

CREATING SUCCESSFUL ROUTES USING GARMIN BASECAMP SOFTWARE AND THE ZUMO XT GPS



My 2022 Honda Africa Twin with my Garmin XT

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Introduction

This book started out as a collection of random notes I made over the years when working with my GPS, Basecamp and Bluetooth devices. I've cleaned it up and added illustrations. I've tried to be as exact as I could when describing my methods. You can get some of this information from the Garmin product manuals and the Basecamp manual. These manuals are very sparse in what they offer and don't go into detail about what is going on behind the scenes. They don't address why you need to know and are missing documentation. There are a lot of features and tricks that the manuals don't address that I discovered myself or in forums on the internet.

I'm the kind of person who likes to have a reason to do something. I've written this giving examples of routes I've worked on and how the tools have helped me solve problems and create high quality routes that I can use myself and give to my friends without sending them on a wild goose chase. Just think what would have happened if I gave a bogus route to the 100,000 mile event riders. BMW Motorcycle Club of Colorado presents our premier and longest-running all-day event ride. This ride is designed to take you over enough mountain passes in a day to equal 100,000 feet.

I've spent a lot of time trying to organize this but I felt it was more important to present ideas and problems first and get around to detailed explanations later. The best way to learn this is to install Basecamp, setup your GPS and work through some of the very good tutorials you can find on the internet. This is one: <https://www.newenglandriders.org/learn-basecamp/> .

While Basecamp is free for anyone to download you have to have a Garmin GPS to get a Garmin routable map. Basecamp is worthless without a map. There are other open source maps (OSM's) available but that's another subject.

Basecamp is available for PC's and Apple. There are known USB problems connecting a GPS to an Apple computer.

I haven't covered Points of Interest (POI's) or Trip planning. I may get to some of them at a later date. There's a lot of information about these subjects out on the net. I've heard that trip planner has problems. I don't use it. Routes created in trip planner will not display route properties.

I don't have an editor so if you find typos, errors or don't understand what I'm saying let me know. Send me an email at chuck@flashoffroad.com

User Data Capacities and Specs of the Garmin Zumo XT

Exceeding these limits can cause the route to not calculate.

1. Maximum of 200 waypoints per route but only 50 can be used for navigation
2. 10,000 points per track
3. 2000 archive tracks
4. 29 (50?) via points per route. Waypoints count as via points
5. 125 shaping points between each via point
6. 3655 points per route?
7. There is a 5000 mp3 song limit.
8. 30 gig of Internal storage
9. Much higher capacity battery than previous units
10. 500 waypoints limit per import

11. Unlimited GPX files (limited by storage)
12. Unlimited waypoints (limited by storage)
13. Unlimited geocaches (limited by storage)
14. Unlimited routes (limited by storage)
15. File names 36 characters
16. 1280 x 720 color TFT screen with white backlight. Sunlight readable and glove friendly.
17. 4.8"W x 3.5"H x 1"D 5-1/2" diagonal screen
18. Sensors: GPS, Galileo and 10HZ Multi-GNSS Positioning
19. Battery life 3.5 hours
20. 32 GB of internal storage
21. Weather proof IPX7

Garmin XT Current Draw

State of the XT	Current Draw in mA
Switched power is off	0
Switched power on Mount empty	0.15 (inline power supply)
Switched power on XT in the mount off	0.8
Switched power on, XT in the mount, XT Sleep	2.18
Switched power on, XT in the mount, XT on	560mA (BT on or off)

XT Power:

You should have 5.5v at the power cord. The top pin is positive.

When you turn off the XT hold the power button till it asks if you want to shut it down. Say yes and it will completely shut down. If you only do a short press and not shutdown it will go to sleep and slowly drain the battery.

My Motorcycle Setup

I have a Garmin Zumo XT GPS, Cardo Packtalk edge Bluetooth 5.2 headphone / intercom and an iPhone 14 pro. I have the Cardo in GPS pair mode paired to the XT GPS and the phone paired to the XT GPS. I also have the Cardo paired to the iPhone so I can use the Cardo Connect app which lets me update the firmware, change parameters like speed dial and FM stations and assist with pairing. With this setup I can hear the navigation, warning messages and music from the GPS.

The GPS through the Garmin Drive app on the phone receives text messages, calls, music, weather, and some paid subscription services such as stoplight camera locations and sends this to the XT.

There are 2 Bluetooth connections between the Cardo and the Phone. "BT_zumo XT" is the main connection and is used for phone connection and media playback from smartphone. "BLE_zumo XT"

(BLE = Bluetooth Low Energy) is used for the data connection to and from the Garmin Drive App and the Smart-Notification.

I have the XT hard wired to accessory power that goes on and off with the motorcycle. Note that earlier versions of the XT mount had problems. The power 'pogo' pins would be intermittent and the GPS wasn't secure. Call Garmin and they'll send you a new mount with the cable.

Bluetooth is a short-range low power consumption secure radio technology that allows the exchange of data between devices. New Bluetooth protocols such as 5.0 allow for greater range.

Notes Regarding Garmin XT Software Updates in 2022-3

My Garmin XT has an option for "adventurous routing" which will take you on smaller more scenic rides if you don't have many via and/or shaping points. *Make sure you set up BaseCamp and the GPS's activity profiles per the instructions below.* If you don't nothings going to work right.

Garmin has had software updates that break the XT. I updated the software and the routes all became erratic and totally screwed up. Usually they come out with an update fairly quick. The takeaway is that when things go haywire it always isn't your fault. The first time I recall this happening was around July of 2022. The problem was fixed with vx 6.50 (current as of 7/2022).

There was another update around the beginning of March 2023 the totally screwed up the routing on the XT. It was fixed around March 18, 2023 with update 6.50 update 2.1

The thing to take away from all of this is once you have developed a route download it into your gps, calc the route and look at the map it creates. If you update the software or maps recheck any critical routes. If the route won't calculate in the gps it probably means you have gone over the User Data Capacities of the GPS such as too many waypoints.

I discovered another minor anomaly. Even though I have the same maps loaded in my gps that I have in Basecamp I get small deviations in points when the gps is plugged into the computer.

I have 100's of waypoints. Sometimes I change the location of a waypoint in BaseCamp or create new ones. You don't have to keep track of new waypoints. You can just upload all the waypoints to the gps and only the new ones will be uploaded. I keep all my waypoints in a list called XP Waypoints. I can select them all and drag them to the Internal Storage list when the GPS is plugged in and any waypoints I don't already have uploaded will be transferred. Waypoints that had their location changed will create new waypoints. If you had a waypoint named Critchel Junction and you changed the location of Critchel Junction it will be uploaded as Critchel Junction-1.

Note: The only way to get the Zumo XT to start navigating with turn-by-turn directions is from the trip planner app. The trip planner only uses routes. There are a number of ways to create routes in BaseCamp or you can create routes in the GPS.

Note: When you are following / navigating a route in the trip planner app on the XT it stops automatic point tracking. I was out one day following a friend on a new ride through an area in Conifer, CO. I already had this section called Kennedy Gulch in the GPS as a trip. I was curious how the GPS would direct me through the gulch so I started following the route. After 10 minutes my friend started to go

another way so I shut off the navigation. When I got home and downloaded the track, I was missing sections of the track when the navigation was engaged.

BaseCamp and your GPS. What to do First

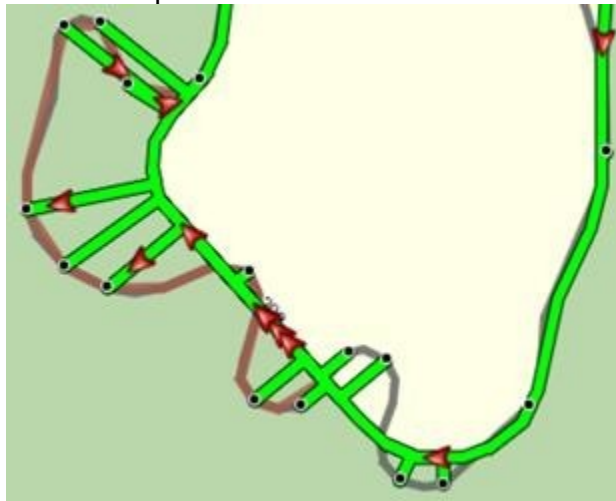
Installing Garmin Express and updating your GPS

1. Install Garmin Express on your computer. This is the free program Garmin uses to keep your GPS maps and software up to date. If Garmin Express is already installed and you have problems download the latest and install it. Google to find a download.
2. Connect your Garmin GPS to the computer.
3. Garmin Express should automatically start in about 30 seconds. If it doesn't, start it manually. Often Garmin will want you to download a Garmin Express update.
4. A window in file explorer may open showing the contents of the gps. The gps acts like a flash drive in this mode. You can do advanced things in this mode such as copying gpx file directly into the gps or downloading music files.
5. Do all the updates Garmin Express suggests.

Installing BaseCamp (it's free)

There are many programs available to create and edit routes. The big issue isn't with the programs; it's the *availability of good maps*. If you own a Garmin GPS maps won't be a problem. Basecamp installs with a Global Map. This map will not allow routing. You will get straight lines between points.

1. Search for "download BaseCamp" to get the program, then install it. BaseCamp comes with a default very sparse map of the world which is pretty much worthless. You have 2 choices.
 - a) You can plug your Garmin GPS into your computer with a usb cable. BaseCamp will recognize it and use the map installed on the GPS.

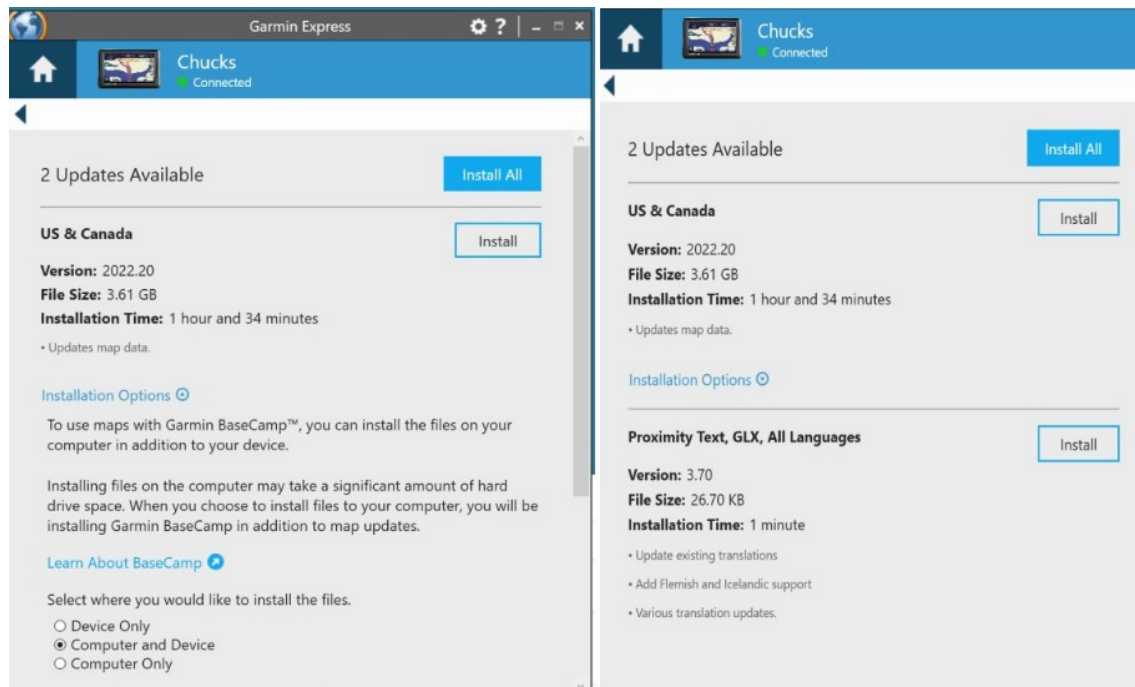


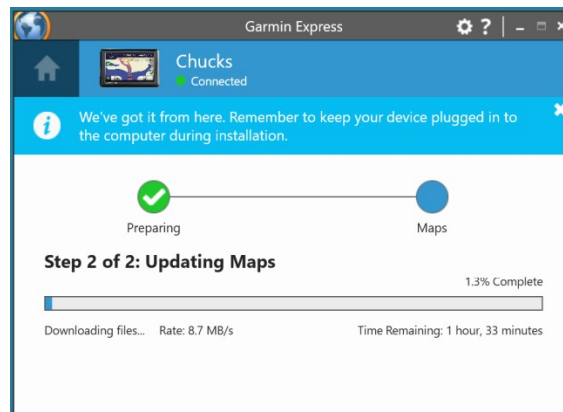
- b) You can install a map to your computer so you can use BaseCamp without having to plug your GPS into the computer.
2. [Installing Maps to the Computer](#) (this doesn't work with all gps models). You want to do this so you can use BaseCamp without the GPS plugged in. If you don't care if the GPS is plugged in don't worry about any of this. The take away is that you want the same map in BaseCamp that you use in the GPS so no points will display off the road. When I updated the map after creating a route the location of some roads changed by 10' or so. In my case it was Colorado CR 742 between Gunnison CO and Taylor Reservoir, Cottonwood pass. I ended up with a

bunch of points off the road. This only happens to points on the route. Everything else adjusts when you recalculate the route.

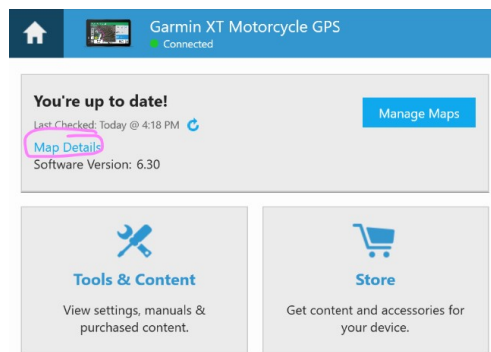
- a) Plug your GPS into the computer and wait for Garmin Express to load.
- b) Select the Garmin XT or your own GPS device.
- c) Update the software and the maps if they are not current.
- d) Select the Map Details link on the main page in the top box. You may have to reconnect to the gps.
- e) The Map Details page will display. Under “Map: Full Coverage of North America 2023.1” or the latest map click on options.
- f) You’ll see the options page. Click on the Install to Computer button. If you don’t see this most likely Garmin has decided that your GPS doesn’t have permission to download the map. On a Windows machine It will put the map in C:\ProgramData\Garmin\Maps\.
- g) The windows computer will ask if you want to make changes to your computer. Say yes and you’re done.
- h) At one time Garmin Express didn’t allow you to install the map on the computer with the Garmin XT as your chosen device. *I was able to use another model, my old garmin nuvi 1490 gps that I use in my car to get the new maps. If you can’t get the map on your computer just leave the GPS plugged in and BaseCamp will use the map in the GPS.*

You’ll see a screen with the gps models you have registered with Garmin. Select the GPS and you’ll get the following displays. Below shows Garmin Express updating software and maps.

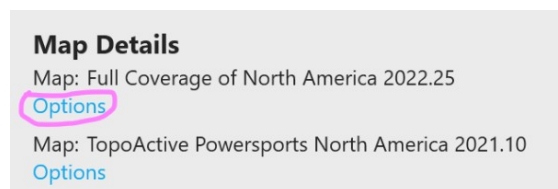




Below shows that the GPS is up to date with its software and maps. Click on Map Details to begin the process of copying the maps to the computer.



When the Map Details box comes up click on Options. Click the Install to computer button.



Click the Install to computer button.

Map Options

Map: Full Coverage of North America 2022.25

Reinstall Map

Reinstall the map that is currently loaded on this device.

Reinstall Map

Install Map to Computer

To use maps with Garmin BaseCamp™, you can install the files on your computer in addition to your device.

Installing files on the computer may take a significant amount of hard drive space. When you choose to install files to your computer, you will be installing Garmin BaseCamp in addition to map updates.

[Learn About BaseCamp](#)

Install Location:
C:\ProgramData\Garmin\Maps

Install to Computer

If you don't see this most likely Garmin has decided that your GPS doesn't have permission to download the map. I clicked on the button and the map was installed in about 2 minutes. It's a 4.5 gig file in C:\ProgramData\Garmin\Maps\. I unplugged the GPS and brought up BaseCamp and the new map 2022.25 was installed. Now I'm going to go to C:\ProgramData\Garmin\Maps\ and *delete the old 2022.1 map and a directory called RMU. As of 6/19/2022 the latest version map is 2023.10*

Garmin Express backs up GPS files at C:\Users\xxx\Documents\Garmin\Backups. Note that this is not where BaseCamp backs up files.

Note: Garmin Can Take up Massive Space on your C: Drive in Windows

Garmin Express keeps all previous downloaded installers and firmware and saves them in this folder: C:\ProgramData\Garmin\CoreService\Downloads\. You can delete the Downloads directory.

Old maps fill up the C: drive and can choke your Windows system. You must delete these files manually from time to time. BaseCamp stores the maps in C:\ProgramData\Garmin\maps. The directories are named after the map and version. Delete the directory holding the old map and a directory called RMU. I think RMU holds the new download until you tell windows it's ok to install the map. Make sure you don't delete the map you are using.

The BaseCamp Catalog / Database

Everything you do in BaseCamp is stored in a database file. BaseCamp enforces unique names within a catalog/ database. You can't have 2 waypoints, routes or tracks with the same name. You can create additional databases in the options / general dialog box and switch between them. This might be useful if you want to separate large categories such as routes for a motorcycle in one database and routes for a boat in another or routes in the US and routes in Europe. I don't use this. The database files are located in C:\Users\(\username)\AppData\Roaming\Garmin\BaseCamp\Database.

When you delete anything in BaseCamp it gets moved to the Unlisted Data Folder as a backup. Because it still exists in BaseCamp's Unlisted Data Folder you will get a message saying that the file name still exists even though you don't see it. Delete the file in Unlisted Data and the file name will be freed up to use.

BaseCamp Backup

As I work with BaseCamp I backup everything. If I'm happy with what I have I'll do a backup. Then I'll try some experiments that might totally screw up what I'm doing. Other times I might forget I'm in one of the edit modes and inadvertently drag across a route and completely screw it up. You can hit ctrl Z to undo the last few moves. If that doesn't work, I'll simply go back and restore my system from the last backup.

To backup go to the top of the screen File/ Backup. A dialog box will appear wanting you to choose the location for the backup. I created a directory on windows in my work area called BaseCamp BU and save them there. Be aware that you may have to browse to your backup location. Backup will create a file with the date embedded in the name "BaseCamp 2021-0622". If you do multiple backups in a day each successive backup will overwrite the last. You do have the option to rename your backup in the dialog box before you save it.

Backup is a good way to move your complete work environment to another computer.

Note: It's a good idea to set the GPS intent / activity profile to be the same as it is in BaseCamp. I found that even if you create your routes with enough points sometimes the route isn't correct unless you are using the same or similar activity profile in BaseCamp and on the GPS. That's what the below setup does.

Following section created by Ed Conde, from New England Riders

BaseCamp Setup

(Do not connect your GPS to your computer yet.)

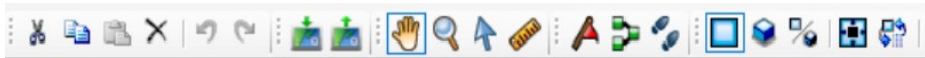
1. Set options in BaseCamp Toolbar: Right click on the toolbar and check all except Playback, Playback Info, and Task Launcher.
2. Next, set the following options in the menu:
 - a) Activity Profile = Motorcycling
 - b) Select Map Product = City Navigator North America NT 2024.1 (or the most recent version)
 - c) Map Detail = Highest
3. Next, we are going to change the preferences and avoidance's for the motorcycle activity profile. This may change some of your older routes that were created using the motorcycle activity profile. If in doubt, backup BaseCamp and all your routes by going to File>Backup. In general, it is better to shut all avoidance's off and not rely on avoidance's to draw your route. It is better to add enough shaping points to force the route where you want to go. Go to the BaseCamp menu and select these choices:
 - a) Motorcycling Profile in the dropdown. Edit>Options>Activity Profile>Routing>Route Preferences = Faster Time.
 - b) Edit>Options>Activity Profile>Routing>Road Type Avoidances = All Unchecked

- c) Edit>Options>Activity Profile>Routing>Feature Type Avoidances = All Unchecked
- d) Edit>Options>Activity Profile>Routing>Area Avoidances = Unchecked
- e) Edit>Options>Activity Profile>General>Map Display Features>Select. Expand Points by selecting the + icon. Expand Transportation by selecting the + icon. Uncheck Air Transportation so your map is not cluttered with airport icons View>Map Controls>On
- f) Edit>Options>Device Transfer> All unchecked. If you have “Always match route to the map on my device whe transferring” and the map in Basecamp is different than the map on the GPS it will force a recalculation which you don’t always want. Make sure that you apply the settings to all devices.

GPS Setup

1. Zumo XT, Zumo 595 and 396 series, BMW Nav 5 & Nav 6
 - a) Settings>Navigation>Avoidances>Disabled (all boxes unchecked) > Save
 - b) Settings>Navigation>Calculation Mode>Faster Time> Save
 - c) Tap Vehicle Icon in upper left of main screen>Motorcycle>Save
 - d) Settings>Map & Vehicle>Map Detail>More>Save
2. Zumo 660 series, BMW Nav 4
 - a) Tools>Settings>Navigation>Avoidances. (Disabled) Uncheck everything, especially seasonal closures and unpaved roads.
 - b) Tools>Settings>Navigation> Route Preferences = Faster Time
 - c) Tools>Settings>System>Usage Mode = Motorcycle
 - d) Tools>Settings>Map>Map Detail = High.

The BaseCamp Toolbar



Cut, Copy, Paste, Delete, Send to GPS, Receive from GPS, Pan, Zoom, Select, Measure, Create a Waypoint, Create a Route, Create a Track



GPS Basics...Tracks Routes and Activity Profiles

When you get your gps and set it up it’s going to ask you to decide on an activity profile. Activity profiles only affect routes, not tracks. There are many profile choices such as routing you the fastest, shortest, avoid toll roads, off road, are you driving, walking or biking. A Motorcycle gps like the Zumo XT has options for adventure routing. Your choice is important because this will determine how the gps creates routes. *A route is the path that the GPS draws between 2 points.* The XT comes with routable street maps (legal streets only) and additional Topo map layer (not routable) showing all the trails.

