**Ideas**

**EEPROM**

Byte 16: BOOL Simulation mode

Byte 17: 0-24 Surface time

Byte 18: 0-24 Submerge time

Byte 19: 0-24 Transmission time

Byte 20: int Motor failure compensation

**Motor Driver**

3 Byte communication

Byte 1: Address

1-255;

Byte 2: Direction

1 = +

2 = -

Else = Stop

Byte 3: Speed

0-255

**SMS**

9: lat sign + 3 digits + 5 digits

9: lon sign + 3 digits + 5 digits

121: Hex distance value

GPS coordinate is at the origin

x->y

Axes

Quad 1->2->3->4

11x11

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**GPS**

* The **sign** tells us whether we are north or south, east or west on the globe.
* A nonzero **hundreds digit** tells us we're using longitude, not latitude!
* The **tens digit** gives a position to about 1,000 kilometers. It gives us useful information about what continent or ocean we are on.
* The **units digit** (one decimal degree) gives a position up to 111 kilometers (60 nautical miles, about 69 miles). It can tell us roughly what large state or country we are in.
* The **first decimal place** is worth up to 11.1 km: it can distinguish the position of one large city from a neighboring large city.
* The **second decimal place** is worth up to 1.1 km: it can separate one village from the next.
* The **third decimal place** is worth up to 110 m: it can identify a large agricultural field or institutional campus.
* The **fourth decimal place** is worth up to 11 m: it can identify a parcel of land. It is comparable to the typical accuracy of an uncorrected GPS unit with no interference.
* The **fifth decimal place** is worth up to 1.1 m: it distinguish trees from each other. Accuracy to this level with commercial GPS units can only be achieved with [differential correction](http://en.wikipedia.org/wiki/Differential_GPS).
* The **sixth decimal place** is worth up to 0.11 m: you can use this for laying out structures in detail, for designing landscapes, building roads. It should be more than good enough for tracking movements of glaciers and rivers. This can be achieved by taking painstaking measures with GPS, such as differentially corrected GPS.
* The **seventh decimal place** is worth up to 11 mm: this is good for much surveying and is near the limit of what GPS-based techniques can achieve.
* The **eighth decimal place** is worth up to 1.1 mm: this is good for charting motions of tectonic plates and movements of volcanoes. Permanent, corrected, constantly-running GPS base stations might be able to achieve this level of accuracy.
* The **ninth decimal place** is worth up to 110 microns: we are getting into the range of microscopy. For almost any conceivable application with earth positions, this is overkill and will be more precise than the accuracy of any surveying device.
* **Ten or more decimal places** indicates a computer or calculator was used and that no attention was paid to the fact that the extra decimals are useless. Be careful, because unless you are the one reading these numbers off the device, this can indicate low quality processing!