Global Positioning Satellite Recorder (U)

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GLOBAL POSITIONING SYSTEM

RECORDER

SOFTWARE USER GUIDE (U)

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1. INTRODUCTION

This manual provides information needed to use the Global Positioning System Recorder Data processing software. The software runs on an IBM compatible computer. The DeLorme XMap program requires Microsoft Windows and a CD ROM reader. Section 5.1 "Copy GPSR data from PCMCIA card" and Section 5.4 "PCMCIA Card Setup for field use" require a PCMCIA drive installed in the computer. The user interfaces with the software using a computer keyboard and when in Windows, a mouse.

New users can be trained by anyone with experience using the system.

1.1. Document Usage Description

This document is divided the sections Introduction, Scope, Definitions and Acronyms, References and Procedure.

The Procedure section is divided into subsections that explain coping the navigational data from the PCMCIA card, converting the data to a text file, mapping the data using Delorme XMap 2.0 and setting up the PCMCIA card for field use.

1.2. Conventions

In this document, the names of keys are enclosed in the angle brackets <> to indicate a key stroke on the computer keyboard. Some words (such as the names of screens or menus) in this document have all letters capitalized to emphasize the word or phrase. References to sets of letters that appear on the screen are enclosed in double quotes.

1.3. Problem reporting

Report problems or suggestions to the Environmental Technology Section of the Savannah River Technology Center.

2. SCOPE

This Guide provides the steps to follow to get the data from the GPSR, convert the data to a text file, and plot the data in the DeLorme Mapping system and the steps to prepare the PCMCIA card for field use.

The user must already know how to use Microsoft Windows. Explaining Microsoft Windows is beyond the scope of this manual.

3. DEFINITIONS AND ACRONYMS

DOS - Disk Operating System.
ETS - Environmental Technology Section of Savannah River Technology Center.
GPSR - Global Positioning System Recorder
IBM - International Business Machines Corporation.
WINDOWS - Microsoft Windows operating system.

4. REFERENCES

IBM Disk Operating System Version 5.0

Microsoft Excel User's Guide 1, Version 4.0

Microsoft Excel User's Guide 2, Version 4.0

Microsoft Excel Function Reference, Version 4.0

5. PROCEDURE

This section explains the steps necessary to copy, convert and map the navigational data and to set-up the PCMCIA card for use in the field.

5.1. Copy GPSR data from PCMCIA card

5.1.1. Remove the PCMCIA (memory) card from the GPSR unit.

5.1.2. Insert the PCMCIA card into the PCMCIA drive attached to the IBM compatible personal computer. The card should fit into the slot firmly. If the card wiggles easily then it is probably upside down.

5.1.3. If in Windows, quit Windows by Clicking on FILE in the menu bar at the top of the Windows Application screen and then clicking on EXIT WINDOWS.

NOTE: An experienced Windows user can perform these steps without exiting Windows, but explaining the use of Windows is beyond the scope of this manual.

5.1.4. Change to the GPSR directory on the Personal Computer (not the PCMCIA drive). This is probably the main drive (preferably a hard disk) which contains Microsoft Windows, Microsoft Excel, and the DeLorme Mapping program. For example, if the GPSR directory is on the C: drive of the computer, type the commands as follows:

```
C:
CD \GPSR
```

If the drive containing the GPSR directory is not the C: drive, substitute the letter of the drive for the C in the first command. Note that the <Enter> key on the keyboard is pressed at the end of each line shown.

5.1.5. Copy the Navigation data with the file extension NVD from the PCMCIA card to the PC. For example, if the PCMCIA drive is drive D: then type the command as follows:

```
COPY D:*.NVD
```

If the PCMCIA drive is not the D: drive, substitute the letter of the drive for the D before the colon. Note that the <Enter> key on the keyboard is pressed after the command is typed.

5.2. Convert data to text file

The files copied from the PCMCIA card are binary files which must be converted to text files to be used. This section explains the use of the Conversion program to translate the data from a binary file with a NVD file extension to a text file with a TXT file extension. The text files can then be loaded into the DeLorme XMap program or into Excel.

