

APRIL 1980 50p

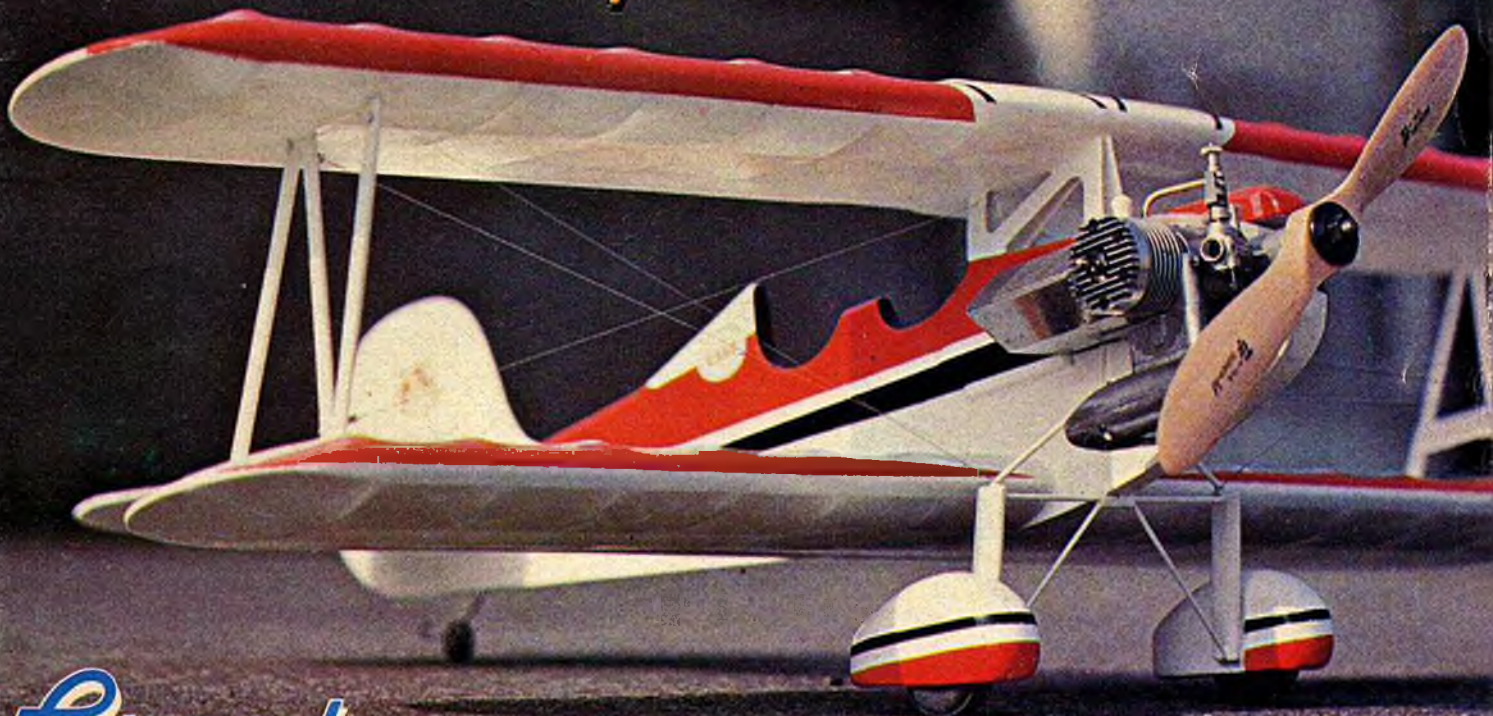
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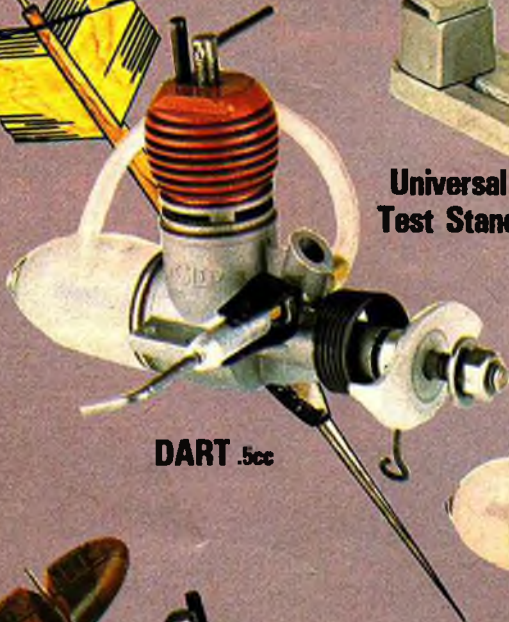
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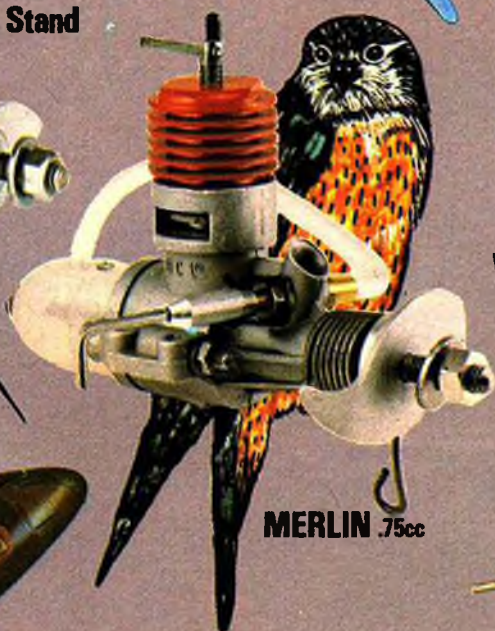
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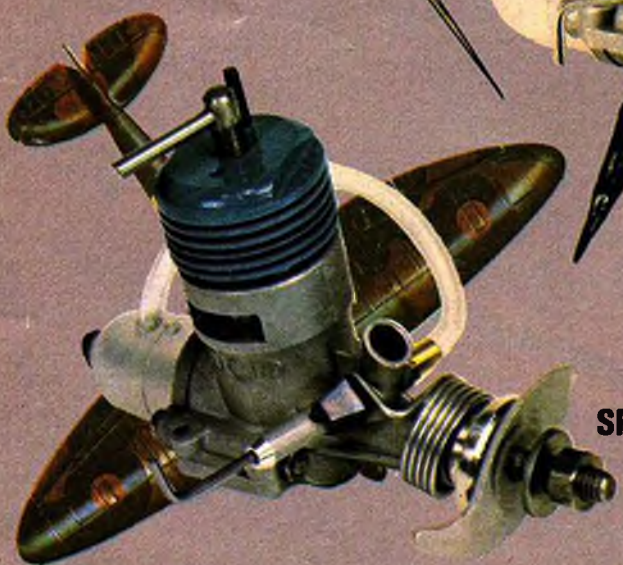
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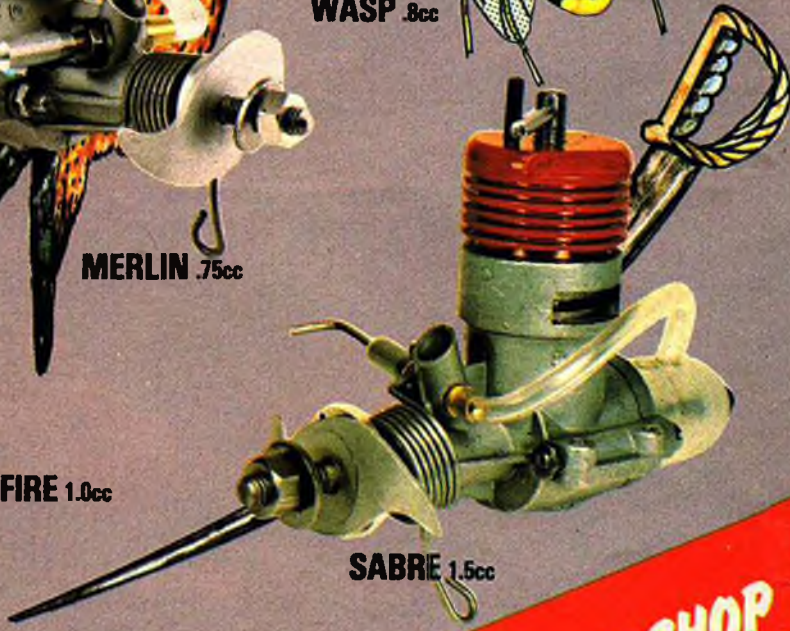
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Aero modeller

APRIL 1980

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MAP **HOBBY MAGAZINE**

Comment

JUNIOR EVENTS will again be a feature of this year's SMAE British National Free Flight Championships, to be held at RAF Barkston Heath, near Grantham, on May 24-26th. This year it is hoped to make available hangar and workshop facilities to enable simple prefabricated kit models to be assembled ready for flight by young-

sters during the event, allowing daily visitors to participate in the flying fun. Trade support is likely with such models as the BBC Hawk, DPR Models Chuck Glider kits, and North Pacific clip together rubber powered models and help from experienced modellers will be on hand to assist the building and flying of models, indoors or outside. In addition there are the two regular Junior kit contests for those intending to bring their own models

along. Remember, these events are for under 16 years old (January 1st 1980) flying glider and rubber models under 1250mm (50in) wingspan built from any commercial kit. Our regular Aero Aces Flying High feature on page 202 tells you all you need to know about building and flying these type of models, so start getting yours ready now and twist Dad's arm into taking you to Barkston Heath over the Spring Bank Holiday.

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On the Cover

Another great model from that most prolific of C/L Aerobatic designers Claus Maikis, who believes in building simple attractive models, which represent maximum flying enjoyment. Our cover depicts the latest addition to the APS Plans Range *Great Lakes* for 4-6cc motors styled from the famous full size machine and one of several models referred to by Claus in his article on page 198.

Next Month

R/C Glider Special. Full Size pull-out plans for Bryan Miller's 1700mm span 2 channel lightweight Soarer *Excelsus*, which owes much of its pedigree to Free Flight design. R/C Sport Flyer gives helpful advice on learning to fly Soarers. Bob Walker takes a look at C/L Mini Goodyear Racing. Lots more news on Free Flight, Control Line, Scale and Aero Aces for Juniors, makes this an issue not to miss. On Sale April 18th.



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Subscription Department: Remittances to Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Hertfordshire HP1 1EE (subscription queries Tel: 0442-51740). Direct subscription rate £8.00 per annum, including index \$20 [U.S.] for overseas subscriptions.

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AEROMODELLER incorporates the MODEL AEROPLANE CONSTRUCTOR and MODEL AIRCRAFT and is published on the third Friday of each month prior to date of publication.

Aeromodeller is printed in Great Britain by Leicester Printers Ltd. The Church Gate Press, PO Box 20, 99 Church Gate, Leicester LE1 5FR for the Proprietors and Publishers, Model & Allied Publications Ltd, (a member of the Argus Press Group)

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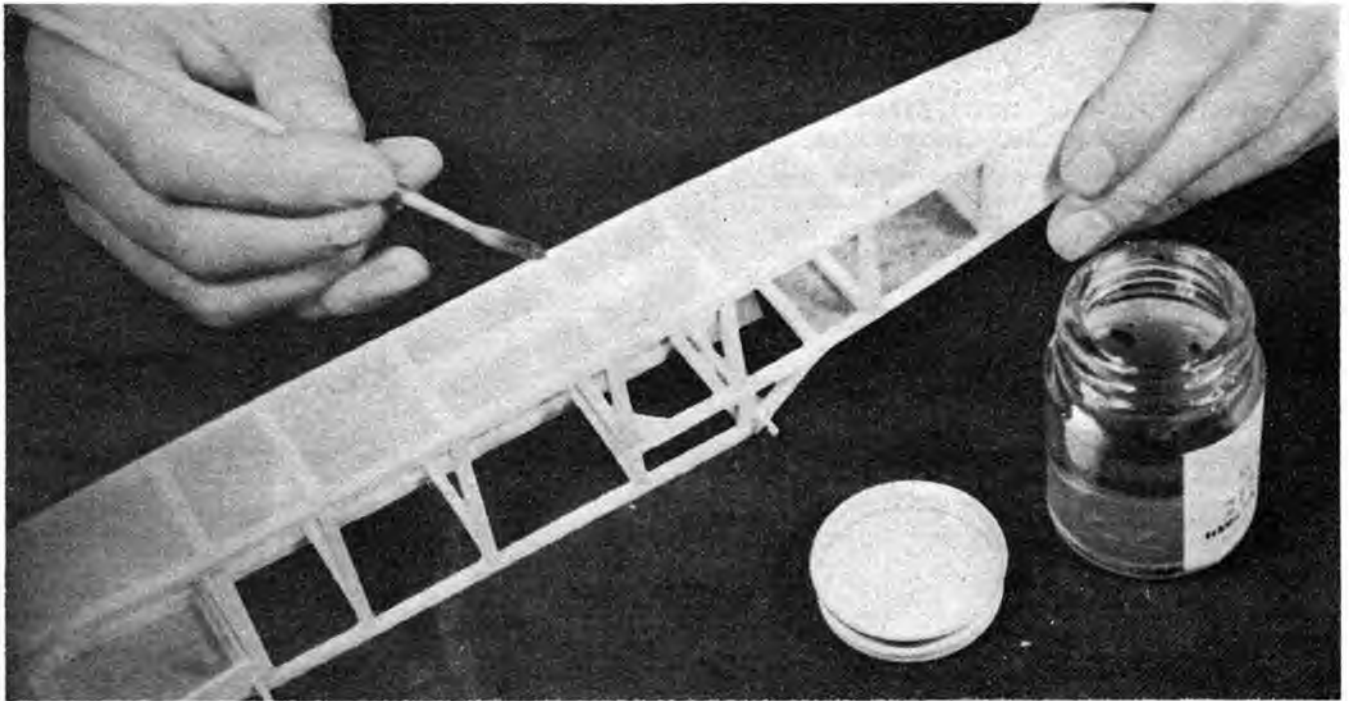


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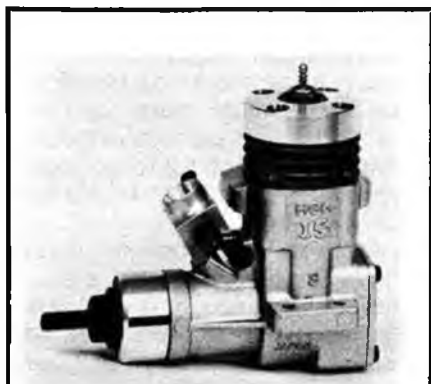
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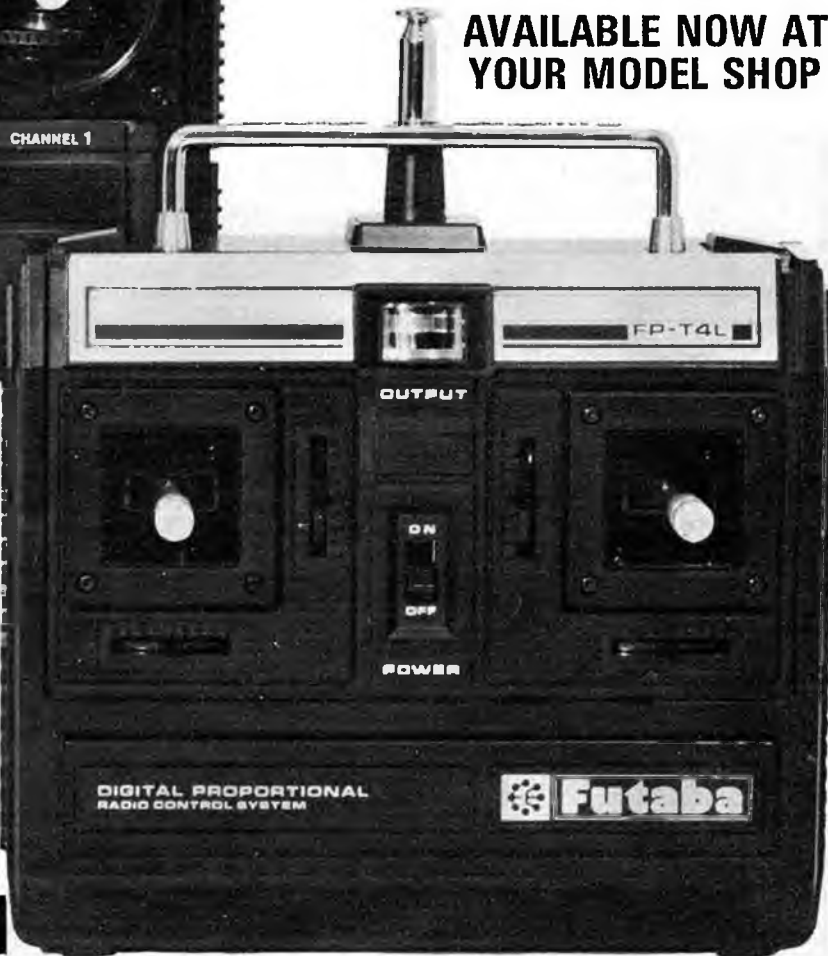
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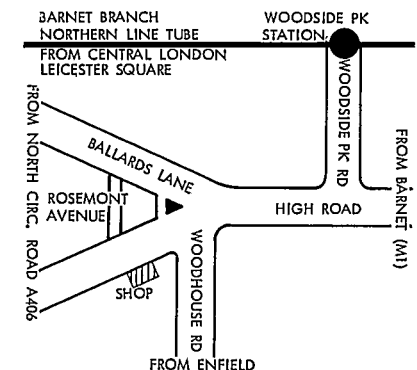
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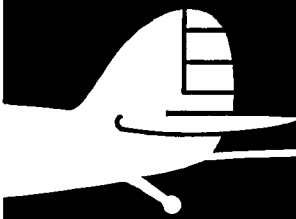


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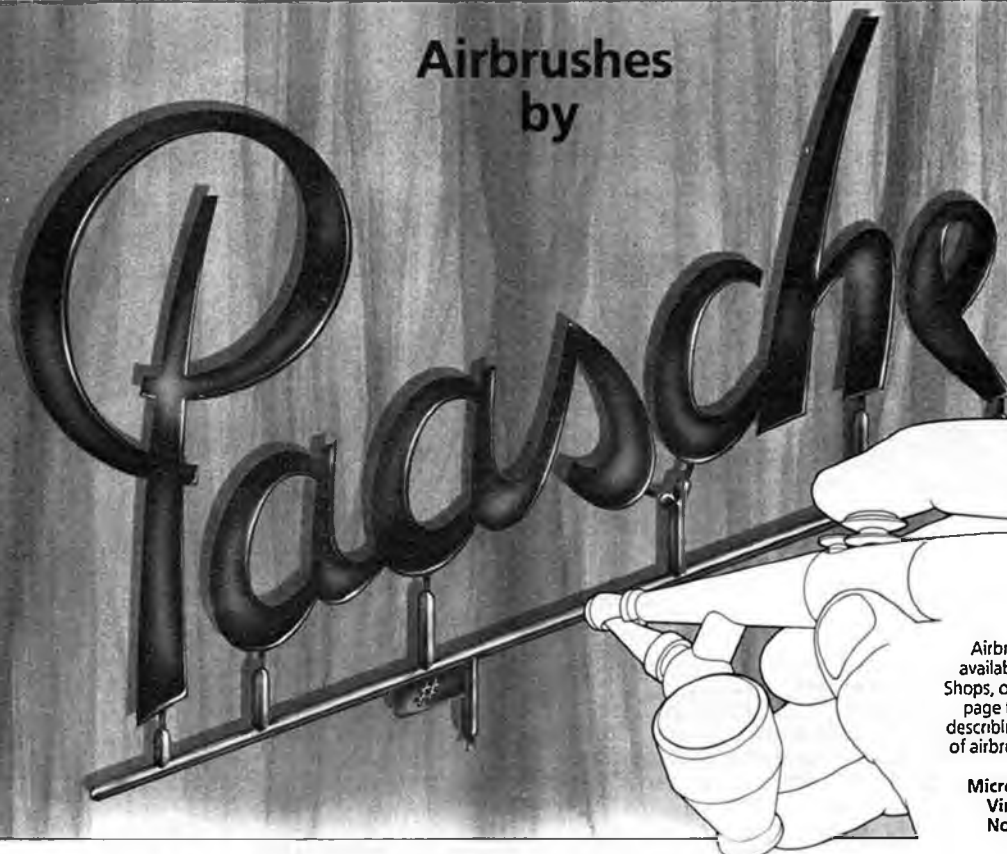
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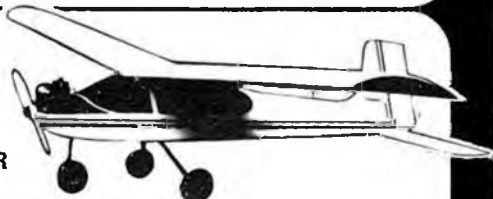
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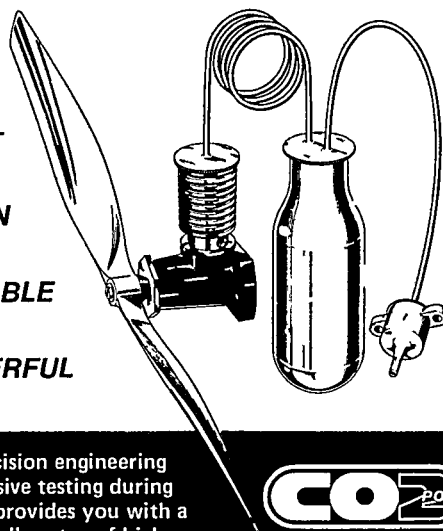
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HOLIDAY TIME

The start of each new year is always heralded by a flood of holiday promotions encouraging the snowbound to dream of summer sunshine. However Aeromodellers need not feel left out, as there are several holidays to choose from, organised specially for them.

Once again *Pontins* offer their National Model Makers Festival, the world's biggest festival for model enthusiasts from Sept. 27th–Oct 4th and/or Oct 4th–11th at Brean Sands Holiday Village, Burnham on Sea. Modellers and their families are invited to bring their models along to participate in one or two weeks of modelling fun which includes all types of R/C, F/F and C/L flying plus building instruction courses for children and Ladies Craft activities for Mums, in addition to all the regular Pontins Holiday facilities. For details Tel: Brean Down (027 875) 203.

Alternatively, Leisure Caravans in conjunction with MAP is offering a one week holiday at Primrose Valley, Yorkshire from May 3–10th with R/C Slope and Power flying, Trade stands and Craft activities with all the facilities of the leisure park. Tel: Scarborough (0723) 512297 for details.

9TH SYWELL EXPO 80

One of the biggest attractions for both full size and model aviation enthusiasts over the Easter Holidays will once again be the flying displays and trade stands at Sywell Airport, near Northampton. Full size flying will include Military and Civilian Formation teams, the famous Barnstormers Flying Circus and free-fall parachuting, while modellers will be well represented with trade and display teams doing their thing in miniature, backed up by extensive modelling trade stands in marquees. Don't forget the dates, Easter Sunday and Monday, April 6–7th.

BARCS AFFILIATE TO SMAE

The British Association of Radio Control Soarers, an independent body catering to the needs of R/C soaring enthusiasts, has agreed at its recent AGM to affiliate to Britain's National body for Model Flying appointed by the Royal Aeronautical Club, The Society of Model Aeronautical Engineers. SMAE has now granted formal recognition to BARCS as an affiliated body with specialist interests. The objective behind this action is to provide better co-ordination and communication between the two bodies in the desire to improve the unity of the Aeromodelling movement in the UK.



Young modellers at last year's National Model Makers' Festival at Brean Sands assemble their first flying models under the guidance of Dave Rawlins of DPR Models who supported the venture. It is hoped a similar arrangement can be included in this year's Barkston Heath Nationals.

1980 INDOOR WORLD CHAMPS

America's National model flying organisation, the *Academy of Model Aeronautics*, is to host the 1980 Indoor World Champs at West Baden, Indiana, from June 20th–24th. The venue is a unique building with a 30m ceiling and 60m diameter atrium, set amid a beautiful campus with lodgings and mess facilities surrounding the flying site. The AMA can be relied upon to organise the event with the same efficiency afforded the other recent Championships and with the defending US World Champion Jim Richmond having just claimed a new World record flight of 52:14 set during their team trials, the stage is set for another fine Championships. Modellers wishing to join the British Team travelling arrangements should contact Bob Bailey for details Tel: Stevenage 723642.

NO STRINGS ATTACHED

Who would have ever believed that one day it would become CHEAPER to fly Radio Control than Control Line! In the case of the latest craze to sweep R/C modelling – Combat flying – the above statement could well be true. The idea is being promoted by David Boddington, the new associate editor to our sister magazine *RCM&E*. David, who launched the idea for Club 20 pylon racing a simplified class for limited performance engines, has now hit upon a similar approach to cheap, fun R/C Combat in April *RCM&E*. Brand new 2-channel R/C equipment can cost as little as £35, a brand new .20 cu in size R/C motor about £15 and £5 for a polystyrene flying wing and the total outlay can be around £55 – less than the cost of a racing .15 cu in glow motor used for Control Line FAI Combat!

FREE FLIGHT IN EUROPE

Details just received concerning the 1980 European Free Flight Championships in Yugoslavia now indicate the dates will be Tuesday Aug 26th to Monday Sept 1st with flying on Aug 28–30th and not as originally published in our February issue. This would now just make it possible for competitors to attend the Pierre Trebod International the preceding week Aug 23rd–24th in France, as a warm-up event to the Championships. Alternatively an additional event to note is the F/F International for F1A, F1B and F1C at Sezimov Usti, Czechoslovakia, on Aug 15–17th which could also provide an interesting double with the Euro Champs.

MODEL MAKER

The popular general modelling magazine of the 1950s and 60s, *Model Maker* is to be relaunched incorporating our recent sister magazine *Model Mechanics*. The first issue will be on sale from March 14th and the format of the new magazine will be a practical approach to basic model making, covering most of the popular hobbies, plastic kits, model aircraft, Meccano, model boats, model engineering, book and kit reviews. Look out for an issue at your local newsagents.

SALE & SWOP FLOP!

Last September when we first announced our free advertising scheme for items under £10, we imagined our offices would be flooded with offers of goodies for sale or swop, just like the good old days when *Aeromodeller* was renowned for a healthy Classified section. The response has been staggering – we have been truly overwhelmed. Perhaps modellers no longer have second hand items surplus to their requirements which they wish to sell, but nevertheless we will continue our offer in the hope that the response improves. Turn to page 238 for full details.

Letters

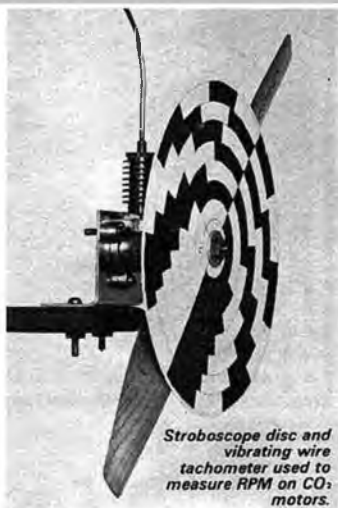
CO₂ REFUELLERS

Dear Sir,
I read with interest Mr Coombs' letter in your January edition regarding CO₂ refuelling systems and their safety. I was, however, a little surprised at his comment since B.O.C. were loaned my Sodastream cylinder based unit, detailed on P657 Nov 79 *Aeromodeller*, and they returned it without criticism. It was not my intention to promote anything which is at all dangerous and before use was hydraulically tested to 3,500 pounds per square inch.

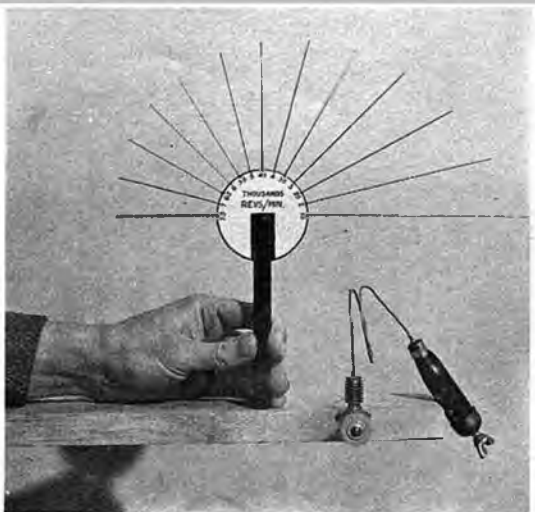
Mr Coombs refers to the "Telco Adaptor on a long hose". Unfortunately, Ian Peacock's article referred to two such units. One based on a Sodastream cylinder and one based on a Distillers Company Brewery Cylinder. It appears to be the latter that is being criticised. This unit was used by many grateful people at the *Aeromodeller* All-Scale Day held at Old Warden Airfield last year, and I understood it was made up by an employee of the Distillers Company.

