

GPS FOR EMERGENCIES

A short guide for humanitarian field workers on collecting data using GPS

Introduction

The information you collect during humanitarian assessments will have limited value if others cannot locate it on a map. Just writing down a place name (eg of a village you visited) is dangerously imprecise: what if that village doesn't appear with that name on other people's maps? What if there are two places with the same name (which is amazingly common!)?

If you have a Global Positioning System (GPS) receiver, you can and should use it to record the unique coordinates of the places you are referring to in reports. If you don't have a GPS unit, note that some satellite phones have GPS built in and can give you your position – check in the handbook.

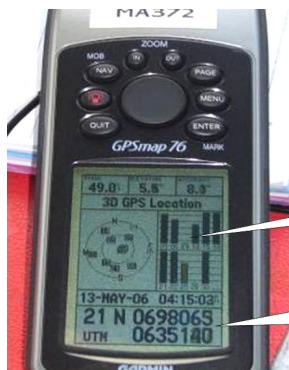
Assuming you have a device equipped with GPS, this short guide is intended to help you to use the basic functions to collect data on the ground in a way that will ensure it is useful back at base, and when shared with other organisations.

Before your field mission

- If you have a GPS receiver, make sure it works! In a new location (even after moving a few hundred kilometres), the GPS needs to be 'warmed up'. Switch it on outdoors and let it search for the satellites. This can take up to half an hour. After that, it will 'remember' where it is in the world and get a satellite 'fix' quickly when you switch it on next time.
- Make sure you have enough spare batteries.
- It's a good idea to clear any points or tracks from previous trips.
- Set the appropriate *coordinate system* and *datum* – see below for an explanation.

Coordinate systems and datums

This sounds confusing, but it does not need to be! The absolute essentials to know are:



A typical GPS display. Note that screens and functions vary between manufacturers and models.

GPS satellites in view with signal strengths

Current position display showing in UTM format:
Zone (21N), X coordinate
Y coordinate

Coordinate systems are ways of describing a point on the earth's surface. The best-known is latitude/longitude. UTM is another, and there are many regional and national systems.

It does not matter which coordinate system your GPS is set to display, provided that you know which one you are using, and note this in your report!

Latitude/longitude can be denoted in several different ways. Here are two ways of reporting the same position. It is not too important which one you use, provided you are consistent.

- **Degrees-minutes-seconds:** eg N(orth) 51° 40' 57" W(est) 0° 39' 25"
- **Decimal degrees:** eg lat 51.682, long -0.627 (note: north and east are positive numbers, west and south are negative)

UTM (Universal Transverse Mercator) is also widely used. It is a global system, based on a scale of metres, and has three components:

- **The UTM zone:** eg 30U
- **The X coordinate:** eg 0661965. This is measured *across* the map.
- **The Y coordinate:** eg 5728316. This is measured *up* the map.

Note that UTM positions are sometimes just as, for example, "0661965, 5728316". The X coordinate comes before the Y. This assumes the UTM zone is already known, but it's not a bad idea to state this also.

Datums are parameters set within the GPS to give precise conformity with certain map projections. We recommend that you always use **WGS84**, unless you are advised otherwise.

Make sure that you know the coordinate system and datum settings of your GPS before you set out.

Types of data you can collect using the GPS

There are two basic types of data that you can collect, and store within the memory of your GPS. They are *waypoints* (or *points*), and *tracklogs* (or *tracks*). Some GPS can also store *paths* or *routes* but these are less useful.



Waypoints (WPs) are a record of a specific point on the ground that you have visited. On most GPS you press a *Mark* or *Enter* button. The GPS then saves the coordinates at that point, and allocates a sequential number (like 001) to that WP. You need to note down separately (see *Recording your data* below) what is of interest at that waypoint.

Most GPS units can record hundreds, or even thousands, of waypoints. They stay in the memory, even when the unit is switched off, until you delete them.



Tracklogs are a record of a series of “mini-points” that are collected automatically by the GPS as you go along. With most GPS this will only happen if tracklogging is switched on, using the setup menu, although on some units, like the *Garmin eTrex*, tracklogging is permanently on.

Tracklogs are a very good way to map the route you have travelled along. You can still add specific waypoints as you go, to note particular features, settlements or landmarks along the way.

Once the tracklog memory is full, some GPS units start to over-write the earlier track. There may be various options for this: check the setup menu or user manual if you are not sure.

How to use GPS to collect data

Here are some suggestions for using the GPS to collect data in various situations you may find on assessment missions.

Assessments along a road. You may be travelling a ‘circular’ route in a vehicle, for example.

- Consider tracklogging the whole route, if you have enough GPS memory.
- Log a WP at the start and end of damaged road sections (for example, a flood washout).
- Log a WP at each village or settlement you pass through.

Remember that unless your GPS is the most up-to-date model with a high-sensitivity antenna, it will need to be placed under the front or back window in the car to get a signal. Also, it won't work well under trees, or amongst tall buildings, or even in steep-sided valleys. You can get external antenna accessories that help with this problem.

Village assessments. Log a WP at the centre of the village you are assessing. It may be useful to WP various other features within the village, if detailed mapping would be helpful. For a big village or town, record tracklogs along the main roads through the settlement, and gather assessment data with reference to these (eg “south of main road, to west of mosque, 150 houses partially damaged”).

Flood and damage surveys. You can use the GPS to capture the extent of various types of damage, eg a flood or area of collapsed buildings. Go to various positions at the boundary of the flood, and take a waypoint at each. If possible, record a tracklog around the perimeter of the damage.

Photographs. Save WPs for locations of photographs taken, for example when recording damage to specific structures or facilities. You can then report the exact place the picture was taken.

Aerial assessments. If you position your GPS unit appropriately (and safely) in a light aircraft or helicopter, it will work well. It is ‘flight safe’ because it does not transmit, it only receives. It is useful to have an assistant to record the assessment information as you go along.

