Magellan GPS NAV 1000M™

Training Guide

READ USER GUIDE COMPLETELY TO INSURE PROPER AND SAFE USE OF THE MAGELLAN GPS NAV 1000M™.

▲ THIS SYMBOL IS USED FOR IMPORTANT SAFETY INFORMATION. WHEN YOU SEE THIS SAFETY SYMBOL, CAREFULLY READ AND FOLLOW THE MESSAGE.

Part No. 22-20002

Magellan GPS NAV 1000M™

Training Guide

Magellan Systems Corporation
Monrovia, California 91016

TABLE OF CONTENTS

USING THE NAV 1000M FOR THE FIRST TIME

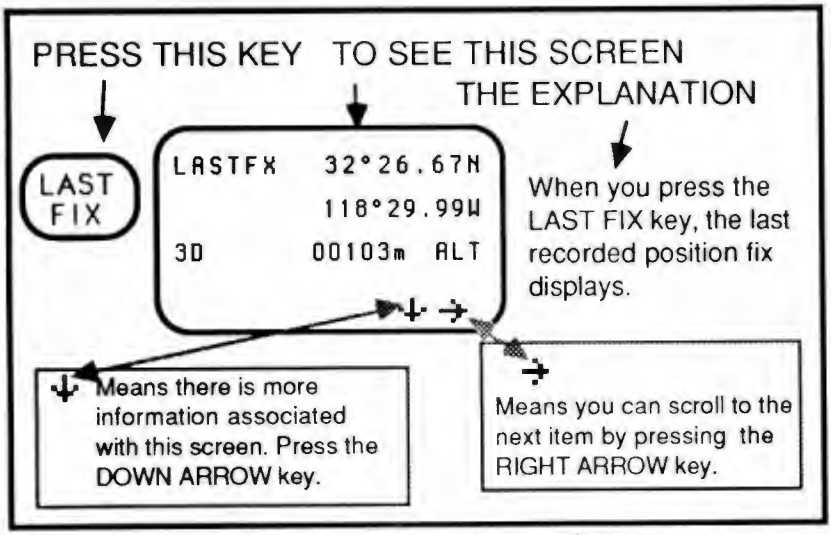
▲ Before using the **Magellan GPS NAV 1000M™** for the first time, read the **User Guide** thoroughly paying particular attention to Section 2: The Basics. You will also find it helpful to read *All About GPS* in the **User Guide** Appendices.

To Operate the Unit

Load AA batteries	See the Field Card or User Guide, pages 2 - 5.
Initialize the Unit	Page 9.
Collect an Almanac	Page 14.
Run through the Tutorial	Page 16.

USING THE TRAINING GUIDE

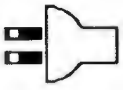
To use this booklet, all you must remember is to press the key shown at the left of the page to obtain the display next to it. The explanation is on the right of the page.



Following Guide Instructions

The down and right arrows indicate that you can obtain additional information.

NOTE: In hand-held (6 AA cell battery) operation, the unit is designed to normally cycle off if you press no key for 120 seconds. Press ON and the appropriate function key to reactivate operation.



The NAV 1000M is designed to conserve power while operating on its six AA alkaline batteries and will turn off after two minutes if no keys are pressed. This battery-conserving operation is referred to as "push-to-fix."

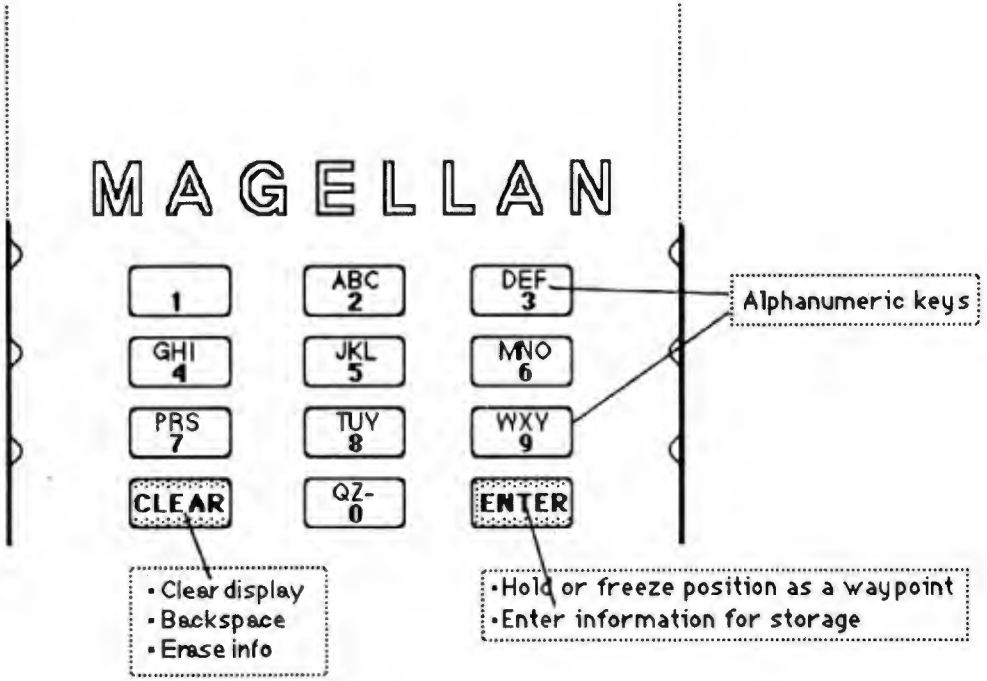
The unit may be operated continuously by using an external AC power adapter (supplied with the NAV 1000M), external DC power (with the GPS exterior antenna kit), or its six internal AA alkaline batteries. Use AUX 2 to select continuous operation when the unit is powered by its internal batteries.

