

4.1 Accuracy / Resolution of GPS Devices

Geoscience Australia's advice their GPS antenna is located at:

-12 11' 18.0391" LATITUDE +96 50' 02.2993" LONGITUDE With an accuracy of +/- 1cm

These positions are obviously in Degrees / Minutes / Seconds with seconds down to 4 decimal places.

The distance between lines of latitude & longitude depend on reference latitude, for example the latitude spacing is widest as the equator and 0 degrees at the poles.

At 0 degree latitude (Equator)

A degree of Latitude is 110,574.27 metres

A degree of Longitude is 111,319.46 meters

At 12 degree latitude (Cocos)

A degree of Latitude is 110,622.28 metres

divide Degrees by 60 means 1 Minute = 1,843.7046 M

divide Minute by 60 means 1 Seconds = 30.72841 M

Now as Seconds are defined down to a resolution of 4 decimal places then latitude position can be determined down to 0.003072841 Metres or 0.03 of a millimetre. Plus / Minus the resolution & maybe other variables that I'm not aware of so it seems to me that GA can comfortably claim an accuracy of +/- 1cm or 10mm.

Resolution for Longitude can be determined in a similar manner but for the exercise I'll just use Latitude in my comparison.

4.2 Accuracy / Resolution of HTC Mobile Phone

Accuracy of the GPS device in the phone is unknown & for the exercise I'm only going to consider the displayed resolution which when sitting approx. 100mm from the centre of the GA reference GPS Phone display showed 12° 11.302 Latitude and 96° 50.038 which when converted to D / M / S equates to 12° 11' 18.1200 and 96° 50' 02.2800

4.3 Accuracy / Resolution of Navig8r Model G35 portable GPS

Likewise the accuracy of the GPS device is unknown & for the exercise I'm only going to consider the displayed resolution which when sitting approx. 00mm from the centre of the GA reference GPS Navig8r display showed 12.1883° and 96.8340° which when converted to D / M / S equates to 12° 11' 17.8800 and 96° 50' 02.4000

5.0 Comparison of Results

When all readings were converted to the common Degrees / Minutes / Seconds and then ignoring the Degrees & Minutes which were identical the following readings were noted :

Device	Latitude Sec	Longitude Sec	Lat Diff (error) from Geo Aust	Long Diff (error) from Geo Aust
Geoscience Aust	18.0391"	02.2993"		
Mobile Phone	18.1200"	02.2800"	+ 0.0809	+ 0.0193
Navig8r Portable	17.8800"	02.4000"	- 0.1591	+ 0.1007

As the Navig8r has a much higher error it will be excluded from further consideration. It only cost less than \$100 over 5 years so what do I expect

As previously indicated I don't put too much faith in the accuracy of a GPS in a mobile phone and are going by the displayed resolution.

Previously I estimated that a value of Latitude in seconds and defined down to 4 decimal places would suggest an accuracy of 0.003072841 Metres and that 1 Second = 30.72841 M