

Basecamp, OpenStreetMaps, Waypoints, & BMW Navigator VI

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Clifford Musante - Background

- Retired
- Technology Executive from Silicon Valley
- Rode Patagonia: 2013
- Rode across USA: 2016
- Riding across Europe, Asia: July 10, 2019 to Nov 7, 2019 (120 Days)
- 7 months of preparation

What problem will we learn to solve today

- The problem statement:
 - How to manage massive amounts of data, efficiently, quickly, across 20 countries. Using this data to navigate the globe, using free maps, and free tools.
- Related Components: OSM maps, Basecamp, waypoints, POI's, Data, Backups
- Related S/W: Garmin Express, Basecamp, Windows Maps, Javawa GMTK, Javawa Device Manager, RTWTool, POI Loader



Data (Organizing and preparing for use)

- Types of Data
 - Waypoints
 - POI
 - Lists, Folders
 - Routes
 - Tracks
- Organizing the data for
 - Deployment to GPS
 - Easy access
 - Less confusion
- Managing Data
 - Backups

Organizing Data in Basecamp (#1)

- Organizing Containers
- Collection
 - Folder
 - List
 - Tracks (Historical record of where you've been, automatically gen'd)
 - Waypoints (Represent Start point, end point, stops along the way)
 - Shaping points (Are waypoints, which don't show up)
 - Routes (File that contains waypoints, shaping points)

Organizing Data in Basecamp (#2)

- Organizing Principles within Basecamp
 - Ensure that it is easy to find routes, waypoints, etc
 - Ensure that the same point does not exist with similar names in different lists
 - Understand that subordinate lists can be seen from the hierarchy above
- Understanding Waypoints and POIs
 - Waypoints
 - Usually used as intermediate points within a route
 - Usually single, logical points, used to force the route, or designate a destination
 - Each waypoint is individually significant
 - Points of Interest
 - Each POI type is separately organized (Placed on a list that can be exported separately)
 - There can be hundreds or thousands of the same type of POI
 - POIs are managed in basecamp just like waypoints, but they must be exported as a GPX file to be significant or relevant
 - All POIs are built into a series of GPX files, and for each GPX file, there can be an audio file, and an Icon
 - Icons related to POI are separately sized and attributed from Waypoint icons, which are selected from the palate within Basecamp, or within the GPS
 - Points of Interest can have proximity sensor set, to play audio file when approaching POI

Organizing Data in Basecamp – Examples (#3)

- BMW Dealers (Folder)
 - Dealers (List)
- BDR (Folder)
 - AZ (List)
 - CO (List)
 - ID (List)
 - MA (List)
- States (Folder)
 - NC (Folder)
 - NC (List)
 - SC (Folder)
 - SC (List)
- Ride Log (Folder)
 - 2018 (List)
 - Ride Log 2019-0328
 - Ride Log 2019-0329
 - Ride Log 2019-0401

Numerous dealers
50 states
POI candidate

My places
Organized by BDR
Waypoint candidate

Places I ride/rode
Organized by state
Waypoint candidate

Places I ride/rode
Organized by state
Waypoint candidate

Organizing Data in Basecamp (#4)

- Object Naming
 - Use names that are descriptive, include differentiator (such as city name or date)
 - Good naming standards make it easier to find, organize objects
- Object Type
 - Waypoint
 - POI
 - Track
 - Route
- Object Icon
 - Use custom icons
- Object Location
 - In a list, in a folder, multiple lists
- Object Persistence
 - Is the same object included/visible in multiple lists?

Examine data in Basecamp

Library

- My Collection
 - All
 - BDR
 - Beer
 - BMW Dealers
 - California
 - Canada
 - Misc States
 - Patagonia
 - Patagonia Ride Logs
 - POI
 - Rallys
 - Ride Logs
 - Temp
 - USA
 - World Tour
 - Asia
 - Europe
 - US
 - US
 - Asia
 - Selected Data from Internal Storage
 - Selected Data from Internal Storage 2
 - Unlisted Data

POI - BMW Dealers

Library

- My Collection
 - All
 - BDR
 - Beer
 - BMW Dealers
 - California
 - Canada
 - Misc States
 - Patagonia
 - Patagonia Ride Logs
 - POI
 - Rallys
 - Ride Logs
 - 2013
 - 2014
 - 2015
 - 2016
 - 2018
 - 2019
 - Rawhyde BCA
 - Rawhyde Training
 - Sierra Rally
 - Temp
 - USA
 - World Tour

Tracks – Ride Logs

Library

- My Collection
 - All
 - BDR
 - Beer
 - NC Breweries
 - BMW Dealers
 - California
 - Canada
 - Misc States
 - Patagonia
 - Patagonia Ride Logs
 - POI
 - Rallys
 - Ride Logs
 - Temp
 - USA
 - World Tour
 - Selected Data from Internal Storage
 - Selected Data from Internal Storage 2
 - Unlisted Data

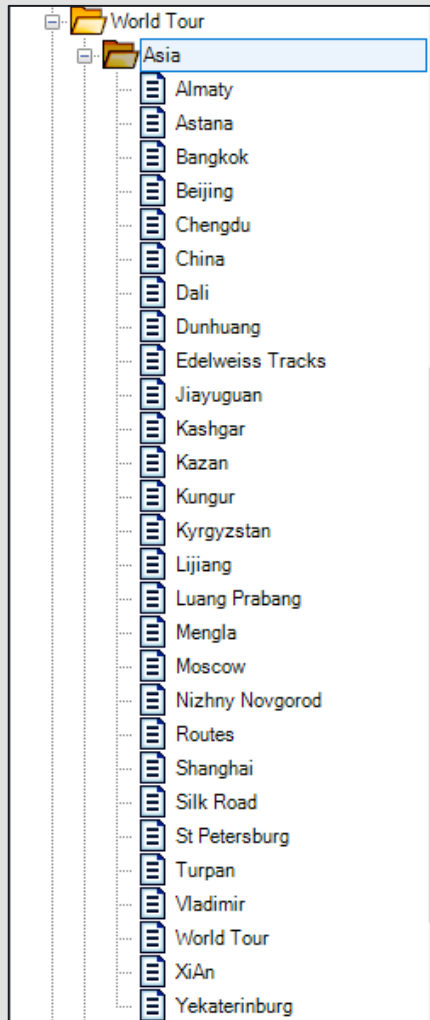
POI – NC Breweries

NC Breweries

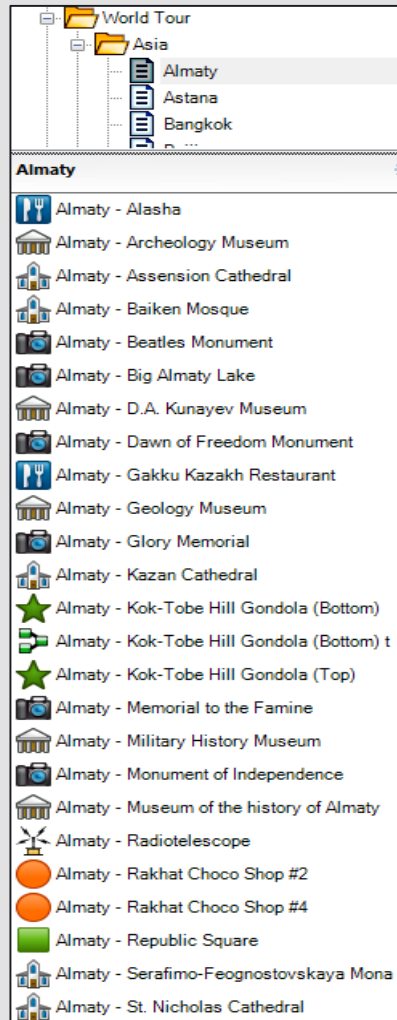
- Appalachian Craft Brewery
- Asheville Brewing Company
- Asheville Pizza & Brewing (pub)
- Asheville Pizza & Brewing (pub)1
- Asheville Pizza and Brewing Co.
- Ass Clown (Brewery)
- Aviator Brewing (tasting room)
- Aviator Brewing Company
- Azalea Coast Brewery
- Big Boss Brewing
- Big Boss Brewing (tasting room)
- Boylan Bridge (pub)
- Boylan Bridge Brewpub
- Broomtail Craft