So if you try to use your offroad tracks and transfer them to routes on your XT it will just show an error or a mess of a route.

If you have a gps in your car, routing is pretty much all you will use.

Typically, you’ll enter an address and the gps will tell you how to get there.

If you tell the gps you want to go to an address in the city it can create different ways to get there depending on the choice you made for the activity

profile. If I sent you a route consisting of a start and end point your gps may give you directions completely different than my gps. This is due to different algorithms / gps brands and different activity profiles.

You create a new route by clicking points on the map in the add points mode. Each time you add a point BaseCamp recalculates the path between the points. If your route disappears off the map or snaps to another road this is due to the route recalculating (based on your activity profile) and finding a faster or shorter way to get to the point you just entered. If you put enough points in you will force the route to go where you want. Of course, I've come across some exceptions to this requiring the use of avoidance areas.

There are 2 kinds of Tracks



Active Tracks: The XT and other GPS's usually have an option to turn on tracking. What this means is that whenever the GPS is on it will create a GPX file that records where you go. You can even get phone apps that do this. A track is a 'breadcrumb' file that is nothing more than a list of points (coordinates) and the time the point was written. *Active tracks from the XT* have other data such as speed, elevation and the date and time recorded on each track point. The gps will create points based on your speed. If you're going 65 mph it might create a point every 2 seconds. If you're walking it might create a point every 10 seconds. A track file for a 200-mile ride at an average of 60mph in Riverside WY created 3153 points on my Garmin XT. Track files are displayed on your gps as maps. *They can't be used to navigate which means giving you turn by turn directions.* You have to convert a track to a route to be able to do that.

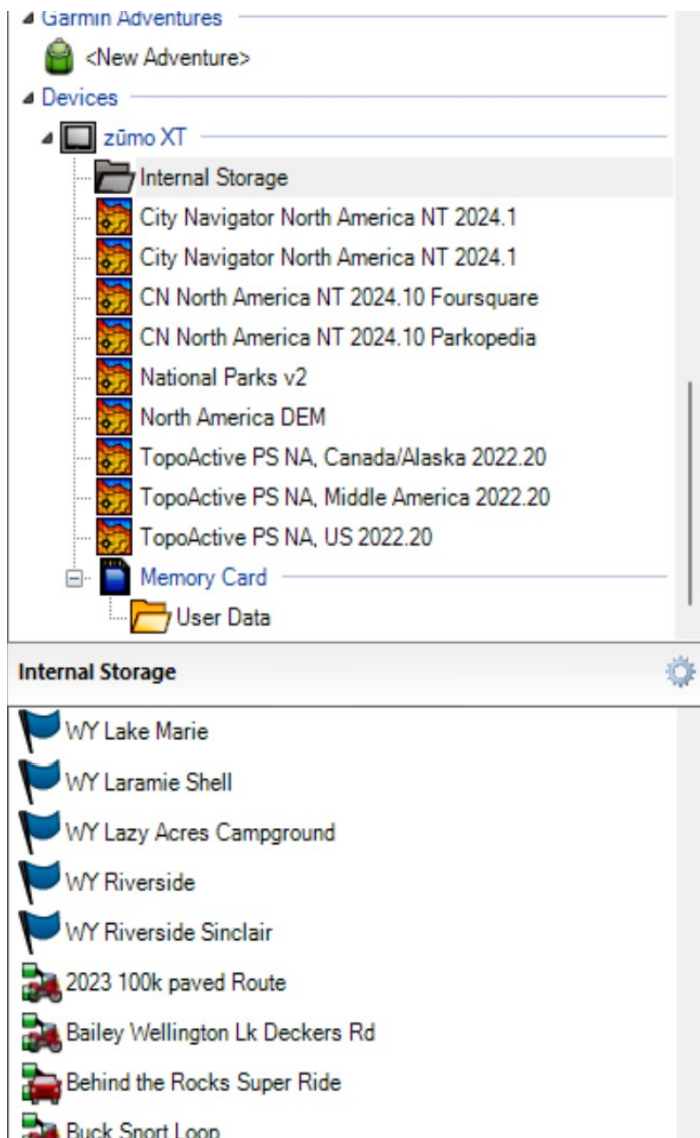
This is what an actual Active track GPX track file segment looks like.


```
<trkpt lat="39.551062630489469" lon="-105.13961906544864">
<ele>1752.1400000000001</ele>
<time>2021-05-07T16:04:36Z</time>
</trkpt>
<trkpt lat="39.55117997713387" lon="-105.14028802514076">
<ele>1755.5</ele>
<time>2021-05-07T16:04:43Z</time>
</trkpt>
```

If you double click on an active track you copied to Basecamp you can select the Graph tab on the top of the info dialog box and it will show you a graph of the elevation vs. distance.

Active Tracks / Unsaved Tracks


When you travel with the GPS it will create a track with the time and date as the file name. It will create a new track each time the device is powered up. *Active Tracks contain the lat/lon, elevation and time.* In the GPS you can save the track as a named track or save it as a trip. When you save it you give it a new name. In the case of a track a gpx file is created with that name in the Internal Storage/GPX directory of the device. The active unsaved tracks and the saved tracks show up in BaseCamp on the Zumo. You can copy these tracks from the GPS to Basecamp by dragging them where you want.



When the GPS is plugged into the computer, everything on the GPS including waypoints, tracks and routes are displayed in Basecamp's *zumoXT/ Internal Storage folder*. Tracks are identified with a shoeprint icon  to the left of the filename. The files on the GPS that you see in Basecamp can be dragged off the GPS to container folders in Basecamp. Even though you see what's on the GPS you can't delete any of the GPS data from Basecamp. You can only delete GPS data on the GPS. You can delete saved tracks one at a time. You can only delete the entire Active/ Unsaved tracks by clearing Travel History.

Freehand Tracks

Many mapping programs will allow you to create a track simply by drawing it on the map. It can be drawn anywhere. A track like this is useless for navigation, unless it is drawn carefully using satellite images to place the track precisely on the position of footpaths, trails, roads etc.

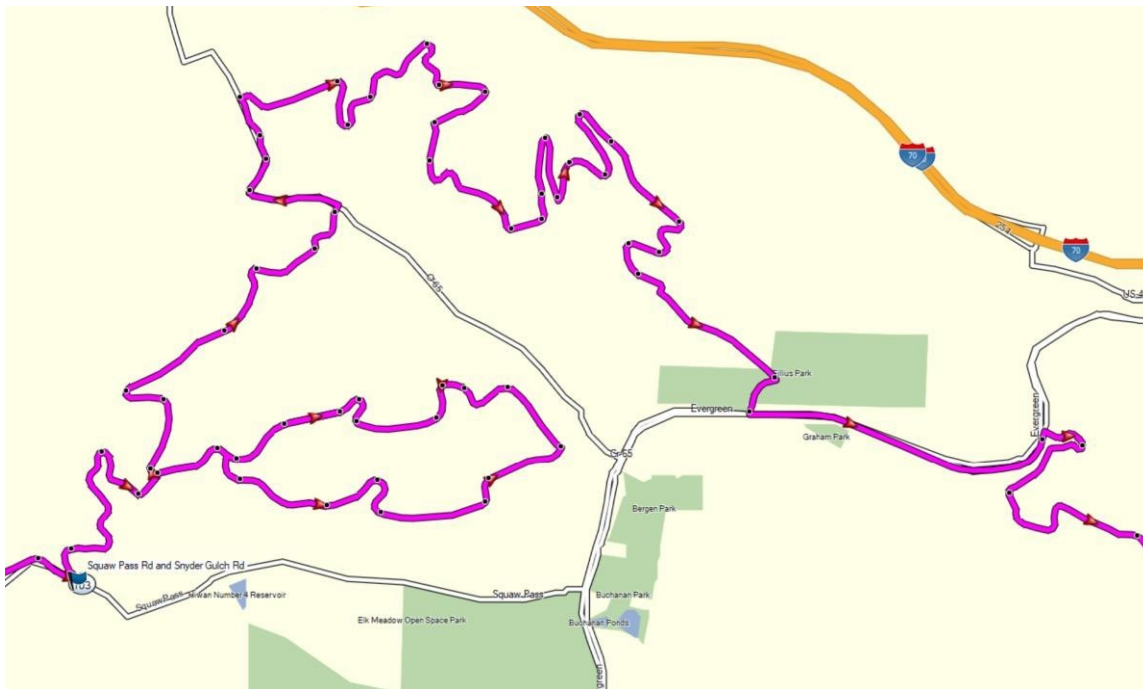
In Basecamp the tool to draw a track freehand is . It shows only the latitude/longitude, the distance and direction of each short section. It is the same type of line as the active track, but without the elevation and time.

Routing Ramifications

The route I created below has 2 points, a start on 119 (upper left) the peak to peak highway and an end at Rt 93 and 58 in Golden. If you were to import my "route" into your copy of BaseCamp or load it onto your GPS it could direct you on one of the three or more possibilities between the start and end depending on your Activity Profile settings and the version of software and maps you are using. The bottom line is you want to receive and create routes that will always show the intended path (where **YOU** want to go) no matter what the settings are in BaseCamp or the GPS. My intention is to show a route through Golden Gate State Park that is admission free and has a lot of curves. My intended path is the top purple one. In a million years I would never create the 2 point route I did and have any expectations of it ever following my intended path. What I have to do is put enough via points aka waypoints aka shaping points on the stretch between the parks West entrance and East entrance so there's no question that BaseCamp and the GPS will follow my intended path no matter what activity profile I have set.



Like everything else there are exceptions. Below is an example of a section of the Central Jeffco Roll that runs through Evergreen Colorado using the Motorcycle Activity Profile. This is the route I want.



Below is the same exact section of the Central Jeffco Roll that runs through Evergreen using the Driving Activity Profile. You can see it is a total mess. I tried putting points in but I couldn't get it to work. This is an example of having to use the motorcycle profile to get the route to work.



Try to not use waypoints and via points for general route making. Save the way points for special places that you need to stop at or know about. Otherwise use shaping points. The GPS has a limit of 29 via / waypoints. I found out that waypoints are considered via points when they're embedded in routes. If the GPS reaches its' limit it will break the route into pieces when it recalculates on the GPS. You can easily turn via points into shaping points and replace way points with shaping points.

A major use of BaseCamp for me

I like to edit track files or rides created by the GPS and turn them into routes. Whenever I go out on a ride my gps is recording. If I happen to find a new interesting place I can take the track file off the gps and copy it to my computer into BaseCamp where I can closely look at it. If I like where I went I'll edit the track to get rid of extraneous points that might be tracking me circling in a gas station, showing the beginning and ending at my house whose location I don't want to make public or taking a wrong turn. Now I won't forget the ride and I can export the track file as a gpx file or a KML (keyhole markup language Google) file and share the ride with my friends.

Detailed Discussion of Track vs Routes

I'm jumping the gun here but I want to talk about track files vs route files. Typically track files have 1000's of points and define the exact way you want to go without any deviations. They have been described as file created by dropping breadcrumbs. Track points are similar in concept to resolution in digital photography. The more points there are the sharper and more accurate your image will be. Track files are typically generated by your gps recording where you've been.

Manually creating accurate track files can end up taking a lot of time because you have to click on every point. Why would you do this? I received 14 long and complex routes most 200 to 400 miles created for the TOR rally in Paonia CO. These routes are very special so I wanted to make sure I

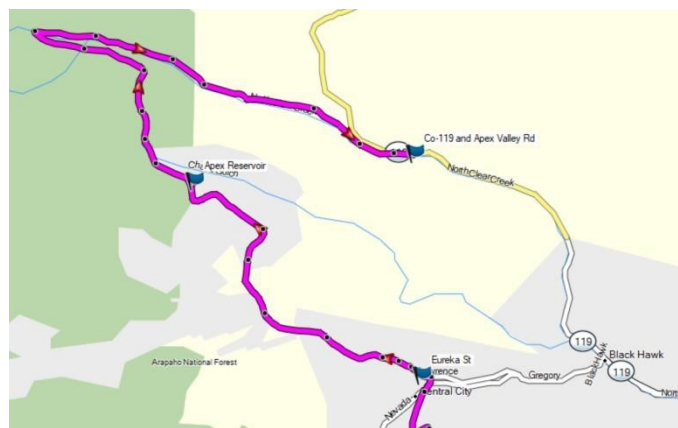
created them accurately. The routes were originally created in a discontinued program, Microsoft Streets and Maps. I was able to install the old program on my computer and display the routes on the map but there was no way to export the route points. I ended up displaying the routes on the screen and manually inputting thousands of points into BaseCamp. Many of the tracks had over 3000 points and took 8 hours to do. Once I created the track I went back and created labeled waypoints of important spots along each track such as cities and passes. These waypoints will display on the GPS as you're riding which adds to the fun of the ride. I've also received Google maps where I had to do the same thing although there might be a way to export the points from Google.

Track files have one big downside; no navigation. Navigation means giving you turn by turn directions.

Tracks can only show lines on the GPS map display. If you want turn by turn directions you have to convert the track file to a route file. This is easy to do in BaseCamp or in your GPS. The problem you run into is that the conversion, depending how you do it might not use enough points to guarantee your intended path. Remember Activity Profiles? If the conversion eliminates points, it's possible that the

gps will reroute you based on the activity profile set in the gps.

I had a track I made riding behind Blackhawk CO on dirt. I converted the track to a route in BaseCamp using an activity profile set to Driving. I used driving because this is the profile that would most likely route me away from twisty remote roads. If I got my route to go where I want using this activity profile I knew my route would probably be successful on any GPS no matter which activity profile was in effect. When I first generated the route in BaseCamp it completely avoided Upper Apex





Road which is where I wanted to go and routed me on 119 N. Clear Creek because it was paved and faster. What I did to get around this is to insert as many shaping points and via points along Apex road to force the route to follow my intended path. Put enough points in and this pretty much guarantees the route will be accurate on any gps regardless of the activity profile. The Garmin XT GPS has a 29 via point limit before it breaks routes in two, so make sure you convert most of your via points to shaping points (we'll talk about this later).



If all else fails another way to force the route is to enter an area of avoidance like this because it's only good for the set activity profile. I like routes to work for all activity profiles but sometimes this is the only way.

I had a situation when I was laying out the 2021 100k paved route shown above where it comes south to 285, makes a left and a big loop to Gunnison, Taylor reservoir, Cottonwood pass and back to 24. When I calculated the route using the motorcycle intent everything worked. As soon as I calculated the route using the *Driving intent* the route headed halfway around the loop going up the section where the airport in Buena Vista is (red circle) and seeming to reverse around Almont. There was nothing I could do to stop this from happening so I created an area of avoidance where the red loop is for the Driving intent.

You can define a specific area on the map to avoid when creating a route *for an activity profile*.

1. Select  from the toolbar. If  is not visible right click on the toolbar and check Area Avoidance's.
2. Select an activity profile.
3. Display the area on the map that you want to avoid.
4. Select create.
5. Drag to draw a box over the area to avoid. The area avoidance appears on the map as a red box and a name for the area appears in the Area Avoidances window.
6. Select Close.

How to Get Turn by Turn Directions

Double click on your route to bring up this dialog box and choose the Route Directions Tab.

2022 paved 100k

Properties Route Directions Route Options Graph Notes References

Summary

Points: 77 Course: 265.3° true
Via Points: 18 Moving Time: 8 h, 43 min
Distance: 392 mi Total Time: 8 h, 43 min



Directions/Name	Distance	Total Distance	Course	Position
P01 BMW N39.58861° W104.86943°				N39° 35.317' W104° 52.166'
Get on E Easter Ave and ride north	9 ft	9 ft	195.2° t	N39° 35.315' W104° 52.166'
Turn right onto S Havana St	804 ft	0.2 mi	90.0° tr	N39° 35.351' W104° 52.009'
Take the I-25 S ramp to the left	1.08 mi	1.2 mi	270.0° t	N39° 34.839' W104° 52.663'
Take exit 194 onto Co-470 W toward	1.29 mi	2.5 mi	170.0° t	N39° 33.763' W104° 52.308'
Exit right onto ramp onto Co-470 W	166 ft	2.6 mi	171.6° t	N39° 33.736' W104° 52.303'
Take the Co-470 W ramp to the right	822 ft	2.7 mi	177.0° t	N39° 33.602' W104° 52.294'
Take the Co-470 W ramp to the right	698 ft	2.8 mi	193.8° t	N39° 33.488' W104° 52.313'
Take exit 14 to the right onto Co-121/	11.87 mi	14.7 mi	226.0° t	N39° 33.451' W105° 04.754'
Take the Co-121 S ramp to the left	0.26 mi	15.0 mi	245.0° t	N39° 33.316' W105° 04.984'
Turn left onto S Wadsworth Blvd	436 ft	15.1 mi	265.1° t	N39° 33.304' W105° 05.076'
Turn right onto W Deer Creek Canyon	0.41 mi	15.5 mi	198.3° t	N39° 32.971' W105° 05.231'
P02a 8481 W Deer Creek Canyon R	279 ft	15.5 mi	21.5° tr	N39° 32.987' W105° 05.286'
Get on W Deer Creek Canyon Rd an	6 ft	15.5 mi	201.5° t	N39° 32.986' W105° 05.286'
Continue on Deer Creek Canyon Rd	1.94 mi	17.5 mi	239.5° t	N39° 33.270' W105° 07.272'

☐ Center Map ☒ More Info

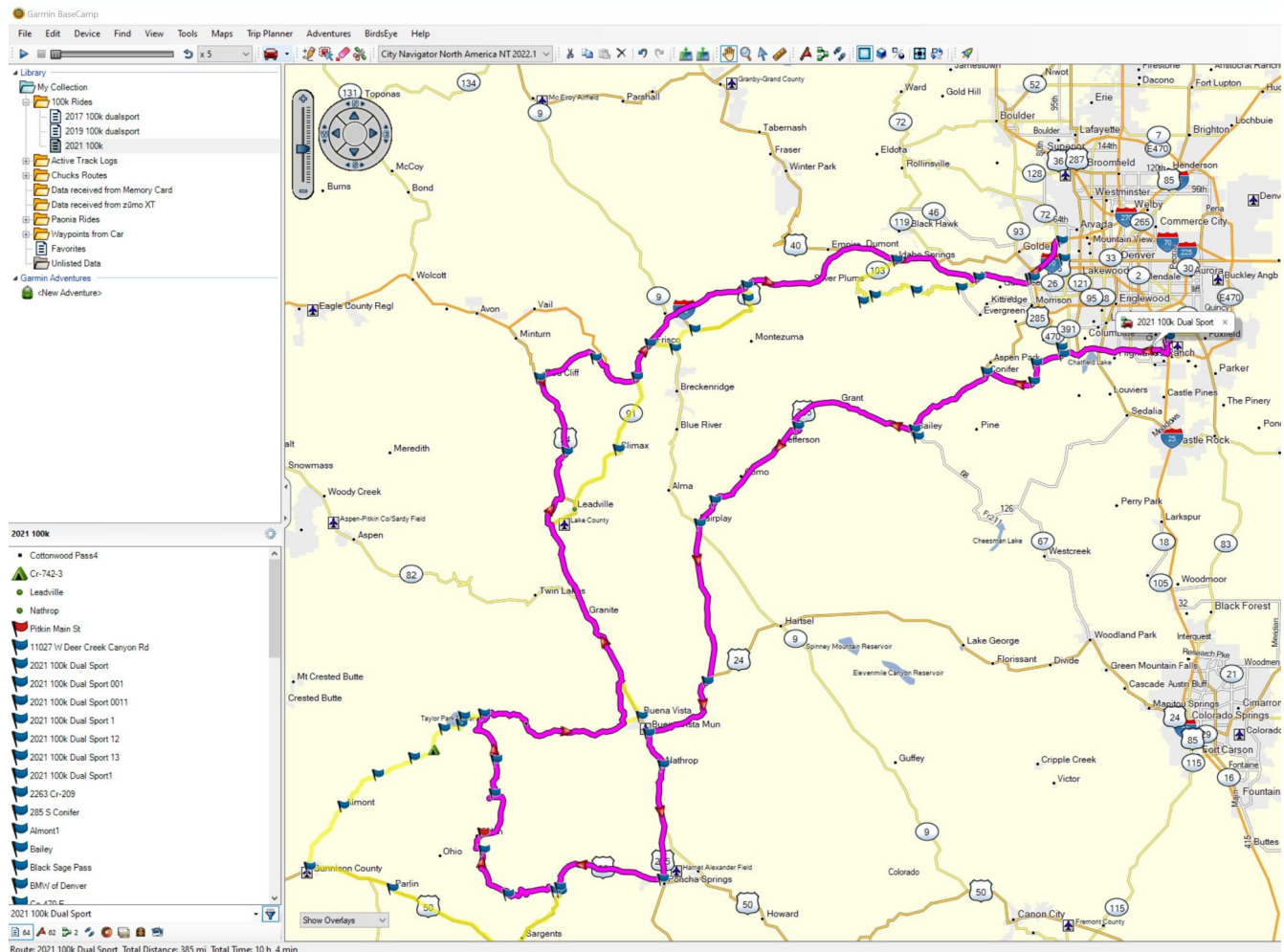
Objects

Refer to any items used to create or define directions and locations. These are waypoints, via points, tracks and routes.

BaseCamp Zooming and Panning

1. You can always roll the mouse wheel to zoom.
2. You can choose the magnifying glass icon to zoom.
3. When you're in the select mode  you can window around an area and it zooms. If you're already zoomed up all the way it won't do anything.
4. You can scroll the screen around by choosing the hand/ pan icon .
5. When you're in other modes such as the select mode, adding points, moving points or erasing points you can scroll the screen around a few ways.
 - a) Using the arrows on the keyboard
 - b) Moving your mouse over the large blue arrow on the screen and clicking on the directional arrows that appear.
 - c) When you move your mouse close to the edge of the map window you can click your mouse when an arrow appears.

