decimal digits replaced by diamond symbols, until a good fix is received.

❖ 4.3 - INPUT FORMATS

The chart plotter accepts several input formats:

1) NMEA-0183/1200
2) NMEA-0183
3) NMEA-0182/TAIYO
4) KODEN 717
5) KODEN 757
6) FURUNO CIF
7) TRIMBLE-200
8) DECCA MK3
9) II MORROW AVENGER
10) MICROLOGIC VOYAGER
11) TEXAS TI9900 I/II
12) NAVSTAR 2000D
13) MICROLOGIC ML 8000 T
14) AP NAV-MK4
15) GPS-NMEA/0183
16) GPS-ROCKWELL

4.3.1) PORT SELECTION

The unit has three input ports: EXTERNAL 1 (EXT1), EXTERNAL 2-(EXT2) and INTERNAL. To select the desired port, press the following keys:

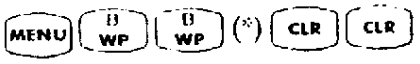
Selection of INPUT SOURCE

By pressing the 'C' key repeatedly, it is possible to select the desired source.

4.3.2) INTERFACE SELECTION (DATA FORMAT)

When installing the chart plotter, you must use the correct interface data format. The plotter accepts several standard interface formats.
To select the desired interface format press the following keys:

Selection of INTERFACE FORMAT



By pressing the 'B' key repeatedly, it is possible to select the desired format.

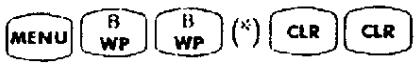
Note

When selecting the formt, the serial interface is automatically set and the parametersselected thru the "SERIAL INTERFACE TEST" are ignored. The chart plotter maintains the format selected when switched Off.

4.3.3) Special Navigator Selection in Ext 1 and Ext 2 Modes

The chart plotter accepts two special interface formats, AP NAV-MK4 and MICROLOGIC ML 8000 T.
First, you must select Input Source as Ext1 or Ext2. Then one of the special navigator can be selected through the following process:

Selection of SPECIAL NAVIGATOR



By pressing the 'B'(*) key repeatedly, it is possible to select the desired special navigator.

One of the special navigator interfaces must be selected first. The Special Navigator Menu can be selected through the following procedure:

Selection of SPECIAL NAVIGATOR MENU

After pressing the 'D' key, if MICROLOGIC ML 8000 T is selected, two options are available:

- press the A DEST key to set the transmission of Cross-Hair coordinates;
- press the B WP key to set the transmission of chain numbers.
  After pressing 'B', the message "CHAIN NUMBER" will appear on screen: by arrow key inserts the chain number, then press ENT to complete process or CLR to abort function.

If AP NAV - MK4 has been selected, only the transmission of the Cross-Hair coordinates may be set.

4.3.4) GPS Data Page

In order to display the GPS Data Page, the GPS-NMEA-0183 or GPS ROCKWELL must

be selected first. It is possible following the procedure:

Selection of GPS-NMEA-0183 or GPS ROCKWELL

MENU | B WP | B WP (*) | CLR | CLR

By pressing the 'B'(*) key repeatedly, it is possible to select the desired special navigator.

The GPS Data Page can be selected through the following procedure:

Selection of GPS DATA PAGE

MENU | B WP | D MARK | CLR | CLR

The following data page is shown on the screen:

```
UTC Time [hhmm:ss]: 1644:11   Date [ddmmyy]: 00-05-00
 SAT NO.      ELEVATION      AZIMUTH        SNR

   01            90            000           90
   02            45            045           75
   03            78            044           44
   04            67            023           32
   05            33            066           56
   06            60            025           15
   07            77            088           10
   08            24            024           64
   09            10            010           78
   10            39            014           05
   11            37            037           37
   12            02            060           50

     Satellites In Use: 12

LAT-LON: 02 25.593 N   031 24.230 W
FIX NOT RELIABLE
SOG: 105  Knt          COG: 221  mag.

HDOP: 25.0             VDOP: 35.0          1) DISPLAY GPS DATA

    PREVIOUS MENU: 'CLR'                   2) TIME OFFSET
```

Two options are available:

- the A DEST key allows you to display the GPS data: press the ENT key to stop (or to continue after pause) the transmission of data on the screen;
- the B WP key allows you to set local time offset: using the arrow key to increase and to decrease.

