Global Positioning System

- 24 GPS satellites in “medium earth orbit”, about 12,000 miles.
- At least 3 satellites can be seen from any point on earth 24/7.
- Trees, canyons, buildings and other obstructions can sometimes block signals.

GPS Basics

- Most handheld GPS computers cycle through Satellite Page, Map Page, Pointer Page, and Menu Page where data is stored and preferences are set
- Satellite page shows number of satellites, and strength of signal, and accuracy
- Map page shows a north pointer, your location, the electronic breadcrumb, and scale
- Pointer page shows a compass ring, direction arrow, several data fields that provide info about time and distance, and various trip information such as altitude, coordinates, speed, odometer, etc.
- Menu page shows waypoint marker, routes, tracks, setup, battery strength, time/date

Setting up your GPS (your terminology may be be different)

- Go to Setup, Settings, or Preferences
- Time: Format (12 hr), Time Zone (U.S. Mountain), Daylight Savings (no)
- Display: Light timeout (1 min), contrast (as preferred), other stuff
- Units: Coordinate System, Map Datum, Distance Units (statute), North Reference (true)
- Interface: I/O format (Garmin)
- System: Mode for battery save, language

Position Format (meaning preferred coordinate system)

- Hddd*ddddd – degrees. fractions of degrees
- Hddd*mm.mm – degrees.minutes.fractions of minutes
- Hddd.mm.ss.s – degrees*minutes*seconds. fractions of seconds
- British grid
- India IA
- Maidenhead
- MGRS – Military Grid Reference System (derived from UTM/UPS)
- UTM/UPS – universal transverse mercator/universal polar stereographic
- Finnish KKJ2

