

For an overview of all tools discussed, click on the **SITE MAP** in the top left. From the Section drop-down, choose **GEOSPATIAL TOOLS**

### Hardware

The 2 essential hardware components for GPS data collection are: 1) a GPS receiver/antenna to receive signals from the satellites and 2) a mobile device – that is, a platform for mobile GIS software that can be used for viewing and storing information from those signals. Any mobile computer - whether it be a handheld device, laptop or personal data assistant (PDA). The mobile device and GPS receiver can be combined in either one unit or remain separate. Juniper systems, Palm PDSa, ToughBooks are just some examples. For a [comparision of Windows CE devices](#), check out this link. Described here for demonstration purposes is the Trimble line of mapping grade units.

### GeoExplorer series

The GPS receiver and the mobile device are housed in a single, integrated rugged mobile device. In the GeoXM, XT and XH models, the antenna is directly under the Trimble logo on the mobile device.

### Pathfinder Pro series

A pole-mounted GPS receiver (Pro XT, XH, XRT) communicates via a wireless Bluetooth connection with a separate mobile device. A Trimble Ranger, Recon, or GeoExplorer, or Juniper Systems Allegro or Archer can serve as the mobile device. Any mobile computing device that can communicate with the GPS receiver and run software for data collection can serve as a mobile device.

### **Pathfinder XB/XC**

The GPS receiver and antenna are housed in a small Bluetooth-capable unit, or a Compact Flash GPS card. These small but less accurate GPS receivers can be added to an existing mobile device, laptop or tablet PC.

### **Juno ST or Nomad**

The GPS receiver and the mobile device are housed in a single, integrated mobile device. The Juno ST is smaller but not ruggedized. The Nomad is rugged but larger. The GPS receiver is a high-sensitivity SiRF GPS chip.

### **Trimble Windows CE- based mobile devices**

Overview shows reported horizontal accuracies with recommended settings.

Correction method	GPS XC card	GPS XB card	Juno™ ST	GeoXM™	GeoXT™	GeoXH™	Pro XRS	ProXT™
Autonomous	15 m	15 m	15 m	15 m	15 m	15 m	15 m	15 m
Real-time differential	n/a	2-5 m + 1ppm	2-5 m + 1ppm	1-3 m + 1ppm	< 1 m 1ppm	< 1 m 1ppm	1 - 5 m + 1ppm	< 1 m + 1ppm
Postprocessed code phase differential	2-5 m + 1ppm	2-5 m + 1ppm	2-5 m + 1ppm	1-3 m + 1ppm	< 1 m + 1ppm	< 1 m + 1ppm	0.5 m + 1ppm	< 1 m + 1ppm
H-Star processing	n/a	n/a	n/a	n/a	n/a	See footnote <sup>1</sup>	n/a	n/a
Postprocessed carrier phase differential	n/a	n/a	n/a	n/a	0.3 m + 5ppm	0.01- 0.1 m + 1ppm	0.01 - 0.3 m + 1ppm	0.01 - 0.3 m + 5ppm
<sup>1</sup> < 0.3 m with internal antenna; <0.2 m with Zephyr™ antenna (3 dual-frequency base station 200 km)								
<sup>2</sup> < 0.3 m with internal antenna; <0.2 m with Zephyr antenna (3 dual-frequency base station 200 km)								

Be sure to visit [http://www.trimble.com/mgis\\_prodcomp.shtml](http://www.trimble.com/mgis_prodcomp.shtml) to see a more detailed comparison of their mapping line as well as the latest addition, the rugged Yuma tablet.

**All mobile devices require both an operating system (OS) and data collection software.**

### Operating Systems

In the past few years, Microsoft has used a number of terms for the version of Windows used for mobile devices including Handheld PC, Windows CE, Windows CE .NET, Pocket PC and Windows Mobile. The most current operating systems for Trimble mobile devices is the Microsoft Windows Mobile 5 or Mobile 6 OS. These operating systems specifically designed to run on mobile devices.

### Mobile device software

**Data collection software is used in the field to collect and update data.**

#### ESRI ArcPad

This ESRI software is tightly integrated with ArcGIS and is the focus of this manual. ArcPad is based on an ArcGIS background. This facilitates data and file management.

#### Trimble GPSCorrect Extension for ArcPad

This optional Trimble software allows mobile users to configure GPS receivers settings on the mobile device and post-process collected data. GPSCorrect is used in conjunction with ArcPad. While ArcPad can be used independently of GPSCorrect, those users will not be able filter incoming GPS signals while in the field or differentially correct their GPS data upon returning to the office.

### Trimble GPSCorrect Extension for ArcPad

This data collection software does not require GPSCorrect to filter incoming GPS signals while in the field or differentially correct their GPS data upon returning to the office.

Refer to this site for a [comparison of ESRI ArcPad and Trimble TerraSync](#) packages.

### Desktop software

You will encounter these applications on the desktop computer -

### Communication software

Microsoft ActiveSync 4.5 is a free application from Microsoft. It facilitates the transfer and

synchronization of information between the mobile device and desktop computer.

### **Post-processing software**

Once back in the office, there are 2 options for processing field-collected ArcPad data. Both of these options are covered on this site.

### **Trimble GPS Analyst**

A Trimble extension to ESRI ArcGIS Desktop is used for the differential correction and validation of your GPS data within a personal geodatabase. This manual covers this software in Step 7GA.

### **Trimble Pathfinder Office**

A desktop suite that can be used to process ArcPad data and includes many other GPS utilities. The Differential Correction and ShapeCorrect utilities in PFO are used for post-processing GPS data.

### GIS software

ESRI ArcGIS is used to plan for, prepare, process and view geospatial data.

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**Mobile computing** is the integration of a number of technologies and resources including

- Mobile device
- GPS receiver
- Wireless communication
- GPS data collection software

- GIS software

Geospatial data