



# GPS Guide



## for District 37 Desert Races

How To Bring Your Club into the 21<sup>st</sup> Century, and also...

- Save everybody time
- Reduce Rescue-3 response time
- Have accurate maps
- Get free help!

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# GPS Guide for District 37 Desert Races



## - Basic Instructions -

### Steps:

1. Gather the right GPS data
  - Garmin GPS units are the standard, and must be able to interface with a computer
  - We need two things:
    - Waypoints of all checks, major crossings, downhills, etc.
    - A GPS "track" of the course itself
2. Clean-up the GPS data
  - Transfer the data to your computer
  - Use Mapsource software, and save in MPS format (second choice is GDB)
3. Create Maps from the GPS data
  - These programs offer the best map quality, although Mapsource maps will do the job: National Geographic's "Topo!", DeLorme's "3-D Topo Quads"
4. Please e-mail this data to us well in advance of the race ([rescuethree@verizon.net](mailto:rescuethree@verizon.net))

See the next page for more detailed instructions (optional)

Contact Rescue-3 for free help: / [rescuethree@verizon.net](mailto:rescuethree@verizon.net) (909)289-8730



# GPS Guide for District 37 Desert Races



- Detailed Instructions (optional) -

Steps (4 total):

1. Gather the right GPS data
  - Garmin GPS units are the standard
    - Other GPS units (Magellan, etc.) may be used if necessary, but may complicate the process. Contact R3 for details before starting.
    - You must use a GPS unit that can interface with your computer, and with the GPS software.
  - We need two things:
    - Waypoints of all checks, major crossings, downhills, etc.
    - A GPS "track" of the course itself
    - These can be recorded at the same time, in a single ride of the course:
      1. ride to the starting line
      2. clear your GPS unit's "track log"
      3. set your GPS to start recording the track
      4. stop at every checkpoint, road crossing, etc., and mark a waypoint. Name it something you'll remember later.
      5. at the finish, turn off the track recorder.

## 2. Clean-up the GPS data

- Transfer the data to your computer
- Use Mapsource software, and save in MPS format (second choice is GDB)
  - other formats can be used with limited success, if necessary. Contact R3 for details.
- Ensure the track looks good and clean, and do minor "clean-up" if necessary
- Rename all the waypoints, to clean them up
  - keep names to 7 characters or less. Examples: 'Ck1', 'Ck2', 'Start', 'Finish', 'RRXing', 'SPLX1' (South Powerline Crossing 1), 'Dwnhl', etc.

## 3. Create Maps from the GPS data

- These programs offer the best map quality, although Mapsource maps will do the job: National Geographic's "Topo!", DeLorme's "3-D Topo Quads"
- The latitude/longitude for each waypoint should either be listed on the map, or in a separate file (Word Doc, etc.)

## 4. Please e-mail this data to us well in advance of the race ([rescuethree@verizon.net](mailto:rescuethree@verizon.net))

- Thank You!

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## GPS Guide for District 37 Desert Races



