

GPS Selection & Installation for London to Dakar

These GPS notes concentrate on selecting and installing the correct GPS unit for use on London to Dakar.

A comprehensive version of the GPS instructions will be available to all registered entrants on London to Dakar. In addition to selecting and installing the GPS, the comprehensive version notes contain details of how to configure and use your GPS for the most effective navigation under rally conditions. Examples are given with suggestions for practice routines to ensure you have the necessary skills before reaching the competing on London to Dakar. The emphasis is placed on practice rather than theory.

For those wanting a broader knowledge there are many books and web sites devoted to the theory and practice of GPS navigation. Some recommended sources are listed in the Appendix at the end of these notes.

The Desert is a big place.

For an impression of the scale of the task consider one section of the rally across part of Mauritania.

Between Nouadhibou (Naddy-boo) and Nouakchott (Nak-shot) the rally crosses a desert region of over 20,000 sq kms. This is about the same size as Wales with little in the way of natural features to guide the way. No road signs, no clear tracks, few distinctive natural features and lots of sand.... Your rally task is to follow a route across this desert, locating control points on the way and keeping to a time schedule.

There may be a temptation to say that many overlanders make the journey to Dakar so what's the big deal. There are some crucial differences between an overland adventurer and a rally crew.

- Overlanders usually travel in groups, probably with a local guide.
- Overlanders don't have a rally time schedule.
- Overlanders don't have to visit specific control point locations.

GPS is the tool that makes the London to Dakar possible. It is essential that all crews are equipped with GPS and know how to use it. When you know how to use your GPS it will tell where you are; where you should be – and much more besides.

Your ability with GPS is crucial.

Selecting a GPS

Every crew on the London to Dakar must have one of the following Garmin GPS receivers.

Garmin III+

Garmin V

Garmin GPSmap 176

Some crews may already own a GPS other than those listed and wonder why it is not suitable. There are a few other Garmin units that might be suitable for experienced users but new users must select one of the above units.

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The GPS receiver that you use on London to Dakar must be one of the recommended Garmin models unless you have specific clearance in writing from the Rally Office to use an alternative model.

There are a couple of critical reasons for limiting the choice of GPS.

- A large amount of route data must be loaded in each GPS. Entering the data manually would be a massive task and prone to errors. An error of 1 minute could have you nearly 2kms off course or an error of 1 degree could have you over 100kms off course. To avoid errors the data must be uploaded electronically.
- Our instructions must apply to all the units used.

Garmin make a very large range of receivers. Take care not to be swayed by an eager salesman who might claim that the unit he wants to sell you is 'as good' or even 'better' than the ones we have listed.

Garmin III+ or Garmin III Plus

For some years the Garmin III+ has been one of the most popular units on the market. It contains all the features needed for the London to Dakar and is the unit used for the route surveys. These notes are based on the G-III+. The small screen size is thought by some to be restrictive. Some suppliers suggest that the G-III+ is obsolete but it still seems to be readily available. The older Garmin III can also be used but is only recommended for those who already have this unit and don't wish to buy a newer GPS

Garmin V

The Garmin V is physically the same as the G-III+ but has more features, increased memory and modifications to some of the operating procedures. It has a higher screen resolution – although the screen is the same physical size. The G-V has features such as “road lock” and “auto routing” that enable it to lock-on to the nearest road and display turn-by-turn route instructions. It will also recalculate routes if you miss a turn. This may be clever to get across town back home but will be no use in Mauritania! The G-V operates differently to the G-III+ in some respects. The G-V is fine if you already have one; or if you want the extra features when you return home; or if the G-III+ supply dries up.

Garmin GPSmap 176

This is regarded as nautical unit but is also suitable for land use. The significant difference is the larger screen. It has most of the same operating features as the G-III+ with extra capacity for storage of waypoints, routes and tracklogs. The GPSmap-176 operates differently to the G-III+ in some respects and may require extra learning to adapt methods to our route instructions. The G-176 is somewhat more expensive than the G-III and G-V units and also has no built in memory for extra maps, requiring a data card to store additional map data. (This is not an issue for the desert sections of London to Dakar.)

