

Outdoor Navigators and Leaders GPS Buying Guide

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How do you select a GPS device: handheld, wearable or smart-device?

There is no perfect or ideal GPS device suitable for all outdoor navigators and leaders in every circumstance. Most outdoor navigators and leaders will wish to invest in just one device, and that will be a compromise. So how do you choose? Key factors are: (1) **location** performance – that’s the core *raison d’être* of GPS; (2) **navigation** performance – we need a compass, good mapping and usually an altimeter to help us navigate; devices that can also autonomously route along paths and tracks (active routing) are ideal (3) device **durability** – we’re outdoor navigators and the environment we’re in is not benign; (4) **usability** – we need controls, buttons, a screen and an intelligible user-interface to operate it effectively. In particular, touch-screens (new technology) can be problematic outdoors whereas tap-screens (old technology) work well, as do well-sized buttons. If you cannot use a GPS device effectively, it’s a waste of time carrying it; (5) **endurance** – can the batteries that power the device last a full-on day or even longer? and (6) **cost** – unaffordable technology is a pipe-dream. **Select a device that ticks the six boxes for you!**



Smart-devices (except for purpose-designed outdoor smart-devices) have issues with *location* performance, *durability*, *usability* (especially with their touch-screens – see below) and *endurance* and, except for recreational users in benign conditions are not suitable for outdoor navigators. Wearables have *usability* issues with their tiny screens and often lack the mapping needed to *navigate* but are becoming increasingly capable for all outdoor navigation – for those that can afford the top-end devices. Modern GPS handhelds usually meet all the key criteria and, *except for those with touch-screens*, tend to be close to the ideal and should be the first-choice for all outdoor navigators and essential for responsible leaders.

Do you already own a GPS handheld unit?

If the answer is “**YES**” and it was *first sold* in 2006 or earlier, it’s probably a **first-generation** unit with low-sensitivity receiver. They don’t locate well and have poor navigation performance. Such units include the “original” Garmin eTrex, the Geko, early Magellan units and the Memory Map Adventurer (together with all wearables prior to 2013); these units should be “retired”; try selling the device on eBay: someone might buy it!



If the answer is “**YES**”, and the unit is **second-generation** with a high-sensitivity GPS that locates well, together with an altimeter, electronic compass and mapping for navigation, then it might not be worth upgrading. Early second-generation units (first sold 2006-2009) like the Garmin eTrex H series, GPSmap 60CSx, Oregon 200 / 300 / 400 and Garmin Colorado 300 are best retired, as are all Magellan eXplorist and Lowrance units – manufacturers no longer in the market. Later devices without navigation sensors, such as the Garmin Dakota 10 or GPSmap 62, are also not recommended. However, later devices with navigation sensors (first sold 2009-2012), such as the Dakota 20, Oregon 450 / 550, GPSmap 62s (and 62st), and Montana 600 / 650



are all still fit-for-purpose and recommended, the GPSmap 62s and Montana 600 / 650 particularly so. All have self-calibrating altimeters, adequate compasses and extensive mapping with active routing technology; they tick all the boxes! None of these Garmin units are now available to buy new. The second-generation SatMap Active 10 and Active 12 GPS units are not recommended (see below).

If the answer is “**YES**”, and the unit is **third-generation** (has dual GPS and GLONASS receivers), with sensors (first sold 2013-2017), then you probably need not upgrade. They are top location and navigation performers.

However, the Garmin eTrex 20 / 20x is not recommended (no sensors) and the budget Garmin eTrex 10 (which lacks both mapping and sensors) is only recommended if, and only if, the device is to be used for emergency relocation. The Garmin eTrex 30 / 30x is fully fit-for-purpose (but lacks active routing technology found in later second-generation handhelds). These eTrex models are no longer available to buy new (they have been superseded by the eTrex Touch 25 and 35 models). The third-generation **Oregon 600 / 650** series are also no longer available to buy new (they have been superseded by the Oregon 700 / 750 series) but are fully fit-for-purpose (although they are limited by their touch-screen— see below).

If you are going to buy a new GPS handheld now, it is best to buy either a mature third-generation unit or a stable fourth-generation device

The location performance of the best second-generation GPS devices is entirely adequate, but outdoor navigators and leaders looking to buy a new device would benefit from the significantly superior performance of **third-generation** (or better) GPS devices; this is particularly noticeable in mountainous terrain. Most **Garmin** third-generation GPS handhelds tick all the boxes (with the exception, potentially, for touch-screen devices). The location performance of any dedicated third-generation GPS device will meet the requirements of all outdoor navigators, but third-generation Garmin handhelds also have self-calibrating ABC sensors and both proprietary and third-party routable mapping with worldwide coverage (both raster and vector, much of the latter being cost-free). Dedicated Garmin devices are all durable, waterproof and, with their built-in or third-party batteries, have adequate to outstanding endurance. Garmin offer handhelds that are button-driven or have either tap-screens or touch-screens; their user-interface is consistent, flexible and configurable and, although some are more intuitive than others, most users appreciate their outdoor-focused feature richness. It's not surprising that they dominate the market; there are good underlying reasons.

