12 ch GPS with WAAS

STANDARD HORIZON

Rugged GPS Navigator

MAGNUM

NAV-40

OWNER'S MANUAL

STANDARD HORIZON
Marine Division of VERTEX STANDARD
17210 Edwards Road, Cerritos, CA 90703, U.S.A.

Table of Contents

FCC Compliance Statement

This device complies with Part 15 of the FCC limits for Class B digital devices. This equipment generates, uses, and can radiate radio frequency energy and, if not installed or used in accordance with the instructions may cause harmful interference with the instructions may cause harmful interference to radio communications.

There is no guarantee that interference will not occur in a particular instance. If this equipment does cause harmful interference to other equipment, try to correct the problem by relocating the equipment.

Consult an authorized STANDARD HORIZON dealer or other qualified service technician if the problem cannot be corrected. Operation is subject to the following conditions: (1) This device cannot cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The **MAGNUM NAV-40** does not contain any user-serviceable parts. Repairs should be made only by STANDARD HORIZON Factory Service (address shown below). Unauthorized repairs can void the warranty.

STANDARD HORIZON
Attention Factory Service
115 North Wright Brothers Drive
Salt Lake City, UT. 84116

Introduction

The **MAGNUM NAV-40** is a precision-crafted, high-performance receiver for the Global Positioning System (GPS) constellation of satellites, providing precise location data and a host of navigation features. Ideal for outdoor use, and sealed against water ingress to the submersible standards of JIS-7/IPX-7, the **MAGNUM** is housed in a rugged, impact-resistant case with outstanding ergonomic design, for effortless operation during a wide variety of outdoor sports and recreation activities.

The advanced features of the **MAGNUM NAV-40** include:

- Long Battery Life: 19 hours with four Alkaline "AA" Cells (up to 50 hours in Battery Saver mode).
- 11-Page, 21-Function, easy-to-operate Operating Menu system.
- Large, illuminated Liquid Crystal Display (LCD) and back-lighting for front panel keys.
- 18,000+ Cities and Airports Worldwide in Database.
- 31,000+ Nav-Aids (Lights and Buoys) in Database.
- Capability of accuracy with 3 meters with WAAS fix.
- 100 Waypoints/200 Routes may be stored.
- User-selectable Data Fields.
- NMEA Data output.
- NMEA Data input (for connection to STANDARD HORIZON VHF Marine Transceivers).
- Unique Operating Pages, including NOTES and CONVERSION.
- 3 Year Limited Warranty, Lifetime Flat Rate Warranty.

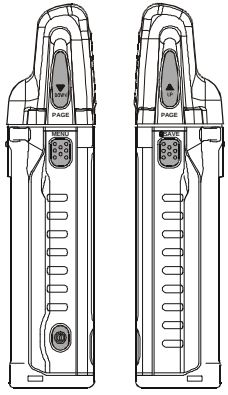
Important Notice

To reduce the risk of unsafe navigation, this owner's manual should be carefully reviewed and the information contained herein should be completely understood. When in actual use, be sure to compare the navigational data (lights, buoys, cities and airports) within the **MAGNUM** from all available navigation sources including the information from other NAVAID's visual sightings, and approved charts as the data provided is effective only at the time the product was produced. This is the sole risk and responsibility of the user.

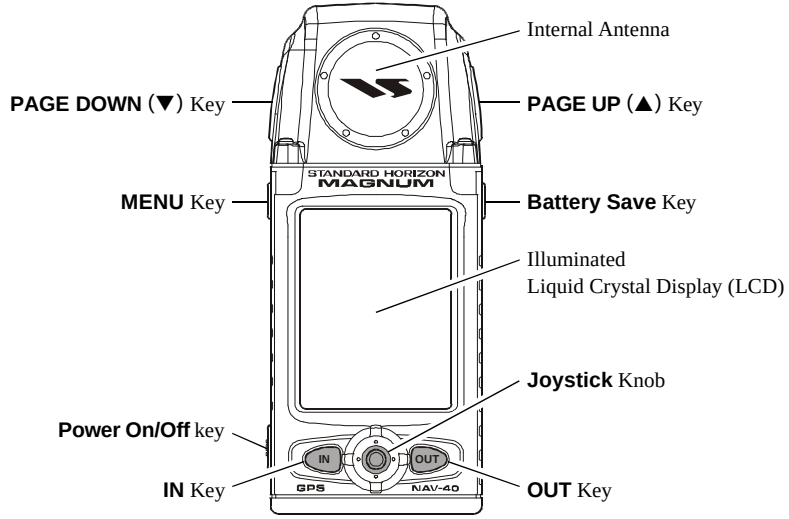
Before You Begin

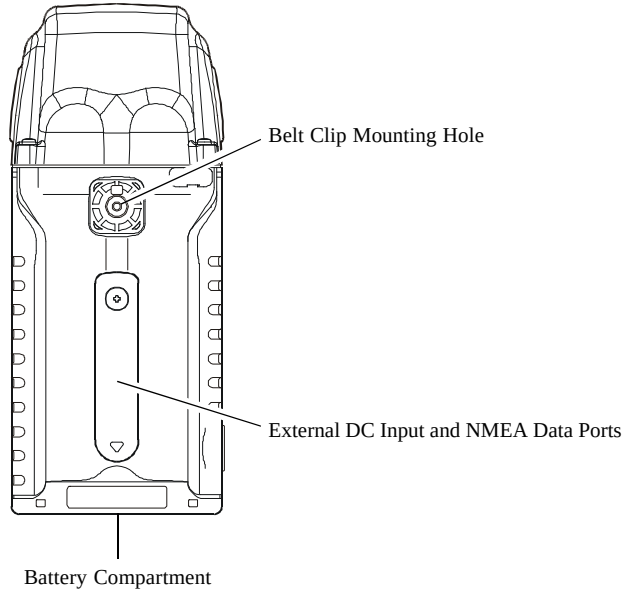
CAUTION: The Global Positioning System (GPS) is operated by the government of the United States, which is solely responsible for its accuracy and maintenance. The system is subject to system operational status changes which could affect the accuracy and performance of all GPS equipment.

Although the **MAGNUM NAV-40** is a precision electronic navigation aid, any navigation aid can be misused or misinterpreted and, therefore, become unsafe. Be sure to have multiple, redundant navigation aids available during maritime or other operation where personal safety is involved.

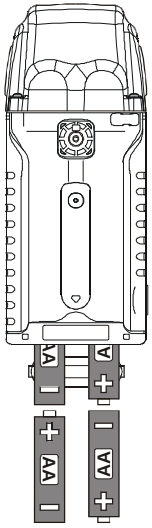


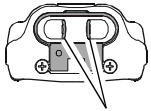
Left side Right side




Belt Clip Mounting Hole
External DC Input and NMEA Data Ports
Battery Compartment

INSTALLATION





Pinch the knobs

Battery Installation

The **MAGNUM** operates on four "AA" batteries (not supplied). Battery life, using AA cells, can exceed 50 hours of continuous use (Battery Saver mode).

To install the AA batteries:

1. Pinch the knobs of the battery cover on the bottom of the **MAGNUM**, then pivot the battery cover downward to open the battery cover.
2. Install the four batteries into the battery compartment. Be certain to align the batteries correctly (proper polarity) when inserting them into the battery compartment (follow the illustration on the bottom of the **MAGNUM**).
3. Pivot the battery cover upward to close the battery cover. Be careful that the O-ring is correctly positioned when closing, to ensure maximum integrity of the water-proofing of the **MAGNUM**.

Important Note: Stored position, waypoint, and other data will not be lost when batteries are replaced, as all such data is backed up by an internal lithium battery with an estimated life of at least five years.

However, you should not open the battery compartment while the **MAGNUM** is turned on (during operation). If this should occur, the current tracking data on the Track page will not be saved, and thus the current navigation Data will be lost.

Quick-Draw Belt Clip (CLIP-14) Installation

1. Connect the hanger to the rear of the **MAGNUM**, with the notch pointing directly up, using the supplied screw (Figure 1). ***Use only the screw included with the clip to mount the clip to the back of the* MAGNUM*!***
2. Clip the *Quick-Draw* Belt Clip onto your belt (Figure 2).
3. To install the **MAGNUM** into the *Quick-Draw* Belt Clip, align the hanger with the *Quick-Draw* Belt Clip, and slide the **MAGNUM** into its slot until a click is heard.
4. To remove the **MAGNUM** from the *Quick-Draw* Belt Clip, rotate the **MAGNUM** 180 degrees, then slide the **MAGNUM** out from the *Quick-Draw* Belt Clip (Figure 3).

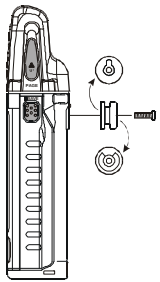


Figure 1

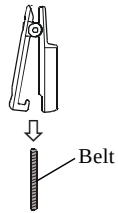


Figure 2

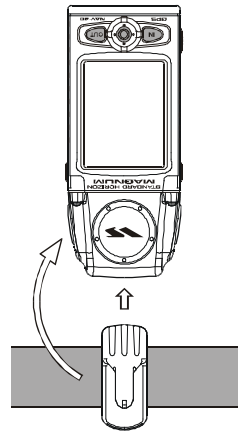
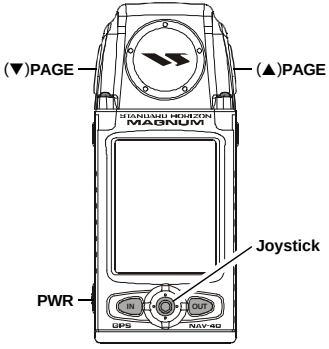


Figure 3

Hint: In order to prevent the **MAGNUM** from slipping off your belt (due to accidental twisting of the receiver when you sit down, for example), loop the hand strap inside your belt, then run the loop of the hand strap through the belt clip.

KEYPAD FUNCTIONS



[PWR] key

This key has two functions, depending on how long it is pressed. Press and hold in the [**PWR**] key to turn to the **MAGNUM** on or off.

Pressing the [**PWR**] key momentarily, while the **MAGNUM** is turned on, will switch the LCD's illumination off (or back on).

[(▼)PAGE]/[(▲)PAGE] keys

Press the [(▼)**PAGE**]/[(▲)**PAGE**] keys to select the desired page.

The available pages are: **GPS STATUS**, **TRACK**, **NAVIGATION**, **HIGHWAY**, **COMPASS**, **TREND**, **CELESTIAL**, **CONVERSION**, **NOTES**, **WORLD TIME**, and **TIMER**. These features will be explained in detail in the pages to follow.

These keys also are used to cancel the settings of items to be configured when using the menu system.

Joystick knob

The **Joystick** knob controls the Up/Down and Left/Right movement of the cursor (on the Track Page), and is also used to select options for operating functions.

When the cursor is moved off of the current position (the current position is called the Home mode), a window will appear that will show the distance, Bearing, and the Latitude/Longitude of the cursor's position.

Press the **Joystick** knob momentarily to enter the selected data, or to select the programmed value for a parameter. *This is the "**click**" command used extensively in this manual.*

[IN]/[OUT] key

Press the [**IN**] key to decrease the map scale (Zoom In), or press the [**OUT**] key to increase the map scale (Zoom Out) when on the Track Page.

[MENU] key

This key has two functions, depending on how long it is pressed.

Press the [**MENU**] key to open the menu window. During Menu operation, this key will also function as a "Back" key, allowing you to step back one page.

Pressing and holding in the [**MENU**] key will lock operation on the current page.

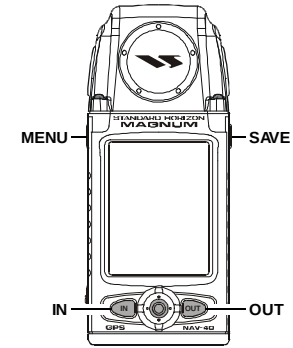
[SAVE] key

This key has two functions, depending on how long it is pressed.

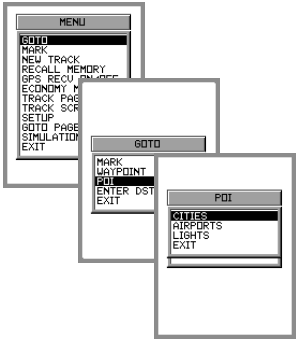
During navigation, pressing this key once when the cursor is shown on the Track Page ("Cursor Mode") will re-center the cursor onto your present location (this condition is known as the "Home Mode").

Press and hold the [**SAVE**] key for two seconds will activate the Battery Saver.

When the Battery Saver is engaged, the display will turn off to conserve battery capacity; however, the GPS receiver and its associated circuitry will still be active continuously, allowing a navigation "Track" to be maintained over a long time period. In this mode, you can expect battery life to be about 50 hours.



Operation Quick Start



1. Insert batteries into the battery compartment (see page 6).
2. Press and hold in the [**PWR**] key until the **MAGNUM** turns On (about 2 seconds).
3. The following "Sign-on Message" will be displayed:

> **CAUTION**
>
> **ALL INFORMATION IS FOR REFERENCE ONLY.**
> **BY USING THIS DEVICE YOU ASSUME TOTAL RESPONSIBILITY AND ASSOCIATED RISKS.**

   After reading the opening message, click the **Joystick** knob (press inward momentarily).
4. The **MAGNUM** will begin operation on the **GPS Status** page. Wait a few moments for several GPS satellites to be acquired. If you do not observe the icons depicting orbiting satellites signal strength appearing on the screen, you may be in a poor location for satellite reception; try moving to a less obstructed position. ***Note***: When the **MAGNUM** is first turned on, it may take several minutes to compute a fix of your location. This is normal, as the **MAGNUM** is downloading "almanac" information from the GPS satellites.
5. Because of the characteristics of GPS, it takes more time to find your location when you first turn on GPS unit or you moved long distance and turn on GPS unit.To shorten the time to acquire the satellites first time after you moved long distance, we recommned to choose nearest city from POI list in **MAGNUM** when you turn it on. Press the [**MENU**] key, move the **Joystick** knob downward to select "**GOTO**" at the top of the screen, then click on **GOTO**. Move the **Joystick** knob upward to select "**POI**," and click on that.

Move the **Joystick** knob down and select "**CITIES**" and click on that. Click once more, then use the **Joystick** knob to select the first letter of your city (for example, "**L**" for the first letter in "***LAS VEGAS***." Click on "**L**," then highlight "**A**" and click on it, then highlight to "**S**" and click on it. Now highlight "**OK**" and click on it. Highlight "**LAS VEGAS,NV,USA**, and click on it. Highlight **HOME LOCATION**, and click on it.

6. Press the [(▼)**PAGE**]/[(▲)**PAGE**] keys to select a different operating page. The [**IN**]/[**OUT**] keys and the **Joystick** knob may be utilized in operation on these pages; details will be provided in later discussions.
7. Press the [**MENU**] key momentarily to activate the Menu system, for custom configuration or setup of features to be used in operation.
8. To turn off the LCD's illumination (to extend battery life), press the [**PWR**] key momentarily. Repeat this process to turn the illumination back on.
9. At any time during operation, press and hold in the [**MENU**] key to lock operation on the currently-shown page.
10. The current level of battery capacity is shown along the "Title Bar" at the top left-hand corner of the LCD. A fully black battery icon indicates a full charge; a half-black battery icon indicates partial charge capacity, and a white battery icon indicates that the batteries are getting low.
11. Press and hold in the [**PWR**] key for two seconds to turn the **MAGNUM** off. After a brief sign-off message (**PLEASE WAIT...**), the **MAGNUM** will shut down. In this condition, the GPS receiver will not be active, and no tracking data will be recorded. However, the last data recorded by the **MAGNUM** at the time of shut-down *will* be retained in memory, and it will be available for reference the next time you turn your **MAGNUM** on.

Operation Quick Start

Battery Indicator

: Full charge
: Partial charge
: Batteries are getting low

TERMINOLOGY
Used for **MAGNUM NAV-40** Operation

The **MAGNUM** (**NAV-40**) is a high-performance Submersible Portable GPS receiver, with a wide variety of operating features that may be new to you. Let's take a moment to discuss the terminology used in the operation of the **MAGNUM NAV-40**.

