

GPS ColorTRAK

Satellite Navigator



User Manual

MAGELLAN

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22-10303-001



WARNINGS

USE GOOD JUDGEMENT

This product is an excellent navigation aid, but does not replace the need for careful orienteering and good judgement. Never rely solely on one device for navigating.

USE CARE

The Global Positioning System (GPS) is operated by the U.S. Government, which is solely responsible for the accuracy and maintenance of GPS.

The accuracy of position fixes can be affected by the periodic adjustments to GPS satellites made by the U.S. Government and is subject to change in accordance with the Department of Defense civil GPS user policy and the Federal Radionavigation Plan.

USE CAUTION

Accuracy can also be affected by poor satellite geometry. When the accuracy warnings appear on the screen, use the data with extreme caution.

USE PROPER ACCESSORIES

Use only Magellan cables and antennas; the use of non-Magellan cables and antennas may severely degrade performance or damage the receiver, and will void the warranty.

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Congratulations on your purchase of the GPS ColorTRAK. Since introducing the world's very first commercial, hand-held GPS receiver in 1989, Magellan has led the way with innovative GPS products to meet a wide range of positioning and navigation needs.

The GPS ColorTRAK is the world's first portable GPS receiver with a high-resolution, color display. With a powerful 12-channel receiver and detachable signal-sensitive antenna, this pocket sized unit provides signal reception for sure tracking.

Designed with both the Outdoor and Marine enthusiasts in mind, the GPS ColorTRAK is ideal for hiking, mapping fishing hotspots, marking trails or charting courses over bodies of water or land. To help you get started using your new Magellan GPS ColorTRAK, read the sections titled *Getting Started* and *Basic Operation*. These two sections will have you recording waypoints and navigating in no time. The remainder of this manual gives you detailed information about all the features and functions of your GPS ColorTRAK.

Packing List

Before you begin, make sure that your package includes the items listed on the box. If any of these items are missing, please contact your local Magellan dealer or distributor.

Features of Your GPS ColorTRAK

- Powerful 12-channel receiver.
- High-resolution color display.
- Detachable super sensitive antenna for superior tracking.
- Industry record - 30 hours of continuous battery life.
- Backlit keypad and display.
- Rugged, durable and waterproof.

Conventions Used in this Manual

The reference section of this manual is designed to assist you in the use of your GPS ColorTRAK. Each topic in the reference section includes a brief description of the activity chosen and a detailed description with sample screens of how to perform the activity. As you become more familiar with your receiver, you will be able to use the pictorial view of the keys as a “quick reference” to perform the desired activity.

Also in the reference section are alerts to inform you of some cautions and notes that will assist you in using your GPS ColorTRAK.

Getting Started/Initialize

2

This section shows you how to begin using your GPS ColorTRAK for the first time. After a brief description of the receiver, it discusses:

- Installing batteries.
- First time use, initializing the receiver.
- Usage.

GPS ColorTRAK Description

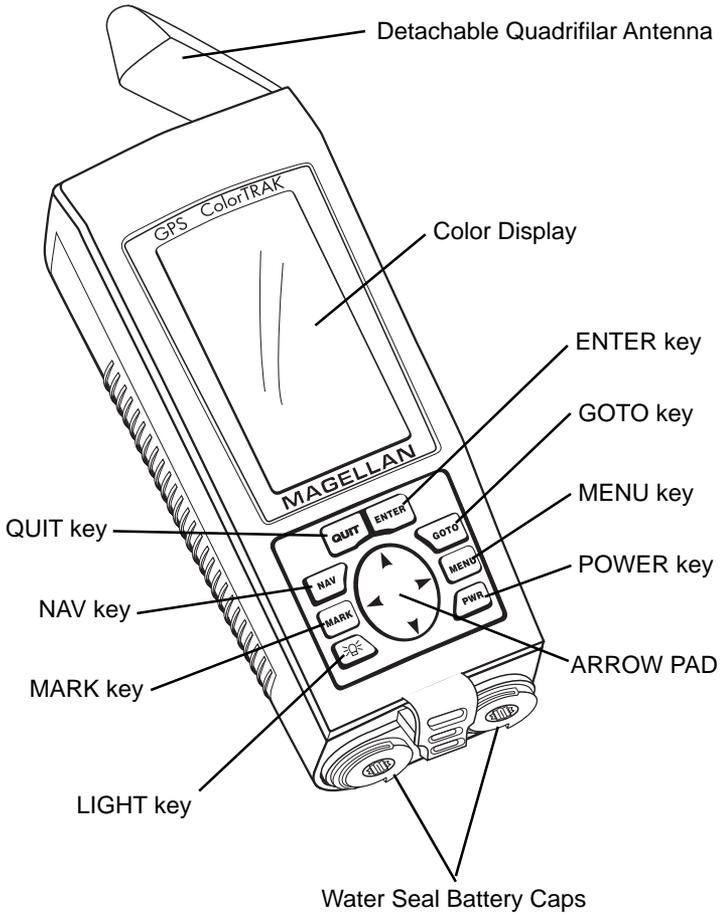
The GPS ColorTRAK has a high-resolution color display, a detachable antenna for exceptional tracking, a backlit keypad and an altimeter. Using four AA batteries, the GPS ColorTRAK will operate continuously for up to 30 hours and the internal lithium back-up battery will keep the receiver's memory active for up to 10 years. The GPS ColorTRAK has a built-in barometric pressure sensor to give you more accurate altitude readings. The receiver does not need any calibration or activation, the altimeter function is automatic. The receiver uses the combination of a pressure sensor and GPS elevation to give altitude readings of about +/- 200 feet.

Receiver Accuracy

The satellite constellation that provides the GPS information your receiver uses is maintained by the Department of Defense (DoD). GPS positioning, for general use, provides 25 meter RMS accuracy or better. Since the signals generated by these satellites are publicly accessible, the DoD has introduced errors into the satellite signals for security reasons. These errors are referred to as Selective Availability (SA).

At present, your GPS position will be accurate within 100 meters horizontally and 150 meters vertically. Due to the errors introduced by SA, it is possible to get readings outside of these values at times.

GPS ColorTRAK Receiver



Using the Keypad



LIGHT - Turns back light off and on and offers two levels of brightness adjustable with consecutive presses of the light key.



PWR - Turns the receiver on and off.



ENTER - Selects menu items, confirms changes and initiates certain functions.



QUIT - Cancels the operation of the last key pressed.



ARROW PAD - Scrolls through screens, menus and enters alphanumeric information. Up/Down Arrows scroll through the alphanumeric characters. Right/Left Arrows page through menus and adjust the scale on the Plot and Compass screens.



NAV - Scrolls through nine Navigation screens.



MENU - Accesses functions specific to the current display, as well as other displays.



GOTO - Allows selection of a destination for a single leg route from a list of waypoints. This key also accesses the Man Over Board function.

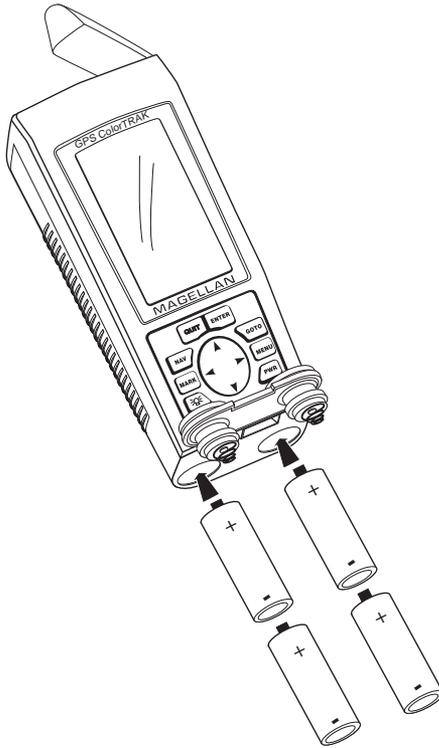


MARK - Creates waypoints or stores the current position.

Installing the Batteries

The GPS ColorTRAK uses four AA alkaline batteries that are installed from the bottom of the receiver. Use the rings to unscrew the water seal battery caps. Insert the batteries into the battery tubes, with the positive end first, two batteries in each side, and screw the battery caps until securely closed.

It is recommended that four batteries be used, however, in case of an emergency, the receiver will operate with only two batteries if both are inserted into one of the battery tubes.



If the batteries are left out of the unit for more than 30 minutes, the unit may need to be reinitialized.

Using your GPS ColorTRAK

The constellation of 24 GPS satellites circling the globe is in constant motion, before your receiver can tell you where you are, it needs to know where the satellites are relative to itself. It does this with the use of an internal almanac, where it has stored in memory a general location for each of the satellites. The almanac tells the receiver which satellites are in view, based on the time, date and location of the receiver.

Until the ColorTRAK is initialized, it may not know its location, time or date, therefore, it does not have a reference point to select which satellites to use. Inputting the initial position, time and date is called *initializing* your receiver, which will save you time. Initializing enables the receiver to begin tracking satellites, and calculating your position, much faster.

Proper Handling - Signal Reception

Because the GPS ColorTRAK receives information it needs from satellites orbiting the earth, the antenna needs to be raised with a relatively unobstructed view of the sky.

Clear View of the Sky

The receiver needs a clear view of the sky, allowing it to choose from all the satellites currently available.

If the view of the sky is poor, (large cliffs or buildings, heavy foliage or other obstructions) the satellite signals can be blocked and the GPS ColorTRAK may take longer to compute a position fix.

Holding the Receiver

GPS ColorTRAK is designed to fit comfortably in your hand. Hold the receiver in the palm of your hand with the antenna pointing towards the sky.



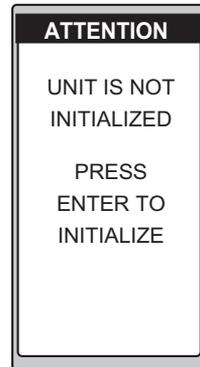
First Time Use - Initializing the Receiver



You do not need to initialize your receiver each time you use it unless the receiver's memory has been cleared or if it has been transported more than 300 miles while turned off.

Turn the Receiver On

To turn your ColorTRAK on, press **PWR**. Because this is the first time you have used your receiver, a screen will be displayed prompting you to initialize your receiver. Press **ENTER** to begin the initialization process.

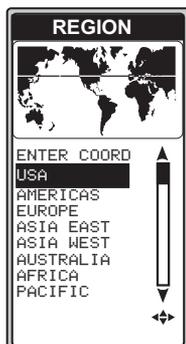


If you do not see this screen once the receiver is turned on, then it was initialized previously. To follow along, press **MENU**, highlight **SETUP** and press **ENTER**. Highlight **INITIALIZE** and press **ENTER** and then you will be taken through the steps to reinitialize the receiver.

Input Location Information

A screen is displayed with a list of geographical regions. Use the **UP/DOWN ARROWS** to highlight the region where you are located and press **ENTER**.

As you proceed with the initialization process, you can press **QUIT** at any time to return to the previous screen or field.



A list of countries, provinces or states (depending upon which region you select) will appear. Use the **UP/DOWN ARROWS** to select and press **ENTER**.

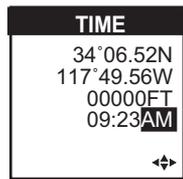
The receiver displays the *ELEVATION* screen with the cursor in the first character of the elevation field. Use the **ARROWS** to enter your present elevation and press **ENTER**. If you do not know your elevation, press **ENTER**.



If this is not the first time you have used your receiver or if it is the first time but your receiver has already begun acquiring satellite signals, time and date may have already been received from a satellite and you will not be prompted for time and date.

Setting Local Time and Date

The cursor moves down to the time field, ready for you to input your local time. Use the **ARROWS** to change the time and to toggle between AM and PM. Press **ENTER**.



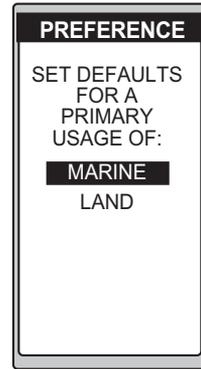
The GPS ColorTRAK will not automatically change due to daylight savings. You will have to reset the time using **SETUP** as explained in the *Customizing* section.

The cursor moves to the date field. Use the **ARROWS** to input the date and press **ENTER**.

Selecting Primary Usage

A screen will be displayed asking your primary use for the receiver, MARINE or LAND. Use the **UP/DOWN ARROWS** to select and press **ENTER**.

The default is MARINE.

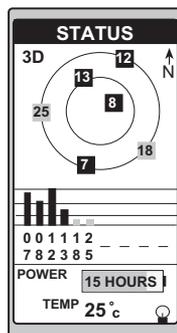


The following chart shows the differences in terminology that your GPS ColorTRAK uses while in land or marine mode. **For purposes of this manual, it will be assumed that the receiver is in the marine mode.**

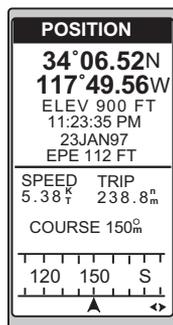
	Land	Marine
Speed	SPD	SOG
Bearing	BRG	BRG
Distance	DST	DST
Heading	HDG	COG
Velocity Made Good	VMG	VMG
Course To Steer	CTS	CTS
Estimated Time of Arrival	ETA	ETA
Time To Go	TTG	ETE
Cross Track Error	XTE	XTE
Recorded Position	Landmark	Waypoint
Units of Measure	Miles/MPH or KM/KPH	NM/KNOTS

Getting a Fixed Position

Once you have chosen the primary usage for your GPS ColorTRAK, the *STATUS* screen will be displayed. At this point, you should go outside in an area where you can get a clear view of the sky. The GPS ColorTRAK will begin receiving data from the satellites in view and will display the progress on the *STATUS* screen.