The NAV 1000M sometimes works differently in continuous operation. This power plug is used to note those differences.

Instructions for Continuous Operation

THE KEYPAD

•Enter and retrieve waypoint information
•Five Last fixes
•Current Position/Altitude
•Current Datum/Date/Time
•Geometric and Signal Quality
•Satellites in Use
•Bearing and Distance to Destination
•Steering
•Enter an Initial Position
•Select Mode
•Set Time
•Establish a route for navigation
•Used to toggle right to the next selection
•Speed over Ground
•Ground Course
ON/OFF
WPT
LAST FIX
POS
NAV
YEL
AUX
LIGHT
INIT
COURSE
•Time
•Set Up
•Continuous Operation
•Collect Almanac
•Satellite Status
•Erase Waypoints
• Scroll to additional info on item selected


MAGELLAN
1
ABC 2
DEF 3
GHI 4
JKL 5
MNO 6
PRS 7
TUY 8
WXY 9
CLEAR
QZ- 0
ENTER
Alphanumeric keys
• Clear display
• Backspace
• Erase info
•Hold or freeze position as a waypoint
•Enter information for storage

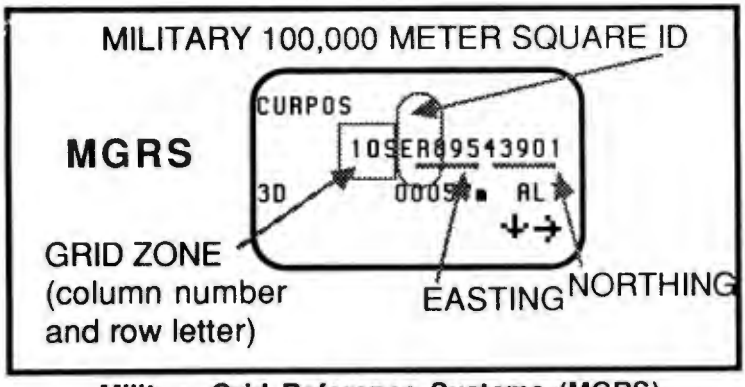
THE POSITION DISPLAY

The position coordinates displayed on the NAV 1000M can be shown in three ways –

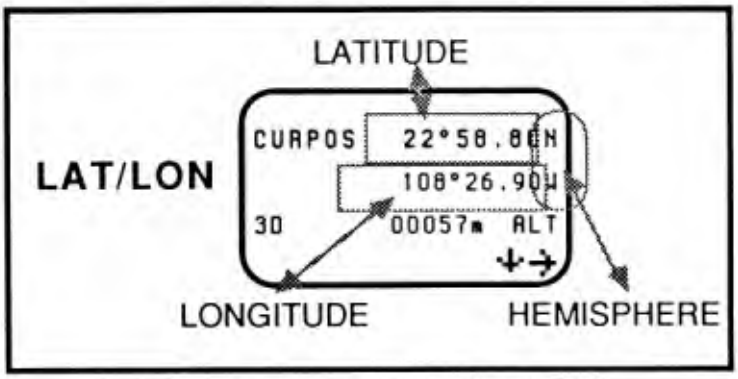
- Military Grid Reference Systems (MGRS);
- Latitude and Longitude (LAT/LON);
- Universal Transverse Mercator Coordinates (UTMs).

The default display for the NAV 1000M is military grids. Use AUX 1 to select other options.

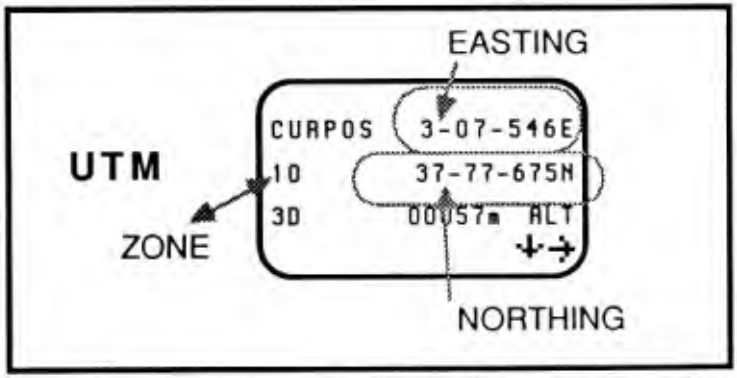
Data input for each system is described in ENTERING WAYPOINTS. The displays are shown below.



Military Grid Reference Systems (MGRS)



Latitude and Longitude (LAT/LON)



Universal Transverse Mercator Coordinates (UTMs)

NOTE: Reset the set up defaults so the displays on your unit will match those of this tutorial. Press AUX 1 and continue to press the Down Arrow key until this display appears: "RESET FACTORY DEFAULTS? NO." Press the RIGHT ARROW key once so "YES" appears. Then press ENTER, followed by "CLEAR."

TURNING THE UNIT ON

When you turn the unit on, it performs a self-test that checks the mode (2D or 3D), the operation (batteries or external power), the age of the Almanac, the memory, and the power level.

When the unit is ready to use, this message displays.

Self-Test Warnings

The following warning messages could appear.

