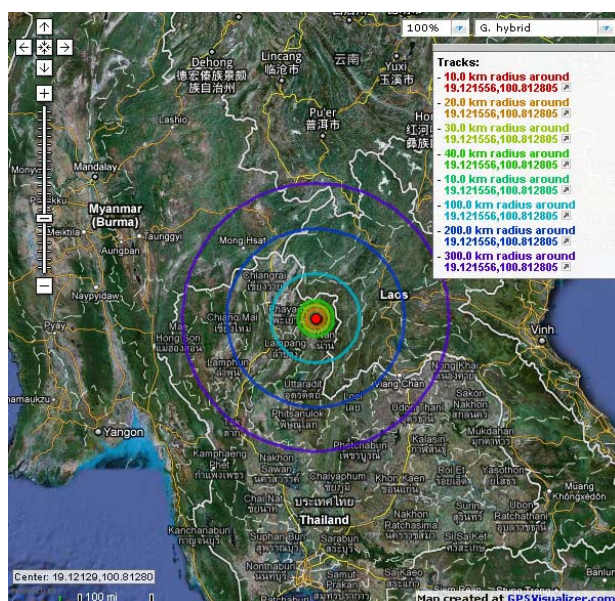


	<p>Rural Training Center-Thailand: Technical Paper ศูนย์ฝึกอบรมชนบท-ประเทศไทย: ทางเทคนิคกระดาบ</p> <h1 style="text-align: center;">Station / Site Geo-Graphics</h1> <p style="text-align: center;">© 2009, G.K. Lee, HSØZHM. All rights reserved, สงวนลิขสิทธิ์</p>	
<p>c/o S. Lee, 64 Moo 2 Ban Na Fa, Jompra, Thawangpha, Nan Province, Thailand 55140 www.neighborhoodlink.com/org/rtcth E-mail: rtc2k5@gmail.com</p>		
<p>Community-based environmental education for the self-sufficiency and sustainability of small rural family farms ชุมชนตามสิ่งแวดล้อมศึกษาเพื่อการพึ่งตัวเองและยั่งยืนชนบทขนาดเล็กครอบครัวฟาร์ม</p>		

You may post questions / comments about this paper to the Discussion area of our website



Seeing & Showing Your QTH

In the RTC-TH, we have a saying: "Geography may not change the world, but it will change the way you see it." This paper gives you two different ways to see and show your station. Both functions (and more) are all available for free, online

at <http://www.gpsvisualizer.com/>

To use it, you only need to input your geographic coordinates. We were interested to see distance range rings from one of our locations. This was

To use it, you only need to input your geographic coordinates. We were interested to see distance range rings from one of our locations. This was easily done using the GPS Visualizer function "Range Rings" found at http://www.gpsvisualizer.com/calculators#range_rings (To get here, click on "calculators" in the menu selections at the top of the home page. Then scroll down to the section "Draw Rings Around a Point.")

"This function will plot a point on a map -- given a set of coordinates or a "location" (an airport code, ZIP code, city/state pair, street address, or coordinate pair) -- and draw a circle, or circles, around that point. To create multiple rings, separate the values in the "radius" box with commas: e.g., "10mi,50mi,100mi." The input screen looks like this:

Draw range rings around a point

This form will plot a point on a map -- given a set of coordinates or a "location" (an airport code, ZIP code, city/state pair, street address, or coordinate pair) -- and draw a circle, or circles, around that point. To create multiple rings, separate the values in the "radius" box with commas: e.g., "10mi,50mi,100mi."

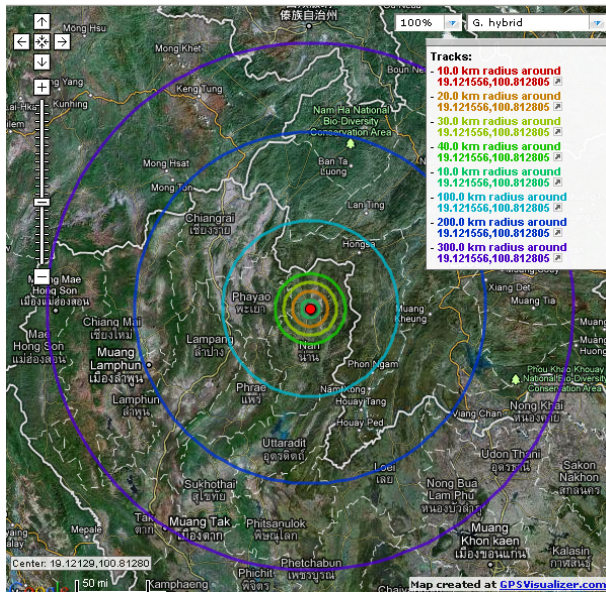
Lat., Lon. or Location Radius 100km map format: Draw map Show coordinates

If you need to put range rings around multiple points on a single map, you can supply your data in the form of a text file or spreadsheet and include a "circle_radius" field; see the [example page](#) for more information.

