Adventure Cycling Association

GPS Data User Guide

Contents

Adventure Cycling with GPS

Adventure Cycling offers files of GPS waypoints that you can download and use in a PC or handheld computer to build routes for a GPS receiver (GPSR). The GPS data is not very useful by itself—it is far too limited. However, a GPSR together with the paper maps of the Adventure Cycling Bicycle Route Network can improve your navigation, both on and off the road. One member calls it a "home entertainment device" that helps pass long hours on the road.

Share your experiences, ask questions, and maybe answer a few on the Adventure Cycling Forum GPS discussion. To find out more, go to: www.adventurecycling.org/forums/intro.cfm

For more about consumer GPSR equipment and programs see Joe Mehaffey, Jack Yeazel, Sam Penrod and Allory Deiss' GPS Information web site at: www.gpsinformation.net The news group "news:sci.geo.satellite-nav" is a good place to meet GPS-equipped cyclists and experts.

Disclaimer: Adventure Cycling strives to keep its waypoint information up to date. Features are continually changing however, so the data may not reflect the latest modifications and/or additions. You are solely responsible for safe navigation and the prudent use of this data.

What are the waypoint files?

The waypoint files are keyed to the maps of the routes in the Adventure Cycling Bicycle Route Network. We have made waypoints for each turn in the narratives and each facility in the service directories. Every waypoint has a comment that describes a town, an intersection, a service, or other point of interest. We use service abbreviations where the name or symbol of the service needs amplifying:

AS	all services	**M**	hotel/motel
B&B	bed & breakfast	**NB**	northbound
BS	bike shop	**R**	restaurant
CG	campground	**RA**	rest area
EB	eastbound	**SB**	southbound
FA	fishing access	**SP**	state park
G	grocery	**SS**	service/gas station
HS	hostel	**WB**	westbound
L	Library		

All the waypoints of one section—one paper map—are in a single file, which is given in three formats:

- *MapSource*, for Garmin Corporation's MapSource™ program only (.mps file extension)

- *OziExplorer*, comma-separated-value text for OziExplorer and many other shareware and freeware programs (.wpt and .rte file extensions)

- *GPX,* XML text for TopoGraphix Corporation's ExpertGPS, Magellan's MapSend™ and other programs (.gpx file extension)

In addition, the files for all the sections of each Adventure Cycling route are combined into zipped files—one for each format—for faster download of an entire route.

Many owners of Garmin mapping GPSRs already own the MapSource™ program, which Garmin sells with many different maps on CD. It shows waypoints graphically on a blank map or on the maps you purchased if they cover the route.

OziExplorer shows waypoints graphically on a blank map or on raster maps that you have purchased or scanned from paper. Many other GPS data programs can read the OziExplorer waypoint files.

ExpertGPS shows waypoints graphically on USGS topographic maps. It supports most consumer GPSRs. A growing number of other programs can read GPX files. A list is found at: www.topografix.com/gpx_resources.asp.

How do I use the waypoint files?

File names

After you have downloaded and unzipped them you will see that the file names indicate the route, the section, the release version, and the format. A typical file is named NT04v001.mps.

NT, indicates the Northern Tier route.

04, indicates Section 4.

v001, indicates the first release of this file.

mps, is the MapSource format. OziExplorer files use wpt for waypoints and rte for routes. GPX files use gpx.

Because you will be editing the waypoints, we recommend that you make these files read-only to prevent inadvertent saving of changes. Another option is before opening the files, duplicate them elsewhere on your hard driver. (Waypoint names are vital to the correct sequence of waypoints.) Save your changes in your own files.

Select the files that cover your route and load them into a GPS data program. Build GPS routes for each day of riding and upload them to your GPSR.

Waypoint names

To identify the waypoints of interest, it helps to know how we have named them. Their names are unique; you may load any combination of waypoint files without conflicting names.

A waypoint name contains exactly six characters chosen to encode its position on the Adventure Cycling map when sorted alphabetically. An example waypoint name is E011C0.

Character 1 identifies the ACA route. The key for all routes is:

A	Atlantic Coast	**N**	Great Parks North
B	Tidewater Potomac	**P**	Lake Erie Connector
C	Great Parks South	**Q**	Grand Canyon Connector
D	Great Rivers South	**R**	Green Mountains Loop
E	North Lakes	**S**	Florida Connector
F	Northern Tier	**T**	Underground Railroad
G	Pacific Coast	**U**	Adirondack Park
H	Southern Tier	**V**	Allegheny Mountains
J	TransAmerica	**W**	Washington Parks
K	Western Express	**X**	Utah Cliffs
L	Lewis & Clark	**Y**	Sierra Cascades
M	Great Divide		

Character 2 identifies alternate routes. 0 stands for the main route and 1, 2, 3, ... Z for alternates. (We use letters A-Z, omitting I and O, when we run out of digits.) E0 for the North Lakes main route, E1 for its Manitowoc alternate.

Character 3 identifies a section, that is, the part of a route printed on one sheet. This character counts from the beginning to the end of the whole route. Waypoints named E01... are on the North Lakes main route, section 1.