If you see...	Take this action...
WARNING BATTERIES LOW	Get ready by loading spare battery clip.
REPLACE BATTS OR LOSE DATA	Exchange fresh batteries in the clip.
INITIALIZE - PRESS INIT	Enter the position and time in INIT.
NEED ALMANAC PRESS AUX 3	Collect an almanac using AUX 3.
MEMORY LOST - PRESS INIT	Reinitialize (INIT), collect an almanac (AUX 3), and re-enter waypoints.

INITIALIZING THE UNIT

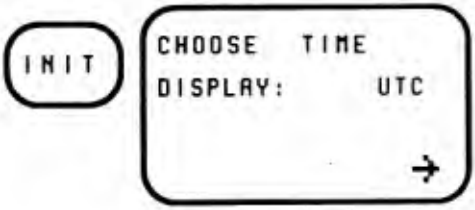
To initialize the unit, you must know your position (within 300 miles) in either military grid reference system coordinates (MGRS), universal transverse mercator coordinates (UTMs), or latitude/longitude.

If you initialize using MGRS, it is important that you have selected the map datum in AUX 1, Set Up, that matches the one your initial position is referenced to. Check your map.

The first time you use the NAV 1000M, you must enter an initial position, time and antenna altitude (if in 2D mode). Read *Interpreting Your Position Fix* in Section 2 of the **User Guide** for help in understanding this process.

Time as well as position is set in the Initialization. Time must first be set in universal time (UT). See Time in Section 2. As soon as you collect an Almanac, the unit will correct the time based on accurate information from the satellites. The purpose of entering time before collecting the Almanac is to enable you to enter waypoints and experiment with features of the NAV 1000M.

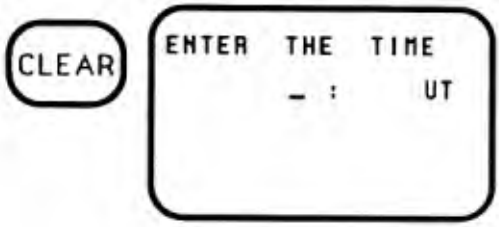
Once time is set in UT, you can initialize local time and set it to display local time (AM/PM).



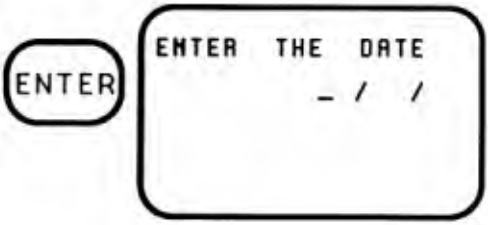
If memory has been lost, the unit must be first initialized in Universal Time (UT).

NOTE: The unit always stores waypoints and other position information using the Universal Time and date. Once initialized in UT, the display can be set to read in local time by pressing the Right Arrow here. (See *Time* in Section 2 of the **User Guide** for an explanation of UT.)

The corresponding current date (DD/MM/YY) and time display, if the unit has been previously initialized.



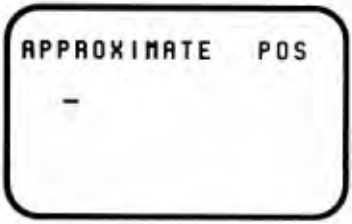
Press the CLEAR key to reset time and date. (If you are initializing the unit for the first time, or if memory has been lost, this display will automatically appear first.) Using the alpha-numeric telephone-style keypad, enter the current time in UT in hours and minutes.



Enter the corresponding date in Day/Month/Year.

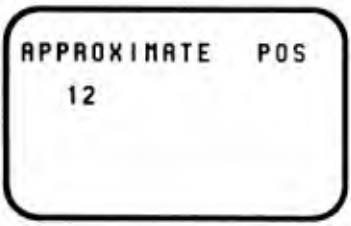
Press the ENTER key. The approximate position, a record of your last fix, will appear unless memory has been lost.

CLEAR



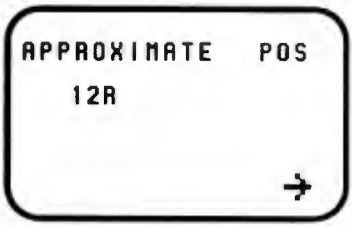
If you want to reset the position, press the CLEAR key.

12



First enter the Grid Zone Designation column number...

R

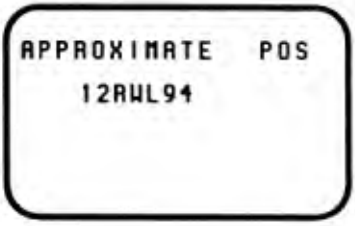


and row letter. Note when a letter is the correct entry, a Right Arrow appears on the display. To obtain an "R", press the 7 key and hit the RIGHT ARROW key once.

WL

Now enter the 100,000 meter square identification, WL in this example, by pressing the 9 key, the 5 key, and then the RIGHT ARROW key twice.

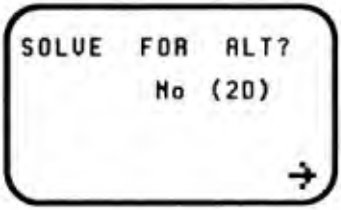
94



Next enter the easting and northing (9 and 4 here) using any display refinement desired. (10,000 meter refinement is all that is needed for initialization.

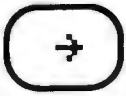
GRID DISPLAY REFINEMENT OPTIONS

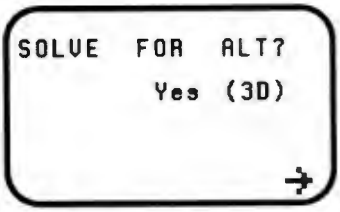
Refinement	Example
10 Meter	10SER89543901
100 Meter	10SER895390
1,000 Meter	10SER9039
10,000 Meter	10SER94



Press the ENTER key to select mode.

