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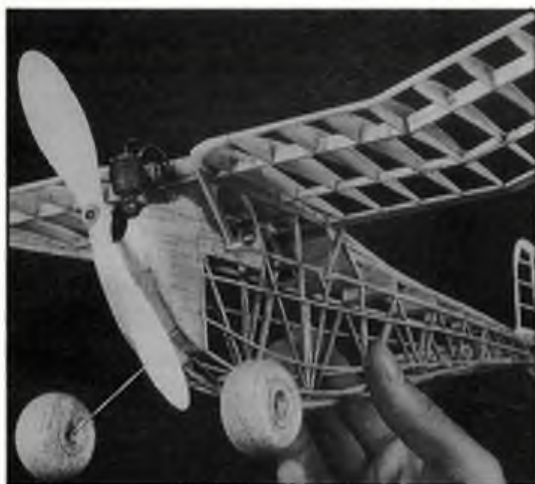
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Cover:

Recreating a myth - the captivating Daedalus HPA: an aeromodelling-inspired record-breaking achievement of the highest order. Our colour exclusive feature begins on p.436.

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**ARGUS
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P.O. Box 35, Wolsey House, Wolsey Road,
 Hemel Hempstead, Herts HP2 4SS



ISSN 0001-9232

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Advertisement Offices: Argus Specialist Publications Ltd., Golden Square London W1R 3AB. Tel: 01-437-0626.

Postmaster: Send address changes to Aeromodeller, c/o Mercury Airfreight International Ltd Inc, 2323 Randolph Avenue, Avenel, NJ 07001, USA.

Subscriptions: Direct subscription rate including Index: Home £23.40, Europe £28.20, Middle East £28.40, Far East £30.20, Rest of the World £28.70 or US \$43.00. Airmail rates upon application from Infonet Ltd., 5 Riverpark Estate, Berkhamsted, Herts HP4 1HL. Tel: (04427) 76661/4.

Overseas Availability: Second class postage paid at Rahway N.J. USA. Postmaster: send address corrections to Aeromodeller, c/o Mercury Airfreight International Ltd Inc, 108 Englehard Ave, Avenel, NJ 07001. Distribution to news stand sales by Eastern News Distributors Inc, 1130 Cleveland Road, Sandusky Ohio 44870. Distribution to North American hobby and craft stores, museums and bookshops by Bill Dean Books Ltd., 166-41 Powells Cove Blvd, Post Office Box 69 Whitestone NY 11357 USA Tel: 1(212) 767-6632. USA Subscription agent Joseph D Daileda, Wise Owl Worldwide Publications, 4314 West 238th Street, Torrance CA 90505.

HANGAR DOORS

Our Man in the Aegean

Keeping tabs on the MIT-inspired Daedalus flight for aeromodellers and the Royal Aeronautical Society Human Powered Aircraft Group were Andrew Cranfield and John McIntyre. Andy missed the flight though he witnessed the frustration of waiting for tailwinds and less than 70°F temperature: but that gave opportunity for him to photo detail for Pat Lloyd's fine sketches in this issue. John got himself onto an escort boat, living what for him was the experience of a lifetime. He's making his own HPA at Cambridge hopefully to fly later this year - more later.

Meanwhile the fantastic aeromodelling-inspired flight leads to even greater things! The RAeS has announced two further International Competitions for which Henry Kremer has donated prizes - £50,000 for a 'Marathon' event and £10,000 for a Seaplane HPA contest - details from RAeS, 4 Hamilton Place, London W1V 0BQ.

Nats natterings

Despite breezy conditions and often unhelpful drift the F/F Nationals at RAF Barkston Heath during the Spring Bank Holiday was well attended and composed of a healthy number of entries. Perhaps one or two classes - notably CO₂ - were less popular this year; but others, such as Slow Open Power, were clearly thriving as happily as ever. Amongst the new, or newly returned faces, we have to mention Jim Baguley who, enjoying F/F anew, participated so wholeheartedly in a variety of events that his flights were



Unusual full-size visitor to these shores in May was Buzz Kaplan's Savoia-Marchetti S.56B which called in to Old Warden and Duxford on its way to engagements on the Continental circuit. A modellable subject...

usually completed well in advance of everyone else! An example to all...

Other enthusiasms were equally clear. Eternal competitor John White surprised many by arriving sans bicycle and model box trailer. This year an automatic Mini conveyed John and son Angus all the way from the Isle of Wight. Something of an epic journey, we hear... And, of course, without the hardened contest types, headed perhaps by

the inspired teamwork of the Falcons, there would be no Nationals at all.

But a major event like the Nats doesn't just happen. Remember all the hard workers behind the scenes - on the gate, at the score-sheet computer, and those who gave up their own flying to run the comps. Consider, too, the hospitality of the RAF, and their good-humoured help in model retrieval during the competitions. A guest's civility and good manners are not usually in question. The majority are enthusiastic, cheerful, and thankful for the use of flying space in this crowded age. A pity, then, to have to record disapproval at the alleged antics of one at Barkston who insisted that the RAF put aside what they were doing to rescue a hangar-bound model at 9pm (yes, nine in the evening) on the Sunday. Stretching hospitality just a bit far, we reckon. Anyway, thanks to all who organised and congratulations to all who flew at the '88 F/F Nats. We enjoyed it!

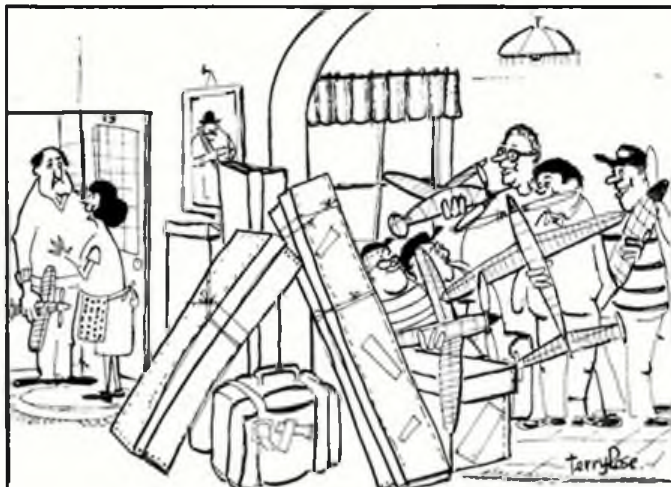
competitors to build their own models. From next year, contestants at World and European Championships (and any other FAI International event that may arise) may fly with models they need not have built themselves. Of course, the rigid and detailed documentation generated at Internationals should make it impossible for a given model to be flown by more than one competitor. But what of domestic competition, where no such legislation exists?

We have heard fears expressed that enthusiasts with numerous models, and sufficient helpers to launch them, might be able to 'go through the box' until a model reached the flyoff. Or would models be lent, borrowed, or even hired out at crucial times? Would such actions be excluded by the SMAE rule that each contestant is limited to only two models? Might models be passed from flyer to flyer in between meetings? Or are such fears groundless.

We have our own views on the lifting of the 'Builder of the Model' rule. But this is the time for you, the enthusiast, to speak. Think about whether the rule ought to be sacrosanct or not, and how enforceable rules ought to be; and then tell us what you think. We're waiting...

Build your own no more?

Most important of the changes voted on at the April FAI CIAM meeting in Paris was the lifting of the rule requiring free-flight



'You remember those nice Americans we met at Old Warden last year - the ones you said could stay any time...'

Xanadu explanation

Unusual X-wing configuration of Kevin Wallace's Xanadu (our full-size plan in the June issue) has aroused correspondence as to the merits or otherwise of sweepback, sweep-forward, washin, washout, dihedral and all manner of aeronautical niceties - sufficient, indeed, to initiate a future Unorthodox feature. In the case of Xanadu all we can do is reiterate the designer's own recommendation; foreplane dihedral is 1.1/2in. under each tip.

But what have you been experimenting with? Tell us of your Unorthodox activities - aeromodelling, of course...

Peterborough rearrangement

Here's a date change. Mick Taylor of the Peterborough MFC announces that their October Diesel A Combat meeting will now take place on 9th October to avoid clashing with the last SMAE Centralised meeting on 16th October. Venue, as ever, is The Embankment, Peterborough. Mick's telephone number - if you want more details - is 0733 204484.

Holiday Free Flight

Now firmly established as a favourite holiday meeting, the SMAE London Area F/F Gala will be held again this year; dates are 27th-29th August and the venue is Training Area 11, Salisbury Plain.

Saturday's Mini-events are

A healthy motto from a fine club. The Impington Village MAC have plans to capture more youngsters - we'll let you know how they get on!



A/1, 1/2A, Coupe and HLG. Sunday's entertainments cover F1A, F1B and F1C (7am start) with Slow Open Rubber (10am). Monday is 'Open' Day (ie: Open

Rubber, Power and Glider) plus Vintage. Camping facilities are available. Contact Glenda Bracken on 01 263 9849 for more details. Go along and add to this friendly and well-attended competition!

Bournemouth at Beaulieu

Pete Redhead tells us that as part of the SAM35 Fly for Fun at Beaulieu on 4th September the Bournemouth MAS will run a competition for the KK Senator with, quote: 'Vintage flavour prizes'. What could they be - surely not an old packet of wine gums? Anyway, if you want to know more, call Pete on 0202 524752...

Peanute pleasantries

In our July report on the SMAE Indoor Scale Nationals we stated that after a flyoff for first place in Peanut, Chris Hutchinson's Farman gained slender victory over Andy Sephton's Lacey. In fact, Andy was the winner, thus demonstrating a RAFMAA clean

Vintage Weekend thoughts! Above: Midge Speed. This is last year's bunch of entrants headed by Andy Brough with enthusiast formidable Johnny Hall at left. Left: R/C gliders will be given an extended 'slot' this year to allow craft such as Peter Michel's Warring Glider to perform at their best. Don't miss 20-21st August!

sweep which we thought had been averted! Our mistake, caused by reference to incomplete results. The scores were 524 and 496 points respectively. Apologies, and thanks to both contestants who each advised us of the error.

Strip search

J.C. Ward writes from North London:

'I was intrigued by the mention in May's Hangar Doors of the gentleman who orders hundreds of strips of 1/16in. square balsa from a mail order firm in the US. I can tell you what he's doing. He's trying to find a straight one...'

Indoor Champs results

Top trio at the Indoor World Championships, held on Johnson City, Tennessee, USA during 28th May-1st June were as below:

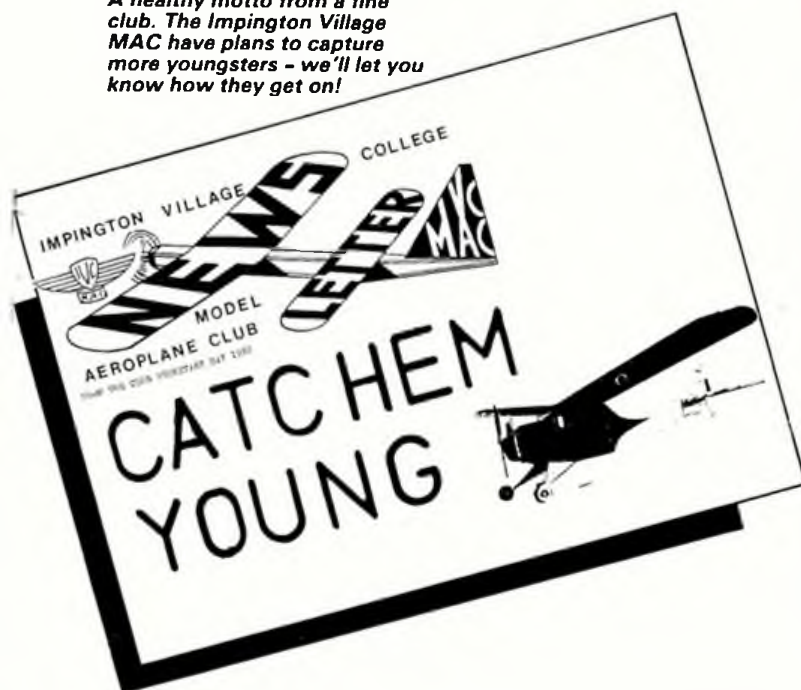
1 Jim Richmond, USA
86:06 total

2 Cesar Banks, USA
83:49

3 Jack McGilvray, Canada
78:59

A well deserved and perhaps not unexpected result; close, too. Britain's Laurie Barr and Reg Parham placed 21st and 22nd respectively.

More news to follow!



1988

SMAE FREE-FLIGHT N



A wet-and-dry report from Geoff Clarke and John and June O'Donnell

SURELY THIS year, we all thought, we'll get a Free Flight Nationals with fine weather all the way through. After all, we were due for it... Entries were healthy, campsite bookings came in thick and fast - and all was set.

Enjoyable it certainly was - but the forecast (accurate for once) of increasingly showery, breezy weather discouraged many from flying, and some well-known faces were absent. The proximity of the Trials was also a factor, with some competitors saving their efforts. Nevertheless, flying was keen despite trying conditions which included a thunderstorm on the Monday!

Saturday, 28th May: Mini-Day

Sunniest of the weather was at the beginning, but an increase in wind-speed and a shift of direction meant flightline moves - and the shortest, most inconvenient segment of the airfield had to be used for much of the day. Many were the models that ended in the missile compound but the cheerful help from RAF personnel on site was much appreciated by all.

First to finish in *Coupe d'Hiver* was Jim Baguley - who participated enthusiastically all weekend, usually completing his scores well before anyone else. All too often, however, he found others getting nearer and nearer. By early afternoon it was clear that at least half-a-dozen fliers were capable of reaching Jim's *Coupe* score of 553 seconds, although some challenges faded as models were lost. Notable to suffer in this way were John O'Donnell and Peter Carter, whose best *Coupe* disappeared after 7.1/2 min. on its second max, after D/T'ing at 2:20! Anthony Ball was let down by a poor last flight: so by five o'clock Derek Neil was the first to pip Baguley. But a dropped fourth flight meant

that he could in turn be caught by Dave Hipperson who was making a late - very late - charge. And so it proved, with a final nail-biting max right at the end of the day clinching the Sparklets Trophy for Hipperson, whose model is 'Coupe No.11' as featured in our April 1987 issue, but built, says Dave, with 'particular care...'

Strong challenge prevailed in HLG. Jonathan Palmer, always a strong contender, took time out from university studies but was let down by one duff fifteen-second flight with his wing-hinge D/T craft. Julian Tipper also dropped an early flight, but Mark Benns was choosing good air and making straight maxes (having lost a model in his first flight). Mark revealed that he had been trimming his potent step-aerofoil model with elaborate stalls and turns to avoid model getaways. Latecomers Andy Crisp and Phil Ball arrived with much confidence, the latter posting a series of competent flights: but HLG specialist Mick Page, who ran things close by losing two models (a maximum of three are allowed) emerged relatively unperturbed by movements of the launch area 'box' to keep ahead of the opposition with his well-known Butterfly design published (with full development details) in the September 1986 issue of *Aeromodeller*.

The two-minute max was eminently attainable in A/1 Glider. John Foster, Gary Manion and John O'Donnell showed early behind likely candidate John Cuthbert, who has had an excellent season so far. Colin Sharman and Tony Cordes, with the same Little Hinney variant with which he won last year's event (and a full size plan in last August's magazine) made a late drive to reach the flyoff which was contested by a healthy seven enthusiasts, including Peter Dickson in his first competition for forty years. Indeed it was close for Cordes whose model had been lost on his third flight, and was recovered just in time for a late attack on the flyoff. John O'Donnell, always dangerous in this class, dropped his last flight after the model unaccountably turned off the line. In the flyoff John Cuthbert was away first, followed by Sharman who pinged off into an apparent boomer - the signal for Manion and Foster to follow suit. Dickson waited, as did Cordes: Dickson was down first after a stall off the line. John Cuthbert's 4:31 looked a good bet: but what of the others? Sharman had slipped out of lift for a disappointing 4:01, leaving Gil Hart victorious with a splendid 7:43 from his Hot Max (another *Aeromodeller* offering!) modified by circle tow and fewer-than-published geodetics.

NATIONALS

RAF Barkston Heath
28-30th May: Weather
variable!



Peter Watson, Open Power winner for the second year running, sharpened performance by trimming during the day in between competition flights!

in this class must prompt the question - are CO₂ motors being forced too hard? Many were the tales of burst sealing rings and other maladies. No fault of the engines, surely - maybe hauling a competition model for two minutes is just more than the task for which they were designed...

Sunday, 29th May: Open Day

Dreadful weather overnight had not cleared by the scheduled 10am start. With no crystal ball it was impossible to predict when - or even if - conditions would improve: so a 2:30 max was set. Perversely, before a long clearance began and competitors with patience found that full-houses were relatively easy to attain, despite an hour of torrential rain mid-afternoon. Twenty-eight qualified for the **Open Rubber** flyoff. Hardest journey there must have been Dennis Davitt's. After two maxes his model was way downwind, so his flyoff model was readied, just in time for his third max. In the flyoff this model half-looped straight into the ground: his first model, retrieved from its second flight, was hastily dispatched to shouts of 'Go! Go!' from son Ian. Dennis' lift marked the spot for John O'Donnell and eventual winner John Carter who had wound right at the start of the round and eventually launched with just one minute to go. His 360 sq.in. 'windy flyoff' model settled well after a slight power stall to land in a tree at 6:27. John's whoop of triumph after returning from downwind was one of the highlights of the Nationals!

Nine qualified for the **Open Glider** flyoff, including a praiseworthy effort from Rex Woodruffe with his fifteen-year-old modified Inchworm which made it nearly to Ancaster on its second flight.

No surprise in 1/2A Power, although it was a close thing. Russell Peers was unlucky to be ruled out of the flyoff when his model's wings were ripped in two by a gust after retrieval. A late finisher was Alan Jack (who dropped his model left at launch on the fourth flight) and Graham Bryant, who made it into the flyoff to join Stafford Screen. Stafford had earlier damaged his first choice Too Heavy in the compound but his reserve didn't let him down, for the same classic straight climb which had brought five straight maxes meant that the flyoff was never in doubt. Bryant's model, first away, flattened slightly - the end of his chances, for he was down in 97 seconds, his lowest of the contest, leaving Screen over a minute ahead.

There was a mere handful of entries in CO₂, and Steve Philpott - who has put in so much development 'tweaking' of motors - was uncatchable although John Pool, forced to change successfully to his new, high-thrustline model on his third and later flights must have wished he had started with it! Nevertheless, the low numbers

Heading: Tom Smith about to release in an Open Power blare of sound. Opposite page, top: Mick Page, victorious again in HLG. Centre: A/1 winner Gil Hart explains how he did it! Below: Runaway winner in CO₂ was Steve Philpott. Left, top to bottom: Power Champ Stafford Screen ponders his 1/2A chances; Rubber Champ Dave Hipperson, surrounded by model boxes, prepares for his Coupe win; John Cuthbert, Glider Champ, with 'sponsored Open Glider' after his win in that class; John O'Donnell looks thoughtful before Open Rubber flyoff; he placed second. Below: John Carter achieved a life's ambition by winning Open Rubber.





Winner John Cuthert was in the air right 'on the hooter'; and away after four minutes careful lift-watching. This was the signal for most of the others to release, but Gordon Beal waited almost until the end to find good enough air for second place with his familiar Optimist design. Last of all to go was Mick Page who chose dreadful sink but cheerily explained that he was saving himself for the FAI event on the morrow....

Not all of the 21 qualifiers took part in the **Open Power** fly-off. For example, Roger Baggott, who had broken the tail of his model, was understandably loath to risk an FAI model. To reach the flyoff had been a battle for some. In an almost exact repeat of last year's drama, Trevor Payne had a lam rebuild session on his K&B engine after a rotary valve pin breakage. He had to run in the engine on the field... Julian Hopper, who had temporarily lost models at the Vintage, Pannett and Kay meeting was re-trimming them in between his competition flights: and Russell Peers had problems after his first-choice model's K&B suddenly refused to play, although it had behaved perfectly at the Grantham Grand Prix. His piped-Torpedo replacement model gave him three maxes and, as in '88 he was away right at the start of the flyoff, followed in a soul-stirring blast of sound by most of the others. Clear winner Pete Watson proved that perseverance pays: he had been trimming 'as he went' during the day to eliminate a stall and went on to achieve a splendid 9:28 flyoff time, beating Peers by over three minutes. No mean achievement! Tom and Jeff Smith turned heads, as always, with their Super Nogs. Tom tells us that new Mk IVs are under way: six inches bigger at 96in, they will have larger, lighter tails for lower pitch inertia and better critical damping. Should be worth seeing...

The **Frog Junior** flyoff brought the well-known trio of Alan Cliff, Anthony Ball and Matthew Chapman, who flew - and finished - in that order. Cliff's excellent 6:30 deserves praise: fair reward for consistent effort in the last year.

Wendy Dixon's full house gave her victory in the **Women's Cup** - the only event on Sunday not to need a flyoff, although it was close. Twenty seconds behind was Ginette Moore who, we're sure, will be trying even harder next year now that she will be ineligible for the Junior Kit Contest! Jackie Francis was just 3 secs adrift in third place, ahead of noted campaigners Jessica Nash, Edna Flynn and Sue Coy. Last year's winners Tricia Dennis, has



had a busy year outside aeromodelling, and lack of trimming showed. But watch out in '89, ladies...

Nine flew in the **Vintage** flyoff. For once, the potent threat of Challengers (John O'Donnell, Chris Strachan and Terry Dilks were thus equipped) was kept at bay. A cheery mixture of rubber and power - but no gliders - was topped by Ewan Jones' Goldberg Zoomer, not without a helping of luck. In the flyoff the Amco 3.5 broke its conrod resulting in a strange climb pattern which held sufficiently in good air!

Monday, 30th May: FAI Day

Once again an early start (6am) was scheduled for the FAI events. There is always the perennial hope of getting a calm, liftless round or two - the mythical 'still air' so often discussed, and yet seldom seen. Another, and perhaps more practical, aspect of the early start is the desire to run the full seven flights required for a 'proper' FAI event (plus flyoffs as required) and still finish at a reasonable time. After all, a lot of fliers have to break camp before

they can even start on the long drive home. Work the next day cannot be an attraction! Half-hour rounds were used throughout, but the arrangements were a little different from the usual FAI A, B, C routine (glider, rubber, power). Presumably intended to avoid engine running at too unearthly an hour, the timetable went A, B, A, B, C prior to a very sensible breakfast break from 8.30 to 9.30. After this a second power round was followed by the conventional alphabetical sequence.

Contest Director was Trevor Payne, who had unquestionably the most difficult day of the Nats. Rounds, launch lines, and possible wind changes all pose their own problems. Certainly he looked relieved when the day was over - but this is getting ahead of the story.

The event started on time in conditions that could be summarised as cool, bright and breezy. Consequently the max for the first round was set at 2.1/2 minutes - and indeed remained at this for the whole competition. Most of the time max flights landed at or around the end of the airfield so there was little complaint at this score. In fact, the wind directions made retrieving down the runway or peritrack very straightforward. Despite the imminence of the Trials, or perhaps impelled by the need to practice, entries in FAI were almost the same as in Open Glider; i.e. numerically in the fifties. Despite the time of day, it was soon demonstrated that there was a lift for those who could find it. With a modern circle-tow A/2 this should not have been too difficult. In the end there were 18 maxes in the first round, plus a very near miss by Brian Lavis, just one second short. Surprisingly, four of those who started so well failed to record any further scores. The 'reasons why' can only mean trouble of some form.

Paradoxically, the second round proved more difficult than the first - with only eleven maxes, spread out so there were only five 'doubles'. Eventually four of these were to take the top four places!

F1B (Wakefield) did not fare much better, with only eleven first round maxes from 30 fliers. The subsequent round was a little easier - but there were only six repeats! Wakefield climbs *have* improved of late - with some models were obviously being able to cope with high power on launch. On the other hand, launch angle and direction are becoming more critical (just like F1C) and many models cannot handle turbulence, or even bumpy thermals, on the glide.

The pre-breakfast round of power saw half-a-dozen maxes from a mere ten scores. It also saw some spectacular crashes - typical of this event when things go wrong. Certainly the event is unforgiving, but some fliers seem to have more than their share of trouble (and equally of perseverance).

When flying resumed after breakfast, with the second power round, there were the normal Barkston ups and downs - and this is reflected in the scores of all categories. Study of the results shows numerous maxes but very few near misses - in short, the normal pattern of contest flights. Naturally, there were the usual tales of woe. One such came from Tony Cordes, flying in his first



Opposite page, top left: Dennis Davitt fought through dramas to place a worthy third in Open Rubber. Top right: Wendy Dixon took the Women's Cup. Below that: Frog Junior winner Alan Cliff waits to go in the flyoff. Dad Neil looks tense! This page, top: Steve Philpott went for the Tailless Power Fund cash with this Mills powered diamond-winger. Above: Spot the trackers during the Open Power flyoff. Many a win Vintage with this Zoomer.



F1C contest. He managed a thermal flyaway due to a timer hang-up - and decided the model was worth an aerial search, courtesy of the Cranwell flying Club. Meanwhile the model had been seen to land way downwind by those searching for Bob Cherry's Open Glider flyoff - so it was no longer waiting to be spotted. Surprisingly Tony saw other lost models - so where do they go? The middle part of the contest (rounds 3 to 6) saw little significant change in the leading positions. Maxes were plentiful, and those on top tended to stay on top!



There was a sudden wind shift, together with a rain squall, just after the fifth Wakefield round opened - but the weather soon cleared to become hot and almost calm before the half-hour was up.

The rain returned part way through the sixth glider round (after two-thirds of those still flying had maxed) and this resulted in a quarter-hour delay between the end of Glider and the beginning of the next Rubber round. There is no doubt that this was an eminently practical decision - even if outside the provisions of the rulebook (which is conspicuously lacking in its detailing of such matters). The CD also resisted the temptation to move control whenever the wind changed direction. Although drift veered from side to side, it remained conveniently more or less down the runway for most of the day. Only for the final rounds of rubber and power did the wind really swing - and by then it had dropped in strength.

The final rounds were dramatic enough. When the seventh Glider commenced, the weather was wet and dismal. The rain was not heavy, but it could not have been an inducement to fly. Nevertheless, two of the three with perfect scores were very soon out, up and away - obviously believing that conditions would deteriorate further. John Cuthbert, in fact, said afterwards that he had watched a Mylar streamer for most of the preceding round without seeing any sign of lift. Consequently, he reckoned it would pay to fly quickly and concentrate on obtaining a good launch - rather than to circle in the rain in the faint hope of finding lift with a wet model. The approach worked; he recorded a near-max of 2:23 - noticeably more than his Falcons clubmate John Carter whose model 'fell out' after an even better start.

This left Pete Williams with his chance - he flew a few minutes later, and seemed to hit a turbulent patch on tow, giving a poor launch with what might be called negative zoom. Setting well below normal line height, the model nevertheless glided well enough to edge out Carter and secure second place.

In retrospect, all three should have waited. There were eight maxes later in the round - but no-one was close enough to catch the leaders. In fact, fourth place was shared by John Williams and Ron Sabey who had ruined their hopes with an eighty-odd-seconds flight apiece earlier in the contest.

The following Wakefield round was better - with good flights from the leaders; all apart from Len Auckland who did a little under two minutes on his



seventh flight to leave just Hipperson, Pink and Pollard to qualify for the flyoff.

Power had got very thin on the ground. Only Stafford Screen and Fred Chilton had all maxes after six rounds. Andrew Cordes (Tony's son, though flying for a different club) had dropped a few seconds and was flying for third. Roger Baggott had got ready to fly in case Andrew made a mistake. What then happened was unexpected. Stafford completed his max-out flying a wooden-winged model (with no sign of aluminium foil). Its pattern was both spectacular and useful. The model climbed straight and past the vertical, then bunted off the top to come back into wind right over the launch point. Obviously this reduced downwind drift - and hence aided retrieval.

Fred soon followed with a straight climb that flattened a little prior to the motor cutting. Unbelievably the model put its nose down, and spiralled into the ground for a few seconds more than the 'attempt'. Presumably this was VIT failure of some sort. Andrew made a very steady flight to secure a rather close max and an easy second place, whilst Roger flew to take the third position. He had a disappointing start to the day, stalling after transition for a mere hundred seconds in the initial round.

There was only a quarter of an hour gap between the end of the seventh power round and the beginning of the F1B progressive flyoff - the only one needed in the FAI events. The three contestants wound up - and waited. Then Dave Hipperson handed his model to a helper, and dashed off to his van to wind a second model. He was barely back on the flight line when Ron Pollard launched, closely followed by Gerry Pink. Too interested in watching the opposition and weighing up their air, Dave launched left and steep. The model went up and over performing a large loop that ended on the runway but not through mismanagement of launch - it had been set in glide mode! A year or two ago this would have been the end of his chances - but flyoffs now permit two attempts, and his first model was still available, and still wound up! There was pandemonium, with what sounded like a dozen people all shouting advice at once. The Falcons should have chosen a somewhat more vocal bird for their mascot if the sound effects were any criterion!