PAGE

The **MAGNUM** has 11 pages used to show position, navigation, track, time, elevation, celestial, conversions, and notes. All pages have a number of operational options and features, depending on the nature of the Page that you are utilizing.

TRACK

The "Track" is a display of your journey, beginning with the starting point (denoted "S" on the map) and ending with the destination (denoted "D"). When you initiate a "New Track" during operation, the S symbol will appear at the beginning of your path, and D will appear when you end your journey and define the Destination point.

WAYPOINT

Along the "Track" you have created, you may wish to make a note of a position along the way, to help you find your way back along the track. These positions are called "Waypoints" and are different from "Marks" which are described next. If you create a "New Track" without saving the current Track, the Waypoints you may have created along the current Track will be deleted.

TERMINOLOGY
Used for **MAGNUM NAV-40** Operation

MARK

A "Mark" is similar to a "Waypoint," except a "Mark" is a position *not* related to a track or a route (i.e. something you might see in the distance, like a building, lighthouse, or mountain). If you save a "Mark," it may be recalled without having to recall a Track associated with it (only Waypoints are tied to a Track in this manner).

ROUTE

A "Route" is a sequence of waypoints connected by segments (or "legs") saved by the operator. The **MAGNUM** can convert a track to a route, or the user can select from a menu of saved waypoints and marks, to make up a route.

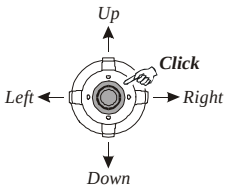
MEMORY

The **MAGNUM** has a non-volatile memory that backs up all stored tracks, routes, marks, waypoints, and other inputted data when turned off.

MOB (MAN OVERBOARD)

During navigation, the "**MOB**" feature provides a one-touch method of storing a location (such as the point where a crew member fell overboard). In this mode, the **MAGNUM** place a **MOB** point and all data shown is related to navigating back this point allowing you to retrace your path to the **MOB** point efficiently.

TERMINOLOGY
Used for **MAGNUM**
NAV-40 Operation



RECALL MEMORY

The "Recall Memory" feature allows you to recall a Route or Track previously stored into Memory.

RECALL LAST DATA

When the **MAGNUM**'s power is turned off, the last position at that moment will be stored into memory as a reference point. When you turn the **MAGNUM** on again, this reference point will be available as a new starting point

SIMULATION MODE

To practice the utilization of the **MAGNUM**'s many functions, especially indoors where GPS reception may be poor, a versatile "Simulation mode" is selectable from the menu. During Simulation Mode operation, the indication of GPS satellite reception, as well as all navigation data, will be imaginary, and must not be utilized for actual navigational purposes.

XTE (CROSS TRACKING ERROR)

Deviations from the selected destination path can be displayed as a Cross Track Error ("XTE") to allow you to make course corrections.

CLICK

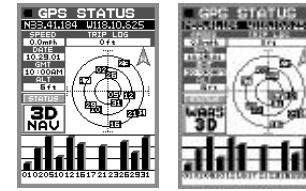
Pressing downward (momentarily) on the **Joystick** knob will select a function, such as initiating the marking of a Waypoint. You will be directed to "Click" this knob in most of the operating examples described later.

GPS Status

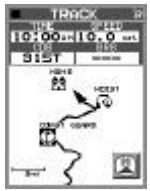
The **GPS Status** page provides display of the number of GPS satellites currently being displayed, along with a bar-graph representation of the relative signal strengths from these satellites.

When GPS reception is marginal, it may not be possible to calculate your current Altitude accurately. In this case, the notation "**2DNAV**" will appear in the window at the bottom left-hand side of the LCD. When reception improves, and the calculation of Altitude becomes possible, "**3DNAV**" will appear in the same window. If reception of the "WAAS" satellite(s) permits high-accuracy position determination, "**WAAS3D**"will appear in this window.

GPS STATUS



TRACK



: North UP

: Course UP

: Destination UP

Track

The **Track** page provides a track history, showing the path you have followed on your journey. This screen includes the capability to Zoom In and Zoom Out, to provide the most meaningful display of position possible. During the journey, clicking on the **Joystick** knob will allow you to note Waypoints, for future reference. By moving the **Joystick** knob, you can position the cursor in order to "Mark" locations of interest that are not along your current path.

The **Track** Page can be configured to include a grid or concentric circles from your current location, and to include data boxes indicating Speed, Odometer, and other navigation information of interest.

Both the Starting point and Destination point of your journey can be displayed, and the **MAGNUM**'s versatile navigation aids allow these locations to be utilized in a number of ways to allow efficient steering.

The perspective of the **Track** Page may be varied; selections include "***NORTH UP***," "***COURSE UP***" (your current direction is always shown as being straight ahead), and "***DESTINATION***" (the destination is always shown as being straight ahead, only available while navigating).

The data to be displayed on the **Track** Page may be selected using the Menu.

Navigation

The **Navigation** "Page" actually consists of two pages. **NAV1** is an abbreviated Navigation Page, containing 8 data boxes. **NAV2** is a more comprehensive page, containing 16 data boxes. Use the [**IN**] or [**OUT**] keys to toggle between these pages.

The data to be displayed on the **NAV1** page may be selected using the Menu.

Highway

This page is a depiction of a highway, with a cursor (arrow) showing your position as you are heading towards a destination. The "CDI" (Course Deviation Indication) width of the highway may be adjusted to make the display more accurate.

The data to be displayed on the Highway Page may be selected using the Menu.

Compass

The **Compass** page uses GPS data to assist your steering toward a particular course or point. Using the [**IN**] and [**OUT**] keys, you may choose to have either your current direction as the top of the compass (with the direction rotating below it), or to have North at the top, with a pointer indicating the direction of travel.

Operating Page Features & Functions

NAVIGATION

HIGHWAY

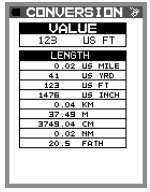
COMPASS

Course Up North Up

TREND

CELESTIAL

CONVERSION



Trend

This page shows the recent trend history of the altitude of a journey. Reception of the GPS satellites must be good in order for this feature to work correctly.

Celestial

The **Celestial** Page includes data from January 1, 2000 and ending December 31, 2040. Available data includes a calendar, moon phase, sunrise, sunset, moonrise, and moonset. Both the date and location pertaining to the celestial data may be modified, as needed, using the **MAGNUM**'s extensive database.

Conversion

The **Conversion** Page is a useful tool, allowing units of measure to be converted according to your needs. You may convert units of ***Length***, ***Area***, ***Volume***, ***Weight***, ***Temperature***, and ***Speed***, using Metric, English, or Nautical units of measure. The temperature option includes Fahrenheit, Celsius, and Kelvin conversions.

Notes

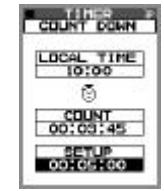
This page may be used as a “Note Pad” for trail or navigation notes, names and telephone numbers, or any other “Memo” information you might want to retain for future reference. The **MAGNUM** is supplied with a database of hotels, rental car agencies, and airlines, for your convenience.

World Time

A World Time Map is available, showing the current local time in two locations around the world. The time zones selected are highlighted on the display, and the general areas of daylight and darkness around the world are also noted. A database of major cities worldwide may be utilized in the setup of the World Time Page.

Timer

Five different versions of the **Timer** Page are available. These are displayed as “**COUNT UP**,” “**DISTANCE**,” “**INTERVAL**,” “**RACING DOWN**,” and “**COUNT DOWN**.”



NOTES

WORLD TIME

Menu System Contents

MENU

The Menu system of the **MAGNUM** is used for many start-up, configuration, and customization purposes. Each option on the main Menu screen may have several different parameters involved in its utilization; for now, we'll just discuss the main points of each Menu option, and details will follow in later chapters.

GOTO ("Go To")

While using the **MAGNUM**, you will probably store Waypoints or Marks during a journey. You may use the "**GOTO**" Menu selection to select a Mark, Waypoint, or "POI" (Point of Interest) and then GOTO that destination. You may also enter the Latitude and Longitude of a new Destination, and then GOTO that location. Waypoints and Marks may have their contents edited by clicking on the "**EDIT**" option after you have selected the Waypoint, in case you wish to modify any aspect of the stored data.

MARK

The "MARK" option allows you to enter a new Mark, Edit an existing Mark, or Delete existing Marks.

NEW TRACK

When starting a new journey, you'll want to begin with a fresh starting point. To do this, use the **Joystick** to select "**NEW TRACK**," then click on "**YES**" when the "**CONTINUE?**" pop-up window appears. A new message ("**PLEASE WAIT. . .**") will appear, and after a few seconds you will be returned to the **Track** page.

RECALL MEMORY

Selecting this Menu item allows you to recall and navigate a Track or Route.

GPS RECV ON/OFF

To conserve battery life, you can turn the GPS Receiver circuitry completely off (if, for example, you just want to enter items into the "Notes" memo pad, or do calculations using the Conversion or Celestial pages, for example. When the GPS receiver is Off, the "⌂" will appear in the Title Bar at the top of the LCD.

ECONOMY MODE

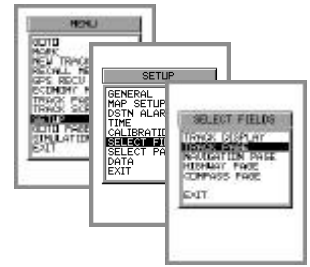
Battery conservation can also be achieved using the Economy Mode. When set to "**ON**" in the Menu, the Economy Mode causes the **MAGNUM** to poll the GPS satellites every 2 seconds, thus reducing current drain. When the Economy Mode is set to "**ON**," "E" will appear in the Title Bar at the top of the LCD.

TRACK PAGE DATA

The **Track** Page may be set up to include four important data boxes, such as Speed, Course over Ground, Odometer, etc. These boxes may be defined by entering the Menu, then clicking on "**SETUP**" ⇨ "**SELECT FIELDS**" ⇨ "**TRACK PAGE**" and clicking on the boxes corresponding to the features desired (you must de-select an item first if four selections have already been made).

For maximum available map area on the **Track** Page, the Track Page Data may also be switched Off. Click on "**EXIT**" when you have completed the setup.

MENU



MENU

Orientation

Click

: North UP

: Course UP

: Destination UP

TRACK SCREEN

Several aspects of the **Track** Page may be configured by the user:

Orientation Selections include "Course Up," "North Up," and "Destination Up." Clicking on the Icon in the bottom right corner will toggle among these three settings.

Forward Wide When this selection is set to "Off," your current location will be centered on the Track screen. When this selection is set to "On," your current location will be centered along the bottom edge of the Track screen, so that a greater area above your location is shown on the screen.

Grid A rectangular-coordinate or circular grid may be superimposed on the screen, if desired.

Auto Zoom If this parameter is set to "On," the scale of the map will be decreased (Zoom In) automatically when nearing a Waypoint.

SETUP

This selection is used for a number of aspects of **MAGNUM** configuration, including ***GENERAL***, ***MAP SETUP***, ***ALARMS***, ***TIME***, ***HIGHWAY***, and ***SELECTING FIELDS***.

GOTO PAGES

This Menu selection provides one-touch access to any of the 11 Operating Function Pages.

SIMULATION MODE

If you wish to practice the use of the **MAGNUM**'s features, without using GPS satellites for actual navigation (for example, to practice indoors), you may use the Simulation Mode. Waypoints or Marks that have previously been stored will be available for use during your practice. When the Simulation Mode is set to "**ON**," the "S" will appear in the Title Bar at the top of the LCD.

Note: even though the display will appear to indicate reception of the GPS satellites, this is just a simulation, as no reception is taking place. Be sure that the Simulation Mode is turned OFF during actual navigation.

EXIT

When all Menu configuration work has been completed, clicking on "**EXIT**" will return you to the last-selected (Operating Function) Page.

MENU

The early discussions of **MAGNUM** operation will provide you with the tools to perform the most commonly-required navigation procedures. Later, we'll discuss some of the more advanced concepts, but only after you're familiar with the basic operation of this versatile GPS receiver.

LEARNING TO NAVIGATE

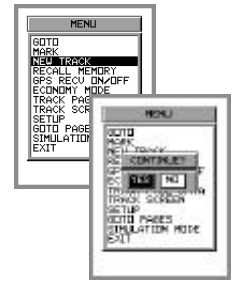
Our first chapter will guide you through your first minutes of operation of the **MAGNUM**.

1. After installing fresh batteries, press and hold in the [**PWR**] key until the **MAGNUM** turns on.
2. The opening message will appear. If you do nothing, this message will disappear after ten seconds, and the "**GPS STATUS**" page will appear. If you wish to move to the **GPS STATUS** page before the ten seconds has expired, just click the **Joystick**.
3. The **MAGNUM** will now begin acquiring signals from the GPS constellation of satellites. At first, "**SEARCH**" will be shown in the bottom left-hand corner box on the **GPS STATUS** page.
4. The first time the **MAGNUM** is turned on (or if you have not used it for a long time), it may take as long as five minutes to acquire enough satellites, and download the "almanac" data necessary to update your **MAGNUM**'s database. This is normal, and in the future it will not take so long. We recommend that you leave the **MAGNUM** on the **GPS STATUS** page, without changing pages, the first time you use it. When a fix has been satisfactorily established, the **MAGNUM** will automatically switch itself to the **TRACK** screen.
5. Once on the **TRACK** screen, your current location will be denoted by a black triangle. Now walk away from your current location for at least two minutes; you should see your position move away from the starting point

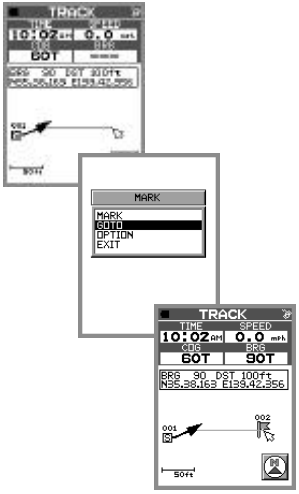
(shown as [IN] on the screen). If the map scale is too large, use the [**IN**] key to "Zoom In" to a more useful scale. Note also that, your walking speed has appeared in the Track Data box at the top of the page (the **MAGNUM** updates your location every 1 second, and updates the track every 15 seconds as a default setting.

6. If you make a 90º turn to the left or the right, you should see your trail changing direction. Now turn around, and use the **MAGNUM**'s Track screen to help you re-trace your steps back to your original location.
7. Now, let's erase what we just did, and get you ready for another journey. Press the [**MENU**] key momentarily, then angle the **Joystick** downward (do not press inward). Move the **Joystick** downward to "**NEW TRACK**." Now click the **Joystick**.
8. A pop-up window will appear, asking you "**CONTINUE?**" Use the **Joystick** select "**YES**," then click the **Joystick**.
9. You will see the message "**PLEASE WAIT**" for a few seconds, after which the Track page will re-appear. You have now established a fresh starting point, and your previous track has been erased.

Congratulations! You've just taken the first steps in learning how to retrace a track, using the Track page. Now let's learn how to go to a location.



"GOTO" TO A LOCATION



"GOTO" A LOCATION

Now let's pick a point away from our current location, and learn how to navigate to this new point.

1. First, set the Scale to a "smaller-scale" value using the [**IN**] key (you should see "50 ft" or "120 ft" displayed in the lower left corner of the LCD).
2. Now move the **Joystick** to the right for about two seconds, so that a small line and an arrow (the "cursor") appears to the right of your current location. Release the **Joystick** at this point, and then angle it downward for about one second. The **MAGNUM** is now operating in the "Cursor Mode." The location of the cursor represents some arbitrary point to the east and south of your current position.
3. Click the **Joystick**. A new pop-up box, named '**MARK**,' will appear.
4. The "**MARK**" selection will be highlighted; move the **Joystick** downward to "**GOTO**," and click the **Joystick**.
5. Now, you will see the **Track** page again, and a small icon will appear by the cursor, as well as a cursor data box; the cursor Data box, showns the Bearing ("**BRG**") and Distance ("**DST**") from your current location to the point you marked in step 3. This new point, by the way, is called a "Mark." If you orient yourself at the proper heading (for example, about 125 degrees True) and start walking, you will be moving in the direction of the new Mark. If you carefully follow the bearing line that was created when you made the Mark, you will steer directly toward the Mark.
6. Now press the [(▲)**PAGE**] key momentarily three times, to bring up the **COMPASS1** Page. You will see a depiction of a Compass, with two indica-

tors. The large arrow shows the direction you need to be moving in order to reach the new Mark, and the thin line shows your current direction of travel.