Ian Peacock stressed the safety aspects in his article and certainly I would agree that all units, of whatever design, should be made and tested by a competent Person or Company. Incidentally, do not be tempted to screw together a string of carbon steel pipe fittings/adaptors, many of these have a safe working pressure of less than 500 psi.

With regards to the thread problem, I am unable to comment on other cylinders but the Sodastream cylinder appears to use an Admiralty Fine Thread with a major diameter of .8125in x 14 threads per inch of Whitworth Form. 1/2in BSP is .8250in major dia x 14 threads per inch also of Whitworth Form. In fact, checking a Sodastream Cylinder the thread was approximately .817in. As you see the difference is small and although, naturally the ADMF thread should preferably be used, a



Stroboscope disc and vibrating wire tachometer used to measure RPM on CO₂ motors.



1/2in BSP thread cut to bottom limit is virtually indistinguishable from it. If round bar is used to ease screw cutting on a lathe use a bar of not less than 1-3/4in dia.

Finally, some minor points regarding the drawing of the Sodastream based unit. The end cap, ball housing, ball and spring were taken from a Humbrol PMS1 unit not a Telco as stated. The spring may be dispensed with and in fact Humbrol no longer use one. The locking bar and 'O' Ring are not required since in practice the PTFE seals very effectively on its own.

Peterborough

Brian Waterland

The first of the enclosed photographs shows an O.K. CO₂ engine mounted on a torque stand, with a stroboscope disc to give the rpm. About the same time I made a tachometer of the vibrating wire variety, for use with CO₂ engines, and this is shown in the second photograph. (Note the wire vibrating at 3,500 rpm.) These devices enabled one to calculate the energy output of CO₂ bulbs, the effect of warming, adding fins, etc.

At that time, war-surplus CO₂ bulbs were plentiful and cheap, but the only successful engines were American, and these were not easily obtainable over here. There was one British engine in production, but it was so bad I shall not mention its name.

Stirling

J. H. Maxwell

CO₂ enthusiasts will be glad to learn that Ian Peacock will continue his series later in the year, with some remarkable breakthroughs into lightweight R/C and C/JL model flying, made possible by latest products recently developed by the modelling trade.

Ed.

CO₂ EXPERIMENTS

I happened to buy an *Aeromodeller* recently, after a lapse of many years, and was surprised to find that CO₂ is enjoying a revival. In particular, Dave Hipperson's tests on Sparklet bulbs reminded me of experiments I did over 30 years ago.

April 13th
INDOOR MEETING. Cardington. CANCELLED

April 13th
CL 1st CENTRALISED. 1/2A, F2C, CARRIER. Venue: Could be Anywhere! Contact Bob Horwood Tel: 0272-48869.

April 20th
CATS 1/2A COMBAT RALLY. Limited entry. Pre entry only. Seniors £1, Juniors 50p. Venue E: Horsenden Hill, Perivale, Middx. Contact: Mark Harrison Tel: 01-997 1794.

April 20th
FF2ND AREA CENTRALISED. F1C (HALFAX+PLUGGE), O/R (GAMAGE), O/G. Venue: local area. Contact: Mike Fantham Tel: 01-736 7163.

April 27th
INDOOR FLYING MEETING. PEANUT, OPEN RUBBER SCALE, CO. SCALE (INCORPORATING INDOOR SCALE NATIONALS). Soft shoes essential. 12.00-18.00 hrs. £1.50 entry plus SMAE entry. Venue F: Derby Municipal Sport Hall, Moor Lane, Derby. Contact: John Blegg 0707 52779.

April 27th
WITHAM CL STUNT COMP. F2B+NOVICE. Venue: Essex Showground, Braintree. Contact: Peter Burgess Tel: Witham 516881

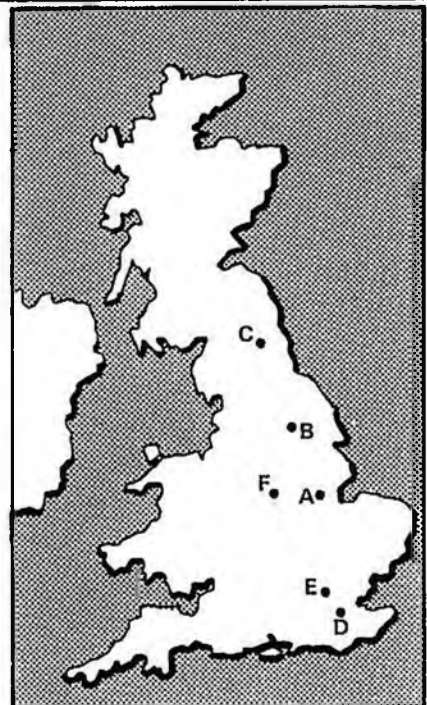
NEW ANNOUNCEMENTS

May 4th
ODIHAM SPRING GALA. F1A, F1B, F1C (first round 10-12em), A1, CDH, 1/2A, HLG, FF SCALE POWER AND RUBBER, F2B+NOVICE. Venue: RAF Odiham. Contact: F/F Tel: Copthorpe 713115.

May 18th
CROYDON GALA. F1A, F1B, F1C, A1, CD'H, 1/2A. 10am start. Venue: Basingstoun. Contact: Ray Elliott Tel: 01-997 1563.

May 18th
NE AREA RALLY. F1A (No rounds - substantial cash prize), O/R, O/P COMBINED MINI HLG. Venue: Albemarle Barracks. Contact: Phil Moate Tel: 0642 557048.

CARDINGTON - The SMAE have so far been unsuccessful in insuring the airship hangars for model flying in 1980; therefore all meetings are cancelled until further notice.



On MoD property, model aircraft may ONLY be flown by FULL SMAE members or contest entrants. All SMAE members (Associates and Juniors) and their families are welcome as spectators, and non members may be admitted by prior arrangement with contest director. For SMAE membership details Tel: 0533-58500.

What's Happening?

EVENTS

April 5th/6th
MODELS FOR ALL EXHIBITION, static exhibits plus Electric RTP. Probably Yorkshire's largest model hobby exhibition, jointly organised by Huddersfield & DMAC. Venue: Huddersfield Sports Centre.

April 6th-7th
9TH SYWELL R/C MODEL EXPO. Full size and model flying displays plus model trade stands with many attractions for the whole family. Venue: Sywell Airport, near Northampton.

CONTESTS

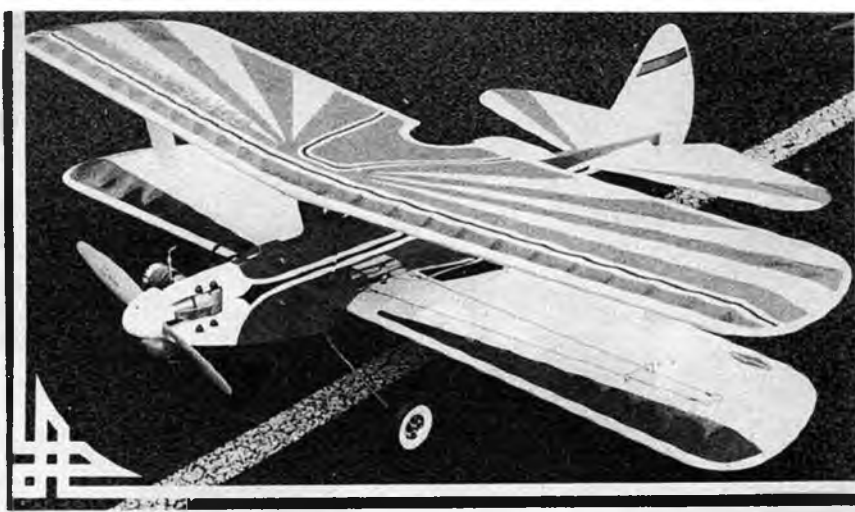
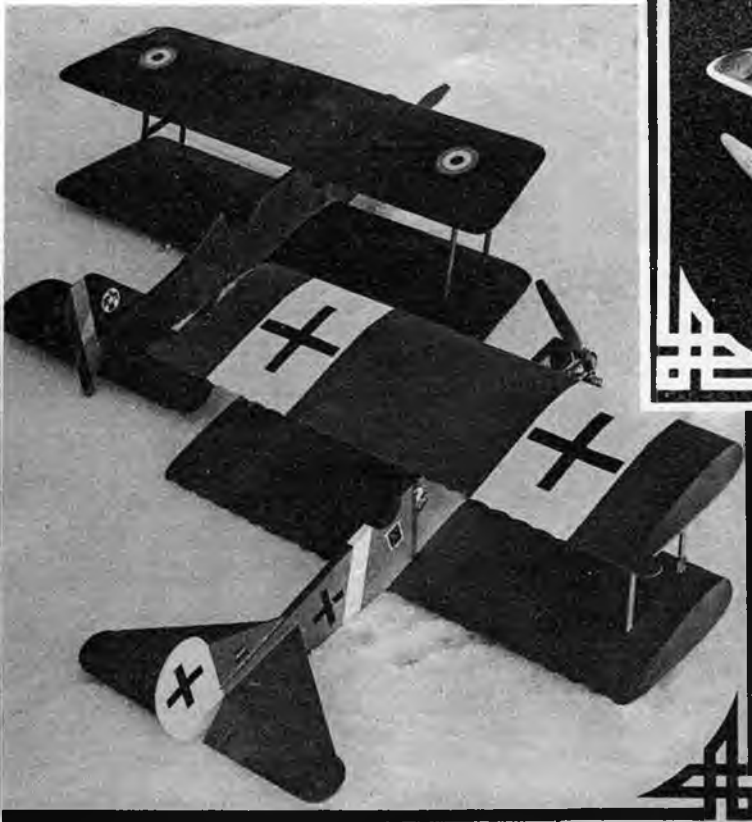
March 30th
SMAE MIDLAND AREA FREE FLIGHT RALLY - OPEN RUBBER, OPEN POWER, OPEN GLIDER, COMBINED MINI, HLG, CO₂. Venue A: Barkston Heath. Contact: G. Ferrer Tel: 0533 886519.

March 30th
N. AREA VINTAGE & PANNETT. VINTAGE O/P & O/G. Airfield must be cleared by 6pm. Venue B: Church Fen-ton. Contact: Jim Moseley Tel: Leeds 864026.

April 5th-7th
FF CENTRALISED THREE DAY. SAT - CLUB CHAMPIONSHIP O/G, O/R, O/P. SUN/MON - EURO TRIALS F1A, F1B, F1C. Venue A: Barkston Heath. Contact: Mike Fantham Tel: 01-736 7163.

April 6th
TYNEMOUTH RACING RALLY. F2C, 1/2A. Limited access SMAE or SAA only. Venue C: Albemarle Barracks. Contact: R. Wilson Tel: 0632 881127.

April 13th
ELMBRIDGE AEROBATIC CONTEST. F2B, NOVICE AND JUNIOR. Venue D: Fairstile Common. Contact: R. C. Large Tel: Mogador 3288 after 7pm.



Have fun Claus Maikis'

PROFILE DESIGN PHILOSOPHY

My aeroplanes are, I believe, well known for being not so ugly. It would appear that I don't spare any effort to produce attractive models, yet in fact I save much work, by using very simple construction methods. Designing simple aircraft is as much a challenge to me, as drawing beautiful lines. Furthermore, you can combine both targets – one doesn't exclude the other, simplicity can produce elegance. Since I seem to have a special liking for beautiful airplanes, and for simple solutions, I can hardly ever resist the temptation to design a nice profile model now and again.

Many of these designs I don't actually build myself. Sometimes I'm lucky enough to find a sport flyer who is tired of that *Nobler*, or a newcomer who wants to fly a cute biplane. Beginners, especially, don't like stark functional designs, they are more easily motivated by good looks. In most cases, outstanding world class aerobatic performance is not of prime importance.

My philosophy when designing these airplanes is to put away all aerodynamic literature, hide the slide ruler, and loan my scales to the butcher! The outlines are judged by eye, all-important dimensions are determined by intuition learned from my 'real' stunters, or at most, from a look

into the catalogue of the biggest manufacturers. All materials, sizes and thicknesses, must be available at the tiniest hobby shop, definitely no specialist parts. A prime consideration is reducing the number of component parts and also the number of materials. As many parts as possible are cut from the same piece of wood – this cuts costs. Sometimes this means making one part stronger than might be necessary – don't worry about this, these aeroplanes are not intended to win the Gold Trophy! Special complicated building methods are out. My profile designs are ideal as beginner models, easy and fast construction is the main priority. The airframe of such a model can be built in one weekend.

Although some of my bigger models are able to fly the complete FAI schedule quite well, the main purpose of such designs is FUN! It's no fun to own an ugly crow. So I spend a lot of time persuading the builders to do a fine paint job. I think the results are always worth the extra effort.

GREAT LAKES BIPLANE

Near to my home there is an airfield with a small aircraft factory nearby. The owner builds and rebuilds old timers for publicity and movie purposes. Sometimes you can see aircraft such as a *Great Lakes Biplane* which he has sold to a private customer. One day I was lucky enough to pass by

when the new owner got some instruction flights. This cost me several rolls of film!

At the time, I was looking for a popular biplane outline for my models, and this was the impetus for me to start building. I didn't intend to build a scale model nor even semi scale, so I didn't care about dimensions. For those interested in details, *September 1961 Aeromodeller* features the aircraft (1/48 x 1/36 scale drawings available, No 2748 price £1 inc p&p). I didn't make higher demands on the airplane than for it to fly the FAI schedule recognisably. So a 29 or 35 engine seemed appropriate. I've always preferred this engine size, even for beginner models.

A few words about engines seem necessary here. Since there are no volume restrictions for sport flying and stunt aeroplanes, we are not interested in a high specific power output. If we need more power, we simply take more volume and use a larger engine. The prime criterion – all other things supposed equal – is the weight of the engine. Many of the more powerful and more expensive 15 or 20 size motors are nearly as heavy as a standard inexpensive Fox 35 or O.S. Max 35. Now these engines have twice the power, so there is little sense in using an expensive small motor. Even the new Schnuerle 19s have less power yet more weight than the 35, remember we are not looking for speed and will need to use a typical stunt size propeller. At least, an old, well run 35

Great Lakes-

At first glance the Great Lakes profile Biplane set in front of these old hangars, gives the impression of the full size machine. Yet nothing is to scale, the model is merely a cartoon of its big brother, but no less enjoyable to fly.



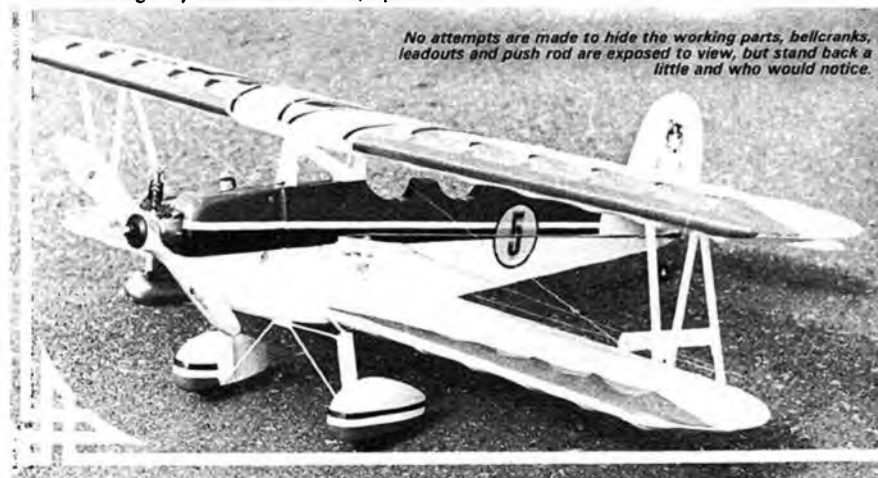
still gives less trouble than any 15, so I strongly recommend a larger size. As I had an old 29 without an airplane screwed to it, the *Great Lakes* was designed for this motor.

If there is any aerodynamic finesse hidden in this design, I am not aware of it. All my ingenuity was used up concentrating on simplicity of construction. So it's not necessary to give lengthy building instructions. The wings follow well known building practice. The centre rib of the top wing is added after joining the leading and trailing edges with a plywood stiffener, while the bottom wing is built in one piece of course, and don't forget the wing tip weight on the outboard panel. When completing the fuselage, cut the slot for the bellcrank support after adding the doublers, but be sure to find the correct location on the engine bearer. A slot is cut at the rear for the tailplane but don't install tailplane and landing gear now. First glue the bottom wing into place, checking carefully the right angle from the front and in plan view. Now cut slots into the centre rib of the top wing to take the centre struts. With a rib template, one can mark the airfoil outline on the struts so that one knows how deep the struts plunge into the wing, they run to the centre line of the rib. Now install the top wing, watch carefully for the incidence - parallel to the bottom wing.

Now the other wing struts are added. I usually mark the centre lines of these ribs to which the struts are glued. If the struts are of equal length, alignment is very easy. Some scrap pieces around the strut should be a useful support for the covering. Now add the remaining parts. The connecting wire for the elevators lies in a groove which is filed into the underside. It is covered with a plywood stiffener, the top side being strengthened with glass cloth, then RC type plastic control horn is installed on the left side. The main landing gear is installed with nylon saddle clips bolted through the fuselage. Then the strut wires are soldered to the main gear. When making any tank attachment, I pre-

fer the tank to be installed a little higher than the engine centre line. If you prefer, you can add some bracing wires. They look good but add lots of drag, but who cares if you fly for fun? If you intend to fly on grass, don't use the wheel fairings. I've had problems getting off the ground even on lawns of English cricket quality. Balance the airplane at the leading edge of the bottom wing.

Now I'll leave it up to you how many nights you want to spend on the finish. This type of model lends itself to a vivid colourful paint scheme, so I think bright colours are more important than high gloss. After all, this aeroplane is intended to give you fun at building and flying. Competition judges won't be much impressed by its aerobatic performance, but everybody else who sees it fly will love it, when you open those "hangar doors" and roll out your *Great Lakes Bipe* - Have Fun.



No attempts are made to hide the working parts, bellcranks, leadouts and push rod are exposed to view, but stand back a little and who would notice.

TOP PLANES

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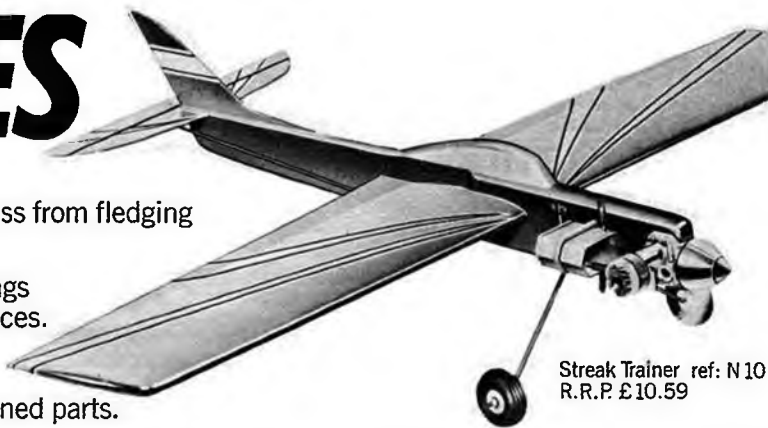
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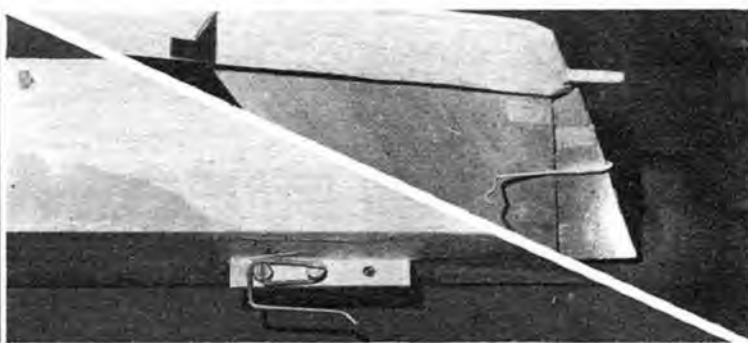
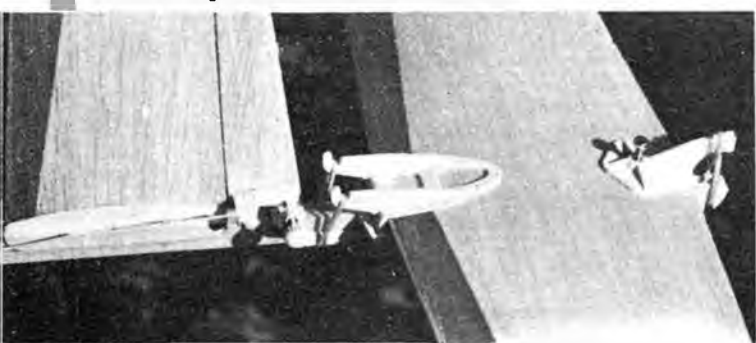
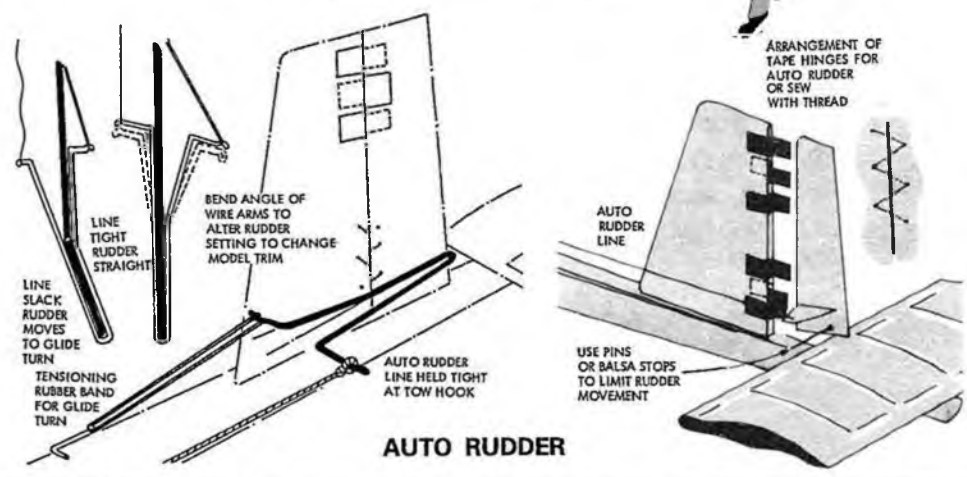
THIS MONTH:

FITTING SIMPLE AUTO RUDDERS AND DETHERMALISERS



HAVING DISCUSSED the construction of beginners' gliders including the covering stage, and mentioned in passing such mechanisms as Auto-Rudders and De-thermalising systems, it now seems sensible to consider the functioning of these devices in more detail. Model gliders have two conflicting requirements for flight: they must fly straight whilst being towed up into the air on the towline; when released from the towline they must fly in wide circles to prevent them flying too far and to make the most of any thermals. Let us look now at ways this can be achieved.

When your glider has been set up for flight, it will have a gentle turn either to left or right. The amount of turn applied is controlled by the rudder, and this becomes effective the faster the model flies. During the tow launch, the model is



Above: Injection moulded plastic fittings on Graupner UHU glider makes AR and DT fitting easy. Note hinged rudder on fin with horn to pull rudder straight and screw adjuster to alter trim. Tail plane is fitted with hold down-tip up tail yoke, while trailing edge is held by separate DT band ready for fuse operation.

Above: Adjustable position tow hook, bent down at rear to accept auto rudder line on KK Caprice with hinged rudder and wire arm and rudder trim adjuster on fin.

pulled through the air at a speed much faster than normal gliding speed, the rudder pushes harder and the model will veer off to one side!

The obvious solution, therefore, is to have an adjustable rudder that can be set straight ahead for the tow, and then deflect to start turning flight with release from the tow. Some of the kits we have built incorporate such a device, called an **Automatic Rudder (AR)**. Although varying in detail design, they all work on the same principle with the rudder being held in the deflected "circling position" by a rubber band, with the "straight ahead" position being obtained by a cord being pulled forward while the tow ring and line is attached. The movement of the rudder is limited by stops, which can be adjusted

to allow fine trimming. A most impressive auto-rudder mechanism can be found in the *Dax* kit, with injection-moulded plastic parts incorporating screwed adjustable stops. A simpler, but equally effective design can be found in the *K.K. Caprice* and *Cambria/Mistral* kits. This consists of a piece of wire bent to form both an attachment point for the operating cord and the tensioning band, and which can also be adjusted to alter the angle of movement of the rudder.

The rubber band used to pull the rudder over to its deflected position should be just strong enough to hold the rudder over against the very small air loads, yet not so strong that it puts too much tension on the Auto Rudder line. Hinges for the rudder must be free to operate without binding,

and the commonest method is to use cotton tape or sewing thread, or two pairs of crossed tapes. The main trouble with hinges is that they can become blocked with dope when the model is being painted, so take care of hinge after dopping.

The cord which pulls the rudder straight is released by one of several methods. A lever hinged above the tow hook can move fore and aft alongside the hook. With the cord tied to it, the rudder deflection pulls the lever to the aft position. When the tow ring is slipped onto the hook, the lever moves forward and so pulls the rudder to the central position. It is useful to have a small rubber band in the line to allow some "give" in the system.

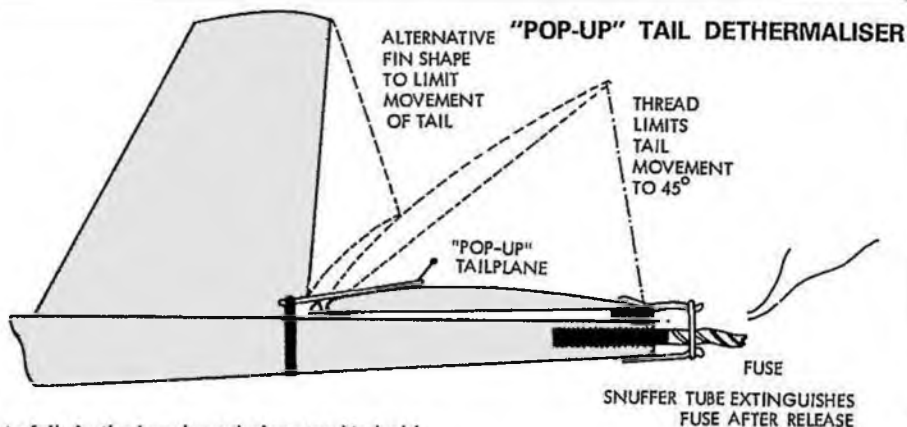
A simpler method is to bend the rear of the tow hook down slightly, and hook the

operating cord to this, using a rubber band, after the tow ring has been positioned. On reaching the top of the launch, the tow ring will fall away from the hook and release the cord. Obviously the attachment of the rubber band to the hook must not be too secure, otherwise difficulty in release will be experienced.

Another old established method, favoured by most flyers, is to loop the forward end of the cord over a small pin which is a loose fit in a tube secured in the fuselage. The pin is attached to the tow line by another short length of cord, such that when the tow ring falls from the hook, the pin is withdrawn and the rudder released. The amount of deflection required by the rudder will be determined during test flying, but as a starting point, about 10°–15° offset should be ample.

