

FLIGHT

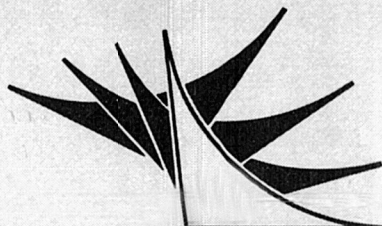
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Magazine of the BMAA

May-June 1985

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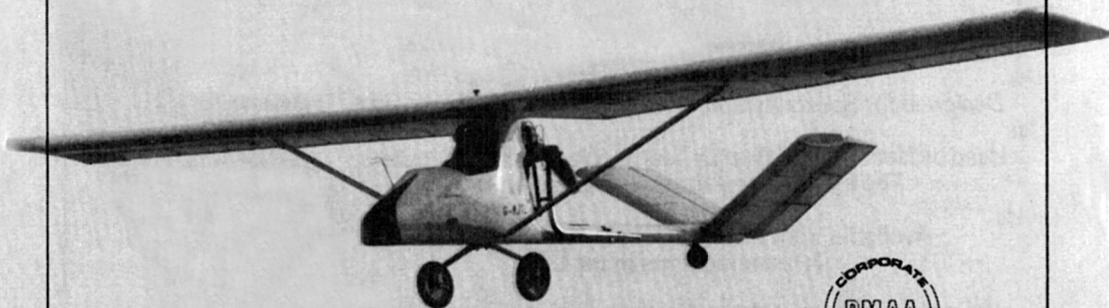
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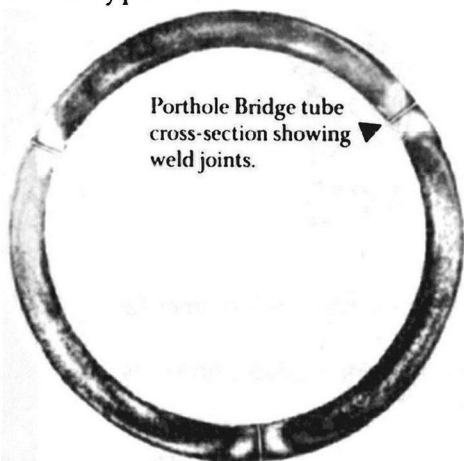
Is this seam safe?

This cross-section (below) shows the structure of aluminium tube made by the Porthole or Bridge tool method of extrusion. The resulting tube comprises a number of extrusion seams along its length (often not externally visible).

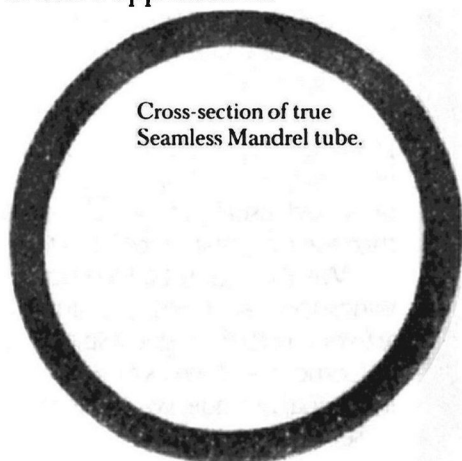
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Porthole Bridge tube cross-section showing weld joints. ▼



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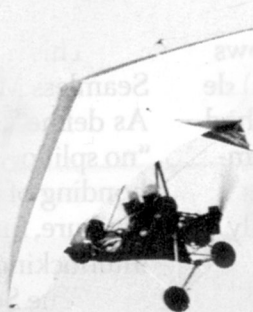
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FLIGHT line

Published by the BMAA

May - June 1985

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Next deadline for advertising and editorial 31 May (all contributions should include home and work telephone numbers)

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Whistles in the wires

New BMAA Logbook

A new-style logbook is now available from the BMAA's Deddington office, replacing the rather flimsy device previously offered. The new book is still a paperback, but has a rather more robust cover, and also has various useful additions, such as a list of phone numbers for met offices, and a space for a record of licenses held.

The new book costs £1.50 including post, packing and VAT, and is available at a discount for quantity purchases - 10% off for five purchased, 15% for 10, 20% for 15 and 25% for 20 or more.

Flexiform Moves to Macclesfield

Flexiform has not been in the news much lately, but things have been happening behind the scenes. The company has moved to Macclesfield (see p58), and is also working on a new wing for the sub-70 kg category. Flexiform proprietor Mike Hurtley told *Flightline* that the new wing weighs only 52 lb (23.6 kg), thanks partly to the use of spanwise-laid sailcloth, yet has the same strength as a normal

solo Striker. In design, he said, it resembles a scaled-down version of the latest Dual Striker. Mike is now looking for a company to work with to build a suitable trike unit.

Flexiform is far from being the only company interested in the sub-70 kg sector, as you can read in our Popham report on p24, and *Flightline* hopes to gather together all the sub-70 kg trikes for a giant test later in the year.

Out of Season, But...

With spring in the air this is hardly the time to talk about winter flying problems, but nevertheless it is worth noting that another in the CAA's *General Aviation Safety Sense* booklets, called *Winter Flying*, is now published and is available free from the authority's Printing & Publications Service, Greville House, Gratton Road, Cheltenham, Glos.

Aimed mainly at light aircraft pilots, it nevertheless has some useful tips for microlighters, including a handy graph showing when carb icing is most likely to occur.

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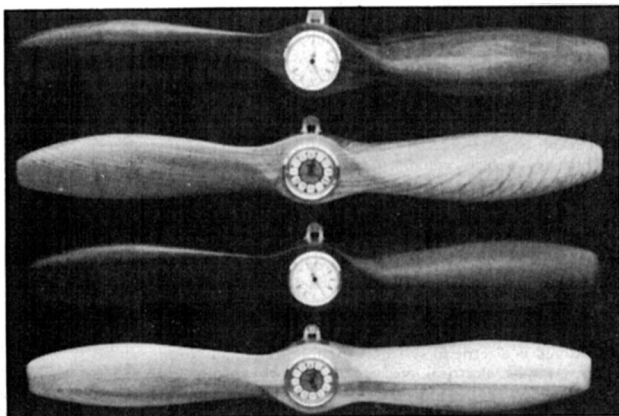
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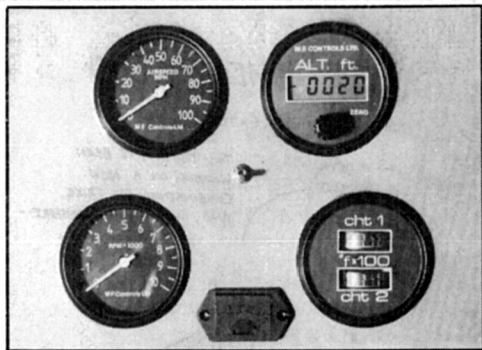
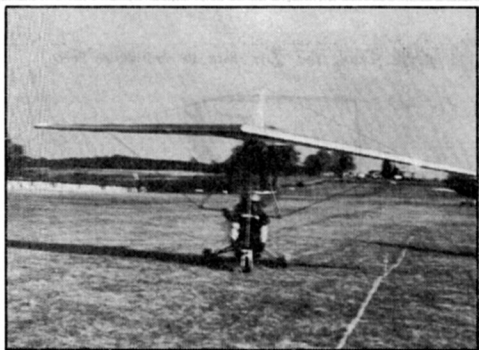
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Enter the Raven

Southdown's much talked-about Raven, which was first shown to the public at the AGM and first seen flying in public at Popham, this month makes its debut in the marketplace.

Since Popham an important change has been incorporated in the wing, which has had spoilers added, to be used as air brakes to reduce approach speeds. Further details in the Popham report on p24, and in *Flightline's* first ever colour spread, on p32.

Electronic Instruments

Questair is now stocking a range of electronic instruments, including 0-4000 and 0-10,000 rpm tachometer, ASI, altimeter, dual chtg and battery pack. Features include a 75 mm easy-to-read face, good vibration resistance, low weight, and an independent power supply with auxiliary switching. The instruments can be arranged on a panel which can be disconnected by a single plug. Prices for a single instrument range from £51 plus VAT upwards.

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- ▶ According to Mike Coghlan of Questair, several hundred of these UK-built instruments are already in use in the USA and the company is now looking for sales outlets in all areas. Questair can be reached at the address on p22.

Whoops Department

In our story on the microlight meeting at Achanon Marne near Reims (*Whistles in the wires* last issue), we dropped a clanger over the sponsor's name. The benefactor is not the Moët champagne company as the article said, but its great rival Mercier. *Flightline* apologises to all concerned.

Derek Lessware Leaves

Following the exhaustion of the £30,000 grant provided by the CAA for the BMAA to set up the airworthiness scheme, and the CAA's refusal to find any more cash, the BMAA has been unable to continue employing a full-time Technical Officer, and Derek Lessware has left the BMAA. For details of the new arrangements, see *Chairman's airwaves* on p54.

Portable Hangers

Mel Beaumont of the Microlight Aviation Club tells us he has details of Weathertek portable garages that could be adapted for microlight use, and invites enquiries on 04252 77603. Made from coated tubular steel with nylon or cotton duck covering, they come in various sizes and prices, around £150 being typical for an average size garage.



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Letters

In-Flight Signals

Sir, A group of microlight pilots in Derby are looking at the possibilities for in-flight communication, particularly when flying as a group. At short distances, up to one mile, commercially available cheap (£41 or £60) two-way 49 MHz FM radio seems a good answer. They're small, light and will retrofit to most helmets. They only use low power so legal problems don't arise in practice, and they don't interfere with the walk-about radio telephones which also use the 49 MHz band. However, radios can fail, so it seems to me that hand signals for close formation flying are an essential, and a good set of signals may even be more practical for many pilots. Therefore I would like the BMAA to evolve and adopt a common set of hand signals, and then go on to look at the radio situation.

Both systems have problems of course. The high noise environment is not suited to speech radio, unless expensive acoustic helmets are bought which not only house the earphones but also screen the noise. That leaves keyed radio using morse, or some simplified and restricted code (effectively like the hand signals) which would be quicker to learn. A simple keyed code would be quicker in use than full morse; the Q codes in amateur radio follow this reasoning.

I would welcome any correspondence on this topic, especially suggestions for the hand signals, the 'Q codes', and for a standard radio frequency.

A possible message set could be:

- 1 Affirmative,
- 2 Negative,
- 3 Can I join your formation/Hello,
- 4 I'm leaving the formation/Goodbye,
- 5 Let's land,
- 6 Let's climb,
- 7 Let's track left,
- 8 Let's track right,
- 9 Let's go home.

Changing the subject, the permit to fly system is gathering momentum. It sounds good; it should improve safety, because the people doing the inspecting and testing are well qualified. Their standards will be controlled and their information pooled.

Ah, but I'm a qualified and practising professional engineer, so my attraction to the sport was that with a simple, low loaded, low tech aircraft, I would have the freedom to do my own engineering and flying, and not pay a fortune for it. Many other microlighters are in this position.

So I believe we need this system, but that inspec-

tor tickets should be given to every qualified pilot who has engineering experience appropriate to an aircraft type. Then with the minimum of fuss he could do his own inspecting at his own expense. And why can't the licence have an engineering rating for this purpose, like we have radio and instrument ratings? Then any pilot could study and be examined for an engineering rating. After all, isn't pre-flight inspection a precursory flying skill, and engineering the entire basis of flying? A similar argument applies to flight testing.

Martin Horan

39 Leyland Street
Derby DE1 3PP

Our Pleasure

Sir, May I through your excellent mag thank Mainair for all their help during 1984? My 'boss' and I were awarded vouchers for a Thomas Cook holiday plus spending money and a rather nice Dealer of the Year Award.

We are so busy with students that we haven't yet had time to take the break. The microlight scene is very busy at present; there doesn't seem to have been any let-up at all this winter, with students cramming in hours and ordering aircraft.

Although Mainair must have a lot of problems keeping up with production, and delivery dates have got a little extended, they still keep to the delivery dates they specify. Thanks again Mainair. We are privileged to be associated with you.

Paula Smith

Airbourne Aviation

Disappearing 'Dactyl' . . .

Sir, I wish to draw your attention to a microlight recently stolen in Winchester. It is a Pterodactyl Fledgling, with a 430 cc Japanese Cayunah engine (*he probably means Cuyuna, which is American* — Ed). It was enclosed in an orange coloured case some 20 ft long, was approximately five years old and unregistered.

The theft took place on 27 August 1984 from the roof rack of a vehicle parked on the forecourt of a pub in Kingsworthy, near Winchester. Any information regarding the whereabouts of this machine will be gratefully received at the address below, or by phone on Winchester (0962) 68100.

The Superintendent

Police Station

North Walls

Winchester SO23 8DW

. . . and Disappearing Eagle

Sir, I sold my twin Chrysler Rainbow Eagle almost two years ago through *Flightline*, but unbelievably I didn't ask the name or address of the buyer, neither did he ask for mine or for a receipt.

I know it sounds hard to believe, but the whole deal was done in a matter of minutes; he rang out of the blue just as we were packing to move from Northampton to Devon and what with family troubles and a recent bereavement, our mind was on other things.

Now I'd like to get the register amended with the new owner's details, but enquiries in the village where I believe the buyer lived and worked have failed to find him, while a letter to Enstone (in case they have a register) has not produced a reply. All I know is that it was sold in April '83 to a man in his mid '20s who said he farmed in the Titchmarsh area of Northamptonshire. His mother came with him and they took it away in a Land Rover. The aircraft is quite distinctive, as I sold it with a set of three skis and shoes.

If anyone can put me in touch with the owner, or simply get him to send his details to the CAA Central Library at 45-59 Kingsway, London WC2B 6TE, I'd be most grateful. My phone number is 054884 2168.

R J Osborne

Torr Hill Farm
Lower Batson, Salcombe
Devon

Pull the Other Leg, Bob

Sir, In reply to Bob Calvert's letter in the last *Flightline*, if there is a flexwing that will 'truly exceed 100 mph', then I think that the condition of flight should be defined by him - eg vertical dive?

The CFM Shadow is the fastest microlight in the world - the FAI world speed record certificate on my office wall reminds me! The Shadow will turn 96 mph straight and level. The world speed record set was 78 mph - there's room for challenge if anyone wishes.

Pilots may be surprised to be told that their ASIs are inaccurate - even when calibrated. I had to have my own 3 km speed course surveyed during 1983 in Suffolk, as over 70 years of UK aviation has not provided a single national course. My ASI was calibrated as accurate within ± 1 mph by CAA equipment. During the four runs to establish a new world record, the ASI did not show less than 85 mph (I held back a little with future attempts in mind), yet the speed when calculated from certified timing pieces against distance was 78 mph. Dispiriting isn't it?

Thus when your flexwing is showing say, 65 mph indicated on your ASI Mr Calvert, the true speed is undoubtedly much less anyway.

Britain currently produces the best weight-shift and three-axis microlights in the world - we don't need to exaggerate.

