

The West Surrey Cyclist



**April - June
2014**

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WHAT WE ARE

CTC is the national cycling charity. It campaigns for both road and off-road cyclists. Membership includes third-party insurance, legal claims advice, travel and technical guidance, on and off-road route information, and a bi-monthly national magazine. It has 70,000 members and affiliates and is the oldest and largest cycling body in the UK. It has a network of local groups of which CTC West Surrey is one.

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WELCOME TO OUR WORLD

I published the wrong date for the Bicycle Icycle last issue. See the back page for the corrected details. Sorry for any confusion caused.

As this thoroughly depressing winter draws to a close, the days are gradually lengthening and at last the weather is improving. Soon it will be time for those who have cycled throughout the winter to take the water wings off their bikes, while those of us who have hidden from the weather will face the annual battle to regain cycle fitness. In my case that means progressing from struggling to do 25 miles at 11.5mph to coping with 100 miles at 14mph. It's not only my legs that must re-adapt to cycling: a certain part of my anatomy will once again need persuading that a saddle is not, contrary to first impressions, an instrument of torture. Hopefully after the initial struggle I shall be able to look forward to another summer of enjoyable cycling.

Unfortunately few people used the wet days and dark evenings to write anything for the magazine. Having carried forward seven pages of content from last time, and intending to write an article myself, I had expected it to be easy to fill this issue. That, however, proved to be false optimism: in the last three months I received contributions totalling only three pages, so it has been a struggle to fill even this thinner than usual issue.

The cupboard is now bare - for the first time since taking over as editor I

have been able to carry forward absolutely no material - so next issue could well be even thinner. As I never tire of telling people, it's the articles etc that you write that determine how good or otherwise the magazine is. I merely shuffle the contributions around to achieve a satisfactory layout. Well, that and write boring GPS articles to fill some of the gaps.

ELSTEAD AUDAXES

By Nick Davison

The Stonehenge 200, Danebury 150 and Elstead 100 Audaxes will be run on Sunday 18th May this year. The control will be in the Elstead Village Hall rather than the usual Youth Centre, which will provide the organisers with much improved kitchen facilities and should avoid the Scouts intervening with their camping equipment. The Village Hall is next door to the Youth Centre. Start times are 0800/0830/0900 respectively.

We shall be modifying the route around Alresford in case the Watercress Festival coincides with our event.

The Stonehenge route passes through Whitchurch for a control and then out onto Salisbury Plain via Tisbury/Bulford Camp to Amesbury, where there is a café control [the route does not go as far as Stonehenge]. The route returns via the Winterbournes and King's Somborne to Alresford for a control and then back through Farringdon/The Worldhams/Churt to Elstead.

The Danebury 150 route also passes through Whitchurch, follows the Test Valley southwards and returns via Alresford and then back as above.

The Elstead 100 route heads out to Overton and returns via the Strattons to Alresford and then back as above.

There are no lunchtime café controls on the Danebury or Elstead routes although the Danebury passes close to Stockbridge where there are several cafés and pubs.

Remember to bring a pen or pencil for the information control questions on the brevet card.

Entries can be made online via Paypal on the AUK website or posted. Entry on the day is accepted with a small surcharge.

CTC TRIENNIAL VETERANS RIDE – JUNE 2013

By Arthur Twiggs

This is one of those events that I am locked into now, rather like the Isle of Wight May bank holiday randonnée, for which I now have 13 badges for completing (I have only been cycling properly for the last 15 years). There is something about 100 miles, with my first confirmed one being the Pru Tour in 1998, not long after I started cycling again other than as a teenager. My ride time for that event will be in the archives but I'm not going to repeat it here!

I chose West Kent for the Tri-Vets originally six years ago because it is not too far to travel and their routes are really well designed. Last year was no exception and I drove to Tonbridge on a glorious June Sunday to get to the Scout Hut venue for an 8am start. 36 riders had registered and we were split into three groups with a ride leader and two marshals allocated to each. There was plenty to eat, tea and coffee and an explanation by the organiser about the arrangements and planning to ensure safety on the routes, including staggering the departures of each group. West Kent have chosen to organise this event with four loops of approximately 25 miles each radiating out in different directions from the base, which provides a good widespread view of the local countryside and allows repairs and/or any emergencies to be resolved at base during the ride.

