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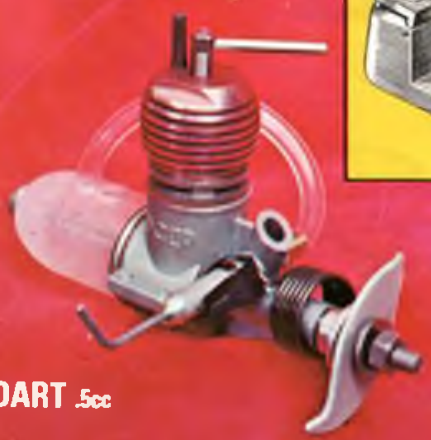

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SEPTEMBER 1979

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MAP HOBBY MAGAZINE

Comment

LATEST PROPOSALS from Britain's National body for model flying, the Society of Model Aeronautical Engineers, include plans for a Newcomers/Non Members Flying Open Day. Working in co-ordination with their own locally affiliated clubs, the Society hopes to make one or more sites available, man power permitting. Experienced model flying SMAE members will be on hand to assist and help newcomers. No specific programme is decided yet, but hopefully those new to aeromodelling would be free to come along and spectate, or better still bring their own models with them, to have the art of model flying explained in this most practical way. If sufficient SMAE clubs come forward, and enough sites can be found, it is hoped a multiple event can be staged simultaneously at local venues throughout the country. The plan is to start these events in 1980, but there is a chance the first of such meetings may be held later this year. We can only applaud the leadership of the SMAE with this new venture and extend their plea for help to all experienced modellers who can assist in expanding the modelling movement. News of actual dates and programme of events will be published in due course – Well done SMAE. For further details contact SMAE Secretary, Maurice Hassell, SMAE, Kimberley House, Vaughan Way, Leicester (0533–58500 office hours).

Contents

Volume XLIV No 524

Page 530 *Page 543*

On the Cover
5.51am June 12th – we have lift off. Bryan Allen pedals towards the end of the hardboard take-off strip at the Warren, Folkestone, and pulls up on the canard foreplane to lift Gossamer Albatross sedately out over the English Channel. Before him lay all the hazards associated with the first ever manpower crossing attempt, which he successfully completed , landing at Cape Griz Nez in France to win the £100,000 Kremer Prize. Full story page 533.

Next Month
Lots more modelling variety. Radio Control Sport Flyer helps you choose an engine and covers safety aspects on the flying field. CO_2 – Its A Gas progresses to building from plans. Aero Aces for the juniors, tells all about propeller use and care, and presents full size plans for John Stroud's C/L trainer "Tough Cookie". APS plan is Theo Georgiadis and Dennis Prior's "Timepiece", Australia's world class team racer. Plus all the news on Free Flight and Scale model flying. On sale September 21st

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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** £7.50 per annum, including index. $15 (U.S.) for overseas subscriptions

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 9FR for the Proprietors and Publishers, Model & Allied Publications Ltd. (a member of the Argus Press Group)
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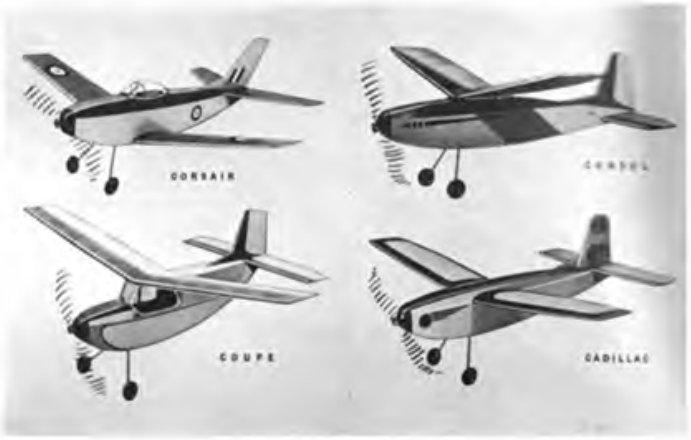

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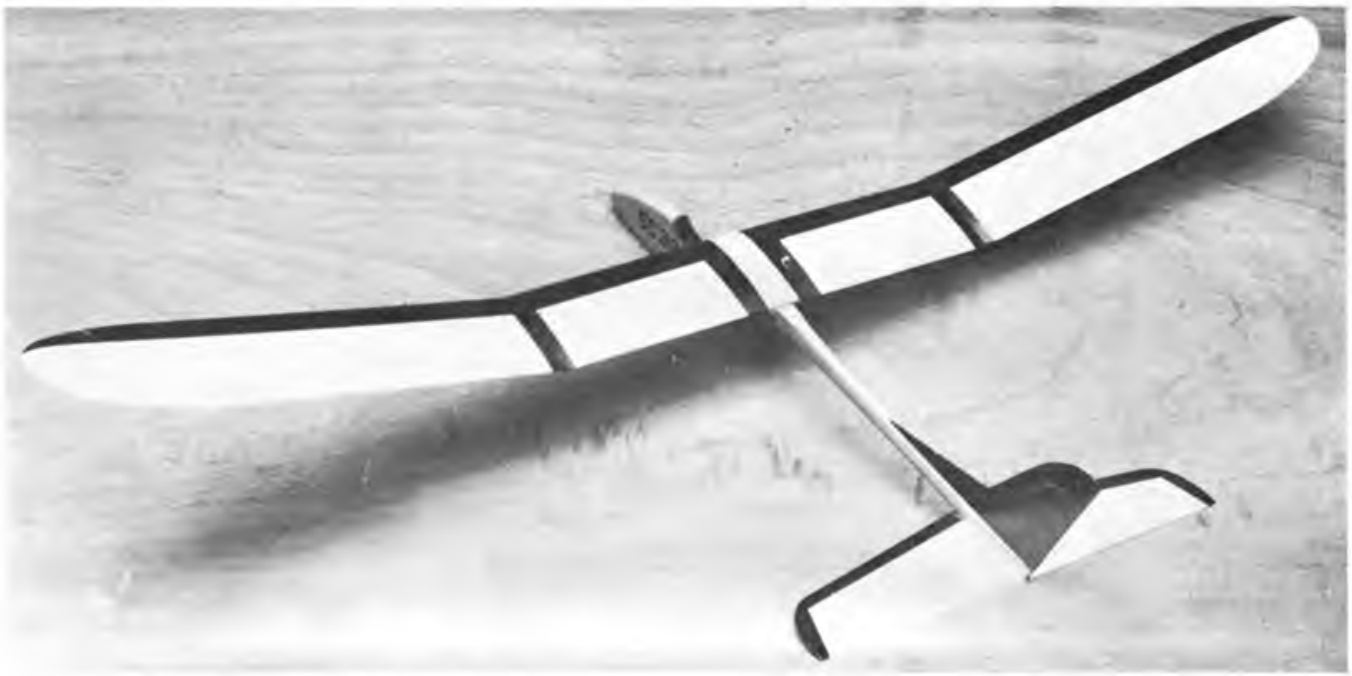

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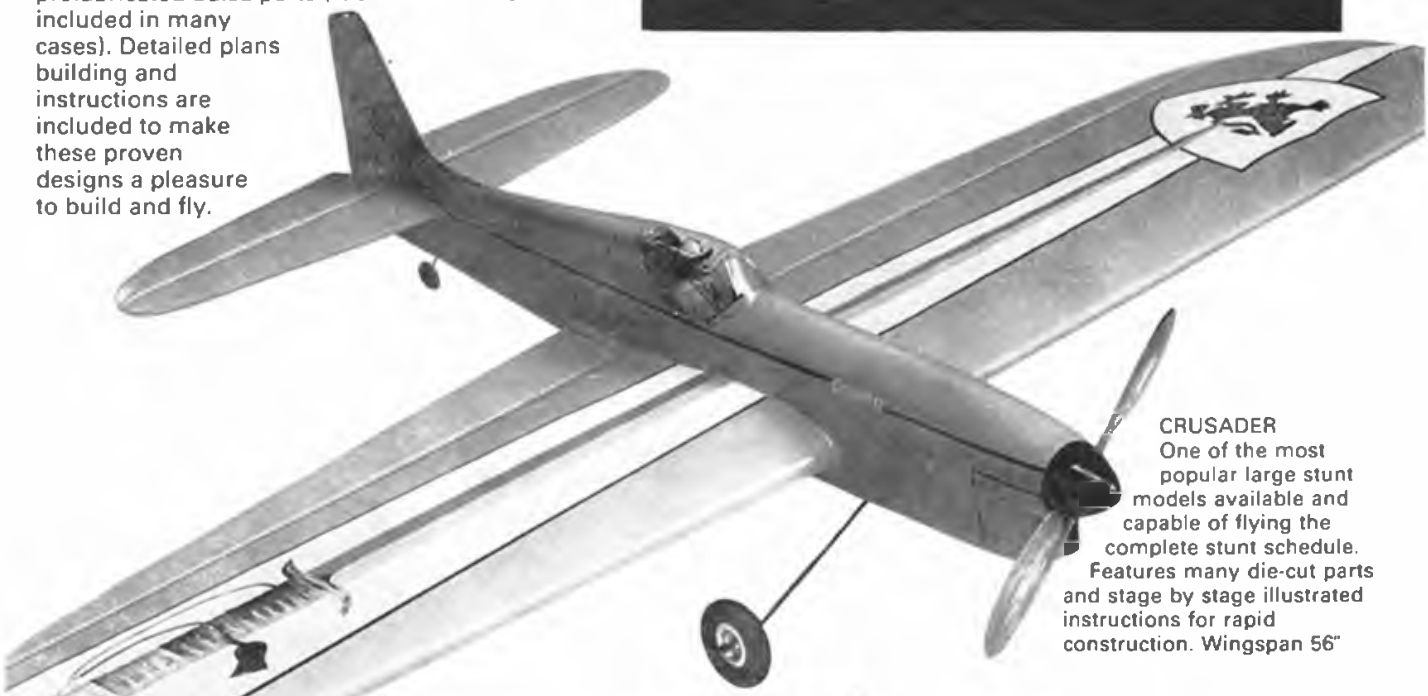

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SUN-POWER AT LASHAM

Hard on the heels of the tremendous cross Channel achievement by the Gossamer Albatross, came the news that Solar-One had made its first long demonstration flights at Lasham on June 13th. This 68ft solar powered machine, designed by David Williams (responsible for the SUM-PAC man-powered machine) and Freddy To, had been built over the past year or so in a Hampshire farmyard with not a little speculation and a great deal of encouragement from Aeromodelling associates. Four Bosch motors are clustered on a nose pylon to drive the 63in propeller at about 1000rpm. On the wing inner panels there are 750 solar cells (purchased at a cost of almost £6000 by Freddy To) and these absorb energy which is fed into a buffer battery of 24 Ni-Cad cells which in turn is used to drive the motor cluster for 15 to 20 minute periods per full charge.

Demonstrations at Lasham were based on the input from the previous sunny day and to the gratification of all, Ken Stewart lifted Solar-One to approximately 60 feet after a very short take-off and flew the entire length of the runway, later repeating the flight on the same charge. Covered in white Solarfilm, the machine is now being re-fettled for much longer and even more spectacular duration flights. Its inventive creators are already thinking of new stages of development having made history with their first effort (for the records the first ever "hop" was made on 19 December 1978 at Lasham) and we look forward to the opportunity of giving readers more information on their spectacular aims. Needless to relate, with David Williams' man-powered aircraft background and Freddy To's own inflatable MPA in preparation, the team had very close connections with Paul MacCready's Gossamer Albatross group. They all share a degree of visionary thinking which leads us to believe that history will look back on June 1979 as a historical month in which entirely new concepts for ultra-light, energy saving flight was first conceived.

Above: *Similar to a 19m sailplane except for its electric power pylon. Solar-One awaits test flights at Lasham in great secrecy. On June 13th the improved machine made its first public demo for TV. In the USA, a converted Easy Riser hang glider by Harry Mauro flew 800 yards on April 29th, also claiming a world first.*

Right: *Solar-One the first ever electric solar-powered aeroplane to fly (19th December 1978) with designer David Williams at the controls. The Bosch motors have since been enclosed in a streamlined pod.*

CHINA AT THE CHAMPS

Latest bulletin from the AMA, organisers of this year's World F/F Championships in California, brings news that the People's Republic of China have entered the event. This follows the recent acceptance of China as a member by the Federation Aeronautique Internationale and incidentally, also the Olympic movement, after many years of isolation. Readers who watched the recent BBC1 documentary on China preparing their athletes for the forthcoming Olympics will await their re-entry to international model flying with eager anticipation. Although much doubt surrounds the likelihood of large entries from Eastern European countries, we may well see more entries from the South American nations who are normally unable to compete in World events staged in Europe.

BETTER THAN EVER QUICKSTARTS

Long time favourite British Diesel Motors are still much in production and serve the ever hungry sport model market. The diesel has consistently outlived innumerable glowplug motor designs and remains popular because of its sheer simplicity. But many makes have disappeared from the scene over the years largely because the production difficulties outweighed the financial returns. The diesel is not an easy engine to put into mass production. It calls for close tolerances and particular techniques in engine cylinder/piston matching. It is labour intensive because the majority of diesel motors have to be selectively fitted by expert handlers wherever they are made – or at least until recently.

Davies Charlton Limited of Isle of Man, world famous for the Quickstart range, have invested huge sums of money in entirely new and most sophisticated equipment which will enable them to produce better-than-ever diesel motors.

We had the pleasure of seeing one of these machines in operation, and it produced ground surfaces to such close tolerances that selectivity is no longer a production requisite. In other words, all pistons fit all cylinders in the new production runs. Already the most popular in the range, the Merlin, has gone through this production phase and is in the shops now. The . cc Dart, 1 cc Spitfire and 1.5 cc Sabre are also getting the same treatment. Davies Charlton are absorbing the tremendous cost of this new investment in machinery so thankfully, the prices are still held down to make these diesels among the best value for money in all model equipment. Thankfully it's a great encourager for the novice and young newcomer to the hobby. We have always recommended youngsters to start with a diesel powered control line model and the new DC technology underlines our recommendations.

RTP RETURNS TO WEMBLEY

After two disappointing years for RTP flyers with cramped facilities in 1978 and complete cancellation in 1979, next year's Model Engineer Exhibition will again feature good facilities and competitions. The main auditorium in the Wembley Conference Centre, once again the venue for 1980 M.E. Exhibition, will be set aside for electric RTP flying on the stage, providing ample flying space and comfortable facilities for spectators. Competitions will again be organised for scale models and for aerobatic flying, but of course all visitors are encouraged to bring their models along to fly whether or not they enter the contests. The dates to remember are Monday & Tuesday January 7th-8th 1980.

Letters

Schools Model Championships

Dear Sir,

A colleague and I have organised three annual schools' modelling competitions and exhibitions (Modelarama) for the East of England. Building on the experience thus gained, this year we would like to 'go National' and attract entries from much further afield. Modelarama '79 will be held this November at the Hospital School right in the middle of Gt. Yarmouth. As in previous years, local firms have offered to donate £100 worth of prizes in the various age groups/classes. We have also been offered considerable publicity by local Radio/TV and Press. In addition I will circulate all Directors of Education, Teachers' Union Journals etc with information.

However more ambitious this year's Modelarama will be, we only see it as a stepping stone to our final objective. As you are no doubt aware, there is an annual English Schools Athletics Championships organised on a county to county basis. It is highly successful in revealing a fantastic depth of talent. If this is true of athletics, why should it not also be true of modelling? There must be enough teachers with different modelling interests in every county in England who would be interested to co-ordinate activities in their areas, leading to a National Exhibition/Competition. The potential of this is enormous. It could not only benefit the pupils – by providing the recognition of their skills which is so often neglected, but the trade and the modelling movement in general by presenting a really spectacular shop window on the hobby. As a teacher, I also feel that it would act as one strong counter-bias as to much inaccurate and sensational criticisms levelled at schools and children by the media.

We want to establish cross country links with colleagues in other areas with similar interests either by letter or phone – Stalham 80397 (evenings). I, myself, am confident that such a scheme has tremendous potential. My colleague, David Balfour and I will be quite happy to get it off the ground. We already have financial backing.

Stalham, Norfolk — Derek Farman

Southern Gala Facts

In reply to Dave Hippersons criticism of S. Gala the interruptions to the contest, caused by full-size helicopter movements, were commenced by a red Very light and ended by a green Very light. To draw attention to these signals a horn was sounded at control where an explanation could have been obtained.

The 16.30 finish, followed by 15 min fly off period, was dictated by an RAF order to clear the airfield preparatory to the arrival of full size helicopters returning from a NATO exercise between 16.45 and 18.00 hours. There was no guarantee that the 18.00 time would not be extended which could have made fly-offs impossible under SMAE rules. The instruction not to use the runway following the fly-off was given to ensure that competitors were not on the ground in the path of landing full size military helicopters (*Concentration* of the pilot and *safety* of the SMAE member).

I take the strongest exception to the accusation of late arrival. I arrived by 10.00 hours the control set up having already been prepared in my vehicle. Cards were immediately available and taken by many competitors without comment.

The SMAE South East Chairman has only recently received a letter from the retiring CO of RAF Odiham, an operational airfield, expressing his satisfaction on the way members of the Society have co-operated in the past and as a result we look forward to future good relations with the new CO and further use of the one and only airfield available to us in the South East.

Comp Sec S. E. Area SMAE — D. L. Cash

Contest Licence Clarification

Dear Sir,

I cannot comment on the N. Gala/S. Gala interchange with Dave Hipperson in your letters column because I do not know the detail of the cases he raises. However may I comment on pre-entry and the use of the Comp Licences? The SMAE Council discussed this recently and concluded that SMAE Competition Licences were never intended to permit holders to ignore the adequately published pre-entry conditions introduced by some organisers. (Personally it would not surprise me if some of those complaining were perfectly aware of this and were using the situation for the well-known game of lets-play-the-words-rather-than-the-spirit of the rules).

Consequently it was decided that provided the pre-entry conditions are properly advertised, the SMAE Comp licence will only confer its full rights if the holder complies with the pre-entry rules. If he doesn't, then it will only absolve him from paying the equivalent of the *single* entry fee. So, if its "pre-entry or double-on-the-day" then the Comp licence holder who chooses not to pre-entor will need to pay a single fee on the day and show his Comp Licence. In effect he will be paying double.

It is a pity that the SMAE Council is forced to waste its valuable time on formulating precise wordings for something whose intent was patently obvious to most of us. The SMAE Competition Licence is a "season ticket" – not a diplomatic passport. It hardly helps the image of the contest buffs.

SMAE Chairman — R. A. Favre

The clarification of the use of Contest Licences from SMAE should put an end to the persistent misunderstandings that have arisen at contests, but will surely place a heavy burden on their organisation. Unable to decide months in advance which class of contest will be suited by particular weather conditions on the day, and not wishing to lose the advantages obtained by purchasing the Contest Licence, there will now be a move for all licence holders to pre-enter every single contest at every conceivable competition, as they are entitled to, rather than have to pay again on the day. This will mean a great deal of additional work for the contest directors filling out extra flight cards which may well not get used.

Pen Pal Please

Dear Sir,

As a keen aeromodeller I am very interested in getting in touch with an American boy with similar interests. I am 16 years old and would appreciate it if my prospective pen-friend could be about the same age. I am learning C/L aerobatics and hope to fly combat, I also fly F/F models and belong to the RAF cadets.

Boston, Lincs. — Colin Harrison

All letters will be forwarded to Colin.

What's Happening?

EVENTS

Aug. 19th
AEROMODELLER ALL VINTAGE *R/C, C/L, F/F* model flying day at Old Warden Airfield, Beds, home of the famous Shuttleworth Collection.

Aug. 26th
FLYING DAY. Venue: Shuttleworth Collection, Old Warden Airfield, Beds.

Sept. 15th
MODELMANIA displays of C/L and R/C aircraft, boats, cars and railways. From 11am–5pm. Venue: St Lawrence School, Hurstpierpoint, W. Sussex.

Sept. 15/16th
VINTAGE AND CLASSIC AEROPLANE ASSOCIATION FLY-IN. COMPETITIONS ETC. Venue: Shuttleworth Collection, Old Warden Airfield, Beds.

Sept. 30th
SHUTTLEWORTH PAGEANT. Venue: Shuttleworth Collection, Old Warden Airfield, Beds.

Oct. 7th
BFKA KITE FESTIVAL, see hundreds of kites airborne simultaneously all day long, held at Old Warden aerodrome, home of the famous Shuttleworth Collection, Bedford.

CONTESTS

Aug. 25/27th
BRITISH NATIONAL CHAMPIONSHIPS *C/L & R/C* **Venue A:** Barkston Heath, *R/C THERMAL* **Venue B:** Cranwell, *F/F* **Venue C:** Everleigh. Contact Nats Director Dick Pavey, Kimberley House, Vaughan Way, Leicester Tel. 0533 58500.

Aug. 26/27th
INDOOR DURATION *F1D TEAM TRIALS* (practice only 25th) **Venue D:** Cardington. Contact: Bob Bailey Tel: Stevenage 723642.

Sept. 2nd
NW AREA *F2A, F2B, F2C, F2D* **Venue E:** 3 Sisters Site, Ashton in Makerfield. Contact: Derek Lee, Tel: Rochdale 73619. **CANCELLED.**

Sept. 2nd
N AREA RALLY *F/F, C/L & R/C* **Venue F:** Church Fenton. Contact Jim Moseley Tel: Leeds 864026.

Sept 9th
5TH F/F AREA CENTRALISED *TEAM POWER (KEIL & PLUGGE) F1B (GUTTERIDGE) A1.* Venue: Local Area Contact: Mike Fantham Tel: 01 736 7163.

Sept. 9th
3 KINGS RALLY *C/L SCALE. CLASS II rules (prizes and trophies).* **Venue G:** Old Croydon Aerodrome. Contact: Derek Bird Tel. 01 874 6394.

Sept. 16th
INDOOR DURATION *E2B, CO₂* **Venue D:** Cardington. Contact: Bob Bailey Tel. Stevenage 723642.

Sept. 16th
1980 C/L WORLD CHAMPIONSHIP TRIALS *F2A, F2B, F2C F2D invitation only.* **Venue A:** Barkston Heath. Contact: Bob Horwood Tel: 0272 48869.

NEW ANNOUNCEMENTS

Sept. 30th
UK SAM CHAMPS *A,B,C, A FRAME & RUBBER* Venue: Sculthorpe Contact: D. Baker Tel. 01 883 9013.

Oct. 6th/7th
RAFMAA INDOOR MEETING Venue: Cardington. Contact: Bob Bailey Tel. Stevenage 723642.

Oct 7th
CAT'S 1/A COMBAT RALLY (limited entry Pre-entry £1, Juniors 50p) Venue: Horsenden Hill, Perivale, Middx. Contact: Marc Harrison, Tel: 01 997 1794.

Oct. 21st
THE *OPEN RUBBER* CONTEST (in rounds, variable max, substantial prizes) Venue: Bassingbourn. Contact Dave Hipperson Tel: 01-446 1575.

Oct 21st
ELLIOTT AUTUMN RALLY *OPEN SPEED F2B, F2C, GOODYEAR, 1/2A TR, 1/2A COMBAT.* (Trophies, Diplomas and refreshment) Contact: Pete O'Neil Tel: Sevenoaks 57899

Oct. 28th
EAST ANGLIAN WAKEFIELD DAY *VINTAGE PRE '51 RULES TED EVANS TROPHY, 51-53 RULES, 1/8 CURRENT FAI RULES* (First round 10-12am). Venue: Watton. Contact: Bob Wells, 26 Nelmes Way, Hornchurch, Essex.

Nov. 4th
COMBAT CHAMPIONSHIPS FINAL ROUND. *CLASS A DIESEL.* Venue: River Embankment, Peterborough. Contact: N. Gill Tel: 0733 252645.

Nov. 18th
NA INDOOR MEETING Venue: Slaithwaite Leisure Centre, Huddersfield. Contact: Jim Moseley Tel: Leeds 864026.

CO_2 it's a GAS!

by Ian Peacock

THIS MONTH: BUILT UP KITS COMPLEX SHAPES FROM SIMPLE CONSTRUCTION

Comet Kits "Curtiss Jenny" typifies slab sided construction with half round formers, stringers and vac formed decking to achieve shape

THE TRANSITION to the "all built up" structure is not as daunting as one might, at first, envisage! It will be appreciated that greater care is needed to work with this type of structure, both in handling the more delicate materials and in ensuring accurate alignment at every stage of the construction. For example the odd cryptic comment found written all over the plan in COMET kits such as "take your time!" and "glue each joint carefully!" seem to sum up the ideal approach.

