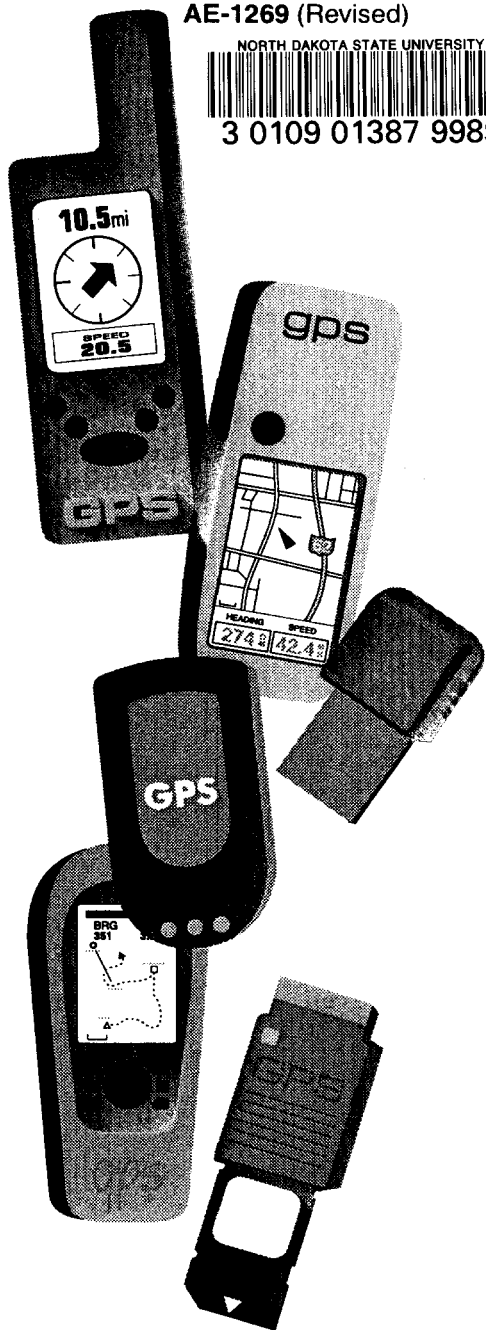




GPS Unit Fact Sheet

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Global Positioning System (GPS) units are available for a wide variety of prices. The information presented in this document focuses on several of the least expensive models from several suppliers. The types of units discussed in this document are hand-held, flash-card, Bluetooth and secure digital units. The units are compared for several operational features. The following paragraphs describe the comparative features included in the tables throughout the circular.

not included with the flash card, Bluetooth or secure digital units because they operate in conjunction with a Geographic Information System (GIS) software program on the host computer, which normally will have the capacity to calculate area.

The differential correction signal used in hand-held GPS units is the Wide Area Augmentation System (WAAS) differential correction system that the U.S. Federal Aviation Administration makes available throughout the United States without cost to the user. The WAAS differential correction signal will provide GPS accuracy to less than 3 meters in hand-held units. WAAS is listed with XTrac capability for the flash-card, Bluetooth or secure digital units because they use either of the two features but not both of them. 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 four satellites with the strongest signals to calculate its position. GPS units with XTrac also will acquire signals from two or more weaker satellites before outputting a position. The satellites with weaker signals usually are lower on the horizon, where the earth's ionosphere and other objects that clutter the

The suggested retail prices are based on averages found on various Web pages on the Internet. Price will vary by location and over time.

The number of channels a GPS unit receives indicates the number of GPS satellites that can be used simultaneously to calculate position. Most units use four satellites to locate positions and then add additional satellites as the units receive more signals.

Battery life is listed for the hand-held and Bluetooth units. The compact flash and secure digital units use power from the attached computers, so they are listed with power usage. The battery life is listed in hours and refers to continuous use.

Area calculation indicates whether the unit has the capability to calculate the acres of areas marked with the GPS unit. Area calculation is

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horizon, such as trees and buildings, may deteriorate the radio signals.

The next feature included is the ability to transfer GPS data from hand-held units to computers. Transferring data facilitates using the GPS data in GIS computer programs. Again, this feature is relevant only in the hand-held units.

Some handheld GPS units also are able to store background maps in built-in memory storage. The maps are proprietary and either are available online or on a CD. Available maps include roads, rivers, towns, elevation and background maps. You generally can't load your own maps into hand-held GPS units.

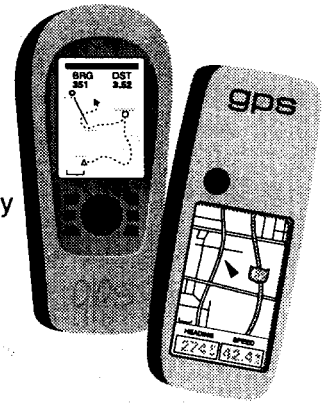
The display size is listed for hand-held units. Larger display sizes make seeing information on the screen easier, but normally increase the size of the unit.

Two-way communication is only an option in hand-held GPS units. Two-way communication allows users to pass GPS locations back and forth between units. By using the two-way feature of these units, the geographic position of the companion unit is displayed on the first unit.