Incidentally, in reply to Eric Woods' Flight Test of the Sirocco 377GB in the last *Flightline*, I'm sure it would be '... interesting to set a Sirocco

against a Shadow' with reference to top speed! Successful as this pretty French microlight is, there is no way that it could compete with a Shadow in terms of outright speed.

The Sirocco, powered by a Rotax 377 using a 52 x 32 inch pitch with 2.6/1 ratio and engine revs of 6750, has a theoretical top speed of 78 mph. The CFM Shadow, powered by a Rotax 447 using a 51 x 44 inch pitch with 2.58/1 ratio and engine revs of 7000 has a theoretical top speed of 113 mph.

I hope everyone can plainly see the difference.

Dave Cook

Managing Director, CFM Metalfax
Leiston
Suffolk

To Solder or Not to Solder?

Sir, As the new owner of Eric Craven's Tripacer/Striker, I read with interest his article in the last *Flightline* on soldered joints.

To be fair to Eric, his mod of soldering the wires and then covering the joint with clear plastic works very well, and has given me no trouble apart from that one incident, which was due entirely to the wire being too short and thereby causing a high-stress spot on a rigid joint. Simple rerouting and lengthening the wire has cured the problem.

But the article suggests that some people would prefer not to use solder. May I then suggest a suitable option?

Crimp the wires in place using bullet-type connectors and then slide a length of clear plastic tubing over the joint. Then seal the ends of the tubing with aquarium sealer, to guard against the elements. As I see it, the advantages are:

- 1 No granulation problems,
- 2 Easy visual inspection,
- 3 Protection from rain, salt spray etc,
- 4 Stress points are spread out and taken on the insulation, not the connection,
- 5 Reassembly is possible time after time without weakening the connection,
- 6 It looks neat and tidy,
- 7 The sealer remains pliable, so you don't get a rigid joint.

A word of caution though: aquarium sealer contains acetic acid, so follow the instructions or it may irritate your skin.

Eric and Margaret sold me a superbly maintained trike, and I'd like through *Flightline* to thank them for the care they took. It took me through the exemption inspection with no trouble at all - thanks too to inspector John Bridge for his professionalism. I really regret selling it, but I'm looking for a dual machine.

Finally, I'd like to reply to Bob Calvert's letter in the last issue about the Flash. I flew Tony Wells' Flash recently and entirely agree with Bob, but I must comment on the exceedingly long ground roll

▶ after landing. The wing just doesn't want to slow down and there was a very slow decay in speed, which could easily catch a flier unawares with disastrous results.

So come on, trike manufacturers, let's have some effective brakes and not the mud-scrappers fitted to most trikes. The new breed of wings make a good braking system important.

Graham F Cutler

94 Waterloo
Clitheroe

What's In a Name?

Sir, I found Peter Blyth's comments about the title of the BMAA (*Chairman's airwaves* last issue) interesting. The title is a mouthful and probably misleading — after all, micro means very small, and I don't think our aircraft are *that* small. So here are some suggestions:

- 1 British Mini Plane Association,
- 2 British Sky-Craft Association,
- 3 British Sky-Trike Association,
- 4 British Ultra-Plane Association.

By the way, I enjoy the magazine.

Bert Smith

10 Cedar Terrace
Dalrymple
Ayr KA6 6DT

Tough On The Clubs

Sir, We have fixed the date for this year's Norfolk Air Race as 14–15 September, despite the fact that no major sponsor has come forward. We have put in a considerable amount of effort trying to find a sponsor, not least in the production of the air race brochure, but to no avail.

Now that club events are being incorporated into the National Championship, it is all the more important to put them on a sound financial basis. The Norfolk Air Race costs around £500 to stage, not including members' petrol and other incidentals over the weekend, which is quite a commitment for one club.

Kelvin Woodard

Eastern Airports HG & MC

Norman Burr writes: I have every sympathy for Kelvin and his club mates, who year after year organise a first-class event with precious little help from outside. They produced an excellent brochure for potential sponsors, yet despite apparently doing all the right things, have been unable to find an organisation to back the event in the way the Zip Club did last year. And it's a problem that's only going to get worse, as the sport grows more sophisticated and people demand higher organisational standards. This is where Sports Council money should be going, and why it's so important that we match the £40,000 pa

that the BHGA has enjoyed for years. BMAA Chief Executive Brian Cosgrove has done a lot of ground-work at national level, and pressure on regional offices of the Sports Council by clubs can only do good, although we would be naive to think that progress will come in time to help this year's events.

Weight-Shift Out Of the Woods

Sir, Most people think of me as a three-axis pilot, since that's what I earn my living at and write about for *Flightline*, but in fact my personal machine is a trike and I've notched up a lot of hours with weight-shift control.

On the strength of this I recently did some *Section S* test flying for Medway Microlights on their HiBred two-scafer, mated to a Typhoon XL. I was familiar with the wing already, having found it particularly good for instructing as it is well behaved on take-off and especially so in that last 50 ft of the approach and through the flare.

So it was the Medway half of the aircraft which was principally under test, and I proceeded to test its strength with a rather firm arrival, albeit with some crosswind component. Subsequently things went smoothly, with the required climb rates, stall speeds and behaviour assessed and recorded, and although this obviously needs care, the weather was excellent and the whole exercise rapidly became fun. It took some 1½ h of solo and dual flying to cover the requirements and I enjoyed every minute.

For the all-up-weight tests Peter Harris came along as ballast together with a Sonic intercom, and here the machine really showed its paces — such a difference from Puma DS number two, with 330 Robin power, which I once owned! Had I been on the back, I'm not sure I'd have liked being thrown around through the required manoeuvres, which included some pretty dramatic hammer stalls, but he assured me he was enjoying things just as much as I, even when I added a few extras out of pure exuberance.

For me the whole experience underlined how much trikes have to offer. With such a strong and responsive machine flying really becomes an instinctive extension of mind.

Eric Woods

76 Brook Road
Merstham
Surrey

At Long Last

Sir, I've just seen the new log book by Bryan Lockyear and I'd like to put on record how impressed I am with it. At long last we have a professionally produced hardback log book which rivals the Airtour log books for quality but is relevant to microlight aviation.

Graham Hobson

Northern Microlight School

Flightline May–June 1985

Acid Rain, With a Difference

Sir, We would be interested to hear from any other microlight pilot who has encountered acid clouds as described in the newspaper cutting enclosed (printed next to this letter — Ed). The incident involved my Gemini.

It is interesting that a group of workmen also reported to the local radio station that they had seen a cloud of gas rise from a factory on the Solent that same afternoon.

M D Hinge

31 High Street
Lymington, Hants

Finley's Thoughts

Sir, My friend and I were talking recently about the vast area of flexwing flying opening up between the powered hang glider and the light aircraft, and of the relationship between BMAA and CAA.

We could see that the sport is at a crucial stage, with laws being set that will be difficult to change later. So here are a few suggestions.

First, trike units and Rogallos should be issued with separate airworthiness certificates, not a combined one. This would allow interchangeability of trike units and wings. Second, individual changes to machines should be inspected and given an additional safety permit; this would encourage individual innovation.

Responsibility has been given to the association, and it is being exercised by the Council of the association, yet for some strange reason without the help of the association's members. All members carry a responsibility to make their views heard and to help evolve a safe workable consensus.

Bill Finley

High Plains

5 Tetley Street, Bradford
W Yorkshire BD1 2NP

Sad Tale From Israel

Sir, 18th October last year was a day you would normally leave your flying machine on the ground, in Israel anyway. There are plenty of days with much better weather, even later in the autumn. It was very unstable, with huge cumimbuses coming and going, very sudden changes in force and direction of the wind. When next day the story of our country's first microlight fatality was on front pages I was feeling very sad and angry indeed.

It was the worst thing to happen and in worst possible time as well. Double fatality, two fine men got themselves killed for nothing. I knew one of them quite well, and worse, he started into microlight flying after seeing my first triking at the Sea

Right: This cutting comes from the Hants Chronicle of 1 March this year (see M D Hinge's letter). Has any other pilot had a similar experience?

"MICROLITE" PILOT RUNS INTO ACID CLOUD

The pilot of a "microlite" aircraft was forced to drop 200 feet when her eyes started to stream in an "evil smelling acid rain cloud" over Romsey.

Lesley Maynard was flying from Damerham to Braishfield on Sunday and was 1000 feet above Romsey when she hit a blanket of sulphurous air.

"It was a beautiful evening, no turbulence; I was enjoying the ride," she said.

"Then the air seemed to smell slightly strange. I had a quick look around the machine and the smell became more noticeable; it smelt like sulphuric acid fumes. There was no sign of any haze; my eyes were streaming by this time."

She immediately dropped 200 feet to clear the cloud, although her eyes were still streaming all the way back to Braishfield.

Another four minutes in the cloud and Lesley, a former chemical engineer, thought she would have been choking badly.

Lesley, from Landford, near Whiteparish, has never heard of microlite pilots hitting acid clouds before, but with recent scares about the effect of acid rain in Britain, she and other pilots intend to monitor the situation carefully.

A spokesman for Greenpeace, who had also never heard of such an incident, said it was "quite incredible."

"The cloud probably came from a power station or oil refinery, which emit sulphur into the air from burning oil or coal," he said.

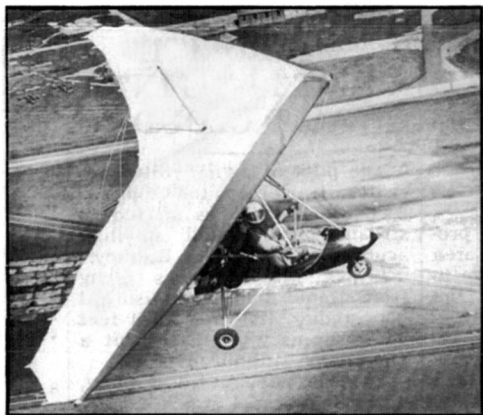
A lesser amount of nitrogen oxide was also formed and both combine with the atmosphere to form acid.

"The acid is more concentrated in the air, where it is in smaller particles," he added.

The wind was blowing from the south-west, so it was likely that she hit one of the relatively narrow plumes from one of the power stations or refineries along the Solent.

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This air-to-air shot was taken on Tuesday 9 April, by which time of course the weather had improved to the extent that at one time nearly every remaining aircraft was airborne in weather like a summers day.

Davidstow:

By Jack Bishop

The great Davistow fly-in *did* happen. This statement is for all of the people who did not turn up. Our old enemy the weather managed again to alter the schedule and plans that had been so carefully drawn up by Ian Stokes and all of the Southwest Airports team, but nevertheless the competition briefing took place on the Friday evening in the hope that Saturday would bring more clement weather.

After the briefing most pilots had a chance to fly while the rest were treated to a mild but very well executed display of aerobatics by Pete Davies in the Shadow. Saturday arrived with bright sun and

Letters

► of Galilee, a year and a half ago. Very bold fellow, he tried to talk me into starting a school for his friends in Moshav, but I wisely declined. This fellow, Avraham Khalfon, was one of the founders of new agricultural villages on the Golan Heights. His companion for this fateful flight was an Israeli Air Force pilot. Both, as I can understand, had little experience in microlighting, and none at all in hang gliding. The craft they used was an American Challenger — a three-axis control airplane with a Rotax engine and tandem seats.

From what information is available, no technical faults of any kind are suspected. The aircraft was flying at about 150–200 ft when it went into steep dive. Both pilots were killed on impact. As a witness stated, it simply fell as if there were no air around it. It could be a windshear, a strong gust from the tail. Some people I talked to, think that the pair, being unaware of things well known to local hang gliding folk, flew themselves into a huge rotor whirling along the western drop of Golan Heights. This 2,000 ft wall has a very abrupt flat top and to clear rotor you have to go for top-landing at a very respectful height far back.

This accident, dreadful as it is, falls also at a very sensitive time, when the Israeli CAA, well known for its overmotherly 'no flights no accidents' approach, had just started to realise that microlights are here to stay, and was modifying its views, making legal flying at least attainable in practice, although still very restricted and through lengthy and tedious bureaucracy. There are though, some signs that they do understand that this accident

was not caused by any technical fault.

Otherwise it is a very interesting time in Israel, marred mainly by the very bad economic situation and bureaucratic red tape. A few schools are working or about to start work, and a few workshops are producing flying machines, but strangely of the more complicated and troublesome kinds. One big agricultural machinery firm is developing the French Agriplane for the local market and Third World countries.

My impression is there will be soon more sellers than buyers. After all, it is a very small country, with a very limited airspace available and countless defence obstacles. Maybe I'll come back to England soon ...

Alfred Porter

Israel

Eighth Wonder Of the World

Sir, Almost every microlighter I've ever met holds safety as his or her number one priority. This is absolutely the way it should be. It is interesting to dwell on what makes for safe flying by looking at the other side of the coin, accidents.

The world at large and, by definition, newcomers to the sport have the impression that microlights are not the safest of things to go flying in. There is possibly a grain of truth in the assumption, but for reasons which probably don't occur to these people. The grockle view is that our machines break up in the air with monotonous regularity. Perhaps they used to, but they don't now. The modern weight-shift wing is the eighth wonder of the world and possibly has greater integrity of structure than most other things used for light, recreational aviation.

But accidents still happen and regrettably always

first blood to Barnish

a continuous wind of 8–10 mph, and the cross-country event started. Most of the pilots were well wrapped up against the vagaries of weather, with one exception – Pete Davies was wearing just light clothes. It's funny how fate can take a hand in things, because most of the other fliers managed to stay relatively dry and Pete had the misfortune of an engine fault which caused him to land out about 30 miles away from the take-off point. By the time I got to him with the trailer, he was quite wet but somehow still smiling.

The weather during the day varied between very bright and spring-like to akin to Siberian, but nevertheless most aircraft made it round the course, and pilots seemed to find the task challenging and

enjoyable. The object of this part of the competition was to test flying and navigation skills; it was not a race, tasks being to prejudge your time over different legs of the course and to estimate the amount of fuel that would be used, as well as collecting various clues along the way. The proof that you did not have to have a superfast machine to compete came with the results, which you can see in the panel.

At this point I'd better explain the scoring system. Everyone who entered at least a week in advance and pays his or her entry fee was automatically awarded 400 points. If they turned up on the day, even if they didn't fly, that went up to 650. Points above 650 had to be earned in competition, and if

will. Furthermore, they will occur in greater numbers than they should because microlighters are generally denied the field facilities enjoyed by all other forms of light aviation. Some of our fliers, or would-be fliers, are lucky enough to live near the big training fields such as Enstone, Davidstow, and Shobdon, but the rest of us are forced to chat up local farmers for the use of fields which, frankly, are better for grazing sheep than flying aircraft from. The pilot must carry a complete mental inventory of all the things sticking up out of the ground in his own field and the surrounding area. He must also look at wind shadow from nearby woods, fly with regard to noise nuisance and take all these things into account in his preconsidered abort routines. The result is that he usually has to follow climb outs and approaches which are anything but straight or forward.