Three of the larger brands of kits fall readily into this step of the construction ladder, all of which are foreign, but all widely available through their relative U.K. importers. STERLING (via RIPMAX) GUILLOWS (Via Trevor Normanton at J.N.T. models) and COMET (via IMPULSE models – an offshoot of the giant Lesney empire) all offer a wide range of scale subjects both civilian and military, ancient and modern.

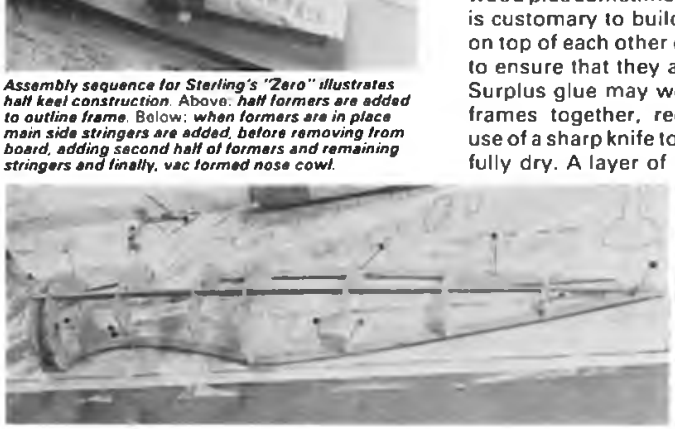
In general terms one would do well to stick to the larger size kits for conversion to CO_2 but not *too* big! Wing spans of around 18-24" seem to be best although this is by no means mandatory. Both smaller peanut size models of 13 inch span and larger models up to 36" are possible and will in fact be dealt with later. Sufficient to say at this juncture that a little more knowledge is needed to work in these sizes.

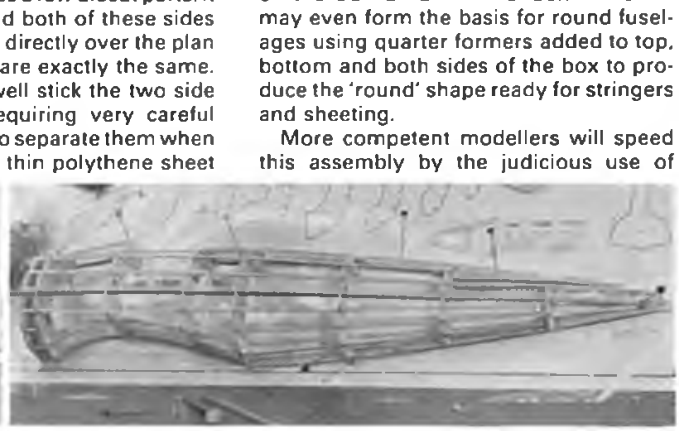
One of the earliest pre-requisites of model aircraft structures was simplicity and lightness and to this end many early kits used a construction technique known as 'slab sided' for rubber, glider and power models. These 'square' or 'rectangular' sectioned bodies are used on many scale models such as the COMET Curtiss Jenny used as our example. Two basic flat fuselage side are constructed from strip wood plus sometimes a few diecut parts. It is customary to build both of these sides on top of each other directly over the plan to ensure that they are exactly the same. Surplus glue may well stick the two side frames together, requiring very careful use of a sharp knife to separate them when fully dry. A layer of thin polythene sheet over the plan is necessary to prevent the frames sticking to the plan and this trick may be extended to a second layer between the two frames to avoid them sticking together!! The fuselage 'box' is completed by standing the two sideframes up over the top view on the plans and adding the upper and lower cross pieces or formers. Curved areas such as upper decking are added using planking or stringers as on the COMET DH4. This 'box' structure may even form the basis for round fuselages using quarter formers added to top, bottom and both sides of the box to produce the 'round' shape ready for stringers and sheeting.

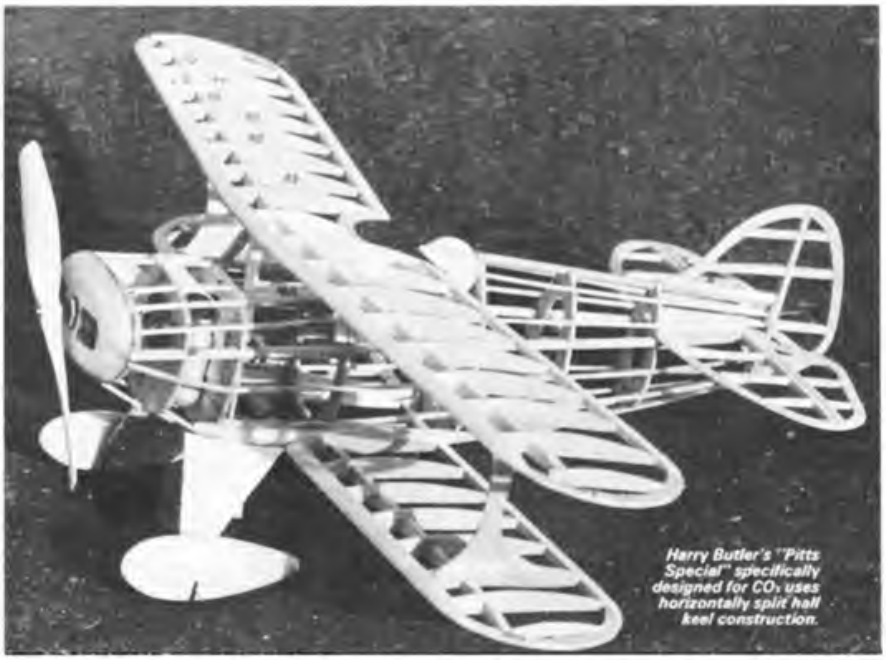
More competent modellers will speed this assembly by the judicious use of

Humbrol CO_2 motor installed in nose of Comet's "Curtiss Jenny".

Assembly sequence for Sterling's "Zero" illustrates half keel construction. Above: half formers are added to outline frame. Below: when formers are in place main side stringers are added, before removing from board, adding second half of formers and remaining stringers and finally, vac formed nose cowl.







Harry Butler's "Pitts Special" specifically designed for CO_2 uses horizontally split half keel construction.

Above: *Standard wing construction on Sterling's "Zero", note use of polythene sheet to protect plan.*

Below: *Geodetic construction used on Comet's "Cessna" is unusual for scale models. Prevents wing warps at expense of non scale like structure.*

'instant' cyanoacrylate glues such as ZAP and HOT STUFF but even the slower drying glues such as balsa cement or white PVA should rarely cause problems for these small scale models can usually be pinned down simultaneously without the parts interfering with each other, allowing one to work on the wing or tail whilst the fuselage is drying and vice versa.

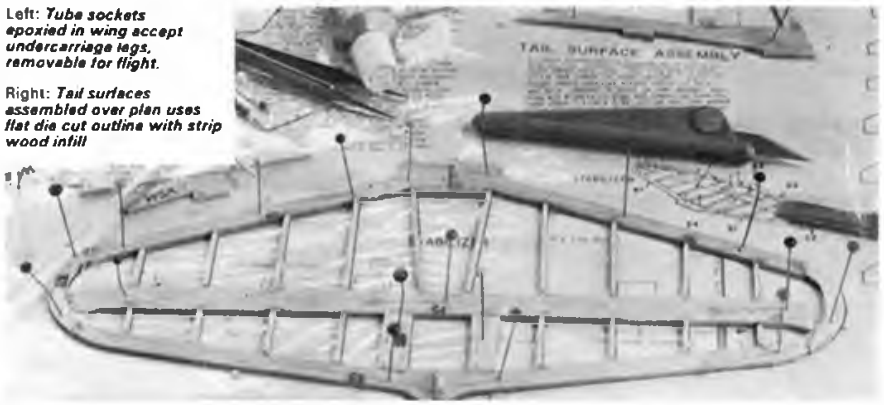
The other widely adopted fuselage structure is known as "half-keel" construction as seen in the GUILLOWS and STERLING range and in some of the COMET kits. Here a basic outline 'frame' or 'keel' of strip wood is laid down onto which "half" bulkheads or formers are added at right angles. Longitudinal stringers are fitted into small notches in each former to produce one half of the fuselage. Quite complex cross sections may be attempted in this manner, the STERLING 'ZERO' being used as our example. Some designs are assembled around a vertical keel producing left and right hand sides whilst others, such as HARRY BUTLER'S excellent little Pitts Special, one of the few kits made expressly for CO_2, are split horizontally giving top and bottom halves. Both methods are equally suitable, usually the fuselage section of the original aircraft suggesting the most obvious way to produce the "split"!

Contrary to most instruction sheets, it is better to fit only a few key stringers to the first side before lifting it from the building board. The remaining half formers may then be added onto the other side of the keel, taking great care to align each one with the corresponding half already in place. Adding the key stringers to the second half stiffens up the structure. All the remaining stringers may then be added *one to each side at a time.* This trick will help avoid the banana shaped fuselage that can sometimes result if all the stringers are added to the initial side before lifting off the plan! Pins pushed through the thicker strip sections and die cut parts, elastic bands or sellotape are needed to keep parts in position until the glue dries. To avoid splitting thinner wood sections, place pins on either side to offer the necessary support.

One of the less common fuselage structures worthy of mention is the tube-o-matic system employed by COMET kits. This is an adaptation of the half keel technique, featuring "whole" formers slid onto a thin card tube for alignment and support. On a rubber driven model, this hollow tube also houses the rubber motor

Left: *Tube sockets epoxied in wing accept undercarriage legs, removable for flight.*

Right: *Tail surfaces assembled over plan uses flat die cut outline with strip wood infill*



and affords protection to the airframe should the motor snap. The "former and tube" method should in theory, offer perfect fuselage alignment.

Wing structures differ little from those encountered last month in the HUMBROL range of kits and therefore should not really pose any additional problems. This is not to say however, that this area should be skimped or rushed, for a badly built wing creates more problems during flight than almost any other airframe component. Virtually all small scale models utilise a common approach to wing structures, having a leading and trailing edge (running spanwise) and aerofoil sectioned ribs running fore and aft. These ribs together with other sheet parts such as wing tips are, like the fuselage parts, die-cut in these kits. To add strength to the structure and to help support the covering tissue will be one or more spars also running spanwise.

A small set square is advisable to make sure that the ribs are all upright EXCEPT for example the root ribs which may have to be leant over at an exact angle to obtain the correct dihedral. Notes on the plans will show just how this should be done and often an angle template will be supplied cut from a scrap of balsa. Occasionally other wing parts are angled to capture the appearance of the real aircraft (the most notable being the wing tip parts) but these will usually be found well described on the plan.

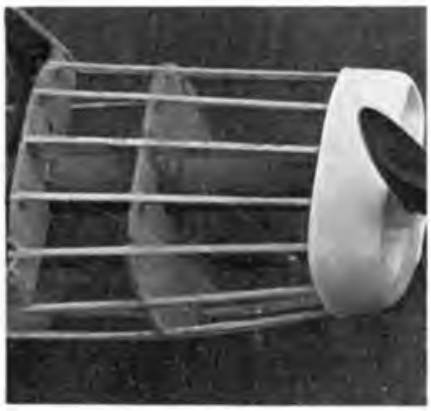
Occasionally one comes across "different" wing structures such as shown in the COMET Cessna. Here a semi-geodetic structure is employed offering a strong, warp resistant framework of high rigidity. When tissue covered, however, the appearance does not look wholely scale.

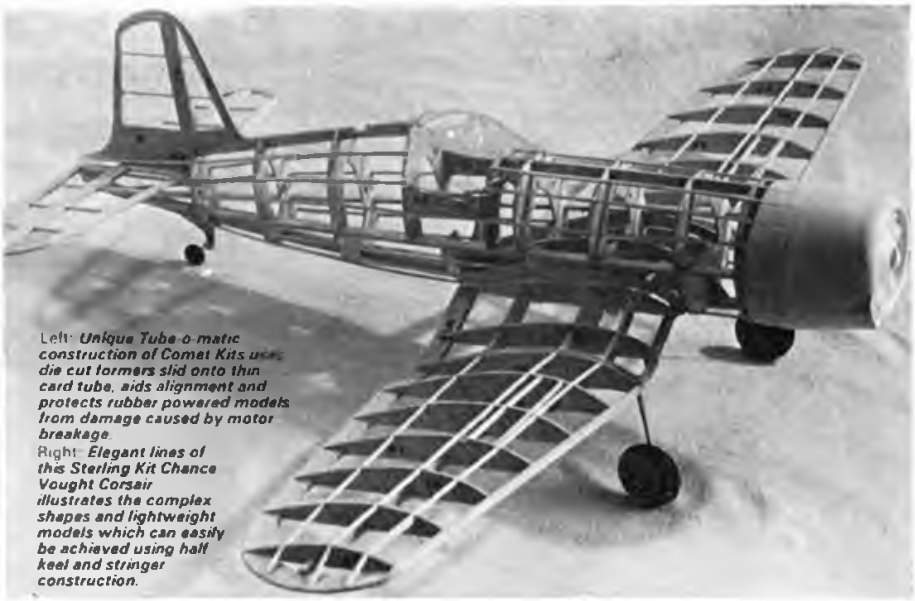
Tail parts may often be cut from flat sheet balsa but equally often they are built up structures. When built up they can follow wing construction, the parts just being smaller but probably the most common style is a "flat plate" consisting of due cut outline parts surrounding a framework of thin strip. This structure is both simple and light, but it does tend to need careful handling if they are fragile and prone to warping and twisting when covered and doped.

Metal parts, should, wherever possible, be avoided on light structures but on fixed undercarriage aircraft one has no choice! Follow the instructions carefully and make sure that the wire is well secured to the relevant load bearing part of the fuselage structure. On aircraft with retracting undercarriages, such as the Zero and Corsair, it is best to omit the undercarriage parts both for weight saving and appearance. They look better in flight without the wheels-a-dangling! If required for display purposes, a "plug in" wire u/c may be made fitting into small aluminium or brass tubes well glued into the structure. The wheels may then be simply 'unplugged' for flight!!

Plastic vac formed parts are quite common in most of these kits, not only just the cockpit canopy but also cowlings, blisters and fairings. These parts are of mixed blessing for whilst they greatly simplify structures, they also add weight. Care must also be exercised over choice of adhesives, as many of the common model glues destroy plastic and some just won't stick. Always experiment on a bit of scrap plastic first. The plastic cowl on the ZERO was in fact a great help, it's huge diameter being more than adequate to hold the motor and the tank and filler and its extra weight helping to achieve the correct balance point so often difficult to achieve with a short nosed subject.

So! Where to next? Well, next month we will look at the next logical step in structures – working from kits where the parts are printed and require cutting out – and working from plans, of which there are many subjects to choose, from the Aeromodeller plans list!





Left: *Unique Tube-o-matic construction of Comet Kits uses die cut formers slid onto thin card tube, aids alignment and protects rubber powered models from damage caused by motor breakage.*

Right: *Elegant lines of this Sterling Kit Chance Vought Corsair illustrates the complex shapes and lightweight models which can easily be achieved using half keel and stringer construction.*

The Gossamer Albatross

Abbots Cliff and Shakespear Cliff form a dramatic backdrop with Dover Western Docks faintly emerging in the 6am light as the Albatross sets a 135 degree course for Cap Gris Nez . .

IF THE WIND DON'T BLOW, AND THE CHAIN DON'T BREAK...

Epic story of Paul MacCready's £100,000 Kremer prizewinning Man Powered Aircraft

as seen by Ron Moulton with Martyn Cowley and Pat Lloyd

"SAM – WE JUST SPOTTED A SHARK – glad Bryan made it all the way." Paul MacCready's profound announcement over the intercom from the cross-channel navigation boat was the exciting climax to his two and a half years of human powered flight experiments.

Who really believed that after the first flight of the original Condor on December 26, 1976 that by August 1977 Paul's team would have captured the hitherto elusive £50,000 prize awarded by Henry Kremer for the first figure-of-eight flight? Or that barely a year after the first tests were made with the third generation MPA by MacCready, the Albatross would have met its seemingly ultimate challenge? When Henry Kremer sportingly gave £100,000 into the keeping of the Royal Aeronautical Society for the first crossing from England to France, neither he nor anyone else connected with man-powered flight could possibly have anticipated such speed of progress.

We spent many inspiring hours with the talented and youthful Albatross crew during their six week stay in England. Almost every one of them an aeromodeller and most with hang gliding experience, they shared a mutual understanding of creativity and imparted such a sense of purpose that merely to be associated with them was an absolute pleasure. There never seemed to be any question that the result would be other than successful. And yet when the absolute achievement came, there was no yelling or cheering, just a simple statement from the incredible "engine" Bryan Allen – *"I'm just a biologist from Bakersfield"*. . . Modesty has its virtues.

THE MACHINE

Finished by June 1978 the first Albatross test flights made in July and August gave encouraging results over the Mojave desert; but when moved to Long Beach, and test flown over airfield runways close to the sea, a series of malfunctions resulted in crashes that demanded improvement. Like many a good model, the Albatross improved through repair and became a reliable bird. Tested at Harper Lake, the Albatross started making fifteen minute flights which were twice the duration of anything previously achieved, but disappointingly, Bryan Allen and his back-up pilot Kirk Giboney were landing somewhat exhausted.

Solutions came in a surprisingly simple way. They changed the propeller. Over on the East coast at MIT, Massachusetts, Professor Lurrabee had produced an optimised propeller design from his computer. He plotted chords and pitches for a blade design using Eppler 193 aerofoil section.

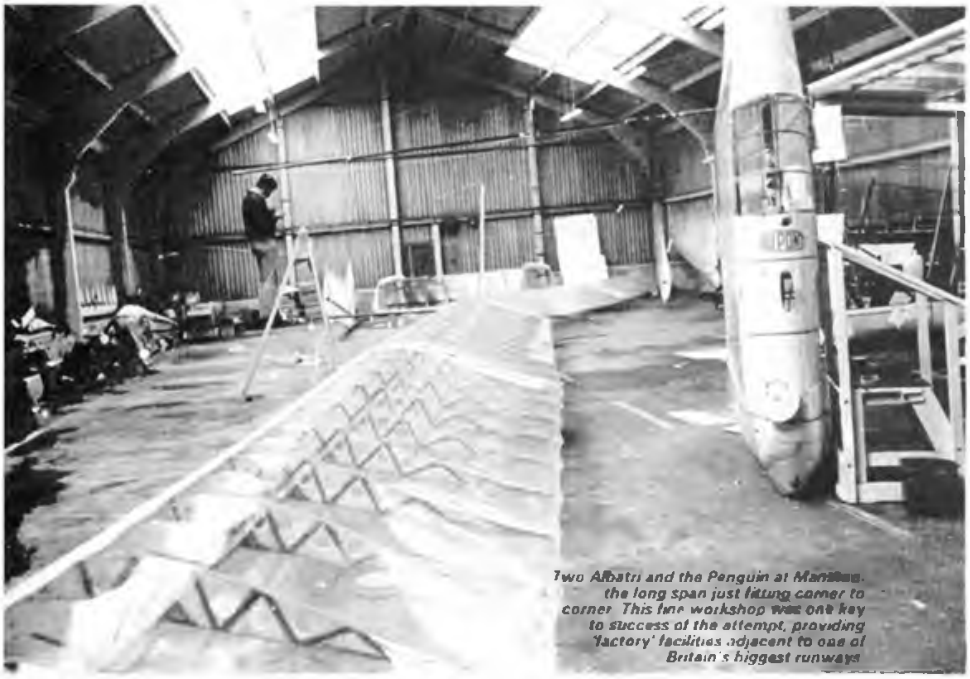
Aero modelling hot wire wing core cutting techniques were used to make the new propeller in Dow SM styrofoam (2.2 lb/cu ft). To cope with the blade twist, the prop was "chopped" into sections of eight to ten inches length to accommodate progressive angular changes so that at no stage was there an error of pitch greater than half a degree.

The root section had a spanwise hole cut in it to accept a one inch carbon tube which eventually joined it onto the prop shaft gripped by a simple hose clip, each other section was notched for carbon spars which joined the tube at the root. Butt-joined end-to-end then covered with Kevlar and epoxy finished the new prop contrasts with the previous lightweight built-up constant chord 'Paddle'. Kevlar is not only considerably lighter than glass fibre but it is also much stronger, however it does have the disadvantage of fuzzing when sanded and is thus more difficult to surface finish. There was a weight penalty compared with the original built-up prop but the pilots reported that, *"If you put power into it, it really put power out"*. By which they meant that they could really feel the response in thrust to extra pedalling effort. In fact, such was its power absorption that on two occasions Bryan Allen shattered propshafts through the load generated by initial acceleration.

On April 25, Bryan Allen made the first long flight of 69 minutes, covering a distance of 13 air miles over Harper Lake. Only reason he landed was that by then he had returned to the start point and it was Kirk's turn to fly. Confidence abounded and with Du Pont sponsorship secured, the long move to England was imminent.

Viewed from afar, it appears somewhat hasty that after only one long flight on a Wednesday, the machine should be loaded three days later over the following weekend on a Royal Air Force Hercules returning from Nellis Air Force Base in Nevada to RAF Lyneham.

Yet in the meantime, the Albatross had been dismantled and trucked hundreds of miles to Los Angeles where it was found that TWA Cargo holds would not accept the components through their doorways! Needless to relate, not a little influence was bought to bear and with the wholehearted cooperation of the RAF, three MPA's were airlifted all the way to the UK.



Two Albatri and the Penguin at Manston. the long span just fitting corner. This fine workshop was one key to success of the attempt, providing 'factory' facilities adjacent to one of Britain's biggest runways

The original Albatross was accompanied by the much lighter and improved but incomplete structure of a near duplicate Mark II and a 75% sized version known as the *Penguin* with 72ft instead of 96ft span.

By May 2nd this unlikely package was in Wiltshire, with no place to go! Yet within a day, a home had been found at RAF Manston in an eminently suitable motor transport "hangar". The team based themselves in a local hotel at Ramsgate after following on standby's and Skytrains. Then Albatross was assembled and by Saturday, May 5th it made its first flight in England – only 10 days after that magic 69 minutes duration flight in California.

To qualify for the cross-Channel attempt, all machines have to go through an airworthiness test in which a flight of at least 2 minutes or 400 metres length is demonstrated. Such a task was a mere nothing for Bryan Allen and the Albatross and two flights were made on May 10th at 4.30am along the vast Manston runway each creating new, unofficial European records.

Now it was a matter of sorting out the complex logistics and the innumerable fine points attached to setting up the crossing; but first there had to be a promotional announcement to the National Press. Where else to hold such an affair other than the United States Embassy, Grosvenor Square, London? The Ambassador, Kingman Brewster declared that he was personally interested *"because he was a one-time model plane maker"*.

It was at this press reception that the quiet confidence of the team emerged to impress the otherwise hardbitten aeronautical journalists of the world. *"No"* said MacCready *"we've never flown over water except maybe over a runway puddle at Long Beach"*. Pressed for a prediction on when he might try he said, *"Well certainly not before next Monday"*.

It was in fact to be some time before another flight was made, at the very end of May after three frustrating weeks of typically British weather variations. During that time the team had just one day off and that included seven hours of driving to visit a Flying Day at Old Warden and the British Indoor Nats at Cardington. These were pleasant, reflective breaks.

Slow flying indoor duration models were familiar to MacCready who'd once been US National Free Flight Champion (as well as the first American to win the World full size gliding Championships) but to others in his team, the sight of microfilm was a novelty which helped to inspire them in their work.

Although less like a gigantic indoor model than the original Condor, the Albatross is very much an enormous man carrying model. Its structure carries no balsa. It could be claimed to be almost entirely plastic. *"A flying sandwich wrapper"* is the sponsor's (Du Pont) claim; but this over-simplifies the situation.

Main differences between the Albatross and the Condor II lie in the reduced wing area, meaning increase of aspect ratio, and much shorter wing chord, reduced by over two feet, together with the changeover from aluminium main structure to carbon fibre reinforced plastics.

