# HOW SURVEYING GPS ROVER WORKS

## Trilateration

Your iPhone/Satnav gives you position by measuring the distance from 3 satellites and calculates its position using trilateration.- See Fig. 1

Surveying GPS uses a minimum of 4 satellites to ensure accuracy and for redundancy but essentially works the same way. Usually in Ireland using GPS (USA satellite system) and GLONASS (Russian system) you have 10+ satellites available to enable a position fix.

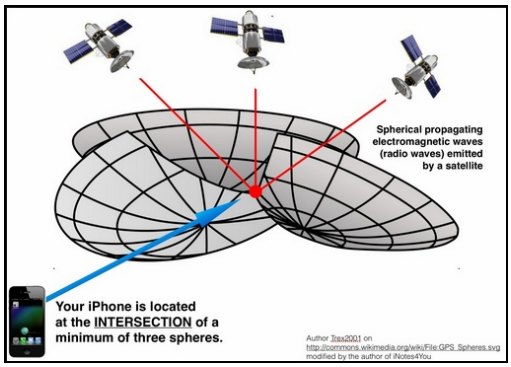


**Figure 1: Trilateration to give your iPhone/Satnav Position**

But using trilateration alone will only give you a position to within about 2m. The surveying GPS accuracy comes from a system of fixed bases around the country which are on known ordnance survey co-ordinates. – See Fig. 2 & Fig. 3


**Figure 2: VRSnow Fixed Bases**

## Bases & the NTRIP Caster

Because these bases are on known positions and because they have a calculated position from the same satellites as the GPS rover (the instrument you survey with) is using they know what the error is in their position. **Position Error = Calculated Position - Known Position**.

These errors are sent at a 1 second interval to a server (the NTRIP caster) where they are distributed as corrections over the internet to all the rovers logged into the server, again at 1 second intervals

So at each surveyed point the rover calculates its position from the satellites, gets a correction from the NTRIP caster, and applies that correction to the calculated position to get a high accuracy position - simple.
**True Position = Calculated Position + Correction**

When you buy a GPS rover to get the required accuracy you pay an annual subscription charge for the corrections (€980+ depending on usage) and an annual SIM card charge (c. €50) for the internet connection.

See the standard Surveying GPS rover, Fig. 4

If you would like to know more about using surveying GPS (co-ordinates systems, geoids, working under trees, feature coding, import/export) join us on one of our training days
or avail of our special offer below.


**Figure 3: Leica Smartnet Fixed Bases**


**Figure 4: Free 1-day hire of GPS rover**

**Training:** http://www.hitechniques.ie/VirtualBrochure.aspx?p=1031

# SPECIAL OFFER - Value €50+VAT

If you are a new user to surveying GPS try it for free - we offer a free days hire (value €50+VAT) to new users wanting to try GPS.
We provide full screenshot step-by-step instructions from power up to .dxf survey output that you can open in Autocad.

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