Meanwhile the other fliers' models were both gliding well in good air. Suddenly Pollard's model DT'd for a minute-and-a-half score. Once again it was Seelig timer trouble - not due to putting the release arm in the wrong groove, but apparently because it jumped out because of lack of lateral (inward) tension.

Hipperson kept his head, knowing he had two or three minutes left, and waited for another good patch of air. Dennis Davitt ran to control, and got an official time check announced over the PA

system. The retaken flyoff went like clockwork, with a good climb from the tired motor into helpful air for an easy 3.1/2 max.

Again, only 15 minutes were allowed before the next flyoff. This seemed unnecessarily tight, especially considering the leisurely pace of the earlier rounds. Gerry Pink was the first to wind, but had a motor break after removing the winding tube and fitting the propeller! The replacement motor held together, and he was first to fly - with a good launch but only mediocre air. Dave launched a minute or so later, didn't get particularly high, but glided just that little bit better. Whether John Carter's efforts in 'flapping' whilst cycling underneath were helpful will never be certain - but Dave's flight was just eleven seconds longer than Gerry's. Very close - and far from trouble-free!

Pollard's models are well known, and have been detailed in Free Flight News and elsewhere. He was using FAI rubber - 28 strands of 1/8in to be precise. Gerry Pink was flying Ghio's Shadow design, and lost one in an early round. Notable was Gerry's use of a Chinese rubber throughout the contest. This material is available from Mike Woodhouse, who very surprisingly neglected the chance to advertise his wares by personal participation in this contest. Certainly, little needs to be said about Dave Hipperson's models or techniques!

The FAI events, of course, decided the overall category championships that are calculated on the basis of performances in the Mini, Open and FAI



contests. The eventual winners all had an extremely successful weekend - and their names should come as no surprise to anyone glancing at the results.

Dave Hipperson was overall rubber champion with two firsts (CDH and F1B) and fourth in Open Rubber. Stafford Screen took the Power title with two firsts (1/2A and F1C) together with third in Open, whilst John Cuthbert improved on even this to win the Glider Championship. He had firsts in both Open and FAI plus a second place in A/1. All are tremendous achievements by the three people involved - and yet are unlikely to be given adequate recognition! At least we can offer our congratulations...

Meanwhile, back at the ranch... Other events had also been flown on the Monday, although they had a more gentlemanly starting time. Slow Open Power and Tailless had been moved this year from their traditional place with the Open events to the following day.

The concept behind **Slow Open Power** seems to offer a simple gadget-free model that is easier than present-day and FAI models. In fact, success with the Slow class seems to come from using just the right amount of power - meaning not so much that trimming is a problem! The entry at this Nationals was reasonable enough with 23 scores, of which just four qualified for the flyoff. This was held in a relatively calm period.

Phil Ball flew-off for a rather uninspiring flight, following at intervals by the others. Tony Brown seemed a clear winner with almost four minutes from his OS 15 powered model - a clear minute ahead of George Fuller whose model *must* look like a Dixielander. Final member of the quartet was Bill Dennis, rather better known as a Scale model flier and *Aeromodeller* columnist.

But the contest was not over. There was a sudden flurry of activity when Phil returned for a second attempt - the first having been an over-run! Few competitors would have even tried to retrieve and refly in the time available - short flight and light wind notwithstanding. Phil wasted no time. The second climb was mediocre, the run short, but the air was wonderful! His flyoff score was exactly five-and-a-half-minutes to win the event. This model has foam wing construction, with a gaudy striped wrapping paper overlay, and is powered by an OS 35 (with its R/C carburettor unit replaced by an ordinary one). This is apparently superior to using the non-R/C engine - yet still legal.

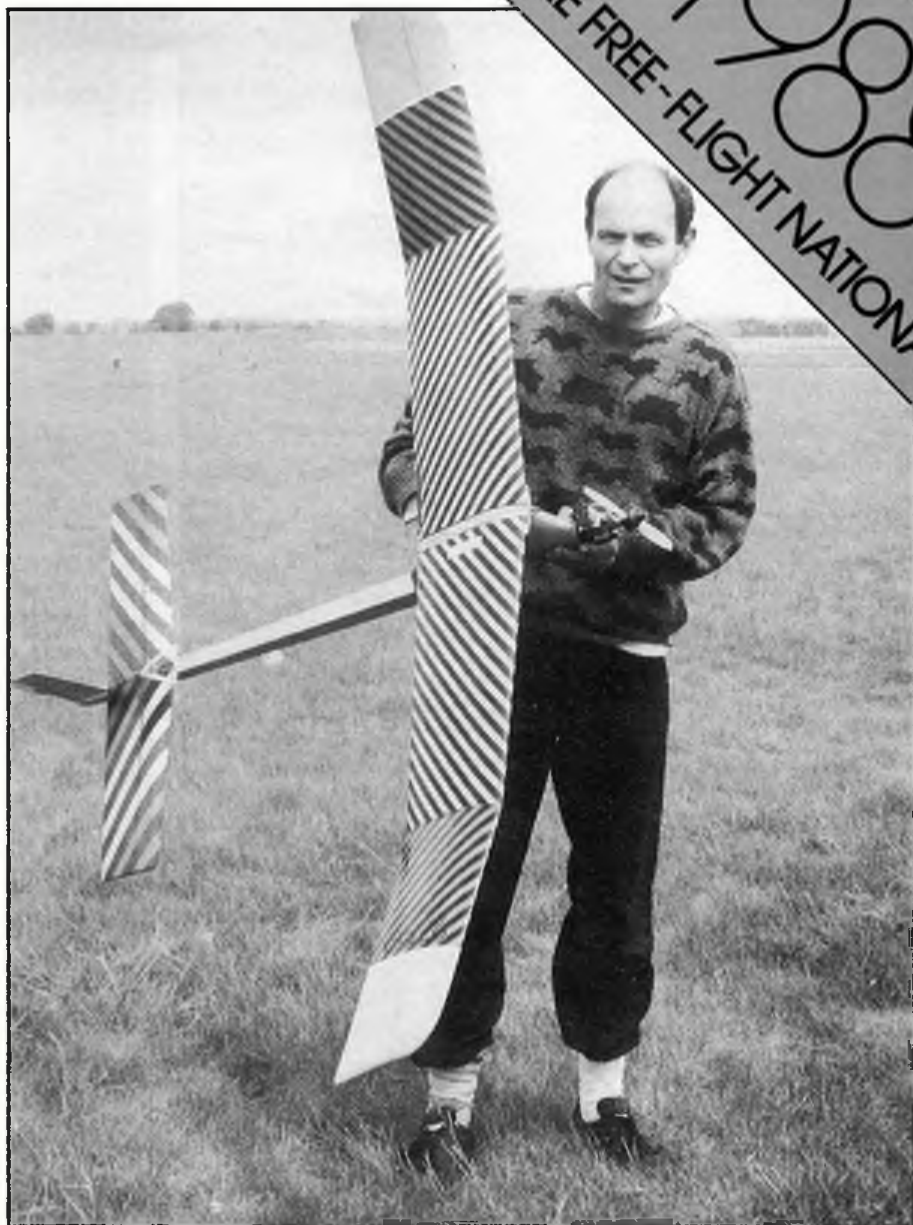
Final SMAE event was **Tailless** - barely kept alive by the efforts of protagonist John Pool. Despite an inordinate amount of publicity the contest only produced nine scores - less than the Frog Junior or even F1C, but more than the Ladies or CO₂.

It was hardly any surprise that John himself proved the winner with the only perfect score - although his close associate Ken Attiwell looked like matching this, until let down by a modest third flight. Russell Peers gave his models their annual outing for third place. Need it be said that all were flying rubber models?

The attempts to promote interest in the subdivisions of tailless did produce some results. Ian Fairgrieves was fourth with a glider, followed by Steve Philpott with the best of the power models. Although accepted as a tailless, it could also be described as an annular wing - or a swept-back, swept forward tandem (joined at the tips). It shows potential, must be strong, and should be consistent as it must be difficult to warp. Time will tell whether it proves the answer!

The SAM 35 group ran their usual **Vintage Wakefield** event on the Monday. This year David Beales, who was CD, ruled out own-designs by restricting entries to Vintage designs. This reduced my participation in the contest to that of giving out the prizes!!

Chris Strachan had a good day, winning both the 4oz. and the 8oz. classes with perfect scores of three 2.1/2 min. maxes. The former was low on entries - but the heavier models needed a three-way flyoff. Peter Michel went first for a rather disappointing 1:58 from his Clements designed Aries, closely followed by Mike Kemp. Although Mike found lift with his Voodoo, it stalled catastrophically on glide thanks to a bad rubber bunch. This left Chris able to set an appropriate D/T for a comfortable, safe, 3:46 from his Yankee IV.



Opposite page, top left: Mick Page in unusual pose. An Aeromodeller subscription to the best caption received by 1st August! Love those knees... Top right: Mike Dixon holds for son Malcolm who won junior Kit Rubber flyoff. Below: Ian Fairgrieves is developing his own style in Tailless using background data from late 40s Aeromodellers. Above: Slow Open winner Phil Ball had to go again in the flyoff after an over-run. Details of foam-wing model next month!

A lot of the SAM 35 regulars were missing from the entry list - and most of the SMAE Vintage fliers were busy elsewhere. Perhaps prospective entrants simply didn't know the event was being held. Publicity was sparse, to say the least, and this was reflected in the support. Even if you are providing what people want, you still have to tell them! All-in-all, a very successful Monday - but we were very lucky indeed. I am sure all involved will agree!

Junior kit contests

Conditions were not ideal for these small models. Several potential competitors had already lost or damaged aircraft during the weekend thereby reducing numbers. Seven competitors in Glider and five in Rubber all joined in with great enthusiasm - only partly because of the good prizes which had been given by the trade and by private individuals! Most popular Rubber choice was again the Performer. Even with the entry reduced to three, there was nonetheless an excellent contest. Peter Martin performed well to achieve 3:25 but both Dixon and Sabey maxed out.

In glider the seven competitors returned some

excellent scores. Only one flyer failed to achieve at least one max. Ginette Moore dropped one flight and was not to achieve her target of three straight wins in this class. Too old to compete next year, her record in Glider of two wins, a second and a third will nevertheless be hard to match. Nicholas Christopher also dropped just one flight. Two reached the fly-off - Keith Chamberlain with the ever popular Caprice and Richard Dyer with a Mistral.

Fly-offs were held at 5 pm with both classes going into the same fifteen minute period. The conditions were the best of the day with little wind and some sunshine. It was somewhat cool after rain and there was no evidence of thermals. It was perhaps a truer test of flyer and model. Dyer and Chamberlain flew almost together, both with excellent tows and launches; Dyer gaining the edge to win by nine seconds. In rubber, Sabey flew first from well upwind and Dixon launched when Sabey's model was almost over his head although he did not appear to realise his rival was there. Dixon's flight was immaculate. Apparently without the assistance of lift he won by a clear margin on 2:08.

Report by Jeff Anderson.

Jim Baguley participated enthusiastically in a variety of classes, usually finishing his flights ahead of everyone else!



1988 SMAE F

A/1: British Airways Trophy (41 flew)

							Total	
1	G. Hart	120	120	120	120	120	+463	1063
2	J. Cuthbert	120	120	120	120	120	+271	871
3	J. Foster	120	120	120	120	120	+252	852
4	C. Sharman	120	120	120	120	120	+241	841
5	A. Cordes	120	120	120	120	120	+57	767
6	G. Manion	120	120	120	120	120	+104	704
7	P. Dickson	120	120	120	120	120	78	678
8	J. Baguley	120	120	120	120	106		685
9	J. Carter	120	120	97	115	120		572
10	D. May	120	89	120	120	120		569

1/2A Power: Hales Trophy (33 flew)

							Total	
1	S. Screen	120	120	120	120	120	+168	768
2	G.J. Bryant	120	120	120	120	120	+97	697
3	P. Gibbons	120	113	120	120	120		593
4	R. Pavely	120	120	106	120	120		586
5	G. Fuller	113	120	120	120	105		578
6	E. Redfern	117	120	120	101	120		578
7	J. Sizer	120	108	120	120	106		574
8	A. Jack	120	120	120	93	120		573
9	P.R. Harris	120	120	120	92	120		572
10	R. Peers	120	120	120	120	85		565

CO₂: Sparklets Trophy (6 flew)

							Total	
1	S. Philpott	120	120	120	0	120	+110	590
2	D. Richards	120	0	120	120	120	+87	567
3	J. Pool	83	0	120	120	88	+68	479
4	S. Rose	120	120	46	34	0	+85	385
5	P. Gibbons	58	91	93	57	68		387
6	J. O'Donnell	120	0	0	0	0		120

HLG: HLG Trophy: (20 flew)

									Total			
1	M. Page	60	42	60	56	60	60	60	41	0	499	
2	M. Bennis	60	31	80	60	53	60	60	60	49	0	493
3	P. Ball	57	60	60	31	69	40	60	33	60	0	460
4	E. Burge	60	60	45	55	44	48	38	50	51	0	451
5	J. Tipper	60	80	60	35	80	37	30	41	51	0	434
6	I. Gardner	32	38	53	38	34	40	46	57	42	0	380
7	P. Bayram	47	59	60	25	41	41	25	31	48	0	377
8	R. Clark	60	55	46	42	41	60	60	10	0	0	374
9	M. Felstead	52	58	60	60	19	34	27	26	23	0	347
10	I. Clark	46	37	31	55	28	33	36	40	36	0	342

Open Rubber: Model Aircraft Trophy (57 flew)

								Total
1	J. Carter	150	150	150	150	150	+387	837
2	J. O'Donnell	150	150	150	150	150	+318	788
3	D. Davitt	150	150	150	150	150	+314	764
4	D. Hipperson	150	150	150	150	150	+294	744
5	N. Lee	150	150	150	150	150	+289	739
6	J. Baguley	150	150	150	150	150	+274	724
7	A. Cliff	150	150	150	150	150	+253	703
8	P. Ball	150	150	150	150	150	+200	650
9	C. Strachan	150	150	150	150	150	+198	648
10	F.G. Sharp	150	150	150	150	150	+196	646
11	P. Gaunt	150	150	150	150	150	+191	641
12	N. Marcus	150	150	150	150	150	+190	640
13	C. Chapman	150	150	150	150	150	+187	637
14	D. Neil	150	150	150	150	150	+177	627
15	N. Cliff	150	150	150	150	150	+171	621
16	L. Aukland	150	150	150	150	150	+160	610
17	M.K. Stegg	150	150	150	150	150	+153	603
18	G. Ferer	150	150	150	150	150	+152	602
19	B. Horsley	150	150	150	150	150	+142	592
20	H. Wilkinson	150	150	150	150	150	+140	590
21	E. Hawthorne	150	150	150	150	150	+124	574
22	W. Beales	150	150	150	150	150	+109	559
23	I. Davitt	150	150	150	150	150	+69	519
24	M. Chilton	150	150	150	150	150	+0	450
	S. Fairless	150	150	150	150	150	+0	450
	P. Chapman	150	150	150	150	150	+0	450
	D. Roche	150	150	150	150	150	+0	450
	R. Pullen	150	150	150	150	150	+0	450
29	M. Pressnell	150	143	150	150	150		443
30	C. Hawke	160	125	160	160	160		425

Junior Kit:

Glider

		Age						Total
1	R. Dyer	12	Vulcan	Mistral	90	90	90	270 + 93
2	K. Chamberlain	13	Grantham	Caprice	90	90	90	270 + 64
3	Miss G. Moore	15	Biggles	Caprice	90	76	90	256
4	N. Christopher	14	Grantham	Caprice	90	68	90	248
5	Miss D. York	12	RAFMAA, Cranwell	Caprice	90	60	96	236
6	C. Sabey	12	Hamilton	Caprice	42	47	90	179
7	G. Morgan	12	Vulcans	Vulture	31	53	47	131

Rubber

								Total
1	M. Dixon	13	Birmingham	Performer	90	90	90	270 + 128
2	C. Sabey	12	Hamilton	Performer	90	90	90	270 + 86
3	P. Martin	12	Tynemouth	Performer	60	74	71	205

We can't fit you all into the available space for results - so if you didn't make the top flight this time, try even harder in '89!

And thanks to all the hard-working members of the SMAE who gave so much of their time to make the event a success; thanks, too, all at RAF Barkston Heath for your hospitality.

More pics from the Nats next month!

Coupe d'Hiver: HJN Trophy (44 flew)

							Total
1	D. Hipperson	120	120	120	120	120	600
2	D. Davitt	120	109	120	120	120	589
3	D. Neil	120	120	120	108	120	588
4	P. Gaunt	120	120	120	120	103	583
5	J. Baguley	120	95	103	115	120	553
6	A. Ball	120	120	120	120	67	547
7	T. Gray	120	93	120	103	91	527
8	I. Davitt	120	120	120	41	118	519
9	A. Beales	120	75	120	141	56	512
10	P. Masterman	85	120	71	115	120	511

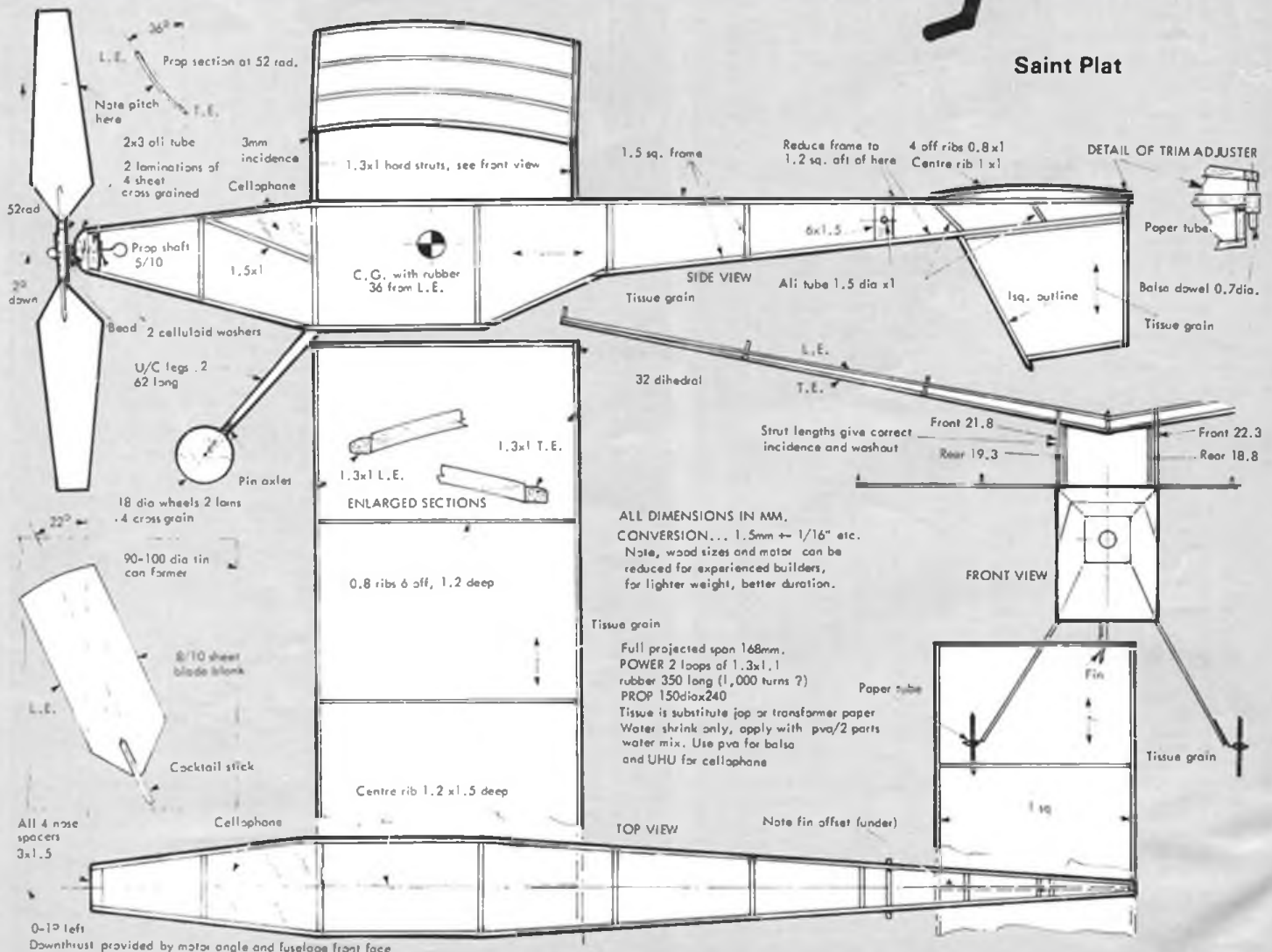
Rene 'The Saint' Jossien describes the charm of the French ancestor of our Peanut Duration class

IN MARCH 1976 I built my first Peanut model, a Leningradec; and with this, three weeks later I carried off the Grand Concours du P.A.M. with three flights of 43, 44 and 45 seconds under a ceiling of only 6.5 metres (approx. 21ft.). At the Grand Concours I realised that many good rubber fliers had difficulty trimming this type of model correctly because they are so small. This was even more difficult for

Left: Rene prepares Saint Axe for flight. Below: The Saint motif, adopted by Rene in appreciation of the famous fictional character.

SAINT FORMULA

Fan



younger modellers in junior classes; so, in the winter of 1976, after building three Peanuts, I decided to formulate a new category of indoor rubber duration model, of more simple lines, the construction and trimming of which would be easier than for small scale aircraft. In France and Belgium it became an excellent introductory class for Peanuts and many juniors learned with these models.

Since that time it has become an exciting class in its own right and thanks above all to the international contests at Flemalle in Belgium, there are many French, Belgian, German, Swiss and Dutch enthusiasts as well as individuals, such as Mark Hinton from England. In addition models from Japan, USA, Poland and Czechoslovakia have been flown by proxy.

Saint necessarily so

After some reflection, more trial and error, and the construction of a prototype, the rules for this class of indoor model appeared in Vol Libre - André Schandel's excellent F/F news magazine - in June 1977 and in the French model magazine MRA in August of that year.

I called this the Saint Formula after my *nom-de-plume* of 'The Saint' under which I have written numerous articles on aeromodeling subjects...

Saint Formula competitions took place first in France, and subsequently in Belgium. Numerous plans by designers such as Frugoli, Fillon and Delcroix as well as myself have been published in Vol Libre thus popularising the class beyond the frontiers of France.

Abroad, Fernand Van Hauwaert in Belgium and Benno Sabel in Germany made this class well known. In England, Bernard Hunt, no doubt inspired by this type of model, devised the PND (Peanut Duration) Class, the first plan of which, John O'Donnell's Cagebird, appeared in the September 1984 edition of *Aeromodeller*.

The durations of Saint Formulae models in small halls were around 150 seconds to begin with, but progress was rapid. Since July 1987 the French record has been held by a youngster of 14, Christophe Hanriot, who achieved a flight of 5:07 with Saint Plait, a model I designed in January 1984 and shown here (thanks to Vol Libre).

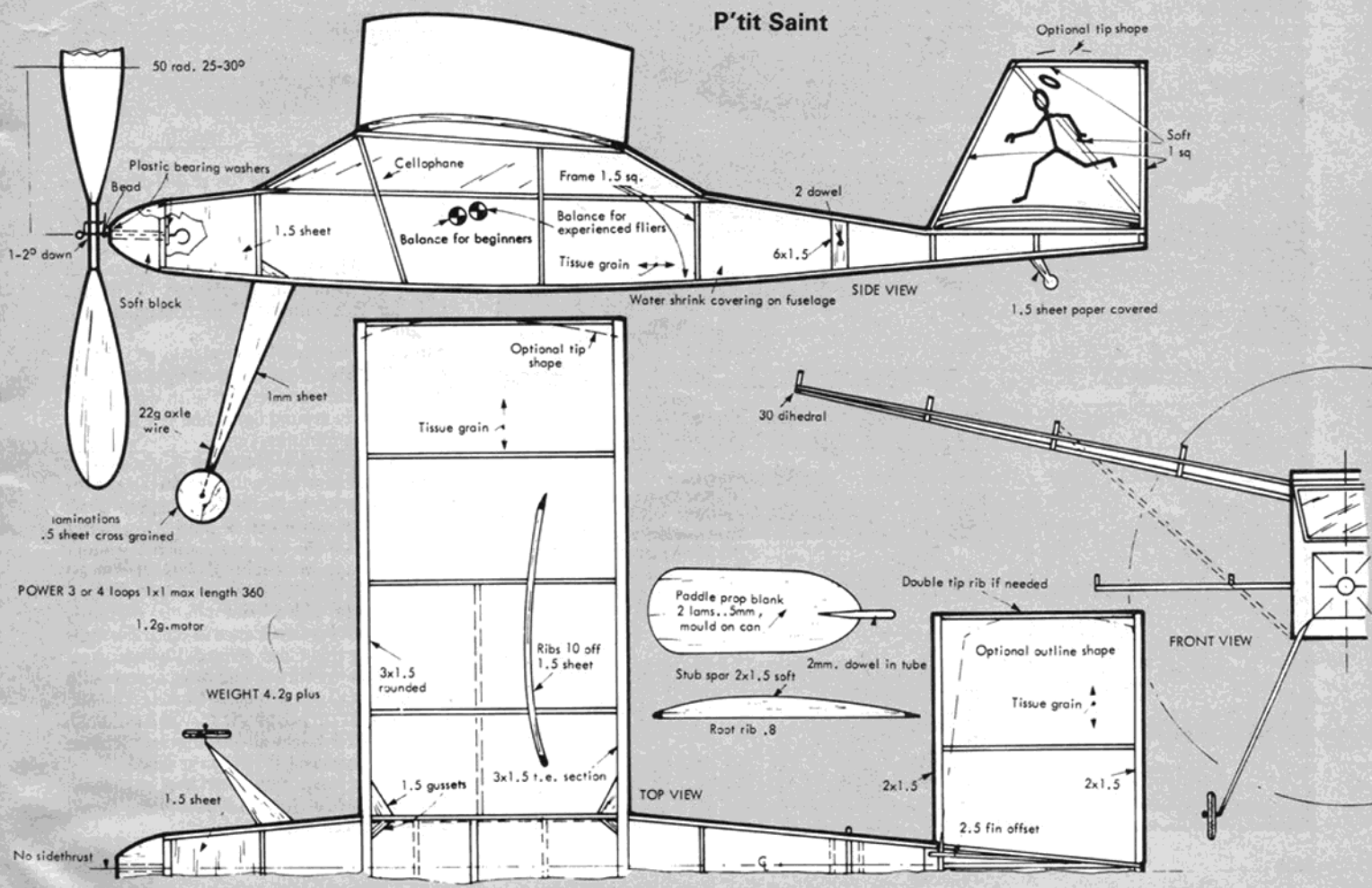
...and how to build one

The construction of a 'Saint Formula' model to the minimum weight of two grams does not require the use of special balsa. It is merely sufficient to cut the strips from good balsa of straight grain and hardness according to requirement. The fuselage

What's what
Saint Formula indoor models conform to the following rules.