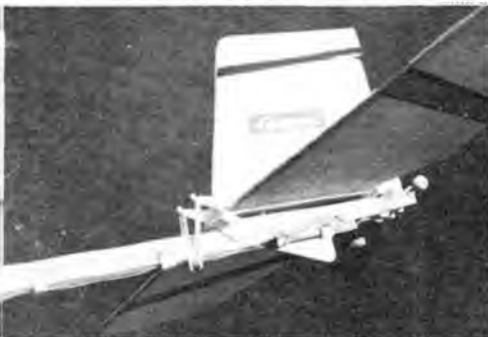
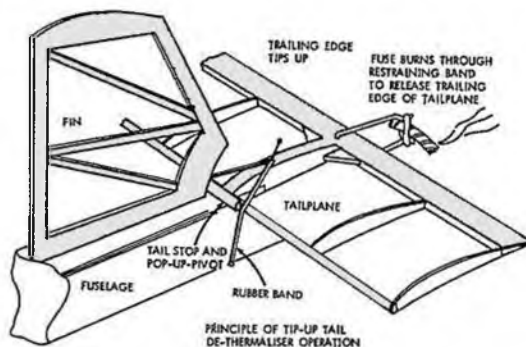
An essential mechanism for gliders with a reasonable flying performance is the tip-up tail **Dethermaliser**, (DT). A glider in circling flight can easily enter a column of rising air, called a thermal, and be carried up for a longer flight. However, models can be lost, because they literally refuse to come down. It is therefore desirable to put a limit on the time the model should be allowed to stay aloft, using a method of bringing the model quickly and safely to earth after a predetermined time. This is called a Dethermaliser, and the commonest method to be seen is the tip-up tail.

A timing device fitted to the model trig-



to fail. As the band was being used to hold down the trailing edge of the tailplane, and because of the way the tailplane is mounted, it is now free to pop up. Dethermaliser tailplanes are invariably mounted on top of the fuselage, and the leading edge forms the hinge. rubber bands are used to both secure the leading edge to the fuselage and, by means of formed wire, apply a load which tips up the trailing edge when it is released. The angle of tip is limited by a piece of cord between the fuselage and the tailplane trailing edge, such that when released, the tailplane is at an angle of 45° approximately.

The effect of this sudden change in configuration on the model is to put it into a "super stalled" condition, and it para-



Pre formed plastic mouldings also used on Carrera Dax glider, enabling AR and DT to be assembled simply like any plastic construction kit. Left, line to clockwork DT timer at nose holds down tail; until line is released allowing tail to pop-up to 45°, right.

gers off the tailplane after a predetermined time decided beforehand. Clockwork **DT timers** can be used, and are shown on the plans of some German kits, but a cheaper alternative is to use a slow burning fuse, sold as **DT fuse**, both are available at your model shop. Alternatively, you can make your own by soaking lamp wick in a solution of potassium nitrate (saltpetre). The burning rate should be between 10 and 25 mm/min, but try a piece before you use it on your model. The wick often has a red spiral thread running through which helps in estimating the burning rate, one section equalling approx 90secs. In operation, the wick is passed through a small rubber band, so that after it has burned for the requisite time, it burns through the band causing it

chutes to earth in a level attitude. The speed of descent is enough to drop it out of a strong thermal, but not so fast as to cause damage on landing.

A note of caution when using smouldering fuse: this can prove a hazard both to the model and to other people's property, as your friendly neighbourhood farmer will not appreciate a smouldering piece of fuse dropping into his haystack! Some means of preventing the fuse from setting fire to either the model or the surrounding countryside is required. To protect the model, a piece of aluminium kitchen foil stuck to the fuselage under the fuse position with Evo-stick will absorb and dissipate the heat, while to extinguish the fuse and prevent it falling from the model, a snuffer tube should be made. This is sim-

Above: Small piece of D.T. fuse, sufficient for 2 minute flight. Do not light directly as shown because of fire risk, instead light from fuse already smouldering.

ply a tube made from tin plate or alloy cut from a soft drinks can rolled round a 4.5mm dia dowel, which carries the fuse such that after burning through the rubber band, it is extinguished inside the tube. The fuse should be a good fit in the tube, to guarantee the fuse is extinguished. Be particularly careful when lighting the fuse in sunny weather, as it is difficult to see the flame. A rapidly spreading brown stain over the surrounding area means you have set light to your model! The best idea is to light a separate piece of fuse away from the model and use that to light the fuse for flight.

Having now covered most of the intricacies of model glider construction, our next article will describe the culmination of all the hard work – the first flights.


 AIRCRAFT
DESCRIBED

Spartan Arrow

OFTEN FORGOTTEN; but still frequently mystifying the present day spotter by the appearance of a lone survivor, the *Spartan Arrow* is a fascinating relic of the thirties. Contemporary with the D.H. *Gipsy Moth*, Avro *Avian* and Blackburn *Bluebird* light aeroplanes, the *Spartan Arrow* was the natural outcome of the original Simmond's *Spartan* design of 1928.

Those familiar with the first *Spartan* will recollect that it had an ingenious method of obtaining component interchangeability, for by using a symmetrical wing section it was possible to fit one wing to any of the four positions on the aircraft! Similarly, the rudder was interchangeable with part of an elevator and one half of the undercarriage structure was common to both port and starboard sides, features which are rare indeed.

In the *Spartan Arrow*, the symmetrical wing section was deleted and a non-symmetrical high lift wing section adopted. Interchangeability was, however, still preserved by making the wing tips and trailing edge portion aft of the rear spar detachable; thus it was possible to use the wing tip and aileron at either end, depending on which side of the fuselage the wing was to be fitted. The two halves of the undercarriages were still interchangeable, but the tail unit had an entirely new shape from that of the *Spar-*

tan. It was hoped that these features would simplify the question of replacement in the event of damage.

The construction of the *Arrow* followed along orthodox lines, the fuselage being of the familiar spruce and plywood pattern, the wings being built up from 'I' section spruce spars and girder type ribs with fabric covering. The wings could be folded, enabling the machine to be stored in an average sized lock-up garage. Provision of Handley Page type automatic slots was optional, the complete arrangement being supplied as a unit capable of being fitted in a very short time.

Petrol was carried in either a 22 or 34 gallon gravity tank situated in the top centre plane, giving the machine a range of 300 or 500 miles depending upon the tank capacity. Early models had ailerons on all four wings, but later production machines had them on the lower planes only.

Although it never proved as popular as its near relation, the *Spartan Three-Seater*, about fifteen *Arrows* were registered in Great Britain. They were used by a number of private owners and by the Isle of Wight, Romford and Portsmouth Flying Clubs for instructional purposes. The prototype, G-AAWY, made its debut in May, 1930, and the second machine, G-AAWZ, was still in service with the Portsmouth

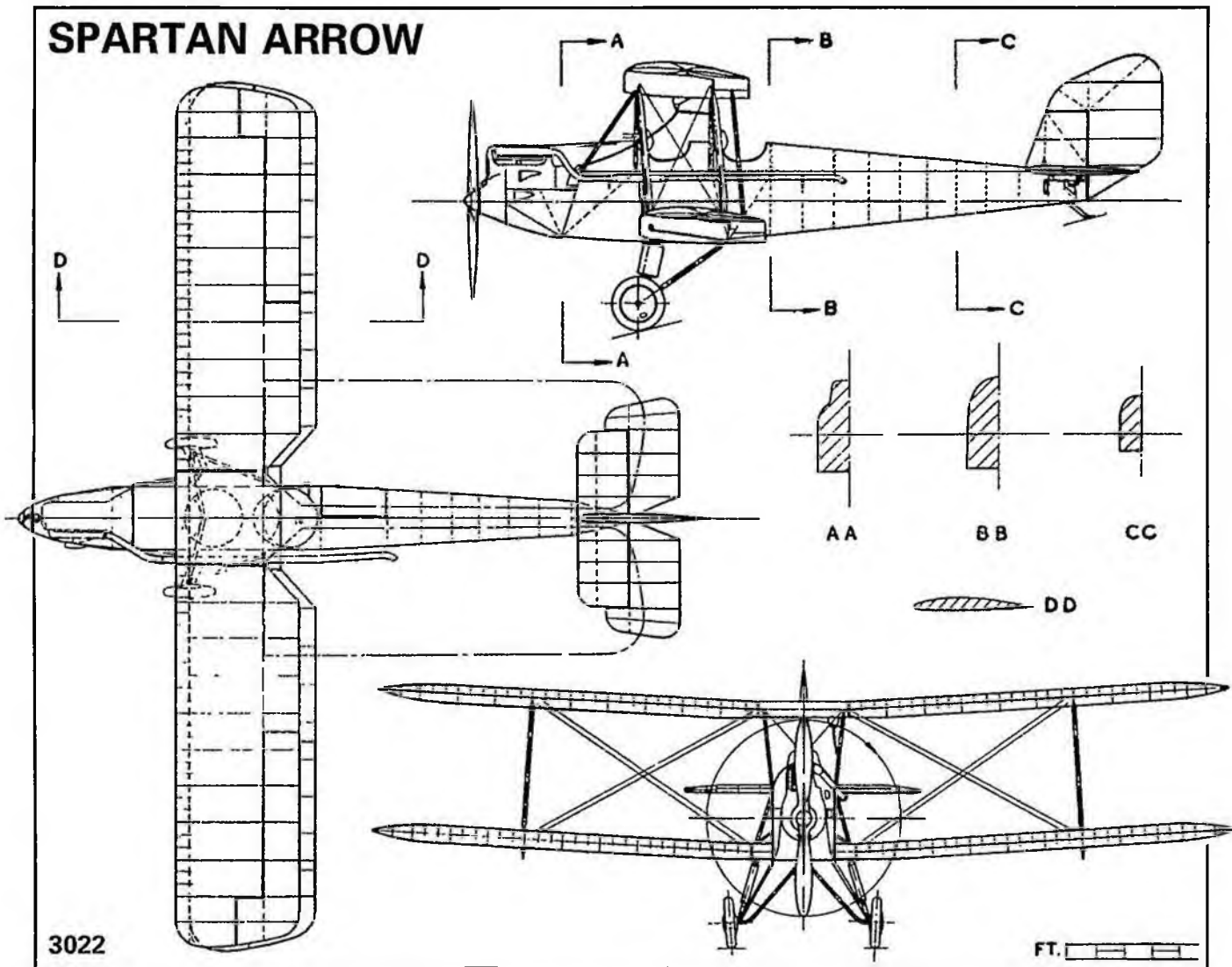
Club at the outbreak of war. Both these machines, together with a later model, G-ABBE fitted with a D.H. "Gipsy II" motor, were entered in the 1930 King's Cup air race, but their performance was disappointing.

'BR and 'WZ finished 54th and 58th at average speeds of 100.4 and 94.3 mph respectively, having failed to make up their handicap allowance, and 'WY retired during the course of the race. One of the later models, G-ACHF, was owned by the Romford Flying Club at Maylands, Essex but was destroyed in a fire during February, 1940. It had a red fuselage with white registration letters and silver wings and tail surfaces.

G-ABWP, however, still survives after a few dormant spells in store. It is powered by a Cirrus Hermes engine and coloured pale blue and silver. As can be seen in the *Air Portraits* photographs, the 48 year old biplane is extremely well cared for by its present owner Ray Blain of Ashton under Lyme and will we hope celebrate its Golden Jubilee in style during 1982

Specification: Length 25ft 0in; span 30ft 7in; height 9ft 6in; wing area 251 sq ft; tare weight 965lb; loaded 1560lb; speed (max) 106mph; landing 40mph. Engines fitted: D.H. Gipsy I or II, A.D.C. Cirrus III and Hermes I four cylinder in line aircooled units.

SPARTAN ARROW



THIS MONTH:

PRE FLIGHT CHECKS LEADING TO YOUR FIRST R/C FLIGHT



THE MODEL OF YOUR CHOICE, is hopefully now built, covered and with all the necessary installations completed. You may now sit back and gloat over your creation, better still take a colour photograph as a permanent reference. No matter how long or short your career as an R/C aero modeller, this first aircraft will always have a special place in your memory.

Before dashing out to prove or disprove the designer's aerodynamic skills, there are a number of pre flight checks which must still be carried out. Care, attention, and patience will be rewarded if nothing (well hardly anything) is left to chance.

marked CG position. If the CG is too far forward however, the model will emulate a very expensive and fragile bomb, burying its nose into terra firma with realistic tearing and splintering noises.

Having emphasised the point, let it be said that a latitude of 5–10 mm forward is generally acceptable. Balance can be checked by placing fingers under the wing at the appropriate position, but a more satisfactory method is shown in Fig 1. The plywood plate is positioned over the CG and held in place by the wing bands. A string is attached to the hook and the model suspended. The aircraft should

hang as if in level flight which often means that the tail appears to be held slightly high. Lead ballast must be fitted at either nose or tail to achieve correct balance. Place the ballast at the extremities of the model and ensure that it is very well secured. Even 50 grams of lead flying about inside a model after a violent manoeuvre or hard landing can cause considerable damage. If possible use bolts and epoxy adhesive. Very often correct balance can be obtained by repositioning the Receiver battery pack or servos. Don't forget to correct the imbalance resulting from a heavier wing tip at the same time by ballasting the lighter tip as required.

If for any reason the CG position is not apparent from the plan use 30% of the wing chord, eg. with a wing chord of 200mm the CG will be approximately 60mm behind the leading edge at the wing root.

CORRECT CONTROLS

No doubt the various controls were checked when installing the radio equipment but now is the time to ensure that all controls are at neutral when the transmitter stick and trim tabs are centralised.

The movement of the control surfaces should be given on the plan or in the building instructions and must be adhered to. There is always a danger of the beginner over controlling the model, and it is therefore better to de-sensitise the controls by reducing the amount of available movement. There are two ways of doing this, either by using one of the holes in the servo arm close to the pivot point, or by

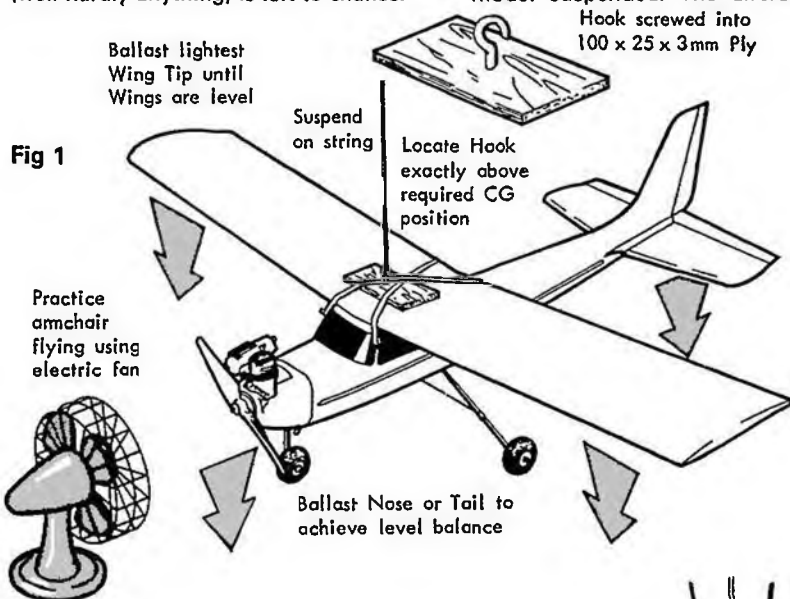


Fig 1

CORRECT BALANCE

Every plan gives a recommended centre of gravity (CG) normally shown as a heavily inked arrow head but sometimes shown as a circle with alternate black and white quarters. This is not for decoration! It is essential to get the CG or balance point in the correct position, otherwise the model simply becomes uncontrollable! Too far back, and at best the model will become critically sensitive to control and very "twitchy", at worst it simply will not fly even if you can persuade it to take off at all. It is quite acceptable for the model to balance on or slightly in front of the

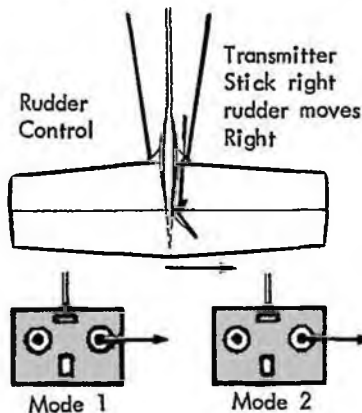
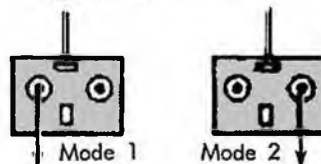


Fig 2

Transmitter Stick back elevator moves Up

Elevator Control



Mode 1

Mode 2

Aeromodeller



Having established that the model has been built accurately, balanced correctly and that all controls have been connected properly it is then necessary to test all systems will function correctly with the motor running. Engine vibration can often aggravate faulty workmanship, and it is best to discover this before the model takes to the air. Hold the model nose up to check adequate fuel feed to make sure the motor does not cut on launch.

using the outside hole in the control horn which is fitted to the flying surface. A combination of these will of course provide the correct amount of movement.

Position yourself behind the model, switch on the transmitter (TX) and receiver (RX) and now check that moving the stick right produces rudder to give a right turn, and moving the stick back produces elevator for climb, Fig 2.

The throttle control should be set up so that stick forward and trim forward give full throttle, stick fully back is tick over, and stick back with trim fully back shuts off the engine. Of all the controls this one is often the most difficult to set up properly. However, perseverance with adjusting the pushrod length by screwing or unscrewing the clevises, and moving control ends from one hole to another is repaid by reliable engine throttling.

Finally check that there is no undue friction in the control runs or between push rods even at the extremes of servo travel (including full trim adjustment). If, at full travel, a servo starts "buzzing" it is in a stalled condition and the control run is being impeded. Correct the fault or obstruction immediately, since a stalled servo will lead to a high current drain, loss of control, and crash!

In case of a "fly away", all my models carry name, address and telephone number, together with an offer of reward to cover out of pocket expenses, if found and returned. Any unobtrusive position will do. This simple precaution is well worthwhile if engine, model and airborne radio pack are returned.

ARMCHAIR FLYING

How good is your imagination? Our next step is some armchair flying. A helper is required who will hold the model up and change its attitudes in response to your movement of the control sticks. "Is this really necessary?" do I hear. Well, if not essential, it will certainly prove beneficial, since the very basic ground rules can be

learnt and mistakes corrected without expensive damage. Practice first of all with the model flying away from you, this is certainly the easiest attitude since right stick sends the model off to your right, pull back and the model climbs, or vice versa. Next ask your helper to stand with the model sideways on to you. Up and down are still easy but turns are slightly more difficult to grasp. Finally have your helper stand with the model facing you. Climb and dive still easy but what's happened to the turns? Right stick and the model goes off to your left! Confusing, isn't it? But better be confused when you are in the safety and comfort of your front room than on a windy flying site with your new model in a screaming spiral turn and terra firma rushing up to meet it. Another idea which is really fun is to armchair fly your model with it suspended in the blast from an electric fan, you will be surprised how the model responds to changes of control whilst suspended in the airstream. Having mastered the above, and provided your helper is still willing, try correcting from various attitudes (set by your helper) back to level flight. Concentrate especially on situations where the model is pointing at you, and at first correct lateral position, so that wings are horizontal to the ground, rather than pitch nose up or down.

WIDE OPEN SPACES

Having passed out as an armchair flyer, the next stage is the biggest and best. Choice of weather and site are most important. Preferably not a sunny day (you don't want to get dazzled), good visibility, and a light wind. Don't forget that if power flying, engine noise may be a nuisance to nearby residents, only choose sites well away from residential areas and always use an effective engine exhaust silencer. Before venturing out to the flying site the following final checks should be made:

Model

1. Radio equipment fully charged or fresh dry batteries

2. Radio operates correctly and 100% reliably
3. Range check radio (25m with aerial down)
4. Visual check of airframe for damage or signs of wear.
5. Visual check of engine and fuel lines.

Field box

1. Transmitter and correct colour frequency penant
2. Fuel and squeeze bottle to fill the flight tank
3. 2-volt starting battery glow clip and leads
4. Tools – plug spanner, propeller nut spanner, screwdriver, pliers, small adjustable or BA spanners
5. Accessories – propellers, wing retaining bands, cloth for wiping model.

At least six wide elastic bands, fully stretched, should be used to hold down the wings and tail. It must be possible to support the model by its wing tips without the fuselage 'sagging' away, and it should not be possible to lift the flying surfaces away from their mounts.

If this is to be your first flight you should always arrange for an experienced flyer to flight test the model and teach you how to fly. There is no doubt at all that this is the best introduction and method of learning. In the first place, an experienced 'pilot' will quickly be able to ascertain in the first place if the model you have built is even capable of sustained flight! Some adjustments are always necessary, and he will be able to trim it as necessary to make it fly properly. A novice pilot with a 'twitchy' model will not be able to differentiate between his inexperience and a model which is badly out of trim. He will invariably blame the model! Secondly, an experienced pilot, given sufficient



Problems of orientation usually arise in situations like this with the model flying towards the pilot, when right rudder actually sends the model to the pilot's left! The trick to remember is "push the rudder stick towards the dipping wing" – it works every time!

altitude, will be able to extricate the model from unusual attitudes! (Full power inverted nose dive.) Provided, of course, that you are prepared to give up the transmitter. Most beginners when faced with the unexpected, freeze to the transmitter like a limpet to a rock, defeating all efforts at wresting the box from their hands. You should make enquiries at your local model shop or contact your local model flying club for their assistance with some tuition, which they will most likely be pleased to offer at no charge.

There are occasions however when an experienced man is not available, although this is definitely NOT recommended, you will have to go solo at some time, so we will run through the sequences of preflight check, take off, circuit, and landing.

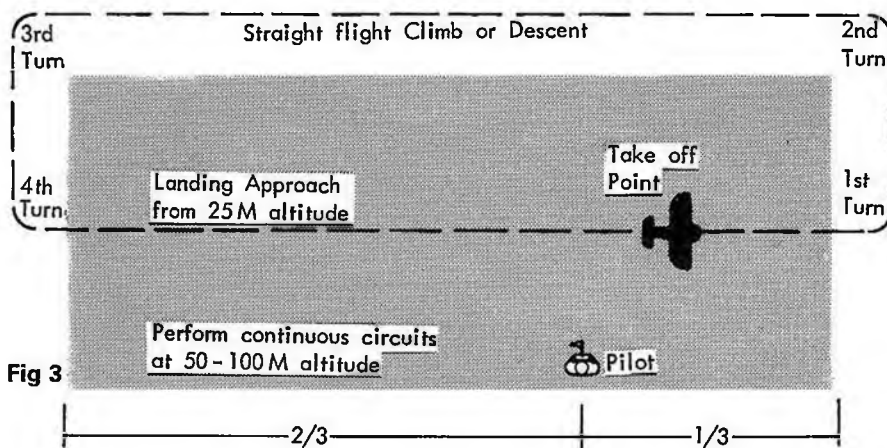


Fig 3

<p>Taxiing - Face model into wind Rudder - Used to correct veering Elevator - Keep Neutral Throttle - 100% Full power</p> <p>1</p> <p>Model taxis along runway or is hand launched</p> <p>Keep model on course into wind and allow to accelerate</p> <p>A</p> <p>Mode 1 Mode 2</p>	<p>Take off - When model achieves flying speed 20-30 M Rudder - Use to correct veering Elevator - 25% up elevator Throttle - 100% Full power</p> <p>2</p> <p>Keep model on course gently pull up elevator allow to climb to 50-100 M</p> <p>Model climbs away at 20°-30°</p> <p>B</p> <p>Mode 1 Mode 2</p>
<p>Turn - When model achieves safe altitude 50-100 M Rudder - 25% left turn Elevator - 10% up elevator Throttle - 50% Power</p> <p>3</p> <p>Model banks and turns to left</p> <p>Throttle down initiate turn with gentle rudder. Keep nose up using Elevator</p> <p>C</p> <p>Mode 1 Mode 2</p>	<p>Cruise - Straight and level practice climbs and descent Rudder - Neutral Elevator - 10% up or down Throttle - 25%-75% Power</p> <p>4</p> <p>Wings horizontal model flies straight</p> <p>Gently pull up Elevator or open throttle to climb Gently push down Elevator or close throttle to descend</p> <p>D</p> <p>Mode 1 Mode 2</p>
<p>Approach - Line up downwind for steady descent Rudder - Use to keep wings level Elevator - Neutral Throttle - 25% Power</p> <p>5</p> <p>Wind Continuous descent into wind towards landing area</p> <p>E</p> <p>Mode 1 Mode 2</p> <p>Throttle back for gentle descent or wait for motor to stop then glide down</p>	<p>Landing - Flare out descent for touch down Rudder - Use to keep wings level Elevator - 25% Up Throttle - 10% Power</p> <p>6</p> <p>Descent flared out to touch down on rear wheels</p> <p>F</p> <p>Mode 1 Mode 2</p> <p>Just before touch down cut throttle and flare out approach with up elevator</p>

TAKE OFF PREPARATION

1. Position yourself in the field as in Fig 3.
2. NEVER switch transmitter on without checking that other users are not on your frequency. If all clear, switch on TX first, followed by RX. Always observe this sequence so that any spurious signals do not activate the RX. Always switch off in the order RX then TX for the same reason.
3. Fill tank and start engine. If this is your first flight, only partially fill the tank for a minute or two's running.
4. Adjust needle valve for optimum setting, checked by holding the model at 45°
5. Visually check correct operation of radio and all control surfaces with engine running at full throttle.
6. Face model into wind, release, with throttle open to full extent.
7. Once a safe altitude has been reached, 50-100 metres, the engine may be throttled back to cruise, and rectangular circuits practised

LANDING PREPARATION

Landing must ALWAYS be performed with the model flying into wind to reduce effective ground speed.

On the landing approach the most important aspect is to keep the wing level to the horizon, this prevents one wing tip catching first and producing a subsequent cartwheel!

When flying around practice 'flat' turns, with a minimum of banking, this develops smooth co-ordination of rudder and elevator control.

Remember that altitude means safety. Most trainer models will recover themselves "hands off" if the TX sticks are left alone - provided the model has sufficient altitude.

After the flight, clean the model down with a cloth, and when you get home wash the model all over in warm water with a dash of liquid detergent. Next month we will look at first flights for slope and thermal soarers. Meanwhile - happy landings.