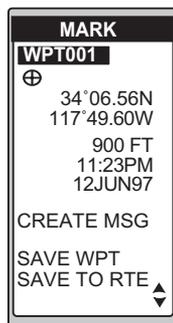
Once the receiver has computed a position fix the *POSITION* screen will be displayed.



Saving Your Waypoint

Once the receiver has computed your current position, you may save this position as a waypoint.

To save (MARK) your position as a waypoint, press **MARK**, **MARK** and the waypoint will be saved with an automatically assigned name. If this is your first saved position fix, the name will be WPT001 as shown.

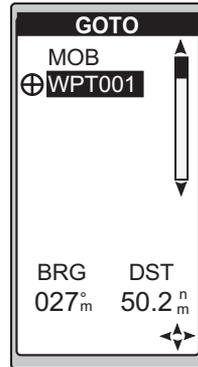


For further information on saving your fixed position with a receiver-generated name or a user-created name, refer to the *Basic Operations* section.

Creating a GOTO

Once this fixed position has been saved in your receiver. Travel to another location away from the saved position to create a route back to the saved waypoint. To create this route, press **GOTO**.

Once **GOTO** is pressed, a menu will be displayed with the waypoint that you just saved (we are using WPT001 as an example). Use the **UP/DOWN ARROWS** to highlight WPT001 and press **ENTER**. The receiver will begin calculating information to return you to the saved position.



You will be returned to the *POSITION* screen with the information on the navigational requirements. Use the NAV key to view the other Navigation screens.

Basic Operation

3

Power Up Sequence

The receiver is powered up by pressing **PWR** (power). On power up, the GPS ColorTRAK will display the Magellan logo/start up animation momentarily and then switch to the *STATUS* screen. The receiver begins searching the sky for satellites and begins the process of computing a position fix.



Navigation Screens

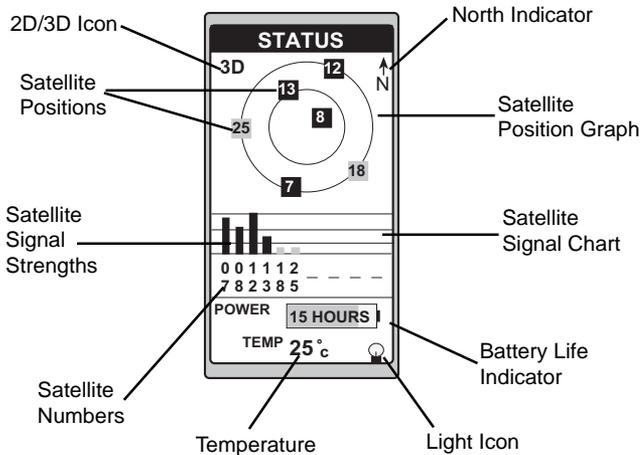
The nine **NAV** (navigation) screens (*STATUS*, *POSITION*, *NAV 1*, *COMPASS*, *NAV 2*, *PLOT*, *ROAD*, *SPEED* and *TIME*) provide you with necessary information you will need to use the GPS ColorTRAK as a navigational tool.

NAV screens can be viewed by pressing **NAV** from any screen. You can scroll through the NAV screens by repeatedly pressing **NAV** or the **UP/DOWN ARROWS** from any *NAV* screen.

All screens, except the *STATUS* and *POSITION* screens, can be disabled by turning them off in the **NAV SCREENS** portion of **SETUP**.

Using the Status Screen

The Status screen will be the first screen displayed, after the Magellan screen, once the unit is turned on. This screen gives you the general well-being of your GPS ColorTRAK by showing you satellite status and signal strengths, battery life and temperature.



The satellite positions are displayed in the Satellite Position Graph with the satellite signal strengths on the Satellite Signal Chart.

On the Satellite Position Graph and the Satellite Signal Chart, satellites displayed in red are for weak signal strengths, green for satellites of strong signal strengths and blue for no signal. On the Satellite Signal Chart, satellites still receiving information will display an empty bar.

The bottom of the *STATUS* screen displays remaining battery power and ambient temperature of the receiver. Power shown is the estimated battery life when the receiver is operating on battery power.

Once the receiver has computed a position fix, the *STATUS* screen will be replaced by the *POSITION* screen.

Selecting Temp Units and Calibration in your Status Screen

You have two options for customizing the *STATUS* screen, TEMP UNITS and TEMP CALIB. Press **MENU** to display the *STATUS* screen menu. Use the **UP/DOWN ARROWS** to make your selection and press **ENTER**. The other menu items displayed will be discussed later in this manual.

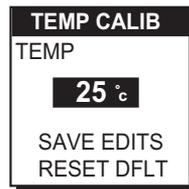


Setting Temperature Units. After selecting TEMP UNITS from the *STATUS* screen menu, you can choose from FAHRENHEIT or CELSIUS. Use the **UP/DOWN ARROWS** to highlight your choice and press **ENTER**.



Setting Temperature Calibration. The GPS ColorTRAK comes with a factory default setting that can be changed to accommodate the environment that you are in. This enables you to calibrate the temperature creating an offset from the factory setting.

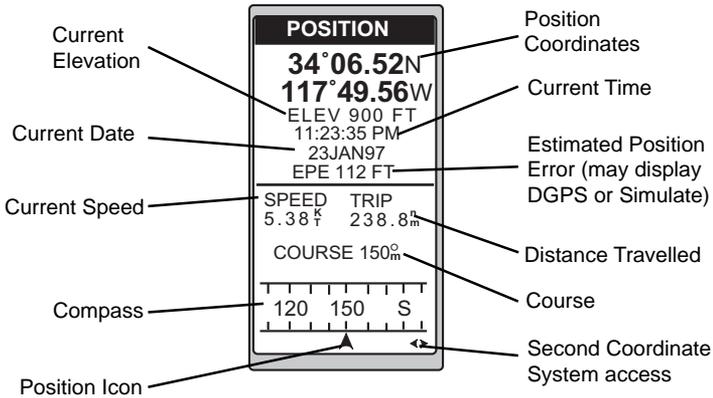
After selecting TEMP CALIB from the *STATUS* screen menu, press **ENTER** to turn the cursor on, allowing you to change the temperature. Use the **ARROWS** to change the temperature and press **ENTER** to exit the edit mode.



Use the **UP/DOWN ARROWS** to highlight SAVE EDITS which will save your changes or highlight RESET DFLT which returns the temperature offset to its factory defaults. Press **ENTER** to return to the *STATUS* screen saving your changes. Press **QUIT** to return to the *STATUS* screen without saving changes.

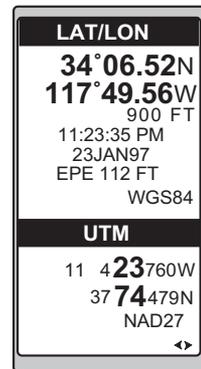
Using the *Position* Screen

The *POSITION* screen displays the coordinates of your last computed position and basic navigation data. You also have the option of viewing your present position using another coordinate system.



Viewing Secondary Coordinate System from the *POSITION* Screen

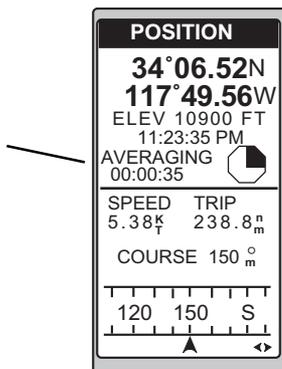
Press the **LEFT/RIGHT ARROWS** and the lower half of the screen changes to display your present position in secondary coordinate system. The datums that have been selected under **SETUP** for each coordinate system are also displayed. In the example shown, we are using the WGS84 datum for our LAT/LON coordinates and NAD27 datum for the UTM coordinates.



Automatic Averaging in the *POSITION* Screen

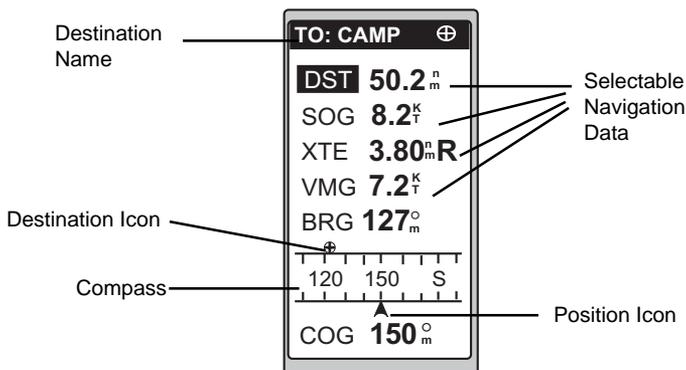
Automatic averaging gives you greater position accuracy. When navigating, your GPS ColorTRAK takes position fixes, however, when you are stationary, at zero speed, the receiver begins averaging mode. Once you begin moving, position averaging ends and the receiver begins displaying instantaneous position fixes while you navigate.

When your speed is zero, the receiver is in automatic averaging mode, the date and EPE will be replaced by the averaging timer, as shown.



Using the NAV 1 Screen

The NAV 1 screen displays your destination along with four selectable navigation measurements and a graphical compass.



The NAV 1 screen displays a numerical reading at 30° increments with the characters N (0°), S (180°), E (90°) and W (270°). Course is shown numerically and represented by the Position Icon at the bottom of the screen. Above the compass, bearing will be displayed with the icon of the destination waypoint. When the bearing to your destination cannot be displayed within the confines of the displayed compass, an arrow will be displayed either on the right or left to indicate the steering direction.

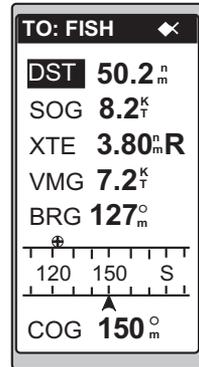
Ideally, when you are navigating, the Position Icon and the Destination Icon should line up, one above the other.

Customizing the NAV I Screen

You can change the four navigational fields. You can choose from BRG, DST, SOG, COG, VMG, CTS, ETA, ETE, XTE, TRN, ALT, TME, TMP and Blank.

To customize your NAV I screen, press **MENU** while viewing the NAV I screen, select **CUSTOMIZE** and press **ENTER**.

Use the **UP/DOWN ARROWS** to select the field you want to change and press **ENTER**.

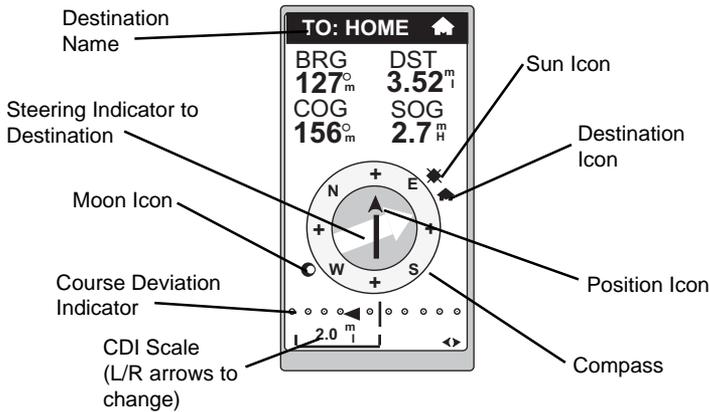


You are presented with a pop-up menu from which you can make your selection. Use the **UP/DOWN ARROWS** to highlight your choice and press **ENTER**. You will return to the NAV I screen, still in the customize mode. You can continue to customize the display or press **QUIT** to exit.

CUSTOMIZE	
BRG	027 ⁿ _m
DST	50.2 ⁿ _m
SOG	8.2 ^k _t
COG	056 ^o _m
VMG	7.2 ^k _t
CTS	028 ^o _m
ETA	01:09P
ETE	02H24M
XTE	L.2 ⁿ _m
TRN	L26 ^o
ALT	83 ^F _T
TME	01:09P
TMP	36 ^o _C
BLANK	

Using the *Compass* Screen

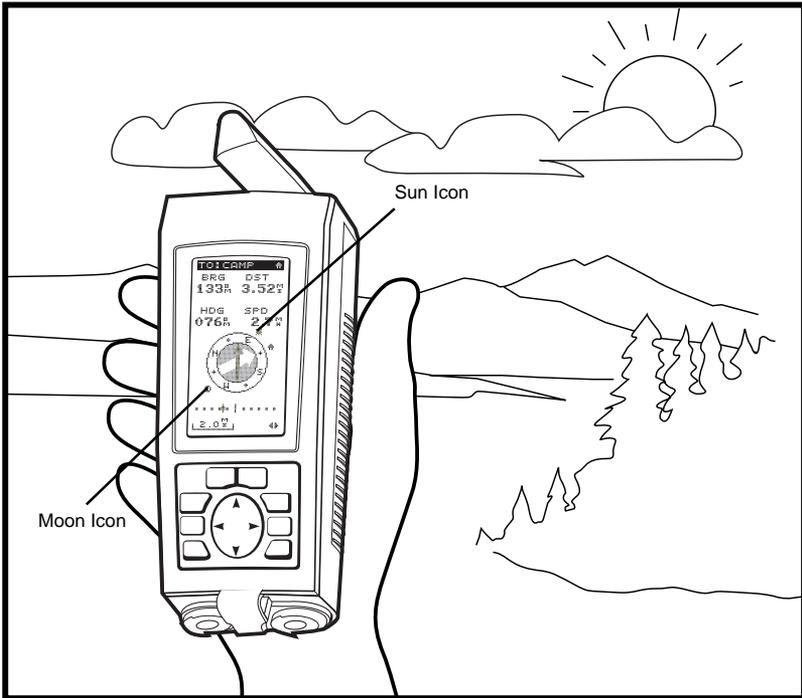
As well as displaying four customizable navigation fields, the *COMPASS* screen provides a pointer compass and Course Deviation Indicator (CDI) to help you reach your destination.



