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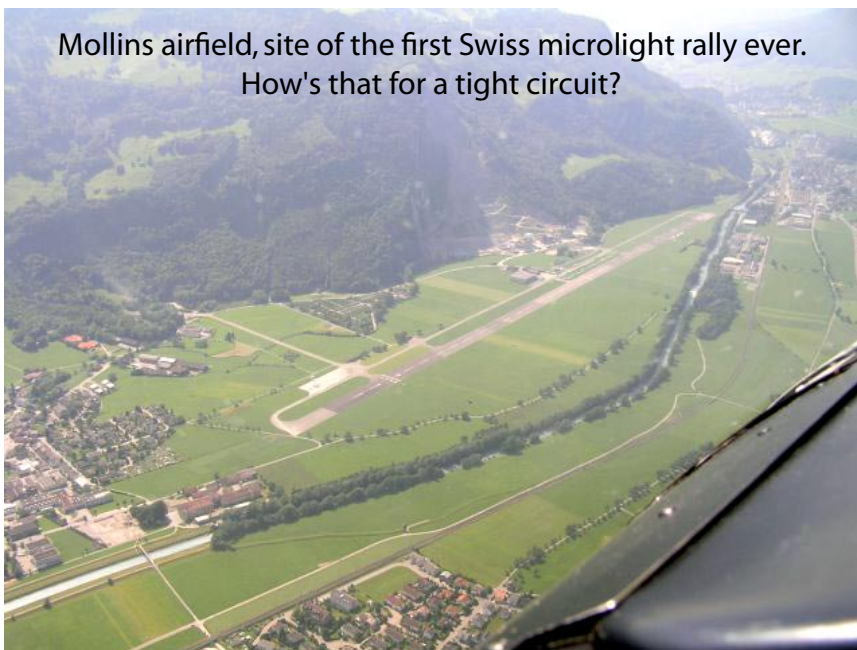
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# Flightline Online




# Swiss First

Mark Turner visits the first microlight rally ever in Switzerland



Mollins airfield, site of the first Swiss microlight rally ever.  
How's that for a tight circuit?

She sent me via VRPs N then W then NW; I'm sure I never found any of them but she seemed happy with my track. As I was approaching W I was asked to descend quickly from 3000ft to 2000ft because of jet traffic. I dashed down and turned towards NW. She asked me to look in my one o'clock and as I did two Mirage F1s passed by wheeling around each other. I'm sure they said something over the radio but really didn't understand.

At Prunay I battled through the odd fuelling ritual, with card and code. Whilst doing this I was entertained by an air display an ex-Patrouille de France Fouga Master. It was extremely noisy as it taxied to the park.

I had already flown five hours and it was getting on for 3:30 so I planned to have a few minutes rest. I opened a drink and pulled out the Mulhouse Habsheim info to read while sat on the grass. Reading it I realised that it would be tight to get in by their published closing time of 5:40. Off I Dashed!

Friday 23 June 2006

The day had come... I had decided to fly to Switzerland for the Swiss Microlight Federation's first fly-in for foreign microlights at Mollis AFB. I planned on heading to Mulhouse to meet up with Ed Cartwright and Nic Snow whom I had met the previous weekend at Spamfield.

I set off on my first leg, Sturgate to Lydd at 7:25. It was bright, clear and smooth - easy flying. After negotiating the com-

plicated yet tiny terminal at Lydd I set off to Le Touquet via Folkestone and Cap Griz Nez. I left just before a C42 group, who went direct at 2000ft. I chose 4000ft and spoke to Manston with their reassuringly loud and strong voice. I landed five minutes behind them! A quick stop and on to Reims Prunay.

An hour and a half later I approached Reims where I contacted CTR traffic to be greeted by a clear-sounding French lady.



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It was now getting well into the afternoon.

It was hot and lumpy, I was getting tired and I had lots of restricted areas to get through before Mulhouse. All this didn't really help, and unlike previous transits, neither did the ATC. Nobody wanted to talk, everyone wanted to pass me on! I approached the mountains before Mulhouse a little anxious of their height.