POI – NC Breweries
Notice special Icon

Examine data in Basecamp



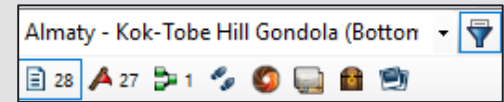
Asia – List of lists



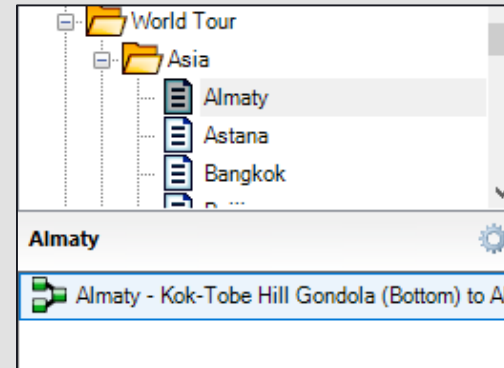
Asia – Selecting list for Almaty (Sorted by name)



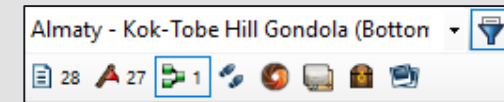
Asia – Selecting list for Almaty (Sorted by type)



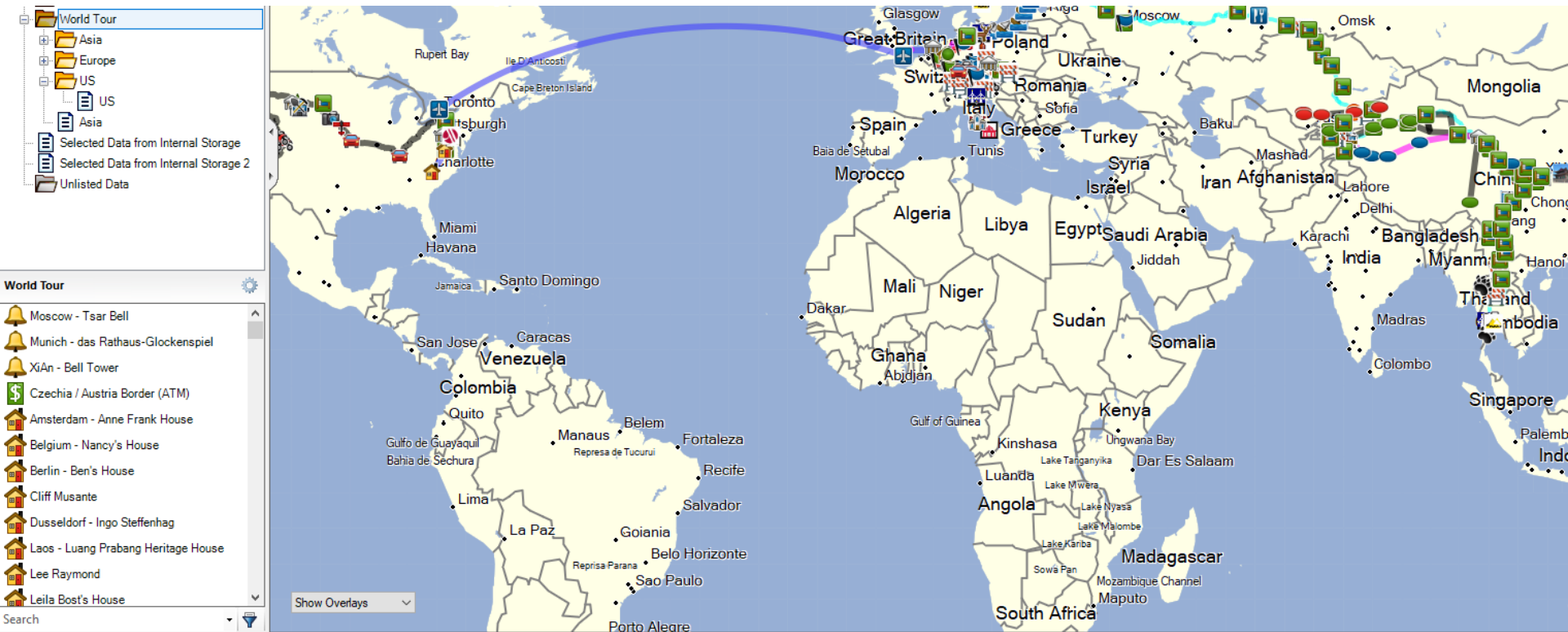
Use filters to select objects



Filters used to select Routes

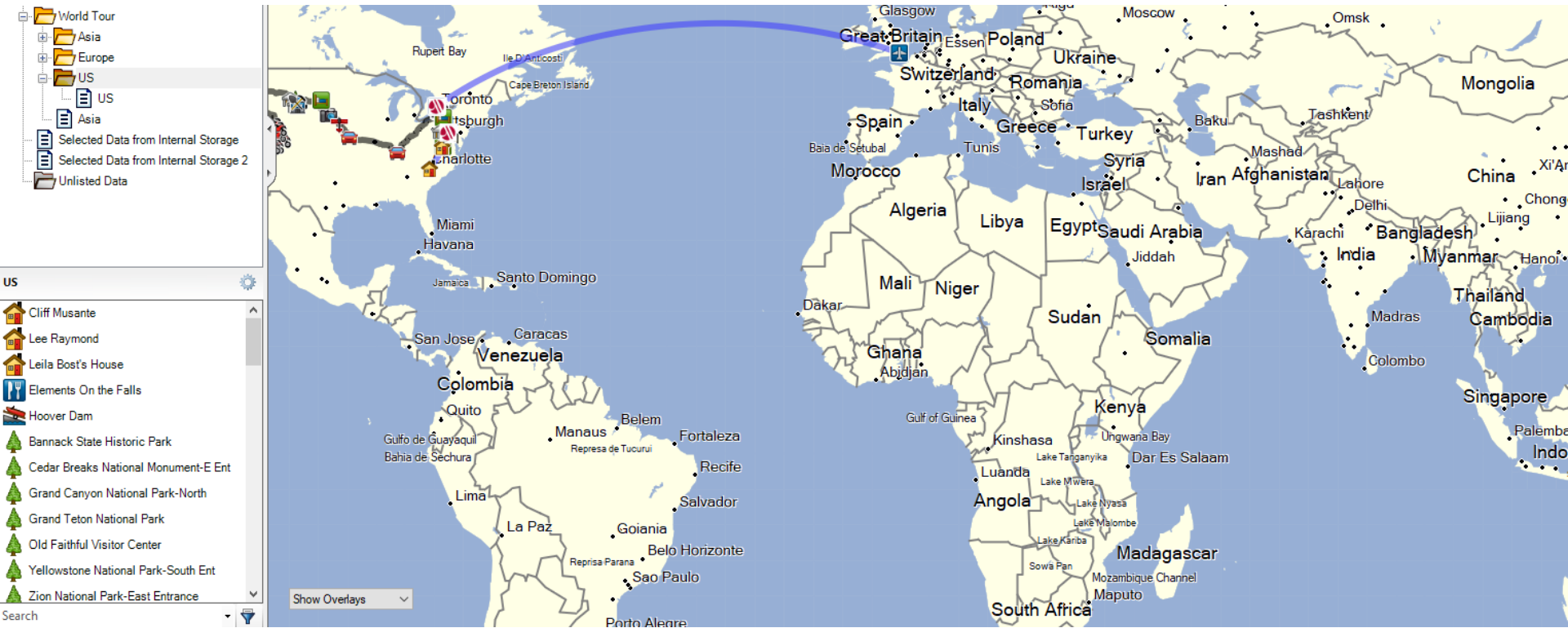


Top Level – World Tour



- Includes all points from US, Europe & Asia

2nd Level - US



- Includes all points in US and Departure/Arrival in UK

2nd Level - Europe



- Includes all points in Europe and Departure/Arrival in UK

2nd Level – Asia



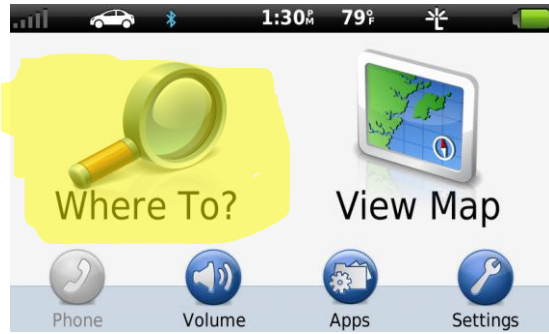
- Includes all points in Asia
- No longer includes Departure/Arrival in UK

Points of Interest (Manage and deploy)

Deploying on GPS

- Directory Location:
- Files to be deployed: GPX file for all points
- File manipulation: GPX file, Audio File, Icon File must be combined into DB
- Audio File: Must have same name as POI file
- Icon: Must be HH x WW x CC, must have same name as other files
- Deployment Tool: SW Tool Name

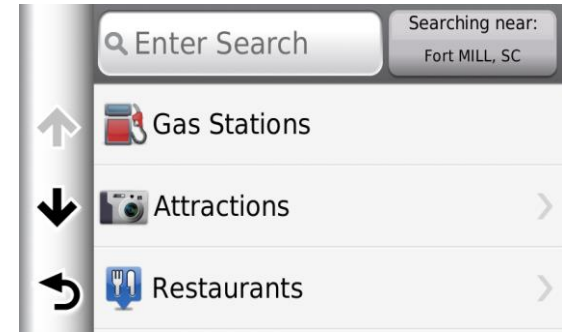
Points of Interest (Look and Feel on the GPS)



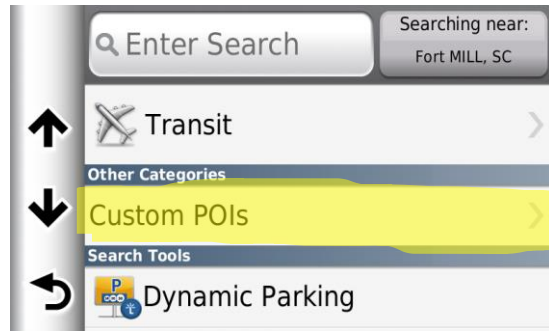
(1)



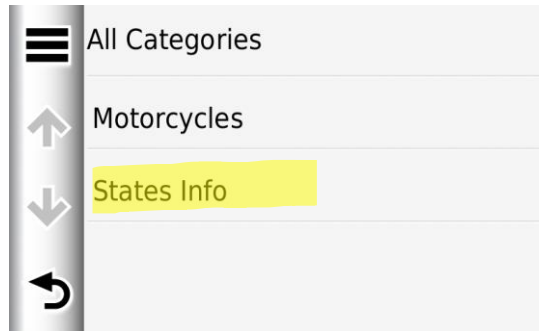
(2)



(3)



(4)



(5)



(6)



Data Management

- Managing Data
 - Backups

Backing up data from basecamp

- Backup of all data
- How to do it
 - Basecamp: [File] -> [Backup] <Enter>