The red Course Direction Icon displays your course over ground while the large white Steering Indicator displays the bearing of the destination relative to the course over ground. When the arrows are pointed in the same direction, you are on course. The CDI indicates your distance left or right of the course line.

The NorthFinder™ feature displays the position of the sun and moon icons, when above the horizon, which allows you to determine the direction of north and your destination while standing still. The destination icon shows the general direction in which you should be travelling.

The NorthFinder™ feature displays the position of the sun and moon icons, when above the horizon, which allows you to determine the direction of north and your destination. The destination icon shows the general direction in which you should be travelling.



Align the sun on the *COMPASS* screen with the sun in the sky, as shown. When aligned, the Steering Indicator will point you in the direction you should be travelling in order to reach your destination.

Customizing the *Compass* Screen

You can change the four navigational fields. You can choose from BRG, DST, SOG, COG, VMG, CTS, TMP and Blank.

To customize your *COMPASS* screen, press **MENU** while viewing the *COMPASS* screen. Highlight **CUSTOMIZE** and press **ENTER**.

Use the **UP/DOWN ARROWS** to select the field you want to change and press **ENTER**.

You are presented with a pop-up menu from which you can make your selection. Use the **UP/DOWN ARROWS** to highlight your choice and press **ENTER**. You will return to the *COMPASS* screen, still in the customize mode. You can continue to customize the display or press **QUIT** to exit.

CUSTOMIZE	
BRG	027° _m
DST	50.2nm
SOG	8.2KT
COG	056° _m
VMG	7.2KT
CTS	028° _m
TMP	36°C
BLANK	

Using the NAV 2 Screen

The *NAV 2* screen displays four customizable information fields. The *NAV 2* screen is designed to help you to see the screen when your receiver is mounted at a distance from you.

TO: CAMP ⊕	
BRG	14.2° _M
COG	171° _M
SOG	11.2 _K _T
DST	50.2 _N _M

Customizing the NAV 2 Screen

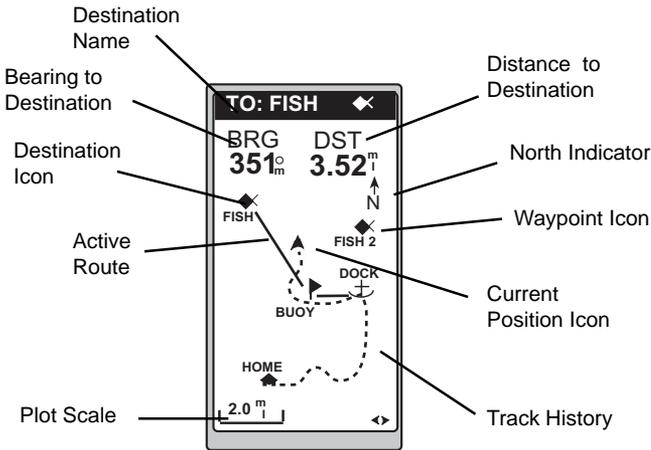
You can change the four navigational fields. You can choose from BRG, DST, SOG, COG, VMG, CTS, ETA, ETE, XTE, TRN, ALT, TME, TMP and Blank. To customize your *NAV 2* screen, press **MENU** while viewing the *NAV 2* screen. Highlight **CUSTOMIZE** and press **ENTER**.

Use the **UP/DOWN ARROWS** to select the field you want to change and press **ENTER**. You are presented with a pop-up menu from which you can make your selection. Use the **UP/DOWN ARROWS** to highlight your choice and press **ENTER**. You will return to the *NAV 2* screen, still in the customize mode. You can continue to customize the display or press **QUIT** to exit.

CUSTOMIZE	
BRG	027° _m
DST	50.2nm
SOG	8.2KT
COG	056° _m
VMG	7.2KT
CTS	028° _m
ETA	01:09P
ETE	02H24M
XTE	L.2nm
TRN	L26°
ALT	83 _F _T
TME	01:09P
TMP	36°C
BLANK	

Using the *PLOT* Screen

The *PLOT* screen is a mini map that shows where you have travelled and where you want to travel. You can view the active route, your current position as well as the other waypoints and destination in the *PLOT* screen.



At the top of the screen, the destination name is displayed along with the bearing and distance from the present position to the destination. The active route leg is displayed by a green line indicating the direction required in order to reach your destination. The plot scale appears at the bottom of the screen and can be changed by using the **RIGHT/LEFT ARROWS**.

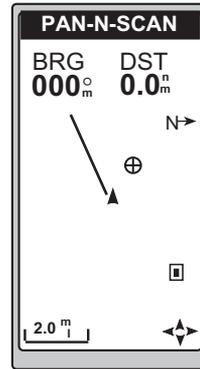
An additional feature of the *PLOT* screen is PAN-N-SCAN. PAN-N-SCAN allows you to use the **ARROWS** to scroll through the *PLOT* screen enabling you to create waypoints and routes graphically.

Selecting PAN-N-SCAN

By using PAN-N-SCAN, you can look ahead or review where you have travelled according to waypoints, routes and track history. PAN-N-SCAN allows you to view the area from .20 miles to 320 miles, depending on your selection.

While viewing the *PLOT* screen, press **MENU**, highlight PAN-N-SCAN and press **ENTER**. Use the **ARROWS** to move the cursor. When the cursor is placed over the waypoint icon, the header will read TO: (waypoint name) and the BRG and DST will show that of the waypoint.

While in PAN-N-SCAN, press **MENU** to reveal the menu screen. If the cursor is over a waypoint when **MENU** is pressed, the menu will be displayed with WPT INFO added to the list.

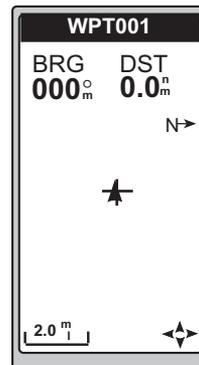


Displaying Waypoint Information

As you navigate using PAN-N-SCAN, it might be useful to have the name of the waypoint you are heading towards appear at the top of the screen.

While in the PAN-N-SCAN screen, the waypoint name can be inserted at the top of the screen. Place the crosshair over the waypoint and press **MENU**. Highlight WPT INFO and press **ENTER**. The waypoint information screen will appear in place of the PAN-N-SCAN screen. Press **QUIT** to return to PAN-N-SCAN with the waypoint name at the top of the screen.

Default setting is ON.



Setting Track History

Using TRACK HISTORY records where you have been by automatically storing locations, as “dropping bread crumbs” from your starting point as you travel. This will be especially useful when you want to return to your starting point, the receiver uses these points to return using the same path to your starting point.

You can set the distance at which the receiver drops these points by selecting TRACK HISTORY. You can choose from OFF, AUTO, and a list of other distance units. If AUTO is chosen, the receiver will automatically store track history points based on your speed and direction of travel. Therefore, when travelling a straight distance fewer track points will be dropped than when you are turning

While in the *PLOT* screen press **MENU**. Highlight TRACK HIST and press **ENTER**. You are presented with a pop-up menu from which you can make your selection. Use the **UP/DOWN ARROWS** to highlight your choice and press **ENTER**. You will return to the *PLOT* screen, still in the customize mode. You can continue to customize the display or press **QUIT** to exit.

Clearing the Track

Sometimes your screen may be cluttered with your track history. The CLR TRACK option allows you to clear your track history, i.e., clear your “bread crumbs”.

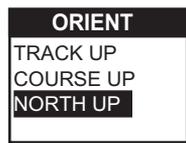
While viewing the *PLOT* screen, press **MENU**. Highlight CLR TRACK and press **ENTER**. Use the **UP/DOWN ARROWS** to select YES or NO and press **ENTER**. You are returned to the *PLOT* screen.

Setting Up the Plotter

This menu allows you to change the orientation, to turn the waypoint names on or off, to turn the plot rings on or off and set the course projection.

Setting Plotter Orientation. Under Plotter Orientation, you have three choices TRACK UP (direction you are moving is at the top of the screen), COURSE UP (the destination of the current leg is at the top of the screen) and NORTH UP (North is at the top of the screen).

While viewing the *PLOT* screen, press **MENU**. Highlight **PLOT SETUP** and press **ENTER**. Use the **UP/DOWN ARROWS** to select **ORIENTATION** and press **ENTER**. A pop-up menu appears allowing you to select **TRACK UP**, **COURSE UP** or **NORTH UP**.



Turning Waypoint Names On or Off. You may have too many waypoints names that clutter your screen. To remove these waypoint names, you can turn the **WPT NAMES** off.

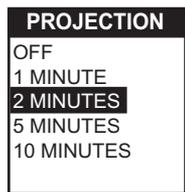
While viewing the *PLOT* screen, press **MENU**. Highlight **PLOT SETUP** and press **ENTER**. Use the **UP/DOWN ARROWS** to select **WAYPOINT NAMES** and press **ENTER**. A pop-up menu appears allowing you to select **OFF** or **ON**.

Turning Plot Rings On or Off. When navigating, you may want to know the distance you will travel to reach a certain destination. To find out, you can turn the **PLOT RINGS** option on.

While viewing the *PLOT* screen, press **MENU**. Highlight **PLOT SETUP** and press **ENTER**. Use the **UP/DOWN ARROWS** to select **PLOT RINGS** and press **ENTER**. A pop-up menu appears allowing you to select **OFF** or **ON**.

Setting Up Course Projection. You may want to know how long it will take you to reach a certain distance. Under **Course Projection**, you can choose from **OFF** or **1, 2, 5 and 10 minutes**.

While viewing the *PLOT* screen, press **MENU**. Highlight **PLOT SETUP** and press **ENTER**. Use the **UP/DOWN ARROWS** to select **COURSE PROJECTION** and press **ENTER**. A pop-up menu appears allowing you to select **OFF** or a time.



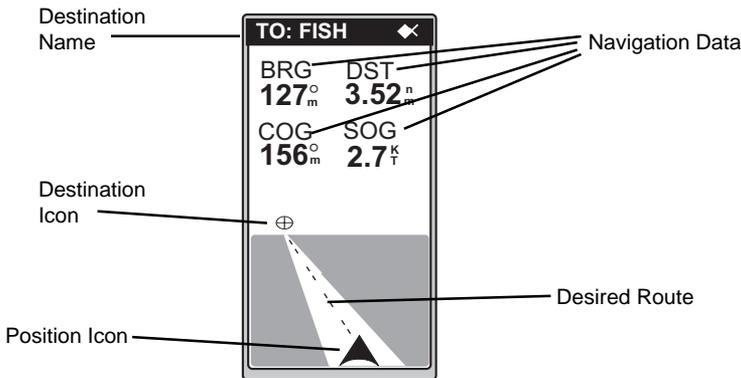
Setting Hide Data/Show Data

When using the *PLOT* screen, you may want bearing and distance to be hidden. You can choose to hide these information fields or have the fields present. Under HIDE DATA/SHOW DATA, you can turn the data fields on or off.

While viewing the *PLOT* screen, press **MENU**. Highlight HIDE DATA or SHOW DATA (depending on which has been selected previously) and press **ENTER**. You are returned to the *PLOT* screen.

Using the *Road* Screen

The *ROAD* screen displays four customizable navigation fields, at the top of the screen, as well as a display to show your position on the travelled course.



At the top of the screen, the destination name is displayed along with navigation data fields. The pictorial road screen shows your position in relation to your desired route, as well as your cross track error. The road shows the direction in which you should be travelling to reach your destination, when the destination icon is straight ahead, you are on course. If you are off course, such that the destination icon is off the screen, an arrow icon will appear to point you in the direction to get back on course.

Setting Hide WPTS/Show WPTS

When using the *ROAD* screen, you may want the waypoints to be hidden. You can choose to hide the waypoints or have the waypoints present. Under HIDE WPTS/SHOW WPTS, you can turn the waypoints on or off.

While viewing the *ROAD* screen, press **MENU**. Highlight HIDE WPTS or SHOW WPTS (depending on which has been selected previously) and press **ENTER**.

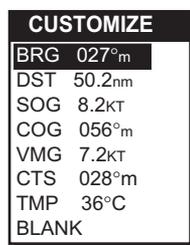
If SHOW WPTS is chosen, you are presented with a pop-up window from which you can make your selection. Use the **UP/DOWN ARROWS** to highlight your choice and press **ENTER**. You are returned to the *ROAD* screen. If HIDE WPTS is chosen, you are returned to the *ROAD* screen.



Customizing the Road Screen

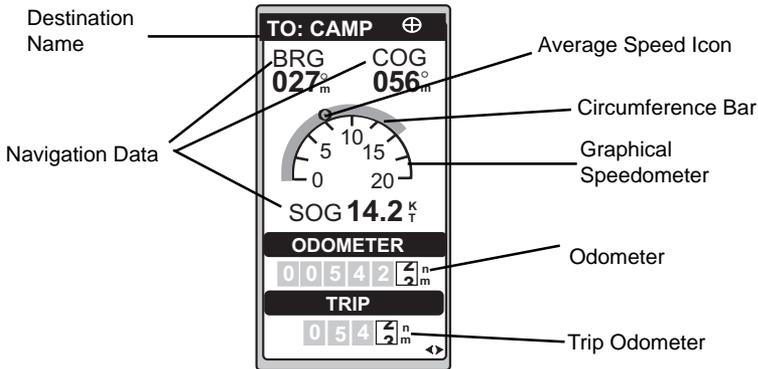
You can change the four navigational fields. You can choose from BRG, DST, SOG, COG, VMG, CTS, TMP and Blank. To customize your *ROAD* screen, press **MENU** while viewing the *ROAD* screen. Highlight CUSTOMIZE and press **ENTER**.