We input our 1) Thawangpha QTH coordinates in decimal degrees (we keep our records this way; we didn't try the traditional degree/minutes/second format); 2) then specified the distance rings of interest: 10km, 20km, 30km, 40km, 50km, 100km, 200km, 300km (these were comma separated, but no spaces were used after the

comma, as per the example); 3) we opted for the Google Maps output (other output choices are JPEG, SVG, PNG, Google Earth); 4) we then clicked on “Draw Map.”

The output results from Google Maps are shown below. [Note: We tried to get the output in JPEG format for this article, but they didn’t look like the Google Maps output. The “map image” detail was washed out; more like a faded background wall paper. So we used the “PrtSc” (print screen) function and cropped/cut pasted the images for this article.]



This was the initial output from the calculator.

Tracks legend now partially blocks some of the information. As we zoom in closer, more and more of the NE sector of the map data in our range rings will be obscured. This can be mitigated by using the Google Maps “arrow” cursor controls. But as you shift the map, you may not get entire area in a range ring showing up in sufficient detail. But since most of life is a compromise, we can learn to live with it. [Note: The other Google Map controls (% opacity/transparency and the drop down menu for G.Map, G. Satellite, G. Hybrid, G. Terrain, Landsat 30m, Blue Marble, Daily MODIS, Open StreetMap, OpenCycleMap topo.)

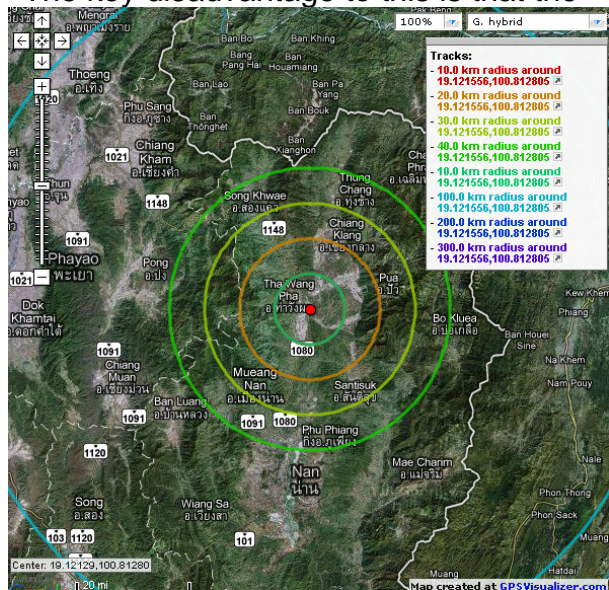
Another GPS Visualizer function we **Tried** was Calculate the great circle distance between two points. (It’s near the top of the same page as the Range Ring calculator.) “This calculator will find the distance between two pairs of coordinates to a very high degree of precision (using the thoroughly nasty [Vincenty Formula](#), which accounts for the flattened shape of the earth). The “Draw map” button will show you the two points on a map and draw the great circle route between them.” The input screen is shown on the next page:

We selected the 300 km range as an arbitrary “convenient” one as it covers nearly all of northern Thailand (our primary area of interest) for EmComm relative to Nan Province.

Luckily, the “Tracks” legend, though overlapping the two outer range rings, is outside of the Thai national border so does not block any data of primary interest for us.

Our station is centered in the display. What is interesting is with the Google Maps output format, the scale and “arrow” functions work. So you can zoom in to get more detail for the inner most range rings (see image below).

The key disadvantage to this is that the



Zooming in to see the inner most range rings.

Rural Training Center-Thailand: Technical Paper Station/Site Geo-Graphics

Calculate the great circle distance between two points

This calculator will find the distance between two pairs of coordinates to a very high degree of precision (using the thoroughly nasty [Vincenty Formula](#), which accounts for the flattened shape of the earth). The "Draw map" button will show you the two points on a map and draw the great circle route between them.