- Where to put it
 - On a storage drive that cannot be corrupted, and is not on same PC as primary

Backing up to local/network drive

Name	Date modified	Type	Size
.recycle	1/31/2016 2:35 PM	File folder	
Backup	11/13/2018 2:19 PM	File folder	
Download	5/18/2019 8:33 AM	File folder	
My Audio	5/21/2018 3:35 PM	File folder	
My Documents	3/25/2019 9:50 AM	File folder	
My Games	3/4/2014 5:07 PM	File folder	
My Icons	11/15/2018 4:00 PM	File folder	
My Pictures	6/5/2019 4:25 PM	File folder	
My PST	6/6/2019 1:45 PM	File folder	
My Video	10/10/2018 1:53 PM	File folder	
Outlook Files	3/16/2019 11:57 AM	File folder	

Name	Date modified	Type	Size
BaseCamp 2018-09-30.Backup	9/30/2018 2:23 PM	BACKUP File	30,5
BaseCamp 2018-10-30.Backup	10/30/2018 10:18 ...	BACKUP File	30,7
BaseCamp 2018-11-24.Backup	11/24/2018 2:01 PM	BACKUP File	31,5
BaseCamp 2018-12-28.Backup	12/28/2018 10:30 ...	BACKUP File	31,5
BaseCamp 2019-03-08.Backup	3/8/2019 12:58 PM	BACKUP File	31,5
BaseCamp 2019-03-27.Backup	3/27/2019 11:21 AM	BACKUP File	31,8
BaseCamp 2019-04-21.Backup	4/21/2019 6:11 PM	BACKUP File	32,5
BaseCamp 2019-05-07.Backup	5/7/2019 7:06 AM	BACKUP File	32,7
BaseCamp 2019-05-08.Backup	5/8/2019 9:34 AM	BACKUP File	32,7
BaseCamp 2019-05-13.Backup	5/13/2019 6:30 AM	BACKUP File	32,7
BaseCamp 2019-05-23.Backup	5/23/2019 9:05 AM	BACKUP File	32,1
BaseCamp 2019-05-28.Backup	5/28/2019 2:29 PM	BACKUP File	32,3
BaseCamp 2019-05-29.Backup	5/29/2019 6:13 PM	BACKUP File	32,4

ne: BaseCamp 2019-06-06.Backup

pe: Backup Files (*.Backup)