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Colour – Other versions – Buying notes

Restrict your choice to one of the above listed units. If you already have another Garmin unit it may be suitable but contact me before making any assumptions. There is a colour screen version of the G-176 designated GPSmap 176C. There are suggestions that the colour screen has a tendency to “wash out” in bright sunlight. For this reason we recommend the mono screen version.

Another very popular Garmin GPS is the Streetpilot III range. Although this is a very sophisticated GPS it does not have some track facilities that we will be using and is not regarded as suitable for the London to Dakar.

All the suggested GPS receivers have a built in ‘basemap’ that cannot be changed. The basemap relates to the original intended sales area. American units have an ‘Americas basemap’ – European units have an ‘Atlantic basemap’ – there is also a rarer ‘Pacific basemap’ version for Australia. The preferred choice is the ‘Atlantic basemap’ version that contains local data specific to Europe. The actual basemap in your unit is NOT critical for our purposes but you should be aware that many cheaper units from sources such as Ebay* may have the Americas basemap.

(The average Ebay price for a G-III+, observed from over 30 sales in the period up to July 2004, is £158. This is purely a ball-park guide. The specification and accessories offered varies from sale to sale. Buyers should exercise the usual precautions if buying from sources such as Ebay.)*

Check which basemap comes with any unit you are about to purchase.
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Accessories

You will need the following essential accessories to fit your GPS in your car.

- An external aerial – When a GPS is mounted in a car the roof panel will obstruct the satellite signal and although the GPS will often still work through the windscreen an external roof aerial is essential to get the most accurate fix. Your Garmin dealer will charge approx £70 for the genuine Garmin external aerial although reliable aftermarket aerials are readily available for considerably less.
- A power supply lead. – Garmin GPS units can run off internal batteries but to avoid constant battery renewal you should wire the GPS to your car electrical supply. GPS vendors can supply a suitable power lead.
- A suitable GPS fixing system – Your GPS needs to be securely fitted so as to avoid vibration and to be clear for the navigator to see. It will also need to be quickly removable.

Installing your GPS

I do not intend to give precise details on fitting your GPS but the following suggestions may be useful.

Do consider the position of your GPS in the car to make it most clearly visible and to avoid direct sunlight on the display screen. The screen will be much harder to read if bathed in bright sunlight.

Many of us simply use Velcro to mount a GPS on the dashboard but bear in mind that the road to Dakar is not all smooth tarmac. For something better Garmin offer a range of mounting brackets although some of these are a little flimsy. For a more

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substantial solution you should check out the range of Ram or Touratech specialist mounts. More details on these in the Appendix.

When navigating at speed, especially with the smaller screen units, I found it very useful to be able to hand hold the GPS to enable easier button pressing and a closer view of the screen. With a Velcro mounting, and enough slack in the wiring, I was able to grab the GPS from the dash and replace it very easily.

Velcro is not perfect. The adhesive tends to get soft at higher temperatures and when you use heavy duty Velcro – as you should – it can be the glue that separates rather than the Velcro. The Ram and Touratech mounts are both very well engineered but don't allow for repeated and quick removal and refitting, although I believe Ram can supply a quick release adapter. Garmin do an adjustable Auto Mounting Bracket (part 010-10329-00 – for G-III & G-V GPS) that is quite versatile and allows for fairly quick release although it might seem a little flimsy and possibly prone to vibration.

Power Connection

Most power leads come ready to plug into the car cigarette lighter socket. This is not a good solution as vibration or touching the lead will invariably break the connection. If a Garmin unit loses its external power it will show a message that power is lost and will turn off after 30 seconds. The G-V does have an audible alarm but the chance is that you will miss the warning and your GPS will be off just when you need it.

Connect your GPS with a fused direct connection power lead to avoid unwanted GPS switch off.
Ensure your GPS is quickly removable and has good batteries to make it available for data uploads during the event.
Leave enough slack in the power and aerial leads to enable hand holding for close work.