So backwoodsmen pilots require a highly developed sense of airmanship in at least equal measure to their basic flying skill. This is fine for experienced pilots but the novice is considerably overstretched by this; a bad decision – or perhaps no decision at all – becomes the major cause of accidents.

The irritating thing is that many accidents to novice backwoodsmen would be avoided if access were allowed to the light aviation airfields such as Shoreham, Redhill, etc. BMAA instructors are amply qualified to instil the circuit discipline required for mixing with other aviation and pilots, I feel, would be happy to pay for the privilege of using these massive fields. I don't know if the management of these fields have genuine safety doubts about us as pilots, and our Dacron things as flying machines, or if it boils down to politics

played by the PFA. Either way it costs us broken spars, limbs and possibly worse.

Our weight-shift machines have never been safer. Apart from an accident which occurred some time ago involving a Hiway Demon wing of faulty manufacture, virtually all incidents in recent years have been shown to have human error as the basic cause.

Flexwings possess a high degree of structural integrity compared to flat wings or fixed wings because it is difficult to overstress them. Modern ones are designed to 4g repetitive or 6g ultimate as a minimum. They offer their most efficient flying characteristics at 1g loading. As this is increased, either by increasing the payload beyond the design limit, or by performing g-pulling manoeuvres such as whipstalls or very tight turns, the wing progressively loses its efficiency. This happens because the wing flexes backwards, and the washout increases towards the tips, limiting the lift at this point on the wing while the centre section stalls. The whole mechanism acts as a brake on the amount of lift – and hence g – which it is possible to pull out of a flexwing design. Combine this with reflex, the attribute which puts a limit on dive speed, and you have a flying thing which is intrinsically safer than almost anything else around. It is difficult to see how even the most reckless pilot could take a wing even halfway to breaking point, although all of us are capable of flying it into a tree given enough misjudgement!

Frank Ogden

11 Stocklands Close, Ardingly Road
Cuckfield
W Sussex RH17 5HH

► the whole event had had to be called off due to bad weather, everyone entered would have been given 1000 points – i.e. full marks.

Now I know it sounds rather odd to give people points for not flying, but the system does make sense, because it encourages people to enter and therefore ensures that the organisers get enough in entry fees to cover their costs even if the weather is lousy – no mean consideration when you think about the work involved in running a national championship event (*here, here – see Letters – Ed*). It also ensures that those who have entered will take the trouble to turn up even if the weather is doubtful, since there are points at stake for doing so, and that in turn means that if the weather improves there will be enough aircraft on site to have a meaningful competition.

The Southwest Airports lads would like to see this system adopted nationally, and judging by the pilots I spoke to at Davidstow, they are not alone in that opinion. However, Competitions & Events Chairman Jeremy James has decided on a much simpler system, with points awarded on a 9-6-4-3-2-1 basis for the first six places, the pilot with the most points at the end of the season being the first National Champion.

At Davidstow some competitors did not complete the course, some never started, and one didn't show up at all, but nevertheless they all got some points. A special mention must go to Peter Lang, with his under 70 kg Medway Half Pint, who proved that these lightweighters are just as useful as their big brothers in these conditions. Sadly though, the weather got worse and flying had to be cancelled on Sunday and Monday, but nevertheless all the people who attended had a good time because as usual there was a barbeque on Saturday night. To cater for the visitors Southwest Airports had set up a food bar in a corner of a hangar with a good

selection of cottage pies, chilies, tea, coffee and so on, so although the weather did spoil some of the weekend, I think we can safely say that there was a fly-in at Davidstow.

We'd like to thank the following for their help: Mr and Mrs Irish at Truro Airfield for their hospitality to the marshals, Betty and Joan for manning the food bar regardless of the leak in the roof (mended by pilot/plumber Rig Wason), Pete Lang and Medway Microlights for braving the weather, Andy Barnish for winning in an old machine, and finally everyone who turned up – we had over 30 machines on the field.

Postscript

By Jeremy James

The second round of the National Championship will be at Woburn on 26 and 27 May (*see p30 – Ed*). Though too late for inclusion in the *Calendar* at the back of this magazine, we've fixed up the third round for 13 and 14 July at Sutton Medlands. Peter Robinson and David Cole of the Cambridgeshire Microlight Club are putting a lot of effort into this midsummer event, so let's have a Woburn-sized turnout for this competition. Remember that you must have a valid FAI competition license (available from John Wincott at 162 Leicester Road, Narborough, Leicester LE9 5BE for £5), plus insurance valid for competitions (available from Deddington).

Some 25 pilots have applied to represent Britain in the World Championships, plus one factory team of six pilots and machines – a total of 31 aviators, from which we shall select a team of 10, plus three reserves. We'll publish the names of the selected few in the next issue, and are applying to the Sports Council for funds to allow us to take part.

Regarding the display team, just nine pilots have offered their services to date.

Results - Davidstow Easter Fly-in

Numbers in normal type are event points, those in bold are National Championship points.

- 1 *Andy Barnish* Ultrasports Tripacer/Southdown Lightning (Robin 330), 936, **9**
- 2 *Jeff Weighell* Southdown Puma Sprint (Rotax 447), 931, **6**
- 3 *Dick Clegg* Mainair Gemini (Rotax 447), 925, **4**
- 4 *Tony Hughes* Solar Wings (Robin 440), 910, **3**
- 5 *John North* Mainair Gemini Sprint (Robin 440), 891, **2**
- 6 *Bob Calvert* Mainair Gemini Flash (Robin

- 440), 883, **1**
- 7 *Alan Reynolds* Puma (Robin 440), 844
- 8 *Keith Reynolds* Southdown Raven (Rotax 447), 822
- 9 *Tony Baker* Ultrasports Panther (Robin 440), 764
- 10= *Pete Davies* CFM Shadow (Rotax 447),
Pete Lang Medway Half Pint (JPX PUL 425), 650
- 12= *Steve Comben* Southdown Puma Sprint (Robin 440), *Rig Wason* Goldwing, *Mark Phillips* Flexiform Dual Striker Trike, 650.
- 15 *Billy Brooks* Solo TS4 (Sachs), 400



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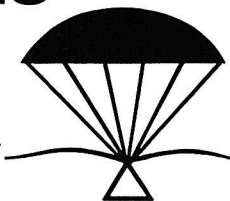
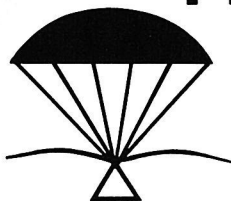
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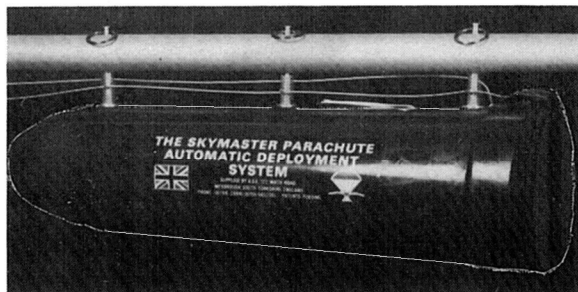
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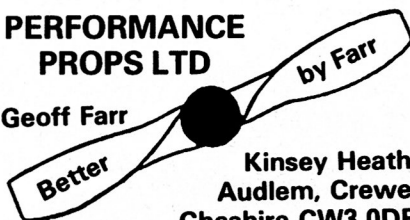
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Main picture: A busy scene on Sunday morning as pilots make the most of the June-like weather, knowing that a front was due in later.

Top right: Ian Grayland of Aerial Arts tries Medway's Half Pint sub-70 kg trike for size. Ian designed the 130 SX wing used on the machine.



By Norman Burr

With a sport as young as microlighting, it seems strange to talk about traditions, yet that is what the March Trade Fair at Popham Airfield near Winchester has undoubtedly become. Strictly speaking, it's not a fly-in but an exhibition for the manufacturers, but some private flyers always manage to slip in and Popham proprietor Jim Espin has, hitherto at least, always turned a blind eye.

There wasn't much else he was blind to though, the usual good Popham organisation being much in evidence. An innovation this year was to keep air-

craft and parking on the south side of the field, a courtesy car being available for those wanting to reach the clubhouse, and the arrangement seemed to work well, keeping the take-off strip as far as possible from the trees and the notorious cross-wind turbulence which they create.

As it happened, there wasn't much wind at all, cross or otherwise, and until the drizzle set in around 2 pm on Sunday the event basked in beautiful spring weather. The sunshine brought out both aircraft and public and the lads in the car park were kept busy all weekend.

There's no doubt that many of the visitors had





Left: Chris Draper of Medway Microlights stands proudly with his HiBred 440, now very close to type approval. He may even beat Solar Wings in the race to have a fully legal Typhoon-winged machine...

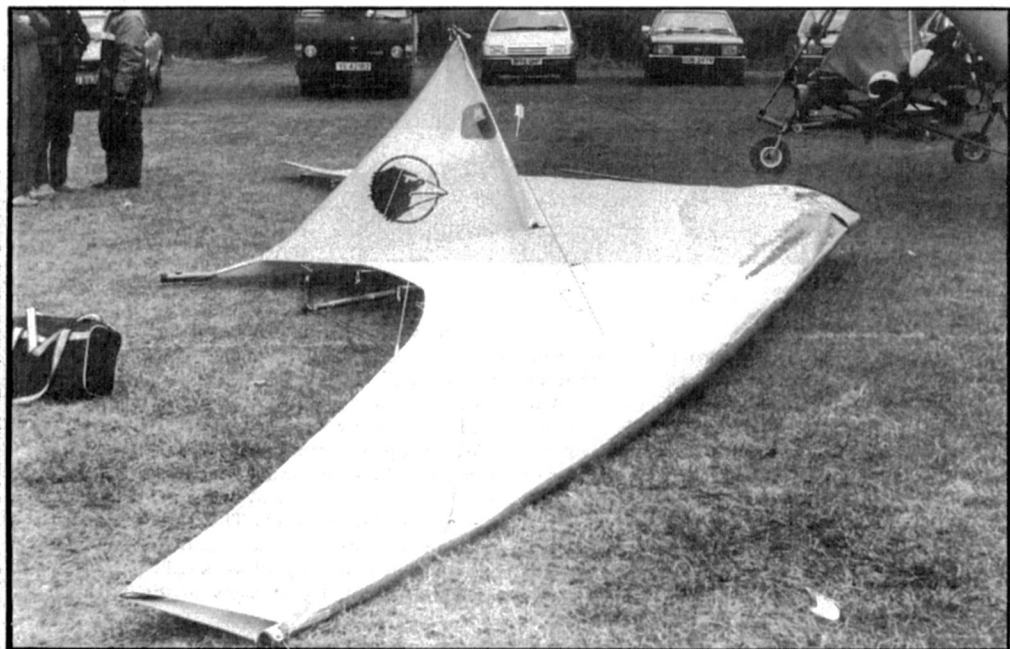
Right: Another application of the Aerial Arts 130 SX is Nigel Beale's under 70 kg machine, though this one's not yet in production.

Below: Snapped just as the Southdown team were packing up and with its battens removed, the Raven's spoilers can be clearly seen. Note the integral strobe in the fin.

come to see the public flying debut of Southdown International's Raven, first seen as a static display at the AGM. For a while they were disappointed, as fog in the Brighton area delayed its arrival until Saturday night, but it was out and about a lot on Sunday, and the question on everybody's lips was

'Is it as fast as the Flash?'

The answer to that question was not to be found at Popham, and will probably have to wait until *Flightline* can arrange a needle match between them later in the year. What was clear at Popham, however, is that Southdown have broken new





► ground by the incorporation of spoilers, a first on a two-seat triking wing.

The latest generation of Rogallos are so much faster and cleaner than their predecessors that the other side of the coin is becoming apparent — they're fast when you don't want them to be, on landing. The Raven, whose area is right down to the legal minimum under the FAI microlight definition, is obviously fast, and without the spoilers — unfortunately they weren't connected at Popham — looked to be landing as fast as or faster than the Flash, which comes in at quite a lick. The spoilers will be operated simultaneously by a slider on the bar, to act as air brakes and reduce the approach speed and landing roll.

Watching all this with great interest were the other members of the big two — Mainair and Solar Wings. Mainair was there in force, the company's Gemini Flashes probably putting in more airtime than any other marque during the weekend. At Solar Wings the emphasis was particularly on towing, the company displaying its new Typhoon XLT wing, an enlarged version of the XL specially intended for towing and mated to a trike unit with a big 503 Rotax. There were no towing demonstrations during the weekend, but it was evident from the hardware in the trike that a great deal of time has already been put into developing equipment for this potentially important branch of the sport. Interestingly, Mark Southhall of Solar Wings said he was so impressed with the handling of the XLT that it may be marketed as a trainer, all 212 ft² (19.7 m²) of it.

During the weekend I had the chance to fly in the standard XL, as Chris Draper of Medway Microlights took me up in his HiBred 440/Typhoon XL to do some aerial photography. Chris demonstrated the power-off stall, which is so mild that it's hardly a stall at all, just a gentle mush. It was easy to see how the XL gained its reputation for being an idiot-proof trainer.

The object of my photographic attentions was the company's other trike, the new sub-70 kg Half Pint, which consists of a very neat JPX-engined trike unit mated to Aerial Arts' equally tidy 130 SX wing, a combination which deservedly attracted admiring glances throughout the show. The 425 cc JPX has an unusually low power output for its size, only 22hp, but as a result revs sufficiently slowly to dispense with a reduction drive. Readers who recall the horrendous racket generated by early direct-drive Pterodactyls may doubt the wisdom of this, but in practice the unit is quite quiet, and develops enough thrust to give the Half Pint a respectable performance. And of course, there's one less thing to go wrong

Readers outside the South East may not be familiar with the Medway name, as the Rochester-based company is quite small and advertises little, relying instead on a fiercely loyal band of

local flyers — very much as Hornet does in Bradford. However, what Chris Draper and friends lack in financial muscle they make up for with sheer enthusiasm and hard work, and it's a safe bet that the Medway name will crop up with increasing frequency from now on. The company has its CAA approval and is very close to type-approval of the 440 HiBred, close enough to be taking orders, in fact, and Keith Vinning hopes to test one for *Flightline* in the near future.

Using the same wing as the Half Pint but a totally different trike unit was Nigel Beale's sub-70 kg machine. Power, as you would expect with a machine built for the personal amusement of the proprietor of Cyclone Hovercraft, is by Rotax, a single-cylinder Rotax 185 being the choice. Nigel initially didn't have any plans to market the machine, but such was the interest shown at Popham that he may make arrangements with a manufacturer to put the aircraft into production; he will not, however, be setting up as a manufacturer in his own right.

One man who was particularly impressed by the Aerial Arts wing was Nigel Huxtable, who found to his amazement that despite its small area (128 ft², 11.9 m²) it soars beautifully. Skyhook's Pixie showed that a sub-70 kg trike can be a viable, useable machine, and now Aerial Arts has built on that achievement.