The first loop was out through Mereworth, Offham and Crouch to the North East of Tonbridge and back to the Scout Hut. All three groups were back in less than two hours which is thanks really to the ride leader and marshals who ensured that no wrong turnings were made and that everyone kept together. After plenty of refreshment at the Scout Hut, the groups again made a staggered departure through the water meadows of the river Medway out through Bough Beech, Haxted and Eden Bridge to the West of Tonbridge – back into Surrey to the West of Edenbridge, and riding past the entrance to Hever Castle on the way back. Unfortunately the group that I was in was plagued by punctures with one rider having to deal with two in close succession. As a result, this loop took us nearly three hours to complete, so we were quite late back to the Scout Hut for lunch.

After a healthy feed and 45 minutes rest we set out again somewhat later than the other groups for a general loop around the North of Tonbridge including Leigh, Hildenborough and Hadlow. The Hadlow folly is always

pointed out to visitors, and this year it was seen to be completely re-furbished and in pristine condition. Unfortunately the puncture plague afflicted us again, including the rider with two, one after the other in the same tyre. This meant that the loop took us about 2.5 hours before we got back for refreshment. We were now well behind the other groups and set out on the fourth loop at after 5 pm. This loop was out to the South and East of Tonbridge taking in Paddock Wood and Yalding. Luck was with us and with the good weather and other conditions we completed this loop in less than 1.5 hours which enabled us to claim a satisfactory completion of the ride in under 12 hours. For the record, one of the riders was doing his 11th tri-vets ride – work it out for yourself!

Hopefully they will be arranging this event again in 2016; I will certainly be watching the rides lists to ensure a place.

US AND THEM: A CYCLING STORY BASED LOOSELY ON RECENT EXPERIENCE

By Dave Williamson

A quick look behind and Frank turned off of the main road and into the lane. He could relax a bit now that he'd left the traffic rush behind. Readjusting his pace he began to settle into the ride. This was his route, the one he took each time he needed to check out an adjustment, to test a new part or even himself after a lay off or illness. A ride with exactly the right number of miles and hills. He knew every bend, virtually every blade of grass and how long it should take almost to the exact minute. This time it was to try out a new saddle fitted to 'old faithful'. At this time of day after the scary mayhem of the four-by-four school run and before the mad executive evening car race, he knew that traffic would be light. The temperature was just right for riding, the early slight frost had melted away and a weakening sun lit up the chameleon changing autumnal trees.

Frank changed down for the approaching incline. The new seat could do with being raised a tad he thought to himself. A woman on bike came rapidly down the slope towards him from the apex of the hill ahead, two French sticks making an impromptu 'V' sign in her handlebar basket. She flashed a brief smile to Frank that broke her look of half fear, half pleasure as she clung on desperately during the descent and then was gone in a haze

of squeaking brakes.

Frank eased to a halt and leaned the bike against a hedge. He fished in his pocket for the spanner he had put there exactly for this purpose. No fancy Allen keys needed with this bike. He started to adjust the saddle when suddenly a voice seemed to come out of nowhere. "Everything all right?" Frank looked up and quickly assessed the previously unseen elderly cyclist on the other side of the road. The battered saddle bag, the care worn club jersey and ancient touring bike spoke volumes. "Yes thanks" Frank nodded. "Just a minor tweak needed". "As long as you're OK then" and with a wave, the stranger spun the pedals and disappeared into the distance.

Frank re-mounted and juggled the gears for the continuing fight towards the top. 'Nice of him' he mused and drifted into thoughts about the fellowship of cycling and that there would probably someone who would turn up out of the blue if he ever experienced any problems. The saddle position felt better now. 'Sorted' he thought and started to concentrate on tackling the incline. A sudden blur at his side jolted Frank out of his musings as another rider suddenly appeared and began to rapidly overtake. A quick glance and Frank took in the carbon fibre frame, the designer clothing with the discreet but necessary logos and the trendy tanned stubble and mirror glasses.

Frank couldn't help himself. "Hi" he said almost involuntarily. The reply was immediate and startling. A contemptuous gob of spit landed ahead of and was consumed by Frank's front tyre. Without even a sideways glance, the stranger got up out of the saddle and rapidly started to leave Frank behind, the glossy wet message on the tyre being the only hint of their meeting. 'Ignorant git' thought Frank, as the warm feelings he'd so recently had towards other riders rapidly evaporated. Soon, he could just make out the other cyclist as he vanished from view at the top of the rise. He settled back into his comfortable pace, still smarting at what had happened. 'Still, soon be at the top' he thought and then it would be downhill all the way to a welcome coffee. He might even open some chocolate hobnobs he reasoned, a thought that began to thaw his resentment towards the man in shades.

