



# NDSU Extension Geospatial Education Program



## Choosing Handheld GPS Units

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There are a great variety of handheld Global Positioning System (GPS) units available so how does one decide which unit to buy? People use handheld GPS units for many reasons that require different features. GPS units are available for a wide variety of prices. Some units operate independently while others work only in conjunction with a computer. John Nowatzki, NDSU geospatial specialist, suggests comparing units for specific features in addition to price. Nowatzki encourages buyers to compare GPS unit for features like battery life, differential correction options, whether or not the unit can be connected to a computer to transfer data, as well as other features.

The most common type of GPS units are those that operate independently, however there are several other types available including flash card, Bluetooth, and secure digital units. These units need to be connected to a computer to operate.

The number of channels a GPS unit receives indicates the number of GPS satellites that can be used simultaneously to calculate its position. Most units initially use four satellites to calculate positions and then add additional satellites as more signals are received. Typically, handheld GPS units are capable of receiving signals from 12 GPS satellites at one time.

Battery life is important for the handheld and Bluetooth units. Compact flash and secure digital units use power from the attached computers so the significant feature with them is how much power they use. Manufacturers' specifications listing battery life refers to continuous use.

Area calculation is a feature in GPS unit that allows users to calculate the acres of areas marked with the GPS unit. The area calculation feature is not relevant with flash card, Bluetooth, or secure digital units because they operate in conjunction with Geographic Information System (GIS) software programs on a host computer which normally have the capacity to calculate area.

Another important feature is whether the GPS unit can use differential correction signals to increase its accuracy. The differential correction signal used in handheld GPS units is the Wide Area Augmentation System (WAAS) differential correction made available by the US Federal Aviation Administration throughout the United States with no cost to the user. The WAAS differential correction signal provides GPS accuracy to less than 10 feet in handheld units.

XTrac is a feature used by some flash card, Bluetooth, or secure digital units. XTrac extends the use of GPS units to areas where signals are difficult to receive such as under tree canopies or near tall buildings. XTrac is a software program on the unit's computer chip that increases the receiver sensitivity. It does so by acquiring signals from GPS satellites with weaker signals as well as the stronger satellite signals before it calculates its position. For example, a normal GPS receiver will acquire signals from 4 satellites with the strongest signals to calculate its position. GPS units with XTrac will also acquire signals from 2 or more weaker satellites before outputting a position. The satellites with weaker signals are usually lower on the horizon where the radio signals may be deteriorated by the earth's ionosphere, and other objects that clutter the horizon such as trees and buildings.

Another feature used to compare GPS units is the ability to transfer GPS data from handheld units to computers. Transferring data facilitates using the GPS data in GIS computer programs. Again, this feature is only relevant in the handheld units.



## Magellan

<b>Model</b>	<b><u>Meridan Color</u></b>	<b><u>SporTrak Color</u></b>	<b><u>SporTrak Pro</u></b>	<b><u>Explorist 100</u></b>
<b>Suggested Retail Price</b>	\$449.99	\$349.00	\$299.99	\$100.00
<b>Receiver</b>	12 channel	12 channel	12 channel	14 channel
<b>Built In Memory</b>	16 MB	10 MB	32 MB	N/A
<b>Battery Life</b>	13 HR	14 HR	14 HR	14 HR
<b>Area Calculation</b>	Yes	Yes	Yes	No
<b>WAAS Capability</b>	Yes	Yes	Yes	Yes
<b>Ability to Transfer Waypoints to PC</b>	Yes	Yes	Yes	No
<b>Map Options</b>	Mapsend Software	Mapsend Software	Mapsend Software	N/A
<b>Display Size</b>	2.2" X 1.75"	2.2" X 1.4"	2.2" X 1.4"	1.8" X 1.4"

## Lowrance

<b>Model</b>	<b><u>iFinder</u></b>	<b><u>iFinder Pro+</u></b>	<b><u>iFinder Express</u></b>
<b>Suggested Retail Price</b>	\$139.00	\$299.99	\$174.95
<b>Receiver</b>	12 channel	12 channel	12 channel
<b>Built In Memory</b>	16MB	16MB	32MB
<b>Battery Life</b>	13 HR	12 HR	12 HR
<b>Area Calculation</b>	No	No	No
<b>WAAS Capability</b>	Yes	Yes	Yes
<b>Ability to Transfer Waypoints to PC</b>	Yes	Yes	Yes
<b>Additional Map Options</b>	Mapcreate Accessory Pack, Freedom Maps	Mapcreate Accessory Pack, Freedom Maps, Hotmaps	Mapcreate Accessory Pack
<b>Display Size</b>	1.7" X 2.2"	3" diagonal	1.2" X 2.7"

## Section 2 – Flash Card GPS Units

Flash card GPS Units are used with devices such as personal digital assistants (PDA's), laptops, and tablet computers. The main advantage of a flash card GPS unit is that it plugs directly into other devices and takes power from the devices so and do not require an external power source.

