

Navigation Northwest

A Quarterly Newsletter of the Seattle Navigation Committee

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Gmap4 - Online Topo Maps and A Lot More - Part 2

By Joseph Elfelt

Gmap4 is a browser app that can display high-resolution topographic maps. In early September I finally finished work to greatly improve the documentation and also added a number of new features. The improved documentation, including Quick Start information, is at http://www.mappingsupport.com/p/gmap4_help.html. Each time you start Gmap4 you are automatically using the latest code.

The geolocation feature has been redesigned. If you open any Gmap4 map with a mobile browser and touch Menu ==> "My location" then the map will center at your position. As you move, the symbol on the screen moves with you - just like a dedicated GPS. If you touch that symbol then the coordinates for your position are displayed using the current coordinate format. To use this feature your mobile device must have a GPS chip and the GPS must be "on". Note that your battery will drain faster when the GPS is "on". Here is the default link for starting Gmap4: <http://www.mappingsupport.com/p/gmap4.php>

Bad news: Since mobile devices do not have WAAS, their GPS accuracy will not be better than about 50 feet. Good news: Many mobile devices can get GPS data from both the USA satellites and the Russian GLONASS satellites. Some of these mobile devices can achieve an accuracy of about 15 feet. The iPhone 4s and newer support GLONASS. If you have an android device you can try a Google search. You can also simply try starting Gmap4 on your mobile device, displaying the Google aerial, turning on Menu ==> "My location" and walking down the sidewalk. Watch how well the symbol on the screen shows your location as you move. To change the map scale from meters to feet, touch the scale symbol.

Here is a trick that lets you use Gmap4 offline on a mobile device. Charge your battery and close all browser windows. Turn the GPS off to conserve the battery. Start Gmap4 and display the area where you plan to hike. Display the "t4 Topo High" basemap and zoom so the scale says 600m or 1,000 feet. Drag the map along the route of your planned hike. This loads the topo map tiles into the browser's memory. Now drive to the trailhead without turning your device off and without closing your browser. At the trailhead, turn your GPS on and do Menu ==> "My location". The map will center at your position. Turn your GPS off but leave your device on and your browser open. Any time you want to check your position, turn your GPS on and do Menu ==> "My location". Note that I do not know how many map tiles can be stored in the browser's memory with this technique.

Finally, remember that you can orient the map on your mobile device by using a compass app.

Questions from the editor:

>>PH: How about NOAA charts? JE: Ask and ye shall receive. NOAA nav charts are now on a GIS server and Gmap4 can display them. **Note that the server is a bit slow.**

http://www.mappingsupport.com/p/gmap4.php?ll=43.888324,-69.397920&z=14&t=NOAA_charts&rest=http://egisws02.nos.noaa.gov/ArcGIS/rest/services/RNC/NOAA_RNC/MapServer?name=NOAA_charts&layers=3&transparent=false

>>PH: Is there explicit support for uploading route maps to Gaia? JE: Gmap4 does not, at least at the present, export any **maps**. You can however use Menu ==> "Draw and save" and save your work as a GPX file.

>>PH: Will you add NOAA charts to the map library? JE: I don't think I will add this as a built in basemap. GIS layers (like the charts) can be specified either in the Gmap4 link (see above) or in a text file. If you are viewing NOAA charts on a mobile device and turn on Menu ==> "My location" then you will see where you are on the chart.

--Joseph Elfelt of Redmond is a former Mountaineer with a keen interest in free, high quality maps. You can reach him at <http://www.mappingsupport.com/>.