Rounding the bend as he broached the summit Frank was surprised to see his nemesis a short distance ahead standing by his bike. As he got nearer, the flat and limp, slim as a pencil rear tyre told its own sorry tale. Frank eased off the pace as he approached. "Oi mate, can you help, only like, I've

got no battery”. The shiny, paper-thin mobile phone was held aloft to emphasis the point. Frank stopped and looked at the scene. ‘All the gear except the gear that’s needed’ he thought. He paused for a bit and thought about what he had on him that could help the stranger, after all, despite everything, he was still a rider in distress. Frank ran through a mental list - wrong size tubes, a pump for the wrong type of valves, steel tyre levers that could massacre those fancy light weight wheels smothered in maker's graffiti. “Sorry mate” – he almost choked on the word. “I don’t think I’ve got anything that could help you. He paused for a second, “Not even one of those things” he added, pointing at the phone. “There used to be a phone box just along a bit further only they took it away last year, probably due to everyone now having mobile phones”.

“I’ll give you some advice though, free of charge. Always have enough stuff with you to at least cope with a puncture. Also, when other riders say hello, you could at least acknowledge they exist. It looks like you’re going to have to walk”. Frank cranked the pedal down and shot off down the homeward stretch, his speed rapidly increasing with the incline, any remarks that might have come from the other rider conveniently masked by the sudden roar of a chain saw on the other side of a hedge.

‘I feel a bit sorry for him’ he thought, ‘but the attitude of some riders is not good’ ‘Blimey’ he laughed, ‘I’m beginning to sound like a grumpy old man’. Then after a pause he laughed again and thought ‘That’s because I am a grumpy old man. Anyway, those hobnobs will taste especially good’.

MESSAGE FROM THE CHAIR

As you are likely to be aware by now, I have recently resigned as club Chair. May I please urge you to continue giving your full support to your new Chair and your Committee.

In the near future the club will be launching its new website and informing members of the launch by email. When it does so, you will be able to view my resignation letter in the blog section (6 March 2014 entry).

Louise Gagnon

Ed: This was breaking news as the magazine was about to go to the printers. Mark Waters has taken over as interim Chair.

RIDING THE WEST COAST OF IRELAND, NORTH TO SOUTH (ALMOST!) - PART 2

By Paul Gillingham

From Rossaveel in Connemara I took the 40-minute ferry to Inishmore, the largest of the three Aran Islands, which was so well portrayed by writer JM Synge and the cult 1934 documentary film 'Man of Aran'. The island has two roads running east to west, big enough to need a bike, and I was glad I took mine. It's like a moonscape, with sheets of white-grey rock and tiny fields enclosed by dry-stone walling of varied design; perched on the edge of a cliff with a 300 foot drop to the pounding waves below is the Iron-age fort of Dun Aengus, sliced in two when half of it plunged into the sea. I was there with a big crowd of tourists who'd come on minibuses, but it didn't matter as the setting was so stupendous. In spite of wind and rain I was able to cycle from one end of the island to the other in time to visit the Aran sweater showroom and catch the once-a-day ferry back to the mainland.

Back in Rossaveel I headed east along Galway Bay and camped beside it at Spiddal. Breakfast of porridge and coffee turned into a nightmare as I was attacked by clouds of midges. "Why didn't anyone say that Connemara was as bad as the Scottish highlands for these nasty blighters?" I thought.

The main road into Galway city was busy, but there was a good cycle path that took me into the centre. I sat on a bench in Eyre Square wondering where to stay to avoid any chance of a midge-fest and tried a hostel at the edge of the Square. This proved a fantastic move as Kinlay Hostel was super-clean, served excellent breakfasts, treated all guests as long-lost friends and had a terrific atmosphere. No wonder it's rated the 7th best hostel in the world by hostelworld.com!

Galway city is full of great pubs and trendy cafés. The pubs were packed and the Guinness was flowing that afternoon and I soon realised why. It was the All-Ireland Hurling final between Clare and Cork, televised from Croke Park, Dublin with an 81,000 capacity crowd. What a game! It was so exciting I wonder it's not an international sport.

