



Creating an Off-Line Map for Use with Vision™ MX280001A Software, and the Mobile InterferenceHunter™ MX280007A

Introduction

Anritsu instruments and PC software applications often use digital maps to display measurement results or RF signal strength at a specific geographic location. Digital maps must be downloaded from developer web sites such as Google Maps or Map Puzzle. Maps may need to be downloaded before traveling to the area where measurements will be made. Anritsu software applications that require digital maps include:

- Vision Monitor/Vision Locate/Coverage Mapping (Options 400/401/486 respectively)
- Mobile InterferenceHunter (MIH) MX280007A

For off-line mapping applications, Anritsu uses tiled pictures to create maps. Once created, the map can be zoomed in/out and moved side-to-side using a mouse pointer. To use the map for positioning and geolocation applications, the upper/lower and left/right corners of the map must be referenced by their corresponding GPS coordinates.

The purpose of the application note is to detail the procedure for creating these off-line maps. While there are several open source options for tile map construction, this application note will be using Map Puzzle to detail the method for incorporating these maps into the Anritsu software application. Map Puzzle is an open source mapping program that can be downloaded from the Internet free of charge.

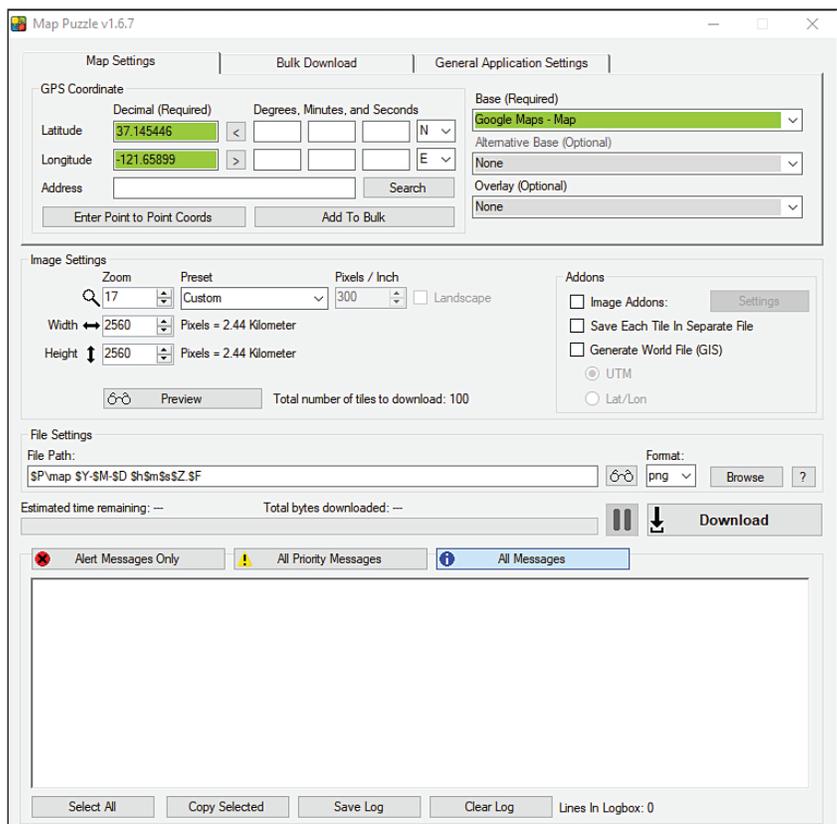


Figure 1. Map Puzzle Interface

Creating a Map – Know The Area of Interest

The first step for creating a map is to know the area of interest. This can be determined by using the following rule of thumb:

- For interference hunting, first consider the area which covers every reported incident of interference. For example, if an LMR interference is suspected, then place a pin on the map of all locations where users are reporting interference on that channel.
- For Spectrum Monitoring, choose an approximate area which encompasses the entire Remote Spectrum Monitoring network.

Using Google Earth, we can better visualize our area of interest as seen below:



In the above screenshot, create a map that extends 1 km or more to the North, South, East, and West of the primary cluster of reported interference locations. This will allow the driver to better navigate and take measurements on all sides of the possible interference source when performing an interference hunting drive. This map should be extended, and the search area expanded if there are any suspicions that the interference source is outside of the cluster of reported interference location. Note the coordinates of the center of the area of interest to use when downloading an offline map using Map Puzzle.

Using Map Puzzle

Execute the Map Puzzle application and populate the latitude and longitude information. A copy of the Map Puzzle interface is shown in Figure 1. The boxes highlighted in green have already been populated with coordinates for Morgan Hill, California. For the “Base” information (upper right in Figure 1), select the type of map desired. In this instance, Google Maps is selected.