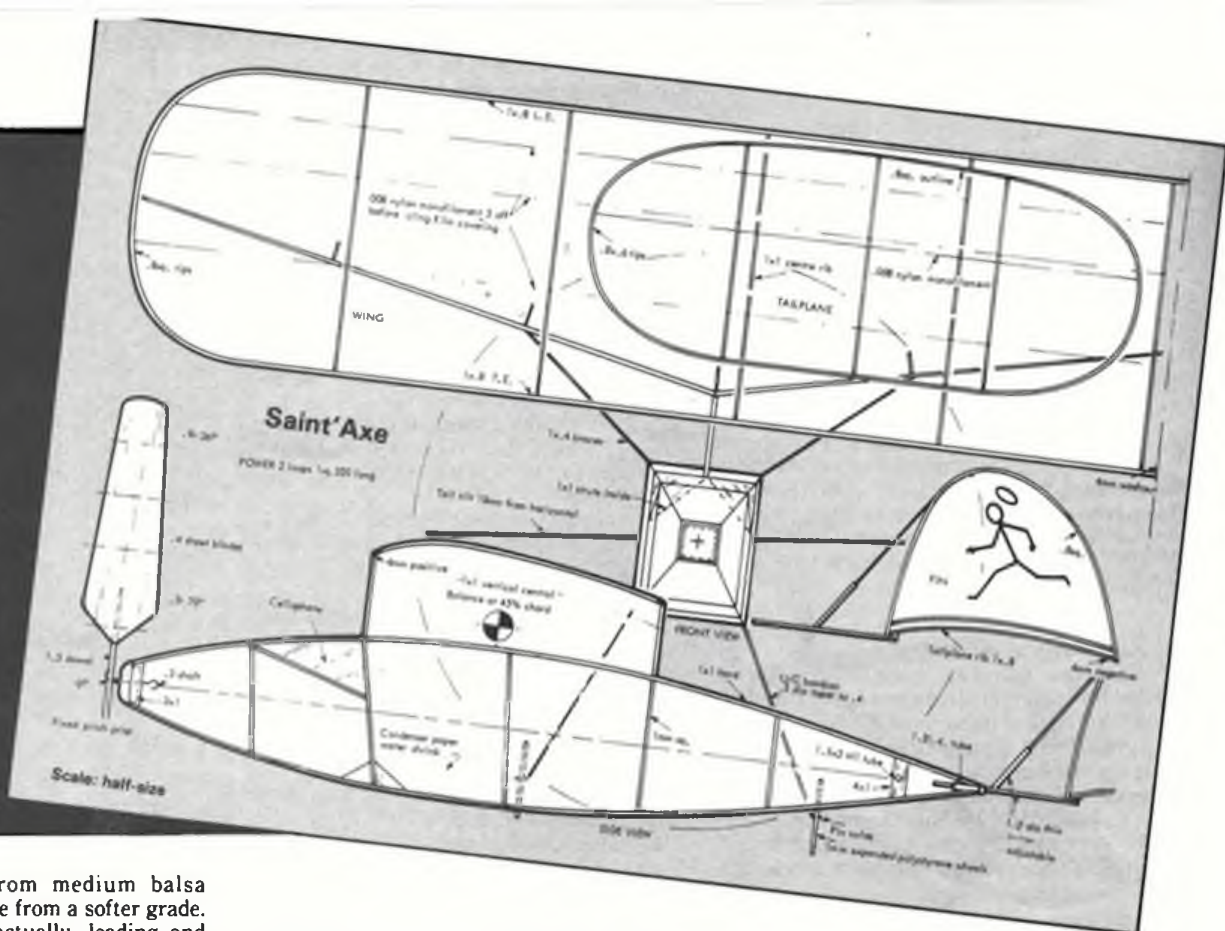
General	Rubber powered model for indoor flying. Motor enclosed by the fuselage. Single skein motor, no gears. Covering: paper or other materials, except microfilm.
Fuselage	Total maximum length excluding propeller: 330mm. (This is a rule change from 9.188 - previously the prop. was included.) Minimum cross section 3 cm x 4 cm. over a length of 5cm (volume 3x4x5cm). Transparent surfaces such as cabin, windshield or cockpit cover: minimum total 2sq. cm (viewed from the front and side).
Wings	Maximum projected span: 330mm. Maximum chord for monoplane: 80mm. If biplane, maximum sum of chords: 100mm, with one chord 40mm minimum.
Tail	Maximum span: 150mm, maximum chord: 60mm.
Undercarriage	Two legs and two freely revolving wheels obligatory, minimum diameter: 18mm.
Propellor	Maximum diameter: 150mm. Maximum blade width: 25mm.
Weight	Minimum weight of airframe i.e. without motor: 2 grams.
Motor	Rubber, length and section unrestricted.
Contests	Contests to be flown over 4 or 5 flights, of which at least TWO must be rise-off-ground. Scoring to be the total of the two best flights. Attempt: Less than 10 seconds.

Why indoor fun-flying?



Scale: half-size

Each Saint Formula model is an ideal introduction to indoor flying. Why not get together with clubmates for informal competition in sports halls - or at Cardington?



longerons are cut from medium balsa whereas the spacers are from a softer grade. For the wing spars (actually, leading and trailing edge) you will need harder balsa than that for the tail and fin. When the class started in France there was no minimum weight stipulation and some builders were able to construct airframes down to 0.8 to 1 gm. with ordinary stock wood, well selected. However, a newcomer

to the Saint Formula (incorporating the later 2gm. rule) unaccustomed to building small models, or an experienced Peanut constructor building down to the earlier rule, would typically arrive at weights of two to three grams.

The permitted diameter of piano wire has

been reduced in order to attain duration of more than three minutes.

Light Jap tissue (12gm. per sq. metre) is used for covering the four sides of the fuselage (the only tightened surfaces), the upper wing and tail surfaces and one side of the fin. To add even more lightness you can use condenser paper, Microlite or very thin mylar.

Experience permits the reduction of airframe weight without too much fragility (at less than 2gm. handling becomes delicate). The quest for minimum weight necessitates one-piece models, just like Peanuts.

Now try these

As examples I include the scaled-down plan of the first Saint Formula the P'tit Saint. It is a design perfectly suited for the young modeller who likes cabin monoplane lines.

The second is Saint Axe, the last of my models before the 2gm rule. It weighed 1.2gm. and flew for four minutes. The construction is fragile!

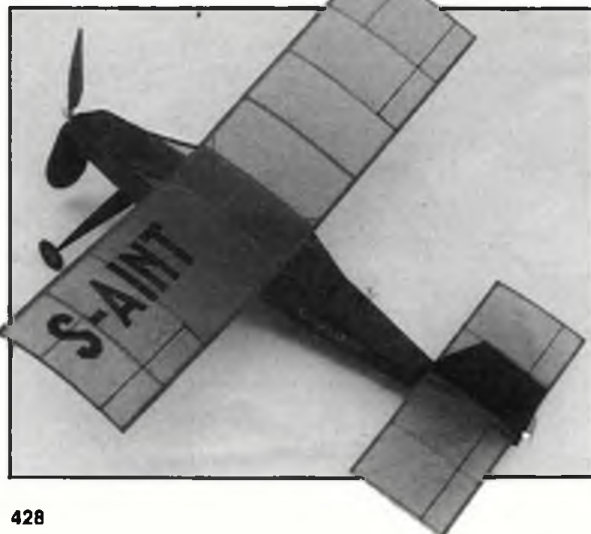
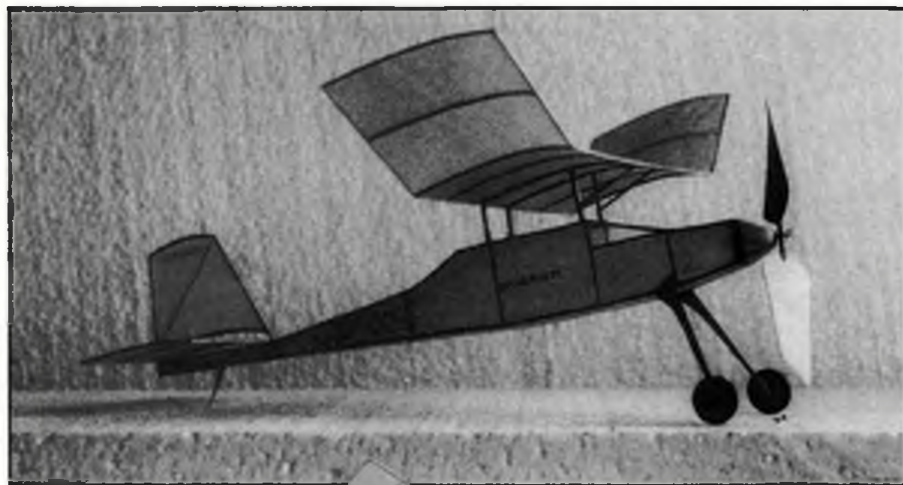
Finally, we publish plans of Saint-Plait, the best of all my models. Keeping to the wood sizes on the plan with light balsa, the weight is around 3gms and it will fly for a good three minutes.

By reducing the sizes by eight-tenths (dimensions are given in brackets) and by lightening other parts such as the prop. block and U/C, the model can be built down to two grams. This is the weight at which Christophe Hanriot made his flight of 5:01 in August 1987.

Fourteen-year-old Christophe is certainly talented, but his experience in Saint Formula shows that this class of model brings great satisfaction to those who take it up with enthusiasm.

Let it be your turn to give it a try and establish a better performance at Cardington, Flemalle - or anywhere else!

Thanks to Mike Green for translating René's original French text. GC.



Attractive, perky craft (Nobrium above and P'tit Saint at left) resemble the larger Manhattan class but demand a less specialised approach. Build one and beat John O'Donnell!

READERS' LETTERS

Bigger bat

When we featured Peter Fisher's rubber-powered bat-wing Noctule as a free plan in the February issue we suggested, fairly lightheartedly, that someone ought to try a larger, power version. We should have known better. Peter Fisher himself reports:

Dear Sir,
Further to the data on the Noctule Mk 1 'Garden Model' I thought you would be interested in my latest project, the Mk 2, which is a 34in. power version for the Giles 0.3cc diesel.



The model, which flew "off the board", has achieved about fifty excellent flights to date. All-up weight is approx 4oz. and the Giles provides ample power, turning a DC 6 x 4 prop at 11,000 rpm. The original rubber model is still performing happily around the bluebells!
Onchan, Isle of Man Peter Fisher

Viva Vintage Team Race!

Dear Sir,
I really enjoyed Terry McDonald's feature on Vintage Team Racing (June issue). The old designs are wonderful to see, and with their bright colours, action and a history dating back to the 1940s, there are strong reasons for modellers of all ages to join in the fun.

As I remember it, the first Class A I ever saw was Gordon Yeldham's Voodoo. It leapt from the grass in a park not far from Southend one Sunday afternoon in 1952, and I've never forgotten the noise of the Oliver and the blue smoke haze and delightful smells that followed it around (in attendance was a chap we knew as 'Duckweed' who had an ETA 29!)

Not knowing where Oliver Tigers came from, I saved up and eventually bought an ED Racer in its bright red box from Bert's in Leigh-on-Sea. I ran it in on a plank, and amazed old

Dad by inadvertently starting it in his bedroom. Years later, fool that I was, I sold it still boxed to a Boy Entrant at Cosford so that I could put some juice in the Allard.

Time slips silently into overdrive as we get older, but on the stocks is a Mercury Texan for my own Oliver Tiger, and come what may I'll be at Old Warden in August. Like the M.E. Exhibition in January it's always a splendid occasion.

London, SW19

David Kinsella

Shanghaied

Dear Sir,
The mystery engine on p.341 of the June issue is actually - despite its resemblance to the OPS and Rossi - a Chinese CS.15 made by the Shanghai Aeromodelling Research Dept.

Flt. Lt. John Stephenson

RAF Marham, Norfolk



Above: The mystery engine from the June issue, with latest CS 15 at top right.

Below: From the mystic Orient, Nathan Paul Sturman and daughter Naomi with PAW 2.49 powered Primary stunt model.



(Yes. And as reported last month, the latest CS catalogue gives details of the whole range. 1988 .15 shown above).

Striking back

Dear Sir,
Here's a letter from the very centre of mainland Japan. Here we fly control line and free flight to remind our friends that the name of the hobby is model aviation! The continued existence of our PAW 149 powered Spitfire (from a local - and now discontinued - kit) stands as defiant proof of this. I'm an American from Philadelphia; and I teach aeromodelling at the English Culture Centre in Maubushi, the Prefectural capital. We build and fly Canadian rubber and power models - and classic designs from Aeromodeller and elsewhere. A flying scale Hawker Hind and FW Stosser - ASP plans by Doug Marsh and Brian Barton - are under way, as well as a semi-scale P-51 by KM, a local company, for my PAW 2.49. I have nothing against R/C, having flown with pulse and escapement before most of the present crowd were born.

Thanks to the efforts of many, there is now an All-Japan Association for the survival of U-Control! The good guys are striking back... and a recent Japan-China friendship meeting for FAI Power and Rubber, and some mini-classes was a big boost to our morale.

By the way - in Japan, Max-flight is the name of a popular brand of golf-ball!

Yours, doing my part to relight energy among the younger Japanese...

Nathan Paul Sturman
Shibukawa City, Japan



SCALE MATTERS

Bill Dennis looks at the Barkston Heath F/F Scale meeting on 8th May - and builds a new model

THIS WAS a new event on the calendar in response to the increase in interest in outdoor Scale flying, and it filled the gap left by the demise of the Odiham Spring Gala (at which F/F Scale was always badly supported anyway).

The overnight weather forecast had not been encouraging, and the morning broke with rain and a stiff breeze. However, at the airfield we were treated to near flat-calm conditions with minimal, highly variable drift. The latter meant that the duration fliers (through whose co-operation we were sharing the venue) were spread all over the drome at one stage...

No fires!

There was a good turn-out; the best I can remember for a SMAE event other than the Nationals, with many enthusiasts having travelled a very long way indeed. All three Scale classes were featured, plus an experimental Jetex event to SMAE schedule but with a 'floating' qualifying time!

The single name on the Jetex results list masks the fact that several models appeared, all nicely finished too; and there is no doubt that Jetex Scale has great potential. It was certainly very entertaining - and against all predictions there was no conflagration!

Winner Ray Johnson's Grumman Panther, the only one to qualify, made a stirring sight. Ray obviously has had long experience in handling Jetex. You could tell this by the very adroit way in which he pulled out the burnt wick with his fingers - no namby-pamby pliers here! It was also amusing to watch the speed with which contestants retrieved their models after landing, with 'chief fireman' Alistair Knight in close attendance - all far removed from the usual Scale post-flight dignified amble!

Of the other models, Derek Knight's



Pete Iliffe triumphantly holds aloft his latest project. This fine Fokker DVIII began life as the vintage Earl Stahl F/F design but metamorphosed into this far more accurate replica for radio control. Spotted at our Old Warden Large Model Day.



Top left: Charlie Newman at Barkston Heath with Jetex KK Hawker Hunter. Model's bugs have been ironed out and the elegant jet flies well. Above: Kevin Wallace enjoys F/F Scale as a change from his unorthodox activities. His CO₂ Bowers Fly Baby biplane is an attractive shape, infrequently modelled. Left: Knight & Pridham electric powered Miles Sparrowhawk by Derek Knight is a stable, fast flier.



Cougar was impressive with its internal motor, but it was carrying a little too much paint and managed only a series of long bounces along the runway. Charlie Newman's KK Hunter was beautifully finished but wouldn't fly with the large negative angle on the tailplane as per the kit; since modified, the model reportedly goes like the clappers. The other models were Paul Briggs' Avro 707 which performed consecutive loops of two-feet diameter, and Doug Sheppard's much larger MiG 15 for a Jetex 100.

The experiment is to be repeated using MIAMA Peanut-type static rules and straightforward duration flight score; I think this will be eminently suitable. I fully expect this class to become as popular as the mass launches so get something built. I think the best approach is to have two motors and a 'helper' to recharge one while you're flying the other!

What else?

I will not give a blow-by-blow account of the other events since most of the models have been seen before. It was interesting to see the CO₂ motors performing well in very humid conditions. I was impressed with the slow flight of Kevin Wallace's Bristol M1D. Kevin has a 46in. version, intended for Mills 1.3 power, under way. This should do well

at the Nationals. Outside the contest, Derek Knight's electric Miles Sparrowhawk, seen unfinished some months ago, now proves a superb flyer; very stable despite scale dihedral, it needs a hefty launch to get it up to flying speed.

The calm conditions suited my DH Hawk Moth well. The Mills .75 has just enough power, with the prop reversed, to fly the model at scale speed. For some reason, the motor throttled itself back toward the end of the flight, which was rather nice. The Mills is a tight fit in the nose of this model and although there are no cooling problems - the cylinder head is exposed - the exhaust gases have difficulty escaping. It is noticeable how much revs reduce once the top cowl is fitted, which must be because exhaust is mixed with intake air. I shall have to put in an extra, non-scale hole.

Thanks go to judges Andy Sephton and Brian Downham, who both had a very long day, and to CD Charlie Newman who has a much better relationship with the Weather Organizer than I ever did!



Top left: E. Whitehouses's fuel-soaked AW FK 8 is a reliable performer. Bottom left: It could almost be 1940! Paul Briggs' large rubber-powered Hurricane breaks ground at Barkston.

SMAE Spring F/F Scale Meeting Barkston Heath, 8th May

Power (4 flew)

		Static	Flight	Total
1	C Newman Avro 504N	833	956	1789
2	W Dennis DH Hawk Moth	883	893	1776
3	D Knight Fairchild Argus	904	712	1616

Rubber (4 flew)

1	P Briggs Hurricane	944	855	1799
2	B Hetherington Dewoitine D338	793	747	1453
3	B Pursglove Douglas O-46A	706	694	1400
4	R Johnson Curtiss Seagull	649	710	1359

CO₂/Electric (7 flew)

1	D Sheppard Bluebird	941	1041	1982
2	D Knight Tiger Moth	1002	776	1778
3	K Wallace Bristol M1D	690	1046	1736
4	I Pallister Catalina	872	837	1709
5	C Newman Avro 504N	833	859	1692
6	C Strachan Bristol Prior	692	705	1397
7	B Hetherington Stinson	660	671	1331

Jetex (4 flew)

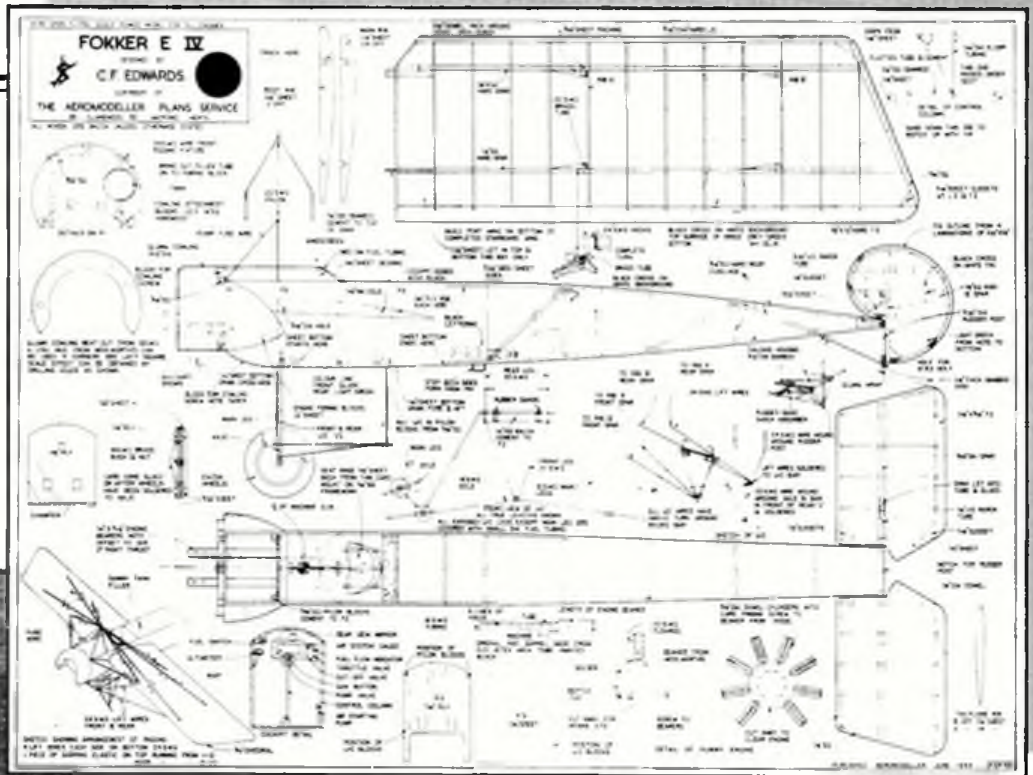
1	R Johnson Grumman Panther	604	746	1349
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The Aeromodeller Fokker Eindhoven

I referred a few issues back to the APS Fokker EIV I was building for the Fred Longbon event at Old Warden - it is more or less finished now so here is a photo. For anyone looking for a simple model to build quickly, the Fokker (plan reference FSP551, price £3.30) has a lot going for it, with mostly straight lines and an absence of any separate control surfaces. I am in some doubt about the nomenclature EIV given to the published design; I am no expert on the type but as far as I can gather the EIV had a twin-row Oberusel and correspondingly wide-chord cowling - this one doesn't, and I've treated it as an EIII, of which there are many more photos. (EIV is correct GC).

The fuselage was built as per plan except for the replacement of the 3/32in. sq. balsa longerons with spruce to inhibit the 'starved-

Plan at right is our APS Fokker EIV by C.F. Edwards. 36in. design is available as plan FSP 551 for £3.30 including postage. Below: Amy Dennis admires Dad's freshly-built version. Below centre: Not a gruesome accident but the components for one of Pete's Pilots. Harness looks uncomfortably surgical. Prices start at £5.00.



horse' effect. The cowling was expertly bashed out for me by a friend, but the rest is plain sailing. The metal panelling is litho plate; the side cheeks were hand-formed over balsa after annealing (smear on some soap, heat over the gas until it blackens, and then dunk in cold water. The soap is merely a temperature indicator).

The tail surfaces were joined by a stub aluminium tube spar, sheathed by a close fitting outer tube glued to the rear of the fuselage. This allows adjustment of incidence. As for the wings, I added half-an-inch to the chord and moved the spars to the upper surface to avoid the dreaded elliptical dihedral.

The rigging wires are Laystrate C/L wire, tensioned at the wings with rubber bands; the wings themselves are attached via separate 14swg dowels in tubes, allowing the dihedral to be adjusted for the best compromise between scale appearance and stability.

The model was covered in tissue and silk. Colour finish was applied with car spray cans - I chose Duplicolour Sierra Beige for the fabric effect. Final weight came out at 10 oz., giving a wing loading of 7oz./sq.foot.



Miniature cockpit occupants

In a recent article I briefly mentioned 'Pete's Pilots' - a range of moulded latex figures available from P.G. Richardson at 45 Lichfield Road, Stafford ST17 4LL. I decided to try one of these in the Eindekker. Nearest scale was 1/12th. When ordering, you have to specify uniform type, facial style (mine has a moustache) and choice of helmet and goggles; I chose the ribbed helmet worn by German bomber pilots which may or may not be authentic in an EIII...

The pilot comes in several parts which

have to be assembled with cyano. Smaller parts such as the goggles and harness have to be cut from a latex sheet before assembly.

There are extensive instructions and some handy tips such as leaving the head loose so that it can be fixed after the pilot is installed. Also useful are the hints on painting - particularly where face and eyes are concerned. Acrylic paint must be used; a selection of useful colours in small quantities, including flesh, is available at a very reasonable price.

There is a lot of surface detail on these figures which gives plenty of scope for producing a first-class pilot, right down to buckles and buttons. If, like me, you hate this aspect of scale modelling, then Pete's Pilots will be a godsend. I only ever made one decent pilot myself, about fifteen years ago, and he has since had to fly a very wide range of aircraft in some rather unsuitable scales!

Indoor Scale congrats

Dear Sir,
Through the columns of *Aeromodeller* may I congratulate the organisers, judges, timekeepers et al, at the SMAE Indoor Nationals. I understand a record entry in all classes was recorded. Those modellers who did not attend missed a feast of creativity, inventiveness and works of art. Multi-engined gems; subjects in such tiny scales that flew happily, all of which ten years ago would have been laughed out of court as impossible... Included in the entertainment were approximately nine hours of magic plus the bonus of two excellent talks. The first was by Chris Coote on Electric Power for F/F Scale Models; the other by Charlie Newman covered Moulding Techniques. These alone were worth more than two quid, the ludicrously low admission. The display of F/F Scale Models on an upper floor, organised by Paul Briggs, added to this most friendly meeting. If you wished to ask a question, you asked... and were answered with patience, being left with a feeling that enthusiasts were interested in imparting possibly a lifetime of modelling, quite unselfishly. Thank you, Mr Sheppard, for the organisation; modellers, it was mirabile visu.
Hunstant, Norfolk
Alan Clarkson



Fuel up! E. Whitehouse readies his F/F Tiger Moth, neat in De Havilland School of Flying colours.

A mini-Vintage classic

GLADIATOR

Maurice Schoenbrun's
famous gas model
reduced to 20in. span
by Alec Gee

close as possible to the back of the 1/16in ply firewall (which carries the bound-on 20swg undercarriage). The motor bolts to a supplementary 1/16in. ply former ahead of this original firewall; the charging nozzle, which is carried behind it, protrudes through the bottom of the cowling block.

Wheels are simply from 1/2in. soft balsa block, spun up and sanded to appropriate balloon shape in an electric drill, bushed with scraps of plastic insulation from electrical wire and finished off with thin card hub-caps to conceal the blob of solder which secures them to the axles.

Get on with it!

The completed airframe was given a coat of thinned sanding sealer and carefully sanded. Light weight tissue was applied using a 50/50 dope/thinner mix as adhesive; the model was then subjected to a light water shrink followed by three coats of dope thinned with 75% thinners. Decoration from coloured lightweight tissue was, naturally, restricted to a minimum and the all-up, unflown weight came out at 49 grams.

Gratifyingly, the model flew straight off the board, describing wide left-hand turns in an extended glide on gas charges from a far-from-fresh CO₂ bulb. Later, when warmer weather arrived and with a new bulb in the charger, more energetic motor runs produced gentle power stalls which were soon eliminated by the application of the noseweight - actually three grams in all - referred to earlier. At this stage the tailplane and fin assembly was cyanosed in position for good, making the tail fuselage dowel, tailplane fixing bands and hook redundant and contributing in a small way to the reduction in tail weight.

In this configuration the Gladiator does everything that was hoped for, flying smoothly in wide, climbing left-hand circuits and gliding on and on when the power runs out ... just like its big brother of nearly fifty years ago!



DESIGNED WAY back in 1940, Maurice Schoenbrun's shapely Gladiator with its big 67.5in. broad-chord wing was typical of a new breed of American Class C gas models devised at the beginning of the '40s in response to free flight competition rule changes calling for a minimum wing loading of 8oz per square foot.

The graceful Gladiator met the challenge with spirit, turning in consistent flights of over three minutes on a twenty-second motor run - and this without the benefit of thermal assistance. On the occasions when thermal territory was entered, the model would soar and float for ever and, at the 1940 US Nats in Chicago, it was lost for the rest of the day, out-of-sight after 35 minutes, this too on a twenty-second, half-throttle Denny motor run! It was, and still is, a classic both in looks and performance.

The idea for a CO₂ version was sparked by the discovery of quarter-scale dimensioned drawings in an out-of-print MAP special of some five or so years ago (Radio Control Aircraft Extra). These, based on first-published drawings from the March 1941 issue of Air Trails, depicted Tom McCoy's radio-assist revival of the design. After a smidgen of photo-copied enlargement the resulting plan, giving a span of 20in. (just over one-third of original size) looked an absolute natural for CO₂. Even the wood sizes translated perfectly to standard dimensions!

Go for your Gladiator

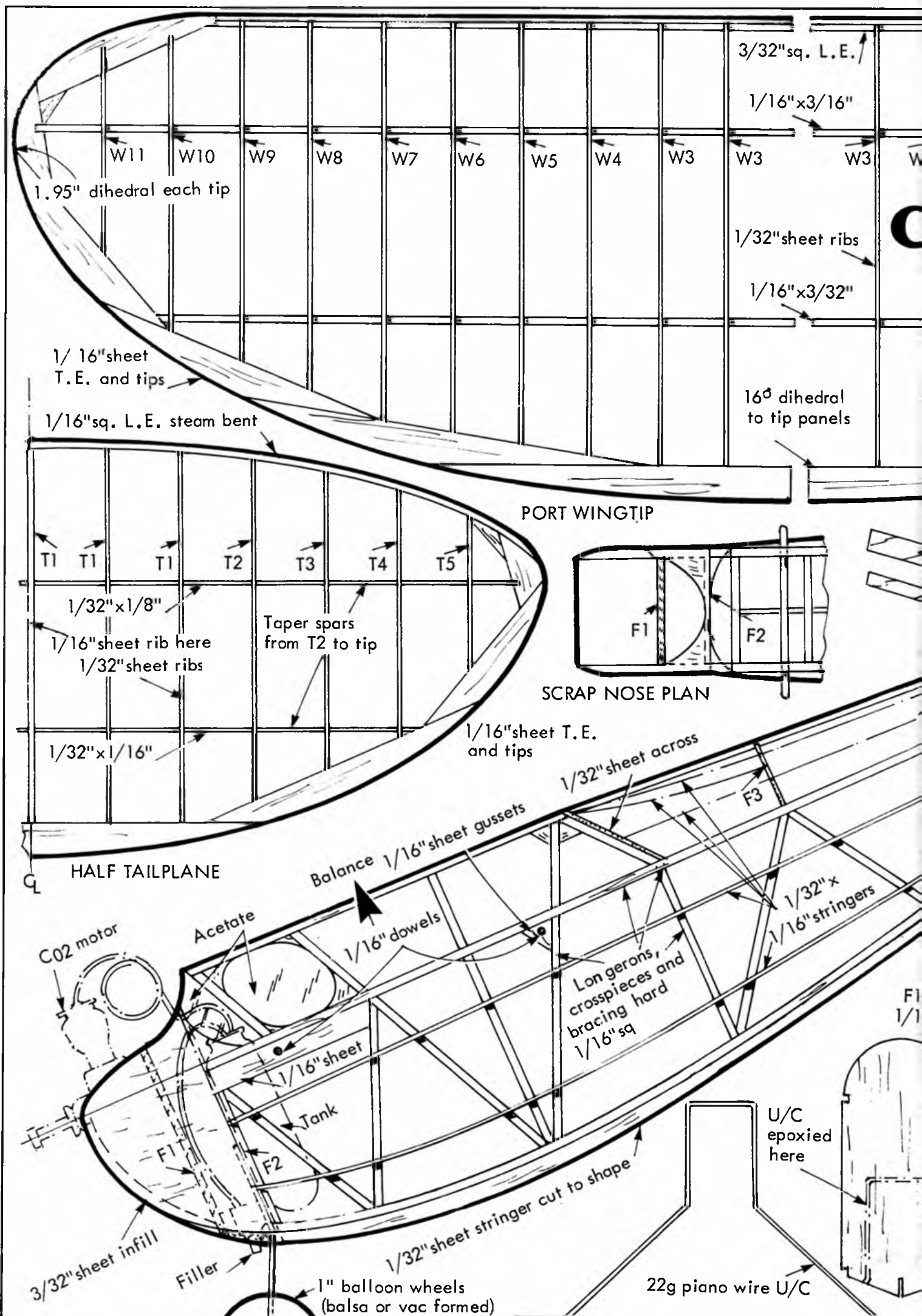
Building the CO₂ Gladiator proved to be pure fun! Cyano was used throughout for speed and lightness; and some carefully selected 1/16in. sq. and 1/8in. sq. strip plus

1/32 and 1/16in. sheet balsa, together with a scrap of 1/16in. ply, is all the timber you'll need for hours of pleasure! Choose medium hard 1/8in. sq. for the wing leading edge and a similarly robust pair of 1/16in. sq. strips for the lower longerons (the finished model will come in for a fair bit of handling around the lower front fuselage and our somewhat soft longerons on the prototype soon bowed under tissue tension and over-excited handling!). Wing trailing edges were sliced from medium 1/16in. sheet and all the ribs (both wing and tailplane) should be from the lightest 1/32in. sheet you can find. Think 'lightness' all the time when building the fin, tailplane and fuselage aft of the indicated CG location; this will pay dividends when it comes to flying and you may just manage to avoid having to add the slug of plasticine to the motor compartment which we found necessary...