- Use consistent backup location
- Allow Basecamp to set/create filename
- Notice that date is embedded into filename
- Take frequent backups, delete unused/unwanted backups periodically

Backing up data from GPS device

- Backup of all data
- How to do it
 - Open Basecamp
 - Attach GPS device to PC
 - GPS objects will appear on LH side of Basecamp
 - No folders in hierarchy of GPS
 - Drag & Drop data (Routes, tracks, Waypoints) to a Basecamp Folder
 - Backup Basecamp according to previous procedure
- Where to put it
 - The objects created on the GPS (Tracks, and perhaps waypoints and routes) get “backed up” to Basecamp Collection, Folder, List
- Cleaning up the GPS
 - Open the GPS and remove “old data”



Maps

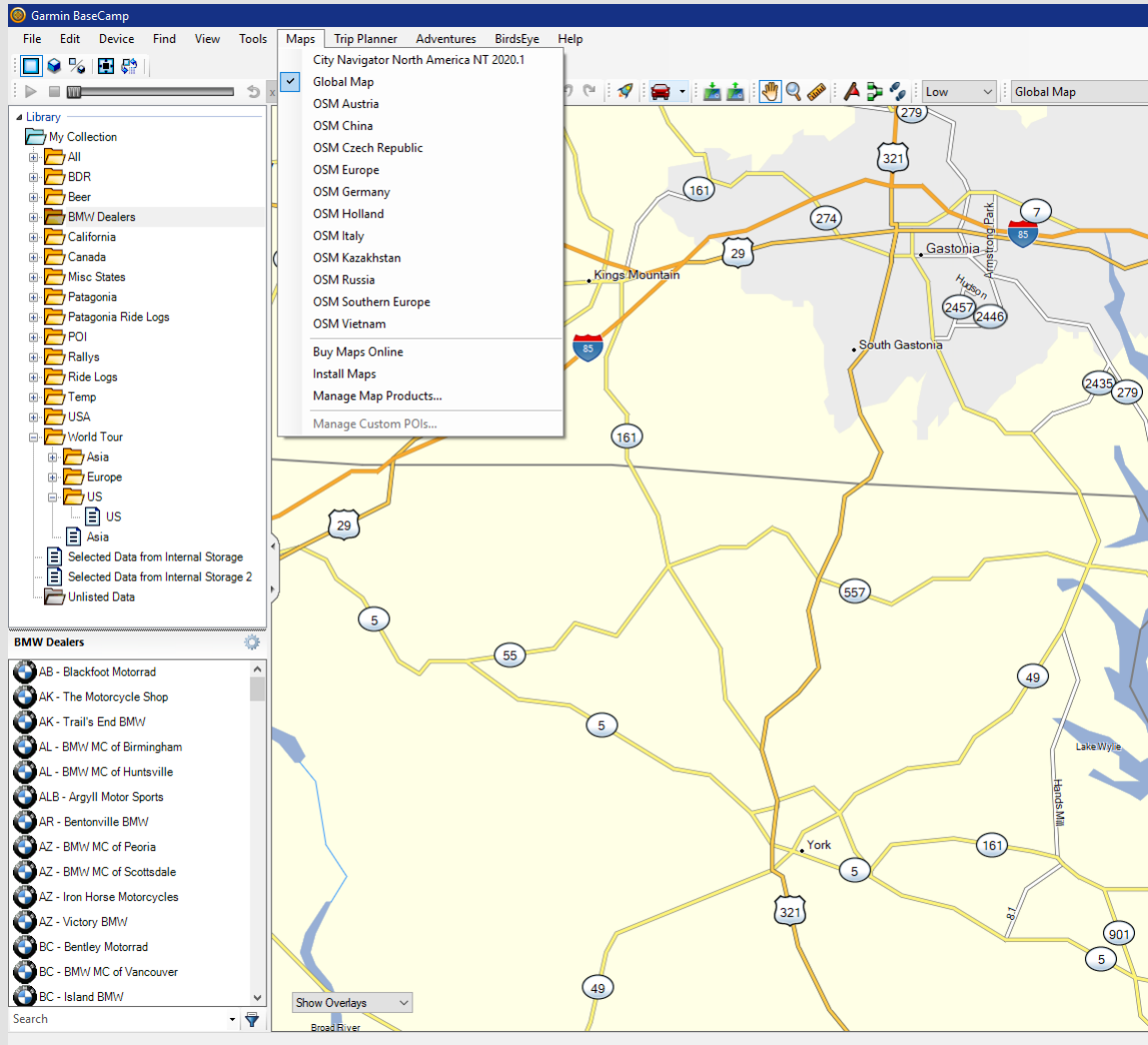
(Load and manage maps in Basecamp)

- Understanding Maps
 - What are they
 - Where to get them
- Understanding file types
 - .EXE (For Basecamp)
 - .IMG (For GPS)
- Accessing and viewing maps
- Setting metadata for maps

Understanding Maps

- Maps can be purchased from Garmin, or downloaded from OpenStreetMaps
- A single “Map”, must include file for PC/Basecamp, IMG file for GPS
- Basecamp can include numerous maps, which you can enable/disable
- A GPS device can include several maps at any given time
 - These maps can be enabled, or disabled to adjust “load time” of the GPS (or size limits)
 - Maps need to be deployed
 - To Basecamp
 - To the GPS device
 - Failure to deploy the “same map” to both devices causes confusion
- Maps downloaded from OpenStreetMaps
 - These maps might cause a conflict when installed
 - There are two methods to create/download a map
 - Preset/Preselected areas (Product ID is set correctly, IMG file = gmapsupp.img)
 - Manually selected areas (Product ID is 2000, IMG file = gmapsupp.img)

Looking at maps in Basecamp



Garmin.openstreetmap.nl (Map of Russia, Size 1996K)

Free maps for Garmin brand GPS devices

from OpenStreetMap

Site menu

- Home
- [About](#)
- [Forum](#)
- [FAQ](#)
- [Manual](#)
- [Screenshots](#)

Choose your map type:

- Generic Routable
- Generic Routable (new style)
- Routable Bicycle (Openfietsmap Lite)
- Generic Nautical (non-routable)
- Transparent overlay with elevation contours

Choose a predefined country:

Africa | Asia | Europe | North America | Oceania | South America


Perhaps you'd like to add some additional tiles?