As is becoming the norm at British microlight events, three-axis machines were very much in the minority. Jim Romain brought along his heavily modified and now rather dog-eared Tiger Cub, complete with four differential ailerons, fin, stiffer wing structure, engine offset and tricycle undercarriage, and proceeded to put in quite a few undramatic circuits. Jim was hoping that Graham Andrews, who did a lot of test flying for MBA on Chris Baker's absolutely standard Tiger Cub and who is thus the ideal person to assess whether Jim has got it right or not, would make it to Popham and give his verdict, but unfortunately he didn't arrive. Undaunted, Jim hopes to get Graham aloft in his Cub soon, and the results could well determine the shape of Cubs to come. Jim's aircraft has lost the elegance of the original, but it's results that count.

Midland Ultralights' Sirocco looked as pretty as ever, graced this time by a canopy to give full enclosure and the company seems to be regaining confidence now that the seemingly endless last-minute permit-to-fly hitches have been ironed out. Last but not least, Angus Fleming brought along his Lazair, still for my money the most graceful microlight in the sky.

All in all, Jim Espin and friends have every reason to feel pleased with themselves for putting on another enjoyable event, and one which provided an encouraging pointer to the coming season. For the sport is growing again — at last.

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Happy days are here again

By Dave Simpson, Woburn organiser

Woburn Abbey opens its gates again for us this year on Sunday and Monday May 26 and 27. They will be providing prize money, trophies and subsidised lunches for pilots and in return ask only that we behave ourselves and provide as much entertainment as possible for their public. This means entering as many competitions as you can and generally aviating as much as you can.

There are some improvements in the arrangements for 1985, the two most important being the provision of a fenced-off paddock for aircraft and competition insurance cover for £5 per head for the two days.

Please read the following notes carefully if you plan to attend.

Flying in

Saturday: Allowed on prior-permission-only basis between 1400 and 1700 on Saturday 25 May; please contact Mike Barry on Woburn (052525) 666 on Friday or Saturday morning. No flying from the park is permitted on the Saturday, only landing.

Sunday and Monday: Flying in any time between 9 am and 7 pm is encouraged each day. Follow the routes shown on the map opposite and report to control on landing. A windsock and landing tee will be set up.

Do not under any circumstances fly anywhere near the two stud areas shown. An orange ground marker will mark the limit of our flying area to the west.

Overnight Stays

Limited camping facilities, for caravans or motor caravans only, are available on site at £2.50 per night. Write to Mike Barry, Woburn Abbey, Woburn MK43 0TP enclosing a cheque and he will save you a place. Camping facilities are also available at the Rose & Crown, Ridgemont, tel (052528) 245.

Hotels are the Birchmoor Arms (052525) 593, Maggie Hotel (052525) 219, and Bedford Arms (052525) 441. I have negotiated special rates at the Bedford Arms for BMAA members.

Documents

The following documents *must* be shown on checking in; otherwise no flying.

1 Insurance certificate: third-party cover for £250,000. For competition entrants, I have negotiated a weekend cover for £5 per head, provided

that the pilot already holds a third-party cover for recreational flying. Cover will be available on the day.

2 PPL Group D. Restricted Group D is satisfactory but proof of 15 h minimum in the last year is required.

3 BMAA membership card.

Pilot Briefing

To be held at 9 am and 10 am each day. Please be prompt and attend *before* you fly each day.

Free Flying

Fly as often and as long as you wish, but note that *take offs* from the park are allowed only between 9.15 am and 7 pm each day. That means if you're really quiet and land dead stick, you can creep in afterwards

Airspace

Luton airspace 9 nm to the southeast, and Cranfield 5 nm to the north.

Competitions

Will be held each day between 11 am and 5 pm and will be as follows:

- 1 Spot landing. No-power landings from 500 ft onto a target.
- 2 Balloon bombing. Balloons half filled with water are dropped onto the target from 20 ft.
- 3 Fast-slow race. Minimum and maximum times are taken between two markers and the first subtracted from the second. Longest time wins.
- 4 Egg rolling. Eggs are rolled onto the target to score without breaking.
- 5 Balloon burst. Balloons arranged in a line across a strip are burst by the aircraft's wheels. No ground contact allowed.
- 6 Concours d'elegance (Monday only). Points are awarded for aesthetics, airworthiness and cleanliness.
- 7 Track accuracy competition. An accurate track must be flown around the park and the clues picked up from ground markers. You will need an OS map sheet 165 for his event.

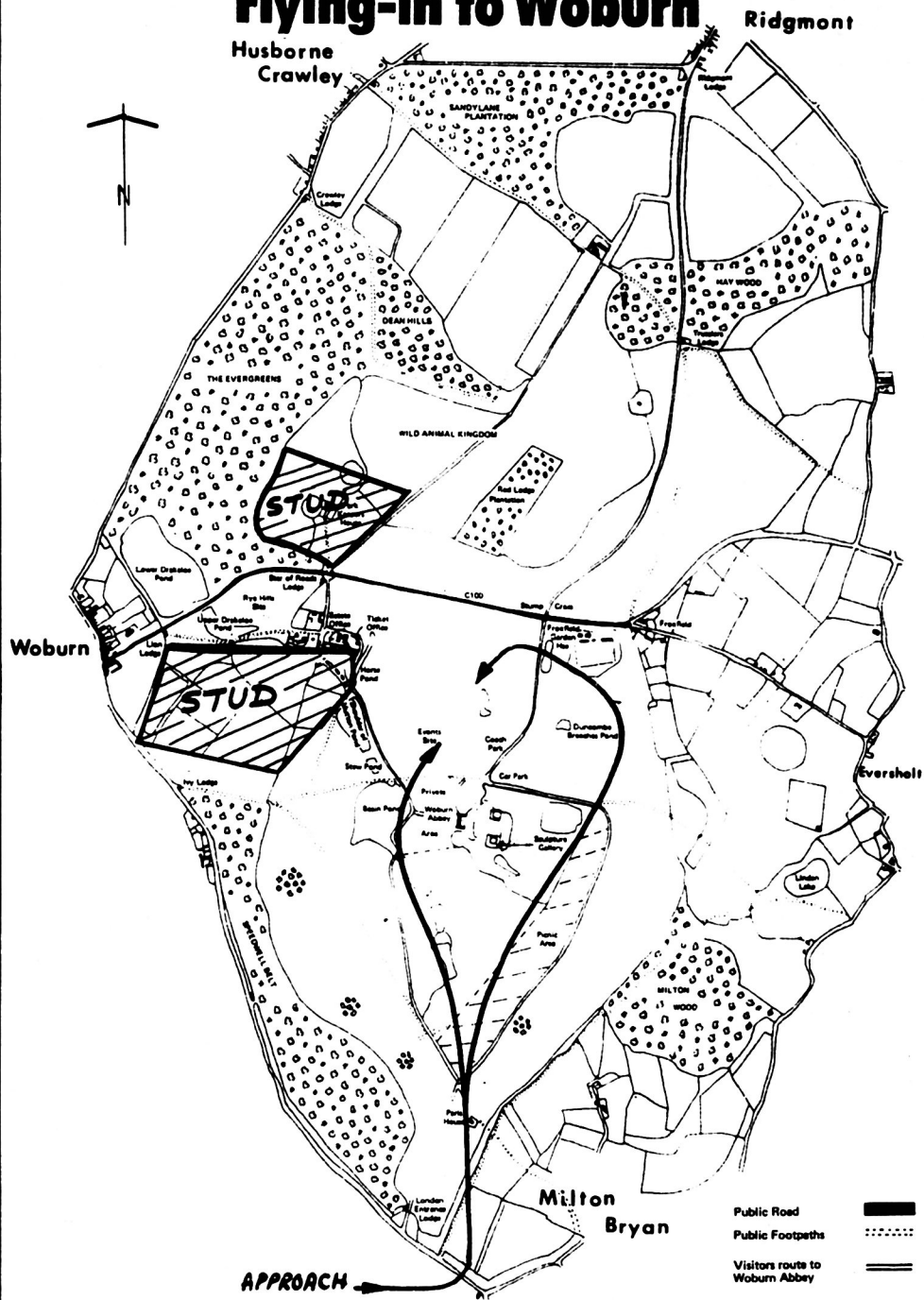
Now that you know what's coming, go out and practise. Some of these events will count towards the 1985 British National Championship.

Weather

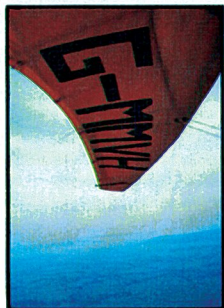
After last year's disaster, an Ansaphone service will be available on (0767) 261312 from 7 pm on Sat-

p53 ►

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Pilot briefing 10.00 am Sunday 26th May

Events start 11.00 am. Please be prompt

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Spar failures: how much do

By Dave Campbell

Looking back to *Flightline* Jan 83, p72, I see that some of the Scorpion crashes were tentatively attributed to failure of the inner part of the wing rear-spar, by buckling under the combined effect of flying-wire and sail tension. There has been no further discussion of this structural failure mode in *Flightline*, so I felt it ought to have an airing, being a potentially deadly hazard.

The sort of wing to which I am referring is the tube-and-fabric, wire- or strut-braced type, whose aerofoil section shape is maintained by flexible battens, eg Pathfinder, Mirage, Phantom and MX, (Fig 1A). The particularly vulnerable part is the inner section of the rear spar.

This is subjected to three important loads:—

- (i) the lift load carried through the sail,
- (ii) the opposing and inward-directed pull from the flying wires, and
- (iii) the reaction to these loads at the spar-to-keel joint, (Fig 1B).

I have shown a wing with just one pair of flying wires (eg Pathfinder), but a similar argument applies with two pairs, eg Quicksilver MX.

Now the horizontal components of the loads in the wire and the keel-fixing reaction hold this tube in compression and, if increased excessively, would eventually cause sudden failure by buckling, or

elastic instability. Put a ruler vertically on the table and press down on the upper end; as you steadily increase the pressure, at first nothing much happens. Then, suddenly it bends: that's buckling.

Now if your tube is bent to start with, the compression load needed to make it collapse is considerably less. This is because the end load can now act around the part of the tube lying off-centre and bend it further, which in turn increases this bending moment (Fig 2). Trikers know this and *never* fly with a bent cross-tube!

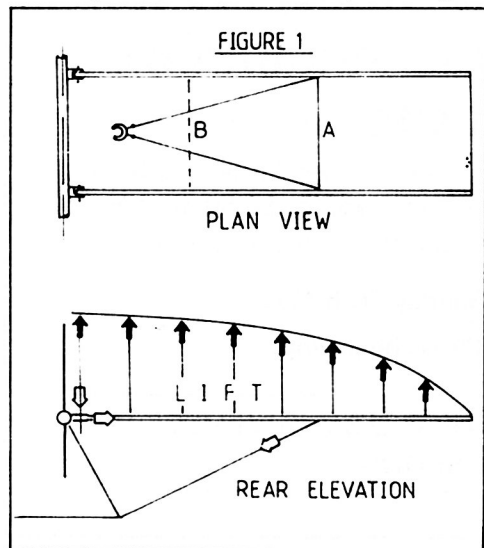
The lift load from the fabric bends the spar between the flying wire attachment and the keel joint and thus makes it easier to buckle. The vertical component of this load bears much more heavily on the front spar than the rear (typically 2 to 4 times more) but the load is pulled by the sail, held in aerofoil shape by the battens, so that the upper sail load at the front is near-vertical but at the rear is near-horizontal, (Fig 3).

This can enormously magnify the bending load on the rear spar and make it much more vulnerable to buckling failure. In a double-surface wing where the lower surface reaches back to the rear spar, if the lifting force is developed mainly across the more horizontal lower surface, then this effect is further increased. The space inside the wing should therefore be vented to a high pressure region so that the lift forces are taken by the upper surface. Failure to ensure that gaps in the upper surface are *totally* sealed could therefore be hazardous. (Velcro seals may thus introduce their own hazards.)

But aren't all of these theoretical anxieties brushed away by the load test? It all depends on how you distribute the load. If you place all your sandbags along the quarter-chord line (or thereabouts, as calculated by your aerodynamicist) you have a chance of properly testing the buckling tendency of the rear spar. But if you put calculated proportions of the loading on the front spar and the rear spar, then the test is useless as an assurance against this mode of failure. The sail tensions which cause spar bending will *not* be generated.

The argument I have set out is qualitative. I had hoped to give calculated estimates of how near to disaster typical two-spar wings are. This is possible, but too difficult for me to do in a reasonable time, so I leave it to members better qualified in structural engineering.

To finish off: there are three further practical conclusions to be drawn from this rather rough analysis:—



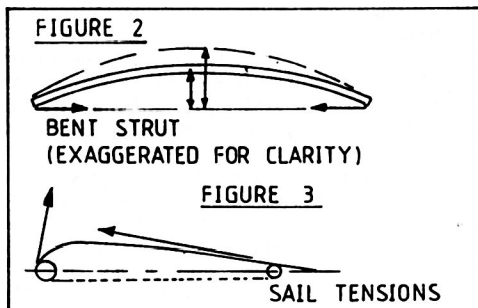
- 1 Don't fly if your rear spar is at all bent inside the flying wire attachment.
- 2 The struts between the front and rear flying wire attachments (A in Fig 1) are in compression from flying wire and sail loads: they should be nice and straight.
- 3 The possibility of rear spar buckling failure would be much reduced by adding another strut (B in Fig 1).

At Dave's request, I circulated his article to several interested parties. All agreed that the problem was very well summarised and shown to be full of incredible technical difficulties. Limitations of space prevent us from publishing their replies in full so I hope they will forgive me if I summarise their comments.

In fact, if the battens are strong enough to maintain the wing profile under all conditions, then the vertical load will be transferred into the trailing edge via the battens and local distortion of the fabric.

The obvious question arises of "Why do some machines, like the Quicksilver, Pterodactyl and Pathfinder 1, appear to be OK, yet others which don't look *that* much different fall out of the sky?"

There is a very strong possibility that the answer may lie in over-design! In early designs, it is almost instinctive to go a little overboard in the strength of a machine, in terms of number of bracing cables,



One problem with some Dacron-covered wings is that they have probably been designed with inadequate attention to compression ribs and drag/anti-drag struts (particularly on those aircraft known to have failed). If these are inadequately incorporated, the loads can transfer to the leading and trailing edges, in a manner with which they cannot cope because of their shape and size.

Derek Lessware has also pointed out that unless the sandbag loading which is often used takes drag forces into account, it will probably not produce a realistic distribution of loads on the spars. There is no doubt that, before carrying out static-load tests, which must bring in the contribution from deflected ailerons at various 'g' loads, designers would be well advised to agree their procedures with the BMAA Technical Committee and/or the CAA.

Another point to remember is that the summation of horizontal forces on a wing *must*, in normal flight, be rearwards due to drag. (Dave's Fig 3

► might be interpreted to contradict this.)