SPRITE

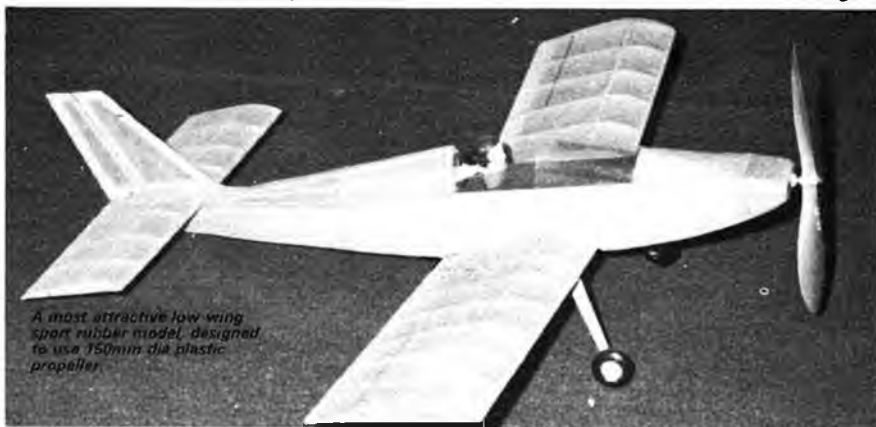
by Richard
Preston

470mm SPAN SPORT RUBBER MODEL

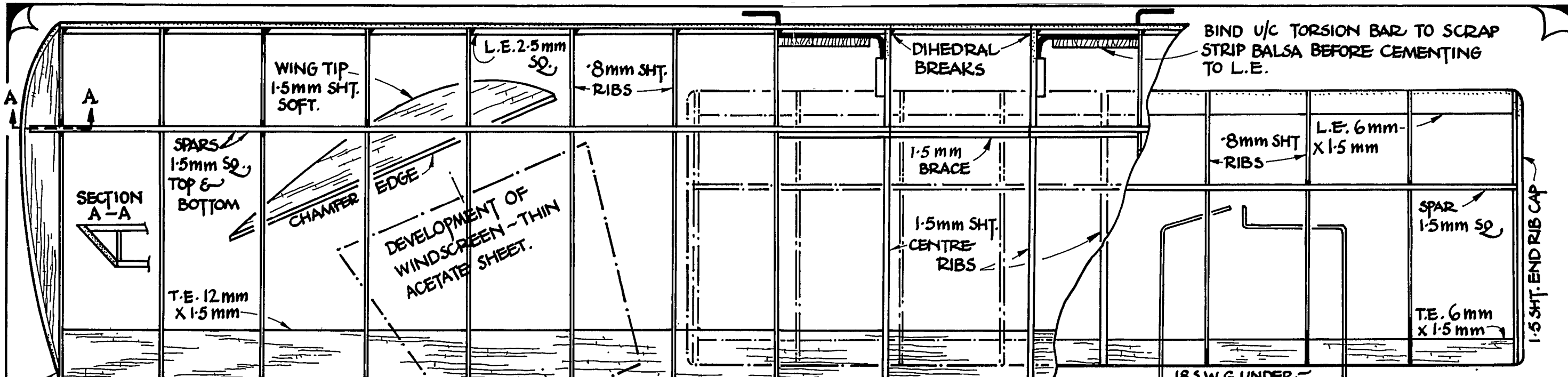
SPRITE WAS BORN out of a requirement for a small sporty-looking, rubber powered model that was easy and quick to build, inexpensive, and would fly well on a standard 150mm commercial plastic propeller. For me, it has fulfilled all these requirements, and it looks pretty as well as being a good flyer. However, the smaller a model is, the more critical the weight becomes when good performance is required, so it is essential that the correct grades of balsa are chosen and also that too much adhesive is not used on the joints, as all the little extra blobs of cement add unnecessary weight which affect the performance and trim of the model. (There are 63 separate glue joints in the wing alone.) Lecture over, now let's get started with the construction, start by cutting out all the fuselage formers and fuselage sides from light 1.5mm sheet. When all these parts are prepared, cement the two main formers (F2 & F3) to one fuselage side ensuring that they are perpendicular, when these are dry the other fuselage side is cemented to the formers making sure that everything is square and 'looks right'. When this assembly is well and truly dry the nose former can be cemented in position holding the sides in with elastic bands or better still some adhesive tape, pull the rear end of the fuselage together and cement. If the basic fuselage is all square and straight the rest of the formers and cross braces can now be cemented into position. All that now remains is to add the forward sheeting, windscreen and rear top spine stringers and the fuselage is nearly complete. The fin and tailplane are very straightforward but they must be kept as light as possible. The wings are built flat on the plan as three pieces, left, centre, and right panels, and when all dry the tips are raised up to the required dihedral angle and the joints cemented making sure that each piece

butts up to each other snugly, the centre section 1.5mm square bracing spar can now be cemented into place and also the fillets in the wing roots at the LE and TE. The undercarriage is bound and cemented to a scrap piece of 3mm square balsa which is then cemented to the wing LE as per plan, giving it a forward rake. The only thing left to do now is to laminate the nose block assembly and cover the fuselage with lightweight tissue, preferably Jap tissue as this is much lighter and requires far less dope. Give model just one coat of thinned dope (60% dope, 40% thinners) and remove any warps that may develop by holding parts straight in the steam from a boiling kettle. Keep any embellishments to a bare minimum as extra bits and pieces only add unwanted weight. One thing that is important with an open cockpit model aircraft is a pilot! He can be made quite easily from a small piece of expanded polystyrene carved with a sharp knife and then painted with enamel paint, and his head rest can also be made from this material. Alternatively a profile pilot can be cut from a polystyrene packing tray, which is also very useful for making all sorts of

extras like exhaust pipes, fairings, etc. Install the rubber motor, well lubricated with medicinal castor oil, and make sure the C of G is in the correct place, add nose weight if necessary. Initial trimming is done on a nice calm day with a few dozen finger wound turns on the motor to allow you to adjust for a nice glide, as all the flying surfaces are fixed it was found easiest to use adhesive tape trim tabs and when the required setting had been obtained to replace these with more permanent acetate sheet trim tabs cemented in place. Trim your *Sprite* for a gentle turn to the right, against the torque of the propeller, when under power and gradually build up to a maximum of 650 turns using a hand drill and the stretch method of winding. Because of the ample propeller clearance, *Sprite* will ROG very well from a smooth surface and personally I think a rubber powered model looks very pretty when taking off under its own power. The flight doesn't have to be long to be enjoyable, it just has to be 'complete' from take off to landing. So there you are, *Sprite* should give you hours of enjoyment on those calm summer evenings.

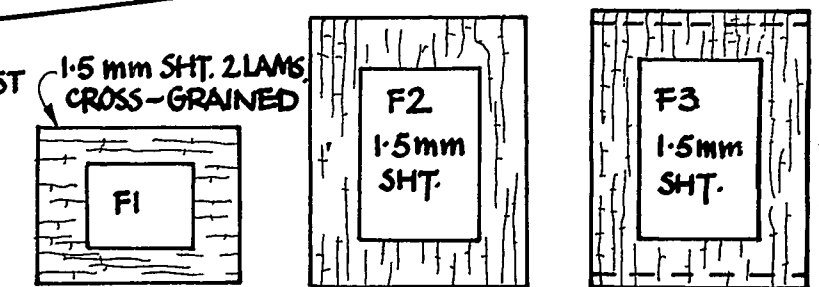
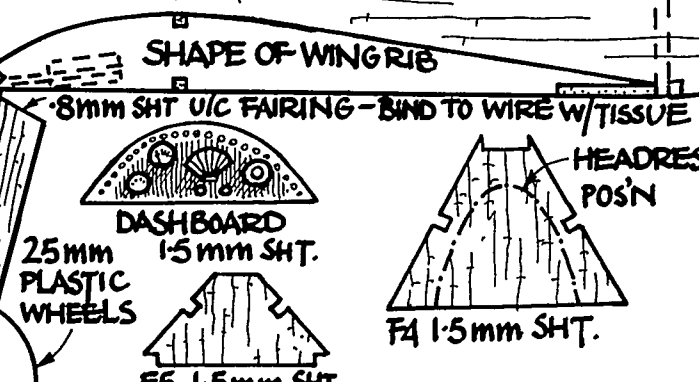
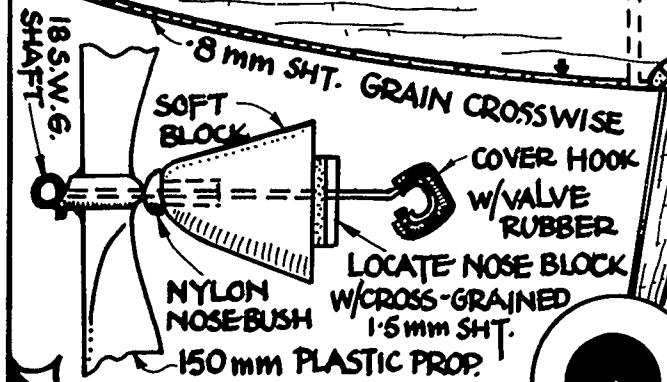
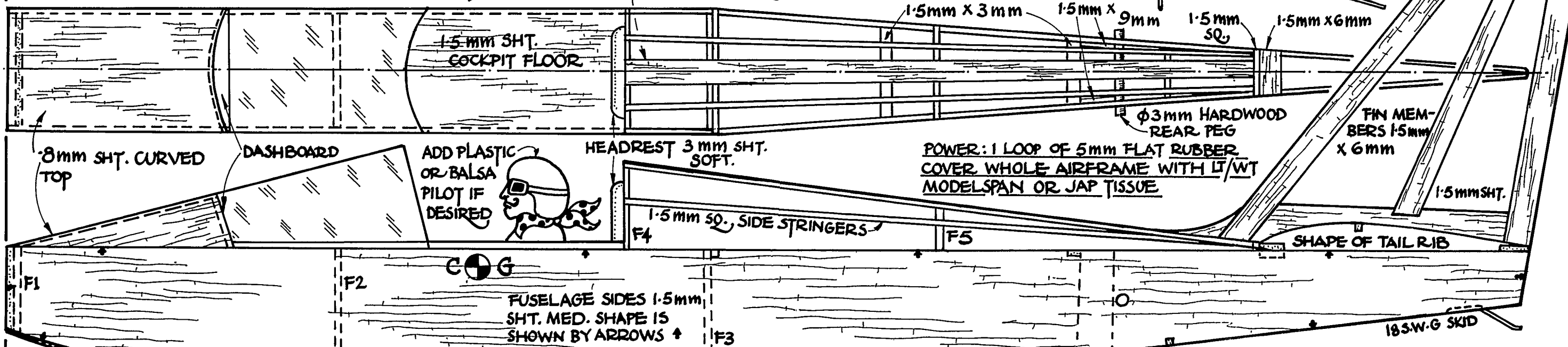


A most attractive low wing sport rubber model, designed to use 150mm dia plastic propeller



32mm DIHEDRAL UNDER EACH TIP

TOP STRINGER 1.5mm x 6mm TAPER AS SHOWN & CHAMFER CORNERS

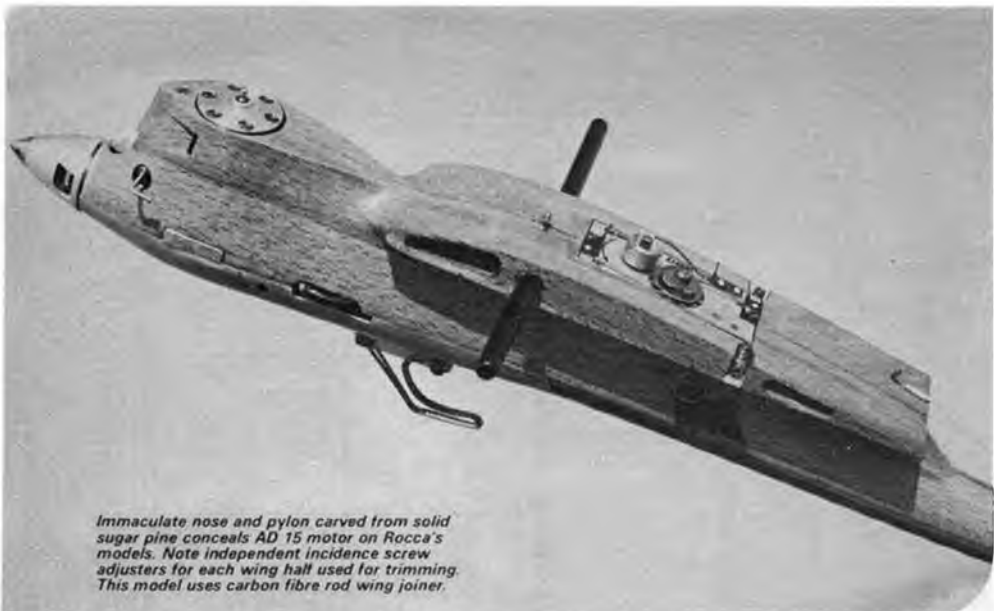


DO NOT COVER THIS BAY



SPRITE
by Richard Preston

AeroModeller Full Size Plans
Centre Spread



Immaculate nose and pylon carved from solid sugar pine conceals AD 15 motor on Rocca's models. Note independent incidence screw adjusters for each wing half used for trimming. This model uses carbon fibre rod wing joiner.

MARIO ROCCA'S MODELLO NO. 2

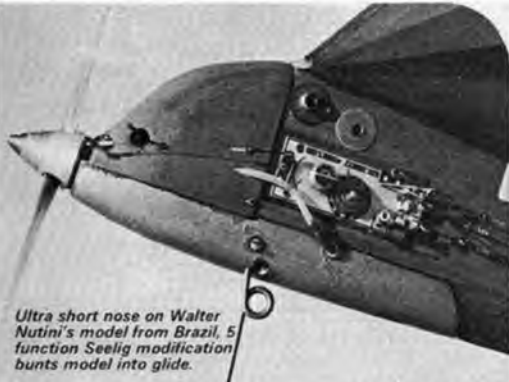
The initial impression of Mario Rocca's World Championship winning design is one of complexity, yet beyond the apparently intricate wing structure lies a model with design and operating principles based on simplicity and embodying a very individual design philosophy. The same aerofoil NACA 4409, is used on both wing and tail producing the effect of a spontaneous diving effect as speed builds up, used to control the climb by inherent geometry rather than relying purely on gadgetry. With CG at 57% and wing at +2° the tail is set at 0° for the climb, a second after flood off a single timer operation moves tail to -2° and rudder to right glide. With no motor brake, for simplicity, the Seelig Timer performs only three operations; flood-off; tail and rudder; and finally DT. In conjunction with the thick aerofoil wings favoured by Mario he prefers low pitch propellers for quicker acceleration which for him produces higher overall climb height. The 180 x 63 carbon fibre propeller

is one of a range made by Mario available commercially which have often been advertised in *Aeromodeller* classifieds (see P57 Jan 1980 issue). Wings and tail are built in the favourite Italian egg box fashion. Using rectangular rib blanks sanded to shape after assembly using a long stiff sanding strip resting on an end aerofoil templates, very speedy construction allows a complete wing to be assembled in a single day, covered with tissue. Fuselage and pylon derive from Mario's previous control line F2A Speed experience, incorporating long alloy pan into a beautifully sculpted cowl and low pylon carved from a solid piece of sugar pine, blending into a glass fibre fishing rod tail boom. The wing mount which uses carbon fibre dowels, incorporates separate incidence adjusters for each wing half set at approx +.8° for the right hand wing, with panels otherwise built flat. The motor used was Albert Dall' Oglio's AD15 originally described on p669 Dec 1978 *Aeromodeller*.

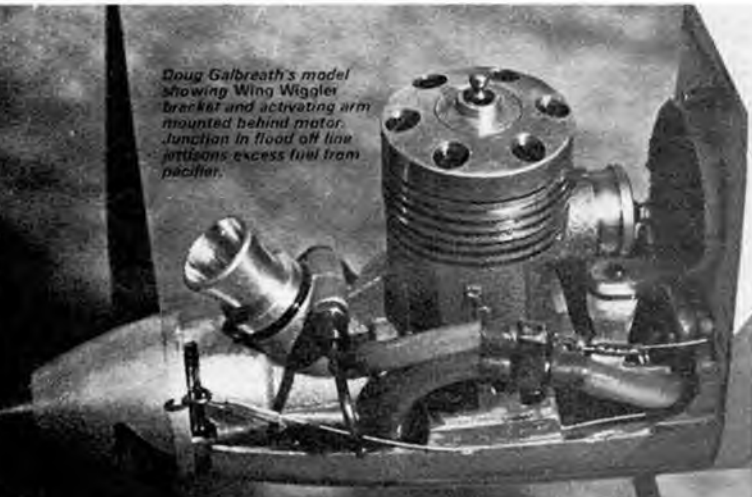
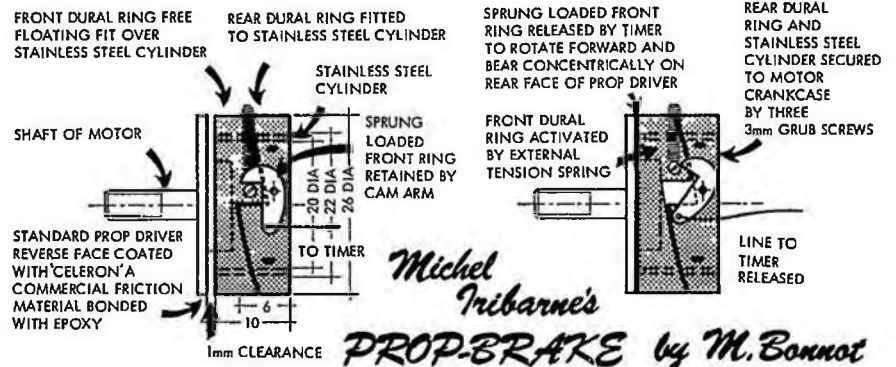
DESIGN TRENDS

The advantages of flapped wings are still generally believed to be outweighed by mechanical complexity, so their potential remains dormant at World Champs events. The sole remaining advocate at Taft was reigning 77 Champion Thomas Koster, his latest model featured superbly engineered full length piano type hinges, milled from solid alloy strips attached to front and rear wing halves and joined by a removable hinge wire. The only flapper Thomas brought to Taft (one of a pair recently built) didn't survive trim flights—however damage was light, except to his pride, and doubtless Thomas will persevere with his development.

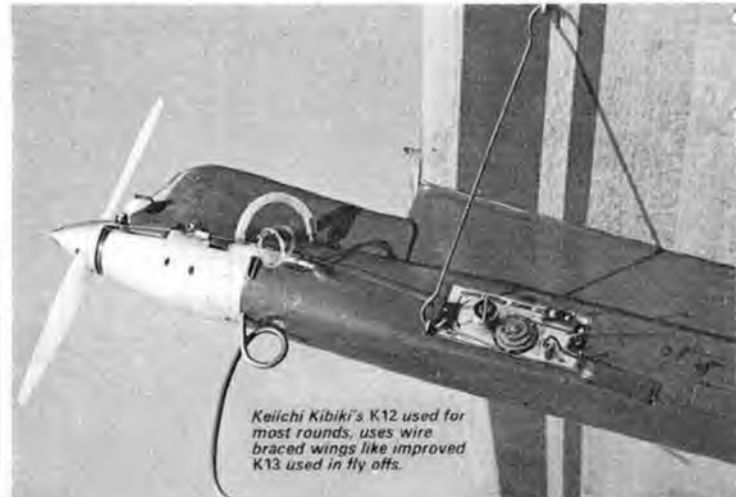
Technologically FIC models continue to improve in their detailed strength to weight construction, and the trend continues towards taper plan forms of higher aspect ratio. Structurally more models are using expanded polystyrene cores, sheet covering remains favourite with lightweight glass cloth (20gm/m²) and epoxy finish. Several models used thin aluminium skin surface covering to increase torsional rigidity. Dave Sugden and other Canadians have built models using 1.8 thou 5052 H19 grade aluminium skins bonded with epoxy. Hans Seelig used styrofoam tail planes covered with 1mm balsa skinned with .015mm aluminium. Carl Bogart also used thin aluminium skins on his 6.5% thick wings bonded to the wing sheeting with double-sided self adhesive *Crazy Tape* used by R/C flyers for veneering wings. This tape offers probably the lowest weight per unit area for such laminations, is immensely strong and is of course uniform and predictable in weight distribution. Another material increasingly being used for its superior strength to weight ratio is Kevlar fibres, used like glass or carbon for fuselages, laminations, mouldings, reinforcements and propellers.



Ultra short nose on Walter Nutini's model from Brazil, 5 function Seelig modification bunts model into glide.



Doug Galbreath's model showing Wing Wiggler bracket and activating arm mounted behind motor. Junction in flood off line partitions excess fuel from pacifier.



Keiichi Kibiki's K12 used for most rounds, uses wire braced wings like improved K13 used in fly offs.

FLIGHT CHAMPIONSHIPS

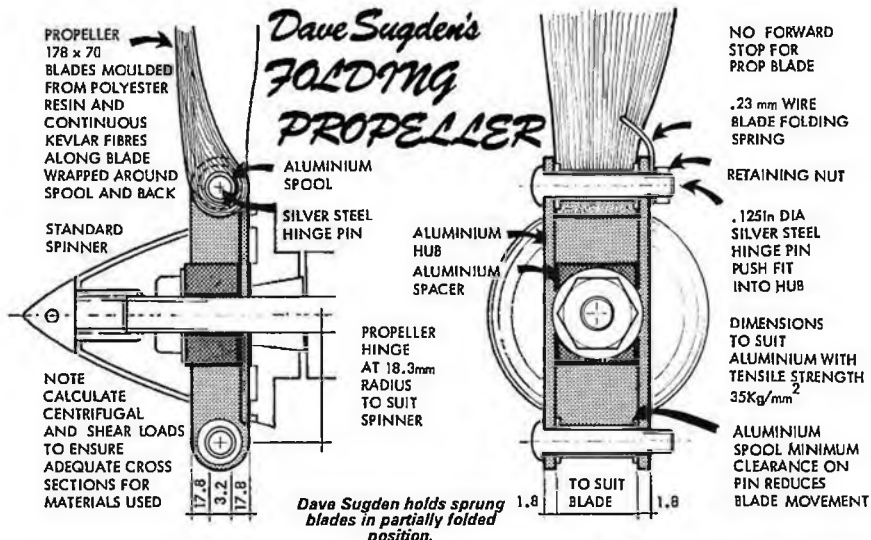
nicalties

DOUG GALBREATH'S WING WIGGLER

The rationale behind Doug's mechanism derives from the practical problems of achieving ultimate performance from a fixed wing model. Flat wing models perform best, but are inconsistent, yet the use of wash-in to improve overall consistency reduces all-out performance and aggravates stall recovery. Doug's solution, the *Wing Wiggler*, should eliminate all these disadvantages.

The mechanism itself is very economically engineered with a simple pivoting "duckbill" arm released to activate wing movement restricted by a piano wire peg moving captive inside an oval section brass tube. Doug uses a pacifier fuel feed with the flood off coupled directly to the wing wiggler to ensure both (or neither) activate simultaneously. An additional Tee junction in the flood off feed ensures all the fuel is jettisoned each flight removing unwanted 'ballast'.

Readers will have already been aware of Doug's misfortune at being disqualified from the Champs after placing 3rd in the fly offs because the standard motor which he used was subsequently found to be marginally oversized. This was all the more unfortunate for poor Doug, because anticipating problems with the notorious "Oversize Rossi" he was one of the few fliers to conscientiously check his own motors personally before the event. The one he used in the fly off was regrettably a motor lent to him just prior to the Championships - by his own Team Manager! Once again the processors made every attempt to establish the accuracy of their findings but subsequent measurements only confirmed their discovery. Bore -0.593in, stroke -0.556in, displacement =2.516cc (U.S. Metrication!) A similar incident marred the 1976 CL World Champs with Swedes Larsson/Rylin losing their 2nd place due to another "Standard Oversize Rossi". At the Taft FIF Champs a high proportion of motors checked were borderline cases, and with no immediate replacement motor available for the now out of production Rossi 15 MkII there are sure to be more anxious times ahead for users of this motor.



DAVE SUGDEN'S FOLDING PROP

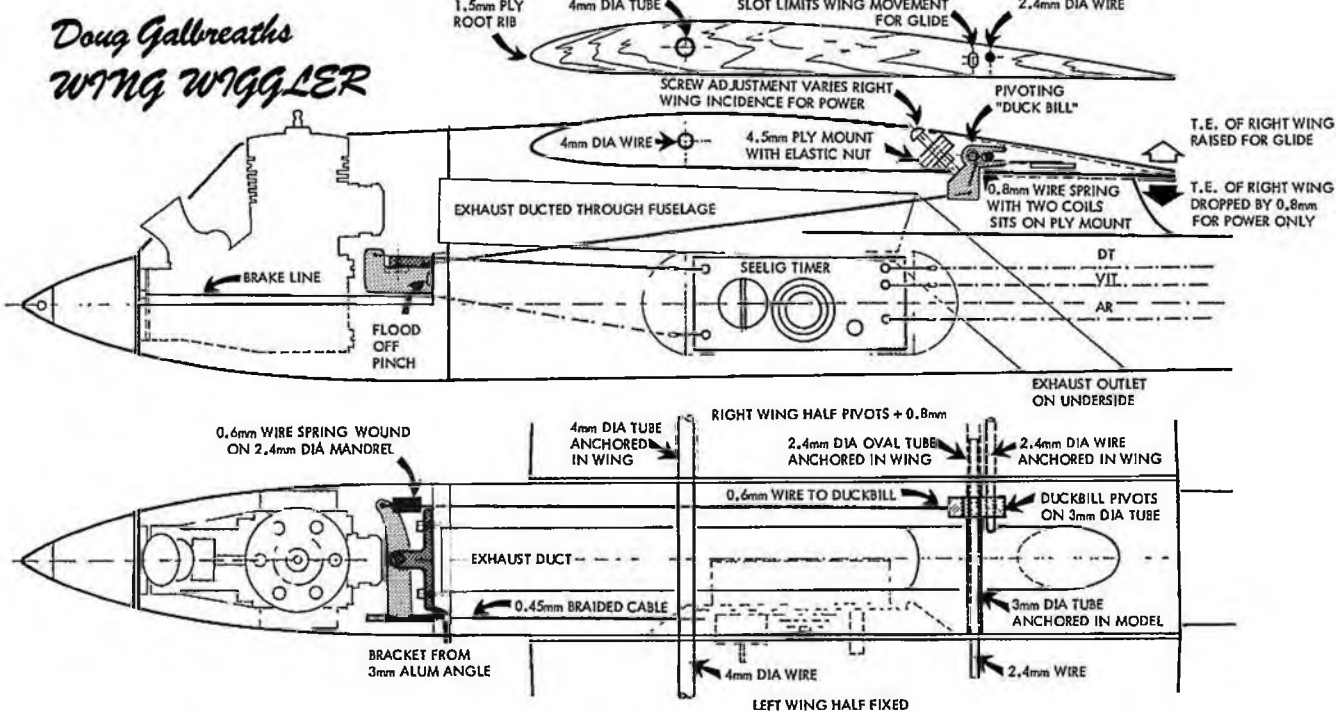
One of the few other innovations seen in F1C, was Dave Sugden's attempt to reduce the drag produced by a stationary prop stuck out in the airstream for the majority of the flight during the glide, by hinging both blades to fold flat alongside the fuselage. Dave warns anyone contemplating making a folding prop that the mathematics prove that extremely high forces are involved, and reminds everyone that the penalty for a blade failing, is the destruction of the model from vibration plus danger of personal injury. Certainly not a project for experiment without considerable care and forethought.

The 178 x 70 prop blades each weighing 24gm, are moulded from polyester and continuous Kevlar strands, wrapped round a built-in aluminium spool bearing, hinged at 18.3mm radius to suit the spinner. The blades require careful design to ensure adequate material cross section, tensile and shear strength to cope with the 250kg plus centrifugal force if they are to run at 30,000 rpm. The blades hinge on silver steel pins and the forward bending load is eliminated by not having a forward stop on the blade travel, the running position being determined by the centrifugal load vector. Blades are lightly sprung loaded backwards to guarantee folding along fuselage. Starting procedure commences with one blade resting on top of the cowling, the other will then self open within half a revolution, when using an electric

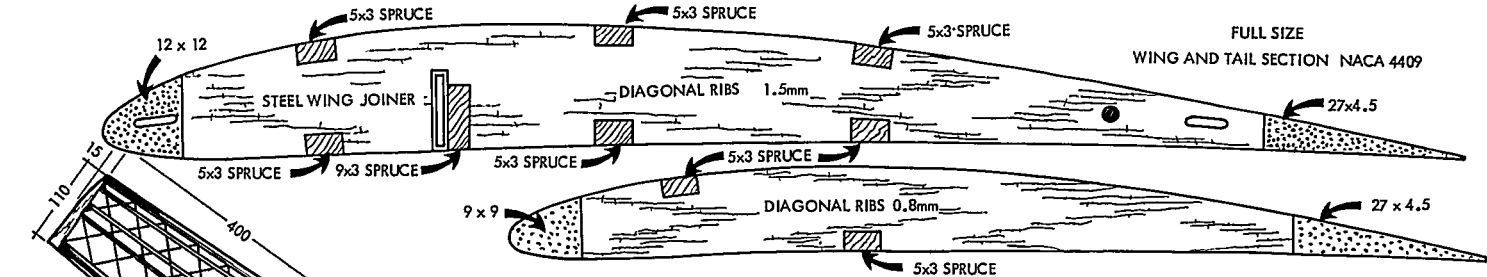


starter. Initial test runs are performed just on an engine prime and longer runs gradually built up with repeated checks for wear and tear being essential.

The potential performance gain from flights made so far is believed to be in the region of 20 seconds with current models on 7 second runs. Dave didn't actually use his blades for the championship flights at Taft, due to not having folders of the correct diameter and pitch, compared with standard blades found during practice to perform better under the conditions prevailing at Taft.



