as your famous namesake who saved the life of Bonnie Prince Charlie in 1746. Now if your machine could fly on the *contents* of a microwave oven, say a steak-and-kidney pie...

Ray of light

For the uninitiated, flying-site negotiation is a very difficult field (ha!) in which to function. The loss, or just the threatened loss of such a facility readily causes gloom and despondency, coupled perhaps with feelings of resentment, and at these times it is all-important to know the right things to say and do. You may even be in the shadow of the feeling that you have been saying and/or doing all the wrong things already, which is exactly why you are in your present state of sorrow. Otherwise, as one strawberry said to the other, you would not be in this jam now.

For around fifteen years Ray Favre, the SMAE Flying Site Liaison Officer has been shedding light in this dismal area. It is to his hard-won know-how and calm reason that many groups and clubs are indebted for the acquisition or retention of their flying fields. Now, for reasons connected with the sordid need to earn a living, Ray is standing down. During his long tenancy of this voluntary post the business of helping modellers in trouble over their flying fields has been moulded into a well-documented science. Whoever takes over his job will come into a legacy of level-headed expertise which was not got for free. It was worked for. It is not easy adequately to say thank you to someone who has put in the kind of time and effort Ray has given. It would be a fitting tribute if, every time we launch a model, we were to think twice about Noise, Nuisance and Accident. Here we come to the sharp comment the Editor is always on about. Ray Favre has done for our movement more than most of us realise. Don't undo his work. Slow down a bit, and stop aiming models at, or over the crowd. Omit the low passes in wrong places, however satisfying they may be. There were a few in 1987, and those of you whose ears are burning - just cut it out in 1988.

Hurricane versus Piper Pawnee

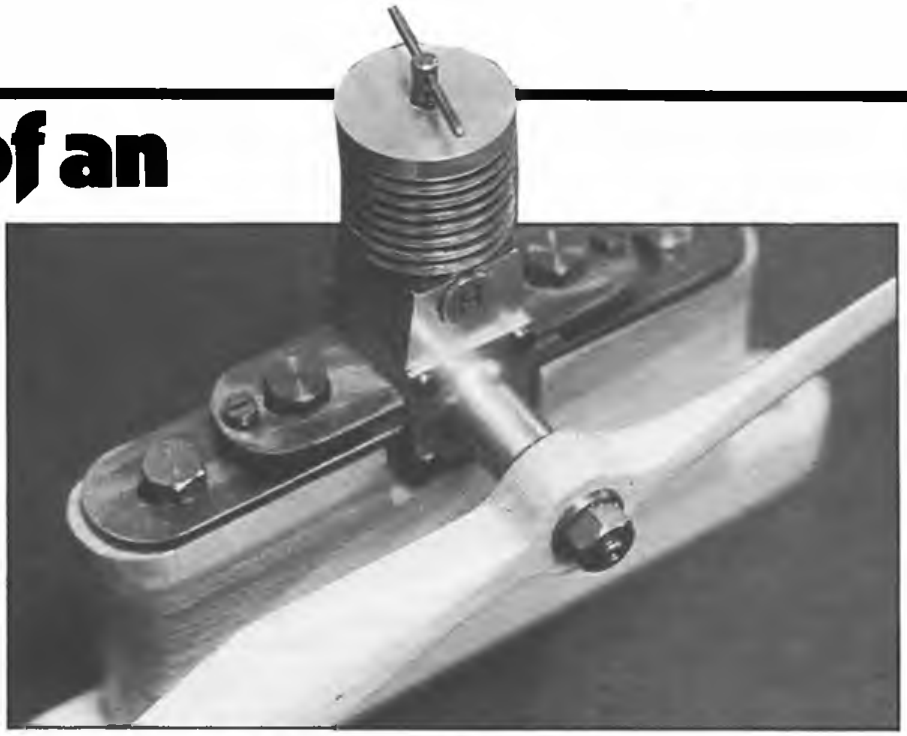
For the weather to interfere with aeromodelling is nothing new. but the form taken by its latest effort is something of a novelty. More than several chaps in the South had to waste time which should have been spent building or flying, in putting the roofs back on their houses. Will the control-line fraternity continue to fly bricks on a string now that they have been seen to go so well on their own? One of the tales to come out of the Great Storm (Large Model Association, eat your heart out!) concerns the crop-sprayer which solemnly and rather independently took off at four-thirty in the morning and before an agonised group of would-be picketers, climbed steadily to about forty feet. It then turned sedately away to glide downwind just like a big free-flight job. Unfortunately, the resemblance didn't end there, and it landed a bit like a free-flight job too.

That Old Black Magic again

A luminary of the aeromodelling scene has just discovered that the failure of his prolonged and determined efforts to bung some life into a sulky nicad was because he had been charging it backwards. It must be stressed that the fault lay in 'equipment supplied', and was in no way due to a boo-boo on his part. He says. Anyway, the results were middling horrendous and copies of his booklet 'All You'll Ever Need To Know About Negative Wire Corrosion' should be on sale at all good booksellers shortly.

'Normal service will be resumed as soon as dinner is warmed through...'

Pictures of an Exhibition



Right: Chris Haupt from Ewell has often entered own-design F/F sport models. For a change, his Wembley project this year was a .19 sideport diesel (built to his own specification, naturally). Below: Reg Parham's demonstrations of Indoor flying through the ages were as popular as ever.

Above: Neat Veron Cardinal by J.Michie even had a pilot! Far left: Resplendent in blue and gold racing colours, this Hurricane 'The Last of the Many' by K. Nicholas attracted much attention. Left: this Flying Minutes Vintage Wakefield gave every opportunity for Peter Lee to show his building skills. Result was a Bronze Medal; he took another for his 100in R/C sailplane seen elsewhere in these pages.

Gold Medal and RCM&E Cup winner - Peter McDermott's fine Sopwith Snipe was of 'museum' quality. What's for next year, Peter?

Details of the SAM 35 stand and the 1988 SMAE F/F Experts' Forum appear in Vintage Corner and Free Flight Scene this month.

Let's carry on from last month with a closer look at aircraft at the Model Engineer Exhibition

Top: Look at 'em all! The multitude before the 'off' in the DPR Chuckie Championships (J O'D photo). Left: Taking careful aim - Laurie Barr, as keen on Indoor flying as ever... Above: Good fun, eh? Ian Dowsett and Mark Hinton just after Mark's winning 26sec Chuckie flight.

QUALITY OF the aeromodelling exhibits this year was uniformly high. Let's take a closer look to amplify our first view in last month's issue.

It was pleasant to see a scattering of APS subjects. We were impressed with the crispness of Geoffrey Willis' Debutante, an ever-popular Vic Smeed design. Exhibition-goers may have wondered at the legend 'Hernia' on the fuselage. We can reveal that it was while from recovering from an operation for said affliction that Geoffrey had time to build the model! The decision to enter was very much spur-of-the moment but a 'Commended' was just reward for the effort. The brand, spanking new Irvine Mills .75 fitted should be ample power and we await news of flight trials.

David Newby's choice was more ambitious. His APS Vickers Viscount, fitted with PAW 249s inboard and 149s in the outers, was actually the second he has built. This latest was smart in the two-tone green of Manx Airways, an unusual but local choice, for David had plenty of opportunity to photograph the original at Blackpool's Squires Gate airport. The three-legged logo on the fin was the result of much effort with sketch-pad and binoculars! Working anti-collision lights were a neat feature. Regular visitors may recall David's previous entries in the seventies - a Lockheed Neptune and that pretty twin-pusher subject, the Piaggio P.166. Maybe we'll see the Viscount flying at Scale Weekend in June?

Mick Taylor is another modeller who found time to spare last year, for a fractured leg curtailed his flying activities severely. Instead, he chose to enter the M.E. with his Fox 35-powered Trixter Barnstormer, a Vintage stunter well-known for its impressive competition record, being the 'OTS' winner at our '86 Vintage Weekend and at the Nats later in the same year. Mick confided that he's been at the building board during his enforced absence from the circle so watch out this season, you Old Time Stunters...

It wouldn't be the M.E. without a control-line entry from Charlie Crawley. This year he chose the Veron Martinet, a relatively little known high-winger - essentially a scaled-down Stentorian - which was actually marketed as a combined F/F and C/L model, a simple tailplane swop being necessary to effect the change. Charlie's Mills 1.3 powered charmer was finished in 'as per' advertisement livery, and will no doubt be circulating at the Finchley club's site ere long. And don't be so shy, Charlie; what do you mean by giving your age as 'over 21' on the entry form?

Peter Lee is another regular competitor. He admits to enjoying the challenge of building to a high standard; no doubt his first two attempts, which gained him Bronze medals in consecutive years, reinforced the attraction. This year he netted two more Bronzes for his own-design R/C sailplane Phli-Pli (so named because the fuselage is of largely plywood construction) and a most attractive Flying Minutes which, says Peter, will be tested at Woodbury Common during the Bristol and West 'do' there in May. He's already started on next year's effort - a Parham Wakefield. Given Reg Parham's involvement with model flying at Wembley we'd say that's a very appropriate choice.

Quick-build - and electrics

A rather quicker approach to Vintage Wakefield building was exemplified by Jonathan Margetts who built his Keilkraft Gypsy in just one week with the aid of a single razor blade and one tube of cyrano! Not only that but he packed it in a box and entrusted it to carrier service all the way from County Galway. A brave, lighthearted effort.

John Michie's two neat entries were those classic sport designs, the Veron Cardinal and APS Ebenezer. Both were very well made and finished. Take heed, prospective entrants - there's room for all types of model aeroplane at Wembley. Complexity is not a necessary criterion of entry.

One of the most interesting craft on display, and fully deserving its Highly Commended for originality of approach, was Roy Ashby's electric-powered motor glider Nicadus. *Aeromodeller* readers will recall Rov's Electriflying Experiences series in this magazine. Nicadus is a development of the models described there, being almost a scaled-up version of his Electric Banana. At 62in. span

Pictures of an Exhibition

with three-function miniature Fleet radio gear and a Hummingbird 20 motor (which drives a hand-carved 10 × 9 prop) weight is 51oz., giving a most satisfactory wing-loading of 8oz./sq.ft. Traditional covering of blue heavyweight Jap tissue was neatly trimmed.

Larger all round was the spectacular yellow and blue Greater Gamma Gull entered by H.L. May; a quadruple-size Baby Gull, the 1946 design featured as a full-size plan in last April's *Aeromodeller*. Elegant span was 140in; construction took place in the builder's 'bedroom workshop'!

Aeromodeller Cup winner Nick Peppiatt had chosen that charming ultra-light, the Gloucestershire Gannet as a subject for Telco CO_2 power, although rubber has also been used as motive power for this well-flown jewel. His second entry, a one-twelfth scale General Aristocrat from the American Flyline kit was also superbly made, and is reportedly a fine flier with its Davis Diesel converted Cox Pee Wee. Apparently the bulky fuselage results in a deep resonance with engine running which adds considerably to the air of realism.

But – as we said last month – the most impressive of the non-Scale subjects, and a worthy Silver Medal winner, was Mick Smith's Mercury III. Slimmer, of higher aspect ratio than the better-known Mercury IV (an APS favourite) this model was designed and first built by Mick himself in 1943 during RAF service in Rhodesia. The Exhibition entry, which boasted an immaculate cream and maroon cellulose finish, is an exact copy – and is a model you'll be seeing more of in '88!

Small-scale choices were as popular as ever. Apart from those already mentioned we noted John Michie's third M.E. entry, a Hurricane framework to Doug McHard's design. Charlie Jeffreys submitted his 1/20 scale Peanut Demoiselle from Walt Mooney plans. This featured home-made 'simplified' spoked wheels from electrical insulation sleeving and Laystrate C/L wire. Twin-rubber exponent Charlie Newman showed his 13in. Grumman Tigercat from Dick Howard's drawings; quoted scale is the infrequently-seen 1/49! Fellow enthusiast Lindsey Smith, who revealed that he is in the process of manufacturing hundreds of 'jet' canopies for Amerang's re-issued Keilkraft Jetex series, intrigued many with his Peanut Cavalier Dart Mustang, a lively subject which will appear as a full-size plan in this magazine ere long...