Characters 4, 5, and 6 identify waypoints in cue sheet sequence when riding the route "forward," that is, in the sequence of the panels on the map.

Waypoint descriptions

The waypoints' descriptions are intended to help you locate them on the paper map, choose which to use for your GPS routes, and create meaningful names for them.

Intersections: The printed cue sheet can say "turn right onto US 97" because it has separate directions for riding both ways. However, a GPS waypoint serves both directions; thus we identify intersections by both roads, for example, "SR 1804/US 97." When riding forward, in the sequence of the panels on the map, this means "ride from SR 1804 onto US 97." When riding the other way, read the description from right to left: "ride from US 97 onto SR 1804." The pointer in your GPSR shows which way to turn.

One-way streets: Where one-way streets require separate routes, the descriptions include, for example, EB and WB for east- and westbound waypoints. Ignore those marked for the direction you aren't going.

Off route: "#" begins the description of an off-route campground or town.

Elevations: Descriptions include elevations of the waypoints in hilly areas (where available).

Route names

We include GPS routes in the published file to make the ACA route stand out on the map. They might also serve as sample routes to help you create the actual routes for a day's riding.

Like waypoint names, GPS route names are unique—not duplicated anywhere in the Adventure Cycling routes—so that you can combine any ACA routes in your computer without conflicting route names. GPS routes use the same alphabet and naming convention as do waypoints. For example, a GPS route might be named F031C2:

Character 1 identifies the ACA route. The key for all routes is:

A	Atlantic Coast	**N**	Great Parks North
B	Tidewater Potomac	**P**	Lake Erie Connector
C	Great Parks South	**Q**	Grand Canyon Connector
D	Great Rivers South	**R**	Green Mountains Loop
E	North Lakes	**S**	Florida Connector
F	Northern Tier	**T**	Underground Railroad
G	Pacific Coast	**U**	Adirondack Park
H	Southern Tier	**V**	Allegheny Mountains
J	TransAmerica	**W**	Washington Parks
K	Western Express	**X**	Utah Cliffs
L	Lewis & Clark	**Y**	Sierra Cascades
M	Great Divide		

Character 2 identifies alternates within the ACA route.

Character 3 identifies a route section, that is, the part of a route printed on one sheet.

Characters 4 and 5 identify the panel number as it appears on the section map. (The Great Divide Mountain Bike Route divides its maps differently.)

Note: See Appendix B for conversion of three digit panel numbers to two digits of 34-character alphabet.

Character 6 identifies different GPS routes when more than one appear on a map panel.

Thus F031C2 names the Northern Tier route, main route, section 3, panel 46, second GPS route on that panel.

Waypoint accuracy

We located the waypoints with Garmin's MapSource™ MetroGuide USA map. Waypoints at intersections are as accurate as the map, typically within 200 feet. Off-route waypoints—points of interest—are less accurate, limited by the map's address-location feature. They will put you on the right street within a few blocks of the point of interest.

The map does not locate a few points of interest, for example, a campground that is "in town." Their waypoints' descriptions include "location uncertain" or "loc uncert."

Reporting corrections

Corrections and additions to the waypoints are welcome. When reporting coordinates, please be sure to state their datum, for example, WGS 84 or NAD27. The coordinates are useless without the datum. Send corrections to Routes & Mapping Dept., Adventure Cycling Association, P.O. Box 8308, Missoula, MT 59807; email them to gps@adventure cycling.org; or use the online form at: www.adventurecycling.org/routes/correctionform.cfm.

Updating the waypoint files

Adventure Cycling updates its waypoint files shortly after printing new and updated maps and addenda. Revision dates are noted in the About text file included with download.

Using GPS data programs

The major GPS vendors and many others sell GPS data programs. Most run on Windows PCs or on Macs with Virtual PC™ (we run Parallels Desktop™ 3.0 for Mac, Build 5589). They fall into two categories:

- Graphical programs show waypoints and routes on maps-proprietary maps from some vendors and general-use maps from others.

- Text programs show lists of waypoints in text format. Some users may find the text format less intuitive than clicking on a map, but the small size of the program and the text files is a great advantage on the road with a handheld computer, for which maps may be too big. The text programs are generally cheaper than the graphical ones. Some are free.

Joe Mehaffey, Jack Yeazel, Sam Penrod and Allory Deiss' GPS information web site (www.gpsinformation.net) describes, compares, and reviews many GPS data programs.

More details about using a few popular programs follow.

MapSource

MapSource™ uses the proprietary maps sold by Garmin Corporation (www.garmin.com). A copy of the program comes with each set of map CDs, and updates are available on the web site. Any of the map sets is suitable for use with our waypoint files. MapSource™ works only with Garmin GPSRs, and it runs only on Windows PCs. Garmin updates the program regularly and downloads can be found at: www.garmin.com/support/download.jsp The suggestions here pertain to MapSource™ version 6.12.2.

Setup

When installing MapSource, the Full Install option places all the map data on the hard drive. It occupies several gigabytes and runs much faster there. If you really cannot spare the disk space, it can be installed to run sluggishly from map data on the CD.

Set up the program with Edit > Preferences for your GPSR and your own preferences.