If bracing wires are fitted to react vertical shear, they might best be directly below the spars in question, so that extra lateral loads are not induced. That does mean providing other members to react the drag forces; but wires directly under the spars will certainly help with the torsional stiffness of the wing.

The question of how and why a wing should be sealed seems to contain enough meat for a separate article! Everybody, but everybody, has a different view on what the contribution is and where and why the loading is developed.

Summarising, what Dave has highlighted is a problem which requires a very sophisticated computer program and a considerable amount of detailed and broad-ranging experimental work to solve it. The difficulties are too closely inter-related, too dependent on a multitude of variable and completely unknown quantities, for any engineer to just sit down and with a flourish of the pen so to speak, produce the working design-rules. So, at least, it appears that we are going to have to accept 'best possible' design of rag-and-tube wings, plus what is hopefully the most realistic static-loading tests, followed by a *full-scale air-test* (with, probably, a personal 'chute and definitely a ballistic 'chute being carried). The latter is going to take a gutsy test-pilot with plenty of insurance!

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What used to

Only two years ago, Bob Calvert's 19,000 ft altitude record was the talking point of the microlight world. Yet now, it is possible to achieve greater heights in a virtually standard machine, as Bob explains...

This winter's altitude record attempts were finally cancelled due to the complications involved in satisfying the CAA. So to amuse myself I decided instead to investigate the ceiling altitude of a production Mainair Flash.

In the short spring evenings I cruised easily to 12,000 ft and then on to 16,000 ft, finding myself limited only by approaching darkness. Clearly the machine had more to give.

It got its chance to prove it on 27 February, when I took off at 17.05 into a light southwesterly and climbed northwest on 80% power. Once above the five-eighths cloud cover at 4000 ft, I settled down for what I expected to be a long slow climb. The climb rate was periodically suppressed by weak wave activity but within 17 min I passed 10,000 ft.

As on the two previous high flights, the view was spectacular (breathtaking even – until I put the oxygen on!). In the distance the Welsh mountains and the Lake District could be seen, the hills gaining a reddish tinge from the sun setting on the cloud tops to the west. Most of the time the climb rate was 300–400 ft/min at 80% power, but I was kept busy moving around the sky whenever it deteriorated. I pondered over the latest time I could begin my descent, and decided on 18.00.

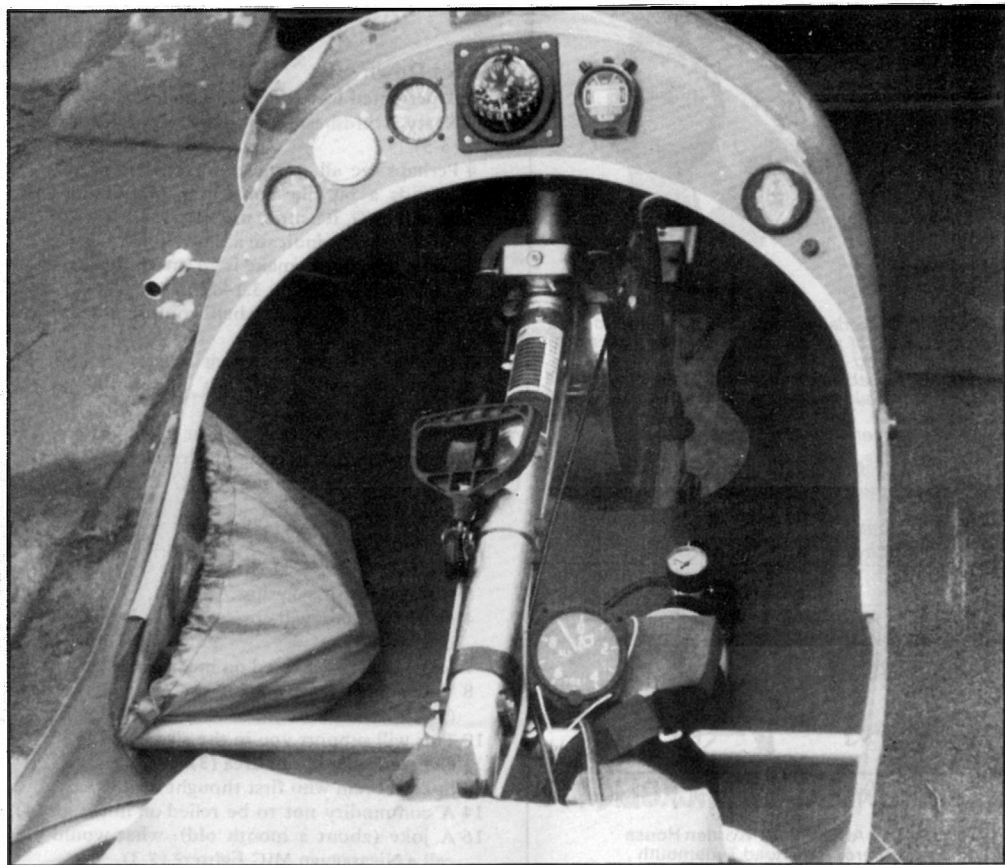
Passing through 18,000 ft, the instruments frosted over and there was ice inside the helmet on the visor. Climbing on full power now, the chtg was reading 325° and I was gradually approaching 20,000 ft, but at 19,600 ft and 18.00 the climb suddenly stopped. I turned south in search of that last bit of lift, and was able to continue the climb to 20,400 ft. Good enough!

Throttling back, I started a rapid descent, travelling at 90 mph and 2000 ft/min, and only 10 minutes later I set up an uneventful landing at Pleasington.

I was pleasantly surprised by the performance of the Flash, whose figures can actually be compared to a light aircraft like the Cessna 152, apart from its top speed! My machine was totally standard apart from a Winter vario, Smith's three-dial altimeter and an oxygen system.

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Microssword

Clues Down

- 1 A perverted way of banking an aircraft? (4)
- 2 Nasty windshear, especially if under 150 kg (5-5).
- 4 Perhaps we all started with one of these? (4).
- 5 Sounds a bit like something hairy under the nose, but O, it's more useful (5).
- 6 Could *tension* indicate a blow? (4-4).
- 9 Some of this will make it go smoothly (3).
- 10 Back to front, many 3.14s (6).
- 11 Don't get in these when confused, get them out when landing (5).
- 12 Cyclic levy engine which won't belt up (5).
- 15 Heap of nasty stuff, but not found on the flying field (7).
- 17 I know it's spelt wrong, but it could keep him warm whilst predicting his destination; anyway, without the offending letter, 18 across would be incomplete (5).

Clues Across

- 3 How far those wingtips reach (4).
- 4 Plenty of these will ensure you don't get tied up in a stall (5).
- 7 Regal letters delivered on most trikes (8).
- 8 You could strike one of these across the wing (5).
- 10 This will support you in the air as well (4).
- 11 Get some gen in this area (3).
- 13 Spaced brain who first thought of it (7).
- 14 A commodity not to be relied on in the air (4).
- 16 A joke (about a month old): what would you call a Nicaraguan MIG fighter? (7-3).
- 18 The last thing to think about when Dling the aeroplane (3).



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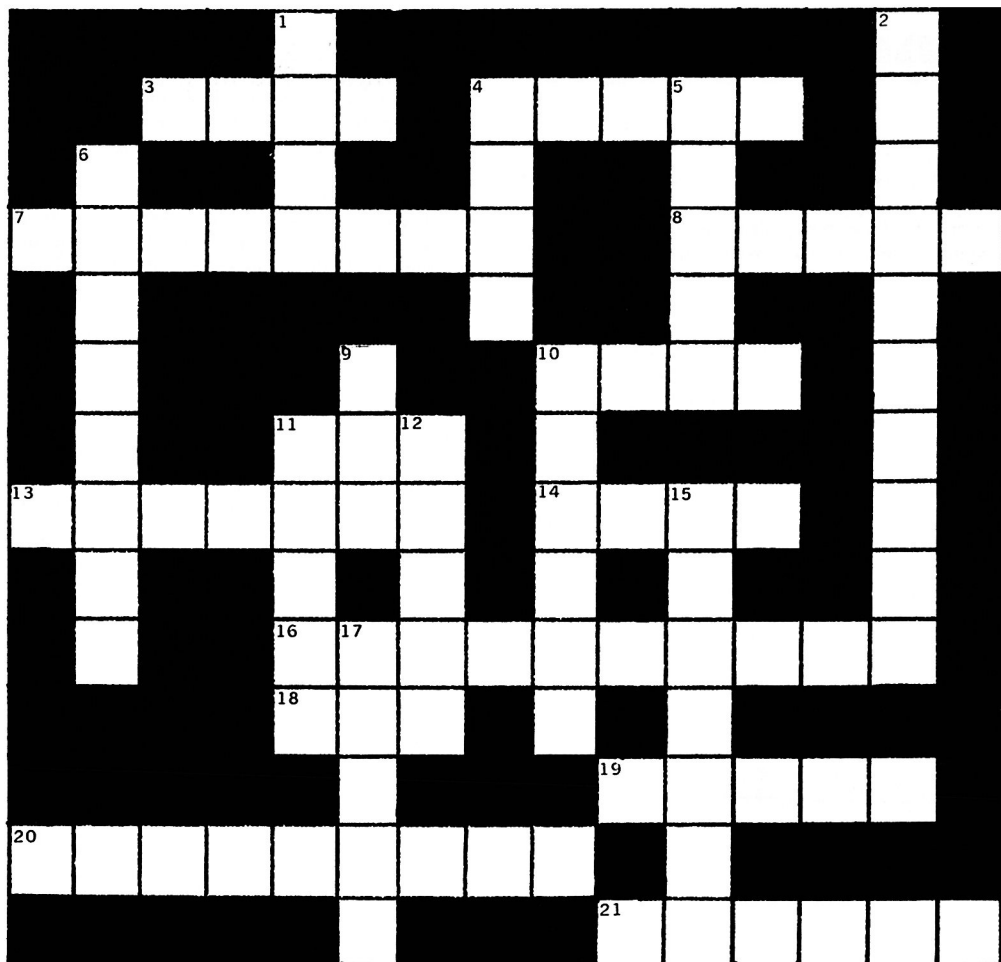
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19 Wood this take-off? (5)

20 Not much life in this wooden landing (4-5).

21 The ratio of 3 and 8 across (5).

Answers on page 53

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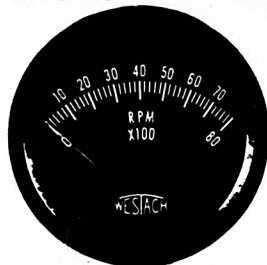
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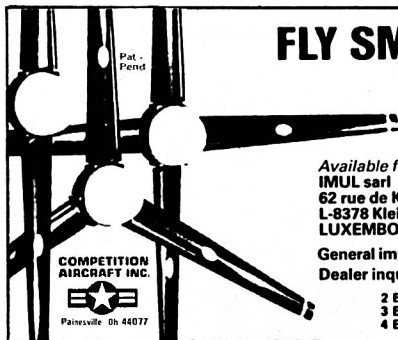


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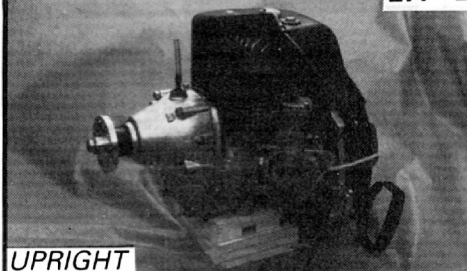


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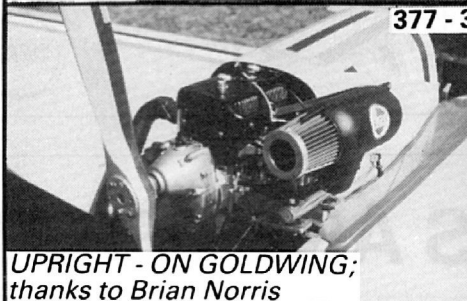


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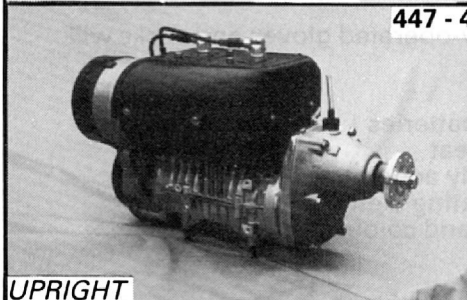


UPRIGHT - ON GOLDWING;
thanks to Brian Norris

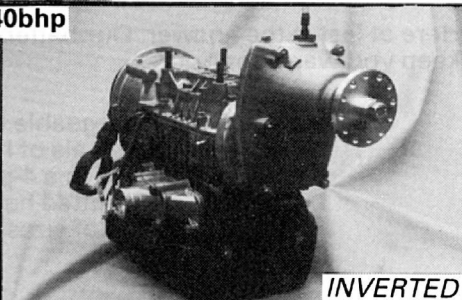


INVERTED - ON TRI-FLYER;
thanks to Nigel Huxtable

447 - 40bhp



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THE CENTRE THAT SETS THE STANDARD



Ready to roll - Brian Hope's Teman Mono-Fly all assembled and awaiting its maiden flight.

Half price, double aggro...

Flightline's more longstanding readers will probably recall that the Teman Mono-Fly was a particular favourite of our late and greatly missed US correspondent, Glenn Brinks, and was the subject of his column on more than one occasion. In the US this strong, simple machine is a popular homebuilt, but in Britain it's a very rare bird indeed. There are one or two around though, one of them constructed by BRIAN HOPE. Here's his story.

Being a lapsed PPL, my interest in microlights tends unashamedly toward the 'little aeroplane' sector of the sport. The spiralling cost of conventional aviation has kept me earthbound for four years, and with the cost of microlights heading the same way, I decided that I would have to build my own aircraft if I ever wanted to get airborne again.

I reasoned that not only would the total cost be less — at most two-thirds of an off-the-shelf kit — but the ability to spread the cost over several months made the whole project more easily achievable.

Of course everything hinges on the availability of a design that meets one's requirements, and I waited 18 months before Glenn Brinks' article in the Mid-Feb '83 *Flightline* convinced me that I'd at last found the machine I'd been looking for. Anybody contemplating homebuilding would be well advised to obtain a recent copy of *Glider Rider* (or *Berger-Burrs!* — Ed), as there are many more designs available in plan form from the US than there are here.

The Mono-Fly is a three-axis strut-braced pusher monoplane with all flying tail surfaces and one-

third span ailerons. The majority of the structure is fabricated from alloy tube, plate and angle, the exceptions being the fibreglass wing ribs and fibreglass-covered foam-core ailerons. As the aircraft is offered as a kit in the States it is possible to purchase any parts considered outside one's ability to make, but in practice this is an unlikely situation because easy construction was a major consideration when the aircraft was being designed.