The Llama Fogged My Glasses and We Had No Map

By Peter Hendrickson

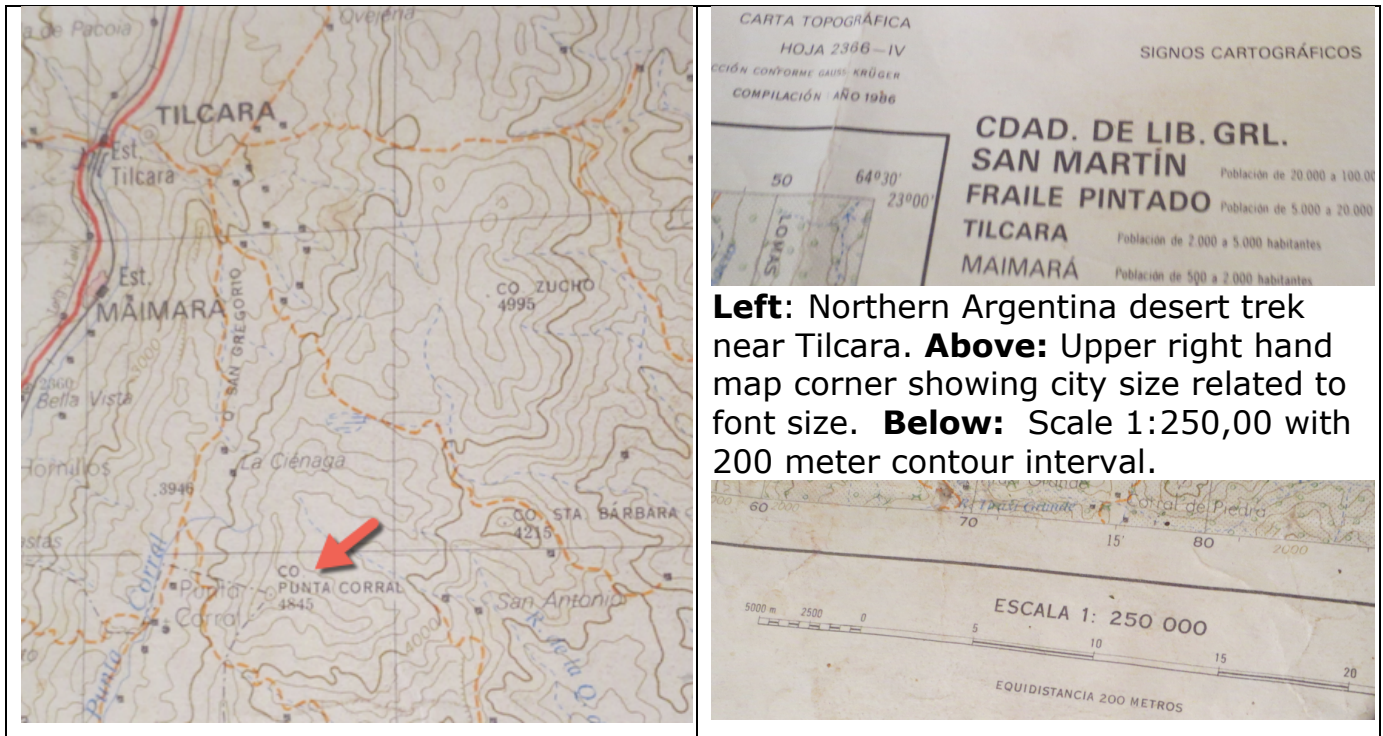
We had looked at the scant trek description before leaving and knew we'd stay on the east side of the north/south Rio Grande, our fail-safe baseline. If disaster struck the real problem would be water and finding a manageable way down the exposed escarpment. This was the first trip with a Suunto Core ABC watch and I left it on altimeter most of the time with occasional compass checks. The Silva Ranger compass stayed in the pack and I cursed for having forgotten to do a prior declination check. We travel to South America two or three times a year for work and compass dip error has not been a problem. We did not attempt A-GPS with our smart phones this trip.

Our guide and llama wrangler, Santos, led us out of Tilcara (elev 3000m) along the rim of La Garganta del Diablo, an unstable canyon, to a higher tributary crossing and into his adobe shelter for a fireside meal with the local farmer. With high desert and clear skies we could later see into Bolivia to the north and towards Chile's Atacama Desert to the west.



Left: Adjusting the llama loads. **Above:** Google Earth image showing trail (left) & pre Inca terracing (upper right).