### - Examples -

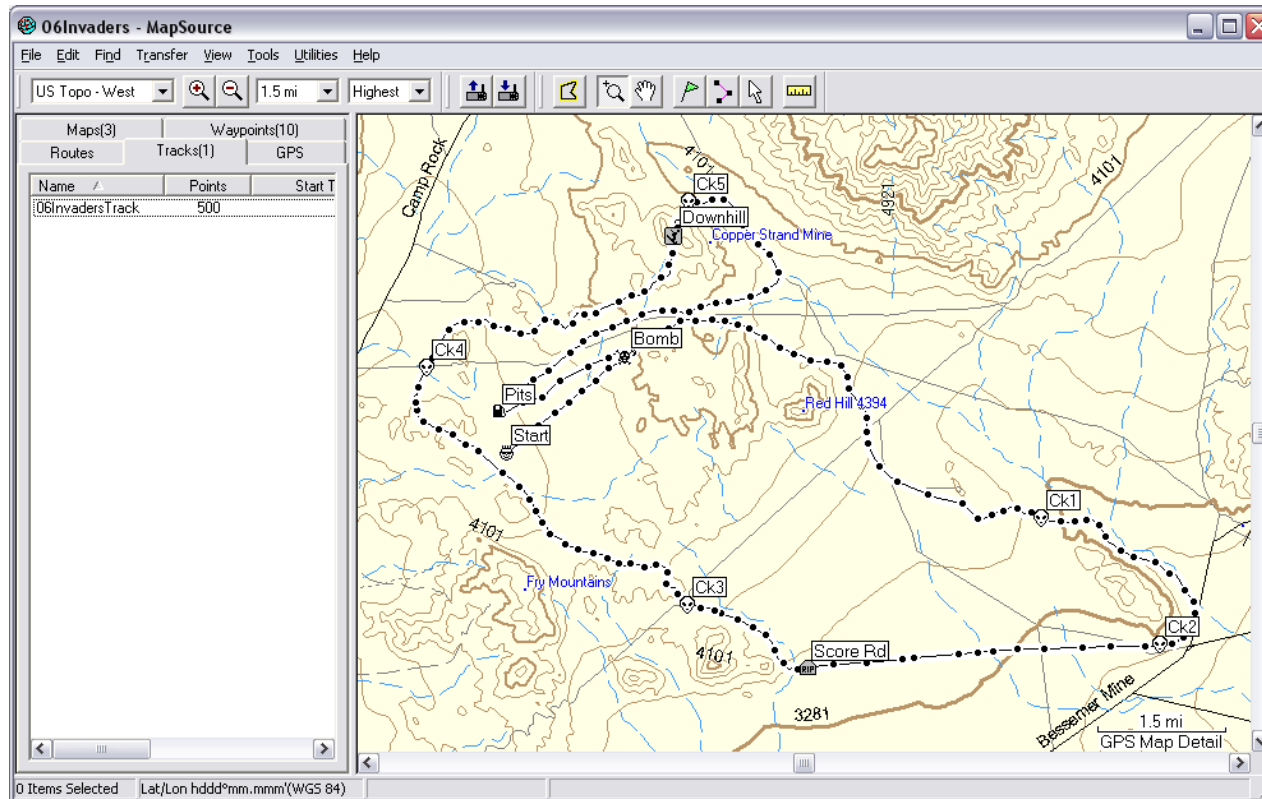
There are 2 tangible objects Rescue 3 would like:

- The GPS Data File:
  - Organized correctly, with the TRACK(S) and WAYPOINTS in a single MPS file
  - Formatted as MPS (GDB is 2<sup>nd</sup> choice)
- A Package of ready-to-print:
  - Map(s)
  - GPS Coordinates (Latitude/Longitude) of each checkpoint, road x-ings, big downhills, etc.

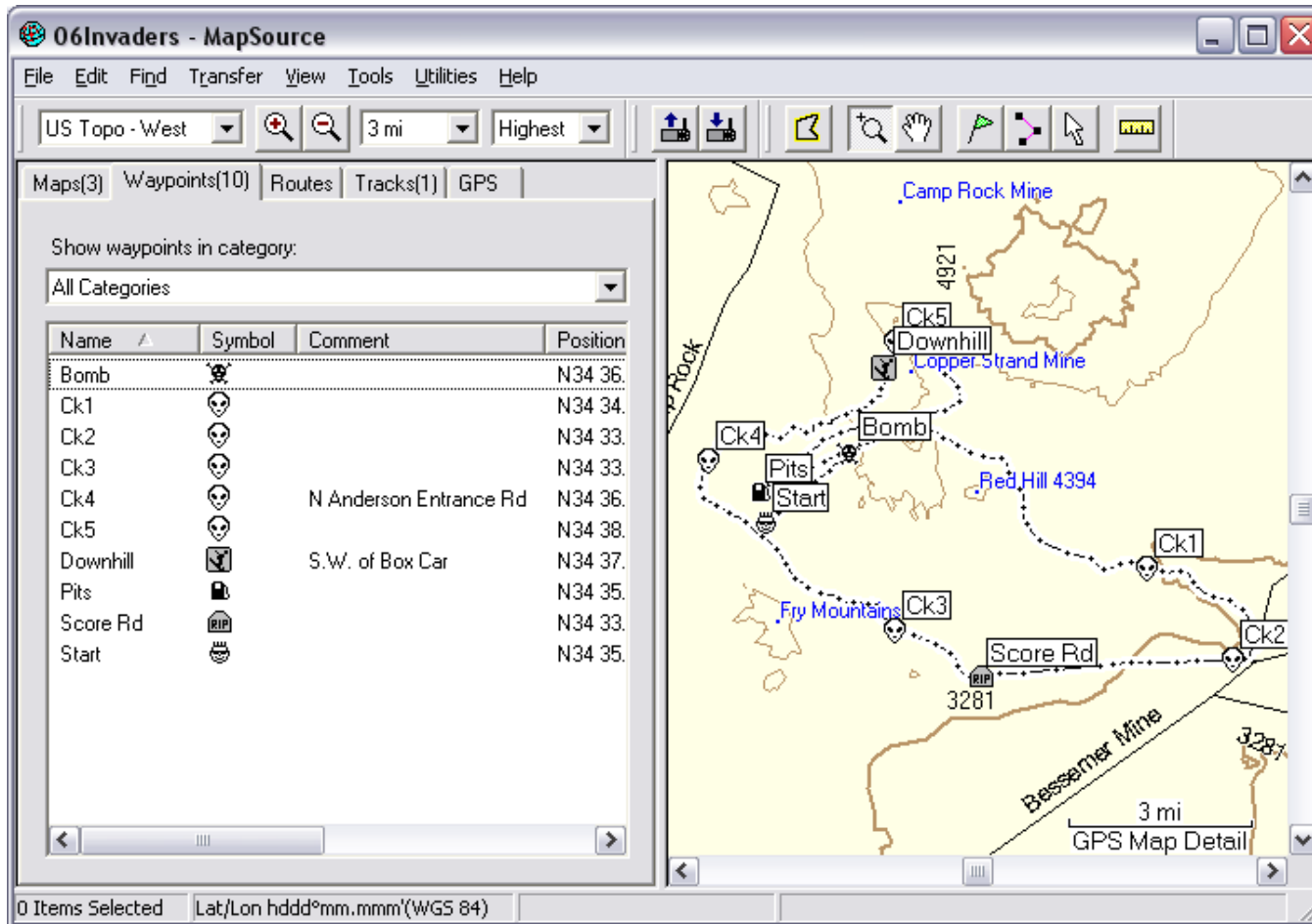
See the examples on the following pages....