Building routes

This is a suggested procedure for selecting the waypoints and building a route for a day's ride. You may wish to use it as a starting point for developing your own methods.

1. Open the waypoint files (File > Open) of the map sections you need, for example, NT04v001.mps. If one file contains all the required waypoints, go to Step 2. If your ride spans map sections, however, some copy-and-pasting is necessary. Using the Selection tool, drag out a rectangle that encloses the waypoints and routes of interest. Copy them (Ctrl-C), open a new file (Ctrl-N), and paste (Ctrl-V). Save the new file (File > Save) with a useful name. Continue to copy from the master files and paste into your new file until your area is covered. Garmin does not document the maximum capacity of a file, but we have successfully tested MapSource with 12,000 waypoints at once.

   MapSource can open only one file at a time. When copy-and-pasting, you can open the two files in alternation, or you can run two instances of MapSource and copy-and-paste between them.

2. Select waypoints. The map shows a brief description at each waypoint, which you can compare with the paper map to help pick the waypoints for your route. Most map panels also include a sample GPS route that follows the Adventure Cycling route across the panel and may be a good starting point for your own.

   Select the waypoints for your ride:

   • Use the Selection tool to drag out a rectangle enclosing them, or

   • Use the Waypoints list in the left-hand panel, where the usual Windows selection conventions apply: Click to select, Ctrl-click to add to the selection, and Shift-click to extend a selection. The waypoints will almost always be consecutive in the list. Where an alternate route leaves the main route, however, its waypoints are found toward the end of the list, after the main route's waypoints.

   The supplied routes help to identify on-route waypoints. In addition, descriptions beginning with "#" identify off-route waypoints. Museums, lodging, libraries, and other points of interest are all off-route; they are not specially marked. Select them as well, even if you do not plan to visit them. You could change your mind on the bike.

   Copy (Ctrl-C) and paste (Ctrl-V) the selected waypoints into a new file. Save it.

3. You are about to edit the waypoints before building a route from them. Although you can work in the master file, both tasks are faster and easier in the small file that you just saved. It's safer too—you don't want to inadvertently save the master file after making changes.

   Our waypoint names, although good at keeping the waypoints in riding order, are not much use on the bike. You would probably rather see "7.2 miles to AMERY" than "7.2 miles to E011C0." Double-click on each waypoint and give it a more meaningful name. Observe the length limit—probably six to ten characters—for your GPSR, and do not duplicate the name among the waypoints that you intend to use at once. The waypoint descriptions will help.

4. Build a route. Using the Route tool, click on the waypoints of your route in succession. Switch to the Selection tool and double-click on the new route to open its Route Properties window, where you can give it a useful name. You can reverse a route with the Invert button. The off-route waypoints, whose comments begin with "#", are sequenced for the rider going forward on the route, leaving the route to that waypoint and returning to the route. If you are riding the other way, you may need to rearrange the waypoints.

   Save the file with your new route in it. You may repeat this procedure to assemble all the waypoints and days' routes that you will load at one time into your GPSR.

5. Upload (File > Save to Device > check Waypoints and Routes). MapSource is not able to upload selected way-points and routes; it sends all of those in the file. To send just some of them, transfer them to a temporary file and upload that.

6. Go ride.

OziExplorer

OziExplorer (www.oziexplorer.com) works with raster maps of many types that are widely available or on a blank map with just your waypoints and routes. You could even scan and calibrate your Adventure Cycling paper maps if you find it worth the trouble. OziExplorer runs on Windows PCs and handhelds that use Windows CE. The author, Des Newman, updates it regularly. The suggestions here pertain to OziExplorer version 3.90.3a.

Setup

Set up the program's configuration (File > Configuration). The settings given here are needed to work with the Adventure Cycling files. Set the rest for your GPS and your preferences.

System tab
　Data File Datum: WGS 84.

Maps tab
　Country or Region: USA (NW)

　Lat/Long Display: Degrees

　Blank Map Datum: WGS 84

GPS tab
　GPS Symbol Set: Garmin III+. Our route files use these codes for icons (display symbols). OziExplorer translates them when GPS Make and GPS Model specify a different GPSR. Where there is no translation, OziExplorer uses a default icon.

Building routes

This is a suggested procedure for selecting the way-points and building a route for a day's ride. You may wish to use it as a starting point for developing your own methods.

1. Load a map. Load a map (File > Load from File > Load Map File) of the area if you have one; otherwise open a blank map (Map > Blank Map).

2. Load the waypoint files of the map sections you need, for example, NT04v001.wpt. Load the first one with (File > Load from File > Load Waypoints from File). Load the others with (File > Load from File > Append Waypoints from File).

   OziExplorer allows a maximum of 1,000 waypoints at one time. All of our waypoint files contain fewer than that, but you may have to select and delete unneeded waypoints before appending more.

   Selecting waypoints: Select waypoints from the map or from the waypoint list:

   • *Map:* If the Selection Control is not visible, get it with Select > Selection Control. Click the button "Draw Box to Select Waypoints." Drag out a rectangle surrounding the waypoints.

   • *List:* If the waypoint list is not visible, get it with (View > Lists > Waypoint List). The usual Windows selection conventions apply: Click to select, Ctrl-click to add to the selection, and Shift-click to extend a selection.