Data Management – the Left side of the screen



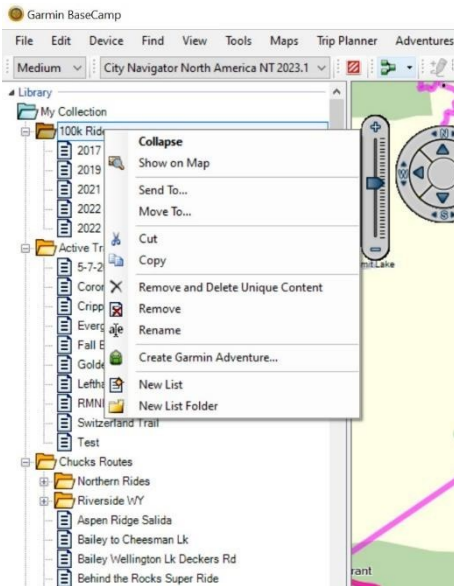
The BaseCamp application saves objects which are routes, tracks, waypoints, and other data in the Library and Devices area. The Library and Devices area is on the left side of the BaseCamp application window.

The upper pane contains 2 high level directories the first being

1. My Collection which will have all the list folders and lists you have created.
 - a) A list folder is nothing more than a directory you create with a descriptive name to organize your data. List folders can contain more list folders / sub-directories and or Lists.
 - b) A list is a container with a descriptive name that holds objects such as waypoints, tracks and routes you create or transfer there. You have to create a list item / container before you can create or import objects such as waypoints, tracks or routes. In the figure below I right clicked on 100k Rides and the dialog box shows New List and New List Folder.
 - c) When you select a list its contents / objects will appear in the bottom pane.
2. Connected devices show up only when you plug a gps into the computer. This directory shows everything that is in the gps including maps, waypoints, tracks and routes.

Example: See above picture. I created a list folder called 100k Rides. Within the list folder are a number of lists / containers named 2017 100k, 2019 100k dual sport and 2021 100k. If you click on any of the last 3 the lower left pane will display their contents / objects which consist of waypoints and the actual route and or track. In this case I clicked on the 2021 100k list container.

You can rename anything by right clicking on the object and choosing “Rename”. You can also select the object and then click on it and edit the name.




Organization Tip: I have a lot of waypoints I got off my car gps. These are friends’ homes, restaurants and doctors etc. I want these places to be available if I want to go to them. I wanted all of these waypoints to be in a separate area in BaseCamp because I probably will never use these to create a route and I like to have them backed up. I created a new directory under My Collection called Waypoints from Car. I dragged the waypoints from my other Garmin Car GPS to this new directory.

Organization Tip: The Favorites List is where I keep waypoints that I use to create routes. Common waypoints for this list will be Home, Morrison, Deckers, Evergreen and other points that I use often. I can drag, copy and paste these waypoints into other Lists when creating routes. See the section on Naming below.

Note: You can move all the elements around by just dragging them to other list /containers. If you right click you can create duplicates, rename, copy, delete etc. on all elements.



Editing Track Points on the Map




1. Click on a track either on the map or in the lower data area to select it. The track appears on the map as a colored line.
2. From the toolbar, select the pan tool .
3. Hover the pan tool over the track.
4. Select an option:
 - a) To add new points to a section of the track, hold Alt on your keyboard, and drag a section of the track.
 - b) To move a point, hold Alt on your keyboard, and drag the point.
 - c) To delete a point, right-click the point, and select Delete Track Point.
 - d) To divide the track, right-click the track, and select Split Track Here or Split Track At Segment. The selected track points are removed from the original track and added to a new track.
 - e) When you split a track the split occurs at the spot where the points are farthest apart.

WayPoints/ Via Points / Shaping Points/ GPX Files

GPX, or **GPS Exchange Format**, is a file designed as a common GPS data format for software applications. It can be used to describe waypoints, tracks, and routes. The format is open and can be used without the need to pay license fees. The files are in XML text format. You can open them and examine them using a text editor such as notepad on windows. Each GPX file can contain a mixture of waypoints, geocaches, routes, and tracks. If the GPX file containing a waypoint or geocache is deleted, the waypoint will no longer be available on the device. When utilizing routes, only 50 points can be used for on-road navigation. Note that KML (keyhole markup language) file is similar to a GPX file and is used in Google Earth. Elements used in a gpx file are:

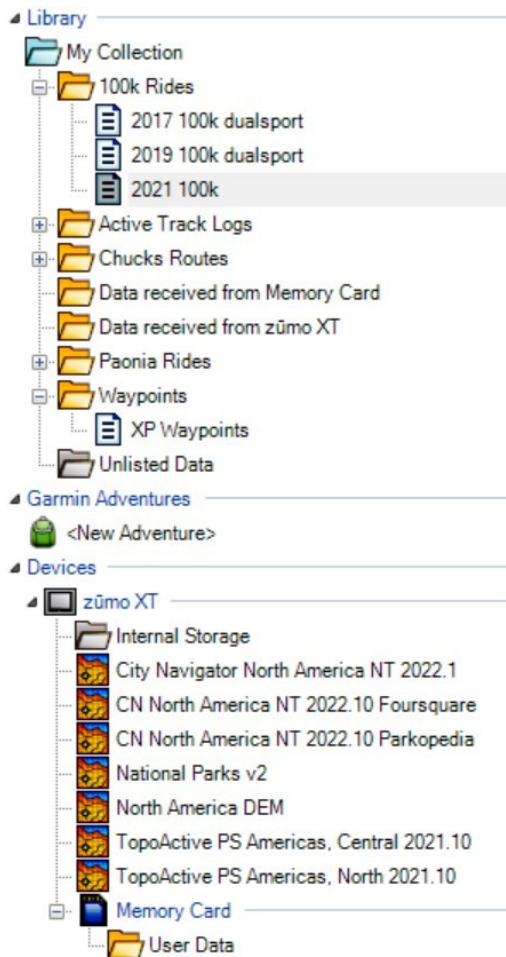
1. **Waypoints:** are informational points on the map and can be added to a route. They are individual points among a collection of points with *no sequential relationship*. They consist of the WGS 84 (GPS) coordinates of a point and a name. They can also have other descriptive information such as an address and display icon. You can include waypoints in a route, but a point in a route is not necessarily a waypoint. If the waypoint is part of a route your GPS wants to announce and pass through every one. You create and name them within BaseCamp. You select the waypoint tool  and click on the map to create one.
2. **Via points:** are points you insert between 2 other points on a route which will force the route to pass through the point. The GPS will announce – visually and audibly – your approach to and your arrival at a Via Point. You might say I want to travel from Denver to Breckenridge via Fairplay. Via points are created when you use the route edit tool  (rubber band) to locate a route to your needs. The point that's created is a "via point". *You can't have more than 29 via points in a route on a Garmin XT*. When you create a route by choosing points on a map or inserting waypoints using the properties dialog box these points become Via points that are embedded in the route. You can see these points on the map and in the dialog box when you double click the route.
3. **Shaping Points:** A shaping point is a via point with the alerts turned off.
 - a) You can have at most 125 shaping points between each via point / way point.
 - b) Shaping points are used to guide the route so that you go on the roads/ path that that you want but are not announced and pass through is not enforced.
 - c) Shaping points appear as dots (small filled circles), on the route lists and on the map.
 - d) Shaping points are silent. They do not alert on arrival either visually or audibly.
 - e) Shaping points will be ignored if they are slightly inaccurately placed but you remain on the route (eg a point placed just up a side road).
 - f) Shaping points do not appear in the list of points presented as 'Select Next Destination' options. When you get off the route or stop navigating and want to continue, the GPS will ask you to choose a point to resume the route. This point has to be a via or a waypoint.
 - g) Converting Via points to Shaping points. Double click on the route in BaseCamp to open the route properties box. Select via points that you want to convert to shaping points. You can't convert waypoints; you have to replace those with via / shaping points. Right click and select "Don't Alert on Arrival". This will change via points to shaping points.

- h) *Tip: When you create your route, you should zoom in to each of the points and check them* to see if they are on the road or path that you want. There is a tool  that lets you move a point. Use it to drag the points back onto the path or road. Off road points are a major cause of messed up routes.
4. **Route:** an ordered list of points (waypoints representing a series of significant turn or stage points) leading to a destination.
 5. **Track:** a sequence of points which are logically connected in order to precisely draw every bend of a path.
 6. Recalculation in BaseCamp and your GPS will take place under many circumstances.
 - a) BaseCamp will recalculate whenever you make changes to the route or activity profile.
 - b) The GPS will recalculate the route when you import it into the Trip Planner.
 - c) The GPS will recalculate the route if the map in Basecamp is different than the map in the XT.
 - d) Recalculation always results in the original intended route planned in BaseCamp being over-ruled and a new route plotted using the activity profile / routing preferences that are set in the GPS or BaseCamp.
 - e) The notion that you must have the routing preferences in your GPS set the same as BaseCamp is false. If your route is “robust” enough and has enough points it almost always will calculate the same path no matter what the activity profile.
 - f) The GPS knows what was plotted in BaseCamp by virtue of the fact that when the route is transferred to the GPS it transmits the start, end, via and shaping points that have been plotted. In the special case where a track was converted to a route in BaseCamp by right clicking on the track and choosing convert to a route the conversion generates hundreds of invisible intermediate points as GPX extensions. I call them ‘Ghost Points’ and the route a ‘Ghost Point Route’. They force the GPS to take you along precisely the same roads that were in the original BaseCamp track. Messing with this route by adding or deleting points will force a recalculation and break the route. When the GPS is forced to recalculate the first thing that gets lost are these extra ‘Ghost Points’. When the GPS calculates a new route without the ‘Ghost Points’ the whole route becomes a mess.
 - g) The moral of the story for those creating their own non-Ghost Point Routes is to include lots of shaping points and do track conversions using the special method outlined below.

GPS Announce, Pass Through and Resume

Note: Your GPS wants to announce and pass through every waypoint and via point. If you pass up one of these points your GPS will try to route you back to it and nag you until it gives up. Shaping points are used to guide the route so that you go on the roads/ path that you want but are not announced and pass through is not enforced.

Note: When you either get off the route, start the route from another location or stop navigating and want to continue, the GPS will ask you to choose a point to begin or resume the route. This point has to be a via or a waypoint. Note that the Garmin XT allows for 29 waypoints/ via points per route. The GPS will route you to the point to continue the route. If the point is far away the gps might end up routing you to the resume point in a path you hadn't intended. If you are very far it won't find any point and show you an error message. Using lots of shaping points in your route is good but they do not appear in the list of points presented as 'Select Next Destination' options. *Make sure you scatter either waypoints or via points throughout your route. Also note that the GPS will display the distance to the next waypoint on the screen. Not the distance to the end of the route.*



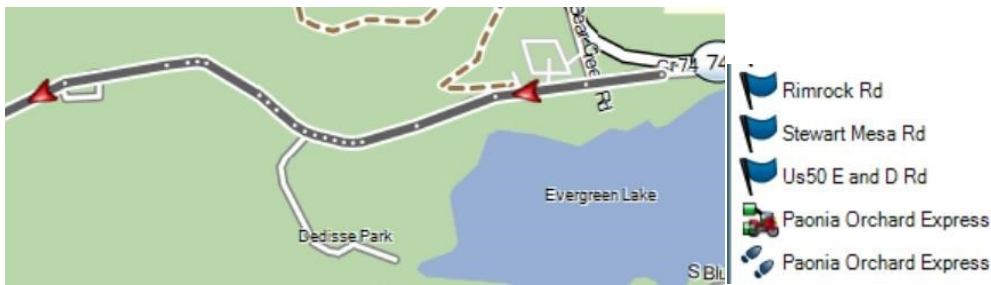
Get Data From the GPS




When you plug your GPS into the computer Garmin Express will probably come up. Just exit out of it. A new folder will appear in BaseCamp under Devices with the name of your GPS. In my case it's called Zumo XT. The directory called Internal Storage contains everything in your GPS. When you select Internal Storage all the waypoints, routes and tracks on your GPS will display in the lower pane. You can move anything from your GPS to your computer by dragging the element from the Internal Storage directory and dropping it to a container on your computer.

Whenever I ride, the GPS is set to record a track of where I go. It names the tracks with the date and time. Here's an example: "Active Log: 2021-06-19 08:19". If I want to save the track and work on it I'll create a list/container under My Collection and drag the track from Internal Storage to the container. Once it's there I can change its name and edit it.

Let's say I rode from my house to Palmer Lake CO. I'd create a new list item called Palmer Lake and drag the Active Log track file to it from the gps. I'll select the Palmer lake list /container item in the top pane which will display the actual track in the lower pane. Track files always have a dual footprint icon to the left of the file name. When you select a track or route file, it will appear on the map to the right. Tracks display on the map as thick grey lines with lots of embedded dots which represent the track points. Routes

display as thick colored lines. You can assign your own colors to the routes and tracks.



The above map shows a track. Next to it shows the objects in a list /container that appear on the bottom left screen. The items with the flag icon  are waypoints, the item with the green squares  is a route and the item with the 2 footsteps  is a track.

Here's a typical edit. First I changed the track name from Active Log: 2021-06-19 08:19 to Palmer Lake Ride. Then I changed the Palmer lake track so it starts at a gas station near my house instead of at my house because if I make this track public riders don't want to start and end at my house. Then I removed a bunch of points when I was circling around in a gas station. You also might want to delete the points created if you took a wrong turn. Typically I'll convert the track to a route (more on this later). Then I'll copy the route to the GPS. You can move anything from BaseCamp to the GPS:

1. By dragging it and dropping it on the Internal Storage directory.
2. You can go to the top screen menu and go into Device where you can receive or send from device
3. Use Send and receive icons at the top. 


Copying from the GPS to BaseCamp on the Computer

Why do I like to put all my Routes, Tracks and Waypoints on the computer?

1. Backup. What if my GPS gets stolen? I'd lose everything.
2. I can edit them
3. I can export GPX and KML files and share the routes with my friends.

Example: I like to take tracks of where I've been and use them in the future for rides. I take them off the gps and store them in /My Collection/ Active track Log/xxx. This is how I personally organize. You can organize the files anyway you want. I connect the XT GPS to the computer with a usb cable and bring up BaseCamp. BaseCamp will recognize the GPS and display everything on the XT in the directory /Devices/ZumoXT/Internal Storage or /Memory Card. All my navigation data is in internal storage. When I click on internal storage all the objects in the gps such as waypoints, routes and tracks show in the bottom left box. I look for the track file I want to copy to the computer. It's going to be named something like "Active Log 2020-08-15 12:35". BaseCamp won't let you store the track unless you first create a named list entry/ container in the My Collection directory. All you have to do is right click on a list directory or a list in the library and choose "New List" and give it a name. Once you create this container you can drag the track to it and it will upload to your computer. Now you can edit the track without the GPS plugged in.

Example: I had a route I created in the GPS called Palmer Lake that wasn't in BaseCamp. I wanted this route to appear in BaseCamp under my 'Chucks Routes' folder which is under 'My Collection'. I selected the 'Chucks Routes' folder and right clicked. I choose 'new list' and gave it the name Palmer

Lake. I clicked on internal storage. In the lower left box, everything in internal storage appeared. I found the route  Palmer Lake and dragged it to the new list item I had created.

Import GPX Files into BaseCamp

Why do I want to do this?

1. Since GPX is a generic format for map data you can share routes created by other people off of websites, attached to emails or on flash drives for your own use.
2. When you get these files, you are able to look at them in BaseCamp before you use them.
3. You can edit these files to include route changes and new waypoints.
4. It allows you to easily download the files to your Garmin GPS

How to Import a GPX file into BaseCamp

Let's say I sent you a gpx file via an email attachment of one of my favorite twisty routes. First you would save the file attachment off the email in a convenient place on your computer. Within BaseCamp select or create a list directory where you want the file to be placed such as "Chucks Routes". Right click on "Chucks Routes" and create a new list container and name it for instance "Morrison to Deckers". Select / click on the Morrison to Deckers list. Go to File/ import into and browse for the gpx file. It will import it into the Morrison to Deckers list item. If you import it into the wrong place you can copy or move the file anywhere you want later.

Click on the list item and the contents of the gpx file will show up in the lower left box. Depending on what is in the GPX file you may see:

1. Waypoints
2. Tracks
3. Routes

If you click on a route or track it will display on the map. Double click on a route or a track and a dialog information box will come up showing you all the properties. At this point you can edit the file and or download it to your GPS.

How to Import a GPX file Directly into the GPS


1. Obtain a route or a track gpx file and have it available on your pc
2. Plug your Garmin GPS into the pc with a usb cable
3. Bring up the file explorer and copy the gpx file from the PC into the gpx folder in the Garmin
4. Eject and disconnect the GPS from the computer
5. Turn on the GPS. If you look in tracks if you transferred a track. If you want you can convert it to a trip. If you transferred a route the GPS will ask if you want to import the route into the trip planner.

How to Transfer a GPX file to the GPS Using Garmin Drive

1. Obtain a route or a track gpx file and have it available on your iphone or ipad (you can email it to yourself). Save the gpx in files.
2. Open the files app, find the file and press and hold on it.
3. Click on share
4. Share to Garmin Drive

5. Garmin Drive will acknowledge receiving the file and ask if you would like to send it to your Garmin device. Click on the Send button
6. The next time the Zumo XT connects to the phone via Bluetooth the file will be transferred to the XT

Copying from BaseCamp to the GPS

When you plug your GPS into your computer with a USB cable a new folder will appear on the left under devices. You transfer tracks, routes and waypoints from BaseCamp to the GPS by simply dragging it to the Internal Storage folder. You can also select an item, and on the top of the screen go to Device/ send to device or click on .

If you drag a Track or a route that has waypoints all of it will be transferred to the GPS. If you are transferring a track to the device it will transfer under the name you gave it. I always name the objects in my list /containers. The track file within the list defaults to the name “Track”. You should rename this because it will transfer to the GPS with the name “track”. You won’t know what it is and will end up renaming it on the GPS which takes more time.

NOTE: You can’t delete tracks on the GPS from BaseCamp. You have to delete them using the GPS. You can delete routes that reside on the GPS from BaseCamp.

Running A Track on the XT GPS

Go into the Tracks App. Select the track. Select the wrench icon and check the box display on map. You have the option to pick the color and set the track width on the map. The track shows up as a line the color of your choosing, and your vehicle icon shows up wherever you are on the map. Click on the Go button on the bottom right. If you follow the line, your icon does too, if you deviate, your icon does too, but the track is still there if and when you self-navigate back to it.

Running A Route on the XT GPS

Once the route is copied to the GPS unplug the USB from the GPS and turn it on. The GPS will come up with a message asking if you want to import new routes into Trip Planner. Say yes. The GPS will recalculate the routes.

Running A Route and the Track at the Same Time on the XT GPS

We all like routes because they give you nice turn by turn directions on the screen and through the headphones. But, there are many ways routes can go awry while tracks are just points set in stone. If you have a track and a route file that are the same you can turn on the track using a light color and a thick line and start the route in trip planner. Both will be displayed on the XT GPS. You’ll know immediately if the route is deviating from the track.

Recalculating Imported Routes

Make sure you have setup BaseCamp and the GPS’s activity profiles as described above. If Basecamp is using the motorcycling profile have the XT set the same way. If you haven’t there’s a good possibility that the new route won’t be what you expected. To keep the GPS from recalculating the route check your settings in Basecamp.

Edit -> Options -> Device Transfer.

Make sure that all of the boxes are unchecked, and make sure that you apply the settings to all devices. (There may be a few device listed in the top drop down box).

Make sure that the map that you are using in Basecamp is Exactly the same map that you are using on your Zumo. If it is, and if you have installed new maps since the route was created, you must recalculate the route using the new maps.

Also

Make sure that you BC route is set to either Motorcycling or Driving. I prefer to have none of the route profile boxes ticked, because none of them get transferred to the XT - except the vehicle (as long as it is car or bike), and the shorter/faster option. The Zumo will default to Faster / Motorcycle if it receives a setting that it doesn't recognize (like Custom), and it may well have to recalculate the route as a result.

The XT will nearly always display the calculating message, when it is organizing the data / putting Waypoints into Saved / Favorites; adding data to its list of routes and a load of other stuff that I don't know enough about to describe. But this normally takes just a few seconds. A full recalculation can take a lot longer than that.

Go into Apps/ Trip Planner/ Saved Trips and you should see your new routes. Select the route with your finger. To run the route just touch Go! I like to check the route out so I always select Map to see if the route looks reasonable. I also like to check the directions. Touch the wrench icon and View Turns. If that looks reasonable you are ready to go.

If you want the gps to give you spoken directions

Go into Volume on the GPS and under Sounds you will see check boxes for Spoken Navigation and Traffic Alerts. If a BT headset is connected it will control the volume.

Music and navigation voice are using different Bluetooth protocols. Music is using a high quality connection and navigation a low quality. This accounts for the sometimes-low quality voice directions.

Printing a Route

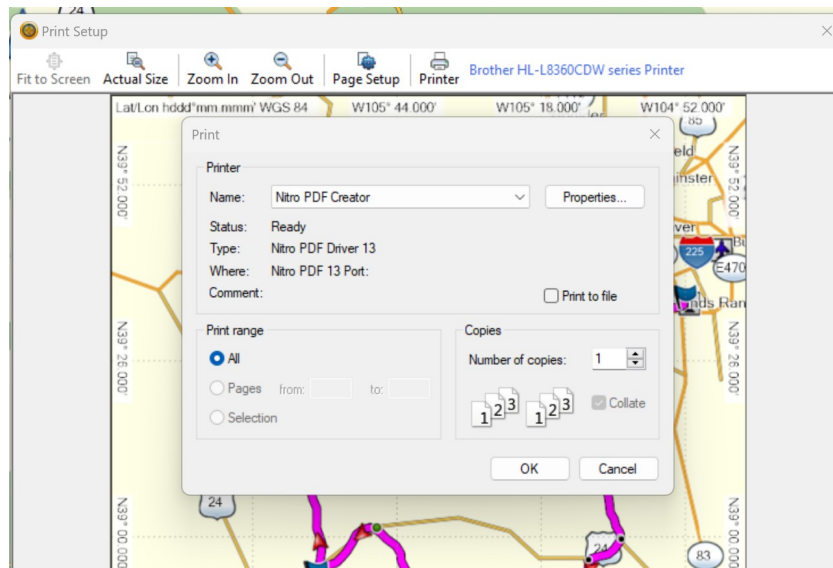
Double click and bring up the route dialog box.