NOTE: The steps that follow assume that the steps in section 5.1 have just been completed. If not, steps 5.1.3 and/or 5.1.4 may need to be performed.

5.2.1. Start the conversion program by typing:

CONVGPSR

and then pressing the <Enter> key on the keyboard.

NOTE: An experienced Windows user can start this program in Windows using the File Manger to find the CONVGPSR.BAT file in the GPSR directory and then double clicking on the file name. However, the program still runs in a DOS environment and not a Windows environment.

5.2.2. Choose a data file from the "SELECT NAVIGATIONAL DATA FILE TO BE TRANSLATED" menu.

This menu lists each data file that is currently in the GPSR directory as a menu option. Each data file is represented by the date and time when the GPSR began recording data.

- Use the arrow keys to move the highlight from one option to another.

NOTE: The Mouse does not work on this menu.

- When the date and time of the file to be converted is highlighted, press the <Enter> key.

- Choose "Exit data file selection" to exit the conversion program.

5.2.3. If the file has already been converted or another data file is on the disk with the same name, the message "*** File already exists:" will be displayed followed by the name of the data file.

- To OVERWRITE the text file, press only the <Enter> key.

- To create a new text file with a different name, type in the new name and then press the <Enter> key. End the file name with .TXT to use the standard file extension and make loading the file into the DeLorme Mapping program or Excel easier. For example, to name the file TEST.TXT, type in the name as follows:

  TEST.TXT

  and then press the <Enter> key.

- ABORT converting the file by holding down the <Alt> key (the key on either side of the space bar) and pressing the <Q> key at the same time.

5.2.4. While the conversion is being performed, the message "Translating data in binary file:" will be displayed on the top line of the screen followed by the name of the file being translated.

The second line of text on the screen will show the Message "into text file:" followed by the name of the text file being created. This file name will be needed in the remaining steps.

When the conversion is completed, the messages "Conversion completed." and "Press any key..." will be displayed.

- Note the name of the text file being created.

- Press any key on the keyboard.

5.2.5. The "SELECT NAVIGATIONAL DATA FILE TO BE TRANSLATED" menu will be displayed again as in step 5.2.2.

- To convert another file, repeat steps 5.2.2 through 5.2.5.

- Choose "Exit data file selection" to exit the conversion program.

When "Exit data file selection" is chosen, the system returns to DOS (or to Windows if the program was started from in Windows).

5.3. Mapping

The following steps explain mapping the converted navigation data using the DeLorme XMap 2.0 program. The steps that follow are only intended to get the user started mapping. There is a lot more that can be done with the mapping program and other ways to accomplish the task described here.

5.3.1. Start windows. Typing WIN and then pressing the <Enter> key should start Windows. If the MS-DOS PROMPT icon was used to exit Windows, type EXIT and then press the <Enter> key to return to Windows.

5.3.2. Start Delorme XMap 2.0 by double clicking on the XMap 2.0 icon.

NOTE: If the map is not shown in the application window after starting XMap 2.0, it may be necessary to perform a media swap by clicking on "Display" in the menu bar and then clicking on "Swap Media!" in the menu that pops up. Then the SWAP MEDIA dialog box is displayed. Be sure that the drive designator for the CD Rom Reader is correct and then click on the OK button or press the <Enter> key on the keyboard.

5.3.3. Choose "Database" and then "Connect to Database" as follows:

- Click on "Database" in the menu bar across the top of the DeLorme XMAP 2.0 application window.

- Click on "Connect to Database" in the menu that pops up below Database.

Then the CONNECT dialog box is displayed.

5.3.4. In the CONNECT dialog box:

- click on "TEXT". The circle beside text should then contain a black dot to indicate that text is chosen.

After clicking on "TEXT", a list of previously connected files will be shown in the big window on the right side of the CONNECT dialog box. If connecting to one of the files listed, then double clicking on the file name in this window will

immediately connect to the file, skipping to step 5.3.9.

If the file is not shown in the window within the dialog box:

- Click on the NEW button at the bottom left corner of the dialog box.