Everything that stands out black in the photographs of the Albatross is carbon fibre. All ribs are capped with a ¼in wide strip and they are also strengthened with black diagonals. One pound grade expanded polystyrene which is used for the majority of the rib and leading edge structure is reinforced in this way, and so too are all the tubular spars made from flat sheet epoxy-impregnated carbon fibre. Bill Watson, an aeromodelling deep thinker from Van Nuys created the tubes in a homemade cooker. The carbon fibre is wound around an aluminium tube of either 1in, 1¼in or 2in diameter according to its ultimate purpose. Similarly the pitch of the spiral winding over the tube determines the strength. For example, spars which have to stand compression have a 15° spiral winding whilst the forward canard or stabiliser spar which has no compression loadings has a 40° spiral winding. There can be up to as many as four layers of these .007in carbon fibre applications which are made one above the other in opposite spirals and then bound by another home-made machine with strapping of Mylar tape at approximately ¼in pitch. The aluminium tube, now wrapped with its multiple layers of CF and tightly bound by the tape is put inside a 4in aluminium tube. This has an epoxy and NiChrome wire sandwich wrapped around the outside which connects to any 40 volt direct supply and cooks the tube up to 300°. After four hours the epoxy is set rock hard but the tube has expanded with the heat and the Mylar shrunk tight around the carbon. It is removed, allowed to contract, the tape detached and all that remains to be done is to etch the aluminum core out with Muriatic acid such as is used in California for cleaning outdoor pools. End result is a very light carbon fibre tube. There are snags. The large diameter (2in) needs a styrofoam plug about every 8 or 10 inches to hold shape and prevent ovality. (The 1in tube especially with four layers is immensely strong and has other applications not only for aeromodelling but also for bicycle frames of the future.) Since the carbon fibre does not come in very long lengths, it has to be carefully joined when setting up the spirals. Similarly the cooker itself is limited to a 12ft length. But the wing is 96ft and each section 24ft long so joins had to be made. These were simply effected by taking two lengths, placing a 3in long splice tube between the two lengths, rewrapping around that area with fresh carbon fibre elements and re-cooking in the oven with the joint in the centre of the oven tube to make a 24ft spar or bowsprit.

Epoxy impregnated fibres (right) ***which roll into tubes*** (left).

The Albatross can be broken down to a

simple basic tubular structure. Its bicycle frame leads up to its support of a 2in carbon fibre prop shaft, the thrust of which is taken against a universal bearing at the front, with a large diameter ball bearing at the rear. The whole hangs underneath the crucial centre joint on the spar, and from the same position the bowsprit projects forward. All the vital angles are set in this one main joint and a total of 25 external plus a further 5 internal brace wires hold the whole assembly together in yacht rigged fashion.

Because the wing spar is set at the aerodynamic centre, the surfaces remain remarkably warp free and do not have any twist in flight except that which is induced by the pilot. Covering is tensiled Mylar, so arranged that the main tension is spanwise to sustain the aerofoil accurately. Herein lies another enormous difference between the Condor and the Albatross. The later wing is better in every way. Reduced chord of 5ft 6in enabled 1in foam 'solid' ribs to be hot wire cut using a plywood template and apart from the carbon fibre around the outline and cross bracing, there is only a 1/32 ply ring reinforcement at the spar hole. A single wire forms the trailing edge and inevitably adopts a scalloped effect between ribs as the tensiled Mylar pulls-in (at the same time also bowing the entire structure considerably as shown in the drawing). There is also a tension wire along the whole leading edge, hidden amid the light styrene structure.

Whilst the wing structure is extraordinarily simple, all connected with its making declare that the second Albatross version is infinitely lighter and more satisfactory due to accumulated mods. A misfire with glue, using contact cement instead of epoxy in the first instance called for a complete recover of the wing. For transportation the wing had to be cut and inserts fitted which added weight and reduced span. Hole cutting proved to be a false economy, saving a mere 4½ ounces, at the same time creating buckling which had to be compensated with the many diagonals and extra glue joints. Weight of the glue in the wing became critical and many of the assembly diary records concentrate on the rate of application and the weight of the amount of glue used. Five minute epoxy was the standard medium, together with the inevitable blow dryer used also for tensioning the covering (which incidentally is only held in place by twinstick tape of a rather special lightweight variety).

Designed to operate at 6° using Lissaman 7669 section, the wing incorporated the same warp control first devised for the Condor's figure-of-eight flight though this was to be used as a correction only three or four times during the Channel crossing. Instead, all course deviations were induced by the Canard stabiliser which is suspended on a single floating 10in styrofoam strut (reinforced with CF) and controlled by Kevlar strings direct from the two hand controls in the cockpit. These actuate small ailerons, scarcely bigger in area than a ceiling tile each, at the stab tips and as servos, they tilt the surface 9° to either side to induce a turn. Other strings adjust the pitch, up or down. The Canard is not typical in that it operates at a lower CL and considerably less angle of attack than the main wing. In fact, the CG of the whole machine is almost in the position of a flying wing due to the reflex section and 7° 30' mean sweep. Being extremely docile in control, with one or two seconds lag in operation, the pitch and roll corrections absorb only a minute fraction of the pilot's horsepower during his major effort at propulsion – a critically important factor for long flights!

One major change over the Condor is that the pilot has been moved into a more natural bicycling position from the supine attitude. The same plastic chain as manufactured by Winfred M. Berg (Max-E-Pitch timing chain) has been used and proved to be invaluable. This comprises a plastic covered stainless steel cable on either side of rigid discs which are all encased inside red polyurethane plastic. The pitch fits French racing cycle sprockets and tension rollers, without apparent stretch problem, so the chain has contributed in no small measure to the success of the machines.

All of the propulsion system; the undercarriage with its two child's toy wheels; instrumentation which includes the transducer Polaroid camera focussing height sensor, altimeter, thermometer; plus an important ventilation system to reduce the internal humidity, is enclosed within a streamlined gondola reminiscent of the high speed bicycles which are becoming popular in California.

Dr Chester Kyle designed a racing cycle steamliner which achieved almost 50mph in 1974. Paul MacCready, Jack Lambie, Bill Watson, Dave Saks and others in the Condor/Albatross team have all been involved in the IHPVA (International Human Powered Vehicle Association) which achieved remarkable speeds in unpaced runs at the Ontario Speedway near Los Angeles. Kyle's racer had indirect influence on the shape of the Albatross fuselage. So too was there an aerodynamic influence through the flow straightening effect on the propeller thrust. A deep fuselage is an essential to carry the wing bracing, enclose the pilot and provide the vertical fin area. But it comes as somewhat of a surprise when one stands close-by to see its enormous bulk, almost 10ft high and over 8ft long. Also to realise that it is hanging under the massive spar centre connection, all held together with epoxy, Kevlar string, and a single nut and bolt!

Bill Watson, the tube-maker, demo's how he does it.

Blaine Rawdon contemplates a Styrofoam prop.

Rib maker Ted Ancona and 2oz Rib section.

TOWARDS THE FLIGHT

For weeks we were, even more than usual, wind-watchers. Late night calls to Ramsgate and early morning peeps at the wind rustling leaves in the dawn conflicted with the prediction that the first week in June would be as in almost every year before –

Only another hour to go! – Joe Mastropaolo checked Bryan Allen on daily ergometer runs at .3hp. Note 2 litre waterbottle for controlled intake.

built up. Two motor launches, four Zodiac rubber rescue boats, countless suits for underwater diving, flares, involvement of the Coast Guard, the Lifeboats, Customs and all the other paraphanalia attached to an otherwise simple crossing of the Channel were by now energised.

At midnight, the telephone recording in Du Pont's master office at Deal was sending out the message that *"Dr Paul MacCready had moved his troops from Ramsgate to the Warren at Folkestone"*.

Our own arrival in the dead of Monday night might well be compared with a flashback to Kitty Hawk. With little to illuminate the narrow pathways down to the British Railways' platform on the sea edge, we found our way (Pat Lloyd, Martyn Cowley and myself) to the large shed which housed the Albatross. Inside we found a single guardian, his radio playing pop, the local paper being read in the miserable light of a single hurricane lamp, yet he was surrounded by parts of an historic £100,000 aeroplane dangling from the ceiling on cords in various pieces. We inspected the intricacies of this familiar shiny dragonfly by torchlight. I doubt if we'll ever forget the atmosphere of the moment. Two hours later the scene was to change completely. The troops had "arrived". A mobile generating plant was started, its overhead cluster of lights spreading a pool on the white concrete in the midst of dead blackness. The pieces were carried gently outside. There was not a breath of wind and assembly over the heaven-sent platform was a simple, very quick process. We took the opportunity to check the wing sweep, a matter up to then of much conjecture, complicated by the rigging and the spar curvature.

By 02.30 the wings were being lifted off the concrete and erected on the fuselage. Paul MacCready was followed everywhere in his movements by a cluster of newsreel and radio men. Their long mikes poked through the heads to catch his every word and listen to the slow deliberated pronouncements of this catalyst who had brought together such a fantastically talented team.

"At this moment, the wind here and at Cap Gris Nez is still, but at mid Channel it is 5 to 6 knots and on that basis we would have too long a flight" – that was the first announcement. Bill Watson confided this was going to be no more than a good full-scale exercise. Like us he felt it in his sleepless bones. Assembly progressed slowly with pilot Bryan Allen playing his part by attaching the canard and checking the control system. Time melted away. We played Bryan our tape recording of the great Lord Brabazon's account of his first ever flight – and crash. This light relief at a moment when tension was rising as fast as the eastern dawn, set the scene. When we arrived and found the lone guardian it had been like visiting Kitty Hawk to find the Wright Brothers. Now we were in an atmosphere of being on Roosevelt field, Long Island amid growing crowds awaiting for the departure of Lindbergh on his flight to Paris. Marines kept the spectators at bay. Four Bobbies added authority.

Left hand controls pitch and turn

Right hand sets clickstop warp disc. Note plastic chain and sprung idler for chain slack.

Airspeed and altitude vertical scale taped to tube.

a window in the Channel weather. Thirty-five years before, Eisenhower had chosen this week for the D-Day Invasion. Thirty-five years before that, Bleriot had flown the Channel, so why should this not now be the time for the great crossing?

But we went through that week from June 4th to 10th (Scale day at Old Warden) with just too much breeze over the sea.

On Monday 11th an almost stationary "high" centred itself over England gradually moving south-easterly. This was what we were waiting for. By mid-afternoon Sam Duran advised us there was better than a 50% chance of at least a 'practice' for the massive operation which had now

Boats were in position, and as the full moon reappeared out of the overcast, we could just make out the anchored master launches about a half mile off shore. Changed from their California casuals and indistinguishable except by shape, in their Black Knight wet suits and waterproofs, the team were ferrying the Zodiacs back and forth to the *Tartan Gem* and *Lady Ellen Elizabeth* which were to be the flotilla leaders. By 04.20, the decision was made to move everyone into position for a "practice" and the take-off runway of hardboard sheets laid down to smooth the way over the rough concrete surface.

Early morning light gave a ghostly tone

to the Albatross as it poised stationary, held only by the two handling cords from its wings as Bryan got aboard his Italian saddle, aided by the omnipresent Sam Duran. Out in front, looking after the stab and the end of the bowsprit was young Marshall MacCready, one of three sons who were helping their father Paul in this historic attempt.

Out at sea with the other MacCready's on the *Lady Ellen* which had positioned from Sandwich after an all-night voyage, I watched anxiously. Paul advised by 05.10 that there was to be a take-off. Great! After 20ft roll Albatross pitched forward, and stopped abruptly. Over the VHF a calm and collected Bryan announced that he had *"a little wheel trouble"*. More than a little. The change from the original nose-wheel which had split on the last of the seven flights at Manston, had become a small disaster.

Taras Kiceniuk, pioneer of Californian biplane hang gliders and designer of the famous Icarus series, leapt from a Zodiac into action. Another spare wheel of the original type was hastily fitted. For one anxious moment they ran out of pliers but a shout brought dozens from car boots, tool kits, everywhere, among the anxious onlookers. By 5.20 the wheel difficulty was being overcome; but it was to take another nail-biting 20 minutes before all was ready once more and the pilot re-prepared for his venture.

The risk was now that any flight of longer than 2¼ hours would mean an arrival in blustery conditions on the far coast. Falling tide and a rising sun brought their own complications. Bryan had a Mylar reflective heat shield on the left side of the nacelle which was intended to diminish the heat effect, and he would be looking forward to a full expanse of sand at Wissant but as the day wore on (still only 05.45am!), it was the sands of time which were running out rapidly.

British Rail found some more sheets of ⅛in ply and laid these end to end to extend the runway, headed out towards the Dover Harbour profile looming through the rosy early mist.

At sea, the Zodiacs led by Project Manager Sterling Stoll awaited what was still to be a "practice". If need be, Bryan could possibly land the gondola on the larger Zodiac whilst others in formation secured the dangling lines. In this way it was hoped that even a "water" landing might be kept dry for return to base. There was also a scheme to hook on a towline in case of trouble in the air.

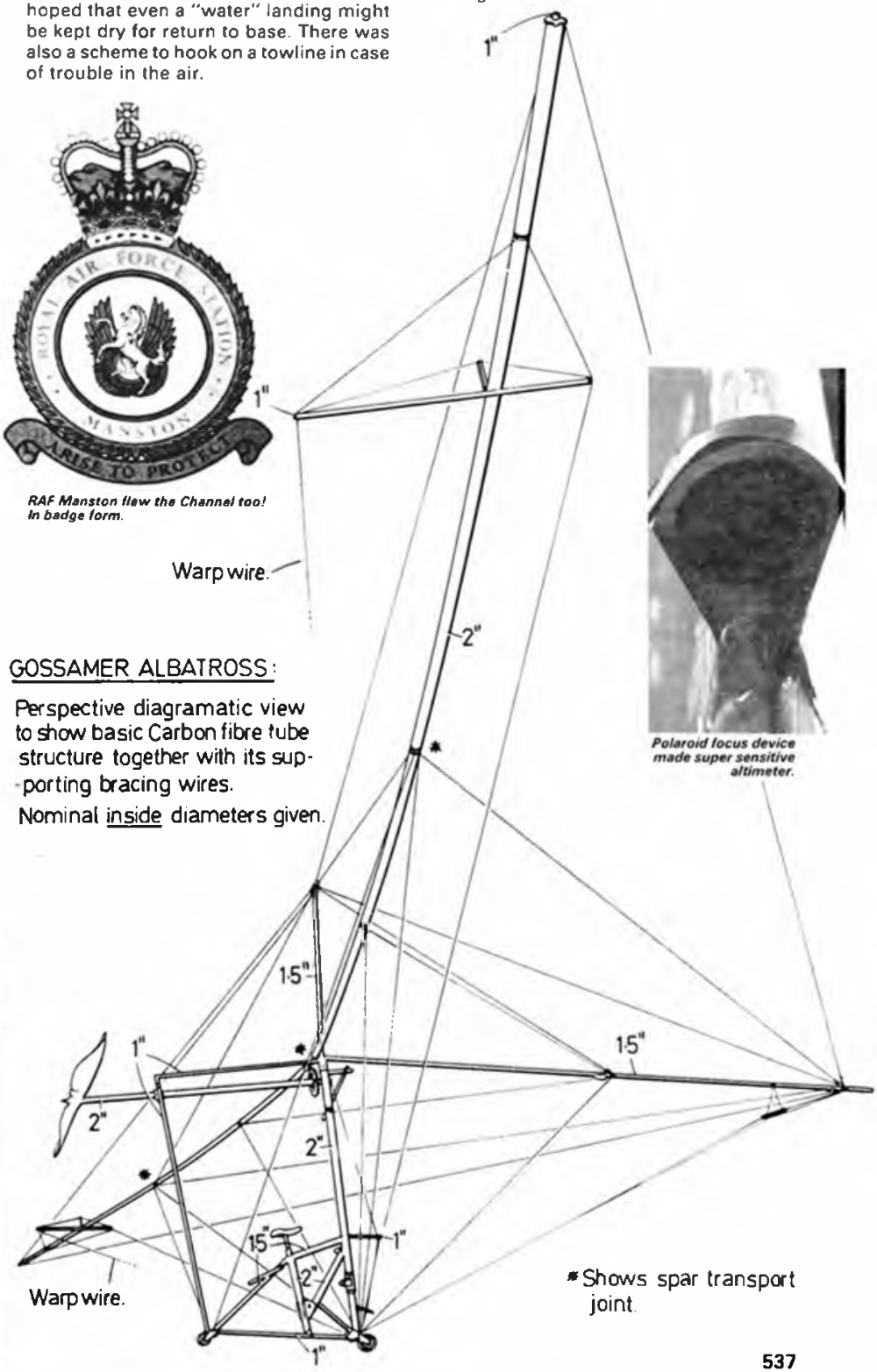
THE FLIGHT

Below deck in the *Lady Ellen,* VHF radio told Paul that all was set once more for take-off. He gave the okay and came on deck to watch with Parker and Tyler his elder sons, each a qualified man-powered aircraft pilot, and from the Moonraker now rolling in the ebb tide we viewed a

RAF Manston flew the Channel too! In badge form.

Polaroid focus device made super sensitive altimeter.

Hot seat from Stella Italia, and lightweight radio.



02.30, Taras Kiceniuk and Bill Watson complete assembly by floodlight and the moon, while pilot Bryan Allen attends to the canard bowsprit and its many cables.

Wheel replaced, life jacket on, Bryan has Taras point the way.

Bill Watson seals the 'door' as Sam Duran makes final checks.

panorama of cliff backdrop to a scene like silent cinema. Passengers in the early morning train from Folkestone to Dover could hardly have been aware of the drama being played out 100ft below them at the shoreline. Inexorably, the off-white profile began to roll forward as if to chase the train. We crossed fingers as it gained speed. Martyn and Pat, close by, felt each jolt of the plastic wheels as they jumped the ply joins. Still rolling as she ran out of panels, Albatross lifted gracefully at 05.51 and seconds later was over the platform edge, headed seawards – and eastward! *"Wow"* was Bryan's first thought as the long line of well wishers yelled encouragement.

A chorus of outboards opened up as the flotilla fell in behind the graceful aeroplane. From our seaward position, we flashed a red guide light for all to follow. Motors idling, and heading 135 degrees, the *Lady Ellen* was to be Command Post. No doubt now that the challenge was 'on' as the Albatross approached, steadily growing in size as it turned to face us, holding 15ft above a millpool surface. Could it be true? The whole scene was unreal. For a full 5 minutes the Albatross curved on to course, its orange tipped prop blades strobing as though pulsed by each stroke of Bryan Allen's powerful legs.

"Lets go" came the command as Parker's rule of thumb (actually thumbs on a ruler sight) told us that the craft was within 1500 metres! With a flurry of foamy wake the *Lady Ellen* opened up. 10 knots was the estimate, and a further five minutes proved that Bryan's speed was exactly that.

The reality of the mission was emphasised as a yellow topped lifeboat out of Folkestone came to join the fifteen other boats and a total of five inflatables. Ahead of us with an indistinguishable horizon lay a seemingly unlimited sea punctuated by the shapes of the huge tankers. Within fifteen minutes of the take-off a large container ship crossed our path but with a safe and adequate margin. Now firmly set on 135 degrees, the Lady Ellen spearheaded a small armada with the white surfaces of the foam plastic in Albatross shining bright in the early sun, fifteen feet above the black Zodiacs. *In the confines of the Mylar gondola, Bryan's rhythmic pace of pedalling at 75rpm, which he had practiced daily for months made the gruelling task almost a bore* . . . A calm sea made it seem so easy yet only five minutes later at 06.10, the first indication of difficulty arose. Until that moment the modified Motorola two-way radio had been perfect. From our command post to Bryan Allen and Sam Duran in the accompanying pneumatics, there had been a complete link but now Bryan was making signs that he was speaking and not getting answers. Obviously he could still receive, and fortunately the rescue boats could stay close enough to ensure that by a wave of a hand, Bryan had heard the instructions.

A sense of isolation, created by inability to talk back emphasised Bryan's feeling of total responsibility for the success of the flight . . . The Lady Ellen's skipper Ron Ward told us before we had started that *"if the flight isn't made today it would never be made"*, meaning that conditions were extraordinarily exceptional for the treacherous Channel. Unbelievably, we progressed over six miles at this steady ten knot pace, Bryan pumping away, the propeller still flickering before our eyes and defying an rpm count (we made it anywhere from 85 to 115 rpm – though in actual fact it was a constant 95 rpm almost all the way). As we left the inshore traffic zone and entered the stronger mid-Channel tide drifting at up to a knot from the North Sea, our own heading veered to 115 degrees.

This was one factor we hadn't fully appreciated. Whilst the navigational boat has to contend with the water surface variations of tide and consequent drift also

the rise and fall of the water, the following aircraft is operating at a constant height and heading when there is no wind. Until we had gone to the eight mile point and were approaching the Varne Lightship at 06.47 the dream-like trouble free sequence continued interminably. It was shattered somewhat when a worried looking Paul MacCready emerged from the navigation room, to look ahead at the ripples appearing on the surface. The perils were all too apparent. Behind us lay a millpool, almost desperate effort to remain airborne, its pilot struggling to increase thrust, and flailing against a headwind that threatened to cancel the whole mission.

Project leader Sam Duran then radioed Bryan to confirm that flying in such turbulence seemed hopeless, and that if he wanted to abort the flight and take on a tow he should raise an arm to signal. Bryan did not want to give up – no-one wanted to give up; he pedalled bravely on

this was the point of no return! Guests on the bridge of *Horsa* by kind invitation of a hospitable Captain and Purser, Judy MacReady and young Marshall were looking at the scene from afar through the ship's binoculars. They had at the last moment dashed to Folkestone and persuaded the ferry to take a parallel course on its normal journey to Calais.

While our attention had been captured by the bulk of the *Horsa* on our port side, a new hazard emerged from the mist

Away! The Siegfried and The Vagabond Press boats make Channel crossing seem so easy but . . .

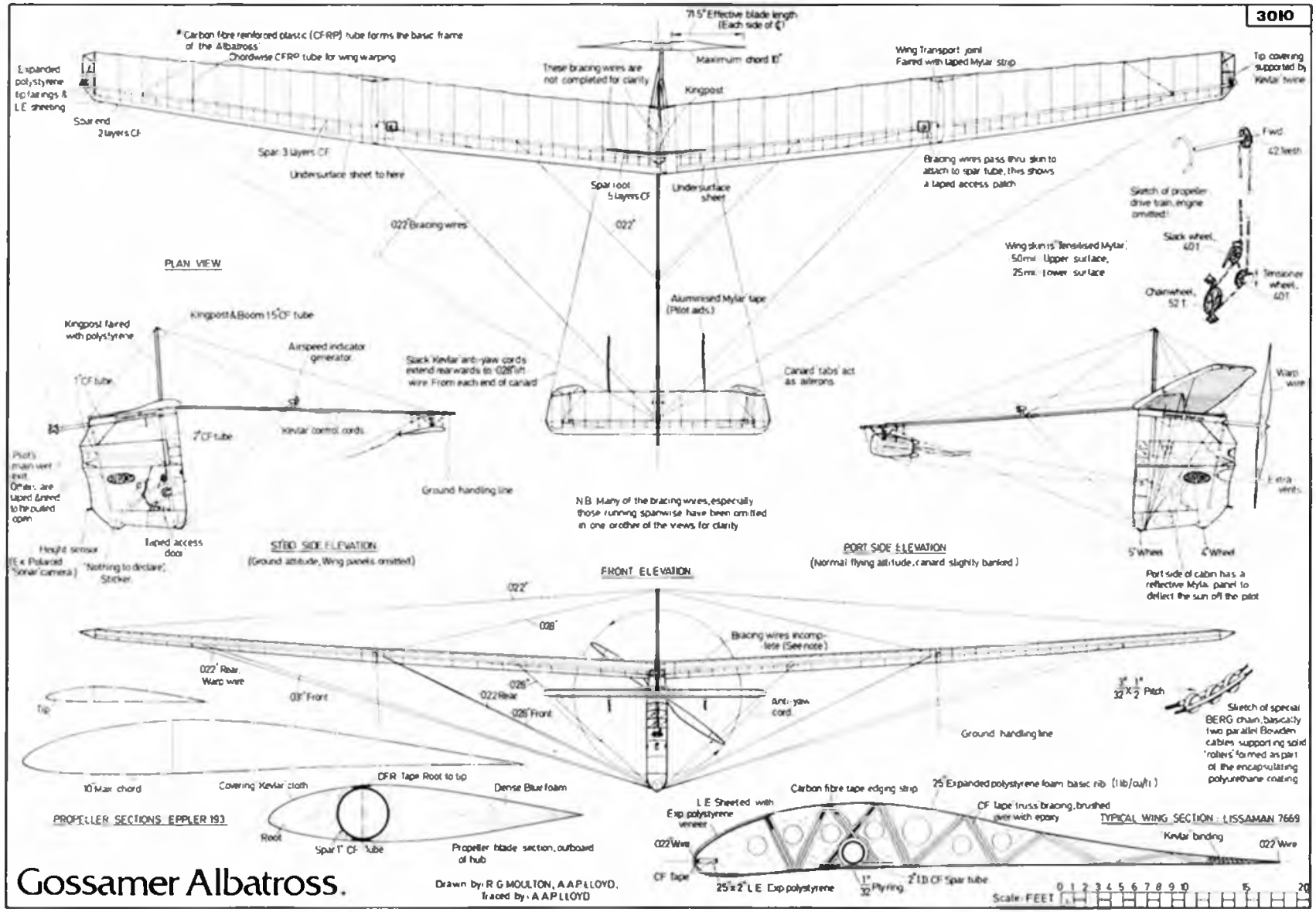
ahead what could have been described as acres of rapids.