Click on the Route directions tab on the top.

Click on the Print button on the bottom right.

Click on the Page Setup or Printer tab to setup the page and select a printer.

You can preview the print job or click on print to run it.



BaseCamp Recycle Bin

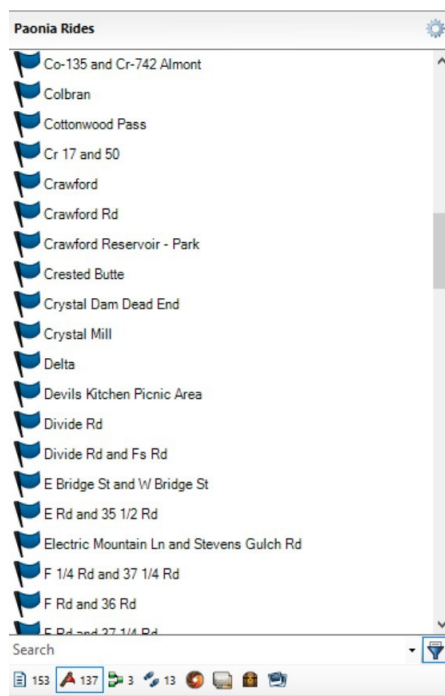
Anything you delete while using BaseCamp ends up in the Unlisted Data Directory. This goes for files on the GPS and files on the PC in BaseCamp. This is a safeguard like the recycle bin in windows.

Naming Objects

BaseCamp enforces unique names within the system. You cannot create objects i.e. waypoints, shaping points, routes or tracks anywhere with duplicate names. When you try to create an object with a duplicate name BaseCamp will give you an error message saying it's invalid. This also goes for files in the unlisted data directory (BaseCamps recycle bin) that you have deleted. I like to clean the unlisted data out so I can reuse names.


What Happens when you Drag and Drop / Copy and Paste a Route or Track

Unlike duplicating, drag and drop / copy and paste create files that are all linked together. Any change in one changes all the copies. The main reason I copy a route or track is to modify it for another use. I would not want it linked causing my changes in the second to change the original. What you do to one is reflected in all the others. When you duplicate a file it gets a new name and is independent of any other route, track or points.



Reusing Waypoints

I created 14 different tracks for the Paonia Top of the Rockies Rally. Each track was created in a separate list container. I added waypoints to the list containers of popular points such as cities and passes. Many of the tracks went through the same places such as the city of Crawford, Kebler Pass and Gunnison. When I grabbed the create a waypoint flag icon and went to create a new waypoint for Crawford I got an error saying it was a duplicate name. I ended up with a Crawford1, Crawford2 ... What I ended up doing was create a list container called Favorites. I went to the list container where the Crawford waypoint was first created where it was named Crawford and dragged it to my Favorites container. I also could have copied and pasted it. Next I dragged the Crawford

waypoint from my favorites to the list container where my route is. Then I opened the route that used Crawford and deleted the old Crawford waypoint which usually had a sequence number after it and inserted the new Crawford waypoint. What this does is create "linked" waypoints. Each link has the same name and points to the original waypoint. If I edit the name or location of any one link the changes are reflected in all the links. That way I don't end up with different names for the same waypoints. In order to fix all the Crawfords I had to find all the places where Crawford was used. Since all my Paonia rides are in a directory called "Paonia Rides" all I had to do is click on "Paonia Rides" in the library and all the waypoints, routes and tracks show up in the lower box. Since I was looking for waypoints I clicked on the point filter  icon in the filter box at the bottom of the lower left content box and it filtered out just the waypoints. I Scrolled down and looked for Crawford. Using

the select tool double click on any of the Crawford waypoints (such as crawford1, crawford2...) and a dialog box will come up. Click on the references tab and it will show you the list item where it is used. Select the list item and delete the duplicate Crawford1 and drag the Crawford waypoint from favorites to replace it. If you create a new track or route that goes through Crawford on Hwy 92 you can simply add the Crawford waypoint to the new route. Because all the Crawfords are now linked you can edit any one and it's reflected in all of them. I zoomed up very close on Crawford and realized the waypoint was not exactly on the road. I like them on the road because when I create routes that have to go through the waypoint the route doesn't have to generate a little path going to the waypoint and coming back to the road.

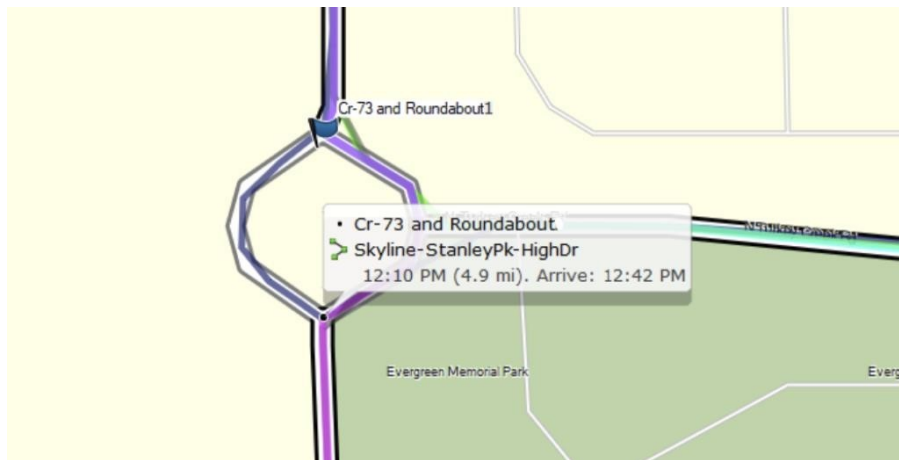
This method does not work if you have a duplicate named shaping point because it won't show up in the waypoint list.

The Case of the Missing Waypoint or Where Used

If you have a waypoint embedded in a route you can't use the waypoint name again. I was creating a new route in an area of 2 lane mountain roads where I ride a lot. There's a roundabout at the intersection of 2 popular roads that a number of my existing routes go through. I'm creating this new route for a group of motorcyclists that might not be familiar with this area so I want to label some important points. This roundabout is one. When I tried to create Cr-73 and Roundabout BaseCamp said the name was already in use and wanted to name it Cr-73 and Roundabout1.

Here's what I do to find a duplicate point:

1. Look in your Unlisted Data directory to see if the point was used and then deleted. If you find it delete it.
2. Select the My Collection directory all the way at the top and look through the waypoints displayed in the lower dialog box. You can click on the flag icon at the bottom of the box to filter out the waypoints. This will find any existing standalone waypoints. If you find the waypoint, double click it to bring up the dialog box. Select the References tab and it will show you what routes the point is used in. *Be aware that there can be via points or shaping points with names that cause duplicate problems.* When you're done don't forget to click on in the bottom filter area on the show all user data icon or you'll wonder why all your tracks and routes disappeared.
3. If this doesn't work, with My Collection still selected, look at your map. Everything in My Collection will be displayed on the map including shaping points. Look for points in the vicinity where you want to insert the new waypoint. Use the select arrow tool and mouse over the points. As you do the point information including the name and what files it's used in will appear.
4. In the example you can see that there are multiple tracks and routes going through this roundabout. You can see the waypoint I created called Cr-73 and Roundabout1. I was forced to name it with a 1 because the name was already used somewhere in BaseCamp. At the bottom of the roundabout is a point. When I moused over it I found that this is the point with the duplicate name and it's located in the Skyline-StanleyPk-HighDr route.



In order to use the new waypoint named Cr-73 and Roundabout I have to either delete or rename the older waypoint in the Skyline-StanleyPk-HighDr route.

Since I knew I was going to use the roundabout waypoint again I dragged it to my favorites list. Any time I want to reuse it, I drag it to the container where my new route is and add it to the route.

Note If you can't find the waypoint you'll have to open up each route and look to see if the waypoint or shaping point name was used in it. Remember, just look in routes. Waypoints are not embedded in tracks. What Happens when you Duplicate an Object

If you duplicate an object such as a waypoint or route (select the route, right click and choose Duplicate). BaseCamp will ask you if you want to duplicate the waypoints. I almost always *say no because you will almost always want to reuse the waypoints*. If you choose yes, new waypoints, routes and tracks are created with new names. These are actual copies of the originals that have no backward association or links to the original files. What you do to these objects has no effect on the originals. If I duplicate a route and say yes to waypoints a new route is created with a new name and all new waypoints are created in the list container with new names. The new names are created with a suffix of 1 to make them unique. All the embedded waypoints in the duplicated route have the new names. If I drag or copy the new route to a new list container the route comes along with all the new waypoints. I can edit the new dragged in route and it doesn't affect the original route file I copied it from. Duplicate makes an actual copy of the files.


Why would you want to do this? I spent 8 hours creating a 333 mile track using 3408 points of an on pavement route for the Top of the Rockies Rally. There is another version of that same route for dual sport riding that includes some dirt roads. Both tracks are about 2/3's the same. I created the paved version first. I then duplicated it (not the waypoints) and used it for the basis of creating the dual sport version. Both versions used just about all the same waypoints so I left the new duplicate in the same list container and edited the differences.

Using Find in BaseCamp



Find in the top menu bar is used to find points of interest (POI's) places like hotels on the map. The list of places found is always from the center of the map out. There's also the search bar on the top right of the screen which works the same.

Delete a bunch of points in a track / route in BaseCamp

Let's say I went down a side road to explore and found nothing but a dead end. I don't want this little excursion as part of my track. I'll use this technique to delete all the points in the excursion.

1. Double click on the track with the select tool  until the track properties dialog box comes up with all the points in the track. The points will highlight on the map.
2. Select the point or points you want to delete and hit the delete key. You can select a range of points by selecting one and holding down the shift key and selecting another. You can select a bunch of non-contiguous points by holding down the ctrl key and clicking on the points.

Adding points to a track in BaseCamp

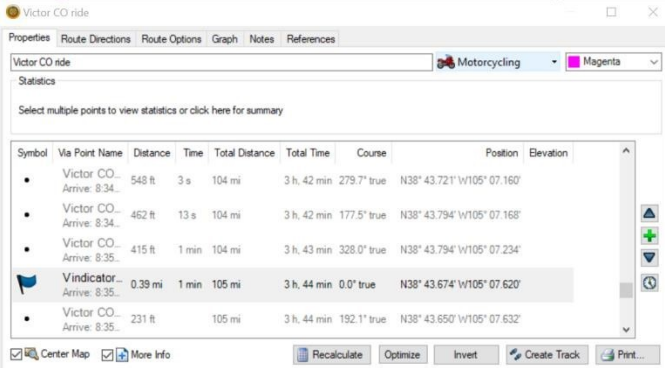
Select the track by clicking on the track in the map with the select tool  or selecting the track in the library box to the left of the map. Choose the insert point tool  Hover over the point on the track line on the map where you want to add points. Move the tool to the right and left and you will see line the segments on either side of the point highlight in black. You may have to zoom out to see them. Click when the highlighted segment is in the direction you want to add points. Hover over the end until you see a big black circle to add points to the end.

You can also select and copy points from a track or route properties dialog box and paste them into another track or route.


Note: Be very careful on divided roads and highways that you get the points ON the correct side of the road. Putting a point on the wrong side of a divided road will REALLY screw navigation. The GPS may tell you to exit the highway and get on going the other way.

Adding Waypoints to a Route in BaseCamp

This needs to be said. *You never have waypoints embedded in tracks.* You can have waypoints in the same list container as tracks which mean that they show up displayed on the map but they are never embedded in a track. Waypoints are embedded in routes because they announce and enforce pass through which is not relevant in tracks. You can add points to tracks, not waypoints.



Symbol	Via Point Name	Distance	Time	Total Distance	Total Time	Course	Position	Elevation
•	Victor CO... Arrive: 8:34.	548 ft	3 s	104 mi	3 h, 42 min	279.7° true	N38° 43.721' W105° 07.160'	
•	Victor CO... Arrive: 8:34.	462 ft	13 s	104 mi	3 h, 42 min	177.5° true	N38° 43.794' W105° 07.168'	
•	Victor CO... Arrive: 8:35.	415 ft	1 min	104 mi	3 h, 43 min	328.0° true	N38° 43.794' W105° 07.234'	
🚩	Vindicator... Arrive: 8:35.	0.39 mi	1 min	105 mi	3 h, 44 min	0.0° true	N38° 43.674' W105° 07.620'	
•	Victor CO... Arrive: 8:35.	231 ft		105 mi	3 h, 44 min	192.1° true	N38° 43.650' W105° 07.632'	

Double click on the route with the select tool  until the route properties dialog box comes up showing all the point names. Select a point in the route where you want the new point to be inserted. Select the + on the right. Select a waypoint. The waypoint has to already be in the list container. Select insert waypoint. The point will be inserted above your selection. On the left, the Vindicator waypoint has been inserted into the route. If that's not what you want click the up and down arrows to move the waypoint to

the correct position. Select recalculate. If the waypoint is out of sequence, you will see a route that tracks back (returns) to the point. Tip: If you end up with lots of waypoints out of sequence you can try the Optimize button which sorts all the points in a logical sequential order.

A Route without Embedded Waypoints

Note: I created a route in a list directory that already contained a track and a bunch of waypoints. I deleted the original track and selected the directory list container and exported that to a gpx. The waypoints were exported with it and appear in the head of the GPX file and are transferred to the GPS as discrete independent waypoints. The waypoints were not embedded in the route. This means that the waypoints do not appear in sequential order in the route and are not enforcing the route to pass through them nor will they be announced. The waypoints will be displayed on the GPS map when you get near them.

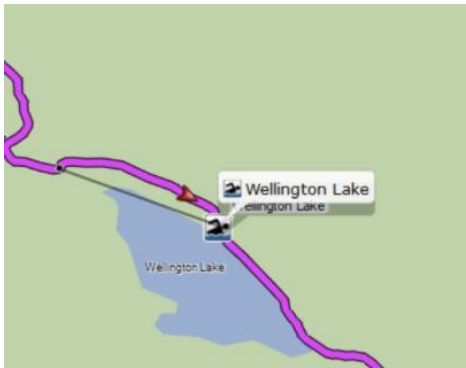
A Route with Embedded Waypoints


Example: I created the route Cache la Poudre River - Ft Collins from scratch by touching points on the map mostly along Rt 14. I then created a number of specific waypoints like the Mishawaka, Stove Prairie Rd and Chambers Lake. I double clicked the route to bring up its property box and added / embedded the waypoints using the + button in the correct order and recalculated the route. I selected the route file and dragged it to internal storage in the XT GPS.

The waypoints now appear as individual waypoints in the XT's waypoint list. You can see the list of waypoints by going into the Where To menu and clicking on Saved. Then choose All Saved Places. This will show the list of all waypoints stored in your GPS. You can then scroll the list or search for a point.

If you don't want the individual waypoints to be added to the GPS's waypoint list delete the waypoints from the list container before you upload the route to the GPS. I recommend copying these waypoints to your favorites or a temporary list container so you will have them to use again.

Adding Waypoints to Routes on the Map



This is nice because it inserts the waypoint into the route in the correct sequence without having to deal with the route properties dialog box. This only works on a "Normalized" route which is a route that was not created using BaseCamp's default track conversion. Select the route to make it active. Select the Insert Tool  (or press I on your keyboard) - your cursor will change to a pencil with a plus sign. Hoover the Insert cursor over the magenta route near the waypoint until a thick black line appears. Keep your cursor in the same spot and press the left mouse button. A thin snap line should appear as shown on the left. Move your cursor (and the snap line) over the waypoint on the map

until the waypoint flag appears (this is like a cartoon text balloon). In this case the flag says Wellington Lake. Press the left mouse button and the Wellington Lake waypoint will be inserted into the route. Press the Esc to get rid of the snap line. Select the hand tool.




Joining 2 Tracks / Routes in BaseCamp

I'll use this when I want to reuse a part of an existing track / route to create a new one. The 2021 100k ride pavement and dual sport routes are exactly the same from the start to Old Monarch Pass Rd and Rt 50. I created the paved version first. Then I created a new route for the dual sport version starting at the Old Monarch Pass road to the end. I duplicated the pavement version and cut it at Old Monarch Pass

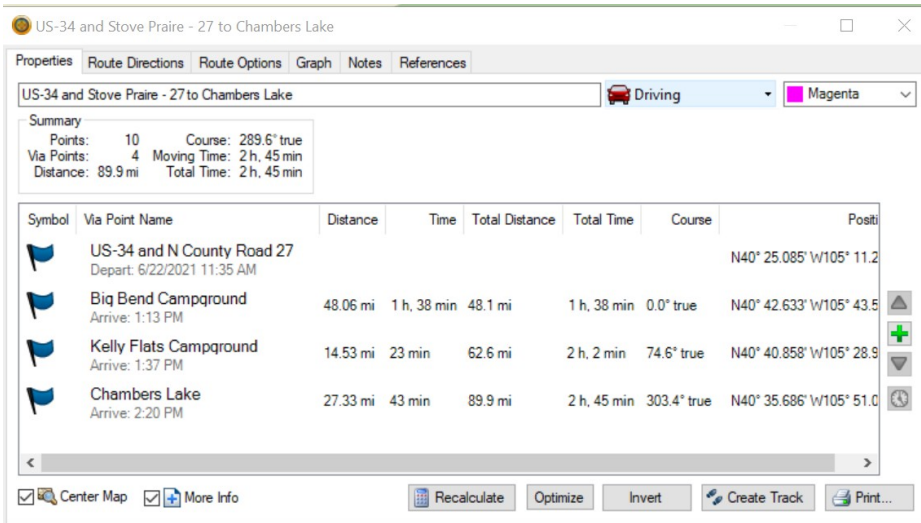
road and Rt 50. I then joined my new dual sport route to the existing segment to create the complete dual sport route.

To join 2 tracks select the tracks in the library box to the lower left of the map. Holding down the ctrl key will let you select multiple items. Right click the mouse while it is over the selected tracks in the library box or go to the top of the screen and click on Edit. Mouse down to Advanced and click on Join selected tracks. A dialog box will come up showing the tracks. If you look on the map the tracks should be selected. At the end of one of the tracks you might see an orange dotted line that goes all the way back to the beginning of the track so it creates a closed loop. If you don't want this (and you usually don't) select one of the tracks in the dialog box and click on one of the arrows to the left. The dotted orange line will disappear. You then have the choice of keeping the original tracks that made up the new one.

Ways to Create a Route from Scratch



1. Like everything else there are a lot of ways to do this. Create a list container for the new route. What I like to do is drag waypoints from my favorites or create a bunch of new way points you want to visit into the list container. Select the waypoints in the list container. Right click and choose "create a route from waypoints". The way points in the list box will be in alphabetical order and the new route will be created so the points are visited in this order. You'll end up with a route going all over the place. Click on the "Optimize" button and the points will be sorted in geographical sequential order. You can then edit and fine tune the route.
2. Create / copy a start and end waypoint in your list container. Click on the new route icon  or go into File/ new/ route. A dialog box will come up with a From and a To container. Drag the start waypoint to the from container and the end waypoint to the to container and click on the Go button. BaseCamp will generate your route. From here you can insert more waypoints in order and shape your route.
3. Click on the new route icon  or go into File/ new/ route. A dialog box will come up with a From and a To container. You can ignore it. Your cursor will be in Insert mode . Start clicking on the map and a route will be drawn. If you want to use waypoints in the route move your pointer close to a waypoint on the map until the description flag pops up and click on it. The waypoint will be added to the route.

Create a Route with Waypoints







US-34 and Stove Prairie - 27 to Chambers Lake








Properties Route Directions Route Options Graph Notes References

US-34 and Stove Prairie - 27 to Chambers Lake  Driving  Magenta

Summary

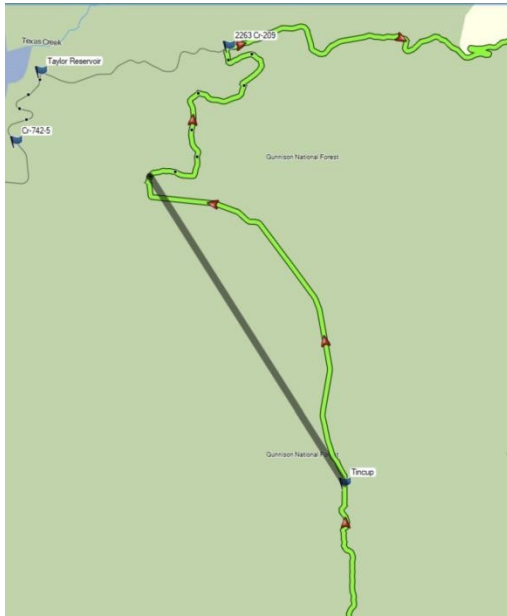
Points: 10 Course: 289.6° true
Via Points: 4 Moving Time: 2 h, 45 min
Distance: 89.9 mi Total Time: 2 h, 45 min

Symbol	Via Point Name	Distance	Time	Total Distance	Total Time	Course	Position
	US-34 and N County Road 27 Depart: 6/22/2021 11:35 AM						N40° 25.085' W105° 11.2
	Big Bend Campground Arrive: 1:13 PM	48.06 mi	1 h, 38 min	48.1 mi	1 h, 38 min	0.0° true	N40° 42.633' W105° 43.5
	Kelly Flats Campground Arrive: 1:37 PM	14.53 mi	23 min	62.6 mi	2 h, 2 min	74.6° true	N40° 40.858' W105° 28.9
	Chambers Lake Arrive: 2:20 PM	27.33 mi	43 min	89.9 mi	2 h, 45 min	303.4° true	N40° 35.686' W105° 51.0

 Center Map  More Info  Recalculate  Optimize  Invert  Create Track  Print...

One good way to create routes is to first create a bunch of waypoints. Use the first and last waypoints to create the route. Select File/ New/ Route. Two boxes will come up, one for the start and one for the end. Drag the start and end waypoints to the appropriate box. The route appears as a colored

line on the map. It's possible the route will not be where you want it to be because it doesn't know about the other waypoints yet. Double click on the route with the select tool until the route properties dialog box comes up. Choose the properties tab which displays a list of points where you can add, reorder and delete points. Select the +. A dialog box will appear. Browse and select the waypoints you want to enter and click on the insert waypoint button. If the waypoint you entered is not in order select it and use the up and down arrow keys to put it in the correct sequence. Click on the Recalculate button and a route will be drawn through your new waypoints.