Press the CLR key to return to previous menu.

❖ 4.4 - COMPUTING FIX ERROR

The chart plotter can automatically correct fixes from the positioning instrument which have a low accuracy level.

4.4.1) Automatic Mode

To compute the fix error in automatic mode, move the Cross-Hair to the ship's real position and then press the following keys:

Selection of AUTOMATIC COMPUTING FIX ERROR

MENU | B WP | A DEST | B WP | CLR | CLR | CLR

Through this operation, the error is calculated and internally memorized for appropriate correction.

4.4.2) Manual Mode

To compute the fix error in manual mode, please follow the procedure:

Selection of MANUAL COMPUTING FIX ERROR

MENU | B WP | A DEST | C PLOT | CLR | CLR | CLR

After pressing the 'C' key, the latitude value may be modified by the A DEST and B WP keys, and the longitude value may be modified by the C PLOT and D MARK keys. When the desired values have been inserted, press the ENT key to confirm or the CLR key to abort operation.

4.4.3) Correcting Fix Error

After the error has been calculated (See par. 4.4.1 or par. 4.4.2), you may turn the Fix Correction ON/OFF by pressing the following keys:

Selection of CORRECTING FIX ERROR

MENU | B WP | A DEST | A DEST | (*) | CLR | CLR | CLR

The 'A'(*) key toggles the selection On or Off.
The chart plotter accepts corrections up to 10 nautical miles.

❖ 4.5 - FILTER FUNCTIONS

The chart plotter can filter the fix received and also the speed.

4.5.1) Position Filter

The chart plotter can filter the fix received from a positioning device. In case of a jittering fix, this option makes the ship's position more stable and the track smoother. This feature is called Position Filter and it can be turned ON/OFF by pressing the following keys:

Selection of POSITION FILTER

The 'A' key toggles the selection On or Off.

4.5.2) Speed Filter

The chart plotter can also filter the speed. The Speed Filter can be turned On or Off by pressing the following keys:

Selection of SPEED FILTER

The 'B' key toggles the selection On or Off.

The chart plotter can set the filter interval for the speed. This interval can be selected by pressing the following keys:

Selection of FILTER STEP

After pressing the 'C' key, use the left and right arrow keys to select the desired step, ENT to confirm the value or CLR to abort.

❖ 4.6 - CHOOSING A TARGET

You can tag a particular mark on the map by using the Target function. In order to

activate the Target function, the Cross-Hair must be placed over the desired waypoint, the [A DEST] key must be pressed and a submenu will appear on the screen: the Target is placed by pressing the [A DEST] key.

By pressing the [A DEST] and [B WP] keys the Target is cancelled: the symbol that identifies Target disappears from the screen.

By pressing the [A DEST] and [C PLOT] keys, the plotter can display the Distance (Distance To Go = DTG), the Time to the Target (Time To Go = TTG) or the Cross Track (Cross Track Error = XTE).

The pressing of the [A DEST] and the [D MARK] key is only valid when in Navigation mode, as the plotter must be first connected to a positioning instrument to use the Autopilot. Otherwise the message "AUTOPILOT NOT ALLOWED" will flash on the screen.

The Target function is activated the same way in Navigation as in Charting mode.

❖ 4.7 - DISTANCE AND BEARING BETWEEN SHIP'S POSITION AND ANY GIVEN POINT

In Navigation mode this function permits fast and easy measurements of distances and bearings between ship's position and any point on the map.

To activate this option place the Cross-Hair over the desired location and press the [R/B] key: the letter "A" will appear over the ship's position and the letter "B" will appear over the point identified by the Cross-Hair and the two points are connected by a straight line. A small cross will identify the beginning and the end of the line "A-B". On the screen the distance, in nautical miles, between "A" and "B" and the relative bearing are displayed.