Enable manual tile selection: then use the map below to add and remove tiles to the selection. [Reset Selection](#)

Request your map or download it directly:

Email address: [Build my map](#)

Paypal: [Donate](#)

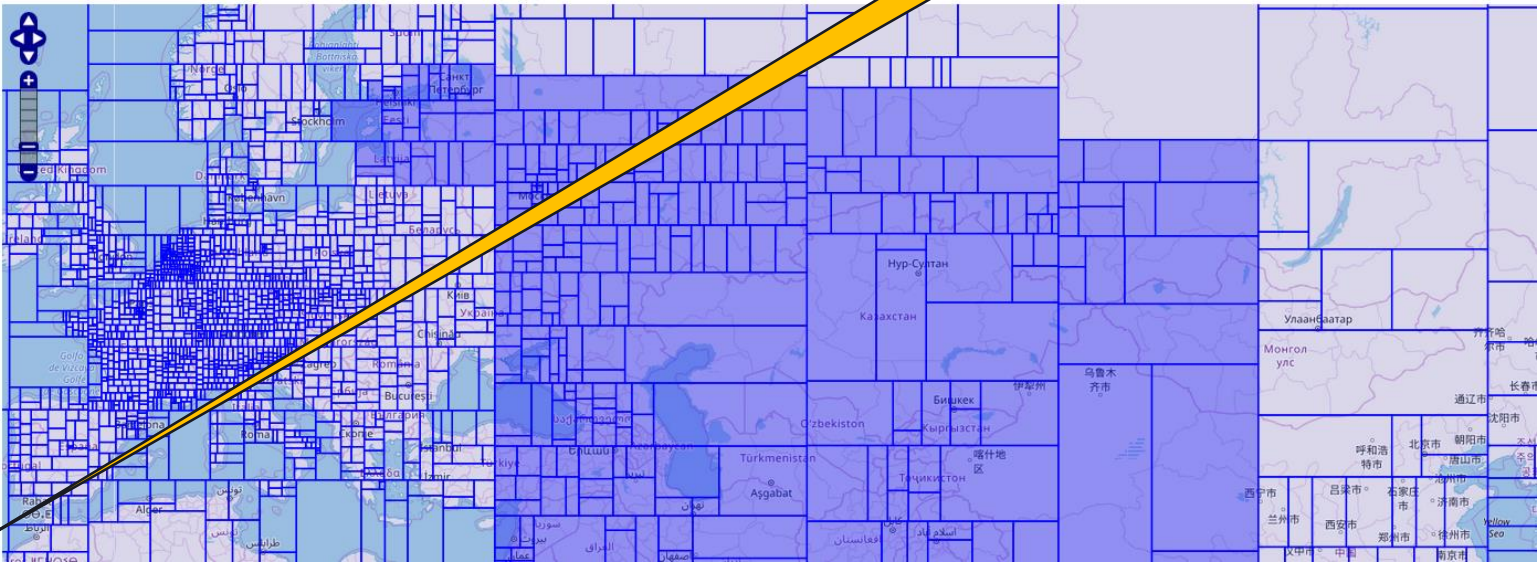
Bitcoin: 

Bitcoin Cash: 

Tools for mapmakers

- [Boundaries](#)
- [Sea polygons](#)

Selected tiles: 1996 MB



Garmin.openstreetmap.nl (Map of Russia, Size 2362K)

Free maps for Garmin brand GPS devices

from OpenStreetMap

Site menu

- [Home](#)
- [About](#)
- [Forum](#)
- [F.A.Q.](#)
- [Manual](#)
- [Screenshots](#)


Other Garmin maps

- [OpenStreetMap](#)
- [OpenFietsMap](#)


Paypal:

[Donate](#)

Bitcoin:



Bitcoin Cash:



Tools for mapmakers

- [Boundaries](#)
- [Sea polygons](#)

Selected tiles: **2362 MB**

Choose your map type:

- Generic Routable
- Generic Routable (new style)
- Routable Bicycle (Openfietsmap Lite)
- Generic Nautical (non-routable)
- Transparent overlay with elevation contours

Choose a predefined country:

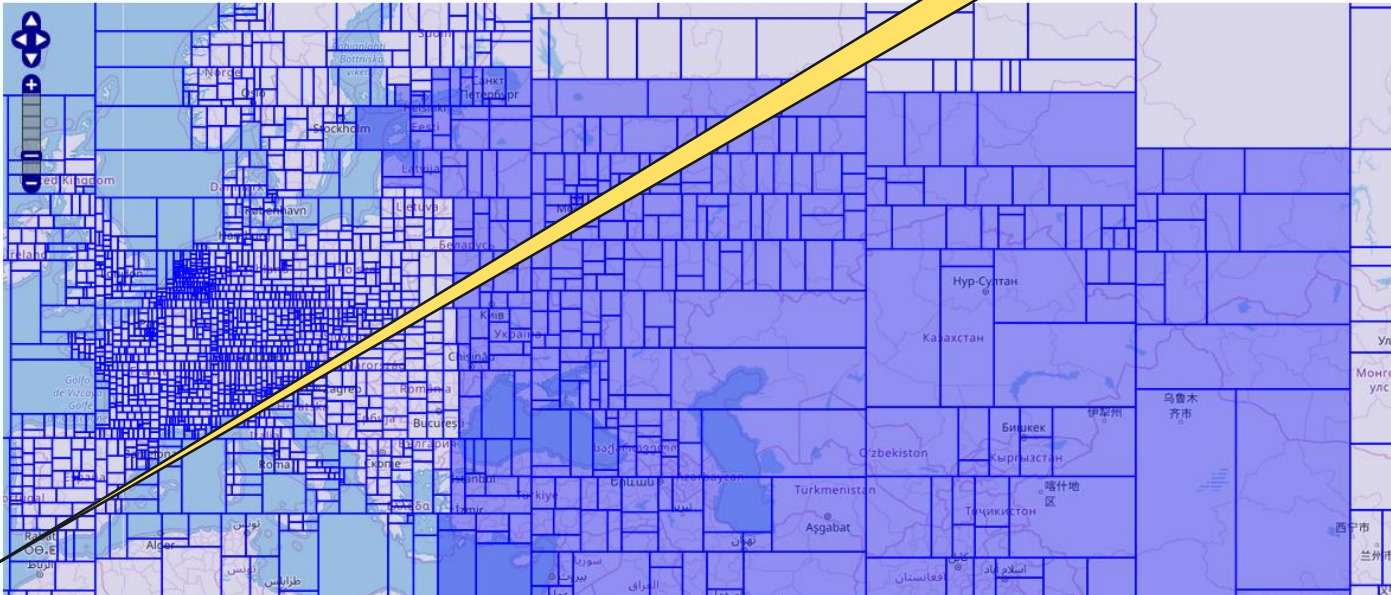
Africa | Asia | Europe | North America | Oceania | South America

Perhaps you'd like to add some additional tiles?

Enable manual tile selection: , then use the map below to add and remove tiles to the selection. [Reset Selection](#)

Request your map or download it directly:

Email address: [Build my map](#)



Notice the file size is **larger than 2GB**

Garmin.openstreetmap.nl (Rules)

- Filesize must be less than 2000 Mb (2 GB)
- Map must be a pre-defined country, or a manually selected set of tiles
- Be sure to select Generic-Routable-New-Style
 - Provides best overlays
 - Greatest level of detail based on zoom level

Installing Maps into Basecamp

All custom maps from OSM come with a generic family ID of 2000, all others have unique family ID values
You cannot install multiple maps into Basecamp with the same family ID, so you must alter the Family ID.