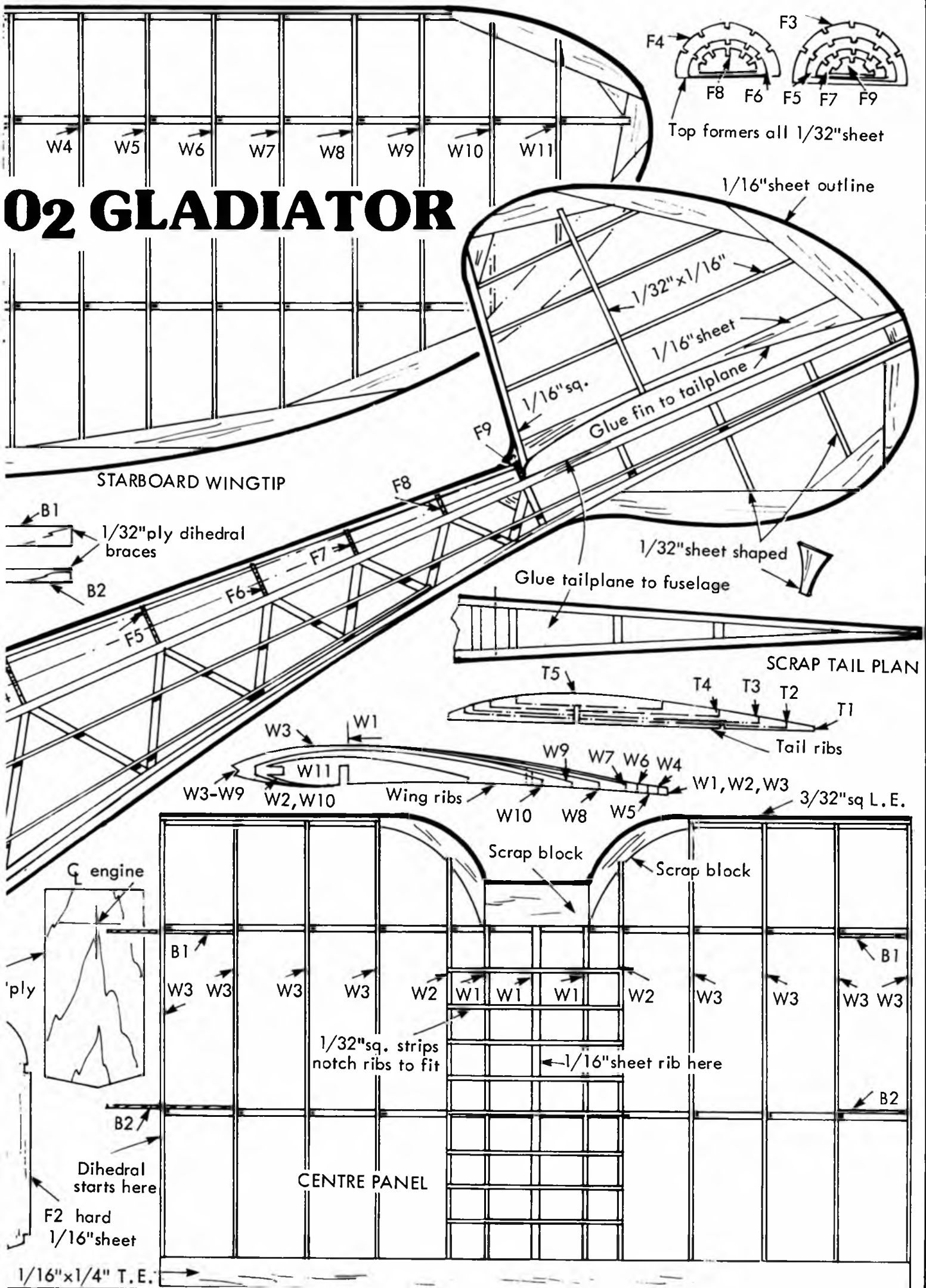
The recessed wing centre-section leading edge is a characteristic and pretty feature of the Gladiator. It could have been designed with CO₂ in mind; the old Micro Mold Shark motor we used fits snugly just where the original Gladiator's petrol engine was located and the coiled CO₂ pipe from the Shark's cylinder head tucks neatly into the leading edge rebate. The tank should be placed as



Tense stuff, this CO₂! Alec releases the Gladiator on a trouble-free test flight....



O2 GLADIATOR



MAN'S GREATEST FLIGHT



**Seventy-four miles pedalled in 3hr
54min: the epic story of the Daedalus
record flight by John McIntyre (left);
plans and detail drawings
by Pat Lloyd**

All at once Santorini appeared out of the haze as the featherweight form flew towards it over the bright blue sea...

MAN'S GREATEST flight, in terms of physical effort, design efficiency and sheer bravado established an incredible record on 23rd April. As an answer to the question 'What's next?' the possibility of recreating the mythical escape of Daedalus from Crete had first been suggested, back in May 1984, by John Langford and Mark Drela shortly after their Monarch HPA had won the £20,000 first prize in the RAeS-organised speed competition. Spanning nearly four years the project had bought together experts in the field of aeronautical engineering, meteorology, medicine and even classical literature - all with one, common hobby - **AEROMODELLING.**

Achievement

This aeromodelling-based achievement has reached far beyond the flight itself by pushing forward understanding of the limits of human endurance. Ultimately it could enable construction of high-altitude, long-duration

aircraft that may even find application in the Planetary Sciences - or be flown in the atmosphere of Mars as airborne 'Martian Rovers'.

Veterans of the MIT Chrysalis and Monarch HPA teams, most of them aeromodellers holding AMA National and FAI International Records, formed the core of this remarkable team. They set their target, survived disaster as well as success and with more than a little skill reproduced a classic myth with a reality that made headlines around the world.

Prototype success

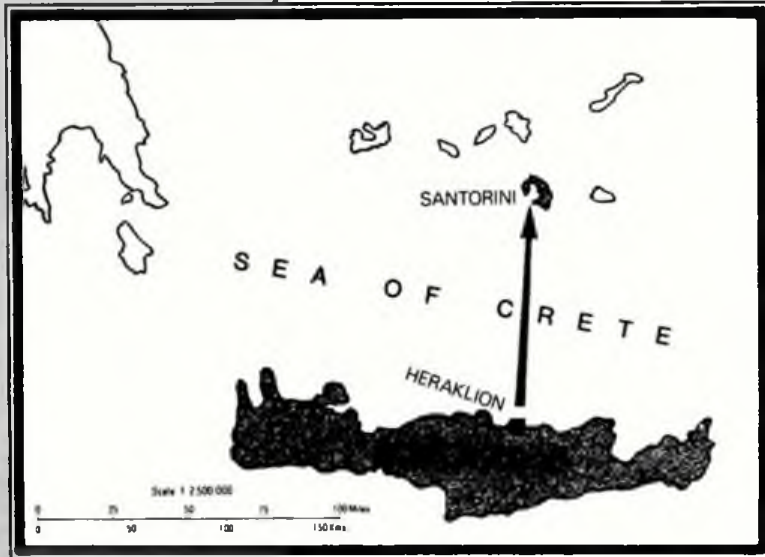
The Daedalus aircraft, unique amongst HPAs in that the limits of the pilot/engine were established from data collected after endurance tests carried out on a specially constructed ergometer, is the result of over two years' design and construction work. Only after the success of a prototype, the Michelob Light Eagle, sponsored by Anheuser Busch,

did the working group feel ready to build Daedalus. This accumulated many hours' flying time and set a distance record on 22nd January 1987 (when Glen Tremml flew 37.2 miles at Edwards Air Force Base).

Nearly three-quarters of a million dollars - actually \$685,000 - was contributed by major sponsors NASA, MIT and United Technologies, while many other companies donated valuable equipment and support.

Calculation and experiment

But what of the craft itself? Mark Drela, Senior Engineer was responsible for aerodynamic design. A past member of Chrysalis and Monarch HPA teams and Assistant Professor in the MIT Department of Aeronautics at MIT, he devised a computer programme accurately to predict the effects of laminar separation bubbles on aerofoil performance in order to design efficient wing, propeller and fairing sections. The extremely high aspect ratio wing, meant to operate at a cruise coefficient of lift (C_L) of 1.1 uses three different sections carefully tailored to the conditions of falling Reynolds Number as the planform tapers from 45in root chord to 15in at the tip.



Heraklion to Santorini - seventy-four miles across the Sea of Crete. A UK equivalent would be from London to Peterborough!

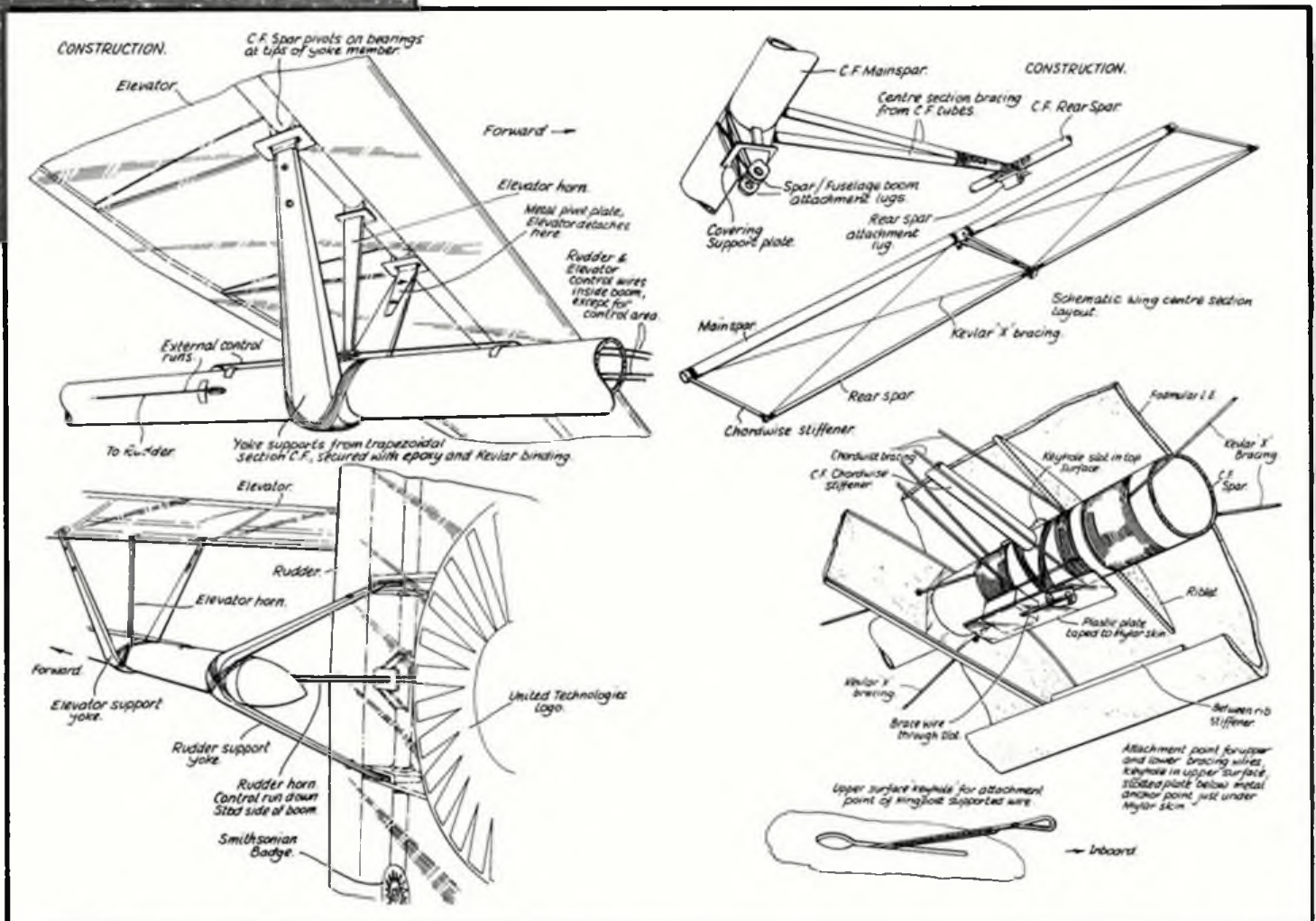
Everything about Daedalus is the result of careful calculation and experiment. For example, the fairing housing the drive shaft is asymmetric with a section that tapers with propeller diameter so that it can extract thrust from the twisted slipstream, thus increasing overall efficiency.

A flying speed of 15 mph was dictated by the need to fly against a possible light headwind and still make the seventy-four-mile crossing to Santorini in *under seven hours* - the longest daylight period for which

winds of under three knots could be expected!. Using a single bracing wire to carry some of the lift load from the wing was found optimum for flying speeds between 11 and 18 mph (an aircraft with extensive wire bracing, such as Gossamer Albatross, can achieve greater endurance and range, but not within a weather 'window' that would permit a crossing of the Cretan Sea).

The streamlined fuselage, which provides not only a pilot fairing but vertical area for stability, is suspended from the wing with just two small bolts. A semi-recumbent cycling position reduced frontal area; ergometer tests showed no disadvantage compared to the more usual 'upright' arrangement.

Power is transmitted to the propeller via carbon fibre drive shafts and special gearboxes built by Bob Parks, the Senior Engineer responsible for mechanical design. His uncompromising craftsmanship served as an inspiration to the team. The variable-pitch propeller, geared to rotate at 1.1/2 times pedal revolutions, is controlled through Bowden cable R/C model type 'snakes' from a small lever so the pilot/engine can match output to his pedalling rate. In truth, Daedalus is an REM model - that's Rudder/Elevator/Motor! There are no ailerons. Rudder alone provides more than adequate manoeuvrability during the long, slow flights. The all-flying fin and tailplane are connected to a side-stick at the pilot's right hand by closed-loop braided Kevlar cables. A foam servo tab, which runs the whole length of the fin trailing edge, generates a powerful centring force to allow 'hands-off' flight - a most important consideration, for at the end of a multi-hour flight the pilot, who will be fatigued, may not be thinking clearly at



the controls... Trim in pitch is managed with the all-flying tail.

Tubular secrets

The carbon-fibre epoxy tubes which form the craft's load-bearing structure are all hand-made by structural engineers Hal Youngren, Juan Cruz and Claudia Ranniger using uni-directional CF pre-pregs. This material is supplied uncured, sandwiched between waxed paper backing sheets. It is cut to size and wrapped around Teflon release-film-coated aluminium mandrels. Great care is taken to ensure that the spirally wound carbon fibre plies butt exactly, leaving no gaps. The number of layers, and their angle of application is determined by the load to be sustained. For example, in the forward spar (which carries not only the main wing bending loads but some compression and tension too) the carbon fibre is applied at plus and minus forty degrees to the tube's longitudinal axis. On the other hand, the equivalent angle at the rear spar, which carries only tension and compression is ± 12 degrees.

'The entire fuselage tips the scales at 5lb 14ozs...'

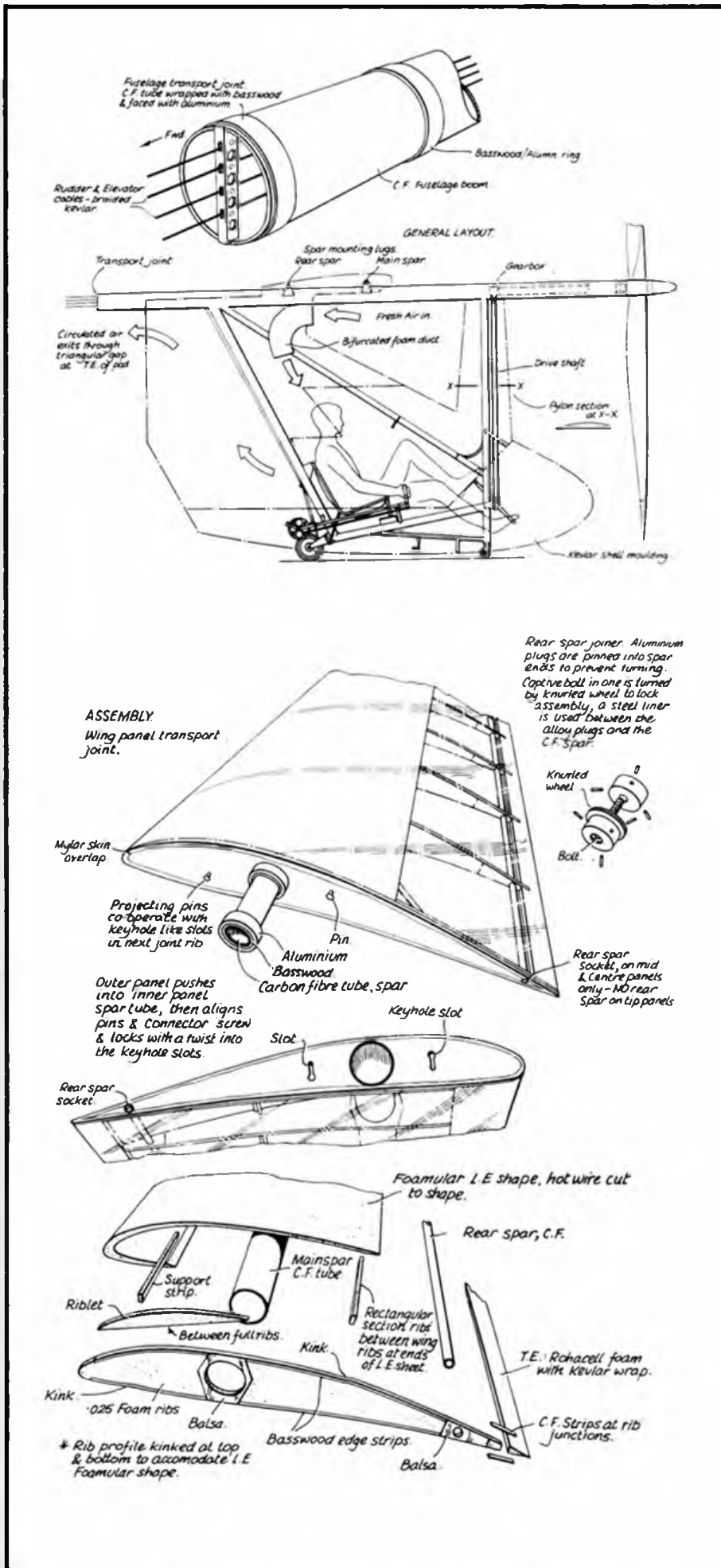
Tapered caps are then added to form flanges at the top and bottom of the spar. The tube is wrapped with 'peel ply' to leave a rough surface which will aid subsequent bonding. Finally the whole sandwich is tightly bound with heat-shrink tape on a purpose built machine.

When enough tubes had been made they were taken 200 miles to the Sikorsky helicopter plant where they were oven-cured at 175°. At this temperature the aluminium mandrel expands and the heat shrink tape contracts, thus compacting the carbon fibre. Tubes over one-inch diameter are pulled off their mandrels - an operation not always without difficulties, as modellers or builders of composite HPAs will be aware! After several unsuccessful attempts to free one sixteen-foot tailboom, involving winches and two university rugby teams, the trio of tube builders stayed up till 2am to ensure no witnesses before fixing one end of the mandrel to a concrete bollard and lashing the tailboom itself to the back end of a truck, which was then slowly driven away... Smaller tubes are etched out with hydrochloric acid, as usually employed for cleaning swimming pools.

To prevent catastrophic buckling of such thin walled, large diameter tubes, balsa/Rohacell sandwich bulkheads are fitted at 8-10in intervals. Tubes are butted at joints, reinforced with carbon fibre cloth and finally lashed with Kevlar or carbon fibre. The five-piece, 112ft mainspar, stressed to 2G, weighs only nineteen pounds - and the entire fuselage structure, which is 26ft long and 6ft high, tips the scales at just 5lb.14oz!

Ribs and wrapping

In common with other HPA projects, wing ribs are from 1/4in thick, 1lb density styrofoam beadboard. Cap strips of 1/32in





Ryan recumbent cycle paces Daedalus 'A' over the vast flats of Edwards Air Base in California. Significantly, with experienced cyclists, the aerodynamic efficiency of the Human Powered Aircraft enables airscrew drive to match the effort required for the wheeled bicycle (Steve Finberg photo). Inset: Glenn Trammell studies the instruments before a test flight. Advanced lightweight electronics monitored flight and physical data (Mike Smith photo).





L to R: 'How did it go' — Post flight checks by the Flight Directors and Engineers logged every detail. At this stage the drive shaft aerodynamic fairing is not fitted. Who played with the Daedalus name stickers we wonder! (Mike Smith photo). Next: Preparing the mainspar for assembly — not so far removed from aeromodelling techniques (Peggy Scott). Next: The Imported Hangar at Hørsholm proved more difficult to erect than the three HPAs! (John McIntyre). End photo typifies the continuous training programme for the five pilots on the project. Road work plus the simulator kept fitness at peak (Steve Finberg).





The sheer grace of Daedalus 'A' in flight at Edwards is captured in Mike Smith's photo where the azure Californian sky emphasises the elegant ultra light form. From the first tests over the desert, the team of aeromodelling scientists had every confidence in making the target flight over the Aegean sea.

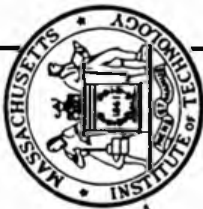


At the point of no return — midway on the 73+ miles venture, Kanellos Kanellopoulos advises the Command Boat that he's coasting and confident (John McIntyre). Structural detail of the so clean airframe, even without the drive shaft fairing makes Daedalus representative of a new generation of HPA designs (Mike Smith).



Below, the Flotilla of Greek Coast Guard and Navy ships plus inflatables track Kanellos on his historic record breaking flight from Heraklion to Perissa beach on Santorini (John McIntyre).





This drawing depicts 'DAEDALUS', Massachusetts Institute of Technology's Man-powered distance record holder at the time of its 23 mile flight from Hebalicon, Crete, to the island of Santorini, on April 23rd 1988. Grateful thanks and acknowledgements to Mark Dretz of MIT, John McInyre and Andrew Cranfield for sketches, photographs, drawings and enthusiasm!

Kingpost

4 Transport joints, indicated by 'X'

FRONT ELEVATION

Carbon fibre tubular spars, three sizes: Centre section, 3.5 dia; Mid section, 3.20" to 2.75" dia; Tip section, 1.75" to 1.75" dia (internal)

CF Spar RIBS RIBS I.E. Sheet

PARTIAL UNDERPLAN, WING ONLY

CF Real spar Keel internal x bracing

I.E. Sheeting, top surface

Wing skinned with 0005 Mylar

Plug in kingpost

V Air exit, Rear edge of cabin pod

SCRAP REAR ELEVATION



071 Steel left wire

Rudder offset to 1/2 of boom

Empty weight 70 lbs
All up weight 279 lbs
Span 112 ft
Length 281.9 ms
Prop diam 11.3 in
Wing area 372 sq ft
Design speed 14-17 mph
Power 0.27 hp
Prop RPM 108

All lights prior to April 23rd were made with the kingpost and bracing wires in position to protect the wingtips from damage. On the day of the attempt the post was removed and wing walkers supported the tips



PLAN VIEW

Propeller driven Airspeed Indicator
CF Tub boom, 3.20" to 2.75" internal diameter
CF tail spars, 1.00" to 0.75" ID

Drive shaft bearing

Scraper linkage extends through rudder



STARBOARD SIDE ELEVATION

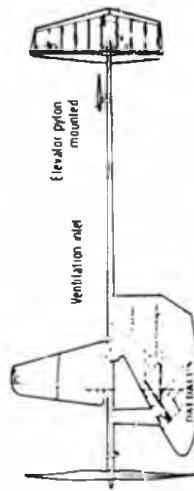
Markings indicated by numbers are shown larger elsewhere



STARBOARD SIDE ELEVATION

Starboard wing omitted to show kingpost and root

United Technologies company logo
Smithsonian badge
US National flag
Greek National flag
NASA logo



PORT SIDE ELEVATION

Basswood strip, 0.75" x 0.2"

foam strip bolted between ribs

Riblet line

Green National flag

US National flag

Hot wire cut foamular 1.4 lb/ft

Balsa 03

ENLARGED WING CROSS SECTION

Carbon fibre tubular spar

Ribs, Styrofoam

Rear spar, 0.75" ID CF tube

Keel epoxy skin

ENLARGED PROPELLER IN-BOARD CROSS SECTION

foamular core tapered CF tube 1.0" - 0.75" Spar

0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8 9

SCALE feet

DAEDALUS

ENLARGED MARKINGS. See in-board side elevation for positions

Drawn by A.P. LLOYD

United Technologies

DAEDALUS

HUMAN-POWERED DISTANCE RECORD-BREAKING AIRCRAFT

basswood are bonded with aliphatic resin; holes around the spars are locally reinforced with 1/16in balsa sheet.

Remarkably, the leading edge sheeting is hot wire cut - not wrapped - from 1.1/4lb density pink foam sold in the States under the trade name 'Foamular'. Steven Finberg, Senior Engineer in charge of electronic design, built a numerically controlled cutter expressly for this purpose. This resembled two upended 'X-Y' plotters bolted to a ply base and connected by nichrome wire. IBM donated a PC which can be programmed to cut the complex, tapered wing sheet panels. Result: a most accurate profile which means the lowest drag and required power yet achieved in any HPA.

Covering of 0.0005in tensilised Mylar, donated by Paul MacCready of Gossamer project fame (who kept in close touch with the Daedalus team throughout) is fixed to the wing structure with contact adhesive. 'Incredible' is the only way to describe the empty weight of 69.1/2lbs; carefully calculated construction of carbon epoxy being solely responsible for this.

Pedal power

The major difficulty facing HPA builders has always been finding athletes who are also qualified pilots. In a complete reversal for the Daedalus project, five world class cyclists were recruited and taught to fly, first in high performance gliders and then in a flight simulator built by Steven Finberg. Training programmes were staggered so that one flier would always be at readiness. Who were the chosen ones?

Kanellos Kanellopoulos is a fourteen-time

Greek cycling champion, a graduate of the University of Athens and a member of the Greek Olympic Cycling team. Erik Schmidt and Frank Scioscia are full-time amateur cyclists from Colorado and Pennsylvania respectively; Frank being a member of the US National Cycling team. Co-ordinator and senior member of the Daedalus pilot team was Glen Tremml from Connecticut, an amateur triathlete and licensed sailplane and light aircraft pilot. Fourth member of the pilot/engine team was Greg Zack, whose

'To keep Daedalus flying nearly one kilowatt of waste heat is produced...'

credentials include two years' participation in national level cycling races in the States.