As I threaded through I passed gliders and paragliders. Many paragliders seemed to be getting ready to go. Three had been going a while because they were well above me and I was almost at 5000ft! As the highest peaks passed me by the valley at Basel sprawled into the distance. This was very welcoming after the hills but it was almost 5:40 and I was expecting the airfield to close. I gave them a call expecting to hear nothing only to find that there was a UK contingent already in circuit!

The tower gave no indication of closing so I routed south past the large aerial and on into the circuit. As I pulled up there were already a number of planes from the UK, two Jabs, three C42s and a 912 Shadow. Here I met the Swansea boys, Colin L in DTOY and Rob in MSKY with another Colin. I had said hello to Colin L at Spanfield the previous week after my Billy-no-mates message on the e-group. I hitched a lift in their taxi into town to chance my arm at the Ibis, (the Swansea boys had their accommodation set up before hand and there was no room left at the inn). After freshening up at the Ibis I struck out again

to meet up with Ed, his dad John and Nic in the centre of Mulhouse.

After such a long day we didn't stay out long, but just long enough for a nightcap at the bar. Already enjoying the local hospitality we found Clive and Kevin, the owners of the Jabirus. As talk turned away from the days' flying and onto the next I took my leave and headed for bed.

#### Saturday

The previous day had been a long one and I had slept like a dog, literally from when my head hit the pillow. We made an early start from the hotel so that we avoided the heat of the day and possible strong winds.

At Mulhouse we found DTOY and MSKY had gone already and the Jabs were getting ready. We filed our flight plans and off we went as a three-ship with Ed, his dad and Nic. The Jabs chose to route further south than we did and were taken over Basle by their ATC. We tracked to the east before turning to route along the bottom of Lake Zurich.

In the misty morning the hills and low mountains slowly came into view. The countryside spread rich and green, rolled and undulated as we passed through Germany, over the Rhine and into Switzerland. Gradually the undulations became sharper until we could see the high craggy mountains in the distance covered in snow. This fantastic flight just kept getting better, the mist was clearing and it was smooth. We picked up the main road out of Zurich towards Mollis along the lake. The contrast was incredible, the large dark lake surrounded by houses and green hills flanked by huge grey craggy mountains!

Our joining instructions led us to the north of the valley where we reported and joined downwind along the valley wall. What an airfield! The mountains either side rose to 6000, 7000 and 9000 feet! The downwind leg was along the sheer wall of grey rocks and green trees towering massively above. I felt giddy with the excitement of such a fantastic arrival. Downwind went fast as we skirted along the mountain wall at what felt like inches, it also felt as if the mountain was pushing me into the airfield!

Most of the UK contingent seemed to have reached Mollis before Ed, Nic and myself and were enjoying finals with four

others. Clive went round at least once but it could have been twice. I think he was enjoying it really. I turned in after Ed and followed him in over the town. It looked busy on the field with quite a few planes there already as we taxied off the runway to the grass. Getting out, the beauty of the location continued to assert itself. The narrow valley was bathed in bright sunlight flanked by grey, green and a now clear blue sky.

Nic's Shadow caused the biggest stir with people making b-lines straight to it! Apparently Shadows are not common



in Switzerland. With everyone down we booked in, stuck our flags in the map and relaxed in the midday sun to watch the world fly-in.

What a relaxing day; good food, some beer and excellent company! Through the day we met with our fellow UK flyers. Eventually 18 planes turned up with Eurostars and C42s being by far the most numerous. The typical mouthwatering Euro-micros began to arrive after us; Pipistrel Sinus, Polaris, Fascinations and Dynamics with a few Tecnams among them!

That evening I had plumped for the tent as is traditional. We had been warned of thunderstorms forecast and we certainly were not let down with a belter crashing into the mountain tops. We sat and watched over a beer before adjourning to the main hangar for some entertainment! Our gracious Swiss hosts presented a good show, with the highlight a short educational film describing the dangers of microlight flying in Switzerland pre 2006!

On to the presentations.

Unfortunately no UK X-Air, Thruster or Spectrum had arrived during the day so that £1000 prize went un-awarded. The longest flight competition was close with



Eddie, Nic and Jon do a spot of planning

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A Harvard at Mollins. Not a micro-light, but who cares?

a few of us coming from the UK, Ed, myself and the Eurostars from Manchester doing about 1000km. The winner was a pair of Danes from far north Denmark who had already gone on somewhere else.