## THE GPS DATA FILE

When you're done riding the course and gathering the GPS data, your MPS file should look like this:



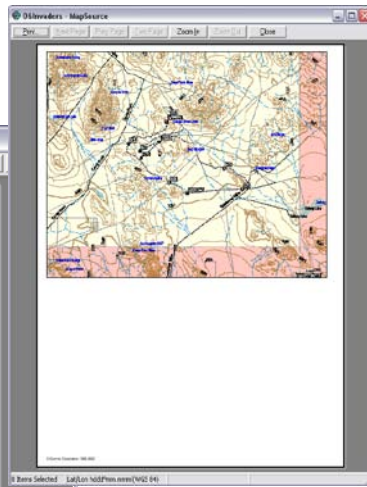
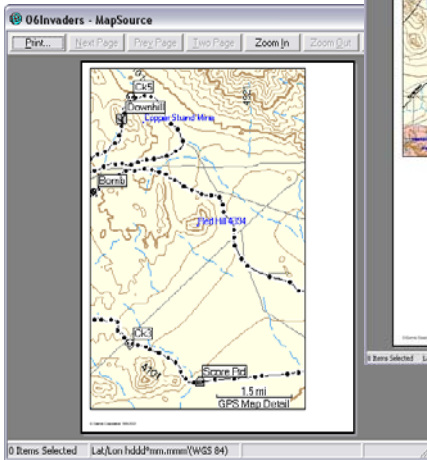
- Do "clean-up" as necessary
- If possible, combine your tracks into 1 track (if a 1-loop course) or 2 tracks (if a 2 loop course), and label each accordingly. Contact Rescue 3 for assistance in learning how to combine tracks.



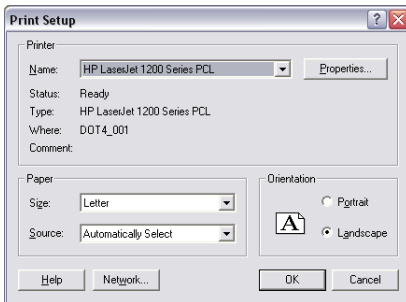
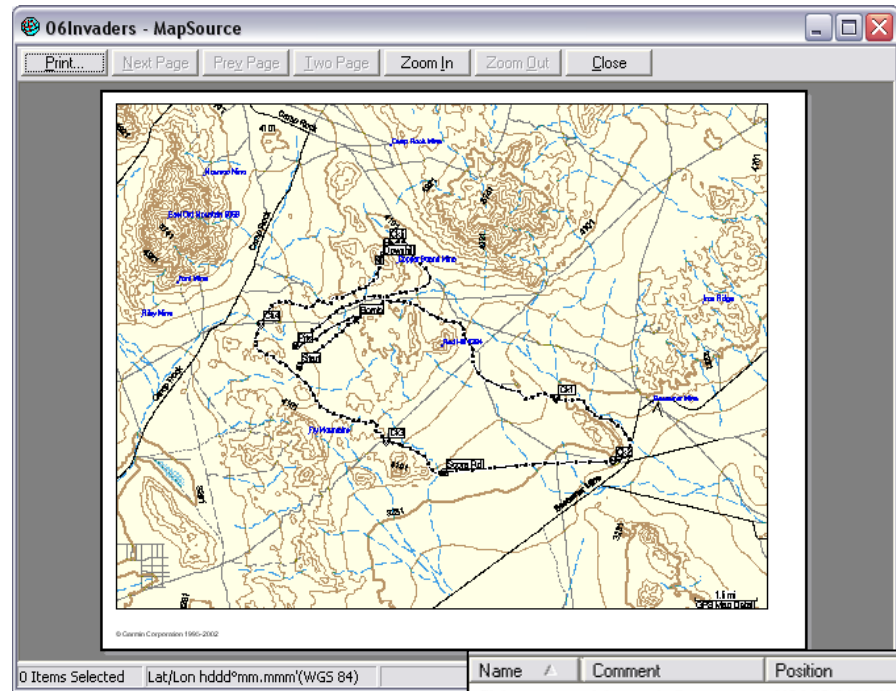
- Keep names to 7 characters or less. Examples: 'Ck1', 'Ck2', 'Start', 'Finish', 'RRXing', 'SPLX1' (South Powerline Crossing 1), 'Dwnhl', etc.
  - Add any important comments. Leave all other comment fields blank.

