



**GEOCACHE ALASKA!** Inc.   
 Exploring the Last Frontier • www.geocachealaska.org

**Phone App & GPS Operations  
 FUNdamentals**

presented by  
 Wes Skinner  
 (NorthWes) 

Prepared by SSO JOAT

Anchorage broadcast via WebEx  
 16 April 2015

---

---

---


---

---


---

---

---

*Tonight's Topics:* 

- ▶ Global Positioning System (GPS)
- ▶ Causes of Poor Accuracy
- ▶ Smart Phones for Geocaching
- ▶ GPS Receivers for Geocaching
- ▶ Brands of GPS Receivers (GPSr)
- ▶ GPS Settings, Coordinate Systems & Map Datums
- ▶ GPS Maps and Garmin Software
- ▶ NW Trails – Installation & Use



16 April 2015 Phone Apps & GPS Operations FUNdamentals 2

---

---

---


---

---

---

---

---

**Global Positioning System** 

- ❖ GPS consists of a constellation of 24-32 satellites orbiting at an altitude of 12,550 miles above the Earth
- ❖ Signals sent by these satellites are received by your handheld GPS receiver (GPSr)
- ❖ The signal includes the satellite's exact position and the exact atomic time, controlled from a ground station
- ❖ Time shifts in the signals are used to figure out the distance to the satellites, which can then be used to calculate (triangulate) the position of the GPSr
- ❖ A timing error of only 1/1000 of a second translates to as much as a 200 mile ground error! Time is critical.

16 April 2015 Phone Apps & GPS Operations FUNdamentals 3

---

---

---


---

---

---

---

---

**Cause of Poor Accuracy** 

- Radio signals going through the atmosphere slow down with great variations; this introduces timing errors
- In certain geographic settings, the signals can bounce off objects, adding time to their travel and creating errors
- Obstruction of a portion of the sky reduces the number and quality of signals being received, which results in fewer points to use for computing your location
- These errors are countered by atmospheric modeling and the use of ground-based corrections through Differential GPS and Wide Area Augmentation System
- Those systems use fixed GPSr with known locations, so they can compare the signal to the known and the exact error can be calculated and sent out for correction use

16 April 2015 Phone Apps & GPS Operations FUNDamentals 4

---

---

---

---

---

---

---

---

**Smart Phones** 

- Apple iPhones (iOS)
- Android Phones
  - Samsung
  - Motorola
  - LG
  - HTC
  - Sony
  - Google
  - Plus many others!



16 April 2015 Phone Apps & GPS Operations FUNDamentals 5

---

---

---


---

---


---

---

---

**Smart Phones** 

- Most smart phones have a built-in GPS receiver as well as an electronic compass that detects magnetic fields along with a tilt sensor to detect gravitational effects
- The combination of magnetic and gravitational forces allows a smart phone compass to be very accurate, though it **MUST** be Calibrated!



16 April 2015 Phone Apps & GPS Operations FUNDamentals 6

---

---

---

---


---

---

---


---

## Smart Phones



www.GEOCACHEALASKA.ORG

- ➔ The compass is calibrated by holding the phone level, and then tilting it in a steady circular motion
- ➔ Follow the on screen directions to perform compass calibration
- ➔ Most compass applications will automatically prompt you to calibrate the compass when needed



16 April 2015 Phone Apps & GPS Operations FUNDamentals 7

---

---

---

---

---

---

---

---

---

---

## Geocaching App



www.GEOCACHEALASKA.ORG

- ➔ The official GroundSpeak Geocaching app is available in a free Intro as well as a full-feature version for \$10
- ➔ Available for both iOS and Android
- ➔ Works with basic or Premium memberships at geocaching.com
- ➔ We will review the iOS version here



16 April 2015 Phone Apps & GPS Operations FUNDamentals 8

---

---

---

---

---

---

---

---

---

---

## Geocaching App



www.GEOCACHEALASKA.ORG

- ➔ Open the app and sign in to your GC account to get started
- ➔ Once your GPS has acquired your location, you can search for nearby geocaches
- ➔ If you are on cell network, you can also view your current Pocket Queries