What problems are faced in translating human power for flight? Working as an aero engine, the pilot reaches only about 20% efficiency, which means that in generating the 200 watts needed to keep the aircraft flying nearly one kilowatt of waste heat is produced - as much as a one-bar electric fire! Preventing overheating and dehydration thus assume major importance. Most of the fuselage facing is covered in reflective, silver Mylar to minimise solar heating, and a large, carefully designed air scoop beneath the wing collects the oh-so-important cooling air.

To compensate for fluid loss, five litres of a cocktail of a carefully balanced mixture of salts, water and glucose, formulated by project physiologist Dr. Etham Nadel in association with the Shaklee Corporation who specialise in the manufacture of sports foods, was carried in six plastic 'lemonade' bottles. Consumption was regulated at one litre/hour!

First wings

First flight of Daedalus A was on 2nd December 1987. By the second week in January '88 twenty-four hours of air time had been accumulated, including four flights of over 25 miles each (thus breaking Bryan Allen's record of 22 miles, set in 1979) during a three-day period by Greg Zack, Erik Schmidt and Kanellos Kanellopoulos.

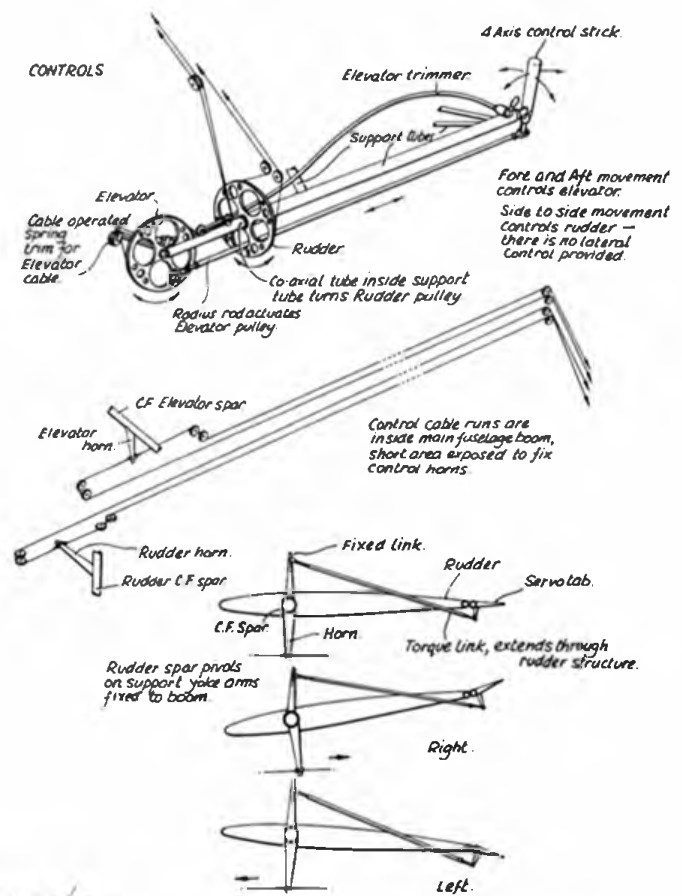
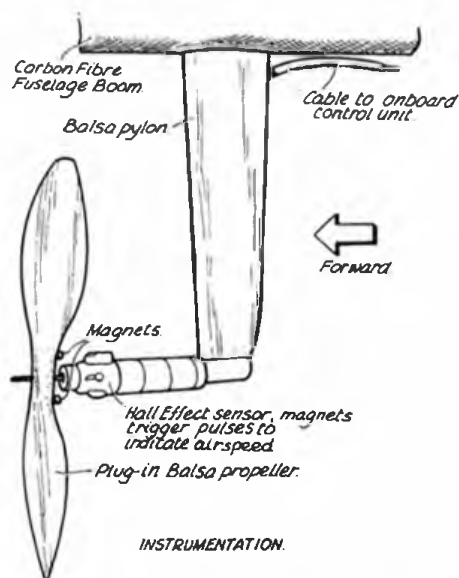
Daedalus flew well from the start, its power requirement of only 2.9 watts per kilogram of pilot mass at 15mph being significantly lower than the equivalent figure of 3.5 w/kg for Gossamer Albatross for a speed only two-thirds as much. The specific power requirement (watts/kg) is the governing requirement for successful human powered flight. As a further comparison, Gunther Rochelt's Muscular I needs 220 watts for a pilot weight of 54kg, meaning an endurance-limiting 4.2 w/kg requirement.

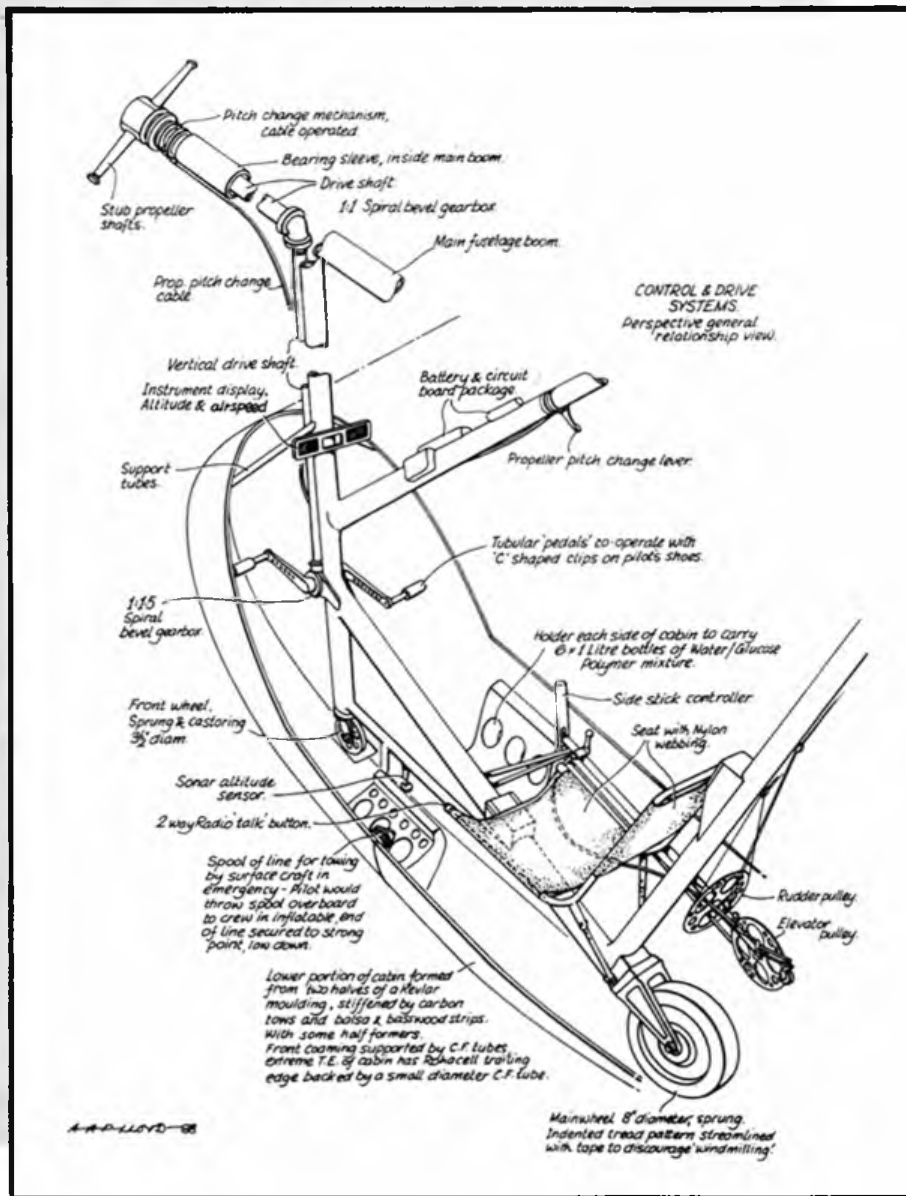
Daedalus A was badly damaged in a crash on 7th February 1988, caused by a combination of a thermal under one wing and a stretched rudder cable. Repairs were not completed until the middle of March. In order to minimise the risk of a further similar crash the dihedral was slightly increased. By February 1988 Daedalus B was ready. After

All sketches of Daedalus structure, and the detailed scale drawing, were produced by Pat Lloyd from notes and photographs provided by Andrew Cranfield and John McIntyre on site in Heraklion.

Special thanks are due to Mark Drela of M.I.T. whose scale drawings of Daedalus form the basis of Pat Lloyd's views, reproduced to 1/144 scale, on p.443.

Copies of the original 1/62nd scale drawing are available from ASP Plans Service, 9 Hall Road, Maylands Wood Industrial Estate, Hemel Hempstead, Herts HP2 7BH, price £1.25 plus 50p postage. Quote plan No. 3085 when ordering.





had to be made on the morrow, with Sunday as reserve date, if flight operation had to be cancelled.

John Langford, programme Manager, who had initiated the Daedalus project four years previously after leading development of Chrysalis and Monarch craft, explained the rigging of Daedalus so that no one would walk into a bracing wire in the pre-dawn darkness. The team's Director of Engineering, Hal Youngren, dealt with the ditching and recovery procedure (the plan was to dismantle the craft and load it onto one of the coastguard boats). A quiet supper and early bed was next for the team after the press had melted away.

By 3am the weather boat, out at sea beyond Dia, had reported a one-knot southerly wind. Just what was wanted. At five o'clock we walked down to the harbour. Equipment was stowed and someone went in search of ice cubes for the champagne.

Confidence! Radios on, and crews on boat and at the field could now communicate.

As Daedalus was rigged under arc lamps it was time for crowded thoughts. Would this be just a practice? Would the flight be called off, allowing everyone to return to the Xenia Hotel for breakfast and Juan Cruiz's seminar on Daedalus' structural design? Or might there be a ditching? Pilot fatigue? Supposing the flight was achieved - what would happen at Santorini? The aimed-for beach at Perissa is small with soft sand and trees beyond. At a fast, downwind landing might the aircraft bog down, crumpling the wings forward and precipitating the pilot through the windscreen?

The boats drifted half-a-mile offshore in the cold dawn land breeze. Radio interrupted - and we heard that fourteen-times Greek cyclist champ Kanellos was taped into the cockpit and spinning the prop to warm up. Out at Santorini the weather station reported a three-knot southerly. It was up to Steven Bussolari. His was the responsibility to ahead or cancel.

Came the OK - the flight was on!
...and away!

Daedalus was supported, gently, at the wingtips. A smoke flare's horizontal trail meant a momentary wait for a lull - then at 7.06 Kanellos was rolling. Sun flashed on the propeller as daylight appeared under the wheels - an easy take-off despite the pilot's concern about the strong tailwind.

To the offshore observers Daedalus grew steadily larger as it seemed to drift out to sea, chased by inflatables. Sunlight glanced from those elegant wings as it swept by, fifty feet up. The flotilla raced out past Dia, throttles wide to keep pace with Daedalus which was now making 20 knots over the water thanks to the healthy tailwind. Kanellos made sure he kept above the turbulent layer next to the surface - doubly sensible, for the extra height would give the leading inflatable a few valuable seconds in which to pick up the line if there were problems. In this way a water landing could be avoided and Daedalus could be towed to safety for a further attempt.

In company with Louis Toth from MIT I tried unsuccessfully to count Kanellos' pedalling rate, or cadence, to get a figure for prop RPM. In fact, the pilot put in an almost-constant 80 revs at the pedals to give 120 at the airscrew. Kanellos radioed his pulse rate and airspeed every fifteen minutes, allowing careful monitoring of his fluid consumption to avoid dehydration and exhaustion.

testing, both craft (and the Michelob Light Eagle) were taken to McGuire where they were loaded into a Greek Air Force C-130 and flown, via Athens, to Heraklion on Crete itself.

There had been no idleness in the preceding weeks. A hangar had to be shipped to Crete and erected for the craft's arrival - a process which took rather longer than expected as the crew were at first unable to reconcile the high level of craftsmanship needed for HPA assembly with the rather more basic standards usually applied to hangar building!

Daedalus B was given a shakedown flight at Heraklion Airport. It seemed as though the whole town had turned out to watch, for the terminal building balcony was packed as the craft was carried out and rigged with the sea and the barren island of Dia, about three miles offshore, as a backdrop. After a short roll the wheels lifted from the tarmac and Daedalus slowly flew the length of the runway - a milestone in itself; its first flight in Crete.

In the event it was to be nearly a month before the weather, hotter than expected and dominated by persistent headwinds, allowed a chance for the Santorini flight. Three attempts had to be abandoned in the first week alone. This frustrating period was spent in making detailed improvements to the

aeroplanes, and, of course, pilot training continued so that one was always on stand-by. Various unsuccessful attempts were made to cycle up Mount Ida in the centre of the island! Defeat - and buckled wheels - were the result. Nevertheless, besides sightseeing, time was taken up with a useful series of seminars covering project-associated topics such as Aerofoil Design and Documentary Film Making.

Readiness...

Towards the middle of the third week in April '88 the evening weather forecasts began to look more hopeful. Northerly winds dropped and the sea became a millpond. During Friday the 22nd, Steven Bussolari, Project Meteorologist, was frequently cross-examined, and there was speculation about what might happen at one Athens newspaper which had run an article stating that the team had given up and gone home!

At the 7pm press conference MIT student Tim Townsend surprised many by passing round a half-inch length of carbon fibre tube, announcing that he had saved two grams and a little drag by sawing off a redundant bit of the fin. Steven Bussolari, with aid of a weather map that had taken all afternoon to prepare, forecast light, southerly tailwinds on Saturday and Sunday. A definite attempt

The wind began to veer west, slowing Daedalus and forcing Kanellos to crab in order to stay on course. Calm conversations passed between the boats and the group on Santorini. John Langford in the command vessel announced the records as they were set; first came straight-line distance after 37.2 miles, followed by 2 hours, 49 minutes duration at 9.51am. Somehow Steven Finberg had managed to get on board an escorting coastguard helicopter. He raced past at wavetop height, filming from the open door. Louis and I shared an impromptu picnic with our crew on LS 34, during which they were presented with Daedalus sweatshirts to mark the occasion.

Then came drama. Just after 10am a container ship was spotted on a collision course with the flotilla. At first contact was unavailing; then the skipper thought he was the victim of a hoax. Once convinced, he made a spectacular about-turn to divert from trouble.

Santorini ahead! On the beach the wind was gusting at five knots, parallel to the shore. As we powered ahead to be on site for the landing, Daedalus shimmered over the sea, now far astern and to starboard. Thanks to the local radio station, which had broadcast progress reports every half-hour, about 400 spectators were ready to welcome Kanellos.

The record!

Ashore - and how hot was the black sand after the cool sea wind as we ran to the landing area, already marked with flares. Then Daedalus curved in as Kanellos tried to head into wind - and the starboard wing folded as the fin went hard over, tumbling the craft ten yards offshore. Kanellos broke through the Mylar door and swam to the

beach where congratulations and champagne were on hand to commemorate a record-smashing seventy-four mile crossing in 3hr. 54min, giving an average speed 18.5mph.

As Daedalus was pulled ashore the scene was a mixture of crash, conference and beach party. There was no escape for Hal Youngren, the project's Chief Engineer, who was interviewed for TV while he was still in the water, grasping one end of the shredded wing he was helping to rescue. He told them; *'This is easily the coolest airplane crash I've ever seen!'*

'Celebrations continued late into the night... surely more aeromodellers share their vision...'

The wreckage was loaded into the waiting trailer, parked at the beach for over a month in readiness. Then it was time for the Press as John Langford stood atop a beached boat, first with the pilots, then with the rest of the team, to spread the words of achievement.

Suddenly the team found themselves alone on the beach. Hal went to phone Bob Parks, the Senior Engineer responsible for mechanical design, with the news. No matter that over in California it was three in the morning! Juan Cruz, composite structures mastermind, summed up feelings by his comment that without the crash, which underlined the craft's fragility, it would all have seemed too easy. Project Engineer Jean-

Joseph Cote added, *'That wasn't a crash - that was a happening!'*

Much to her credit, the owner of the Elfersina Hotel (where the weather station crew were based) wasn't in the least ruffled by the sudden invasion of almost the entire Daedalus team, dishevelled, sunburned, some clutching pieces of aeroplane, and for the most part without a Drachma apiece. And imagine everyone's delight to find, on the verandah writing postcards, Peter Ernst, a Swiss leading builder of human-powered vehicles. He had spent a month at Santorini waiting to see Daedalus. Never had he any doubt that it would be successful.

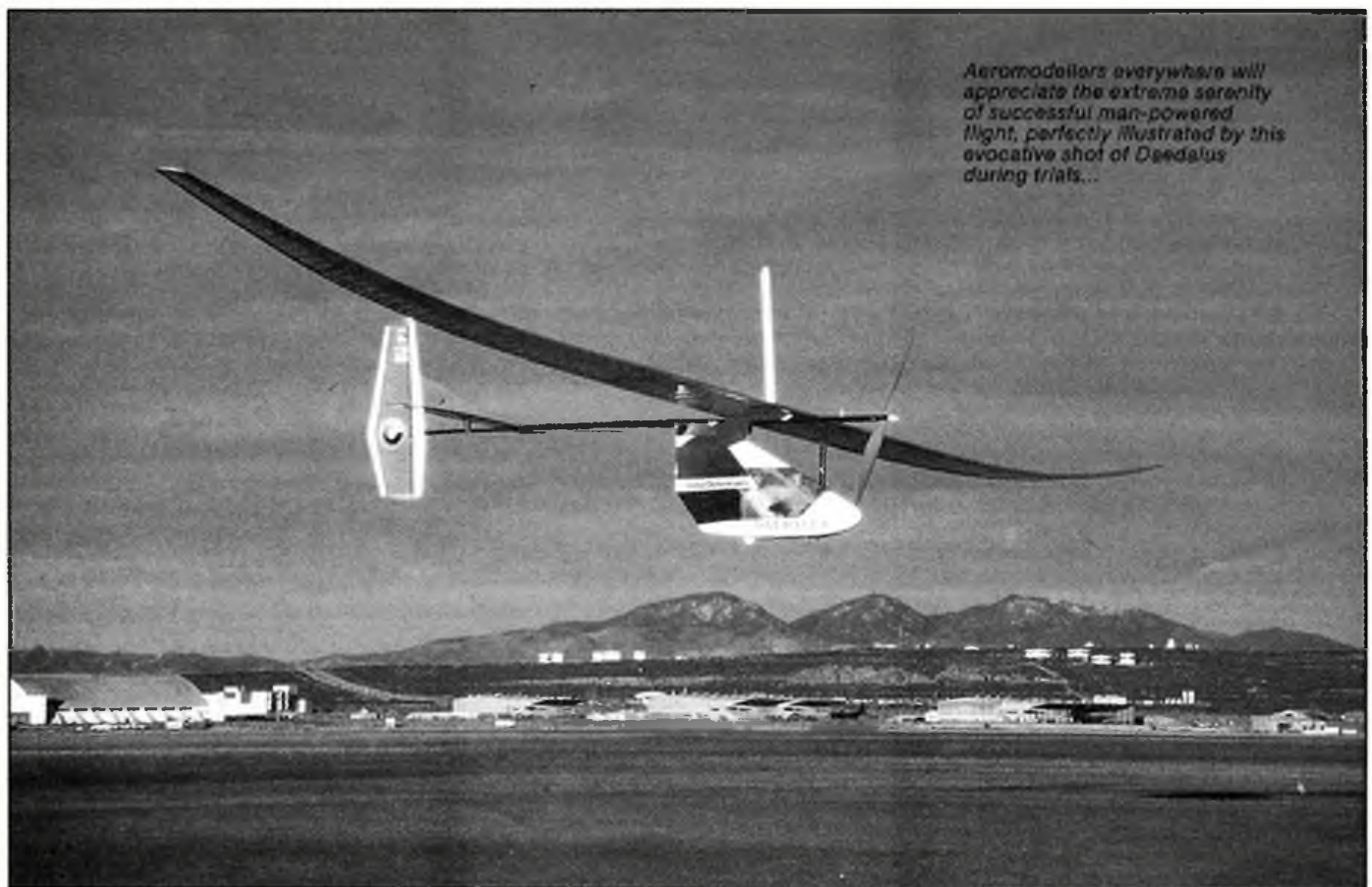
Celebrations continued late into the night. It was after 2am before the remains of Daedalus were finally collected from the beach and allowed to slumber outside the hotel...

What next?

The story does not end there. The Michelob Light Eagle is to return to the USA for more flight tests and Daedalus is assured of display in the Smithsonian Institute. Then what? Henry Kremer is to sponsor two more prizes for human-powered flight, as announced in Hangar Doors in this issue. The success of a small group of dedicated enthusiasts shows what imagination and ingenuity can achieve - surely there are more aeromodellers and engineers who share their vision?

But perhaps the final words should rest with Juan Cruz. After the press had departed, seemingly bemused by an aeroplane crash where everyone was happy, he said: *'That's it, folks. You've been working for three years; you've been famous for fifteen minutes - and I bet we miss the news!'*

Miss the news? Man's greatest flight? Not a chance...



Aeromodellers everywhere will appreciate the extreme serenity of successful man-powered flight, perfectly illustrated by this evocative shot of Daedalus during trials...

FLY LEAVES



International Peanuts and Pistachios, Volume Three

Compiled by Bill Hannan. (Available from Box A, Escondido, CA 92025, USA. Price \$6.70 air mail to Europe. ISBN 0 9611652 5 1).

'Welcome to Volume Three' are the first words you read on opening this fun-packed slim volume. We'd endorse that fully. Within these pages is inspiration, and help, to build a variety of these perhaps most characterful of Indoor Scale models. Maximum wingspans of thirteen and eight inches define Peanut and Pistachio respectively (that is, as far as the UK is concerned; alternative, overseas criteria are nine-inch and six-inch overall length). We liked the scale drawings and data for the Wedell-Williams Racers; not to be heretical, we'd say that here's a trio of likely candidates for enlargement to Indoor Air Race size for the next Alumwell meeting. Build-from plans for the Farman Moustique, Piper Cub and Caudron Type N, although hardly unusual subjects, are meant to urge the reader to get out the balsa; but it is the photogalleries that enthral most. Our favourites were the Peanut DH Humming Bird and Gee Bee Z (!). Good to see the work of some Brits in there, too. And amongst the feedback from Volume Two we just have to share this view from Georges Chaulet:

'Why are small models particularly interesting? Because this human vision is stereoscopic... a small object, close to... is more completely seen than a larger one. The head of a pin reveals more than half its surface... a hot-air balloon is so large that we may see less than half of its surface at close range. The earth is seen with so little relief that it appears flat to us. Our appreciation of a miniature object is more complete. Certainly we find interest in very small paintings and sculpture.' Perhaps you agree. Buy this energetic production and find out!

August 1988

Aircraft of the Royal Air Force since 1918

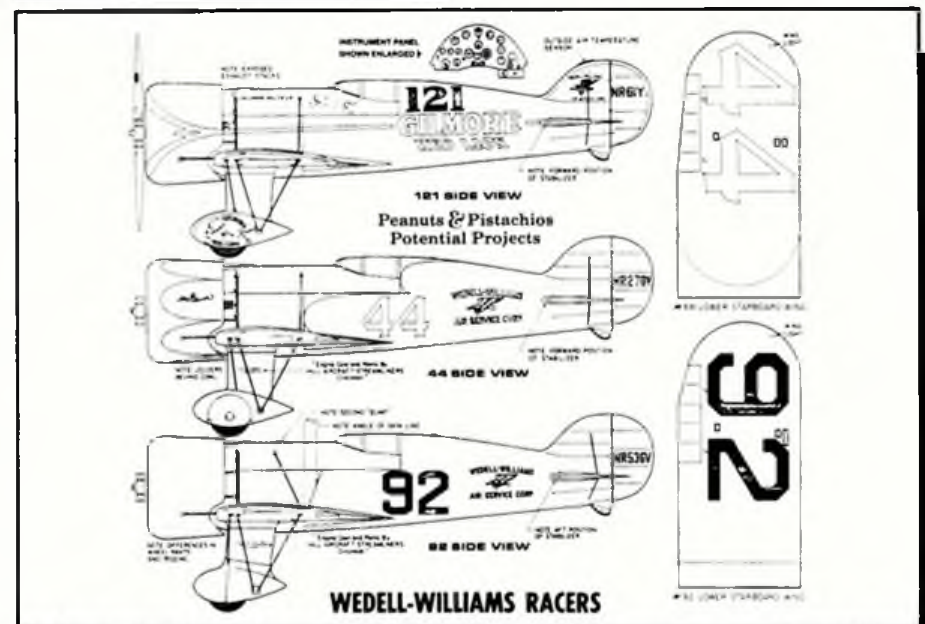
by Owen Thetford, and Saunders and Saro Aircraft since 1917 by Peter London (Putnam; £25 and £20 respectively. ISBN 0 85177 810 0 and 0 85177 814 3).

One updated re-issue and one new publication here to add to the library shelves. Aircraft of the Royal Air Force, a most popular volume since introduction in 1971, now includes latest types such as the Tornado F.3, Harrier GR.5, TriStar KC.1 and Boeing Sentry, to name but a handful. John Sizer - a name not unknown to scale enthusiasts - has provided twelve new three-views which are augmented by over seventy photographs of these fresh recruits. Much of the rest of the text has been revised, and expansion of appendices to makes this yet another indispensable full-size reference.



It is about time that the work of Saunders and Saunders-Roe was chronicled in this series. Peter London's refreshing volume shows painstaking research, not only of the multitude of flying boats and seaplanes but projects, rotorcraft, and those most modifiable of subjects, the Simmonds and Spartan aircraft of the late 20s and early 30s. We wonder who will be first with a Cruiser tri-motor for free-flight? Despite occasional failures, most notable of which is the unhappy Lerwick, and the curtailed effort of Princess and SR 177, the story of this company is of bright success and logical progression. This makes for a most interesting read. Peter London has done a fine job. You'll love it — but you'll wish you could have seen the Duchess project in flight...

Below: Wedell-Williams Racer gen — just part of the compelling third volume in Bill Hannan's International Peanuts and Pistachios series...

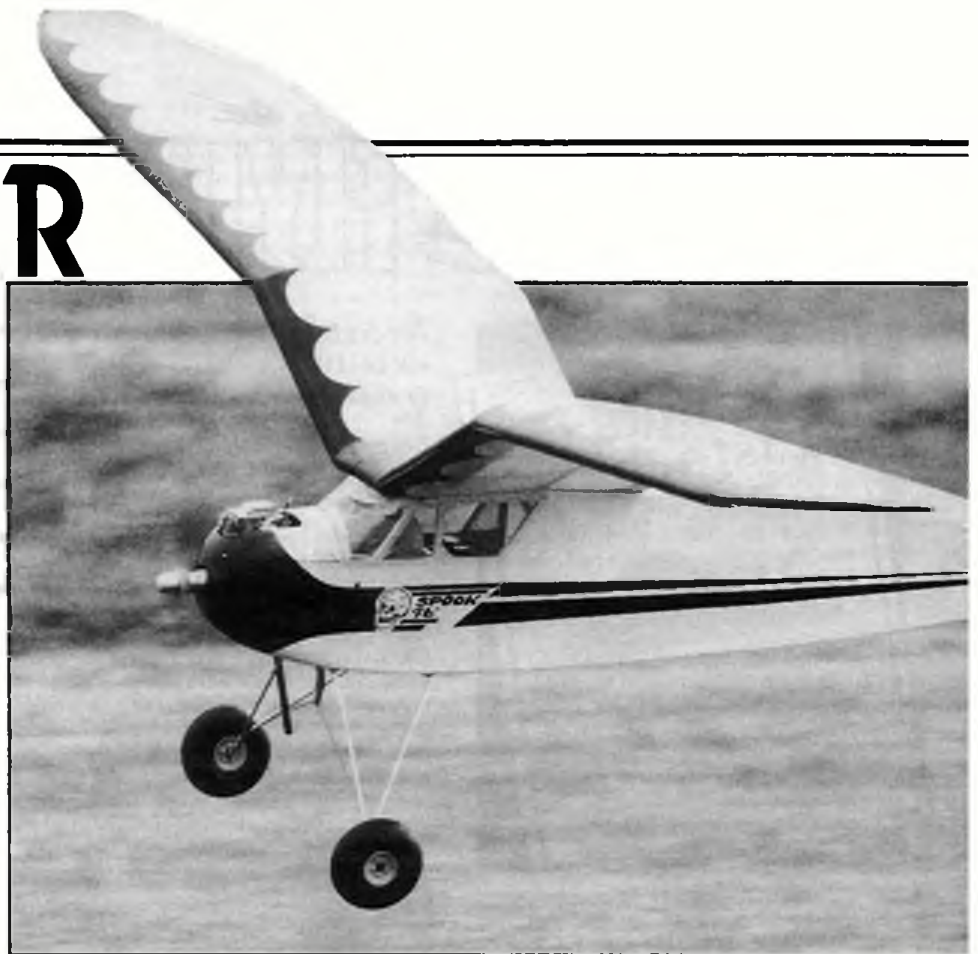


VINTAGE CORNER

Alex Imrie takes to the air at our Large Model Day at Old Warden and – just for a moment – indulges his Scale interest...