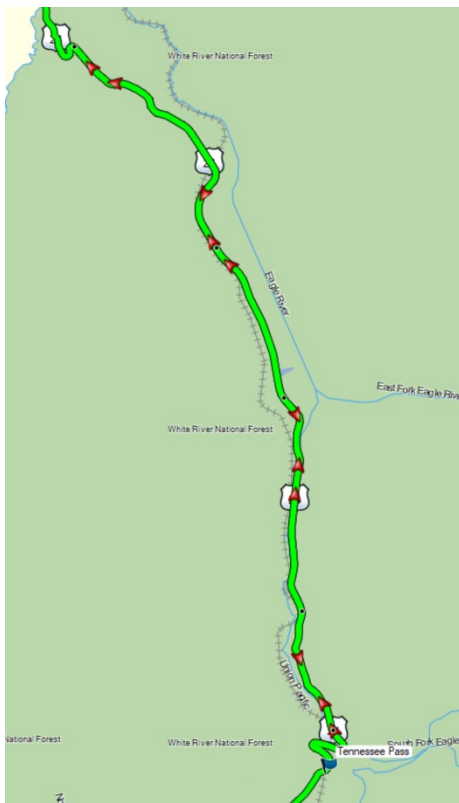
You can also select a bunch of waypoints in the list box, right click and choose Create a route using selected waypoints. The waypoints probably won't be in any logical geographical order. You can fix this by double clicking on the route with the select tool until the route properties dialog box comes up. Click on the Optimize button or move them around with the up down arrows.

You can add points to the end of a route. Hover over the end until you see a big black circle. This means you will be adding to the end.

BaseCamp – Adding Via / Shaping points to Force a Route where you want it

Let say you created a route between 2 waypoints and it didn't go where you want. Select the route in the left pane to make it active or using the select tool select the route

on the map. Choose the insert point tool . Hover over the route and a thick black line will appear between the start and the end of the route or between the closest waypoints or via points. Click on the mouse and the line will turn into a thin rubber band. Now you can click on points that you want the route to go through. The route will dynamically recalculate as you click on points. Keep inserting points until the route follows your intended path.






Often times you will find that a portion of a route that already has waypoints, via points and shaping points is off track. In this case when you hover over the route the thick black line will appear between two waypoints, via points or shaping points. *As you hover watch where the thick black line appears* and click on it when it spans the area you want to insert points into. If you end up inserting points in the wrong sequence you can totally screw up the whole route.


Be aware that you can only have 29 total waypoint/ via points in a route. Also note you can have at most 125 shaping points between each via point / way point.


Note: If you find that you've screwed up your route you have a few options. A screwed up route usually has paths running in

multiple directions, in circles and on roads you don't want to use. See the route to the left. There are arrows running in 2 directions in this section.


1. Hit ctrl Z or  which will undo your last edits. It only undoes about 3 edits but it often works.
2. Use the erase tool  and start deleting points in the area you were working on. Once you delete enough points the route sometimes snaps back. Sometimes I have to delete points that are not necessarily near to where the screw up is. Sometimes you can trace the route to the point where the direction reverses and delete some points there.
3. The last resort is to recover from a backup. That's why *I always backup BaseCamp when I get to a spot where I have a clean route.*

In this case I used the erase tool  and deleted one point South of Tennessee pass and started deleting points going North up the highway until things straightened out. I have no idea what happened. I'm going to insert some shaping points between Tennessee pass and Red Cliff which is a 10-mile stretch.

Note: You can create a route with a minimum of 2 points, a start and an end. The route is created using the Garmin algorithms that take into account the activity profile you have chosen such as the shortest distance or the shortest time. *If you transfer this route to a device with a different activity profile the route will be recalculated to something possibly completely different.* To ensure this doesn't happen you can create your route with lots of via / shaping points. You have a limit of 29 via points in the Garmin XT so turn some via points into shaping points to get under the 29 point limit. There's also a 125 shaping point limit between via points. In most cases this ensures the route will follow your intended path no matter how a GPS is set up. When you're done, click on another icon like the pan tool  to end the command.

Example: The end point of the 428-mile 100k route was changed from a Golf course in Littleton, CO to a park in Arvada, CO. I created a waypoint for the Arvada Park. I divided the route in 2 where I70 meets C470 which is a location before the route went to the golf course. I deleted the segment that went to the golf course. I double clicked on the route with the select tool  until the route properties dialog box came up. Using the plus button, I added the park waypoint as my new end point. Then I recalculated.

Check Your Route When It's Complete

When I created the route above, I initially used about 50 waypoints which is over my 29 point limit. Everywhere the route deviated from the intended path I inserted shaping points. The route is now accurate. I double clicked on the route with the select tool  to bring the route properties dialog up.

Properties

Route Directions

Route Options

Graph

Notes

References

2021 100k Dual Sport

Green

Summary

Points: 285

Course: 314.0° true

Via Points: 118

Moving Time: 11 h, 17 min

Distance: 414 mi

Total Time: 11 h, 17 min

Symbol	Via Point Name	Distance	Time	Total Distance	Total Time	Course	
	BMW of Denver Depart: 7/2/2021 2:53 PM					N39° 35.0'	
•	E Dry Creek Rd1 (won't alert) Arrive: 2:55 PM	0.98 mi	2 min	1.0 mi	2 min	0.0° true	N39° 34.0'
•	E Dry Creek Rd and Road and Ramp1 Arrive: 2:56 PM	0.24 mi	1 min	1.2 mi	3 min	0.0° true	N39° 34.0'
•	Co-470 W (won't alert) Arrive: 2:59 PM	2.40 mi	3 min	3.6 mi	6 min	303.0° true	N39° 33.0'
•	Co-470 W1 (won't alert) Arrive: 3:09 PM	11.20 mi	10 min	14.8 mi	16 min	0.0° true	N39° 33.0'
•	W Ute Ave and W Toller Dr (won't alert) Arrive: 3:12 PM	2.04 mi	3 min	16.9 mi	19 min	0.0° true	N39° 33.0'
•	8995 S Owens St Arrive: 3:14 PM	0.65 mi	1 min	17.5 mi	21 min	0.0° true	N39° 33.0'
	11027 W Deer Creek Canyon Rd Arrive: 3:14 PM	557 ft	25 s	17.6 mi	21 min	329.3° true	N39° 33.0'
	Deer Creek Canyon Rd and S Deer Cree... Arrive: 3:28 PM	4.18 mi	14 min	21.8 mi	36 min	0.0° true	N39° 32.0'
	Highgrade Rd Arrive: 3:27 PM	3.52 mi	9 min	25.3 mi	45 min	37.7° true	N39° 30.0'

☒ Center Map
 ☒ More Info

Recalculate

Optimize

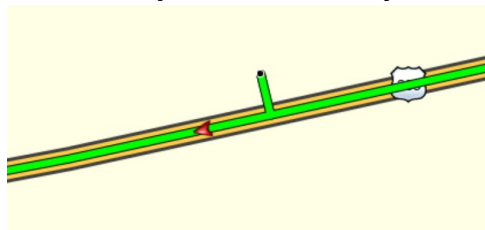
Invert

Create Track

Print...

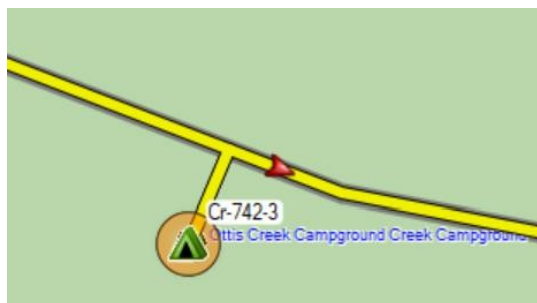
The box tells me all the information about the route. Frankly it doesn't make any sense. It says that I have 118 via points which is actually the total count of all the points shown in the box which includes way points, via points and shaping points. Looking at the points there are actually 49 via points. I have no idea where the 285 points comes from. Way points have a flag to the left. Via points are the points displayed with bold type and a black dot to the left. Shaping points are displayed with dim type and a black dot to the left. I'm going to convert at least 20 via points to shaping points so I don't go over my 29-point limit.


Note: When you're done with your route zoom up all the way and scroll through your route to make



sure there are no errors such as points off the road. If you don't fix these your GPS will direct you to make a turn down the branch and turn around. This also can cause the route to double back and make a complete mess. Use the move tool to drag the point back on the road. The route will then recalculate. The first example could have occurred from inaccurately picking the point or when I updated the Garmin

map. The road may have changed location on the new map causing an existing point to fall off the road. I think this is the case because I had quite a few of these.



In the second example you can see where a point was created for a campground off the road. This happens when you insert a point anywhere near it. My guess is these places pay for that to happen. The best thing to do is to delete the point and replace it with a new shaping point. If you use the move tool  to drag the point back on the road the name remains.

Sometimes you'll find a waypoint that's off the road which isn't unusual. This happens with many locations because the actual location is not in the middle of the road. Unless I'm actually stopping, I move these points onto the road. Make sure the directional arrows are always pointing the way you want to go. It's easier to find errors now than to get screwed up on the road. Bring up the route properties box and click on each point and verify they are all in the correct spot and in sequence. Especially watch for points on the wrong side of a divided highway. Zoom in close to see.

Why am I seeing points (dots) on my route that I can't edit?

While you're sequencing through your points to check if they are in the right order or you are editing the route you may see lots of little black points (dots) that you can't select. These other points are just points shining through from another route in your list directory that you are not presently working on. Often, I'll have 2 or more versions of the same route in the list directory. For instance, I might be doing a paved and dual sport route in the same directory. Parts of each route usually overlap. When I edit the overlapping areas, I can see points from the other routes. Sometimes I find these points distracting. What I do is create another list container called temp and drag the routes I'm not working on there. Then I delete these routes from my working directory. I'm left with one route and no distractions. When I'm done, I just drag the other routes back to the working directory / list container.

Upload to the GPS

The last thing you do to check the route is to transfer it to the GPS by dragging the routes to internal memory. When you turn on the GPS it will come up with a message "New Routes found. Import to trip planner?". Push the Yes button. You will be presented with a screen showing the routes it found. I transferred 2 routes so I said select all and import. The GPS started a conversion which recalculates the routes. It came up and said that my 2021 100k Paved has more than 29 via points. Route was split into 2 trips. It said the same for the 2021 100k dual sport. I had another one that said it couldn't calculate the route. That one turned out to have 2 instances where there were more than 125 shaping points between via points.

I went into Apps/ Trip planner to look at the routes. I had 4 routes.

1. 2021 100k Paved1
2. 2021 100k Paved2
3. 2021 100k dual sport1
4. 2021 100k dual sport2

I looked at the 2021 100k paved and looked at the map. I scrolled to the bottom of the waypoint list and it ended at Cottonwood Pass. The dual sport ended at Cumberland Pass.

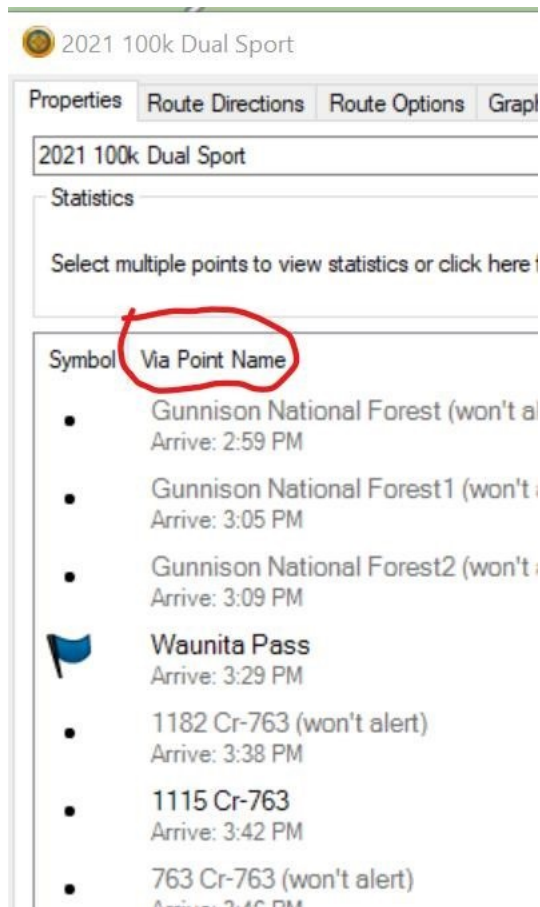
The points in the gps have orange flags with circles for waypoints and via points. Circles with blue centers are shaping points.

I counted the different kinds of points in the 2021 100k dual sport1 route.

Orange flags with circles around them via points and waypoints: 30

Circles with blue centers are shaping points: 43

I went back to the original routes and deleted waypoints and replaced them with shaping points.




I went to the BaseCamp version of the 100k dual sport and counted the waypoints (flags) and via points (black dots with bold type) and came up with 30 at the Cumberland pass. This means that the 29 via point limit includes waypoints. Then I noticed that the heading label in the route property box says “Via Point Name” in the column showing waypoints and via points. Then I went back and started to count the amount of shaping points between each via point to make sure there weren’t more than 125.

Convert a track to a route using the BaseCamp default method

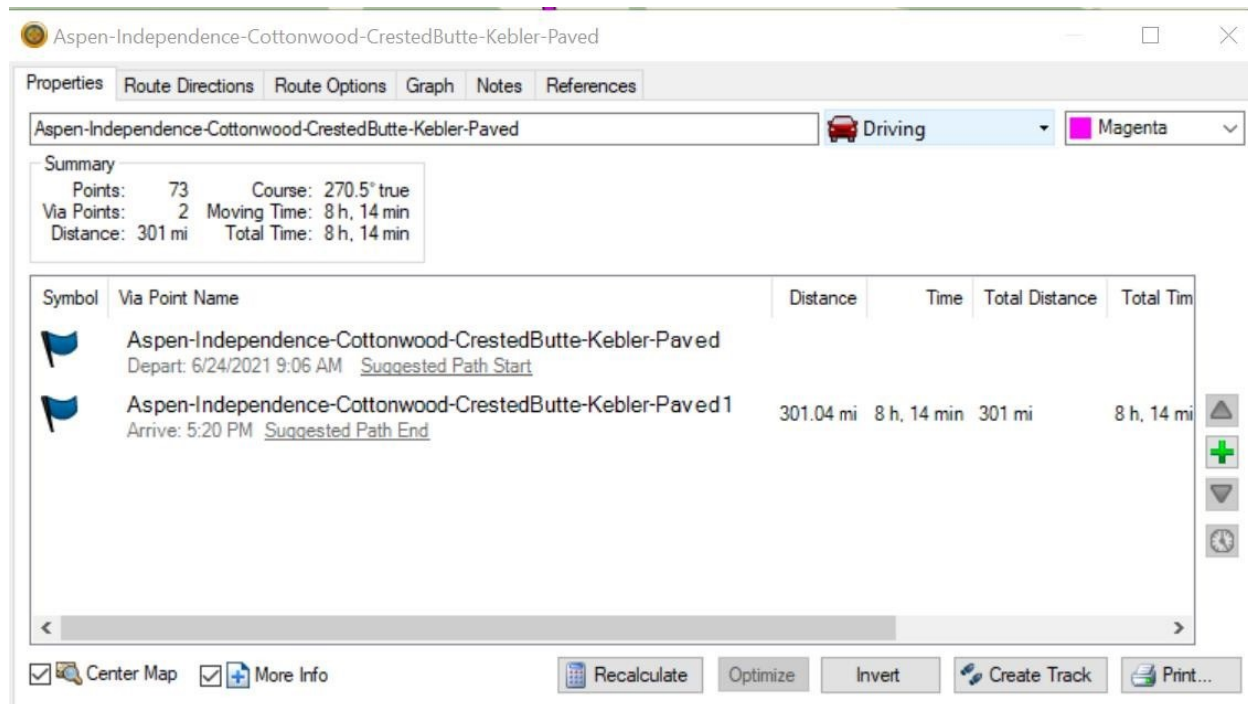
You’ll usually do this to get spoken navigation. I’ll assume you have BaseCamp setup with a normal activity profile such as motorcycling or driving. You select a track in the bottom left list container and right click on it. Choose “create a route from selected track”. You can also select the route and go up top to Edit/ Create Route. *When you create a route this way you get a special hybrid file* that for the most part can’t be edited.

BaseCamp creates 2 way points for the beginning and end points. These points are named after the name of the track. If the track is named Palmer Lake a begin waypoint called Palmer Lake1 and an end point called Palmer lake2 are created. You can change the names of these created points by double

clicking the route with the select arrow  to bring up the route properties dialog box. Select a waypoint and right click on it. Choose Edit Via point. You can change the name of the point.

The route is created in a special Garmin format that generates hundreds of invisible intermediate points as GPX extensions. I call them ‘Ghost Points’ that force the GPS to take you precisely along the same path that was in the original BaseCamp track with enough track points to ensure the route follows the track no matter what activity profile you have chosen. (There is one exception). The track points are invisible, you can’t add waypoints, via points nor can you move points. As soon as you try to do anything to this file it recalculates. When it does, the route becomes a total mess. It seems to throw away all the ‘ghost points’ except the start and finish causing the route to become useless.

The route dialog box (below) will tell you the route has 73 points and 2 via points but you can’t see these “ghost” points and you can’t edit anything in the route or you will break it. I’ve looked at exported GPX files from these conversions and they actually contain all the track points from the original file. You can load this file onto your Garmin GPS and it will work. *Just don’t do a recalculation.*



Route/ Track Dialog Box for a route generated from a track

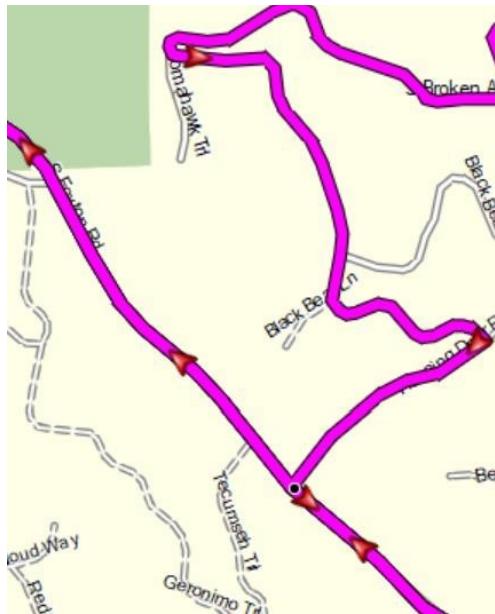
My guess is Garmin created this hybrid file so you can do a quick and easy conversion to a route that will always follow your intended path and give you turn by turn directions no matter how your activity profile is set. As you’ll see below, manually creating an editable route can be a lot of time-consuming work.

When I load one of these route files onto my GPS it comes up with a warning message that says not to recalculate the route.

Notes: I created a route from a track of my Victor CO ride. BaseCamp created a start and an end point. I renamed the end point in the route dialog box, recalculated and the route was still good. Then I inserted the gas station at the beginning of the route. I recalculated and the route was still good. Once I

deleted the original generated start point the route fell apart and lost all of its points. I tried to round trip one of these track files to the gps. I sent the track to the gps and converted it to a route on the gps. I copied the route from the gps back to BaseCamp. The route was still worthless.

Basecamp – Converting Tracks and Routes



How to take a track from your GPS and create a quality route

Many of my tracks are round trips. Some are circle routes where the destination never overlaps the return. When the ride is not a circle often the way back is not exactly the way I got there but there are a lot of overlaps in the track where I am returning home the same way I got there. This will create a situation where the track or route goes 2 directions on the same road. I call these *2-way paths*. When you convert the track to a route you can end up with a mess if the route needs to be edited with via and shaping points. The map on the left shows this. The path is supposed to go SE at the T but it took off NW. With 2 paths going 2 directions on top of each other it's almost impossible to add via points to straighten this mess out. If this is the case I have 2 strategies to use.

1. Bring up the route dialog box and choose a point near the problem. If you hover the pan tool over a point on the map the name of the point will appear. Select this point in the route dialog box and a circle will appear over this point on the map. Press the down arrow on the keyboard of just select the next point and watch where it appears on the map. These points are always in sequence and should go in one direction. You can often find errors by cycling through points making sure they are in sequence. You can delete a point by pressing the delete key.



2. I broke the track / route into 2 pieces, one going and one returning. Find the first place where the trip to or destination path meets up with the returning path and break the track in two with the divide tool. In the upper right of the example, you see the arrows pointing west which show the trip to or destination path. This path joins the highway where you see the Victor CO ride label and moves parallel with the return path. I'm going to cut the path in 2 at the red arrow where the trip to / destination path joins the return path. I now have 2 paths. The original track called Victor CO ride now ends at the breaking point. BaseCamp created a new track and named it Track. It's the return track beginning at the breaking point and ending at the end point. I'll

rename "Track" to "Victor CO return" so I know what it is. Now I'll convert each one of the

tracks to routes and won't have to worry about 2 way overlapping tracks. Once I clean up the routes, I could join them back together if I want.