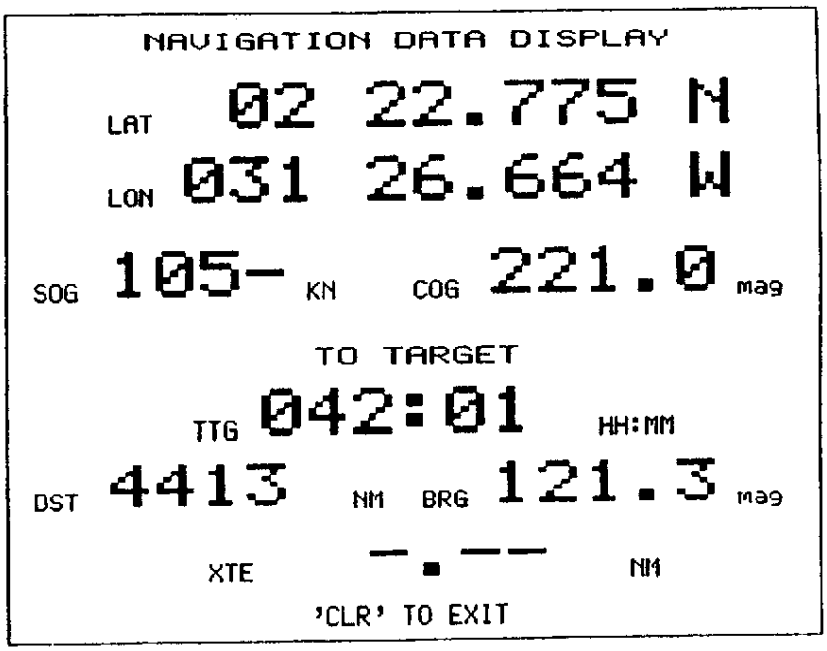
To clear the "A-B" segment, simply press the [CLR] key and then the [C PLOT] key, and the segment will be deleted.

Note

In Navigation mode the distance is between the ship's position and any given point, while in Charting mode, it is between the Cross-Hair and any given point (See also par. 3.3).

❖ 4.8 - NAVIGATION DATA DISPLAY

The Navigation Data Display can be selected by pressing the [ENT] key for 1 second.



Press [CLR] to return to cartography.

chapter 5
USER POINTS

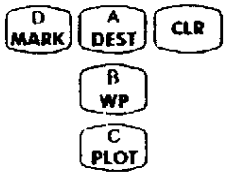
5.1 - INTRODUCTION

A user point is a place on the chart stored by its coordinates and displayed on the screen with a reference symbol. The chart plotter gives two types of user points, Mark and Event points.
The Marks are reference points, that can be set either in Charting or in Navigation mode, related to Cross-Hair position. Three types of Marks are available.
Events are markers directly related to the ship's position. It is simply a way of marking where the boat is.

5.2 - PLACING MARKS ON THE CHART

To permanently place a Mark on the chart, the Cross-Hair must be placed over a desired position and then follow the procedure:

Selection of INSERT MARK



Three types of Marks are available, press the 'A', 'B' or 'C' key to select the desired type.

By holding the A DEST, B WP or C PLOT key for more than one second, the exact coordinates of the point identified by the Cross-Hair are now displayed, and you now have the chance to modify them. The left and right arrow keys move the cursor, while the up and down arrow keys insert the desired values, and the ENT key is to confirm the entries.

Note

It is not possible to set a Mark over an existing Mark of the same type (the unit emits three beeps), but it is possible to set a Mark over an existing Mark of a different type.

❖ 5.3 - PLACING EVENTS ON THE CHART

As previously pointed out, a Mark is simply a reference point on the map. It can be set in either Charting or Navigation mode.
An Event, is a marker directly related to the ship's position. It is simply a way of marking where the boat is. To create Events, in either mode, follow the procedure:

Selection of INSERT EVENT

After pressing the 'D' key a symbol will appear on the screen, marking the boat's position.