FULL SIZE
WING AND TAIL SECTION NACA 4409

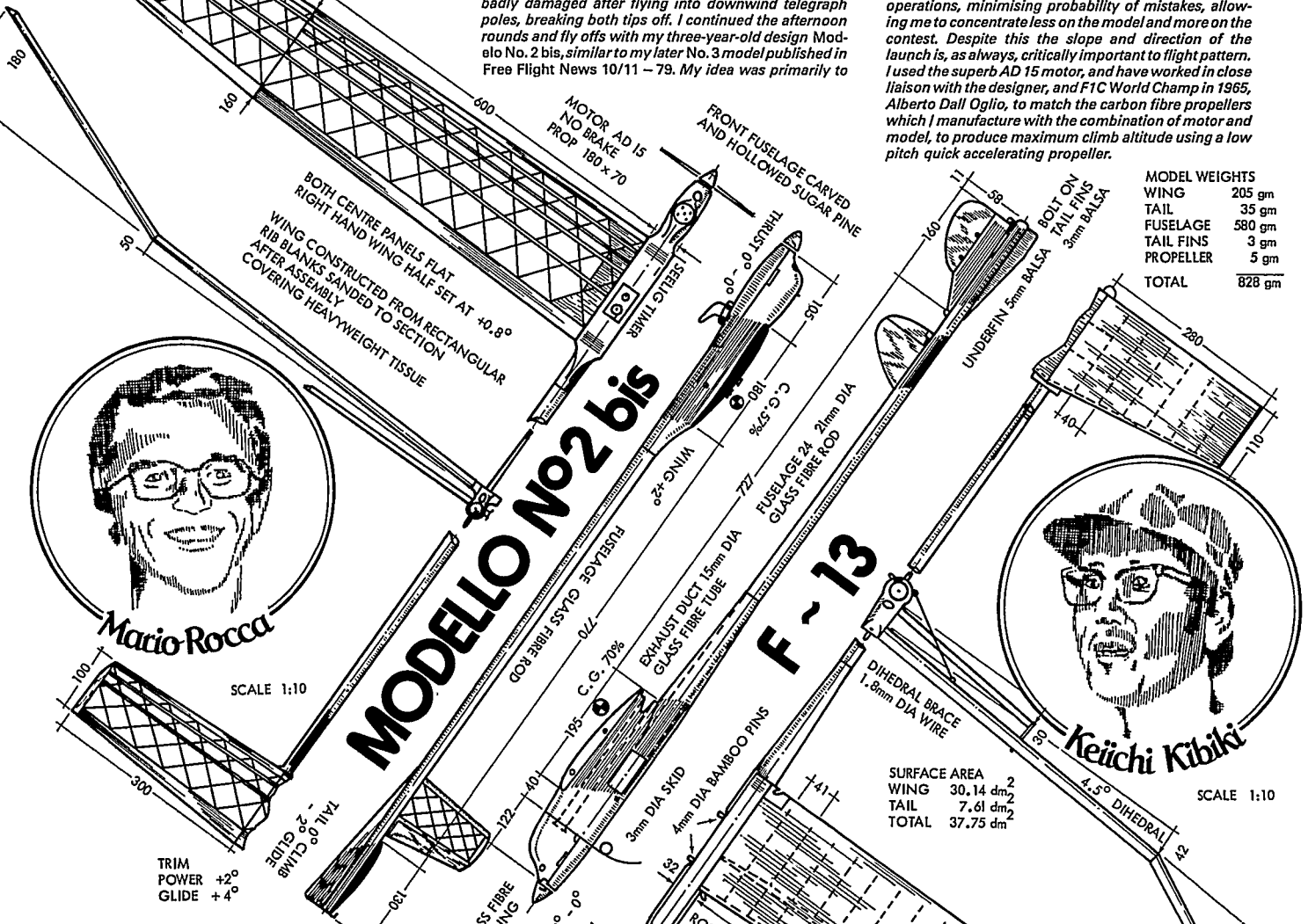


MARIO ROCCA'S MODELO NO. 2 BIS

The model I used for the first five rounds at Taft was badly damaged after flying into downwind telegraph poles, breaking both tips off. I continued the afternoon rounds and fly offs with my three-year-old design Modelo No. 2 bis, similar to my later No. 3 model published in Free Flight News 10/11 - 79. My idea was primarily to

build a good glider, trimmed for a very vertical climb to compensate for the slower actual airspeed. The model is designed to require simple adjustment and handling operations, minimising probability of mistakes, allowing me to concentrate less on the model and more on the contest. Despite this the slope and direction of the launch is, as always, critically important to flight pattern. I used the superb AD 15 motor, and have worked in close liaison with the designer, and F1C World Champ in 1965, Alberto Dall'Oglio, to match the carbon fibre propellers which I manufacture with the combination of motor and model, to produce maximum climb altitude using a low pitch quick accelerating propeller.

MODEL WEIGHTS	
WING	205 gm
TAIL	35 gm
FUSELAGE	580 gm
TAIL FIN	3 gm
PROPELLER	5 gm
TOTAL	828 gm

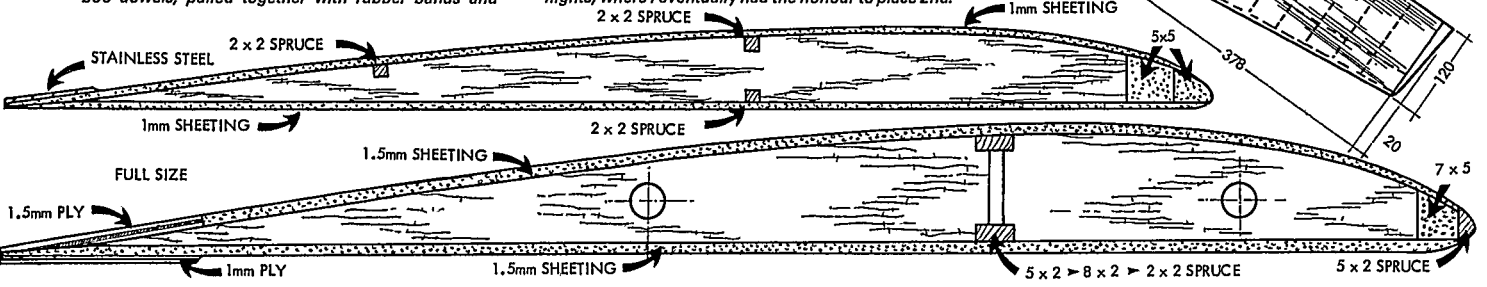


KEIICHI KIBIKI'S F13

I started flying the first two rounds with my very new and superior F-13 model, which I only began trimming a month prior to the Championships. Despite a perfect climb I suffered from insufficient glide trim and bad transition - yet still maxed, so I changed models for the third to seventh rounds choosing to fly my 1977 F-12 model which appeared in the NFFS International Planbook. My designs were inspired by the models of Kostor, Schaller and Verbitsky which I saw at the Plovdiv Champs in 1975. The wings are mounted on 4mm bamboo dowels, pulled together with rubber bands and

braced with piano wire struts. The tail fins screw on, with nuts located in the end ribs. Making good use of the intervals between each round I made several test flights with F-13 improving glide trim and auto rudder timing. Thus finally I made up my mind with confidence that I would use my new model for all the deciding Fly-off flights, where I eventually had the honour to place 2nd.

SURFACE AREA	
WING	30.14 dm ²
TAIL	7.61 dm ²
TOTAL	37.75 dm²



FULL SIZE

12 x 6 > 9 x 1.5 SPRUCE - TIP 3mm BALSA

1.5mm SHEETING

RIBS AND DIAGONALS 1,5

WING JOINER 7 x 1 x 150 STEEL

0.8mm SHEETING

RIBS AND DIAGONALS 0,8

FULL SIZE

1.5 mm SHEETING

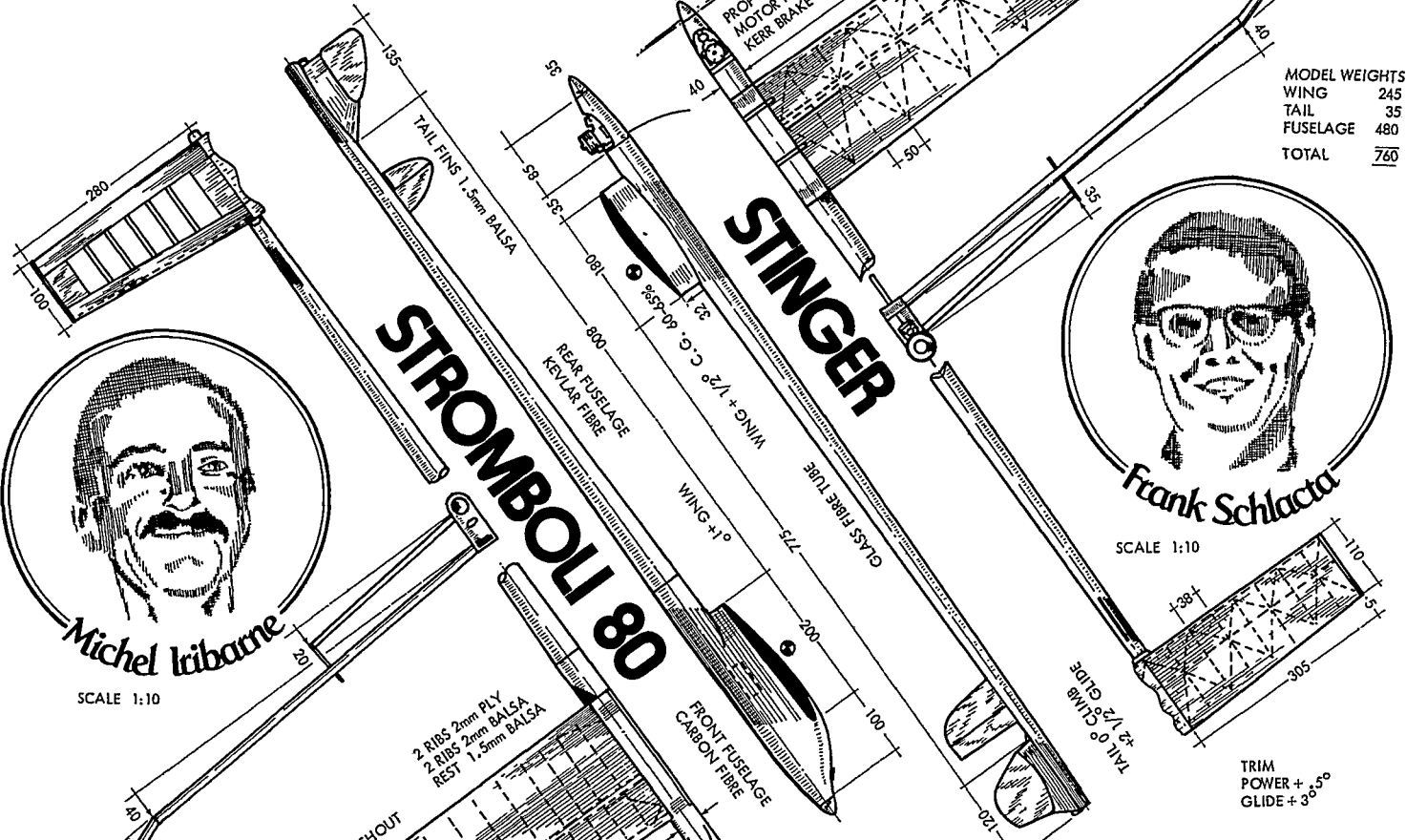
0.8mm SHEETING

FRANK SCHLACTA'S STINGER

After missing the 2nd fly-off in Bulgaria in '75 by 10 seconds flying my old Loon designs, it became evident I needed models with higher potential. I decided to go all out for maximum performance with high aspect ratio designs which I used for the Champs in Denmark in '77. However, I was plagued with inconsistencies and trim changes later attributed to having used too soft a grade of wood for wing ribs allowing warps to develop as conditions varied throughout the day. These wings have been replaced by ones using stronger quarter grain

stock for ribs with geodetic construction throughout. This solved the problem and my models are now steady, reliable and good performers, capable of a potential 5.30 from 7 secs. I broke one model during early morning practice on the day of the event, then the one I flew during the day was damaged upon landing during the fly-offs, but I chose to repair and continue rather than swap to my third model. Unfortunately, I decided to tweak the trim before the final flight - alas, too much.

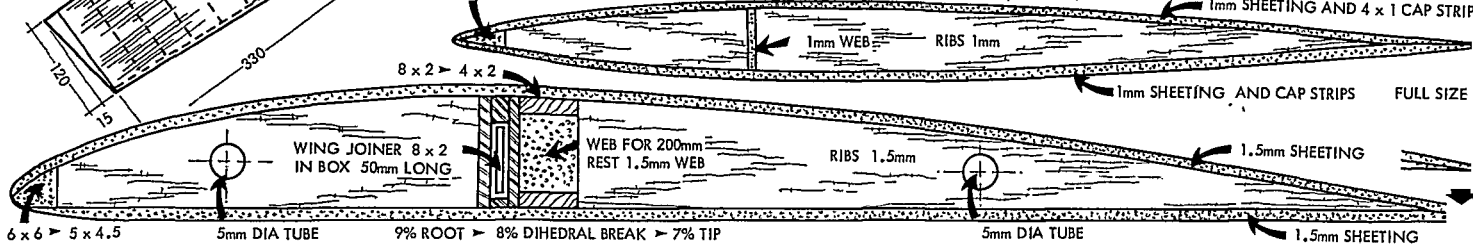
MODEL WEIGHTS	
WING	245
TAIL	35
FUSELAGE	480
TOTAL	<u>760</u>



MICHEL IRIBARNE'S STROMBOLI 80

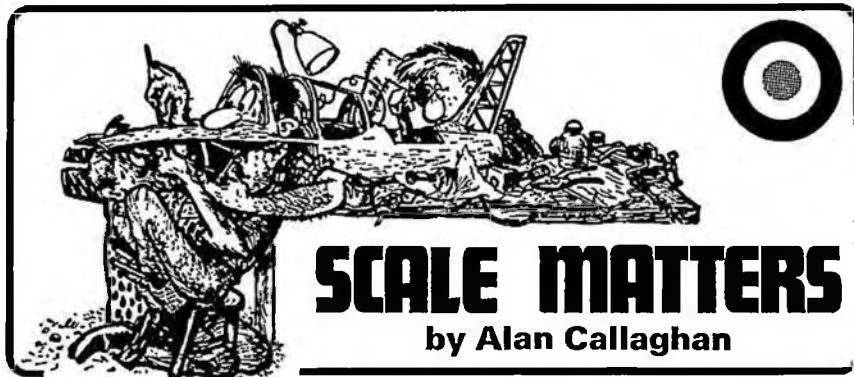
In all modesty, I believe I have a valid theory which has not yet convinced other power flyers - that is to use a bi-convex aerofoil on the tailplane. I have used such tailplanes since 1972 on all my models, and have discovered several advantages: in the climb phase, no tendency to dive in with increasing speed; in the glide

phase, a higher pitching moment aided by a forward centre of gravity is repaid with improved margin of stability and reliability. Constructionally I have concentrated on meticulous weight grading of wood to lighten flying surfaces. My fuselages are made entirely in fibre, using carbon for the motor pod and Kevlar for the rear boom; this is stronger and less prone to the effects of atmospheric changes. My engine brake designed by M. Bonnot is simply the best in the World! From the moment we take up contest flying, there is no limit to the progress we can make. Everything is a function of perseverance, calmness, and enthusiasm in the search for that impossible perfection.



IT IS ALWAYS GRATIFYING to receive news of our readers' models for inclusion in *Scale Matters* from time to time, especially when it involves something a little out of the ordinary in one way or another. Coming into this category quite definitely is a new C/L Scale subject being built by Geoff Spriggs. This is a 1800mm span version of the *Savoia-Marchetti SM 73* tri-motor airliner dating from 1934.

The model is powered by three unthrottled diesel motors (one PAW 19 in each of the outer nacelles, and a FROG 3.49 BB in the fuselage) and was scaled up from the APS plans (FSP 1077 by T. Potesta price £2.75 inc p&p) designed originally as a Free Flight model. To ease transportation of such a large model, Geoff has made the outer wing panels detachable and the traditional structure of mostly balsa and ply, is nylon covered for strength and durability. Striking lucky in contacting *Sabena* Belgian World Airlines for additional information, Geoff was provided with plenty of material including original photos and a full colour illustration. If only this were the type of response one could



SCALE MATTERS

by Alan Callaghan

shall be most interested in the kind of sound they make in concert.

The span of this model is 1600mm and the intended weight around 2.75kg. The fuselage as shown in the photo weighs only 300gms and is also detachable from the wing, like the *SM73*, for transportation purposes. The *Fortress* is one of the most well-proportioned of all WWII bombers as anyone who saw the real thing flying at a number of UK Airshows during 1979 might agree. Peter's nominated deadline

will be the *Aeromodeller* All-Scale Day at Old Warden on June 22nd this year, where hopefully he will be able to give a similar performance in miniature. Whether the model will be troubled by having to take off from a grass surface remains to be seen, but the rather large scale size wheels found on this aircraft should help matters quite a bit.

A somewhat different subject comes from the building board of Bernard Sexton of the Three Kings Club. Bernard continues his quite prodigious output of unusual electric RTP models with a new *Gere Sport* biplane in 1:12 scale. This model is 475mm wingspan and powered by a Mabuchi FT26 electric motor driving a Cox 125 x 75 prop through a specially-made geared extension shaft. A very nice touch is the use of *Trexler Airwheels* of exactly the right size, which will give those very impressive soft and quiet touch-downs. The model is built very accurately with rib-for-rib and stringer-for-stringer construction, and has a dummy motor detailed down to the ignition leads and spark plugs. In an attractive maroon and cream colour scheme this quite angular and chunky aircraft assumes much of the atmosphere of the pioneering days of American light plane development.

Bernard's next project is equally interesting in being a *Handley-Page Gugnunk*,



Control Line Scale Savoia-Marchetti SM 73 by Geoff Spriggs. Left: Model is powered by two PAW 19s and one Frog 3.49 BB diesel and is built with detachable wings to ease transport problems. Below: The design is scaled up from Aeromodeller FF Scale design FSP1077 by T. Potesta (price £2.75 inc. p&p), and with plenty of wing area and light loading should prove an ideal sedate flying scale subject.

get from every source one approached for information! But that's another story . . .

As photographed, the *SM73* weighs in at 2.5kg and is anticipated as being a nice sedate flyer; certainly an airliner should be nothing else, but in the kind of typical colourful paint scheme carried by many *Savoia-Marchetti's* Geoff's model should be a real eye-catcher when finished. I hope he's been practising starting those diesels!

Going one better, purely in a manner of speaking, is Peter Miller's latest project, which is in the shape of a 1:19 scale *Boeing B-17G Fortress* to be powered by no less than four G-Mark horizontal twin glows! The advantage of using these particular motors is that they are compact enough to be concealed entirely within scale cowlings, which could not be achieved using single-cylinder motors of an equivalent capacity. Peter informs us that the motors run very sweetly indeed—I





This Electric RTP model by Bernard Sexton is an American Gere Sport Biplane and features Trexler Airwheels. Finished in maroon and cream it is a very accurate model.

built to the same scale as the *Gere*. This, at around 1000mm span, will be an attempt to see how practicable a very large but light electric RTP model can be in aiming to achieve a slow and realistic flight pattern. How much more satisfying it is when the subject chosen is so appropriate to the aim behind it.

Electric RTP models are not always appreciated by other Scale fans, but Bernard puts forward some good arguments in their favour. The models can be built to include as much detail as desired, with much less of the weight restrictions found on other small free-flying scale models; they are quiet, clean and don't cost the earth to build. These kind of attributes, together with the ease with which multi-engined types can be operated should not be overlooked too readily if you can already accept the somewhat limited flight performance that they are capable of.

Still within the realms of the unusual is a new FF Scale subject by 2FSA member Geoff Clarke. The subject is the *Granger Archaeopteryx* the original version of which can be examined at the Shuttleworth Collection. Being unable to find satisfactory 3 views for this model, Geoff made his own by the rather lengthy process of measuring from real life at the Old Warden museum. The aircraft is modelled

in its early version on which the fuselage was painted in a subdued shade of green rather than the current blue.

The power for this flying model is a PAW 1.49, which may at first seem rather small for a 1575mm, 1kg model, but the *Archaeopteryx* is mostly wing, it is a relatively clean subject aerodynamically. Geoff reports that it will "burble around" quite safely and happily, and he is now spending some enjoyable hours building the scale *Bristol Cherub* together with additional details. Like most of us, Geoff is very apprehensive about testing a new model for the first time but with this model he evolved a totally unique method: Control of the *Archaeopteryx* is achieved by

adjusting the wingtip elevons and the rudder. Without knowing even an approximate suitable washout setting for the elevons Geoff did not wish to risk the entire model, and so he removed the wings from the fuselage and test glided them separately! Upon refitting the fuselage the trim was found to be very nearly correct and only a small modification to the sidethrust setting was necessary when powered flights were attempted.

When he chose this subject originally, Geoff also considered the *Westland-Hill Pterodactyl* series but the *Granger* seemed a simpler subject to begin with. The inspiration acquired has now prompted the beginnings of one of the *Westland's* which with any luck should be ready by next year. It occurs to me that an informal fly-in of scale tailless aircraft might be a worthwhile possibility at some future date – the choice of subjects is much wider than may be imagined at first, but from the journalistic point of view I would make a plea for someone to unearth one that is spelled as simply as "CUB"!

SMAE SCALE EVENTS

by Bill Dennis

The F/F Scale contest scene has a slightly different look this year, and hopefully this will reverse the trend of abysmal atten-

FF Scale Granger Archaeopteryx by Geoff Clarke. Powered by a PAW 1.49, this model spans 1575mm and weighs 900gms. The small plates fitted to the elevon are temporarily trimming devices.



dances, which has been the rule rather than the exception in recent years.

Following the success of the two outdoor rubber contests held at last year's Nationals and Old Warden, these will be repeated and there will be additional events (to the provisional SMAE rules) at Odiham on May 4th and October 5th.

For the non-contest flyer, the SMAE will be holding a F/F, C/L & R/C 'fly-in' at Barkston Heath on July 6th. The "SMAE News Outdoor Rubber Scale Contest" will also take place at the "fly-in".

Other events include the Selby Trophy at the N. Area Rally and the Woodvale Rally, plus several local events which would get better support if the organisers advertised them!

Full SMAE membership is of course, required for most of these events – plus all the other advantages! Any queries regarding these meetings can be directed to Bill Dennis, telephone Reading 669219.



Under construction for the Aeromodeller All-Scale Day at Old Warden on June 22nd, is this 1:19 Scale CIL Boeing Fortress by Peter Miller. Power is from four G-Mark Twin Glow motors!

US-MADE FREE-FLIGHT GOODIES

While at Taft I picked up a few product information sheets on items you cannot normally buy in Britain; with the recent lifting of currency restrictions payment overseas is no longer a problem (until all the money goes abroad, of course). Hi-Flight Model Products had samples of FliteSpar, which is a carbon fibre/foam urethane/carbon fibre laminate, in sizes from 1/8in sq up to 1/8in x 3/8in and 1/4in sq. up to 1/4in x 1/2in, at prices from \$1.20 to \$2.80 per foot. For more details write to Hi-Flight at 43225 Whittler Avenue, Hemet, California 92343.

Champion Model Products have kits of the winning Coupe d'Hiver aircraft at the 1979 US Nats, the Model B Champion Coupe, at \$13.95, featuring pre-cut prop blocks and 170 pre-cut or formed parts. Separate prop blade and prop assembly kits are also available at \$2.95 or \$4.95, the latter including shaft, nose block materials, washers, etc. Champion also have FAI Supplies and Pirelli rubber. A letter to them at 880 Carmen Court, La Verne, California 91750 will bring a list.

As far as I know, RM Enterprises are the only people currently marketing a kit for an FAI Power model; the Zingo at \$16.50 is a partial kit not containing stripwood or fuselage sides, but is a good introduction to the World Championship class and could also be flown as an Open model if built light with a good .15 or .29. RM also have the 1/2A Maverick at the same price, but this time as a full kit; the model was selected as the Top Small Gas Model of 1978 by the NFFS. Another NFFS Top Ten Model, this time a circle-towing A/2, is the Ultimate Dragmaster designed by Tom Hutchinson, available in de-luxe kit with a fibreglass boom at \$31.50, or a balsa fuselage version is available at \$25.95. These prices include shipping within the US, but a letter to RM will give you the overseas cost; their address is 3255 NW Crocker Lane, Albany, Oregon 97321.

RUBBER STOP-WATCH COVERS

To protect your stopwatch against accidental shock damage it is sensible to keep it in a shock-absorbing rubber cover, but recently these have been hard to find. Presumably intended originally for pocket watches, and incorporating a metal loop moulded into the top of the cover (which has to be cut off for a centre button stopwatch) I have located a stockist in London. A rather high-class yacht chandlery, Captain O. M. Watts, 45 Albemarle Street, London W1X 4BJ has them at 40 pence each, and would probably welcome a suitable additional sum for post and packing. On the subject of stopwatches, do avoid whirling them round on the end of your neck lanyard; the G forces that even quite casual rotational velocities can produce do the innards no good at all.

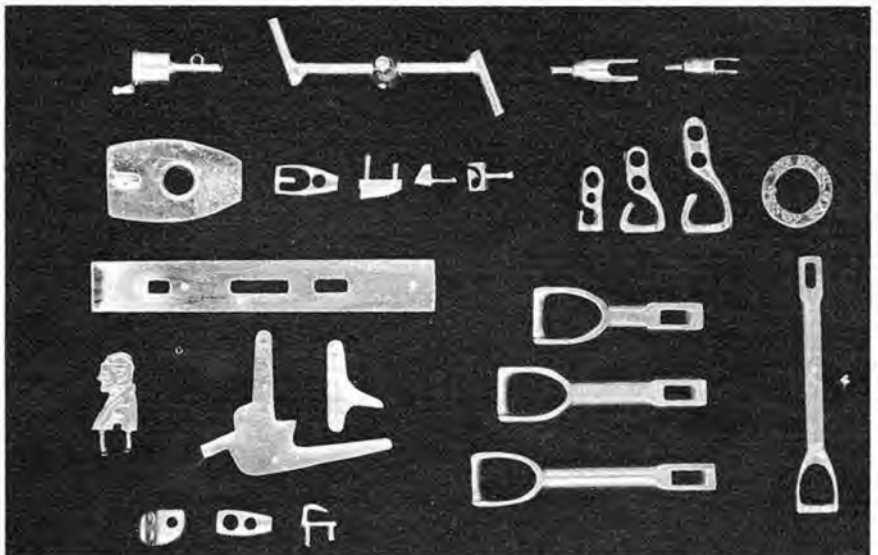
MARK II MAXAID TOWLINE WINCH

Elton Drew tells me that there are a few improvements to the 1979 model of the Maxaid winch partly, I suspect, as a result of the rather hard knocks mine received during last year's A/2 flying. The very useful T-shaped handle is now made of a tougher, more runway-resistant material, the winding knob shape has been improved and the winding shaft is now of an increased diameter, which should eliminate a slight tendency towards 'bell-mouthing' which occurred where the winding handle met the shaft. The winch still retains the features that make it so attractive to contest flyers - pocketability, thanks to the folding handle, 170gm (6oz) weight, 8.77:1 ratio gearing, with brass gears running in nylon bearings and rapid spool removal.

Price of the complete winch is now up to £10.50. Maxaid circle tow impulse-release type hook units are still available at £4.80, and another useful item I noticed in their list is PTFE tubing for carrying auto-rudder lines with minimal friction, at 60 pence for 4 metres.

HOW TO LOSE A MODEL

Recent model losses at Bassingbourn, Odiham and elsewhere have almost certainly been thefts or, at best, removals with the idea of fat rewards for return. It is unfortunate for us in free-flight that much of the model flying publicity in local papers concerns R/C models and emphasises their high cost and expensive equipment. However, to put a label on a free-flight model stating that a reward is offered for its return often appeals to the baser instincts of the finder, and has sometimes led to telephone ransom demands. Certainly the labels used



by my own club state simply that 'all expenses will be refunded', and do not give people the idea that they are holding some kind of airborne blank cheque. Of course you may want to give some kind of small remuneration in cash or in kind when a model is returned. However, if a telephone call to you about a lost model gives you an inkling that a bargain is about to be struck, get the address or phone number of the finder and arrive with the friendly neighbourhood policeman. Stealing by finding is a felony as is extortion, but the mention of rewards makes the position far less clear.

It amazes me how sloppily some people add name and address labels to models; faded, oil-soaked ball-pan screws give the impression that you don't care much about the aeroplane, so other people may not either. Putting the label on top of the pylon where it is covered by the wing is fine if you want the model to end up in a barn, but not if you want it back; few non-modellers think of taking a wing off or even undoing rubber bands. It also makes sense to have brief name and address details on every part of the model; if it ends up in a tree and bits blow down, any one of them should let the finder tell you about it. SMAE numbers or club transfers are not enough. The occasional use of the word 'please' on the main label may also help people to go out of their way to help you. I use lightweight Modelspan backed with typing paper in the typewriter (to avoid cutting through the tissue) and do a series of name, address and phone number labels to cut up later as required for wings and tailplanes; they are easily doped on and it saves crushing the ribs when you feed a light tailplane into the typewriter.