The plans package at \$40 post paid is quite simply excellent value for money, with 11 x 8½ inch (27 x 20 cm) pages clearly drawn and all hardware specified. The plans are presented as sub-assemblies — e.g. wing, tailplane, engine mount etc — all broken down into individual parts and numbered for easy reference. Notes pertaining to construction methods are either carried on the relevant drawing or on separate sheets. They give full details of how to construct the mould for the ribs and how to build a cheap bending machine for the alloy leading and trailing edges; in short, a thorough job of draughtsmanship that is easy to work to.

As the US and British specs are not the same, a little research is necessary to arrive at a suitable material specification. I settled for HT30TF tube, HE30 angle and HS15TB plate, but actually finding sources of these materials is easier said than done; apart from British Aluminium, none of the advertisers in *Flightline* at the time could help. For fellow homebuilders tearing their hair trying to locate supplies, I suggest the companies listed at the end of this article. Fibreglass materials are available from a variety of suppliers, but I got mine from Strandglass who can offer sound technical advice should you need it.

Actually making the various bits and pieces was

▶ a pretty uneventful business, though it was greatly aided by a little prior investment. My Burgess band-saw saved hours of tedious hacksawing, and an automatic centrepunch proved a godsend during marking out. There are literally hundreds of holes to drill and accurate size is imperative, so I bought a set of new good quality bits and whenever possible drilled mating parts together, to avoid the possibility (likelihood?) of the holes in individually drilled parts not lining up. Alloy components were etchprimed and painted before being rivetted or bolted up.

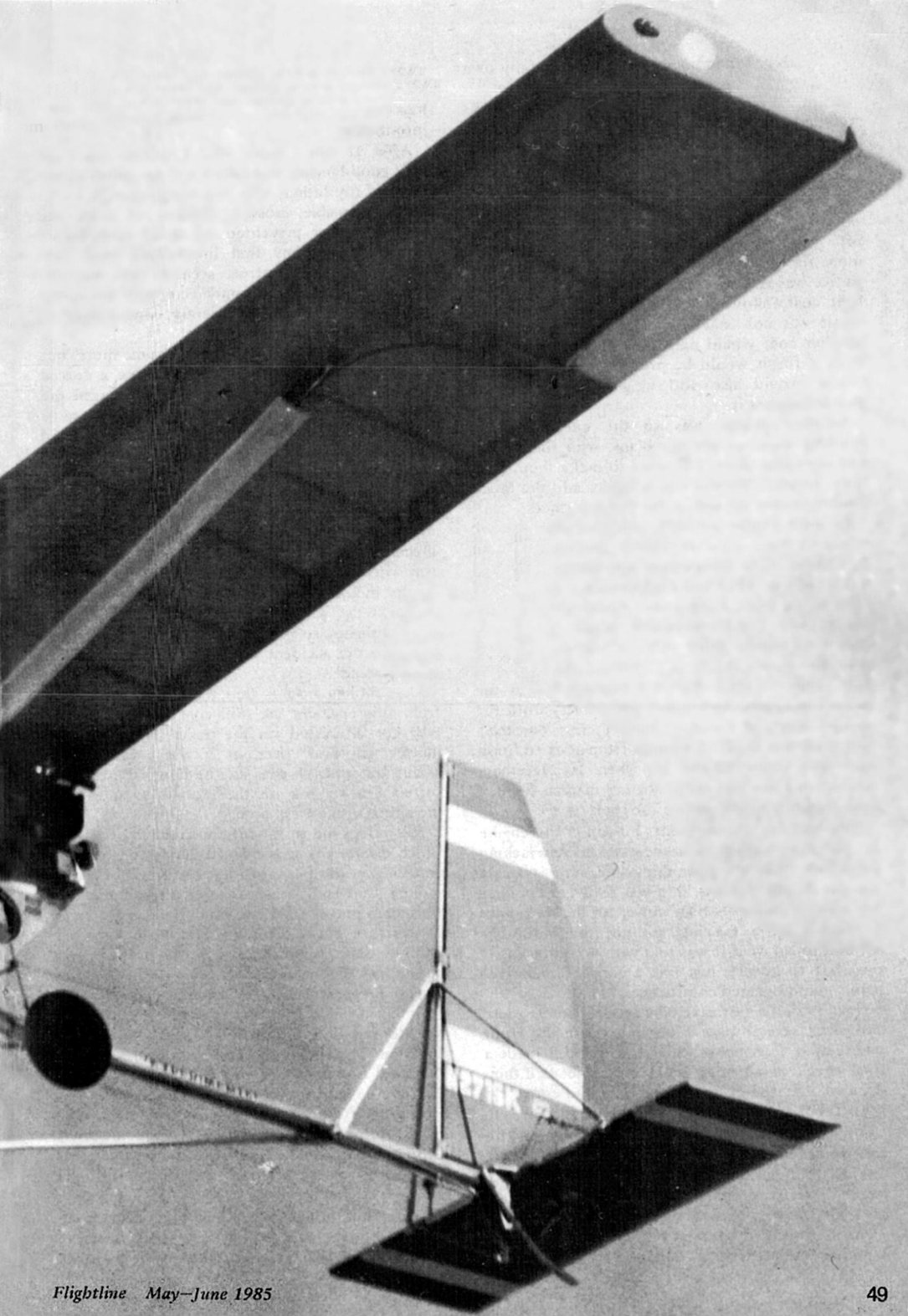
Perhaps the messiest part of the operation is making the ribs, of which there are 26 in all. The mould is designed in such a way as to enable left and right ribs to be made from it, and has to be coated in vegetable oil before use. I found the best system was to lay up one per day and allow it to set overnight; releasing the rib in the morning presents no difficulty, provided you cover the mould in cling film before lay up.

In the States a number of Mono-Flys have been built with the four-stroke Onan generator engine, but this is heavy and rather feeble. Others have used Kawasakis or Rotax 503s, but I decided that the gear-driven Rotax 377 would be best, mounted

right way up with a single carb. I bought it from Andover Norton for £724.50 including VAT, considerably cheaper than the price quoted by Cyclone Hovercraft at the time. I indulged myself a little with the prop, having looked carefully at both Romain and Goodwin props at Woburn. Robin Goodwin's are far from cheap – at £80 it was £30 more than our Jim's equivalent – but they're a beautiful job and well worth the extra in my view. A 52 x 34 inch seems to be the order of the day. A rev-counter from Mainair just about completed my shopping list. ▶



Flashback to Flightline Mid-Feb '83: Flying the Mono-Fly in the Californian sunshine. Brian Hope would be up there in the Kentish sunshine, if only he could get his paperwork sorted out....



► Inevitably, I incorporated a few ideas of my own as I went along. Originally I was going to use ceconite covering, but after speaking to the guys building the MW5 I opted for the much cheaper Aerolene Ultralight fabric available from South-down Aero Services at Lasham. It heat shrinks the same as ceconite, has a life expectancy of at least 10 years and went on without trauma. Fabric, dope and glue totalled £109 and I finished the job off with a coat of polyurethane car finish, though more for aesthetic reasons than anything else. My choice was A & W Gipfast, of which I sprayed one light coat followed by a single full wet coat. The result was not exactly mirror like and no doubt another coat would help the appearance, but too thick a finish would be prone to cracking and of course would also add weight. On balance, I decided against it.

Another change was to the ailerons. After building them as per the plans, with foam cores and fibreglass skins, I decided to make them from alloy instead. They're much lighter and the fabric finish matches the rest of the flying surfaces.

By now you're probably thinking that the job seems to have gone extremely smoothly, but in fact there were frustrations and delays. I started work early in 1984 and registered her as G-MMJX right at the start, hoping that this would make life easier from the permit-to-fly point of view; it didn't, of which more anon. I was also held up over the power pack, as I ordered the engine in July, only to find that this coincided with the factory holidays, so I didn't get delivery until the second week of October. Nevertheless, construction took less than 12 months from start to finish and cost under £2500, so when 10 December arrived and she was ready for her maiden flight, I gave myself a hearty pat on the back.

This was the big moment. I'd run-in the engine as per the manual, a somewhat nerve-wracking procedure with the poor thing screaming its heart out for 5 min periods, and was ready to conduct my aircraft under its own power for the first time. I tried a little taxiing around; the Mono-Fly seemed to do what it was told with no odd traits — push-left to go-left, just like a conventional aeroplane — and I gained confidence.

Next I tried a fast taxi. The acceleration is good, and after several runs I began to ease the front wheel up a few inches. So far so good. I made a final check of all nuts, bolts and cables and then decided that the hour of reckoning had come. I'd lift off, cut power and land straight ahead.

Off we roared, and I eased back gently on the control column. But almost before I realised it, I was off and climbing, and past the point where it would be safe to come down in the remainder of the field. My best bet was to keep going!

The feeling of those first few moments of flight is quite indescribable. Many evenings toiling

away, first in a cold garage and later in a draughty barn, had come to fruition and this thing which I had crafted with my own hands was carrying me into the air.

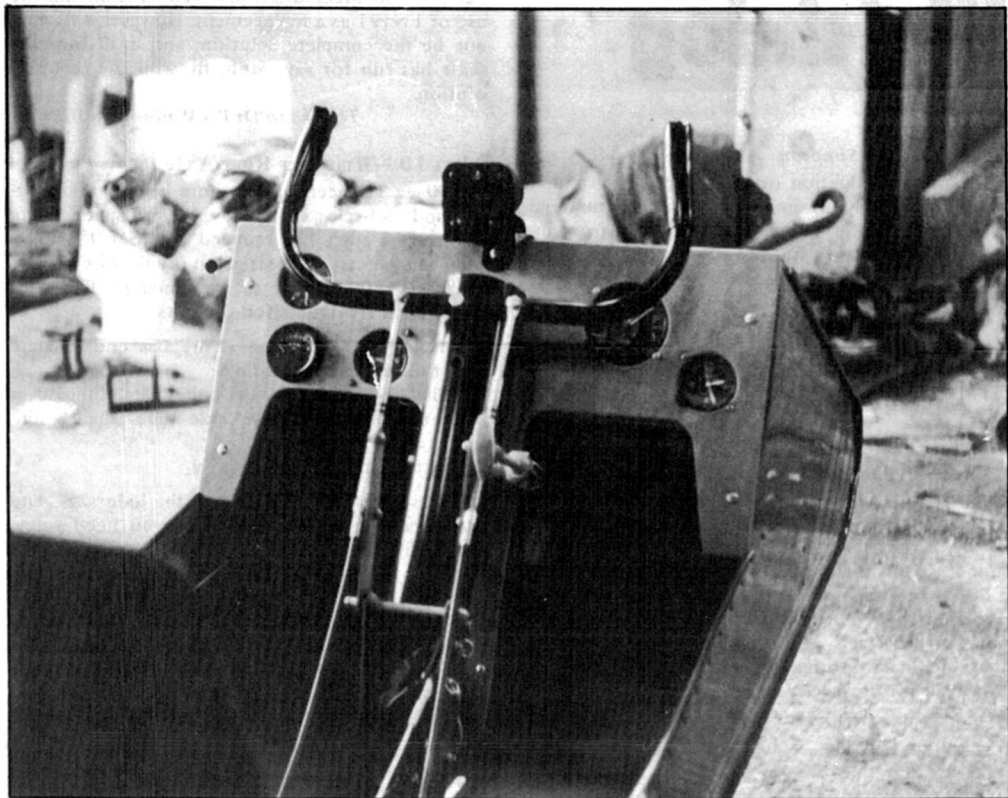
After 15 min I made what I confess was a not very good landing and called it a day, much to the relief of my father, who was watching with everything cross-able crossed. Pressure of work and rotten weather prevented me flying again before Christmas, but my first impressions were very favourable. The controls seemed light but not twitchy, the aircraft responded correctly to control inputs, and it climbed excellently, considering that at 15 stone I'm no microlight.

In the New Year I took her up some more, but an engine failure caused me to make a forced landing in a ploughed field, which damaged the undercarriage and wing tips. Unfortunately, some well-meaning soul saw me come down and phoned the police. Before I knew what was happening there were police and ambulancemen all over the place, hastily followed by the local press. Perhaps inevitably, the reporters' first question was 'How many times have you crashed this aircraft', which incensed me sufficiently to send them on their way without comment. There was a happier side to the incident, however, as a rival paper rang me the next day and I sold them on the positive side of microlights, so much so that they agreed not to publicise the accident but to do a feature on the sport instead!

My problem now is that the official rumblings from this accident are still continuing, since the AIB got interested via the police. Hopefully the matter will blow over, as it was a very minor affair, but until I can get the airworthiness side sorted I'm staying on the ground, even though the aircraft is now repaired.

This brings me to the biggest problem of all, one which dwarfs any that I faced during construction or flying — the permit-to-fly. I've filled in forms, spoken to Derek Lessware and uttered the odd whispered prayer to Allah, but I don't seem to be any further down the road than when I started. Frankly, I'm disappointed with the BMAA's lack of support to homebuilders. At no time did they suggest I contact the PFA, even though they had no intention of helping me themselves. It's all very well to say that production aircraft must come first, but why didn't they say so sooner? Had the Technical Committee acknowledged from the start that there was no way they could help in the foreseeable future, I could have got in touch with the PFA many months ago. To leave members without support just because the two organisations don't see eye to eye at management level is simply not on.

I built the Mono-Fly in order to achieve affordable flying, and as far as cost goes it has worked, for it would have taken twice as much



cash to purchase something like a Sirocco. However, the sheer aggravation of all the bureaucracy is making me wonder whether I've done the right thing. Anyway, the PFA is now in receipt of the construction drawings and hopefully it won't be too long before they provide positive assistance, something the BMAA failed to do in 12 months of communications.

I'll let you know

AALCO, Crawley, Sussex (tel Crawley 518999) for plate.

Southdown Aero Services (address p4) for ultra-light fabric.

J Smith, Clerkenwell, London (tel 01-253 1277) for angle, plate and tube.

Woods Aeroplanes, Birchwood House, Ashlands, Ford, Salisbury, Wilts for US spec (AN/MS) hardware.

Light Aero Spares, Littlehampton, Sussex (tel 09062 74221) for ceconite fabric, relevant adhesives and paints.

Temam Aircraft Inc, PO Box 1338, Hawaiian Gardens, California 90716, USA (tel 213/402-6059).



Watchdog

Edited by Dave Simpson

With the introduction of the inspector system, I could reasonably assume that *Watchdog* material would be coming to me thick and fast from inspectors. This hasn't been the case so far, so please inspectors, and everyone else, put pen to paper. It does not need to be long, tidy or Queen's English but we do have a mutual responsibility for fault reporting – so *communicate*.

So much for the commercial, now let's get down to the nitty gritty.

Alert 9 – Nicklow Reduction Drive

(Commonly fitted to Tiger Cub, Puma Sprint and others)

The prop shaft fitted to a Tiger Cub failed after 12 h. A replacement shaft, supplied by Nicklow, failed after a further 10 h. The power plant used a 60/23 reduction and a 56 x 33 prop. The failures occurred at the junction of the tapered and parallel parts of the shafts. A metallurgist's report revealed that the shaft was made from mild steel and was too weak for the stresses applied to it.