Use the **UP/DOWN ARROWS** to select the field you want to change and press **ENTER**. You are presented with a pop-up menu from which you can make your selection. Use the **UP/DOWN ARROWS** to highlight your choice and press **ENTER**. You will return to the *ROAD* screen, still in the customize mode. You can continue to customize the display or press **QUIT** to exit.



Using the Speed Screen

While using the *SPEED* screen, you can view the graphical speedometer, odometer and trip odometer as well as the numerical bearing, course over ground and speed over ground.



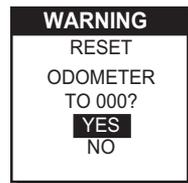
The top of the screen displays the destination name, bearing and course. The Graphical Speedometer is shown with a green Circumference Bar that moves clockwise around the Speedometer to indicate instantaneous speed. The scale for the Speedometer is adjustable by using the **RIGHT/LEFT ARROWS** to increase or decrease the scales. The Average speed is represented by the red icon on the Speedometer and can be customized.

Resetting the Odometer

You may want to reset the Odometer field to zero.

While viewing the *SPEED* screen, press **MENU**, highlight **ODOM RESET** to zero and press **ENTER**.

A pop-up window will appear. Select **YES** or **NO** and press **ENTER**.



Resetting the Trip Odometer

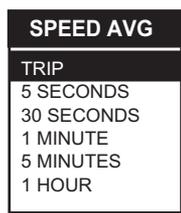
You may want to reset the Trip field to zero.

While viewing the *SPEED* screen, press **MENU**, highlight **TRIP RESET** and press **ENTER**. A pop-up window will appear. Highlight **YES** or **NO** and press **ENTER**.

Setting the Speed Average

You may want to reset the Speed Average field in your receiver. You can choose from TRIP, 5, 30 seconds, 1, 5 minutes or 1 hour.

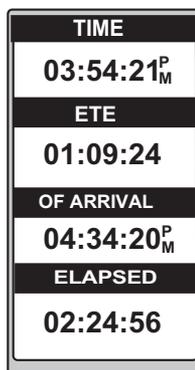
While viewing the *SPEED* screen, press **MENU**, highlight **SPEED AVG** and press **ENTER**. A pop-up window will appear. Highlight the desired time frame over which averaging will be performed and press **ENTER**.



The default is 30 seconds.

Using the *Time* Screen

The *TIME* screen displays the current time, estimated time enroute (ETE), time of arrival and elapsed time in regards to the route you are navigating in. The first data field can be customized to correct the current time and to select the time format.



Selecting *Time* Format

You may need to correct the current time or change the time format. Your choices for time format are LOCAL 24HR, LOCAL AM/PM and UTC.

While you are viewing the *TIME* screen, press **MENU**, highlight **FORMAT** and press **ENTER**.



A screen will appear with your format selection and the current time with a cursor. Use the **ARROWS** to make any changes to the current time and press **ENTER**.

Saving a Waypoint

Waypoints are used to create routes and GOTOs. Before you can set a route or GOTO, you must have a saved waypoint in your receiver. You have two options when naming waypoints. You can create waypoints with either a receiver-created name or with a name you create yourself.

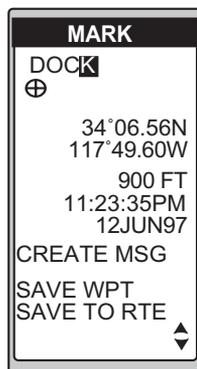
Saving Your Position Fix with a Receiver-Generated Name

From anywhere in the receiver, you can save (**MARK**) your position with a receiver created name. This is the fastest way to save your position.

To save a waypoint with a receiver-created name, press **MARK, MARK**. The waypoint will be saved with a receiver-generated name beginning with WPT001, WPT002 and so on.

Saving Your Position Fix with a User-Created Name

To save a waypoint with a user-created name, press **MARK**, press **ENTER** and the **ARROWS** to enter alphanumeric characters. Once you have entered the name, press **MARK** again to save the waypoint.

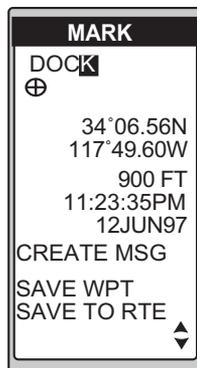


You have the option of creating a message when you are naming your waypoint. This will be explained in the *Working with Waypoints* section.

Creating a Waypoint

A waypoint is a recorded position that can be used in a route or a GOTO. You can save up to 500 waypoints in your GPS ColorTRAK and refer back to them at any time, as long as the waypoints have been saved.

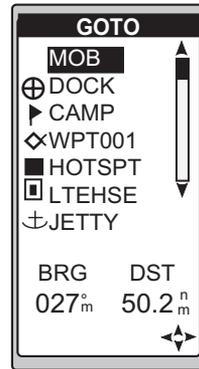
Press **MARK**. To create the waypoint, highlight the data field you wish to change and press **ENTER**. Use the **ARROWS** to input the data and press **ENTER** to exit the edit mode for that data field. To save the changes you have made, press **MARK** or highlight **SAVE WPT** and press **ENTER**.



Creating a GOTO

A GOTO is a route which guides you from your current position to any waypoint in the receiver's memory. As an example, you can save a waypoint at your home. No matter where you go, you will always be able to navigate back home by using GOTO.

To create a GOTO, press **GOTO** and the GOTO MENU will be displayed. Use the **UP/DOWN ARROWS** to highlight the desired waypoint destination and press **ENTER**. The scroll bar, on the right, indicates the approximate position on the waypoint list.



You are returned to the last viewed *NAV* screen. The name of the waypoint is at the top of the screen with navigation information that you can use.



This completes the basic operation of the GPS ColorTRAK. From the information provided, you can now navigate from place to place quickly and easily.

The following chapters provide you with additional information on using your GPS ColorTRAK that build upon what you have learned.

Working with Waypoints

4

This section tells you how to edit, delete, project and sort waypoints. You can store up to 500 positions which can be used to build routes for navigation.

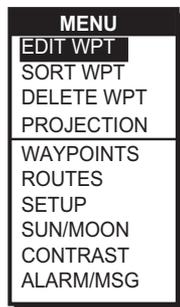
Editing a Waypoint

Under editing a waypoint, you have the following options:

- Editing a waypoint name.
- Editing the waypoint icon.
- Editing coordinates.
- Editing elevation.
- Editing a message.

Editing a Selected Waypoint

From any *NAV* screen, press **MENU**, highlight **WAYPOINTS** and press **ENTER**. Highlight the waypoint you wish to edit and press **ENTER**. Press **MENU**, highlight **EDIT WPT** and press **ENTER**.



Editing Waypoint Fields

Following the instructions on selecting a waypoint, select the waypoint you wish to edit. Use the **ARROWS** to highlight the data field you wish to change and press **ENTER**. Again, use the **ARROWS** to make your changes. Press **ENTER** to exit the edit mode for that data field.



Creating/Editing/Deleting a Message in a Waypoint

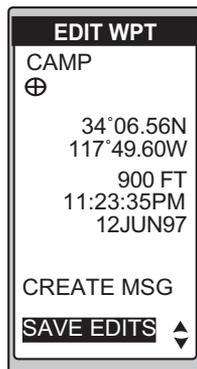
To create a message, follow the instructions on selecting a waypoint. Use the **DOWN ARROW** to highlight CREATE MSG and press **ENTER**. Use the **ARROWS** to input alphanumeric characters. Your message may contain up to twenty characters. When your message is complete, press **ENTER**.

To edit a message, follow the instructions on selecting a waypoint. Use the **DOWN ARROW** to scroll to the message and press **ENTER** to turn the cursor on and use the **ARROWS** to input your changes. When your message is complete, press **ENTER**.

To delete a message, follow the instructions on selecting a waypoint. Use the **DOWN ARROW** to highlight CLEAR MSG and press **ENTER**.

Saving Changes to the Selected Waypoint

To save your edits, follow the instructions on selecting a waypoint. Highlight SAVE EDITS and press **ENTER**.



Projecting a Waypoint

This function allows you to create a waypoint at a certain distance and direction from an existing waypoint or from your current position.

From any *NAV* screen, press **MENU**, highlight **WAYPOINTS** and press **ENTER**. Highlight the waypoint you wish to project and press **ENTER**. Press **MENU**, highlight **PROJECTION** and press **ENTER**.

The *PROJECTION* screen will be displayed. Use the **UP/DOWN ARROWS** to highlight the field where you want to make changes and press **ENTER**.

PROJECTION	
FROM	WPT003
G.C. BRG/DST	
BRG	000 ^M
DST	000 ^M
LAT/LON	
	34°08.56N
	117°50.60W
UTM	
	11 423760W
	37 74479N

You can change any of the four sections in the *PROJECTION* screen. The FROM data field can be changed to your current position or to any saved waypoint. A pop-up window appears when **ENTER** is pressed when the FROM waypoint is highlighted.

WAYPOINTS	
POS	
⊕	CAMP
▶	HOTSPT
◇	FISH

In the G.C. (Great Circle) BRG/DST field, you can input the bearing and distance into the data fields in order to compute the projection. You can also input information into the coordinate fields.

Once you have the necessary information in the data fields and the receiver has projected the position, you can save the position by pressing **MARK**.

Sorting a Waypoint

You may want to change how the waypoints are sorted. You have the options of ALPHABETIC, NEAREST and ICON/NAME.

From any *NAV* screen, press **MENU**, highlight WAYPOINTS and press **ENTER**. Press **MENU**, highlight SORT WPT and press **ENTER**.

A pop-up window will appear with options. Use the **UP/DOWN ARROWS** and press **ENTER**. The sorting process may take more than a few seconds to complete.



Deleting a Waypoint

You may find that you have too many saved waypoints that you no longer use. In this case, you can delete these unnecessary waypoints. **Once these waypoints are deleted, you cannot undo this process or retrieve these deleted waypoints.**

From any *NAV* screen, press **MENU**, highlight WAYPOINTS and press **ENTER**. Highlight the waypoint you wish to delete and press **ENTER**. Press **MENU**, highlight DELETE WPT and press **ENTER**.

A pop-up window will appear. Use the **UP/DOWN ARROWS** to select YES or NO and press **ENTER**.

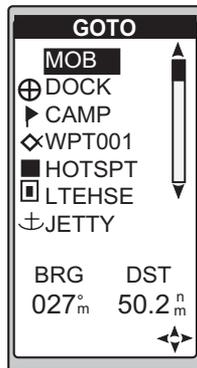


A route is a planned course of travel defined by a series of waypoints stored in the receiver's memory. These waypoints are connected to form the segments or "legs" of the route. There are 4 different types of routes consisting of GOTO, BACKTRACK, MOB and MULTI-LEG ROUTE. The GPS ColorTRAK holds 20 routes with 30 legs. The route function allows you to activate, create, view/edit or delete any one of the 20 routes.

Creating/Clearing a GOTO

A GOTO is a route which guides you from your current position to any waypoint in the receiver's memory. As an example, you can save a waypoint at your home. No matter where you go, you will always be able to navigate back home by using GOTO.

To create a GOTO, press **GOTO** and the GOTO MENU will be displayed. Use the **UP/DOWN ARROWS** to highlight your destination waypoint and press **ENTER**.



To clear a GOTO. The CLEAR GOTO function allows you to delete an active GOTO route.

While in the GOTO screen, press **MENU**, highlight **CLEAR GOTO** and press **ENTER**. Your GOTO will be deleted.



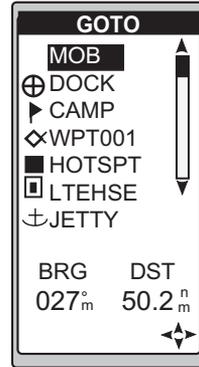
If there are no active GOTOs, then Clear GOTO will not be displayed in the **MENU**.

Creating a Man Over Board Route

Another type of route is Man Over Board (MOB). The MOB route is useful when you want to instantly create a route.

To activate MOB, press **GOTO**. A GOTO MENU will appear with MOB (the first on the menu) highlighted. Press **ENTER** and the receiver will store the position and set a GOTO route to it. MOB waypoints will be created and titled MOB001, MOB002 and so on. If a MOB already exists, the receiver will give you the option of replacing the MOB.

To clear a MOB. The CLEAR MOB function allows you to delete an active MOB route. While in the GOTO screen, press **MENU**, highlight CLEAR MOB and press **ENTER**. Your MOB will be deleted.

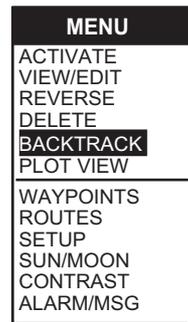


Creating a Backtrack Route

Backtrack creates a route that starts from the last point recorded in track history, using the “bread crumbs” saved, to the first point recorded for track history. By following this route, you “retrace your steps” back to the starting point.

Press **MENU**, highlight ROUTES and press **ENTER**. Press **MENU** and highlight BACKTRACK. A route will be created and given a name in the format of BXXPxx. XX is the BACKTRACK number and xx is the waypoint number ranging from 01 to 31. For example, your first backtrack will read B01P01. The backtrack waypoints will be listed in the menu just as other waypoints.

BACKTRACK routes can be deleted just as other routes.