7. Now press the [**OUT**] key once. The page will change to the **COMPASS2** page, where a very large arrow will depict your current direction of travel, and the thin line will show the direction you must travel in order to reach the Mark. After noting these two COMPASS screens, press the [(▼)**PAGE**] key three times to return to the Track screen.
8. If you have been walking along the proper course (and if the Mark you created isn't too far away!), you may be getting close to the Mark. As you near this point, you will hear an "Alarm" beeper sounding, and the display will show "**APPROACHING DESTINATION**." You may click the **Joystick** once to silence the beeper.

You have now learned the technique for going from "Point A" (your original location) to "Point B" (the arbitrary Mark you created) using the cursor.

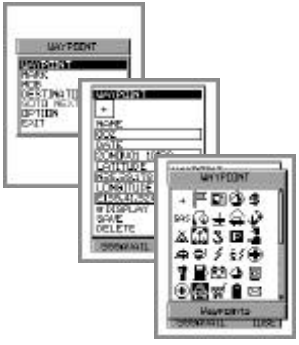
NAVIGATING TO A POINT OF INTEREST
(City, Airport, Lighthouse)

Let's say you are in Los Angeles, California (USA), and want to find the most direct route (as the crow flies) to San Diego, California. The **MAGNUM** can do this very easily.

1. Press [**MENU**] key, and select "**GOTO**" from the pop-up window. Click on this selection.
2. In the "**GOTO**" window, highlight "**POI**" ("Points of Interest") and click on that selection. Please note also the other selections: **MARK**, **WAYPOINT**, and **ENTER DSTN**.
3. In the "**POI**" window, highlight "**CITIES**," and click on that selection.
4. In the "**CITY**" window, you will be asked for the name of the City. Highlight "**OK**" and click on it, the **MAGNUM** will show a alphabetical search engine. Click on the first character location of the blank line near the top of the screen.
5. Now use the **Joystick** to highlight to the letter "**S**" and click on that letter. Note that "**S**" now appears in the previously-blank line, and the high-lighted box has moved to the right. Now highlight to "**A**" and click on it, and then highlight "**N**" and click on that letter.
6. Now highlight the "**OK**" box and click on it.
7. The city list will now appear, and you will be at the top of the "**SAN**" cities. Move down to the bottom of the page, and click on "**SANDIEGO,CA,USA**" at the bottom of the page.
8. Now you will be in a "**CITY**" pop-up window, and "**GOTO**" will be high-lighted. Click on "**GOTO**."

9. The **MAGNUM** will display the Track page showing San Diego, along with a Bearing line from your current position to San Diego. At the top of the track page, data box's show the Bearing to San Diego, the Distance to San Diego, and the Latitude/Longitude of San Diego!
10. Press the [**SAVE**] key to change from cursor mode to home mode. If your vehicle, boat, or airplane is in motion, the black triangle representing your position will move. Use the [**IN**] and [**OUT**] keys to adjust the scale of the page, if needed.
11. If you are traveling to San Diego, a "Destination Alarm" will sound when you near your destination.

Creating a "Track" and Storing it into Memory



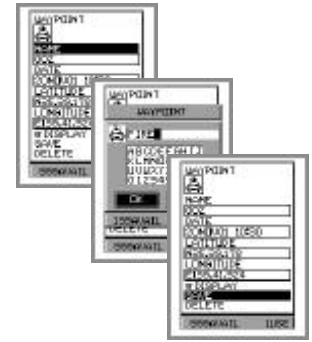
One of the most powerful features of the **MAGNUM** is its ability to store and recall records of track, or convert tracks into routes. When using the "New Track" feature, you can mark Waypoints that can help guide you to your starting point (if you are returning home from a day of fishing, for example), and this section will describe how to create, label, and utilize this information. Let's do some exploring around your neighborhood.

1. Begin by turning your **MAGNUM** on, and wait for the receiver to acquire a "fix" on your position; you will automatically be taken to the **Track** page.
2. Press the [**MENU**] key, and use the **Joystick** knob to select "**NEW TRACK**" from the available selections. Click on this selection.
3. Use the [**IN**] key to zoom in on your position (use the "80 ft" or "120 ft" selection).
4. Now begin walking away from your current location. Make some wide turns left and right over the course of about 300 feet, and then stop at some landmark like a fire hydrant. Click the **Joystick** knob once.
5. A pop-up box will appear, entitled "**WAYPOINT**." Move downward using the **Joystick** knob to select the "**WAYPOINT**" option, then click on that selection.
6. Move downward using the **Joystick** knob to select "**WAYPOINT**" again; and click on this selection.
7. You will now be prompted to select an icon to be appended to this Waypoint; more the **Joystick** knob down to select the icon of an emergency vehicle, and click on that selection.
8. Move the **Joystick** knob to select the "**NAME**" field, and click on that selec-

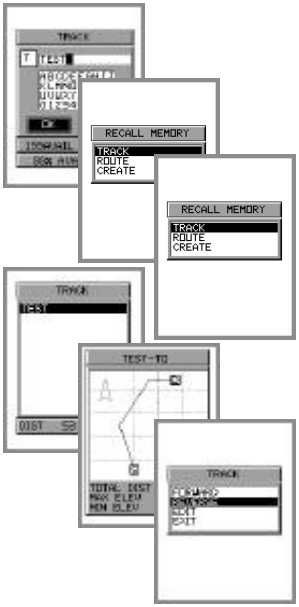
tion.

9. You will now be prompted to create a name for the Waypoint. Click once, and one of the characters below the current name (which is probably "**002**" or similar) will be high-lighted, as will the first character in the current name. Move the **Joystick** knob to select the first letter of the new name (use "F" to make the name "FIRE"). Click on the "**F**." Notice that you are now being prompted for the second character of the name. Highlight to "**I**" and click on that letter, then highlight to "**R**" and "**E**" similarly, clicking on each of those letters; when you are one, highlight to "**OK**" and click on it.
   Note: if you make a mistake in labeling, move up to the "Name" line, high-light the incorrect character, click on it, then move down to the correct letter and click on it.
10. The **MAGNUM** will now show the main "**WAYPOINT**" pop-up window, on the "**SAVE**" selection. Click on it. You have now saved and labeled a Waypoint.
11. Continue walking, but make a broad "S" turn over the course of the next 300 feet, then stop again at another landmark (such as a tree). Stop, and click once. Using the same procedure as you followed in steps 5 - 10 above, label this Waypoint "TREE" and be sure to click on "**SAVE**" when prompted.
12. Make a 90º turn with respect to your previous direction of travel, and walk about 200 feet, and then click once.
13. This time, when the "**WAYPOINT**" pop-up window appears, highlight to "**DESTINATION**," and click on that selection. The "**TRACK**" pop-up window will now appear. You will be prompted to name the "Track" (journey) you just "completed."

Creating a "Track" and Storing it into Memory

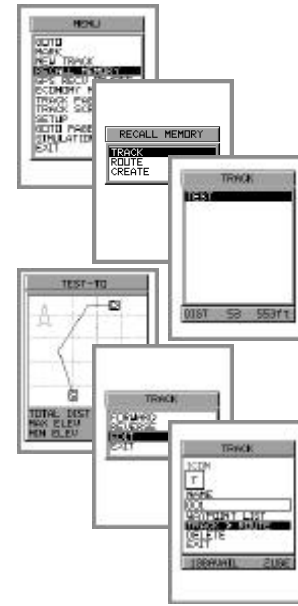


Creating a "Track" and Storing it into Memory



14. Click on the first character, and assign "TEST" as the name of the Track. Highlight to, and click on, the letters "**T**" "**E**" "**S**" "**T**" in that order, then click on "**OK**" when done.
    You have now stored a complete track into memory. You may keep on tracking from your current location; for example, if you just want to return to your destination, turn around, and follow the path on the screen back to the origin. Instead, though, walk to some point off of the previous course. How can you find your way home now?
15. Press [**MENU**] key, and select "**RECALL MEMORY**" from the pop-up window. Click on this selection.
16. From the next pop-up window, select "**TRACK**" (because you stored a Track).
17. In the next pop-up window, click on "**TEST**," which is the track you stored. At this point, a map showing the track you made and saved earlier will appear. Now will want to find your way home; click once on this screen, and select "**REVERSE**" from the next pop-up window. You will be shown a Bearing and Distance to the original Start point, so you could just follow that Bearing if there were no obstructions.
18. Press the [**SAVE**] key momentarily to change from cursor mode to home mode, and you will now be tracking your way back to the original Start point; note that there is a straight-line path also shown – this provides you the shortest-distance path, but you can also see the original Waypoints and path, if you need to follow the original Track (if you were re-tracing your steps in a city, for example). When you approach the original Start point, the Destination Alarm will sound; click once to silence it.

Creating a "Track" and Storing it into Memory



Finally, remember all the "S" turns that were in the original Track? That replicates what your journey might look like if you were trolling in a fishing boat. When the day is done, however, and you're low on fuel, how do you find the shortest way home?

19. Press [**MENU**] key, and select "**RECALL MEMORY**" from the pop-up window. Click on this selection.
20. Click on "**TRACK**" in the "**RECALL MEMORY**" window, then click on "**TEST**" in the "**TRACK**" window.
21. When the stored Track appears, click once. The "**TRACK**" window will appear; move one position upward to "**EDIT**," and click on this selection.
22. In the next "**TRACK**" window, move two positions upward to the "**TRACK > ROUTE**" selection; click on this.
    Warning: *what you are about to do will erase your* Track, and change it into a "Route."
23. Select "**YES**" in the "**CONTINUE?**" box, and click on it. Click on "**EXIT**" in the next box.
24. Now you will be back in normal operation. Press the [**MENU**] key once, then move to and click on "**RECALL MEMORY**" as before.
25. In the **RECALL MEMORY** pop-up window, select and click on "**ROUTE**." You will now be taken to a "**ROUTE**" pop-up window, and you will observe "**TEST**" in this window! Click on **TEST**.
26. A new page will appear, showing the same Start and Destination points that were on the TEST *Track*, but without all the S-turns between the Waypoints. You have now straightened out the turns, and this represents the shortest way

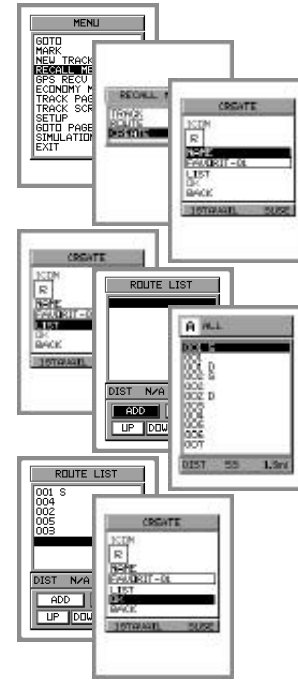
to navigate the original journey, minus the turns not associated with the Waypoints. Click here.

27. A **ROUTE** window is now shown, that has "**FORWARD**" and "**REVERSE**" options. If you choose **FORWARD**, you will be shown Bearing and Distance to the original ***Destination*** point; if you choose **REVERSE**, however, you will be shown Bearing and Distance to the original ***Start*** point.
28. To show the shortest distance to the next waypoint; on the **WAYPOINT** window, select "**GOTO NEXT POINT**," and click on it. Answer "**YES**" to the next prompt, and a new line will show the direct path to the next Waypoint. Repeat this process for each Waypoint, and you'll see the new line changing position.

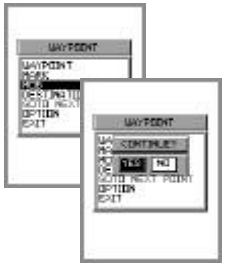
Creating a "Route" and Storing it into Memory

The **MAGNUM** has the capability to make a route from prevously stored marks and waypoints.

1. With the **MAGNUM** turned on press the [**MENU**] key, highlight "**RECALL MEMORY**" and click on this selection.
2. Highlight "**CREATE**" and click on this selection.
3. A "**CREATE**" pop-up window will be shown. To begin, choose and enter in a name for the route.
4. After completing step 3, move the **Joystick** knob down to highlight "**LIST**" and click on this selection.
5. A "**ROUTE LIST**" pop-up window will be shown, select "**ADD**" and click to enter.
6. Highlight the first mark or waypoint to be the first point in the route leg and click to enter.
7. Repeat steps 4-6 to enter in other legs of the route.
8. If you made a mistake in the order of selected marks or waypoints in the route, you can change the order by simply highlighting the mark or waypoint you desire to move, then push the **Joystick** to the right to hightlight "**UP**" or "**DOWN**." Click to move the item.
9. When finished move the **Joystick** to the right to highlight "**OK**" and click to save the route into memory.



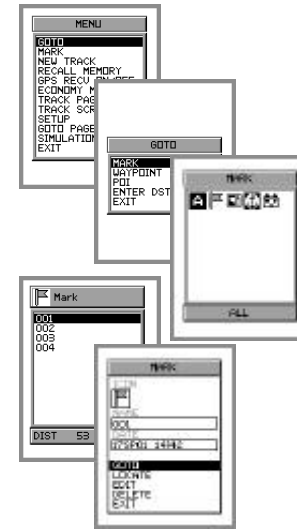
MOB (MAN OVERBOARD!)



In the event that you have a "Man Overboard" situation, or some other situation requiring quick, clear setting of a location so you can navigate back to it, the "**MOB**" (**M**an **O**ver**B**oard) feature is provided. Begin on the Track page.

1. Let's say that you have an "**Man Overboard**" situation while you are tracking your current journey. Immediately click on the **Joystick** knob.
2. The "**WAYPOINT**" pop-up window will appear. Use the **Joystick** knob to highlight "**MOB**" and click on it. Click on "**YES**" when asked if you want to "**CONTINUE**."
3. A new Track screen will be created. The **MOB** point will be shown as "S," and as you move away from the **MOB** point, both your track and a direct-bearing line back to the **MOB** point will be shown; graphically, therefore, you will always know the shortest distance to the **MOB** point.
4. If you are some distance away from the **MOB** point, use the **Joystick** knob to navigate the cursor so it is pointing directly onto the S corresponding to the **MOB** point. The cursor data box will appear, showing the Bearing and Distance to the **MOB** point, as well as the Latitude and Longitude of the **MOB** point (so you can notify rescue personnel as to the location of the emergency).

SAVING/RECALLING MARK/ WAYPOINTS



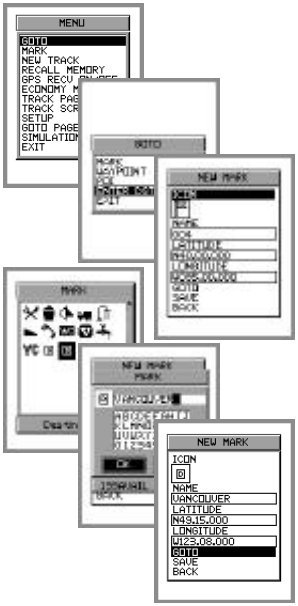
In the previous discussions, we discussed a method of marking, identifying, and naming a location. The **MAGNUM** includes special tools that help you remember what the various Marks and Waypoints represent.

As you define Marks and Waypoints, you will assign different icons to aid in identification.