5.3.5. In the OPEN A TEXT FILE dialog box, choose the text file containing the navigational data that was converted using the steps described in section 5.2 of this manual.

The data file was saved in the \GPSR directory. Therefore, find the \GPSR directory icon in the Center box of the OPEN A TEXT FILE dialog box. It may be necessary to double click on the top icon (the root directory icon) in the center box and then scroll down to the GPSR directory.

- Double click on the GPSR directory icon. The text files will be displayed in the left box of the OPEN A TEXT FILE dialog box.

- Double click on the data file to be mapped.

Then the TEXT FILE INFORMATION dialog box will be displayed.

5.3.6. In the TEXT FILE INFORMATION dialog box:

- Click on "By Tab".

- Click on "First row contains column names." until an 'x' is in the small box on that line.

- Click on the "Next>" button on the bottom row of the dialog box.

Then the DATABASE DESCRIPTION dialog box is displayed.

5.3.7. In the DATABASE DESCRIPTION dialog box:

- Click on "Import points (Latitude & Longitude)".

- Click on the "Next>" button on the bottom row of the dialog box.

Then the DATABASE COLUMN IDENTIFICATION dialog box will be displayed.

5.3.8. In the DATABASE COLUMN IDENTIFICATION dialog box, the box to the right of "Latitudes" should contain "Latitude" and the box to the right of "Longitudes" should contain "Longitude". If either of these is not correct, click on the down arrow box to the right of the incorrect value and then click on the correct value. The value of the "Unique key" does not matter (for the simple purpose being described in this document) as long as the value is not "None".

- When the information is correct, Click on the "Done" button.

5.3.9. Then a dialog box with the message "Database connected" will be displayed.

- Click on the "OK" button or press the <Enter> key on the keyboard.

The TABLE VIEW window will be displayed.

5.3.10. When the TABLE VIEW window is first displayed:

- Click on the SHOW ALL button in the lower left corner of the TABLE VIEW window.

Then the data will be shown on the map as a red box for each point.

NOTE: The data may be hidden by the TABLE VIEW window. The TABLE VIEW window can be moved by positioning the mouse cursor in the top line of the TABLE VIEW window with the heading "Table View" and then dragging the window with the mouse by holding down the left mouse button. The TABLE VIEW window can be moved nearly completely of the screen for an unobstructed view of the map.

NOTE: If the map has been zoomed in and the data is not showing, the map will need to be zoomed out until the data can be seen. To zoom out, double click on a smaller number in the scroll window of the ZOOM box which is usually in the lower right corner of the screen. For example, double clicking on the 1 in the ZOOM box scroll window will display the world map.

5.3.11. To zoom in on the data:

- Click on "Auto" in the bottom of the ZOOM box window until there is an X in the box to the left of "Auto". If there is already an X in the box beside "Auto", this step can be skipped.

- Choose the Map Cursor Tool by clicking on the top left button in the TOOLS window. If this is the tool that shows on the map for the cursor, then this step can be skipped.

- Position the Map Cursor Tool in the upper left corner of the area to be zoomed and hold down the left mouse button while dragging the cursor down and to the right until a box appears. With the box shown around the area to be zoomed in on, release the mouse button. Then the map will be drawn magnified. Keep repeating this step until the view of the map is the desired size.

- The map can be re-centered by moving the Map Cursor Tool to a location on the map and clicking the left mouse button. The map will be re-drawn with the clicked location at the center of the map.

5.4. PCMCIA Card Setup for field use

This section explains the setup of the PCMCIA card for use in the field. The setup includes verifying and/or setting the number of seconds between recording navigational data and deleting all navigational data files on the PCMCIA card.

5.4.1. Insert the PCMCIA card into the PCMCIA drive attached to the IBM compatible personal computer. The card should fit into the slot firmly. If it wiggles easily then it is probably upside down.

5.4.2. If in Windows, quit Windows by Clicking on FILE in the menu bar at the top of the Windows Application screen and then clicking on EXIT WINDOWS.