Lat. 1, Lon. 1	<input type="text"/>	Distance->	<input type="text"/>	km	<input type="text"/>	map format:	<input type="button" value="Draw map"/>	<input type="button" value="Draw profile"/>
Lat. 2, Lon. 2	<input type="text"/>	<input type="button" value="clear"/>	<input type="text"/>	mi	bearing	<input type="button" value="Google Maps"/>	<input type="button" value="Show coordinates"/>	<input type="button" value="units: km"/>

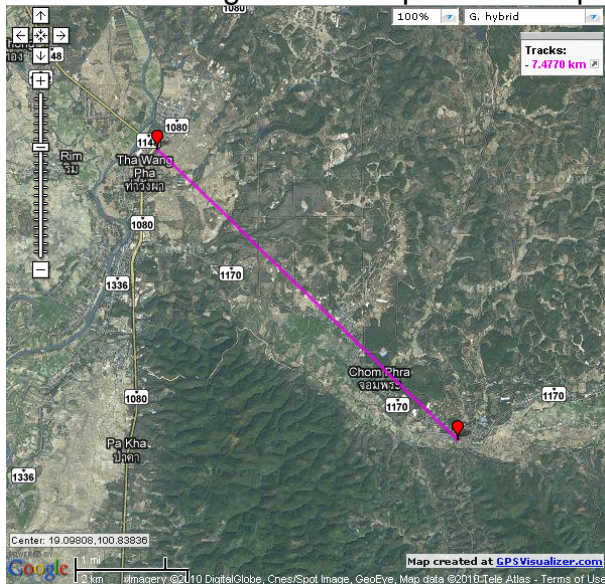
The basic inputs are the latitude/longitude coordinates for the two points of interest. We wanted to know the straight line distance between our Thawangpha QTH and our Na Fa QTH. If you click on the "Distance" button, the calculation is done and displayed in the two boxes ("km" and "mi") along with the azimuth from point 1 to point 2. The results for the calculation are shown below: (Distance is 7.48 km / 4.648 mi; azimuth 134.183.)

Calculate the great circle distance between two points

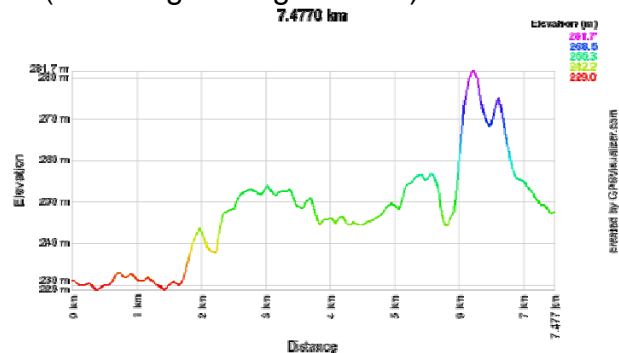
This calculator will find the distance between two pairs of coordinates to a very high degree of precision (using the thoroughly nasty [Vincenty Formula](#), which accounts for the flattened shape of the earth). The "Draw map" button will show you the two points on a map and draw the great circle route between them.

Lat. 1, Lon. 1	<input type="text" value="19.121556,100.812806"/>	<input type="button" value="Distance->"/>	<input type="text" value="7.48 km"/>	<input type="text" value="134.183°"/>	map format:	<input type="button" value="Draw map"/>	<input type="button" value="Draw profile"/>
Lat. 2, Lon. 2	<input type="text" value="19.0746,100.86392"/>	<input type="button" value="clear"/>	<input type="text" value="4.648 mi"/>	bearing	<input type="button" value="Google Maps"/>	<input type="button" value="Show coordinates"/>	<input type="button" value="units: km"/>

The Map Format (drop down menu) is the same as mentioned earlier. So clicking on the "Draw Map" button gave us the resulting image on the left below. Clicking on the "Draw Profile" gave us this pleasant surprise (see image on right below).



Our Thawangpha QTH to our Na Fa QTH



Our Thawangpha QTH to our Na Fa QTH

This was a pleasant unexpected bonus surprise in this function. We cannot vouch for the accuracy of the data or the resulting display. However, it does give us a different way to see the relationship between our two station sites for very little

effort on our part. Prior to this, we could only hazard a guess based on our drive along the road between these two sites. And, the routing of the road is NOT a straight line. So the impressions or misimpressions we got from the drive is rather different from the plotted profile from this program function. [Note: To get the proper perspective for the profile, it should be scaled and aligned with the "straight line" between the two QTHs on the left hand image above.]

When we finally get antennas set up at the Na Fa QTH, we plan to then use a free online calculator "VHF/UHF Line of Sight Calculator" (which is available at <http://www.vwlowen.co.uk/java/horizon.htm>) The input screen is shown below:

<input type="text"/>	Antenna Height of 1st Station (ASL)
<input type="text"/>	Antenna Height of 2nd Station (ASL) <input checked="" type="radio"/> Feet <input type="radio"/> Metres
<input type="button" value="Distance"/>	<input type="button" value="Reset"/>
For the 1st station, the Radio Horizon is <input type="text"/> away.	
For the 2nd station, the Radio Horizon is <input type="text"/> away.	
The total line of sight distance is <input type="text"/> <input checked="" type="radio"/> Miles <input type="radio"/> Km.	

You need to know the antenna heights in either feet or meters ASL (above sea level). [Note: Be sure to select the units for both input and output BEFORE clicking on the "Distance" button to do the calculations.]