

# MODULE I, INTRODUCTION TO GPS/GIS

## *Lab Exercise #6 - Satellite Mission Planning*

### Instruction Sheets

#### OBJECTIVES

This exercise can act as an extension of Lab Exercise #5, where students viewed the GPS receiver to determine the location of satellites in the sky. Another aspect of this type of exercise is referred to as Mission Planning. This refers to the ability to use special software to determine where the satellites will be on a specific future date. Students will be able to:

- determine the position of GPS satellites
- determine best time for data collection mission

#### MATERIALS

- GPS Receivers to collect almanac (Trimble Geo Explorer)
- Mission Planning software (Trimble Pathfinder)
- Operation Manual for Hardware

#### PROCEDURE

Note: This lab will use Trimble GeoExplorer and Trimble Pathfinder. Other GPS receivers and software is available and can be used. Refer to Hardware and Software manuals.

1. Divide class into groups based on the number of receivers.
2. Review what almanac and ephemeris are.
3. Send groups outside to acquire satellites and almanac. The almanac will automatically be collected as the receiver collects satellite data.
4. After almanac has been collected, return to computer lab and download almanac.
5. Refer to software manual for mission planning process.
6. Each group needs to chart or print out the following information:
  - DOP schedule for tomorrow
  - Satellite availability for 8:00 am to 10:00 am tomorrow
  - Best time to collect data two days from now

#### Definitions

<u>Almanac:</u>	File transmitted by the GPS satellites that contain orbiting information
<u>Ephemeris:</u>	Current satellite position, health and time information
<u>DOP:</u>	Dilution of Precision, a measure of positional accuracy based on satellite geometry (i.e. the relative placement of satellites in the sky)



# MODULE I, INTRODUCTION TO GPS/GIS

## *Lab Exercise #6 - Satellite Mission Planning*

### Student Worksheet

#### OBJECTIVES

Students will be able to:

- determine the position of GPS satellites
- determine best time for data collection mission

#### MATERIALS

- GPS Receivers to collect almanac
- Mission Planning software
- Operation Manual for Hardware

#### PROCEDURE

Note: This lab will use Trimble GeoExplorer and Trimble Pathfinder. Other GPS receivers and software could be used. Refer to Hardware and Software instruction manual.

1. Review what almanac and ephemeris are.
2. Go outside to acquire satellites and almanac.
3. After almanac has been collected, return to computer lab and download almanac.
4. Each group needs to chart or print out the following information:
  - DOP schedule for tomorrow
  - Satellite availability for 8:00 am to 10:00 am tomorrow
  - Best time to collect data two days from now

#### **Definitions**

<u>Almanac:</u>	File transmitted by the GPS satellites that contain orbiting information
<u>Ephemeris:</u>	Current satellite position, health and time information
<u>DOP:</u>	Dilution of Precision, a measure of positional accuracy based on satellite geometry (i.e. the relative placement of satellites in the sky)