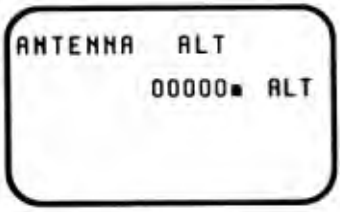
NOTE: 2D means two dimensions. In 2D mode, the unit uses three satellites and does not solve for altitude. The antenna altitude must be entered correctly (±5 meters) to obtain an accurate position. Antenna altitude is your elevation plus the antenna height. 3D means three dimensions. In 3D mode, the unit uses four satellites and solves for altitude as well as latitude and longitude. For further information, see *2D vs. 3D Fixes* in Section 2 of the **User Guide**.





Press the RIGHT ARROW key to select 3D, the mode we recommend for land use.

▲ **WARNING: The recommended mode for land use is 3D. In 2D mode, best accuracies are obtained when the correct altitude is entered, because position error is a function of altitude error. See *2D vs. 3D* in Section 2 of the User Guide.**



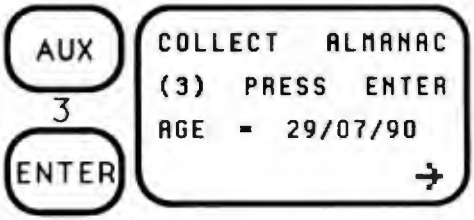
If 2D mode had been selected, you would have been asked to enter the antenna altitude in meters. Sea level is the default.

NOTE: The unit can also be initialized using Lat/Lon or UTMs. Press AUX 1, ENTER and Down Arrow to change the position read-out options.

COLLECTING AN ALMANAC

You will need to collect an almanac from one of the satellites before using the unit. This information is like a bus schedule that your unit will use to locate other satellites for navigation.

Since this will take at least 12-1/2 minutes, we recommend that you use either the AC power adapter that comes with the basic unit or the DC regulated adapter from the GPS Exterior Antenna Kit (accessory) to save your internal AA batteries.



When you select AUX 3 - Collect Almanac, this message displays containing the Almanac date..

Press the ENTER key once...

NOTE: If the date is less than six months old, there is no need to collect an almanac now, unless you desire the most recent system information.

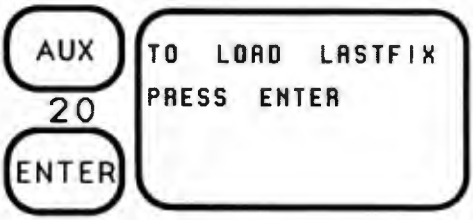
By pressing the ENTER key, you start the unit's search for a single satellite from which it will obtain the almanac.

When the unit locates and locks onto a satellite, this message displays. The time indicates when the process began. Add 12-1/2 minutes to determine when the almanac collection will be complete.

When collection is complete, the unit will store the information and display the new almanac's date. Because of the nature of the GPS system, the almanac date transmitted will be a couple of days ahead of the current time and date.

THE TUTORIAL

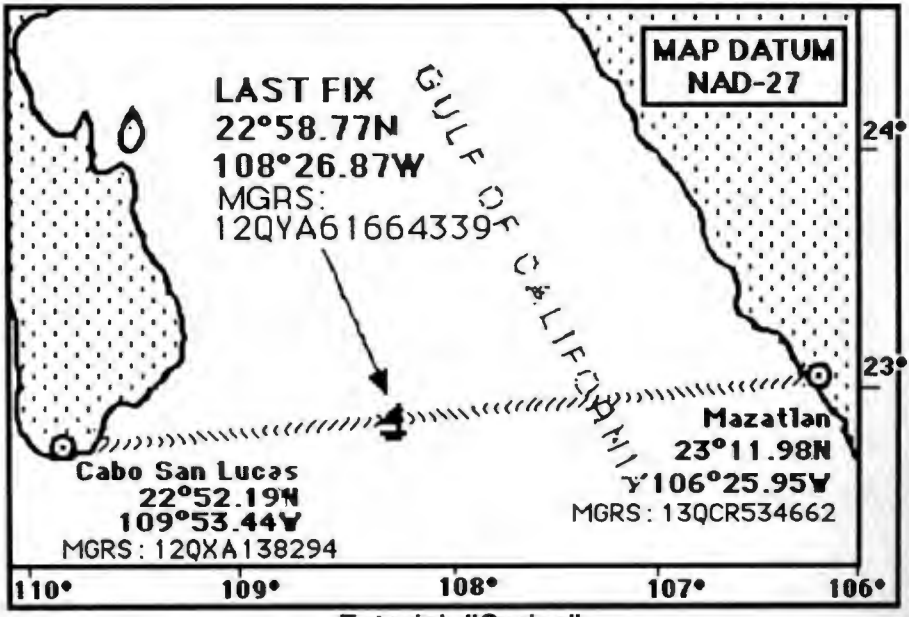
The NAV 1000M has been programmed so it will create a Last Fix that you can use to learn the navigation functions. The tutorial will make use of this fictional position and the two waypoints you are about to enter. These exercises will teach you how to use the Waypoint, Course and Navigation functions.



Press AUX 20 and ENTER now and the unit will give you this message. Press the ENTER key one more time to create the temporary position represented by the small boat in the chart on the next page.

Waypoints can be entered using the military grid reference system, universal transverse mercator coordinates, or latitude and longitude. The unit stores waypoints by the names you give them. These names can be up to six characters long. We will enter two waypoints, Cabo San Lucas and Mazatlan, to show you how this works.

