Notes on Control – Punching Distance and GPS Accuracy

The App design is conservative at this stage, with the aim of making sure that controls punch for people even if the distance can appear excessive – and given that we don't have any marker in the field, if a control doesn't punch, people are left wondering which way they should go (not knowing the direction of their GPS error at that point).

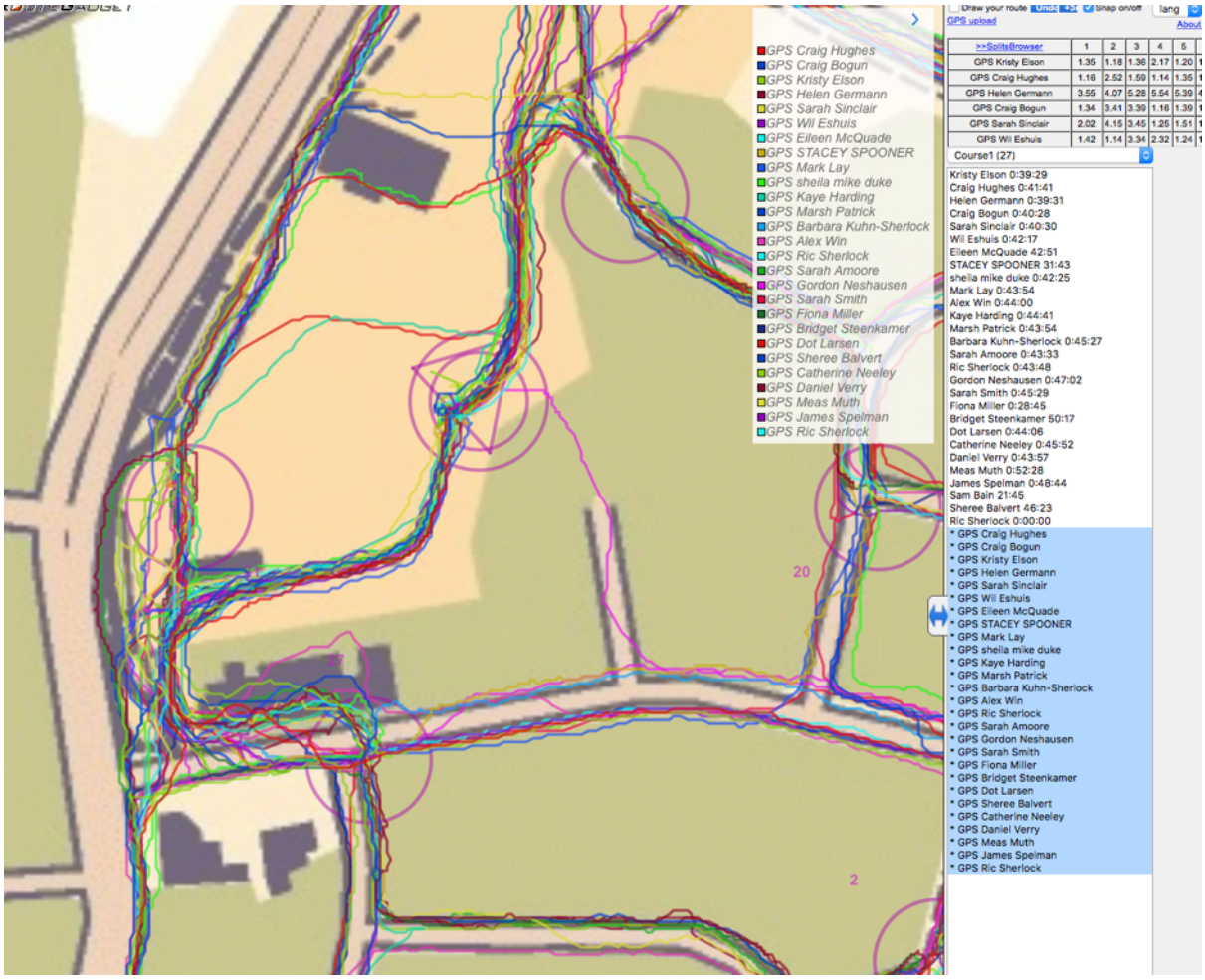
Generally, for Street-O events the feedback has been good. There hasn't been a lot of Campus style events as yet. GPS technology is improving and will continue to, so this matter does need ongoing review.