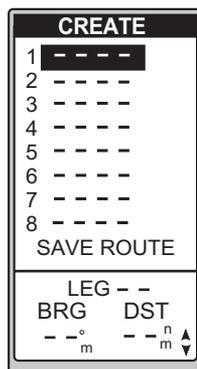
Creating a Multi-Leg Route

You may want to create a route with your saved waypoints. For example, if you want to create a route from your home, to a campsite and then to a great fishing spot, you can create a route that would take you to each place.

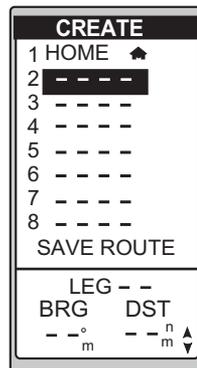
Press **MENU**, highlight **ROUTES** and press **ENTER**. A **ROUTE MENU** will appear.

Highlight an empty route and press **MENU**, highlight **CREATE**. A screen will appear with the first dotted line highlighted. Press **ENTER** to display your list of waypoints.

Highlight the first waypoint for your route and press **ENTER**.



The receiver will display the selected waypoint in the starting location and will highlight the destination for leg 2. Press **ENTER** for your next selection. Continue this process until you have completed the route. To end the creation process, use the **UP/DOWN ARROWS** to highlight **SAVE ROUTE** and press **ENTER**.



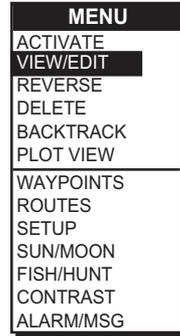
Or

Press **MENU**, highlight **SAVE ROUTE** and press **ENTER**.



Viewing/Editing a Route

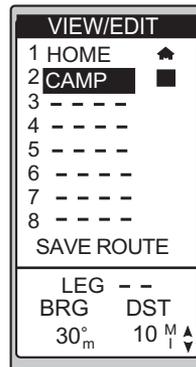
From any screen, press **MENU**, highlight **ROUTES** and press **ENTER**. Highlight the route you wish to edit and press **ENTER** or press **MENU**, highlight **VIEW/EDIT** and press **ENTER**.



Inserting a Leg

With the route you have created, from your home to a campsite, you can insert a leg in the route. For example, on your way to the campsite, you find a stream that you want to stop at on your way back. You can add the waypoint for the stream to your route.

While viewing the route you wish to insert a leg into, use the **UP/DOWN ARROWS** to highlight the waypoint that you want to insert a leg before and press **MENU**. Highlight **INSERT** and press **ENTER**. A list of waypoints will appear, highlight the waypoint you want to insert and press **ENTER**.



Changing a Waypoint in a Route

Using your home to campsite route, you may decide that you want to go to the fishing spot on the way to the campsite and not stop at the stream. You can replace the waypoint representing the stream with the fishing spot.

While viewing the route you wish to change a waypoint in, use the **UP/DOWN ARROWS** to highlight the waypoint that you want to change and press **ENTER**.

Or

Press **MENU**, highlight **REPLACE** and press **ENTER**.

A list of waypoints will appear, highlight the waypoint you want to be replaced and press **ENTER**.

Adding a Waypoint at the End of a Route

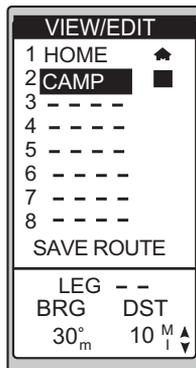
You may be navigating using the home to campsite route and find a great picnic spot. You would want to add this to the end of your route.

When viewing the route you wish to add a waypoint to the end of, use the **UP/DOWN ARROWS** to highlight the first dotted line of the route and press **ENTER**. A list of waypoints will appear, highlight the waypoint you want to add to the end of your route and press **ENTER**.

Deleting a Waypoint in a Route

On your next trip while navigating from the home to campsite route, you find the campsite has been closed. You may want to delete the campsite leg from your route.

While viewing the route you wish to delete a waypoint from, use the **UP/DOWN ARROWS** to highlight the waypoint you want to delete and press **MENU**. Highlight **DELETE** and press **ENTER**.



Saving a Route

Once you have made changes to your route, you may want to save those changes.

While viewing the route, press **MENU**, highlight **SAVE ROUTE** and press **ENTER**. The changes you have made to your route will now be saved until you delete them.



Activating/Deactivating a Route

While navigating in your route from home to campsite, you may decide you want to activate (turn on) the home to campsite route and begin navigating.

Press **MENU** and select **ROUTES**. Highlight the route that you wish to activate, press **MENU** and highlight **ACTIVATE**. Activating a route will automatically deactivate any other route or **GOTO**.



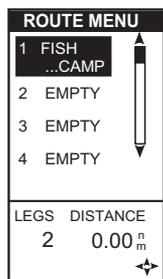
While navigating in your route from home to campsite, you may decide you want to deactivate (turn off) the route and return to it later.

Press **MENU** and highlight **ROUTES**. Highlight the route that you wish to deactivate. Press **MENU**, highlight **DEACTIVATE** and press **ENTER**.

Reversing a Route

Once you have reached the end of your route, you can reverse the route to return home. For example, Camp...Fish, goes from point A to B to C to D, reversed would read from D to C to B to A and the title would read Fish...Camp.

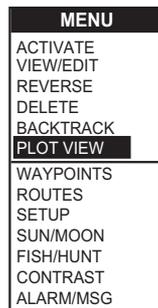
Press **MENU**, highlight **ROUTES** and press **ENTER**. Highlight the route that you wish to reverse and press **MENU**. Highlight **REVERSE** and press **ENTER**. The screen will display the **ROUTE MENU** and the waypoints in the titles will reverse.



Using Plot View in a Route

While navigating in your route, you can view the entire route in a small screen overview with the use of Plot View.

Press **MENU**, highlight **ROUTES** and press **ENTER**. Highlight the route that you wish to view, press **MENU**, highlight **PLOT VIEW** and press **ENTER**.



Deleting a Route

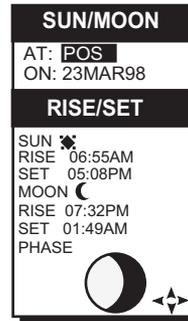
After your last trip using your home to campsite route, you decide you no longer want to visit those sites. You can delete the route from your receiver.

Press **MENU**, highlight **ROUTES** and press **ENTER**. Highlight the route that you wish to delete, press **MENU**, highlight **DELETE** and press **ENTER**.

Working with Sun/Moon and Fish/Hunt

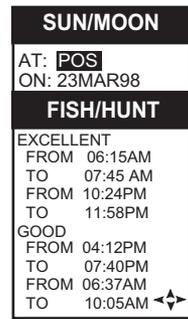
The Sun/Moon function displays solar and lunar calculations and the Fish/Hunt function displays times for excellent and good Fishing/Hunting. The default will be the current position unless the function is accessed from a waypoint menu or waypoint information screen.

Working with Sun/Moon. From any *NAV* screen, press **MENU**, highlight **SUN/MOON** and press **ENTER**. You can change the location (AT) and/or the date (ON) for this calculation. The **UP/DOWN ARROWS** will move the highlight between the AT and ON fields (shown at the top of the screen) to allow you to change the location and date. To change the location, highlight the AT field and press **ENTER** to display your saved waypoints. Highlight your choice and press **ENTER**. To change the date, highlight the ON field and press **ENTER**. Use the **ARROWS** to enter the new date and press **ENTER**.



Working with Fish/Hunt. From any *NAV* screen, press **MENU**, highlight **FISH/HUNT** and press **ENTER** or use the **LEFT/RIGHT ARROWS** to toggle between the Sun/Moon data screen and the Fish/Hunt data screens.

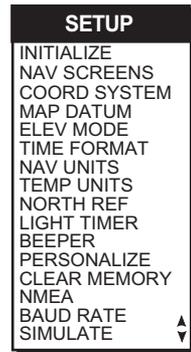
You can change the AT and ON fields just as you did previously, if desired.



Selecting the Simulate Mode

The Simulate mode will help you become familiar with your receiver and how it works by generating artificial position fixes. By utilizing Simulate, the receiver will create a route and will continue until you end it. In order to end and delete the route created, you can return to the window (where you initiated the mode) and select OFF or power the receiver off. It is important to reset the receiver to your current position and not the position that was created in the Simulate mode.

To begin, press **MENU** from any *NAV* screen, highlight **SETUP** and press **ENTER**. The **SETUP** menu will appear. Highlight **SIMULATE** and press **ENTER**.



A pop-up window will be displayed giving a list of options consisting of OFF, AUTO and USER. Highlight OFF to turn the Simulator mode off. Highlight AUTO to turn the Simulate on and set a simulated route.

If USER is selected, you will be asked to input COG and press **ENTER**, then input SOG and press **ENTER** to display a simulate activated window.

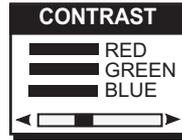


Default setting is OFF.

Selecting Contrast

You may want to change the contrast of your receiver. The colors consist of RED, BLUE and GREEN. You can adjust the lightness or darkness of the colors, depending on your preference.

From any *NAV* screen, press **MENU**, highlight **CONTRAST** and press **ENTER**. A pop-up window will be displayed. Use the **LEFT/RIGHT ARROWS** to adjust the contrast and press **ENTER**.



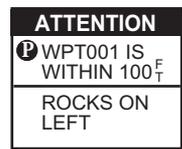
Selecting Alarm/Message

Accessing the Alarm/Message Screen

While navigating, you may decide to set an alarm in your GPS ColorTRAK. The GPS ColorTRAK has four types of alarms: Anchor alarm, which will notify you when your anchored boat has drifted; Arrival alarm, which will notify you when you are within the arrival circle of your destination ; XTE alarm, which will notify you when you have gone off course; and Proximity alarm, which will notify you when you are within the proximity of any waypoints you have chosen.

From any *NAV* screen press, **MENU** and highlight **ALARM/MSG**. A screen will appear with your choice of alarms and messages. Use the **UP/DOWN ARROWS** to highlight your choice and press **ENTER**.

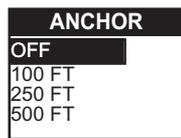
Sample. When the pop-up window for an alarm is displayed, the distance and a message, if there are any available, will appear. A sample is shown.



Selecting Anchor Alarm

The Anchor alarm will notify that you have moved from the set position. For example, while boating, you can set your Anchor alarm. Once your boat begins to drift from the set position, your receiver will sound to notify that you are moving.

While viewing the Alarm/Message screen, highlight the ANCHOR ALARM and press **ENTER**. A pop-up screen will appear with your choices for alarm settings of OFF, 100, 250 or 500 feet. Highlight your selection and press **ENTER**. The beeper will sound when the GPS position is at a distance greater than the distance you have chosen. The alarm will sound until you turn it off or the condition is corrected.

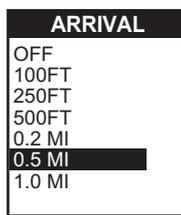


The default is OFF.

Selecting Arrival Alarm

The Arrival alarm will notify you when you are within the arrival circle of the destination waypoint.

While viewing the Alarm/Message screen, highlight the ARRIVAL ALARM and press **ENTER**. A pop-up screen will appear with your choices for alarm settings of OFF, 100, 250, 500 feet, 0.2, 0.5 and 1.0 miles. Highlight your selection and press **ENTER**.



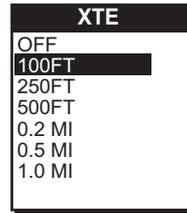
The alarm will sound and a pop-up window will appear when the GPS position is within the arrival circle distance you have chosen. The pop-up window will display the arrival circle distance as well as any message you have inputted for the waypoint. The alarm will sound until you turn it off.

The default is OFF.

Selecting XTE Alarm

The XTE (Cross Track Error) alarm will notify you when you have gone off your set course.

While viewing the Alarm/Message screen, highlight the XTE ALARM and press **ENTER**. A pop-up screen will appear with your choices for alarm settings of OFF, 100, 250, 500 feet, 0.2, 0.5 and 1.0 miles. Highlight your selection and press **ENTER**. The alarm will sound when the GPS position is off your set course within the distance you have chosen. The alarm will sound until you turn it off or the condition is corrected.

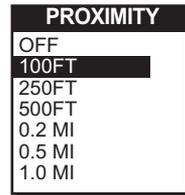


The default is OFF.

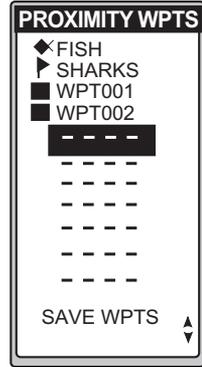
Selecting Proximity Alarm

The Proximity alarm will sound when you are within the proximity of any waypoints you have chosen that are not on the active route or GOTO.

While viewing the Alarm/Message screen, highlight PROXIMITY ALARM and press **ENTER**. A pop-up screen will appear with your choices for alarm settings of OFF, 100, 250, 500 feet, 0.2, 0.5 and 1.0 miles. Highlight your selection and press **ENTER**.



The PROXIMITY WPTS menu will be displayed for you to select proximity waypoints. Highlight the empty field, as shown, and press **ENTER**. Your saved waypoints will appear. Highlight a waypoint and press **ENTER**. The selected waypoint will appear. To continue this process, use the **DOWN ARROW** to make the next selection. When you have completed your selection, use the **UP/DOWN ARROWS** to highlight **SAVE WPTS** and press **ENTER**.



Or

Press **MENU**, highlight **SAVE WPTS** and press **ENTER**.

The alarm will sound when the GPS position is within the proximity distance you have chosen. The alarm will sound until you turn it off.