This exercise assumes you are on a cruise in the Gulf of California roughly half way on a trip from Cabo San Lucas to Mazatlan.



Tutorial "Cruise"

NOTE:

Before performing the tutorial, go to AUX 1 setup and change the following parameters:

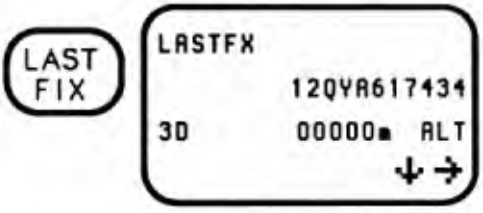
LAT/ LON DISPLAY to DEG/MIN.

ENTER DATUM to 25-NAD 27.

MAGNETIC VAR to AUTO MAG (M).

LAST FIX

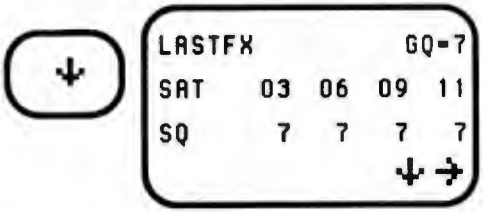
The **LAST FIX** key provides temporary access to previous position fixes. These fixes will update each time you take a new fix.



When you press the LAST FIX key, the last recorded position displays. This particular position was created when you pressed AUX 20.

Press the DOWN ARROW key to see the current map datum and the day and time of the last fix.

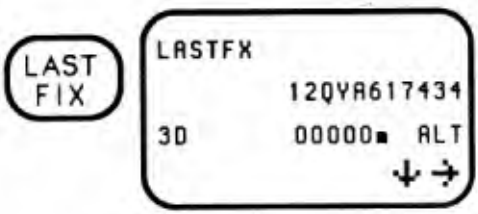
NOTE: The time and date of this fix corresponds directly to the moment at which you pressed AUX 20.



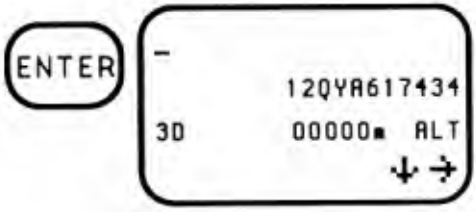
Press the Down Arrow key again to see the Geometric Quality (GQ) and the satellites used for the fix. The Signal Quality (SQ) of each satellite appears as well.

SAVING POSITIONS AS WAYPOINTS

You may save any position fix—a current position, a Last Fix, or its related backups—as a waypoint. You save the position by pressing the ENTER key while viewing that waypoint. The ENTER key acts like a "HOLD" key, freezing the position while you name it. This example saves the Last Fix.



First locate the coordinate you want to store.



Press the ENTER key while viewing a position. Information continues to display, but the cursor is now in the upper-left corner of the message display. You can give the waypoint a name ...

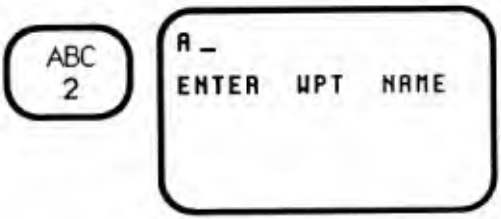
Or simply press ENTER and the unit will automatically generate a name using the format WPT01, WPT02, etc.

ENTERING WAYPOINTS

Waypoints will be entered in the coordinate system selected in AUX 1, Set Up. Before entering the position, determine what map datum it is referenced to. Check your map. Use AUX 1, Set Up to select the corresponding datum in your NAV 1000M.

To manually enter a waypoint, begin by pressing the WPT key.

First, you will enter the waypoint CABO. Press the ENTER key to get the first entry message.

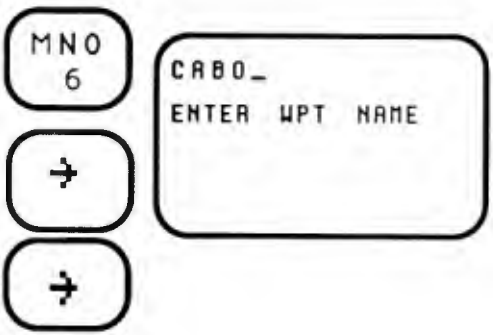


Press the 2 key. Note that the letter "A" appears on the screen.

Press the RIGHT ARROW twice to change the "A" to "C". (Continued toggling with RIGHT ARROW would reveal an endless loop of "ABC2ABC2...")

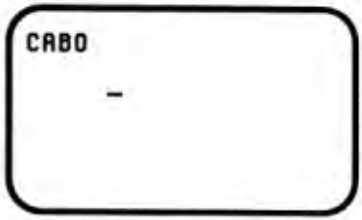
Press the 2 key again. The first two letters of "CABO" are now entered. If you make a mistake, press CLEAR to erase the letter.

Pressing the 2 key and the RIGHT ARROW once creates the "B".



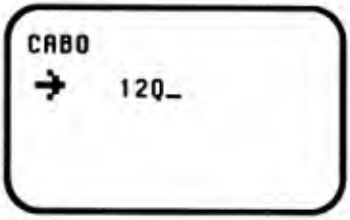
"O" is created by pressing the 6 key, followed by two RIGHT ARROWs.

ENTER



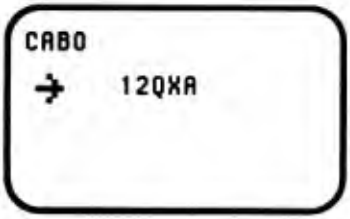
Press ENTER. You can begin entering the grid reference.