To confirm that the coordinates entered are correct, click on the “Preview” button to view the map that will be generated. Figure 2 shows the map created by our Morgan Hill coordinates.

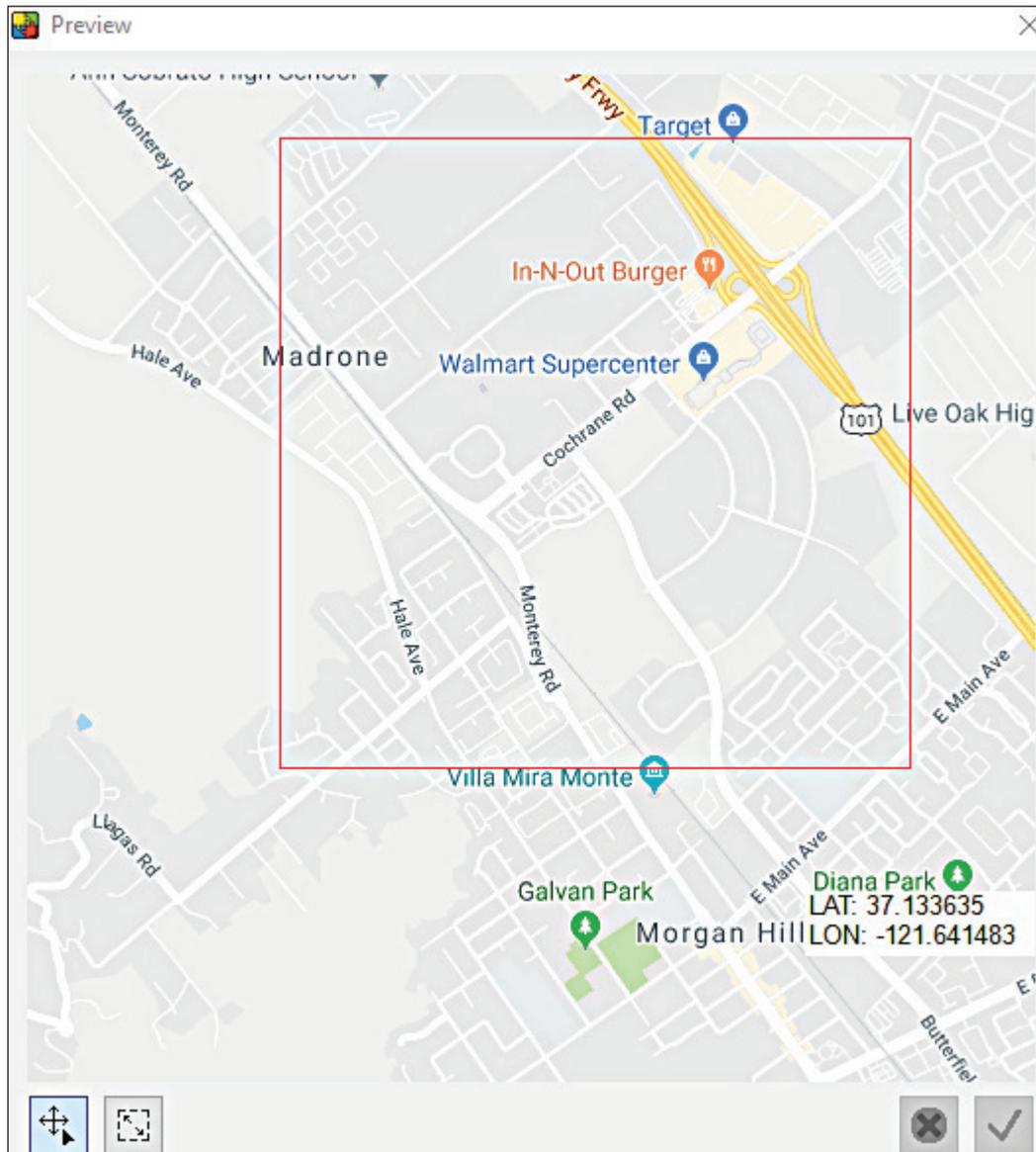


Figure 2. Map Preview Created Using Specified Coordinates

Users can also adjust the width/height parameters in Map Puzzle to increase or decrease the map coverage. Subsequent previews can be done to view the updated coverage area. Another option is to vary the number of tiles used for the map. This controls the zoom levels available once the map is constructed.