Moving up a size or two, Wal Cordwell's by now well-known DH90 Dragonfly upheld the C/L Scale banner. This attractive red and silver biplane twin fully deserved its Commended award. Perhaps we'll see a few more like it next year? Whatever happens, you can bet on seeing the pretty Dragonfly around the rallies this year, for Wal believes in model flying. And you'll never guess his next choice... but for now we're sworn to secrecy!

A quartet of entries in the new Unorthodox class included Paul Clark's X-15, an up-to-date choice for rocket power to his own drawings. A multitude of silk-screened decals added to scale effect. Now that model rocketry is about to become 'street legal' here in the UK we expect many more subjects like the X-15 in future. Paul's entry was a shrewd piece of PR for the British Space Modelling Association; to judge from the amount of interested comment it achieved its aim.

You had to retreat a couple of dozen years to Vic Dubery's A-Frame Twin Pusher, itself a 30s development of one of the earliest forms of model aeroplane. The rolled-balsa motor tubes and overlapping prop arcs showed refinement. Equally characterful was John Coolen's rubber duration helicopter, beautifully made to a 1947 Ron Warring design. John, who admits to being a Warring admirer, has built the model with the intention of participating in the next Howard Boys Memorial event. He acknowledges the enthusiasm of Laurie Barr and his Fly-Rod competition as major help upon his return to model flying in retirement. Final Unorthodox entrant was George Bushell whose well-flown Joey, a tailless powered R/C glider 'plank' is familiar to those at last year's Pterodactyl Trophy event...

Nor can we forget the other R/C entries, many of which will be aired this year. Brian Peckham's fine Robinson Redwing looked just as if a 'reducing' magic wand had been waved over the original; and Peter McDermott's Sopwith Snipe was outstanding. Jet power was represented by Donald Smalley's 1/12 A-10A Thunderbolt and his semi-scale Jaguar GR Mkl – the latter, from his own plans, features traditional balsa-and-ply construction to achieve light weight and is powered by a K&B 7.5.

Bernard Hughes' fine Bell 222 helicopter was based on the Heim kit but the many

Aeromodeller Cup winner, Nick Peppiatt's CO$_2$ Gloucestershire Gannet, in the early morning sun outside our office at Hemel Hempstead.


Above: More from Nick Peppiatt – his General Aristocrat, VHC at Wembley and a proven flier, was caught by Alex Imrie's camera at Scale Weekend last year.


Above: Geoffrey Willis' Debutante, 'Commended at Wembley, is christened Hernia! Explanation in text... Below: Peter Lee's Bronze-winning Phli-Pli.

modifications included a working 'full-size' exhaust system, retract gear, lights and windscreen wipers. Yes, really! Totally scratchbuilt, Alan Robins' six-foot Lancaster had a couple each of .40 and .20 four-strokes and is certainly a model we'd like to see aloft... Maurice Randall was another to submit a model all his own work. A nice touch - his quarter-scale Tiger Moth featured a pilot who moves with the controls!

The DPR Model Flying Championships

Now established as an annual event, and a special attraction on the opening day of the popular Model Engineer Exhibition, keen model flyers and newcomers alike travelled to Wembley to take part in the days competitions, or just to fly for fun!

The Hit The Kit competitions for the 'under 13s' at 11am, 1pm and 4.30pm proved extremely popular with around one hundred excited youngsters circling the auditorium, their models built from DPR kits in the Model Workshop, trying to score a direct hit on one of the six or more larger DPR kits, to win these super prizes!

At midday the Superfighter Championship, also for under 13s, using slot-together Spitfire, Mustang and Hurricane aircraft, proved a real challenge with each youngster having three timed flights; the best to score.

Following an exciting fly-off to establish 2nd and 3rd place, the overall results were as follows:-

Superfighter Championship

1	Paul Richards	Age 12
2	Nicholas Kisiel	Age 12
3	Michael Hancox	Age 12

The main event of the day, the DPR Models 1988 National Chuckie Championship attracted 25 Juniors and 38 Senior entries, compared to 18 entries overall for the Cosmo Challenge event the previous year.

All the models were required to be built from the standard DPR Chuckie kit, using original materials, with a restricted degree of modification allowed for the adults.

The standard of flying was very high and after three flights each, and a fly-off between four of the adults, additional prizes were awarded to the 4th and 5th place runners up, particularly since 13-year-old Kenny Wile had travelled from America to take part in the competitions and visit the Exhibition. A special prize was also awarded for the best flight in the competition by a lady competitor to encourage further participation next year!

Winner of the Junior Chuckie Championship, 11-year-old Ralph Gray won the Riko Tamiya Tamtech Radio Controlled Car. He was one of a group attending from King John School, Thrapston, Northants, making the trip particularly worthwhile for his teacher Mr. Wooller.

Mark Hinton achieved a remarkable 26 seconds for his best flight to win the Riko Cessna Skyhawk and Acoms four-function radio in the senior event, a happy conclusion to their honeymoon, following his recent marriage to Anita, who helped him carry all the prizes away!

DPR 1988 National Chuckie Championships

Juniors

1	Ralph Grey	Age 11
2	Andrew Dennis	Age 10
3	Nicholas Kisiel	Age 12

Seniors

1	Mark Hinton	Age over 21
2	Robin James	Age over 21
3	Peter Dolby	Age over 21
4	Kenny Wile	Age 13
5	Lee Dolby	Age group 13-21

Best Lady

Janet Spicer

All the prizes were presented by David and Janice Rawlins, Directors of DPR Models, assisted by their 2.1/2 year old daughter Jenilee.

DPR Models would like to thank all the competitors for their support, many of whom travelled considerable distances from the North of England to the South Coast. Particular thanks are expressed to 'Argus Specialist Exhibitions' for providing superb facilities, and Magazine Subscriptions, and RIKO International, whose assistance with prizes was greatly appreciated.

Below: Another flying field shot. Roy Ashby's Nicadus electric R/C glider continues his familiar design theme. Right: At the close of the show, Mick Smith dismantles his fine Mercury III. Bottom right: John Coolen's helicopter.

FREE FLIGHT SCENE

Dave Hipperson's monthly miscellany for the competition enthusiast

THE FALCONS League table embraces most non-SMAE events. In the light of experience the Falcons organisers award points down to 4th place, with fewer - *pro rata* - if less than four actually fly. This means it's always worth attending and flying in club events no matter what the weather as there will always be some points to be won. They also limit scoring to one event (any event) per day with only the best eight performances to count. Further placings are used to break any ties for the annual trophy but not for lesser positions. Altogether it is a very practical and workable league combining the best aspects of the current SMAE and the FAI World Cup systems. The Club should also be congratulated for sticking with it for a third season - a lot of paperwork is needed to keep it up to date. The only criticisms I have heard were over confusion as to whether a certain event last year - the Northern Area FAI day - actually counted towards the League. It wasn't mentioned in the advance hand-out literature. Falcons assure us that this year their list is complete and is available from the Club Sec, Russell Peers, or from Club members at contests throughout the season.

This year's results show how limiting the number of scoring efforts to eight has tightened up the placings - all of which were very closely contested right up to the final event of the year. If only John O'Donnell had managed to produce a CDH model of his own for the Aeromodeller Coupe do at Henlow he may well have been able to top this chart - deservedly, too, after an excellent season.

As it was, the ubiquitous Russell Peers won the Falcons League Championship as well as the SMAE Championship. An incredible feat. Not only that but he was only six points shy of a full house!

Falcons League Table

			Points
1	R. Peers	5 1sts, 3 2nds	58
2	J. O'Donnell	5 1sts, 2 2nds, 1 3rd	56
3	J. Carter	3 1sts, 5 2nds	54
4	J. Cuthbert	3 1sts, 4 2nds, 1 3rd	52
5	P. Ball	2 1sts, 3 2nds, 2 3rds, 1 4th	44
6	T. Dilks	3 1sts, 1 2nd, 1 4th	32
7	J. Hopper	3 1sts, 1 2nd	30
8	C. Strachan	1 1st, 2 2nds, 3 3rds, 1 4th	27
9	D. Davitt	1 1st, 2 2nds, 1 3rd, 2 4ths	26
=	D. Hipperson	2 1sts, 1 2nd, 1 3rd	26

Russell and Janet Peers at the SMAE Prizegiving with the spoils of a magnificent flying season. Russ also topped the Falcons League table - see item above.

Steve Fielding's 1/2A Power winner

It was this design that won the 6th Area centralised event towards the end of the '87 season on a day when quite a few qualified for the flyoff. Steve speaks rather disparagingly of the model's still air time because of its weight but the sturdy construction has produced a model strong enough for all weathers and easy to trim.

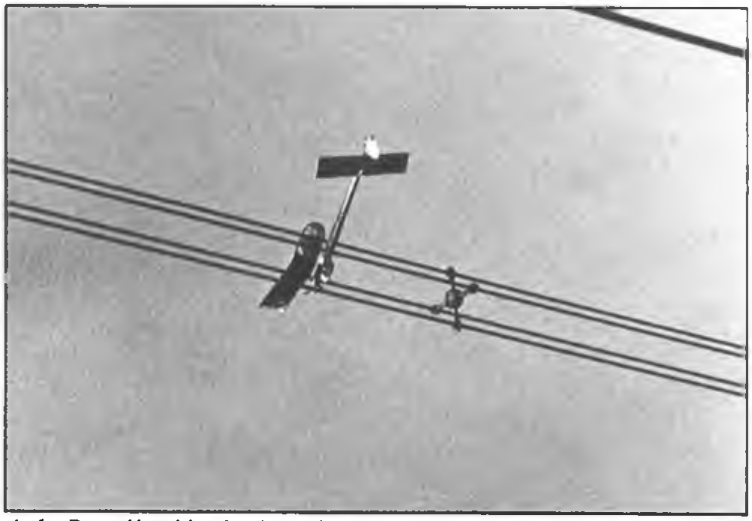
The model was built back in '86, overall proportions and sections being based on an earlier model that had proved successful around the end of the '70s. It certainly has a dramatically low aspect ratio (i.e. 7:1) but this must help its rough-weather pattern; and it certainly rides lift well.

Steve's motor is a TD.051 turning a 5.1/2x3 Tornado running on 40% nitro, pressure fed via backplate tapping and flooding-off to stop. No VIT is used but there is an auto-rudder. This cuts in just before the flood-off and moves a mere 1/16in. to the right for a nice open right-hand glide. The ideal pattern is a tight one-and-a-half-turn spiral under power with auto-rudder looking after the transition and glide turn. Steve warns that the launch needs to be accurate at between 60 and 70 degrees and slightly to the right of wind (above five degrees). If launched straight into the wind the roll gets a little out of phase at the end of the climb and this can spoil the recovery. Attempts to remedy this by increasing the auto-rudder deflection worked but spoiled the glide which is best left as an open turn. Steve doesn't say if he has tried bringing the same amount of rudder in earlier.

The designer admits that a weight of nearly eight ounces is a little excessive for this size of model. He sees no reason why it couldn't be built an ounce or so lighter. Nevertheless, how many times have we seen that the winning designs are not necessarily the lightest...

The 1988 Free Flight Forum

I promised you that we would let you know when the papers from last year's talks at the Model Engineer Exhibition were available. They are ready now at £4.50 each from Martin Dilly, 20 Links Road, West Wickham, Kent. You may



Left: Dave Hambley is pleased with his 1st place trophy in F1A at the Scottish Nats. He was also third in Open Glider. JO'D photo. Above: Russell Peers' first comp. flight of the '88 season ended thus after a max in power lines one-and-a-half miles downwind. Half the wing broke free on impact, but the force of the wind held the rest in the wires until the early evening, when the wind abated and the model simply fell out.