Experience in Practice:

See below approx 27 tracks from the Waikato Urban Rogaine (using MyOMaps on Android and iOS).

A couple of things to notice:

- There is a walking path leading SSW out of the Start and so the spread of tracks here is some indication of GPS variability.
- You can't see the scale on RouteGadget so see the following Google Earth image.



See roughly the same scene in Google Earth (Unfortunately, all the tracks are the same colour).
The little vertical yellow line relates to the dialog box showing that the line is 14.91m long.
So, the experience is that runners on a running track experience a spread of GPS locations about 15m wide.

You can see a much wider spread near the shops near 36.

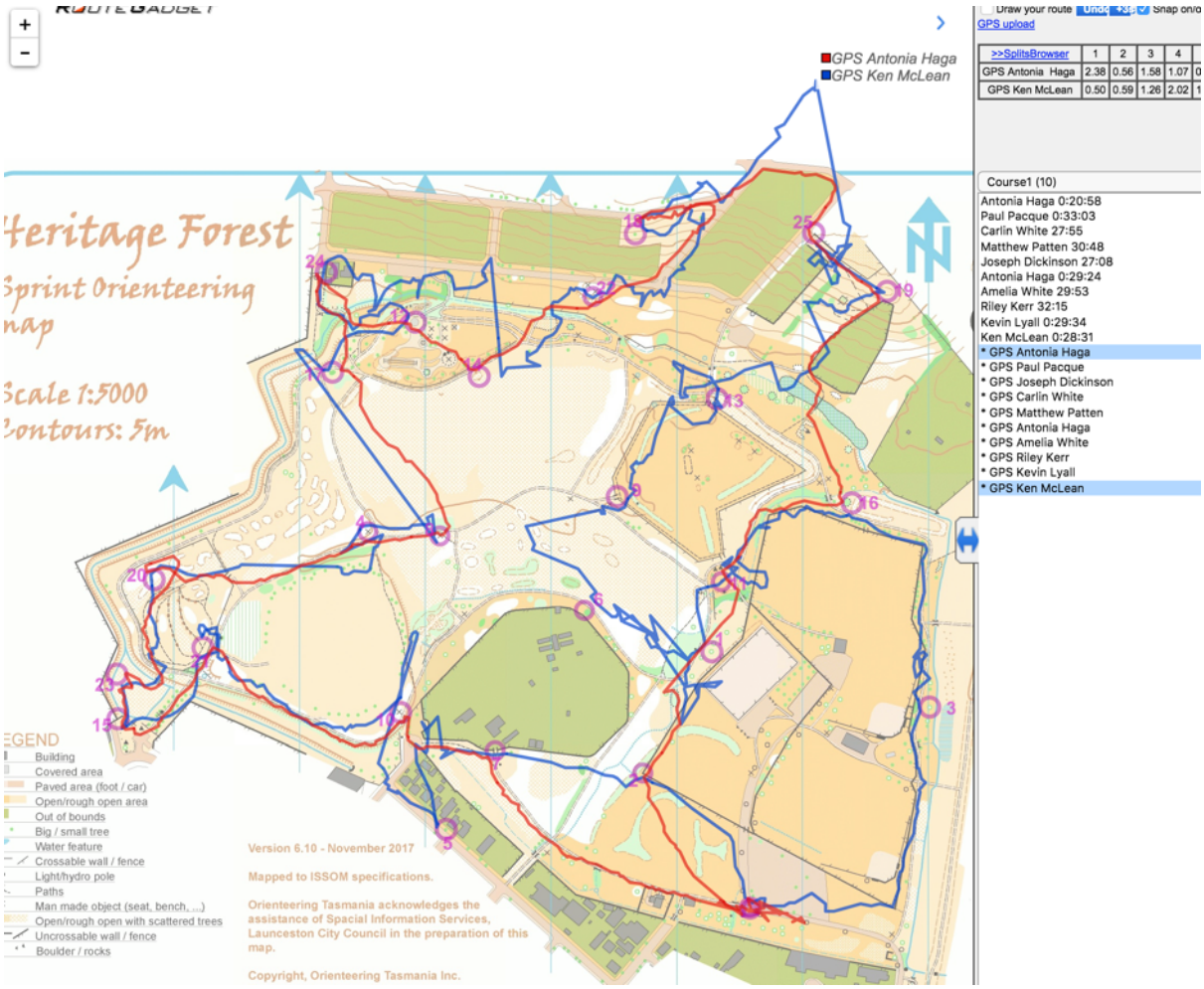
Zoomed in:

So currently, we've gone with a nominal 10m tolerance for detecting a control:

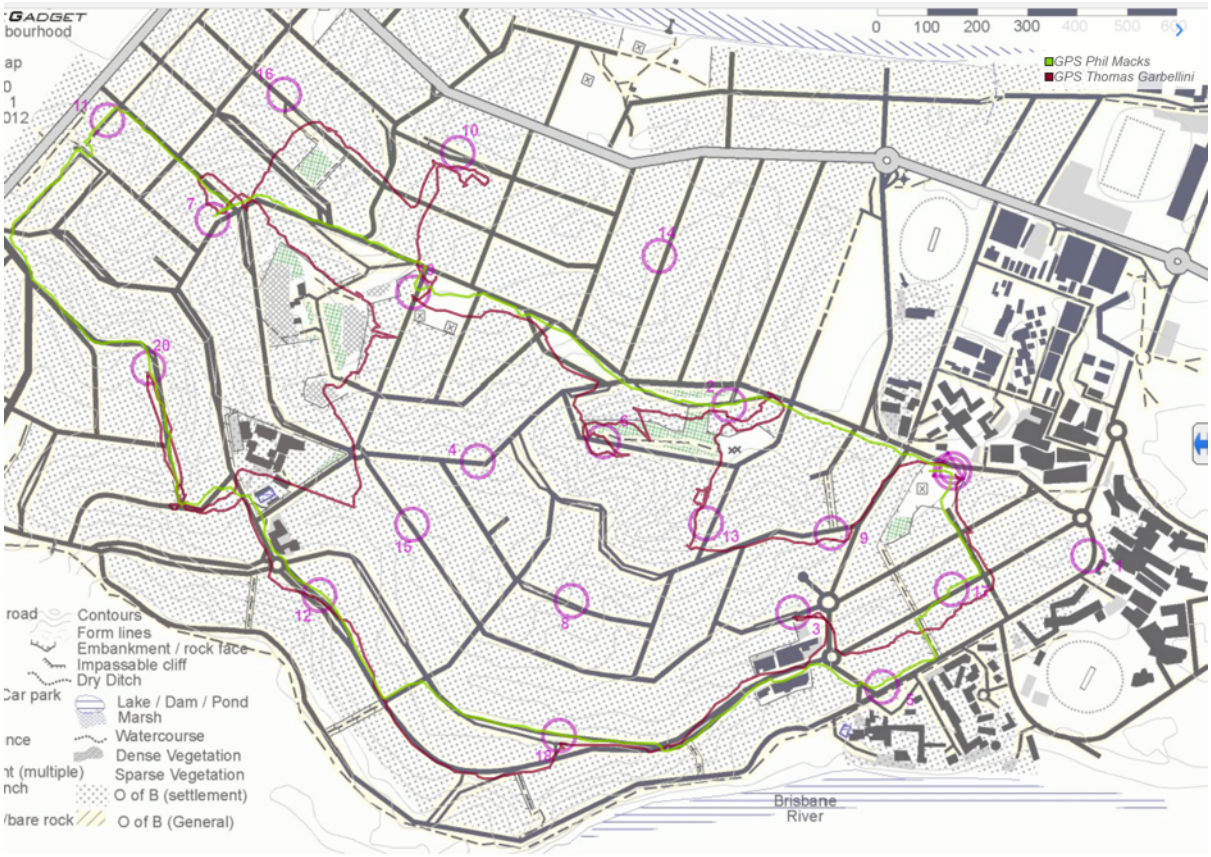
- Which accommodates GPS error, and
- Control location error.