As we approached, it did not seem too bad, but it was clear that we were gaining considerably on the Albatross and the order was given to slow engines and slow we did, steadily, as Parker and Tyler MacCready called out the distance remaining between the Albatross and the Lady Ellen. We lost all of five knots. What's more it was not a convenient headwind but one from the port quarter which added to the complication of the tide. Paul estimated that at this rate the crossing could not possibly be completed within two and a half hours, until then considered to be an absolute limit of endurance. There was no land reference to be seen, only a minesweeper orbiting our group in curious fashion. We might well have been in mid-Atlantic! Bryan was clearly having a great struggle physically and mentally as the hopelessness of the attempt dawned on the team. These were moments when even the committed official observers daren't look at this white bird in mid ocean, its stabiliser flopping side to side in

for another five minutes before finally submitting and signalling to the boat crew. As the lead Zodiac positioned itself under Gossamer Albatross, Bill Watson stood up with the modified fishing rod ready to hook up under the front wheel. Bryan pedalled his craft up to fifteen feet altitude to allow the Zodiac to get in underneath, and as he did so noticed a marked improvement in the Albatross's performance. The air close to the rough sea was turbulent, but here only a few feet high it was markedly much smoother. Bryan now realised he could fly on a little further and now began yelling and waving "don't hook up yet!" Fortunately, Bill heard him and Bryan flew on — and on. The plan had been to skim the surface of the water to benefit from ground effect lift, from now on when the surface of the sea was calm Bryan would fly low as planned, but when the surface of the sea was choppy he would return to this higher level . . . Over to one side the Seaspeed *Horsa* channel ferry boat provided a dramatic reminder to those followers with only a couple of inches of freeboard that

directly ahead – on a *collision course*. One of the biggest of all tankers lay right on our path. It seemed inevitable that we would be heading for either a collision, or a turbulent near-miss. Navigator Frank Booton was already in touch with HM Coastguard at St Margaret's Bay who were plotting the positions by radar and radioing the Captain to alter course. This deviation was taking us to the south of our destination. It could not last for long, but in fact for almost two miles we were now moving with some 3 Kts tidal assistance to the south of our true line between Folkestone and the Cap. There were troubles among the Press boats too. A small launch, commissioned by Japanese TV broke down. It had to be left behind. Presumably they fixed the problem as we heard no more!

To Bryan, the flight just continued remorselessly, with the flat, featureless seascape of the channel extending limitlessly in all directions. He was apparently making no visible or mental progress as he pedalled to the continuous rhythmical accompaniment of the outboards and motorboats pop-popping along . . . 14



The Achievement

Duration: 2 hours 49 minutes. *Distance:* 22 miles, 453 yards 9 inches (Certified by AOPA and Royal Geographic Society for F.A.I. World Records).

DATA

Span 93' 10" (Canard 18' 4")
Chord (root) 5' 6" (Canard 3' 6")
Chord (tip) 3' 11" *Sweep* 7° 30'
Prop. Dia: 13' 6"
Pitch 12' approx.
Wing Area 472 sq. ft.
Canard Area 64.2 sq. ft
Weights (empty) 70lb approx. (flying) 215lb approx
Area Loadings (wing only) 7.25oz/sq. ft. (total area) 6.4oz/sq. ft

Dye-line prints of this drawing to 1/48th scale (×3) are available as Plan 3010, price 80p from Aeromodeller Plans Service. Drawings of the Gossamer Condor II, also to 1/48th scale are coded 2992, price 80p, with the Condor I to 1/96th scale. See Aeromodeller Annual 1978/79 and Aeromodeller March 1978 for further data on the Condors.

Zodiacs close-in as Albatross sags low over mid-channel swell against a cruel headwind. At times the clearance was mere inches! Don Monroe photograph

miles gone and now 7 knots on the log, we resumed the heading to bring us north of Cape Gris Nez, now we were heading 123 degrees. *Soon after the 2 hour point, problems started mounting for Bryan. His carefully measured, weight conscious rations were running out. First he exhausted the two-litre water supply, of which he needed to drink a measured amount regularly, to prevent draining his energy through dehydration. Soon after both altimeter and air speed indicator failed with flat batteries. He was flying blind, in danger of dropping into the water or falling below stalling speed. Unable to accurately determine his position over the translucent swell of the channel, his only reference now came from Taras Kiceniuk radioing his height, "two feet . . . one foot . . . 6 inches, pedal Bryan, pedal". On several occasions Bryan was literally inches from being swallowed by the sea. Only a super-human spurt on the pedals lasting 15—20 seconds, equal to the power of another take-off run saved him. Such exertions kept him aloft, yet drained his energy still further and now he was suffering from leg cramps as dehydration set in. He felt during each minute that he could go no further yet he continued, with 4½ miles still to go* . . . It was now 8.00 o'clock and a hundred press men were willing Bryan to *"Come On"*. Though the sea surface was now calmer, it was by no means a millpool and clearly the French coast was going to present us with some unanticipated difficulties. The wind seemed to be approaching north-easterly, parallel to the coastline. It was critical that when the Cap emerged, that we should be to the north side because any drift past that point would be nothing short of disaster!

Two and a quarter hours gone and still only the barest shape of land in sight. Nothing solid. We slowed a little then the calm sea ahead gave us encouragement and almost simultaneously, that so-welcome lighthouse arose from obscurity.

When Bryan finally sighted land, his heart sank. To give up in mid channel was somehow excusable as a brave attempt. To surrender in sight of land would not only let the whole team down, it would be a tragedy. Yet the Cap was still 2.7 miles away! As Bryan's right leg muscles seized up he continued by making up with more power from his left. When this leg gave pain, he reverted to the right. Finally he was literally limping along in the air with the French coast hardly moving perceptively any closer . . . There was a wind even if it didn't ruffle the surface and Bryan was making a bare 7 or 8 knots. Fifteen more minutes and land was looming larger, we were now obliged to veer off to the left ourselves to avoid the shallows off shore. Paul, Parker, Tyler and fellow observer Brian Faulkner Bryant were now wreathed in smiles. All Bryan had to do in the Albatross was to make those last 1¼ miles, to position himself over the sandy beach. Through the glasses we made out a small group of welcoming French people on the rocks and then a red ballon ascended. It was carrying a transmitter aerial aloft for live coverage on French radio and TV, and unwittingly provided a perfect signpost for Bryan to locate his landing point.

With an air temperature of 68 degrees, sea temperature 54 degrees and his own body temperature building inside the fuselage, up to 72 degrees the Mylar had mostly misted over and forward vision became limited. *Near exhaustion, Bryan was not thinking clearly. Should he head for the nearest coast and crash on the rocks to at least make landfall? Or should he try to continue along the coast to the beach and risk falling into the sea and losing the prize at this final hurdle. He willed his legs not to let him down and negotiated the surf-splashed rocks, now covered with French reporters* . . .

Eyes straining against the haze, we followed Albatross as Bryan threaded his way through the rocky area towards the strand of beach. Minutes ticked by inter-

Designer Paul MacCready seeks landfall.

Headed for rocks, desperate to succeed, exhausted, fighting side wind and cramp, Bryan approaches the Wissant beach

Feted in Paris at the Musee de l'Air, le Bourget, the Albatross was honoured by dignitories in the aeronautical world.

minably, 8.30 . . . 8.35. Rounding the final outcrop of rocks into the bay the wind again took the upper hand and Bryan found that full canard deflection and wing warp were having little effect. Albatross was being blown back onto the rocks, yet finally it responded, he was back on course over the surf, over the beach. Albatross hovered in the breeze savouring the final seconds of its epic flight before alighting on the beach in France at a magical 8.40 am. It was down – people were running, grabbing the lines to hold *Albatross* steady and upright on the beach.

We raced from the Lady Ellen after cracking a bottle of the Skipper's champagne and congratulating the crew for a fantastic piece of navigation, and waded our way through the surf from a Zodiac to find Bryan, now in the care of Dr Ingrid Dodd. Modestly, he was receiving the acclaim of the world's press, clamouring to capture historic photographs. Paul MacCready hobbled through the surf, one leg still in plaster after cracking his ankle in a recent jogging accident, to congratulate Bryan with the words *"Well done kid, take the rest of the day off"*. A bemused Gendarme and even more important-looking Customs officials were there to be photographed, formalities forgotten! More boats arrived, more press men, school children, holiday makers and the lady Mayor of Wissant with a delightful posy of flowers together with an American/French Tricolour flag. Celebration was an inadequate expression to describe this exhilerating scene.

Meanwhile the team were at work, in the excitement of the moment immediately after landing there had been a minor crack-up on the spar but not to worry, the carbon fibre had done its job.

Officially the time was 2 hours 49 minutes and the distance 22½ miles, although the distance flown through the air allowing for head wind was equivalent to 33 miles. As physiologist/trainer Professor Joe Mastropaolo was to tell us later, he had predicted that Bryan's eventual limit of power output sufficient to fly the Albatross was 170 minutes so there was a whole minute to spare after all!

Dismantled, the incredible Albatross was taken to the double garage of a beachside house which Paul had predictably reserved for that very purpose. Alas, an excited dog chose to attack it but again no matter, polystyrene is easily replaced and no-one was dismayed by the incident, except perhaps the owner of the dog. Still in their wet suits the teams were ecstatic over the achievement, it was no less than they had expected but even so they were conscious of the historic occasion. What made them happiest of all was the fact that among the first to welcome them on the beach were two Belgian pioneers of man-powered flying, the Maaschelein brothers, who had heard that very morning over French radio that the attempt was "on" and they dashed hundreds of kilometres at top speed to be sure to be there.

For MacCready and the team it was to be the longest of long days. A celebratory lunch which started at 10.00 am and finished somewhere in the afternoon dragged on until eventually arrangements were made to move Albatross for showing at the Paris Salon Aeronautique, Le Bourget. There it was to be honoured by the world's leading authorities in aeronautics, gathered for the bi-annual occasion. It could not have been more fitting that the Albatross should hang amongst the collection of very famous French prototypes in the Musee de l'Air. Moved to Calais for the Bleriot celebrations it was eventually shipped back to Ramsgate and crated for return to the USA. Meanwhile, the other Albatross and Penguin were containered ahead to Texas and transported to the EAA rally at Oshkosh.

There should be no anti-climax after this magnificent achievement. Instead, we should look upon it as a turning point in man-powered flight inspiration. Three prizes still remain, £1,000 for the first to fly 3 minutes, £2,000, £1,500 and £1,000 awarded to the first three to fly the slalom course and yet another £10,000 for the first other than an American or American design to fly the famous figure-of-eight. Now that this young team of Californian aeromodellers and air enthusiasts have shown that it takes little more than adaptability, know-how and initiative to achieve success, surely there must be more enthusiasts among us who want to follow their lead?

Henry Kremer's most generous gifts of prize money, the goal which motivated these young aviators, which have been administrated by the Royal Aeronautical Society deserve the final accolade in this remarkable story.

In borrowed jacket and pants with a bunch of flowers in celebration, Bryan the engine gets his feet wet for the first time.

Paul at the moment of congratulation to the victorious team. "That's one job we don't have to do again."

Taras, Blaine and Dave Saks are jubilant as they lead Ted and Bill Watson off the beach, their job done

Little BUG

BY CHARLIE NEWMAN

BEEN FEELING LOW recently? Your A2 finding every downdraught? Your stunter only going square when hitting the tarmac? Clearly what you are suffering from is an overdose of serious modelling. This amusing piece of lunacy was conceived as an instant cure. Little Bug is bound to cause a good deal of mirth wherever it is unleashed as its flight pattern tends to be unpredictable. The sight of this little model with its nose in the air stooging about should raise a smile from even the most competition-orientated Aeromod. The original was built in no time at all and flew straight from the board. So if you don't have a Telco or similar, do yourself a favour and treat yourself, and get stuck in.

Though an unusual layout, this little job is ideal for the younger modeller having a fairly forgiving flight performance. A word of caution however – the area around the nose is sheeted and involves some tricky curves thus any youngster attempting this model should have built at least one other model which required 'construction'. Otherwise it is easy to build and should offer no real problems. For the benefit of less experienced builders, a reasonably full description follows.

Begin by cutting all keel-pieces from 1/16th sheet, together with all the formers and part 'X', ensure the correct grain direction shown relative to the part concerned. Next, assemble the keel over the plan, note the short keel between F1 and F1a which is extended to reach F2 temporarily until after the nose sheeting has been applied. F2 should also be left solid until the same stage. This maintains the shape of the model and the downthrust angle.

The formers should now be added, being careful to keep them all at 90° to the board. Then take one of the two parts 'X' and glue to the tops of formers F2, 3 and 4 plus the keel. To ensure that the dihedral angle is correct, use the template shown (template X).

Meanwhile, cut out all the ribs, cut out a rib template R1 from thin ply or even stiff card, without the spar notches, using a sharp knife, cut out 15 ribs. Line these up and pin them together securely so that they can be lightly sanded to an even shape, and using a square needle file or a junior hack-saw blade, cut the spar notches. The rest of the ribs should be traced directly onto the wood and cut out individually.

By this stage, the fuselage should have set and can be removed from the board, the remaining formers being added, again checking that they are true with their other halves. Cement the other part X in place, this time using template to ensure symmetry. While drying, cut out the parts for wheel spats and wing-tips, and some lengths of 1/16th square about 12in long from good medium hard 1/16th sheet. When it is dry, return to the fuselage. Study the plan and mark on F3 and F6 the position of the stringer which supports the rear wing (the only complete stringer shown on the plan). Now with a straight edge mark F4 and F5 as well. Do this both on the left and right hand sides. Then take two of stiffest pieces of 1/16th square and glue to the formers, ensuring that they lie along the marks, that they are straight, and that the fuselage has remained true. Taking the fuselage when dry, mark the positions of the other stringers on F2 and F6 (three each side). Always start pinning from the front, working rearwards, checking for straightness the whole time.

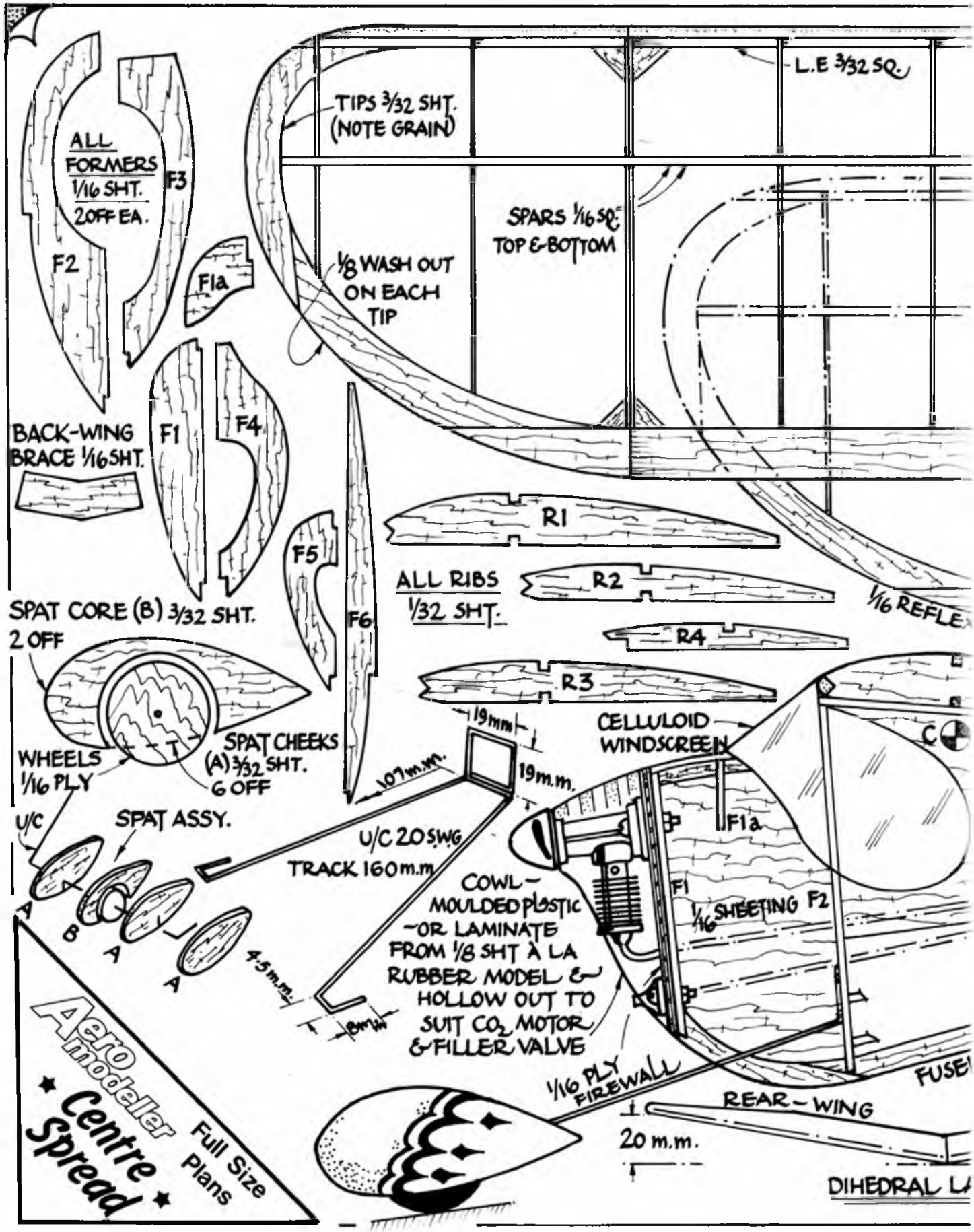
Bend the U/C wire, do not be tempted to use heavier wire as the legs project a long way forward and the balance will be affected. The U/C should now be lightly tacked to F2 with five-minute epoxy before sewing with thread and reinforce with more glue.

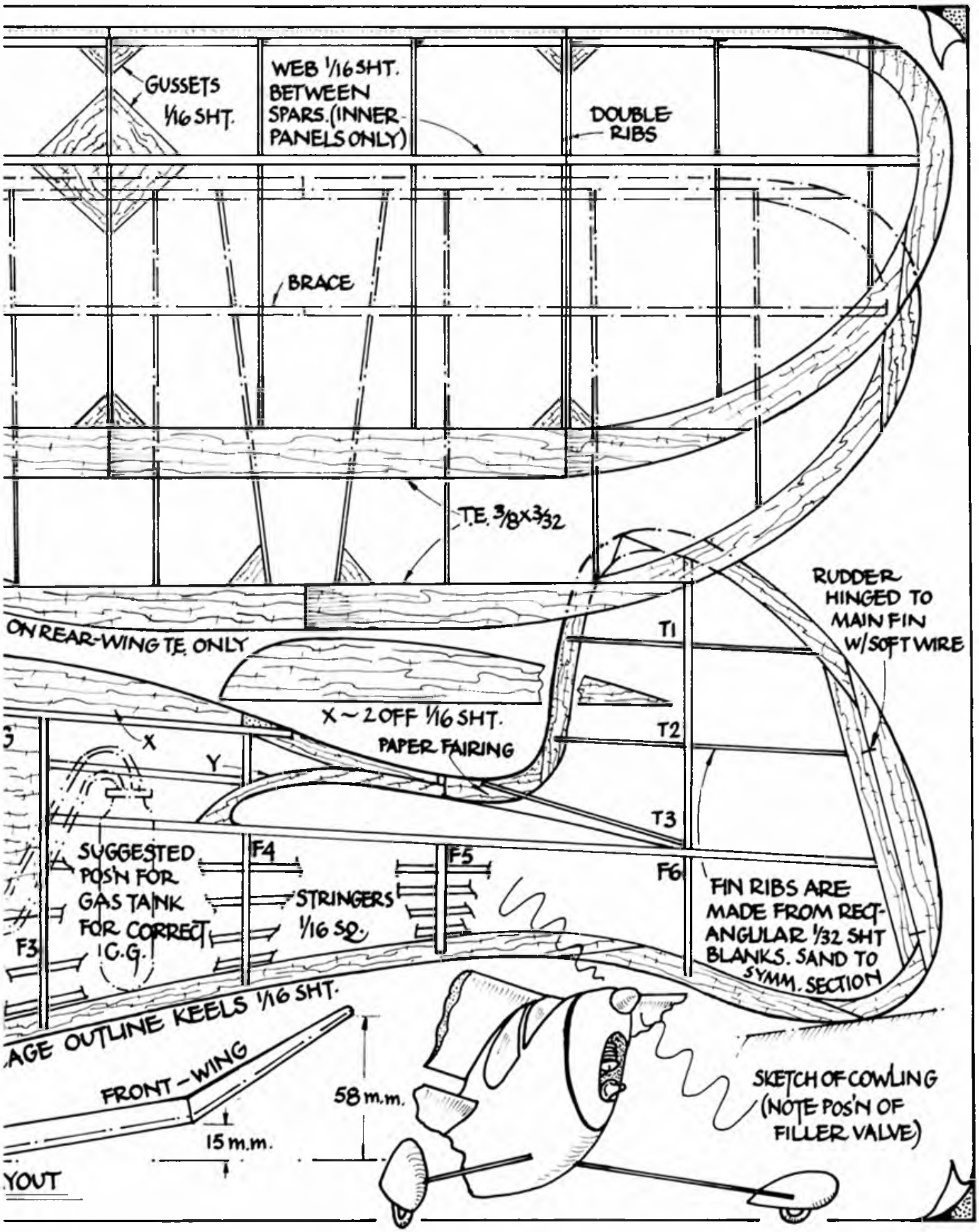
Next, cut two pieces of medium soft 1/16th sheet to fit between F2 and F3. They should sit proud of the formers and not flush. Put the two together and cut out the windscreen aperture and then fix them to the fuselage. It will be found that the sheet will project straight forward and will not lie against the curved edge of part X. The wood should simply be steamed to shape, with the aid of a kettle. As this piece gets progressively thinner and the curvature is not that great, it is not a difficult task – do use soft wood however!

Glue fin ribs (T1-3) in place either side of F6. If preferred, one may cut rectangles of 1/32nd sheet, glued in place and sanded to shape after.

The fuselage nose is covered in 1/16th sheet, though less experienced modellers might find it easier to use 1/8th sheet in planks (short wide strips) and sand in the curves. In either case, it should be carried out in the same way as the stringers, working along each side simultaneously. Please note that this is an operation best carried out beyond the earshot of mothers and wives as it is likely to draw on previously untapped areas of your vocabulary. The essential thing to bear in mind however, is that F1 is kept straight so that the thrustline is unaffected. When completed, cut away the keel between F1a and F2, also open out F2 to accept the gas tank.

Study the thrustline shown on the plan and using the actual motor as a guide, mark the two holes and drill them in a piece of 1/16th in ply. Push through two 10BA bolts, check that the motor fits, and

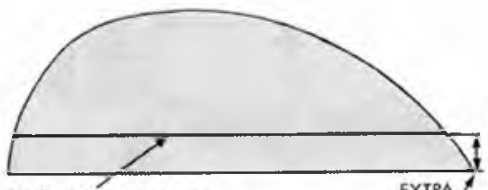




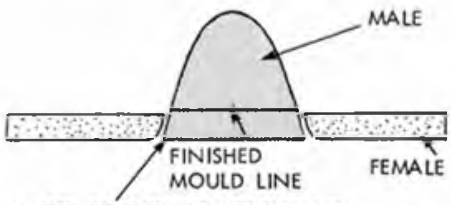
epoxy them in place. Cut away F1 to accept the bolt-heads and epoxy the ply in place. When set, trim the ply to the shape of the nose. The cowling can be moulded from Plasticard described later or carved from soft balsa block and hollowed.

Use hard balsa for the cowl mould and carve it very slightly undersize, finishing with fine wet and dry paper and a lot of elbow grease to ensure the mould has the best finish possible. The next stage is to take a piece of ply or 1/4in balsa and mark out the plan view of the male mould in the centre, adding about 1/32–1/16in all round for clearance. Thus the male is slight *under*sized while the female is slightly *over*sized. Next, curve the edges of the hole in the centre of the female, having cut out the marked area. This eases the flow of the plastic. Check that the male will pass through the female and the two shapes correspond closely.