**Making Mapsource Maps:** do a Print Preview and check the page settings

*Course is off page*



*Map doesn't fill page*

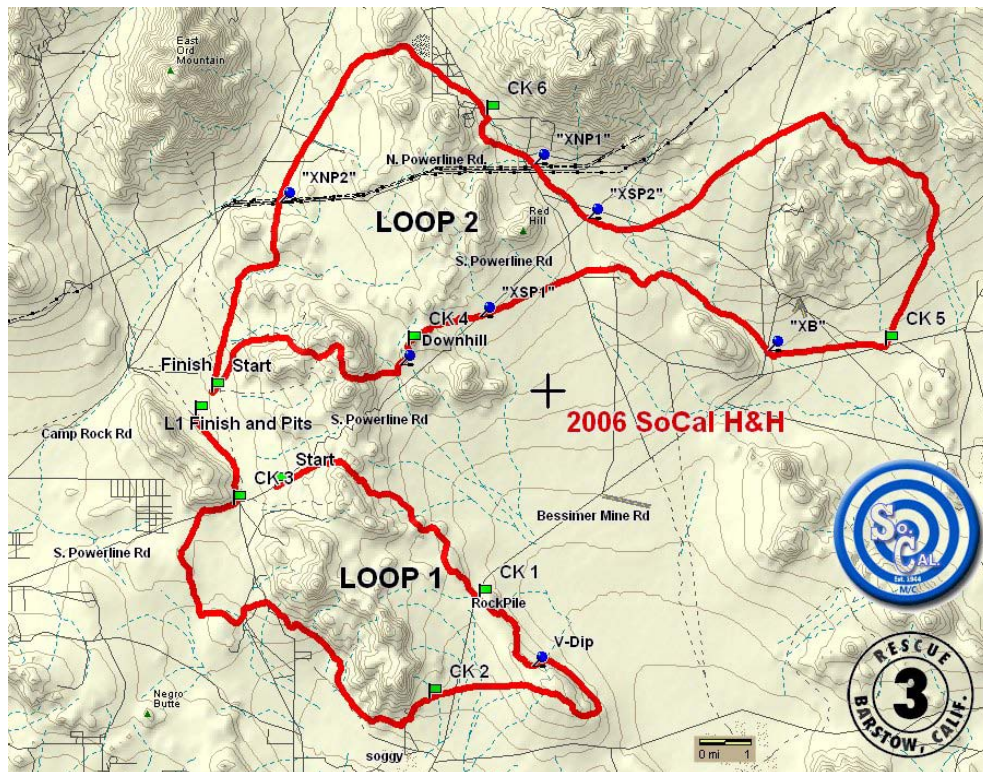


- The map should nearly fit the page
- Nearby roads and landmarks should be in view
- Take a screen-print of the finished map (button on your keyboard), and paste into Word or a paint program, then save to a file, to e-mail to Rescue 3. Do the same for the waypoint tab, showing the latitude / longitude of each waypoint (example at Rt.)