1. Store about six Marks into memory. Assign two or three of them the same icon, and assign different icons to the others.
2. Press the [**MENU**] key, and use the **Joystick** knob to highlight "**GOTO**." Click on this selection.
3. The "**GOTO**" pop-window will appear. Highlight "**MARK**" and click on it.
4 The "**MARK**" pop-up window will appear. You will notice that the icons corresponding to the icons you just stored into memory are on the screen. At the upper left-hand corner of the pop-up window, an "A" is shown.
5. If you click on the "A" the Mark numbers for *ALL* of the Marks will appear. If you click on any of the icons, only the marks corresponding to that icon will be displayed. If you click on the icon which you assigned multiple times in step (1), you will notice that all those numbers appear on the number list.
6. You may now click on the Mark you wish to "Go To," then click on "**GOTO**" in the next "**MARK**" pop-up window, and you will be returned to the track screen.

Note: If you get a pop-window warning you that the "**Destination is Already Present**," the **MAGNUM** is simply advising that you are already going to a destination. The "***STOP***" selection will stop the **MAGNUM** navigating to the destination, and the "***START***" selection will start navigation to the new destination.

GOTO a Destination using Latitude/Longitude



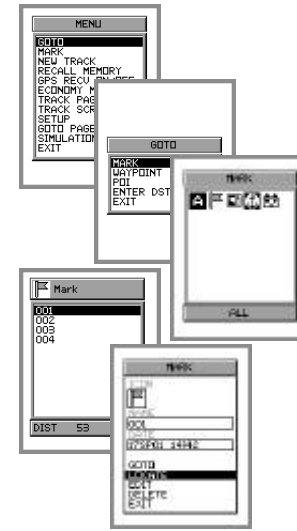
Frequently you will know the Latitude and Longitude of a desired destination. You can enter position information directly so as to define a destination.

1. Press the [**MENU**] key, and highlight the "**GOTO**" selection; click on this selection.
2. The "**GOTO**" pop-up window will appear. Highlight the "**ENTER DSTN**" selection, and click on it.
3. The "**NEW MARK**" pop-up window will appear. Click on "**ICON**," then select the icon you wish to use to signify the destination. Note that "" is available, at the bottom of the list. Click on the icon you wish to use.
4. Now highlight to the "**NAME**" field, and click on it. Let's say that we're navigating to Vancouver, BC, Canada; in the "**MARK**" pop-up window, use the techniques described previously to name "**VANCOUVER**," clicking on "**OK**" when done.
5. Now highlight the "**LATITUDE**" field, and click on it. Use the **Joystick** knob to enter "**N49.15.000**" as the Latitude, and click when done.
6. Next, highlight the "**LONGITUDE**" field, and click on it. Use the **Joystick** knob to enter "**W123.08.000**" as the Longitude, and click when done.
7. Highlight the "**GOTO**" selection, and click on it. The Track page will appear in a few seconds, and the small data box will show the bearing and distance to Vancouver (along with Vancouver's Latitude and Longitude).

Locating a Mark or Waypoint

It's easy to determine your Distance and Bearing to a distant Mark or Waypoint. Select the Track page.

1. Press the [**MENU**] key, then highlight the "**GOTO**"; click on this selection.
2. The "**GOTO**" pop-up window will now appear. If you want to look at a Mark, highlight "**MARK**" and click on it; in the case of a Waypoint, highlight and click on "**WAYPOINT**." For now, let's use "**MARK**," presuming you have some points marked already.
3. The "**MARK**" pop-up window will appear. If you know the icon associated with the Mark you wish to find, click on it; otherwise, click on "" to view all the Marks.
4. Choose the Mark you wish to find, and click on its number; in the next pop-up window, highlight "**LOCATE**," and click on it.
5. The Track screen will appear, with the chosen Mark shown, along with a pop-up window showing the Bearing and Distance from your current location to the Mark. The Latitude and Longitude of the Mark will also be shown.
6. Press the [**SAVE**] key to switch from the Cursor mode to the Home mode.



Determining Bearing/ Distance Between Two Distant Points

There are times when it might be useful to be able to describe the Bearing and Distance between two points, neither of which is your current location. This is easy to accomplish, using the "Cursor Mode" of the **MAGNUM**.

1. Use the **Joystick** knob to move the cursor to "**Point A**," which is the starting point from which you wish to measure. Press ***and hold in*** the **Joystick** knob for about two seconds, until you hear the second "Beep."
2. After releasing the **Joystick** knob, now highlight ending "**Point B**," the Bearing and Distance of which (relative to **Point A**) you wish to measure. Click once.
3. In the cursor window, you will now see a small field to the left, showing the general direction and the Bearing in degrees from Point A to Point B (for example, "**SE 143**" which corresponds to "***Southeast, 143 Degrees***"). In the right side of the pop-up window, you'll see the distance from **Point A** to **Point B**. The Latitude and Longitude of Point B will also be shown.
4. Press the [**SAVE**] key to return from cursor mode to home mode.

Deleting a Mark

If you decide you no longer need a Mark, it is easy to delete it.

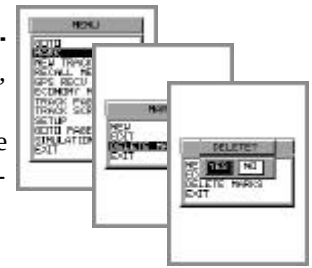
1. Press the [**MENU**] key, then highlight "**MARK**" and click on this selection.
2. In the "**MARK**" pop-up window, highlight "**EDIT**" and click on it.
3. The "**MARK**" pop-up window (including icons) will appear. Highlight the icon corresponding to the Mark you wish to delete, and click on it (alternatively, you may click on "**A**" ("All").
4. From the "**MARK**" number list, highlight the Mark number that you wish to delete, and click on it.
5. In the information box for that Mark, highlight "**DELETE**" and click on it. At the prompt, confirm your selection by clicking on "**YES**."
6. Press the [**MENU**] key, then click on "**EXIT**" in the Mark screen.

Deleting All Marks

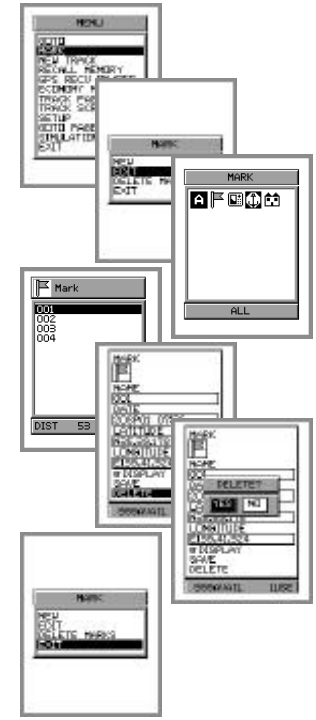
If you wish to delete ***all*** the Marks you have stored, this is also easy to do.

1. Press the [**MENU**] key, then highlight "**MARK**." Click on this selection.
2. In the "**MARK**" pop-up window, highlight "**DELETE MARKS**" and click on it. At the prompt, confirm your selection by clicking on "**YES**."
3. After a few seconds, you will be returned to the Track screen, with all marks having been deleted.

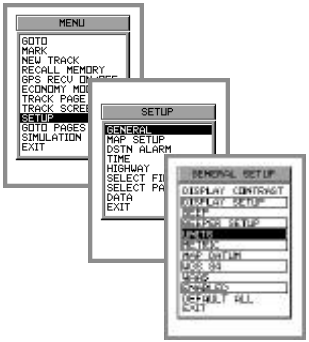
Deleting All Marks



Deleting a Mark



Changing the Units of Measure



The units of measure may be changed, between three selections: "Statute," "Metric," and "Nautical."

1. Press the [**MENU**] key, then highlight "**SETUP**" selection; click on this selection.
2. Highlight the "**GENERAL**" selection, and click on it.
3. Highlight the "**UNITS**" field, and click on it.
4. The selection box below will expand, and you may now highlight the units of measure you prefer. Click on your preferred selection.
5. Highlight the "**EXIT**" selection, and click on it. You will now be returned to the screen you previously were using.

Congratulations! You have now mastered the basics of navigation using the **MAGNUM**!

USING THE NAVIGATION PAGES

Now that you've become familiar with the basic steps used in Navigation, let's look at some of the data that is calculated by the **MAGNUM** to make your journey even easier!

From the Track screen, press the [(▲)**PAGE**] once; this will show on the "**NAV1**" screen, which is a subset of the total data available. We'll come back to the **NAV1** page in a moment, but for now please press the [**OUT**] key once; this will switch to the (more comprehensive) "**NAV2**" page.

On the **NAV2** page, you have a complete table of data that is either (A) received from the GPS satellites, or (B) calculated by the **MAGNUM** based on the received data. These fields include:

Compass — Your current course is shown at the top of the LCD.

Lat./Long. — Latitude and Longitude are shown just below the Compass.

Altitude — Calculated if reception permits "3D" navigation.

Time — Received from the GPS satellites.

Speed — Calculated when you are in motion.

Avg. Speed — The average speed, calculated over time.

Max. Speed — The maximum speed calculated on your journey.

VMG — Velocity Made Good: when following an indirect course (one not on a direct bearing between the Start and Destination points), VMG is the net effective speed calculated along the direct bearing path. In other words, you might have to tack back and forth at a Speed Over Ground of seven knots to produce a VMG of three knots.

Using the NAVIGATION Pages

COG Course Over Ground (your current direction). Both "**True**" ("**T**") and "**Magnetic** ("**M**") options are available.

BRG Bearing towards your destination (will show "- - -" if no destination is defined). If there are Waypoints along the way, the Bearing shown will be *toward the next Waypoint.* Both "**True**" ("**T**") and "**Magnetic** ("**M**") options are available.

XTE Cross Tracking Error: shows your deviation from the original course toward your destination.

Trip Log This is an odometer showing the distance traveled on the current Track. It is reset to zero when you select "New Track" in the Menu.

Trip Odom. This is an odometer showing the total distance traveled since you last reset the odometer (see page 46).

Trip Time This is the elapsed time for the current Track. It is reset to zero when you select "New Track" in the Menu.

ETA to Dstn. This is the estimated time of arrival to your destination, based on the Average Speed calculated above.

Dist. to Dstn. This is the distance to your destination (presuming you follow a direct route to the destination).

ETA to Next WP This is the estimated time of arrival at the next Waypoint.

Dist. To Next WP This is the distance to the next Waypoint.

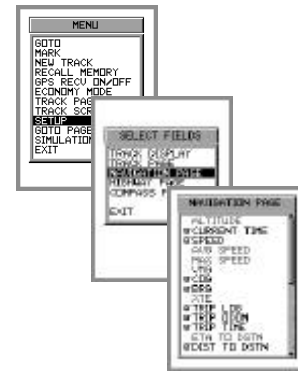
Now, some of the information provided on the **NAV2** may not be of particular interest to you, so a condensed navigation data page, called "**NAV1**," allows you

USING THE NAVIGATION PAGES

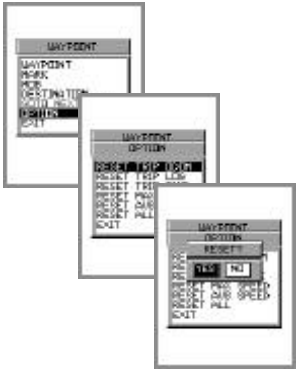
to see 8 of the above 16 data fields, in a larger font for easier viewing. The fields to be displayed in the **NAV1** screen may be selected by you to provide the most useful data, and since **NAV1** is the default Navigation page, the ability to select these data fields is a tremendous convenience feature.

Here's how to select the displayed fields for the **NAV1** page:

1. Use the [(▼)**PAGE**]/[(▲)**PAGE**] keys to select **NAV1**, then press the [**MENU**] key once to enter the Menu.
2. Push the **Joystick** knob upward to highlight "**SETUP**" and click on "**SETUP**."
3. Push the **Joystick** knob upward to highlight the "**SELECT FIELDS**" and click on "**SELECT FIELDS**."
4. Push the **Joystick** knob upward to highlight the "**NAVIGATION PAGE**" selection.
5. Click on the **NAVIGATION PAGE** selection.
6. You will now see a series of boxes identifying all the features described above (except the Compass and Latitude/Longitude fields, which always appear on both Navigation pages). The fields currently being displayed on the **NAV1** page are shown in Bold font, and the small box to the left of the description has an "✓" in it. If all eight fields have been selected for display on **NAV1**, the other fields will be in a lighter font, and no boxes will appear by them; this signifies that it is not possible to add another field without removing a currently-selected one.
7. Just for practice, use the **Joystick** knob to high-light "**TRIP LOG**," then click on this selection. You will observe that small boxes now appear by *all* the



USING THE NAVIGATION PAGES



selections, with the "✓" inside the box showing which fields are being displayed (note also that the box by the **TRIP LOG** selection is now vacant). Now press the [**MENU**] key once, then click on "**EXIT**" the **NAV1** screen will be shown with one field missing in the bottom right-hand corner.

8. Once more, press the [**MENU**] key to return to the Menu, then click on **SETUP ⇨ SELECT FIELDS ⇨ NAVIGATION PAGE**, and then click on one of the open boxes (try "**BEARING**" for this test). You'll notice that the screen will revert to one where the eight selected fields are in bold font, and the remainder are not; this indicates that all fields are now full. Click on **EXIT** (at the bottom of the selection screen), the **NAV1** screen. Now shows the "Bearing" selection.
9. As a reminder, pressing the [**IN**]/[**OUT**] keys will toggle you between the **NAV1** and **NAV2** screens.
10. If you want to reset any of the Odometers, or reset other parameters, just click the **Joystick** at any time. The "**WAYPOINT**" pop-up window will appear; use the Joystick to select **OPTION**, then click on **OPTION**, and select (for example) **RESET TRIP ODOM**, then click on that item. Select "**YES**" and click on "**YES**" when prompted, then click on **EXIT** to return to normal operation. The available parameters in this procedure are:
    - **RESET TRIP ODOM**(eter)
    - **RESET TRIP LOG**
    - **RESET TRIP TIME**
    - **RESET MAX SPEED**
    - **RESET AVG SPEED**
    - **RESET ALL**

11. If you wish to lock operation on either Navigation page, press and hold in the [**MENU**] key for about two seconds (until you hear a long beep). The "🔒" icon will appear in the Title Bar at the top of the LCD.

USING THE TRACK SCREEN

We've already discussed the basic steps in navigating using the Track screen. In that exercise, we used the **Joystick** knob to move the cursor to a point away from our current location, and we also have used the [**IN**]/[**OUT**] keys to change the map scale on the track screen. But there is much more we can do on this display.

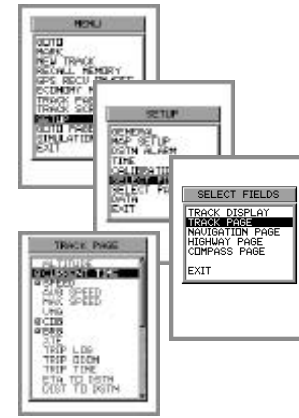
The **Track** screen may be customized, much in the same way that we just customized the **NAV1** page, and there are two ways in which we may change the way the Track page displays information for us.

On the main **Track** page, by default, a four-field data display will appear, with the same data available as on the **NAV1** page (with the exception of Compass and Latitude/Longitude). If you have started a New Track, per our previous exercises, you can see your current Latitude and Longitude by moving the **Joystick** momentarily any direction for just an instant. This will create a tiny offset from your current position as though you were going to make a Mark right next to you, and it is a convenient means of adding this information to the screen. The Bearing and Distance from your current location will also be shown, and if you just touched the **Joystick** for an instant, both of these should be "**0**." For now, press the [**SAVE**] key momentarily to return to the Home mode from the Cursor mode.