It is expected that with ongoing improvements in GPS technology, it may be possible to reduce the tolerance in the future.

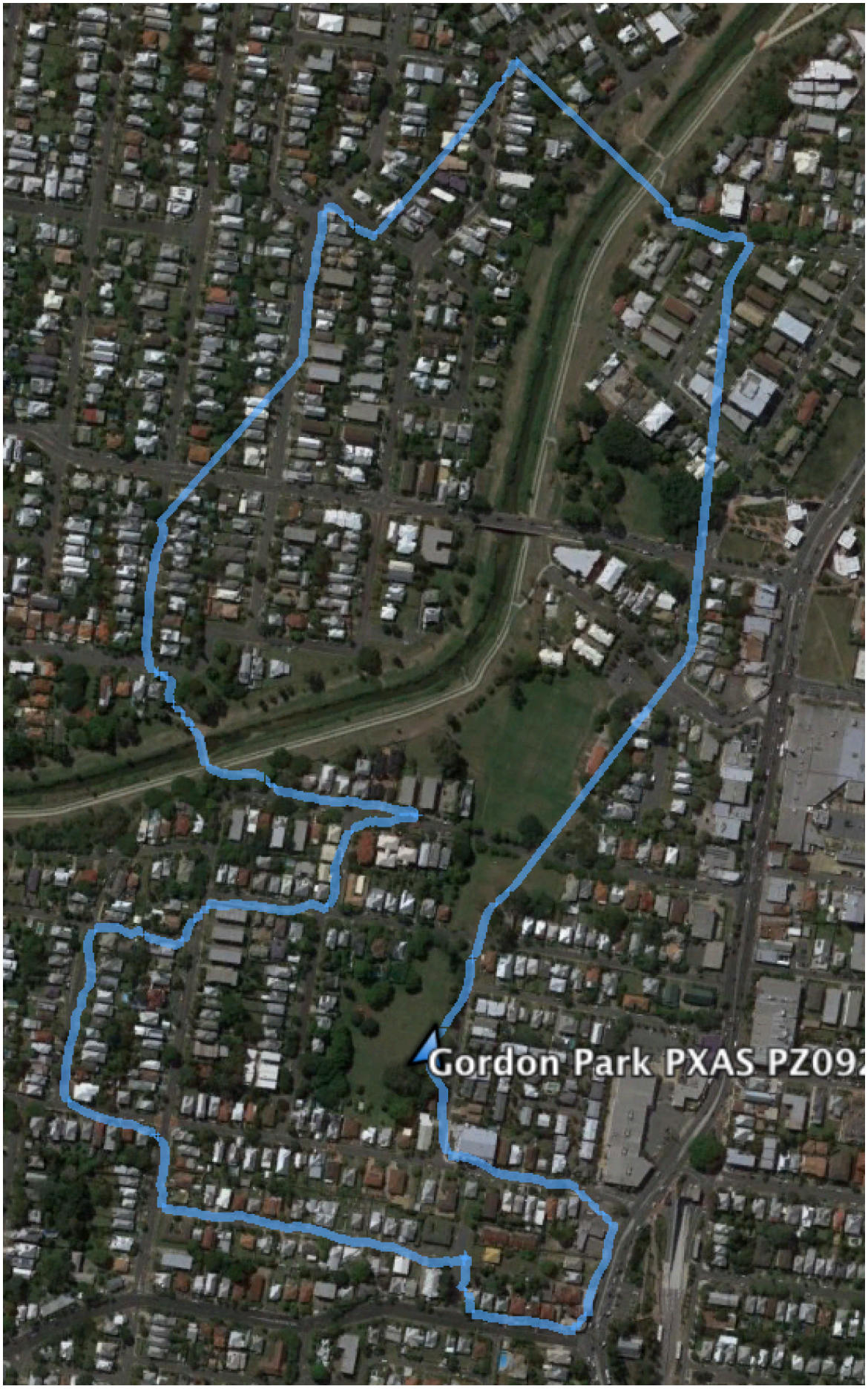
Examples of Various Anomalies with GPS Tracks



Blue Track:
"I was using a new nokia5 using Android Nougart. I did not disable the power saving, which accounts for the big deviations. I was holding the phone low and it did seem erratic."