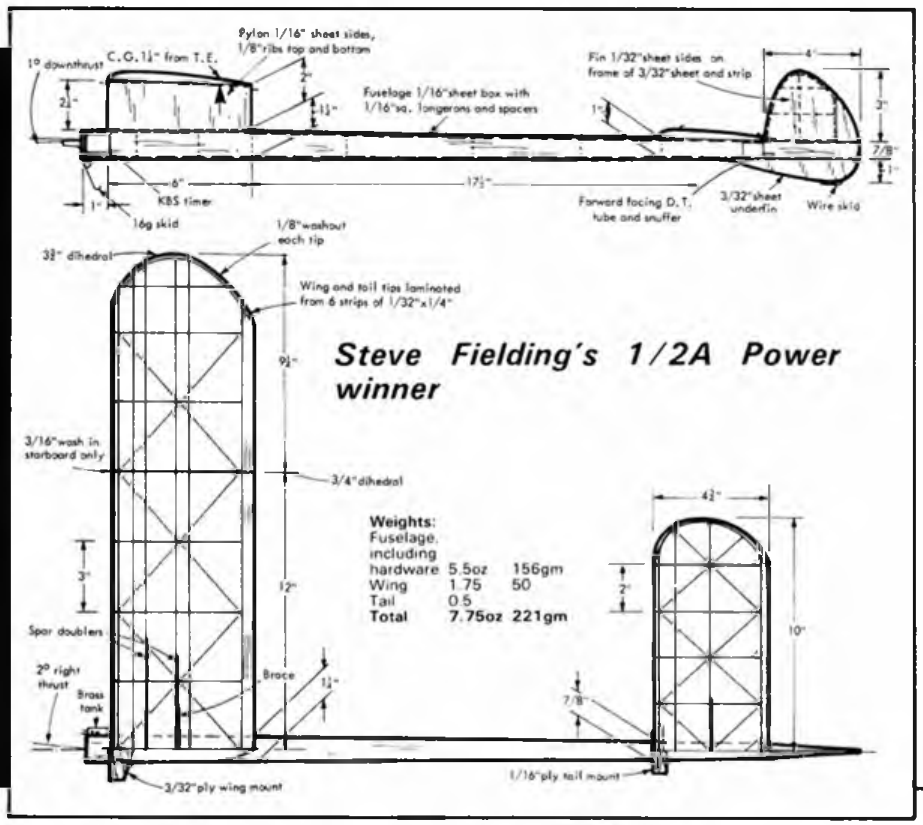
recall they include work from Fantham, O'Donnell, Spooner, Hunt and Buskell (see last month's Flyleaves column).

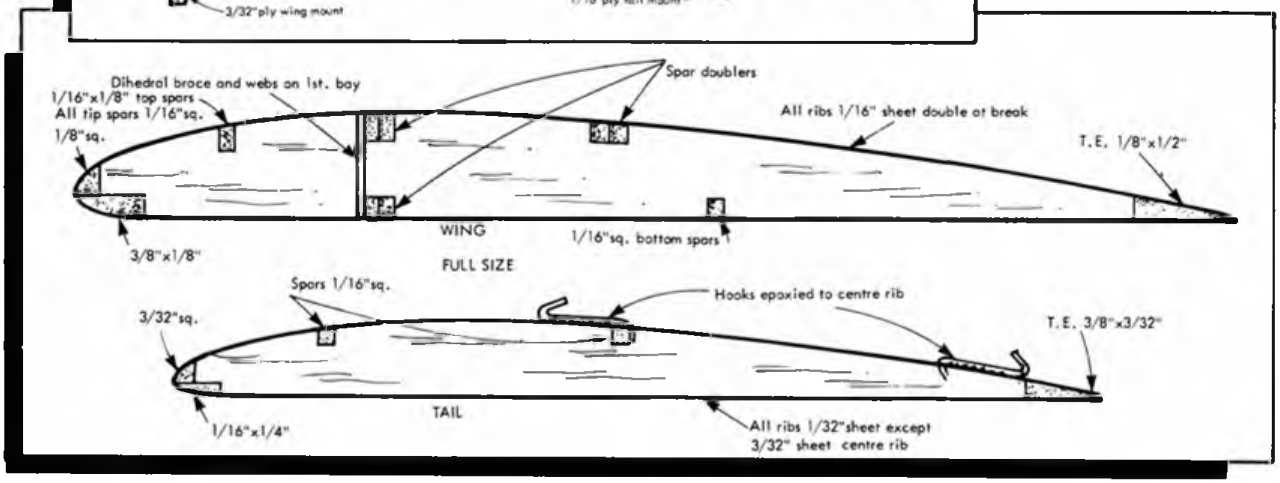
Once again this year the highlight of the first Saturday of the Exhibition was the five talks that comprised the Free Flight Forum. Expertly chaired by Mike Warren and Martin Dilly the sessions were lively – and very well attended. Indeed, attendance at the start was such that very nearly all the available seats were taken – some three-quarters by easily recognisable free-flight contest fliers. The remainder had perhaps only a passing interest and drifted away slowly.

No one could have failed to have been impressed with the general standard of delivery and the content of the papers. The enthusiasts involved had obviously put in a great deal of work. Furthermore, it would be no exaggeration this year to call these talks great entertainment as well as containing useful information.

Mike Woodhouse explained the ways to best incorporate 'Hi-tech' materials such as Kevlar, carbon and glass into free-flight structures. Of particular interest was the application in the areas of spar and wing stiffening of carbon cap strips and glass covering. The most interesting part came when Mike explained in detail the method he employs in building Kevlar/balsa F1B motor tubes. Possibly this is quite elementary to him but it was a revelation to many; and very well explained.

Mike Evatt's paper on electronic thermal detection indicated that there may well be more to it than simply hot air and lulls in the breeze. His recorders have reached the stage of sophistication that allows a plot of both these factors plus air pressure and humidity! As if this were not enough the audience were jolted into an even higher degree of concentration when by way of some innocent looking mathematics Mike illustrated convincingly that if the air was stable then waiting for a warm patch was very likely to *reduce* duration! His equipment, involving no less than four radio servos and considerable quantities of electronic circuitry including amplification devices to boost signal strength down the wires so as to escape radio interference, was by his own admission a very significant package to have to erect at a contest and then adjust if the wind direction shifted. He could have done with a little more time in the lecture hall too! Undoubtedly his paper will show more of this work in greater detail.





Full-size ribs for Steve Fielding's 1/2A - note spar doublers and webs sensibly arranged.

Cleemac members at September's enjoyable Hemingford Abbots Vintage meeting. Tony Rushton holds his Fury; next are Ken Bates (Achilles and CO_2 Scram), Peter Robinson (Ace if Diamonds and Hadland Midget) and Tony Balding (CO_2 Porlock Puffin). JO'D photo.

Indoor interest was kept alive by Dave Pymm who illustrated his findings in computer assisted propellor design. An intriguing part of his talk centred on his and Bernard Hunt's experiments with torque-actuated variable-pitch props for low-ceiling work. With computer simulation they were able to deduce that the most efficient set-up was achieved when pitch movement was 'stopped' just a few degrees above and below the optimum cruise setting. These simulations were then found to hold up quite reasonably in practice.

Mike Warren, Chairman for the first session, took centre stage for the penultimate paper. He had spent considerable time researching the subject of Team Selection and Training throughout the world. As a result of a questionnaire he had been flooded with data from more than two-dozen countries. Despite this he had been able to simplify and compact it into an informative and amusing talk delivered with a style of which James Burke himself would not have been ashamed. Considerable data on just what comprises other countries' Trials systems was further enhanced by pertinent quotes from other spheres of the sporting press. One was left with the distinct feeling that Mike could give an absorbing talk on almost any subject. The potted biographies of the five speakers made much of Mike's recent work in various consumer research establishments. It failed, however, to point out that before all that he had had a grounding in a profession that gives him the useful edge when having to deliver from a stage. He was an actor; obviously he has forgotten none of the skills.

Finally, Andy Crisp let us in to all he knew about Chuck Gliders. He brought along various models to illustrate his lecture and hence presented quite an insight into both the history and subsequent development of today's 'state-of-the-art' model.

He too could have done with more time but managed to compress much into twenty-five minutes.

More than in any previous year I would expect the papers, when published, to be invaluable reading to all. The talks themselves were mere tasters of what is on offer. These talks are attracting more people each year; this time more than 65 stayed to hear them all. Nevertheless, that doesn't preclude some possible improvements. In particular it would be encouraging to hear a little more explanation of contest free flight - its purposes, challenges and what motivates us to do it. Ideally this should be right at the start of the lectures so that those 'fringe' fliers might be encouraged to stay. I am sure such a talk would be of interest even to the most experienced. Are there any takers?

Rule changes

This can be a trying time of the year if, like me, you have been a competitive aeromodeller for more than a quarter of a century and can see worrying signs on the horizon. This is especially so this year as the rule change ideas floating around this time appear to be more far-reaching than usual and could, I feel, be more damaging to the long-term interests of aeromodellers than I can previously remember.

The SMAE rule change proposals which I bemoaned the other month as having been shelved were given a dusting-off in time for them to be discussed - albeit briefly - at the Council meeting in January. Although hardly given adequate time at least a few of the less contentious rules were passed. However, no sooner was this accomplished than they were shelved again for next season.

These changes, which will come into effect from January 1989, along with any others to be passed in October, simplify the requirements for score recording at Area and centralised meetings; eliminate the threat of pre-entry for any contests except the Nationals and Trials; rationalise the Senior Champs scoring so that no matter how few fly in an event some points are awarded; and remove the 'throw away' flight in CO_2. From next year this event will be flown and scored in exactly the same was as any other Mini class, that is, with five flights, a two-minute max and the usual attempt rule.

Sadly, along with these tidying-up changes another occurred which I believe was simply a change for change's sake. The Open Power run will be reduced from ten to seven seconds. I know that most Open Power fliers and many Areas were against this and I wonder why their opinions bore no weight. I think it will fail to encourage more participation, simply shunting some into the more relaxed class of Slow Open. Pure Open Power will become even more specialised. Of course some FAI fliers welcome this because it will allow them to fly their models in Open without having to re-set the trim so they don't start coming down again after seven seconds. However, it is hardly likely to improve the numbers situation as we know already there only has to be a slight breeze blowing for F1Cs to stay in their boxes. The perfect example of this was last year's Astral Trophy when only seven flew Nationwide on a day accurately described as 'breezy'.

Perhaps I ought to come clean and admit that I have always considered myself a bit of a power flyer in exile; that is, exiled from the first class in which I flew competitively in the early 60s when the ill-conceived 'Lindsey' silencer restriction decimated interest in the class overnight. I feel a similar thing has happened again - just at the stroke of a pen. I can only hark back to my dire warnings when the 2.1/2-minute max was introduced a few years ago for Area events. It will take a lot to reverse it. Will you Open Power fliers still want to go back to 10 seconds badly enough to fight it in October 1990 when you will have your first opportunity to overturn the rule? Or perhaps by then we will be fighting a move to reduce it to five secs, or even worse, scrapping the class completely!

The writing's on the wall - and it's getting larger...

We know that the FAI are, amongst other things, considering lifting the 'builder of the model rule.' If they do then there would be great pressure for the UK to follow suit - indeed it would be essential in FAI. The CIAM's argument revolves around the assumption that it is impossible to establish just who builds a model. They also seem under the impression that lifting the restriction might attract more contestants by allowing some to have a go in classes for which they have no models of their own. Just how they expect this to occur at World and European levels defeats me; they must be hoping the idea will be taken up by National governing bodies. They go on to suggest that as so many components are now mass-produced many fliers are already breaking the rules. I disagree; and I have already explained why. There is a long jump between a

complete shop-bought F1B made from commercial components and a finished model. I would say it's just as big a jump as it would be to suggest that we had to grow our own balsa wood. The very best one can buy is a sophisticated kit; and kits have never been illegal. The modeller still has a lot to do and he still has to trim the model - the most important part. If the builder-of-the-model rule is scrapped then so will be the 'trimmer of the model.'