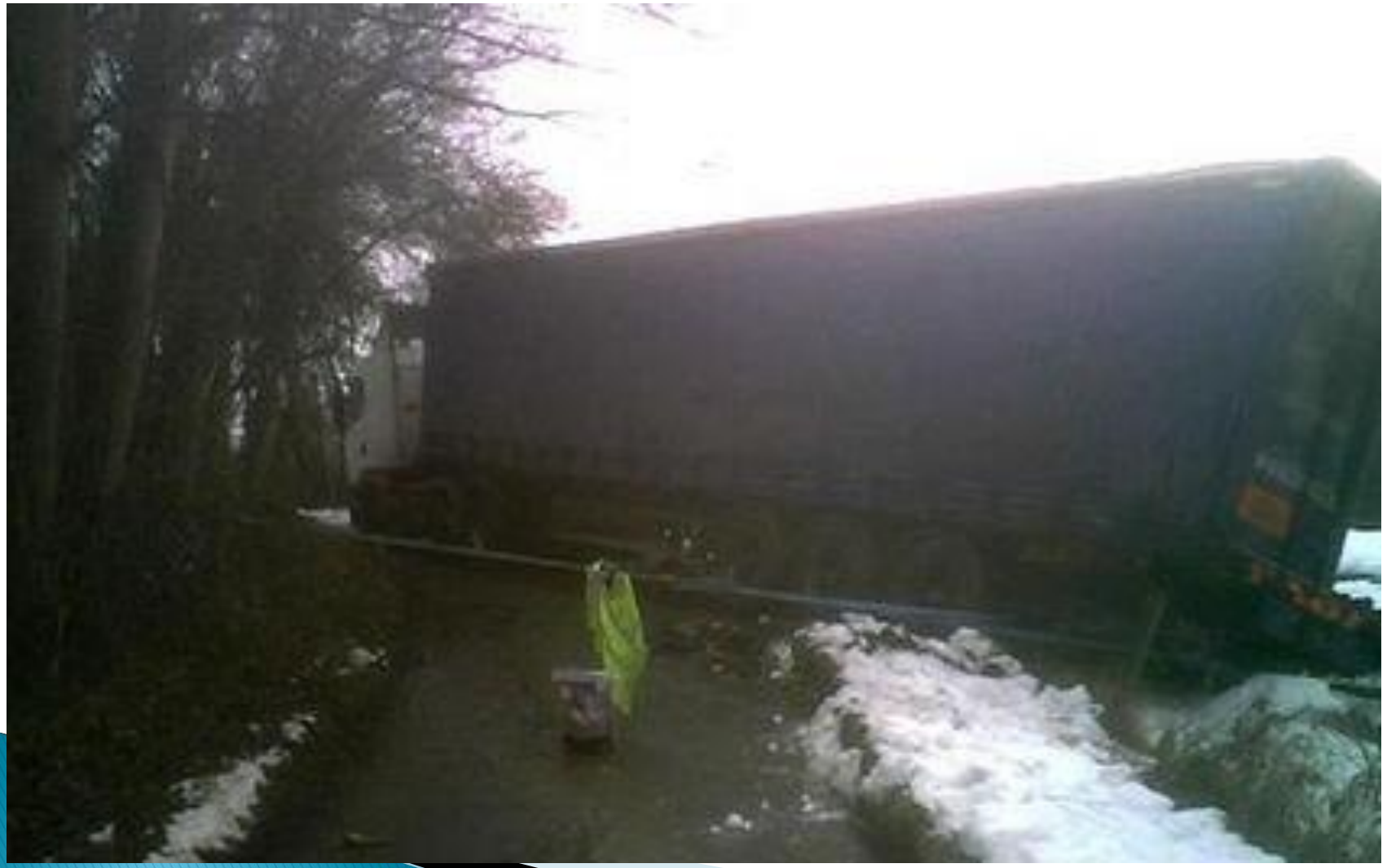
Map Datums

- The Datum is the survey grid used to match the coordinates and features on the ground.
- Most USGS topos are in World Geodetic System (WGS) 83 and/or North American Datum (NAD) 27.
- Most GPS Receivers can be set to numerous datums
- National Geographic TOPO! can be set on WGS84 or NAD27
- Make sure your map and/or computer mapping program is set on the same Datum as your GPS!
- Results between Datums can vary several hundred feet.
- Set your GPS on WGS 84 (default for Garmin eTrex)