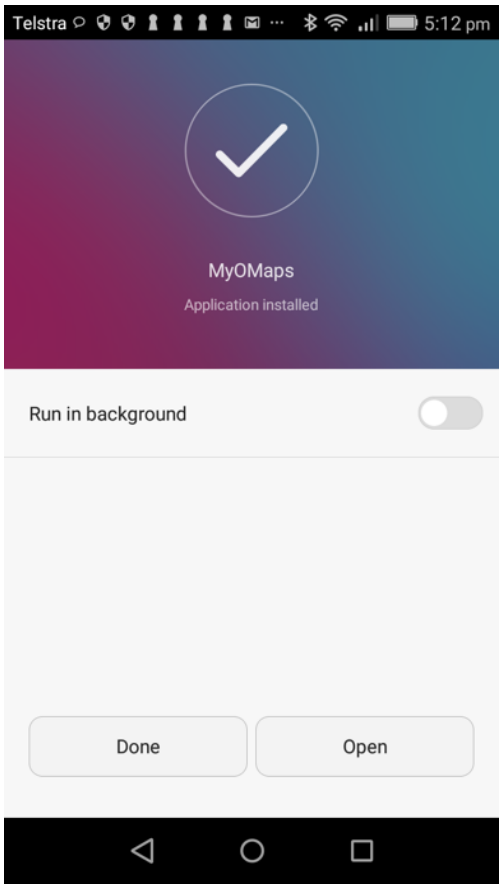
The red track became offset in the NW part of this run (after control 20 on the way to 7, 11 16,10) and then returned to normal accuracy. Potentially due to an A-GPS anomaly(?)


Gordon Park PXAS PZ09

Android 6 – Where the user was blanking the screen between the controls, and the App was not tracking in the background – thus the straight lines between some points (This behaviour was “corrected” in v40.1), however users may still elect not to have the App run in the background, which will cause this effect.

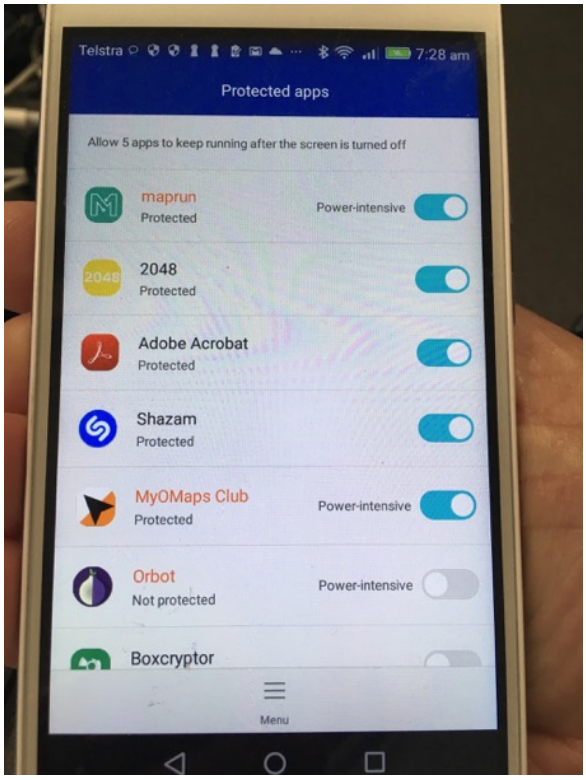
Poor quality track on an old Samsung Android.

General Notes on Android Phone Settings



This is a screen presented on install of the App on a Huawei Android (LYO-L02) running Android 5.1.

If you select NOT to run in the background – the App doesn't run in the background!



Factors to be considered regarding GPS performance:

- Where you carry the phone
- Running in the background
    - If Android allows you to specify – have you allowed it to?
    - Inherent restrictions in later versions of Android – aimed to be overcome with a foreground presence
- Power saving mode
- AGPS settings – sometimes may need to be reset?
- Is the phone used for other GPS-based Apps?
- Quality of the phone? (eg early Samsung's)
- iPhone vs Android