16 April 2015 Phone Apps & GPS Operations FUNDamentals 9

---

---

---

---

---

---

---

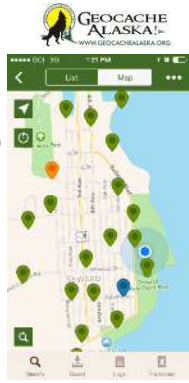
---

---

---

### Geocaching App

- When you look for nearby caches, you will get a map view showing your location (blue dot) and all the local cache markers
- You can zoom and slide the map around on your touch screen as needed to see what treasures are around you



16 April 2015 Phone Apps & GPS Operations FUNDamentals 10

---

---

---

---

---

---

---

---

### Geocaching App

- Switching to List view will show you the basic info about all of the nearby caches
- The Premium caches will only be available to you with a Premium account on geocaching.com (\$30 per year)



16 April 2015 Phone Apps & GPS Operations FUNDamentals 11

---

---

---

---

---

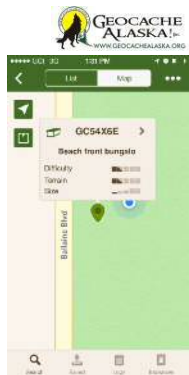
---

---

---

### Geocaching App

- When using the Map view, tap on the cache marker to see the basic info
- You can then tap on the pop up box to view cache details



16 April 2015 Phone Apps & GPS Operations FUNDamentals 12

---

---

---

---

---

---

---

---

## Geocaching App

- ➔ The details of the cache listing
- ➔ Each section of the listing (Description, Recent Logs, Hint, Attributes, and the Photo Gallery) are viewed on a new page via the links at the bottom of the screen



16 April 2015 Phone Apps & GPS Operations FUNDamentals 13

---

---

---

---

---

---

---

---

---

---

---

---

## Geocaching App

- ➔ The cache Description:



16 April 2015 Phone Apps & GPS Operations FUNDamentals 14

---

---

---

---

---

---

---

---

---

---

---

---

## Geocaching App

- ➔ The cache Hint, which will be decoded:



16 April 2015 Phone Apps & GPS Operations FUNDamentals 15

---

---

---

---

---

---

---

---

---

---

---

---

## Geocaching App

➔ The cache Attributes:  
Scroll down to see all!



16 April 2015 Phone Apps & GPS Operations FUNDamentals 16

---

---

---

---

---

---

---

---

---

---

## Geocaching App

➔ The cache Logs:



16 April 2015 Phone Apps & GPS Operations FUNDamentals 17

---

---

---

---

---

---

---

---

---

---

## Geocaching App

➔ You may click on the Navigate to Geocache button from the cache list and use the Map or Compass tools to get there

➔ The Compass view points direction and distance, but make sure you have recently Calibrated your compass!



16 April 2015 Phone Apps & GPS Operations FUNDamentals 18

---

---

---

---

---

---

---

---

---

---

### Geocaching App

- When your distance drops down to a low number, it is time to put the phone in your pocket and start looking around for the cache!
- Note the accuracy under the distance of +/- 16 ft, so the cache could be up to 21 feet away at this point



16 April 2015 Phone Apps & GPS Operations FUNDamentals 19

---

---

---

---

---

---

---

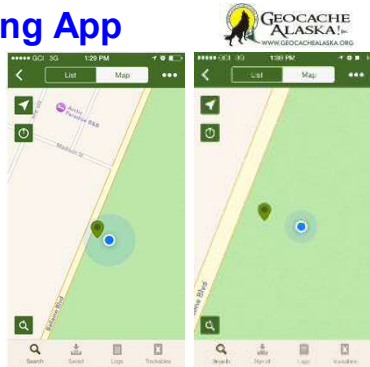
---

---

---

### Geocaching App

- When using the Map view, be sure to zoom in to see how far away the cache is!