The llamas knew the way. That night we soaked in the unfiltered sky, wishing we had packed a southern hemisphere star chart. The next day we followed a faint track 1km until it joined a two-llama wide clear trail leading towards Chile. At 4000m+ we lunched with the farmer's wife who ran 900 goats on the scrubby terrain with several dogs. The dogs had cued us when to turn off the main trail to her place.



Left: Northern Argentina desert trek near Tilcara. **Above:** Upper right hand map corner showing city size related to font size. **Below:** Scale 1:250,00 with 200 meter contour interval.

Our destination the next day was the pilgrims' rest compound above 4000m at Punta Corral in and along a dry riverbed still richly littered by the 10,000 Easter pilgrims two months earlier. A sketch map would've sufficed. The return took us along the exposed escarpment above the main road far below. What a delight to lose altitude on a mild winter day along a less used trail. My llama accepted my lead, resting his chin on my left shoulder and fogging my glasses in the ice-breaking morning chill.

We returned the llamas to Tilcara where Santos dug out some 1:250,000 topo maps. The scale promoted only fair, retrospective route finding. And an Argentinian Quad is scant defense against territorial dogs. Weeks later Google Earth revealed pre Inca terracing, faint tracks, fenced fields...sometimes it is only after a trek that you know what to seek in your digital search.

Traveler Note: *Contact Santos Manfredi through Caravans Llama at www.caravanadellamas.com.ar/ for trek inquiries and direct booking. Our booking agent was Argentinian Explorer at <http://www.argentinianexplorer.com/>. They were flawless on short notice with the trek, four in country airport transfers, two flights and two hotels. We generally rely on Lonely Planet, Trip Advisor, Blogs and Expedia for rough travel initial planning. --Editor*

Alpine Scramble Compresses 2015 Curriculum Dates

The Seattle Navigation Committee has approved an Alpine Scramble Committee proposal to add a scramble-focused workshop (April 9) and field trip (April 11) to the 2015 Basic Course dates. Scramble Co-Chair Nina Crampton said instruction starts in March (rather than January) to compress the course length.

Prospective scramble students are still encouraged to complete their Basic Navigation Course requirement as early as possible. The Navigation Committee canceled the previously scheduled February 15, 2015 field trip and the handful of registered students were offered priority enrollment in the other four winter/spring field trips. You must take the workshop before enrolling in one of the field trips.

Basic Navigation Course Offerings 2015

The October 29 Basic Navigation Workshop and the November 8, 2014 Field Trip are unexpectedly filled to capacity (90 & 85) with students on waiting lists. We continue to seek instructors for the Field Trip to Heybrook Ridge. Greg Testa led a stewardship Annual Fall Brushout crew to the Western and Eastern stump areas to clear sight lines Saturday, October 4, a lovely day in the mountains. Even without power tools, both sighting fields are ready for students.

Below is the URL to find Basic Navigation Course workshops and field trips.

<https://www.mountaineers.org/about/branches-committees/seattle-branch/committees/seattle-navigation-committee/course-templates/basic-navigation-course/basic-navigation-course-seattle-2014>

Date & Day	Workshop	Date & Day	Fieldtrip
28 Jan, Wednesday	Program Center		
09 Feb, Monday	Program Center	14 Feb, Saturday	Heybrook Ridge
26 Feb, Thursday	Program Center	14 Mar, Saturday	Heybrook Ridge
05 Mar, Thursday	Program Center	15 Mar, Sunday	Heybrook Ridge
02 Apr, Thursday*	Program Center	11 Apr, Saturday*	Heybrook Ridge
29 Oct, Thursday	Program Center	07 Nov, Saturday	Heybrook Ridge

**Registration preference to 2015 Alpine Scramble students*

Finding Navigation Courses, Activities and Events

Navigation Committee instructors are experiencing growing pains with the new course management system. Here are some tips for instructors and students to find and enroll in Seattle navigation courses, clinics and events.