### Flash Cards

<b>Brand</b>	TeleType	SysOn	I. Trek	Holux	Haicom
<b>Model</b>	<b><u>CF GPS Receiver V3.0</u></b>	<b><u>CF Plus II GPS</u></b>	<b><u>CF GPS Ultra</u></b>	<b><u>CF GPS Ultra</u></b>	<b><u>Multi-mode GPS HI-303S</u></b>
<b>Suggested Retail Price</b>	\$249.00	\$169.99	\$129.99	\$139.99	\$149.99
<b>WAAS/XTrac Capability</b>	WAAS	Xtrac	Xtrac	Xtrac	Xtrac
<b>Receiver</b>	12 channel	12 channel	12 channel	12 channel	12 channel
<b>Power Voltage</b>	3.3 Volts	3.3 Volts	3.3 Volts	3.3 Volts	3.3 Volts
<b>Dimensions</b>	3.3in x 1.63in x 1.5in	3.9in x 1.85in x 0.6in	3.6in x 2in x 0.8in	3.6in x 2in x 0.8in	3.7in x 1.7in x 1.1in
<b>Compatible Devices and PDA Requirements</b>	Available Compact Flash Spot Operating System: Pocket PC 2000/2002, Windows Mobile 2003, WinCE, NET	Available Compact Flash Spot Operating System: Pocket PC 2000/2002, Windows Mobile 2003, WinCE, NET	Available Compact Flash Spot Operating System: Pocket PC 2000/2002, Windows Mobile 2003, WinCE, NET	Available Compact Flash Spot Operating System: Pocket PC 2000/2002, Windows Mobile 2003, WinCE, NET	Available Compact Flash Spot Operating System: Pocket PC 2000/2002, Windows Mobile 2003, WinCE, NET

### Section 3 – Bluetooth GPS Units

Bluetooth GPS is a wireless radio technology that allows the GPS to receive position location data without a wire or cable connection. Bluetooth GPS units connect to laptops and tablet computers, and PDA's wirelessly. The fact that bluetooth GPS units can connect to PDA's without a cord makes them suitable for in-vehicle navigation. Bluetooth GPS units have internal batteries and many of them are rechargeable.

#### Bluetooth GPS

<b>Brand</b>	I. Trek	SysOn	Holux	RoyalTek	GlobalSat
<b>Model</b>	<b><u>Bluetooth GPS Receiver</u></b>	<b><u>Bluetooth GPS Receiver Plus</u></b>	<b><u>Bluetooth GPS Receiver GR-231</u></b>	<b><u>BlueGPS Mini RBT-1000XT</u></b>	<b><u>Bluetooth GPS Receiver BT-318</u></b>
<b>Suggested Retail Price</b>	\$129.99	\$189.99	\$169.99	\$194.99	\$179.99
<b>WAAS/XTrac Capability</b>	N/A	Xtrac	Xtrac	Xtrac	WAAS
<b>Receiver</b>	16 channels	12 channels	12 channels	12 channels	12 channels
<b>Battery Life</b>	20 HR	9 HR	9 HR	8 HR	15 HR
<b>Dimensions</b>	3.2in x 1.7in x 0.8in	3.6in x 2.2in x 0.9in	3.1in x 2.2in x 0.9in	2.8in x 1.6in x 0.9in	3.5in x 2in x 1.2in
<b>Rechargeable Batteries</b>	Yes	Yes	Yes	Yes	Yes
<b>Compatible Devices</b>	Bluetooth Enabled Computers	Bluetooth Enabled Computers	Bluetooth Enabled Computers	Bluetooth Enabled Computers	Bluetooth Enabled Computers

### Section 4 – Secure Digital GPS Units

Secure digital GPS units are much like flash card units except that they plug into the secure digital slot of a PDA, laptop, or tablet computer. The choice to use a secure digital or a compact flash card GPS depends on the type and availability of expansion slots on the computers that will be used with the GPS unit.

#### Secure Digital GPS Units

<b>Brand</b>	I. Trek	Pharos	Pretec
<b>Model</b>	<b><u>SD GPS Receiver</u></b>	<b><u>SDIO GPS Receiver</u></b>	<b><u>SDIO GPS</u></b>
<b>Suggested Retail Price</b>	\$139.99	\$229.95	\$179.95
<b>WAAS/Xtrac Capability</b>	Xtrac	WAAS	N/A
<b>Receiver</b>	12 channel	12 channel	12 channel
<b>Power Voltage</b>	3.3 Volts	3.3 Volts	3.3 Volts
<b>Dimensions</b>	3.1in x 1.2in x 0.7in	1.2in x 1.3in x .55in	1.5in x 0.5in x 0.5in
<b>Compatible Devices (PDA Devices with SD slots)</b>	Acer n30 Dell - Axim X3/X30, X50V HP iPAQ - h1930, h1940, h2210, h3970, h4150, h5550 02 XDA II Windows Mobile 2003 for PPC Phone Edition	Windows Mobile based Pocket PC's with Secure digital slot	PPC 2002/ PPC 2003 or later with SDIO Now! Palm OS 5.x or later with SDIO interface.