To create the map, click the **DOWNLOAD** button. By default, the map is created in the same directory as the Map Puzzle application.

In the Map Puzzle message window, you will see the progress report scroll as the map is constructed. At the top of the window, copy the listing of the six GPS coordinates (as shown in Figure 3). This is done by highlighting the six coordinate lines and typing <CTRL> C (for copy).

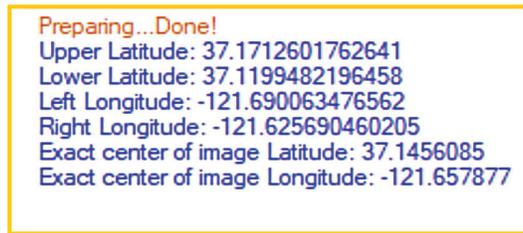


Figure 3. GPS Coordinates Created After Downloading a Map

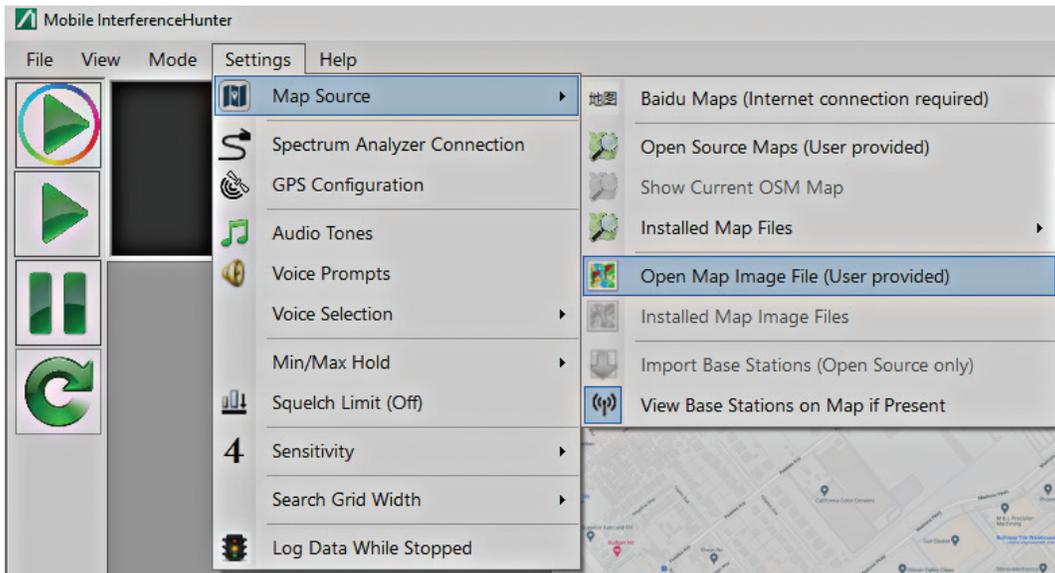


Figure 4. Importing Offline Map in Mobile InterferenceHunter Application

Figure 5 shows the pop-up window that appears once the selection in Figure 4 is made. Simply click on the **PASTE** button to import the copied coordinates (Figure 5, illustration on the left). The coordinates previously copied from the Map Puzzle interface will appear. This is shown in Figure 5 (right).

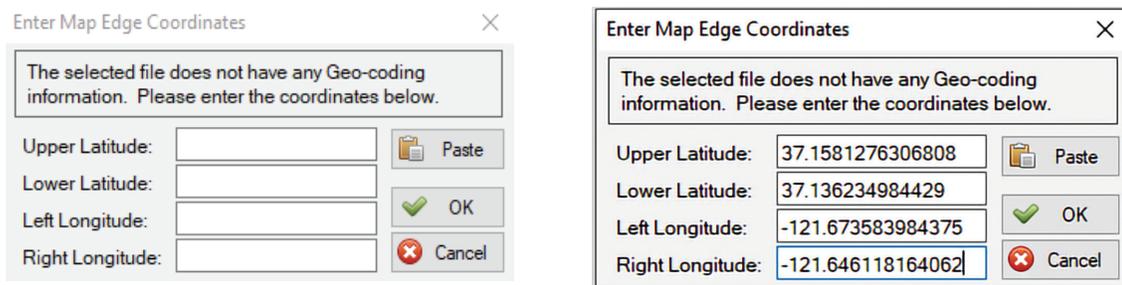


Figure 5. Window Where GPS Coordinates are Copied. The Picture on the Right Shows the Panel Populated with Coordinates.