FOAM WINGS

US A/2 flyer Jim Thornbery from Seattle has some interesting experiences with foam wings for gliders. Jim has used both 1lb/ft³ polystyrene bead foam and 1.8lb/ft³ Styrofoam, which is a DuPont-made material with higher compressive and shear strengths than the lighter bead-based foam. He comments that the Styrofoam has a definite grain, which increases core stiffness in one direction.

In cutting the cores Jim discarded the normal technique for producing R/C wings with thick airfoils. In which templates of the airfoil itself are pinned to the squared-off ends of a foam blank as a guide for the hot-wire

cutter; instead he used external templates, which avoids the problem of the locating pins for a thin, undercambered airfoil poking beyond the surface of the finished core, and snagging the cutting wire, which ruins the final result, as the wire over-melts locally where its path is slowed. With Jim's method there is sufficient 'area' in the external templates to keep the pins well clear of the hot wire. The lower templates are used first, and then removed so the upper ones can be aligned and used to cut the upper camber. He also suggests that an airfoil template could be used with large lead or ears at each end for the pins, in which case the core would require trimming at leading and trailing edges after cutting.

Diagrams show the structure Jim used; lower surfaces are covered in 20gm glass cloth applied with Varathene polyurethane varnish, with an extra layer over the centre third of the span, at the dihedral breaks and on corners. Glass cloth was used on top of the centre section and just aft of the spar to reinforce the D-box. Jim quoted the mainspar weights as 28-30gms each, and total wing weight at 182.5gm (6.43oz).

An earlier wing that Jim Thornbery used had .025mm hardened aluminium sheet top and bottom instead of the balsa and glass, *A/1a* Verbitsky F1C wings at Roskilde; Jim reports that it was extremely stiff in torsion, but that it dented easily and even punctured, and also wrinkled on top, presumably under towing loads.

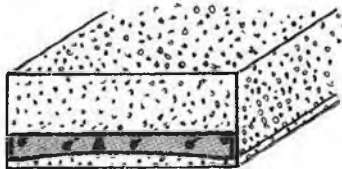
Jim has also used foam for tailplanes, the best of which weighed 10.5gm, using 1.8lb/ft³ Styrofoam with no skin or spars, apart from a tapered balsa stub leading edge at the top to resist the D/T bands. Hooks and fittings were attached to 0.4mm ply with 20gm glass cloth on the centre section to spread the loads.

Dennis Davitt from Leeds launches his Open Rubber model for an early morning flight at Dave Hipperson's contest.



OPEN RUBBER CONTEST, BASSINGBOURN

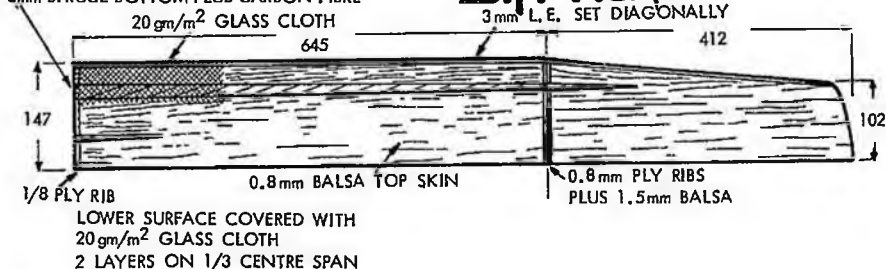
Billed as 'The Ultimate Open Rubber Contest', this event was held at Bassingbourn on October 21st at the same time as a national land-yacht regatta. Dave Hipperson organised this event as a one-class contest run in short rounds with a variable max for each. The idea was that this should be set according to the wind speed and visibility; in the event the drift increased during the day so that by mid-afternoon models were drifting well outside the airfield. Maxes were 2½, 3, 4 and 4½ minutes, with the first fly-off round set at 5½. With a £50 first prize and substantial other cash and goods prizes for the contest, there were 40 entries, 33 of whom flew – more than at the Everleigh Nationals. There was quite a sprinkling of new faces rarely seen attending contests at Bassingbourn, including the eventual second place winner, Nigel Lee of East Grinstead.



LOWER CAMBER TEMPLATE A IS PINNED INTO PLACE AND LOWER SURFACE IS HOT-WIRE CUT. A IS REMOVED AND B PINNED IN PLACE FOR UPPER SURFACE CUTTING.



MAINSPAR TAPER TO DIHEDRAL BREAK 18° 6mm
2.5mm SPRUCE TOP, Balsa SHEET WEB
3mm SPRUCE BOTTOM PLUS CARBON FIBRE



It was also good to see several Juniors competing, two of them, Ian Davitt and Jonathan Walker, managing three maxes each, Jonathan only just missing the fly-off with a creditable 4.18 fourth round time. One of the favourites, Russell Peers, dropped a minute on the 3½ minute round, mainly due to weak rubber and a strong patch of sink, and Jon Fletcher had a harrowing first round when his timekeeper's watch stopped and he had to make a reflight. The model landed on a clod of earth in a ploughed field and damaged the rear fuselage; an extensive Zapping session had it mended only seconds before the close of the 3½ minute round, but a slight trim change brought the model down just six seconds short at 3.24. Even closer to a max was Coupe flyer Peter Carter, who had finished his first Open Rubber model earlier the same morning, but D/T'd early to score 2.28 instead of 2.30 on round 1.

Overshadowing the flying at Bassingbourn was a chance-in-a-million accident to Bob Wells and Jessica Nash, returning along the grass by the runway after recovering Bob's model downwind. A land-yacht taking part in the regatta went out of control and ran off the runway, hitting them both at high speed; Jessica escaped with severe bruising but Bob had a severe compound fracture of a leg and was taken to Addenbrooke Hospital. Those who witnessed the injury looked in need of hospital treatment themselves, but Bob is now on the mend, though unlikely to do much glider towing for some time. It was about the same time last year that Chris Edge was carted off to the same hospital after breaking an arm while throwing a hand-launched glider.

After three rounds 12 people had managed the 2½, 3½ and 4 minute maxes, but the 4½ minute one proved the undoing of half of them. With the drift now around 10–12 knots, the recovery of long flights was taking people several fields out. Only Nigel Lee and Phil Ball made the 5½ minute max. With the final fly-off round just about to start only Phil Ball had returned with his model. Then literally at the last minute Nigel Lee turned up, but with a damaged model. More cyanoacrylate and a motor change saw both flyers winding for the decider, Phil also having needed field repairs to a damaged fuselage. Nigel Lee's aircraft was down for 2.25 but Phil's model performed faultlessly to return a massive 6.53 winning flight. Extensive cash and goods prizes had been collected by Dave Hipperson, and distributed at the prize-giving held at the local pub.

From time to time we have heard that what people really want is big cash prizes (or impressive trophies, or stainless steel meat plates, or pottery flower vases); by way of a readership survey, what would you like to see at

a free-flight contest by way of prizes or organisation? Thanks to Humbrol, Michael's Models, Free Flight News, Tim Gray and Mike Woodhouse, the prize list totalled £120 in cash, with roughly the same value of F/F goods, and was certainly the most attractive prize list at any British competition I can remember. I wonder what the effect of a quality large prizes would be on an F1A contest, for which far more people have models.

RESULTS: 1st P. Ball *Grantham* 20.00+6.53, 2nd N. Lee *E. Grinstead* 20.00+2.25, 3rd C. Batty *Bristol & West* 19.38, 4th J. Bailey *Biggles* 18.16, 5th M. Fanthem *Richmond* 17.25, 6th I. Taylor *Falcons* 16.20, 7th J. Fletcher *St Albans* 14.24. **Juniors:** 1st J. Walker *Birmingham* 14.18, 2nd I. Davitt *Leeds* 12.45, 3rd C. Lindsey *Wolves* 3.69.

THE WELLS JUBILEE WAKEFIELD, WATTON, 28.10.79

A blanket of fog covering most of the South East did little to encourage the far-travelled to attend to this year's Jubilee Wakefield event as before at RAF Watton in Norfolk. Understandably, rather less turned up than last year, the most notable absentee being Bob Wells himself who had been run down by a land yacht the previous weekend and was recovering in hospital from a very completely broken leg. Friends stepped in to run the event and managed very well throughout the day. The mist lifted at 10.30am and retrieval was never a problem as the drift never rose above 10mph. An interesting mixture of Wakefield events brought together the ancient and modern plus what could have been if the rubber hadn't been restricted in 1954! The Trophy itself being quite rightly awarded for this last class – an idea of Bobs, to see what could be done under the old rules with our present techniques. It was disappointing therefore to see no real high performance creations from what is so close to an open rubber formula. O'Donnell took the Trophy again but this time was not flying his usual Maxie as the current marque was 'stolen' at Odiham. He appeared with a slight lash up completed only the previous night. Rather a tribute to the importance of the event though, as John is very short of models in all classes but opted to build a special for this event in preference to anything else! His total of 11:20 was made up of two perfect ROG, 4 minute maxes and a short flight at the end when it was obvious he had an unassailable lead.

Masterman and Spooner started strongly with good flights in F1B in conditions that offered very light lift and as a consequence was difficult to read. Brian's taper wing 'best' model looked to be climbing the highest of the day but it was interesting to notice many long runs making their appearance. Ray Elliot, out of luck with just one very poor flight – was running 50 seconds and Roy Miller's last max climbed for 52secs. Hipperson was down to 12 strands of the best Dowsett Firell and running off in 60 seconds plus from a massive 520 turns.

While this was progressing, the Pre-54 event was being dominated by P. Michel with a handsome all red Chester Lanzo Wakefield. Brian Yearley, who so narrowly missed the Vintage Flyoff at the Nats, was flying his superbly built Flying Minutes and exhibiting quite the smoothest pattern on the field. He insisted that the glide was poor due to the model being 2oz too heavy and produced the uncovered frame of another which he claimed will be down to weight!

Dave Hipperson had built a KeiKraft Contester specifically for the event last year which he missed, so it was with some trepidation that he made the first ROG flight on full turns. He finally took the event with 7:24 after Michel dropped on his last flight after an unlucky power stall on the first attempt broke the prop.

In F1B Spooner maintained his lead all day with three maxes after dropping a few seconds on the first flight. Roy Miller flew consistently all day with big two-minute flights and a very convincing max on the last round. O'Donnell had put himself out of this event when his Delayed Prop Release failed to deploy and the model dived into the concrete. It was only then that the blades released and the wild thrashing about that followed made a considerable mess of everything but the wing.

A prize giving including cash, plaques and the Ted Evan's Memorial trophy rounded off a pleasant day, and one worth building a special model for next year – why not give it a try?

RESULTS: Ted Evan's Memorial 1. J. O'Donnell *Whitefield* 11:20, 2. S. Fairless 8:42, 3. G. Hawke 7:33. **F1B** 1. B. Spooner *Craydon* 11:49, 2. R. Miller *Northwood* 11:14, 3. D. Hipperson *Craydon* 10:50. **Pre-54 Wakefield** 1. D. Hipperson *Craydon* 7:24 (Contester), 2. B. Yearley *St Albans* 6:53 (Flying Minutes), 3. P. Michel 6:50 (Chester Lanzo)



Stan Fairless seen here ROGING his '53 rules Wakefield, had a long journey from Newcastle-on-Tyne to attend Bob Wells' Jubilee Wakefield event. Latest news on Bob is that after 3 months, he is now back home convalescing and expresses his thanks to the many modellers who have kept in touch during the treatment in hospital to his leg.

NE AREA SMAE INDOOR MEETING Spennymoor, Oct 28th by Jeff Anderson

A good turn out of flyers for our first meeting this winter produced a somewhat disappointing level of entries. An experiment adopted was to utilise two halls, separating Duration Flyers from the HLG and Scale Flyers, but this resulted in too great a division of interest and a rather expensive flying session.

HLG was closely fought and resulted in a clear win for Dave Goodwin with an aggregate time of 59.85 seconds. Ron Pollard and Allan Jack tied with an aggregate of 58.60 seconds necessitating a fly off. Alan chose to fly first producing a time of 27.15 seconds and Ron showed some coolness and nerve by producing an outstanding 29.35secs flight, higher than his second best time in the competition.

The Scale Competition, sponsored by Modeller's Den, had a lower entry than usual with only six models presented to the judges. A number of new models were on display including a Beach SE5A Replica by Richard Anderson and a 1/12 Scale Wittman Tailwind by Jeff Anderson. Both of these models did well in static but require additional trimming. Tom Wilson had similar problems with a Mustang. Peter Frostick from Bromley was a clear winner with a Farman Mustique which performed well in both static and flying; Bernard Hunt broke the hall record with an astonishing time of 1.52 with his Piper Cub J3. The first three places were taken by Peanut Models and it is several years since we have seen an "open model" out of the money.

The EZB Competition provided mixed fortunes for a number of our regular flyers and was eventually won by Bernard Hunt with an aggregate time of 20:02 seconds. Bernard equalled the hall record in the process with a time of 11mins 22secs. Second place was taken by H. Tubbs putting in an extremely good time of 10:39secs but he was closely followed by John Blackburn of Huddersfield. Graham Davitt from Leeds was again the top junior taking fourth place in both HLG and EZB.
RESULTS: EZB 1. B. Hunt (Huddersfield) 20:02, 2. H. Tubbs (Leeds) 19:50, 3. J. Blackburn (Huddersfield) 19:38. **HLG** 1. D. Goodwin (Vulcans) 59.85, 2. R. C. Pollard (Tynemouth) 58.60+29.35, 3. A. G. Jack (Tynemouth) 58.60+27.15. **Scale** 1. P. Frostick (Bromley RMC) Farman Mustique 6pts, 2. P. Street (Sunderland) Miles Sparrowhawk 6pts, 3. B. Hunt (Huddersfield) Piper Cub J3 7pts, Junior 1. G. Davitt 12pts, 2. R. Anderson 3pts, 2. J. Davitt 3pts.

SMAE MINI MEETING, Barkston, 11.11.79

Despite last minute confusion over the venue, the 2nd SMAE Mini got off to a healthy start with a very considerable turnout, events attracting 15 plus and A1 nearly 20. However, it was soon evident that ground level turbulence was going to make flights difficult, and a forced move of control point simply compounded the problems. By 11am the wind strength was such that max flights were using all the aerodrome.

A1 suffered worst from the turbulence, Ray Moore making an unusual appearance at the top of this list with less than 7mins, leading his clubmates Cowley and Bailey, the only people to break 7mins in Glider.

All the more surprising, therefore, to see nearly a full score in HLG with Mike Page holding top slot from quite early on in the day and adding another outdoor first to

his list this year. Chris Edge taking 2nd – at his first HLG outing since last year's arm break! COs also produced a high standard despite the unkind conditions with the top three all exceeding 9mins and Phil Ball making it look easy with 9.20 for top place and still the sixth flight in hand if he needed it.

Lift as such was not only scarce but nearly impossible to detect in the swirling wind off the nearby hills and trees. There was some compensation in that there were no big holes either and so a model that got away was likely to do a reasonable time if not max. The power flyers had it best in this respect with over the top third breaking 8mins comfortably. It was good to see Stafford Screen take first place with the potent model with which he had so much trouble at the Nats. Club mate and also team member Harris followed in 2nd place.

All day Coupe flights had been wrecked by the unpredictable wind. O'Donnell was making the most of conditions that suited his fast climbing layout when mysteriously on the last flight all went haywire and he recorded only 44secs in colossal turbulence. Brian Kenny had led most of the day but his final score was only 6.56 with Ian Davitt close behind at 6.50 including a 36sec flight! Roy Miller, last year's winner, started flying quite late and to be fair when conditions had deteriorated still further, and many people were packing up just physically unable to record flights of much more than a minute. He flew his usual large gentle climbing design and put together a very creditable 8.32 far more than he needed to clinch the contest. A number of his flights looked very smooth considering the conditions.

RESULTS: A1 Glider 1. R. Moore (Biggles) 7.24, 2. M. Cowley (Biggles) 7.12, 3. J. Bailey (Biggles) 7.01, 4. J. Ashmole (Grantham) 6.53, 5. S. Philpott (Whitefield) 6.35. **Coupe d'Hiver** 1. R. Miller (Northwood) 8.32, 2. B. Kenny (Vulcans) 6.56, 3. I. Davitt (Leeds) (J) 6.50, 4. N. Beaumont (Croydon) 6.45, 5. P. Ball (Grantham) 6.44. **1/2A Power** 1. S. Screen (Birmingham) 9.33, 2. P. Harris (Birmingham) 9.00, 3. J. Fletcher (St Albans) 8.52, 4. D. Reader (Birmingham) 8.40, 5. R. Baggott (Birmingham) 8.28. **HLG** 1. M. Page (Peterborough) 4.52, 2. C. Edge (Welland Valley) 4.29, 3. L. Gray (Falcons) (J) 3.49, 4. G. Percival (Grantham) 3.30, 5. B. Malton (Peterborough) (J) 3.19. **CO: Duration** 1. P. Ball (Grantham) 9.20, 2. M. Coomes (Grantham) 9.13, 3. D. Hipperson (Croydon) 9.11, 4. J. Cooper (Biggles) 8.55, 5. S. Philpott (Whitefield) 8.06.

CALIFORNIAN CONTESTS

Extensive coverage of the Taft World Champs combined with the need to catch up with the flood of home events towards the end of last year have until now precluded reports on those other FAI events held in California. However, to keep the records straight here's how the British contingent fared.

LIVOTTO INTERNATIONAL, Sept. 29–30 Taft

The Juan Livotto International was a privately run warm-up event preceding the Champs and was surprisingly sparsely attended. Falling just prior to the budget autumn rates for airline travel may have been a contributory factor. The organisers spared no trouble to make the Europeans feel at home, including freak "British Thunderstorms" at this otherwise deserted site. Nevertheless those competitors who did attend generally benefited from valuable contest practice under almost identical conditions to the actual Champs. In F1A, Paul Lagan, Lee Hines and Arno Hacken dropped only a

single flight each but of the 24 entries only two maxed out, US Team flyer Jim Walters and GB Team manager Mike Fantham. Mike found a four minute thermal and Jim Walters piggy-backed his flight to require a five minute Fly Off. This time Fantham was wiser and launched down wind where Walters was unable to reach him, adding another victory to his amazing series.

3rd SIERRA CUP, Oct. 13–14 Sacramento

Wakefield and Power held on the second day provided another near miss for the amazing Paul Lagan, just 3 seconds out of the fly off, with Israel's Itzhak Ben-Itzhak just 36 seconds down. The four minute fly off looked easy but America's Walt Ghio had a disastrously prophetic follow-up flight, when the model dived in, due to an incorrectly set timer! Power proved a satisfactory work-out for the Americans with their teams all producing maxes; Carl Bogart retired satisfied after four rounds, with Roger Simpson and Doug Galbreath maxing out. It was however twin brother Reid who gave Doug a run for his money in the progressive fly-offs, witnessed with interest by the recently arrived Chinese contingent.

RESULT: F1A 1. M. Fantham GB 1260+240+218, 2. J. Walters USA 1260+240+141, 3. P. Lagan NZ 1219, 4. I. Weston NZ 1213, 5. L. Hines USA 1210, 16. D. Oldfield GB 958, 18. M. Cowley GB 934. **F1B** 1. A. Hottard USA 1260+240+300, 2. L. Dewitt USA 1260+240+264, 3. A. Armesto ARG 1260+240+149, 4. W. Ghio USA 1260+240+9, 5. P. Lagan NZ 1257. **F1C** 1. Reid Simpson USA 1260+240+300+300, 2. D. Galbreath USA 1260+240+300+240, 3. Roger Simpson USA 1260+208, 4. M. Thompson USA 1203, 5. Matthies USA 1200, 6. M. Cowley GB 1166.

The week after the Champs most of the World Team model flyers including the Chinese travelled North for the 3rd Sierra Cup at Sacramento. The event was superbly organised with three flyers to each pole and 1 hour rounds. Mike Fantham maxed the tricky opening round but then broke the spell, dropping his second flight with 2.16 – his only serious mistake of the year! Steve Marriott clocked up six maxes then found a whirlwind of a thermal which spun the model in at 89 seconds. However British hopes were maintained with John Cooper, Martin Dilly and Dave Oldfield maxing out with 16 others, including two Chinese. Four minutes proved easy for most and Cooper showed the way literally, by marking strong lift in the five minute fly-off. The 10th round proved the decider, this time Per Quarnstrom, 2nd at the Champs, lead the field with 3.21 ahead of young American Greg Sussex flying a Lee Hines Mean Machine. John Cooper became victim of a time-keeping error when one time-keeper refused to stand up to witness the flight, resulting in a 16 second discrepancy on the official watches, depriving him of an averaged 8 seconds and thereby third place.

The second day, for F1B and F1C flown simultaneously, produced little excitement in Wakefield for the British. A four way fly-off was won by Jean Petiot with Bob White saving face coming second with Kiwi Lagan close behind in 3rd. Power however produced more excitement during the 10 man fly-off with a mid-air collision after 3 minutes glide for Stafford Screen resulting in a damaged tail which stalled the model in for a sub max flight. However, a quickly taken second attempt gave Stafford the max and a 4.29 flight in the next round gave him 5th place. The final 10th round held in rapidly deteriorating daylight proved a narrow victory for organiser Roger Simpson, 3 secs ahead of Thomas Koster, with Australia's Peter Nash a very worthy 3rd.

RESULTS: F1A (69 entries) 1. P. Quarnstrom S 1260+240+300+191, 2. G. Sussex USA 1260+240+300+185, 3. I. Drori IL 1260+240+300+164, 4. J. Cooper GB 1260+240+300+159, 5. S. Cherev IL 1260+240+300+142, 7. D. Oldfield GB 1260+240+215, 9. M. Dilly GB 1260+240+199, 29. M. Fantham GB 1216, 36. D. Barnes GB 1190, 38. M. Cowley GB 1171, 40. S. Marriott GB 1169, 46. P. Owens GB 1119, 49. M. Duce GB 1096, 51. B. Bailey GB 1087. **F1B** (50 entries) 1. J. Petiot F 1260+240, 2. R. White USA 1260+205, 3. P. Lagan NZ 1260+187, 4. J. MacGillivray CDN 1260+168, 5. D. Tongway AUS 1259, 25. S. Marriott GB 1181, 33. A. Walls GB 1120, 34. I. Kaynes GB 1107, 40. M. Duce GB 621, 50. R. Pollard GB 175. **F1C** (34 entries) 1. R. Simpson USA 1260+240+360+305, 2. T. Koster DK 1260+240+360+302, 3. P. Nash AUS 1260+240+360+225, 4. D. Galbreath USA 1260+240+281, 5. S. Screen GB 1260+240+269, 12. R. Collins GB 1235, 15. K. Faux GB 1220, 18. P. Harris GB 1207, 19. R. Monks GB 1186, 20. M. Cowley GB 1180.

MICROMOLD CO₂ KITS

Following *MicroMolds* increasing interest in CO₂ model flying, comes the release of a range of new kits specifically designed for CO₂ motors. **Starhawk**, **Skyranger** and **Attacker** are each attractively styled semi scale free flight sport models. The models are all sheet balsa construction with curved plate wings incorporating a semi jedelsky strip leading edge, but no ribs are required. All parts are accurately die cut to shape from good quality balsa; literally all you will need is a tube of glue and a knife, and assembly should prove fast and straightforward. The models will accept any of the currently available CO₂ motors, although Micromold would obviously recommend the Telco unit which they are now producing. Plenty of colour-

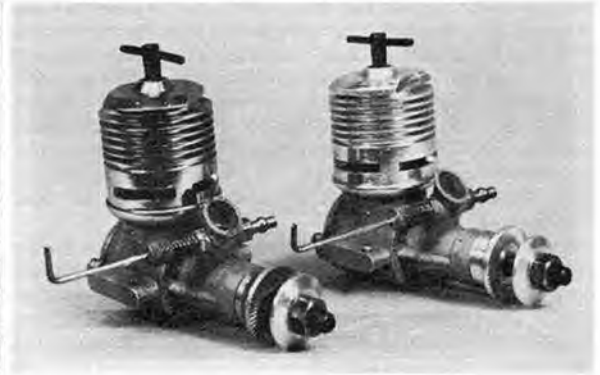
Trade Topics

ful transfers are included and although the models will fly best with natural finish, a limited amount of colour paint could be used. The advantages of CO₂ power – silent, clean and instant starting – make these models an ideal choice for both newcomers or sport flyers.

KOMAR K2.5 AND K3.5

Manufactured in India, these two diesel engines from *Aurora Models* (the same suppliers of the famous *Mills .75* and *Mills*

1.3 now also produced in India) are currently being imported by *Irvine Engines*. Although not representative of latest model engine design, the **K2.5** and **K3.5** will nevertheless provide a useful alternative power source to the sport C/L or F/F enthusiast. The motors were originally produced in the 1950s by K. Model Engineering Co of Gravesend as the *K Falcon* but like the *Mills* are now back in production in India.



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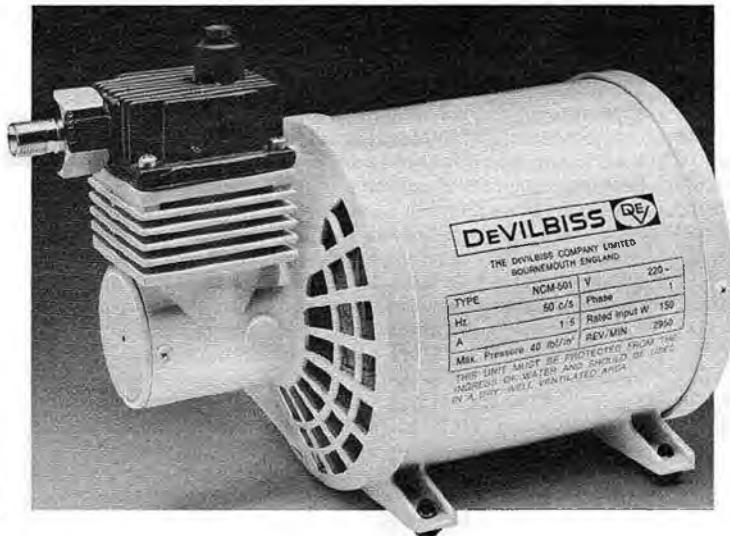
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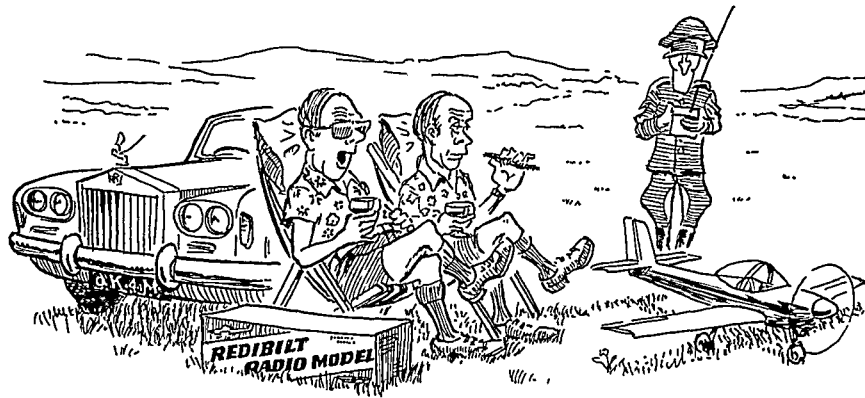
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TOPICAL TWISTS

by Pylonius

illustrated by Sherry



"IT WAS MY DOCTOR WHO SUGGESTED I SHOULD TAKE UP A CONSTRUCTIONAL HOBBY!"

TESTING TIME

Starting off in aeromodelling in the present fairyland of gadgets and goodies must be pretty confusing. Where, it is asked, can you make a start? To take just one aspect. Your ability as a craftsman may yet be untested. Your only essay into the mini construction field may have been a school project such as a Dan Dare spaceship made from two washing-up liquid dispensers and a cornflake carton, or the Tower of London re-created in Dried Milk Cans and polystyrene offcuts. It is true that you may well be an undiscovered prodigy who, in one brilliant year, will be nudging the World Champions off their perches. On the other hand you could be Johnny-all-thumbs with as much flight flair as an overweight ostrich.