My route from Galway took me into the weirdly wonderful landscape of the Burren, with its miles of polished limestone pavement or 'karst'. There are said to be 65 megalithic tombs here and 500 ring forts and my route

took me to the Ballyalban earthen ring fort and the photogenic Poul nabrone dolmen built in 2,500 BC, one of the iconic monuments of Ireland.



That evening I was in Lisdoonvarna, home of the month-long Matchmaking Festival, where I was forced to stay for two days because of heavy rain. During September the bars and hotels of this small spa town are packed with people, average age 65, out to have a good time and possibly find a mate. There is dancing daily from mid-day to well past midnight, which I enjoyed even though I wasn't an Irish farmer and wasn't on the hunt for a wife. I did, though, meet Ireland's most famous matchmaker Willie Daly in his 'office' in the Matchmaker Bar. A charming 68-year old farmer whose father and grandfather were matchmakers before him, he brings lonely hearts together with the help of a huge contacts book bound in leather; as he said, they appreciate the old ways in rural Ireland!

I was staying at the excellent Burren Hostel which has a lively pub opposite with traditional Irish music nightly. Next to it is The Burren Smokehouse, where I stocked up on smoked salmon for the next two days. The whole town exuded 'good craik'!

After a stiff climb out of Lisdoonvarna I was soon in Doolin on the coast, a village also famous for its traditional Irish music. I only had time, though, for a lunchtime Guinness in the atmospheric O'Connor pub, an unwise

move as my next stop was the 600 feet high Cliffs of Moher. Teetering on the cliff edge I hazily admired the view across to the three Aran islands knowing that somewhere beyond them, over the horizon, were the skyscrapers of Manhattan.

From the Cliffs the coastal road passes through Lahinch, where surfers in wetsuits rode angry Atlantic breakers, and then on to a tea shop in Milton Malbay where I had the best ham and cheese sandwich ever. Nearby is Spanish Point, where I parked the bike outside the Armada Hotel and gazed at the lovely, golden beach where, 500 years before, 60 Spanish survivors of a wrecked Armada ship swam ashore only to be executed by chieftains loyal to England.

The city of Limerick has a bad press in my guidebooks, so I decided to give it a miss by heading directly south for the River Shannon and crossing on the 20-minute ferry. A mile beyond the ferry is the village of Tarbert, where I had a room to myself with en-suite in the comfortable 18th century Ferry House Hostel.

The next day was gorgeously warm and sunny and the cycling was an absolute delight even though the road to Tralee was lumpy with mountains looming on the horizon.

Along the way I made brief detours to the ruins – thanks to Cromwell - of a 15th century Franciscan friary and then a Cistercian abbey and had my sandwiches in solitude beside the Rattoo Round Tower built in 1100AD.

The route south from Tralee to Killarney started next morning with a tough climb over the Slieve Mish mountains with only sheep for company on an otherwise empty road and then a fierce drop – said to be the steepest in the west – down into Castlemaine. Then the old Killarney road directly south



Dunguaire Castle

finally took me over a hill where, in the distance, rose the spire of Killarney cathedral with its backdrop of lake and mountains, a marvellous sight. Here they were, at last, McGillicuddy's Reeks!!

Killarney is a lively town, so that night I enjoyed good 'craik' in a pub with Irish music. There wasn't time to ride the Ring of Kerry, but next morning I set off on a day's ride around part of it, the glorious Gap of Dunloe route through McGillicuddy's Reeks, with its hugely steep descent; inching past on the way up were the 'famous 'jaunting cars' (horse-drawn carriages) and I was soon sipping tea at the famous Lord Brandon's Cottage. From there it was a delightful ride through virgin forests alongside the lake of Killarney and detours to the Torc waterfall, Muckross House and the ruined Muckross Abbey, with its ancient yew still growing inside the cloister. As I later scribbled in my notebook "THIS WAS THE MOST STUNNING BIKE RIDE EVER!"

In the morning I pedalled through Killarney's National Park to Ross Castle on the lake and then made a quick visit to Killarney Cathedral, built by the architect Augustus Pugin, who designed Big Ben and the Houses Parliament in London. It was now raining hard, so I took the bus to Cork and found a bed in the friendly Sheila's Hostel near the middle of town.