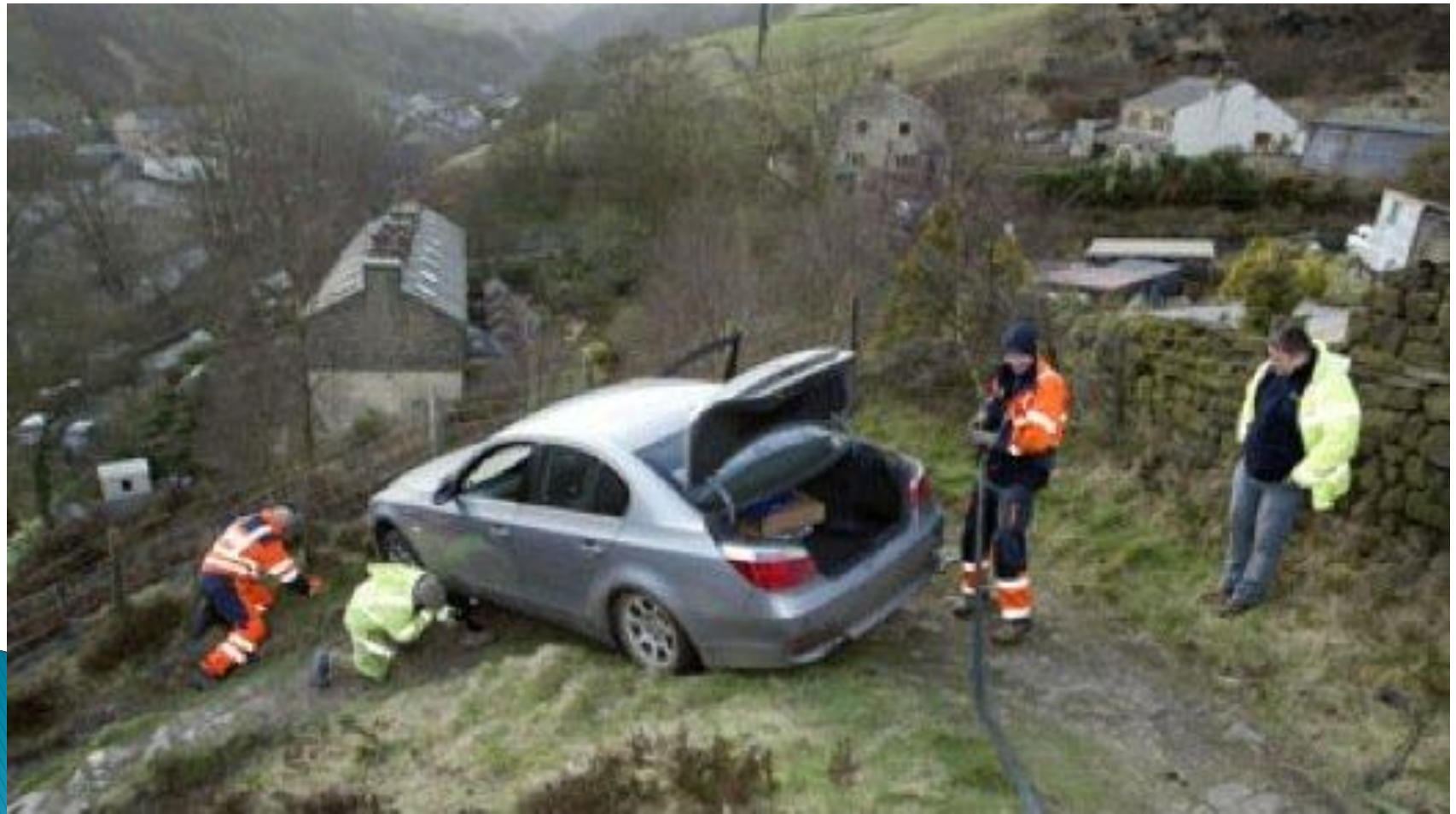
Precautions

- GPS is not a substitute for common sense
- Like any device, a GPS can fail when you need it most.
- As a backup, should also carry:
  - Maps
  - Topo map you printed out or bought
  - Other trail maps
  - Compass
  - Cell phone for emergencies

An unfortunate truck driver in Cotswold, England faithfully followed his GPS down a tiny road that was too small for his big rig. When he tried to back out, he got stuck and blocked the road for five days until construction crews could dig it out.



In March of 2009, a determined driver in West Yorkshire, England followed his BMW's GPS down a footpath to the edge of a cliff -- only stopping when he hit the fence guarding the edge. Not surprising, he was charged with "driving without due care and attention." You think?



GPS Precautions

- From *Q&A About GPS (USGS)*

  "Be aware that the vertical heights displayed by your recreational GPS receiver will not agree well with USGS map elevations.

  "Do not use GPS elevations for critical navigation decisions."

  "It is not uncommon for satellite heights to off from map elevations by +/- 400 feet."

GPS Precautions

- From *Using GPS (Backpacker Mag.)*

  "If you are using a NAD 27 map and a WGS 84 on your GPS unit, you could be off by as much as ¼ mile."

  "What GPS can't do…. is replace basic navigation skills."