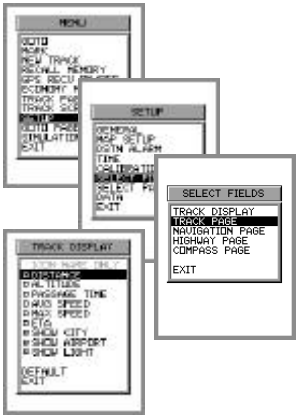
USING THE TRACK SCREEN

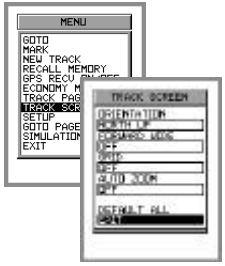
To change the parameters displayed on the Track page, use the following procedure, which is identical to that used for setting up the Navigation page, (a maximum of four fields may be selected, however):

1. Select the Track page, using the [(▼)**PAGE**]/[(▲)**PAGE**] keys. Now press the [**MENU**] key once, then select **SETUP ⇨ SELECT FIELDS ⇨ TRACK PAGE**.
2. Highlight one of the currently selected fields, then click on it to de-select that field. Now select a different field, and click on it to select that field for display.
3. Press [**MENU**], then click on **EXIT** to return to the Track page. You will observe that the displayed data fields are different, according to your selection.
4. You also can turn off the data fields, so as to free up more area for the map display. To do this, press [**MENU**], then move the **Joystick** knob upward to "**TRACK PAGE DATA**." Click on this selection. A pop-up window will appear, with "**OFF**" highlighted; click on this selection, and in a few seconds the **MAGNUM** will return to the Track page, which now will be without the data fields. Repeat this process to restore the Track Page Data, clicking on "**ON**" in the pop-up window.
5. Another customization you can perform is to add or delete some of the "fine print" on the track display. To do this, press the [**MENU**] key, then select **SETUP ⇨ SELECT FIELDS ⇨ TRACK DISPLAY**. Click on this selection. The bottom three selections ("**SHOW CITY**," "**SHOW AIRPORT**," and "**SHOW LIGHT**") are items tied to databases supplied with your **MAGNUM**, and you may choose to have the Track page show these features, which are under the



Using the TRACK Screen





general category of "Points of Interest," or "POI" ("LIGHTS" stands for "Lighthouses"). Besides the bottom three display options, one of the top six selections may also be chosen, using the same techniques as we have practiced earlier. The only unique selection in this area is "Passage Time," which is the estimated time when you will pass the next Waypoint. Click on **EXIT** (at the bottom of the selection screen) to return to the Track page.

6. Finally, you can change the way the Track page appears during navigation. Press the [**MENU**] key, then move the **Joystick** upward four positions to "**TRACK SCREEN**;" click on this selection. You can now view and/or modify any of the four aspects of the screen's configuration, as follows:

ORIENTATION Selections include "**COURSE UP**," "**NORTH UP**," and "**DESTINATION UP**." With **COURSE UP**, top of the display is oriented to the direction or course you are heading. With **NORTH UP**, North is always shown at the top of the display. With **DESTINATION UP**, your Destination will always be shown at the top of the display.

FORWARD WIDE When this selection is set to "**OFF**," your current location will be centered on the Track screen. When this selection is set to "**ON**,"your current location will be centered along the bottom edge of the Track screen, so that a greater area above your location is shown on the screen.

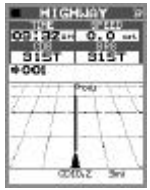
GRID A rectangular-coordinate or circular grid may be superimposed on the screen, if desired. Select and click on

"**ON**" for the rectangular grid, "**CIRCLE**" for the concentric circles, and "**OFF**" for no grid of any kind.

AUTO ZOOM If this parameter is set to "**ON**," the scale of the map will be decreased (Zoom In) automatically when nearing a Waypoint.

7. If you wish to lock operation on the Track page, press and hold in the [**MENU**] key for about two seconds (until you hear a long beep). The "**🔒**" icon will appear in the Title Bar at the top of the LCD.

Using the HIGHWAY Page



The **Highway** page creates a "3D highway" that shows the most relevant navigation information. Basically, it is a view similar to that experienced when driving on a highway to a destination. If you are navigating or a route with Waypoints stored, the Highway page will show the turns necessary to follow all the Waypoints to the final destination.

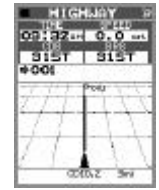
The highway's width ("CDI" or Course Deviation Indication) can be set up so the width of the highway is **0.2**, **0.5**, **1.0**, or **2.0** miles. Press the [**MENU**] key, highlight **SETUP**, and Click on **SETUP**. Now highlight **HIGHWAY** and click on it. Highlight **CDI**, choose the desired highway width, and click on the desired width.

Use of the **Highway** page requires that you enter a destination.

There are four data fields at the top of the **Highway** page. These fields may be customized, as on the other pages. To do this:

1. Press the [**MENU**] key, then use the **Joystick** to select **SETUP**. Click on **SETUP**.
2. Select **SELECT FIELDS** and click on that selection, then select **HIGHWAY PAGE** and click on it.
3. The available display fields are now displayed, and you may modify the available selections to suit your preferences, remembering that a maximum of four fields may be displayed on the **Highway** page.
4. Click on **EXIT** when you are done.

5. If you wish to lock operation on the Highway page, press and hold in the [**MENU**] key for about two seconds (until you hear a long beep). The "**🔒**" icon will appear in the Title Bar at the top of the LCD.



Using the COMPASS Page

The **Compass** Page is a convenient, intuitive aid to navigation. Like the Navigation Page, there actually are two Compass pages, **COMPASS1** and **COMPASS2**. They will show your current direction of travel and, once a destination has been set, it will show the Bearing toward the desired destination.

COMPASS1, the default page, depicts the Course Over Ground (COG) as a thin black line which always points toward the top of the Compass. On the Compass scale itself will be found a arrow, which points in the direction of the current Bearing to destination. Adjusting your course to match the Bearing will cause the black line and the arrow to coincide, confirming that you are traveling along the correct path.

COMPASS 2, which may be selected with a single press of either the [**IN**] or [**OUT**] key,

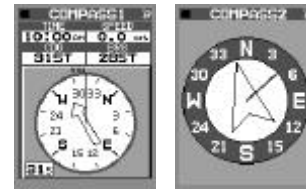
Is a North-facing Compass display, where the current Course is shown by a very large arrow, and the desired Bearing is shown by a solid black line.

If you ever get confused by which indicator is which, it may be helpful to return to the **Highway** page, so as to get a further confirmation as to the proper Course. However, **COMPASS1** includes provision for a four-field Data display, similar to that found on the other pages, and if "**COG**" (Course Over Ground) and "**BRG**" (Bearing) are selected, there should be no confusion.

USING THE COMPASS PAGE

The four data fields at the top of the **COMPASS1** page may be customized, as on the other pages. To do this:

1. Press the [**MENU**] key, then use the **Joystick** to select **SETUP**. Click on **SETUP**.
2. Select **SELECT FIELDS** and click on that selection, then select **COMPASS PAGE** and click on it.
3. The available display fields are now displayed, and you may modify the available selections to suit your preferences, remembering that a maximum of four fields may be displayed on the **COMPASS1** page.
4. Click on **EXIT** when you are done.
5. If you wish to lock operation on the Compass page, press and hold in the [**MENU**] key for about two seconds (until you hear a long beep). The "🔒" icon will appear in the Title Bar at the top of the LCD.



USING THE TREND PAGE

The **Trend** page is very simple. Presuming that you have satisfactorily been receiving in the 3DNAV or WAAS GPS modes, the **Trend** page will show you the changes in your altitude.

No data fields are available on the **Trend** page; it is a self-contained informational page only.

If you wish to lock operation on the Trend page, press and hold in the [**MENU**] key for about two seconds (until you hear a long beep). The "**🔒**" icon will appear in the Title Bar at the top of the LCD.

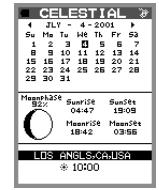
USING THE CELESTIAL PAGE

The **Celestial** page is a highly useful resource, full of astronomical data that may be of help to you in your trip planning (especially when fishing).

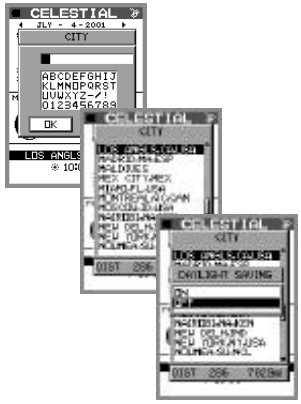
Included on the Celestial page are a calendar which is good through December 31, 2040; data fields showing sunrise/sunset and moonrise/moonset times; an illustration showing the phase of the moon for the selected day; and the current time (GMT).

You can use the Celestial page's flexibility to inspect astronomical data for days other than today:

- Move the **Joystick** knob left or right to change the day within the current month. Moving the **Joystick** up and down will change the row on the calendar, and moving it left and right will change the column (day of the week). All astronomical data will be updated to conform to the correct data for the date selected.
- Press the [**IN**] and [**OUT**] keys to change the month.
- Press the [**SAVE**] key once to return to today's date, if you have been investigating data for other dates.



USING THE CELESTIAL PAGE



You can also change the time zone of the time display at the bottom of the page. To do this:

1. Press and hold in the **Joystick** knob for about two seconds (until you hear a beep). A "**CITY**" pop-up window will appear.
2. Click the **Joystick** knob once to initiate selection of the desired time zone, using a city within the time zone as a reference.
3. The first digit of the city's name will now be high-lighted, as will the letter "**A**" in the chart. Use the **Joystick** knob to select the first three letters of the city's name. For this exercise, let us choose the Pacific Time Zone in the United States, using Los Angeles as a reference. After you have highlighted "**L**," click on it, then move over to "**O**," clicking on that, then move to "**S**" and click on that letter.
4. Now use the **Joystick** knob to highlight to the "**OK**" box, and click on that. A window will appear, and "**LOSANGLS,CA,USA**" will be high-lighted. Click on this selection.
5. Another pop-up box will appear, asking if Daylight Savings Time needs to be accounted for. Assuming not, click on the "**OFF**" selection. At this point, the field at the bottom of the Celestial page will be updated to reflect the new time zone. If necessary, the date on the calendar will follow the revised time. The setting of the city on the Celestial page does not affect the setting of your "Home" time on the World Time page.
6. If you wish to lock operation on the Celestial page, press and hold in the [**MENU**] key for about two seconds (until you hear a long beep). The "🔒" icon will appear in the bottom right-hand corner of the LCD.

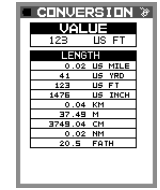
USING THE CONVERSION PAGE

The **Conversion** page is a handy reference tool which allows quick conversion among units of measure for Length, Area, Volume, Weight, Temperature, and Speed.

The default conversion window is "**LENGTH**," which utilizes "US MILE" as its reference value. Let us explore how to perform conversions.

1. Using the [(▼)**PAGE**] and [(▲)**PAGE**] keys, select the **Conversion** page.
2. Use the **Joystick** knob to highlight **US MILE**, and click on that selection.
3. The numerical value at the left edge of the "**VALUE**" field will be high-lighted. Move the **Joystick** knob upward to select "**3**" (Miles) as the value you wish to convert. When you have reached "**3**," click on it.
4. You will now see that the value of "3 Miles" has been converted in all the other fields.

   For example, 3 Miles corresponds to 5279.99 US Yards, 4.83 km, and 2.61 Nautical Miles.
5. Now let's do a weight conversion. Press either the [**IN**] or [**OUT**] key once; the main "CONVERSION" menu will appear; move the **Joystick** knob downward to select "**WEIGHT**," and click on that selection.
6. Move the **Joystick** knob to select "**KG**," and click on that selection.
7. Use the **Joystick** knob to select a value of "**5**" kg in the "**VALUE**" window, but to not click at this time; instead, move the **Joystick** knob to the right, and then move it up and down to select "**3**" (so as to make the total weight "53" kg). Click on this value.
8. Observe that conversions have been provided for eight other units of measure.



Main "CONVERSION" menu

9. Other conversions may be performed using the same technique.
10. If you wish to lock operation on the Conversion page, press and hold in the [**MENU**] key for about two seconds (until you hear a long beep). The "🔒" icon will appear in the bottom right-hand corner of the LCD.

USING THE NOTES PAGE

The **Notes** page is a "scratchpad" which contains a database containing the names, addresses, and other information for a number of airline companies, hotels, and rental car companies. You may add entries to the database yourself, or edit the database should a telephone number, Web site URL, or other data change.

To select an entity in the Notes database, use the [**IN**] and [**OUT**] keys to scroll through pages of the database, then move the **Joystick** knob up or down to select the line on the selected page. When you have found the entity you are looking for, click on that line.

You may edit an existing entry, using the following procedure:

1. Once you have selected the entity (as described previously), move the **Joystick** knob to the right to highlight "**EDIT**" along the bottom of the LCD. Click on this selection.
2. The first character of the "**SUBJECT**" line will be high-lighted. If this line is ok, just click.
3. Now you are in the "**NOTE**" field; please pay close attention to the navigation rules in this area: the location of the character to be edited is selected *only* using left/right movement of the **Joystick** knob, while the character itself (A, B, C, . . .) is selected ***only*** using up/down movement of the **Joystick** knob. Move from line-to-line in the NOTE field, press the **Joystick** knob to the right or left until the line is selected.
4. When all edits have been completed, click once, then highlight the "**OK**" box at the bottom of the LCD. If you need to fix the **SUBJECT** line again, click instead on the "**MEMORY**" box, make your changes, click twice, then click

Subject Field

Note Field

USING THE NOTES PAGE

on the "**OK**" box.

New entities are entered in exactly the same fashion.

1. Click on the "**NEW**" box at the bottom of the LCD.
2. Enter the desired title for the new entry in the "**SUBJECT**" field, being careful to observe the navigations rules detailed above. Click when the Subject field has been completed to your satisfaction.
3. Now enter the desired information in the "**NOTES**" field. When done, click once.
4. If everything is OK, highlight the "**OK**" box and click on it. If you need to revise the Subject field, click instead on "**MEMORY**," as before, and complete the process as described earlier.
5. If you wish to lock operation on the Notes page, press and hold in the [**MENU**] key for about two seconds (until you hear a long beep). The "**🔒**" icon will appear in the Title Bar at the top of the LCD.

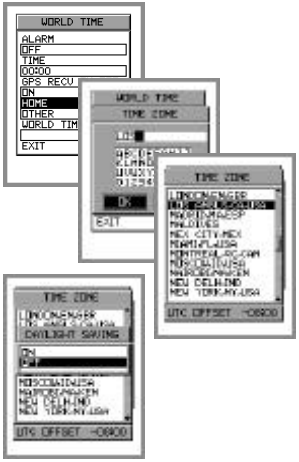
USING THE WORLD TIME PAGE

The **MAGNUM** includes a convenient World Time reference page, which can display both the time in your own time zone ("Home") plus one more ("World"). The World Time clock also features a Wake-up Alarm clock with Snooze function.

CLOCK DISPLAY FEATURES

1. When operation is locked on the World Time page, the "🔒" icon will be displayed in the bottom right-hand corner of the LCD. As with other pages, press and hold in the [**MENU**] key for about two seconds to activate the "Lock" function.
2. When you are using the World Time page, you may or may not be using the GPS receiver. Just as a reminder, when the GPS receiver is On, the "🛰" icon will appear in the upper right-hand corner of the LCD, and when the GPS receiver is Off, the "🏠" will appear.
3. On the World Time page and the data boxes at the bottom of the screen, the Home time is designated by Black highlighting, while the World time is designated by Gray highlighting.
4. On both the Home and Summer time data boxes, if Daylight Savings Time ("Summer Time") is programmed, the "☀" icon will appear. Summer Time may be set independently On or Off for Home and World time.
5. In the "**ALARM**" data box, if the Alarm is Off, "**OFF**" will appear in the box. If the Alarm is turned On, the time zone (Home or World) on which the Alarm is active will have a "🔔" icon displayed just below the data box for that time zone.