#### Sunday

Another early start, packed the tent into the plane and off we went.

The early morning in Switzerland was very clear as the thunderstorms of the previous night had blown everything away. The view along the valley and lake to Zurich was marvellous - better than the day before. I really enjoyed the flight back through Switzerland to Mulhouse; we were in no rush so enjoyed the scenery.

Lots of discussion in Mollis revolved around the forecast for the channel for midday. Everyone was expecting it to be worse than we had enjoyed so far so we wanted to press on and get as far north as possible from Mulhouse.

We got to Mulhouse before the locals so had to go self service on the fuel... Quickly off again for a flight towards Reims and a stop at a small friendly place Ed recommended - Equiry. Again a brilliant flight, viz starting to go a bit but smooth and quiet without the ATC on Sundays. A little old lady in a floral dress wandered out with her clipboard to serve l'essence. Very friendly and fantastically French - what a great place.

On our taxi out a Robin called 'vent derriere' so we bolted together across the huge grass field and into the air. Great fun but a smoother bit with short grass would have been better.

Our next stop was to be St Omer for fuel and then on to the Channel if we could, but then came the rain...

Quickly after Equiry the cloud started

to thicken and the sky to darken from the west. As we passed west of Reims we got a little turbulence and a bit of drizzle. We were down to 1200ft but the going was still good. As we were on the micro frequency we could hear the Jab boys behind us and Chris T with the Eurostar in front of us. Everyone was faced with the same front from the west and we were headed straight for it!

As we passed north of Reims we found ourselves in intermittent drizzle and occasional heavy rain. We decided enough was enough and headed for St Quentin. Which is what Chris had decided and already turned back! Ed had already mentioned Laon before setting off as a suitable place to get stuck. We let everyone know on the frequency and went in to Laon. Within a few minutes we were joined by Chris and the Swansea C42s and the waiting

Later in the day our three ship, Ed and John, Nic and myself tried to get through in the clearing weather but at St Quentin cloud was down to the deck. Back we went to Laon to log a local flight.

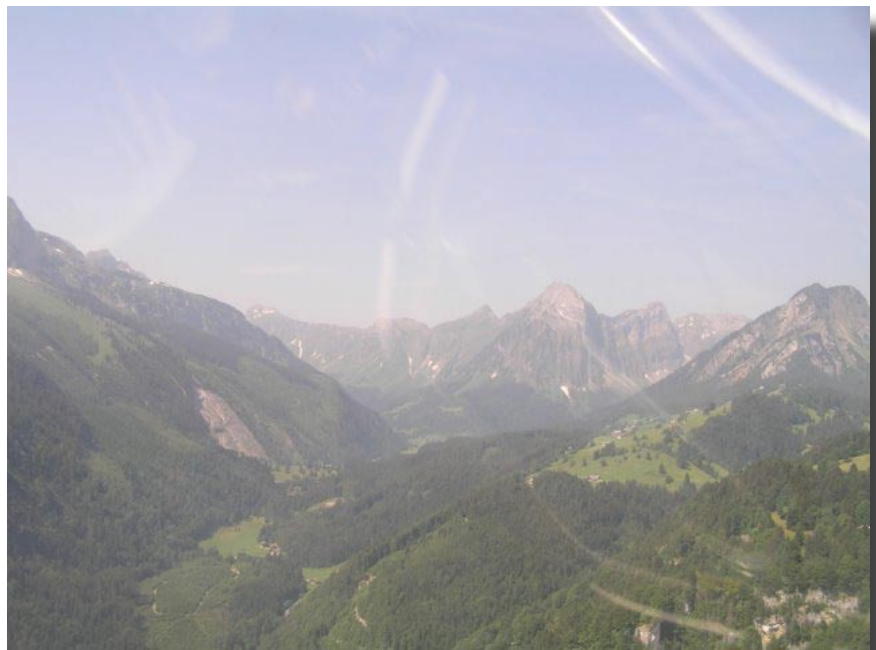
Into town we went. We had another good night in a passable motel made up for by the excellent company.