In domestic UK events contestants would be allowed to swop models at crucial moments such as flyoffs - which, I am told, are now an essential part of a day's flying rather than an occasional, exciting finale. He with the most mates could have the most 'cracks' at getting in the flyoff as his helpers could always fly his models if he failed himself. Juniors and Lady fliers would immediately become shadows of their fathers or husbands. There would exist no further incentive for them - or others in the same classes - *ever* to build again. They couldn't afford to as they would know they would be competing against experts' models every time. It would also be a body blow for those who believe they might have a slight edge over their fellow competitors by building better models. This in turn could easily deter those old-fashioned competitors who actually enjoy building their own models.

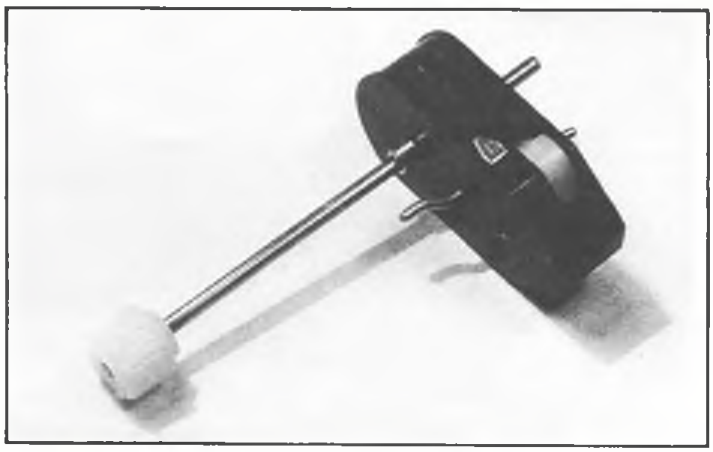
At Trials level - where by inference it would have to be adopted immediately - we may well see contestants buying the potent machinery necessary to qualify; from abroad if necessary. This would be particularly so in Power; less likely in Rubber, and, agreed, it would have least effect in Glider.

Already we know flying skills are far more likely than building ability to result in a win in A/2. Not surprising, therefore, that when I have previously heard of the lifting of the builder-of-the-model rule it has invariably come from a glider flier.

Be that as it may, the ludicrousness of the whole idea falls into sharper focus when one considers the rule when actually applied to the World/European Champs scenario. At the very events that the idea was presumably designed to affect it would be controlled automatically by the pre-contest processing and model identification systems. In other words, model swopping would be far more difficult, if not impossible. The damage that would have been done to domestic events by this time could be catastrophic.

The other contentious rule change proposal from the FAI fits in suspiciously well with the above. It is to allow radio control of certain functions on F1C models. A very loosely-worded proposal would allow such models to do almost anything on R/C by naively stipulating 'D/T action only.' As I have said before, dethermalising does not necessarily mean tipping the tail to a 'super stall'. What about slight changes in incidence, or rudder movements? Once radio is on board the ingenious could do almost anything. The FAI cites safety advantages in trimming, which cannot be argued against; but it isn't trimming we are talking about - it's contest flights. The presence of radio control on a contest free flight model goes against everything free flight stands for. Be warned.

In these proposals we have the two biggest threats ever to our movement. They could kill it from the inside. I call upon all true free flighters to say No, No; a thousand times No.



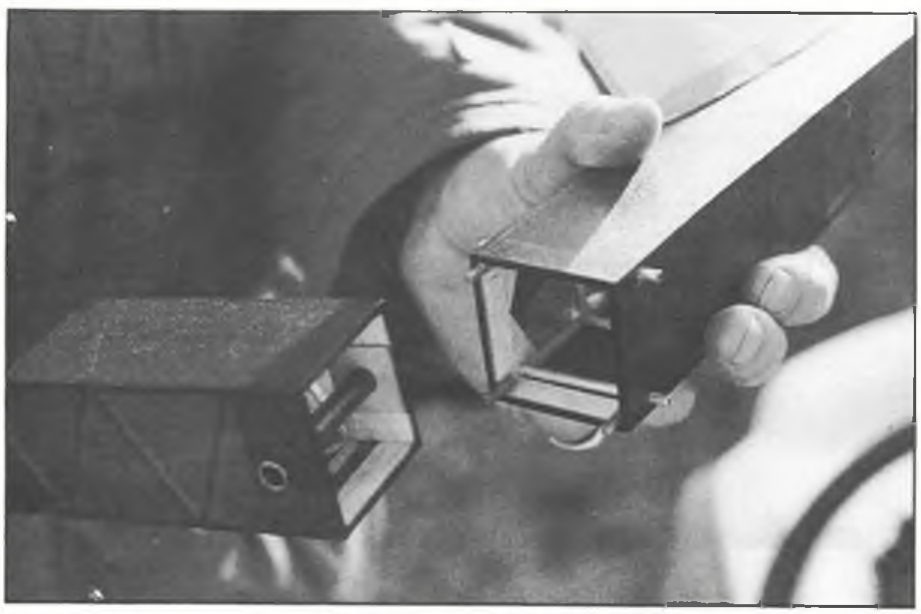
The Tomy Motor available from Ian Dowsett at £1.20 each. Note the 'fat' waggler and stepped secondary drive shaft.

Tomy motor supply

For those weary of the trudge around the toy shops searching for Tomy Toys there is now a convenient source of their motors; a version with long main shafts and easily-removable brass collars each side of the motor body. The governer is the original 'fat' design which is very easy to damp in whatever way you favour. The units are of black plastic (apart from the governer, which is white) and have a small, high-geared secondary shaft extending quite close to the main one. This is stepped - presumably it was designed for the drive of some foot-equipped or 'walking' design.

The motors run for around 25-30 secs unmodified. Our samples were very smooth-running in this mode suggesting they could be slowed a long way - maybe

Below and right: George Sharp means business in Open Rubber this year. His 400sq.in. flyoff model - part of which is visible in the rank of fuselages - has a detachable rear fuselage, banded on via the motor peg.



down to six or seven minutes' effective action. All the modifications described in our articles of a few months ago would be possible, apart from the use of the secondary shaft as an on/off switch (unless you can work out a way of straightening the stepped secondary drive shaft or can trap it). It is easily cut off and ground smooth if a use can't be found.

These motors are available from Ian Dowsett, 2 Warren Drive, Eastcote, Ruislip, Middx. at £1.20 each, post free.

F1B - how many turns?

Presumably everyone in F1B uses close on 40 grams of rubber and lube. Hopefully, not too many use more than that. We were interested in finding out how many turns fliers were applying to their motors. Data was collected at the first Trials at Barkston Heath in October '87. As the made-up length of motors would directly affect this we actually measured them all for this analysis rather than rely on competitors' estimates. What fliers think they use and what they actually use are often somewhat different!

Rubber make and strand size as well as maximum torque, prop dimensions and run durations were also obtained where possible. Surprisingly, few fliers use torque meters. Even some that do use them only for checking a new batch of motors, not for every comp. flight. All use the Wilder meter, Mike Woodhouse's close copy of same or their own versions, often calibrated against a Wilder. Thus it was possible to compare some torque figures. In this regard the figures from Pink, Peers and Hipperson would seem to tally bearing in mind their variations in motor length. Pollard's do not quite match. It could be a factor that Ron alone uses an 'original' Wilder which might read higher than the others; or (just as likely) the other three are being a bit over optimistic with their estimates of maximum turns! (It must be said, however, that in most cases the turns quoted were in accord with what their counters said just after they had flown!)

Very few fliers could quote their prop. dimensions off the top of their heads or even had a note of them to hand. Diameter was an easy matter to measure but pitch is still very much a grey area, even in these enlightened circles. Many prefer to set up their props in terms of degrees of incidence to a datum line. This, of course, is just as convenient when alterations and modifications are required; it just complicates direct comparison.

As far as the 'crunch' question was concerned, Pollard certainly claims to get more turns on 18in. of motor than anyone else. His figures would tally with similar quotes obtained from foreign fliers at continental contests. As far as peak torque is concerned Mike Chilton must handle the most with motors often less than 16in. long wound to 340! My estimate would be well in excess of 130 in/oz. Little wonder he has experienced blade failure when experimenting with delayed-prop-release from the fully-folded position! Although it is not clear exactly what pitch his propellers are, something in the 'upper 20s' would be necessary to damp this powerhouse down to thirty seconds' run. It's still a very fast climb, requiring considerable VIT.

F1B Motor Analysis Chart

Name	Rubber	Motor Length	Turns	Torque	Prop	Motor run
M. Woodhouse	Pirelli 1/8in.	17.25in.	340-350	-	23½ × 29½	34-35 secs
T. Dilks	Champion 1/8in.	18.5in.	380-400	-	24in. d.	40-42 secs
G. Pink	Champion 1/8in.	17.75in.	380	95 in/oz	Doring	40secs
I. Taylor	Pirelli 1/8in.	17.5in.	380-400	-	24 × 27½	38-40 secs
M. Chilton	Champion 1/8in.	15.5 - 16in.	320-340	120-130 in/oz. estimated	22½in. d. (Doring)	30 secs
R. Peers	Pirelli (Miller) 1/4in.	17.75 or 19.5in.	360 or 420	100 - 110 in/oz	23¼ × 30	40-45 secs
D. Hipperson	Champion + FAI Supplies 3/16in.	18.5in.	380-400	80 - 90 ins/oz	24 × 29 (Doring) 25½ × 30 (Doring)	42 secs 47 secs
B. Aslett	Pirelli 5mm	18in. (New)	390	-	22 × 27½ (Helical)	30 secs
R. Pollard	FAI Supplies 1/8in.	18in.	400-410	120 ins/oz	23½ × 30 (Russian)	38 secs
N. Cliff	FAI Supplies 3/16in.	19in	400	-	24½ × 29½	45 secs
P. Gaunt	Chapion + FAI Supplies	19in	390-430	-	21in. d.	35 secs

Few fliers still have reliable Pirelli. Most have switched over to Champion/FAI. Peers is still using Miller/Dowsett stock however - the best rubber there has ever been - but he breaks a lot of motors. This inevitably results in underwinding when the subconscious takes over (as it always does, sooner or later). This is well illustrated when one compares his turns on 17.75in. of Pirelli to Pink's turns on the same length of Champion. Even more so when one remembers that it would be usual to manage slightly more turns on Pirelli than on the same length of FAI. Pink's extra '20' would more than compensate for the rubber quality as long as the trim was adjusted for the steep power curve of FAI. With the modern VIT/AR set-ups pioneered by the Russians a few years ago it would appear that now Pirelli is much less of an advantage in Wakefield, and is probably best left for long-running Open models.

It is unclear what has encouraged so many to switch over to 1/8in. strip. It certainly allows more accurate manufacture of a stranded-up motor to a required length without recourse to odd numbers of strands and the fancy knots that entails. However, should repairs be required, de-stranding, especially on the field, can become very frustrating with this much spaghetti. The general feeling is that 1/8in strip 'takes more turns' and 'delivers more power!'. More power is probably unlikely; but most people feel comfortable with it. There certainly must be an ideal number of strands; after all, a solid lump of rubber would not wind up far, so wouldn't the most strands possible be the best solution? Should we consider 1mm square?

Motor run estimates reflected torque/prop dimension combinations quite closely. Forty seconds would appear to be the average. The figures quoted here were actually found to be slightly pessimistic when we took timings during the contest; most motors running a second or two longer than their owners thought.

What's happening

6th March — SMAE 2nd Area Centralised Free Flight. F1C for Halfax Trophy and Plugge points.
Open Glider - no trophy
Open Rubber - Gamage Cup.

Area Venues. Contact either Area Comp Secs or SMAE Comp Sec: Richard King; 01-890 4504.

20th March — SMAE 3rd Area Centralised Free Flight
Open Power for White Cup
Open Glider - no trophy
F1B - Weston Cup and Plugge Points.

Area Venues. Contact either Area Comp Secs or SMAE Comp Sec: Richard King; 01-890 4504.

2-3rd April — Easter Two-Day SMAE Meeting
Saturday: F1A/B/C - four rounds
Sunday: F1A/B/C - three rounds plus Open Glider/Rubber/Power.
(Only SMAE Trophy is for F1B - The Duce Trophy).