Next morning was gloriously sunny, so I headed out along Cork harbour on a cycle track, which was once a railway, to the town of Cobh, formerly Queenstown, the last port of call for the Titanic. This had been the major emigration port for the USA and Canada and the Heritage Centre tells its story, including that of the last 123 passengers, mainly 3rd class, who boarded the Titanic. After the exhibition and a visit to the White Star Line offices I climbed the hill to the majestic St Colman's Cathedral, also built by Pugin, which must have been the last landmark seen by all those ill-fated passengers in 1912.

All that now remained to do in Ireland was to kiss the Blarney Stone, corny but somehow necessary, so on yet another sunny morning I climbed the long hill out of Cork and rode the 5-plus miles to join the coach loads of tourists at Blarney Castle. Feeling the journey was now complete I took the early evening bus via Waterford to Wexford, arriving well after dark. There was a gorgeous full moon and I parked my tent just feet from the Irish Sea, the moon casting its glow on the waters.

It was a magical end to a glorious, serendipitous journey. The route hadn't

been planned, but it worked out exactly as I would have liked. I loved the empty roads, the old fashioned shops, the music-making, the roadside shrines to ‘Ave Maria’, the medieval ruins, the pubs in cottages, the aroma of turf fires. Edward Enfield in his book compared cycling in Ireland to cycling in Greece, based on the beauty of the landscape and the friendliness of the people. I haven’t yet cycled in Greece, but I’m sure he’s right!

BIKE RIDING IS SO NICE, BUT THERE ARE RISKS

By John David of CTC South Bucks

Reprinted from the September 2013 edition of The Beech Leaf by kind permission of the editor and the author.

Almost certainly I’m the only reader to do this, but I re-read my piece about canals and bike-riding which the Editor kindly published recently. It came to me that what I was chewing the fat about was the dreadful number of hazards, hidden and obvious, that cyclists face all the time when perched on this wonderful machine.

In fact, if we sat down and philosophised deeply about it, we probably wouldn’t go cycling at all. I’m not just thinking about traffic, an inherent danger which lurks a hundred times in a full day, but all sorts of awful perils which could strike at any moment.

I recall sadly an accident which occurred recently to Ron Carlton, a lifelong CTC member and leading enthusiast in the Bristol area. He was bowling downhill with a group and someone in front of him lost a saddlebag. It just fell off, but because of the speed they were going Ron couldn’t avoid it. He struck it, went over the bars and ended up in hospital with severe head injuries,

Now the person who, one suspects, didn’t fix the bag on securely, is bound to be mortified at what happened. It behoves everyone to make sure, before going out with a gang, to make sure that all accoutrements to our bikes are securely affixed – but who’d have dreamed up such a bad scenario?

Accidents will happen. On the other hand, some can be avoided or, at least, the risks can be lessened. For example, it should be obvious procedure not to stop at a hazardous spot on the road to mend a puncture, or make an

adjustment, or don a waterproof.

Somewhere near at hand there will be a field gate, a passing space or a patch of grass on which to place the bikes, instead of trying to operate with vehicles rushing past at the elbow. Anyway, up-ending the bike on a soft patch to change a tube will do far less damage to the saddle or bar tape than sitting it upside down on tarmac,

There are all sorts of tips not listed in the Highway Code to dodge potential danger when on the road. Traffic pinch points seem to be proliferating, many lacking a cycling cut-through. You only need to be trapped in this narrowing space once by an impatient driver to realise these are deadly risks for innocent cyclists.

There's only one way to cope, and it certainly isn't to waver and wait for the bullying driver to go past. It is to anticipate his coming and intent, to swing out of the gutter (a right arm signal, perhaps) and move into the centre of the limited area, so forcing him into the choice of either giving you your right of way or mowing you down; hopefully the former. You are riding assertively, of course, and it may take courage at times. But it's better than the alternative, squashed bike and person.

Many of us will have watched in awe as the GB team pursuiter, both genders, rode imperiously to gold medals at the London Olympics. How a rider, having done his or her effort at the front, sweeps up the banking and hurtles down again, at 35mph- plus, to slot unerringly 2in. behind the rear wheel of the last teammate.

Looks easy, but it's far from it. Following a wheel is what we all do when out on group rides, not at those speeds and there's no banking involved. But riding close to the wheel in front is a technique which most of us sub-consciously acquire, and it's rare for wheels to clash and tumbles to occur.