There are three third-generation Garmin GPS devices that are recommended as first choice: the button-driven **GPSmap 64s**, the tap-screen **Montana 610 / 680**, and the **Oregon 700 / 750**. The “t” variants of these devices include a topographic map of Europe (routable for the 750t, and recreational for the 64st and 680t) but are not recommended because the routable map has no contours, and although the recreational map has contours, it is not routable! The cheapest, and best location performer is the GPSmap with its well-known button-driven interface, and the most usable, but largest, is the Montana with its huge tap-screen and it also has a superb battery pack with the best endurance – but it is the most expensive. The connectivity and functionality of the mid-price Oregon has the edge over the others, but it's a touch-screen, and although being “glove-friendly”, it isn't quite there. All have the same outstanding mapping and navigation capability and are exceptionally durable. The Montana 680 and Oregon 750 have cameras that their lower-numbered siblings lack. The GPSmap 64 (no sensors) and the eTrex Touch 25 (no altimeter) are not recommended, and the budget touch-screen **eTrex Touch 35** (with built-in routable topographic mapping without contours) is a second-choice recommendation (because it's low-cost, but less durable and has a weaker touch-screen).



Think carefully about buying a Garmin GPS device with a bundled mapping card. Most devices can be bought with a 1:50K OS map of Great Britain for an extra £100 (usually £150). This map is actively routable (on paths etc) only in National Parks (and road-routable throughout). The resolution of the map is adequate but not the quality of those on smart devices. Many outdoor navigators like the familiar OS mapping so this might be a worth-while add-on, but it is recommended to use a cost-free or low-cost vector mapping alternative that has the same level of detail as a 1:25K map and is actively routable throughout (see below). Beware members of the MTA or BAIML who receive a 25% discount on basic Garmin GPS units, you will not receive this discount when buying a bundled package so may end up paying considerably more.

The tap-screen, touch-screen dilemma!

The “original” touchscreens responded to a tap – from a finger, a glove or any solid object. Tap-screens work well for outdoor navigators because they can be used in a wide variety of more adverse situations without hindrance. However, tap-screens can only be used to select, drag and scroll but not much else. The newer touch-screens respond to all sorts of gestures so are more dynamic. But they work only with the “fleshy” part of the finger – they don’t respond to tap. Many touch-screens claim to be “glove-friendly” but, in practice, few work-well except with a warm, fleshy finger or a special “stylus”. When it’s cold, or raining hard, they can be difficult to use. Fair-weather navigators may be happy with a touch-screen, and some will prefer the flexibility they offer, but most outdoor navigators would prefer a tap-screen (or button-driven) device. My advice for outdoor navigators and leaders is to stick to tap-screen and button-driven devices.

On a tight budget?

For a location-only device, usable only in an emergency, go for the Garmin eTrex 10 (around £65). By all means look for a second-hand Garmin GPSmap 62s or Montana 600 / 650 at a good price, but you’re not likely to be successful. The Garmin Oregon 600 and GPSmap 64s are going out-of-production and buying one of these new may well be cheaper than buying a pre-used device. Spending wisely on a new device that’s not the absolute latest without buying unnecessary mapping may be a wiser investment that will satisfy all your needs and last at least 5 years. Relying on a smart-device is unwise however wonderful you perceive it to be.

SatMap products are not recommended – why?

When SatMap introduced its Active 10 GPS unit in 2008, it was revolutionary. For the first time, a GPS unit could display its location on an electronic version of a “real” map on a big screen. Unfortunately, the unit was not durable, it was not waterproof, its user-interface was not outdoor-navigation friendly, its sensors were poor – and its mapping was extraordinarily expensive. SatMap updated its offering with the Active 12 in 2014 adding a hi-res screen and an altimeter. All the flaws of the Active 10 remained, the new altimeter wasn’t really integrated into the device and the hi-res screen simply used more battery power and didn’t render maps much better than its predecessor in the eyes of most outdoor navigators. The technology underpinning the Active 12 (Windows CE, originally released in 1996) was, by this time, obsolescent. Unfortunately, many users were already trapped in the eco-system (having spent, for example, as much as £2000 for full UK mapping at 1:25K when it was first marketed). In 2017, SatMap launched their Active 20 product. To give the company credit, this has a superb button-driven or touch-screen combi-interface not found in any other GPS unit to date, and its location performance is outstanding. It is also (supposedly) waterproof, but the flimsiness of some of its build (such as the USB port seal and battery-pack) makes this very questionable. Unfortunately, though, the design remains fundamentally flawed with essentially the same underlying technology as the Active 10, that can only be judged by now as obsolete. The firmware is very buggy and cannot cope with the power drain demanded by a transmissive hi-res display – stunning but inappropriate technology in such a GPS device. In the 18-months that I have owned the product, despite extensive testing, and countless software updates these bugs and power issues remain. I conclude that the Active 20 is simply is not fit-for-purpose and I don’t think these issues can ever be adequately addressed because of its fundamentally defective technological design.