Venue - Salisbury Plain Training Area No.10
Contact: Phil Ball; 0332 665361 (FFTC).

24th April — SMAE Spring Meeting
A1/CDH/CO_2/1/2AP/HLG/Vintage/Slow Open Power.

Venue. Barkston Heath.
CD: Dave Hipperson.
Contact: Phil Ball; 0332 665361 (FFTC).

VINTAGE CORNER

Alex Imrie goes to Wembley with notebook in hand...

Heading: Roy Clements of Luton, a member of the 1949 Wakefield Team launching his Airies III in a local competition. This design has been recently redrawn; plans are available from Terry Rose. Peter Michel's fine example was on show at the M.E. Exhibition. Below: Two M.E. stalwarts on the SAM35 stand. John Perry (left) takes time off from discussing Vintage C/L matters to watch Noel Barker's benchwork at his Goliath.

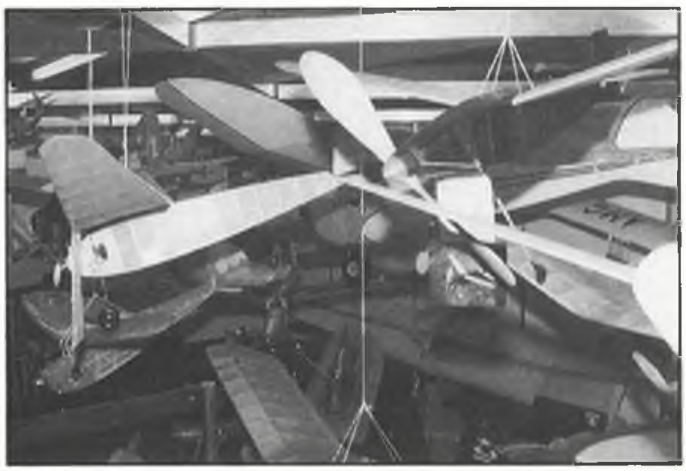
MODELS GENERALLY have always interested me; so, as a result, attending the M.E. Exhibition has become an annual pilgrimage that is eagerly anticipated. This year, the exhibition was the fifty-seventh of its kind to be held in the last eighty years. For the first time the venue was the New Exhibition Hall. This was a great improvement on recent previous shows that were very congested affairs, where, regardless of the excellent Exhibition Guide, one was sometimes lucky to find a sought-for advertiser's stall. This year presented no such problem, and improved catering areas where one could actually sit down instead of having to squat on the rubbish-littered floor also added to the enjoyment. As implied above, my time at Wembley was not merely confined to the aeronautical exhibits and I was able to enjoy the breathtaking workmanship apparent on clocks, locomotives and ships as well as aircraft. However, in all sections there are models entered that are certainly not outstanding in construction or finish; yet to me they are just as important at this unique show as are the super models that nowadays tend to be too well completed with immaculate finishes that are better than scale!

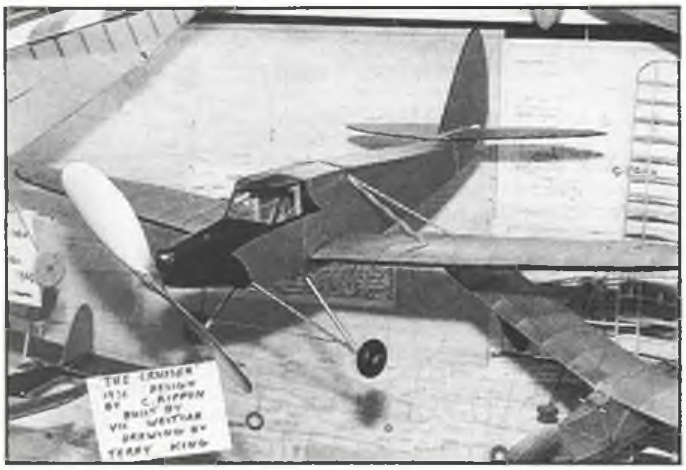
In the competition classes for aircraft it is obvious that many are late entrants, since there is no mention of them in the Exhibition Guide. Again one is bound to mention the size war. To enter any of the aircraft classes with a 1/72nd scale model shows that the entrant, regardless of his skill, certainly does not lack courage! To my mind, he is immediately at a disadvantage but the quite excellent models seen in this scale show that the 'watchmaking' approach has a strong following. At the other end of the spectrum, many of the large scale models should generally have been better-detailed than they were. In some cases the lack of detail and as a result the incorrect appearance and finish of many components was quite alarming, showing that all the entrant was placing before the judges was bulk. I am sure that modellers do not need me to tell them that the bigger the model, the more exact has the detail to be in order to retain the standard already hinted at.

A worthy Silver Medal winner, beautifully built and possessing an immaculate finish was Mick Smith's eight-foot high-wing spatted Mercury III, the forerunner of his well-known Mercury IV, plans for which are still available as PET/504 at £8.50 per set. The narrower wing chord (13 inches instead of 15 inches) and generally slimmer lines make the Mercury III a most attractive model, lacking the beefiness of the later version.

It is difficult for the visitor to fathom out why certain models were awarded the distinction that their place cards proclaimed, since exhibits of any one class are not always grouped together. Just why this should be I do not know, but I suggest that the Exhibition organisers endeavour to meet this simple criteria next year. As an example, models in different classes were on the same stand, and due to the

Below left: Just a fragment of the SAM 35 kaleidoscope. Model upon model was crowded in - a fine Vintage vision. Below right: Vic Westcar's gorgeous silver and black Cruiser. The placard tells all!





incompleteness of the Exhibition Guide already mentioned one was rather left in the air as to what model had won what. *(All models, late entries or not, are exhibited with a card indicating into which class - say, D1, D2 or D3 - they fall. As the Exhibition Guide quite clearly states which class is which, and contains details of models therein up to the Guide press date, it is simple to keep track. GC).*

One cannot comment on all the models, and every visitor will doubtless have his own particular favourite regardless of its placing. I am sure all will agree that the judges do have a difficult task, but I feel that this could be eased by increasing the number of classes or at least by segregating the model types.

The 'loan' section was a good idea, enabling visitors to see models that had made their mark in years gone by. One such was the Auster AOP9 and its radio control equipment made and exhibited by John Michie in 1959 when he was a 15 year-old schoolboy. He enlarged Ron Moulton's 36 inch design to 45 inches and made the radio gear from Harry Hundleby's MAP book; are 15 year-olds still imbued with this do-it-yourself spirit? If not they are the poorer for its lack; the purchase of ready-to-operate equipment takes away what was really the greatest thrill of the lot - making it yourself. *(As long as it was reliable, presumably. GC).* John's selection of the AOP Auster at the time was possibly explained (apart from the design's good flying qualities) by the army aviation influence in his family, his father having gone to war in an Airspeed Horsa as a member of the Glider Pilot Regiment. John took up aviation as a career and is an airline captain with British Airways flying Boeing 737s. What is more, he is still a modeller and had another three models on show at Wembley.

SAM 35 stand

This display of vintage models has been a notable feature of the ME Exhibition for a number of years now; and it always attracts the visitors. A change of location from the gallery over the foyer to the gallery over the Greenwich Room was made this year, resulting in a space of some eighty feet absolutely crammed with models. I counted 130 but there were probably more. Many had been seen on the field last year, but there were some new shapes yet to be flown. Amidst the coming and going Noel Barker spent the whole of the exhibition period working on his APS Goliath designed by G W W Harris, a nine-foot semi-scale model based on the Taylorcraft Auster. Noel is incorporating many of his own constructional features into this model and, for example, has built up all the ribs as in full-size practice (except, of course, that on the Auster the ribs were built-up from pressed strip aluminium). He also has fitted sprung landing gear; and I noticed that he was using a nice scale-type tubular steel motor mounting for the flat twin four-stroke engine that will power what Noel is now calling 'Barker's Folly'. Overhead, as he worked on his portable bench, hung his

Bill Langley is still flying his Halfax Spartan, fitted with a rare Czech NV1 diesel. Design is typical of the immediate post-war British cabin power models then in vogue for precision flying. Another of the ilk was the much better known Keil Kraft Junior 60.

Dennyplane with the unusual registration (for a Dennyplane) of G-AJIT. When asked, Noel related that the registration was that of the Auster upon which he learned to fly (an aircraft which is still flying today). Maybe this marking will be more apt for his 'Folly' when finished?

Amongst the models on show were gaggles of the popular Earl Stahl flying scale rubber models, the usual Wakefields, and sports models as well as power designs of various denominations. The less common types included a Club Miss Blue Bird (covered in white tissue!), Club Super Duration, C A Rippon's George (the 1940 Flight Cup Winner). Ian Lucas' Diasphere (a diamond fuselage duration model with convertible undercarriage wheel/floats), Bill Dean's Strato Baby and the newly rediscovered Airies III, a 1948 Wakefield designed by Roy Clements of Luton and now drawn-up by Terry Rose. The example seen was the handiwork of Peter Michel and looked absolutely splendid with its silk-covered fuselage. The flying scale rubber models were not all of Earl Stahl origin. An Alan Booton Spad 510 from Air Trails magazine, a Megows' Caudron racer and a Blackburn Roc from the pages of a 1941 *Aeromodeller* added a spice of variety to this class of model. It was encouraging to see that some modellers use the reduced size plans that appear from time to time in Vintage Corner. For example, an enterprising builder had made a replica of Jim

Lewis May with his 12 foot version of Gordon Rae's Baby Gull of 1946. This big model is known as Greater Gasmma Gull (see text).

Fullarton's 1935 Wakefield entry that was described in this column in July 1986, even using the original colour scheme of black wing and fuselage with a white tail unit. Vic Westcar was the culprit who built the Cruiser seen at the SAM 35 AGM and mentioned under the heading 'Rubber Models' in the January issue. Appropriately enough he was shown in the same issue with his Tsetse Fly, and both of these models were on show at Wembley. So once again, thanks to the excellent response by SAM 35 members, the public were presented with a most varied selection of vintage model aircraft, the sight of which will doubtless cause a few more 'old time' modellers to join this band of happy enthusiasts for whom time stands still!

Found!

Mike Kemp, the Rubber Columnist for SAM 35, writes that he has in his charge a red Ajax that was found in the cornfield during last year's Vintage Weekend at Old Warden. It's the old story - no owner's name and address on the model. This Ajax has yellow wings and tail, and, most significantly, has plastic wheels replaced with aluminium ones; so if you can identify your Ajax from this description let us know and we will put you in touch with Mike.

Not only real aircraft come to grief when the landing gear is retracted too soon after take-off! Mike relates how on his first launch at Warwick's 50th Anniversary Meeting last year, the undercarriage snapped up but the prop touched and broke off; the rapidly unwinding rubber then burst through the fuselage structure not improving things any. Luckily, says Mike, he had his reserve Voodoo with him!

Extended captions...

Often the amount of information accompanying a photograph cannot all be included in the caption space so here is something extra on three photographs

The rarely seen Scientific Firefly, a gas-type free-flight rubber model. The dummy engine looks convincing; motor hum ratchet on the prop shaft provides the sound effects. The size of the prop is the give-away! Model is the work of Tom Rostron of Poole.

Overflow from last year's Old Warden events! Dennis Heath of Dunstable with his red Bowden Humming Bird, fitted with a .3cc Topsy diesel that he made himself.

Paul Hucke's attractive 10 1/2 foot gull-wing sailplane Stiegker - a 1941 design - flying at a Schwäbisch Hall meeting last year. We look forward to meeting our German friends from SAM 85 at Old Warden again this year.

used this month. Doubtless by now the Greater Gamma Gull will have been completed and flown, since the picture dates from the middle of last year. Lewis May of the Malvern Club is shown with his 12-foot version of the Gordon Rae design which started life as the 35in. Baby Gull in 1946, and was last year published in this magazine as a pull-out plan. The polyhedral wing layout is based on the 70in. span 1949 version. The balsa, ply and hardwood used in its construction puts its uncovered weight up to seven pounds.