NOTE: An experienced Windows user can start this program in Windows using the File Manger to find the SETGPSR.EXE file in the GPSR directory and then double clicking on the file name. However, the program still runs in a DOS environment and not a Windows environment.

5.4.3. Change to the GPSR directory on the Personal Computer. This is probably the main drive (preferably a hard disk) which contains Microsoft Windows. For example, if the GPSR directory is on the C: drive of the computer, type the commands as follows:

```
C:
CD \GPSR
```

If the drive containing the GPSR directory is not the C: drive, substitute the letter of the drive for the C in the first command. Note that the <Enter> key on the keyboard is pressed after each command is typed.

5.4.4. Start the GPSR Field Setup program by typing:

```
SETGPSR
```

and then pressing the <Enter> key on the keyboard.

5.4.5. Choose the disk drive designator for the PCMCIA card.

The "CHOOSE DISK DRIVE for PCMCIA CARD" menu is displayed with drives A: through F: as options. The last two options are "Other" and "Abort".

- Use the arrow keys to move the highlight from one option to another.

NOTE: The Mouse does not work on this menu.

- When the desired option is highlighted, press the <Enter> key to choose that option.
- Choose "Abort" to exit the program without making any changes.
- Choose "Other" if the drive designator is not listed as one of the options. Then the user is prompted to "Type in the Drive Designation...". Type in the correct drive designation and then press the <Enter> key.

NOTE: An invalid drive designation will cause the program to abort with an error message such as "File not found." The program has no way of knowing whether a valid drive designator is really the drive that contains the PCMCIA card.

5.4.6. After a drive has been designated, choose the number of seconds between recording each set of navigational data.

The "CHOOSE NUMBER of SECONDS between recording position" menu is displayed with the number of seconds between recording the data as the options. The highlighted option when the menu is first displayed is the currently set record time.

- Use the arrow keys to move the highlight from one option to another.

NOTE: The Mouse does not work on this menu.

- When the desired option is highlighted, press the <Enter> key to choose that option.

- To not change the record timing, Choose the "Abort" option. The data can still be deleted if "Abort" is chosen.

- To change the number of seconds between recording, choose the option that corresponds to the desired number of seconds.

Refer to the table that follows to determine optimal record time. The seconds that the recording time can be set at are shown in the first column. The column headings are the speed of travel in kilometers per hour. The data in the body of the table are the Kilometers between the recording of each position.

Estimate of Distance between recording at chosen Speed.

Recording Time (Seconds)	Speed in Km/Hr 25	50	75	100	125	150
	Kilometers between Position Recordings					
1	0.01	0.01	0.02	0.03	0.03	0.04
5	0.03	0.07	0.10	0.14	0.17	0.21
10	0.07	0.14	0.21	0.28	0.35	0.42
15	0.10	0.21	0.31	0.42	0.52	0.63
20	0.14	0.28	0.42	0.56	0.69	0.83
30	0.21	0.42	0.63	0.83	1.04	1.25
60	0.42	0.83	1.25	1.67	2.08	2.50

The seconds that the recording time can be set to are shown in the first column. The column headings are the speed of travel in kilometers per hour. The data in the body of the table are the

Kilometers that will be traveled between the recording of each position.

5.4.7. After the record timing has been set (in some cases even if it fails), the "DELETE DATA FROM PCMCIA CARD" menu is displayed. The second line of text on this screen shows the command to be used for deleting the data files.

- To delete the navigational data files (files with NVD file extension) from the drive designated in step 5.4.2, choose the "DELETE Data" option.

NOTE: Once the "DELETE Data" option is chosen, the data files will be deleted from the designated drive.

- To quit the program WITHOUT deleting any files, choose the "Exit without deleting" option.

When deleting is completed, the messages "Set-up for field completed." and "Press any key..." will be displayed.

- Press any key on the keyboard to return to DOS (or Windows if the program was started from Windows).

NOTE: On most computers, Windows can be started by typing WIN and then pressing the <Enter> key. If the MS-DOS PROMPT Icon was used to exit windows, type EXIT and then press the <Enter> key to return to Windows.