Name	Comment	Position
Ck1	L1 at rockpile	N34 29.846 W116 39.877
Ck2	L1 W of Bessemer	N34 28.197 W116 40.884
Ck3	L1 Pwrln n North Xing	N34 31.381 W116 44.790
Ck4	L2 after downhill	N34 33.793 W116 41.360
Ck5	L2 SE corner	N34 34.020 W116 31.731
Ck6	L2 near box car	N34 37.815 W116 39.719
L1Pits	L1 Finish and Pits	N34 32.865 W116 45.569
L1Start	L1 Start	N34 31.695 W116 43.965
L1VDip	L1 V-Dip	N34 28.730 W116 38.836
L2Down	L2 Downhill	N34 33.706 W116 41.481
L2SF	L2 Start Finish	N34 33.251 W116 45.233
XB	L2 Bessemer Xing	N34 33.948 W116 34.124
XNP1	L2 N Pwrln Xing 1	N34 37.029 W116 38.804
XNP2	L2 N Pwrln Xing 2	N34 36.394 W116 43.889
XSP1	L2 S Pwrln Xing 1	N34 34.506 W116 39.896
XSP2	L2 S Pwrln Xing 2	N34 36.132 W116 37.724



## Making Maps in “Topo!” or “3-D Topo Quads” (optional):



Once the GPS track and waypoints are loaded successfully, you can change symbols, colors, add a title for the event, label the loops, label roads, fix overlapping waypoint text, line weight, etc.

When the map looks nice, take a screen-print (button on your keyboard), and paste into a paint program (or Word, etc.) and:

- Ensure the map SCALE is shown
- Save Image to a file, to e-mail to Rescue 3
- Make other more detailed map files, if desired (see examples at right)

You need to transfer your GPS course data into the mapping software either by:

- Transferring from your GPS unit again, or
- Converting the Mapsource file, using

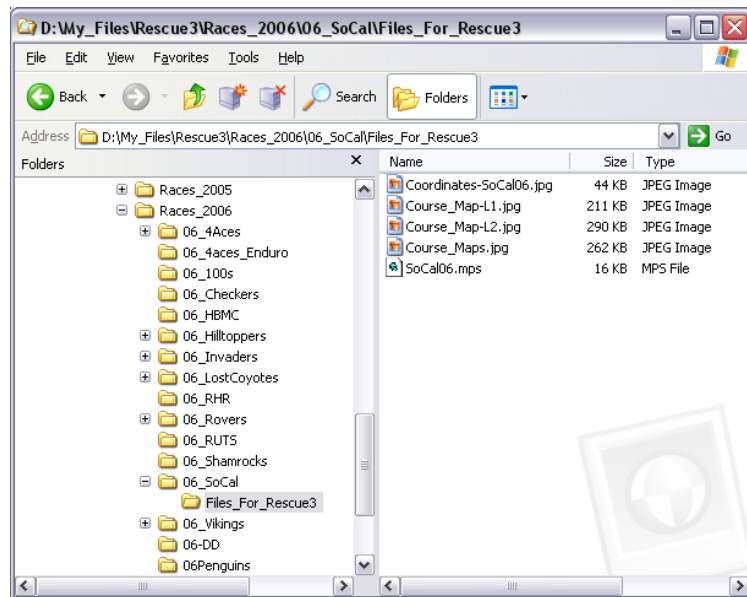
<http://www.gpsbabel.org/>



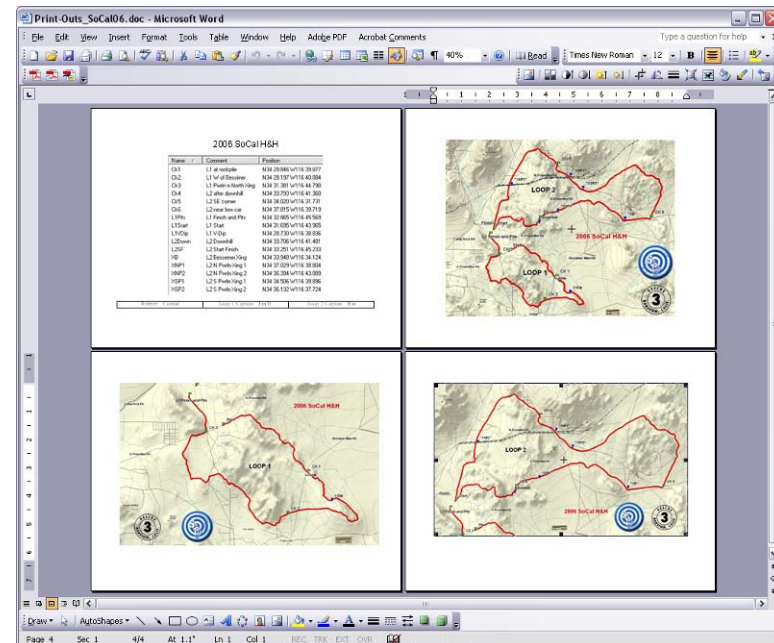
## THE READY-TO-PRINT PACKAGE

First, assemble your files in a new folder on your computer:

- MPS file (with track of course & waypoints of checks, etc.)
- Screen-prints of your maps
- Screen-print of your GPS coordinates

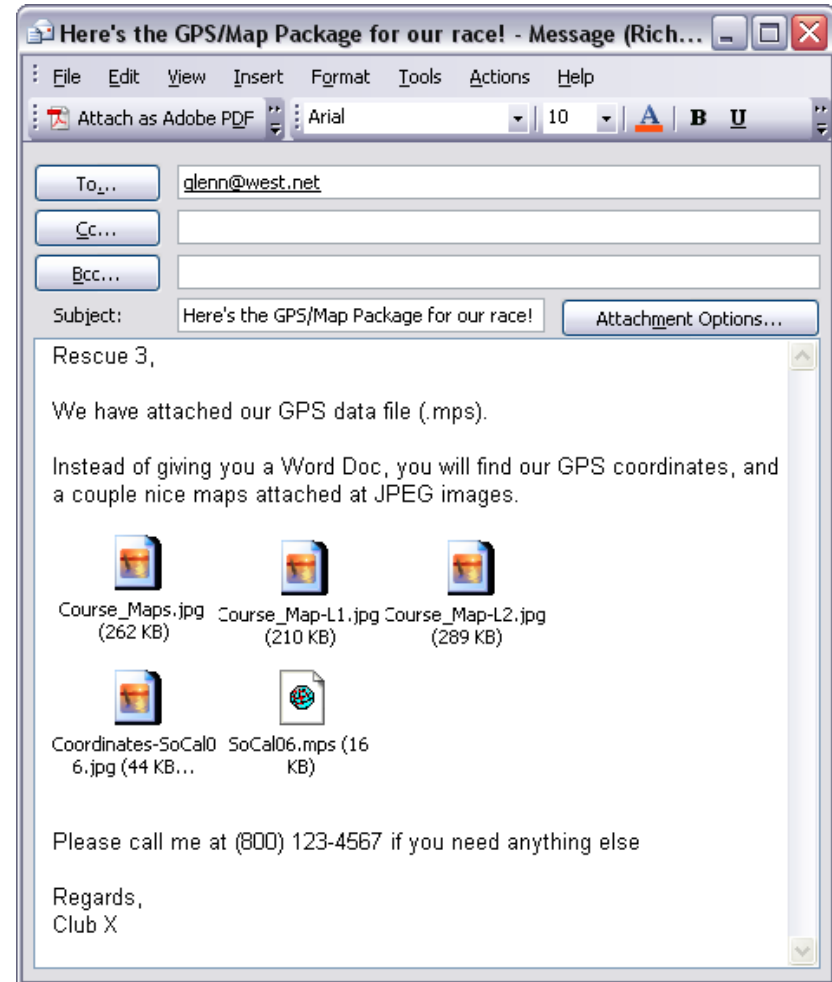
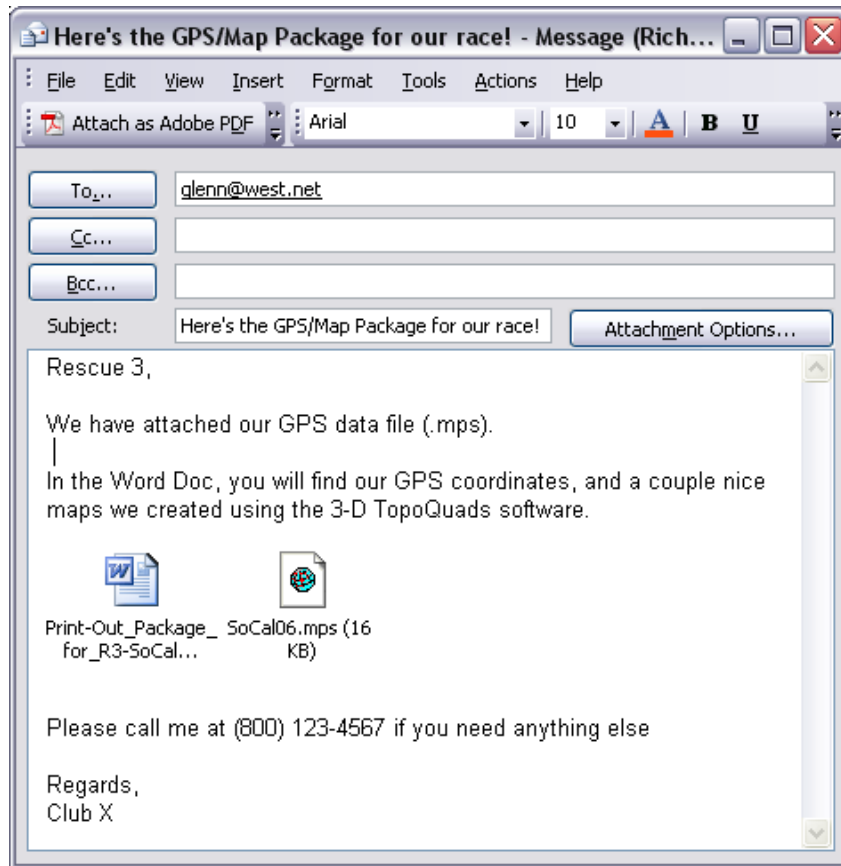