The Compatible Units feature is included for the flash-card, Bluetooth or secure digital units because the Compatible Units must operate in conjunction with a computer. Some units require specific computer operating systems.

Section 1 – Hand-held GPS Units

Hand-held GPS units are portable devices that can be used in a variety of settings. Hand-held units are marketed primarily for use in outdoor recreational activities; however, they are used in many other applications, too, such as measuring areas and marking points. The main advantages of hand-held GPS units are their lightweight and compact size.



Garmin

Model	eTrex	eTrex Legend	Geko 101	GPS 76	GPS V	GPS 12XL	Rino 120
Suggested Retail Price	\$106.24	\$182.13	\$113.32	\$228.56	\$321.41	\$309.07	\$267.84
Receiver	12 channel	12 channel	12 channel	12 channel	12 channel	12 channel	12 channel
Built In Memory	N/A	8 MB	N/A	1 MB	19 MB	N/A	8 MB
Battery Life	22 HR	18 HR	12 HR	16 HR	25 HR	24 HR	15 HR
Area Calculation	No	Yes	No	Yes	Yes	Yes	Yes
WAAS Capability	N/A	Yes	N/A	Yes	Yes	N/A	Yes
Ability to Transfer Waypoints to PC	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Map Options	N/A	Mapsource CDROM Uploadable Information	N/A	Mapsource Points of Interest CD	City Select CDROM Uploadable Information	N/A	Mapsource CDROM Uploadable Information
Display Size	2.1" X 1.1"	2.1" X 1.1"	1.44" X 0.92"	2.2" X 1.6"	2.2" X 1.5"	2.2" X 1.5"	1.4" X 1.4"
Two-way Communication	N/A	N/A	N/A	N/A	N/A	N/A	Yes

Magellan

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

Lowrance

Model	iFinder	iFinder Pro+	iFinder Express
Suggested Retail Price	\$139.00	\$299.99	\$174.95
Receiver	12 channel	12 channel	12 channel
Built In Memory	16 MB	16 MB	32 MB
Battery Life	13 HR	12 HR	12 HR
Area Calculation	No	No	No
WAAS Capability	Yes	Yes	Yes
Ability to Transfer Waypoints to PC	Yes	Yes	Yes
Map Options	Mapcreate Accessory Pack, Freedom Maps	Mapcreate Accessory Pack, Freedom Maps, Hotmaps	Mapcreate Accessory Pack
Display Size	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 (PDAs), laptops and tablet computers. The main advantage of a flash-card GPS unit is that it plugs directly into other devices and uses power from those devices.



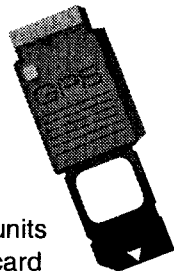
Section 3 – Bluetooth GPS Units

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, tablet computers and PDAs wirelessly. The fact that Bluetooth GPS units can connect to PDAs without a cord makes them suitable for in-vehicle navigation. Bluetooth GPS units have internal batteries and many of them are rechargeable.



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.



Flash Cards

Brand	TeleType	SysOn	I. Trek	Holux	Haicom
Model	CF GPS Receiver V3.0	CF Plus II GPS	CF GPS Ultra	CF GPS Ultra	Multi-mode GPS HI-303S
Suggested Retail Price	\$249.00	\$169.99	\$129.99	\$139.99	\$149.99
WAAS/XTrac Capability	WAAS	XTrac	XTrac	XTrac	XTrac
Receiver	12 channel	12 channel	12 channel	12 channel	12 channel
Power Voltage	3.3 Volts	3.3 Volts	3.3 Volts	3.3 Volts	3.3 Volts
Dimensions	3.3" x 1.63" x 1.5"	3.9" x 1.85" x 0.6"	3.6" x 2" x 0.8"	3.6" x 2" x 0.8"	3.7" x 1.7" x 1.1"
Compatible Devices and PDA Requirements	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

Bluetooth GPS

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

Secure Digital GPS Units

Brand	I. Trek	Pharos	Pretec
Model	SD GPS Receiver	SDIO GPS Receiver	SDIO GPS
Suggested Retail Price	\$139.99	\$229.95	\$179.95
WAAS/XTrac Capability	XTrac	WAAS	N/A
Receiver	12 channel	12 channel	12 channel
Power Voltage	3.3 Volts	3.3 Volts	3.3 Volts
Dimensions	3.1" x 1.2" x 0.7"	1.2" x 1.3" x .55"	1.5" x 0.5" x 0.5"
Compatible Devices (PDA devices with SD slots)	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 PCs with secure digital slot	PPC 2002/ PPC 2003 or later with SDIO Now! Palm OS 5.x or later with SDIO interface

**Additional information is available from the suppliers
at the following Internet Web sites:**

Garmin: www.garmin.com

Magellan: www.magellangps.com

Haicom: www.haicom.com.tw/

SySon: www.sysonchip.co.kr/eng/index.html

RoyalTek: www.royaltek.com

GlobalSat: www.globalsat.com.tw/index.htm

Lowrance: www.lowrance.com

Holux: www.holux.com.tw/

I. Trek: www.semsons.com

TeleType: www.teletype.com

Pretec: www.pretec.com

For more information on this and other topics, see: www.ag.ndsu.edu



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