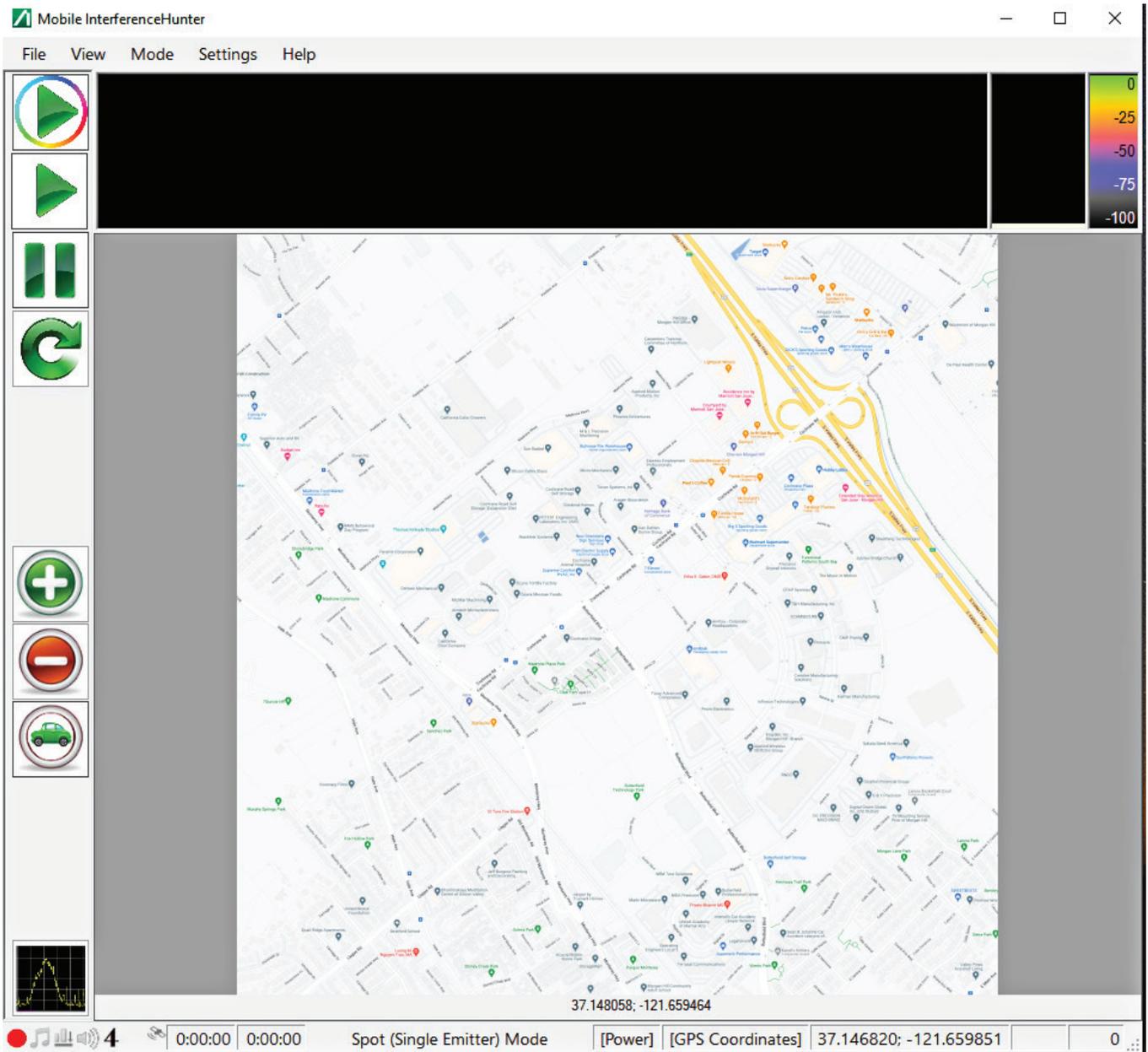


Figure 6. Loaded Map Once GPS Coordinates are Entered

Conclusion

Appending the GPS coordinates of an off-line map is a one-time procedure. Once the map is constructed, the GPS coordinates will be embedded into the map file and used each time the map is opened.

When using Map Puzzle, it is imperative to copy over the correct coordinates when each map download is done. To avoid confusion, clear the message window in Map Puzzle after each download once coordinates have been copied. Users can also verify that the coordinates for the map are correct by "mousing-over" the four corners of the map in the software application. These coordinates should closely match the coordinates entered into Map Puzzle.

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List Revision Date: 20230901



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11410-01132, Rev. B Printed in United States 2023-09
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