The maps are installed to

C:\Garmin\maps\OSM XXXX\

Map settings (As installed on my computer)

Name on Computer	Name on Device	Folder Name	Family ID
OSM Southern Europe	OSM Southern Europe	OSM Southern Europe	2000
OSM Russia	OSM Russia	OSM Russia	2010
OSM China	OSM China	OSM China	2020
OSM Kazakhstan	OSM Kazakhstan	OSM Kazakhstan	2030
OSM Vietnam	OSM Vietnam	OSM Vietnam	2040
OSM Europe	OSM Europe	OSM Europe	2050
OSM Holland	OSM Holland	OSM Holland	2060
OSM Czech Republic	OSM Czech Republic	OSM Czech Republic	2070
OSM Germany	OSM Germany	OSM Germany	23276
OSM Austria	OSM Austria	OSM Austria	24040
OSM Italy	OSM Italy	OSM Italy	24380

Name on Computer	Name on Device	Folder Name	Family ID
OSM Germany	germany	OSM generic routable new(DEU)	24276
OSM Russia	russia	OSM generic routable new(DEU)	24643
OSM Italy	italy	OSM generic routable new(DEU)	24380
OSM Great Britain	greatbritain	OSM generic routable new(DEU)	24826
OSM China	china	OSM generic routable new(DEU)	24156
OSM Austria	austria	OSM generic routable new(DEU)	24040
OSM Czech Republic	czech	OSM generic routable new(DEU)	24203
OSM Netherlands	netherland	OSM generic routable new(DEU)	24528
OSM Canada (Ontario)	canada	OSM generic routable new(DEU)	24989

Viewing all maps and their metadata

JaVaWa GMTK 4.1

Backup Restore Move Remove Info Repair Codes Extra Help

Installed maps

Name	Size
City Navigator North America NT 2020.1	3.48 GiB
OSM Austria	538.49 MiB
OSM Belgium	296.12 MiB
OSM Canada (Ontario)	452.62 MiB
OSM China	766.99 MiB
OSM Czech Republic	485.19 MiB
OSM Estonia	82.72 MiB
OSM Finland	361.01 MiB
OSM Germany	2.20 GiB
OSM Great Britain	789.01 MiB
OSM Italy	966.84 MiB
OSM Kazakhstan	242.38 MiB
OSM Kyrgyzstan	66.75 MiB
OSM Laos	117.93 MiB
OSM Liechtenstein	9.80 MiB
OSM Netherlands	466.23 MiB
OSM Russia	1.76 GiB
OSM Slovakia	226.40 MiB
OSM South Carolina	156.70 MiB
OSM Switzerland	310.60 MiB
OSM Thailand	269.35 MiB

Use Ctrl-click to (de)select individual maps.

Select all Select none

GPS-EXPERT.NL

Sponsored by:
GPS-Expert.nl

For all your
GPS advice and
GPS knowledge

JaVaWa GMTK 4.1

Original

Family ID (FID) 24040 24040

Name on computer OSM Austria OSM generic routable new(AUT_07-05-2019)

Name on device austria OSM generic routable new(AUT)

Folder name OSM generic routable new(AUT)

Modify Cancel Restore original

JaVaWa GMTK 4.1

Original

Family ID (FID) 24056 24056

Name on computer OSM Belgium OSM generic routable new(BEL_07-05-2019)

Name on device belgium OSM generic routable new(BEL)

Folder name OSM generic routable new(BEL)

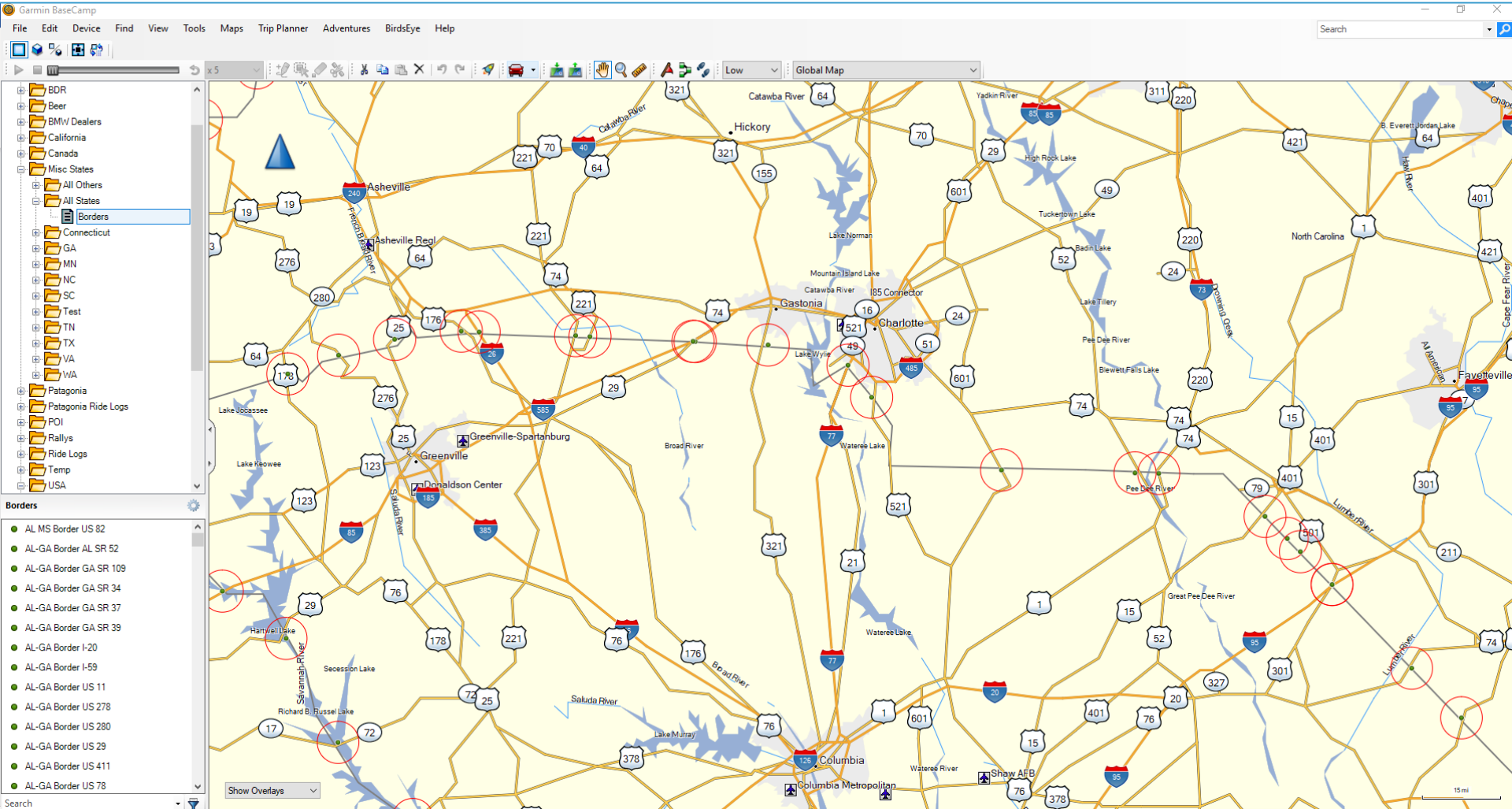
Modify Cancel Restore original

This PC > WINDOWS (C:) > Garmin > Maps

OSM generic routable new(AUT)	6/6/2019 1:54 PM	File folder
OSM generic routable new(BEL)	6/6/2019 1:54 PM	File folder

Notice that most maps are color-coded orange (Showing an error that map segments are included in multiple maps)

Looking at Points of Interest in Basecamp



• Notice how all of the borders between states are encircled? (Proximity is set)