The Answer to Converting Tracks to Usable Routes

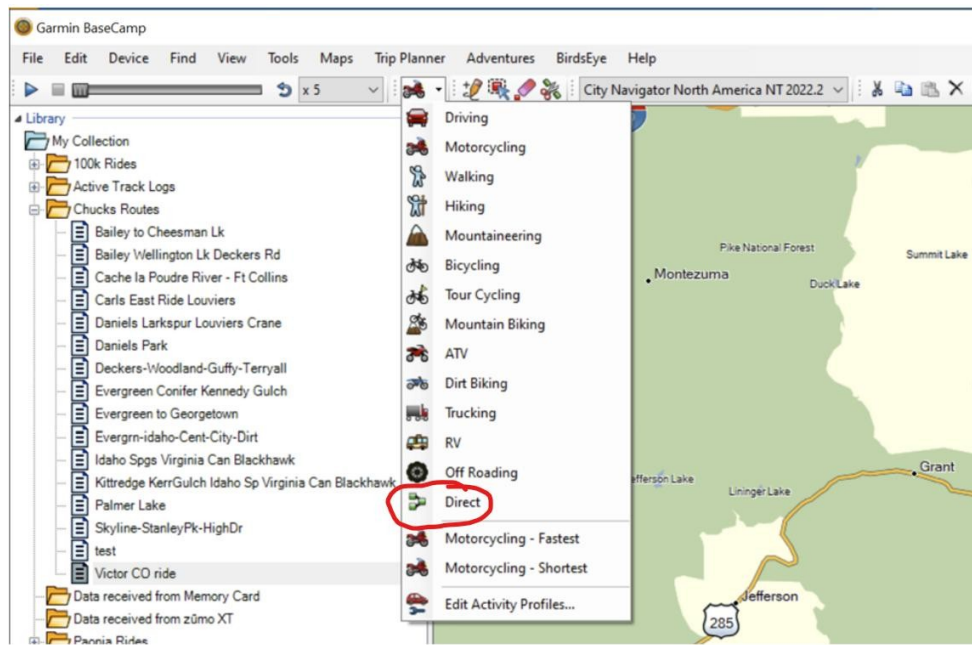
The problem

The screenshot shows the 'Track Dialog Box' for a track named 'Victor CO return'. The window has tabs for 'Properties', 'Graph', 'Notes', and 'References'. The 'Properties' tab is active, showing a summary of the track's statistics. Below the summary is a table with 8 columns: Index, Elevation, Leg Distance, Leg Time, Leg Speed, Leg Course, Time, and Position. The table lists 8 legs of the track. At the bottom of the dialog, there are buttons for 'Filter...', 'Invert', 'Create Route...', 'Create Adventure...', and 'Print...'. A 'Center Map' checkbox is also present.

Index	Elevation	Leg Distance	Leg Time	Leg Speed	Leg Course	Time	Position
1	9208 ft	0 ft	0:00:01	0 mph	0.0° true	6/10/2...	N38° 56...
2	9207 ft	74 ft	0:00:01	51 mph	57.5° true	6/10/2...	N38° 56...
3	9205 ft	365 ft	0:00:05	50 mph	70.5° true	6/10/2...	N38° 56...
4	9194 ft	342 ft	0:00:03	78 mph	59.2° true	6/10/2...	N38° 56...
5	9185 ft	282 ft	0:00:04	48 mph	52.6° true	6/10/2...	N38° 56...
6	9174 ft	517 ft	0:00:05	70 mph	50.3° true	6/10/2...	N38° 56...
7	9163 ft	0 ft	0:00:01	0 mph	0.0° true	6/10/2...	N38° 56...
8	9163 ft	0.2 mi	0:00:10	61 mph	51.3° true	6/10/2...	N38° 56...

Track Dialog Box for my Victor ride

I right clicked on my Victor CO return track which has 2636 points and choose "Create Route from Selected Track". BaseCamp created a route using its' default method. I ended up with a route that has generated start and end waypoints.

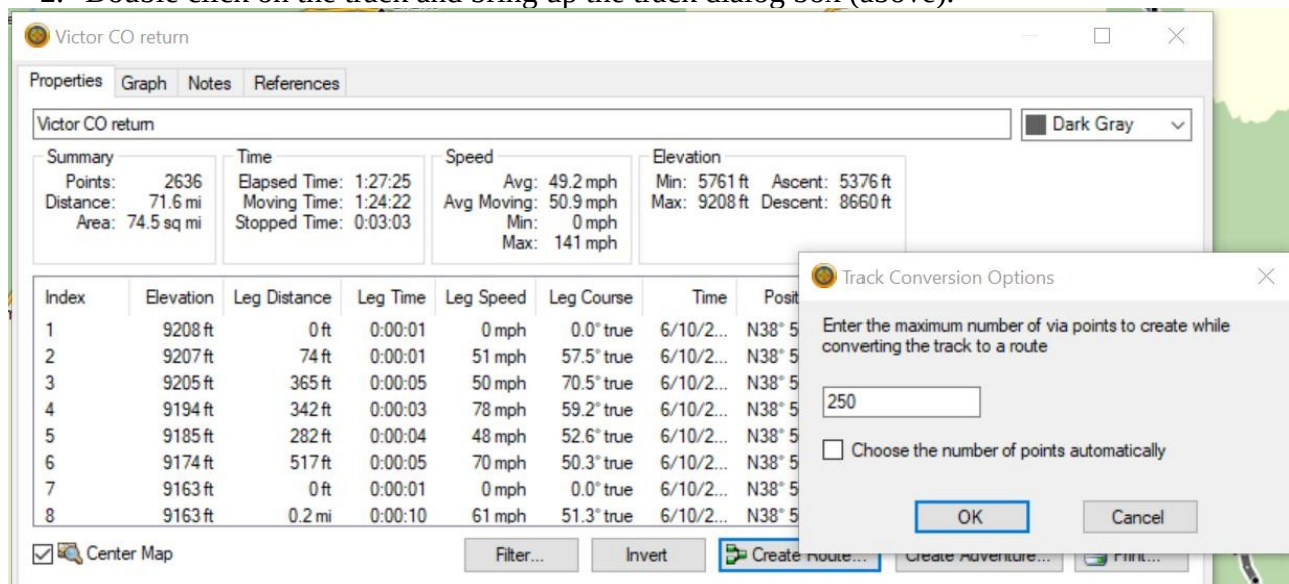


The Intent D

Create a standard “Normalized” editable route

This is a route that has enough via and shaping points so it will match your intended path no matter which activity profile you use.

1. On the top of the BaseCamp screen (above) click on the drop down and set the intent to Direct. Direct gives you point to point lines and doesn't route between points. *What it does give you is the option to set the number of shaping points BaseCamp generates for the route.*
2. Double click on the track and bring up the track dialog box (above).



3. Click on the Create Route button. The track conversion options box will appear. You can enter the maximum number of via points to create while converting the track to a route or choose

auto. BaseCamp will generate a route that matches the track as close as it can using the generated via points. When I choose auto, BaseCamp created 1291 via / shaping points. When BaseCamp does the route conversion many of the track points will be thrown out and some will be converted to shaping points. The trick is to set enough shaping points to guarantee the new route follows the intended path. The route is 71.6 miles and we have 1291 points. I'll end up with more than 18 points per mile which is a lot. This generated an accurate route but I think using around 2 or 300 points is going to be sufficient. When you enter a number it doesn't necessarily generate the exact number of points.

4. In the new route dialog box set the intent back to motorcycle. This will generate a route that is smooth between the via points. I checked the route and I had to edit 2 locations where it didn't follow my intent.
5. Be aware that you can only have 29 total waypoint/ via points in a route. Also note you can have at most 125 shaping points between each via point / way point. This can be a problem when you generate shaping points using the above method. I've had to go into a route and count the shaping points between via points and insert via points to satisfy this limitation.

If you double click the new route, you'll see all the shaping points in the dialog box. These shaping points are set to "won't alert" which makes them shaping points. This means as you travel the route the gps will not alert you as you approach the point. You can change this by right clicking the point and selecting "Alert on Arrival". This makes the shaping point a via point. In the dialog box set the intent back to Motorcycling so the route follows roads. The route will recalculate. Zoom in and examine your map and make sure it matches the track. If it doesn't you can add more via points, waypoints or edit the track.

Now you will be able to add and delete waypoints, shaping points and via points.

Note: If you stop (take a side excursion) and need to restart the ride you need to get back on the route. The gps will ask you for a point to go to. These points have to be way points or via points embedded in the route that have Alert on Arrival set. Shaping points do not work for this. If you only have the start and finish waypoints there is a chance the GPS will skip all the intermediate points and route you directly to the end. That's why it's good to have a number of via points on the route.

Tip: One way to get a lot of points into a route is to convert your route to a track. BaseCamp will generate lots of points in the converted track to guarantee the track is exactly like the route. For instance, I took the 100k dual sport route which had 69 points and converted it to a track which generated almost 6000 points. I could give this track to someone else and be guaranteed that they would get the exact map without any possibility of it getting recalculated. They could in turn convert this track on their gps to a route. See creating routes from tracks to understand the ramifications of doing this.

Manually Copying Tracks to the XT

This pertains to manually copying GPX files by connecting your XT to your PC with a USB cable. The Garmin will look like a flash drive. The Garmin XT has 30 gig of Internal storage which is a lot. If you installed a SD memory card you will have another directory named Memory Card. I installed a 32 gig SD card that I use for mp3 music files. Copy the tracks to \zūmo XT\Internal Storage\GPX on the XT.

1. Only copy 20 tracks at a time.
2. Make sure each track does not have more than 9,999 track points.

3. Turn on your device, go to tracks and choose import.
4. Tracks should now be on your device.

Transferring Routes Between Garmin GPS's Via Bluetooth

1. Select Apps/ Share Route.
2. Select Bluetooth.
3. Select the routes you want to share
4. Select Done. The gps will prepare files to transfer
5. The GPS will look for a nearby Bluetooth device and transfer the files.
6. Note: the Zumo 595 and 396 series, BMW Nav 5 & Nav 6 have notoriously low-capacity batteries that may run out when transferring data when not hooked up to power.

Transferring Tracks Between Garmin GPS's Via Bluetooth

1. Select Apps/ Tracks.
2. Choose a track.
3. Click on the wrench icon in the top left corner of the screen.
4. Select share 5. Select Bluetooth.
5. Select Done. The gps will prepare files to transfer
6. The GPS will look for a nearby Bluetooth device and transfer the files.
7. Note: the Zumo 595 and 396 series, BMW Nav 5 & Nav 6 have notoriously low capacity batteries that may run out when transferring data when not hooked up to power.

Google Interface

Convert a gpx to a Google map.

1. You need a Google account which you have if you have gmail.
2. Import a gpx into Google: go to google my maps
3. Go to <https://www.google.com/maps/d/> and choose Create a new map.
4. Click add a layer and then click on import. Here's where the info is:
<https://www.alphr.com/gpx-google-maps/>

Convert a Google map to a gpx

I've found this on-line site that converts a google map to a gpx. What it does is read the google turn by turn directions and convert that to a route. Probably not the best way but it seems to work.

<https://mapstogpx.com/#>

You can go into Google maps and export a KML or a KMZ file. KMZ contains icons that we don't need so export a KML which just has the track. You can then import the KML file into BaseCamp as a track. You may end up with points off the road because the maps are not the same.

There's another on-line program called GPS Visualizer, <https://www.gpsvisualizer.com/>

Music on the XT GPS

1. Music must be in a folder named mp3.
2. The folder can be on the external card.
3. There is a 5000 song limit.

The unit creates default playlists based on the metadata called id3 attached to the songs. The metadata has information like the album, artist etc. If you browse albums you may see an option named unknown. These are songs without id3 metadata.

Create a play list

1. Touch **Music**
2. Touch **Source**
3. Touch **MP3**
4. Touch **Save**
5. Touch **Browse**
6. Touch **Playlists**
7. Touch **New Playlist**
8. Enter the desired name for the playlist
9. Touch **Done**
10. Select the desired songs for the playlist
11. Touch **Save**

Transfer your music directly from your computer to the micro-SD card while the Zumo is connected to your computer with a USB cable. Create a new folder on the SD card (call it 'MP3') and copy your songs into that folder. Here is the link from Garmin describing the process:

https://support.garmin.com/en-US/?productID=679804&tab=topics&topicTag=region_music

Restart the XT if it Stops Functioning

1. Press and hold the off button for at least 12 seconds until a message appears to turn the GPS off. The GPS is usually in a standby mode. This really shuts it off so it will not use any power and possibly drain the batteries.
2. Release the power button after the device powers off.
3. Press the power button to restart the XT.

XT only works when plugged in

Open it and check the battery connector which .may have disconnected.

First level Reset and Diagnostic Mode

1. Start the GPS
2. Press the Volume button and get into the volume menu.
3. Hold your finger on the top right corner of the screen for about 8 seconds.
4. A diagnostics page will appear.
5. The top option will be “Clear all user data”.

How to Reset the Zumo XT

Why would you want to reset and clean out the GPS? I bought the XT back in March of 2022.

Before that I had a Garmin Zumo 595. When I got the 595, I transferred the waypoint from the Garmin in my car to the 595 along with tracks I created using a GPS logger and an app on my cell phone.

When I connected the new XT to Garmin Explorer on my PC it updated the software and maps. Explorer knew that the XT was a new device and asked me if it should transfer the backups it had created for the 595 to the new XT. I agreed and everything was transferred over. The problem was that some of the tracks and routes must have had slightly different formats and didn't transfer over cleanly. I




also had problems with duplicate waypoint names. Some were embedded in routes with the same name as waypoints in the waypoint list or other routes. I ended up with a number of waypoints with the same name with -1, -2 ... I tried to clean up the mess but I still have weird tracks and routes that I just can't delete.

The first thing I did was to back up everything in the XT to BaseCamp. I connected the XT to the computer with the usb. Under Zumo XT in BaseCamp, you will see a directory called Internal Storage. Click on that. In the lower box you will see every waypoint, track and route in the XT. I have a directory called Data received from zumo XT. I created a list container called Zumo Dump. I selected everything in Internal Storage and dragged it to the Zumo Dump container.

Go into settings/device/reset. First, I cleared travel history which does exactly the same as the delete travel history in the tracks app. Next, I deleted all settings and data. If you do this *you will have to pair the Bluetooth phone and headset again. You will also have to reset all your activity profiles.*

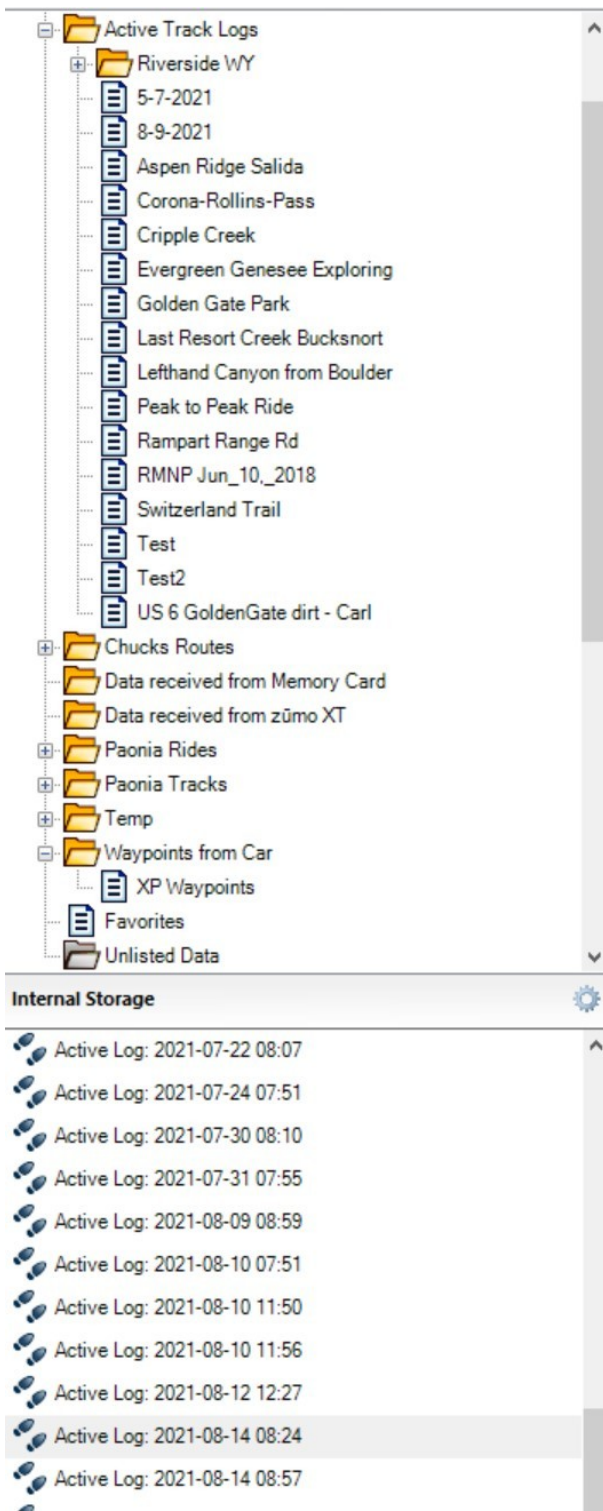
1. When I plugged the usb back into the XT a software update was available. I updated the software. I shut off the XT and then restarted it.
2. The XT's \zūmo XT\Internal Storage\GPX directory as viewed on the PC contained Current.gpx, CurrentTrackloog.gpx and Position.gpx.
3. The mp3 files on the memory card were all still there.
4. The PC\zūmo XT\Internal Storage\Garmin contains a directory called Diag, Current.m3u8 – 34k, GarminDevice.xml – 76k, transaction_request_log.bin – 740k, transaction_response_log.bin – 41113k.
5. BaseCamp showed nothing in the internal storage except some entries for Garmin Locations.
6. I selected all my waypoints in BaseCamp, went to device/ send to. Chose the zumo XT, not the memory card. This PC\zūmo XT\Internal Storage\GPX\Current.gpx has all the waypoints.
7. All my waypoints now show up in the Zumo XT internal storage as shown by BaseCamp.
8. Next I want to load my tracks to the XT. You can only do one at a time. When you select an Active track container make sure it contains at least a track file by looking at the bottom dialog box. These have an icon showing 2 shoes 🦶. It also might contain some waypoints. The track files and the waypoints get transferred to the XT. The track files are in This PC\zūmo XT\Internal Storage\GPX. It looks like the waypoints are in transaction_request_log.bin – 741k, transaction_response_log.bin – 43185k.

9. Next I want to send my routes  to the XT. Sometimes I put the track file in the route file container. In this case choose the route file and send it to the XT.
10. When I disconnected the usb and turned on the XT it found all my routes and asked to import them into the trip planner. The data files in internal storage/garmin grew a little so the route files must be in transaction_request_log.bin – 743k, transaction_response_log.bin – 43274k.

Setting up the Garmin Drive app and Bluetooth Pairing

I installed the Garmin Drive app on my iPhone 14 pro and paired it to the XT. This allows the XT to act as a telephone, play music from the phone and get information such as weather and radar cameras (some of this is by subscription).

Next I paired the XT to the Cardo Packtalk Edge bluetooth headset in GPS mode.




1. Press the phone button on the Cardo for 5 seconds.
2. The LED starts flashing red and blue.
 - a) Pair to the first mobile phone - just recognize the headset on the phone and pair it.
 - b) Pair to a GPS - tap the phone button once and pair it to the XT.
 - c) Pair to the motorcycles TFT display - roll the control wheel backward.
 - d) Pair to a second phone - roll the control wheel forward.

A Case Study – Colorado Peak to Peak Ride


On August 14, 2021 BMW Motorcycle Club of Colorado did a ride from Morrison Colorado to Estes Park Colorado and back on the peak-to-peak highway. I ran a track on my Garmin XT for the ride. We had 16 bikes so keeping everyone together was a consideration. We had planned stops and one unplanned short stop to regroup. When I got home I had nearly 200 miles on the round trip. Some of this was the distance from my house to Morrison combined with running around in a couple of parking lots and a short unsuccessful attempt to get into Rocky Mountain Natl Park.

The first step in my route creation process is to clean up the track because you can't get any undesirable changes in the intended route because at this stage we're only dealing with points.

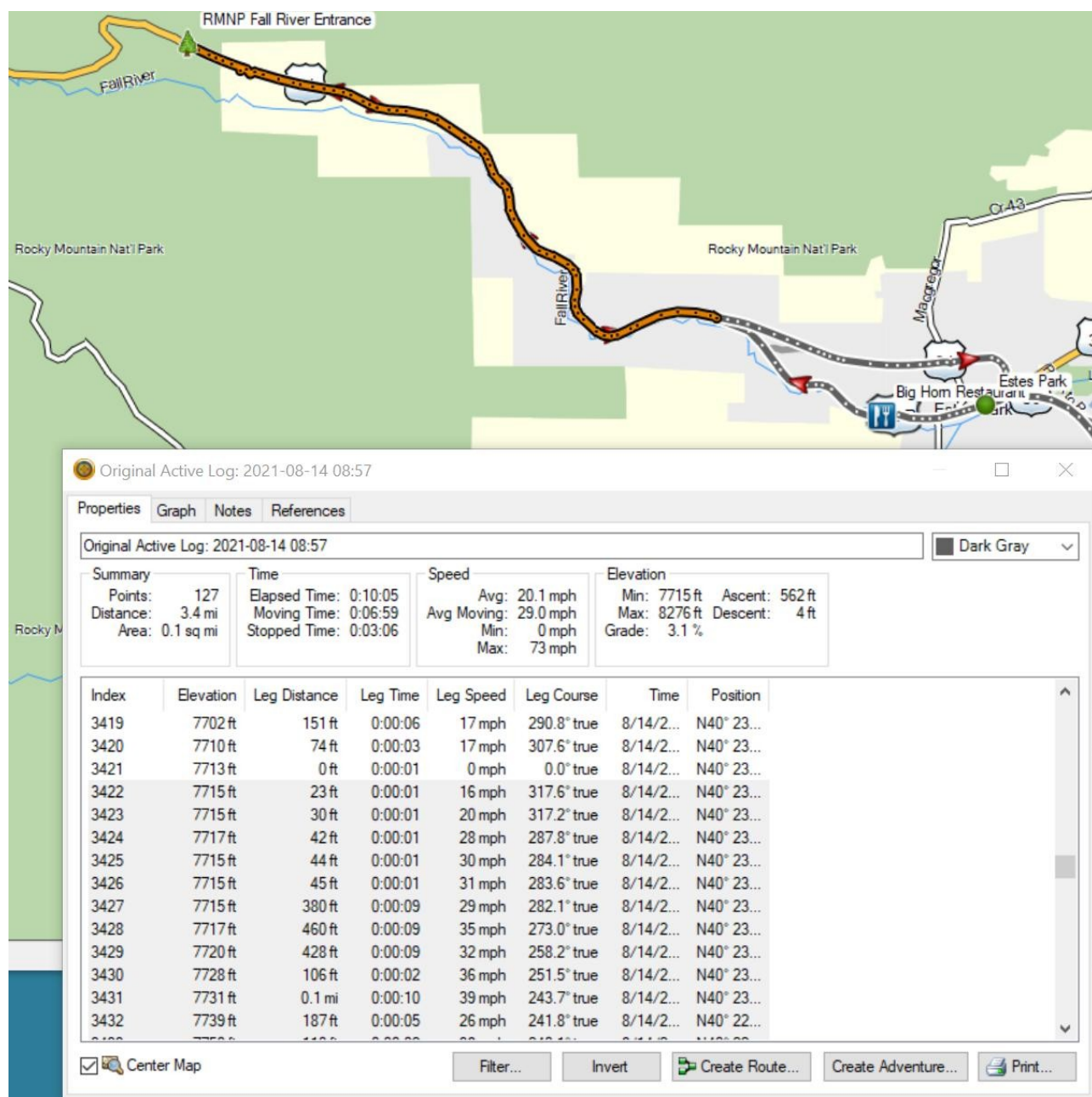
The first thing I did was to create a list container called Peak to Peak Ride under My Collection/ Active Track Logs. Right click on Active Track logs and choose New List. I connected my GPS to the computer with a USB cable, brought up BaseCamp and

clicked on Internal Storage. Everything in Internal Storage appeared at the bottom left of the screen. Since I was only interested in tracks I clicked on the track filter  at the bottom of the window and saw I had 2 tracks with the date of the ride. One was called Active Log 2021-08-14 08:24 and the other was called Active Log 2021-08-14 08:57. I selected Active Log 2021-08-14 08:24 and viewed it on the map. It was a segment of the route that went from my house to Morrison which I didn't need.