IBELIEVE that all model aeroplane enthusiasts secretly admire the flying scale model. After all, when we first were attracted to the hobby, the models that we chose were almost always those that looked like the 'big ones'. In my case, although my father built duration type models, which meant that I was raised in a model aeroplane environment, I did not try to imitate him, but made flying scale models, being fascinated by all the detail that could be incorporated into shapes that bore romantic names like Mr Mulligan, SE 5 and Fokker Triplane. They were, of course, too heavy to fly; but although I went on eventually to make pure flying models, I never lost my flying scale interest.

It was this dormant desire that drew me to Large Model Day at Old Warden on 15th May, because there is absolutely no doubt that in the air, large models are much more like the real thing than models of normal size. Despite the strong wind which prevailed all day it was sunny and warm, and a good

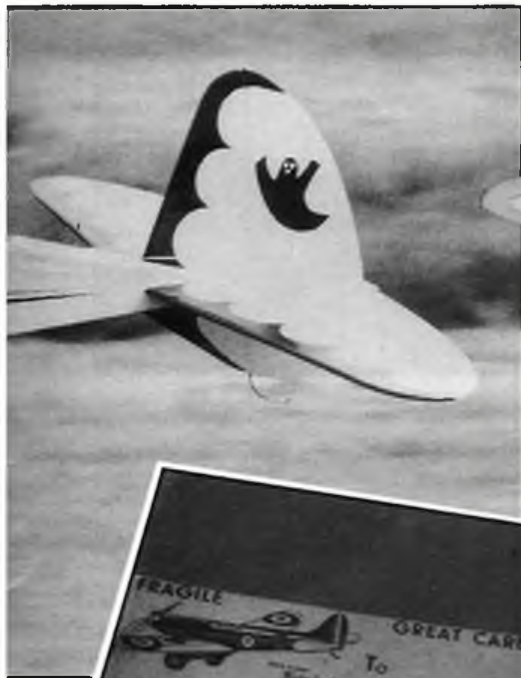


attendance resulted. R/C frequency slots were continually filled except when last-minute hitches prevented participants from getting to the flight line with a serviceable machine. The emphasis was, of course, on large flying scale models, but one or two giant vintage designs present will be commented upon in due course.

At a meeting like this there are always a few outstanding models that cause particular

Above: Lloyd Ressler's 96in. enlarged Spook. Laser 75 powered, flies low and slow at Large Model Day. The gull-wing layout was said to have been inspired by the full-size Martin PBM patrol flying boat. Below: The Avro Avian that so impressed our columnist – John Armstrong's Enya 120 four-stroke powered beauty is a delight in maroon and silver. Not vintage – but we just had to include it...





Above: You too can have a finish like this! Ken Tansley's double-sized Keil Kraft Bandit from Balsa Cabin plans is Merco 49 powered and has Fleet R/C gear. Undercarriage is beefed-up. Secrets of neat nylon covering in text. Left: US model aviation historian Walt Grigg sent us this shot of his original Rigby Swallow in the box! Total cost from manufacturers, the Vase Press Ltd, Thrapston, Kettering was 2/6d! Below: A Joe Ott box from the Whitman range, beautifully printed in five colours. Pic from Walt Grigg, who enjoyed our tribute to Ott in last December's Vintage Corner.

attention to be lavished on them because of rare choice of prototype or the high standard of execution that a familiar shape receives. I particularly liked the Enya 120 powered silver and maroon Avro Avian registered G-ACGT. Only the Master Airscrew flying propeller gave a hint that this was indeed not a full-size aeroplane that had forgotten to grow-up! It was quite the best flying scale model that I have seen in recent years. Not only did the cockpits contain exact scale instruments (like the air speed indicator, engraved 'Moth' and 'Stalling Speed 42 mph') and correct non-sensitive altimeter, revolution counter and oil pressure gauge, but there was a wealth of detail on the airframe and in its fittings; for example the use of scale-sized pinking on the edges of the rib tapes! Working folding wings were fitted and the streamline section of the flying and landing wires had been carefully reproduced by soldering two lengths of piano wire together to get the scale width. Builders of large biplanes that had Rafwires can't get away anymore with simple piano wire bracing. In fact, some of the larger machines at this meeting had poor detail fittings. The type of bracing seen on a thirty-inch free flight scale model just won't do on the quarter-scale stuff. An effort has to be made to reproduce the full size details and fittings otherwise the model doesn't look right. Only those who have tackled this work know how time consuming it is, even after one has found the correct information.



Other vintage aircraft types there possessed excellent detail but none, to my mind created the atmosphere that the Avian simply exuded - and which had taken John Armstrong of Liverpool over two years to research and build. Unfortunately this model did not fly due to radio interference, but almost all of the others did and they were well handled in the windy conditions.

Giant Vintage

It would appear that many modellers beside myself, whose names are usually associated with models other than flying scale, have also retained a deep interest in models of their full-size favourites. Down on the flight line I learned from Mir... Smith (of Mercury fame)

that, surprisingly, his basic interest was flying scale, and he intends to produce something in this line soon. Those of us who remember the fine construction and finish of his Mercuries will look forward to this. Ken Tansley (about whom more later) also harbours such a secret desire, but simply stated that he found flying scale 'too difficult', which shows the secret admiration he holds for the flying scale modellers.

Not all of the models at this meeting were flying scale. One could hardly miss seeing the double-sized Buccaneer built by Len Shannon and powered by a 50cc glowplug Quadra. We have mentioned this model before. Now it was joined by Mick Hutt's yellow, twelve-foot enlarged Diamond Demon entitled Diamond Devil. Powered by a 38cc Zenoah engine, it was flown well, even if it

was almost stationary at times in the strong wind. The original Diamond Demon was a 48in. high-performance cabin model produced in kit form by the Bay Ridge Co for the Ohlsson 23 in 1939. Last year we enjoyed seeing Mike Callaghan's example at our meets. Another large model that I had not seen before was a Laser-powered Spook nicely decorated with suitable markings in black and white. Years ago Mick Radford, one of our early vintage men made a Spook, but too seldom does one see this attractive design which was kitted by Modelcraft in 1940 in both 48 and 72 inch sizes. Possibly the complication of the gull wing puts modellers off?

Arthur Fox had his Model Craftsman Dragonfly with him, a twin boom pusher design by J S Luck (not to be confused with Dragon Fly, an 84in low-wing model by Charles Williams, described in March 1938 Flying Aces). Arthur's model is powered by a Magnum 91S. Before flying it underwent a last-minute modification to the upper rudders by fitting a piano wire balance between them to prevent flutter. Soon the Dragonfly was battling with the wind, under control of Arthur's son, in quite a sprightly manner but the model was later seen to be descending in a gentle curve with furious tail-unit flutter - not on the rudders, as had been anticipated, but on the elevator. The resulting firm landing seemed to cause some separation of components. Ken Tansley brought his double-sized Keil Kraft Bandit, that attractive Bill Dean design from the late 1940s that gave the writer his only competition success when he placed second in an East of Scotland open power competition in 1948. At the risk of boring readers I can say that I finished the model in the small hours and set off on the thirty-mile bike ride to Turnhouse with the model tied to my back, unhappily my bicycle 'sprang a leak'. This caused an arrival too late to undertake any test flights so I could only glide the model before the contest. If ever 'straight off the building board' applied, this surely met that criterion! On the flight line, the Mills 1.3 diesel started first flick and the model did a beautiful ROG followed by a vertical spiral climb. Twenty seconds later the Snip timer did its stuff and a lovely floating glide resulted giving me second place to Peter Montgomery from Kirkcaldy - a sort of Scottish Bill Dean who I met again some thirty years later when he was working with Solarbo. So I have a sentimental attachment to the Bandit! Ken's 88in. version is powered by a Merco 49 and fitted with Fleet radio. It sports the old Northern Heights Club badge on the rudder. Nicely built, the model was immaculately covered in nylon, with not a twisted thread in sight, so I immediately asked him the secret of getting the warp and weft of the fabric so straight and even along and across the flying surfaces. Ken says:

'It is all too easy to end up with either oblique or wavy grain lines, which not only look bad, but can, when tensioned by doping, produce warps, and the larger the wing the worse the problem. The trouble sets in because when the nylon is wetted, the lines of the weave virtually disappear and it is almost impossible to check that the covering is being applied evenly. When dry, the faults

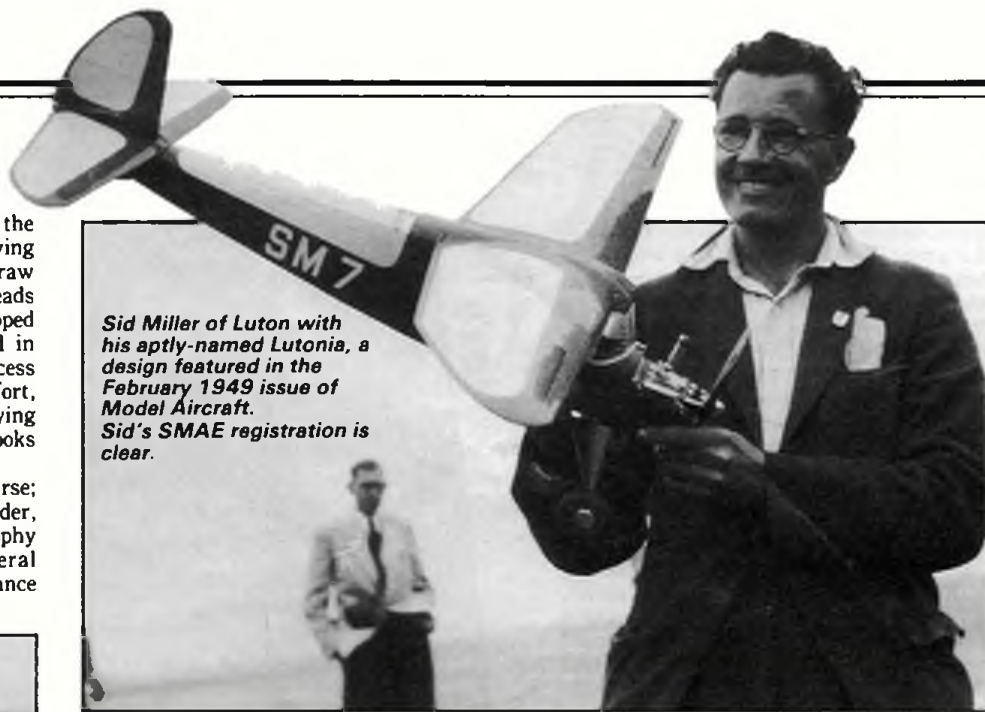


are clearly visible and are not dispelled by doping. My method of avoiding this is to cut the nylon carefully to size in the usual way, but whilst still dry, and using a fine sewing needle and dark thread, two parallel lines of one-inch tacking stitches are run about five inches apart spanwise from end to end of the panel following the line of the weave, which is easily seen on the dry nylon. Next, run similar thread lines chordwise across the fabric panel at about six inch spacing, again following the line of the weave. Do not tie off or fix the ends of the threads, but leave about three inches extra thread at each end. This action has produced a thread graticule on the nylon; now lay the material flat on a board, and spray with water, which will also help to "stick" the threads in place. They need not be tight, as long as they show a reasonably straight line. Now cover in the usual way but using the thread graticule to keep the grain straight both spanwise and chordwise, checking spanwise threads against the line of the leading edge, spars,



sheet covering and trailing edge, and the chordwise threads against the line of the wing ribs. Before the adhesive dries, carefully draw out the threads. The long spanwise threads are easier to deal with if they are snipped through in several places and removed in short pieces. While admitting that the process is a bit finicky, it is well worth the effort, and is much better than a warped flying surface, or a recovering job; also, it looks good!

We can certainly vouch for this of course; Ken has always been an excellent builder, winning the Northern Heights Coote Trophy for construction and finish on several occasions, as well as the Concours d'Elegance



Sid Miller of Luton with his aptly-named Lutonia, a design featured in the February 1949 issue of Model Aircraft. Sid's SMAE registration is clear.



Opposite page, top: This twelve-foot version of the 1939 Bay Ridge Company's Diamond Demon by Mick Hutt flew well at Large Model Day. Model fuselage was transported on the roof of Mick's car! Above: Ken Tansley, wearing his POW hat, starts the Ohlsson 23 in his 54in. monococque-fuselage model at Stoughton during a duration competition in 1946. Note the registration; 'AG' were the Christian-name initials of Alec Bell who obtained Ken's registration as mentioned in text. Left: Jerry Evan's KK Bandit at last year's Vintage Weekend gave your writer an acute bout of nostalgia. Real all about his competition success in 1948!



Above left: This attractive design by Bob Copland has yet to resurface. Maybe Bob still has the plans? Yet another Ohlsson 23 is being tuned in preparation for a flight in the Astral Cup at Fairlop in 1948. Bob's SMAE petrol model registration was BC-1. Perhaps a log of these old references would be interesting... Right: At the same event is Bert Judge with the prototype Frog Janus. Bert's flight box, a green Frog Penguin kit box would be a collectors' item today, even if empty and fuel-stained!

for general flying models at the 1956 Northern Heights Gala. Ken knows what he is about. His simple trick on how to apply nylon is one of many practices that we hope he will tell us more about.

More Tansley topics

It seems that people generally are less tolerant these days than they used to be. Sadly this attitude extends into our hobby. Opposition to long accepted practices and the interpretation placed on certain competition rules are quite often clever schemes to get around what otherwise might have proved a difficult hurdle - in the old days it was called cheating! Ken relates that no matter how distasteful an official's decision was; in the old days this was accepted without question. He tells of his own experience in this regard at the hands of Alex Houlberg, Chairman of the SMAE. Ken was flying in the Bowden International Trophy at Radlett in September 1945 with his Premier Lion. He did well on his first two flights, and as was his usual practice in competition work, he drained the tank and replenished it with fresh fuel, and changed the ignition flight battery in preparation for the final round. Alex Houlberg, officiating at this important power contest, saw the battery change and disqualified Ken, maintaining that this violated the Bowden rules which stated that no part of the model was to be repaired or replaced during the competition. Ken's feeling was that a battery was just as

expendable as fuel, but he did not question the disqualification, which on this occasion probably cost him the much coveted Bowden Trophy. Had this happened today would a similarly-placed modeller continue to argue his point or would the Rules Committee in 1988 have already deleted this rule as a petty restriction?

I have often wondered why Ken's models in the immediate post-war years bore the SMAE registration of AG-7 (personal initials were usually issued). This is the reason. He wanted to enter his power model at a forthcoming Sunday competition to be held on a site accredited by the SMAE (it was an SMAE rule that all models had to be registered and insured, the fee for which was £1.00). On the Friday evening before the competition, Ken, short of time working on the model, asked Alec Bell, a fellow Northern Heights member who was also the Hon Sec of the SMAE, to arrange this on his behalf at the SMAE meeting being held that evening. However, on the Friday in question it was not possible to assign appropriate initials for Ken and the SMAE allocated him AG-7. This proved to be a lucky designation for Ken who enjoyed many competition success with it, so he naturally adhered to it and did not try to have a more suitable registration issued. Incidentally, your columnist was AI-2 in 1947...

Vintage finish

The majority of power models in the old days were merely functional flying machines.

Many carried only the minimum of dope for the simple reasons that dope cost weight and money; since models' life expectancy was short, to many modellers it seemed a waste of time and cash (which was always short) to overdo the decoration. The name of the game was flying, and time in the sky was what counted. However, there were a few models that bore finishes every bit as good as today's gleaming beauties of fibreglass and resin, and doubtless this breed of model brought about the Concours d'Elegance competitions which were such a feature of the late 1940s meets. At one Northern Heights Gala Sid Miller of Luton won the Concours with his beautiful mid-blue Bowden Contest, which had already won top honours at the Model Engineer Exhibition, and when asked how he had obtained the fantastic finish that this machine presented he stated 'Woolworths paint and elbow grease - about 95% of the latter!'

We don't seem to go in for rubbed finishes these days on our vintage models, yet many of the models readied for the appearance contests sparkled like new cars. Before the war Berry Brothers Inc of Detroit, manufacturers of Berryloid aircraft finishes used on full size aircraft, introduced their Berryloid model contests. The Berryloid Trophy winner at the 1938 US Nationals was an attractive yellow and brown Brown Junior powered high-wing cabin monoplane designed and built by Harold Coovert. He described his model in the November 1938 issue of Air Trails and gave details of how he obtained the exhibition finish. Silk covered, the airframe was given six coats of clear dope to fill the pores in the fabric, then two coats of thinned colour dope were followed by twelve coats of unthinned colour dope, followed by a thinned colour coat... all brushed on! After a drying period of 24 hours the finish was rubbed down with Berryloid rubbing compound and finally polished with Simoniz car polish to give the necessary lustre. Despite this beauty treatment the model flew well and was not deemed to be overweight. In recent years we have seen Brian Ferrett's Berryloid Trophy Winner at a number of our meetings, and although it is a faithful copy of Coovert's model, in correct colours, I doubt that Brian used quite as much dope!

Replica Rigby Swallow

Enthusiasts becoming aware that Ray Roberts' Paper Airplanes of Burbank California were offering the Rigby Swallow,



Just as we went to press we learned of the untimely death of Vic Dubery. An appreciation will follow next month. We are sure Vic would be happy for us to include this photograph of him at an early post-war Thurston Cup Competition - flannel bags and all...

which is described as a 12in. model with a three inch propeller, and capable of flying for 35 seconds could hardly wait to order this despite its price of \$12.95. A friend of mine did so and after an inordinately long wait of some three months found he had to pay a heavy HM Customs levy. Imagine his disappointment when he found a double-sized impression of this famous design xerox printed on cream card in a faded blue - and copies of seven pages from Rigby's book, a copy of which he has had on his shelves for the last 20 years anyway! It was anticipated that the mechanism parts of tin nose piece and propeller might not be included (they weren't!) but, remembering the brilliant red, white and blue colouring of this original card model, it was hoped that this at least would

be reproduced, especially since previous card models obtained from Ray had been quality printed and of a high standard. Alas! the Rigby Swallow seems a drab effort, and just why the model is given twice the size quoted in the Paper Airplanes catalogue (favourably reviewed in the July 1987 *Aeromodeller* by the writer) is not known.

Help wanted

We are now in possession of some details of the thread braced card model mentioned in the June *Aeromodeller*, thanks to George Blair of Edinburgh. This model was described in, and given away with, *The Modern Boy* on 23rd February 1929. It appears that this was an FJ Camm, not Rigby, creation. Hopefully sufficient information will be given to enable enthusiasts to construct a replica; but we need the following issue of that paper, No 56, dated around 1st March 1929, which contained the second part of the construction article and dealt with propeller assembly. Can any reader kindly send us a Xerox copy of the article? The shape of the model is somewhat different to that sketched by Joe Maxwell but the layout is the same so he is to be congratulated on his retentive memory of some 60 years, as is Josh Marshall, since the propeller is eyelet-assembled from two blade blanks, and the model is indeed coloured blue and orange in the manner that he recounted!

Here's Elbert J. Weathers' Mystery Man, which left its undercarriage on the tarmac and landed on a buried, single wheel. 'Joe' Weathers, who died in 1984, has just been elected to the NFFS Hall of Fame.



FOR 1988 I decided to push the aspect ratio of the wings of my Wakefield in an effort to improve glide performance. Two wings were built, one featuring the Gard 6509 section and the other the glider section, Benedek 6356b. The Benedek wing was based upon ideas expounded by Martin Pressnell and as advised, invigorators were also fitted. In an effort to ensure that the wings were strong enough, high-tech materials were incorporated. Other changes in the model were the incorporation of the two-function Arrow timers which are based upon Snoopies. Also the prop diameter was cut back to 560mm, the blades being thinner and lighter than the 1987 version.

Proof of the pud...

How has this worked out so far? The glide of both models is the best I have yet achieved on a Wakefield. The Benedek-wing model, flown in Norway, was successful in getting to the fly-off, helped in no little way by an excellent glide. The structure has proved more than adequate to the task and both models have been flown in wind very satisfactorily.

The Arrow timers have done the job well and, being very light, have ensured that the models are down to weight. The change of prop and power configuration has worked, prop run being about 35 secs on 350 turns of Pirelli or FAI, 440mm long, or 40 secs on 400 turns on a similar length of Chinese rubber. The Chinese rubber has increased the height achieved...

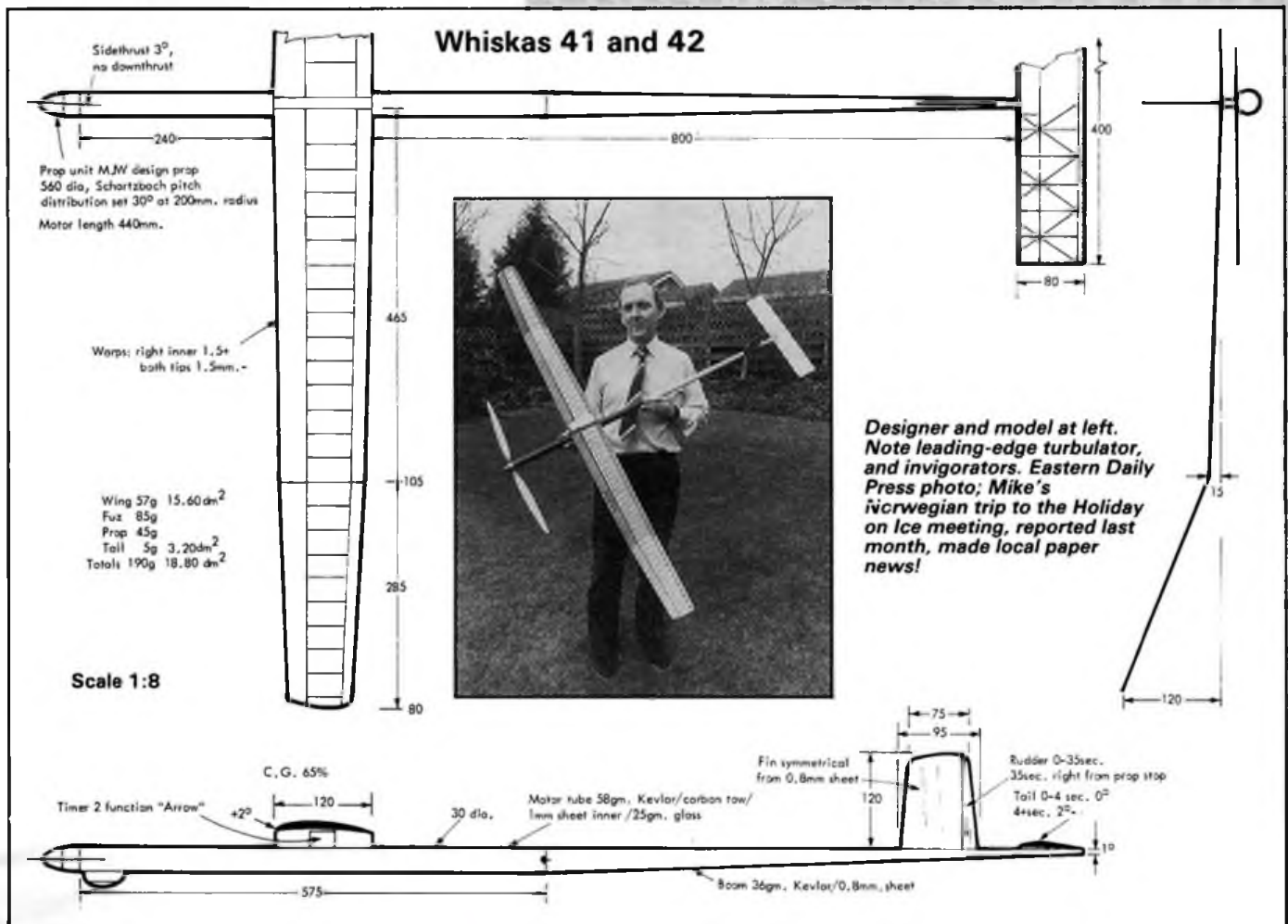
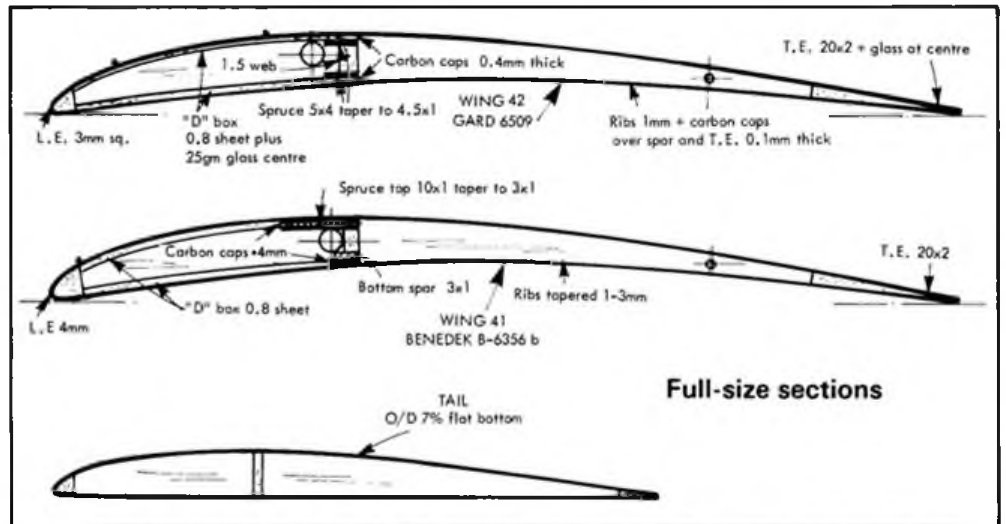
and next...

For the next model I intend to keep a similar platform, although the wing tips will be lengthened by one panel 'taken' from the centre. I also intend a few structural improvements as well as incorporating more hi-tech materials; and I shall continue with the 6356b in preference to the Gard section.

WHISKAS

-the Wakefield

Latest development of an established F1B contender described by Mike Woodhouse



Designer and model at left. Note leading-edge turbulator, and invigorators. Eastern Daily Press photo; Mike's icrwegian trip to the Holiday on Ice meeting, reported last month, made local paper news!

FREE FLIGHT SCENE

Enthusiasm couldn't be dampened at the Woodbury Weekend on 30th April-2nd May.

Dave Hipperson tells all...

The wet and windy weather arrived spot on cue for this year's Bristol & West Woodbury weekend. The champagne flyoff events on the opening night, when enthusiasm and anticipation are always at their highest, produced large entries but a rapidly dwindling number of actual participants when realisation dawned that the already breezy evening was degenerating further. The wind rose and the west country weather played its trump card with rain and sea fog! Before this arrived ten fliers managed to get away in Vintage, the Lanzos of Strachan and Dixon catching similar buoyant but turbulent air. These two took top places and produced what were to be the longest flights of the entire weekend. In the stiff south-easterly they quickly traversed the common and then overflew the Castle Brake Caravan park itself. This wind direction, which remained - with small variations - for much of the weekend, actually proved quite convenient for it gave those retrieving a chance to rest and dry off whilst downwind!

The remainder of the first evening's classes were rather blown (and in the case of Open Rubber, washed) away. Peers' top Power effort was severely buffeted by turbulence and then vanished behind trees well before it was down. Martin Kinder's return to contest flying was notable, for what must have been his shortest ever winning flight; and finally the five that braved Open Rubber really did suffer as the rain came and the cloud closed down. Neither John O'Donnell's nor John Carter's models could cope with the turbulence when launched on reduced power in an attempt to stay below the cloud. Chris Strachan's managed but not before a number of heart stopping stalls. This kept the climb to an absolute minimum and won him another class with a quite commendable duration, given the conditions.

Incredibly, at the end of this debacle no one seemed the slightest bit demoralised. Great credit is due to the dogged determination of the host club who ran this first evening with the same attention and enthusiasm as if it had been a glorious summer's night! Their enthusiasm rubs off on the competitors.

Conditions actually worsened overnight. The following morning, although miraculously dry, was both cold and very windy. Nevertheless entries were far higher than one would normally expect in such conditions. Chris Chapman's heroic full score in Rubber was the only such total in any event. Those trees once again robbed Peers of time on one of his winning Power flights. By late afternoon there were actually some discernably calmer spells as thermals passed, but such air was usually rising with such ferocity that models launched into it gained enormous height. Martin Kinder - once again winning Glider - had his last contest flight snatched up by such a patch, only to be



Above: Matthew Chapman launches in Rubber at Woodbury on the morning of 1st May. Model landed in woods and was only partially retrieved! (John O'Donnell photo).
Below: A very dapper John Carter immediately after his winning total in FAI.