#### Monday

The standby day off from work just in case.

Laon was looking better but still poor. We planned to try for St Omer, stop for fuel then shoot over the channel and home. Everyone took to the phone for Lydd, Le Touquet, home for a forecast and work to let the boss know not to expect an appearance.

Hope and positive thought were defi-



began...

Shortly before landing we had spoken to Clive and Kevin in the Jabs. They were the other side of Reims and facing the same weather. Choosing safety over courage they turned north for Charleville.

The last hour was quite a contrast to the previous legs of the journey; low cloud and rain forcing us low and blocking the route.

antly making the sun come out so a plan was hatched. This time Chris T could go first (we had tried yesterday) and he can tell us what it's doing. We would route via airfields so if the weather deteriorated we would be near somewhere to stop. Off we set in our groups with a few minutes' gap - we really didn't want to be bumping into each other.

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The line-up at Mulhouse

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We routed via St Quentin, Perone, Albert then St Omer with Abbeville and Le Touquet as alternatives if it was bad up north. Everything started well but the cloud was lingering the further north we went. Chris found it first and was forced to descend, we followed 10 miles behind and soon found we couldn't get through. We passed Albert and it was getting uncomfortable as the darkness loomed to the north preceded by wispy low cloud. It was no good, we had to stop and sit it out, so one by one we headed to Abbeville. Nic charged on enjoying playing in the low cloud. Chris in the Eurostar arrived at Abbeville first, being in front, but sounding like he arrived before setting off? Ed and I headed along the Somme valley enjoying the scenery of the small villages with their tall churches as we passed them by.

Safely at Abbeville gradually everyone arrived. By mid afternoon 14 of the 18 UK microlights that had travelled to Switzerland were at Abbeville! By six o'clock many had gone into town with the promise of a fine day on Tuesday.

Ed, John, Nic and I stayed at the motel on the airfield and enjoyed a fantastic

meal in the restaurant. That evening as we checked in the weather was clearing which prompted the first intrepid pilots to press on for home.

Tuesday

We planned to set off early again but the weather still looked a bit poor so we settled for breakfast instead!

Hitting the net with kind permission of the fuel guy, it soon became clear that there was an acceptable window in the weather for the channel around lunchtime. We were on!

We took off heading to pass over Le Touquet. The fresh morning air was calm and the cloud rising and clearing. Ed activated the flight plan with Lille on the wing and pressed on to Le Touquet. Here there was a hint of concern for the weather as we heard Chris landing. As we passed north and

was safe and the crossing was fine.

caught sight of our crossing the cloud gave way to CAVOK conditions over the channel. Excellent. Ed relayed to all via Le Touquet that the crossing would be good and we shot off heading for Dover and home.

As we coasted in Ed needed to stop and tape up his radiator so we dropped in to Stoke Medway at lunchtime. From Stoke we passed Waits Farm and said goodbye to Nic. Ed and I continued to Chatteris where we split and I was alone again for the first time since Friday night. A quick splash and dash to Fenland to be comfortable for fuel and then home to Sturgate. The weather got better and better up north. By the time I landed there was no wind and beautiful blue skies celebrating the end of an excellent trip.

I had a fantastic trip made all the better with brilliant company. Special thanks go to Ed, John and Nic for letting me tag along with them. I definitely didn't end up as Billy-no-mates!

So five days flying.

13 Flights.

19 Hours.

1320 Nautical Miles.



Who said the Germans don't have a sense of humour?

# Engineering Practice: Safety in Detail: Trike Axles

By Peter Lovegrove

I saw and still see bad engineering on trikes, as much as on other machines. I have in mind, for example, the drag-ties to the axle-booms (Figure 1) (on one machine). The rear ends of these ties were curved, which is how not to design a tie. As soon as the main wheels are dragged backwards by striking grass tufts, for instance, these bends try to straighten and something has to give. The same problem is solved on other craft by the simple bracket shown in Figure 2, which is also easier to make!

Another common bit of ill-conceived engineering is the form of the plates often found on the inboard end of the half-axle boom (Figure 3). They are effectively 90° out from the position where stresses are

kept to a minimum.