1. I dragged the track Active Log 2021-08-14 08:57 from the GPS into the list container Peak to Peak Ride.
2. I selected Peak to Peak Ride on the top. In the bottom box I duplicated Active Log 202108-14 08:57 and named the duplicate Peak to Peak 2021-08-14 08:57.
3. I renamed the original track to Original Active Log 2021-08-14 08:57. I'm going to do all my editing on the duplicate. I like to save the original in case I want to go back or need to start over.

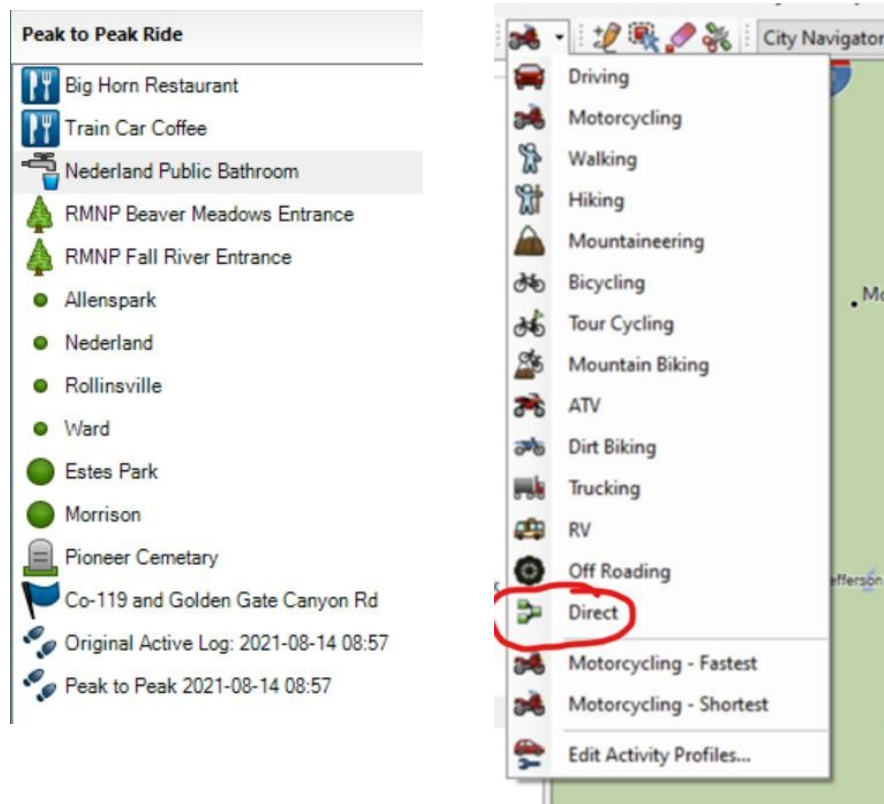
Then I selected Peak to Peak 2021-08-14 08:57 which made it appear on the map. I'm going to edit the track mostly using the delete tool  to remove points. Here's what I did.

1. Removed a turnaround all the bikes made at the beginning in Morrison because everybody cued up facing the wrong direction.
2. The clutter when we stopped at golden gate canyon road and peak to peak, to regroup
3. The clutter when we stopped at Train car coffee in Nederland.
4. The clutter when we stopped at the Big Horn restaurant for lunch.



5. I rerouted the run we made to the Rocky Mountain National Park entrance to a road I found that loops back to highway 34.
6. I double clicked on Peak to Peak 2021-08-14 08:57 to bring up the track information dialog box.
7. With the pan tool active I clicked on a point near Valley Road which was going to be the reroute. That point highlights in the track information dialog box. At this stage the track is going out and coming back.
8. Holding the shift key down I clicked on a point above the point that was selected which selects a range of points. The track turned brown along the selected points. The brown track was heading toward the Rocky Mountain Park entrance.

9. I kept adding to the selection until the whole incorrect route going both directions was selected. I then hit delete. I reshaped the route to go up Valley Rd to hwy 34 by moving left over points using the move tool 🗑️.
10. I cleaned up our rest stop in Nederland.
11. I changed the end of the run from my house to Morrison. I used the divide tool 🍷 and cut the route on C470 a little after the Morrison exit. I then used the move tool to move points onto the Morrison exit ramp and into Morrison where I ended.
12. I created around 12 waypoints to use when I do the route.
13. Drag the new waypoints to your favorites list so you can reuse them.

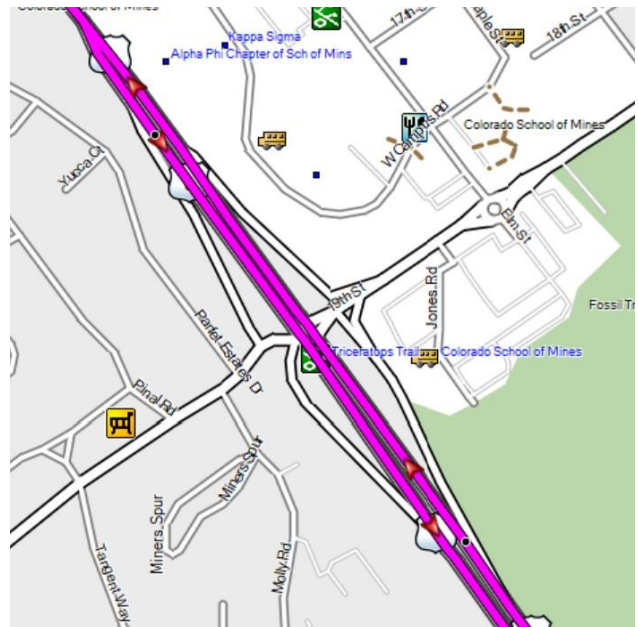
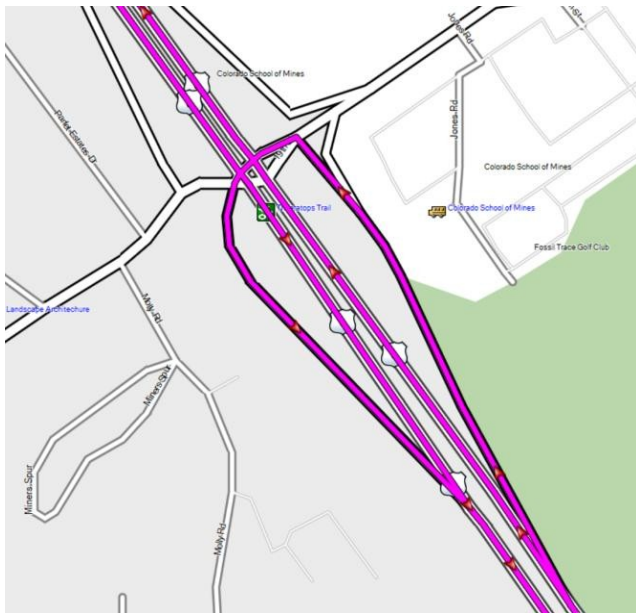


When I was done this is what the Peak-to-Peak Ride list box looked like. Now I'm going to create a standard "Normalized" editable route. I'll want BaseCamp to generate a route with shaping points so I'll set my intent to Direct. I'll right click Peak to Peak 2021-08-14 08:57 and select Create route from selected track. Track conversion options dialog comes up asking me to enter the via point count or check the box to let the program choose the number of points. I'll let the program choose the points and I'll see what I end up with. The program generated 2916 points for a 164-mile ride which is way too many for a ride that is along major highways. I'm going to try and generate a route with about 2 points per mile and see what happens. $164 \times 2 = 328$. I'm going to delete the route I just created which is named Peak to Peak 2021-08-14 08:57.

The route I deleted is now in the unlisted Data directory. I'm going to delete it there because even though it's been deleted once it still exists which will prevent me from using the name again when I generate a new route. I generated another route and it came up with 314 points. I changed the intent to motorcycling in the route dialog box and BaseCamp generated the new route. I double clicked the route to bring up the route property box. I selected the first point and looked at it on the map. Using the


arrow key, I pressed the down arrow and began to walk the whole route checking on the map as I went. Everything was fine except for one problem in Golden. The route exited the highway, made a turn and got on the other way. The sequence of points didn't show this. I'm going to look at the turn-by-turn directions to see what's going on. For some reason it's telling me to exit at 19th, go around and get back on the highway going the way I came and then making a U turn.


I'm going to insert a bunch of shaping points through the intersection and see what happens. I added points and it still didn't clear up. Just for kicks I changed the intent to Bicycling and that caused the route to go the correct way. I eliminated the extra points I had inserted and it recalculated correctly. I decided to take a point that was NW of the intersection and move it a bit more to the right so it would be definitely on the right side of the road. I changed the intent back to driving and the route calculated correctly.



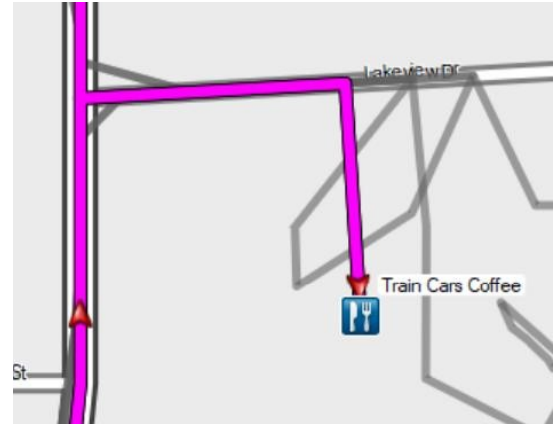
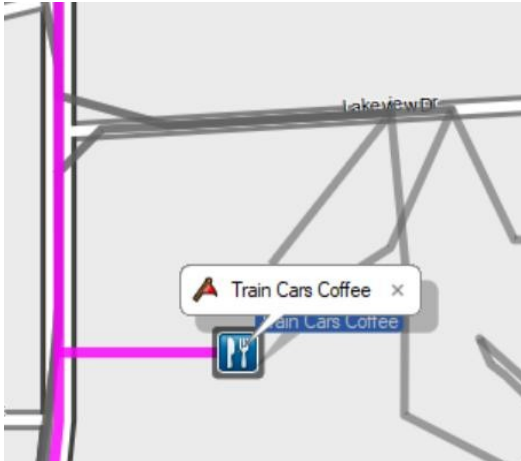
The next step is to add the waypoints I created to the route. The easiest waypoint to add is the first one which is Morrison. Double click the route to bring up the route property box. Select the first point. Click the plus sign on the right and all the waypoints will be displayed. Choose Morrison and click insert waypoint. The Morrison waypoint should now be the first one in the route. Since I'm now using Morrison as the beginning select and delete the former first point.

Click on recalculate.

The waypoints have to be inserted in the route in the correct driving sequence or you will end up with a routing mess that reverses directions. The waypoints in the list box are in alphabetical order. Click on the first one which is the Big Horn Restaurant. It will display on the map. Zoom up on it. Make sure the route is selected and select the add point tool . You'll get a black rubberband to the right of the existing point and one to the left of the existing point. You'll also see the Big Horn waypoint which is displaying to the right of the existing point. Click on the rubberband that's on the right. You'll get a couple of thin lines. Move the point to the Big Horn waypoint. When the waypoint's balloon text

displays click on the point. This will insert the waypoint into the route at the correct place. Select the erase tool  and delete the old point that was the turn in for Big Horn. The route will recalculate.

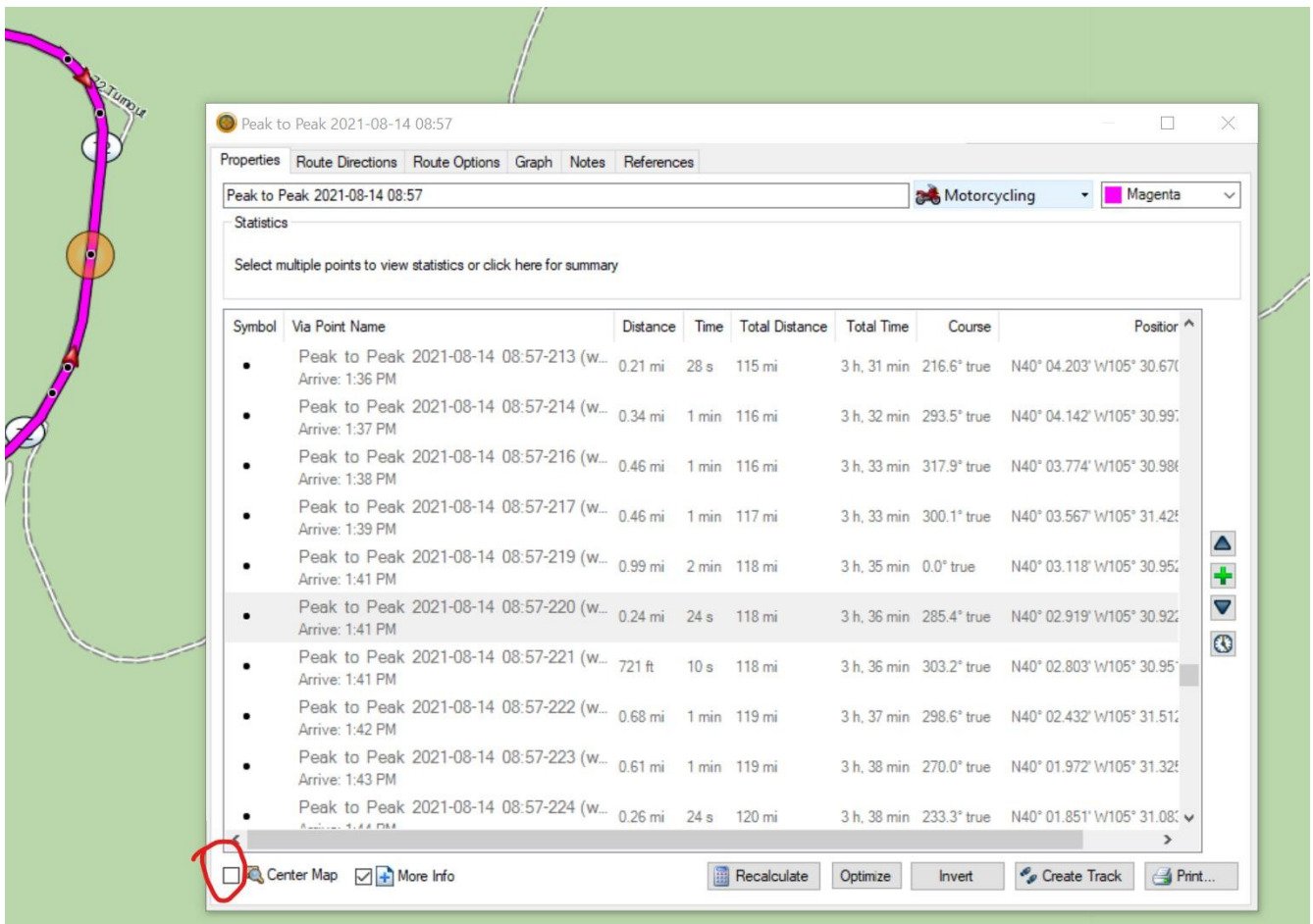
Next select Train Cars Coffee which is in Nederland off to the right of the road. You have to drive into the rear strip center parking lot to access it. When I added it to the route BaseCamp drew the route straight off of 119 and not around the parking. The light grey lines are the actual track lines of where I drove around the parking lot. I got it to calculate correctly by moving the Train Cars waypoint to the right about an inch.



Next add the Nederland waypoint using the rubberband method. Bring up the route dialog box and scroll down to the Train Cars Coffee waypoint and select it. The map will zoom in to it. The next waypoint should be Nederland. Select it. Select the next point in the dialog box and make sure it appears after Nederland to verify the sequence.

Once the route got into Nederland it became 2 ways, coming and going. As you add the new waypoints you want to add them in the correct sequence which is traveling North to Estes Park. What I did was step through the points in the route dialog box until I got to the next point which is Ward. I used the rubber band method to insert Ward into the route. There already was another point next to Ward so I deleted it. Next, I added Allenspark the same way and stepped through the points until I got to the point right before the Estes Park waypoint where I used the rubber band method to select it. There were a few rubber bands to pick from. I chose the one that led down to the Big Horn Restaurant. If you do end up inserting a point out of sequence you can either hit ctrl Z to reverse the action and redo it or use the up and down arrows in the dialog box to move the point. I backed up BaseCamp.

There's one more point to add which is the Nederland public bathroom where we stopped on the way back. I stepped the route all the way back to Nederland which allowed me to inspect the points to make sure nothing was wrong like a point off the road. I found that there were a lot of extra points on 7 and 72 I didn't need. Once you're on these highways there's pretty much nowhere else you can get rerouted to. Extra points mean more overhead in route calculations and file sizes. I unchecked the Center Map box at the bottom left of the properties dialog box as I stepped through the points. This allowed me to zoom out and see the next point and determine if I needed it.



I stepped all the way to the point before the Nederland public bathrooms. This time I'm going to use the direct point insert method. With the point selected before the bathroom I clicked the plus sign on the right of the dialog box and I stepped the route all the way back to Morrison eliminating a few more extra points.



END – The materials below are random notes I’ve written down about the GPS and my motorcycle setup.

Where Files are stored on the XT

If you copy a GPX file to Zumo XT > Memory Card > Garmin > GPX, it did not show up on the device until you go through the import process (didn’t see it on import) on the XT. After that, it is stored in Zumo XT > Internal Storage > GPX.

I’m copying 2021 100k Dual Sport.gpx This PC\zūmo XT\Internal Storage\GPX This PC\zūmo XT\Internal Storage\GPX\Current.gpx has all the waypoints.

In BaseCamp I sent 2021 100k Dual Sport.gpx to the memory card. 2 files were written in This PC\zūmo XT\Memory Card\Garmin\GPX . One was named Route.gpx and the other Waypoints.gpx.

Waypoints.gpx had all the waypoints that are in 2021 100k Dual Sport.gpx.

Next I sent 2021 100k Paved.gpx to the same place. A new file called Route0.gpx showed up in This PC\zūmo XT\Memory Card\Garmin\GPX. The Waypoints.gpx file was updated. I knew by looking at the Modified date and time.

I turned on the XT and it didn’t announce that I had routes waiting to be imported into trip planner. In fact the XT didn’t know the 2 routes existed.

I’m going to delete the files in This PC\zūmo XT\Memory Card\Garmin\GPX and transfer them to the internal memory.

4 files were created in This PC\zūmo XT\Internal Storage\GPX. Temp.gpx, Current.gpx, CurrentTrackLog.gpx and Position.gpx I unplugged the XT from the usb and restarted it.

Now it comes up with the message “New Routes found. Import to trip planner ?”

This time it didn’t error out saying I had too many via points. It created both routes.

Garmin Zumo XT

This may be an Android device

Tracks cannot be *actively routed*, providing turn-by-turn directions. Convert to a trip for that. Be careful when combining GPX files. The track point limit is 10,000.

Format SD card FAT 32.

The unit has 32gb of internal storage with over 15GB free.

Uses a mini usb plug

Wiring suggestion: Muyi (GM) waterproof connectors to wire the unit in.

There's an industry standard called "AMPS" which is a 30x38mm hole pattern, or you can use a diagonal two-bolt mount that is 48.4mm between holes. RAM makes a bunch of different AMPS compatible plates

Initial setup and backups

I plugged the XT into the computer and Garmin Express came up and saw the XT. Like all my other Garmin devices it updated the software and maps in about 15 minutes. Then it asked if I wanted to transfer the waypoints and tracks from my old Zumo 595. I said yes. It turns out it transferred a big mess of stuff along with the good. It transferred old tracks and waypoints I had erased off the 595 a long time ago. It must have pulled the data from old backups. Now I have old tracks I can't delete.

Garmin Express makes backups when it updates the software on the gps. It puts them in

C:\Users\Chuck\Documents\Garmin\Backups\xxxxxxx (file named the SN of the device)\202004-19 (14.51.40) file name with the date. I found that Garmin Express seems to merge the old backups with the new data on the gps creating a mess. I now delete the backups when I know they may contain a lot of junk. Anything I want to keep I upload into BaseCamp and back it up there.

You can manually do a backup in garmin express by choosing "Tools & Content". If you go into the Utilities tab you can back the device up.

Transfer the routes from my iPhone

(MRA) to the XT and many of them are coming up 'FAILED TO IMPORT ROUTES' I have tried several times. The problem might be the SD card in the XT. Take it out and it might work.

Transfer a file to the XT from the iPhone (I've never done this myself)

If you have a mapping app on your phone that can create gpx files this might be for you. You can use the share sheet in iOS to share a file with Garmin Drive (open it with Garmin Drive). GD will then ask you if you want to send it to your Zumo. You can use the Garmin Drive app on your phone to send tracks directly to the XT over bluetooth. Go to the Files app and choose GPX. You should see some gpx files on your device. Click on more and choose a place to copy to ? Note: I haven't tried this.