Using the WORLD TIME Page



Setting the Home Time

The HOME time appears not just on the World Time page; it also is used on the Track, Navigation, Highway, and Compass pages. Although the Menu may be used to set the time (navigate to SETUP, click on it, then select and click on TIME), there is a quick path to the time setting process directly from the World Time page:

1. Select the **World Time** page using the [(▼)**PAGE**]/[(▲)**PAGE**] keys.
2. Press and hold in the **Joystick** knob until the "**WORLD TIME**" pop-up box appears (about two seconds).
3. Highlight the "**HOME**" field (4th from the bottom), and click on that selection. The "**TIME ZONE**" pop-up box will now appear.
4. Click once in the empty field to enable selection of a city in your time zone from the built-in database. For this exercise, let us use the Pacific Time Zone of the United States, during the winter, and we will use "Los Angeles" as a city reference.
5. Highlight the letter "**L**" in the character field, and click on it. Now highlight to "**O**" and click on it, then navigate to "**S**" and click on it. Now highlight to the "**OK**" box at the bottom, and click on it.
6. Another **TIME ZONE** box will appear, and Los Angeles will be highlighted. Click on it.
7. A "**DAYLIGHT SAVING**" box will appear, with "**OFF**" highlighted. Click on it (if you were programming during Summer Time, you would highlight to "**ON**" and click on it).
8. "**PLEASE WAIT**" will appear for a few seconds, and then you will be returned to the World Time page.

USING THE WORLD TIME PAGE

Note: The Home time is not used as the reference for the Celestial page; that time zone may be set separately, so you can investigate celestial events in a distant place without affecting your Home time zone setting.

SETTING THE WORLD TIME

The World Time is set using exactly the same procedure. Let's use "Honolulu" as the reference for the time zone we wish to set.

1. Select the World Time page using the [(▼)**PAGE**]/[(▲)**PAGE**] keys.
2. Press and hold in the **Joystick** knob until the "**WORLD TIME**" pop-up box appears (about two seconds).
3. Highlight the "**WORLD TIME**" field, and click on that selection. The "**TIME ZONE**" pop-up box will now appear.
4. Click once in the empty field to enable selection of Honolulu from the built-in database.
5. Highlight the letter "**H**" in the character field, and click on it. Now highlight to "**O**" and click on it, then highlight to "**N**" and click on it. Now highlight to the "**OK**" box at the bottom, and click on it.
6. Another **TIME ZONE** box will appear, and **HONG KONG** will be highlighted. Move down one slot, and click on **HONOLULU**.
7. A "**DAYLIGHT SAVING**" box will appear, with "**OFF**" highlighted. Click on it (if you were programming during Summer Time, you would highlight to "**ON**" and click on it).
8. "**PLEASE WAIT**" will appear for a few seconds, and then you will be returned to the World Time screen.

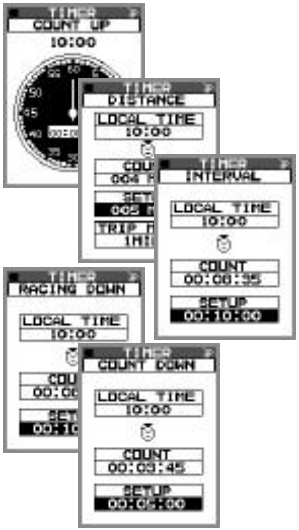
Using the WORLD TIME Page

Setting and Using the Alarm Clock

1. Select the World Time page using the [(▼)**PAGE**]/[(▲)**PAGE**] keys.
2. Press and hold in the **Joystick** knob until the "**WORLD TIME**" pop-up box appears (about two seconds).
3. Highlight the "**ALARM**" field, and click on that selection. You will be prompted to select "**HOME**" or "**WORLD TIME**" as the tie to use to drive the Alarm. Select and click on "**HOME**."
4. Move down to the "**TIME**" field, and click on it. Let's set "**10:30 PM**" as the Alarm time.
5. The first digit of the time will now be highlighted. If you are using 12-hour time format (set via the main Menu in the "**TIME**" Setup area), move one slot to the right, and then move the **Joystick** knob up or down to select "**10**" as the "Hour" setting (you will scroll through twelve hours of time via this field). Highlight one slot to the right, and set "**3**" as the "tens of minutes" digit, then move one slot to the right and set "**0**" as the "minutes" digit. Now move the **Joystick** knob to the right (if you are in 12-hour format) and select "**PM**." Click once when done. Note: if you are in 24-hour format, each digit may be set separately, and you do not need to set "**AM/PM**."
6. Move down to the bottom, and click on "**EXIT**."
7. "**PLEASE WAIT...**" will appear for a few seconds, and then you will be returned to the World Time screen.
8. When 10:30 PM arrives, the Beeper will sound the Alarm. Press any key to silence the Alarm; you will now be in the "Snooze" mode. Every five minutes, the Alarm will sound again, and a "**SNOOZE**" pop-up box will appear. Hit any key to reset the Snooze feature for another five minutes.

9. Press the **Joystick** knob for two seconds to go back into the **WORLD TIME** setup box, highlight "**ALARM**," click on it, then select and click on "**OFF**" to turn off the Alarm.
10. If using the **MAGNUM** on battery power, be certain your batteries are fresh if you depend on the **MAGNUM**'s Alarm Clock for an important wake-up notification. Turn off the GPS receiver to conserve battery life select economy mode from the main menu and also enable the battery save function. If the batteries are exhausted while you are sleeping, the Clock will obviously fail.

Using the TIMER Page(s)



Five different Timers are provided in the **MAGNUM**. These can be used for a variety of time-keeping purposes. They include:

Count Up Timer

This is a standard Stopwatch. An "interval" time may be set to sound an alarm at the interval desired (lowest value: 1 minute). Counting continues after the alarm sounds.

Distance Timer

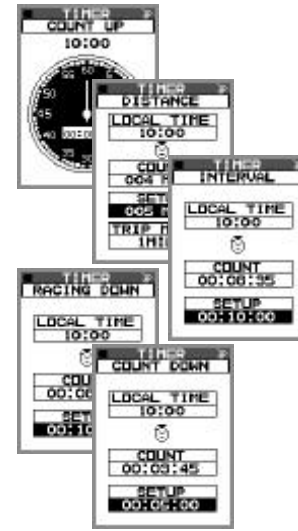
This graphical "timer" sounds an alarm when you have covered the programmed distance. If you set a "**SETUP**" distance, for example, of 3 Miles, the "**COUNT**" box will count down from that value every mile, resetting itself every three miles, and the "**TRIP METER**" box will count (up) the total mileage.

Interval Timer

This is a graphical count-down timer that sounds an alarm after the programmed interval of time has passed. Counting continues after the alarm sounds. If you click the **Joystick** knob, the timer will pause, and will resume when you click again.

Racing Down Timer

This timer sounds an alarm, during the programmed count-down timing process, At 10 minutes before time-out, 5 minutes before time-out, 3 minutes before time-out, 2 minutes before time-out, one minute before time-out, and at the time-out time. At the end of the count-down, the timer stops.



COUNT DOWN TIMER

Somewhat similar to the Racing Down Timer, the Count-Down Timer is set to some time value (such as 10 minutes), and it will count down from that value; when "**00**:**00**:**00**" is reached, the alarm will sound and the timer will stop. If you click the **Joystick** knob, the timer will pause, and will resume when you click again.

RULES FOR USING THE TIMERS

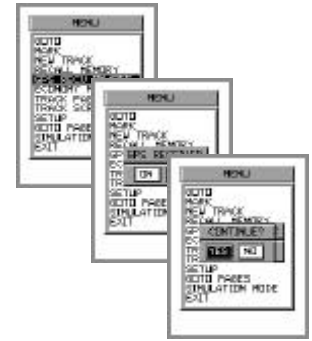
1. When operation is locked on the Timer page, the "🔒" icon will be displayed in the bottom right-hand corner of the LCD. As with other pages, press and hold in the [**MENU**] key for about two seconds to activate the "Lock" function.
2. When you are using the Timer page, you may or may not be using the GPS receiver (it is necessary for it to be on if using the Distance Timer page). Just as a reminder, when the GPS receiver is On, the "🛰" icon will appear in the upper right-hand corner of the LCD, and when the GPS receiver is Off, the "🏠" will appear.
3. Press the **Joystick** knob to begin timer operation. A small "⏳" will appear on the LCD.
4. An alarm will sound every time an "interval" is reached.
5. Press the **Joystick** knob to pause the timer.
6. Press and hold in the **Joystick** knob for about two seconds (until you hear the second beep) to reset the timer values to zero.
7. Use the [**IN**]/[**OUT**] keys to move between the different timers.
8. Move the **Joystick** knob upward or downward to set the values for the timers.

SIMULATION MODE

It frequently is helpful to practice your navigation skills under "simulated" conditions. The "Simulation Mode" of the **MAGNUM** allows you to do practice without actually receiving signals form the GPS satellite constellation. Here's the simple procedure for getting into the Simulation mode:

1. Press the [**MENU**] key, then highlight the "**SIMULATION MODE**" selection, and click on it.
2. In the "**SIMULATION MODE**" pop-up window, click on "**ON**."
3. If you are on the **GPS Status** page, you will see a display of the apparent reception of GPS satellites, including the bar-graph of signal strengths. However, this is a simulated display, and no satellites are being received. In the simulation mode, you cannot navigate in the real world.
4. In your practice, it may be helpful to simulate motion (as if your vessel were under way). To do this, move to the **Highway** page or **Compass 1** page, and move the **Joystick** knob left or right to set a course heading; move the **Joystick** knob upward or downward to set your velocity. When you reach your "Destination" in the Simulation mode, move the **Joystick** knob downward to reduce the velocity to zero.
5. Be sure to turn off the Simulation mode when you wish to engage actual navigation.

When the Simulation Mode is set to "**ON**," the "[S]" will appear in the Title Bar at the top of the LCD.



BATTERY SAVER SETUP

Several methods of battery capacity enhancement are available, allowing the life of a typical set of alkaline batteries to be extended to at least 50 hours.

GPS Receiver On/Off

Turning off the GPS receiver, when it is not needed (for example, if you are using the "Conversion" page), can result in a significant battery capacity savings.

- ❒ Press the [**MENU**] key, then highlight the "**GPS RECV ON/OFF**" selection. Click on this selection.
- ❒ The "**GPS RECEIVER [ON] [OFF]**" pop-up window will appear; click on the "**OFF**" selection.
- ❒ When prompted to "**CONTINUE? [YES] [NO]**" click on "**YES**."
- ❒ You will return to the Menu page; click on "**EXIT**."

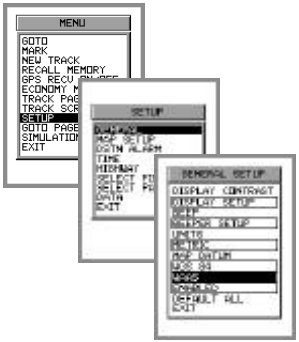
When the GPS receiver is Off, the "🏠" will appear in the Title Bar at the top of the LCD.

Saver Mode

The **MAGNUM** has a unique feature that will enable operation up to 50 hours of operation. To enable the Battery Saver mode, press and hold the [**SAVE**] key until the display shows "**SAVER MODE**," At this point the display will turn off. The **MAGNUM** will wake up and breath show the last selected page every 2 minutes to inform that it is in saver mode. During Saver mode, the **MAGNUM** is receiving an calculating all GPS navigation information.

To disable Battery Save mode, Click the **Joystick** knob.

Disabling WAAS Operation



Disabling WAAS Operation

For higher resolution, the **WAAS** (Wide Area Augmentation System) mode (default setting is on) is enabled (by default), allowing resolution of your position down to about ±3 meters. The **WAAS** feature configures the **MAGNUM** to search for a **WAAS** satellite, the data from which will be used to resolve your position with higher precision. When **WAAS** data is successfully being received, "**WAAS 3D**" will replace "**3D NAV**" in the window on the track page.

When **WAAS** operation is enabled, however, and your location does not permit reception of **WAAS** satellites, position accuracy may be degreded. In this case, you may wish to disable **WAAS** operation temporarily.

Here's how to disable **WAAS** operation:

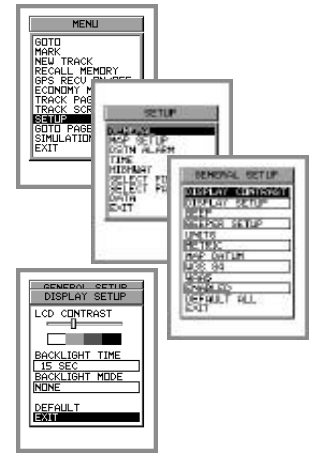
- ❒ Press the [**MENU**] key, then highlight the "**SETUP**" selection; click on this selection.
- ❒ Highlight the "**GENERAL**" selection, and click on it.
- ❒ Highlight the "**WAAS**" selection, and click on it. The box below will expand, revealing the "**ENABLED**" and "**DISABLED**" selections. Click on "**DISABLED**."
- ❒ Highlight "**EXIT**" and click on it.

SETTING THE BACK-LIGHTING

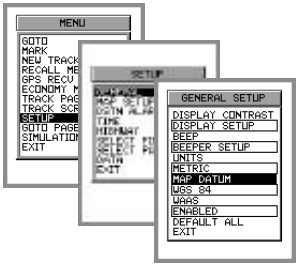
The display back-lighting configuration may be customized to match your preferences.

- ❒ Press the [**MENU**] key, then highlight the "**SETUP**" selection; click on this selection.
- ❒ Highlight the "**GENERAL**" selection, and click on it.
- ❒ Highlight the "**DISPLAY CONTRAST**" box, and click on it.
- ❒ To modify the LCD contrast, highlight that field, and click once. Now use the **Joystick** knob, moving it left and right, to adjust the contrast. Click once more when done.
- ❒ To adjust the delay after which the back-lighting will disappear (see next section also), highlight the "**BACKLIGHT TIME**" field, and click once. The expanding box below allows you to select among 15, 30, 60, or 120 seconds of illumination, or "Continuous." Click on the preferred selection.
- ❒ To set up the "**BACKLIGHT MODE**," which determines when the back-lighting will be engaged, highlight "**BACKLIGHT MODE**" and click on it. In the "**KEY**" mode, pressing any key will engage the illumination. In the "**MESSAGE**" mode, any "Message" (such as an Alarm) will engage the illumination. You can choose both of these, as well as "**NONE**" (manual activation only). If "**NONE**" is selected, just press the Power key momentarily to engage the illumination. Click when done.
- ❒ Highlight "**EXIT**" and click on it.

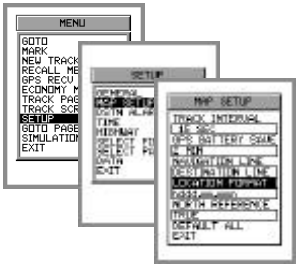
SETTING THE BACK-LIGHTING



Setting the Map Datum



Setting the Location Format



Setting the Map Datum

While most operations will utilize the default "**WGS 84**" database of locations, you may have a map or a chart that uses a different database. A number of commonly-used databases are loaded onto your **MAGNUM**, and you may easily choose one of them:

- ❒ Press the [**MENU**] key, then highlight the "**SETUP**" selection; click on this selection.
- ❒ Highlight the "**GENERAL**" selection, and click on it.
- ❒ Highlight the "**MAP DATUM**" field, and click on it.
- ❒ Highlight the **MAP DATUM** selection you wish to use, and click on it.
- ❒ Highlight the "**EXIT**" and click on it.

Setting the Location Format

While the default map coordinates (degrees, minutes, seconds) will be useful for most applications, there are other location formats used in some situations. The **MAGNUM** can be configured to handle any of these.

- ❒ Press the [**MENU**] key, then highlight the "**SETUP**" selection; click on this selection.
- ❒ Highlight the "**MAP SETUP**" selection, and click on it.
- ❒ Highlight the "**LOCATION FORMAT**" selection, and click on it.
- ❒ In the expanding box at the bottom, select from the available choices: "**hddd.mm.mmm**," "**UTM UPS**," "**LORAN TD**," or "**BRITISH GRID**." Click on your desired format.
- ❒ Highlight the "**EXIT**" and click on it.

