

Reference Info for Locus Pro Mapping System (April 2016)

QAP Robert B. Denny

Maricopa County Sheriff's Office Air Support Division

r_denny@mcs.maricopa.gov 480-396-9700 (o) 480-707-8128 (c)

Required Apps (Google Store) - Install These First:

- **Locus Map Pro - Outdoor GPS** (<https://play.google.com/store/apps/details?id=menion.android.locus.pro>)
- **File Manager HD** (<https://play.google.com/store/apps/details?id=com.rhmssoft.fm.hd>)

To get started (it's best if you are on a fast WiFi!):

1. Go to <http://solo.dc3.com/avtablet> and work through the steps on the page reachable via **Click Here for New Tablet Setup** (link at the bottom of the page). This will get the tablet into a good starting condition including zillions of Maricopa County waypoints and enable some useful maps for *online* access. Now download the *offline* maps you want from the main page. This will take considerable time even with a fast internet connection if you want them all!
2. Watch the various videos that you can reach from the above web page. These display nice on your tablet full screen and HD.
3. Plan to explore this app. There is a ton of capability here. I've provided you with a jump start including an initial settings configuration (there are a million settings), over 600 waypoints in Maricopa County, A variety of offline map imagery for Maricopa county, and a support website that at least somewhat makes it easy for non-technical; people to load up and use this fabulous tool.

Suggestions:

1. Go back to [my support site](#) periodically and look for new/updated maps and waypoint sets. This means you have to keep track of what you've loaded and updated by date. I can't do that. It's harmless to re-download a map or waypoint set, though, so when in doubt do it. **Everything after April 2016 is "new" immediately after initializing the system**. So once you initialize it, go through all of the maps and waypoint sets and load up the ones with a date after 4/20/16, Then make note of today's date. Next time you come back, grab anything that shows a later date, then write that date down, etc.
2. Take your tablet with you in the car, on the trail, on your bike, wherever. Record tracks from the moment you leave the office or house, then stop recording and save when you stop traveling. Use the default date/time naming for the tracks. Keep ALL of them. This will get you into the habit of using it. You can leave it in your pack etc. with the screen off all day while recording a track. You can store tens of thousands of tracks on your tablet, they are small. **Note: Use the triple-dot menu on a saved track to allow sharing via email. If you have cell service and 4G hot spot, you can mail a track to a (e.g.) search coordinator in KMZ or GPX format from within Locus!**
3. Practice creating waypoints from various coordinate formats. The videos show you how. Get this right before you are in the heat of battle or in a training exercise where the pressure is on. It is really easy to get fouled up when you're unfamiliar with using this software. There is a video showing how to input various formats and to do instant conversion between formats.
4. Learn how to download *offline* maps yourself using the tools that are included in Locus. This way you can create your own offline maps for later use. Hint: in the list of available online maps, use the triple-dot menu next to the online map from which you want do download.

Notes

- If you are using *online* maps (with internet service through WiFi) all of the map imagery that comes in while you are using this will be stored on your system and will be available thereafter even when there is no internet service. I have added online map providers for Google streets, satellite with streets ("hybrid") and terrain, Trimble MyTopo (excellent, maybe the very best), and US Forest Service topo (via the CalTopo service).
- There is a tool inside Locus for downloading offline maps that you can use when you don't have internet service. While using an online map, in the section where you select which map is active, touch the triple dot on the right next to the map name in the list. Then select download. Figure it out from there!
- The File Manager HD app is like the **File** Explorer on Windows (not the Internet Explorer browser) or the Finder on the Mac. It can be used to move and copy files around on the tablet as well as back and forth with DropBox, Google Drive, and Windows computers via file sharing.

Supporting the Mapping System

There's no way I can provide a "manual" on how to create waypoint sets and on-board/offline maps. Instead I'll try to provide you with the "nuggets" you need. No pictures here, you're just going to have to do this and figure it out. What I'm providing is enough to get you going, and if you run into a snag, feel free to call, but be aware I cannot provide touch by touch instructions.

Creating and Importing Waypoint Sets for Locus

Locus will import waypoints sets from Garmin GPX files and also Google Earth KML/KMZ files. The latter is the best way to make waypoints. Locus will import KMZ files which contain the icons for the waypoints and those icons will show.

1. Create them in Google earth and put them under a branch of the Places tree of GE (including the icons you want, I have provided GE icons within Locus as part of the initial setup).
2. Then when you have the ones you want right click on the parent branch below which your places/waypoints are and select **Save Place As...** to save the waypoint set as a file. Save **it as kmz (*.kmz) this is vital**. The resulting KMZ file contains the waypoint set for Locus.
3. Now mail the KMZ file to the tablet, or put it in a DropBox folder (you need the DropBox app on the tablet for this). In any case touching the KMZ file attachment or in the DropBox will start Locus and you'll be right in the exact same waypoint import process you already used to update waypoint sets when you first started using the system! Note that if you have Google Earth installed on the tablet, it will ask you if you want the KMZ to open in Locus or Google Earth. Choose Locus, one time.