- **Basic Navigation Course, Introduction to Map & Compass, Smart Phone & Dedicated GPS Course** are best located by:
 - Clicking the Learn tab on the Mountaineers home page.
 - Choose Select An Area...Navigation and click on Find Courses
 - Scroll down the Courses, Clinics and Seminars page to the Seattle course of your choice, for example Basic Navigation Course—Seattle

- Course Activities will be listed so click on the date(s) wished
- Click on the Registration Call Out for either Student or Instructor
- **Navigation Committee Meetings and other Events**
 - These are events so start with About on the home page
 - Click on Branches & Committees, then select Seattle Branch
 - Click on upcoming EVENTS to display a monthly calendar grid where you find activities and events in the Program Center and elsewhere
- **Need More Help?**
 - Committee Chair Peter Hendrickson responds to emails most days: p.hendrickson43@gmail.com
 - Listed activity leaders also respond
 - Program Center staff are deeply knowledgeable at Home Page: About tab, Contact Us, QUICK HELP: info@mountaineers.org or TEL 206.521.6001 Member Services

Introduction to Map & Compass—Getting Started

The Seattle Navigation Committee has scheduled six Introduction to Map and Compass dates for 2015 at the Sandpoint Way Program Center from 6:30 to 8:30 p.m. Instructors are drawn from the pool of Basic Navigation Course teachers. You can enroll at: <https://www.mountaineers.org/about/branches-committees/seattle-branch/committees/seattle-navigation-committee/course-templates/introduction-to-map-compass/introduction-to-map-compass-seattle-2014-1> as shown in the screen capture below. Primary Leader is Greg Testa. This Getting Started introductory class does not satisfy the navigation requirement for Alpine Scramble, Basic Climbing, Snowshoe or Backcountry Ski.

COURSE ACTIVITY	DATE	TYPE	REQUIRED?
Introduction to Map & Compass		SEMINAR	YES
Mountaineers Seattle Program Center	Tue, Jan 13, 2015		
Mountaineers Seattle Program Center	Thu, Apr 16, 2015		
Mountaineers Seattle Program Center	Tue, May 12, 2015		
Mountaineers Seattle Program Center	Thu, Jun 18, 2015		
Mountaineers Seattle Program Center	Tue, Jul 14, 2015		
Mountaineers Seattle Program Center	Mon, Aug 17, 2015		

Instructors Help Shape New Smart Phone & Dedicated GPS Course

Lead instructor Bruce Crawford teamed with Peter Hendrickson to work with more than 30 experienced navigation instructors May 27 and August 7 to bring a new smart phone/dedicated GPS course to life. The 2.5 hour evening sessions at the Program Center and in nearby Magnuson Park went quickly and student/instructors offered several suggestions to improve the offering.

Navigation Committee Treasurer and SAR volunteer Brian Starlin taught the first, revised session to 11 students October 6. It was a balmy evening and students were enthused to use the smart phones and dedicated devices to add to their navigation skills. We have scheduled six GPS classes annually. The current URL provides a description and the 2015 dates will soon be loaded:
<https://www.mountaineers.org/about/branches-committees/seattle-branch/committees/seattle-navigation-committee/course-templates/smart-phone-dedicated-gps-seattle/smart-phone-dedicated-gps-seattle-2014-1>

Smart Phone & Dedicated GPS Course	Location
Thursday, January 22	Seattle Program Center
Monday, April 20	Seattle Program Center
Thursday, May 14	Seattle Program Center
Monday, June 22	Seattle Program Center
Tuesday, August 11	Seattle Program Center
Monday, October 05	Seattle Program Center

Navigation Projects

Navigation instructor Brian Seater is assisting with script writing and production logistics for a long-delayed series of brief, wilderness navigation YouTube videos. The content is intended to provide additional instruction after workshops and field trips. We hope they will become a reliable source of information for anyone entering the wilderness, particularly in the Northwest. A mechanical engineer by day, Brian is part of a team building robots for the aviation industry. The committee is also working with an Eagle Scout candidate to develop a compass practice course in a Seattle city park. We are modeling the effort on a Mazamas self-guided course in Portland's Mt Tabor Park at this URL:

<http://mazamas.org/index.php/resources/mt.-tabor-navigation-practice-course/>

Links, Apps of Interest

Our often-consulted Seattle Navigation website has lived "outside" the official The Mountaineers website for many years. Sub-Committee Chair Wes Rogers is working with staff and other committees to see how we might bring our pages into the fold. Your comments and suggestions are ever welcome.