Top: Peter Michel's mighty Lanzo is protected from the worst of the elements as Derek Ridley heroically holds on. Model is the large version of the famous Stick and features undercarriage. Flight ended early thanks to launching with screwdriver through rear motor peg! Centre: Russell Peers launches for his last Open Flight to take power for the umpteenth consecutive time... Above: Martin Kinder won Champagne Glider flyoff and Open Glider with this Mick Reeves designed Humplehound (J O'D photo).

dumped almost as quickly as it passed over the downwind ridge. Up and down in little over three minutes. Martin Kemp made history by winning Vintage with his game little Senator - with a good score too against the might of Phil Ball's Challenger. Leitch's Banshee, not as happy in the wind as it had looked at Barkston a few weeks earlier, still produced a stable pattern every time to illustrate why this design was so popular in its day. He was third.

That part of the weekend that everyone has come to look forward to - the lavish barbecue - followed the day's flying with an amusing prize giving and raffle draw from Gerry Pink. Indeed, this was a fine night indoors; outside, the gale raged and the rain lashed down. It was encouraging to see many new faces; and incredible to discover that the event had been so heavily oversubscribed that a dozen or so caravans on an adjacent site had been booked to accommodate the overflow.

After the night of gales and torrential rain many were reluctant to venture out for the early start on FAI day. Some actually couldn't, for their cars wouldn't start in the damp! Once again the worst of the rain ceased by the start. Ten flew but there were no power models. Falcons Carter and Peers dominated the day with a few maxes apiece - and numerous treed models. Flying from the mowed area allowed gliders more of a chance than usual for Woodbury so Carter managed a respectable total to finish two minutes in the lead. Chris Tribe, also flying Glider, was unlucky to have no model left for his last flight and thus no chance of moving up to second place - which he could so easily have done, given another flight. Although just as strong, the wind had relented from its awkward direction, swinging more westerly and allowing models to take a diagonal line across the common and reducing losses.

It had been a blowout as usual; perhaps the worst weather ever. However, thanks to total commitment by the organisers and super accommodation at the Castle Brake Park I heard nothing but praise. Those that attended will be going again next year, and doubtless, many more that have not yet

Fourth Centralised SMAE event: 8th May

Most centres of activity for this event believed they were experiencing unique weather and the rest of the country was being rained off! A perfect spur for large entries and maximum effort everywhere although, in reality, all areas had at least some very calm, flyable weather. In general the westerly venues fared best with even a little sunshine at Merryfield. Those two easterly sites - so lucky this year - had long periods of rain; all morning at Albemarle and towards the end of the afternoon, drying out again before the flyoff, at Watton. This didn't stop two of the winners coming from these areas. Glider, for teams of three (and the Model Engineer Trophy) had the largest entry in many years for an Area meeting with nearly 100 recording scores; 35 of them perfect. Team positions were decided on a very tight

Woodbury Weekend

30th April-2nd May

Champagne Flyoffs: Saturday night

Open Glider (4 flew)

1 M. Kinder 1:59

Open Rubber (5 flew)

1 C. Strachan 2:42

Open Power (7 flew)

1 R. Peers 2:23

2 C. Harrison 2:05

Vintage (10 flew)

1 C. Strachan	3:23	Lanzo
2 S. Dixon	3:22	Lanzo
3 P. Ball	2:08	Challenger

Open Events: Sunday (2:30 max)

Open Glider (8 flew)

1 M. Kinder 7:28
2 P. Tribe 6:11
3 J. Cuthbert 6:00

Open Rubber (6 flew)

1 C. Chapman 7:30
2 M. Chapman 7:04
3 C. Strachan 6:22

Open Power (5 flew)

1 R. Peers 7:24
2 M. Parker 4:17
3 A. Chilton 3:36

Vintage (6 flew)

1 M. Kemp	6:24	Senator
2 P. Ball	5:51	Challenger
3 J. Leitch	4:15	Banshee

FAI Combined: Monday (10 flew)

1 J. Carter	10:17	F1A
2 R. Peers	8:14	F1B
3 C. Tribe	7:28	F1A
4 P. Tribe	6:27	F1A

Vintage Precision (8 flew)

1 S. Roger	7% error
2 M. Kemp	10% error
3 C. Strachan	20% error

travelled to Woodbury will be considering it too. This is a delightful aeromodelling weekend, and Gerry Pink, Elton Drew, Dave Greaves, Bernard Aslett and the other Bristol & West Club organisers deserve our thanks.

flyoff with dull and misty conditions prevailing for most. Bristol & West's 'A Team' of Colin Sharman, Elton Drew and Rod Audley totalled nearly eleven minutes thanks to a useful six-minute-plus from Colin. Coupled with Derek Wain's score this secured top Plugge points too and, once again, extends Bristol & West's lead in the overall event. But individual honours in glider went elsewhere. Phil Owens, flying at Rufford, held on for nearly seven minutes in the very calm conditions there; and Mike Warren was likewise close behind in similar air at Beaulieu.

Times in FIC for the Halifax Trophy were seriously affected by low cloud problems and were well down on what might have been expected for such a calm day. Alan Jack found it clear enough, when the rain eventually ceased at Newcastle, to put together the only full total and then a very competitive five-minute-plus flyoff. One of Ray King's best FIC performances at Church Fenton brought



Top left: Chris Strachan prepares his Earl Stahl Hurricane sport model in the Vintage Precision event; flew too well - lost in lift after 2.1/2 minutes! Above: Joe and Edna Flynn struggle in the wind... Left: Dave Greaves casts a critical eye over his Wakefield. (JO'D pics). All Woodbury photographs convey something of this distinctive terrain...

him second place and after a promising show at Easter Andrew Cordes flew an impressive model at Barkston well enough to place third despite low cloud and a slight problem with launch consistency. John Buskell was most unlucky at Beaulieu with a full score ruined by a first flight engine cut at three seconds. He finished in fourth spot.

At Barkston, Coupe d'Hiver was very much a matter of sudden death. A dropped flight put you way down the results. Thanks to numerous gliders marking the lift four out of five of the overall CDH flyoff came from this venue but all suffered, as did the gliders, from persistent drizzle that coincided with the flyoff period. Ray Pavely, all on his own in the class at Watton, thus had dry conditions for this crucial last flight; he won at a little over three minutes and that was D/T'd down!

SMAE 4th Area Centralised event

Open Glider (no trophy). 97 flew. 35 in fly off

1	P. Owens	Rufford	7:30 + 6.49
2	M. Warren	Beaulieu	7:30 + 6.22
3	C. Sharman	Merryfield	7:30 + 6.18
4	A. Wells	Watton	7:30 + 5.56
5	J. Cooper	Barkston	7:30 + 4.46
6	C. James	Beaulieu	7:30 + 4.37

Coupe d'Hiver (no trophy). 33 in fly off

1	R. Pavely	Watton	10:00 + 3:03
2	D. Hipperson	Barkston	10:00 + 2.45
3	G. Ferer	Barkston	10:00 + 2.34
4	P. Gaunt	Barkston	10:00 + 2.31
5	A. Ball	Barkston	10:00 + 2.00
6	D. Davit	Church Fenton	9:38

FIC for the Astral Trophy (14 flew)

1	A. Jack	Albemarle	12:30 + 5.16
2	R. King	Church Fenton	12:24
3	A. Cordes	Barkston	11:54
4	J. Buckell	Merryfield	11:43

Team Glider for the Model Engineer Trophy (26 full teams)

1	Bristol & West 'A'	Sharman, Drew, Audley	22:30 + 10:50
2	Birmingham 'A'	Philpott, Colledge, Baguley	22:30 + 9:13
3	Crookham 'A'	Stewart, Edge, Madelin	22:30 + 8:59
4	Falcons	Cuthbert, Peers, Carter	22:30 + 7:38

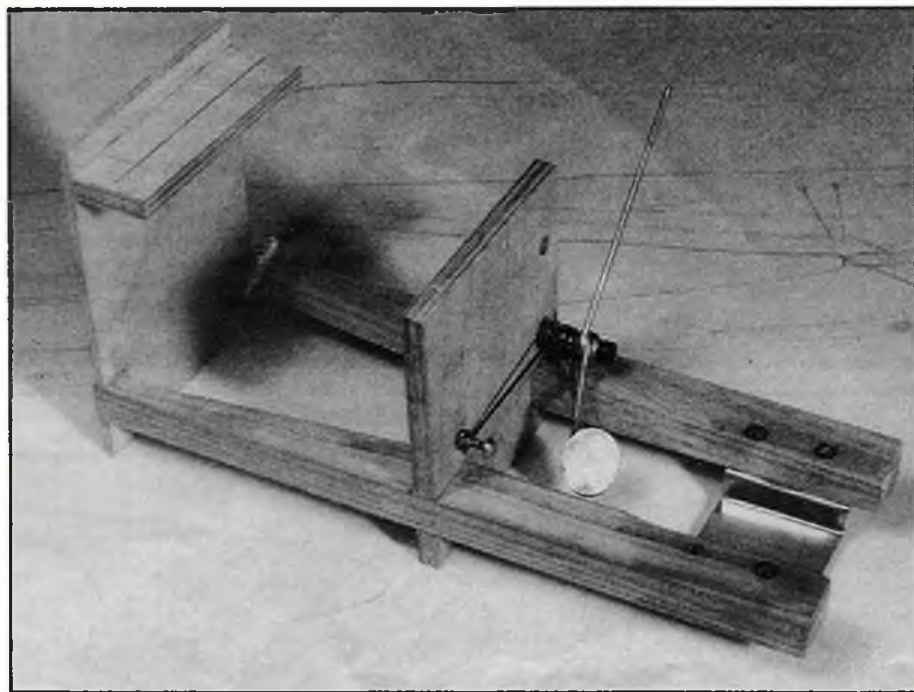
Plugge Positions after 4 events

Bristol & West	832
Anglia	813
Vikings	752
Biggles	706
Crookham	698

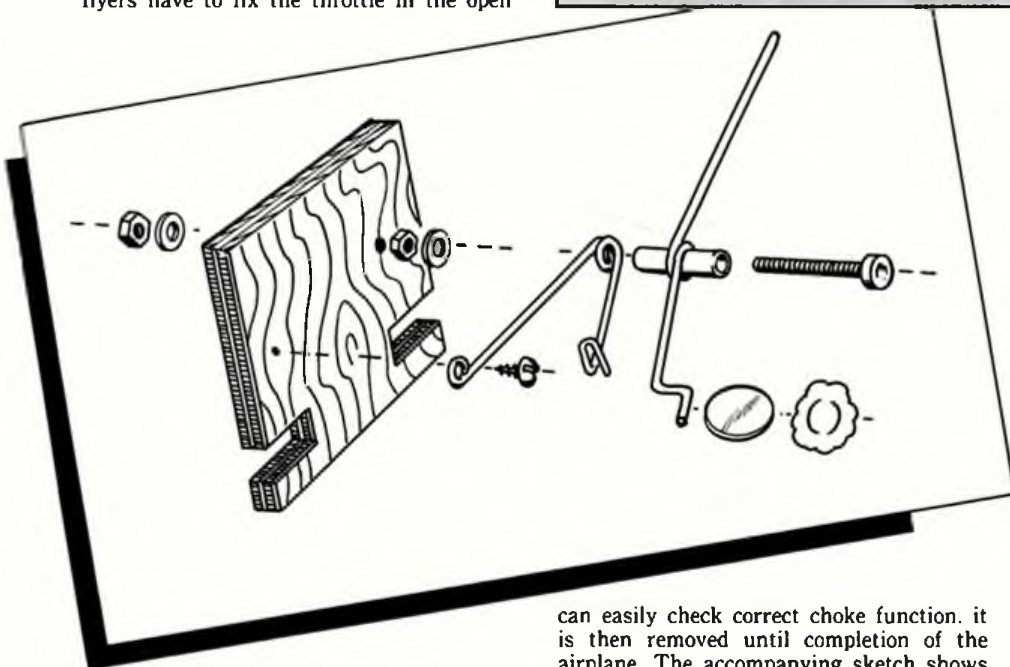
FROM THE HANDLE

Claus Maikis kicks off with a look at remote choke construction

Since almost all four stroke engines have a rear carburettor, preparing for the start poses some kind of a problem. Every pilot has developed a special version of priming and/or choking to ensure those quick starts necessary to obtain the first ten points of the score. While a first flick start may be necessary for the contest flyer, endless flipping is equally frustrating for the Sunday flyer. With the combustion chamber not easily accessible on four-stroke engines, and with priming through the exhaust valve being unreliable (and downright impossible with an add-on muffler) you have to rely on choking for reliable starts. Modern engines sometimes have a built-in choke. But since we stunt flyers have to fix the throttle in the open



Above: Four-stroke choke, shown exploded at left, is adaptable to close-cowled installations on models besides stunters...



setting, this often precludes use of the choke. The only solution is to make your own.

In all my four-stroke equipped airplanes I've used a home-made choke. In order not to touch the original carburettor (after all, I wanted to keep the option of being able to sell the engine in its original form to R/C flyers!) the choke was mounted on the airframe. In addition, this allowed for easy installation, without any complicated fiddling during mounting or dismantling the engine. Installation can be made at whatever construction stage you feel appropriate. Early on, it is easy. Parts can easily be shaped to fit without the danger of destroying a good surface finish. With the engine installed you

can easily check correct choke function. It is then removed until completion of the airplane. The accompanying sketch shows construction for an upright mounted engine. Builders who fancy an inverted engine need not despair. Simply turn your *Aeromodeller* upside down and you'll see the completely opposite arrangement for that purpose! The only difference is that you have to lift the lever instead of pushing it down (admittedly, pushing down is easier). If you really prefer it to work that way, simply put the lever arm on the same side as the choke plate.

Construction of the choke is extremely simple. With the formers and engine bearers assembled, mount the engine and decide where the mounting hole for the unit (its turning axis) will be. The longer the moment arms are, the easier construction and alignment will be. Cut a brass tube about

half-an-inch long for the choke bearing. Bend the lever arm from 1.5mm diameter wire and solder to the brass tube. Bend a spring from 1mm wire. This spring is fixed with a wood screw into the former. Install the complete unit to the former, making sure it's mounted rigidly, yet moves freely. Cut a plate from tin or brass sheet and solder to the lever arm. Check that the plate covers the carburettor intake when the lever is pushed. It might be necessary slightly to reposition the plate or to bend the wire. When you're satisfied with the alignment, put some silicone rubber on the plate. With a rubber band, fix the choke in the closed position and let the silicone dry. This way you have a perfect fit which completely closes the intake when choking. Now remove the whole unit and install when you have to cut the slot for the lever in the fuselage side. It is permanently fixed after final completion.

With this kind of choke reliable starts (on even a four-stroke engine) are possible. If you already manage first flick starts, it may be more a tribute to the engine. But without a choke it will be difficult. Remember that to suck fuel into the combustion chamber in a four-stroke engine, the piston has to go down, not up as in a two stroke engine. It's the first stroke of the cycle; the next stroke is compression (that's where you feel it). If you fasten the propeller as most people do you'll feel compression when the prop is at '3 o'clock' when viewed from the front. Simply turn it back about '10 o'clock' (clockwise). That's when the intake valve is open. Now work the choke, turn the prop (anti-clockwise!) again to the '3 o'clock'

position, release the choke and flick the prop as hard as you can.

If the engine isn't running now, forget who told you about this performance...

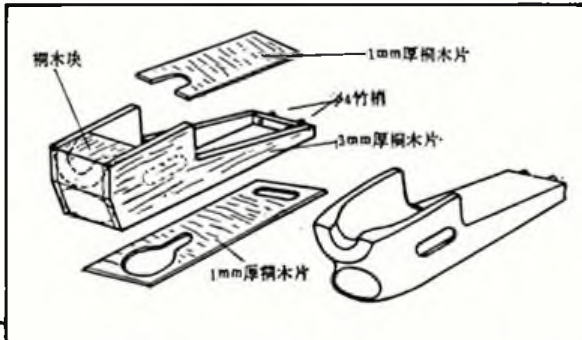
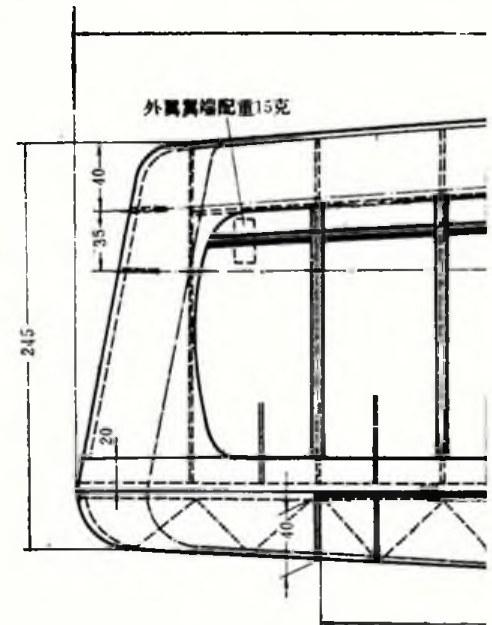
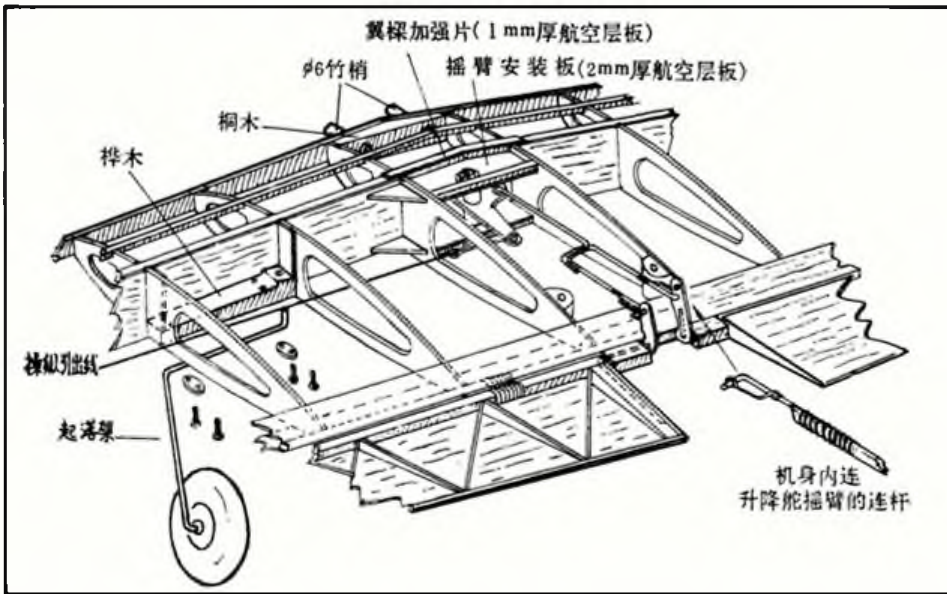
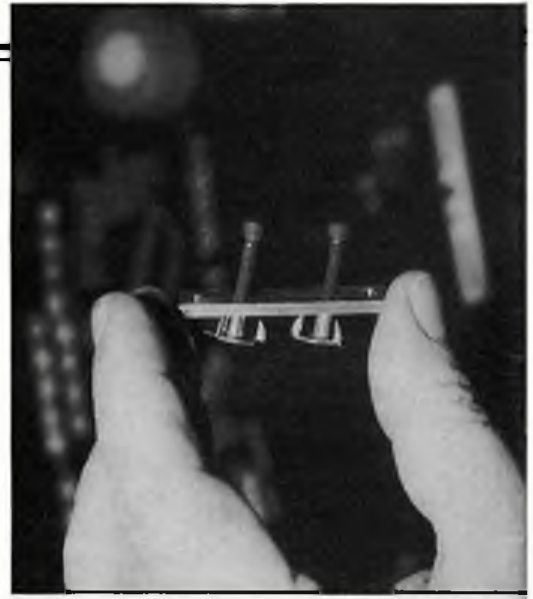
Product Report from Phil Bolderson

Windy Urtnowski is one of America's top control-line aerobatic fliers. He's never been champion, but comes consistently close and has won the Stunt concours prize more times than you could shake a stick at. Several of his 'planes have been published in American magazines, and he shares Flying Models' C/L Aerobatic column with ex-World Champ Bob Hunt.

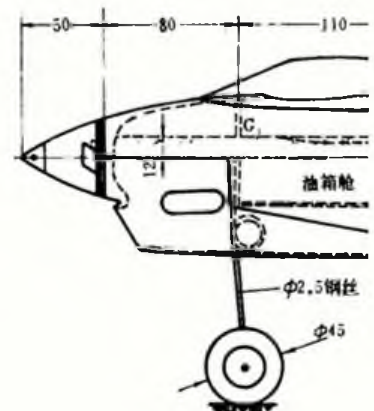
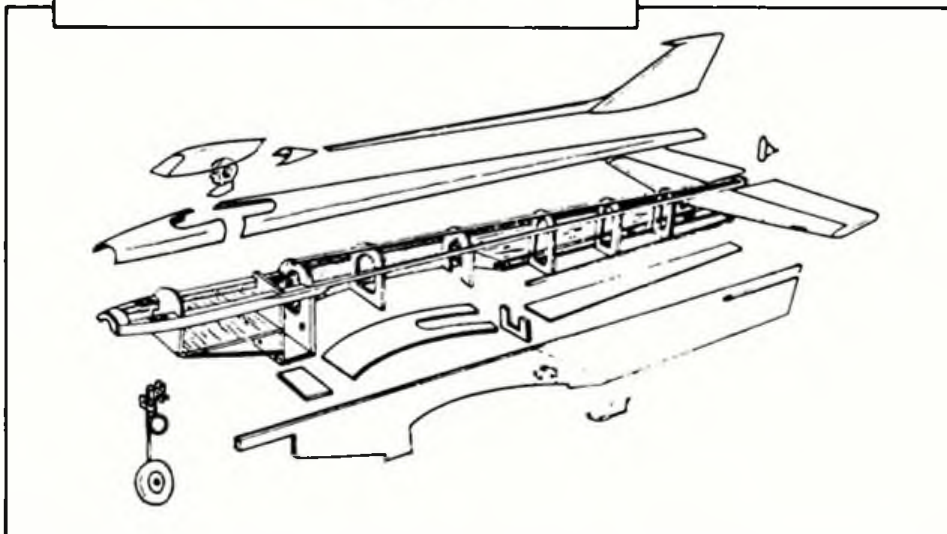
Since being made redundant he has been steadily building a product line orientated exclusively towards the highly specialised control line market, and aerobatic fliers in particular.

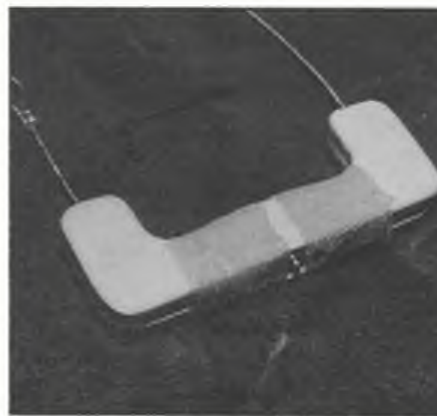
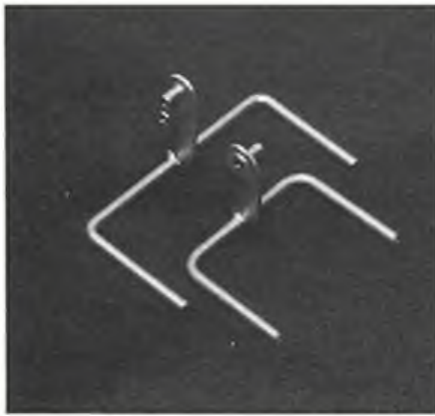
His catalogue/newsletter is very informative (send your name and address to be in US Dollars... and no, he doesn't take credit cards. The items aren't particularly cheap, but those I have are good quality.

Windy Urtnowski C/L products, as reported by Phil Bolderson. Left to right: ST.60 mounting pad (blind nuts, bolts and plate); flap and elevator horns; adjustable handle, grip-taped. Available from: Pro-Stunt Products, Little Ferry, NJ 07643, USA.

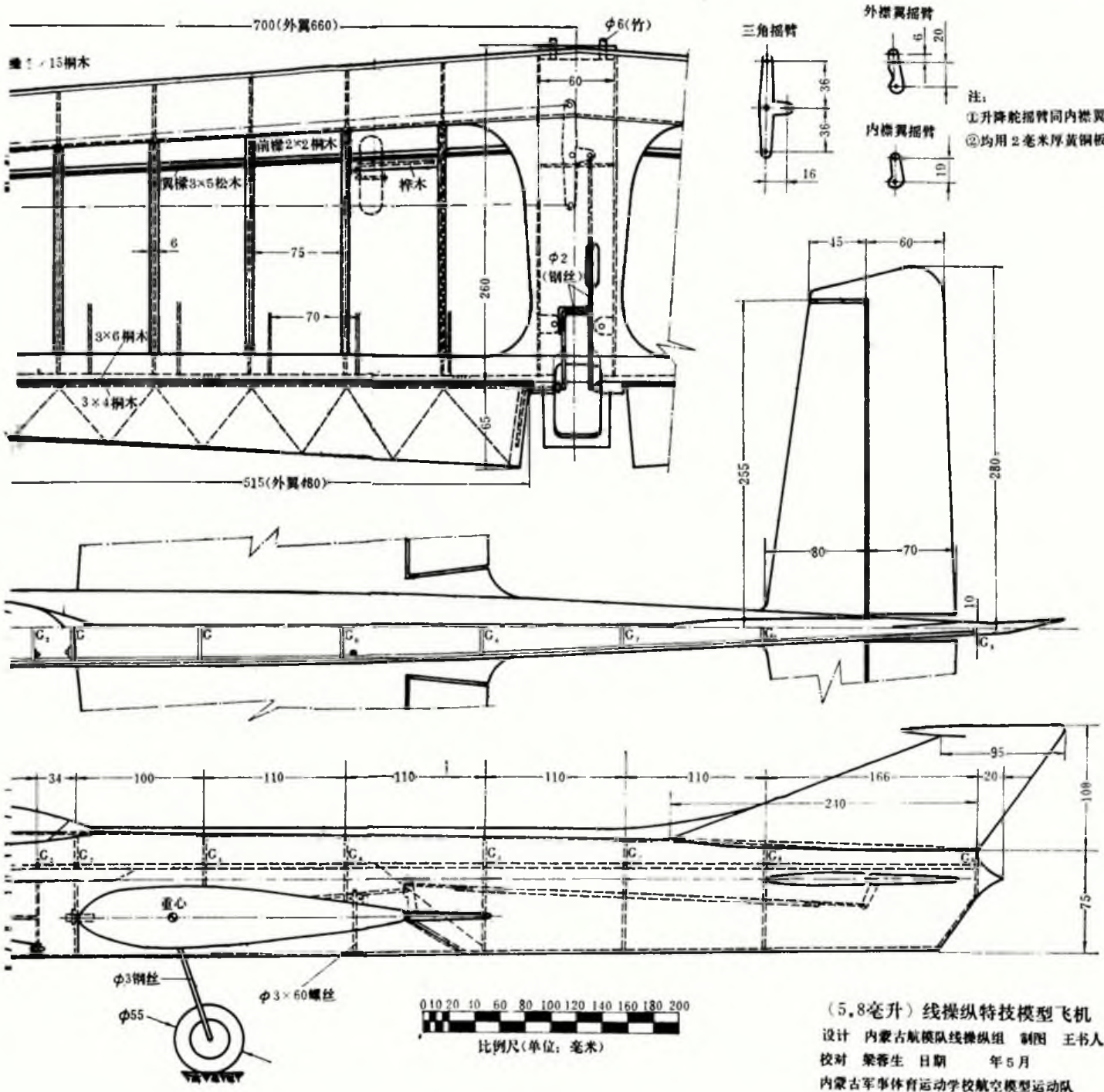


Oriental stunter XCZTJ-7701 reveals its secrets. Wingspan is 1360mm; length 1048mm; wing area 37.62dm² and wing section NACA 0018. Model intended for .35 engines. Reproduced with thanks to Hangkong Moxy.