Phil Smith has no plans at present to make drawings available via his list for the Carl Hermes Dallas Fury (sufficient demand can change this!) which he has enlarged one-and-one-quarter-times from the details in the 1951/52 Frank Zaic Yearbook. Phil considers this to be probably the most graceful of all the elliptical wing power models, and wonders if Bill Dean used this machine as the basis for his pylon series of Slicker (the Fury was apparently flying in the late 1940s). Phil's model is 84 inches span to suit an OS .60 four-stroke engine. He did not find it the easiest model to build. The flat crutch has triangular fuselage formers that carry deep longitudinal stringers which have to be chamfered to contour. Root wing chord is 17.1/2 inches 'with that classic floating wing section NACA 6409,' says Phil. Laystrate closed-loop circuits are used for lightness in the control hook-up of the three function R/C.

A news item in the January 1988 issue of the San Diego Aeroneers' Newsletter (the 100th!) kindly sent to us by Jim Alaback really emphasises how time flies. We hear of the donation of Jim Adams' KG3 gas model, built some 22 years ago, to the San Diego Aerospace Museum. Jim, who is the American SAM SPEAKS Editor, flew this model powered by a Forster 99 petrol engine in SAM events for sixteen years. It was built absolutely 'as per' from the descriptive articles by Joe Kovel that appeared in the April and May 1935 issues of Model Airplane News. Authentically coloured with dark blue fuselage and red-orange wings and tail, it can really be considered an authentic KG as opposed to a modified example which would have earned the title of 'replica'. Nevertheless it is a sobering thought that a model of such recent construction is already destined for museum exhibition...

The flying wing

The following account of a 'de Luxe Thermal' is taken from the pages of Model Engineer for 7th July 1932, to which magazine due acknowledgement is made.

'On Wednesday afternoon, June 22nd at about 3pm Mr R White, of the 10th Wing TMAC made a preliminary flight with his "All-Balsa" monoplane. On landing the wing of this machine became detached from the fuselage and tail-unit. A light breeze of about 5 or 6mph caught the wing and raised it skywards. Mr White immediately set off in pursuit, thinking that just a gust had caught it, and after a second or so the wing would fall into his grasp. To his amazement, however, the wing careered away on an upward flight, climbing steadily, but rotating widthwise the whole time. It afforded some amusement to the many spectators, resembling a prehistoric bird in its rotating flight. There were two witnesses to this phenomenal flight, Mr Alec Gordon and Mr G J Child, the latter following the wing's flight through powerful binoculars. It remained visible for ten minutes before it vanished in the haze of distance at a height of about 1,000 feet in the direction of Raynes Park.

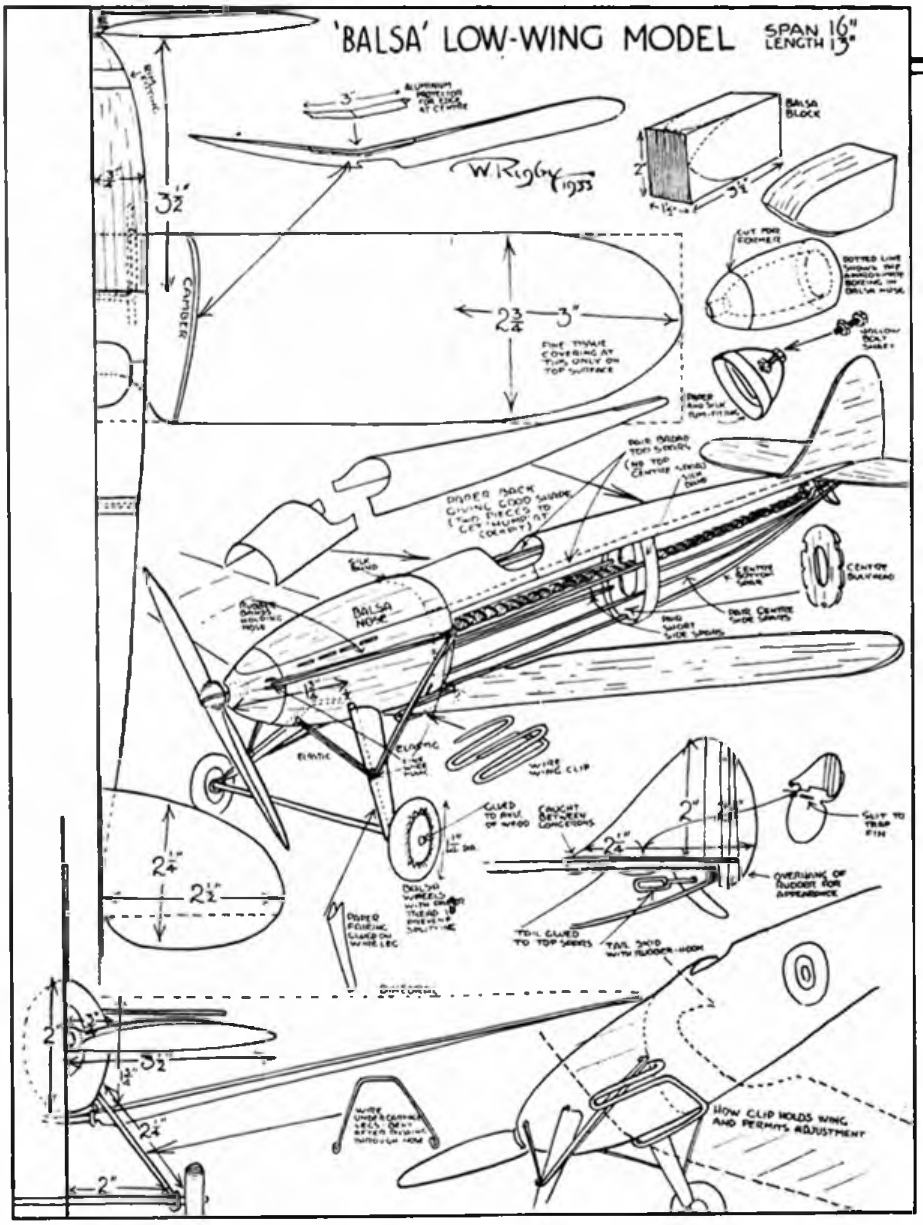
'The wing was a paper-covered balsa constructed unit weighing about 1-1.1/2 ounces, measuring 4 feet in span and a chord of 6 inches. Should the missing wing appear in one of the gardens of a reader on the other side of the Channel (you never know!), the owner, who is a regular reader of these pages, would like to hear about it.

'On the same day the Press published an article regarding some hay being lifted into the air from the fields around Hitchin and depositing itself on the roofs...

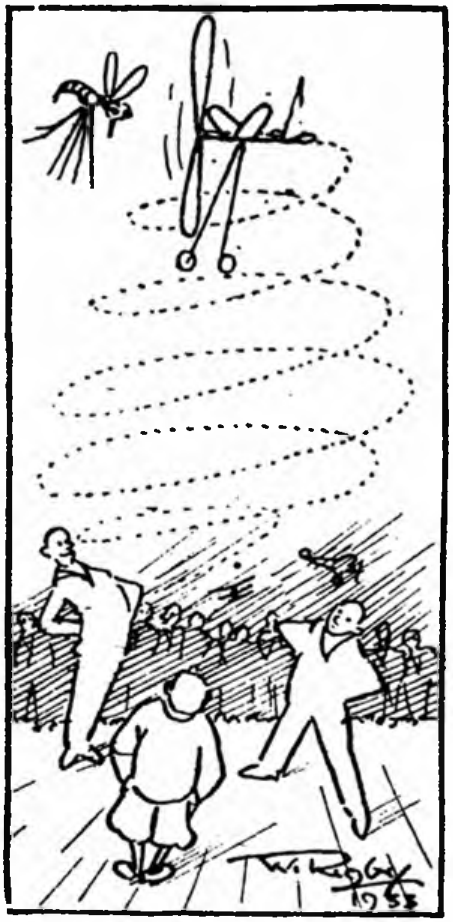
'But then Wimbledon and Hitchin are many miles apart.'

The Baby Blue Dragon, a pleasing C E Bowden design, as modelled by Stuart Ludar-Smith of Bishops Stortford. AM 35 power.

Phil Smiths refuels his Dallas Fury, a late-1940s design by Carl Hermes from the 1951 Zaic Yearbook - here enlarged 1.25 times for an OS 60 four-stroke.



Left: Self-explanatory building drawings for Balsa, a low-wing rubber-driven design by Wallace Rigby whose card models we reviewed last month. Below: Another Rigby afterthought. This illustration was to show the consternation felt by a mosquito (stranded from a previous Flower Show) when confronted by a Rigby indoor model flying at one of the pre-war TMAC meetings at the Horticultural Hall. . .



'Balsa' low-wing model

Having last month looked at Rigby card models, here is a model from the same stable that utilises the then 'new-fangled' balsa wood, a model aeroplane making material whose use was becoming widespread in this country at about the time that this design was described in Captain W E John's fine monthly Popular Flying in June 1933. It is an attractive model which bears great resemblence to the Frog Interceptor which had appeared some six months earlier. The drawing is self explanatory, and only the salient points from the original article are given below.

The main feature is the balsa nose, left reasonably heavy and strong to enable the undercarriage wire, wing clip and longerons to be inserted without splitting. Broad top longerons are used in order that the turtle back can be securely attached without the need for a central stringer. A thin coating of glue or gum should be given to the underside that will set hard and help the decking to retain its shape. The wing is cambered by covering the bottom with tissue using gum as an adhesive. On drying the paper contracts and pulls the wing into shape. The outer three inches of the top surface should be treated in the same way and this will provide the necessary washout by flattening the camber at the tips. Dihedral is applied by wetting the centre of the wing and holding down while the tips are raised 1.3/4 inches. Gum a strip of paper one inch wide around the centre of the wing to retain this dihedral. The front of the nose block is cut off and is kept in place by a rim of paper covered in silk like a box lid. Note that glues and gums used in this construction were not of the cellulose variety - if you do use such adhesives care must be exercised in order that shrinkage does not cause the paper to warp. Build one!

Below: Jim Adams at the first SAM Champs in Denver in 1967 with the Forster 99 powered KG3 which he has recently donated to the San Diego Aero-Space Museum for exhibition in their History of Model Aviation section.

FLYLEAVES

More to read and enjoy - the latest books reviewed

Introduction to Electric Flight

by Ian Peacock (Argus Books, £6.95. ISBN 0 85242 910 X)

Increasing numbers of model flyers are becoming convinced that electric power is the way ahead in this noise-conscious age. This book reviews the progress made so far, particularly for the benefit of the newcomer, and points some future directions.

After a brief look at the early history of electric flight, where the then-amazing Dorland Hall RTP demonstrations and the pioneer work of Fred Militky are rightly stressed, the author concentrates hard on recent and current - sorry for the pun - developments.

The basics of electric motors, batteries and charging are thoroughly explained, including some interesting cross-reference to techniques of the electric car world. Have you ever considered running-in a new electric motor by giving it a quick burst in a bucket of water? But let's not give too many secrets away...