   Hint: If you combined waypoints from several master files, put the list in riding sequence by clicking the Sort button. The waypoints, sorted by their names, appear in sequence when following the route "forward," in the order of the printed map panels. They will almost always be consecutive in the list. Where an alternate route leaves the main route, however, its waypoints are found toward the end of the list, after the main route's waypoints.

   Deleting selected waypoints: Click "Delete Selected Objects" on the Selection Control or "Delete the Selected Waypoints" on the waypoint list.

   After combining waypoints from several master files, save the new file. You will return to it.

3. Load a route file with (File > Load from File > Load Routes from File). OziExplorer cannot append routes from other files. When your area of interest spans two ACA sections, you should process them separately if you wish to use the given routes as a starting point for your own routes.

4. Select waypoints. The map shows a brief comment at each waypoint, which you can compare with the paper map to help pick the waypoints for your route. Select the waypoints for your ride, using either the map or the waypoint list.

   The supplied routes help to identify on-route waypoints. In addition, comments beginning with "#" identify off-route towns and campgrounds. Museums, lodging, and other points of interest are all off-route; they are not specially marked. Select them as well, even if you do not plan to visit them. You could change your mind on the bike.

   When you have selected all the waypoints, save them in a new file for the day's ride:

   • Map: Click "Save Selected Objects to New File" in the Selection Control.

   • List: Click "Save Selected Objects to a New File" in the Waypoint List.

5. You are about to edit the waypoints before building a route from them. Although you can work in the master file, both tasks are faster and easier in the small file that you just saved. It's safer too—you don't want to inadvertently save the master file after making changes.

   Open the file for a day's ride and show the Waypoint List.

   Our waypoint names, although good at keeping the waypoints in riding order, are not much use on the bike. You would probably rather see "7.2 miles to AMERY" than "7.2 miles to E011C0." Double-click on each way-point and give it a more meaningful name. Observe the length limit—probably six to ten characters—for your GPSR, and do not duplicate the name among the waypoints that you intend to use at once. The Comment information will help. Renaming the waypoints does not change their positions in the list, which remain in "riding forward" order.

   Save the edited waypoints file.

6. Build a route. Display the Route Editor (View > Route Editor). In its top window, double-click the number of a route. In the Route Properties window, add waypoints to the route in the order you will ride them. The off-route waypoints, whose comments begin with "#", are sequenced for the rider going forward on the route, leaving the route to that waypoint and returning to the route. If you are riding the other way, you may need to rearrange the waypoints. Name the route and click OK.

    You can also add waypoints to the route from the map. Click "Add Wp" in the Route Editor. Click on way-points on the map to add them in sequence at the end of your route.

    Save the file with your new routes in it (File > Save to File > Save Routes to File). You may repeat this procedure to assemble all the waypoints and days' routes that you will load at one time into your GPSR.

7. Upload. In the Route Editor, select the desired routes and click "Send." To upload the off-route waypoints, display the Waypoint List. Select all the desired waypoints and then click "Send Selected Waypoints to the GPS." The on-route waypoints will be sent again, which does no harm.

8. Go ride.

G7ToWin and G7ToCE

These text-based programs read OziExplorer waypoint files and transfer them to Garmin, Magellan, and Lowrance/ Eagle GPSRs. G7ToWin also sends waypoints to Street Atlas.

G7ToWin runs on Windows 9X/NT/2K/XP. G7ToCE runs on the Pocket PC, H/PC 2000, and H/PC Pro 2.11. Both are free and available from http://www.gpsinformation.org/ronh/g7towin.htm. The author, Ron Henderson, updates them regularly. The suggestions here pertain to G7ToWin version A.00.124.

Setup

Set up the program's configuration (File > Configuration). The settings given here are needed to work with the Adventure Cycling files. Set the rest for your GPSR and your own preferences.

General tab
Waypoint Sort Options: Uncheck "Sort Before Output." Check "Sort After Input."

Reading Duplicates: Choose "Munge." (If you inadvertently duplicate a waypoint name, the program modifies one of them.)

Text file modifiers: Check "Don't Convert Input Time."

Icon Property tab
Icon Family: GIII/GIII+. Our waypoint files use these codes for icons (display symbols). G7ToWin translates them when the General tab has selected a different GPSR. Where there is no translation, G7ToWin sends the default icon that you specify here.

Save the configuration (File >Save Configuration). G7ToWin does not save it automatically.

Building routes

This is a suggested procedure for selecting the waypoints and building a route for a day's ride. You may wish to use it as a starting point for developing your own methods.

1. Open the waypoint files of the map sections you need (File > Open > Files of type Ozi/PCX5 Wpt Files (*.wpt)). You may open several at once. G7ToWin and G7ToCE can hold up to 100,000 and 15,000 waypoints, respectively.

2. Open the corresponding route files (File > Open > Files of type Ozi/PCX5 Route Files (*.rte)). You may open several at once.