Now you can either provide the screen-prints of the map(s) and coordinates to Rescue 3 as separate files, or you can paste them into a Word Doc.



Then e-mail them to Rescue 3 well in advance of the race

Either way, please include the names and cell phone numbers of your referee and course captains, etc.



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# GPS Guide



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### - Recommended Equipment -

**GPS Unit For Bikes:** Rescue 3 recommends that you have a Garmin "outdoor" GPS unit that is capable of interfacing with your computer

- The Garmin "GPSMap 60" series is **the only new GPS with BOTH a USB and serial connection, so it is guaranteed to work with all current and future 3rd-party software. For this reason, it is Rescue 3's most highly recommended model series.** They display topo maps, do turn-by-turn navigation in the city (with software purchase), have large displays, many functions, an external antenna jack (for in-car use), are easy to use, and are very durable.
  - "[GPSMap 60](#)" - grayscale (~\$203)
    - Don't confuse with Garmin's "GPS 60" which is completely different, and can't display maps.
  - "GPSMAP 60C" (discontinued) - color (~\$300)
  - "GPSMAP 60CS" (discontinued) - color, built-in compass & barometer (~\$250)
  - "[GPSMap 60Cx](#)" - color display, removable memory card (~\$317)
    - \*Highly recommended by Rescue 3 because of memory card\*
  - "[GPSMap 60Csx](#)" - color display, removable memory card, built-in compass & barometer (~\$353)
    - \*Highly recommended by Rescue 3 because of memory card\*
- Good medium-range units that display topo maps:
  - Garmin's "etrex [Legend](#)" (~\$119) or [Legend Cx](#) (color, removable memory card, ~\$224)
  - Garmin's "etrex [Vista](#)" (~\$174) or "[Vista Cx](#)" (color, removable memory card, ~\$300)

- the Vista series, as well as some of the GPSMap 60 series above, have built-in compasses, so you can tell which direction you're pointed when you're stopped (most GPS units require you to be moving >3MPH before they can calculate which direction you're traveling)
- Cheapest Garmin units, don't display maps, but will display and record waypoints and tracks (the stuff we need), and can still be used on the trail with some success:
  - Garmin's "[Foretrex 101](#)" (~\$115) - straps on your wrist
  - Garmin's "[etrex](#)" (~\$64 refurbished or ~\$74 new) - the base etrex unit
  - Garmin's etrex [Summit](#), [Venture](#), or [Camo](#) (as low as \$95)
  - These discontinued Garmin units will work: "GPS 12", "GPS 12XL", "GPS III", "GPS III+", any "Vista", "Legend" or "GPSMap" series (get used for as low as \$60)

#### Notes Before You Buy:

- You can see a comparison of Garmin units at: <http://www.garmin.com/outdoor/compare.jsp>
- The best prices we have found, for new units, is on [www.amazon.com](http://www.amazon.com). These are the prices listed above. Go to [www.amazon.com](http://www.amazon.com), search for the model number, then click on the "new & used" link that looks the cheapest. The availability of the low priced units seem to change from week to week.
- eBay has used "buy it now" units for less than \$75, and bidding may save you a few bucks.
- **CAUTION:** Most new units now have a USB connector, so if your computer is older, you will need to either add USB capability to your computer, or get the Garmin 60Csx (the only unit still with a serial port connection)
- **CAUTION:** Older units, including older versions of those listed above, may only have a serial connection (no USB) to your computer, so newer computers without a 9-pin serial port will require a USB "serial port replicator" and software ( <http://www.pfranc.com/usb/usb.shtml> ), which is not recommended for inexperienced folks (and costs at least \$30)
- **CAUTION:** Some low-end or older Garmin units cannot connect to a computer at all, so please steer clear of them (Gecko, etc.)
- Read all sections below, and look at prices for the accessories for your chosen GPS model

### **Recommended GPS Units For Trucks:**

- **Lowrance "Baja 480c" (~\$550) - ruggedized, color**
- Lowrance 4800M (~\$420) - monochrome
- high-end Lowrance units are ~\$900-\$1,700
- Software is MapCreate or OziExplorer. Contact R3 for more details.