Now cut out a sheet of plasticard 60 thou polystyrene in this case, to the same over-all size as the female mould and attach it to the lower (rounded) surface of the female with drawing pins at 1in spacings, and hold approx. 4in above an electric cooker ring and move it to and fro in order



ARRANGEMENT OF MALE MOULD



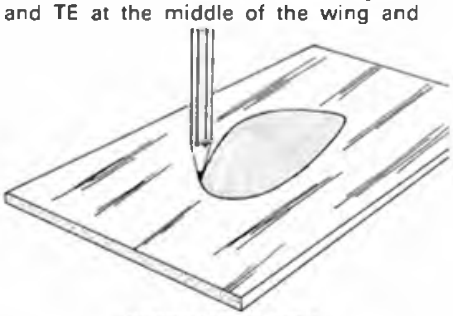
NOTE ROUNDED SECTION AND CLEARANCE FOR THE PLASTIC

to achieve even heating. As the plastic softens it will become limp and will sag initially, becoming taut again as it gets hotter. It is at this point (easily recognisable with a bit of practice) that the plastic is ready to be pressed. Move across swiftly to the male, and holding the female level, force it straight down on the male mould. Hold it there for a few seconds to let the plastic harden. If you do not manage to get a full draw in one, simply return the plastic to the heat and repeat the process until success is achieved.

You should find this process not only easy, with practice, but also great fun. Problems will undoubtedly arise initially, but perseverance is as always, the answer. This has been a basic run-down on the moulding process. Experts may find it facile in places but it is intended to get modellers, young and old, to mould things for themselves. Once one has achieved a certain degree of proficiency, then one can get involved with more sophisticated and complex jobs.

Set out the T.E. and tips of both wings over the plan, (and lower spar), glue together and pin down. Glue all ribs in place and add the upper spar and the L.E. When the rear wing is dry, cut in half, make the dihedral brace from 1/16in balsa and glue between the upper and lower spars of one half. The upper spars will be too long by approximately 1/16in and should be cut back and the leading edge and trailing edge should be angled with a sanding block to the dihedral angle. Carve and sand TEs to section shown on plan.

The front wing tips should be cut, leaving a rib on the inboard side of the cut. Pin the centre panel to the board and offer up the tips at the correct dihedral angle and glue, then add remaining ribs to the tips and to the centre section. Cut through LE and TE at the middle of the wing and


MARKING OUT THE FEMALE

dihedral. Fill in between the spars of the innermost bays with 1/16in and add large gussets to the lower side of the wing.

The front wing and two rear wing halves are covered as separate units and then offered up to the fuselage, cutting away F4 and F5 where necessary to accept the dihedral. When you have got it right, glue the brace to one half and let it set. Then apply glue to the mounting stringers in the fuselage, to the formers and to the ends of the spars, LE and TE. Join rear wing through the gap in the fuselage between the keel and the stringers.

Now add pieces 'Y', the short stringers and the paper fairing at the base of the fin, cut to shape from notepaper in two halves, left and right. It is easiest to attach if dampened first to mould it to shape. Cover fuselage with lighweight tissue. Make the wheels from 1/16th ply and glue spats together, parts B with one A and cut slot to accept the U/C wire. Place the wheels over the wire and glue the spats over the wheels ensuring they still revolve freely. When dry, add remaining part 'A', then carve and sand to streamlined shape.

Open out a hole in the nose large enough to accept the gas valve. Position the hole behind the cylinder head of the motor, leaving enough space below to mount the valve at the angle shown. To mount the motor, remove the pipe from the cylinder head, being careful not to lose the ball valve. Push the gas tank through the hole in F2 so that it rests roughly midway between F3 and F4. Feed the valve and pipes to the motor through the hole in F1. Bolt the filler valve to the nose, reattach the motor to the pipe and bolt in place. Cut the cowling to fit but do not fix it at this stage. An easier, though less tidy mounting is simply to glue a piece of 1/2in x 1/4in across F2 (shown dotted on the drawing). Mount the valve on small piece of 1/16th ply and let into the sheet in one side of the fuselage and glue. This means that you will not have to take the motor apart in order to mount it but it no longer allows you to hide the valve in the cowling.

Hold the front wing on with rubber bands and check the C/G. The model does have a tendency to be nose heavy so be warned. Move the gas tank around to achieve the correct C/G position, thereby avoiding the need for ballast.

We are now ready to sally forth into the wide blue yonder. If the C/G is correct, give the model a couple of test glides to ensure that it flies straight. It should have a fairly steep glide angle so do not be alarmed if it seems to be brick-like! Now for the big one; give the model a short charge and launch slightly nose-down. It should climb away to the left, nose high and rocking from side to side occasionally.

Having flight trimmed the model, using shims to alter the incidence under the front wing, it can be glued permanently in position. Little Bug flies to the left under power and to the right when gliding. It is relatively unaffected by wind and is a good rough weather model as a result. The rate of climb is very good, particularly on a hot day so watch out; it can travel an awfully long way in a short time. It will not take off owing to the floppy nature of the U/C but it will raise a good laugh in the air which is what it's all about! Happy landings and do not forget that name and address!

THIS MONTH:

SURVEY OF FINISHING TECHNIQUES – PREPARATION, SANDING & FILLING, COVERING & PAINTING

SO HOW FAR have we got? If you have been following our series, you will by now have the basic principles of choice of radio control equipment, how it works, installation into the model, and how the controls affect the flight of the model. For those of you who are currently building or are planning a new project, this month we shall cover (literally) the methods of preparing a basic airframe for finishing, be it heat shrink plastic film or tissue and nylon with a paint finish.

Preparation

Whatever surface finish you propose using, good preparation of the airframe is essential if you want a model to feel proud of which is worth looking at. There are those who do not seem to mind what the model looks like and simply wish to get into the air with the minimum of time and effort; if the cap fits, skip this section!

No matter how carefully you construct the model, there will be rough or bruised areas and, perhaps, even joints which are not quite a snug fit. This latter problem most usually occurs where wing ribs are let into the trailing edge, or joins between sheeted areas.

Sanding

Having finished actual construction and/or shaping of nose or tip blocks, the next stage is to carefully inspect the framework and with a sharp knife remove any unwanted 'blobs' of glue which project beyond the basic lines of the model. The reason for this, so often missed by even experienced modellers, is that during the sanding stage, these 'blobs' can break away, roll under the glasspaper, and leave unsightly and sometimes deep, score marks. It is essential to use a sanding block for the next stage, this cannot be emphasised strongly enough. It is an easy tool to make and is one of those items that once used calls forth the comment "how ever did I manage without one before". Fig. 1 shows a simple but very effective sanding block. When the glasspaper is worn out, it can simply be stripped off (the backing paper de-laminates from the abrasive surface) and a new piece glued on. For curved areas, a pad of glasspaper can be used in the palm of the hand, not with the finger tips. Take great care that the edge of the pad does not tear into the balsa.

Having given the whole airframe a careful but thorough rubbing down (see Fig. 2 for method of ensuring wing ribs are of even height), careful inspection should identify bruises, dents and gaps.

Filling

Bruises and dents are caused generally by the fibres of the balsa being compressed; by wetting the area, the individual fibres will swell and regain their previous position. Once the area is dry, a light sanding will finish the repair. If the dent or score-mark persists, then it must be filled.

Fillers are also used to seal badly fitting joints and come in a wide variety of types and forms. The most useful for the modeller is Polyfilla (internal not external), Tetrion internal, and 'Elastic' Plastic Padding. Obviously, there are many other excellent types and the use of any one is a matter of personal preference.

a) **Polyfilla & Tetrion Types:** Overnight drying preferable. Remember that as they dry, some shrinkage will occur. Probably lighter weight than other types and easier to rub down. If used on shallow marks, will sometimes 'pull out' during final sanding. Reasonably good key to wood, but not suitable for filling impervious materials.

b) **Plastic Padding (Elastic):** Quick drying, non shrink, but quite heavy, therefore not recommended for filling large gaps. Very good key to both porous and non-porous materials. May be used with success in shallow repairs.

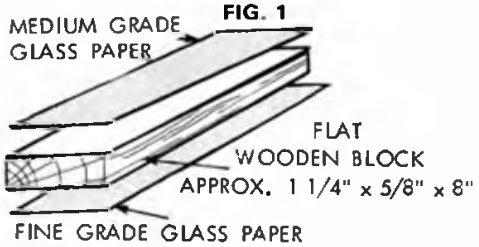


FIG. 1
STRIPS OF GLASS PAPER GLUED TO EACH SIDE WITH CONTACT ADHESIVE

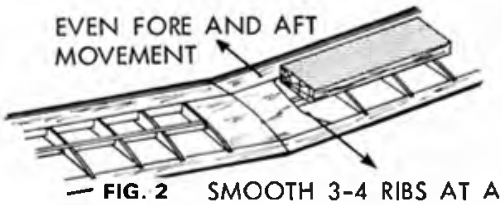


FIG. 2 SMOOTH 3-4 RIBS AT A TIME THEN MOVE ON TO THE NEXT SET, ENSURING OVERLAP.

We should now have an airframe with all dents, bruises, score-marks and joints filled, sanded to a smooth contour with rounded edges and no sharp projections.

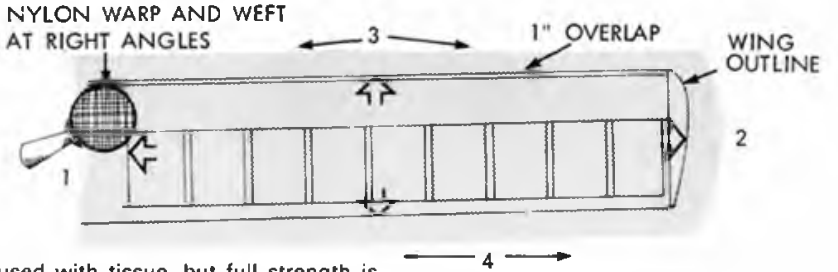
If covering with tissue or nylon, the whole structure must be given two coats of slightly thinned dope, (75% dope 25% thinner), rubbing down between coats, to seal the wood before actual covering takes place. Always remember, the final finish is only as good as initial preparation will allow. Most coverings and paint finishes will accentuate faults and bad construction, rather than hide them.

Covering

Whether using tissue or nylon, the covering methods and techniques are basically similar, with the exception that nylon or silk must be soaked, with surplus water allowed to drain until uniformly damp before proceeding with the covering operation. Use as large a panel as can be attached without wrinkling. If possible, panels should end where a definite break of contour appears (e.g. dihedral, fuselage edges or corners). Compound curves around fuselage nose, etc., are covered using several small strips of material.

Cut the panels approximately 1" larger than required, lay over the framework, then apply dope through the material onto the wood underneath. Thinned dope can

FIG. 3
WORK TO NUMERICAL SEQUENCE THEN OUTWARDS FROM 3 AND 4
THIS SEQUENCE HOLDS GOOD FOR ALL COMPONENTS, NOT JUST WINGS



be used with tissue, but full strength is preferable for nylon. Only the edges need be fixed apart from concave surfaces (e.g. under-cambered wing ribs). Press the centre of one end down, then stretch along the length and press down at the centre of the other end. Stretch the material to the full width at the centre of the sides and press down (Fig. 3), then work outwards from this centre point, stretching and working out all wrinkles as you proceed. If sections become glued down before all the wrinkles are out, application of thinners will be sufficient to soften the dope so that you may continue working. In the case of nylon, ensure that the warp and weft of the material is at right angles to the axes of the area being covered. Finally, trim the covering to within 1/4in of the edge and secure neatly with dope. Panels on wing and fuselage sides should overlap by about 1/4in.

Once the dope adhesive is dry, tissue coverings are shrunk by spraying with water. The essential part of this is to ensure even damping all over. Nylon coverings will be damp already, and in both cases, covered articles must be left to thoroughly dry overnight before any other steps are taken. It is as well to pin down flying surfaces on a flat board covered with polythene sheet during the drying process to ensure that warps are not induced.

Having covered the total airframe, the next step is to apply the initial coats of dope. Generally, two or three coats of 50% thinned dope for tissue and full strength for nylon will be sufficient to ensure that all necessary functions are properly fulfilled;

a) Air proofing, especially necessary with flying surfaces to ensure good performance by increasing lift and decreasing drag. To check this has been adequately accomplished, try blowing through the covering.
b) Strengthening – more important with tissue than nylon.
c) Tightening – more effective with nylon than tissue.

Once again, components should be pinned down overnight between coats.

One note of caution – an over-enthusiastic application of dope will dramatically increase the weight of the model, leading to the emulation of a flying brick!

Paints & Finishes

These can be subdivided into dopes, enamels, epoxy, polyurethane and fuel proofers.

Dopes

Coloured dopes have little or no shrinking/tautening properties. They are basically cellulose solutions acting as a carrier for pigments and fillers. This high proportion of solids content makes them comparatively heavy.

Enamels

Most enamels used for plastic models are eminently suitable, giving a very wide range of colours, many of which are 'authentic' when the tyro progresses to semi scale and scale models. They perhaps score over colured dopes in that when brushed on, they retain a "wet edge" longer and are so formulated as to give good flow characteristics, making them easier to apply evenly with the absence of brush marks.

Fuelproofers

In order to protect the finish from the ravages of glow fuel, both dopes and enamels must be fuelproofed. This is normally achieved by applying a single, clear varnish type coating of some suitable thermosetting resin, such as epoxy or polyurethane. The one-part household products produced by such companies as Blackfriars, Furniglas or Roncraft are suitable, but tend to yellow, particularly on ageing. The two-part epoxy systems such as Tuf Kote are an improvement, but tend to give a high gloss finish which is not always required and can also craze after ageing.

Epoxy & Polyurethane Paints

As will be realised from the above, a coloured 'fuelproofer' would seem to be the best of both worlds. However, they tend to be expensive at first sight. They do, however, have good covering power, so thinner or less coats may be used to give very high gloss finishes. Best results are achieved by spray coating rather than brushing which often produces an uneven coating and the surface tends to look thick and 'jammy'.

General Tips and Information Tables

Cellulose dopes must never be applied over enamel, as it will bubble and blister. However, enamel may be applied over thoroughly dried dope.

Always clean dust off before painting, preferably with a vacuum cleaner, followed by a tack cloth.

Always paint in a dust-free atmosphere.

If applying more than one coat, ensure that the base coat is fully dry.

Colours In Order Of Increasing Weight
Black, Silver, Dark Blue, Red, Orange, Green, Yellow, Light Blue, White.

Plastic Films

These comparatively modern covering materials carry their own heat sensitive adhesive, are pre-pigmented, fuel proof, and are available in solid, translucent and metallic colours.

All types are based upon biaxially orientated polyester. More simply, when produced they are reheated to about 80°C and stretched equally in two directions, at right angles. This stretched size is retained until cool when it is taken off in reels. If the material is then reheated to a similar heat, its 'memory' makes it revert to its original size. Further application of heat ensures that it retains the new condition/dimension.

These materials are available now in two forms. The original film (0.00025" to 0.005") and as a woven material resembling nylon. Application of both types is similar.

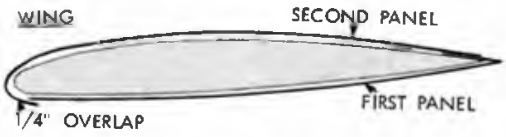
Panels are cut approximately 1" oversize, the backing film removed and then laid over the airframe. Use a household iron at the 'rayon' setting, just hot enough to curl up a 1in sq sample of film on the upturned iron, if it shrivels its too hot. The film is tacked into position, using the same procedure as shown in Fig. 3. Once again, whilst not being essential that all wrinkles are out, it will assist the shrinking process if the material is as smooth as possible. Having tacked the covering into position, it must then be sealed simply by running the sole of the iron round the edge and thereby securing the material. A 1/4in band all round should be sufficient. Any excess material can then be trimmed off.

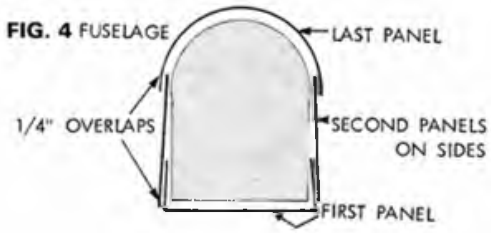
Shrinking may be carried out by passing the covered frame backwards and forwards in front of a gas or electric fire, by

Typical Doped Covering Weights
(Weight in ounces per 100 sq in area)

Covering Material	Covering Coat	Clear Dope Finishing			
		1	2	3	4
Lightweight Modelspan Tissue	.026	.038	.053	.067	.082
Heavyweight Modelspan Tissue	.055	.070	.089	.104	.125
Nylon*	.15	.17	.19	.20	.22
Plastic Film**	.18-.25	–	–	–	–

* Dependant on grade of nylon and number of coats required to fill pores.
** Weight includes pigmentation and range is dependant upon colour.





the use of a special heat gun (a hair dryer barely gives sufficient heat) or by turning the iron setting up to 'cotton' and passing the iron slowly over the area but without it actually touching the surface (aim for a 1/16in-1/8in gap). This latter course is recommended for the beginner. The film will soften, may wrinkle (some colours will temporarily turn yellowish-brown), then tighten. This technique is not difficult, but may need some practice. It is an art, rather than a science!

	Tissue and Nylon	Plastic Film
Preparation	Careful work to fill and smooth followed by coats of dope.	Careful smoothing and dust-free structure essential, do not dope.
Covering	Time-consuming with danger of warping as covering shrinks. Requires application of dope to seal.	Quick results but some care needed to give wrinkle and crease-free finish.
Ease of application	All types of surface can be covered (e.g. compound and concave curves) with ease.	Flat or slightly curved areas can be easily covered, but compound and concave areas require care and practice.
Strength	The doped covering imparts strength and rigidity to the basic frame. Tissue is prone to tearing but nylon is a good deal stronger.	No additional rigidity is imparted to the structure. Some models (e.g. biplanes) require functional struts or rigging wires. Puncture resistance high.
Weight	Dependant upon colour – probably slightly lighter than plastic film.	Can be heavier but accurate assessment of covering weight can be made.
Colouring	Unlimited choice but metallic finishes not easy. Best results from spraying.	Limited choice, but metallic colours available.
Overall Finish	Personal expertise and spray painting required for optimum finish. Fuel-proofing needed.	Easier to obtain good finish. Only joins need fuel proofing.

Panels should overlap approximately 1/4in, see Fig. 4. Any less and they may pull away from each other upon shrinking or worse still during flight. When overlapping this material, air may be trapped, causing small bubbles which can be pricked out with a pin, using a sharp stabbing movement.

Once all panels are covered, the material should be gently warmed by passing the iron over the surface, then pressed down with a soft cloth to ensure a firm bond. If you are not satisfied with the way in which a panel has taken, simply reheat the area, lift one corner and pull the panel off. Panels removed in this way should not be re-used.

Compound curves such as nose areas and wing tips can be covered by tacking and sealing along one side of the panel, then stretching the material over the surface whilst applying heat to soften the material. A final smoothing with a soft cloth ensures good adhesion. This is perhaps the most difficult technique and requires the most practice.

The resultant model should have a smooth, colourful and fuel-proof finish. The final job is to seal the overlapping edges with fuelproofer to prevent glow fuel seeping in and softening the adhesive.

Trimming

Any model can be improved by coloured trim flashes, insignia or lettering. Although standard transfers can be applied over plastic films, it is more satisfying to make up your own. Make a paper pattern of the required outline and using this, cut out the film, peel off the backing and using some of the proprietary adhesive solvent, wipe very thinly over the covering before positioning the insignia and smoothing down with a cloth. Once again, edges must be sealed with fuelproofer.

Choice of Covering Material

Simply, personal choice.

Choice of Colours

Whilst the main reason for colouring a model is to enhance its appearance, by careful choice of colour, the beginner can be assisted in the problem of orientation when flying the model.

Red, yellow and orange are the best colours for visibility and it is suggested that flying surfaces should use one of these colours with a darker colour for the fuselage. To assist orientation, a distinctive stripe or insignia in a sharply contrasting colour should be put on the underside of one panel of the wing. Insignia on the top surface are fine for appearance, but unless you intend flying inverted, of little use for recognition in the air.

Further help can be gained by fitting a contrasting narrow stripe along the front of the leading edge to assist on the landing approach to ensure that the model is level.

Next month: Tips for the flying field and choosing engines.

Sequence for iron-on covering. Top: *Cut panel roughly to size. Tack on, pulling spanwise, then chordwise. Trim, leaving 1/4 in overhang. Seal round all edges,* right, *and stick down overhang* below. *Finally, shrink tight with heat gun and rub down to stick.*

THIS MONTH:

TROUBLE-SHOOTING CHART – FAULTS, SYMPTOMS & REMEDIES

If your model does not fly, why not? It has got to be either the pilot, the model or the weather conditions. If you are daft enough to fly in windy weather the conditions are really the pilot's fault as well! Unfortunately models are not fitted with "black box" air accident data recorders to identify faults and we must rely on our own observations. I have drawn up a table of the common faults and possible remedies for solid construction trainer planes. The general principles still apply to more manouevrable planes but the number of possible faults and remedies starts to grow.

Symptom	Remedy
1. MODEL SINKS TO THE GROUND AFTER LAUNCH	
1.1. Engine too small for model.	1.1 Check engine/model combination. If it is wrong either build another model or buy another engine.
1.2. Engine not running at full power.	1.2. Always tune the engine to run at maximum speed.
1.3. Engine/propeller combination not correct.	1.3. Select and fit propeller of correct size. Smaller props run faster.
1.4. Model overweight.	1.4. Unless the extra weight is due to a modification you can remove, there is nothing one can do to add lightness. A more powerful engine might keep the model airborne.
1.5. Centre of gravity too far forward.	1.5. Check position of C of G on plan and on model. Add tailplane weight if necessary.
1.6 Launch throw not hard enough.	1.6. Instruct assistant to throw the model as hard as possible without a jerky action.
1.7. Lack of control movement.	1.7. Check controls for range of movement, 20° up and 10° down, and freedom. Correct if the controls are not free over the whole range.
1.8. Not enough "up" control given by pilot.	1.8. Pilot error. Give full up at launch and be prepared to neutralise quickly as model picks up speed.
2. ENGINE HESITATES OR CUTS ON LAUNCH. MODEL HITS THE GROUND	
2.1. Assistant throws model with jerky action.	2.1. Instruct assistant and perhaps open needle valve 1/4 turn and try again.
2.2. Fuel tank too far back in the model.	2.2. Move the tank forward to within no more than 1/2in of engine.
2.3. Fuel tank too far outboard from the centre line of the model.	2.3. Re-position the tank as near as possible to the centre line of the model, or even inboard.
3. MODEL CLIMBS AFTER A LAUNCH AND CRASHES AFTER PERFORMING A NEAR WINGOVER.	
3.1. Centre of gravity too far back.	3.1. Check plan and model. Add weight to nose or move engine forward.
3.2. Control system stiff.	3.2. See 1.7.
3.3. Pilot error. Too much "up" kept on for too long.	3.3. Neutralise control as soon as model picks up speed after launch.

MODEL SINKS TO GROUND AFTER LAUNCH

MODEL HAS ERRATIC FLIGHT PATH

PILOT GETS DIZZY

Ian holds the Kall Kraft Champ firmly supporting the engine bearers while David flick starts the 1cc Davies Charlton Spitfire.