This book admits that there are many inconsistencies in the world of electric propulsion. Even the experts often fail to agree. The author's purpose is clearly to unravel as many mysteries as possible and with the help of his own practical experience he achieves this in a most readable way. Almost every available motor and R/C aircraft kit is discussed, as are many individual projects; and there is no doubt that such a guide can be very helpful. Your reviewer, who is an electrical ignoramus, would have benefitted from a table listing motor-and-prop combinations in groups equivalent to i.c. engine categories; admittedly the information is in the book, awaiting search. Nearly all the content is R/C based. Perhaps F/F (and even C/L) applictions might form the backbone of a further volume? **GC**

German Aircraft of the First World War

by Peter Gray and Owen Thetford

Electric Electric Aircraft and their predecessors

by Stephen Ransom and Robert Fairclough

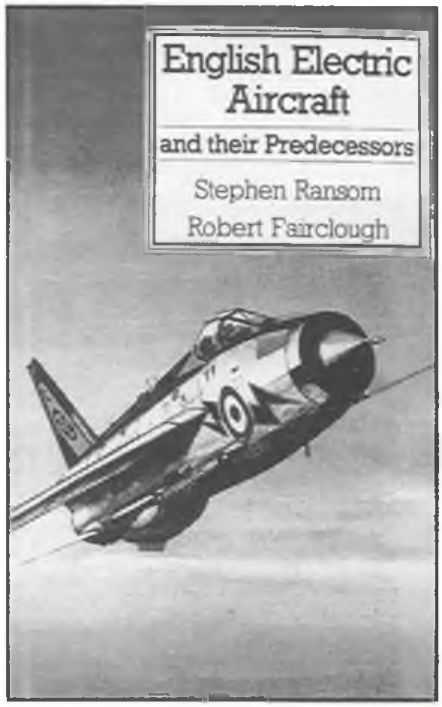
Curtiss Aircraft 1907-1947

by Peter M. Bowers

(Published by Putnam Publications at £20 each. ISBN 0 85177 809 7, 0 85177 806 2 and 0 85177 811 9 respectively)

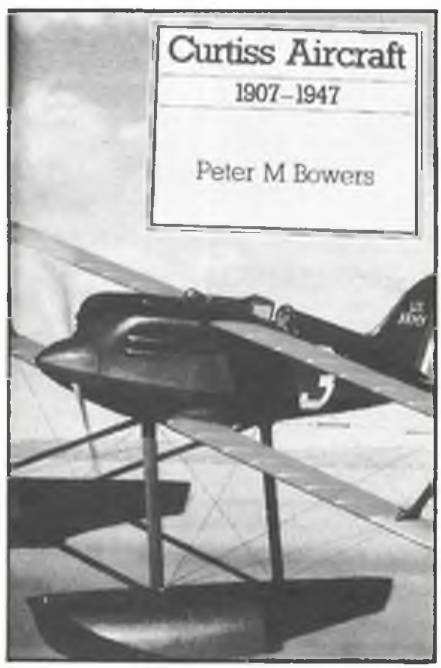
Conway Maritime Press are continuing with their admirable policy of re-issuing these sought-after Putnam books. Actually, of this latest trio to come to our attention. English Electric Aircraft, is newly published; we will deal with it in a moment.

German Aircraft first appeared in 1962 and even though much material is now dated - or, more accurately, later research has added to it - this is still a most valuable work. Crisp three-views of better-known craft add to concise text but the most fascinating part of the book - to your reviewer, at least - is the substantial appendix of lesser-known craft wherein appears a fascinating mixture of triplanes, quadruplanes and miniatures to accompany a selection of more conventional craft that didn't make squadron service. Despite its age, this is a volume to enthrall and to set the serious student upon further research (even



though the dust-jacket is awful!). Flying model subjects, such as LVGs, Hannovers and Rumplers abound - but who can provide us with a drawing of that delightful Zeppelin D1?

Curtiss Aircraft is a much more recent volume, dating from 1979. Author Peter Bowers has amassed an astounding collection of data, extending even to illustrations of differing styles of



nameplates and trademarks. Due weight is given to the prodigious workload of Glen Curtiss during the formative years and the resilience of his aircraft company post-WWI makes for fascinating reading. Regrettably, the slump in military requirements after 1945 meant closure and transference to North American Aviation, but not before a huge variety of Hawks and, notably, P40s (of which nearly 14,000 were made) had marked the company as a notable quantity producer.

Most craft are treated to a three-view in this volume. Particularly modellable are the Tanager (the Handley-Page Gugnunc's competitor in the Guggenheim Safe Airplane Competition) and the CW-19W Coupe. An interesting account of a company whose products indeed form an index of contemporary military aircraft performance.

The story of English Electric aircraft is most unusual, and very much a tale in two parts. The early and 'pre'-history is relatively complex but painstaking, original research has resulted in the combining of the intriguing story of the craft built and flown by Howard Wright, Horatio Barber and W.E. Cooke (amongst others) with a scattering of later subjects, culminating in the unflyable M3 Ayr flying boat of 1925. Forty years were to elapse before genesis of the Canberra was to be passed to the company, although much 'shadow' wartime production had occupied the company until then. The majority of the book covers development of this aircraft and the Lightning fighter. Much detail has been unearthed, including the famous stories of Lightning canopy disintegration (on one occasion, at supersonic speed).

Despite the necessarily disjointed but fascinating story, there is a good deal to interest the modeller in this account. Particularly, we should say, amongst the drawings of early aeroplanes and the projects (although our review copy was indistinct in parts due to over-inking, or perhaps because of overmuch reduction). The 1953 P7 - a nose-mounted contra-prop Dakota replacement - is almost an aero-modelling caricature!

We've said it before. No serious aviation enthusiast can be without these volumes. **GC**

VIDEOS

Farnborough, the Glorious Years 1956/57, 1958/59, 1960/61 and 1962

(Available from Now Video, Kirby Hill, Boroughbridge, North Yorks YO5 9DS at £19.95 each, except for 1962 at £15.95. All four at £60.00)

Ideal armchair viewing, this. Here we have a series of newsreel clips - all in colour - featuring highlights from the classic Farnborough years. In fact, one of our review quartet was missing (we had a double chance to look at 1958/9 instead!) but we thoroughly enjoyed the later trio. Quite a sad business actually, to recall the optimism with which so many British projects - notably those for the civil market - were lavished. Who remembers 'the aircraft that will halve air fares to Europe!' as the Vickers Vanguard? Or the Westland Westminster, demonstrating its weight-lifting ability year after year before ranks of uninterested buyers. And the most notable disappointment of all - the Rotodyne, applauded in its day as the answer to city-centre travel, but now, in retrospect, looking an uneasy hybrid.

But there is the exhilarating, too. The Buccaneer, the Lightning and the nimble, massed Hunters of 'Treble-One' squadron. Naval might in the stocky Scimitar - surely one of the noisiest craft ever to demonstrate at Farnborough? And did they really half-loop and roll Victors and Vulcans to demonstrate the 'toss-bombing' technique? Then we see the SC1 with four engines for lift and one for propulsion - a useful test-bed but a blind alley in development - which now appears a quaint oddity; it is easy to forget how its

hovering ability, long overshadowed by Harrier cavortings, stunned the crowds at the time.

These videos are poignant reminders that memory can rapidly fade. Even the elegance of the Comet airliner - an aircraft not long gone, after all - was a vivid surprise to your reviewer, who must have seen dozens over the years. But one image of Farnborough remains clearly reinforced after this enjoyable exercise in nostalgia. It was often very wet! **GC**

The Air Plan; Target Germany; Sky Giant

(After the Battle Video Cassette No. 26. £24.95)

All the videos in this range consist of original wartime footage. Here we have an interesting trio which not only entertain but contain much of relevance to the scale enthusiast.

The Air Plan, half-an-hour long, depicts the air war in Europe and during the Normandy invasion. There is much 'in the field' material of Spitfires, Hurricanes, Mustangs and Typhoons (the latter shown in fine rocket-firing form) demonstrating a variety of markings including often hastily-applied invasion stripes. Fortresses, Liberators, Lancasters and even a Whitley represent the bombing force. How tactically-efficient this all was may be pondered by the viewer...

Target Germany relies heavily upon cross-cut sequences from Target for Tonight and other sources. The knowledgeable will enjoy identifying various pieces of the jigsaw; to others the film will simply be an entertaining exposition of Bomber Command activities. The Short Stirling is featured at length (isn't it about time we saw a C/L version of this characterful 'heavy'?). The tone of Sky Giant, a tribute to the Avro Lancaster,

indicates the public affection in which this machine was held. Ten minutes of film includes a good deal of production - line test flying as well as concise background information. Stirring stuff!

Aviation videos are an increasingly popular source of archive material; this one is recommended not only on that score but as an atmospheric hour's-worth of living-room flight! **GC**

WHAT'S ON

Get ready for the flying season!

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

13th March
GRAND NATIONAL VINTAGE SWAP-MEET
Venue: Mansfield Leisure Centre, Chesterfield Road South, Mansfield, Notts. Take Exit 29 from M1.
Small entrance fee.
Contact Keith Harris. Tel: 0623 842167.

19-20 March
4TH ANNUAL SAM 35 HOBBY & MODEL SHOW
Venue: The Samuel Whitbread School, Shefford, Beds.
Contact: Peter Harvey. Tel: 0462 816980.

27th March
PETERBOROUGH MFC DIESEL A MEETING
Venue: Peterborough Embankment.
Contact: Mick Taylor. Tel: 0733 24484.

10th April
VINTAGE, PANNETT AND KAY
Venue: Driffield.
Contact: D. Davitt. Tel: 0532 675433.

10th April
PETERBOROUGH MFC. SPORTS AND VINTAGE DAY
Venue: The Embankment, Peterborough.
C/L Events: Vintage Old Time Stunt and Midge Speed to SAM35 rules. Concours, plus fly for fun.
F/F Events: Jetex, Keil Kraft, Veron flying scale rubber, plus small field fly for fun.
Contact for C/L: Mick Taylor. Tel: 0733 204484.
Contact for F/F: Pete Gibbons. Tel: 0733 314741.

17th April
SOUTH BIRMINGHAM MFC CONTROL LINE FLY FOR FUN RALLY
Venue: Rubery Hill Hospital, Rubery, Nr. Birmingham. 10am start. General flying for all SAM and SMAE members.
Contact: Peter Martin. Tel: 021 459 5520.

24th April
WITHAM CUP C/L AEROBATICS EVENT
Venue: Slip End, Luton. Open and Novice C/L Aerobatics. Contact: P. Burgess. Tel: 0376 516881.

24th April
SMAE INDOOR SCALE NATIONALS
Venue: Alumwell Centre, Walsall (Junction 10, M6). Peanut and Open Rubber Scale plus CO2 Electric. Informal competitions for Team Racing and kit scale models: entry for these on the day. Static exhibition of free-flight scale models, talks and demonstrations by leading scale modellers; really enjoyable day out for the family. Full details and entry forms (SAE please) from: Doug Sheppard, 13 Luckington Road, Monks Park, Bristol, Avon BS7 0UT. Tel: 0272 697595. Pre-entry by 22nd March.

24th April
MODELVILLE '88
2nd model exhibition. Crookhorn School, Stakes Hill Road, Waterlooville, Portsmouth, Hants. 10am-5pm. Adults £1.50. Children, Senior Citizens 60p. Trade stands, model aircraft and boat displays, engineering, railways, trams, soldiers, wargaming, etc. Free parking. Organised by the Rotary Club of Waterlooville in aid of Rotary charities.
Contact: Peter Tipping, 4 Westbrooke Close, Horndean, Portsmouth, PO8 9RE. Tel: (0705) 595145.

30th April
BRISTOL AND WEST WOODBURY WEEKEND
Venue: Woodbury Common, Nr Exmouth, Devon. Saturday, 5-7pm: Champagne fly offs, O.R.O.G.O.P. Vintage Rubber. Sunday, 10am start: O.R.O.P.O.G. SMAE rules Vintage. Monday, 8am start: Combined FAI (5 rounds). Caravan accommodation at special rates. Sunday evening supper.
Contact: Elton Drew, SAE to 2 Downfield Close, Alveston, Bristol BS12 2NJ.

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

1-2nd May
HOLKER HALL RALLY
Venue: Holker Hall and Gardens, Cark-in-Cartmell, Nr. Grange over Sands.
Classes flown: A: Best All Round and Entertaining Model, Holker Trophy & cash prize. B: Best Biplane - cash prize. C: Best Sports Model - cash prize.
Contact: Mrs C. Johnson. Tel: 044 853 328.

15th May
ASP LARGE MODEL DAY
Venue: Old Warden Airfield, Beds.
Contact: Aeromodeller. Tel: 0442 41221.

15th May
TYNEMOUTH MAC RALLY
Venue: Albermarle Barracks. O.G. O.R. O.P. Combined Mini. Vintage. HLG. 10am start (11am for power). Pre-entry essential before 8th May.
Contact: Tony Brown. Tel: 091 2362155.