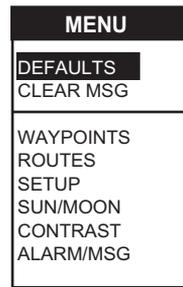
The default is OFF.



Due to government imposed Selective Availability, the alarm figures, under 100 feet, may have errors. Do not rely on this feature for precise navigation.

Viewing the Alarm/MSG Menu

While viewing the Alarm/MSG screen, press **MENU**. A menu will display a screen option to **DEFAULTS** and **CLEAR MSG**.



Selecting Alarm Defaults

After a memory clear, you may want to restore the alarm default settings.

While viewing the Alarm/MSG menu, highlight **DEFAULTS** and press **ENTER**. A pop-up window will be displayed, select **YES** or **NO** and press **ENTER**.



Clearing Alarm Messages

The message buffer may become cluttered with information. You can use the CLR MSG to delete the messages.

While viewing the Alarm/MSG menu, highlight **CLR MSG** and press **ENTER**. A pop-up window will be displayed, select **YES** or **NO** and press **ENTER**.



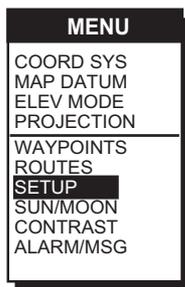
Customizing (Setup)

7

Selecting Setup

Setup allows you to initialize the receiver and set system parameters to your preference.

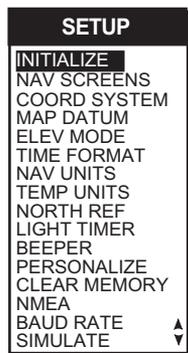
To view the Setup Menu, from any screen press the **MENU** and highlight **SETUP** and press **ENTER**.



Initializing

By initializing your receiver, you establish the initial position for the receiver. This will enable the receiver to search the sky for available satellites. You will need to reinitialize if you have travelled more than 300 miles while the receiver is turned off.

To reinitialize, press **MENU**, highlight **SETUP** and press **ENTER**. The Setup Menu will appear, highlight **INITIALIZE** and press **ENTER**. Follow the steps requested to initialize, as done when the receiver was initialized the first time (see *Getting Started*).



Disabling NAV Screens

You may find that you do not use one of the nine NAV screens provided in the receiver. You have the option to disable NAV screens, except for the *Status* and *Position* screens.

To disable a NAV screen, press **MENU**, highlight **SETUP** and press **ENTER**. Highlight **NAV SCREENS** and press **ENTER**. The NAV 1 screen will appear with a pop-up menu asking if you want to turn this screen off. Select **OFF** to disable the displayed screen or **ON** and press **ENTER**. The **COMPASS** screen is displayed with the same pop-up menu. Select **OFF** or **ON**. You will continue to be prompted for the other NAV screens.



Selecting a Coordinate System

A Coordinate System is provided for you. This option allows you to select primary and secondary coordinates used for entering and viewing position information. The most common is LAT/LON. You can choose from LAT/LON, TD, UTM, OSGB, IRISH, SWISS, SWEDISH, FINNISH, FRENCH, GERMAN, MGRS and USER GRID.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **COORD SYSTEM** and press **ENTER**. A pop-up menu will be displayed, highlight your choice and press **ENTER**.



If a format is required for the coordinate system you have chosen, a pop-up menu will be displayed. Highlight your selection and press **ENTER**.





You would generally want the receiver to use position coordinates in the same map datum that is used by your maps. For example, the Irish Grid uses the Irish datum, Finnish Grid uses KKK datum, Swedish Grid uses the RT 90 datum and Swiss Grid uses the Swiss datum.

The default primary coordinate system will be Lat/Lon in Degrees/Minutes and the default secondary coordinate system will be UTM.

Selecting Map Datum

You can change the datum the receiver uses to compute position coordinates. You will want your receiver's datum to match the datum on the map or chart you are using. Use the map "legend" to determine the datum required for the map or chart. If you are not using a map or chart or are unsure which datum to use, select WGS84.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **MAP DATUM** and press **ENTER**. A pop-up menu will be displayed, highlight **PRIMARY** or **SECONDARY** and press **ENTER**.



A pop-up menu will appear. Highlight your choice and press **ENTER**.

Default setting is WGS84.

Selecting Elevation Mode

You have the option of changing your elevation mode to 2D (2-Dimensional) or 3D (3-Dimensional). You may find 2D useful if you know the elevation of your position and the elevation will not change. For example, if you are at sea level, you could use 2D because you know that your elevation is zero.

To change the Elevation Mode, press **MENU**, highlight **SETUP** and press **ENTER**. Highlight **ELEV MODE** and press **ENTER**. A pop-up menu will appear. Highlight **2D** or **3D** and press **ENTER**.



If you select **3D**, the receiver will return to **SETUP**. If **2D** is selected, the receiver will ask for elevation. A pop-up menu will appear, use the **ARROWS** to input your elevation and press **ENTER**.

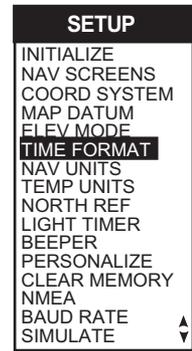


The default elevation mode will be **3D**.

Selecting Time Format

You have the option of changing the format in which the time is given. Your choices are **LOCAL 24HR**, **LOCAL AM/PM** and **UTC**.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **TIME FORMAT** and press **ENTER**.



A pop-up menu will be displayed, highlight your choice and press **ENTER**.



If **UTC** is selected, the receiver will return to **Setup**. If **LOCAL24HR** or **LOCAL AM/PM** are selected, a pop-up menu will be displayed prompting you to input the correct time. Use the **ARROWS** and press **ENTER**.

Selecting NAV Units

You can choose the units of measure used by your receiver. NAV UNITS gives you the options of MILES/MPH, NM/KNOTS and KM/KPH.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **NAV UNITS** and press **ENTER**. A pop-up menu will be displayed, highlight your choice and press **ENTER**.



Default setting is MILES/MPH for land use in the United States and KM/KPH for land use outside the United States.

Default setting is NM/KNOTS for marine use.

Selecting North Reference

The GPS ColorTRAK uses *magnetic north* as a default reference for all navigation computations. You can change this to *true north* (good, if you are using a map) or back to *magnetic north* (default, good to use if you are using a compass) under **SETUP**.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **NORTH REF** and press **ENTER**.

A pop-up menu will be displayed, highlight your choice and press **ENTER**.

Default setting is **MAGNETIC**.

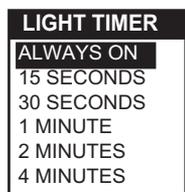


Selecting Light Timer

With the Light Timer function, you can choose the setting for the light timer. You can choose from ALWAYS ON, 15 and 30 seconds, 1,2 and 4 minutes.

The light timer is a power saving function that automatically turns the light off. Once the light has been turned off by the timer, it can be turned on with the next key press. For example, suppose you select the timer setting for 30 seconds. If you press the light key to turn the light on, it will remain lit for 30 seconds, as you had selected. With the next key press, the light will turn on again for 30 seconds. This process will continue until you press the light key again to turn the light off or turn the receiver off.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **LIGHT TIMER** and press **ENTER**. A pop-up menu will be displayed, highlight your choice and press **ENTER**.



Selecting the Beeper

You can select the options for when the beeper will sound. Your choices are OFF, KEYS ONLY, ALARM ONLY and KEYS/ALARM.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **BEEPER** and press **ENTER**. A pop-up menu will be displayed, highlight your choice and press **ENTER**.



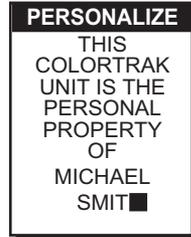
Default setting is ALARM ONLY.

Selecting Personalize

With the personalize function, you have the option of inputting your name into the ColorTRAK receiver.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **PERSONALIZE** and press **ENTER**. A pop-up menu will be displayed, highlight **OFF** or **ON** and press **ENTER**.

If **ON** is selected, use the **ARROWS** to enter your name, consisting of up to two lines of ten characters and press **ENTER**.



Selecting Clear Memory

The Clear Memory function allows you to delete track history, waypoints, routes, back waypoints, as well as reset defaults to the factory defaults. There is also an option to delete everything in the receiver's memory. Use caution when accessing the Clear Memory function. **Once you have deleted, you cannot undo the process or retrieve this deleted data.**

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **CLEAR MEMORY** and press **ENTER**.

A pop-up menu will be displayed, giving options for clearing. Highlight your choice and press **ENTER**.



If you clear all memory, the receiver will clear everything and power itself off.

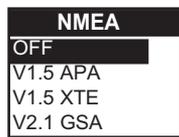
Selecting NMEA

Your GPS ColorTRAK receiver can be set to output GPS data to interface with your personal computer. You can select from OFF, V1.5 APA, V1.5 XTE and V2.1 GSA.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **NMEA** and press **ENTER**.

A pop-up menu will be displayed, highlight your choice and press **ENTER**.

Default setting is OFF.



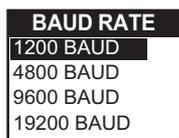
Selecting Baud Rate

Connection to external devices requires that the baud rate of the data being sent or received by the GPS ColorTRAK be matched to the baud rate of the external device. Your choices are 1200, 4800, 9600 and 19200 baud.

Press **MENU**, from any screen, highlight **SETUP** and press **ENTER**. Highlight **BAUD RATE** and press **ENTER**.

A pop-up menu will be displayed, highlight your choice and press **ENTER**.

Default setting for baud rate is 4800.



Receiver will not turn on:

1. Check to see if batteries are installed correctly.
2. Replace with four new AA alkaline batteries.

Takes more than 10 minutes to get a position fix:

1. If there are any obstacles nearby or overhead, move to a new location.
2. Make sure that the antenna is pointing up, has a clear view of the sky and is a reasonable distance away from your body.
3. Check Sat Status to see where the satellites are and if the receiver is acquiring data.
4. If the receiver still does not get a position fix within 10 minutes, you may wish to repeat the initialization procedure.

Elevation jumps up and down:

1. Errors induced by the Department of Defense called Selective Availability (SA) can cause the elevation values to fluctuate.

Battery life seems shorter than it should be:

1. Make sure that you are using four AA alkaline batteries. Magellan System recommends Eveready Energizers™ for use in the GPS ColorTRAK.
2. Shorter life span of the batteries can be due to excessive use of the backlight. **Turn the backlight off when not needed.**

Position coordinates on your receiver do not match the location on your map.

1. Make sure that your receiver is set up to use the same datum as your map. The map datum is generally shown in the map legend. See Map Datum under *Auxiliary Functions* for instructions on selecting the map datum in your receiver.
2. Check your LAT/LON format. Make sure that the format selected in COORDINATE SYSTEM (DEG/MIN/SEC or DEG/MIN.MM) is in the same format as the map you are using.

Commonly Asked Questions

Does the receiver adjust itself for daylight savings time?

No. You need to reset the time for changes in your area. (see *Changing Time Display*).

Will my receiver function correctly in the year 2000?

Absolutely. Even though the last two digits of the year are displayed, the full year designator is stored in memory.

Why won't the receiver accept the coordinates I am inputting?

The most common cause is that you are trying to enter coordinates that are in degrees/minutes while your receiver is set to degrees/minutes/seconds. Because the last two digits in degrees/minutes is in hundredths (00-99) and degrees/minutes/seconds can be no higher than 59 (00-59), inputting a number higher than 59 while in deg/min/sec results in an error and the receiver does not accept the entry.

Can I use NiCad batteries in my GPS ColorTRAK?

Yes. However, the battery life of your GPS ColorTRAK will be diminished as well as the possibility of an incorrect reading on the battery life gauge with the use of NiCad batteries.

Can I attach my GPS ColorTRAK to external power?

Yes. However, this requires the optional external power cable available from your dealer or Magellan Systems.

Why doesn't the temperature reading match the external temperature?

The reason for a different temperature reading is due to solar heat or heat from your hand as you hold the unit. These factors can cause an increase in the temperature. You can reset your receiver to its factory settings for a more accurate reading (see *Setting Temperature Calibration*).

You say my receiver should work for 30 hours on four batteries, mine doesn't last that long?

There can be two reasons. The first, and most common, reason is that you have the display backlight on. The light increases the drain on the batteries causing the decrease in battery life. The second reason is that you are using NiCad batteries. As mentioned before, while your GPS ColorTRAK will operate on NiCad batteries, the battery life is diminished.

Contacting Magellan

If after using the troubleshooting section, you are still unable to solve your operation problems, please call Magellan's Technical Service at (800) 707-9971 or via e-mail at colortrak@mgn.com.

Representatives are available Monday through Friday from 7 AM to 5 PM, PST. Faxes can be sent to Customer Service at (909) 394-7070 .

If necessary, you can also return your unit to Magellan for repair (Please call for assistance first). If possible, please notify us before shipping the unit by Parcel Post or UPS, and include a description of the problem, your name, address and a copy of your sales receipt. If your return shipping address is different, please let us know.

Please return the enclosed registration card in order to have your information on file.

With all correspondence, please state the model of your receiver and if calling, please have your unit with you.

Packages should be sent to:

Magellan Systems Corporation
960 Overland Court
San Dimas, CA 91773
ATTN: Warranty/Repair

NMEA Data Messages

Your GPS receiver can be set to output GPS data in the NMEA 0183 version 1.5 or version 2.1 format to interface with other marine devices or equipment.

NMEA DATA MESSAGES. NMEA data is output at 4800 baud, 8, N, 1, checksum off. These settings are acceptable to most equipment and software applications. The baud rate can also be set to 1200, 9600 or 19200.