Fitting an External Aerial

The usual way to fit the external aerial is with Velcro or double sided tape. Position the aerial on the roof avoiding any obstructions – just behind the front screen above the co-drivers seat is usually good. Run the cable across the roof and through the door shut. Protect the cable from being trapped when the door closes and secure with gaffer tape. Those wanting something more sophisticated, and perhaps less prone being tampered with, should check out specialist suppliers. I believe that GPS Warehouse can supply a suitable bolt-through tamper proof aerial.

See the Appendix for GPS suppliers and sources.

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Appendix

Contact

These notes were assembled by Chris Bruce for the Endurance Rally Association. Contact me through the Rally Office or direct by e-mail at FreewayCB@aol.com with any questions or comments that you have regarding these notes.

NOTE: Put some obvious reference to London to Dakar on the subject line as I delete emails where I don't recognise the origin. I don't claim to have all the answers but your contact might raise issues that could benefit us all.

Sources of Information

The internet is a huge source of information about GPS equipment, theory and practice.

Regarded by many as the GPS portal on the net is <http://www.gpsinformation.net/> where you can find information and links to the whole world of GPS.

Trimble is the company that made that £1200 GPS I used back in '91 and although they have largely abandoned the consumer market they have a pretty good tutorial on the theory of GPS at <http://www.trimble.com/gps/>

Of course Garmin themselves have a comprehensive site at <http://www.garmin.com/>

High street stores such as Maplins or good outdoor and camping equipment stores are regular suppliers of Garmin GPS receivers although their prices are not usually as keen as the specialist suppliers. And, it has to be said, their staff are not usually very knowledgeable in this specialist area.

Specialist UK GPS suppliers

Probably most notable among the UK suppliers of GPS kit are:

GPS Warehouse at <http://www.gpsw.co.uk/> or phone 020 8893 9393

and Global Positioning Systems at <http://www.globalpositioningsystems.co.uk/> or phone 08453 45 42 45

GPS Mounting systems

As mentioned in the text Touratech <http://touratech.co.uk/> and Ram mounts <http://www.ram-mount.com> both make specialist mounts suitable for fixing a GPS.

Touratech is a German company that make special and sophisticated mounts developed primarily for motorcycle use. The web link above is to the UK division where you will find an on-line shop for their products.

Ram mounts are American. The link above is to their US site where you will find a baffling array of different models. Both GPS Warehouse and Global Positioning Systems sell Ram products in the UK.

GPS Warehouse have a special Ram mount site at <http://www.ram-mount-uk.com/>.

The following may be useful to help you sort out the huge variety of Ram Mounts. On the web site you'll see that these mounts comprise a universal clamp that tightens on a hard rubber ball at each end. One ball end is fixed to the car and the other fixed to the GPS. I have not used the system under rally conditions in the

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desert but the brackets are well made. The metal bits are good and strong and the rubber ball parts are properly engineered to do the job.

There is a suction Ram mount for fitting to glass. This does hold on well but would probably vibrate too much for rally use and might come off at high temperatures.

To make up a suitable Ram mount to fit your GPS you need the basic clamp and ball assembly plus a holding bracket for your particular GPS.

A clamp assembly with a flat base for bolting through a dash or instrument panel is RAM-B-138. A similar clamp assembly but with a base suitable for clamping to a tube such as a front roll cage pillar is RAM-B-108U-GP1

To hold your GPS you'll need RAM-HOL-GA2 for Garmin III+ or G-V.

See holder and clamps for G-III & G-V at

<http://www.ram-mount-uk.com/ram-hol-ga2.htm>

or

RAM-HOL-GA7 is the holder for a Garmin-176 .

See holder and clamps for G-176 at

<http://www.ram-mount-uk.com/ram-hol-ga7.htm>

If the flat plate or tube clamp base is not suitable for your needs you may find a ball with a single stud fixing more suitable.

A couple of single-bolt fixing ball ends are RAM-B-237 or RAM-B-273

See alternative ball mounts at <http://www.ram-mount-uk.com/handlebar-mounts.htm>

Ram also do a quick release fitting that I suspect would need two parts RAP-271ST and RAP-272 fitted between the universal clamp and the GPS holding bracket.

IMPORTANT – I have not used all these bits so please satisfy yourself that any chosen solution is what you need before spending your money.