3. Select waypoints. Examine the list of waypoints (Waypoints > List). The waypoints, sorted by their names, appear in sequence when following the route "forward," in the order of the printed map panels. Looking at the Comment column and your paper map, select the waypoints that lie along and near your route (typically one day's riding). These will almost always be consecutive in the list. Where an alternate route leaves the main route, however, its waypoints are found toward the end of the list, after the main route's waypoints.

    The supplied routes help to identify on-route waypoints. In addition, comments beginning with "#" identify off-route towns and campgrounds. Museums, lodging, and other points of interest are all off-route; they are not specially marked. Select them as well, even if you do not plan to visit them. You could change your mind on the bike.

    The usual Windows selection conventions apply: Click to select, Ctrl-click to add to the selection, and Shift-click to extend a selection. When you have all the waypoints, right-click and choose Send Selected Waypoints to a File. Name that file for the day's ride that you have planned.

4. You are about to edit the waypoints before building a route from them. Although you can work in the master file, both tasks are faster and easier in the small file that you just saved. It's safer too—you don't want to inadvertently save the master file after making changes.

5. Clear the master list of waypoints (File >Clear >Waypoints). Open the file for a day's ride and list its waypoints.

   Our waypoint names, although good at keeping the waypoints in riding order, are not much use on the bike. You would probably rather see "7.2 miles to AMERY" than "7.2 miles to E011C0." Double-click on each waypoint and give it a more meaningful name. Observe the length limit—probably six to ten characters—for your GPSR, and do not duplicate the name among the waypoints that you intend to use at once. The Comment information will help. Renaming the waypoints does not change their positions in the list, which remain in "riding forward" order.

6. Build a route. Start with a dummy route (Routes > Create Dummy Route). Double-click on the route named "DUMMY ROUTE" to open a window where you can select the waypoints to build your route in the order you will ride them. The off-route waypoints, whose comments begin with "#" are sequenced for the rider going forward on the route, leaving the route to that waypoint and returning to the route. If you are riding the other way, you may need to rearrange the waypoints. Name the route and click OK.

   The route-editing window displays only the waypoints' names and sequence numbers. To see the full waypoint descriptions, open the same waypoint file in a second instance of G7ToWin.

   Save the file with your new routes in it. You may repeat this procedure to assemble all the waypoints and days' routes that you will load at one time into your GPSR.

7. Upload (GPS > Upload to GPS > All).

8. Go ride.

ExpertGPS

ExpertGPS downloads USGS topographic maps over the Internet as needed while you work with it and is sold by TopoGrafix Corporation (www.topografix.com). It can also use maps that you have scanned, or a blank map with just your waypoints and routes. ExpertGPS works with most consumer GPSRs; it runs on Windows PCs. TopoGrafix updates it regularly. The suggestions here pertain to ExpertGPS version 1.3.6. TopoGrafix also supplies EasyGPS, a free text-based program that works much like the text part of ExpertGPS.

Setup

Set up the program with File > Preferences. Set the datum to WGS 84 on the Coordinates tab. Set the rest for your GPSR and your own preferences.

Building routes

This is a suggested procedure for selecting the waypoints and building a route for a day's ride. You may wish to use it as a starting point for developing your own methods.

1. Open the waypoint files (File > Open) of the map sections you need, for example, NT04v001.gpx. If one file contains all the required waypoints, go to Step 2. If your ride spans map sections, however, some copy-and-pasting is necessary. Open a new file (File > New). Referring to your paper maps and the Comments in the waypoint descriptions, copy waypoints from the master files—their names appear on tabs at the bottom of the window—to the new file. Save the new file (File > Save > Save as type: GPS Exchange File) with a useful name. Continue to copy from the master files and paste into your new file until your area is covered. There is no explicit maximum number of waypoints. We have successfully tested ExpertGPS with 12,000 waypoints at once.

   Selecting waypoints: Select waypoints from the map or from the waypoint list:

   • *Map:* Click the "Select Tool" button. Drag out a rectangle surrounding the waypoints.

   • *List:* In the waypoint list, the usual Windows selection conventions apply: Click to select, Ctrl-click to add to the selection, and Shift-click to extend a selection.

     Hint: If you combined waypoints from several master files, sort them by waypoint name. Click on the "Waypoint" heading at the top of the column. Then the waypoints appear in sequence when following the route "forward," in the order of the printed map panels. They will almost always be consecutive in the list. Where an alternate route leaves the main route, however, its waypoints are found toward the end of the list, after the main route's waypoints. Click "Waypoint" again to sort in reverse if you will ride the other way.

   Deleting selected waypoints: Press the Delete key.

2. Select waypoints. The waypoint list shows a brief comment for each waypoint, which you can compare with the paper map to help pick the waypoints for your route. Select the waypoints for your ride in the waypoint list.

   The supplied routes help to identify on-route waypoints. In addition, comments beginning with "#" identify off-route towns and campgrounds. Museums, lodging, and other points of interest are all off-route; they are not specially marked. Select them as well, even if you do not

plan to visit them. You could change your mind on the bike.

Open a new file (File > New) and paste (Ctrl-V) the selected waypoints into it. Save the file for the day's ride.

3. You are about to edit the waypoints before building a route from them. Although you can work in the master file, both tasks are faster and easier in the small file that you just saved. It's safer too—you don't want to inadvertently save the master file after making changes.