There are several NMEA output message sets, each with a slightly different application. Check documentation for your external equipment to choose the appropriate message set.

SET	OUTPUT/USAGE
V1.5.APA	BWC, APA, GLL, VTG Remote displays, version 1.5 marine autopilots
V1.5 XTE	XTE, BWC, GLL, VTG Version 1.5 Marine autopilots
V2.1 GSA	GSA, GSV, GLL, GGA, RMB, RMC, APB, and autopilots. Vers. 2.1 NMEA recommended navigation data, satellite data and autopilots.

NMEA Message Definitions

APA	Autopilot cross track error, direction to steer, status of GPS, route status, destination waypoint name, and bearing from origin to destination (old format).
APB	Revised autopilot message contains all of the above plus: heading to steer toward destination, bearing from the present position to the destination (magnetic or true).
BWC	Range and bearing to a waypoint.
GGA	GPS position, time, fix quality, number of satellites used, HDOP (Horizontal Dilution of Precision), differential reference information, and age.
GLL	GPS-derived latitude, longitude, and time of fix.
GSA	GPS receiver operating mode, satellites used in the navigation solution reported by the S--GGA sentence and DOP (Dilution of Precision) values.
GSV	Number of satellites in view, satellite numbers, elevation, azimuth, and SNR value.
RMB	Data status, cross track error, direction to steer, origin, destination landmark, landmark location, bearing to destination, and velocity toward the destination.
RMC	Time, latitude, longitude, speed, heading, and date.
VTG	Track (magnetic and true) and groundspeed (knots and KPH).

NMEA OUTPUT DATA FORMAT - VERSION 1.5

APA Autopilot Format A

1 2 3 4 5 6 7 8 9 10

APA,A,A,X.XX,L,N,A,A,XXX.,M,CCC

1 OR'ed Blink and SNR (A = valid, V = invalid)

2 Cycle Lock (A = valid, V = invalid)

3-5 Cross Track, Sense (L = steer left, R = steer Right), N.Mi. Units

6-7 Arrival Circle, Arrival Perpendicular (crossing of the line which is perpendicular to the course line and which passes through the destination waypoint.

8-9 Bearing dest. WPT. from origin WPT., Magnetic

10 Dest WPT. identifier

BWC To Selected Waypoint, Great Circle

1 2 3 4 5 6 7 8 9 10 11 12

BWC,XXXXXX,XXXX.XX,N,XXXXX.XX,W,XXX.,T,XXX.,M,XXX.X,N,CCCC

1 UTC of Bearing

2-3 Lat, N or S of waypoint

4-5 Long, E or W of waypoint

6-7 Bearing, True

8-9 Bearing, Magnetic

10-11 Distance, naut. miles

12 Waypoint identifier

GLL Geographic Position — Latitude/Longitude

1 2 3 4 5 6

GLL,1111.11,a,yyyy.yy,a,hhmmss.ss,A*hh

1-2 Latitude, N/S

2-3 Longitude, E/W

4 UTC of position

6 Status A = Data valid

VTG Actual Track and Ground Speed (SPD)

1 2 3 4 5 6 7 8

VTG,XXX.,T,XXX.,M,XX.X,N,XX.X,K

- 1-2 Track degrees, True
- 3-4 Track degrees, Magnetic
- 5-6 Speed, knots
- 7-8 Speed, kilometers/hour

XTE Cross Track Error

1 2 3 4 5

XTE, A,A,X.XX, L,N

- 1 Or'ed value Blink and SNR (A=Valid, V=Invalid)
- 2 Cycle Lock, (A=Valid, V=Invalid)
- 3 Cross Track Error
- 4 Steer Left of Right (L = Left, R = Right)
- 5 Units (N.Mi.)

NMEA 0183 VERSION 2.1

APB Autopilot Sentence "B"

1 2 3 4 5 6 7 8 9 10 11 12 13 14

APB,A,A,x.x,a,N,A,A,x.x,a,c-c,x.x,a,x.x,a*hh

- 1 Status: A = Data valid
 - V = Loran-C Blink or SNR warning*
 - V = general warning flag for other navigation systems when a reliable fix is not available.*
- 2 Status: V = Loran-C cycle lock warning flag
 - A = OK or not used
- 3 Magnitude of XTE
- 4 Direction to steer (L, R)
- 5 XTE units, nautical miles
- 6 Status: A = arrival circle entered
- 7 Status: A = perpendicular passed at waypoint
- 8-9 Bearing origin to destination, M/T
- 10 Destination waypoint ID
- 11-12 Bearing, present position to destination, Magnetic or True
- 13-14 Heading to steer to destination waypoint, Magnetic or True

GGA Global Positioning System Fix Data

```
      1      2      3      4      5 6 7      8      9 10 11
GGA, hhhmss.ss,1111.11,a,yyyy.yy,a,x,xx,x.x,x.x,M,x.x,
      12 13 14
      M,x.x,xxxx*hh

1   UTC of Position
2-3 Latitude - N/S
4-5 Longitude - E/W
6   GPS Quality Indicator
    0 = fix not available or invalid
    1 = GPS SPS Mode, Fix valid
    2 = Differential GPS, SPS Mode, fix valid
    3 = GPS PPS Mode, fix valid
7   Number of satellites in use (00-12, may be different from
    the number in view)
8   Horizontal dilution of precision
9   Antenna altitude above/below mean sea level
10  Units of antenna altitude, meters
11  Geoidal separation - difference between the WGS-84 earth
    ellipsoid and mean sea level (geoid), "-" = mean sea level
    below ellipsoid
12  Units of geoidal separation, meters.
13  Age of Differential GPS data - Time in seconds since last
    SC104 Type 1 or 9 update, null field when DGPS is not used
14  Differential reference station ID, 0000-1023
```

GLL Geographic Position — Latitude/Longitude

```
      1      2      3      4 5      6
GLL,1111.11,a,yyyy.yy,a,hhmss.ss,A*hh

1-2      Latitude, N/S
2-3      Longitude, E/W
4        UTC of position
6        Status  A = Data valid
           V = Data not valid
```

GSA GPS DOP and Active Satellites

GPS receiver operating mode, satellites used in the navigation solution reported by the \$--GGA sentence, and DOP values.

1 2 3 4 5 6 7

GSA,a,x,xx,xx,xx,xx,xx,xx,xx,xx,xx,x.x,x.x,x.x*hh<CR><LF> ,

- 1 Mode: M=Manual, forced to operate in 2D or 3D mode,
A=Automatic, allowed to automatically switch 2D/3D
- 2 Mode: 1= Fix not available, 2=2D, 3=3D
- 3-4 PRN numbers of satellites used in solution (null for unused fields)
- 5 PDOP
- 6 HDOP
- 7 VDOP

GSV GPS Satellites in View

Number of satellites (SV) in view, PRN numbers, elevation, azimuth and SNR value. Four satellites maximum per transmission, additional satellite data sent in second or their message. Total number of messages being transmitted and the number of messages being transmitted is indicated in the first two fields.

1 2 3 4 5 6 7 8 9 10 11

GSV,x,x,xx,xx,xx,xxx,xx.....xx,xx,xxx,xx*hh<CR><LF>

- 1 Total number of messages, 1 to 3
- 2 Message number, 1 to 3
- 3 Total number of satellites in view
- 4 Satellite PRN number
- 5 Elevation, degrees, 90° maximum
- 6 Azimuth, degrees True, 000 to 359
- 7 SNR (C/No) 00-99 dB, null when not tracking
- 8-9 2nd-3rd SV
- 10-11 4th SV

Notes: 1) Satellite information may require the transmission of multiple messages. The first field specifies the total number of messages, minimum value 1. The second field identifies the order of this message (message number), minimum value 1.

2) A variable number of "PRN-Elevation-Azimuth-SNR" sets are allowed up to a maximum of four sets per message. Null fields are not required for unused sets when less than four sets are transmitted.

RMB Generic Navigation Information (immediately follows RMC)

1 2 3 4 5 6 7 8 9 10 11 12 13 14

RMB,A,X,XX,a,c--c,c--c,1111.11,a,yyyyy.yy,a,x.x,x.x,x.x,A *hh

- 1 Data Status (A = valid, V = invalid)
- 2-3 XTE, naut. miles and direction to steer (L or R) [If XTE exceeds 9.99 NM, display 9.99 in field 2.]
- 4 Origin waypoint ID
- 5 Destination waypoint ID
- 6-7 Destination Waypoint Latitude (N or S)
- 8-9 Destination Waypoint Longitude (E or W)
- 10 Range naut. miles, present fix to destination waypoint Great Circle. [If range exceeds 999.9 nm, display 999.9.]
- 11 Bearing, True, Great Circle, Present fix to dest. waypoint
- 12 Closing velocity to destination, knots
- 13 Arrival (OR'ed arrival circle and crossing of line which is perpendicular to the course line and which passes through the destination waypoint.)
- 14 CHECKSUM (Mandatory in this sentence.)

RMC Transit Specific (to be followed by RMB)

1 2 3 4 5 6 7 8 9 10

RMC,hhmmss.ss,A,1111.11,a,yyyyy.yy,a,x.x,x.x,xxxxxx,x.x,a *hh

- 1 Time, UTC of position fix
- 2 Status (A = valid, V = Navigation receiver warning)
- 3-4 Latitude at UTC time, N or S
- 5-6 Longitude at UTC time, E or W
- 7 Speed over ground, knots
- 8 Course over ground, degrees
- 9 Date (DDMMYY)
- 10 Magnetic variation, degrees
- 11 Magnetic variation, sense (E or W)
- 12 CHECKSUM (Mandatory in this sentence)

The formats listed are NMEA formats and Magellan receivers may not output all of the information listed for a particular format.

A complete copy of the NMEA specifications can be obtained from:

NMEA, PO Box 3435 New Bern, NC 28564-3435

Available Datums

Datum	Full Name	Datum	Full Name
WGS84	World Geodetic System	INDIA	Indian (India, Nepal)
NAD27	North America 1927	IRAN	Iran
NAD83	North American 1983	IRELA	Ireland 1965
ADIND	Adinda	KAUAI	Kauai
ALASK	Alaska	KERTA	Kertau 1948
ARC50	Arc 1950	KKJ	KKJ (Finland)
ARC60	Arc 1960	LIBER	Liberia 1964
ASTRO	Camp Area Astro	LUZON	Luzon
AUS66	Australian Geodetic 1966	MASSA	Massawa
AUS84	Australian Geodetic 1984	MAUI	Maui
BOGOT	Bogota Observatory	MERCH	Merchich
BUKIT	Bukit Rimpah	MINNA	Minna
CAMPO	Campo Inchauspe	MONTJ	
CANAD	Canada	NAHRW	Nahrwan, Saudi Arabia
CAPE	Cape	OAHU	Oahu
CARTH	Carthage	OEGYP	Old Egyptian
CENAM	Central America	OHAWA	Old Hawaiian
CHATH	Chatham 1971	OMAN	Oman
CHUAA	Chau Astro	PITCA	Pitcairn Astro 1967
CORRE	Corrego Alegre	QATAR	Qatar National
CYPRU	Cyprus	QORNO	Qornoq
DJAKA	Djakarta (Batavia)	RT90	RT90 (Sweden)
EGYPT	Egypt	SAM56	Provisional So. Am. 1956
EUROP	European 1950 (All of Europe)	SAM69	South American 1969
EUR50	European 1950 (W. Europe)	SCHWA	Schwarzeck
EUR79	European 1979	SICIL	Sicily
GANDA	Gandajika Base	SIERR	
GEO49	Geodetic Datum 1949	SWISS	
GHANA		TANAN	Tananarive Observatory 1925
GRB36	Ordinance Survey of GB, 1936	THAI	Indian (Thailand, Vietnam)
GUAM	Guam	TIMBA	Timbalai
GUNSG	G. Segara	TOKYO	Tokyo
GUNSR		USER DEFINED	
HAWAI	Hawaii	VOIRO	
HERAT	Herat North	WGS72	World Geodetic System 1972
HJORS	Hjorsey 1955	YACAR	Yacare
HUTZU	Hu-tzu-shan	ZANDE	Zanderij

Specifications

CHARACTERISTICS

Performance

Receiver: 12-channel technology, tracks up to 12 satellites to compute and update information with detachable quadrifilar antenna

Acquisition Times (under optimal conditions):

Warm Approximately 15 seconds

Cold Approximately 1 minute

Update Rate 1 second continuous

Accuracy:

Position 49 feet (15 meters) RMS (with Selective Availability turned off).

Velocity 0.1 knot RMS steady state (with Selective Availability turned off.)

Limits:

Speed 951 mph

Altitude 17,500 meters

Physical:

Size 6.88" x 2.5" x 1.1" [h] x [w] x [d]

17.48 cm x 6.35 cm x 2.79 cm

Weight 12 ounces (340.2 grams) with 4 AA batteries installed

Display 1.8" x 1.4" [h] x [w]

4.6 cm x 3.6 cm

high contrast color LCD with EL backlit display

Housing Waterproof construction, wraparound rubber armor

Temp. Range:

Operating 14°F to 140°F to (-10°C to 60°C)

Storage -40°F to 167°F (-40°C to 75°C)

Power:

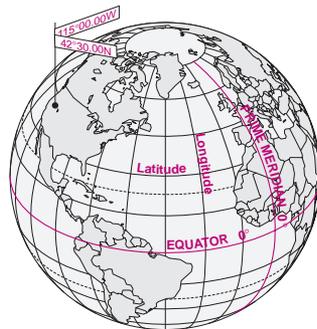
Source 4 AA alkaline batteries or 9-35 VDC with optional power cable

Battery Life Up to 30 hours continuous operation

Coordinate Systems

Positions are locations that are described in a unique way so that one location cannot be confused with another. This is done by using a coordinate system to describe locations. Your Magellan receiver has the ability to use any one of seven different coordinates systems; LAT/LON (latitude and longitude), UTM (Universal Transverse Mercator), OSGB, Irish Grid, Finnish Grid, Swedish Grid, or Swiss Grid. The one you select (in SETUP) will be determined by the maps and charts you use; you would generally want the receiver to display position coordinates in the same system that is used by your maps.