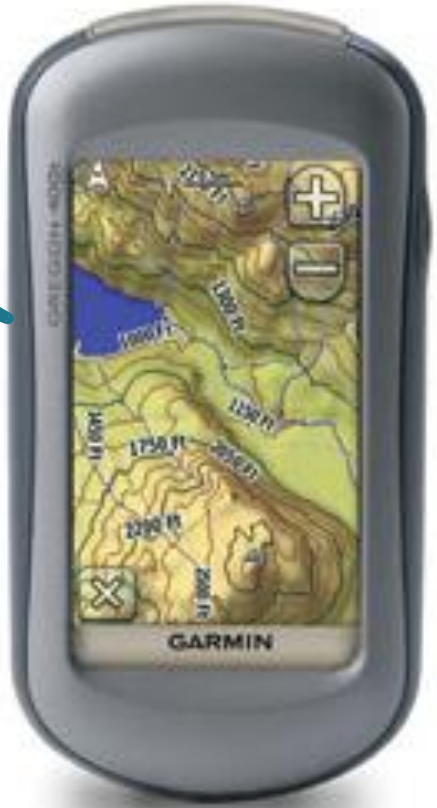
Selecting a handheld GPS

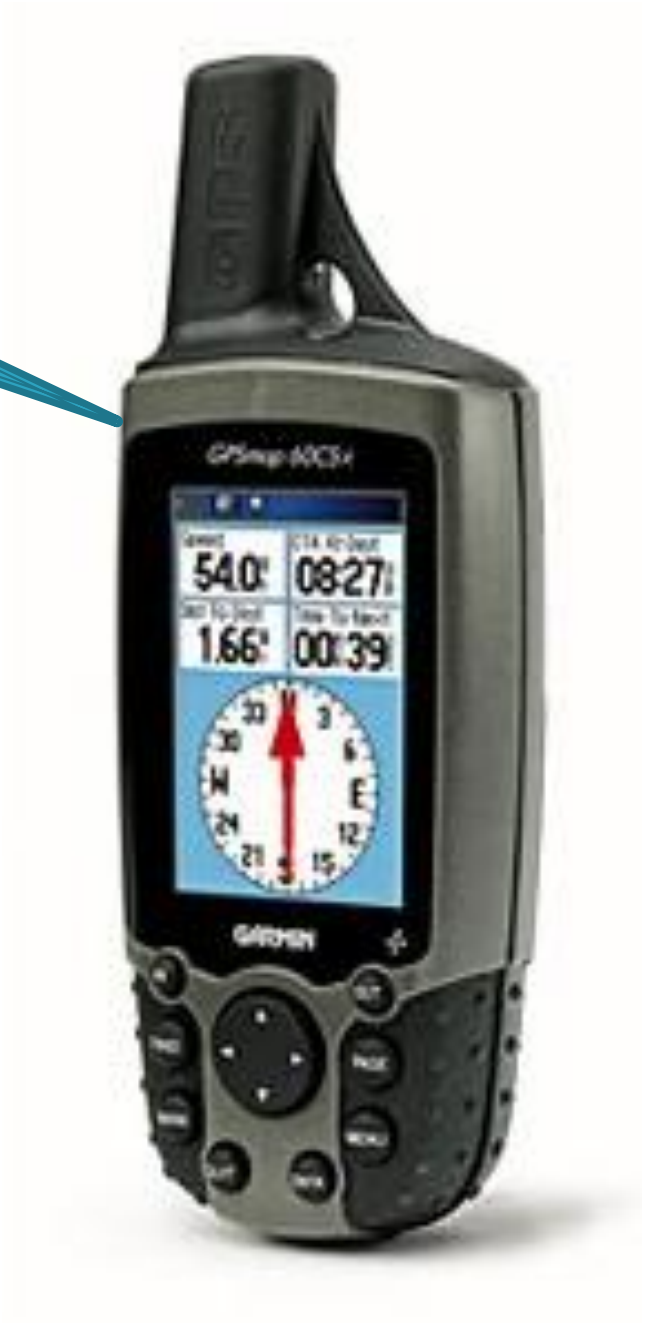
- Ease of Use
- Ease of data transfer to and from a computer (topographical maps, waypoints and routes)
- Useful functions: accumulated altitude gain, average moving speed, elevation, distance to a waypoint, total distance and time en route
- Readability in direct sunlight
- Battery usage
- Satellite acquisition time
- Memory
- Cost