But they do happen, particularly when less experienced individuals are involved. I learned when team pursuit training not to steer precisely behind the wheel in front, but to plant it a couple of inches to the right. Not enough to lose the advantage of slip streaming, but it will provide a small safety margin in the case of an unexpected emergency.

In a group, on the road, if something goes suddenly wrong ahead – an unwarned pothole, a change of mind, a blow-out – there's a chain reaction and a sudden slowing or stopping of that wheel in front of you. If you steer

to the left you'll find yourself trapped between the rider in front and the kerb or verge, and often with nowhere to go if he or she has stopped. If on the other hand if you're positioned slightly to the right to begin with there is more likely to be clear road ahead and space to brake sensibly.

Many hazards a wheel teach us lessons, usually after we've once fallen foul of them. Don't brake hard with your front brake while negotiating a gritty corner, don't ride too close when in a mixed ability bunch tackling a steep hill (someone's bound to muff a gear change or even leap off without warning), never go round blind bends on the right side of a lane.

Rainy weather always sets amber lights flashing. Again, take it easy on those bends, steep hills, and brakes. Leave extra space to allow for less efficient wet-weather braking. If you're wearing a rain hat make sure it's properly fixed on and won't blow away in the wind.

Oh hats! Some of our acquaintances have commented on the fact that my wife and I, after half a century of riding bareheaded, are to be seen with snazzy helmets. Now I've always thought the CTC policy of personal choice to wear or not to wear a helmet is the correct and most sensible course.

As just outlined, we are bombarded with risk whenever we are out on a bike, but in more than a half-century of serious cycling I personally have known of only one stack-up (apart from poor Ron) where the victim has suffered a dreadful head injury. It can happen, but the damage is more usually broken collarbones and wrists, or bodily cuts and bruises.

But one factor persuaded me to take out the insurance policy that is the cycle helmet. And that is the perception in medical, police and insurance circles that if you had an accident but were not wearing a helmet you were in some odd way partially or wholly responsible for your predicament. This can be to your detriment with an insurance claim, for example.

When I presented myself at Wycombe Hospital with what turned out to be a broken wrist following a fall, not off the bike but when I my foot slipped on wet grass after having a rural comfort stop, almost the first question was: "You'd been cycling but were you wearing a cycling helmet?"

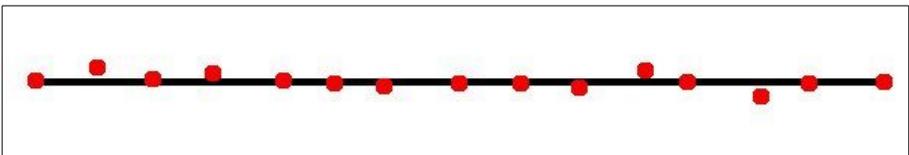
I answered that I wasn't and was then sternly admonished by a medic that I should have been. Ridiculous under the circumstances, but a warning and one that might have consequences in law or an insurance claim.

HOW FAR? - PART 2

By Dane Maslen

As you've been naughty boys and girls and failed to fill the magazine with your own articles, I'm afraid you're going to have to put up with another four pages about the accuracy, or otherwise, of ride distances as calculated by a GPS. In part 1 (Jul-Sep 2013) I discussed the trivial discrepancies that could arise because of the use of different formulae for the calculation of distances. This time I'm going to consider the more significant errors that can creep into the calculation because of measurement error. First, however, I'll start by reminding you that for any given journey your GPS can show you a trip distance (calculated from all the position measurements) and a track distance (calculated from only those position measurements that were saved in the track file at the end of the journey).

A GPS does not measure position perfectly. If you rummage around in the items of information that your GPS can display, you'll probably find one called something like 'Accuracy of GPS' or 'EPE' (Estimate of Positional Error). This is an estimate of the accuracy of the measurement of your position. The Garmin GPS II I bought about 20 years ago manages an EPE of only about 15 m. My Garmin Oregon 450t on the other hand usually reports an EPE of 3 m, though this increases if conditions are not ideal for signal reception, e.g. in tree cover. For the benefit of non-statisticians, I should explain that 'an EPE of 3 m' means that the measured position should be within 3 m of the real position about 68% of the time, within 6 m about 95% of the time, and within 9 m about 99% of the time.