GPS wearables have come-of-age

Many outdoor navigators sport a chunky “watch” that is also an altimeter: many will be the Suunto brand. This Finnish firm dominated the “wearables” market when GPS was first bundled into a watch but, although still a strong market contender, has now been eclipsed by Garmin. Many GPS wearables are smaller than the early altimeter watches – but have full ABC sensors, smart-watch functionality and a battery life that lasts a full-on outdoor day. Unlike the early GPS watches, their location performance is excellent. Don’t confuse GPS wearables with fashionable Apple and Android smart-watches: these are toys compared to the outdoor navigation capabilities of GPS wearables. The best GPS wearable devices are third (or even fourth) generation location aids, with full navigation capability (combining ABC sensors and routable mapping), as durable as the most rugged GPS handheld, surprisingly usable – even in gloves and mitts, and with an endurance that eclipses some of the best GPS handhelds. Unfortunately, the associated cost is as eye-watering as their capability. Nearly all wearables work hand-in-hand with a smart-device with similar push- and pull-

functionality found in smart watches. Most have a dedicated phone app to facilitate this. Unlike Suunto devices, the latest Garmin wearables have built-in routable mapping – and space for the full range of Garmin-compatible raster, vector and custom maps. Garmin is now also developing their **Explore** app (and website) so that waypoints, routes and tracks can be exchanged between wearable, smart-device and “cloud”. So, tap a waypoint or plan a route on a smart-device, send it to the wearable, and navigate – or use the wearable as a conventional handheld device. The future is probably the wearable plus smart-device combination, and at present, that is only the Garmin Fenix 5 plus series with routable European mapping (or the far cheaper Instinct wearable without mapping).

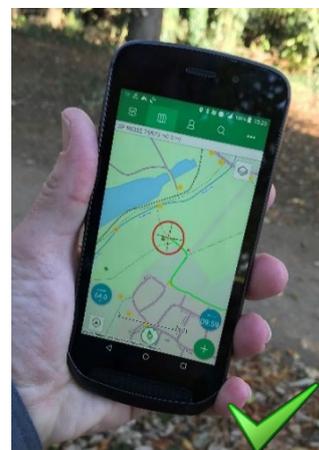


4G GPS devices are the future



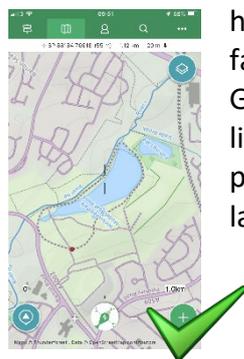
The SatMap Active 20 was one of the first **fourth generation** (4G) GPS devices to market; its location performance is outstanding but, as explained above, it is a flawed product. Garmin entered the 4G market somewhat later and adopted a slightly different approach. With Garmin it's either GPS + GLONASS or GPS + Galileo rather than GPS + GLONASS + Galileo which, in my opinion, is the optimal for 4G devices. But with Garmin 4G devices come a host of other capabilities: most notably, embryonic internet-of-things – a much more connected way of working with smart-devices and the “cloud” more directly. Two Garmin 4G products are now my top, first-choice GPS products: the Fenix 5x plus described above (for wealthy outdoor navigators) or the GPSmap 66s – a 4G makeover of the enduring GPSmap 60 – 62 – 64 series of devices. It is (at the higher end of) affordable, stable because it's based on a heritage of proven functionality, and everything a GPS handheld device needs to be now – and for the next 5-years or more. I've only been using it for a month or so, but it has surpassed my high expectations already. I doubt if many outdoor navigators or leaders would regret buying one.

For the first time ever, however, I would also recommend a **dedicated outdoor GPS smart-device**. Over the years there have been a succession of “tough phones” that have the necessary durability to be used outdoors but have had disappointing performance and endurance. Recently, the Land Rover brand introduced a purpose designed outdoor smartphone with superb 4G GPS location performance together with a good suite of bundled apps. Based on the Android platform, the Land Rover Explore has a field-replaceable battery-pack with a high sensitivity GPS aerial. It uses GPS, GLONASS and BeiDou (the Chinese equivalent of the European Galileo) and has a location performance as good as, or better than many GPS units. Its transfective screen (as used on virtually all GPS devices except the SatMap Active series) is hi-res and displays maps with great clarity without the excessive power demands of virtually all other smart-devices. Bundled with the first-rate ViewRanger app (see below) and priced competitively against top-end GPS devices and other premium smartphones, it offers a great deal. Several months of field testing has revealed little to criticise it except that it does have a touch-screen, albeit a good one (see above).