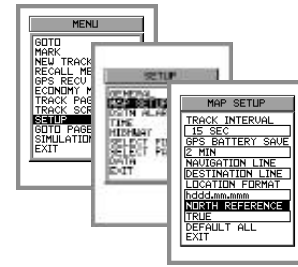
SETTING THE "TRUE" OR "MAGNETIC NORTH" REFERENCE

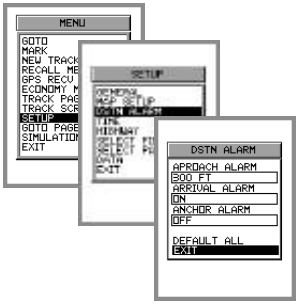
You may configure the **MAGNUM** for either "True" North, or "Magnetic" North reference formats:

- ❒ Press the [**MENU**] key, then highlight the "**SETUP**" selection; click on this selection.
- ❒ Highlight the "**MAP SETUP**" selection, and click on it.
- ❒ Highlight the "**NORTH REFERENCE**" selection, and click on it.
- ❒ Select either "**TRUE**" or "**MAGNETIC**," and click on your preference.
- ❒ Highlight the "**EXIT**" and click on it.

Note: On the data boxes where a direction is shown, "**T**" will indicate "***True***" North reference, while "**M**" will indicate "***Magnetic***" North reference.

SETTING THE "TRUE" OR "MAGNETIC NORTH" REFERENCE





SETTING UP THE ALARMS

Several Alarms are available, to alert you to conditions of interest. These include:

- ❍ ***Destination Alarm***: Is engaged when you near your destination.
- ❍ ***Anchor Alarm***: Is engaged when your position changes while you are at anchor.
- ❍ ***GPS Fix Alarm***: Beeps when a "fix" on your position is achieved.

These Alarms can all be configured at the same time:

Destination Alarm

- ❒ Press the [**MENU**] key, then highlight to the "**SETUP**" selection; click on this selection.
- ❒ Highlight the "**DSTN ALARM**" selection, and click on it.
- ❒ Highlight the "**APPROACH ALARM**" selection, and click on it.
- ❒ In the expanding box below, select the distance from Destination at which you wish the Alarm to be engaged. Click on that selection.
- ❒ Highlight the "**ARRIVAL ALARM**" field, and click on it.
- ❒ To activate the Arrival Alarm, click on the "**ON**" option.
- ❒ To activate the Anchor Alarm, which is active when you are not navigating to a destination, highlight the "**ANCHOR ALARM**" field, and click on it.
- ❒ Select the distance of anchor drag beyond which you wish the Alarm to sound, and click on it.
- ❒ Highlight "**EXIT**" and click on it.

The Alarm consists of a written message, as well as a "Beep" if the Beeper is turned on. See the next section.

Setting Up the Beeper

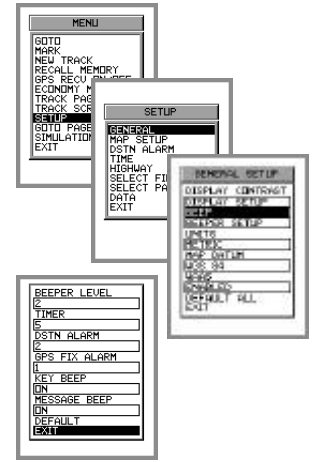
The **MAGNUM**'s Beeper provides an audible alert, useful for a number of functions.

- It can alert you when an Alarm is engaged.
- It can confirm that a key has been successfully pressed.

Here's how to configure the Beeper of your **MAGNUM**:

- Press the [**MENU**] key, then highlight the "**SETUP**"; click on this selection.
- Highlight the "**GENERAL**" selection, and click on it.
- Highlight the "**BEEP**" and click on it.
- The top field is the "**BEEPER LEVEL**" selection. By clicking on it, you can select a louder or softer intensity for the Beeper. Or you can turn all the Beepers off, if you like. Click when done.
- The next field down is the "**TIMER**" Beeper duration, which is the length of time the Beeper will be heard when the Timer has expired. After making your selection, click on it.
- The next field down is the "**DSTN ALARM**" (Destination Alarm), which sounds when you are nearing your Destination. If you set this to "Continuous," you can always click once to silence it.
- The next field down is the "**GPS FIX ALARM**," which sounds when your **MAGNUM** has successfully achieved a fix on your location. After making your Time duration selection, click once.
- The next field down is the "**KEY BEEP**" selection. If you just want to disable the Key Beeper, you can do this here; click when done.
- The final field at the bottom is "**MESSAGE BEEP**," which sounds when a Message is shown on the display. Click once you have made your selection.

Setting Up the Beeper



Setting North Up/ Course Up/Destination Up

: North UP

: Course UP

: Destination UP

On the track page, you will notice an icon in the bottom right corner. This icon represents the display mode of the **MAGNUM**. "**N**" means the display is in the "***North Up***" mode; "**C**" indicates "***Course UP***;" and "**D**" indicates "***Destination Up***."

To change display modes, move the cursor over the icon and click on the icon. Click repeatedly, if necessary, to select the desired setting.

Resetting the Microprocessor

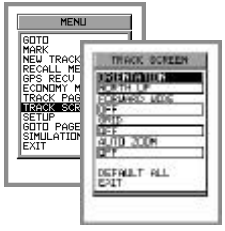
If you encounter erratic operation, or simply wish to clear out all tracking and other data and start with factory default setting, you can perform a microprocessor reset. Warning: this will erase all saved data, so only do this if you're encountering serious trouble that you need to recover from.

- ❒ Press the [**MENU**] key, then highlight the "**SETUP**" selection; click on this selection.
- ❒ Highlight the "**DATA**" selection, and click on it.
- ❒ Highlight the "**MASTER RESET**" field, and click on it.
- ❒ At the prompt, navigate to "**YES**" and click on it. In a few minutes, you'll be returned to the Track page.

Resetting the Microprocessor

Turning the Track Data Box On/Off

Track Screen Orientation



: North UP

: Course UP

: Destination UP

Turning the Track Data Box On/Off

On the Track page, a small box which includes the current Speed and the Trip Odometer appears by default. In order to make more room on the Track screen, this data box may be disabled:

- ❒ Press the [**MENU**] key, then highlight "**TRACK PAGE DATA**." Click on this selection.
- ❒ The **TRACK PAGE DATA** pop-up window will appear. Click on the "**OFF**" selection to disable this data box.
- ❒ To restore the Track Page Data box, repeat this procedure, clicking on "**ON**" in the pop-up window.

Track Screen Orientation

The map on the Track page may be oriented in one of three ways. In the default North Up mode, North is always shown at the top of the screen. In the Course Up mode, your current direction is always shown at the top of the page. In the Destination Up mode, the map is oriented such that the bearing toward the Destination is always aimed toward the top of the screen.

- ❒ Press the [**MENU**] key, then highlight "**TRACK SCREEN**." Click on this selection.
- ❒ The **TRACK SCREEN** pop-up window will appear.
- ❒ Highlight the "**ORIENTATION**" box, and click on it.
- ❒ Move the **Joystick** knob to the choice you prefer, based on the above descriptions, and click on that choice.
- ❒ You will be returned to the **TRACK SCREEN** menu; click on **EXIT**.

The Track page can also be modified to provide additional space by placing your current location at the bottom of the screen, instead of the middle of the screen. To do this:

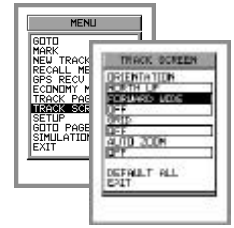
- ❒ Press the [**MENU**] key, then highlight "**TRACK SCREEN**." Click on this selection.
- ❒ The **TRACK SCREEN** pop-up window will appear.
- ❒ Highlight the "**FORWARD WIDE**" box, and click on it.
- ❒ Click on "**ON**" if you wish to place your present location at the bottom of the screen, and "**OFF**" if you want it centered on the map.
- ❒ You will be returned to the **TRACK SCREEN** menu; click on **EXIT**.

Auto-Zoom Feature (Track Screen)

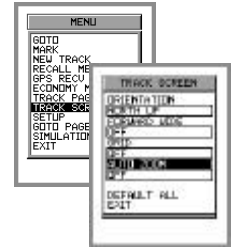
When navigating to a destination, the Track Page scale originally used when the journey was set up may not permit useful navigation at the end of the journey. The Auto Zoom feature allows the Track Page scale to automatically reduce as you approach the destination, without you having to press the [**IN**] key.

- ❒ Press the [**MENU**] key, then highlight **TRACK SCREEN**. Click on this selection.
- ❒ Highlight the "**AUTO ZOOM**" selection, and click on it.
- ❒ Click on the "**ON**" option.
- ❒ When you have returned to the **TRACK SCREEN** window, click on **EXIT**.

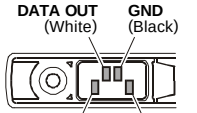
Track Screen Orientation



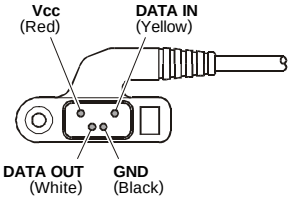
Auto-Zoom Feature (Track Screen)



Connecting the NMEA Data Cable

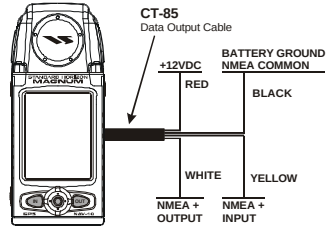


Unit View



Cable View

Connect the NMEA Data Cable (model **CT-85**) to the rear-panel NMEA connector of the **MAGNUM**. The color code for connection to your Standard Horizon transceiver, or other optional equipment, is shown below.

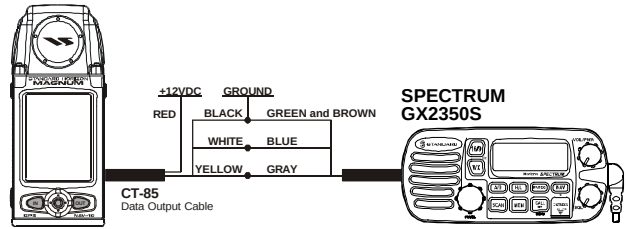


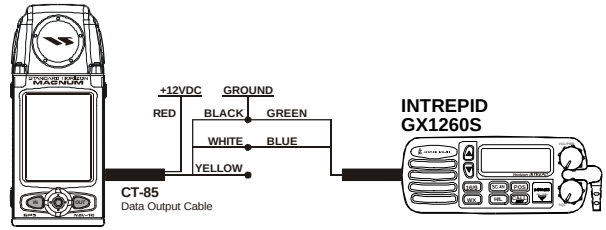
12VDC
Connection to 12VDC positive for external battery power.

BATTERY GROUND
NMEA COMMON
Connection to 12V battery ground.
Also connection to the negative NMEA connection of VHF or other NMEA device.

NMEA + OUTPUT
Connects to the NMEA input from VHF or other device listening for NMEA sentences.
Outputs sentences: GGA, RMC, VTG, RMB, GLL, APB, and XTE.

NMEA + INPUT
Connects to the NMEA output from STANDARD HORIZON VHF for Digital Selective Calling Distress and Position Requests.





DSC (DIGITAL SELECTIVE CALLING)

Digital Selective Calling is a semi-automated method of establishing a radio call, it has been designed by the International Maritime Organization (IMO) as an international standard for establishing VHF, MF and HF radio calls. It had also been designated part of the Global Maritime Distress and Safety System (GMDSS). It is planed that DSC will eventually replaced aural watches on distress frequencies and will be used to announce routine and urgent maritime safety information broadcasts.

This new service will allow mariners to instantly send a distress call with GPS position (when connected to the transceiver) to the USA Coast Guard and other vessel within range of transmission. DSC will also allow mariners to initiate or receive distress, urgency, safety and routine calls to or from another vessel equipped with a DSC transceiver.

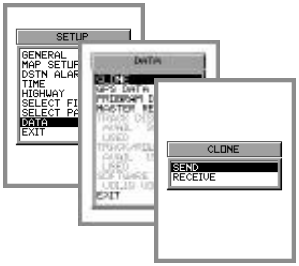
DISTRESS CALL

Distress call and Position Request are functions performed by an external device (VHF DSC radio) connected to NMEA Input Port. The **MAGNUM** allows displaying and saving as marks Distress Calls and Position Requests sent by the VHF radio.

When a Distress Call or Position Request is received the **MAGNUM** will automatically mark the position on the Track page and add same the received position as a mark. A pop-up screen advises the user that a Distress Call or Position Request Call has been received. Within the pop-up screen it asks the user if he would like to:

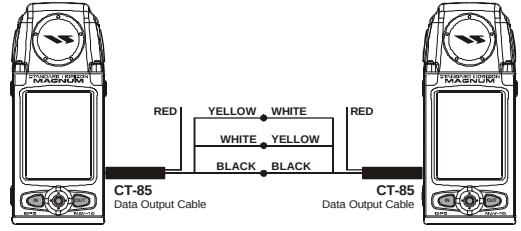
"GOTO VESSEL" activates the navigation to the Distress Call or Position Request icon. The **MAGNUM** will automatically change the TRACK PAGE to allow show the Distress Call (or Position Request).

Cloning Data to another MAGNUM



The settings for Tracks, Marks, etc. may be copied from one **MAGNUM** to another, so as to allow them to be set up identically.

- ❒ Turn both **MAGNUM** GPS units off.
- ❒ Connect the Cloning Cable (**CT-85** x 2; as shown below) between the rear-panel NMEA connectors of the two receivers.
- ❒ Turn on both **MAGNUM** units.
- ❒ On both units, press the [**MENU**] keys, then highlight "**SETUP**." Click on this selection.
- ❒ On both units, highlight the "**DATA**" selection, and click on it.
- ❒ On both units, highlight the "**CLONE**" option, and click on it.
- ❒ On the ***Destination*** **MAGNUM**, "**RECEIVE**" will appear on the display; when this happens, click once ("**PLEASE WAIT...**" will appear on the display).
- ❒ On the ***Source*** **MAGNUM**, "**SEND**" will appear; when this happens, click once. "**PLEASE WAIT...**" will appear on the display.
- ❒ When the cloning process is complete, turn both **MAGNUM** units off, and disconnect the Cloning cable.
- ❒ If a problem occurs in the data transfer, "**CLONE SENDING**" will appear on the displays. Check your cable connections, and try again.



(two **CT-85**'s required)

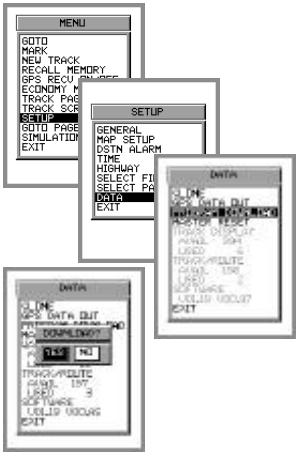
Sending NMEA Data to Another Device

The **MAGNUM** is capable of sending an NMEA data stream to a compatible Standard Horizon transceiver, or to another device capable of receiving an NMEA data stream. To do this:

- ❒ Turn the **MAGNUM** off, then connect the NMEA Data Cable (model **CT-85**) to the rear panel connector of the **MAGNUM**. Now turn the **MAGNUM** on.
- ❒ Press the [**MENU**] key, then highlight "**SETUP**." Click on this selection.
- ❒ Highlight "**DATA**," and click on it.
- ❒ Highlight "**GPS DATA OUT**," and click on it.
- ❒ Highlight "**NMEA1083**," and click on it. The **MAGNUM** will now transmit an NMEA0183-format data stream.

Note: See page 82 for interconnections.

Downloading Program Updates



As firmware updates become available, they may be uploaded from your computer to the **MAGNUM**.