Below are links or apps that may be of interest:

- Backcountry Navigator Pro (an Android app) map picker source from Andy Cahn: http://support.crittermap.com/entries/22449208-Choosing-a-Topo-Map-in-the-USA?utm_source=BackCountry+Navigator+Android+Newsletter&utm_campaign=6e6250e0a1-newsletter_06_05_2014&utm_medium=email&utm_term=0_d5dccc1a8-6e6250e0a1-203401713
- The Math Behind Your GPS as recounted by a kid: <http://www.youtube.com/watch?v=pX6PcRN6Kow>

Windows Developer Offers A-GPS Tips & Pitches Two, Free Windows Apps

By Nikita Kozhekin

I personally think there are both good and bad things about using Cell Phones with a GPS App. Disadvantages of cell phones are pretty obvious:

1. The battery of your cell phone is used for a lot more than just GPS (and you often cannot control that). This means on a long hiking trip you can feel much safer and in control with a real standalone GPS unit compared to a cell phone that can run out of juice fast and for sometimes unpredictable reasons. Many modern cell phones have sealed designs with irreplaceable batteries, so you cannot just take extra batteries to tuck in the cell phone, while you can do so for a standalone GPS unit. [Some carry a battery pack to recharge smart phones.—Ed.]
2. Very few cell phones are waterproof and rugged, while most standalone GPS units are (you can solve that though by using a special cell phone case).
3. Cell phones use A-GPS (Assisted GPS). They are “assisted” in getting a GPS fix quickly by triangulation from cell phone towers. This is very neat and allows you to get a GPS fix much faster in a city. Unfortunately it doesn’t help at all when in the backcountry where there are no cell towers in range. In fact it often makes things worse, because over-reliance on A- part from cell phone manufacturers and strict requirements on reducing battery consumption result in manufacturers using less and less powerful GPS antennas in cell phones. They can be very slow to acquire location in the backcountry.

However there are numerous advantages. As a developer I’m very much in love with using GPS in my cell phone, because the cell phone is now basically a small computer and programming apps allows me to make it so much more extensible. We can make software features to augment GPS data which are simply not available on standalone GPS units. If you happen to have a data connection, possibilities include querying accurate elevation data from topo models, etc.

If you happen to be a windows phone user (I know, I know, not a majority), I want to use this opportunity to pitch in my free GPS windows phone apps. They are inspired by search and rescue!

Newest one is called "Maps Tool".

<http://www.windowsphone.com/s?appid=4bf54046-e1a3-4140-9f6f-7516948a5d29>

This app allows you to convert coordinates between different coordinate systems/projections (like lat/long, UTM, MGRS, etc.) and adjust for different datums (like WGS84, NAD27, etc.). It also allows you to see township/range/section information on a map, just like what we studied.

My other app is called "GPS Calculator."

<http://windowsphone.com/s?appid=4e06928a-de12-e011-9264-00237de2db9e>

It has many features to work with GPS data, like calculating distances, projections, area, magnetic declination, sunset/sunrise, etc. It can also do many tasks we do during ESAR training (like finding location based on current location, distance in feet and bearing in degrees). It does so--very accurately.

--Nikita is a Mountaineers and ESAR volunteer instructor. You can reach him at nikozhek@exchange.microsoft.com

Navigation Publications

The Bob and Mike Burns father and son authorship team is well along the way to publishing the third edition of their classic, *Wilderness Navigation*. Bob reports that the Mountaineering Books edition is on schedule for a March 2015 release. The authors have graciously accepted three rounds of suggestions and comments from the Seattle Navigation Committee which requires the book for the Basic Navigation Course. The committee will use the 2nd edition in the interim but we are keen to see how the new edition might best be integrated with instruction.