   Our waypoint names, although good at keeping the waypoints in riding order, are not much use on the bike. You would probably rather see "7.2 miles to AMERY" than "7.2 miles to E001C0." Edit each waypoint in the list (right-click > Edit Waypoint, or press Enter) and give it a more meaningful name. The name is in the Waypoint column. Ignore the Description column; it will not be sent to your GPSR. Observe the length limit—probably six to ten—for your GPSR, and do not duplicate the name among the waypoints that you intend to use at once. The waypoint comments will help.

4. Build a route. Open a Combo List for the file that you saved in Step 2. Cut and paste, or drag and drop, waypoints from the waypoint list (top window) into the route segments list (middle window), working in the order you will ride the route. To change the order of waypoints in the segments list, drag and drop them. The off-route waypoints, whose comments begin with "#", are sequenced for the rider going forward on the route, leaving the route to that waypoint and returning to the route. If you are riding the other way, you may need to rearrange the waypoints. You can reverse a route with (Route > Reverse Route).

   You can also build a route from the map. The Draw New Route tool creates a new route and adds waypoints to each time you click the mouse. To end the route, double-click on the map to create the ending waypoint. The Route Editor opens, where you can name the route.

   Save the file with your new route in it. You may repeat this procedure to assemble all the waypoints and days' routes that you will load at one time into your GPSR.

5. Upload (GPS > Send Routes to GPS) sends the routes and the on-route waypoints. (GPS > Send Waypoints to GPS) sends the off-route waypoints and resends the on-route waypoints, which does no harm.

   6. Go ride.

Magellan MapSend

MapSend™ uses the proprietary maps sold by Magellan (www.magellangps.com). A copy of the program is an option with several of their GPS products. MapSend™ works only with Magellan Map 330 and Meridian GPSRs, and is available for Windows PCs. The suggestions here pertain to MapSend Streets™ version 1.00b.

Setup

When installing MapSend™, the Full Install option places all the map data on the hard drive. It occupies roughly 600 MB, but does not require accessing the CD drive to run.

Converting waypoint files

This step is required to convert Adventure Cycling's data to the proprietary format used by MapSend™, and requires the use of a free utility called GPSBabel, available by going to http://gpsbabel.sourceforge.net and clicking on "Downloads". GPSBabel runs on many platforms, including the Windows platforms that MapSend™ runs on.

1. After following the instructions to install GPSBabel, run the program called gpsbabelfront.exe. This will open a dialog window which allows you to specify the input and output file names and formats. Click on the Input file "..." box, and browse to the folder containing the Adventure Cycling route files (Selecting GPX XML (*.gpx) in the file type pulldown menu will show the route files that work best with GPSBabel and MapSend™).

2. After selecting the file to be converted, click on the Output file "..." box, and browse to the folder where you want to create the MapSend™ files. Enter the file name (using an extension of ".wpt" will allow MapSend™ to display the files more easily) and click Save. After specifying the output file name, choose Magellan MapSend from the Output file Format pulldown. Click on the "Process" button, and the Result window should display "Command executed successfully." You will now have a file containing routes and waypoints that Magellan's MapSend™ application can work with.

3. If you will be working with multiple route files, you may wish to convert all of them at this point.

Building routes

This is a suggested procedure for selecting the waypoints and building a route for a day's ride. You may wish to use it as a starting point for developing your own methods.

1. Open the waypoint files (Waypoints > Load from file) which you converted using GPSBabel. If one file contains all the required waypoints, go

to Step 2. If your ride spans map sections, however, you will need to open multiple files. Some modification may be necessary, as MapSend™ only supports a maximum of 500 waypoints at a time, with 20 waypoints per route. If you are unfamiliar with the roads in the region, you can follow the Adventure Cycling routes closely, with side trips to visit any of the waypoints whose descriptions are of interest. Before uploading your routes to the GPSR, you will need to break up the Adventure Cycling routes to contain less than 20 waypoints, and delete unneeded waypoints so that fewer than 500 are open at once (you might need to re-think any rides that plan to visit more than 500 waypoints!). You will be able to combine your waypoint files with additional Adventure Cycling files to create a customized set of routes for the areas you will be riding.

Our waypoint names, although good at keeping the waypoints in riding order, are not much use on the bike. You would probably rather see "7.2 miles to AMERY" than "7.2 miles to E011C0." Give each waypoint a more meaningful name. MapSend™ will impose a length limit of eight characters, and if you duplicate the name among the waypoints, will change the last character to a sequential number. The waypoint descriptions will help.

2. Select your region. MapSend™ allows you to create up to 4 rectangular regions with a total of 8 megabytes to upload to your GPSR. This will make detailed street information available during your ride, and important step as most of the roads on the default map are larger highways that will not make for safe or enjoyable riding, while the Adventure Cycling waypoints have been selected for quieter small roads.

3. After finishing your routes and selecting the regions, click on Regions > Upload to GPS. Be sure to include all the maps you will need as the regions must be uploaded in one operation, which can be time consuming. Once the regional maps have been uploaded, click on Waypoints > Upload to GPS to perform the same operation for the waypoints and routes. Again, all the desired information should be included, as subsequent uploads will replace the current one, although this operation will not be as lengthy. Saving your waypoint file just before uploading may make it easier to identify what your GPSR contains.