12Q



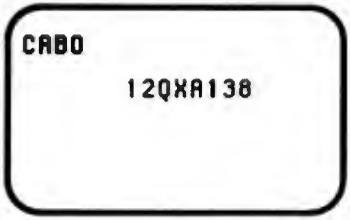
As with Initialization, enter the Grid Zone Designation number and letter 12Q. Note that the Right Arrow appears on the display when the entry requires a letter.

XA



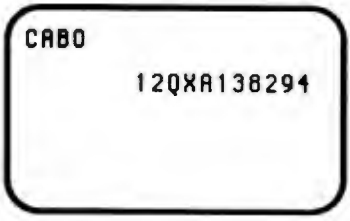
Now enter the 100,000 meter square identification by pressing the 9 key and the 2 key.

138

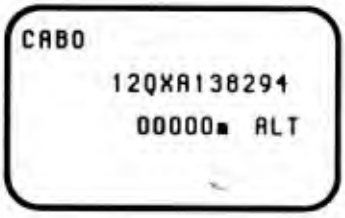


Now enter the easting in any desired refinement, 100 meters in the example. (Refinement need not match that set in AUX 1, Set Up.)

294



Now enter the northing in the exact same refinement as the easting.



Press ENTER. Now enter the waypoint's altitude in meters.

Press ENTER again to save this waypoint.

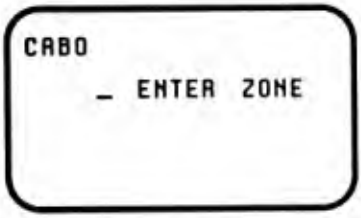
Repeat this process entering the waypoint for Mazatlan. Remember, first press WPT, then ENTER to begin the entry procedure.

NOW ENTER MAZATLAN ==> MAZTLN
13QCR534662
ALT = 0 meters

Entering a Waypoint in UTM Coordinates

The UTM coordinates for Cabo San Lucas are easting of 613,802 meters and northing of 2,529,392 meters.

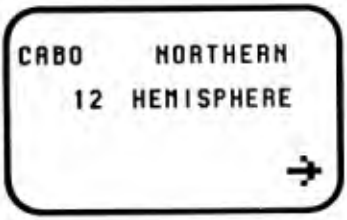
Enter the alphanumeric name CABO as just explained. (If you have already created waypoints named CABO and MAZTLN, you must first erase them using AUX 5 or by pressing CLEAR while viewing those waypoints.)



Starting at this display . . .

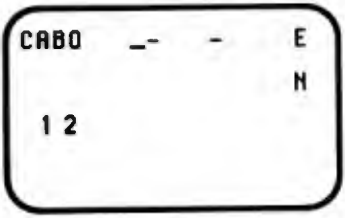
12

ENTER

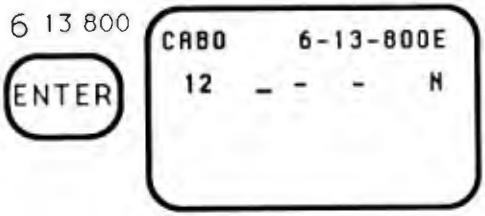


Press "1", "2" and the ENTER key to designate the UTM Zone 12. Use the RIGHT ARROW key to select hemisphere.

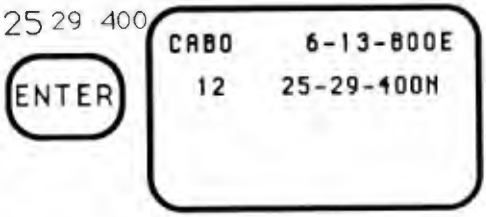
ENTER



Press the ENTER key again to see the data entry display for the coordinate.



Key in the easting value of 613,800 meters. Then press ENTER again.



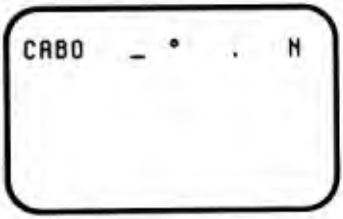
Now key in the northing of 2,529,400 meters.

Press ENTER again to complete the waypoint by specifying altitude.

The UTM coordinate for Mazatlan is Zone 13, 3 53 400 E and 25 66 200 N. Go ahead and enter this position. If you have done this correctly, the course and navigation information in the chapters ahead will be right.

Entering a Waypoint in Latitude/Longitude

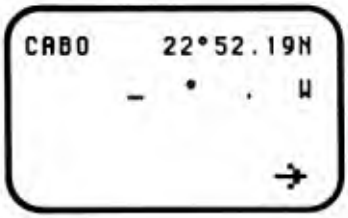
Enter the alphanumeric name CABO as in the first illustration. The latitude of Cabo in degrees and minutes is 22°52.19N.



Beginning at this display . . .

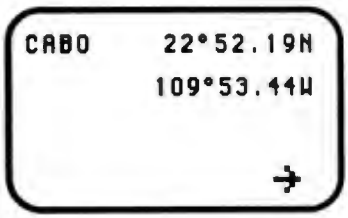
225219

ENTER



Enter the latitude. If you press the RIGHT ARROW key now, you will see the hemisphere change from "N" for North to "S" for South. N is the correct entry. Press the ENTER key.