❖ 5.4 - USER POINT IDENTIFIER FUNCTION

You may insert an identifier on Mark and Event points, by the following procedure:

Selection of AUTO-NUMBERING FUNCTION

The 'C' key toggles the selection On or Off.

If the Autonumbering option is On, after pressing the the 'MARK' key (and then the 'A', 'B, 'C' or 'D' key), the points are displayed on the screen identified by a number in automatic mode.
If the Autonumbering option is set Off, when you set a Mark or an Event point, it is possible to insert the desired label (max 10 characters) to identify the point. Press the up and down arrow keys to insert the desired character and use the left and right arrow keys to move the cursor to left or right position. Press ENT to confirm or CLR to abort.

Note

The user point identifiers are shown on the screen only if the User Point Identifier option is On (See par. 5.5)

❖ 5.5 - USER POINT IDENTIFIER DISPLAY

The user can display the user point identifier on the screen, by the following procedure:

Selection of USER POINT IDENTIFIER FUNCTION

E SET → B WP → B WP → (*) → CLR → CLR

The 'B'(*) key toggles the selection On or Off.

If the User Point Identifier option is set On, you set a Mark or an Event point, the user point is identified on the screen by a number.

❖ 5.6 - DELETING MARKS/EVENTS OFF THE CHART

A single Mark can be deleted by positioning the Cross-Hair on it and by pressing the CLR and then the A DEST key.

To erase an Event, position the Cross-Hair over the Event to erase, press the CLR and then the B WP key.

If all the Marks or Events placed on the electronic chart have to be cancelled:

Selection of DELETING ALL MARKS/EVENTS

MENU → A DEST → (*) → A DEST → ENT → CLR → CLR

B WP

C PLOT

D MARK

F MODE

After pressing the 'A'(*) key, the Clear User Points submenu will then appear, press the number corresponding to the desired function:

- the 'A' key to clear all Marks ⧖;
- the 'B' key to clear all Marks ✳;
- the 'C' key to clear all Marks ⋈;
- the 'D' key to clear all Events ⅄;
- the 'F' key to clear all stored user points.

After pressing the key corresponding to the desired option and pressing ENT to confirm the choice, an "OK" message will appear on the screen.

❖ 5.7 - INFORMATION ABOUT AN USER POINT

To obtain the coordinates of a Mark (or Event), place the Cross-Hair on it. On the display is the user point number and its coordinates.

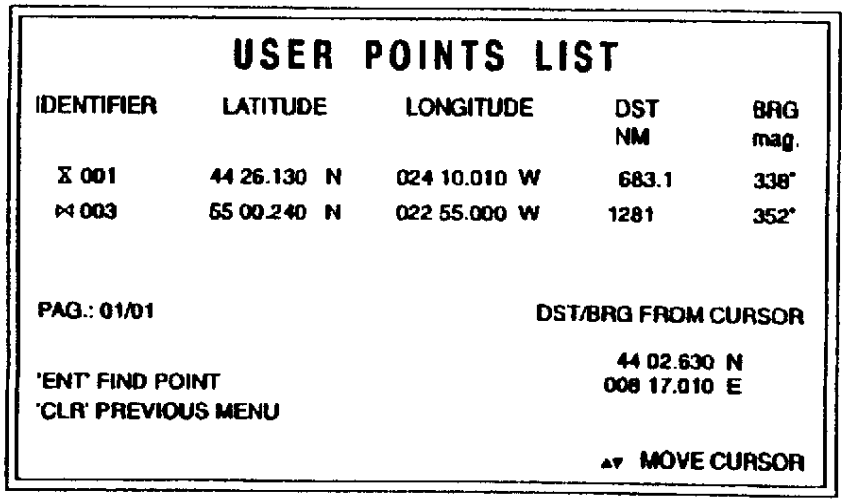
❖ 5.8 - USER POINTS LIST PAGE

The User Points List Page gives information about all stored user points: latitude and longitude, distance and bearing from the cursor (if the system is in Charting mode) or the ship's position (if the system is in Navigation mode) are displayed for each point.
To select the User Points List Page follow the procedure:

Selection of USER POINTS LIST PAGE

MENU → E SET → CLR

After pressing the 'E' key, the following page is shown on the screen:



Press the up and down arrow key to select the desired user point in the list, and press the ENT key if you want to display the selected user point. After pressing the 'ENT' key, the chart plotter exits from the User Points List Page and the chart redraws, shown the selected point with the Cross-Hair placed on it: a window containing the coordinates and the identifier of the user point is opened on the screen. If the Page contains more than 16 user points, the list follows in the next page(s): press the ZOOM OUT key to display the next page(s) and the ZOOM IN key to return to the previous page(s).

Press CLR to return to previous menu.

chapter 6
AUTOPILOT MODE

6.1 - INTRODUCTION

The chart plotter can be connected to an autopilot through a standard interface NMEA-0180, NMEA-0180/CDX or NMEA-0183.
The autopilot function can only be used when the chart plotter is correctly receiving the ship's position from the positioning instrument, the Navigation mode is selected and a Target Point is properly inserted. Once the Target Point is set (See par. 4.6) and the autopilot function is activated, the chart plotter computes the course between the current position and the Target that must be sent to the Autopilot, and starts to transmit the Track Error to the Autopilot. When arriving at a preset distance (which can be selected among 0.5, 1 and 5 miles) from the Target Point, the plotter gives an audible alarm.

Note

If the Target Point is changed, the new course, on which the Track Error is calculated, is set.

6.2 - TURNING THE AUTOPILOT ON/OFF

To enable the Autopilot function follow the procedure:

Selection of AUTOPILOT FUNCTION

The 'D' key toggles the Autopilot function engaged or disengaged alternately.
If you are in the split screen mode, the Autopilot status is displayed in the Text Area near the "AUTOPILOT:" indication (See par. 1.6.2).

Note

If the ship's position is not correctly received or if the Target point is disabled, the Autopilot function is automatically turned Off.

❖ 6.3 - SETTING AN AUTOPILOT ALARM RANGE

To select the Autopilot alarm range (0.5, 1 and 5 miles) press the following keys:

Selection of AUTOPILOT ALARM RANGE

By pressing the 'B' key repeatedly it is possible to select the desired autopilot alarm range.

❖ 6.4 - AUTOPILOT INTERFACE SELECTION

The chart plotter can be connected to an autopilot through a standard interface NMEA-0180, NMEA-0180/CDX or NMEA-0183.
To select the desired interface follow the procedure:

Selection of AUTOPILOT INTERFACE

By pressing the 'A' key repeatedly it is possible to select the desired autopilot interface.

chapter 7
USER DATA MENU

7.1 - USER DATA REPORT

All used marks, events, routes and tracks (User Data Report) are displayed on the screen following the procedure:

Selection of USER DATA REPORT

After pressing the 'F' key, the following page is shown on the screen:

USER DATA REPORT

MARK ⧖	:003
MARK ★	:002
MARK ⌶	:010
EVENT ⅄	:120
WAYPT	:003
TOTAL	:138
ROUTES	:01
TRACKING MEMORY FREE	:070%

7.2 - USER CARTRIDGE

The user cartridge is used by the chart plotter to save user data: it is a convenient medium for storing and retrieving your information.
The user cartridge may be inserted into the available slot.

Before a new user cartridge can be used, you must format it, by selecting the "Format User

Cartridge" option provided by the chart plotter. This function initializes the user cartridge and prepares it for storing information.

Remember that if a user cartridge is not blank, formatting it destroys any data already on the user cartridge (See par. 7.2.5 for more details).

Warning!

The cartridges must be formatted in order to be reused, but remember that with this operation all data memorized on the cartridge will be lost.