15th May
PETERBOROUGH MFC 1/2A COMBAT.
Venue: The Embankment, Peterborough.
Contact: Mick Taylor. Tel: 0733 204484.

22nd May
SMAE NORTH WEST R/C FLY IN
Hosted by Blackpool and Fylde RCMS.
Venue: Blackpool Zoo flying site. All flyers welcome.
Contact: Chris Bromley. Tel: 0253 25080.

28-29th May
ST ALBANS MODEL ENGINEERING SOCIETY EXHIBITION
Venue: Marconi Hall, Longacres, St Albans, Herts.
Contact: K. Chiesa, 49 Mount Drive, Park Street, St Albans, Herts.

4-5th June
WEST MALLING INTERNATIONAL MODEL AIRSHOW
Venue: West Malling Airfield, nr. Maidstone, Kent. 10am to 6pm each day. Adults £2.50, Children and OAPs £1.50. Camping available. Free car park programme, raffle entry. Discount tickets in advance. Contact: David Watts, 58 Salisbury Road, Tonbridge, Kent TN10 4PE. Send SAE.

18th-19th June
ASP SCALE MODEL WEEKEND
Venue: Old Warden Airfield, Beds.
Contact: Aeromodeller. Tel: 0442 41221.

19th June
BLACKPOOL AND FYLDE ELECTRIC FLY IN
Venue: Blackpool Zoo Flying Site. Contact: Chris Bromley. Tel: 0253 25080.

19th June
CHILTERN CUP C/L AEROBATICS EVENT
Venue: Slip End. Open, Novice and Vintage C/L Aerobatics.
Contact: R. Landon. Tel: 0525 713472.

2-3 July
EAST TILBURY AEROMODELLERS FLY FOR FUN EVENT
Venue: Bata Sports Field, East Tilbury, Essex. Licensed bar, childrens' attractions, possible parachute display, static microlight display.
Contact: Geoff Harris, School House, Princess Margaret Road, East Tilbury, Essex RM18 8SB.

3rd July
PETERBOROUGH MFC DIESEL 'A' COMBAT.
Venue: The Embankment, Peterborough.
Contact: Mick Taylor. Tel: 0733 204484.

3rd July
SMAE F/F SCALE MEETING
Venue: RAF Abingdon. Power, Rubber, CO_2/Electric Scale. No flying before 10am.
Contact: Charlie Newman. Tel: 086 77 3020.

10th July
ASP GOLDEN ERA MODEL DAY
Venue: Old Warden Airfield.
Contact: Aeromodeller. Tel: 0442 41221.

16th-17th July
INTERNATIONAL WINGS & WHEELS SPECTACULAR
Venue: North Weald Aerodrome, Essex. Junction 7 from M11.
Contact: J. Woodley. Tel: 04024 71494.

17th July
SHUTTLEWORTH MODEL GROUP DAY
Venue: Old Warden Aerodrome.
9am-6pm. Everyone welcome for general flying.
Contact: Mick Staples 0223 241 978.

17th July
BLACKPOOL AND FYLDE SCALE FLY IN
Venue: Blackpool Zoo flying Site. Semi-scale to Super-scale, all welcome. Good grass runway.
Contact: Chris Bromley. Tel: 0253 25080.

17th July
KNAVESMIRE FREE-FLIGHTERS ANCIENT AND MODERN SILENT MINI-EVENT
Venue: York Racecourse.
Events: Coupe d'Hiver, A/1 Glider, CO_2, Mini-Vintage Rubber (34in span max.), Mini-Vintage Glider (54in span max), H/L Glider, Kit contest, Best Junior and other impromptu small classes. 9.00am start in rounds, variable max.
Contact: John Pool, 8 Sycamore Road, Barlby, Selby, N. Yorks YO8 7XB. Tel: 703060.
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24th July
COLCHESTER MAC VINTAGE DAY
Venue: Bures. R/C Vintage Model Fly-In plus Texaco, Class 1, Class 2 and Class 3 Ratio competitions to SAM 35 R/C rules. 10am start. Proof of insurance required. Spectators welcome. There will be a BBQ and refreshments. SAE for full details inc map to: Peter Grant, 2 Duncan Rise, Gt Yeldham, Halstead, Essex CO9 4QE. Tel: 0787 237967.

24th July
OXFORD MFC DREAMING SPIRES GALA
Venue: Port Meadow, Oxford. All classes of F/F Scale plus Silent Vintage. No power models apart from F/F Scale.
Contact: Charlie Newman. Tel: 086 77 3020.

31st July
FACCT THERMAL SOARING RALLY BARCS LEAGUE EVENT
Venue: RAF Weston-on-the-Green.
Pre-entry £2 + SAE + Frequency.
Contact: Mr H.G. Webb, The Bungalow, 13 East Street, Fritwell, Oxon OX6 9PX.
SMAE members only.

20-21st August
ASP VINTAGE MODEL WEEKEND
Venue: Old Warden Airfield.
Contact: Aeromodeller. Tel: 0442 41221.

21st August
FACCT MINI GLIDER BARCS RULES
Venue: RAF Weston-on-the-Green. Pre-entry £2 + SAE and 2 frequencies.
Contact: Mr. N.G. Webb, The Bungalow, 13 East Street, Fritwell, Oxon OX 6 9PX.

11th September
SHUTTLEWORTH MODEL GROUP SILENT DAY
Venue: Old Warden Aerodrome.
9-6pm. Everyone welcome. No i/c engines to be run.
Contact: Mick Staples. Tel: 0223 241 978.

18th September.
ASP FOUR-STROKE MODEL DAY
Venue: Old Warden Airfield.
Contact: Aeromodeller. Tel: 0442 41221.

25th September
SOUTH MIDLAND THERMAL SOARING RALLY BARCS LEAGUE EVENT
Venue: RAF Weston-on-the-Green. Pre-entry £2 +SAE and 2 frequencies.
Contact: Mr J.H. Shaw, 'Alvere', Witney Road, Freeland, Oxon OX7 2HQ.

25th September
ROLLS ROYCE MAC VINTAGE DAY
Venue: Hucknall.
C/L Events include Midge, Old Time Stunt and Vintage T/R, A and B.
Contact: Terry McDonald. Tel: 0332 511273.

25th September
DOUG BLAKE TROPHY C/L AEROBATICS EVENT
Venue: Slip End, Luton. Open, Novice and Vintage C/L Aerobatics. Contact: G. Alison. Tel: 0923 772675.

2nd October
ASP AUTUMN KITE FESTIVAL
Venue: Old Warden Airfield.
Contact: Aeromodeller. Tel: 0442 41221.

16th October
PETERBOROUGH MFC DIESEL 'A' COMBAT.
Venue: The Embankment, Peterborough.
Contact: Mick Taylor. Tel: 0733 204484.

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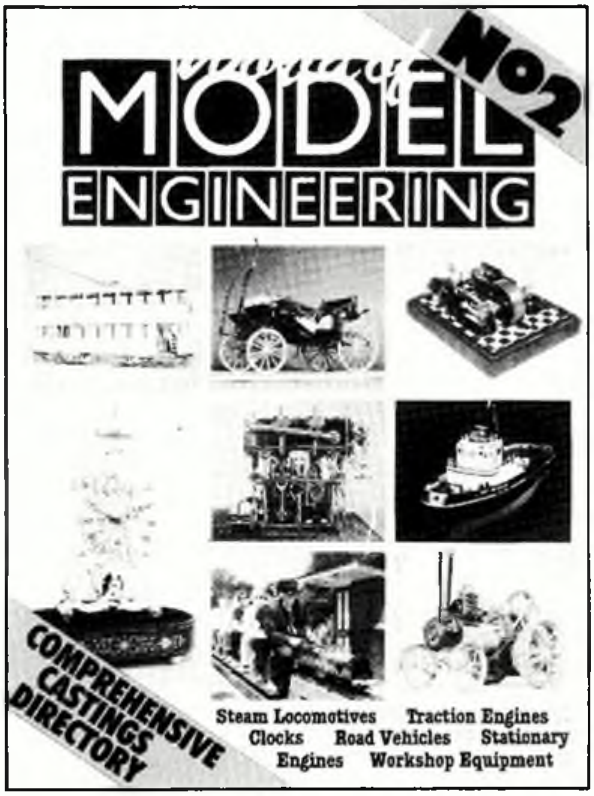

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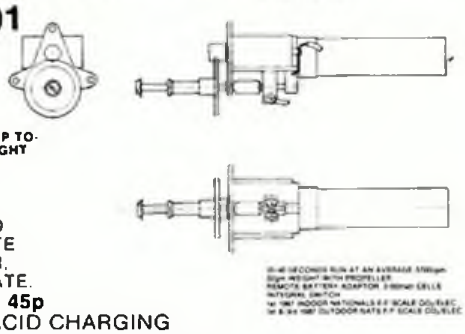

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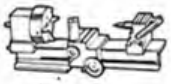

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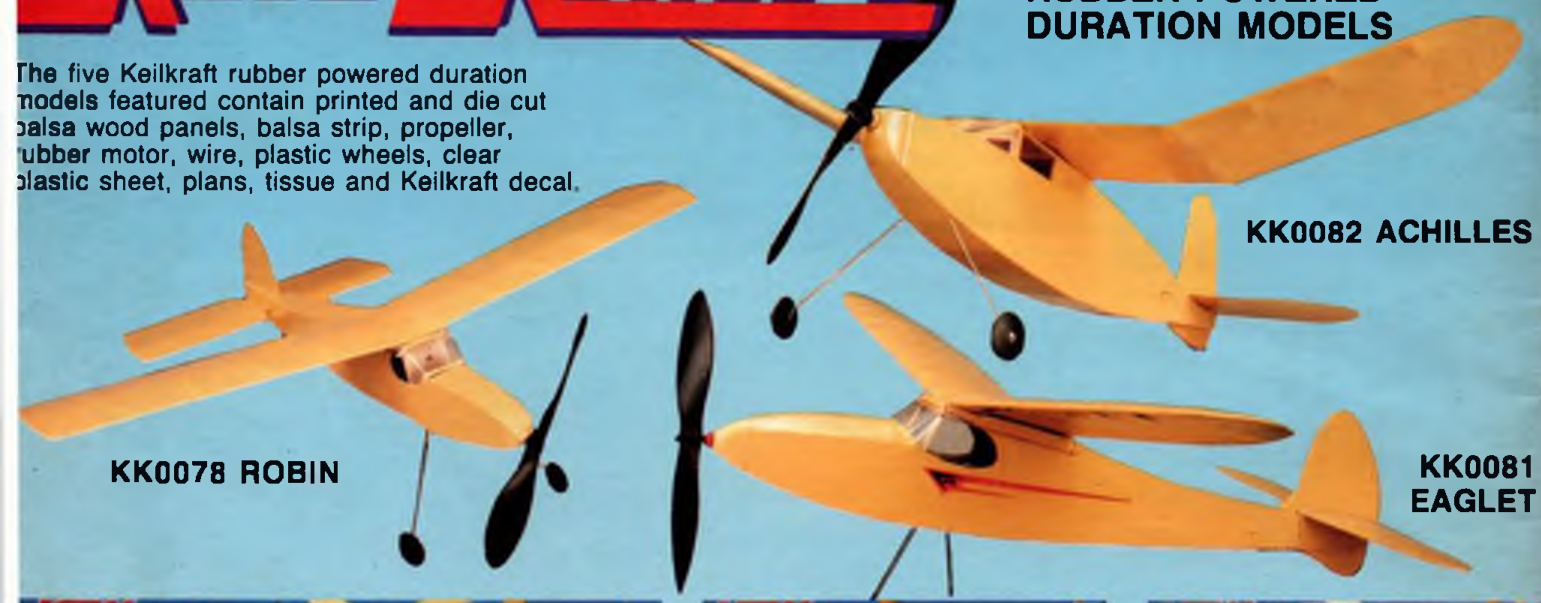

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