The diagram above illustrates the potential consequences of measurement error on the calculation of the trip distance. It's a simulation of travelling about 240 m in a straight line at a speed of about 31 kph with the GPS measuring the position every 2 seconds with an EPE of about 3 m. The solid line represents the motion in a straight line while the dots represent the measured positions. If the distance were calculated by simply joining the dots, it would be overestimated by 1-2%. At slower speeds the overestimation would be even greater, e.g. over 40% when walking, so

you'll be relieved to learn that this is apparently not how a GPS calculates the distance. From the experiments that I have carried out with my GPS, it's obvious that the calculation involves some sort of fancy smoothing of the measured positions.

Here's an experiment you can try for yourself: put your GPS in the garden, clear the trip counter, leave the GPS for 90 minutes or so, look at the trip distance, save the track, and then look at the track distance. Neither the trip distance nor the track distance are likely to be correct, i.e. zero, but they will be a lot less than would be expected from just 'joining the dots'. When I recently did this experiment with my Oregon 450t, setting it to record a track point every two seconds, I got a trip distance of 65 m and a track distance of 170 m. I'll leave you to think about those numbers for a moment: you should notice something peculiar about them.

Out of curiosity I repeated the experiment with my old Garmin II. Given its poorer EPE I expected the measured distance to be correspondingly higher, but I was also curious to see whether it was less sophisticated in the way it calculated the distance, i.e. whether it used an algorithm that was more similar to joining the dots, in which case the measured distance would be even higher. Unfortunately it only reports the trip distance to the nearest 0.1 km, so for a long time the distance was shown as 0.0 km. When I next looked, it had shot up to 0.7 km. Presumably at some stage in the interim the configuration of satellites in the visible sky (buildings and trees blocked quite a lot if it) was sufficiently poor that the accuracy of measurement had deteriorated substantially. As such this experiment didn't tell me anything about the algorithm used by the Garmin II to calculate distance, but it did demonstrate that significant errors in the calculation can arise when the GPS can only measure positions with poor accuracy.

Have you noticed what's so odd about a trip distance of 65 m and a track distance of 170 m? The trip distance is calculated from all the position measurements, whereas the track distance is calculated from only a subset of them, so if the same algorithm were used to calculate both distances, the track distance could not be larger than the track distance (if that isn't immediately obvious to you, look at the diagram on the previous page again and consider the example of a trip distance calculated by joining all the dots and a track distance calculated by joining every other dot).

When I first did the experiment, I concluded that the simple method of joining the dots was being used to calculate the track distance whereas a

more sophisticated algorithm was being used for the trip distance such that measurement errors were largely smoothed out. Subsequently I've come to believe that some smoothing is applied even when calculating the track distance (my program for reading a GPX file and calculating the distance is very simple-minded and does a 'join the dots' calculation: for the track file from the experiment it calculates a distance of 201 m, not 170 m).

It occurred to me that I could analyse the position measurements from the track file to see if they were consistent with the EPE of 3 m that the Oregon 450t had claimed at the time. Satisfyingly I found that they were (the standard deviation of the measured positions from the average was indeed 3 m), but in the process of doing the analysis I discovered the answer to something that had puzzled me ever since I'd had my Oregon 450t, namely how was it managing to detect quite small movements (less than a metre) if each measurement had an accuracy of no better than 3 m?

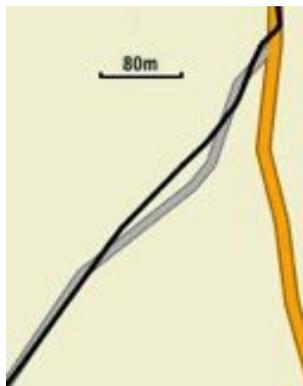
Imagine that you are attempting to use a ruler to measure the length of something to the nearest quarter of a millimetre. Errors in positioning the ruler will cause you to get a scatter of answers if you repeat the measurement several times. Think of this scatter as being the precision with which you can read the ruler. It doesn't represent the error on your measurements as potentially there are errors in the calibration of the ruler too. If the ruler is incorrectly calibrated, then there is some correlation in the errors on your measurements, i.e. they will all tend to be either too long or too short. If you were to use several different rulers to do the measurement, you'd finish up with a greater scatter of answers. That scatter represents the real error on your measurements.