With any split-axle arrangement, the unavoidable elastic movements of the cable(s) between the axle-ends allows the axle-booms to move up and down, thus bending the support plates slightly (Figure 4), or enlarging the hole through which it takes the main support-bolts, or enlarging the holes for the bolts which attach the axle-booms.

With the hammering a trike gets on grass fields - on which most are used — this sort of wear is not trivial. Aluminium alloys simply do not like this sort of treatment. In case you don't believe that particularly high g-forces are involved when you take-off or land on grass or rough concrete,

because you believe it depends on the pilot's skill, let me quote in paraphrase from a helicopter test report. On this particular machine, the chart-recordings of the rotor-blade g loadings showed that the highest g forces recorded were not taken in the test flights, take-off or landings; they occurred as the machine was towed over the hangar step!

To return to our trike-frame, the easiest way to remove excessive loads on such plates is to redesign them into a bracket so as to place the bolt through the axle boom parallel to the keel (Figure 5). If you want to rotate the axle boom forwards for storage or transport, as seems to be popular, it is a

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This article, from the May/June 1982 issue of *Flightline*, continues Peter Lovegroves' excellent description of engineering faux pas in layman's terms. For those thinking of venturing into the world of ultralight microlights, it will give you a good idea of the things to look out for in a new design - and what to look for on your daily inspection.

simple matter to turn it 90° before doing so. To lock the brackets in either location, plates can be attached to the rear of them by welding along the 'dead' edges, solid- or pop-rivetting or with Multibond cement, and a pip-pin pushed through these and the keel (Figure 6).

Plastic inserts and thicker-wall tubing have been put forward as providing protection against failure of the tube wall under the tensile force of the cable(s) below the axle. Increasing the tube wall from 17swg (0.056 in, 1.4mm) to 16swg (0.064 in, 1.6mm) will raise by about 14% the amount of metal withstanding the loads. But plastics flow under load and never return to their original size - not for nothing are they called plastic - so plastic inserts and washers should be used only as spacing devices, where forces are trivial, never as load-bearing material.

To spread the loads from the cross-cables into the axle-booms, one suitable method would be to have a metal insert fixed within the end of the axle, with a shoulder pressing against the tube end (Figure 7). The area of the tube wall which supports the compressive load from the cable is then: 2 x tube wall-thickness x bolt diameter plus approximately 3.14 x tube wall-thickness x tube outside diameter.

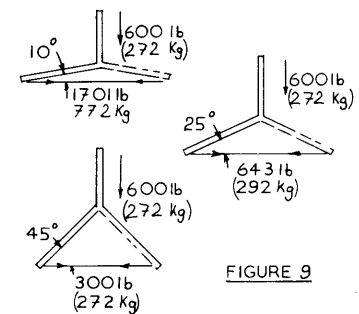
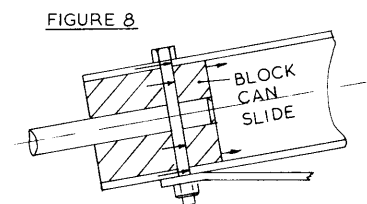
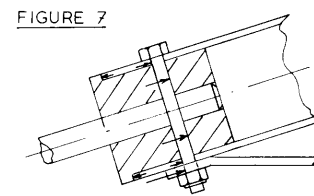
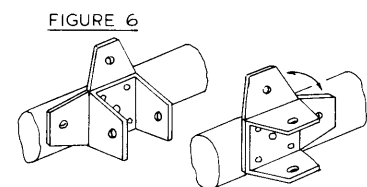
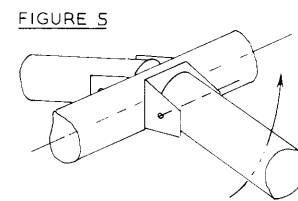
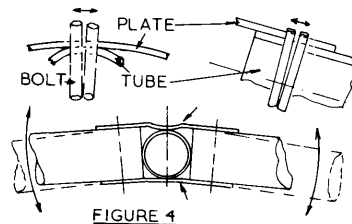
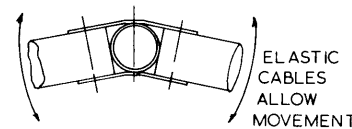
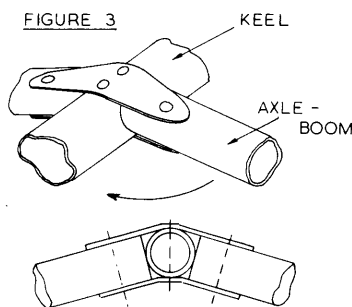
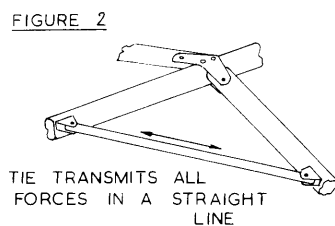
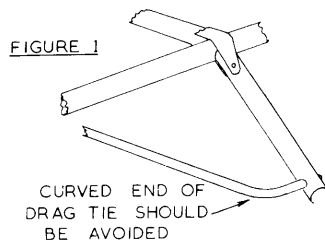
For a 1 1/2in (38mm) outside-diameter tube, with a 16swg wall thickness, this means there is over ten times the area bearing the load, compared with the situation without the block.