### **Software Options:**

For Garmin units: One of these two Garmin software packages is required

- Garmin's "Mapsource Topo U.S." software - \$64
  - For loading topographic map contours on your compatible GPS unit. It also allows you to transfer data to/from your unit (and then e-mail the files to Rescue 3 or your friends), and back-up your favorite data in an organized way. You will see routes and tracks overlaid on topo contours with major roads and landmarks also shown.
- Garmin's "Trip & Waypoint Manager" - \$25
  - It's basically Mapsource without the maps, for GPS units that don't support maps, or for the person looking to save money. It will allow you to transfer data to/from your compatible unit (and then e-mail the files to Rescue 3 or your friends), and back-up your favorite data in an organized way. You will see the routes and tracks as a squiggly line on a blank background, with only highways for reference.
  - This may come with certain GPS units; see Garmin.
- The mapping-capable GPS units often support city street maps, turn-by-turn road navigation, and POIs (Points of Interest, like gas stations, restaurants, etc.). The common software for these purposes are listed here: <http://www.garmin.com/cartography/ontheRoad/> (be careful of compatibility & memory limitations, though)

### For Mapping (3rd Party) Software:

- Garmin's Mapsource Topo U.S. (listed above) is required in order to get Topo maps to show-up on your GPS unit, and can be used to print simple Topo maps, with GPS data overlaid on it. The graphical quality and options are somewhat limited with Mapsource, though. Third-Party mapping software can be used to make better quality printed maps (with shaded contours), view the terrain in 3-D, and to draw your own tracks or routes. It often also allows you to search for landmarks or regions by keyword, move existing points within a track, and even link photos to locations. You can transfer data to/from your GPS unit, but don't expect to be able to exchange tracks or routes between 3rd-party software and Mapsource, as there are compatibility issues with the different formats. These software packages are more complicated than Mapsource, but are more powerful as well. **The main value for D-37 is for creating better maps than what Mapsource produces (optional)**
  - "3-D Topo Quads, California-South" by DeLorme - Has 7.5-minute (1:24,000 scale) scanned USGS maps, for good detail. In comparison, DeLorme's "Topo USA" software has 1:100,000 scale maps. Has more features than National Geographic's Topo! (below) ~\$90
  - National Geographic's "Topo! California State Series" - Has the same resolution maps as 3-D Topo Quads, but is known for it's printed map quality. ~\$80

### GPS Mounts:

- You can't beat the Cycoactive or RAM mounts ([www.cycoactive.com](http://www.cycoactive.com)), either for your bike, or your truck (~\$40 for the RAM handlebar Mounts)
  - We highly recommend handlebar mounts for all units other than the Foretrex (which straps on the wrist). Mounts are much more convenient than pulling the unit out of your bag or pocket all the time, and you can see it while riding!

## GPS Cables:

### Computer interface:

- **Most new USB-interface units come with a USB cable for your computer, so no other cable is required.** It is a standard mini-USB cable used for digital cameras and the like.
- If you get an older GPS unit, it will likely have a 4-pin plug (in-line or round). These are serial connections, and will require a serial cable compatible with your unit, and your computer. For the serial units, you can get cables with or without cigarette lighter adapters. The official Garmin cables are expensive, so we recommend cheap ones by Gilsson Technologies...
  - For the older etrex series (4-pin, straight), it's \$16 + \$5 shipping. Choose cheapest "used & new" seller at: [http://www.amazon.com/gp/offer-listing/B00073MPCG/ref=dp\\_olp\\_3/102-6576770-0472113?ie=UTF8](http://www.amazon.com/gp/offer-listing/B00073MPCG/ref=dp_olp_3/102-6576770-0472113?ie=UTF8)
  - For the old GPS 12, GPSMap 60 series, GPS V, and others (4-pin, round), it's \$16 + \$5 shipping. Choose cheapest "used & new" seller at: [http://www.amazon.com/gp/offer-listing/B00073MP9Y/ref=dp\\_olp\\_1/103-0497428-6327817](http://www.amazon.com/gp/offer-listing/B00073MP9Y/ref=dp_olp_1/103-0497428-6327817)
- Wiring for your bike (optional): You can power your unit from your bike, instead of batteries. See [www.Cycoactive.com](http://www.Cycoactive.com) for more details.

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