Exporting Waypoint Sets from Locus to Google Earth etc.

I'm not going to give step by step instructions here. In Locus you can, of course, create waypoints, and they need should probably go into folder(s) other than those containing the "standard" ones. Try to figure out how to export Points sets. Use KMZ as the format. The KMZ files go into Locus/Export folder on the tablet. You can use File Manager HD to move it to DropBox, or you can attach the KMZ to a mail message. This KMZ can be read into Google Earth and become part of your GE Places. **PS:** You can export Tracks as KMZ and show them on Google Earth too! Note the "share after export" for a fast way to get export data onto a DropBox or Google Drive without copying files with FileManager.

The above Import/Export info is only the tiniest part of what can be done with other formats and file transfer methods.

Creating Maps - Basic

This is really going to be high level. Hopefully once you dig into this you'll see why. The basic concepts:

- Locus uses maps in files of type **.sqlite** (databases) containing "tiles" of image data that form the map image on the screen at various magnifications. This is all magic. The map of a particular type (Google Street, for example) for a particular area can be contained in one giant (sometimes a couple of gigabytes) **.sqlite** file. Both of the tools described below produce Locus/RMaps SQLITE files.
- To allow Locus to "see" new offline maps, copy the **.sqlite** files into **/Locus/Maps** on the tablet (using **File Manager HD**, connected to a DropBox or whatever). You can organize them into multiple folders under Locus (not just "Maps") but you then need to be in the Maps selector, personal tab, then select Add Maps from the triple-dot menu in Locus and point Locus to the additional folders (**/Locus/Whatever**) containing your maps.
- After copying maps on to the tablet, exit and restart Locus so it can see the maps. Then go into the Maps screen, Personal tab, and use the triple-dot menu and select Re-initialize map. This assures that all of Locus' info is in the **.sqlite** database. This is required if adjacent/overlapping maps are to tile together seamlessly. Once you have reinitialized the map(s) you might want to copy them back off the tablet and put them somewhere for others to use. They will not have to go through this re-initialize hassle.

Creating Maps - Tools

The two main tools for creating maps are Mobile Atlas Creator and MapC2Mapc. They are very different tools, but both of them can output the Locus/RMaps SQLITE format tile database maps for Locus. Here are the web sites for these tools:

Mobile Atlas Creator (MOBAC): <http://mobac.sourceforge.net/>

MapC2MapC: <http://www.the-thorns.org.uk/mapping/>

Both are surprisingly powerful.

MOBAC

MOBAC reaches out to web based map sources of many types and allows you to select an area to cover and the zoom-level (level of close-in detail) you want, then download it and make a **.sqlite** map. The more detail you want of an area, the more that needs to be downloaded, and of course the larger the resulting map **.sqlite** file will be. For example, the Google Hybrid (satellite/street) maps I made for Maricopa County total up to be almost 5 Gb. When producing a map in MOBAC, select RMaps/SQLITE as the output type. If you play with this and play with the results you'll eventually get it. The MOBAC profiles are useful for recreating a map if the source imagery is updated later. MOBAC docs show how to create control files for custom map sources, so if you know of a tile data source that isn't supported in MOBAC, you can make your own control file. This can get tricky, but the info is out there. I have a few... contact me.

MapC2MapC

This program's main use is to convert digital and paper maps into usable geo-referenced Locus **.sqlite** maps. Since digital maps can come in all sorts of projections and datums, MapC2MapC contains a huge database of these mapping formats and can convert to the format needed by Locus. It also has its own geo-referencing tool. With this, you can open a digital JPEG/PNG/BMP image and place reference points in Lat/Long or UTM. Then MapC2MapC will "warp" the digital image to put it on the Mercator/WGS84 standard before slicing it up into tiles, etc.

This is only the tiniest peek at MapC2MapC's capabilities. The point of this tool is to allow you to take imagery from a zillion sources and turn it into scaled and geo-referenced maps for Locus. For example I had our County GIS people produce digital georeferenced maps (GEO-TIFF) of our huge and rugged county wilderness/mountain parks. These include detailed trail maps with mile markers. I took the GEO-TIFF and ran them through MapC2 MapC to get the exact same county park maps, legend and all, on Locus. Now we can fly these trails in pitch dark on NVG while looking for someone with a feeble light.

Mapping Support Web Site

I created the mapping support site to ease the task of initializing and supporting 15 tablets for our Air Support division. The secret sauce that allows the bulk installation of waypoints, the pre-setting of all of the configuration options, and the "one touch" installation of maps without requiring users to hand-copy the map files (.sqlite) into folders is a Locus feature called Locus Actions. Combined with a set of active web content scripts on the server end, the process of initial setup as well as distribution of new and updated waypoint sets is mostly automatic.

If you're interested in doing something like this, contact me for info. You will need substantial skills with web site design though, probably a bit more than the GoDaddy new user level.

####