

## GPS ACQUISITION FEATURE

The GPS acquisition application, now standard on 3000 EZ<sup>plus</sup> and 3000LCP seismographs, is a timesaving and convenient feature. With state, local, and project requirements becoming more stringent, the need for accurate and complete data is critical. By combining the technologies of the Global Positioning System and GeoSonic's seismographs, a few simple keystrokes can assure that an accurate recording location is documented. This not only provides a location that can be used to calculate accurate distances, it reduces manual record keeping and the potential for error.

Using a GPS unit with the SSU 3000 EZ<sup>plus</sup> or 3000LCP

Requirements:

SSU 3000<sup>plus</sup>: firmware versions 2.66 and above

SSU 3000LCP: firmware versions 0.31 and above

GPS unit: NMEA 0183 output capability; PC interface cable with RS232 serial port connector

☞ The following example uses a Garmin® eTrex personal navigator with a PC interface cable, part number 010-10206-00.

### SETTINGS – GPS UNIT

Read and follow the instruction manual accompanying the GPS and familiarize yourself with its operation. Additional information may be found, in the case of Garmin units, at their website.



Turn the unit ON by pressing the PWR button on the right side of the unit. Press the PAGE button (right side of unit) until the Menu page is displayed. Using the arrow buttons on the left side of the unit, arrow down or up to the SETUP option. Press ENTER. Highlight I/O format and press ENTER. Scroll down to NMEA OUT then press ENTER. I/O format should indicate NMEA OUT and baud should be 4800. Finally, press PAGE to return to setup menu.

### SETTINGS – SSU 3000

If you want your seismograph to always prompt you for GPS acquisition, follow these steps. You will need your unit's 4-digit password/access code. This procedure is optional.

After the unit has powered up and the COMMAND menu is displayed, press 6 for *Utilities*. Press 7 for *advanced options*. Enter your password followed by *enter*. Press the down arrow until the *ALWAYS SHOW GPS?* option is displayed. Press 1 for *YES*.



## CONNECTING THE GPS TO THE 3000

The data connector port is standard on all eTrex GPS units. To access the port, lift the bottom edge of the black flap on the top of the unit back. Connect the four-pin end of the cable to the unit by lining up the groove in the connector with the lip in the port (the cable will be to the left) and sliding the connector down into the slot.



Connect the RS232 serial port connector to the nine pin port of the 3000

## SAVING A GPS LOCATION

The SSU 3000 displays the GPS location data in the following format:

(latitude) degree degree minute minute. minute minute minute heading (longitude) degree degree degree minute minute. minute minute minute heading

abbreviated: ddmm.mmmhh dddmm.mmmhh. If the GPS is setup to another unit standard, the data is converted into hddd.mm.mmm for storage in the 3000. To ensure that your GPS display window reading format matches your stored data, follow these steps.

After the GPS unit is turned on, press the PAGE button until the Menu page is displayed. Arrow down to Setup, press ENTER. Go to Units, press ENTER. The first option is POSITION FRMT. Press ENTER. Highlight the 'hdd $\diamond$ mm.mmm' option. Press ENTER. Press the Page button to exit the screen.

☞ If you will be using GPS coordinates from two or more locations to calculate distances, you can avoid having to make a lot of conversions by taking all readings using the same format.

### Option 1

If you have set up your seismograph to always prompt you for GPS acquisition –

Connect the GPS to your seismograph. Turn on the GPS unit and the SSU 3000. After the 3000 has powered up, and the banner has been displayed, the GPS LOCATION window is displayed. If there is a GPS location in memory, it will be displayed on the last line. Press 1 to acquire the location. If there is an adequate GPS signal, the location will be displayed. Press *enter*. The GPS location will be stored in the third line of the Additional Notes.

☞ If you turn off the additional notes, or overwrite the third line, the GPS location will not become a part of the record (option 7 under Text Setup).

### Option 2

If you have not enabled the automatic GPS check or you want to re-acquire a new location-



Connect the GPS to your seismograph. Turn on the GPS unit and the SSU 3000. After the 3000 has powered up and gone through the various windows and messages, press 3 for *Text setup*, 8 for *Acquire GPS*. The GPS LOCATION window will be displayed. If there is a GPS location in memory, it will be displayed on the last line. Press 1 to acquire the location. If there is an adequate GPS signal, the location will be displayed. Press *enter*.

☞ If you turn off the additional notes, or overwrite the third line, the GPS location will not become a part of the record (option 7 under Text Setup).

### A (very) SHORT COURSE IN GPS

Sample location: N 27° 46.147' W 082° 39.648'

Your *latitude* reading is N 27° 46.147' i.e. 27 degrees, 46.147 minutes north. *Latitude* measures distance (0 – 90°) north and south of the Equator. Latitude lines are parallel to each other. In other words, each degree of latitude is always equal to 60 nautical miles.

Your *longitudinal* reading is W 082° 39.648' i.e. 82 degrees, 39.648 minutes west. Longitude lines are not parallel. *Longitude* measures distance (0 - 180°) east and west from either the Greenwich Mean meridian or the International Dateline meridian. One degree of longitude at the equator is equal to 60 nautical miles, but one degree of longitude at the North or South Pole is 0.

There are 60 minutes per degree. 1 minute of latitude equals 1 nautical mile or 6076 feet. 0.001 minute of latitude equals 6.076 feet.

There are numerous map and conversion programs, as well as websites, available that will aid in calculating the distance between two GPS locations.