LAT/LON Coordinate System. LAT/LON is the most commonly used coordinate system today. It projects lines of latitude (parallels) and lines of longitude (meridians) onto the earth's surface. Lines of latitude are the equator and the horizontal lines that are parallel to it. Lines of longitude are the vertical lines that are perpendicular to the equator and pass through the poles. A position is described as being the intersection of a line of latitude and a line of longitude.



Specifically, a position is up to 90 degrees north or south of the equator (up to the poles, which are 90°N and 90°S; the equator is 0° latitude), and up to 180 degrees east or west of the Prime Meridian, which is 0° longitude. (The Prime Meridian passes through Greenwich, England.) Parts of a degree are minutes; there are 60 minutes (written as 60') to a degree. Minutes can also be divided into smaller units. Fractions of a minute can be expressed as decimals or as seconds. (There are 60 seconds to one minute, written as 60"). So a Lat/Lon position coordinate can be expressed in two ways, which your Magellan GPS receiver displays as 25°47.50 or 25°47'30.

UTM Coordinate System. Another commonly used coordinate system is UTM (Universal Transverse Mercator), which is generally found on land-based maps and quad sheets that are produced by government map providers. On land, you may find that UTM coordinates are easier to use than Lat/Lon.

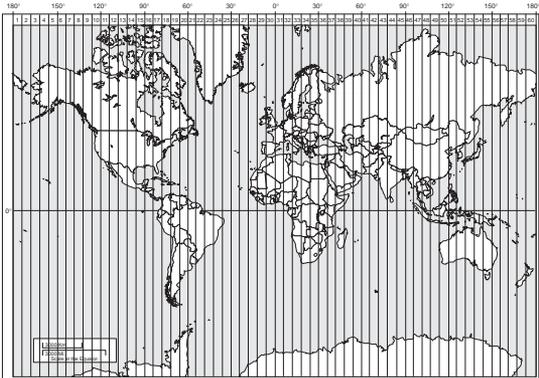
Instead of projecting an imaginary grid of intersecting lines onto the globe, UTM projects sections of the globe onto a flat surface. Each of these sections is called a "zone." There are 60 zones to cover the entire earth between 84°N and 80°S (polar areas are not described by UTM). Each zone is 6° wide as projected from the earth's center.

A UTM position is described by three elements; the zone it is in, the easting, and the northing. Eastings and northings measure how far into a zone a position is in meters. Eastings are an east/west measurement, and correspond roughly to longitude. Northings are a north/south measurement, and correspond to latitude.

This chart shows the position of Magellan Systems described in both Lat/Lon and UTM coordinates.

LAT/LON	
DEG/MIN	DEG/MIN/SEC
34°06.58N	34°06'35"N
117°49.56W	117°49'34"W

UTM			
11	4	23	818 E
37	74	624	N



NOTE: The area described by the UTM coordinate system extends to 84°N and to 80°S.

Other Coordinate Systems. OSGB coordinates are similar to UTMs, but they describe only Great Britain. They must be used with the GRB36 datum, which also describes Great Britain. This coordinate system cannot be used in any other part of the world. The GPS ColorTRAK automatically selects the GRB36 datum when the OSGB coordinate system is selected in Setup. (While OSGB coordinates must be used with the GRB36 datum, the GRB36 datum can be used with LAT/LON coordinates; just be sure the map you are using uses both LAT/LON and GRB36.)

If you select OSGB in the COORD SYS portion of the Setup Menu be sure to change the map datum back to the one you will be using (WGS84 is the default) when changing to another coordinate system.

Irish Grid uses the Ireland datum, Swedish Grid uses the RT90 datum, and Swiss Grid uses the Swiss datum. Under USER DATUM you may also use another datum you are familiar with (but which is not listed).

What is GPS?

9

What is GPS?

GPS is a constellation of navigation satellites that orbit the earth. The precise time and position information transmitted by these satellites is used by a GPS receiver to triangulate a position fix.

GPS was developed by the United States Department of Defense to provide consistent, reliable navigation information that is unaffected by rough terrain and bad weather, and is highly resistant to multipath errors and interference. The DoD continues to administer and control the Global Positioning System.

Although GPS was developed as a military navigation system, its civilian and commercial uses were recognized. The satellites transmit two codes, a military-only encrypted code (PPS) and a civilian-access, Standard Positioning Service (SPS) code. All commercial and consumer GPS receivers are SPS receivers.

How Does GPS Work?

Each GPS satellite transmits its precise location (position and elevation) and the start time of the transmission. A GPS receiver acquires the signal, then measures the interval between transmission and receipt of the signal to determine the distance between the receiver and the satellite, a process called ranging. Once the receiver has computed range for at least three satellites, its location on the surface of the earth can be determined.

Each satellite transmits two types of data, almanac and ephemeris. Almanac data is general information on the location and health of each satellite in the constellation. Since it contains general information, an almanac can be collected from any satellite. A receiver with a current almanac in its memory knows to look for satellites, given its last position and the time of day.

Ephemeris data is the precious satellite positioning information that is used for ranging. Each satellite transmits its own ephemeris data.

Both almanac and ephemeris data are required for a GPS receiver to locate and acquire satellites quickly and compute a position fix.

Accuracy

GPS positioning with an SPS receiver that is intended for general use will produce accuracies of 25 meters or better.

In fact, SPS receivers have proven to be far more accurate than anticipated. DoD has decided that 25-meter accuracy is a potential risk, and has introduced Selective Availability (SA) to maintain a military advantage. SA is a random error that is introduced to the SPS code ephemeris data and reduces the accuracy of any SPS receiver. The size of the error changes, but rarely exceeds 100 meters.

The DoD civil GPS under policy is that GPS accuracy, as affected by SA, is sufficient for general navigation. In an open environment, it usually is. Even with SA, a GPS receiver will bring you within visual range of a destination or target, and GPS remains the best available source for accurate, repeatable navigation and positioning information.

DGPS

Differential GPS (DGPS) computes the size of the error and applies it to positioning information. There are several ways to perform DGPS, one of which is broadcast differential. Broadcast differential uses GPS receivers at control sites to measure the range of errors for all visible satellites and determines a correction for each satellite. These corrections are broadcast in the RTCM SC-104 format by a radio beacon at the control site to any differential beacon receiver that is within range of the signal.

The differential beacon receiver receives and demodulates the signal, then relays it to the user's differential-ready GPS receiver. The user's GPS receiver applies the corrections to the positioning information it collects to compute

differentially corrected position and navigation data.

This technique requires that your GPS receiver be connected to a compatible differential beacon receiver. You must also be within range of a differential radio beacon.

More Information on GPS

For information relating to the operation of your Magellan GPS receiver, call Magellan at (800) 707-9971 and ask for Technical Support.

General information on the Global Positioning System and satellite status is available from the Civil GPS Information Center (GPSIC) in Virginia. It is operated by the United States Coast Guard for the Department of Transportation and was established to provide information and to serve as a point of contact. There are three ways to reach the GPSIC via telephone:

1. 24-hour recorded message at (703) 313-5907
2. Web site at www.navcen.uscg.mil
3. 24-hour live operator at (703) 313-5900

Navtech provides seminars and books on GPS and navigation. The Navtech bookstore can be reached at (800) NAV-0885 or (703) 931-0500 or FAX to (703) 931-0503.

Accessories for your GPS ColorTRAK are available from your Magellan dealer or you can order directly from Magellan using the order card supplied with your receiver or call Magellan at (800) 669-4477 (press 3 twice to place an order).

Carrying Case: The carrying case protects your GPS ColorTRAK from the elements and allows you to carry your GPS ColorTRAK on your belt.

Swivel Mounting Bracket: Mounts the GPS ColorTRAK on a dashboard or other surface, allowing for hands-free operation.

Power/Data Cable: Allows you to connect your GPS ColorTRAK to external power, external alarm and data.

External Power Cable with Cigarette Lighter Adapter: Allows you to connect the GPS ColorTRAK to a cigarette lighter for external power.

PC Kit: Includes all necessary hardware to connect to your PC and detailed street mapping software that enables trip planning, trip recording and in-vehicle navigation capability.

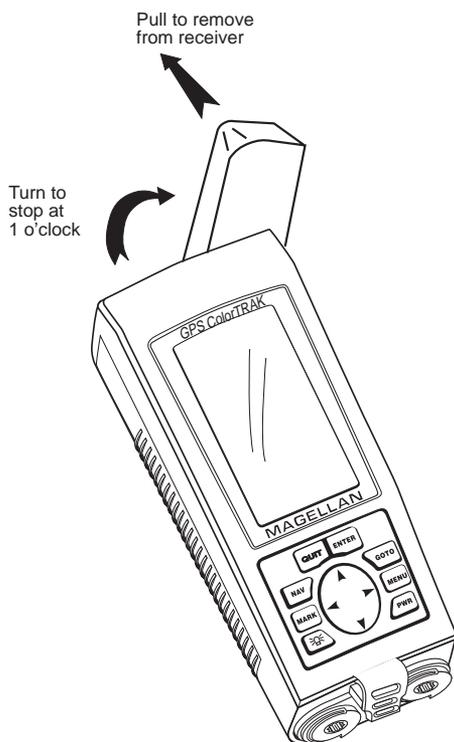
PC Interface Cable with Cigarette Lighter Adapter: Connects the GPS ColorTRAK to your PC for data transfer and to a cigarette lighter for external power.

Differential Beacon Receiver (DBR): Connects to your GPS ColorTRAK to receive differential corrections for 5-10 meter accuracy.

Antenna Removal. The GPS ColorTRAK has a quadrifilar antenna that can be removed. The antenna may be removed in order to connect an external antenna.

To remove the antenna, hold the receiver in one hand and rotate the antenna to the stop at the 1 o'clock position (as shown below). Firmly grip the antenna with the other hand and pull the antenna from the receiver.

To replace the antenna. Remove any external antenna that you have connected. Place the antenna at the 1 o'clock position and connect the antenna to the receiver.



Active Leg	The segment of a route currently being travelled.
Altitude	The current elevation above sea level.
BRG	Bearing. The compass direction from your position to a destination, measured to the nearest degree.
CDI	Course Deviation Indicator. A graphical representation of your position relative to your planned course, giving you an indication of how far left or right of the planned course you are and how to get to the destination.
COG	Course Over Ground. The direction the receiver is moving. COG can be reported in true or magnetic north values.
Coordinates	A unique numeric or alphanumeric description of the position.
CTS	Course to Steer. The direction you should be travelling in order to return to the course while proceeding towards the destination. It is a “compromise” course bearing that projects from your current position to a point on the course line mid-way between a point perpendicular to your position and the current leg destination waypoint.
Datum	Refers to the theoretical mathematical model of the earth’s sea level surface. Map makers may use a different model to chart their maps, so position coordinates will differ from one datum to another. The datum for the map you are using can be found in the legend of the map.

Default	The value or setting automatically chosen by the unit unless otherwise directed. Can be changed in Setup.
DST	Distance. Distance from position to destination.
ETA	Estimated Time of Arrival. The estimated time of day the leg's destination waypoint will be reached.
ETE	Estimated Time Enroute. The estimated time remaining to reach the next waypoint in a route.
HDG	Heading. The direction you are facing, defined as an angle from North.
Latitude	The angular distance north or south of the equator measured by lines encircling the earth parallel to the equator from 0° to 90°.
LAT/LON	Coordinate system using latitude and longitude coordinates to define a position on the earth.
Leg (Route)	A segment of a route that has a starting (FROM) waypoint and a destination (TO) waypoint. A route may consist of 1 or more legs. A route that is from waypoint A to waypoint B to waypoint C to waypoint D has three legs with the first being from waypoint A to waypoint B.
LMK	Landmark. A location saved in the unit's memory which is obtained by entering data, editing data, calculating data or saving a current position. Used to create routes. Same as a waypoint.
Longitude	The angular distance east or west of the prime meridian (Greenwich Meridian) as measured by lines perpendicular to the parallels and converging at the poles from 0° to 180°.
Magnetic North	The direction relative to a magnetic compass.

NMEA	National Marine Electronics Association. A professional organization that defines and maintains the standard serial format used by marine electronic navigation equipment and computer interfaces.
OSGB	A coordinate system describing only Great Britain, similar to UTM's. Used with GRB36 datum.
Position fix	Position coordinates as computed by the GPS ColorTRAK.
SOG	Speed Over Ground. The speed at which the receiver is moving.
TRN	Turn. Degree or direction to turn.
True North	The direction to North Pole from an observer's position. The north direction on any geographical meridian.
TTG	Time To Go. The measurement of how long it will take you to arrive at your destination. TTG is based on how fast you are moving towards the destination and the distance remaining.
UTC	Universal Time Coordinated. Formerly referred to as Greenwich Mean Time (GMT).
UTM	Universal Transverse Mercator metric grid system used on most large and intermediate scale land topographic charts and maps.
VMG	Velocity Made Good. The component of the velocity that is in the direction of the destination.
Waypoint	WPT. A location saved in the receiver's memory which is obtained by entering data, editing data, calculating data or saving a current position. Used to create routes.

XTE

Cross Track Error. The perpendicular distance between the present position and the course line. Given as a distance, right or left, of course when facing the destination.

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