If the block does not bear on the end of the tube wall, (Figure 8), we are back to the condition where the block is virtually free-sliding inside the tube bore and is thus incapable of supporting any compressive load. All it does do is to keep the bolt straight and operating in double shear.

Finally, a couple of other points:

Firstly, by increasing the axle-boom angles to 25° compared with the 10° which I saw on one machine, you reduce the cross-cable loads by over 60%. Going to 45° reduces them by over 80%! (Figure 9).

Secondly, a properly angled and cable-braced axle-boom system is stronger than most straight axles.



# The Way We Were

25 years ago

Reading through the Sep/Oct 1982 issue of Flightline is a salutary reminder of how far we've come in that time. The Scorpion saga was coming to a head; there had been five accidents, two of which had been fatal, and the type had been grounded.

It's often thought that the introduction of pilot licensing, airworthiness et al followed from the Scorpion accidents, but by September 1982 it was mandatory to have your aircraft registered, and a pilot's licence. Airworthiness was the missing element that wasn't introduced until 1984.

But despite this, the atmosphere was astonishingly positive; the

Dragon was just coming onto the market, the Huntair Pathfinder was a steady seller and the subject of its first flight test, and there were advertisements for the Raven Vector, Quicksilver, Lazair, Goldwing, Micro Bipe and the Vitality – a side-by-side canard that never made it into the air. Strangely enough, Flexiform and Hornet were the only flexwing manufacturers to advertise.

And the London to Paris race had just been successfully completed, with a substantial proportion of the 76 competitors completing the course. Mind you, the final leg from Pontoise to Paris was 19 miles, and some competitors ran out of fuel in the 35mph headwind...

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From the May/June 1982 Flightline, here's the contribution of regular cartoonist Beef Heftytoo, whose appalling punnery is still much missed.

**"BEEF" HEFTYTOO**  
MICROLIGHT PILOT  
EXTRAORDINARY

AERIAL PHOTOGRAPHY  
THIS MONTH FOLKS

THESE ARE SOME  
AERIAL PHOTOGRAPHS  
I'VE TAKEN

MY FIRST ATTEMPT AT  
INSTANT PICTURES---

--- PRODUCED A BAD CASE OF POLAROIDS---

--- I MUST HAVE BEEN SITTING IN THE AIRCRAFT TOO LONG.  
THEN I TOOK SOME PICTURES OF A NUDIST BEACH,

OH HO HO  
HA HA

I'M NOT KEEN ON HIS  
FLASH

JUST WHAT IS  
HE EXPOSING  
UP THERE?

BUT I HAD PROBLEMS WITH OVER EXPOSURE.  
FINALLY, I TOOK SOME PICTURES OF MERTHYR TIDFIL  
AND I NOW ADVERTISE AS "BY ROYAL APPOINTMENT"!--

SOME DAY  
MY PRINTS  
WILL COME--

--- WITH THE PRINTS OF WALES,