Handle (shaped, adjustable)	US\$
Horns with 1/8in. wire and bearing for pushrods	30.00
Heavy duty delrin bellcranks	10.00
Same with bearing	7.00
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Super Tigre .80 fuselage crush, complete	10.00
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Aluminium landing gear (6061 aluminium)	29.00
	15.00



(5.8毫升) 线操纵特技模型飞机
 设计 内蒙古航模队线操纵组 制图 王书人
 校对 梁春生 日期 年 5月
 内蒙古军事体育运动学校航空模型运动队

HAVE YOU ever watched a Midge Speed event, fancied a try but were put off by the brick-like glide, fragile construction and lack of a suitable vintage motor that seems necessary to win? I was until 1987, when I decided to build one with modified construction that would make the best use of the power available from a PAW 149DS. I kept as close to the original outline as possible, changing only the items that I had observed giving problems to other enthusiasts. The result was a controllable, fast and robust model that will glide for up to two laps after a typical 90+ mph. run, which is more than can be said for the original. My Midge's strength is not in question as it remained unscathed after a head on collision with gentleman John Noble's Mills-powered Bullet (the latter was seriously damaged: apologies to John, it was my fault!). Despite its 'modern' construction it won only one event in 1987 but has always placed well. I feel that this shows that the SAM 35 rules have been well structured because they allow a diversity of engines without one type becoming dominant.

This event has provided me with plenty of enjoyment without the hassle of repairing models after every meeting, so before all you vintage purists cry 'cheat' look at the plan and let me explain the modifications and the reasons behind them.

Engine mounting

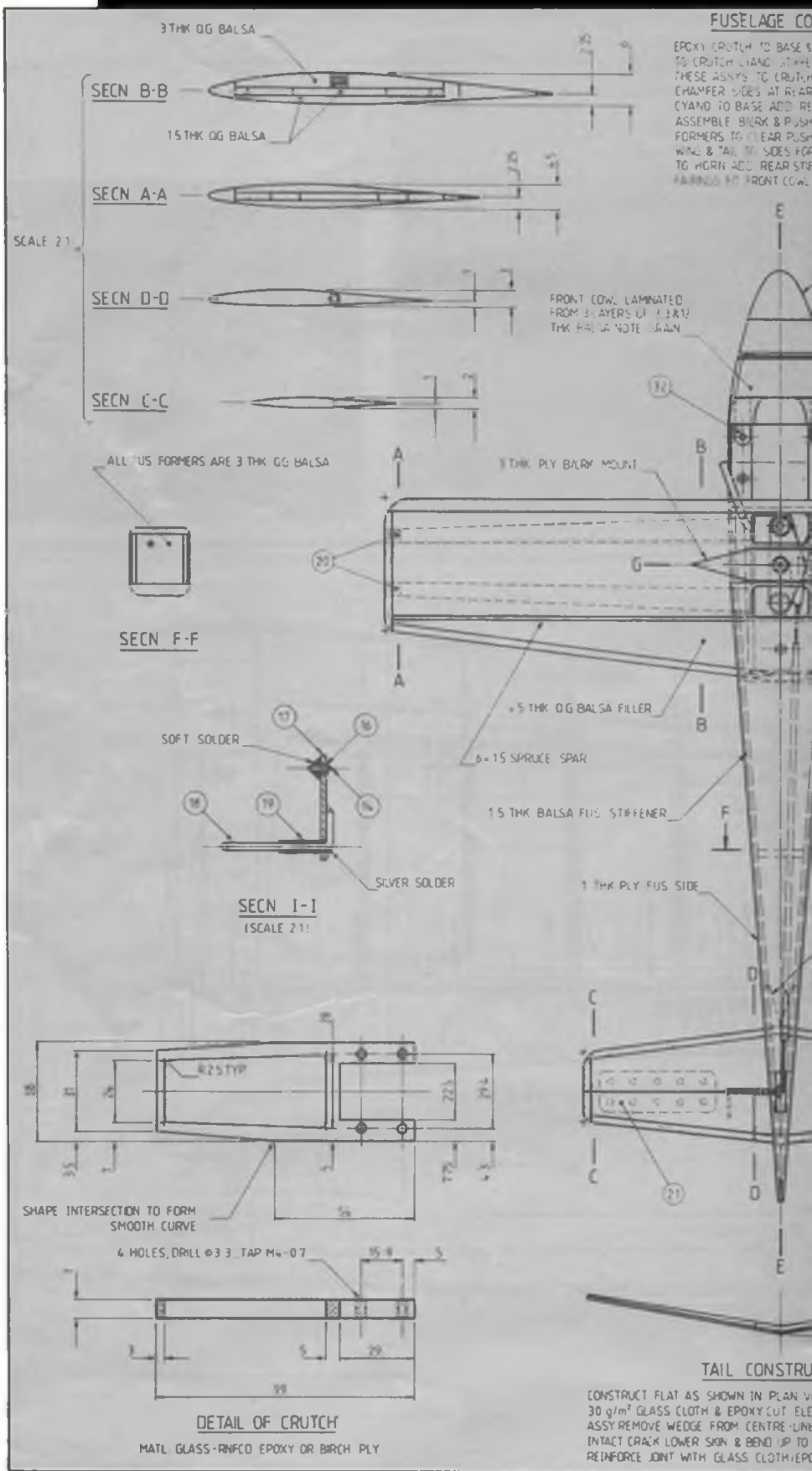
Problem: The standard beech bearers usually break at the rear bolt holes and since they are only attached to a flimsy balsa box they don't do a lot to damp out the copious vibrations that most small diesel engines generate.

Solution: Make a crutch from layers of printed circuit board or one piece of 7mm. (1/4in) multi-ply. Do not use three-ply as it is only slightly better than balsa in this application! Note that the drawing shows tapped holes for home-made blind nuts but plain holes with commercial blind-nuts can be easily substituted.

Tank

Problem: The standard item gives short engine runs and makes the needle valve tricky to set for consistency.

Solution: Substitute a larger capacity 'uniflow' type - this one borrowed from a design shown in a speed article by Peter Halman. It works very well, gives plenty of time for the engine to warm-up and allows the pilot to sort himself out before a timed run.



True Vintage - or Class 1 Speed?

Over to Ian Horne...

modified

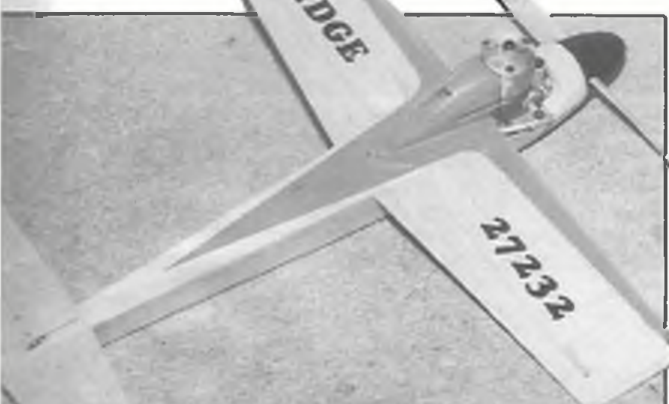
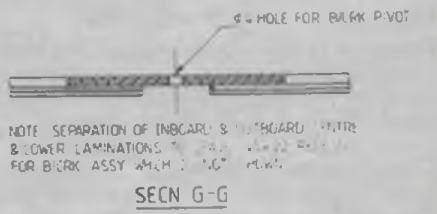
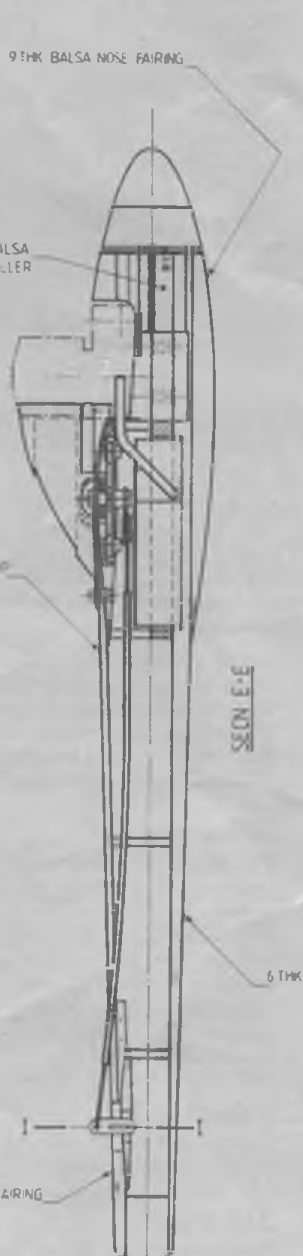
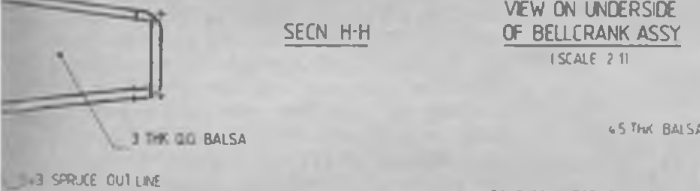
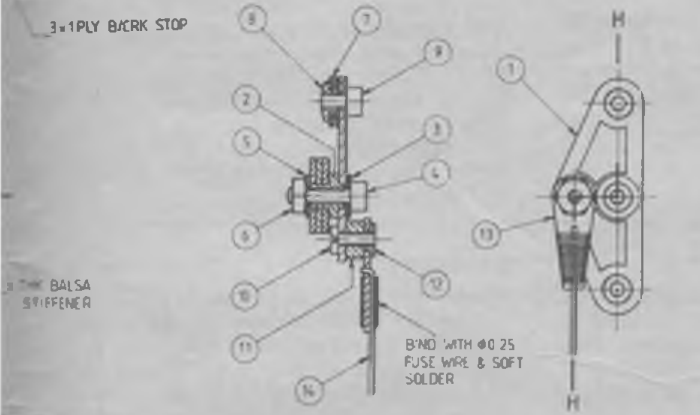
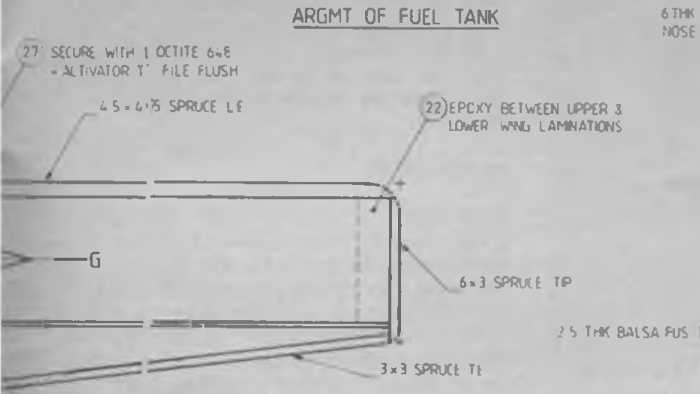
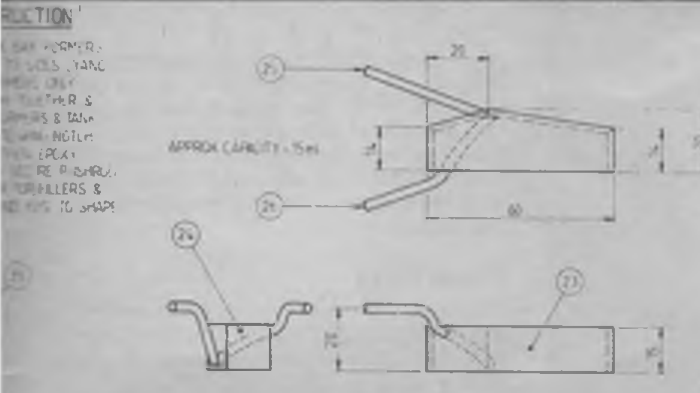
MODIFIED MIDGE

ORG. NO. **A1 012**

DRAWN BY: **IAN S. HORNE**

A VINTAGE CLASS 1 CONTROL-LINE SPEED MODEL SIMILAR TO 'MERCURY MIDGE' BUT WITH MODIFIED CONSTRUCTION TO IMPROVE DURABILITY & TO SUIT PAW 15DS

ITEM	DESCRIPTION	QTY
1	BELLCRANK	1
2	BELLCRANK PIVOT NUT	1
3	WASHER	1
4	M2.5x10 SKT HD CAPSCREW	1
5	M2.5 PLAIN WASHER	1
6	M2.5 PLAIN NUT	1
7	LINE CONNECTOR	1
8	CONNECTOR PIVOT NUT	1
9	M2.5x6 SKT HD CAPSCREW	1
10	M2x6 CH HD SCREW	1
11	SPACER NUT	1
12	PUSHROD PIVOT NUT	1
13	BELLCRANK/PUSHROD CONNECTOR PLATE	1
14	PUSHROD, #0.7 PIANO WIRE	1
15	PUSHROD GUIDE, 0.9IDx2.000 PLASTIC TUBE	1
16	PUSHROD/HORN BRG	1
17	HORN PLATE	1
18	HORN WIRE	1
19	HORN BUSH, 1.2IDx2.00x8.0 BRASS TUBE	1
20	LEADOUT TUBE	2
21	ELEVATOR HINGE, 0.1THK MYLAR	1
22	TIP WT, 40x10x1.5 LEAD, APPROX 7g	1
23	TANK SHELL, 0.2THK TINPLATE	1
24	TANK SIDE/END, 0.2THK TINPLATE	1
25	FEED PIPE, 3.200x0.7 WALL COPPER TUBE	1
26	VENT PIPE, 3.200x0.7 WALL COPPER TUBE	1
27	M2.5 THREAD INSERT	4
28	M1.6 THREAD INSERT	3
29	M1.6x6 CH HD SCREW	3
30	M1.6 PLAIN WASHER	3
31	COWL BASE PLATE, 0.4THK ALUM ALLOY	1
32	COWL MTG BRKT	2
33	COWL CLIP, #0.9 PIANO WIRE	2
34	COWL MTG TUBE, 0.9IDx1.600x6.0 ALUM TUBE	2
35	#32 COMMERCIAL PLASTIC SPINNER	1



Midge



Engine out - and the removable rear cowl reveals bellcrank through fretted wing centre section.

Leadouts

Problem: 20 swg. piano wire will eventually kink at the wing exit point causing the controls to stiffen or jam.

Solution: Make a team race type button bellcrank and connect the flying wires directly. Access for replacement is via a removable cowl. If this type of bellcrank is beyond your workshop equipment then make one similar to the original but in steel and make flexible leadouts in heavyweight laystrate with flying wire connections at the wing tip.

Pushrod

Problem: Control slop caused by wear and vibration. Weight and too much flexibility.

Solution: Make a lighter and neater pushrod using the white inner from a Kavan R/C control snake and 22 swg. piano wire. I made a small shouldered bush to retain the wire to the elevator horn and to increase bearing area. Use a short piece of brass tube and a washer if you don't have access to a lathe.

Elevator horn

Problem: When an R/C type horn is bolted directly to the elevator the portion of hinge adjacent to the horn is stretched every time the pushrod applies 'down-elevator.' Eventually the hinge will fail.

Solution: Use team race technology and combine the inner hinge and horn. Use 0.1 mm mylar for the outer hinge. (I use plastic

drafting film). Silver solder the wire to the brass place, fit the hinge tube and then bend over the tang. Cyano the tube to the tail and the tang to the elevator but be careful that you don't get cyano into the wire/tube hinge. I did and had to start again!

Wing and tail

Problem: Lack of strength and inability to resist small dents in leading and trailing edges.

Solution: Make flying surface outlines from spruce and add spruce bar to wing to compensate for bellcrank apertures. Note that airfoil sections on wing and tail are semi-symmetrical at the root chord but change to symmetrical at the tips.

Elevator

Problem: Lack of control authority.

Solution: double the elevator area!

Tip weight

Problem: Slack flying wires and loss of control at take-off.

Solution: Add 7gm (1/4 oz) tip weight to outboard wing to compensate for weight of flying wires and symmetrical planform of wing.

Fuselage

Problem: Lack of strength, especially at the rear. Insufficient mass at the rear to place

the centre of gravity 5-10mm behind the wing leading edge when using a heavy engine like the PAW 149. Lower edge of fuselage side kinked making building more difficult.

Solution: Make fuselage sides from 1mm ply with straight lower edges and 1.5mm balsa doublers to increase the glue area for the top and bottom.

Front cowl

Problem: The standard plan does not show any means of attaching the front cowl that will make it removable for access to the engine.

Solution: With spinner, propellor and front engine bolts removed, the cowl may be slid forward to disengage its wire clips from the mounting tubes in the balsa nose filler. Note the 0.5mm ply facings to prevent bruising of the cowl.

Rear cowl

Problem: The standard cowl blocks the most effective exhaust port and prevent air from cooling the rear of the engine.

Solution: Slot the cowl to clear the exhaust port and construct from four pieces of scrap balsa to form a central duct. Shape to a close fit to the engine cylinder fins so that air is drawn through the fins and out through the rear of the cowl. The balsa cowl is epoxied onto a shaped aluminium plate (made from a beer can) which fastens to the fuselage with M1.6 (10BA.) screws and home-made thread inserts. Alternatively use 8BA screws with nuts soldered to small pieces of tin-plate epoxied into the fuselage. Note that the latter would have to be fixed before the fuselage is completed.

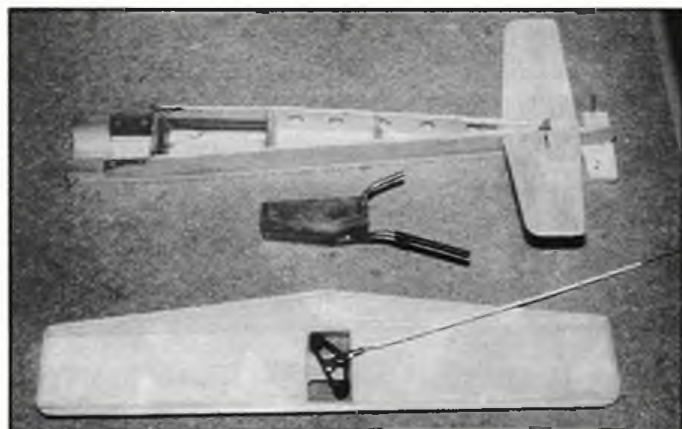
Finish

Problem: Tissue, dope, paint and fuel-proofer are heavy, tedious to apply and contribute little to structural strength.

Solution: Cover wing and tail in 20 gm/sq.m (0.6oz/sq.yd.) glass cloth and epoxy resin before fixing to fuselage. Cover fuselage after completion. The easy way is to lay a pre-cut panel of glass cloth over the panel to be finished and stipple through the minimum amount of resin using a shortened brush and working out from the centre of the panel along the warp and weft of the cloth. I have used Ripmax SP 113 and Tufkote two-part fuel proofer with success but I am sure that any low-viscosity finishing resin will be suitable. Don't worry about cloth that hangs over edge. Let the resin cure completely then sand it off just like tissue. Trim the model in colours of your choice (but remember the weight) and give a final coat of your chosen finishing resin all over.

The PAW 149DS that I use is fitted with a waisted spraybar and a Graupner 150 x 150 (6 x 6) glass-filled nylon propellor. Current folk-lore has it that the early engine with the cast-iron main bearing and vertical intake is a little faster than the later type with removable venturi. New piston/liner assemblies fit the old crankcases so you can get yours up to scratch using Mr. Eifflaender's excellent spares service.

So all my Midge secrets are revealed. Nothing I have described is beyond the skill of the average modeller which means that you can incorporate some or all of these ideas in your next Modified Midge. If you still think that I am cheating you must enjoy breaking models! Why not take up combat? Vintage combat... now there's an idea...



Major components before assembly. Note uniflow tank. Full-size copies of Ian Horne's drawing on previous page available for an SAE and £1.50...

Aeromodeller

WHAT'S ON

24th July
COLCHESTER MAC VINTAGE DAY
 Venue: Bures, R/C Vintage Model Fly-In plus Texaco, Class 1, Class 2 and Class 3 Ratio competitions to SAM 35 R/C rules. 10am start. Proof of insurance required. Spectators welcome. There will be a BBQ and refreshments. SAE for full details inc map to: Pater Grant, 2 Duncan Rise, Gt Yeldham, Halstead, Essex CO9 4QE. tel: 0787 237967.

24th July
OXFORD MFC DREAMING SPIRES GALA
 Venue: Port Meadow. Scale events up to 1.5cc Power, Rubber, CO₂/Electric, Jetex. Vintage, Chuck glider, Lightweight Rubber (folders and freewheelers), Glider (up to A/2), Flight Cup Rubber. Open Tailless (no cut-off date). SMAE insurance required. No power models except for Scale, above. Contact: C. Newman. Tel: 086 77 3020.

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

31st July
DEVON RALLY
 Venue: Woodbury Common, near Exmouth. O/R, O/G, O/P, All-in FAI, All-in Mini. 10 am start. Contact: Chris Chapman on 0209 212902 or Alan Parker on 0404 822861.

7th August
INDOOR FLYING AT CARDINGTON
 All-in Index and fun flying. Contact: Bob Bailey. Tel: 0438 723642.

7th August
NEWBURY AND DMAC VINTAGE MEET
 Venue: Newbury Racecourse. Vintage R/C and C/L. Proof of insurance required. Contact: Mark Richards. Tel: 0256 841273.

7th August
THREE KINGS C/L PROFILE CARRIER & VINTAGE STUNT EVENT
 Venue: Old Croydon Aerodrome, Purley Way, Croydon, Surrey. Silencers and proof of insurance essential. Contact: Wal Cordwell. Tel: 01-764 1661.

13-14th August
SCOTTISH FREE FLIGHT NATIONALS
 Venue: Newbigging, Lanarkshire. Entry details from Ron Sabey. Tel: 0387 52285.

13-14th August
SCOTTISH CONTROL LINE AEROBATIC NATIONALS
 Venue: Fife Airport, Glenrothes. Entry details from Ian Galt. Tel: 0505 683873.

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

21st August
FACCT MINI GLIDER BARCS RULES
 Venue: RAF Weston-on-the-Green. Pre-entry £2 + SAE and 2 frequencies. Contact: Mr N.G. Webb, The Bungalow, 13 East Street, Fritwell, Oxon OX6 9PX.

28-29th August
INDOOR FLYING AT CARDINGTON
 Team Trials for 1989 Indoor Eurochamps (best 2 from 6) and fun-flying. Contact: Bob Bailey. Tel: 0438 723642.



28-30th August
SMAE SCALE AND R/C NATIONALS
 Venue: RAF Barkston Heath. Contact: SMAE. Tel: 0535 618500.

11th September
SMAE NORTHERN GALA
 Budapest Trophy for 1/2A T/A. Wharfedale Trophy for FAI T/R. Venue: RAF Dishforth. Contact: Jeff Smith. Tel: 0532 663432.

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

18th September
WALSALL MAC VINTAGE MEETING
 Venue: Newtown, on A34 between Bloxwich and Cannock. Take J11 off M6. Classes 1, 2, Texaco, Flying Fifteen. Contact: Tony Proggatt, SAE to 12 Tower View Road, Landywood, Gt. Wyrley, Walsall WS6 6HE. Tel: 0922 415883.

18th September
INDOOR FLYING AT CARDINGTON
 All-in Index and fun-flying. Contact: Bob Bailey. Tel: 0438 723642.

18th September
THREE KINGS C/L SCALE DAY
 Venue: Old Croydon Aerodrome, Purley Way, Croydon, Surrey. FAI Scale and Profile Classes. Best WW2. Silencers and proof of insurance essential. Contact: Wal Cordwell. Tel: 01-764 1661.

16th October
SMAE INDOOR SCALE MEETING
 Venue: Alumwell Centre, Walsall. Two minutes from M6. J10. Peanut, Open Rubber, CO₂/Electric, Kit Scale and Air Racing. Lots of trimming time. Come and join the growing numbers! SAE for full details to: Doug Sheppard, 13 Luckington Road, Monks Park, Bristol BS7 0UT.

More events next month!
Have we got yours yet?

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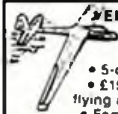
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For full details of this exciting
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Tel: 0959 77550**

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IDEAS, INVENTIONS Wanted
Call ISC 01 434 1272 or write Dept
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9 x 7 26p SAE to
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Available also in french. Overseas send
4 Postal Coupons. sorry no callers.**

VINTAGE and collectable model engines. Call in to Godalming RC Models, 3, & 3A Bridge Street, Godalming. Shop hours 10.30am - 5.30pm Mon - Sat. The Shop with the stock.

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**Advertise your products and services in
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is 4th July 1988**

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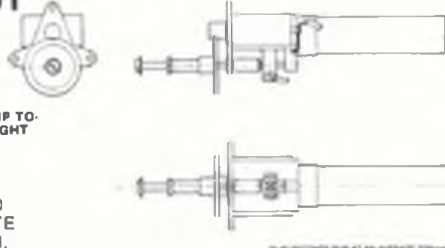


£120 including 3 or 4 jaw chuck Milling attachment and other accessories available. Centre height 2 1/2" o-lance between centres 9".
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
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Please supply... Aero Modeller Binders **£5.20 inc. P&P**
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Please allow 21 days for delivery

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Rates: 54p per word (inc VAT). Min. charge £8.10. Semi display £9.50 per single column centimetre. Min 2.5cms.

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- ★ EXTREMELY STRONG
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New range of team race wires

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This space is donated in the interests of high standards of advertising.

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**Tel: 0734 733690**

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28th-29th AUGUST 1988.
OPEN 10.30-6.00PM

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Adults: £2.00;
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(Sat 5.30) Closed Wed.
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PROOPS

of TOTTENHAM COURT ROAD

The old established supplier to the model, craft and experimental hobbyist have formed a new company.

BULKDALE ENGINEERING LTD.

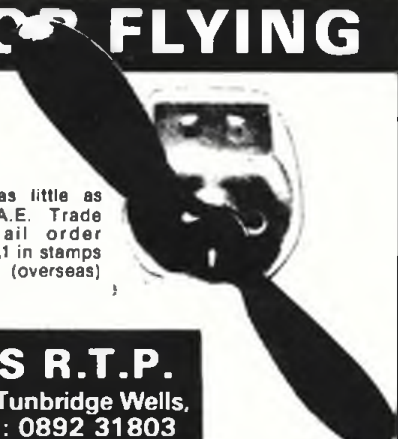
To supply their wide and ever increasing range of goods to other retailers, on a wholesale basis. For the present the new Company will continue to function from
52 Tottenham Court Road, W1P 0BA.

The retail activities at this address will NOT be affected.

Retailers in the model, hobby and engineering trades should contact David Proops, Managing Director of the new Company to find out how we can help to increase your profitability.

Contact David on 01 636 4420 or write to the address above for full information.

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There are no difficult noisy engines to start. No expensive fuel to buy and its quiet and pollution free. You can start for as little as £15.50. All enquiries S.A.E. Trade enquiries welcome. Mail order catalogue and guide send £1 in stamps (UK) or 5 reply coupons (overseas) inc. P&P.

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Offer only applies to order made using the printed Order Form from the Handbook and worth £5.00 and over before postage charges.

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To: A.S.P. Plans Service, 9 Hall Road, Maylands Wood Estate, Hemel Hempstead, Herts. HP2 7BH. Telephone: 0442 41221
 Please send mecopies of Plans Handbook No.1 @ £1.50

Overseas Postage: £1.00
 U.K. Inland Postage: £0.35

TOTAL

I enclose cheque/P.O. payable to A.S.P. Ltd
 Please debit my Barclaycard/Access Account Number:

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Name
 Address

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Please send to: Society of Model Aeronautical Engineers (AM) Kimberley House, Vaughan Way, Leicester LE1 4SQ

MEMBERSHIP APPLICATION

I wish to become a Full Member of the SMAE at £9.50 (£8.00 if under 18 on Jan 1st. this year).

Please register me as a contest flyer and send up-to-date details via the Competition Newsletter at £2.00 per year (Delete if not required).

Enclose stamped addressed envelope at least 8" x 6"

Please send me an application form for a contest season ticket. This saves you money if you enter several events a year (Delete if not required)

Age if under 18

Model Club, if any

Name & Address (BLOCK LETTERS PLEASE)

Please circle main interest if you wish to co-operate with a local club
 C/L R/C F/F GENERAL
 ENCLOSURES Cheque/Postal Order + S.A.E. + Completed form

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— no limit on Aircraft, car or Boat scale, just an engine size limit of 40cc —
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 Send an SAE for full details or simply fill in the form below to receive your certificate, smart plastic wallet and decals.

To: Insurance Office, Argus Specialist Publications Ltd., P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS.
 Name (In full)

Address

Please tick class of insurance required:-
 Passenger £6.00
 Standard £5.00
 Please make cheques payable to ASP Ltd. AERO

Kindly mention AEROMODELLER when replying to advertisements

Appendix - Links to the plans

No free plans on pull out banner in this issue.

SAINT FORMULA by Rene Jossien

Indoor Rubber

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CO2 GLADIATOR by Alec Gee

CO2 Gladiator Mini Vintage by M. Schoenbrun

[https://outerzone.co.uk/plan_details.asp?ID=3544 ...](https://outerzone.co.uk/plan_details.asp?ID=3544)

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WHISKAS THE WAKEFIELD by Mike Woodhouse

FF Rubber Development

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MODIFIED MIDGE by Jan S. Horne

Vintage control line speed

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