Some smart-device apps are far better than others ...

Apps seem to suffer more from over-hyped marketing than dedicated GPS devices. The idea that you can have something as capable as a GPS unit without having to buy one is appealing but fallacious. Most apps fall far short of the feature-rich navigation capability of a dedicated GPS device with just one or 2 coming close. Some apps are free and lack utility, many are little more than moving map displays and some are serious and capable navigation aids. The popular MemoryMap, OS Maps and Anquet OMN apps fall in to the second category; they lack serious navigation capability and often require a relatively costly subscription for their limited mapping availability. These map-focused apps are worth avoiding. Apple iOS users will be disappointed to discover that Android tends to have the edge on app capability and performance. My first-choice app, ViewRanger, is different between the two operating





systems and Android is best. It is a low-cost, fully-functional navigation app with really-good world-wide, cheap, subscribed mapping and a huge variety of paid-for mapping that you can use to plan routes on a web-browser. Alongside ViewRanger is Locus Map Pro which has much in common, excellent world-wide, low cost mapping in a variety of formats together with (free) third-party mapping and more functionality than ViewRanger. Neither are as capable as good dedicated GPS devices and limited by the smart-devices they are used with; many have serious issues with location performance, battery life and their touch-screens. To use a navigation app effectively on a smart-device, even in benign conditions, requires a high-level of in-use management to avoid excessive battery drain. Most

importantly, when using a smart-device it's important to have a suitable app to verify location performance. Android has an excellent app, GPS Status (which is integrated with Locus Map Pro), but the iOS version doesn't appear to work; the iOS GPSdiagnostic app is the closest that I have discovered which is acceptable. There are several other country-specific or generic apps with merit but, as a rule, except when used with a dedicated outdoor smart-device, apps are best avoided.



Do you need global area network connectivity?

Garmin GPS devices that pair with smartphones generally allow the user to be tracked by authorised third-parties over the internet (wide area network (WAN) connectivity which relies on Wi-Fi or a mobile telephone network); messages can obviously be sent using the smartphone if it is connected to a network. The Garmin inReach range of GPS devices provides global area network (GAN) connectivity using the Iridium satellite network that allows tracking and messaging literally anywhere. The GPS element of the inReach range does not match the feature-richness of standard Garmin outdoor GPS units (at present) but the relatively low-cost inReach mini pairs with Garmin Fēnix wearables and the GPSmap 66s and the combination therefore realizes the best of both devices.



In an ideal world ...

Most outdoor navigators need to decide to buy **either** a handheld device **or** a wearable. In my opinion, the best button-driven device currently available is the **Garmin GPSmap 66s**; the best tap-screen device is the **Garmin Montana 610 / 680** and the best touch-screen device is the **Garmin Oregon 700 / 750**. None of these devices is ideal or perfect for everyone – but close! Runner-up to the GPSmap 66s is the **GPSmap 64s** which is cheaper and almost as capable. Buy a Garmin device without built-in or bundled mapping and get low-cost or cost-free third-party actively routable vector mapping. I recommend the website <http://www.freizeitkarte-osm.de/garmin/en/index.html> as the first port-of-call for better-than-OS-quality mapping at no cost, for life. For reliable but emergency location **only**, the low-cost Garmin eTrex 10 could be considered. The best wearables are **the Garmin Fēnix 5 plus** series with the **5x plus** being the top model – it's a near-ideal device. Although I've not used the map-less Garmin Instinct, it appears to be a fine budget contender. The Fēnix 5, Instinct and GPSmap 66s all work with the new Garmin Explore app and website (although at the time of writing this website does not function with these devices). Outdoor leaders and professionals should adopt the best-practice of carrying a dedicated GPS device **in addition to** a mobile communication device (mobile telephone – WAN, inReach – GAN messaging, or a sat-phone – GAN telephony). For those that only want to carry a single device the **Land Rover Explore** smartphone with the ViewRanger **or** Locus Map Pro **and** GPS Status apps is a very strong contender particularly at the "Christmas 2018" promotion price.

Do think carefully about spending a lot of money on such an important navigation asset and, once acquired, ensure that you are entirely capable of carrying out the core GPS skills: (1) setup and operation; (2) location; (3) marking waypoints; (4) navigating to waypoints, coordinates or a point on the map and (5) track-back. I provide training courses tailored specifically for outdoor leaders – including how to get that all-important free vector mapping; "open" courses are promoted through professional associations such as the MTA and BAIML. It is possible to arrange private courses; contact me at rick.shearer@outlook.com for further details.

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