Fix 9 – The metallurgist involved recommends the use of EN19T as a replacement. However, this may not be the complete solution, and until the new shaft has run for say, 50 h, fly with the requisite caution.

Thanks to Dr PG Walton, Washington

Alert 10 – Tripacer Rear Axle

A 250 cc Tripacer landed more heavily than normal and its back axle collapsed. On inspection the axle-to-wire angle had reduced to about 9°, thereby placing a very high stress on the tie wire (nearly 4000 lb, 1800 kg, for a 3 g landing). The axles sag through a combination of faults:

- 1 The tie-wire bolt holes at the axle end elongate with time and heavy landings;
- 2 The keel-plate to axle bolt holes elongate in both the plates and the axle tube (mainly the latter);
- 3 The tie wire stretches slightly.

All these effects accelerate as the axle sags, and the stresses increase till one day you need a new prop and a sail repair ...

Fix 10 – The solution has been fully dealt with in a previous issue (May–June '82 p34) but briefly:

- 1 Raise the axle-to-wire angle to at least 20°, thereby halving the tie-wire stress.

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FIGURE 1

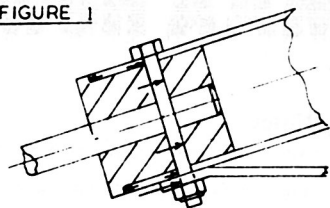
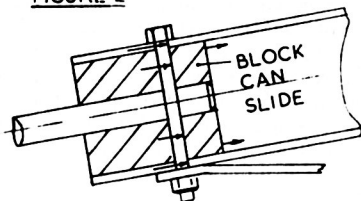


FIGURE 2



2 Support the bolt holes at *both* ends of each axle properly by fitting shouldered bushes as shown in Fig 1. Make the bushes out of aluminium alloy or Tufnol (SRBF) but nothing soft. Alternatively, support the bolts by adding thick wall insert to each axle end and fixing properly, as in Fig 2. (To make life difficult, the axles are 16 gauge, not 17 gauge, so your bit of 1 5/8 inch od won't fit.) The bushes are preferable.

Thanks to Phil Brookman, LMAC

Alert 11 – Mainair Propeller Hub Failure

Two casting failures appeared recently on the one piece top pulley/propellor hub. The boss immediately forwards of the prop flange broke. Both showed signs of casting flaws and the problem is being investigated by the manufacturer. The failure is fortunately progressive, and a detailed inspection should reveal any cracks.

To inspect, remove the propeller and on hub-type units, remove the centre location tube. Using a powerful lamp, carefully inspect all around the outside of the hub immediately forwards of the

flange. Inspect the bore 10–12 mm down the hub. Mainair Sports ask that they be contacted immediately if the unit is suspected of being faulty.

Thanks to Mainair Sports, Bulletin no 14.

Alert 12 – Goldwing Spoilers

If moisture is allowed to enter the wooden housing of the spoilers, the wood may swell and jam open the spoilers on the leading edges. If both spoilers are accidentally held open in this way, the aircraft's glide is severely degraded.

Fix 12 – The ex manufacturer, Brian Harrison, recommends that the spoiler slot be widened by carefully chain drilling forwards of the slot. Carefully remove a sliver of wood, using a pad saw or similar. Keep the wings dry.

Alert 13 – Suntour Throttle Levers

The ratchet type throttle levers, commonly used on Mainair Sports aircraft and others, have a small black tin cover over the mechanism. This cover is secured with a small crosshead screw, which presumably copes well with bicycle vibration, but cannot stand any more than a few hours of the microlight variety. Only the screw comes out, but it can easily get into the prop.

Fix 13 – Loctite.

Happy days are here again!

► p30

urday 25 May, confirming that the event is to be held, or otherwise, and giving the latest forecasts for the following two days. Forecasts for each day will be displayed from 9 am at control.

Park Entry and Parking

Entry to Woburn Abbey is free to BMAA members bringing a microlight with them. To all others, entry is £1.50 per car. Follow the normal park entry routes. If the land is wet, access to the pad-dock and the strip may be limited to microlights only – signs will give details.

Microssword answers . . .

Answers Down

1. Warp
2. Microburst
4. Kite
5. Tacho
6. Wind sock

9. Oil

10. Pilots
11. Flaps
12. Rotax
15. Cumulus
17. Heeta

Answers Across

3. Span
4. Knots
7. Kingpost
8. Chord
10. Prop

11. FIR

13. Rogallo
14. Luck
16. Phantom jet
18. Sex
19. Plane
20. Deadstick
21. Aspect

Chairman's airwaves

By Peter Blyth

Since writing this column in the last issue of *Flightline*, the one thing which has pretty well monopolised the Council's time has been the restructuring of our Technical Committee. Eric Niedermayer relinquished his position of our Technical Committee Chairman towards the end of last year and his role was taken over temporarily by our Chief Executive Brian Cosgrove. Derek Lessware, our full-time Technical Officer, left our employ on 18 February, the CAA having refused to provide further funds towards his salary and the association being unable to support him on its own. He is being replaced with a team of voluntary technicians. The changeover has of course had to have the blessing of the CAA, to ensure the continuity of the airworthiness scheme. I'm hopeful that a more simple approach to airworthiness will eventually be achieved. Full details of our new team will be published in the next issue of *Flightline*.

The BMAA is now applying its mind to the problem of three-axis training machines, or rather the lack of them. Some time ago CIMA recommended that those three-axis machines used for training purposes should be allowed an extra 25 kg on top of the regulation 150 kg, simply to 'beef them up'. Several Continental countries have now adopted the suggestion and we are pressing the CAA to implement the recommendation in the UK.

Now that we are all coming out of hibernation, can I say a word about illegal flying? It is impossible to know how many unregistered aircraft and unlicensed pilots are operating, but I suspect the numbers are substantial. If any members come across instances of illegal flying, I beg them to do their best to 'educate' the offenders, in the interests of our good name and the future of our sport, remembering that the BMAA is here to help flyers become legal — it is not our job to censure anybody. To get legal costs money and is a hassle, but believe me the cost and hassle is nothing compared with being found out (usually as a result of an accident). Another amnesty for unlicensed pilots has now been agreed, as you can read in *Training Notes*.

Safe flying!

BMAA news

Training Notes

By Ian Stokes, Training Committee Chairman

As the flying season once more approaches many of you will be eager to get into the air again and shake off the fetters that hold all sane-minded non-flyers to our Mother Earth. For the 700+ licence holders among you this should be no problem, but for those of you flying without a licence it means constantly looking over your shoulder, not being able to enter any sort of events or competitions, not being insured (if you crash into somebody and kill them as well as yourself, do you really want to leave your dependents with a law suit possibly running into hundreds of thousands of pounds?)

Your instructor should

LIST OF GROUP D FLYING INSTRUCTORS AS AT 1 APRIL 1985

AFI

Guy Banfield
Brian Berry
Steve Comben
Peter Kerr

QFI

Tony Anderson	
Bill Anderson	
Simon Baker	— X Examiner
Bob Bailey	— X Examiner
Iain Barr	— X Examiner
Ted Battersea	— X Examiner/Examiner of Instructors (0227 720400)
Graham Bingham	— X Examiner
Roger Black	— X Examiner
Eden Blyth	— X Examiner
Gerry Breen	— X Examiner
Bob Calvert	
Dave Clarke	— X Examiner
Mike Coghlan	— X Examiner
Peter Davies	— X Examiner
Julian Doswell	— X Examiner/Examiner of Instructors (060872 413)
Chris Draper	— X Examiner
John Fairweather	— X Examiner
Dave Garrison	— X Examiner/Examiner

and if you are caught a considerable fine. Why don't you — for the sake of going to an instructor and flying dual to his satisfaction, solo under his supervision for the requisite hours and taking a few exams that if you can't pass you shouldn't be flying anyway — get yourselves legal and enjoy your flying to the full?

For those of you just starting out, a word of advice. Following this article is a list of currently rated Group D instructors and it is only a person with a current instructor rating who can legally teach you to fly, and then only if you are members of the same club. If you are taught to fly by a non-rated or lapsed instructor you are both liable to be taken to court and fined heavily, and any hours you have done with him will not count towards your licence. Ignorance of his status or the law is never entertained as an excuse. It does not matter what assurances are given or who they are given by, at the end of the day it is down to you. So, if in any doubt, ask to see his rating, no

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instructor should take offence at this request. There is no reason for instructors to let their ratings lapse as there are now a number of Examiners of Instructors spread fairly evenly across the country, and for pilots wishing to become AFI's there are FIC instructors running courses at several schools.

STOP PRESS: I have just negotiated a last, short and **FINAL** amnesty for non licensed pilots with the CAA and if you in the first instance contact an Examiner of Instructors (phone numbers below) with all the evidence of your experience, legal or illegal, he will tell you what you will have to do to obtain a licence. This amnesty will last only from now to 30 June this year and if you do not present yourself during this period you will have lost your last chance to count any illegal hours you have accrued. If you know any non members who may not read this article and fall into this category, please inform them of the good news.

be on this checklist....

	of Instructors (0480 811389)
Brian Godden	
Barry Gordon	— X Examiner
Brian Harrison	— X Examiner
Graham Hobson	— X Examiner/Examiner of Instructors (061-973 4085)
John Hollings	— X Examiner
Malcolm Hurst	
Neil Jefferson	
Dave Lewis	— X Examiner
Martin Lowther	— X Examiner
Malcolm McBride	
Jamie McSweeney	
Dave Mudie	
Walter Neumark	
Mark Phillips	— X Examiner
Alan Reynolds	
Peter Rosenfeld	
George Rowbotham	— X Examiner
Dave Simpson	— X Examiner
Chip Smith	
Mac Smith	— X Examiner/Examiner of Instructors (0202 822486)
Ian Stokes	— X Examiner/Examiner of Instructors (056686 514)
Keith Vinning	— X Examiner
Geoff Weighell	— X Examiner
Tony Wells	
Steve Weston	

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Diplex Altimeter 0-8000ft	£25
Winter Altimeter	£72
Hours-run meter, quartz, 12v, 2"	£25
Westach instruments	
Tacho 0-8000rpm, 2"	£38
CHT & sender	£30
EGT & sender	£30
CHT/Tacho combined	£58
Instrument case - accommodates any two of the above, mounts on 1/2" 1 1/4" tube (please state front panel hole requirements)	£7
Arbee instruments - pressure transducer vario	
90' meter, cw mounting stalk	£149
as above, 240' meter	£165
All instruments ex stock	
Please add £2 for postage, packing & insurance	
Agent for Mainair Sports	
Southdown Sailwings	
Flexiform Skysails	

Dave Simpson

Ultralight Flight Engineering

13, Portman Close, Bedford Road, Hitchin, Herts SG5 2LUX.

Tel. (0462) 52103 after 6.00pm.

Contact

Dorset Wings

By Jack Swingle

The club's first annual buffet/disco was held on 16 March at a local hotel, and no less than 56 people – members, spouses, and friends – joined in the fun. Presentations were given for outstanding pilot of the year, which went to Sue Worburton-Pitt, and greatest contribution to sport and club, which went to club chairman Michael Coghlan.

Inclement weather restricted flying in our area from Christmas until mid-March, but quite a number of members visited the Popham trade show, which proved interesting. At least two of them sampled the high-speed performance of the Gemini Flash, courtesy of John Hudson and Mainair.

The club is planning a number of fly-outs to other locations, one to a venue close to the Chesil Beach. Our events organiser, having raided his piggy bank and purchased the field to which we normally fly, now hopes to arrange a fly-in on our own property later in the year.

Buckinghamshire Microlight Club

By Jack Bishop

The last few weeks have brought some changes in the club committee. Firstly, Dave Simpson is now the CFI and the club's safety officer is Nigel Huxtable. Also, the club now has a very smart

emblem which has been provided as a cloth badge for flying suits.

On the flying front there has been a lot of excitement about the new under 70 kg trike and wing produced by Nigel Beale for the Popham trade show (*Nigel has since decided not to produce this himself – see Popham report – Ed*). Meanwhile, on the three-axis front, Mirage owners will be interested to learn that Mirage godfather Lewis Perring recently had a visit from Gary Hoover, the American owner of the Mirage company, which is now quite separate from Phantom manufacturer Ultralight Flight. Gary flies Pan am jets and used a stopover in London to discuss permit-to-fly problems with Lew.

By the time you read this we will have visited Benson airfield in April and the first of various fly-ins will be approaching; in short, the club continues to prosper. Anyone interested in joining should contact Sally Huxtable on Eaton Bray 220242.

Windsports Flying Club

By David Bosomworth

The Windsports Flying Club has just been formed, centred on Wombledon Airfield. It meets on the first Wednesday of every month at the Feathers Hotel, Helmsley, and all are welcome.

Our first meeting, in March, was attended by BMAA Chairman Peter Blyth, who gave an enlightening talk on the association's past, present and future.

Elected officials are: chairman Derek Hall (0653 2645), secretary David Bosomworth (0904 796576) and treasurer Eden Blyth (0751 32356).

Calendar

All queries relating to events in this calendar should go either to the contact number listed, or to Jeremy James at the number on the *Contents* page. Closed-to-club events are not included in this calendar; before organising other events, clubs are urged to check with Jeremy to avoid date clashes. Events marked * are provisional at the time of going to press.

Britain

1 May–31 July: Tiger Club Dawn to Dusk competition, open to microlights. Contact The Organiser, 13 Kestrel Avenue, Moormeade Park, Staines, Middlesex TW18 4RV.

11–12 May: Biggin Hill International Air Fair. Contact Sales Link Ltd on 01-821 6222.

11–12 May: Leicester MAC rally. Details from David Stott on 0933 651546.

25 May: Microlight exhibition in Norwich. Contact Kelvin Woodard of Eastern Airports HG&MC, 127 West Acre Drive, Old Catton, Norwich.

26–27 May: BMAA fly-in at Woburn Abbey, Beds. The BMAA event of the year. Details on 0462 52103 evenings/weekends.

5–9 June: Bristol Boat Show incorporating microlight display. Contact Cherry Salter on 0272 422316.

24–26 August: Microlight fly-in and competition at Popham Airfield, near Winchester. Details on 0256 75733.

14–15 September: Norfolk Air Race. Contact as Norwich exhibition.

24 November: BMAA AGM.

Belgium

17–18 August: Third Coxyde Flying Show, including microlights. Contact Jacques Jacob Publicite, ch de Waterloo 496D, 1060 Bruxelles; tel 02 539 3033.

Bristol Microlight Aircraft Club

By Cherry Salter

The Bristol Club held its first AGM in February and now has a membership of over 50. There are two big success stories of the year: first the running of the ground school, which is free to members and made available through the dedication of Mike Batchelor and Steve Slade (to whom many thanks) and second the various syndicates we have building single- and two-seat Microknight machines, which should be ready by the summer.