Now let's return to that track file. It contained nearly 3000 track points. The standard deviation of those points was 3 m, but for subsets of 100-200 consecutive points the standard deviation was up to a factor four smaller. It was as though one 'ruler' were being used to measure these positions while another 'ruler' were being used to measure earlier or later ones. Substitute 'one set of satellites' for 'ruler' and I suspect that that is indeed what is going on. Consecutive position measurements are likely to be based on signals from the same set of satellites and apparently all tend to offset from the true position by roughly the same amount, but eventually a satellite moves into or out of sight and the offset changes.

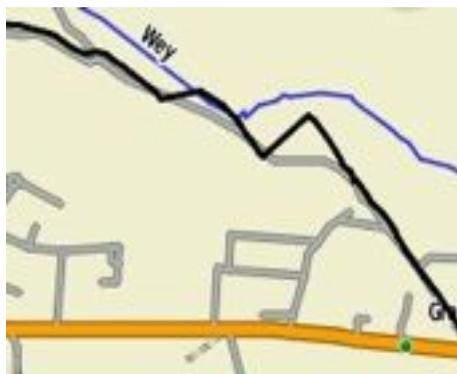
If you're still awake and have given some thought to the conclusion I drew in the previous paragraph, you might have realised that if I am right, then

the diagram on the first page of this article is too pessimistic and exaggerates the amount by which 'join the dots' would overestimate the distance.

Though smoothing reduces the amount by which distance is overestimated, it potentially causes a different error. This diagram shows a ride along a road with moderate tree cover. As you can see, the track has been smoothed so much that it doesn't follow the bends of the road, so the distance travelled would have been slightly underestimated by the GPS. My guess is that the tree cover increased the GPS's estimate of the error on the measurements of position such that the measured positions were consistent with an excessively smoothed track. There might, however, be other explanations.



Although I have suggested that smoothing is used to reduce the effect of the errors in measurement of position on the calculation of trip distance,



one other possibility that has occurred to me is that the GPS might try to fit the observed track points to a series of straight lines that are consistent with the EPE of the measurements. To some extent that appears to be what is happening in this example where the GPS struggled to measure my position in very heavy tree cover (I assure you I did not really blunder off the road, through the woods and into the

stream), thereby introducing spurious kinks into the track.

So after four pages of mind-numbing tedium what conclusions can we draw? Well, for that last example I estimated that the length of the ride was overstated by about 0.3 km, but as the ride was over 100 km, the distance measured by the GPS was nonetheless undoubtedly rather more accurate than a typical miscalibrated cycle computer would have managed. On the other hand my experience when walking leads me to suspect that the smoothing of measured positions in calculating the trip distance can result in a significant underestimate if one is zigzagging tightly in trees.

DATES FOR YOUR DIARY

Sun 6th April: Bicycle Icycle (70km), 09:30, 4 Quarry Hill, Godalming GU7 2NW. **Note corrected date.** Event details and booking form are on the website. See <http://ridewithgps.com/routes/1038768> for route. (Mark Waters 01483 414307, markwaters@ctcwestsurrey.org.uk)

Sat 26th April: Cycle Jumble, Ripley Village Hall, 09:00.

Sun 27th April: 35/50-mile Reliability Rides, start 08:00-09:00 from Waverley Borough Council car-park in Godalming (SU 971440). **Note new Godalming start location and that there is no Pyrford start.** (Roger Philo 01483 233381, president@ctcwestsurrey.org.uk)

Sun 18th May: Stonehenge 200, Danebury 150 and Elstead 100 from Elstead Village Hall starting at 08:00, 08:30 and 09:00 respectively. (Nick Davison 01428 642013, stonehenge200@ctcwestsurrey.org.uk)

Sun 20th July: 100/75-mile Reliability Rides. More details next issue.

Sun 17th August: Tour of the Hills. More details next issue.

Deadline for next issue June 1st. Get your cycling stories in to the editor now: editor@ctcwestsurrey.org.uk

The editor welcomes contributions of all types, e.g. articles about cycling holidays, anecdotes about events on club rides, letters to the editor, product reviews etc. Short items are very welcome: they fill the gaps left by longer articles. If you have photographs that could be used to illustrate your article, feel free to send them too. Whether they are used or not will depend on space constraints. All contributions will be acknowledged when received.

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Front cover: Could this be the real cause of 'snake bite' punctures? (photo by Derek Tanner, taken on NCN7 near Blair Athol).