You would need to know something of your luck quotient, too. This can vary from all things bright and beautiful to Disaster Incorporated. We all look on with awe and wonderment at the sort of flier who unfailingly turns in a perfect performance, and whose models never crash or go missing. At the same time we have every sympathy for the bloke who puts all the dents in the flying field, has a chronic glitch in his equipment and, apart from other hang ups, usually finds a lodgement in a convenient tree.

Temperament must also be taken into account. Are you lazy or just born idle? Will your model output match your ambitions? It could be that you are the work intensive type, unsparing in your efforts to achieve perfection. Perhaps the creator of one of those too good to fly models that do the epic flights hanging from the model shop ceiling. And who, when asked by the wife to put down the model work and have a look at the telly, either answers, "What telly?" or, "Why, has it gone wrong?" Such people have no use for the silicon chip; they are way ahead of it. On the other hand your work rate might be absolutely appalling. If the attic conversion is now entering its sixth year, or you have to mow the lawn with a machete, then you might be well advised to try something simple or even ready made. After all, you don't want to take the kids over the common to fly it when they are in their thirties.

Then again, you might be a nice model builder, but wholly unpractical where gadgets and mechanics are concerned. There are, for instance, quite a lot of women who are nifty car drivers, but ask one of them what the clutch is for and she'll think you're making some improper remark. You would do well to check on I.Q., too, before embarking on certain aspects of model flying. Einstein, himself, could well have been baffled by some of the advanced servo link ups, whilst glider circle towhook gadgetry is strictly Brain of Britain stuff.

You could also do well to check yourself physically. For instance, are you the sedentary type or have you a taste for jogging and other muscle-wrenching antics? It could be that you are the original Michelin man, in which case rubber power flying could easily make you over-tired. And it is here that Radio and middle age spread can join so happily, money wise and operator wise. Or, if you are the giddy type, you should perhaps avoid control line flying, even if it is good for the circulation.

All this could be embodied in a questionnaire at the model shop and other hobby outlets. It could be on the lines of the sort of self analytical quiz you get in the Women's journals, like, 'Will you

make the ideal wife?' (you need to be married to a model flyer) or 'Are you self-conscious?' (a modeller must have a solarfilm skin). The relevant information could be fed into a computer. After which you'll probably take up electronics.

MONEY FLIES

One thing the personality tests discreetly avoid is the question of money, but much depends on the size of your wallet, for the bigger the bank balance the greater the lure. Money means status, and if you have a Ferrari in the garage and a yacht in the Med you could hardly be seen messing about with anything less prestigious than multi radio at its sleekest or something impressive in the way of helicopters. Were you to be seen flying a rubber powered model you'd have all the trendy psychiatrists queuing at your door. But even the wealthy must tread warily, for it is all too easy to be landed with some ghastly, all plastic monstrosity, which could just get marginally airborne if given over to a group of aeronautic experts. Worse still, if your budget is just as marginal, for when, in desperation, you seek advice on the flying field you could be told to 'get rid of that load of rubbish for a start' – which is a bit thick considering the row you had with the wife over deferring the next mortgage payment.

But rich man, poor man, the beginner is well advised to try something nice and simple, for if that first model does turn out like a row between a drunken woodchopper and a one-armed paperhanger, then you can take up skin diving or hang gliding without too much embarrassment.

Lying in wait, too, for the handy credit card is the big kit. Now, as any lion tamer will tell you, big kits can be dangerous if not properly handled, and the same goes for the model variety. To the complete greenhorn the simplest kit can be full of baffling snags. This is not the fault of the kit makers. Kits are devised and prepared by experts who have probably never met a beginner. On the other hand, the inveterate hobbyist may think the kits to be designed by beginners. It is usually advisable to build a few models first before tackling anything as difficult as a kit.

Another word of caution. Before setting up the spare bedroom as a workshop, you might consider what sort of aeromodeller you will become. Generally they come in three grades: hard core, padding and decoration, and that's only as far as the club is concerned: the people who do most of the flying and organise everything; the people who fly occasionally and are usually to be seen around unless there is any work to be done; and the people who are occasionally seen around but never in the company of anything resembling a model aircraft. Outside the world of the club there is the diletante. He's the sort of chap who is quite a whizz as a model builder but is a bit of a dabbler with an exasperating resistance to the bite of the model bug.

A last word of warning. Model flying can not only be damaging to your wealth, you will need the support and comfort of family and friends during this crisis in your life. Remember you are embarking on a whole new way of life – much like entering a monastery. That is, if you intend to become a real aeromodeller and not just a buyer of goodies.

AEROBATICS

by Glen Alison

1980 C/L WORLD CHAMPIONSHIPS - BRITISH STUNT TEAM

This year the bi-annual Championships is being organised by the National Aero Club of the Polish Peoples' Republic in the town of Czesochowa from the 12th-18th July.

Britain has an all new team this year in Aerobatics, none of whom has represented us at a World Champs before. Bill Draper from Nottingham, has just had an excellent year at home contests in 1979 and will be flying his *Super Hawk* design powered by an *Enya 40*. Developed from his *APS Kitty Hawk* (Plan No 1240 price £2.65 inc p&p), the model has 40dm² wing area and features a detachable wing. Bill has made a special stunt venturi for the motor of 9mm dia choke and fitted with a spray bar assembly from an *Enya 35*. Propellers are normally Tornado nylon 276x150 two blade or 250x150 three blade.

Our second man is Barry Price Robinson of Newton Aycliffe, Co Durham. He likes big models such as the *Olympus* powered by a *Merco 49* and this impressive combination seems to be well liked on the Continent. Barry was our highest placed at 6th in the 1979 European Championships at Merville, France, last Autumn.

Third man, Peter Coates from Whitefield was our reserve until Jim Mannall withdrew from the team but now is preparing three models to take to Poland. His own design is called *Pisces* and is a conventional modern design with fixed wings powered by *Super Tigre 46s*. By careful wood selection and a tissue/dope finish Pete has kept the weight right down to a remarkable 1.2kg.

Good luck team!

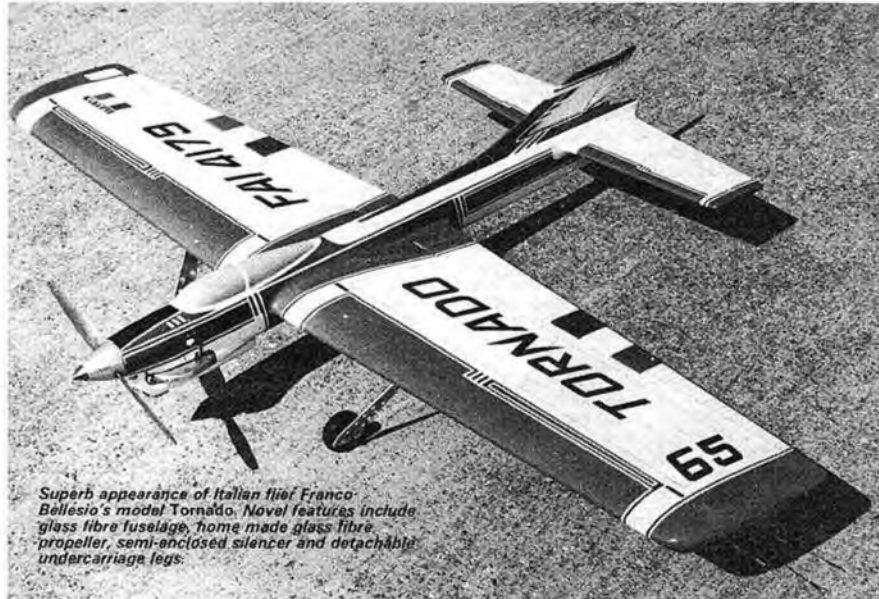
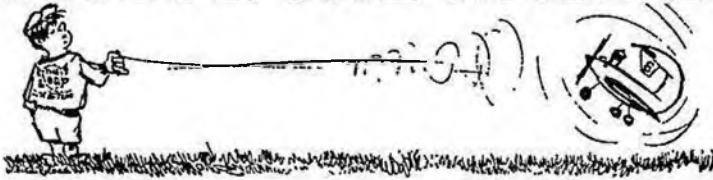
CONTINENTAL CONTESTS

Contest fliers will be interested to learn of an additional control line event in Germany to the well-known Bochum competition in September. It is at Bictigheim on 14th/15th June when the weather might be more suitable for camping and one might incorporate a visit to Utrecht in Holland for an Open International on the previous weekend, June 7th/8th. A good combination of a continental camping holiday with a two day international contest at each end I'll publish more details of the Bictigheim event as soon as they are available.

NEW RULE CLARIFICATION

I would like to clarify a point that has arisen since the publication of the proposed new Novice Stunt rules.

FROM THE HANDLE



Superb appearance of Italian flier Franco Bellesio's model Tornado. Novel features include glass fibre fuselage, home made glass fibre propeller, semi-enclosed silencer and detachable undercarriage legs.

recently ratified by the SMAE, in the February 80 *Aeromodeller*. This concerns the "promotion" point at which Novices graduate to the Senior class and it is proposed at 480 points. This score would apply to the new schedule which has a higher overall scoring structure than the old.

ADJUSTABLE TIP WEIGHT BOX

Harald Pokorny writes from Austria of his method of incorporating a box for adjustable tip weight in his foam wing stunters. He uses a block tip with a circular cavity formed in it by pushing a sharpened tube into the block and twisting back and forth until the required depth is

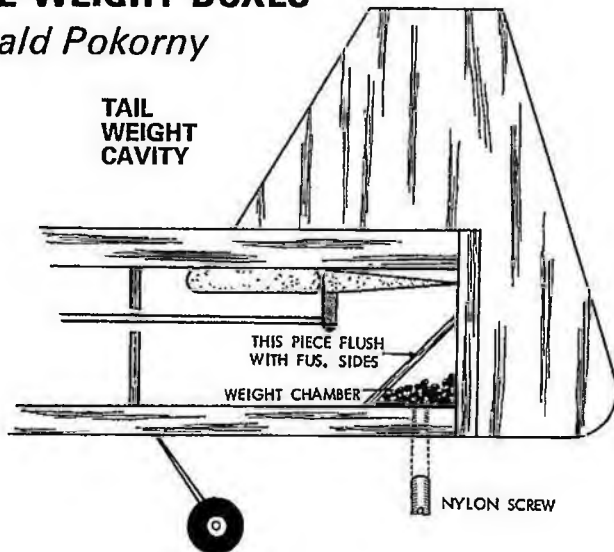
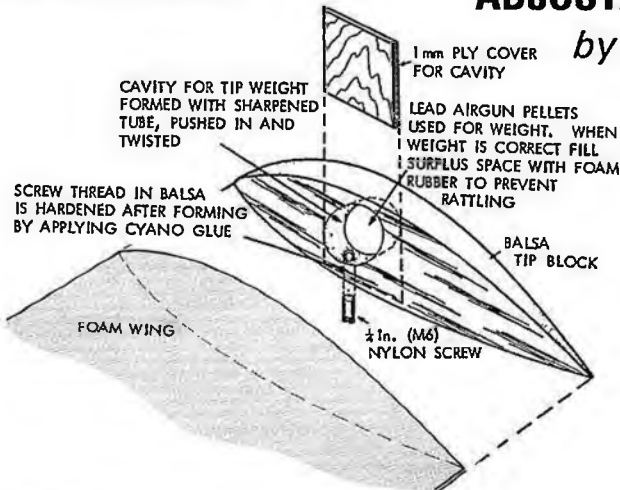
reached. The core is then easily removed and the cavity covered up with a thin ply plate. The filling hole underneath is formed by first drilling an undersized hole and then forcing a nylon screw into it so that it forms its own thread in the balsa. When the nylon screw is removed then the threads are hardened and protected by applying a few drops of cyanoacrylate glue such as Zap or Hot Stuff etc. Airgun pellets or fishing shot are used for weight and when correctly adjusted the excess space can be filled with scraps of foam rubber to prevent rattle.

Harald uses a similar method for adding tail weight to a nose heavy model (a rare problem I find!). A cavity is constructed under the tail plane and plugged in the same way.

TIP WEIGHT CAVITY

ADJUSTABLE WEIGHT BOXES

by Harald Pokorny



NOVICE STUNT SCHEDULE

I have judged many Novice Stunt competitions over the years, and I have noticed the same basic faults being repeated time and time again. On talking to fliers after their flight, it is obvious that they are often not aware of the errors or how their manoeuvres are judged and therefore are not trying to correct them! So here are a few observations that might help you get nearer the prize list or "promotion" into the Open class.

Preparation

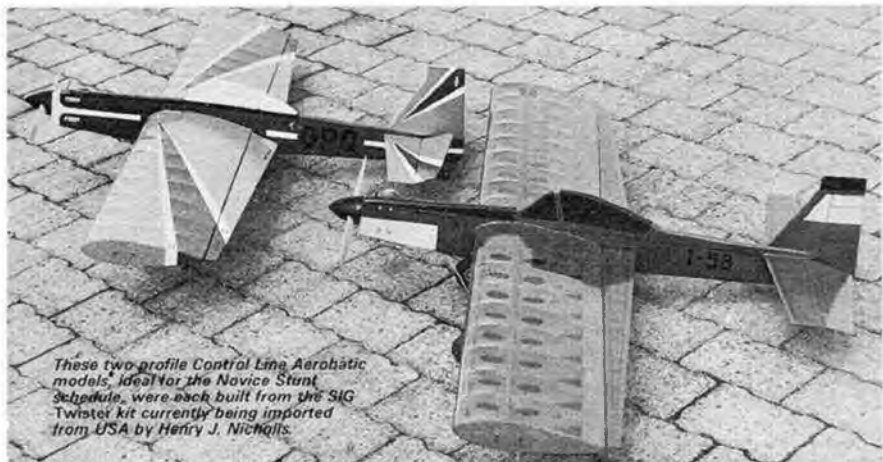
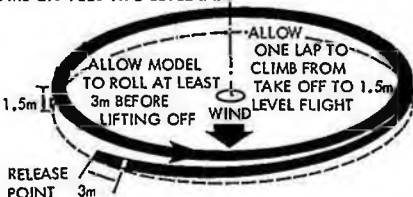
Have the lines connected and fuel tank filled *before* entering the circle. It causes an unnecessary delay to the smooth running of the contest and frustration to flier and judge alike. There is always the aggravation of getting the engine started anyway without any extra delays from lack of simple preparation.

Take Off

Many Novice competitions are held on grass sites so make sure that your undercarriage is suitable. Because of the extra rolling resistance of the wheels through grass, the wheels need to be positioned much further forward to prevent the model nosing over when released. Use "balloon type" wheels rather than "streamlined" variety as these handle the grass better having greater contact area with the ground.

Try to achieve at least 3m rolling on the ground before lifting off and then remember that the model should take a whole lap to climb up to level flight altitude of 1.5m and then remain level for two more laps i.e. Take off and level flight is a three lap manoeuvre. There should then be a two lap interval whilst the score is written down before the next stunt is attempted. So there is at least a total of

TAKE OFF PLUS TWO LEVEL LAPS



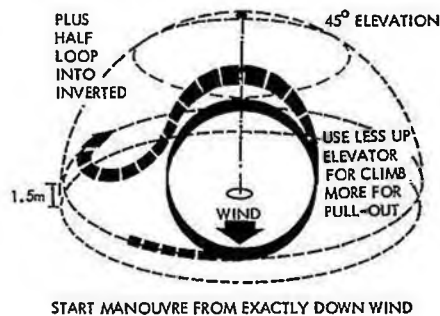
five laps between release of model and entering the first manoeuvre. Hence the reason that some fliers will lose the score of the first manoeuvre if say only 3 or 4 laps have been flown.

Consecutive inside loops

The main problem with loops is that they are not accurately superimposed over each other i.e. each successive loop moves a little to one side resulting in an imperfect flight pattern.

I believe the problem is caused by having too much up elevator control applied at the top of the loop thus the looping radius tightens up and the whole manoeuvre moves to one side. So, to maintain circular superimposed loops, ease off the up control at the top of the loop and also try to pick a reference point with your eye such as a tree on the horizon and relate your stunt to it. You can be sure that the judge will be doing just that. If you start your manoeuvre not exactly downwind then of course the wind will also blow the looping model towards the true downwind position.

3 CONSECUTIVE INSIDE LOOPS



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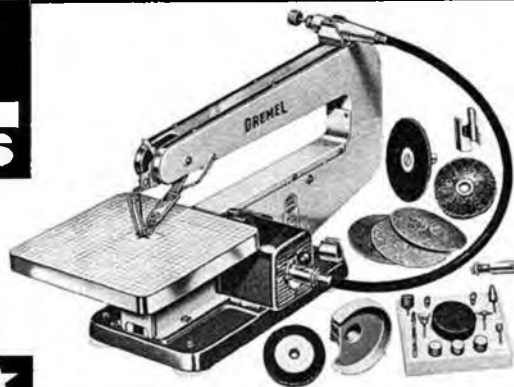
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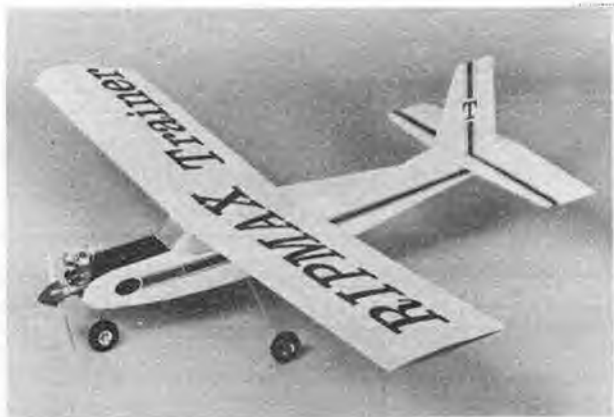
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4. Polythene sheet to cover plan plus drawing pins.
5. Modelling knife.
6. Wheels (3).
7. Wheel retainers + Allen key.
8. Pre-cut engine mount.
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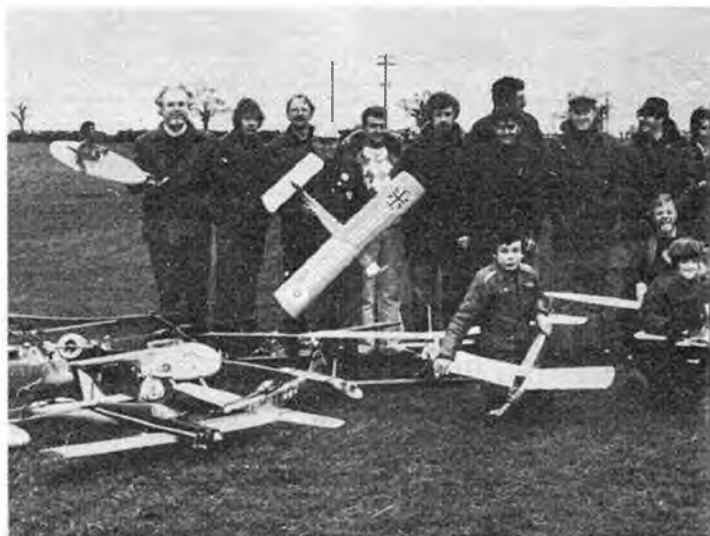
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CLUB NEWS

HAVING AT LONG LAST, tried my none too steady hand at indoor flying I found it to be good fun and quite a challenge. Like every other aspect of model flying you only get out of it what you put in, and to make the activity worth the while you need lots of patience and a whole new course in trimming. It can have its frustrations and hang ups (literally) though, particularly when a wayward drift spoils an otherwise promising flight, and when those wall and ceiling projections jut out too prominently. However, the bonuses are worth the while. Most of these extremely light models, such as the EZBs, are virtually crashproof, and even the Peanut Scale models seem to bounce rather than break. What is more, it is free of most of the tensions and anxieties that are to be met on the flying field. A most recommended branch of model flying.

The counterpart to indoor flying on the outside, of course, is Free Flight; and no more able exponents over the years have there been than the members of the **Croydon & DMAC**, past and present. In the report sent in by Malcolm Wood, the Club PRO, we are reminded that the Club Championship Trophy for highest points gained in selected SMAE contests throughout the season, was an almost perpetual possession of the club, but has become elusive over the past few years. It was decided at the 1978 AGM that the time had come for a retrieving operation. Before every scoring event in 1979, Ray Elliott canvassed round to ensure the maximum turn out. Results were good, with Croydon scoring high in all events except FAI Power. Alas, though, the scoring was just not high enough to stave off the Biggles Free Flight Team who ultimately won the Plugge Cup once again, so it's a case of an even bigger effort next year. *Sec: D. H. Thomson, 18 St Peters Way, London W5.*

Our next report is from a club with wide diversified interests. According to PRO, Roger Brown, the **Northampton MAC** is one of the oldest clubs in the country, founded in 1932 by someone who must have enjoyed one of the longest model flying careers: no other person than Howard Boys, the club President. Other people of note associated with the club over the years are Ted Evans of Wakefield fame and current *Aeromodeller* editor. Unhappily, the club went into decline in the late 60s due to urban sprawl swallowing up usable flying space. However, the club was jerked out of the doldrums in 1979 with the election of a new and dynamic

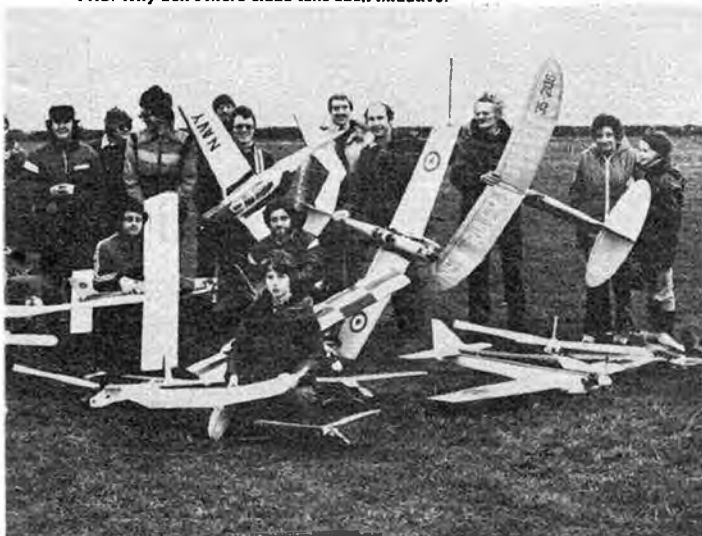


committee which found a permanent flying field, large, flat, and relatively isolated. It also programmed the club nights to include lectures, auctions, film shows etc. Membership shot up to a paid up figure of 70, representing most aspects of the hobby. Vintage is well represented by Frank Smith and Jack Humphries, both members of SAM. Control line also has a good following, particularly in 1/2A Combat, in which Marc Humphries and Rob Roy have been previous Nationals finalists. Radio gliding, aerobatics, Scale and sport make up the greater part of the club interest, but Free Flight does get a look in. To give some idea of the wide ranging enthusiasm the report is accompanied by a fulsome feature in a local newspaper with photographs showing a formidable array of models of all kinds. Looking through the club newsletter, *Flying In-Formation*, the notice that caught my eye was for a Camping/Caravanning/Modelling Weekend. The outing is scheduled for the Spring Bank Holiday to an airfield in Norfolk. Apart from the inevitable model flying there are shopping trips, a visit to the theatre, and a party at a country pub, plus an excursion to the seaside. Something for all the family. Seems a good idea. *PRO: Robert Brown, Warwick House, Church End, Roade, Northants.*

Peter Stimpson, PRO of the **Ipswich MAC**, writes to remind us that the club is still very much in the business of making and breaking planes, and taking an active part in Area and Local events. With a First Division in the town, the club has something to live up to. At least the Green/Cunningham team did their bit by coming second in Goodyear at the Nationals. Nearer home, Dave Parker won the Club Stunt contest and John Green the Club Combat Event. Not such good news is that the club has lost the use of Martlesham Heath, with all its historic associations, because of housing development, urban sprawl being one of the greatest threats to our hobby. Fortunately for the club, the local council is allowing flying in Chantry Park, near the pond, on Sunday afternoons. *Sec: A. Malcolm, 433 Bramford Lane, Ipswich, Suffolk.*

Not a marvellous turn out for the first AGM of the **Sheffield Control Line AMS**, making for an informal evening. Even so, a full committee of six was elected and club fees agreed at £3 for seniors and £1.50 for juniors. It was decided, too, that the definition of a junior was someone undergoing full time education, which, in these enlightened times, could mean anyone up to the age of thirty. There was support for the proposition that club meetings should be held once a month at a more permanent meeting place. It was also recommended that flying should go on every Sunday afternoon (weather permitting) at Richmond Park. It was felt that such intensive practice should augur well for competition success during the present year. *Sec: John James, 22 Hooton Road, Kilnhurst, Rotherham. Tel: Mexborough 588476.*

Northampton MAC members lined up for a publicity photo, one of many used in a full page feature in their local paper, the Chronicle and Echo - well done that PRO. Why don't more clubs take such initiative?



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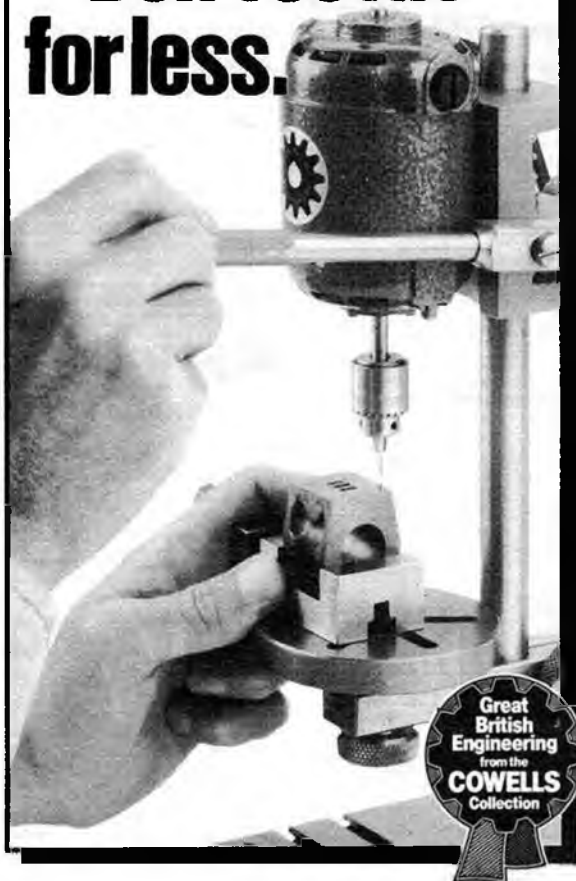
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How do we get a *Seadog* on dry land? that is if rainy England could be considered dry. Well, initially it is the South Eastern Area Digest of Gen, which, in the December issue gives news of the re-election of officers at the Area AGM. It is a good thing that there are always people to run our affairs for us gratis. They should never be taken for granted. News of the Odiham Spring Gala on the 4th May is of an endeavour to alter the format of the R/C Aerobatic event to a semi-Scale contest. Seems the big turn outs in the south east are for Thermal Soaring, with the Bloobirds club notable amongst many others in this popular branch of the sport. Mean-time Free Flight goes on apace at the Ashdown Forest site with its not overlarge but consistent following. Adding interest to the Area meetings is the concurrent RAFA Shield events. Top club in the final analysis is Brighton, with Crawley second.