1095344

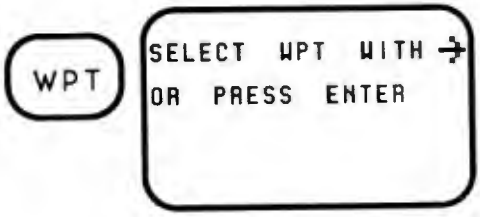


Now enter the longitude. "W" for West can be changed to "E" for East with the RIGHT ARROW key. W is the correct entry.

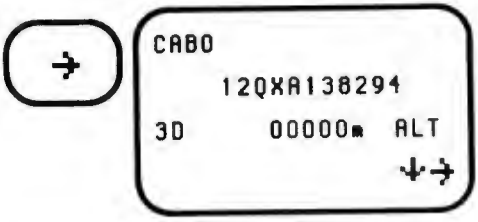
Completion of the waypoint entry is identical to the two previous examples.

The position for Mazatlan in Lat/Lon is 23°11.98N/106°25.95W. Enter this position now. If you have done this correctly, the course and navigation information in the chapters ahead will be right.

VIEWING WAYPOINTS



To begin viewing waypoints, press the WPT key.



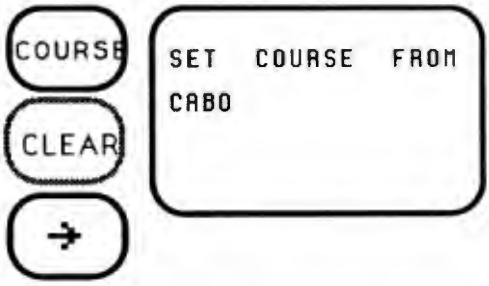
To view the waypoints just entered, press the RIGHT ARROW until CABO appears.

You can also view a waypoint by referring to its name. Press WPT again. By pressing the 6 key (M), and ENTER, you will see the first waypoint with a name beginning with "M".

Entering any part of the waypoint name, "C", "CA", "CAB", or "CABO" will retrieve the waypoint.

SETTING A COURSE

Now you will set a course from CABO (Cabo San Lucas) to MAZTLN (Mazatlan) using the two waypoints you have just created.



To set the course, press the COURSE key and then press RIGHT ARROW until the waypoint "CABO" appears.

NOTE: If a previous course had been set, press the CLEAR key between course and right arrow.

Press ENTER. The destination waypoint can now be selected using the RIGHT ARROW or ...

By entering the first letter or any part of the waypoint name, M or MAZ, for example. (and the RIGHT ARROW key, if necessary).

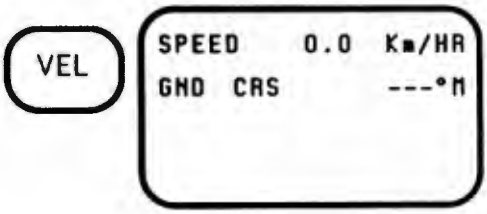
Press the ENTER key and the unit calculates and displays the bearing and great circle distance from your course start to destination.

NAVIGATION

When you press the NAV key, your bearing and distance from your Last Fix to the destination waypoint (MAZTLN as set in the Course function) displays. Steering, the direction you should turn, is obtained only in continuous operation.

NOTE: Dashes will appear for bearing, and steering when you are less than 20 meters from the destination. Dashes will appear in steering when you are moving less than 0.2 MPH.

VELOCITY



Speed or speed over ground (SOG) and ground course appear next. Since the unit is not in continuous operation (AUX 2) and you are not moving, this is the display you will see.

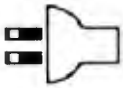
NOTE: Speed and ground course are available only in continuous operation. Dashes will appear in ground course and zeros in velocity when you are moving less than 0.2 knots.

TAKING A POSITION FIX

Before pressing the POS key, turn the antenna straight up with a clear, unobstructed view of the sky. The unit should be held above eye level so the body will not block the satellite signals.

The POSITION (POS) key activates the unit's receiver. Press the POS key each time you want to obtain a position fix. Under normal conditions, it will take less than four minutes to obtain a position. If you have taken a reading within the hour, it will take approximately three minutes.

To operate the receiver continuously, use AUX 2 to establish continuous operation in hand-held use. Turning the unit off changes the operation back to push-to-fix.



When operating on an external power supply, press the POS key to turn the receiver on. After obtaining the initial position, the unit will continuously update your current position, the current time, and the navigation solutions. (See *External Power Operation* in Section 2 of the User Guide for more information about update rate.)

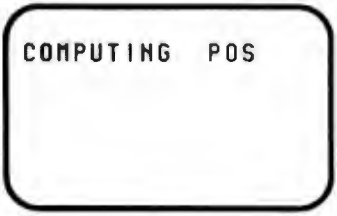
The unit begins its search for satellite signals when you press the POS key. The initial message indicates whether you have set the unit for a 2D or 3D search. (See *Interpreting Your Position Fix* in Section 2 of the User Guide.)

▲ **WARNING: The recommended mode for land use is 3D. If you do not know your exact altitude, do not use 2D mode. Best accuracies are obtained when the correct altitude is entered (within ±5 meters).**

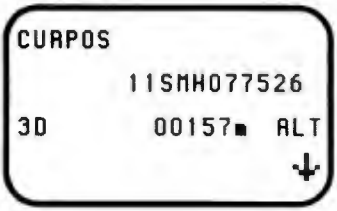
When the unit finds the first satellite, this message displays. As each subsequent satellite is located, additional satellite symbols display.

When the appropriate number of satellites have been located (four for 3D, three for 2D), this message displays.