What did we observe

- State border crossings are PointsOfInterest
- Each POI is easily visible
- Every State Line POI is saved in a single list/folder
- Each POI has
 - Proximity set at 3.0 mi
 - The Same ICON
 - An audible alert at the perimeter



Tools and Metadata (Garmin toolset is limited) (Free tools are available)

- Why are tools needed
- Where and how to get tools
- Understanding the tools
 - Javawa GMTK
 - RTW Tool
 - Javawa Device Manager
 - POI Loader

Map name (before and after)


(Set filename, map name, map set name)

Maps on SD card: E-disk (E:\)

File name	Contains maps			Map set name
austria.img 457 MiB	Austria ID 6365			MTB-Austria
belgium.img 290 MiB	mtb_be_09.05.2019 ID 6375			mtb_be_09.05.2019
canada.img 1.6 GiB	mtb_ca_10.05.2019 ID 6537			mtb_ca_10.05.2019
china.img 609 MiB	mtb_cn_05.05.2019_UC_ENG ID 6555			mtb_cn_05.05.2019
czech.img 433 MiB	mtb_cz_09.05.2019 ID 6381			mtb_cz_09.05.2019
estonia.img 57 MiB	mtb_ee_09.05.2019 ID 6385			mtb_ee_09.05.2019
finland.img 364 MiB	mtb_fi_09.05.2019 ID 6389			mtb_fi_09.05.2019
germany.img 2.6 GiB	mtb_de_09.05.2019 ID 6371			mtb_de_09.05.2019
greatbr.img 932 MiB	mtb_gb_09.05.2019 ID 6393			mtb_gb_09.05.2019
italy.img 1.1 GiB	mtb_it_09.05.2019 ID 6367			mtb_it_09.05.2019
kazak.img 90 MiB	mtb_kz_10.05.2019_UC_LOCAL ID 6560			mtb_kz_10.05.2019
kyrgstan.img 23 MiB	mtb_kg_10.05.2019_UC_LOCAL ID 6567			mtb_kg_10.05.2019
laos.img 24 MiB	mtb_la_10.05.2019_UC_LOCAL ID 6596			mtb_la_10.05.2019
leichten.img 2 MiB	mtb_li_09.05.2019 ID 6357			mtb_li_09.05.2019
netherla.img 535 MiB	mtb_nl_09.05.2019 ID 6421			mtb_nl_09.05.2019
russia.img 2.1 GiB	mtb_ru_05.05.2019_UC_ENG ID 6580			mtb_ru_05.05.2019
slovakia.img 139 MiB	mtb_sk_09.05.2019 ID 6409			mtb_sk_09.05.2019
swiss.img 268 MiB	mtb_ch_09.05.2019 ID 6327			mtb_ch_09.05.2019
thailand.img 230 MiB	mtb_th_10.05.2019_UC_LOCAL ID 6506			mtb_th_10.05.2019

Maps on SD card: E-disk (E:\)

File name	Contains maps			Map set name
austria.img 457 MiB	Austria ID 6365			MTB-Austria
belgium.img 290 MiB	Belgium ID 6375			MTB-Belgium
canada.img 1.6 GiB	Canada ID 6537			MTB-Canada
china.img 609 MiB	China ID 6555			MTB-China
czech.img 433 MiB	Czech Republic ID 6381			MTB-Czech Republic
estonia.img 57 MiB	Estonia ID 6385			MTB-Estonia
finland.img 364 MiB	Finland ID 6389			MTB-Finland
germany.img 2.6 GiB	Germany ID 6371			MTB-Germany
greatbr.img 932 MiB	Great Britain ID 6393			MTB-Great Britain
italy.img 1.1 GiB	Italy ID 6367			MTB-Italy
kazak.img 90 MiB	Kazakhstan ID 6560			MTB-Kazakhstan
kyrgstan.img 23 MiB	Kyrgyzstan ID 6567			MTB-Kyrgyzstan
laos.img 24 MiB	Laos ID 6596			MTB-Laos
leichten.img 2 MiB	Leichtenstein ID 6357			MTB-Leichtenstein
netherla.img 535 MiB	Netherlands ID 6421			MTB-Netherlands
russia.img 2.1 GiB	Russia ID 6580			MTB-Russia
slovakia.img 139 MiB	Slovakia ID 6409			MTB-Slovakia
swiss.img 268 MiB	Switzerland ID 6327			MTB-Switzerland
thailand.img 230 MiB	Thailand ID 6506			MTB-Thailand



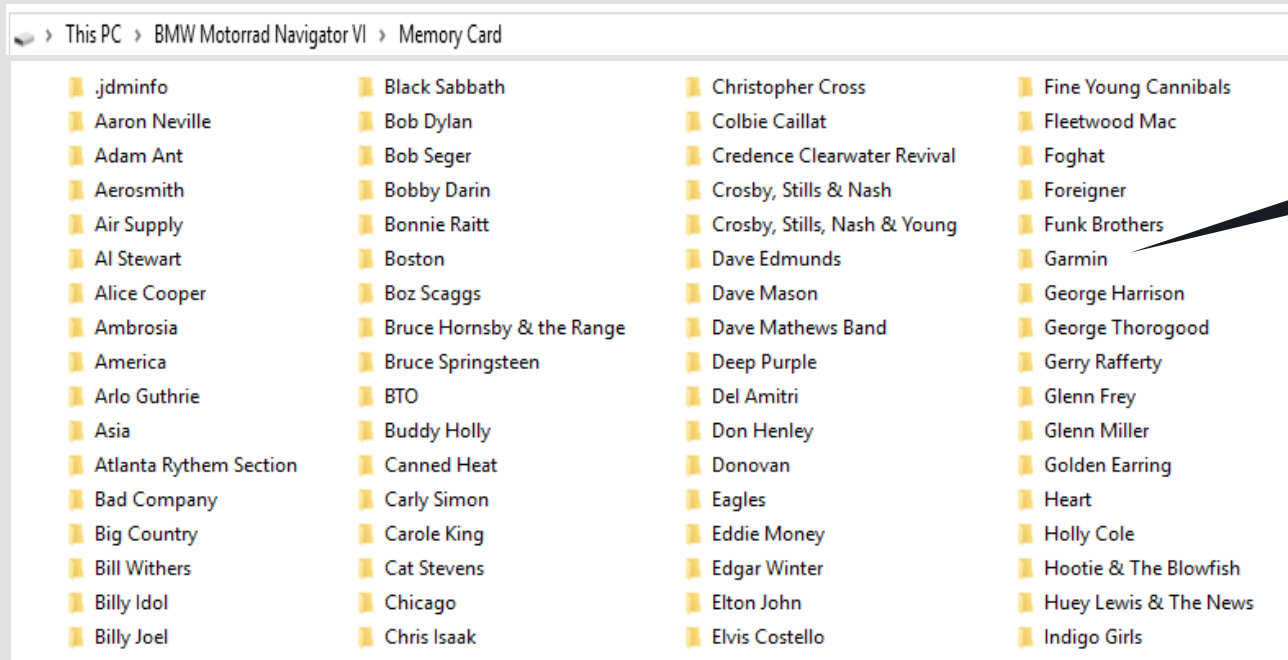
Maps and the GPS (Loading and unloading) (Set the metadata first)