DON'T PANIC IF YOU PICK UP THE HANDLE UPSIDE DOWN

Symptom	Remedy
4. LOSS OF LINE TENSION (NOT DUE TO PREVAILING WIND)	
4.1. Incorrect balance caused by insufficient wingtip weight.	4.1. Add sufficient wingtip weight. The weight of about two 2p pieces should be about right.
4.2. Insufficient or incorrect rudder offset.	4.2. Adjust fin to give correct or more offset.
4.3. Engine not correctly aligned.	4.3. Check engine alignment and adjust to obtain 2° or 3° right side-thrust.
4.4. Model flying too high.	4.4. Pilot error. Keep the model flying about 10 or 15 ft high. Step back to regain line tension.
4.5. Lines too long.	4.5. Shorten lines by 5ft and try again.
4.6. Bellcrank position wrong.	4.6. Bellcrank pivot point must be *behind* C of G by at least 1/2 inch. Reposition the bellcrank if it is not.
4.7. Lead out position wrong.	4.7. Lead outs should rake backwards.
5. MODEL HAS AN ERRATIC FLIGHT PATH AND IS VERY DIFFICULT TO KEEP STRAIGHT AND LEVEL EVEN IN CALM WEATHER.	
5.1. Model unstable. Centre of gravity too far back.	5.1. See 3.1.
5.2. Control system sticking and stiff to move.	5.2. See 1.7.
5.3. Over control.	5.3. Pilot error. Try rigid wrist system.
5.4. Controls too sensitive.	5.4. If there is no adjustment possible fit a new, longer, control horn.
6. MODEL RESPONSE TO CONTROLS VERY POOR. DIFFICULT TO PULL OUT OF EVEN SHALLOW DIVES OF ABOUT 10°	
6.1. Model overstable. C of G too far forward.	6.1. See 1.5.
6.2. Control system too stiff or not enough movement.	6.2. See 1.7.
6.3. Model underpowered.	6.3. See 1.1+2+3.
6.4. Model overweight.	6.4. See 1.4.
7. PILOT GETS DIZZY.	
7.1. If the line tension is good, then maybe the lines are too short.	7.1. Try flying on lines 5ft longer.
7.2. Inexperienced pilot.	7.2. Keep flying and one seems to get used to it, concentrate on model not the landscape.
7.3. Engine run too long for an inexperienced pilot.	7.3. Fit a smaller fuel tank to give flights of about 2 or 3 minutes, or half fill with fuel.
7.4. Model fast and overpowered.	7.4. See 7.1 or fit a smaller engine.
8. MODEL FLIES SLOWLY WITH A NOSE-UP ATTITUDE. DIFFICULT TO CONTROL.	
8.1. Model underpowered.	8.1. See 1.1+2+3. Try a different make of propeller if the engine and propeller are the correct size.
8.2. Model 'mushing' as a result of overcontrol.	8.2. Slowly reduce the amount of up control and "whip" the model to pick up speed.

RACING
by Dave Clarkson

FROM THE HANDLE

KRATE RACE – the "new" C/L event

After the Australian Nats, our competition minded modellers turn to more suitable summer sports – swimming and sailing. To improve enthusiasm Peter Somers (former *Windsock* editor) invented (?) the Krate Race – the event for all modellers. No event could possibly be simpler. No Rossis, fancy fuel systems or sophisticated equipment. With a little urging even the most non-competitive modeller will not be afraid of entering. There is no possible excuse that the model did not get finished in time. After all the idea is to actually build the model on the flying field from packing crate materials provided and then prove it flies!

Rules are few:

1. The organisers provide the wood pile of busted up crates with liberal sprinkling of nails. Also throw in some pieces of 3 ply for tails, irregularly shaped of course.
2. Start the competitors Le Mans style with a 100 metre dash for the woodpile – first there gets the best wood!
3. Teams of two.
4. No power tools of any kind (starters forbidden).
5. No radio engine mounts or pre-mounted engines.
6. Models must rise off the ground from a fitted undercarriage.
7. For safety, an unmounted bellcrank, leadout and pushrod assembly is permitted, assembled beforehand.
8. A pull test is applied to all models prior to flying – 10kgm is suggested. Motors over 5cc must fly on heavyweight lines, 50ft radius.
9. The winners are the first team to fly 5 consecutive laps in any fashion. Timing begins with the Le Mans start and finishes on the 5th lap.

Witness some of the action from the 8th annual West Australian Krate Race run by the Mercurians model aircraft club. Does the idea appeal?

This year Western Australia celebrates the 150th anniversary of its founding. Yes, 150 years ago people came to found a colony at what is now the most isolated capital city in the world – Perth. Isolated from other modellers too, with the next organised C/L club some 2500km away.

To celebrate, the Mercurians MAC will run the 1st International Postal Krate race in October 1979. To enter, hold your own club event on any Sunday in Oct and post your results rapidly to Mercurians MAC, c/o Norm Kirton, 80 Forrest Road, Padbury, Western Australia 6025.

We will publish the results in this magazine.

Who will set the inaugural World Record? *Have Fun!*

USSR Nats

FROM KARL PLOTSIN (Latvia) to Jurgen Lenzen (West Germany) to Doc Jackson (USA) to yours truly came these results: I hope that this tortuous route explains the delay!

F2C Team Race	*Best Heat*	*Best Semi*	*Final*
1. Burtsev/Koroty	3·54	3·54.7	7·56.5
2. Sapovalov/ Onufrienko	3·54	3·55	7·57.4
3. Barkov/Surajev	4·09	3·55	8·06
4. Titov/Kudtatsev	3·56.9	4·00	
5. Kramarenko/ Krasnoroutsky	3·59	3·59	

Coming so soon after the 1978 World Champs at Woodvale, these results have some significance. Ever since the late 1960s the Russians have dominated Team Race at European and World levels generating an expectance of superiority in their times. These results are perhaps the best information on how they might have figured in the Woodvale results had they been allowed to compete. Even if the conditions at Minsk were unkind, they could not have been much more unkind than at Woodvale so direct comparison should be valid. If this is so, then it would appear that we in Western Europe have at long last caught and maybe passed the Russians for the National Championships of the USSR is no little contest and you can be sure that the entrants were trying their hardest. If the Russians are able to come to France later on this year for the European Championships – maybe then we will see if the era of Russian dominance is at an end.

Above: *A Le Mans start decides who gets the best krate. Fred Adler and Jim Stivey almost knocked out this year with a broken saw!* Below: *Laurie and Ken Chatley add the final nails!* Bottom: *Don McSwain eyeballs his pride and joy for accuracy, mercifully his specs are opaque.*

LIGHT IS RIGHT

THERE CAN BE NO doubt that in FAI-TR the motto 'Light is Right' is a true one. When I started in FAI-TR in 1972, typical model weights here in the UK were 20-21ozs. It took the foreign competitor dominated Nats of 1973 to teach us that lighter models were better and since that time model weights have come steadily down. A year or two ago, typical model weight was down to 15-16ozs and now 13-14ozs seems to be becoming the norm. As usual our Continental brothers lead the way with some of the leading competitors getting below 12ozs. Mathematical proof of 'Light is Right' is not necessary for we have all the proof we need in that little experiment I reported on at the time of the Woodvale World Champ ionships when, after the contest, Henry Nelson's motor in Geschwendtner/Mau's 12·oz model gave about 10% more airspeed than the same motor in Dodge/Nelson's 18½oz model. Just think about it – a 6oz lighter model could give 20 seconds improvement in heat times. Those of us who want to win in FAI-TR cannot afford to ignore such a potential benefit in race times. So the question must be just how can such big weight reductions be achieved. Let me examine a few methods.

Motors –

The Nelson AAC with magnesium back-plate and lightened shaft as currently being shipped by Henry Nelson is almost 40 (1.4oz) lighter than the standard motor. The BG is over 15gm (0.6oz) lighter than the old Bugl MkII. Even without the aluminium motor screws that can give up to 10gm (0.4oz) additional saving that some get by using such, these 'new' motors are a real help.

Pans –

The standard pan is now I guess, the Nelson magnesium pan. Used as received in its standard cast form, this weighs around 34gm (1.2oz). Simply by cutting off the rear of the pan, from behind the central bridge, and using the front hold-downs cast into the pan, plus hold-downs immediately behind the motor saves about 13gm (0.5oz). Taking a Dremel or similar to the insides can save a further 6gm (0.3oz).

Tanks –

Until the beginning of this year, Jim and I used to use a 'Turtle' tank made from brass sheet with a NWMS tank valve and a NWMS shut-off soldered onto it. On the motor was a Bugle NVA and on the pan was a modified ST or OS NVA as the prime needle. Now we use a tin-plate forward feed 'wedge' tank and a Theo Georgiadis Oddy type multi-function (with an integral prime needle) mounted on the motor. A saving of 21gm (0.7oz) resulted – a further 10gm could be had if we opt for an aluminium tank a la Geschwendtner/Mau i.e. a total of over 1oz just on the fuel system.

Before considering the model, let us see how far we have come.

Original	New	Saving
Standard Nelson	Nelson AAC	40gm
As cast Nelson pan	shortened & lightened pan	15gm
'Turtle' tank + NWMS systems	Aluminium tank + 'Oddy' type multi function	30gm
		85 gm

So my 'Nelson Sprint' which at Woodvale was officially weighted at 445gm (15.6oz) could now be weighing 360gm (12.7oz). Well it is not that straight forward for all of this weight has come from over and in front of the model CG which means that an APS 'Nelson Sprint' built incorporating these changes in the mechanical specification would have too rear-ward a CG resulting in a possibly unflyable model. So model design changes are needed and whilst we are at this stage, why not design in some lightness here too.

Wing –

Using similar density wood of about 4½lb/cu ft, changing to a ⅛in sheet wing from a 3/8in sheet wing will save about 15gm (0.6oz). To retain tortional and linear rigidity, a reduction in span to about 28in is required plus accompanying chord increases to retain the desired wing area. A side bonus of this change is a reduction in wing frontal area of no less than 40% which must in itself help improve model airspeed.

Fuselage –

Very little indeed can be done with the front-end. However it is the rear-end that needs lightening. Rear of the first inch or so of the wing centre chord, the fuselage only serves to keep wing and tail rigidly apart and to streamline down the air-flow from the maximum cross-section (fixed at a minimum of 39.6 cm sq by the rules) as smoothly as possible. Aerodynamists may argue but current TR experience says that a linear taper is best, and certainly easiest to achieve. The conclusion is that we want a uniformly tapering elliptical rear fuselage of maximum rigidity so why not save money and roll it from sheet balsa. Heaton/Ross use an 1/8in balsa rear crutch plus two thicknesses of rolled 1/32in balsa top and bottom. Geschwendtner/Mau use a 1/16in balsa rear crutch plus rolled 1/16in balsa top and bottom. Both use just one former at the front to establish the cross-section. Malcolm Ross and John Mau are pretty fast catchers so these constrictions must be strong enough. Quite a change from my 1/8in spruce and 3/16in balsa sheet rear fuselage though! And no doubt, a great deal lighter – maybe another 15gm (0.6oz).

So by going to a Geschwendtner/Mau type model another 30gm (1.1oz) weight saving is possible. The overall result is, as you will see from the descriptions here, easily achieved without using 'exotic materials' and produces a model weighing 330grm (11.6oz).

Now you know what my plans are. I hope that the result will be easier achievement of times in the 3-50s with a greater possibility of getting into the 3-40s. All of the evidence starting from Woodvale points in this direction. Of course all of this may just be in pursuit of the TR man's version of the fisherman's tale, everyone now seems to jaw-jaw about their new, super-light model and maybe this whole article is just so much jaw-jaw.

There is one draw back of super light models and that is that they can also be super flimsy models. I would hate FAI-TR to become like FAI Combat and have bits of models fluttering about in the breeze as a frequent result of flying. However now that the £100 – TR motor is here, I guess not many of us are going to go overboard and be stupid about 'Light is Right'.

JURA CUP INTERNATIONAL 26th and 27th May, Breitenbach, Switzerland

The site at Breitenbach may well have the most beautiful setting of any contest site in the World – surrounded by trees up a small secluded valley and with an Alpine back-drop. The site itself is a little less idyllic for the TR centre circle is small at 2.25m radius and has quite a drop at its edge causing those who get too close to run the risk of literally falling of the centre circle (yes! it did happen). It is possible for the Stunt fliers to have problems too for the TR height marker and/or the trees got in the way of some. Still, with all of that scenery it would be improper to complain too loudly.

Team Race had a big 10 nation entry – the 3 Bulgarian teams had come the furthest to compete (or maybe it was the 2 Spanish teams). The sensations of the meeting were the airspeed of the BG motors from Denmark and the Cipolla motors from Italy which were getting close to the 20sec for 10 laps barrier. Apart from this, the number of crashes was noticeable with both Tribe/Tribe (GB) and Cipolla/Cipolla (I) destroying 2 models each.

The final (held in a real Alpine cloud-burst) was notable for three things. Firstly the Cipolla brothers from Italy could not fly because they had lost all of their models in crashes. Secondly, the BG of the Metkemeijer brothers started to digest its piston partway through the final meaning a very slow finish. Thirdly Steve Smith and Colin Brown won using their new flying wing model – generating a lot of interest in many other competitors. This win however didn't bring the team prize. 1. Netherlands 11-44.1, 2. Denmark 11-45.1, 3. Italy 11-49.5, 4. Great Britain 12-12.7.

It is apparent from these results that we TR fanatics have a real choice of alternatives at last for motors – a very healthy situation indeed.

Postscript

For those who have ordered BG motors or are thinking of doing so, the Danish manufacturers have already cured the piston weakness that caused the demise of the Metkemeijer's motor in the final. All motors in the second and subsequent batches (the first batch of 30 has already been sold and distributed) will have pistons made from a much stronger material.

Criterium Midden Nederland – 9th and 10th June, Utrecht, Holland

For team-race in particular this annual meeting at Utrecht is one of the most important on the FAI Calendar. This is because the quality of jurying and organisation has always been of the highest and the site at Utrecht is faultless for this size of contest. This eleventh running of the Criterium at Utrecht was no exception and the organisers deserve all praise for that.

I suppose that many of us went this year to Utrecht to see how the BG vs Nelson motor battle is developing for at Breitenbach, Switzerland, just two weeks earlier Nelson dominance had suffered quite a reverse. The results at Utrecht show that the Nelson is still highly competitive but so is the re-born Bugle – the BG from Denmark.

Confirming the team results at Woodvale, here at Utrecht the unofficial team prize resulted in for Team Race: 1. Great Britain 11-38.7, 2. Netherlands 11-39.9, 3. Denmark 12-01.6.

This good performance by the British in team race plus excellent performances by Jim Mannall, Pete Tindal (the winner at Breitenbach) and Mike Taylor in Stunt who finished 3-4-5 respectively and by Gordon Isles, our only entry in Speed who placed 2nd with a new British record of 253.70 km/hr (157.6mph) after a 4am repair session the previous evening, all contributed to an overall British victory for the total contest: again a close one but any which way is OK for our first ever overall victory at Utrecht – 1. Great Britain 40 points, 2. Denmark 38 points, 3. Netherlands 25.5 points.

Dave and Jim Woodside with their Nelson Sprint (Plan CL/1351, price £1.65p + 20p P&P)

The sun shone all weekend too – quite a few of us got a bit of a tan – so Utrecht this year could be said to have been very satisfying for we British.

To return to the Team Racing: a couple of incidents gave the excellent jury of Dave Rudd (GB), Ed Meijer (NL) and Karl Kosmolla (D) real problems in the semi finals. The first incident involved (would you believe it) Heaton-/Ross and the Metkemeijer brothers who in their first semi final virtually all agreed finished in a dead heat. However the watches had them 0.1 sec apart and since neither improved their time in the second round of semi finals, the rule book said that the Metkemeijer brothers should go into the final. Very sportingly the Metkemeijer brothers refused their final place on the grounds that they had dead-heated with Heaton/Ross and not beaten them. To resolve this deadlock a fly-off was agreed which Heaton/Ross won decisively and thus they, not Bert and Rob Metkemeijer, entered the final. One can only applaud the Metkemeijers' sporting behaviour: I sincerely hope that their concept of fairness is followed in the future by others – perhaps the rule makers have something to do here?

The second incident was much less easy to resolve for it involved the old problem of what on earth does one do about a re-run in the semi finals. In their second semi final Petersen/Geschwendtner (DK) gained a re-run because the jury ruled that a timing error had occured. The only solution that the rule book allowed was to split the last semi final into two two-up races, a situation hardly fair to the other semi finalists not involved for there can be little doubt that the chances of gaining a good time in a two-up race are much higher than in a three-up race. Good competitors that they are, Petersen/Geschwendtner took the chance they had been offered well and improved their time considerably thus gaining a place in the final. You can be assured that this Jury decision caused quite a bit of discussion.

After these incidents and their more-or-less satisfactory solutions, the final could have been an anti-climax. Well it wasn't for we saw the fastest final in the World this year and at long last, a three-up final all of the way with a really close finish. Noticeable in the final was little Hans Geschwendtner looking significantly taller for he had borrowed yours truly's 'ugly boots' with the two inch thick soles and they certainly helped.

Results

Jura Cup

			Best Heat	Best Semi	Final	
1.	**Smith/Brown**	**GB**	**3-55.7**	**3-48.3**	**8-27.2**	**Nelson**
2.	Metkemeijer Bros	NL	3-50.3	3-48.3	10.15.9	BG
3.	Cipolla Bros	I	3-53.0	4-01.0	DNF	Cipolla
4.	Geschwendtner/Mau	DK	3-42.5	4-30.5		BG
5.	Nitsche/Kuhnegger	A	3-49.6	4-27.2		BG
6.	Voghera/Menozzi	I	3-52.5	4-14.0		Cipolla
7.	Visser/Buys	NL	3-54.2	4-03.0		Nelson
8.	**Tribe Bros**	**GB**	**3-54.5**	**rtd.**		**Nelson**
9.	Petersen/Geschwendtner	DK	3-54.9	4-07.0		BG
21.	**Rudd/Haycock**	**GB**	**4-22.5**			**Nelson**
22.	**Fry/Harknett**	**GB**	**4-30.3**			**Bugl**
28.	**Surugue/Broad**	**F/GB**	**4-36.5**			**Bugl**

Utrecht Results

			Best Heat	Best Semi	Final	
1.	Geschwendtner/Mau	DK	3-56.5	3-51.5	7-41.8	BG
2.	**Heaton/Ross**	**GB**	**3-52.2**	**3-54.7**	**7-47.9**	**Nelson**
3.	Petersen/Geschwendtner	DK	3-59.3	3-51.7	7-58.9	Bugl
4.	Wakkuman/v.d.Weerd	NL	3-51.6	4-04.3		Nelson
5.	Visser/Buys	NL	3-52.0	3-55.4		Nelson
6.	**Langworth/Broadhead**	**GB**	**3-52.3**	**4-18.5**		**Nelson**
7.	**Clarkson/Woodside**	**GB**	**3-54.2**	**3-57.8**		**Nelson**
8.	Metkemeijer Bros	NL	3-56.3	3-54.6		FMV
9.	Brendel/Rumpel	D	4-01.0	4-31.0		Nelson
13.	**Fry/Harknett**	**GB**	**4-08.6**			**BG**
14.	**Surugue/Broad**	**F/GB**	**4-15.9**			**BG**
15.	**Smith/Yeldham**	**GB**	**4-19.5**			**Nelson**
18.	**Lorrimer/Cooper**	**GB**	**4-28.9**			**Nelson**

AEROBATICS
by Glen Alison

Above: *Glen Alison's latest aerobatic model featuring Al Rabe aerofoil section wing including dihedral, powered by Super Tigre 46. Fuselage is covered in light glass cloth, finish is K&B Super Poxy and all-up weight is a modest 45oz.*

Left: *Close up of spatted wheel on Glen's Cavalier after sand-papering ready for final coat of Super Poxy. Note white silicone rubber flexible fillet at wing junction.*

WHEEL SPATS

I have always admired the smart appearance of wheel spats on semi-scale type stunters with 'fixed' undercarriages and decided to make a set for my latest model. However, it was not such an easy job as it first appeared especially as the undercarriage was already installed. The first step was to draw the side profile allowing at least 4mm inside clearance all round for the wheel. It is vital to decide how the spat will be located and secured in order to prevent movement and binding of the wheel when in use.

In this design the main support comes from the hard 3mm balsa leg fairings epoxied in front and behind the wire leg. These fairings extend into and fit in a slot cut in the spat core. The wheel is retained by a commercial brass collet which locates in a hole in the side plate.

The spat is assembled by first doing a 'dry run' holding the components together with pins to make sure that the wheel has adequate clearance and spat alignment is correct. If everything is OK then disassemble and paint-/fuelproof the inside of the wheel cavity as it cannot be done later. Fasten the inner leg fairings to the undercarriage wire with epoxy, holding in place with elastic bands or Sellotape until set. This assembly can be bound with nylon or glass cloth and epoxy for added strength. Remember it is vital that these are aligned at 90° to the axle. Secure the wheel on the axle with the screw type collet. The outer side plate is glued to the core piece before attaching these to the leg. Check again for free wheel movement. Lastly, the inner side plate and the small outer leg fairing are fixed in place. When set, the carving and sanding can begin to get a pleasing streamlined shape. Note the leg fairings must stop 5mm short of the wing underside to prevent them digging into the wing covering when the undercarriages flexes. To make

a neat job of this join I used clear silicone rubber bath sealant to form a flexible fillet at the joint. You squeeze it out like toothpaste and mould it to shape using a moist fingertip. It sticks well and is fuel proof. It sets in an hour or so. You may find it easier to build up a shape in several stages to avoid working too much at a time.

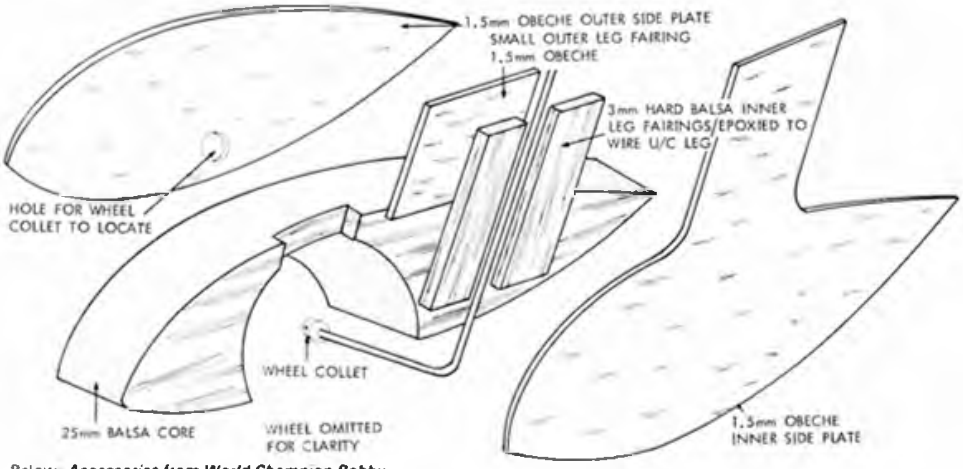
CAVALIER MK. 3

Just to show that I actually build models of my own besides just writing about other peoples, here are a few details of my latest effort. Basically it is a development of the mark 2 Cavalier which owed much to the Italian BAGA 32 design kitted by Aviomodelli. The major difference is the wing which is now a direct copy of Al Rabe's Mustang wing (See *Aeromodeller* September 78) complete with dihedral and covered in 1.5mm balsa. Fairly small with a wingspan of 58in and area of 625in². Engine is a standard ST.46 and my usual double clunk uniflo tank is fitted using exhaust pressure. The finish on the fuselage is 0.6oz glass cloth as described two months ago with K&B Super Poxy for trim. The wings and tail are covered in white Solarfilm with the Super Poxy used as trim. A warning here! To improve adhesion of the paint to the film I decided to roughen the surface slightly to help key the paint. It doesn't work and a dreadful 'wooly coat' effect is achieved. So I recommend just cleaning the film throughly with thinners etc. to remove any grease or contamination, then the paint adheres satisfactorily. The colour scheme is a copy of the Zlin aerobatic aircraft. Yet to fly, the model weighs in at 45oz so should perform well.

NOVICE STUNT MODEL DESIGN COMPETITION

There has been a moderate response of entries so far in this competition. Five entries have been received and I am sure there must be many more budding designers out there just working up courage to send their creation in. Just as a reminder, here is the specification, it couldn't be simpler. a) Profile fuselage and b) top engine size of 3.5cc (0.20 cu in) So send your entries in as soon as possible.

Designs are judged for simplicity, ruggedness and any features designed to aid alignment and warp free construction. Judging will be by the CLAPA Technical Committee and the winning design published (that means money!) in the *Aeromodeller*, plus of course, you will be helping all budding aerobatic pilots by producing a simple design that will help them master the art of Control Line Aerobatics.