Hot Air, the newsletter of the **Grantham & DMAS**, is not quite so gaseous as its title may suggest. There are, for instance, a number of snippets of an amusing and quite literary nature. One, by dint of much specious reasoning, tries to suggest that model flying is one of the classics of human activity, much to do, it is averred, with our connection with Leonardo de Vinci. *Sec: Mr N. Grantham, 115 Fifth Ave, Alma Park, Grantham, Lincs.*

The **Leicester MAC** news bulletin asks its members what New Year resolutions they have made, if any. Usually though, those pie in the sky building intentions are made at the end of the season when we are still full of the ideas and enthusiasms that inspire us as winter approaches. Something that a cosy armchair in front of the telly drowsily erodes. One thing you could do is to build an electric powered model, expert advice upon which appears in an article by David Face. The electric motor is an ideal unit for a powered glider. It is encouraging here to note that the provisions for model flying on many local open spaces debar only power models propelled by internal combustion engines and other forms of combustion. David Face describes a mild form of aerobatics achieved, even a lazy loop, and looks forward to the day when a full aerobatic schedule is possible. *Sec: I. McKeggie, 12 Pochin Drive, Burnmill Park, Market Harborough.*

CAPTION CONTEST



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

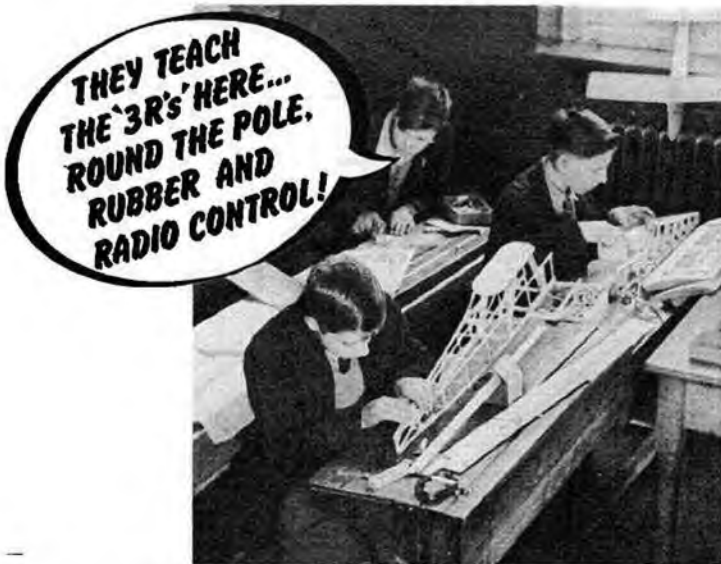
The lively and neatly produced magazine of the **Anglia MFC**, surveys the successes of the Thermal Soaring members over the past year. In a way, thermal soaring has taken over the competitive role in the club, for the once invincible free flight team (winners of the Plugge Club Championships in 1977) has gone into something of a decline, aggravated by Bob Wells' unfortunate accident, and Ray Pavely taking a business sabbatical. Lament of the Chairman, Peter Hindle, is that the club is failing in its efforts to attract young members into the club. There is no doubt that the high cost of flying radio on a countryside airfield makes it extremely difficult for the non too affluent youngster to participate. It would seem the only youngsters on the radio scene are the progeny of the mature flyers. Yet even that does not account for the indifference of the younger generation to what is undeniably a challenging and exciting hobby. Enthusiasm is a contagious thing, and with so many urban sites banned to model flying few youngsters actually get to see any model flying! *Sec: C. J. Goodley, Chase Farm, Woodham Mortimer, Maldon, Essex.*

In *Wings and Fins*, the newsletter of the **Coventry MAC**, the Chairman, Ray Haywood, is hoping that 1980 will see something of an up turn in Free Flight activity. He reminds us that newly developed power forms, electric and CO₂, have extended the range of models, and here we might remind readers again that such models are usually acceptable on urban sites where there is not a complete ban on model flying. *Sec: N. H. Goodman, 23 Berwyn Way, Stockingford, Nuneaton, Warks CV10 8QW.*

Main news in the **Banbridge Aeromodelling Club** (Northern Ireland) newsletter is of a trip to London by some of its members. Mainly it was a bumper tour of the big model shops to marvel at the goodies and gadgets now on offer. A nice way of lightening the winter gloom. The trip was rounded off with a visit to the RAF Museum. *Newsletter Editor: B. Rooney, 4 Bridge Street, Banbridge, County Down, NI.*

That's all for this month. Your reports, photos and newsletters welcome.

Clubman



FEBRUARY WINNER - HARRY FOSTER, DERBY

It was back to school and thinking caps on for many readers who cast their memories back to the "best days of their lives" in search of a caption - but surely school was never that good! "I STILL SAY THE ESCAPE COMMITTEE GOT IT ALL WRONG, THESE PLANS ARE 1:4 NOT 4:1!" claimed Jamie Allward, Dorset. "IT'S RUMOURED WE DO ACTUAL LESSONS NEXT TERM!" whispers A. Healey, Burnley. "DON'T TELL MY FOLKS JIM, BUT I WOULD HAVE PREFERRED A MECCANO SET FOR XMAS" claims Geoff Green, High Wycombe. This month's winner, Harry Foster, also sent us another gem "IF YOU MISBEHAVE, THEY MAKE YOU GO HOME AT 4 O'CLOCK!"

The original photograph came from the Peter Webster Secondary School, Chesterfield, published in our June 1953 edition, where Aeromodelling was part of their scholastic activities, a forerunner of many other schools which now recognise the educational value of such a creative activity, and which today has been elevated to a GCE and CSE subject.

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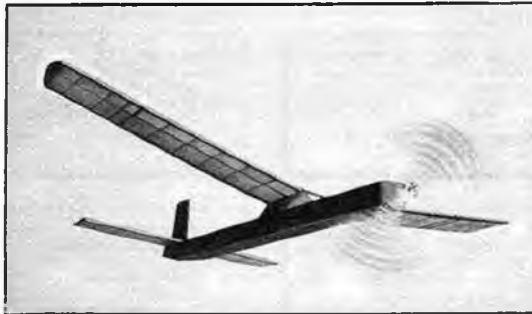
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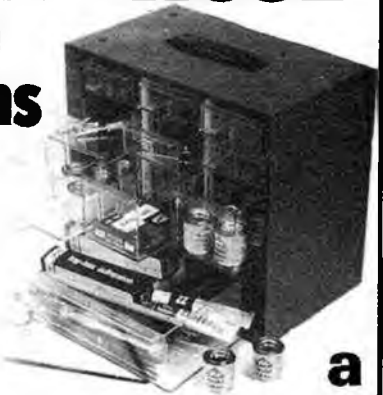


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CAMBRIDGE Tel. 59620
MODEL MANIA ★
17 KING STREET
Open: 9.30am-5.30pm
Mon-Sat. Inc. Lunchtime

CHESHIRE

MACCLESFIELD Tel. 0625 29467
HOBBY-CRAFTS (MACCLESFIELD) LTD
PARK MILL
HOBSON STREET
Open: 9.30-5.30 Mon-Sat

DORSET

BOURNEMOUTH Tel. 424038
R. F. AUSTIN - MODEL SHOP ★
156 SEABOURNE ROAD
SOUTHBOURNE BH5 2JA
Open: 9am-5.30pm Mon-Sat
Closed 6pm Thurs-Fri
Half day Wed

BOURNEMOUTH Tel. 517032
J. & H. MODELS ★
823 WIMBORNE ROAD
MOORDOWN, BH9 2BA
Mon-Thurs 9am-5.30pm
Fri 9am-6.30pm. Sat 9am-6pm

SALE Tel. 061-962 4561
HOBBYWORLD ★
200A MARSLAND ROAD
Mon-Sat 9.30-6.00
Wed early closing

BOURNEMOUTH Tel. 763480
WESTBOURNE MODEL CENTRE ★
59 SEAMOOR ROAD,
WESTBOURNE
Open: 9am-5.30pm Mon-Sat

STOCKPORT Tel. 061-480 5478
THE MODEL SHOP
280 WELLINGTON ROAD SOUTH
Open: Mon-Sat 9am-5.30pm
Closed Tuesdays

ESSEX

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

CLEVELAND

MIDDLESBROUGH Tel. 211212
HOBBYDROME,
283 Linthorpe Road,
Open: 9.30am-5.45pm.
Late night Friday 8pm.
Closed Wed.

HARLOW Tel. 21697 & 418817
K & C MODELS ★
PARDON MILL
PARDON MILL LANE
Mon-Sat 9.30-6.30
Sunday 10.00-12.00

CORNWALL

FALMOUTH Tel. 314902
RAILCRAFT OF CORNWALL ★
103 KILLIGREW STREET
Mon-Sat 9.00-5.45

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

DEVON

EXMOUTH Tel. 72540
EXMOUTH MODELS
78 EXETER ROAD
Mon-Sat 9.00-6.00

WICKFORD Tel. (037 44) 2621
WICKFORD MODEL EXCHANGE ★
ST PETER'S TERRACE
LONDON ROAD
Open: 9.30am-6pm Mon,
Fri-Sat. Late night Thurs 7pm.
Closed Tues and Weds.
Sun 10am-1pm

GLOUCESTERSHIRE

CHELTENHAM Tel. 34644
THE MODELLERS DEN
39 HIGH STREET
Open: 9am-5.30pm Mon-Sat

HAMPSHIRE

ANDOVER Tel. 61307
RADIO CONTROL SUPPLIES ★
1a UNION STREET
Open 9am-6pm. Fri 9am-8pm
Closed Monday

PLYMOUTH Tel. 0752 21851
PLYMOUTH MODEL CENTRE
11 OLD TOWN STREET
9am-5.30pm Mon-Sat
Late night Friday 6.30pm

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

TORBAY Tel. 0803 521767
MANSEL'S MODELS ★
PALACE AVENUE, PAIGNTON
Open 9.15am-5.30pm
Mon-Sat inclusive
Half day Wed
Late night Fri 7pm

FAREHAM Tel. 234136
G. M. H. BUNCE & CO LTD. ★
206 WEST STREET
Open 9am-5.30pm. Closed Wed

KENT

FARNBOROUGH Tel. 44600
DON MODELS
 24a QUEENS ROAD
 NORTH CAMP
 Mon-Sat 9.00-6.00
 Closed all day Tues

BEXLEY Tel. Crayford 522308
BEXLEY MODEL CENTRE
 18 BOURNE ROAD
 Mon-Sat 9-5.30
 Thursday closed all day

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

LONDON NORTH WEST

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

PORTSMOUTH Tel. 25049
RAY BROWN MODELS ★
 10 KINGSTON ROAD
 Open: 10am-5.30pm
 Lunch 1pm-2.30pm
 Closed all day Wed

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

LEICESTERSHIRE

HINCKLEY Tel. 30952
PUNCTILIO MODEL SPOT ★
 6 WATERLOO ROAD
 Open: Mon 9.15am-7pm.
 Tues 2pm-7pm
 Wed & Thurs 5.30pm-7pm.
 Fri 9.15am-7pm. Sat 9.15am-5pm

LONDON SOUTH

ELTHAM Tel. 01-850 4324
ELTHAM MODELS ★
 54 WELL HALL ROAD SE9
 Mon-Sat 10am-5.30pm.
 Closed Thurs

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

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

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

LONDON Tel: 01-703 4562
MODEL AIRCRAFT SUPPLIES ★
LTD.
 207 Camberwell Road, SE5
 Open: Mon-Sat 10am-6pm.
 Fri 10am-7.30pm.
 Closed all day Thursday

SOUTHAMPTON Tel. 25919
HOBBY LOBBY LTD ★
 52 COMMERCIAL ROAD
 Open 9.30am-5.30pm Mon-Fri
 Sat 9.30am-5pm

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

LOUGHBOROUGH Tel. 61421
THE MODEL SHOP ★
 64 ASHBY ROAD, LE11 3AE
 Open: 10am-5.30pm
 Monday-Saturday

LONDON Tel. 01-653 4943
NORWOOD JUNCTION
MODELS LTD.
 3 ORTON BUILDINGS
 PORTLAND ROAD, SE25 4UD
 Open 9.30am-1.30pm -
 2.30-6.00pm Mon-Sat
 Early closing Wednesday 1pm

HERTFORDSHIRE

HATFIELD Tel. 63404
DESIGN AND HOBBIES ★
 5 MANOR PARADE
 Open: Mon-Sat 9.30am-6pm.
 Thurs closed 7pm
 Closed all day Wednesday

NEW ASH GREEN Tel. 0474
THE HOBBY HOUSE 872136
 10 UPPER STREET NORTH
 Open 9am-5.30pm. Closed Mon

LINCOLNSHIRE

LINCOLN Tel. 25907
THE MODEL CENTRE
 24 NEWLAND, LN1 1XG
 Open: Mon-Sat 9am-6pm.
 Early Closing Wed. 1pm

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

HEMEL HEMPSTEAD Tel. 53691
TAYLOR & MCKENNA LTD
 203 MARLOWES
 Mon-Thurs 9am-5.30pm.
 Fri-Sat 9am-6pm

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

STAMFORD Tel. 4524
SPORTS & HOBBIES ★
 4 ALL SAINTS STREET
 Open 9am-5.30pm. Half day Thurs

LONDON EAST

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

LANCASHIRE

HERTFORD Tel. 50101
MODELLERS WORLD ★
 4 OLD CROSS
 Open: 10am-5.30pm
 Closed Thursday

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

LONDON CENTRAL

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

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

ST ALBANS Tel. 53954
S A M S
 12 HATFIELD ROAD
 Mon-Fri 9am-6pm
 Sat 9am-5.30pm

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

BISHOPSGATE E1
HADLEY HOBBIES Tel. 01-283 9870 ★
 131 MIDDLESEX STREET
 Sun 9.30am-2pm
 Mon-Fri 9am-6pm
 Very close to Liverpool Street
 Station

MIDDLESEX

HARLINGTON Tel. 01-897 2326
RADIO CONTROL MODEL
CENTRE ★
 214 HIGH STREET
 Mon, Tues, Thurs & Sat 9.15am-6pm
 Fri 9.15am-7.30pm
 Closed Wed

HONG KONG

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

MANCHESTER Tel. 061-834 3972
THE MODEL SHOP ★
(MANCHESTER)
 209 DEANS GATE
 Mon-Fri 9.30am-6pm. Sat 9.00-5pm

LONDON NORTH

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

HARROW Tel. 01-863 9788
THE MODEL SHOP
 190-194 STATION ROAD
 Mon-Sat 9.30-6.00
 Wednesday 9.30-5.00

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

PRESTON Tel. 51243
PRESTON MODEL CENTRE ★
LIMITED
 (Opposite Polytech.)
 2 Fyde Road
 Open: 9.30am-6pm Mon-Sat

LONDON Tel. 01-607 4272
HENRY J. NICHOLLS &
SON LTD ★
 308 HOLLOWAY ROAD, N7
 Open: Mon-Sat 9am-5.30pm

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

WEMBLEY Tel. 01-902 4823
WALLY KILMISTER LTD
6 & 7 NEED PARADE
Mon-Sat 9.00-5.30
Closed Wednesday

NORFOLK

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

NORWICH Tel. 0603 42515
GALAXY MODELS ★
88 CATTON GROVE ROAD
Open 6 days a week

NORTHANTS

NORTHAMPTON Tel. 31223
THE MODEL SHOP ★
230 WELLINGBOROUGH ROAD
Open 9am-6pm. Half day Thurs

NORTHAMPTON Tel. 35718
STAGG MODELS ★
20 DERNGATE,
Open 9am-5.30pm
Early closing 1pm Thursday

NORTHAMPTON Tel. 27726
TAYLOR & McKENNA LTD
41-43 PRINCES WALK
GROSVENOR CENTRE
Mon-Thurs 9am-5.30pm.
Fri-Sat 9am-6pm

NORTHUMBERLAND

NEWCASTLE UPON TYNE Tel. 22016
THE MODEL SHOP ★
18 BLENHHEIM STREET
Mon-Fri 9am-5.30pm. Sat 9am-6pm

NOTTINGHAMSHIRE

NOTTINGHAM Tel. 204040
M. A. CHAPMAN MODELS
18 MANSFIELD ROAD
DAYBROOK SQUARE
Open Mon-Sat 9.30am-6pm

NOTTINGHAM Tel. 50273
GEE DEE MODELS LTD ★
19-21 HEATHCOTE ST,
OFF GOOSEGATE
Open 9.30am-5.30pm.
Early closing Thurs

SUTTON-IN-ASHFIELD Tel. Mansfield 58157
MODELLERS CORNER ★
146 OUTRAM STREET
Open Mon-Fri 9am-8pm
Sat 9am-6pm
Half day Wed (1pm)

WORKSOP Tel. (0909) 2855
RUSSELL MODELS ★
MODEL CENTRE, RYTON STREET
Open Mon-Sat 0930-1730
Thursday 0930-1300

OXFORDSHIRE

OXFORD Tel. 42407
HOWES MODEL SHOP ★
9-10 BROAD STREET
Open 8.45am-5.30pm. 6 day week

RUTLAND

OAKHAM Tel. (0572) 56100
RUTLAND SCALE ★
MODEL CENTRE
11 Mill Street,
Open 10am-5pm Mon-Fri,
9am-5pm Sat, 10am-4pm Sun
Closed all day Thurs

SCOTLAND

GLASGOW Tel. 041-632 8326
RIDDELL BROS ★
61 MOUNT ANNAN DRIVE
Mon-Sat 9-1; 2.15-6
Tuesday closed all day

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

PERTH Tel. 24540
DUNNS MODELS ★
29 SCOTT STREET
Mon-Sat 9.00-5.30
Wednesday Closed

STAFFORDSHIRE

BURTON-ON-TRENT Tel. 64240
J. & N. MODELS ★
22 DERBY STREET
Open 9am-5.30pm. Closed Wed

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

STOKE-ON-TRENT Tel. 263574
JOHN W. BAGNALL LTD,
30 PICCADILLY, HANLEY
9am-5.30pm. Closed all day Thurs

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

SUFFOLK

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

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

SURREY

ADDLESTONE Tel. Weybridge 45440
ADDLESTONE MODELS LTD ★
63 STATION ROAD
Open 9am-6pm
Closed all day Wednesday
Late night Friday 6.30pm

HORLEY Tel. 2412
HORLEY MODELS
91 VICTORIA ROAD
9.15am-5.30pm
Closed Wed

KINGSTON on THAMES Tel. 01-546 4488
MICK CHARLES MODELS ★
180 LONDON ROAD
Mon, Tues, Thur, Sat 9.30-5.30
Fri 9.30-8. Closed all day Wed

WOKING Tel. 66493
WOKING MODELS ★
9 GOLDSWORTH ROAD
Open 9am-6pm Mon-Sat
Closed Wed afternoon

SUSSEX

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

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

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

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

WALES

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

CARDIFF Tel. 31367
RYALL & WALTERS RADIO ★
MODELS
34 LLANDAFF ROAD
Open
9am-12.30pm-1.30pm-5.30pm
Monday 8pm. Closed Wed

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

PONTYPOOL Tel. 58070
TREGARON MODELS ★
40b GEORGE STREET
GWENT NP4 6BY
Open: Mon 12-7; Tues, Weds
9.30-5.30; Fri 9.30-7.30;
Sat 9.30-5; Closed Thursday

SWANSEA Tel. (0792) 52877
SWANSEA MODELS &
HOBBIES LTD ★
PLYMOUTH STREET
SA1 3QQ
Open: Mon-Sat.
Late night Fri 6pm

WARWICKSHIRE

BIRMINGHAM 10 Tel. 021-772 4917
BOB'S MODELS ★
520-522 COVENTRY ROAD,
SMALL HEATH
Open 9.30am-6pm.
Early closing Wed 1.30pm

BIRMINGHAM Tel. 021-373 5945
021-373 3535
JIM DAVIS MODELS
311-313 MARSH LANE
ERDINGTON
Mon-Sat 9.30am-6.30pm

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

SOLIHULL Tel. 021-744 3374
SHIRLEY MODEL SUPPLIES
62 STRATFORD ROAD
SHIRLEY
Open
Mon-Sat 9am-2pm-3pm-6pm
Thurs 9am-8pm

WEST MIDLANDS

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

WILTSHIRE

CHIPPENHAM Tel. 2466
 CHIPPENHAM MODEL
 CRAFT LIMITED ★
 65 NEW ROAD
 Mon-Fri 9am-5.30pm
 Sat 9am-5pm
 Wed 9am-1pm

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

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

NORTHALLERTON Tel. 0609 3334
 T. & F. M. GROVER LIMITED
 216-217 HIGH STREET
 Open: 6 days a week
 8.30am-5.30pm

SWINDON Tel. 26878
 SWINDON MODEL CENTRE ★
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 THEATRE SQUARE
 (Next to Wyvern Theatre)
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 Open all day Wednesday

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

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

OTLEY Tel. 466535
 MODEL SHOP (H. & S. CLIFF)
 FLYING MODELS
 57 GAY LANE
 Mon-Sat 6am-6pm

WORCESTERSHIRE

KIDDERMINSTER Tel. 2179
 P. & R. MODELS ★
 1 SEVERN GROVE
 RIFLE RANGE ESTATE
 Open: Mon, Tues, Thurs, Fri,
 9.45am-5.30pm.
 Sat 9am-6pm
 Closed all day Wednesday

DONCASTER Tel. 872791
 SOUTH YORKSHIRE
 MODEL SUPPLIES ★
 83 HIGH STREET, BENTLEY
 Mon-Fri 10.00-6.00
 Saturday 9.30-5.30
 Tuesday half day

LEEDS 17 Tel. (0532) 684809
 JUST MODELS ★
 120 GLEDHOW VALLEY ROAD
 Open: Mon-Sat 9.30am-6pm
 Closed all day Tuesday
 Sun 9.30am-12.30pm

YORK Tel. 0904-34281
 YORK MODEL CENTRE ★
 17 DAVYGATE CENTRE,
 DAVYGATE
 Open Mon-Sat 9.00am-6.00pm
 No half day

YORKSHIRE

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

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

**You can buy
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 from the shops
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★ Shops offering a
 mail order service are
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1/32"x3"	£1.39	1/8"x1/8"	52p	1/16"x3"	£2.36
1/32"x4"	£2.32	1/8"x1/4"	82p	3/32"x3"	£2.73
1/16"x2"	£1.20	1/8"x3/8"	97p	1/8"x3"	£3.18
1/16"x3"	£1.50	1/8"x1/2"	£1.27	3/16"x3"	£4.20
1/16"x4"	£2.40	3/16"x3/16"	82p	1/4"x3"	£5.02
3/32"x2"	£1.35	1/4"x1/4"	£1.20	SPRUCE STRIP Per 5	
3/32"x3"	£1.80	1/4"x3/8"	£1.57	1/8"x1/8"	90p
3/32"x4"	£2.59	1/4"x1/2"	£1.87	1/8"x1/4"	£1.27
1/8"x2"	£1.50	3/8"x3/8"	£2.02	3/16"x3/16"	£1.27
1/8"x3"	£2.10	1/2"x1/2"	£2.77	1/4"x1/4"	£1.95
1/8"x4"	£3.00	Shapes Per 5		POLYSTYRENE	
3/16"x2"	£1.96	LE 1/4"	82p	FOAM BLOCKS	
3/16"x3"	£2.59	LE 3/8"	£1.31	3"x24"x36"	£2.45
3/16"x4"	£3.60	LE 1/2"	£1.80	3"x12"x36"	£1.25
1/4"x2"	£2.21	LE 3/4"	£2.36	3"x8"x36"	95p
1/4"x3"	£3.00	LE 1"	£3.52	W.B.P. PLY	
1/4"x4"	£4.59	RA 3/8"x3/8"	90p	3"	Size 4"
3/8"x2"	£2.66	RA 1/2"x1/2"	£1.12	£1.20	0.8mm £1.60
3/8"x3"	£3.93	RA 3/4"x3/4"	£1.92	£1.35	1.5mm £1.80
3/8"x4"	£6.18	RA 1"x1"	£2.32	£1.50	2.0mm £2.00
1/2"x2"	£3.22	TE 1/4"x3/4"	£1.16	OBECHI VENEER	
1/2"x3"	£4.99	TE 1/4"x1"	£1.31	12" widths at 20p per ft.	
1/2"x4"	£7.76	TE 5/16"x1 1/2"	£1.61	cut to size.	

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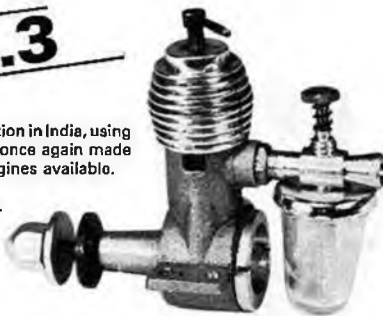
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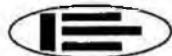
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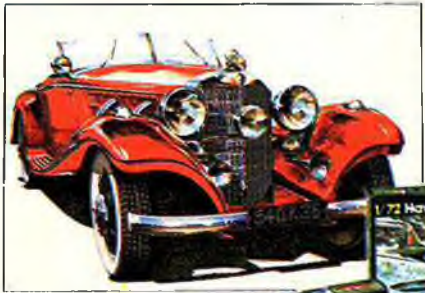
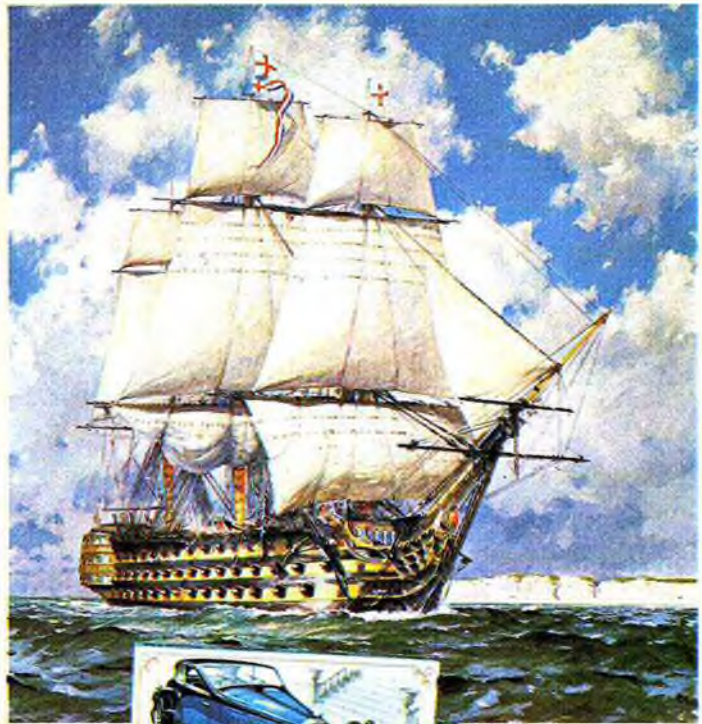
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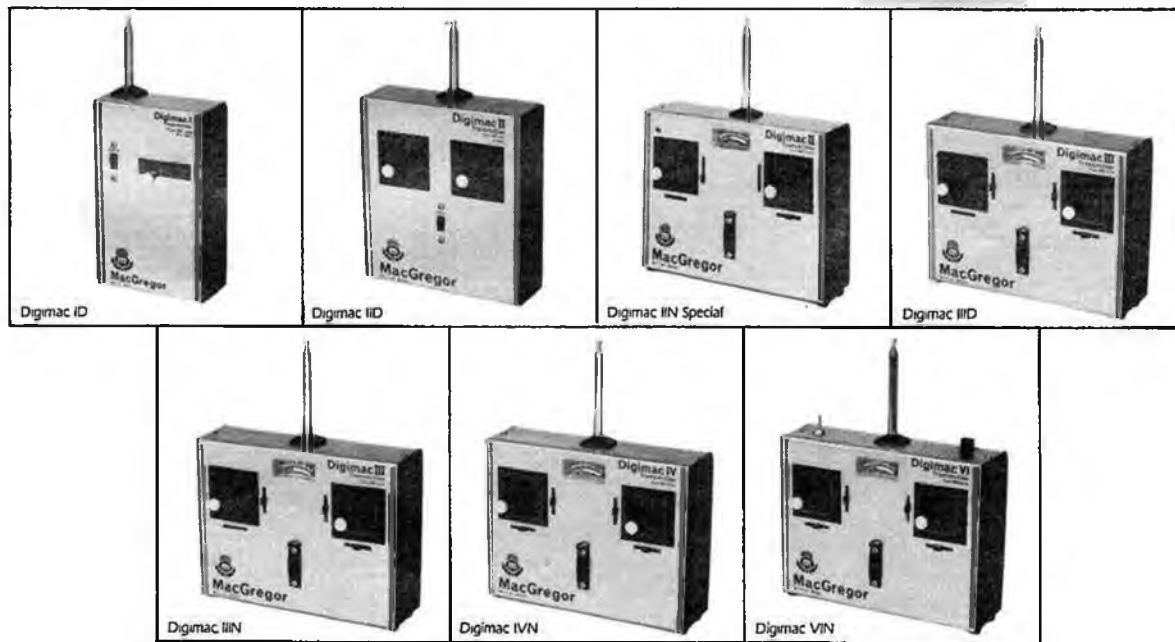
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