- Loading maps onto GPS
- File type and File size
- Map Descriptions
 - Dependent on metadata

Installing maps into GPS

- Filenames:
- Directory Location: \Memory Card\Garmin\filename.img (kazakistan.img, vietnam.img, etc)
- Set all names for .IMG files to friendly names, using JAWAVA Device Manager

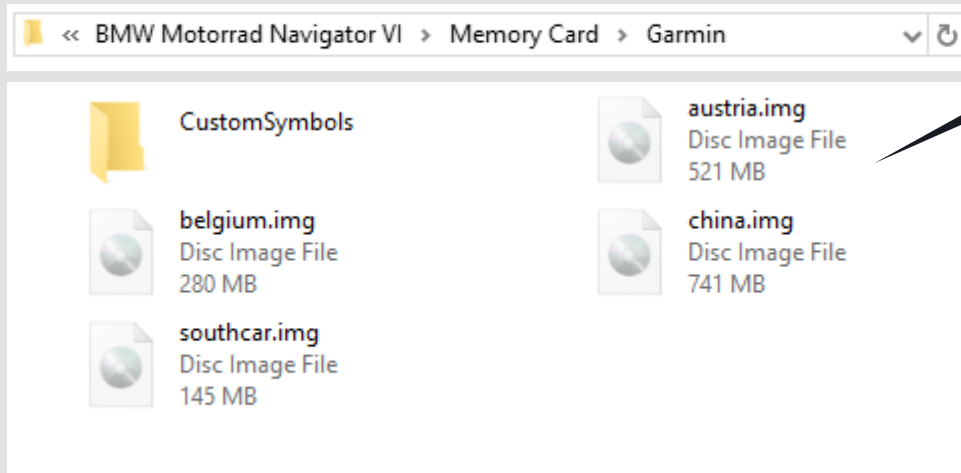
GPS File/Folder structure (Overview)



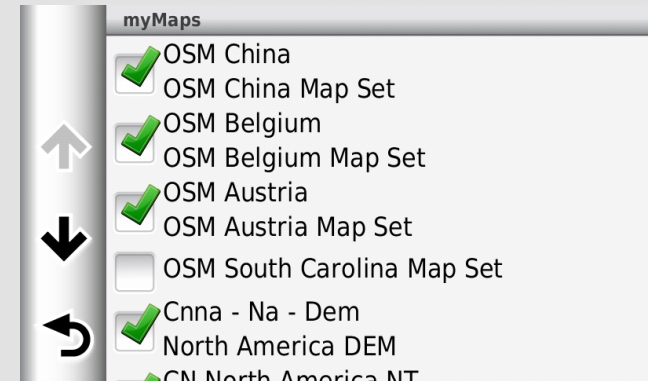
Garmin folder
contains
music/maps

- Place music, maps, custom symbols as shown
 - Music folders contain MP3, MP4, Other
 - Garmin folder includes maps, in .IMG format (with metadata set)

GPS File/Folder structure (Detailed view)

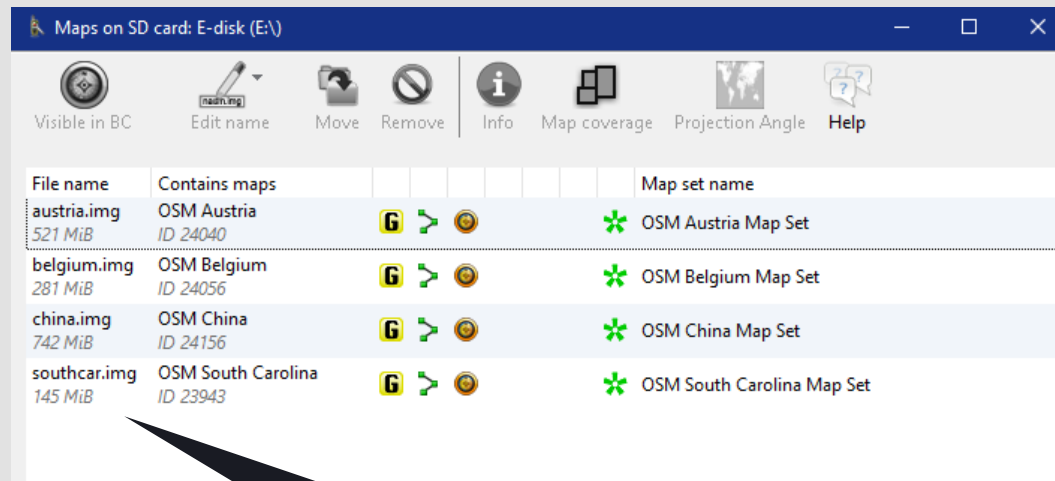
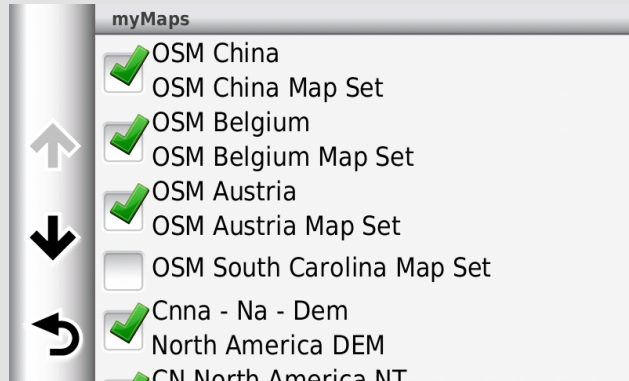


All maps are
.IMG format



- Maps located in Garmin directory appear as available
 - Notice name of map, and mapset name
- Alternate naming for mapset 1) OSM Custom Map Set 2) OSM China Map Set

IMG files: What metadata needs to be set



Using Javawa Device Manager, we can see the metadata for all of the installed maps.

- Maps have been copied/moved to SD Card, which mounts as E:
 - Device Manager examines SD Card, locates maps, allows metadata manipulation
 - Metadata has been set, maps renamed

A scenic landscape photograph of a mountain valley. In the foreground, a rocky outcrop is visible. The middle ground features a large, calm lake reflecting the sky and surrounding mountains. The background shows high, rugged mountains with patches of snow and some clouds. The overall scene is majestic and natural.

Appendix

- [Download this presentation](#)
- [Find my Blog](#)
- [Questions?](#)

S/W Downloads & Tools

Javawa GMTK

- **Download** at: http://www.javawa.nl/gmtk_en.html
- **Purpose:** Is used to manipulate the properties for a windows deployed map.

RTWTool (Routes, Tracks, Waypoints)

- **Download** at: http://www.javawa.nl/rtwtool_en.html
- **Purpose:** Used to convert tracks to routes intelligently, or any to any conversions

Javawa Device Manager

- **Download** at: http://www.javawa.nl/jdm_en.html
- **Purpose:** Allows you to manipulate the Image map files that get deployed on the GPS. These files will need to have their attributes changed, so that they are easy to distinguish from one another.

POI Loader (Provided by Garmin)

- **Download** at: https://www8.garmin.com/support/download_details.jsp?id=927
- **Purpose:** To convert and publish a GPX file that contains POIs, as a POI DB, which also includes audio and icon information