As a result of the ground school, 10 people will be sitting exams this Easter, but there is an urgent need to find a weight-shift instructor willing to come down to us at weekends. Most enquiries the club receives are from people wanting training (there are eager pilots west of Enstone, you know!) and although I recommend various schools they are all well away from us. I'm sure there is good money to be made by an enterprising instructor prepared to bring his trike.

We have a fabulous 40 acre field in the glorious Mendips overlooking the Cheddar Gorge, and will shortly have a club house — a mobile home we picked up for £50! We also have occasional use of Ashton Court estate, some 5 min from the city centre and kindly loaned by the City Council.

Despite very depressing weather on the morning of our September fly-in, it cleared sufficiently to get our local MP airborne and for HTV to make a very positive news item about microlights. John Hunt bravely flew in from Crickhowell, although it took 4 h including much ground time, and several Dorset Wings and Severn Valley members also visited. The latter club also organised a skittles

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match, in which we were soundly thrashed, though it was great fun — do any other clubs wish to take us on?

So with membership growing all the time, we are looking forward to a really great year, and welcome new members at our club night, which is the third Wednesday of every month at the Bristol & Wessex Aero Club, Lulsgate, at 8 pm. Ring me for details on Bristol 422316.

Taunton Microlight Aircraft Club

By Jim Greenshields

Following a mention in the Jan-Feb '85 edition of *Flightline*, the first meeting of the new Taunton Microlight Aircraft Club was held at the Farmers Arms near Taunton on 12 February.

Eleven people answered the call, including five pilots, and the evening was deemed an encouraging success. With the club having obtained the use of Upottery Airfield and its concrete runways, the founder members now hope that more pilots in the area will come forward to swell the ranks. An instructor and a secretary would come in handy too...

France

4-8 May: Perche-Normandie regional round of French championship. Contact 01033 3327 9834.

16-19 May: Round of French Championship at Achanon Marne, near Reims. UK pilots welcome. Contact Jean-Paul Mathieu, Route Nationale 3, Courtisols 51460; tel 01033 2669 6220.

26-27 May: Poitou regional round of French Championship. Contact 01033 4986 5978.

1-9 June: Southwest regional round of French Championship. Contact 01033 5980 0826.

13-16 June: French microlight association adventure race at Fréjus. Contact 01033 9440 0480.

16 June: Alençon six hour competition. Contact 01033 3327 9834.

30 June-7 July: Finals of French Championship, organised by French microlight association at Rens. Contact 01033 9032 5675.

16-24 August: World Championship at Rens. Contact Jeremy James at the number on the Contents page.

12 September: 'Grand Course' at Blois, organised

by French microlight association. Contact 01033 9032 5675.

United States

26 July-2 August: Oshkosh fly-in and convention, organised by FAA. Contact FAA at Wittman Airfield, Oshkosh, Wisconsin 54903-2591.

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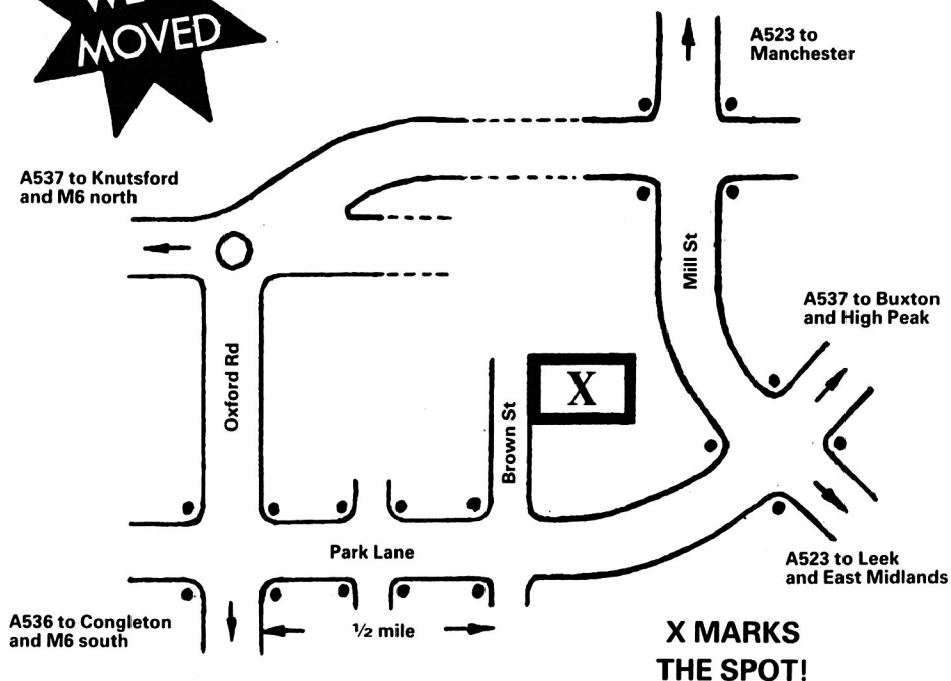
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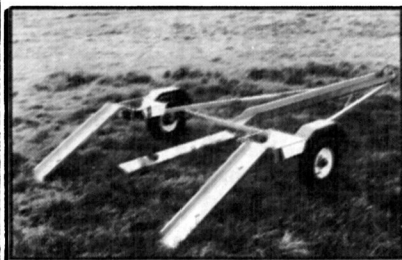


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Small ads are £2 to BMAA members advertising *privately*, all business ads and non-members' ads £4; maximum 30 words in every case. Box number £2 extra. Please make cheques or postal orders payable to BMAA and send with ad wording to *Flightline*, Oak Cottage, The Green, Wennington, near Lancaster LA2 8NW.

Aircraft for Sale/Wanted/Exchange

Readers are reminded that the CAA should be informed of any change of aircraft particulars or ownership.

EAGLE G-MBNA. Excellent condition. Robin 250 engine. Extra fuel tank for long range, Desert colours. Hangared from new and can be seen flying. £1500 ono. Ring Nick Hall, 043787 658 (Dyfed). (5/1)

PANTHER XL 440. 10 months old, 60 h. Registered G-MMOP. Wing blue with red tips, pod, instruments, 5 gal tank, trailer with lights, and more — £3600. Tel 01-251 3846 (Murphy). (5/4)

STRAIGHT SWAP Tiger Cub 440, fully instrumented, trailer, all mods and exemption certificate, for two-seat trike, or sell £2500 ono. Plymouth (0752) 28559. (5/5)

FOR SALE: Tripacer 250 trike and registered wing, excellent condition. Complete with roof rack, £950. Skymaster parachute, as new, £275. Phone 07875 2940. (5/6)

CHEROKEE G-MJJD with Hiway Skytrike. New Nicklow high-performance exhaust and reduction drive. Skymaster chute if wanted. 250 cc Robin. £1100 ono. 0788 890092 (Warks). (5/7)

CHARGUS 250 trike and trailer. Good condition, £450 ono. Two 51 x 26 props, £50. One strengthened Gryphon, £145. One new Hiro engine, £50. Tel Budleigh Salterton 3230. (5/8)

MICROLIGHT WING for sale. Was attached to Charger trike. Trike stolen, hence sale of wing. £500 ovno. David J Tucker, Guards Depot, Pirbright Camp, Woking, Surrey GU24 0QQ; tel Brookwood 4511 x267. (5/9)

CHARGUS TITAN two-seater, airworthiness test passed, 440 Robin, electric start, long-range tank, recent engine overhaul. £1950 ono. Tel 0244 678331 (Cheshire). (5/10)

LIGHTNING DS and 440 two-seater trike (inspected and exemption paid). Trailer. £1500 or p/exchange cheap single outfit/or 250 power unit/large Demon similar. Ring Colin Beer, Paignton (0803) 526860. (5/13)

QUICKSILVER MXI. 70 h TT, team Eipper colours. Recently inspected and permit to fly applied for. £1600. Tel 0522 43938 evenings. (5/14)

QUICKSILVER MXII. Rotax 503. Personal wing colours, long-range tank, manual/electrical parachute, wing and trike covers, plus fold-down trailer. Must be seen — £4600 ono. Grange-over-Sands 2528. (5/15)

PANTHER XL twin-seater. 440 cc, brand new, garage stored. 1 h flying time. Complete with blue pod. Perfect condition. Will accept £3995 ono. Tel 01-518 6514. (5/16)

FOR SALE: two microlights, both registered. Lone Ranger, enclosed cockpit, electric start, on

4-wheel trailer. Weedhopper, all mods completed, on 4-wheel trailer. Offers. 0621 88278 (Suffolk). (5/18)

WANTED: 440 two-seater — Panther, Gemini, Puma, etc — with permit or permissible. Up to £3000 available immediately after demo flight. Ring Charlie Bridgman, Bristol 40962 or 691432. (5/19)

WANTED — QUICKSILVER MXII. Must be in good condition with low hours. Also chute system for dual aircraft. Phone any time: Brentwood (0277) 216672. (5/20)

ONE-FIFTH SHARE in Tiger Cub. Hangared Popham Airfield. £800 ono. Contact Mac Smith: 025675 733 work, 0202 822486 home. (5/22)

STRIKER G-MMAX. 440 dual. Excellent condition, later type extra strength wing design. A fast super flyer — £2700. Evenings: Bristol (0272) 839910. (5/23)

TRIPACER 330 G-MBRO with pod and Airwave Nimrod wing, 80 h, immaculate condition. 12 months exemption. Reason for sale: purchasing two-seater. £1600 ono. Roland Hughes, Windsor 66505 home, 01-357 3197 work. (5/24)

QUICKSILVER IN YORKSHIRE — contact Harden Microlights. New and used machines, spares, kits for your MXII. Keighley, W Yorks; 0535 661782. (5/26)

QUICKSILVER MXII twin-seat, test flown only. Registered, Rotax 503 46 hp engine, electric start, long-range tanks, wheel pants, etc. Contact Martin Ridsdale, Harden Microlights, 0535 661782 (W Yorks). (5/27)

GEMINI SPRINT 440, full permit, pod, long-range tanks, map pockets, new prop, fully instrumented, £3500. Phone 0772 725943 day, 311288 evenings (Lancs). Ask for John. (5/30)

QUICKSILVER MXII. Cuyuna 550, immaculate, 15 h only. Instrument pod, trailer, trike/wing covers, many extras. Truly beautiful, completely customised. House purchase forces sale. Almost £7000 worth, only £4500. Richard Dover, 0274 615876 evenings, 597038 day (W Yorks). (5/33)

WANTED: Puma Sprint or Panther XL440 (not lightweight engine) with pod and trailer. Must be in excellent condition throughout — no ex-school machines please. Plymouth (0752) 701307/23231. (5/34)

EAGLE SEAPLANE, uprated rigging and strengthened sail, pilot/instrument pod. Martin Levi floats, Robin 250 engine. Registered and with c of a. £2300. Phone Ryde 66493 for a no obligation chat. (5/35)

MAINAIR 250/CUTLASS — 100% reliability record, just test-flown and recommended for exemption. Well above average, £1200. Also Magic II 177, £750. Would consider p/ex both for Sprint plus cash. Tel Steeton (0535) 52762 (W Yorks). (5/36)

TWO ROTEC RALLY 2Bs, one with 7 h, the other still boxed. Rotax 377 engines. £7400 ono. Tel 08885 629 (Aberdeenshire). (5/37)

QUICKSILVER MXII. Inspected and air tested for individual exemption. Going concern, complete with wing/tail bag and purpose-built folding top trailer. Offers around £3000. Mullion (0326) 240798 evenings/weekends. (5/39)

MAINAIR TRI-FLYER 330 with red and white Hiway Demon 175. Flown 60 h. Engine tacho, chtg fitted, exemption applied for. Price £1200. 0352 720672 (Clwyd) or 051-355 3955. (5/41)

EAGLE. Zenoah engine, very good condition throughout. Exemption ticket applied for. £1500 ono. Tel Diss 51848. (5/43)

GOLDWING (G-MBXC). full instrumentation, brakes, few hours only, with trailer. Offers to Amersham 7516 evenings/weekends. (5/44)

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WHY WAIT? New (Rotax) Puma Sprints from stock (Midlands). K Vinning, 05645 77737. (5/51)

REGISTERED DS Lightning wing for a two-seat machine. Trike already sold. £500. Take tent in part exchange! Steve Wells, 0271 72511 or 0271 73869 evenings (Devon). (5/52)

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Miscellaneous

FLIGHTLINE back issues are available to members (for prices contact Deddington); non-members send £1 for sample copy. Also **TRAINING ON MICROLIGHT AIRCRAFT** by Ann Welch at £1.50, **OFFICIAL OBSERVER'S GUIDE TO COLIBRI BADGE & RECORD CLAIMS** price £1, and **SAFETY & ACCIDENT INVESTIGATION HANDBOOK** also £1. All prices include postage. Always quote your BMAA number and send cheque or postal order (payable BMAA) to BMAA at New Street, Deddington, Oxford OX5 4SP.

PPL D sample examination papers, two nav and met £3, two air law £2, two technical £3 (all papers include answers) or £7 set. Send cheque or PO to C R Bishop, 88b Staverton Park, Bamfurlong Lane, Cheltenham, Glos. (5/2)

FRUSTRATED BUILDER wants reduction gear unit for Valmet 160 engine, tooth or three-belt drive, with or without engine or prop. Dilks, 29 Westmeath Avenue, Leicester; tel 412474. (5/11)

CUYUNA engine complete, including reduction drive and exhaust assembly. Low hours. £200. 060872 8149 (Oxon). (5/12)

TWO NEW ENGINES: Zenoah 242 cc G25A with reduction drive, Hunting 525A with electric start, muffler, dual ignition and reduction drive. Offers. Phone 0621 88278. (5/17)

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NEW CUYUNA engine. Still in box, complete with carb, exhaust etc. 35 hp. Prop included. Harden Microlights, 0535 661782 (W Yorks). (5/29)

WANTED: altimeter (light aircraft or microlight type), ASI, tachometer, temp gauges etc. Also floats for Eagle or trike (damaged/tatty considered). T B Woolley, 109 Victoria St, Narborough, Leics LE9 5DQ; tel 862756 or 886167 evenings. (5/31)

STROBE LIGHTS dispatched by return of post. 12 V. Specify lens colour. £12 inclusive. Dennar Engineering Ltd (Aviation), 29 Old Park Lane, Macclesfield. (5/32)

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WANTED: McCulloch 101 or similar in good condition. Engine for spares also wanted. Phone Bradford (0274) 682334 evenings. (5/42)

WANTED: Eagle spares, including Chrysler parts and prop, mainsail, canard sail. Also want working or repairable microlight engines, plus others suitable for conversion to microlight use. T B Woolley, 109 Victoria St, Narborough, Leics LE9 5DQ; tel 862756 or 886167 evenings. (5/46)

EXTRA INSTRUCTORS required to operate at England's latest school. Contact Midland Ultralights, Kilworth Marina, North Kilworth, Lutterworth, Leics LE17 6JB; tel 0858 880484. (5/48)

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