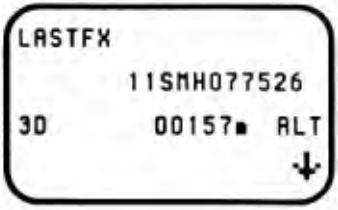
As the data is being collected, symbols appear until all data is obtained.



After satellite data has been collected, this message displays. You may lower your arm when you see this message since all the information has been collected from the satellites.



The current position is saved as a Last Fix in hand-held battery operation.

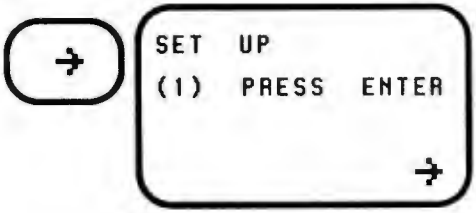


Press the LAST FIX key to review the waypoint.

AUXILIARY FUNCTIONS

The AUXILIARY (AUX) key is a feature that contains a series of supplementary functions.

When you press the AUX key, this message displays, which includes the date and time. To access functions ...



Press the RIGHT ARROW key to scroll to the desired functions.

You can see the full list of Auxiliary functions by continuing to press RIGHT ARROW.

(1) SET UP
(2) CONTINUOUS OPER
(3) COLLECT ALMANAC
(4) SAT STATUS
(5) ERASE WAY POINTS

To clear all memory, press AUX 13 and ENTER, then follow the instructions on the display.

SET UP -- AUX 1

The Set Up function in AUX 1 allows you to customize the NAV 1000M displays.

Features you can change are the :

- **Terrain Setting**
- **Coordinates**
  Lat/Lon Display
  Grid Refinement
- **Enter Datum**
- **Magnetic Variation**
- **Distance/Speed Units**
- **Altitude Units**
- **Beeper On/Off**
- **Date Order**
- **Reset Factory Defaults**

Terrain Settings help the unit work most efficiently in a given environment.

• **Interrupted**	Is recommended for most uses. It assumes a clear view of the sky, but that the satellite signal is being interrupted and, therefore, the unit will tolerate intermittant obstructions.
• **Obstructed**	Is recommended when the view of the sky is obscured by foliation and many obstructions. (It uses satellites higher in the sky and hangs on to a strong signal rather than switch to a a weaker signal though the weaker signal might provide better accuracies.)
• **Clear**	Should be used to obtain the best accuracies possible. It assumes an excellent view of the sky without interruptions. It always switches to better satellites if it can improve accuracy.

Use the following worksheet to plan your selections.

SET UP WORKSHEET

SELECT ONE OPTION FOR EACH SET UP FEATURE
(Factory defaults are shown in bold)

TERRAIN SETTING
- ☐ **INTERRUPTED**
- ☐ OBSCURED
- ☐ CLEAR

COORDINATES
- ☐ **MGRS**
- ☐ LAT/LON
- ☐ UTM

GRID ACCURACY (If MGRS)
- ☐ **100 M SQUARE**
- ☐ 1,000 M SQUARE
- ☐ 10,000 M SQUARE
- ☐ 10 M SQUARE

OR

LAT/LON DISPLAY (If LAT/LON)
- ☐ **DEGREES/MINUTES**
- ☐ DEGREES/MINUTES/SECONDS

MAP DATUM

☐ **25-NAD27**	☐ 37-YACAR	☐ 2-ARC50	☐ 14-HJORS
☐ 26-ALASK	☐ 38-TANAN	☐ 3-AUSTR	☐ 15-HUTZU
☐ 27-MAUI	☐ 39-TIMBA	☐ 4-BUKIT	☐ 16-INDIA
☐ 28-OAHU	☐ 40-TOKYO	☐ 5-ASTRO	☐ 17-IRELA
☐ 29-KAUAI	☐ 41-VOIRO	☐ 6-DJAKA	☐ 18-KERTA
☐ 30-GRB36	☐ 42-SDIND	☐ 7-EUROP	☐ 19-LIBER
☐ 31-QORNO	☐ 43-SDLUZ	☐ 8-GEO49	☐ 20-USER
☐ 32-SIERR	☐ 44-SDTOK	☐ 9-GHANA	☐ 21-LUZON
☐ 33-CAMPO	☐ 45-SDWGS	☐ 10-GUAM	☐ 22-MERCH
☐ 34-CHUAA	☐ 46-WGS72	☐ 11-GUNSG	☐ 23-MONTJ
☐ 35-CORRE	☐ 47-WGS84	☐ 12-GUNSR	☐ 24-NIGER
☐ 36-PROVI	☐ 1-ADIND	☐ 13-HERAT	

SET UP WORKSHEET

SELECT ONE OPTION FOR EACH SET UP FEATURE
(Factory defaults are shown in bold)

MAGNETIC VARIATION

- ☐ **M (AUTO MAGNETIC)**
- ☐ T (TRUE)
- ☐ U (User Set _ _° _ _'E or W (SPECIFY))

DISTANCE/SPEED DISPLAY

- ☐ **Km (kilometers) and Km/HR (kilometers per hour)**
- ☐ MI (statute miles) and MPH (miles per hour)
- ☐ NM (nautical miles) and KNOTS

ALTITUDE UNITS

- ☐ **meters**
- ☐ feet

BEEPER

- ☐ **OFF**
- ☐ ON

DATE ORDER

- ☐ **DAY/MONTH/YEAR**
- ☐ MONTH/DATE/YEAR

NOTES

MAGELLAN™
SYSTEMS CORPORATION

260 EAST HUNTINGTON DRIVE
MONROVIA, CA 91016
(818) 358-2363
FAX (818) 359-4455

#22-20002