16 April 2015 Phone Apps & GPS Operations FUNDamentals 20

---

---

---

---

---

---

---

---

---

---

### Geocaching App

- Regardless of the navigation method used, at some point you need to Look Up and search!



16 April 2015 Phone Apps & GPS Operations FUNDamentals 21

---

---

---

---

---

---

---

---

---

---

### Geocaching App

- ➔ You may enter your cache log from the app by selecting log type, and then writing a message, attaching a photo, and even selecting trackables to drop or visit this cache

16 April 2015 Phone Apps & GPS Operations FUNDamentals 22

---

---

---

---

---

---

---

---

---

---

### Geocaching App

- ➔ When you go to your inventory list, you must select each trackable in turn to enter a drop or visit log for this cache
- ➔ You need to be on cell network to get access to your trackable inventory

16 April 2015 Phone Apps & GPS Operations FUNDamentals 23

---

---

---

---

---

---

---

---

---

---

### Geocaching App

- ➔ It is possible to view any Pocket Queries that you have run within the last 7 days, and they can be saved to an offline list on your cell phone for use while you are not on a cellular data network

16 April 2015 Phone Apps & GPS Operations FUNDamentals 24

---

---

---

---

---

---

---

---

---

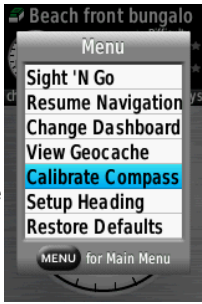
---





## Garmin GPSr

- Push the Menu button from the compass screen and select Calibrate Compass
- Be sure you are away from any magnetic fields or large pieces of ferrous metals while you complete the Calibration



16 April 2015 Phone Apps & GPS Operations FUNDamentals 28

---

---

---

---

---

---

---

---

---

---


## Garmin GPSr

- Follow the directions provided on screen, which will include turning the unit in specific directions

Calibrate Compass

Slowly turn the unit in the directions shown.

Start




Slowly Rotate the Unit Until Prompted

Step Complete

Select Continue to start the next step in calibration.

Continue



Slowly Flip the Unit Until Prompted

16 April 2015 Phone Apps & GPS Operations FUNDamentals 29

---

---

---

---

---

---

---


---

---

---

## Garmin GPSr

- You may use the Map or Compass methods to navigate to a Geocache
- Zoom in on the Map to see nearby Geocaches
- Use the directional keypad (or touchscreen) to select the Geocache you want to view



16 April 2015 Phone Apps & GPS Operations FUNDamentals 30

---

---

---

---

---

---

---

---

---

---

### Garmin GPSr

- As you zoom in on the map, you will get a better sense of how far away the cache is
- The GPSr also shows your track line as you move
- The background map depends on the maps you have installed on your GPSr



16 April 2015 Phone Apps & GPS Operations FUNDamentals 31

---

---

---

---

---

---

---

---

---

---

### Garmin GPSr

- Newer GPSr may have all the cache data in a GPX file loaded, so you may view cache specific details and the cache description, hint, etc.



16 April 2015 Phone Apps & GPS Operations FUNDamentals 32

---

---

---

---

---

---

---

---

---

---

### Garmin GPSr

- You may navigate to the cache via the Map or with the Compass tool
- When a cache is found, it can be marked as Found and some units allow you to enter a log that can be transferred to your computer later
- GPSr do not do trackables



16 April 2015 Phone Apps & GPS Operations FUNDamentals 33

---

---

---

---

---

---

---

---

---

---

**Brands of Handhelds** 

- ➔ Garmin - [www.garmin.com](http://www.garmin.com)
- ➔ Magellan - [www.magellangps.com](http://www.magellangps.com)
- ➔ DeLorme - [www.delorme.com](http://www.delorme.com)
- ➔ Lowrance - [www.lowrance.com](http://www.lowrance.com)
- ➔ Trimble - [www.trimbleoutdoors.com](http://www.trimbleoutdoors.com)