Software update when available can be downloaded from the following web site

www.standardhorizon.com

- ❒ With the **MAGNUM** turned off, connect the **MAGNUM** to your computer, using the supplied **CT-84** PC Interface Cable.
- ❒ Press the [**MENU**] key, then highlight "**SETUP**." Click on this selection.
- ❒ Highlight the "**DATA**" selection, and click on it.
- ❒ Highlight "**PROGRAM DOWNLOAD**," and click on it. At the "**DOWNLOAD?**" prompt, click on "**YES**." The data will now be downloaded from your computer. "**WAIT FReq**" will appear on the display. When done, "**COMPLETE**" will appear.
- ❒ Turn the **MAGNUM** off, and remove the **CT-84** from the rear panel connector.

PHYSICAL

Case:	Polycarbonate Waterproof to JIS class 7 (similar to IPX7 standards, Waterproof to 1 m for 30 minutes)
Size:	2.6 in (W) x 6.2 in (H) x 1.4 in (D) 65 mm (W) x 157 mm (H) x 36 mm (D)
Weight (Approx.):	7.9 oz (w/o battery), 11.1 oz (w/4 AA batteries) 225 g (w/o battery), 315 g (w/4 AA batteries)
Operating Temp. Range:	–4 °F to +158 °F (–20 °C to + 70 °C)
Map Datums:	over 100

PERFORMANCE

Receiver:	12 parallel channels L1, 1575.42 MHz C/A code, 1.023 MHz chip rate
Acquisition Time:	Hot Approx. 8 sec typ Warm Approx. 48 sec typ Cold Approx. 60 sec typ
Update Rate:	1 second, continuous
Position Accuracy:	10 m 90 % without SA 1 to 5 m, typical (WAAS)
Velocity Accuracy:	0.1meters/second without SA 0.05meter/second, typical (WAAS)
Dynamics:	Acceleration 4 g., Max.
Interfaces:	NMEA 0183 (versions 2.00-2.30) and RS-232C for PC interface
Antenna:	Built-in

POWER

Input:	Four 1.5 V “AA” batteries
Battery life:	50 hours w/saver, 19 hours w/economy mode, 12 hours w/o saver

Appendix

Map Datum List

ADIAN	Adindan- Ethiopia, Mali, Senegal, Sudan
AFG	Afgooye- Somalia
AIN EL ABD70	AIN EL AND 1970- Bahrain Island, Saudi Arabia
ANNA 1 AST65	Anna 1 Astro '65- Cocos I.
ARC 1950	ARC 1950- Botswana, Lesotho, Malawi, Swaziland, Zaire, Zambia RC 1960, Kenya, Tanzania
ARC 1960	ARC 1960- Botswana, Lesotho, Malawi, Swaziland, Zaire, Zambia RC 1960, Kenya, Tanzania
ASCNSN ISLD	Ascension Island
ASTR B4 SOR.	Sorol Atoll- Tern Island
ASTR BCN E	Astro Beacon "E"- Iwo Jima
ASTR POS71/4	Astro DOs 71/4- St. Helena
ASTR STN1952	Astronomic Stn 1952- Marcus Island
ASTRLNGEOD84	Australian Geod 1984- Australia, Tasmania Island
BELLEVUE	Efate and Erromango Island
BERMUDA 1957	Bermuda 1957- Bermuda Islands
BOGOTA OBSER	Bogata Obsrvatry- Colombia
CAMPO INCHSP	Campo Inchauspe- Argentina
CANTN ISLD66	Canton Astro 1966- Phoenix Islands
CAPE	Cape- South Africa
CAPE CANAVRL	Cape Canaveral- Florida, Bahama Island
CARTHAGE	Carthage- Tunisia
CHATHAM 1971	Chatham 1971- Chatham Island (New Zealand)
CHUA ASTRO	Chua Astro- Paraguay
CORREGO ALEG	Corrego Alegre- Brazil
DJAKARTA	Djakarta (Batavia)- Sumatra Island (Indonesia)
DOS 1968	DOS 1968- Gizo Island (New Georgia Islands)
EASTR ISLD67	Easter Island 1967
EUROPEAN 1950	European 1950- Austria, Belgium, Denmark, Finland, France, Germany, Gibraltar, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland
EUROPEAN1950	European 1950- Austria, Belgium, Denmark, Finland, France, Germany, Gibraltar, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland
EUROPEAN1979	European 1979- Austria, Finland, Netherlands, Norway, Spain, Sweden, Switzerland
FINLAND	Finland
GANDAJIKA BS	Gandajika-Base- Republic of Maldives
GEOD DATM 49	Geodetic Datum '49- New Zealand
GUAM 1963	Guam 1963- Guam Island
GUX 1 ASTRO	Guadalcanal Island
HJORSEY 1955	Hjorsey 1955- Iceland
HONG KONG'63	Hong Kong
HU-TZU-SHAN	Taiwan
INDIAN BNGLD	Indian- Bangladesh, India, Nepal
INDIAN THAIL	Indian- Thailand, Vietnam
IRELAND 1965	Ireland 1965- Ireland
ISTS 073 AST	ISTS 073 ATTRO '69- Diego Garcia
JOHNSTN ISLD	Johnston Island NAD27 Central
KANDAWALA	Kandawala- Sri Lanka
KERGULN ISLD	Kerguelen Island
KERTAU 1948	West Malaysia, Singapore
L..C. 5 ASTRO	Cayman Brac Island
LA REUNION	
LIBERIA 1964	Liberia 1964- Liberia
LUZON MINDAN	Luzon- Mindanao Island
LUZON PHILPN	Luzon- Philippines (excluding Mindanao Island)
MAHA 1971	Mahe 1971- Mahe Island

MARCO ASTRO	Marco Astro- Salvage Island
MASSAWA	Masswa- Eritrea (Ethiopia)
MERCHICH	Merchich- Morocco
MIDWAY AST61	Midway Astro '61- Midway
MINNA	Minna- Nigeria
NAD27 ALASKA	North American 1927- Alaska
NAD27 BAHAMA	North American 1927- Bahamas
NAD27 CANADA	North American 1927- Canada and Newfoundland
NAD27 CanalZ	North American 1927- Canal Zone
NAD27 Caribn	North American 1927- Caribbean (Bardados, Caicon Islands, Cuba, Dom. Rep., Grd. Cayman, Jamaica, Leeward and Turks Islands)
NAD27 Centrl	North American 1927-Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua)
NAD27 Cuba	North American 1927- Cuba
NAD27 Grnlnd	North American 1927- Greenland (Hayes Peninsula)
NAD27 Mexico	North American 1927- Mexico
NAD83	North American 1983- Alaska, Canada, Central America, CONUS, Mexico
NAPARIMA,BWI	
NHRWN MASIRA	Hahrwn- Masirah Island (Oman)
NHRWN SAUDI	Hahrwn- Saudi Arabia
NHRWN UNITED	Hahrwn- United Arab Emirates
OBSRVTORIO66	Observatorio 1966- Corvo and Flores Islands (Azores)
OLD EGYPTN30	Old Egyptian- Egypt
OLD HAWAIIAN	Old Hawaiian- Mean Value
OMAN	Oman- Oman
ORD SRVY GB	Old Survey Grt Britn- England, Isle of Man, Scotland, Shetland Isl, Wales
PICO DE LAS	Canary Islands

PROV S AM'56	Prov So Amricn '56- Bolivia, Chile, Colombia, Ecuador, Guyana, Peru, Venezuela
PROV S CH'63	So Chilean '63- S. Chile
PTCAIRN AST	
PUERTO RICO	Puerto Rico & Virgin Island
QORNOQ	Qornog- South Greenland
QUTAR NATION	Qatar South Greenland
ROME 1940	Rome 1940- Sardinia Island
SANTA BRAZ	Sao Braz- Sao Miguel, Santa Maria Islands
SANTO (DOS)	Santo (Dos)- Espirito Santo
SCHWARZECK	Schwarzeck- Namibia
SE BASE	Southeast Base- Porto Santo and Madiera Islands
SOUTH ASIA	South Asia- Singapore
SPPR HILL'43	Sapper Hill 1943- East Falkland Island
STH AMRCN'69	S American '69- Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Venezuela, Trin/obago
SW BASE	Southwest Base- Faial, Graciosa, Pico, Sao Jorge and Terceira
TIMBALAI'48	Timbalai 1948- Brunei and E. Malaysia (Sarawak and Sabah)
TOKYO	Tokyo- Japan, Korea, Okinawa
TRISTAN AST	Tristan Astro- Tristan da Cunha
VITI LEVU'16	Viti Levu 1916- Viti Levu/Fiji Islands
WAKE-ENWET60	Wake-Eniwetok- Marshall
WGS 72	World Geodetric System 72
WGS 84	World Geodetric System 84
ZANDERIJ	Zanderij- Surinam (excluding San Salvador Island)

Supplied Accessories

- **CLIP-14** *Quick-Draw* Belt Clip
- **CT-84** PC Interface Cable
- Wrist Strap
- Owner's Manual
- Quick Reference Guide

Available Options

CT-84 PC Interface Cable
CT-85 Data output Cable
MMB-78 Universal Bracket

Flat Surface Installation

Per the diagram below, and using the **MMB-78** Universal Bracket as a template, drill two holes onto the surface to which the **MMB-78** is to be mounted. Use the supplied self-tapping screws to mount the **MMB-78** to the surface.

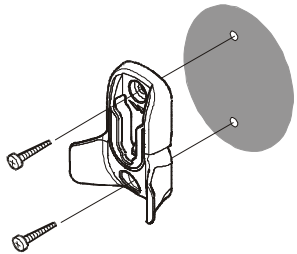
Mounting to Pipe (Hand Railing, etc.)

Use the supplied U-Bracket, and the supplied nuts and bolts, to clamp the **MMB-78** to a convenient pipe. Tighten the nuts snugly to hold the **MMB-78** firmly in place.

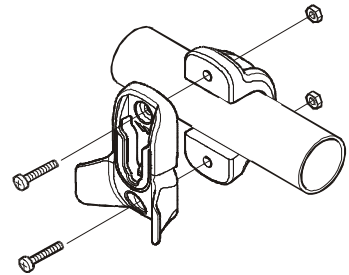
Operation

To install the **MAGNUM** into the **MMB-78**, align the hanger with the **MMB-78**, and slide the **MAGNUM** into its slot until a click is heard.

To remove the **MAGNUM** from the **MMB-78**, slide the **MAGNUM** out from the **MMB-78** while pressing the **MAGNUM** to the backward.



Flat Surface Installation



Mounting to Pipe

For general troubleshooting, please refer to this **TROUBLESHOOTING CHART**.

TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	REMEDY
Does not turn On.	The Batteries may be low or the polarity of the AA cells may not be correct.	Check the polarity of all batteries.
Does not get a valid fix.	The GPS may not be in a good location.	Make sure that no metal obstacle around GPS acting as a shield for the antenna.
Does not turn Off.	The **MAGNUM** may be in an unpredictable status.	If, after pressing [**PWR**] (for at least 3 seconds) the **MAGNUM** does not turn Off, remove the Batteries.
Screen becomes very dark after a long exposure to direct sunlight.	The Internal temperature is very high.	Change the contrast. Refer to page 73. Remove from direct sunlight.
Does not respond to any command.	The **MAGNUM** maybe in an unpredictable status.	Try to turn off, and then back on. If the problem still persists, remove, replace the batteries and turn back on.
External NMEA devices are not receiving data.	The connections or the software settings may not be right.	Check the connections (refer to page 82) or settings (refer to page 85).

Product Support Inquiries

If you have any questions or comment regarding the use of the **MAGNUM** you can visit the **STANDARD HORIZON** Web site to send an E-mail or contact the Product Support team at 562/404-2700, M-F 7:00-5:00 PST.

On-Line Warranty Registration

Please visit **www.standardhorizon.com** to register the **MAGNUM** GPS.

It should be noted that visiting the Web site periodically may be beneficial to you, as new software versions may be released from time to time.

STANDARD HORIZON LIMITED WARRANTY

STANDARD HORIZON (a division of Vertex Standard USA) warrants, to the original purchaser only, each new Marine Product ("Product") manufactured and/or supplied by STANDARD HORIZON against defects in materials and workmanship under normal use and service for a period of 3 year from the date of purchase.

In the event of a defect, malfunction or failure of the Product during the warranty period, Standard Horizon's liability for any breach of contract or any breach of express or implied warranties in connection with the sale of Products shall be limited solely to repair or replacement, at its option, of the Product or part(s) therein which, upon examination by STANDARD HORIZON, appear to be defective or not up to factory specifications. STANDARD HORIZON may, at its option, repair or replace parts or subassemblies with new or reconditioned parts and subassemblies.

To receive warranty service, the purchaser must deliver the Product, transportation and Insurance prepaid, to STANDARD HORIZON (Marine Division of Vertex Standard)., 115 North Wright Brothers Dr, Salt Lake City, UT 84116-2838, Include proof of purchase indicating model, serial number and date of purchase. STANDARD HORIZON will return the Product to the purchaser freight prepaid.

STANDARD HORIZON will not warrant installation, maintenance or service of the Products. In all instances, STANDARD HORIZON's liability for damages shall not exceed the purchase price of the defective Product. This warranty only extends to Products sold within the 50 States of the United States of America and the District of Columbia.

STANDARD HORIZON will pay all labor and replacement parts charges incurred in providing the warranty repair service except where purchaser abuse or other qualifying exceptions exist. The purchaser must pay any transportation expenses incurred in returning the Product to STANDARD HORIZON for service.

This limited warranty does not extend to any Product which has been subjected to misuse, neglect, accident, incorrect wiring by anyone other than STANDARD HORIZON, improper installation, or subjected to use in violation of instructions furnished by STANDARD HORIZON, nor does this warranty extend to Products on which the serial number has been removed, defaced, or changed.

STANDARD HORIZON cannot be responsible in any way for ancillary equipment not furnished by STANDARD HORIZON which is attached to or used in connection with Products, or for the operation of the Product with any ancillary equipment, and all such equipment is expressly excluded from this warranty. STANDARD HORIZON disclaims liability for range, coverage, or operation of the Product and ancillary equipment as a whole under this warranty.

STANDARD HORIZON reserves the right to make changes or improvements in Products, during subsequent production, without incurring the obligation to install such changes or improvements on previously manufactured Products. The implied warranties which the law imposes on the sale of this Product are expressly LIMITED, in duration, to the time period specified above. STANDARD HORIZON. shall not be liable under any circumstances for consequential damages resulting from the use and operation of this Product, or from the breach of this LIMITED WARRANTY, any implied warranties, or any contract with STANDARD HORIZON. IN CONNECTION WITH THE SALE OF ITS PRODUCTS, STANDARD HORIZON MAKES NO WARRANTIES, EXPRESS OR IMPLIED AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, EXCEPT AS EXPRESSLY SET FORTH HEREIN.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitation on how long an implied warranty lasts, so the above limitations or exclusions may not apply.

This warranty gives specific legal rights, and there may be other rights which may vary from state to state.

Appendix

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Appendix

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Note

Vertex Standard

U.S. Headquarters: 17210 Edwards Road • Cerritos, CA 90703
Tel (562) 404-2700 • Fax (562) 404-1210

Declaration of Conformity

No. 40921

We declare in sole our responsibility that the following equipment:

Responsible Party Name:	Vertex Standard USA, Inc.
Address:	17210 Edwards Rd. Cerritos, CA 90703 U.S.A.
Phone number:	562-404-2700
Fax number:	562-404-1210
Type of Equipment:	GPS
Brand Name:	STANDARD HORIZON
Model Number:	NAV-40 / NAV-45
Manufacturer:	Vertex Standard Co., Ltd.
Address of Manufacturer:	4-8-8 Nakameguro Meguro-ku, Tokyo 153-8644, Japan
TF Number:	QA980103
Issued Date:	April 9th, 2001
Issued Place:	CA, U.S.A.

Conforms to the following specifications:

FCC Rule:	FCC Part 15 Subpart B
Standard applied:	ANSI C63.4-1992

This device complies with Part 15 of FCC Rules. Operation is subject the following two conditions: (1) This device may not cause harmful interface, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Representative Person's Name: Mr. Mikio Murata

Signature:

Date: April 9th, 2001

STANDARD HORIZON

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