    Note: The Magellan Map 330 GPSR can hold up to 500 waypoints, but the comment fields, which contain important descriptions for identifying the waypoint, are only uploaded for the first 200. The rest will be blank, and may corrupt the comment fields if they are downloaded to MapSend™ at a later time.

Descriptions beginning with "#" identify off-route waypoints. Museums, lodging, and other points of interest are all off-route; they are not specially marked. Select them as well, even if you do not plan to visit them. You could change your mind on the bike.

4. Go ride.

Appendix A – Microsoft Streets & Trips

This procedure uses Microsoft Streets & Trips with the Adventure Cycling Association waypoint data. While there may seem to be many steps, it really isn't too complicated. Once you get it going, this makes it a breeze to plan your route right on an interactive map, customizing your ride with any points of interest or stopovers you desire, while also retaining all the original ACA points of interest.

This information pertains to the 2005 edition of Microsoft's Streets & Trips (S&T) mapping software. It should be compatible with Windows 98SE as well as XP. Older versions of S&T may fail at some stage of this process, but I haven't tested them. The other software used in this method are the freely available EasyGPS (http://www.easygps.com/) for working with the ACA waypoint data and transferring them to/from the GPS unit, g7towin (http://www.gpsinformation.org/ronh/) for converting the data into a format S&T can read, and st2gpx (http://gpsbabel.sourceforge.net/st2gpx/st2gpx.html) for converting Streets & Trips files back into EasyGPS format.

Building Routes

This is a suggested procedure for selecting the waypoints and building a route for a day's ride. You may wish to use it as a starting point for developing your own methods.

1. Create a file of all the waypoints along the part you'll ride: It's easiest to make this file cover about one map section. In EasyGPS, open the waypoint files (File > Open) of the map sections you need, for example, NT04v001.gpx. If your ride spans map sections, however, some copy-and pasting is necessary. Open a new file (File > New). Referring to your paper maps and the Comments in the waypoint descriptions, copy waypoints from the master files—their names appear on tabs at the bottom of the window—to the new file. Delete the routes that exist in the file already; we'll make our own, and these will just get in the way later. Save the new file (File > Save > Save as type: GPS Exchange File) with a useful name, like "waypoints for section 1.gpx". Continue to copy from the master files and paste into your new file until your area is covered.

2. Convert the new waypoints file to a "comma-separated values" (.csv) file: Run g7towin and open the new waypoint file you made in Step 1 (File > Open). View the waypoints (Waypoints > View). Save the list as a comma-separated values

file (File > Save As). Give it an appropriate name and save it as type "Comma Separated Values File (*.csv)". You may move onto Step 3 now, but one more tweak will make the importing easier later. Open the new .csv file in a text editor. (Right-click on the file, select Open With, and select Notepad or Wordpad from the list. You may uncheck the box next to "Always use this program to open this file" if you wish.) Delete the first lines that tell g7towin what kind of file it is, so that the new first line begins "Type","Name","Lat", etc. Save the file and exit the text editor.

3. Import the waypoints into S&T: Run S&T and click on Import Data Wizard (in the Data menu or from the button near the top of the screen). Select files of type "Text Files" and select your new .csv file of waypoints. The Import Data Wizard will begin. On the first screen, select Comma as the separator character, then click Next. If you performed the tweak of the file at the end of Step 2, S&T will see that the first line contains the column headings. It knows how to read the name, latitude, and longitude of each waypoint. I recommend changing the Name column to Name 2 and marking the Comment column as Name in the Data Type dropdown. This way, the description of the waypoint will show when you click Show Name later. Click Finish, and enjoy the neat graphics as the waypoint data are converted into S&T pushpins. Move on to Step 4.

    If you did not tweak the .csv file at the end of Step 2, you will have to tell S&T how to read the data. Find the column that contains the Latitude and select Latitude from the Data Type dropdown. Indicate the column for Longitude in the same manner. For the name, I like to set the Comment (e.g. "Circle Dr/Main Av") as Name and the Name (e.g. H07070) as Name 2. Click Finish, and enjoy the neat graphics as the waypoint data are converted into S&T pushpins.

4. Save a map template: This step is optional, but to do it now will save the time of converting the same set of waypoints each time you want to use them to make a route. Adjust the map view to your liking. (E.g. font size or map style) You may also want to change the look of the push-pins. In the Legend and Overview pane, double-click the new pushpin set. Here you may choose a different look for the waypoints. (They are now pushpins in S&T. I will refer to them as way-points or pushpins interchangeably when dealing with them in S&T.) You can also indicate which fields you want displayed when you double-click on one on the map. When the map looks the way you like, save it as a template. (File > Save As,

choose Map Template as the type, then name it and save it with your other data for the current map section.) You now have a map to use as a base for the routes of this section.