Navigation Gear--Compasses

The annual search for declination adjustable, clear baseplate, reliable wilderness navigation compasses is over. Committee sub-chair Greg Testa reviewed many current offerings from several manufactures. Most did not meet Mountaineers criteria. Design and manufacture issues continue to vex the committee and local Search And Rescue (SAR) units. See (a) 2014-2015 compass recommendations and (b) instructions for the compass check station outside the Program Center. Navigation instructor and licensed land surveyor Bob Boyd set up the station.

Required Features of a Compass for Basic Navigation Course **Seattle Mountaineers—Revised October 2014**

1. **Adjustable declination:** A moveable orienting arrow, which provides a built-in declination adjustment. If there is one feature that simplifies map and compass work, this is it. Compasses with adjustable declination can often be identified by the presence of an adjustment screw, usually brass or copper-colored, and a small key attached to the lanyard.
 - All students **MUST** have a compass with adjustable declination. The presence of a declination scale does not guarantee that it can be adjusted. We also recommend not having the ‘tool-less’ declination feature (we have no experience with newest models).
 - If you already have a compass without adjustable declination, you may not use it in this course. Experience indicates that such compasses detract from the learning experience.
2. A **transparent rectangular base plate** with a direction of travel arrow or a sighting mirror.
 - Transparency allows map features to be seen underneath the compass.
 - A rectangular shape provides straight edges and square angles to plot and triangulate on the map.
3. A **bezel** (the rotating housing) marked clockwise from 0 to 360 degrees in increments of two degrees or less. In general, bezels should be large to allow use while wearing gloves - the larger size also improves accuracy.
4. **Meridian lines:** Parallel 'meridian lines' on the bottom of the interior of the circular compass housing rotate with the bezel when it is turned. The meridian lines run parallel to the north-south axis of the bezel, however turned, for plotting and triangulating on the map.
5. A **ruler and/or gradient scale** engraved on one of the straight edges, used for measuring distances. Compasses with other additional scales facilitate advanced navigation.
6. A **3 to 4-inch base plate**. A longer straight edge makes map work easier.

Additional recommendations

- A sighting mirror in the cover: This reduces errors introduced when moving the compass from eye-level after sighting to waist-level for reading the dial.
- A liquid-filled housing: Reduces erratic needle movement (only needed on some compasses). In some cases, steadying the compass needle can be difficult
- An inclinometer: a gravity driven arrow that allows you to measure slope angle.