*Just a sample of the popular brands of handheld GPSr*

16 April 2015 Phone Apps & GPS Operations FUNDamentals 34

---

---

---


---

---

---

---

---

**GPSr Settings** 

- ➔ Most GPSr can be used right out of the box without changing anything
- ➔ At a minimum, ensure that you have the coordinate system and map datum set to the right units for Geocaching use
- ➔ Other settings include standard or metric units, time formats, and battery types

16 April 2015 Phone Apps & GPS Operations FUNDamentals 35

---

---

---


---

---

---

---

---

**GPSr Settings** 

- The coordinate system used in Geocaching is Degrees Minutes or "DMM"
- Format: **N DD° MM.MMM'** **W DDD° MM.MMM'**
- Map Datums are the survey "baseline" coordinates used when drawing a map
- The Map Datum used in Geocaching is **WGS 84** which stands for "World Geodetic System 1984"
- Note that much of Alaska's mapping was done under North American Datum 1927 (NAD27), which can still be found on USGS paper maps

16 April 2015 Phone Apps & GPS Operations FUNDamentals 36

---

---

---

---

---

---

---

---

## GPSr Maps



- ✘ A non-mapping GPS will show you a blank “map” with relative waypoint positions and show your “breadcrumb” track log
- ✘ The basemap included with many mapping units is a very simplistic street and feature map with marginal accuracy
- ✘ More accurate and complete maps come with high-end units or can be purchased

16 April 2015 Phone Apps & GPS Operations FUNDamentals 37

---

---

---

---

---

---

---

---

## GPSr Street Maps



- ❖ Street Maps show details of roads and street addresses without much terrain
- ❖ Used for vehicle navigation, the accuracy and detail drops as you get further away from large cities



16 April 2015 Phone Apps & GPS Operations FUNDamentals 38

---

---

---

---

---

---

---

---

## Topographic Maps



- ❖ USGS type topographic maps are the most common for outdoor users
- ❖ They show all terrain features just like a paper map as well as most roads
- ❖ Many varieties are available



16 April 2015 Phone Apps & GPS Operations FUNDamentals 39

---

---

---


---

---

---

---

---

**Garmin Software** 

- **MapSource:** The original Garmin interface software which used to be included with any new GPSr purchase, no longer available to buy.
- **BaseCamp:** The latest Garmin software which can be [downloaded](#) from Garmin's website
- Garmin software allows creation and editing of waypoints, tracks, routes, and uploading or downloading of all data from your Garmin GPSr, including purchased map products & NW Trails

16 April 2015 Phone Apps & GPS Operations FUNDamentals 40

---

---

---


---

---

---

---

---

**Phone vs GPSr** 

- ✓ **Most people have a Smart Phone, so it is a logical choice for beginners to start with**
- ✓ **It is also more likely that you will have your Phone with you for spur of the moment geocaching, such as while you are traveling**
- ✓ **The Phone GPS accuracy is not as good as a GPSr, however it will get you close enough for cache finding and for makes easy logging**
- ✓ **Use a GPSr to capture accurate coordinates for Hiding caches. Don't use a Phone!**

16 April 2015 Phone Apps & GPS Operations FUNDamentals 41

---

---

---


---

---

---

---

---

**Resources** 

- GS Knowledge Books: [support.groundspeak.com](http://support.groundspeak.com)
- GeocacheAlaska! Forums: [geocachealaska.proboards.com](http://geocachealaska.proboards.com)
- Trimble GPS Tutorial: [www.trimble.com/gps](http://www.trimble.com/gps)
- Switchback's NW Trails: [www.switchbacks.com/nwtrails/](http://www.switchbacks.com/nwtrails/)
- Garmin GPS Info: [www8.garmin.com/aboutGPS/](http://www8.garmin.com/aboutGPS/)
- US Gov't GPS Info: [www.gps.gov](http://www.gps.gov)

16 April 2015 Phone Apps & GPS Operations FUNDamentals 42

---

---

---

---

---

---

---

---