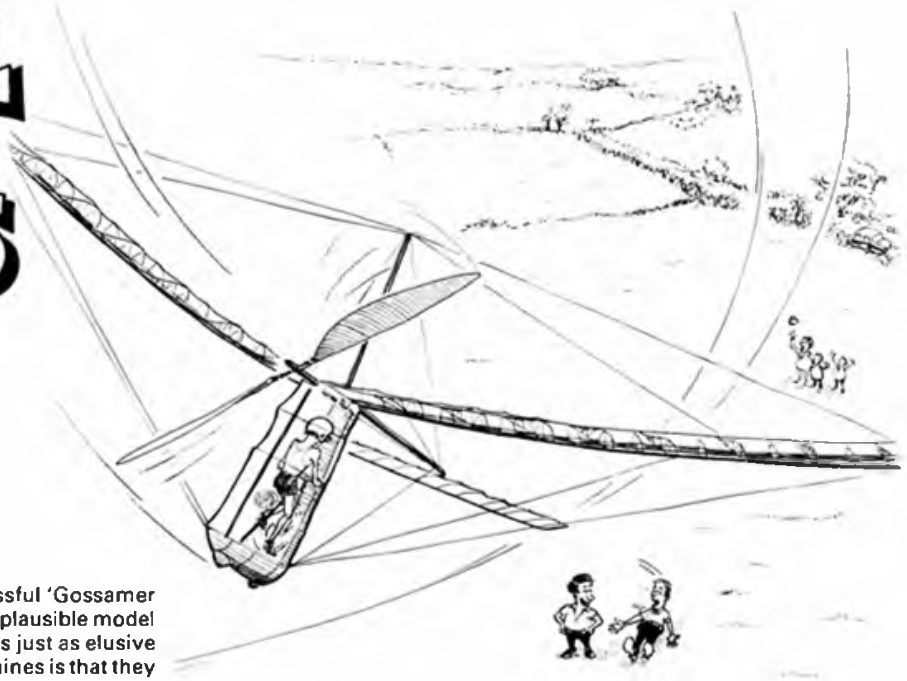


EXPLODED VIEW OF WHEEL SPAT

Below: ***Accessories from World Champion Bobby Hunt: adjustable leadouts; foam wing bellcrank mount; landing gear blocks with cover plates; bushed elevator and flap horns; write to 205 Wood Avenue, Middlesex, New Jersey, USA.***

TOPICAL TWISTS

by Pylonius
illustrated by Sherry



"I told you not to bet him £100,000 he couldn't loop it."

SEEING IT THROUGH

The most infuriating thing about the highly successful 'Gossamer Albatross' is that it is too unlikely looking to make a plausible model aircraft. Come to that, though, the Wright Biplane is just as elusive a subject. Another similarity between the two machines is that they were the result of solving the aeronautical problems in the lightest possible way. The Albatross might look like a bit of bad supermarket wrapping, but it proved to its more curvaceous rivals that beauty is but polythene skin deep.

Another famous machine that has something in common with the Albatross is what is claimed by some to be the first flying machine: the 'Coachman Express' of Sir George Cayley. This, too, had a stabilizer poking out on a stick. No doubt the manipulation of this rickety rod gave the coachman more trouble than was experienced by the wave hopping pedal pilot. We do know, though, that the rewards for flight pioneering were not quite so munificent in the coach-and-four days as they are now. Spoofer's 'Early Aviators' cites the Coachman's reward as a brace of florin, plus VAT (the latter full of mulled ale obtainable at the Squire and Dragup). Of the flight itself there is little known, and little credence can be given to this supposed exchange of words between Sir George and his coachman prior to the flight.

"Wot if I starts doiving in loike, sirr?"

"You just give Up, you fool."

"That's wot Oi'm afraid you might say, sirr."

There is, too, the story that the machine was hoisted in the air by a team of six shire horses, pulling on a new hempen rope. Remnants of the rope were to be seen for some years outside the Squire and Dragup, together with the legend, "A good pull up for Coachmen."

Coming back to the Albatross, the next obvious step is a flight across the Atlantic – the normal course of pioneering progression. On the basis of ten thousand pounds for one mile, and one hundred thousand for twenty miles, it looks as if an appeal to the European Monetary Fund might be necessary before the pedals start moving off the Atlantic seaboard.

INTER-NATIONALS

It is rumoured that next year's not-get-together which, so far, we have called the Notionals, will, for geographical reasons, be given a less parochial title. The event may still be held over the August Bank Holiday, except where it may conflict with the international dateline, but in order to escape the jolly exchanges on the Citizens Band, the Radio control venue will be Abu Dhabi, just north of the Cadillac Disposal Centre. Camping will be allowed on alternate days, but the whole area would have to be evacuated at five minutes notice if required for a helicopter polo match.

The Control Line site could well be a North Sea Oil Rig. All entrants would have to wear life jackets at all times, and flying undertaken only between high and low tides. The period can be determined by counting the laps.

In view of the difficulties in finding any sort of venue for Free Flight events it was hoped to stage this part of the Notionals in the Arctic, but the Eskimo Conservation Department could only offer round the pole facilities. Efforts to book a Co_2 Scramble Event on a Nuclear Dropping Zone were abandoned following pollution objections from the Friends of the Earth.

NOT QUITE THE SAM

An ailment that is increasing in incidence, not only in this country but throughout the world, is Vintagilitus. Whilst most cases are of a mild nature, just the odd flourish of a pre-1950 model, there are those smitten to a more serious extent, plunging headlong into what they believe to be a happier and more fulfilling past.

Now whilst you may imagine they have gone completely gaga, their embracing of the pre-war way of modelling life goes only so far. True the recreated models are marvels of verisimilitude and all the simple joyfulness of flying in the old chug-chug fashion lived to the full, but they are careful not to go the whole hog and take on with the other vintage joys the more rugged aspects of old time model flying. I mean, you don't see them struggling to the flying field on pushbikes, with models strapped on their backs, or even trying to pile their gear onto a bus. They do not even attempt to re-create the old life style on the typical cramped flying fields of the period, preferring to travel miles to some open range. All this I will tolerate if it makes them happy, but when I read of a group of them toting along their pre-war gassies in a private, air conditioned coach, I feel the whole thing is going too far.

One thing the Vintagilitus sufferer cannot easily relinquish is all that modern knowhow he has. He is like a time traveller zooming back to a model meeting of the Thirties. He knows what are the good designs and what flopped, and he'd be muttering advice to the historic flyers, based on his up to date model knowledge. "All that downthrust is getting you nowhere – try a bit of washin on the inboard wing", and "That model wouldn't have fallen apart if you'd used a spot of epoxy on the dihedral joints." He might even be moved to deplore the competitor's lack of tactical sense. "No, no, you fool, you're launching into dead air!", and might even be on the point of suggesting a detergent bubble machine or strip of mylar.

What perhaps is possible, and could add to the fun, is a complete post Thirties technical and aeronautical brainwash, to give the pure and uncluttered mind of a pre-war model flyer. With the right sort of psychological treatment you might be induced to turn up on the flying field in grey flannels and Fair Isle pullover

RIPMAX

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with contest performance.

GRAUPNER *UHU* 48" span **£9.25**
Latest version includes plastic fuselage shells and other parts, preshaped balsa parts, wire and other hardware.

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A1 class contest sailplane with dethermaliser. Converts to pylon power (Pylon mount **price £2.10**)

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GRAUPNER *BETA 77* span **£34.20**
Specially designed for 2-channel (rudder & elevator) radio control. Preshaped balsa parts plus plastic root ribs, spar braces and canopy frame.

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Near-scale soarer. Foam wings, preshaped balsa fuselage and tail parts. Die-cut ribs, canopy, etc.

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Guaranteed performance and SUPREME RELIABILITY – at a genuine LOW PRICE. We recommend a MEDALLION outfit.

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2 Combo + 2 servos **only £49.50**
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Here RIPMAX have selected a really interesting range of flying scale models from 16" to 36" span – plus Peanuts (all 13" span). Models that will give you a lot of satisfaction to build – and fly. Each kit complete with rubber motor.

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CONTROL LINE
Here most of the RIPMAX kits are drawn from the famous Sterling (American) range. Colourful, interesting models with a performance to match. Extensively prefabricated kits which are easy to build. Again the emphasis is on scale, but also include full stunt/combat models.

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32½" span STEARMAN PT 17	£17.75
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32" span SE5A	£16.95
32½" span FOKKER D-7	£16.95
35" span CORSAIR F4U-1	£17.75
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SEE THEM ALL AT YOUR MODEL SHOP

Above prices may be subject to change – check with your local stockist.

Bob Bailey reports....

TYING RUBBER MOTORS

There are two main problems that one requires to overcome when tying motors from strip rubber. With unlubricated rubber when tying a knot and pulling it tight the edges of the rubber fray because the rubber is dry; the obvious sequel to this is that the rubber is likely to break at the knot when the motor is wound up. With lubricated rubber, there is no problem with it fraying but with a good lubricant the knot slips undone when the motor is under tension when it is wound.

OUTDOOR MOTORS

A simple and quick method that I have found successful is to tie a 1½ thumb knot in each end with the rubber either already lubricated or well wetted with saliva if as yet unlubricated. Pull each thumb knot very tight and trim off any excess leaving 1/4in–3/8in free. Tie a reef knot in the usual manner and pull tight. This method works very well with lubricated rubber so is good for repairs (See Figure 1 for knot details).

An oft quoted method is to tie a reef knot and bind the ends with wool, but I wouldn't recommend it because the presence of the wool must detract from the function of the lubricant by causing friction.

INDOOR MOTORS

Here, something more refined is needed. Indoor motors are stretched a lot more than outdoor motors, so the knot is much more highly stressed, also a bulky knot is undesirable for two reasons:

1. it uses up valuable rubber weight and converts it into dead weight.
2. the knot in the motor can catch on the stick fuselage and can therefore cause a bunch to occur in a wound motor. This bunch prevents that part of the motor from unwinding.

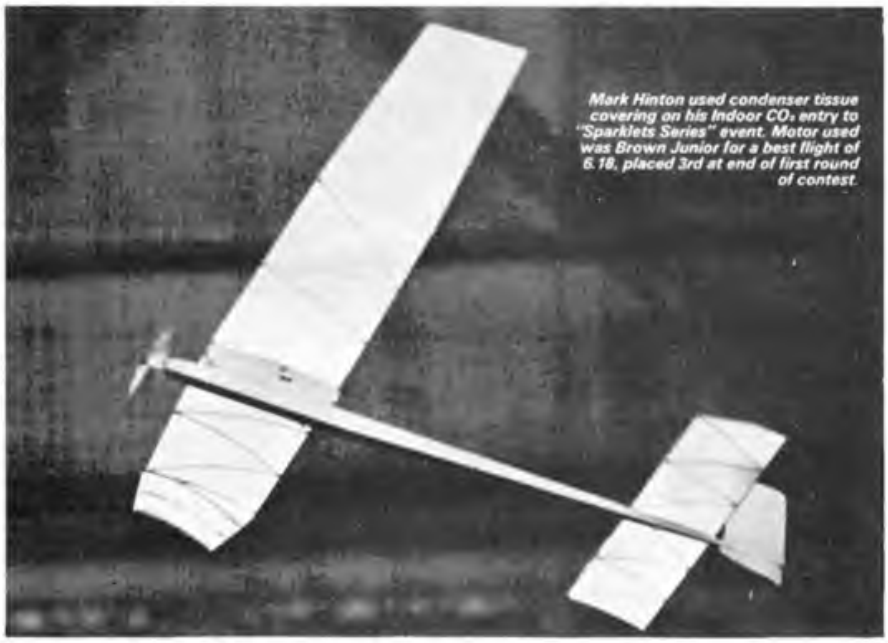
A good method but one which is awkward to do without a helper is to stretch the rubber where the knot is to be, using a pair of pliers to grip the ends of the rubber.

Bind the two strands together with cotton or thread, 5–8 turns depending on the thickness of the thread and the knot, then release the tension (See Figure 2). If the rubber has been lubricated, it is advisable to wash off some of the lubricant before retying. As a precaution, a drop of cyanocrylate on the free ends and pinching them together will ensure that the knot stays intact.

A better and easier method was developed over the winter at the low ceiling meetings for use with the new orange Pirelli which seems more susceptible than most others to having the edges cut by the cotton. Tie one loop of cotton round the two strands about 1/16in from the ends (better with lubricated rubber), apply a drop of cyanoacrylate and pinch the ends together. Then tie a single thumb knot and pull tight. No pliers, and no helpers needed. The knot will only fail if the cotton loop is tied too close to the ends. See Figure 3.

As a postscript, I reckon this method will work well on outdoor motors (I would suggest tying the cotton loop 1/4in from the free ends).

Free Flight Scene



Mark Hinton used condenser tissue covering on his Indoor CO_2 entry to "Sparklets Series" event. Motor used was Brown Junior for a best flight of 6.18, placed 3rd at end of first round of contest.

CARDINGTON, 13th May 1979

The conditions for this meeting were better than for the previous meeting – instead of being cold and damp they were warmer and damp. EZB and CO_2 Duration were the events of the day. Testing of CO_2 motors during the winter had indicated that motor runs of about 8 mins were possible. A glance at the results shows that this was not the case, the motors running for shorter times (more like 3–4 minutes at the most). Nobody as far as I know understood why. Dave Hipperson put in an early 6.33 which didn't seem to worry anyone else too much but in the end, it was the longest flight of the day. A back up time of 5.18 gave Dave the lead which was well clear of the opposition until Ian Dowsett's last flight. This was looking very promising – the model landed at 6.28. Was it enough? No, too short – by 4 secs! 1st round victory to Dave.

EZBs in general had rather a torrid time. Dave Pymm showed excellent form with his two and only flights – they were enough to keep a long way in the lead. The damp caused all sorts of trimming troubles for most of the lighter models which made it difficult to put things together for some decent flights. This is well reflected in the results which showed a wide scatter in total flight times even for the first three or four places.

RESULTS: EZB 1. D. Pymm 17.52 + 19.13 = 37.05, 2. B. Hunt 15.52 + 17.24 = 33.16, 3. D. Morley 16.02 + 14.28 = 30.30. **CO_2 Duration** 1. D. Hipperson 6.33 + 5.18 = 11.51, 2. I. Dowsett 5.19 + 6.28 = 11.47, 3. M. Hinton 4.13 + 6.16 = 10.29.

FIG. 1 OUTDOOR MOTORS

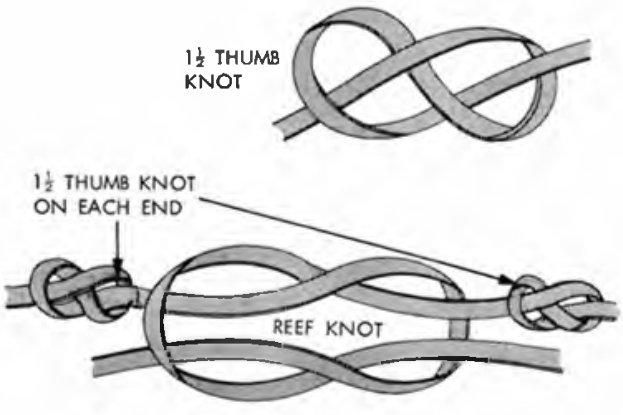


FIG. 2 INDOOR MOTOR

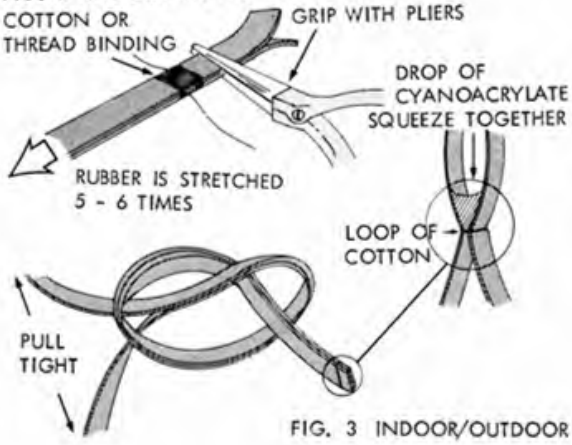


FIG. 3 INDOOR/OUTDOOR

INDOOR NATIONALS, 26th-28th May 1979

Saturday

During the week, the weather had been reasonable if not good. Come the Saturday morning, the rain was coming down in torrents with worse promised for later on! A full day of events included CO_2, duration, Manhattan, Open and 12in HLG. Various people were trimming EZB from the Monday but conditions were not encouraging, being cold and damp instead of the preferable warmer and damp.

Manhattan saw some excellent flying but only two actual entries, both with 6 gram models. Henry Tubbs who has worked hard on Manhattan over the previous months, put together two very nice flights of 6.55 and 7.00; these were enough to keep him 26 secs ahead of Laurie Barr whose best time was 6.53. These models, along with Pennyplane are much more suited to bad conditions than are EZBs. Some 4g models have appeared but various problems have prevented them from giving of their best. Henry Tubbs has, I believe, the best (unofficial) 4g time of 8.45. Let's hope for some more support later on in the year.

Open HLG – the first of the series of three for the Sweepette Trophy was a bit thin on entries compared with the previous warm-up event. Maybe the clash with the Coup d'Amsterdam in Holland robbed us of some support. John Buskell continued to dominate with two excellent flights of 68 and 73 secs – we wonder by how much will he be able to increase this in good conditions? 3rd place went to Gary Dowsett (still a junior) whose best flight was 60 secs. This flight constitutes a new Junior record – Congratulations Gary!

12inch (wingspan) had good flying but lack of support as per Manhattan with Mick Page winning fairly comfortably from Dave Hipperson.

Now to CO_2 – that man Hipperson again – increased his best time to 6.45 – once more the highest time of the day. This flight came somewhat later on in the day to give him the lead over Ian Dowsett. Ian came back with his last flight – a very respectable 5.55 – but to lose by 6 secs – definitely slipping!

Ron Green had built an enormous model with 48in x 48in wing at 26g all up weight; the glide was naturally superb. Ron managed to get a good charge in at last to do 6.31, his best flight yet as far as I know. However, Ron ended up in 3rd place 38 secs behind Ian.

Sunday

Two events were scheduled – FAI and Open Microfilm. After the bad conditions on the Saturday, it was nice to see a considerable improvement for the Sunday – the first FAI contest of the season.

Conditions improved steadily until mid afternoon; Laurie Barr was quick to take advantage with his well tried and trusted layout, recording his best two times in three flights. The latter – 38.44 was so close to the centre catwalk at one time that Laurie had to use the balloon itself to adjust the flight path and keep the flight going. Meanwhile Dave Pymm was getting things together with two very useful flights. Ron Green and myself were experimenting with large propellers, but didn't have any luck with them using orange Pirelli – the motors weren't thick enough.

Bernard Hunt opened his account with a 32.50 – his first flight over 30 mins and a very fine effort. His back up flight of 31.05 was enough to put him a few seconds ahead of former team member Martin Shepherd who made a welcome reappearance after what seems a long absence.

Derl Morley put in two quite good flights. I was still struggling and in the end decided to use one of last year's props and a motor to match it, and this combination transformed the model –38.23. I didn't have time to get another flight in due to the finishing time of 7pm otherwise the story might have been different! This flight was just enough to sneak me into 3rd place ahead of Derl.

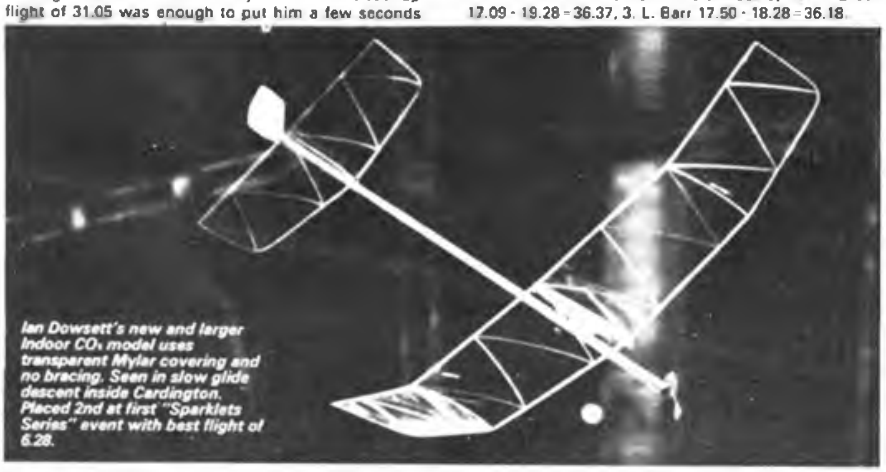
During the day we were honoured by a visit from the famous Man Powered aircraft flyers – Dr Paul MacCready and his team who were then still waiting for some better weather for the Channel crossing. As I write, the news of the team's success is still fresh. On seeing the TV film I noticed the prop had been redesigned to join the blades into the hub instead of having the roots truncated as on the Condor. Lower rpm as well.

Monday

Started off dry and cold but didn't stay that way very long – it became wet and cold. Conditions for EZB were, in a word, diabolical. 35cm microfilm models appeared to tolerate the bad conditions much more than EZB, due to bracing and no tissue to sop up the moisture. However, EZB was well supported. Models with high pitch props were particularly prone to consistency problems which caused frequent power stalling on the burst. The biggest surprise of the day was Dennis Davitt's 1 3g model (heavy!) which was admirably suited to the conditions. On one flight, Dennis wound the orange rubber motor up as much as he dared and launched with tremendous torque; the model climbed like a Wakefield and at a similar angle! We all thought it was going to go through the roof but it stopped short. Dennis managed to get two 15 min flights – good enough to give him his first win at Cardington. Bernard Hunt was on his usual consistent form and was not far behind – just 15 secs! I managed to get 3rd place with one very indifferent flight and one reasonable one.

35cm hasn't seen much support recently so it was good to see a well fought contest with some excellent flights. These models look incredibly minute when high up, so steering them is no easy task! Ray Monks found form quickly to put in two decisive 19 min flights which was enough to keep in the load. Ron Green started later, being busy with an EZB. His very long moment arm Archeopterix type Swiss influenced model flew very consistently to give him 2nd place. Bernard Aslett's model which has done over 23 mins had stalling problems and occasionally a victory roll which we sometimes see with these models, had the best time of the day – 19.56, but couldn't get a good enough back up flight to beat Laurie Barr.

RESULTS: CO_2 Duration 1. D. Hipperson 5.31 + 6.45 = 12.16, 2. I. Dowsett 6.15 + 5.55 = 12.10, 3. R. Green 5.01 + 6.31 = 11.32. **Manhattan** 1. H. Tubbs 6.55 + 7.00 = 13.55, 2. L. Barr 6.53 + 6.36 = 13.29. **Open IHLG** 1. J. Buskell 68 + 73 = 141, 2. P. Ball 65 + 67 = 137, 3. G. Dowsett (J) 55.6 + 60 = 115.6. **12in IHLG** 1. M. Page 51 + 48 = 99, 2. D. Hipperson 35 + 35 – 70. **FAI Microfilm** 1. L. Barr 34.33 + 38.44 = 73.17, 2. D. Pymm 36.47 + 35.55 = 72.42, 3. R. Bailey 31.28 + 38.23 = 69.51. **EZB** 1. D. Davitt 15.06 + 15.18 – 30.24, 2. B. Hunt 14.33 + 15.36 = 30.09, 3. R. Bailey 14.31 + 11.22 = 25.53. **35cm** 1. R. Monks 19.21 + 19.04 = 38.25, 2. R. Green 17.09 + 19.28 = 36.37, 3. L. Barr 17.50 + 18.28 = 36.18.



Ian Dowsett's new and larger Indoor CO_2 model uses transparent Mylar covering and no bracing. Seen in slow glide descent inside Cardington. Placed 2nd at first "Sparklets Series" event with best flight of 6.28.

ROOTES TROPHY, Cannock Chase, 13.5.79.

by Lawrence Gray

Flown at Cannock Chase, a local moorland beauty spot dissected by valleys and surrounded by forest, the site is not ideal but proved quite usable, and competition was fierce mainly between Falcons Club and Whitefield Club.

Weather was fine all day, with a fresh breeze and no shortage of lift, but turbulence over the valleys pulled many flights down to sub-max scores. The max was set at 2.30 in open events but John Carter *(Falcons)* and J. O'Donnell both landed rubber models in the downwind forest along with R. Sheene's glider. Open Rubber would have produced an interesting fly-off between John Carter and J. D. O'Donnell but only the former flew off as both J. D. O'Donnell's 'Scram' and 'Maxine' were in the forest and his 'Scram' is regrettably still missing.

Open Power was won by Steve Philpott with a 1/2A beating Russel Peer's Open Power model in two flights, both maxes, against three disappointing flights from Russel. Open Glider was won by Falcon's Junior Lawrence Gray with 6.42 with Richard Sheene of Nantwich club second, after losing his glider towards the forest after its second max. HLG flown to a 1 minute max and was also won by Lawrence Gray with 4.37 with Steve Philpott second with 4.00. At the end of the day, Falcons were the overall winners, using the Plugge points scoring system.