Garmin Models

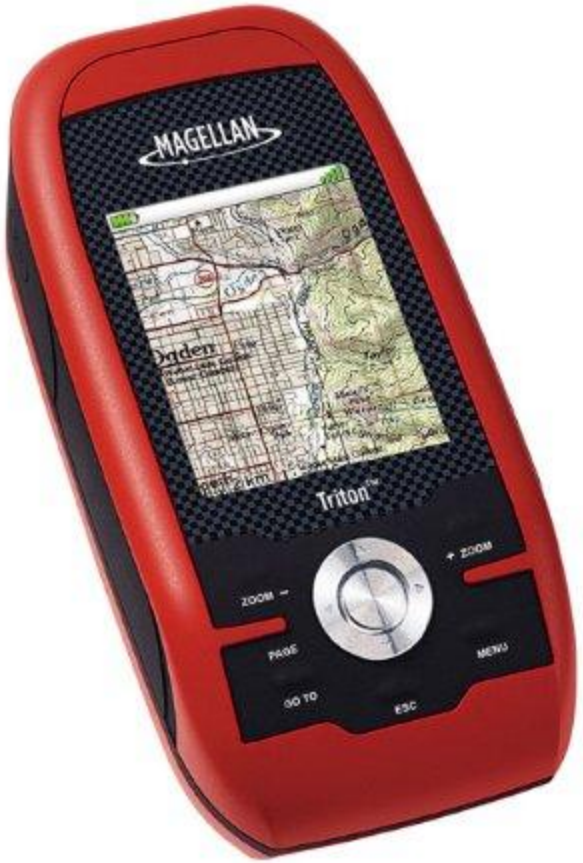
60 CSx

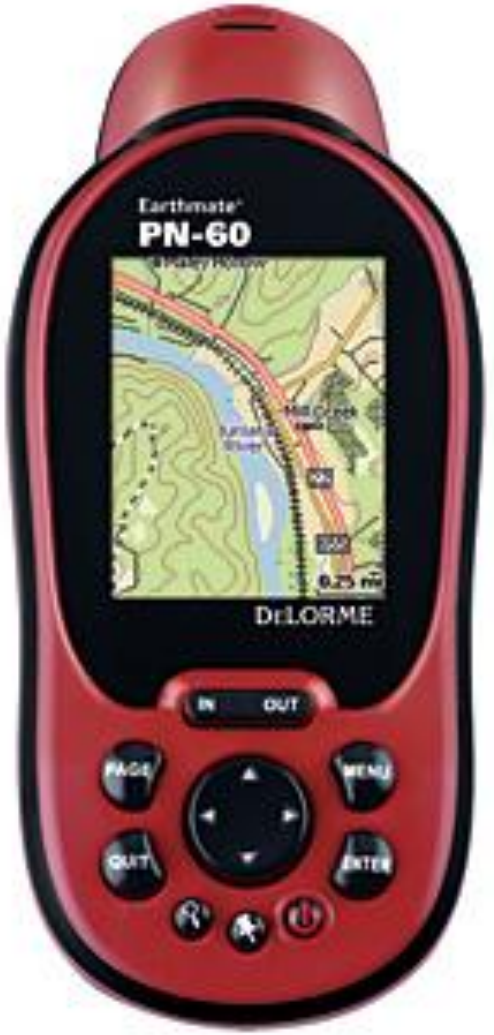
Oregon 400t





Magellan Triton 400 Delorme PN-60





Delorme Spot

DeLorme and SPOT have teamed up to provide a ruggedized handheld GPS with all the famous DeLorme street and topo maps included, plus the ability to type and send one-way text messages via the SPOT satellite system.

Garmin Colorado vs. Oregon Video

- http://www.greateagletech.com/categories/GPS/HandHeld/
- Info, not a recommendation

- As time allows

Demonstration of National Geographic TOPO!

- Cheryl Werstler
- 30 minute demonstration of major features, show download of data from a web site source, explain file formats, generate an elevation profile
- Focus is on accessing and displaying information in format useful to hikers.

Geocaching Competition (Bill Leightenheimer)

- Competition limited to seminar participants and is intended to hone their skills at using their handheld GPS
- Jars with code words on a tear-off slip have been placed in several different locations
- Participants will be provided with locations, elevations, and maps (locations are not be difficult to get to)
- Participants are to find the jars, remove a code slip, and report the code word to Bill Leightenheimer at 825-5756
- First individual or team to complete the exercise by locating all 4 caches and obtaining all four (or the most) code phrases will receive a $25.00 gift certificate and their photo in a future club newsletter.
- The time limit for completing the exercise is one week; time expires on Saturday, November 20th at 6:00 pm mst.