5. Make a route: If you saved a template in Step 4, open it up. Otherwise, use the map with the imported data from Step 2. Make a driving route in S&T by marking the points along the desired route. Start by right-clicking the pushpin for the day's start, probably a hotel or campsite, and choosing Route > Add as Start. You have begun, and it's only Step 5! Select the next waypoint on your journey and add it as a Stop, making sure it gets numbered with the next number. (Sometimes S&T will attempt to help you design a route by changing the order of the waypoints you enter, based on proximity to the previous one. If it puts one out of order, you can correct it in the Route Planner panel by selecting the stop and clicking the Move Up or Move Down button.) Continue to select waypoints along your route, which you'll most likely choose by following the ACA map narrative. All turns, significant road bends, and other points of interest will be already be on the map waiting for you to include them as part of the route if you want. You can also view selected Points of Interest included with S&T by choosing View > Show or Hide Places. You can add these to your route in the same way as you add the pushpins.

When the day's route is complete, you can let S&T complete its route-making by telling it to Get Directions (Route > Get Directions), but this is not necessary. (A word on distance is in order here. When S&T makes a route by connecting many waypoints, it will begin to overestimate the distance traveled. If the route contains a section that S&T thinks is impassable by car, it may take a long way around. If a waypoint is recognized as being on the wrong side of a divided highway or just off the road, there will be a diversion in the route. And so on. All of these discrepancies add up to driving distances that may be far off the actual biking distance. Know that now. If you want to get a better estimate of riding distance, use the info from the ACA maps and supplement it with any intentional diversions you plan. You can also use the convenient Measure Distance Tool in S&T. If you want, you can even try opening another instance of S&T and attempting to force it to replicate the chosen route. You should use the Avoid Area feature and try to use as few points as possible at all the right intersections to make it describe the right route. The distance it shows then may be fairly accurate.) The route described by S&T will not be saved or wind up in your GPS. What will make it to the unit is the data for every Stop along the route (as waypoints), the order of the waypoints

(as route legs), and the pushpins (as waypoints). So any point you add to your route as a Stop, be it a pushpin, part of the ACA route, an address, or simply a bend in the road will become a waypoint in your GPS later. Here's how.

6. Save your route as a S&T map file: File > Save As. Choose type Streets & Trips (not Map Template), name it uniquely, and save it with the data for the current map section. The new file will end with the extension .est.

7. Convert the map to .gpx format for use with EasyGPS: This is where the beauty of st2gpx shines through. This simple utility will read the information contained in the saved .est file and convert it to a .gpx file, which can be opened by EasyGPS. Users should familiarize themselves with the usage of this program before continuing. The instructions and FAQ should get you up and running. Although the latest version (05, as of this document) will claim to have some difficulty in the conversion process and will also produce a null file, it works just fine. (You can delete the null file that will be left over after a conversion.) Once you have created the new .gpx file from your .est file, place them both with the other files for the current map section. Rename the files as you wish. I like to call the .est and .gpx files by the same names, using the riding day number and the endpoints. (E.g. "17 Bogalusa to Easleyville.est" and "17 Bogalusa to Easleyville.gpx") Open the new .gpx file in EasyGPS. It will contain the day's route and all the waypoints for the section, as well as any new waypoints created for this route in S&T. For the sake of convenience later, I like to delete all the points in the top pane now. (The saved route will contain the waypoint data for all of its stops, and we'll add the complete set of ACA waypoints back in later, so it's safe to delete the listed waypoints now.) (Right-click on one of the waypoints, press Control and A to select them all, then press the Delete key.) Also, I like to edit the route info to make it easier to sort them later. To do so, right-click on the route name in the bottom pane, and choose Edit Route. I name the route with the riding day number, and then describe the start and end towns in the Description box. Save the file with the changes. (It's time for another note on distance. The distance given by EasyGPS will not be an accurate riding distance, either. It will be the distance between the waypoints as they would be connected by straight lines, so necessarily shorter than the riding distance.)

8. Continue to create routes for each day by repeating Steps 5 through 7.

9. Send the data to your GPS: You have a few options here. You can upload each route individually using EasyGPS, and then separately upload the waypoints-only file you created way back in Step 1. If you'd like to create a single .gpx file that contains every route in the section along with all the waypoints, just upload all the appropriate routes and the waypoints as just described above, then open a new EasyGPS file and receive the routes and waypoints back into the new file. Save it, wrap it in foil, label it, and put it in the freezer until you're ready to ride.

   Thanks to James Sherring for helping with st2gpx and Ron Henderson for helping with g7towin. Their tiny utilities make all of this possible.

Appendix B – Three digit conversion

three digit number	34 character conversion
100	A0
101	A1
102	A2
103	A3
104	A4
105	A5
106	A6
107	A7
108	A8
109	A9
110	B0
111	B1
112	B2
113	B3
114	B4
115	B5
116	B6
117	B7
118	B8
119	B9
120	C0
121	C1
122	C2
123	C3
124	C4
125	C5
126	C6
127	C7
128	C8
129	C9

three digit number	34 character conversion
130	D0
131	D1
132	D2
133	D3
134	D4
135	D5
136	D6
137	D7
138	D8
139	D9
140	E0
141	E1
142	E2
143	E3
144	E4
145	E5
146	E6
147	E7
148	E8
149	E9
150	F0
151	F1
152	F2
153	F3
154	F4