RESULTS: Open Glider 1. L. Gray (J) *(Falcons)* 6.42, 2. R. Sheene *(Nantwich)* 5.00, 3. T. Dilks *(Falcons)* 4.14. **Open Power** 1. S. Philpott *(Whitefield)* 5.00, 2. R. Peers *(Falcons)* 4.21. **Open Rubber** 1. J. Carter *(Falcons)* 7.30 + 1.29, 2. J. O'Donnell *(Whitefield)* 7.30, 3. I. Taylor *(Wolves)* 6.42. **HLG** 1. L. Gray (J) *(Falcons)* 4.37, 2. S. Philpott *(Whitefield)* 4.00, 3. D. Knibbs *(Falcons)* 3.22.

NA VINTAGE TROPHY AND PANNETT MEMORIAL MEETING, Driffield, 20.5.79 by Jim Moseley

These annual competitions, for Vintage Duration and Open Power respectively, were this year supported by a number of other events organised by various N. Area members, comprising Open Glider, Open Rubber, and that peculiarity of the North – Vintage 20.

Despite the relative unpopularity of Driffield as a flying site due to distances involved for those travelling from out-of-Area, a goodly lineup of cars was evident at 10am in bright and sunny conditions though with a fresh wind coming off the nearby North Sea, with models being taken off the airfield during a maximum flight, though fortunately into reasonable recovery areas.

Some considerable activity was seen during the next two hours with several Pannett entrants having two maxes upon the scoresheet by noon, Mike Hargreaves being lucky or supremely self confident by using only 5–6 second engine runs on each occasion. The 'Super Nogs' of the Smith family were as impressive as always though Tony had the misfortune to throw a propeller blade from his K&B soon after launch on his first flight, to finally stall downwind for only 1.08; Russel Peers also found troubles when his K&B 'Woodpecker' D/T'd into the only tree in the recovery area and broke its tailplane into two pieces.

In mid afternoon, after some heavy rain, people emerged to recommence flying in poor visibility with the cloudbase down to little more than a few hundred feet, as demonstrated by both Julian Hopper and Jeff Smith who put their respective power models out of sight well before the end of the engine run. Russel, who had spent the rained-off period rebuilding his tailplane played things safely with a shorter engine run, as did Mike Hargreaves and both turned in steady times just below the cloudbase to take 1st and 2nd places respectively.

Meanwhile in Vintage Duration, Dave Wolstenholme (E. Lancs) had ventured out into the rain with his 'Scram' and quickly put in a three flight total of 7.19 which eventually was sufficient to win him the trophy, with Morley's Doug Scott making second place with an E.D. Competition Special powered 'Jimp' which consistently flies a slow, graceful pattern well suited to the poor visibility. Two gliders were flow, a 'Fugitive' by Brian Harding and a new shape to the field, a 'Nord 2' by Chas. Plant, which returned a max on its first flight but then deteriorated rapidly as it got increasingly soggy, the weight of the wet tailplane being counteracted on the last flight by a large screwdriver protruding from the weightbox, whereupon it flew quite well. Ray Moore demolished a Halifax Rapier in short order and the 'Lanzo Stick' of B. Pettinger (N. Yorks) proved unequal to the damp conditions and was quickly retired.

Above: *Junior Ian Davitt from Leeds hooks propeller onto "Borderline" Vintage 20 entry.* Below right: *Graham Brown (Wharfedale), placed 4th in Open Glider, flying a Kelston "Swift".*

Left: *Ray Moore seeks guidance from above but dropped last flight.* Right: *B. Page from Huddersfield was top junior in P-30 with two maxes.* Below: *Doug Scott checks the alignment of his 2nd place E.D. Comp Special "Jimp".*

Participation in the subsidiary events was once again inhibited by the weather with but one person, Jeff Parker of Leeds flying in Open Rubber, 'doubled' up with Vintage 20 to win that also, the model being an APS 'Borderline' Wakefield. Another version of the design took third place in this event for junior Ian Davitt with John Godden filling the gap for 2nd with a new Webra Mach 1/'Creep' which appeared to be a very promising combination. Vintage 20 is an event open to designs published up to 20 years before the current year and is proving moderately popular in attracting people to build replicas of favourite models previously flown in the '50s.

Gerry LeVey's Open Glider event attracted eight entries of which seven flew, mostly in the rain. Only two maxes were returned, one by Brian Worthington in the morning and the other by a lightweight belonging to junior Kevin Moseley during the downpour, forcing Nick Walton to have to make a final flight to ensure retention of the lead.

In all, the meeting was successful though marred significantly by the weather which kept far more models packed securely in boxes than actually took the air; of those that were flown, as might be expected the power models were least affected by the conditions though rubber and glider models deteriorated quickly, this fact being reflected by the scores.

RESULTS: Pannet Memorial 1. R. Peers *(Falcons)* 8.32, 2. M. Hargreaves *(Leeds)* 8.25, 3. J. K. Smith *(BAC)* 7.08. **NA Vintage** 1. D. Wolstenholme *(E. Lancs)* 7.19, 2. D. Scott *(Morley)* 6.37, 3. C. Plant *(Darlington)* 6.20. **Open Glider** 1. N. Walton *(NYFFG)* 7.22, 2. B. Worthington *(Morley)* 6.28, 3. K. Moseley (J) *(Leeds)* 4.32. **Vintage 20** 1. J. Parker *(Leeds)* 7.39, 2. J. Godden *(Leeds)* 4.20, 3. I. Davitt *(Leeds)* 4.11. **Open Rubber** 1. J. Parker *(Leeds)* 7.39.

"NORTHERN AREA NEWS" MICRO MEETING, Heath Common, Wakefield, 3.6.79 by Jim Moseley

Following discussion in the Newsletter regarding the present lack of airfield space available in the Northern Area a decision was taken to run a contest for small field models to probe reaction to flying on sites not normally used or considered suitable for such activity.

Accordingly the classes chosen were P30 Rubber, CO_2 Duration, H.L.Glider and, to round things off, 'Micro Glider' – a simple specification for quickly built, low cost gliders of 36in maximum span restricted to flat bottomed airfoils, fuse D/T and 100' towline. The fuse requirement was specifically to discourage extended towing and to eliminate the expense of a timer, in the hope that this would encourage younger modellers to have a go.

Heath Common is a rough undulating reclaimed tipping site, approximately triangular in shape and traversed by two minor roads; and attraction for some was the fact that with a public house at each corner there was opportunity for refreshment after retrieval of a model no matter which direction the wind chose to take!

It was immediately obvious that there was far more interest in P-30 than the organisers had predicted, local flyers being supported by those from Timperley, East Lancs and Wigan Clubs, and eventually 15 entered. John Godden (Leeds) rapidly put in three two minute maxes flying an APS 'Teachers Pet' which proved quite conclusively that P-30 is *not* a small field class, whilst John Blackburn (Huddersfield) dropped his first flight but maxed comfortably thereafter to take second place, though not until he had brought some light relief to the day by originally assembling the model, test gliding it thoroughly and installing it upon his winning rig preparatory to a first powered flight, at which moment 'friend' Richard Earnshaw broke the news gently to him that the wing was on backwards . . .

Jeff Parker (Leeds) flew an interesting design from 'Model Builder' featuring a slim, rolled tube fuselage and gull wings with tip dihedral, whilst John Pool (N. Yorks FFG) produced and trimmed a tail-less biplane pusher (!) which eventually flew well and consistently throughout the afternoon although flight scores were not high.

CO_2 Duration attracted six entrants of which Dave Wolstenholme (East Lancs) won with three maxes from a simple 24in model; the addition of a two-wheel undercarriage to protect the vulnerable prop shaft on the Telco did not appear to detract from its flying ability. Barry Kershaw (Wigan) looked a likely contender for a fly-off after two effortless maxes, particularly as later conditions were warm and sunny, ideal for CO_2 operation, but the model appeared slightly off trim on that occasion to record but 1.26.

HLG was poorly supported with only two entries though these fought it out keenly, Barry Hyde (Timperley) finally taking a 12 second lead over Barry Kershaw. However, the new Micro Glider event brought five entries of which four eventually completed their flights; John Godden made three quick flights during the final hour and contacted lift on each occasion for three maxes for his second win of the day, followed by Jim Moseley (Leeds) with a total of 4.01.

The rough flying site proved quite suitable for an event of this nature, though the excellent weather undoubtedly helped, and the contest appeared to be well received by all those present with a happy, low-key 'club' atmosphere prevailing throughout the day, with few people working from the rear of cars as is usually the case upon an airfield, and a proposal that the function be repeated in August was warmly approved.

Second NAN Micro Meeting – Heath Common, August 12th 1979. Events: P-30, HLG, CO_2 Duration, Micro Glider plus A/1 Coupe.

Results: P-30 1. J. Godden *(Leeds)* 6.00, 2. J. Blackburn *(Huddersfield)* 5.25, 3. D. Davitt *(Leeds)* 5.17. **CO_2 Duration** 1. D. Wolstenholme *(E. Lancs)* 6.00, 2. B. Kershaw *(Wigan)* 5.26, 3. S. Fielding *(Morley)* 4.58. **Micro Glider** 1. J. Godden *(Leeds)* 6.00, 2. J. Moseley *(Leeds)* 4.01, 3. B. Temporal *(Wakefield)* 2.27. **H.L.Glider** 1. B. Hyde *(Timperley)* 4.38, 2. B. Kershaw *(Wigan)* 4.26.

SMAE 4th Area Centralised, 10.6.79

RESULTS: Open Glider –Model Engineer Cup: 1. A. Jack *(Tynemouth)* 9.00 - 7.53, 2. J. Cooper *(Biggles)* 9.00 - 6.54, 3. J. Ashmole *(Grantham)* 9.00 - 6.00, 4. P. Moate *(Tynemouth)* 9.00 - 5.04, 5. C. Shepard *(Wolves)* 9.00 - 4.24. **Team Results** – Model Engineer Cup: 1. Croydon 'A' *(Smith, Jellis, Dilly)* 27.00 - 6.25, 2. Richmond *(Fantham, Williams, Warren)* 27.00 - 5.43, 3. RAFMAA 'A' *(Baines, Carter, Channon)* 25.18, 4. Biggles 'A' *(Cooper, Bailey, Crisp)* 25.13, 5. Liverpool 'A' *(Owens, Evans, Nicholson)* 25.05. **F1C Power** – Astral Trophy: 1. A. Jack *(Tynemouth)* 15.00 - 5.49, 2. P. Bond *(Anglia)* 14.21, 3. R. Collins *(Anglia)* 13.10, 4. S. Screen *(Birmingham)* 13.03, 5. F. Chilton *(Crookham)* 12.08. **Coupe d'hiver** 1. D. Hipperson *(Croydon)* 9.56, 2. M. Dilly *(Croydon)* 9.28, - 2. D. Roche *(Anglia)* 9.28, 4. J. Brookes *(Louth)* 9.26, 5. I. Dowsett *(Northwood)* 9.22. **Plugge Totals** 1. Biggles 1022, 2. Croydon 875, 3. St Albans 813, 4. B & W 743, 5. Norwich 581.

Famous for his tailless models, John Pool flew this unique tailless biplane pusher in P-30! Modest performance but stable and consistent.

Left: *Organiser Jim Moseley with his 36in span Micro Glider.* Right: *Dave Wolstenholme won CO_2.* Below: *Don't look now, but your wing's on backwards. John Blackburn found out in time to place 2nd in P-30.*

NEWS FLASH!

BRITISH F/F NATIONALS
EVERLEIGH DROPPING ZONE

Due to a clash of dates, with an Auto Cross Car Rally Club which is also using the dropping zone for a competitive event on Sunday, August 26th, all the Free Flight events are to be rescheduled to be flown early and late. Approximate times are dawn until 9.00-ish and approximately 1700 hrs until sunset. Revised timetable will be sent to all competitors in due course.

CLUB NEWS

THE THREAT, or, as we have recently experienced, the actuality of a petrol shortage, makes us realise just how dependent we model flyers have become on the motor car for our multifarious pursuits. You could say that, in recent years, the hobby has developed in accordance with the facility given by personal transport. For instance, the modern radio model, plus its sophisticated equipment, would represent an impossible bulk to take on bus, tube or train. And, even in free flight, the amount of ancilliary equipment – pedal bikes, thermal detecting apparatus etc. – is enough to make any bus conductor blanche. Odd thought, though, but one of the largest model meeting ever held in this country, in terms of entries, was the 1939 Wakefield Trials at the old Faireys Aerodrome (the site of Heathrow), where the majority of the 400 plus entrants got there by the general means available at the time: public transport.

Our first report, albeit a short one, is more concerned with the weather than the means of transport. Even so, some of those countrified flying fields must have been pretty inaccessible during the drifting snows of the past winter. However, the **Northwich Eagles Model Club** kept going, we are informed by the Secretary, John Goldsmith, in spite of numb thumbs and broken propellers. And they are flying on, in spite of the hard summer. We are also told that the club will be promoting itself at various fetes and Open days during the season with C/L and R/C flying displays in their Cheshire environs. Apparently Vintage has now caught on with the members and it is hoped that a number of new/old projects will take the air at the Old Warden Vintage meeting. New members of whatever type of model flying are welcome. Club nights are the 1st and 3rd Mondays of the month at 8pm in the Danefields Tenants Assoc., Danefields Road, Northwich. *Mr. Goldsmith's phone number is Kelsall 51086.*

Al Wisher, ex freeflighter of note, now a luminary in the Radio Glider world, and recent subscriber to our companion journal *'Radio Models'*, writes to us in yet another capacity, Secretary of the **Daventry M.A.C.** His report tells of a restructure of the club committee, and of a brief given to all members to recruit one new member each, so that full use can be made of the club's excellent facilities. Membership at present is a somewhat lean 15, which obviously could do with some amplification – an appropriate term, perhaps, since Daventry, Northants, was one of the earliest BBC stations, dating from the 'Cat's Whisker' age. Daventry boasts facilities far better than most local clubs can offer: fortnightly club meetings, with a local hall for indoor flying and electric cars; the offer of a sports hall for indoor contests; two flying fields: one for R/C Power and the other for Free Flight and R/C Gliders. In addition the club runs a summer evening series of contests to cater for all types. Prospective new members can contact *Al Wisher on Daventry 4574.*

Mr N. Goodman of the **Coventry & DMAC** has sent along the latest edition of the club newsletter *'Wings and Fins'*. Mainly it is taken up with an autobiographical article – part art, part tickle – by Mr R. Garner, the competition Secretary. Like the Muppet show it all started with a Frog in a box (the famous Interceptor fighter model of the 1930's) by way of a Frog on a box (early power model) to the inevitable Radio Control. There is the threat of a part two in the next edition. *Sec. N. H. Goodman, 23 Berwyn Way, Stockingford, Nuneaton, Warks CV10 8QW.*

Now, Ladies and Gentlemen, introducing for the very first time the number one issue of the **Leatherhead MFC's** newsletter. The print is bold and should keep the most myopic member suitably informed on what the active members are up to. It is hoped to publish the newsletter on a quarterly basis. Two club fields are mentioned in the newsletter, both of which have a implicit humorous tang: Effingham Common and Fetcham Grove. It is on the common where regular flying meetings are held, but the C/L site, Fetcham Grove, is temporarily in suspense, awaiting a revival of

Just the thing for a balmy summer's evening. Richmond MAC's Sleek Streak contest held in Richmond Park. Standard models were pooled and redistributed for fairness. Next event is billed the "chuck-it-or-else-Gala". No apathy in that club!

the vertiginous sport. A showpiece for the club will be the static and flying display to be staged at the Mole Valley Show at the Leatherhead Leisure Centre on the 27th August. It is hoped to put a representative group of models on show, and to give flying demonstrations both Stunt Control Line and Radio. Other club activities during the high summer will be a Glider-Bungee Fun-Fly, using the club's newly purchased bungee, a C/L Speed event and a Power Fun-Fly. *Sec. S. V. Tucker, 'Fairways', The Warren, Ashtead, Surrey.*

The **Mitchell MAC,** has a change of Secretary, according to a report from the Chairman, Mr A. Edwards. The new Secretary appears to be setting the sort of industrious example the young members should strive to emulate, for he has a clutch of very impressive Radio models, including a Bell Helicopter and a 12ft Glider. Another welcome addition is the oldest member, Mr F. Ford who, at 73 years of age, when most of us are thinking of RIP, has built an RTP model, and a four engined one at that. Very nicely built, too. Going to the other age extreme the boys and girls of the Holden High School have turned out a nice batch of 20 RTP models, most of which flew first time off. The club is now flying displays and altogether getting busier with the need for new and better flying sites. To the rescue, though, comes the local Council, with the promise of a site for all types of model. *Sec. David Leigh, 20 Darnley St., Shelton, Stoke on Trent, Staffs ST4 2BH.*

News of the **Southend Radio Flying Club,** sent in to us by David Verlander, Hon. Sec., is of a re-negotiation with the Council for a licence to continue aeromodelling activities on Two Tree Island which should last at least up to the end of 1981. The two film shows put on by the club at the Cliffs Pavilion (publicised in these columns) were both successful: the first for making a profit and the second for the public relations value, the club playing host to top local dignitaries (What d'you mean, deck chair attendants?). Taking its place in the scheme of things as a Sport, Radio flying is to feature in the Essex Games which are held in a different town each year. Mostly we model flyers are for the high jump, so it is good to see the old hobby given such social recognition. This year the venue is Southend-on-Sea, where along the seashore, the oil is fighting the mud for supremacy. Two Radio events are to be staged: a Stand-Off Scale, and a Miniature (Handicapped) Kings Cup type pylon race. It is hoped that other clubs will follow the Southend example in putting on events when the Games come to their home towns. *Sec. D. B. Verlander, 46 Dawlish Drive, Leigh-on-Sea, Essex SS9 1QX.*

Slope soarers with a geographical turn of mind may like to know of the coming into being of a new club to serve the area North of grid line 12 on OS Sheets Nos 82 and 83. Putting itself on the map in this way is the **North Lakes R/C Soaring Association**. The club has four slope sites upon which to operate, with others that may be used on occasion. If interested contact the *Secretary, D. S. Atkinson, 10, The Island, Anthorn, Carlisle CA5 5AN or phone him during office hours at Carlisle 23456.*

From the *Northern Area News* comes a mention that there is something appropriate in the Free Flight Nationals being held at the Everleigh Dropping Zone for it was due to the dropping of a large size in bricks that we got landed on this no camping, accommodationless site, miles from nowhere. It was intended to hold a two day FAI meeting for the hardened enthusiasts at Everleigh with the Nationals F/F Programme dated for later in the year at a Midlands Airfield. For most of us, I suppose, it will be a case of Neverleigh.

The **Leicester MAC** *Bulletin* reminds us of the risks we run in using those modern chemicals that solve so many of our model building problems. We all known that cyano will stick your fingers together, but did you know that the fumes from some adhesives can make you high – more than it will do for my models. ("Don't tell me, you're sticking drunk again".) Watch out, though, for the fibre glass catalyst – one drop in the eye and bang goes the sight from it. And make sure you top up your fire insurance policy before topping up your model tanks. Dopes and thinners, too, can readily burn down the old homestead. Apart from the asthmatic aspirations of balsa dust, aeromodelling is quite a healthy hobby. The Bulletin writer can see the day when we will have Government Health Warnings printed on all kit boxes. Survivors from all that emerged from the intensive care units to take part in the Final (Flying) Stage of the Winter Building Competition. No report yet to hand, but P. Toyne came out top with a Tornado 11, with J. Porterfield leading the Junior contingent with his Middlephase. Another Junior success was that of Clive Wallace who set up a new C/L Duration record of 18 min 53 secs, beating the previous record by over 3 minutes. Rumours that he had to be unscrewed from the ground are being denied. *Sec. P. Toyne, 1 Sherrard Drive, Sileby, Loughborough, Leics. LE12 7SG.*

Comment in *'Nitro'* the newsletter of the **Belfast MFC,** is on the not too good flying conditions of the past few years, saying that they could hardly be regarded as Vintage. Oddly enough, when Vintage models were flown for real the weather seemed to be nothing but perfect, although this is obviously a rose tinted trick of

CAPTION CONTEST

the memory. But the editorial goes on to stress that bad or indifferent weather need not be so offputting if we adapt our models and techniques to the not so pleasant flying day. We could even come to enjoy its challenge. I do know for a fact that it is the people who appear most often at the top of the result sheets who are prepared to fly whatever the conditions. But what are they flying in that corner of the British Isles? Mostly Control Line it would seem, with good followings in most of the classes, with Stunt showing up well of late.

A lot of space in the **Maidstone F/F Group** newsletter is taken up with a safety angle generally overlooked by most model flyers: the minimum radii of curvature of forward projections of models. Many sharp nosed gliders do not conform to the SMAE, Safety Code, nor rubber models with wire projections, and certainly not the most dangerous of all: the pointed spinner Power Duration model. It could be that failure to comply with the Safety Code might well nullify an insurance claim. The Group makes its due contribution to the national scene, but feel that the South East Area flyers are handicapped by having only the somewhat restricting Ashdown Forest for Area events, where others enjoy the wide open spaces of an aerodrome. Some compensation comes, though, from a duration sustained overflying the valley; useful in clocking up those vital seconds in Coupe D'Hiver.

Although Free Flight operates under ever crippling conditions in this country – the spread of crops and the closing down of airfields – it still enjoys a fullsome life on the other side of the world. To hand we have Australia's *'Free Flight Down Under'* which has been in circulation for quite a number of years, and as enthusiastic for free flight as ever. Looking through their results they seem to have an antipodean counterpart of our own John O'Donnell in a Mr P. Nash, who has been wiping up the opposition. Then from New Zealand comes another newsletter with a long history, *'Torque'*, and the well produced New Zealand Newsletter giving the results of what seemed to be a very healthy and well supported Nationals.

Your reports, photos and newsletters welcome.

Clubman

JULY WINNER – JEFF ANDERSON, MIDDLESBROUGH

Lots of entries to the July challenge, so on with the runners up. Bob Brown of Newbury thought "THIS MUST COMPLY WITH THE MODEL OF THE BUILDER RULE". S. Craven of Bradford pointed out "1/8 SCALE: 1/4 SCALE, 1/2 SCALE – IT HAD TO HAPPEN SOON". Doug Jefferies asked the quarter scaler's query "WHEN WILL THEY INVENT THE KICK-START?" and some magic captions from R. R. Lewis from Fishguard "WOT NO CHOCS?" and F. E. Hill from Halifax and M. Hawkins of Bristol who both sent in "CHOCS AWAY!" The original was the result of some trick photography depicting Donald George of Liskeard, Cornwall, with his AM25 powered model and first appeared in our June 1958 edition. If you want to try your hand at winning a year's Subscription, send your entries to this month's contest to Aeromodeller, PO Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE, results November.

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ALL FORMERS 1/16 SHT. 2 OFF EA.

F1 F1a F2 F3 F4 F5 F6

BACK-WING BRACE 1/16 SHT.

SPAT CORE (B) 3/32 SHT. 2 OFF

SPAT CHEEKS (A) 3/32 SHT. 6 OFF

WHEELS 1/16 PLY

SPAT ASSY.

U/C

A B A A

U/C 20 SWG TRACK 160 m.m.

107 m.m.

19 m.m.

19mm

4·5 m.m.

8m/m

TIPS 3/32 SHT. (NOTE GRAIN)

1/8 WASH OUT ON EACH TIP

L.E 3/32 SQ.

SPARS 1/16 SQ. TOP & BOTTOM

GUSSETS 1/16 SHT.

WEB 1/16 SHT. BETWEEN SPARS. (INNER PANELS ONLY)

DOUBLE RIBS

BRACE

T.E. 3/8 x 3/32

1/16 REFLEX ON REAR-WING T.E. ONLY

R1 R2 R3 R4

ALL RIBS 1/32 SHT.

CELLULOID WINDSCREEN

COWL — MOULDED PLASTIC — OR LAMINATE FROM 1/8 SHT À LA RUBBER MODEL & HOLLOW OUT TO SUIT CO_2 MOTOR & FILLER VALVE

1/16 PLY FIREWALL

C G

X Y

X — 2 OFF 1/16 SHT. PAPER FAIRING

SUGGESTED POS'N FOR GAS TANK FOR CORRECT C.G.

STRINGERS 1/16 SQ.

1/16 SHEETING F2

F1 F1a F3 F4 F5 F6

T1 T2 T3

FIN RIBS ARE MADE FROM RECTANGULAR 1/32 SHT BLANKS. SAND TO SYMM. SECTION

RUDDER HINGED TO MAIN FIN W/SOFT WIRE

FUSELAGE OUTLINE KEELS 1/16 SHT.

REAR-WING

FRONT-WING

20 m.m.

15 m.m.

58 m.m.

DIHEDRAL LAYOUT

SKETCH OF COWLING (NOTE POS'N OF FILLER VALVE)

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