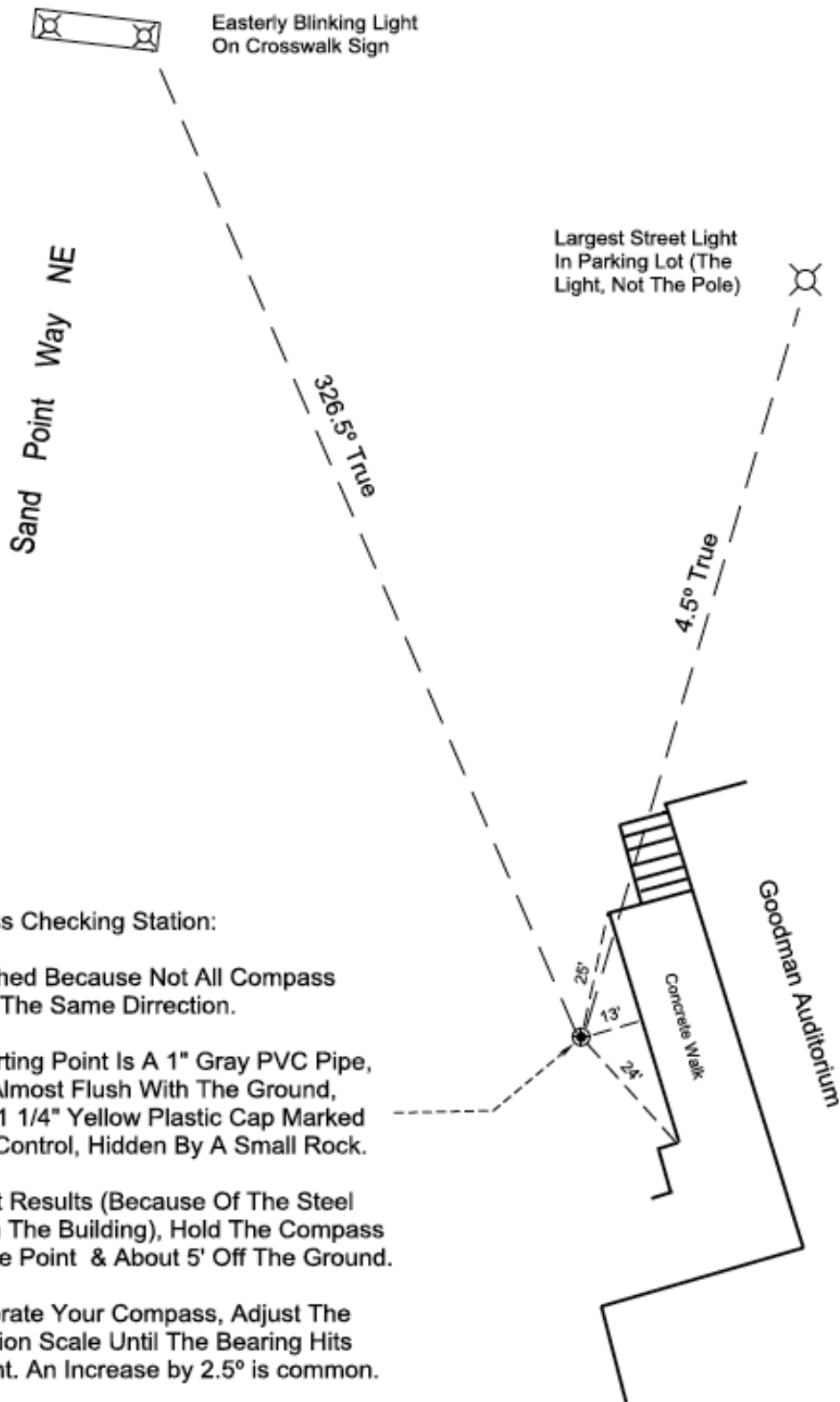
Current favorites with a sighting mirror include the Silva’s Ranger CL and Ranger 75.

Recommended compasses without a mirror include the Suunto M-3 IN and the Silva Explorer Pro.

Please note that not all of these recommended compasses are available at REI. Silva can be purchased online at Campsaver.com and at Cabela’s. Suunto is currently available at REI and online. Keep any receipt! We have unfortunately had many defective compasses in the past.

Brunton compasses have also been recommended. However, current offerings all now include ‘tool-less declination’ which requires pressing down on the bezel to set the declination. We have found this to be difficult and may not provide the best accuracy. While Brunton compasses meet all our specifications, tool-less declination makes them problematic and we do not recommend using this brand for the class.

We also recommended the Suunto MC-2 last year but experienced issues with warped mirrors as well as incorrect declination settings. The manufacturer has corrected the mirror, but a local SAR has reported that most compasses still exhibit the declination problem. Most can be corrected with an additional 2 degrees East adjustment (e.g., 16 degrees East would need to be 18 degrees east). If you are comfortable with declination settings and taking accurate bearings with this issue in mind, the MC-2 is OK. However, we would not recommend using it for the Basic Wilderness Navigation course.



Compass Checking Station:

Established Because Not All Compass Point In The Same Dirrection.

The Starting Point Is A 1" Gray PVC Pipe, Driven Almost Flush With The Ground, With A 1 1/4" Yellow Plastic Cap Marked Survey Control, Hidden By A Small Rock.

For Best Results (Because Of The Steel Roof On The Building), Hold The Compass Over The Point & About 5' Off The Ground.

To Calibrate Your Compass, Adjust The Declination Scale Until The Bearing Hits The Light. An Increase by 2.5° is common.

Please Hide With Rock When Finished.

RWB
2/2014

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**"Do not go where the path may lead, go instead where there is no path
and leave a trail." --Ralph Waldo Emerson, American writer, 1803-1882**

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