BirdsEye Imagery and Alternate Custom Map Overlays

BirdsEye Imagery is just a jpg file that displays on the map as an overlay. It gives you much more detail on the map. It's similar to a Google Satellite view. You must have wifi enabled.

You can download the files by going to the apps/ BirdsEye image. Here you can erase old image files and download new ones. It will ask you to name the file, what the location of the file is and the distance from the selected location. The max distance is 20.4 miles.

1. Touch Apps
2. Touch BirdsEye Direct

3. Touch the Download icon
4. Touch Location and use the search options if you want to download a specific location. Default is your current location
5. Touch Detail to select an image quality option. Select an option and touch Save.
6. Touch Size to enter the size of the area to be shown in the downloaded imagery files. Enter a distance from the selected location and touch Done.
7. The maximum size of BirdsEye area depends on the location and detail level set
8. Touch Save To if you want to select a specific location to save the file. Select an option and touch Save.
9. Touch Download
10. Enter a name and touch Done

Custom Maps

Quick note on using OSM (open source maps) free topo maps. You lose use of a lot of the special Garmin POI's and location features when you disable the installed Garmin maps.

You can use OSM maps in BaseCamp but they *might not be routable*. They have to say they're routable to work.

I don't know if anyone uses custom maps and I don't recall reading it in the manual but it looks like they are supported. I was able to take a jpg image of a map, calibrate it in Google Earth and save it as a kmz file. Put it in a CustomMaps subfolder of the Garmin folder (both internal and sd card, not sure which it's using).

[OSM – OpenSourceMaps](#); The Free Wiki World Map – An openly licensed map of the world being created by volunteers using local knowledge, GPS tracks, and donated sources. [Free maps for Garmin units](#). Also, [mapmania.info](#) and [openmapchest.org](#) maps offer maps for Garmin devices.

[BackCountryDiscoveryRoutes](#) are a nonprofit initiative that allows people in different parts of the USA to download dual-sport tracks in some states. There are wonderful tracks and roads to ride. All due to people contributing information.

[JaVaWa device manager](#) is a Dutch developed app that helps you load and manage maps on your GPS device. It is simple to use and works perfectly with Windows machines. There are other useful features on their site to use. PLEASE NOTE! The owner of this app last updated the app in 2016 so it might not work in Apple or other devices.

Turn tracks on and off on the map

From the Home screen: Apps/Track Button:UpperLeftTrack Icon: Select the track you want to work on: click the wrench in the upper left:

Garmin Explore (I don't use)

This is a mapping app on your phone. Explore manages routes and tracks across your zumo, phone and computer. It's probably the old Delorme maps program (Garmin bought Delorme). The app will sync the routes you create with the XT. One thing it does do is use the waypoint icons from BaseCamp on the GPS. You may not want to use it because it's a cloud app and if you're out of range you won't be

able to get your routes. It also means that Garmin has access to all your routes in their cloud. I use Garmin BaseCamp on my PC.

Clean out BaseCamp and re-import

In BaseCamp I deleted all the data under the data received from Zumo XT and then reimported (device/ receive from device) it to get the latest info on the gps. If you reimport with existing items anywhere in the BaseCamp My Collection directory, the new items are renamed -1 -2 so you end up with multiple copies of tracks and points. The same thing happens if you download duplicate files to the device. You will get file names with -1 -2 etc. I deleted duplicate tracks and old waypoints. *When you delete anything in BaseCamp that doesn't exist anywhere else it gets moved to the Unlisted Data Folder which is like the recycle bin in windows. If you try to create another point, track or route with the same name because it still exists in BaseCamp's Unlisted Data Folder you will get a message saying that the file name still exists even though you don't see it. Delete the file in Unlisted Data and the file name will be freed up to use.*

When you go into the trip planner on the XT you can import 'items' into the planner. What you are doing is importing routes. When you create a trip from a track the GPS is generating a route file that has to be imported into the trip app.

Experiment I did. Go into the XT through the usb and delete everything in the gpx folder. I pulled the usb cable and restarted the XT. It took a while. Nothing was gone. It rebuilt the file PC\zūmo XT\ Internal Storage\GPX\Current.gpx. I suspect it recovered everything through duplicate files on the memory card.

How to Clean Out the XT This did not clean out “phantom” active tracks.

My XT seemed to accumulate old active tracks that for some reason can't be cleaned out. Usually all you have to do is go into the tracks app on the XT. Click on the lower right for unsaved tracks. Click on the wrench and it will let you clear travel history. This is supposed to clear out tracks that the GPS created on its own when you travel around. For some reason it doesn't seem to clear out everything. When I hook the GPS up to BaseCamp, I see all kinds of junk still in the device. Some of these were old files that got imported to the XT when I initially updated the device and restored all my Zumo 595 files. You can't delete them on the gps. You can delete some of them in BaseCamp.

The best way to clean out the GPS is to upload anything you want to keep to BaseCamp if it isn't already there and reinitialize the GPS so everything is wiped out back to factory settings.

Can't Get Rid of Old Active Track Files

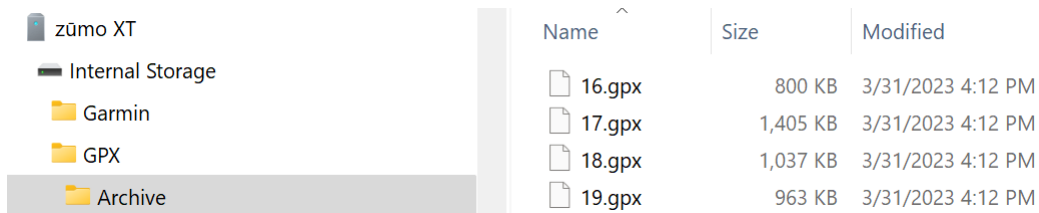
I use my Zumo XT with BaseCamp on a PC through a USB port. When the XT is plugged in, BaseCamp sees what's on it. If I click on internal storage I get a nice list of everything that is on the XT GPS such as the waypoints, tracks, active tracks and routes. What I usually do is upload a track from the XT to BaseCamp, edit / clean it up, turn it into a route, rename it and download it back to the XT. Then I like to delete the old track. This is my problem.

In BaseCamp when I click on internal storage, at the bottom I see the active logs that I want to delete. They are all tracks that have file names like “Active Log 2020-05-19 09:31” You can't delete these files in BaseCamp.

Next I unplug the XT and turn it on. I go to apps/tracks and select the right side bottom tab which is unsaved tracks. I select the wrench icon on the top left and choose Clear Travel History. Next I choose the Where I've been app. I click on the 3 horizontal bars on the top left and choose clear travel history. After I do this all the active logs are gone when you view them in the GPS.

When I plug the XT back into the computer and look at the files on the XT's internal storage in BaseCamp many of them are still there.

What you have to do is plug the XT into the USB and bring up the file explorer to view the files on the XT. Go to the GPX/Archive directory and delete the contents.



Make your track line thicker

1. Go into Apps / Tracks
2. Select a Track
3. Select the wrench Icon
4. Select Track Width and choose normal, Wider or Widest
5. You can also set the color of the track

I'll use this to display the track under the route when I don't trust the route. I'll usually set the track width to Widest and use a light color. This way if the route deviates I'll see where to go.

Creating Proximity Alerts for Custom Points of Interest in POI Loader

When sending points of interest (POI) to a compatible device, a proximity alert can be set in [Points of Interest \(POI\) Loader](#) which is a separate download program from Garmin. This will cause the device to sound an alert when traveling within a certain distance of a POI.

Proximity alerts are triggered by speed information, certain keywords in the POI name or file name, information entered in POI Loader's manual mode, or entered in the proximity fields when creating the waypoint in [Garmin MapSource](#) or [Garmin BaseCamp](#).

For more information about setting proximity alerts in MapSource or BaseCamp, see the FAQs [Creating Custom POIs in MapSource](#) or [Creating Custom POIs in BaseCamp](#).

Note: not all devices are compatible with MapSource and BaseCamp

Proximity alerts can be created with a minimum distance of 0 feet or meters, and a maximum distance of 200,000 feet or 60,690 meters. This comes out to about 37.88 miles or 60.69 kilometers.

POI Loader prioritizes proximity alert information using the following hierarchy:

1. Proximity alert distance embedded into individual POIs in a .gpx file ○ This information can be entered using Garmin MapSource or Garmin BaseCamp

2. Proximity alert distance entered in POI Loader's manual mode
3. Proximity alert distance calculated by POI Loader, based on speed information in the individual or file names
4. This calculation uses the following formula: *Prompt distance = speed information × 36 seconds*. In this formula, the speed value represents the value in the individual POI or file name, not the speed of the GPS when the alert is triggered. The proximity alert will be triggered at the designated distance if traveling at a minimum of 5mph (approx. 8km/h).

The following keywords will trigger a proximity alert if it is included in the POI name or filename:

- GATSO
- mobile
- SPECS
- safety
- speed
- redlight
- camera

If the file name includes one of the above keywords, but no speed information, the POI Loader uses an alert speed of 0. This will generate a proximity alert at a distance of 0.25 miles or 400 meters if traveling at a minimum of 5mph.

For more information about POI alerts, open POI Loader and click on the Help button.

For information on enabling or disabling proximity alerts on your device, refer to its [owners' manual](#). You will need to go to your GPS and make sure alerts are set for Custom POI's for this to work

Using OSM (open source maps)

1. First off, I have used the following sources to get maps: <http://www.gmaptool.eu/en/content/usa-osm-topo-routable>, <https://www.openmapchest.org/>, or <http://garmin.openstreetmap.nl/>. I liked OpenMapChest was the best because I was able to get a full USA and a full Canadian map file after making a small donation to support the service.
2. I believe all of them create a directory (folder) containing a “gmapsupp.img” file. They also provide a file that allows you to install the map in BaseCamp.
3. Put a folder in the root folder (not in a sub-folder) on your SD Card called “Garmin”.
4. Take that gmapsupp.img file and rename it something like gmapsupp_OSM_USA.img just so you know which file it is later. Or don't. It'll still work. NOTE: this renaming does not work on my Nuvi, which will only accept a gmapsupp.img or gmapsup1.img file (2 files max).
5. Put the file in the new Garmin folder on the SD card like you would move any file. Drag and drop or copy/cut and paste the file--no installer file required.
6. Put the SD card back in the Garmin if you have removed it, fire it up and the map should be recognized

To show / hide the new map

1. I am not sure if this matters or not, but on mine I went to Settings-- Maps and Vehicle-- Map Layers, and checked the custom maps box (possibly irrelevant).
2. Also on the Garmin, go to Settings-- Maps and Vehicle-- My Maps. You should see new OSM map options there. If you don't something went wrong. Check or uncheck the desired maps.
3. Last thing, check capitalization on your folder name. I think it possibly needs to be "Garmin" with a capital G.

Possibly clearer instructions can be found here: <https://www.openmapchest.org/instructions/>

Cardo Packtalk Edge aka PT Edge

7/17/2023 Performance Cycle installed the speakers and the unit to the helmet. Centering the speakers on the ears is very important.

Firmware Update Tool

I downloaded the Cardo Systems Update Tool to my windows 11 computer and installed it. This only updates the firmware. Run the program and signup with Cardo. Verify your email. Connect your unit to the computer with the supplied usb C cable. The unit came with firmware 3.0. It updated to 3.2 which lets it communicate with the latest Sena's.

Release notes here: <https://www.cardosystems.com/packtalk-edge-release-notes/>

Tutorial: <https://www.gl1800riders.com/threads/garmin-zumo-xt-cardo-edge-iphone-13.482452/>

Click the update firmware button. It takes about 10 minutes. Exit the program.

Pairing to devices.

You can pair it to 2 different devices like a phone and a gps.

Mobile phone: hold the bottom button (mobile button) down for 5 seconds. LED's are flashing red and blue. Go to your phones bluetooth menu and select PT EDGE and it will pair.

To pair a second device do the exact same thing, press and hold the bottom button. When you hear "phone pairing" roll the wheel forward (to the front). You will hear 2nd phone pairing.

To pair with a GPS hold the bottom button for 5 seconds. When you hear "phone pairing" tap the phone button one more time and it will say "GPS Pairing". Go to the GPS bluetooth menu and find the PT EDGE device and select it.

To pair with the BIKE hold the bottom button for 5 seconds. When you hear "phone pairing" roll the wheel backwards and it will say "BIKE Pairing". Go to the BIKE bluetooth menu and find the PT EDGE device and select it.

You can cancel the pairing by holding the bottom mobile button down for 2 seconds and it will say "Pairing Failed".

I paired the GPS. Then I paired the iPhone 14 Pro. I had installed the Cardo Connect App on the phone. I called up the app and signed in using my email address. I entered 5 radio stations and 2 speed dial numbers. There are other things like volume you can play with. The app can also update the firmware.

Commands

Start music with one tap of the front (media) button. One additional press skips ahead. Two presses skips back. Stop music push the roller wheel.

Start FM radio with 2 taps of the front (media) button. 3 taps will scan stations. One tap will stop the scan. 2 clicks will go to the next station. Stop the FM radio push the roller wheel.

Create a DNC intercom group by pressing and holding the intercom buttons a few seconds on the units.

Mute the group by pressing the wheel for a few seconds.

Cardo Voice Commands

- **Answer**
 - **Ignore**
 - “Hey Cardo, **end call**”
 - “Hey Cardo, **speed dial**”
 - “Hey Cardo, **redial number**”
-
- “Hey Cardo, **music on**”
 - “Hey Cardo, **music off**”
 - “Hey Cardo, **next track**”
 - “Hey Cardo, **previous track**”
 - “Hey Cardo, **share music**”
-
- “Hey Cardo, **radio on**”
 - “Hey Cardo, **radio off**”
 - “Hey Cardo, **next station**”
 - “Hey Cardo, **previous station**”
-
- “Hey Cardo, **volume up**”
 - “Hey Cardo, **volume down**”
 - “Hey Cardo, **mute audio**”
 - “Hey Cardo, **unmute audio**”
 - “Hey Cardo, **mute microphone**”
 - “Hey Cardo, **unmute microphone**”

-
- “Hey Cardo, **call intercom**”
 - “Hey Cardo, **end intercom**”
-

- “Hey Cardo, **battery status**”
- “**Hey Siri**”
- “**OK Google**”

Sena 20s Evo

Bluetooth Pairing

This might not matter for the XT. It did matter on the Garmin 595. The order in which you pair could be important, make sure you pair the Sena device to the GPS first, and then pair the Smartphone to the GPS. The most common problem that people run into is from pairing your phone first and then pairing the headset. In most cases the devices need to all sync to the Sena headset but with the Garmin Zumo, your phone and headset need to be linked to the GPS as the GPS makes all the processing decisions (music, navigation, notifications, etc). *Don't pair the Sena to the phone.*

<https://blog.ja-gps.com.au/2018/11/how-to-pair-sena-headsets-with-garmin-gps-devices/>

Update the Sena 20s Evo

Note: when doing an update on 2/14/2023 on Windows 11 a driver couldn't load into the Sena because windows has a memory integrity setting preventing it. You need to turn it off temporarily.

1. Go to windows search and enter core isolation
2. Click on core isolation details
3. Turn Memory integrity off
4. Restart the computer and continue
5. Note: The drivers from Cambridge Silicone Radio that Sena is using are not on a Microsoft 'safe' list for win 11 as of 2/14/2023. Because of this you can't turn core isolation back on unless you delete the driver. The latest the Sena Bluetooth device Manager Program on the Sena website:
<https://firmware.sena.com/senablueetoothmanager/SenaBluetoothDeviceManagerForWindowsHelp/Contents/Resources/English/installation.html> Install the program.

If you already have the Sena Bluetooth device Manager program on your computer:

Run it as an Administrator.

1. Right click on it
2. Mouse over More
3. Click on run as Administrator

It will tell you if there is an update. It saves the update image on your computer at:

C:\Program Files (x86)\Sena Technologies\SenaBluetoothDeviceManager\IMG

Note: If you don't run the program as an administrator you probably will get a message saying you can't save it in the above location. Back out and run it again as an administrator.

The install will begin. Follow the screens and use the defaults. It will uninstall the older version and run the new version installer.

1. Bring the Sena Bluetooth device Manager software up if it isn't already.
2. Make sure the 20s Evo is off
3. Plug in the 20s to the usb
4. Hit next and the program will recognize the unit
5. A device driver box may appear. Just click next and finish.
6. A box will appear saying Completing Sena Bluetooth Device Manager 4.4.4 Setup.
7. Make sure the box is checked saying run Sena Bluetooth Device Manager xxx
8. Click the Finish button

The latest Sena bluetooth manager will be running. (this is the program that updates your Hardware).

If you get the incorrect parameter error hit enter then next

Device Recognition: Power off your product and connect it to your PC using USB. Leave the 50s powered off.

Click NEXT

Push the download button the program will grab the latest software img file and save it in C:\programfiles(86) Sena Technologies\SenaBluetoothDeviceManager\img\ 20S-v2.2.2.img

Push the update button and it will update the firmware on the device. *This is where I got an error message saying a driver couldn't be updated because of a memory integrity error. See above.*

You can also set the configuration options.

You have to click on save to change them.

You may have to re-pair your Sena to your devices.

On 6/20/2020 I updated to 2.0.4 is an update for IOS 14

On 01/12/2021 I updated to 2.0.5 Minor bug fix with removing the noise that occurs with HFP audio On 07/01/2021 2.0.5 is current

On 05/10/2022 I updated to 2.2.1 Removal of the features used with the accelerometer if it is not present in the device

On 7/08/2022 I updated to 2.2.2 improved iOS connectivity and compatibility with RC3 and RC4 Sena remotes.

I checked on 10/20/2022, 02/14/2023 and 7/11/2023 and 2.2.2 was still the latest.

Sena 20s evo Setup Parameters

1. Audio multitasking enable
2. Intercom audio Overlay sensitivity Level 6
3. Navigation App Support disable
4. Smart Volume control disable
5. Motion Sensor sensitivity Low
6. VOX Phone enable
7. HD Intercom enable
8. Eight-way Intercom enable
9. Voice Prompt enable
10. FM Station Guide enable
11. Sidetone disable
12. Advanced Noise Control enable
13. Audio Boost disable
14. HD Speaker Accessory disable
15. Audio Equalizer off
16. Speed Dial 1 720428xxxx
17. Speed Dial 2 847651xxxx
18. FM Radio Region Americas - 89.3, 97.3, 99.5, 103.5, 105.1
19. RDS AF disable

The Sena was acting flaky. I didn't hear any message when it turned on and the audio always reset to a level that was so low I couldn't hear gps voice commands. I did both resets and it fixed the problem.

Reset the Sena 20s evo

There are 2 ways.

1. Remove the unit from the mount and turn it on

There is a little hole in the back between the 2 top screws. Insert a paperclip in the hole and push gently for 1 second. The unit will turn off. This will not restore all the factory settings.

2. Turn the unit on. Press and hold the phone button for 12 seconds until the LED shows solid red and you hear double beeps. You will hear a voice prompt saying "Factory Reset".

Within 5 seconds press the Jog Dial to confirm reset. You will hear "Headset reset, good-bye"

Pairing the Sena 20s evo intercom

Press the jog dial and phone button simultaneously on both units for six seconds until they start flashing quickly (pairing mode), then press the jog dial of your unit once. After a few seconds, the two units pair, and their lights return to a slow blue flashing rhythm.

Driving with the XT From FB Group

If I plan a trip with Basecamp and drive off the route (either by a little or a lot), will the XT:

- 1) take me back to the route to the place where I left the route?
- 2) take me back to the nearest point of the programmed route?
- 3) create a new route to my next programmed destination?

The answer to that is quite complex. It is supposed to take you to the point on the route that you were heading for anyway - whether that is a via point or a shaping point - so #3 in your list. (so it doesn't head for the next via, as suggested above)

But if you rejoin the route and have by-passed shaping points, it will continue ahead to the next route point without taking you back to the missed shaping points. But until you rejoin the magenta line it will be directing you back to the next point in the trip list.

You cannot miss out Via points in the same way though.

However, there is a serious issue with the XT routing behavior, which Garmin knows about, they have all of my testing evidence, and we have discovered where the fault is and come up with a solution to fix it. It is now waiting on the team in the USA to sort it.

The issue is that under certain circumstances it doesn't do this. Instead it seems to find the closest point of the route, and if you have just deviated and it has asked you to turn back, then the closest point is behind you. So it ends up taking you back the way you have traveled to the point where you left the route.

It does this with routes from any software, not just Basecamp. But it doesn't do it if the route has been built on the XT screen in Trip Planner.

The main circumstances when this occurs are when the XT has recalculated the route eg by pressing skip, or selecting closest entry point.

Look at my documents on zumouserforums.co.uk and join us - you will get much more reliable information from members there.

You need some more background info to understand the way it works.

It depends on the points you use ..via points or shaping points.

Via points are Hard points. If you miss one the XT will send you back until you've passed it or continue if you choose to skip it.

Shaping points are soft.

If you miss that the XT will navigate forward.

Also the XT introduced persistency.

A trip based on a track file has no via points or shaping points.

Even in that situation the XT will try to keep the route intact and get you back to it.

Personally I never work with auto recalculation. I prefer to decide myself where to re enter the route

For that you need to switch 'Auto recalculation' off.

I don't use these kinds of routes anymore either.

Personally I prefer using tracks as file transfer to the device.

I convert them on the XT to a trip/route.

That works best for me

1) No

2) Perhaps

3) Yes it will recalculate. What it comes up with may or may not match.

4) Here we go....

If I've put the effort into creating a route in basecamp I also save it as a track. I will import both the track and the route to my zumo. I will display the track on the map which is the same as taking a highlighter to a paper map, the track shows at any scale no matter what I am doing with a route. I will select the route in trip planner for turn by turn directions. I always have my GPS set to north up and prompt me when I go off route so I can choose if it recalculates or not. Using this method I can enjoy a 'free ride' and go off my original plan. I have my original plan on the map as a track file and if I see an exciting looking road I can go off route and by recalculating compare the changes to my original plan and ETA. If at any time I get back on the track if I want to be true to my original route I reload the trip and select closest point of entry. For day rides I plan in Google Maps, convert to GPX using GPS visualizer and load to the ZUMO using drive. All in under 10 minutes.