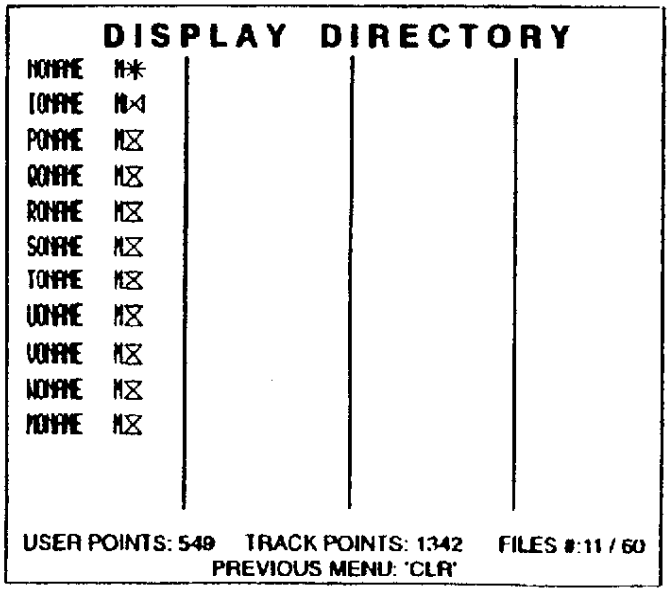
7.2.1) Display User Cartridge directory

Data stored on user cartridge is grouped in files. A file is a collection of information (of the same type) stored on a user cartridge. Each file must have a unique name, ideally one that describes its contents. For example, MARK1 is a file of Marks of the first type.

The names of your files are kept in a directory on each user cartridge.
If you want to know which files are on your user cartridge, you can use the "Display Directory" option.
This function is accessed by the following commands (after inserting the user cartridge into the slot):

Selection of DISPLAY DIRECTORY

After pressing the 'A' key, the directory will appear:



60 files are available, which are grouped on screen organized in 4 columns each of 15 files. The file name consisting of an "extension" to indicate the contents of the file (*).
In the bottom line of the screen information about the number of user and track points free, with the number of created files, are shown.

Note(*)

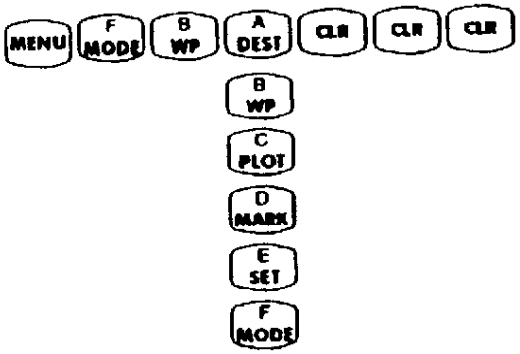
The available extension are M⧖, M⋈, M✳ for the three types of Marks, EVT for Events, RTE for routes and TRK for tracks.

Before pressing the 'A' key to display directory, check the user cartridge is inserted into the slot. If there is no user cartridge present in the slot, the warning message "INSERT USER CARTRIDGE AND PRESS ANY KEY WHEN READY" will appear: insert the cartridge and press any key when ready.

7.2.2) SAVE A FILE

The Save File submenu stores on user cartridge the desired group (file) of user points, for example a file of routes, present on screen. To access this function:

Selection of SAVE FILE



After selecting a group and pressing the [ENT] key to confirm the choice, the user can choose the filename. At first the default name ("NONAME") or the name of the last stored file is shown. Use the up and down arrow keys to change the character highlighted and use the right and left arrow keys to move the cursor to previous or next letter.
If you have inserted an existing name, the plotter emits three beeps and the message "UNABLE TO SAVE DATA FILE ALREADY EXISTS" is shown on the screen: change the name using arrow keys. Once finished, press [ENT] to confirm (or [CLR] to abort operation): on the screen will be shown the message "SAVING DATA ..." followed by the number of saved points (For example, saving a file of Events, it shows the number of stored Events points).

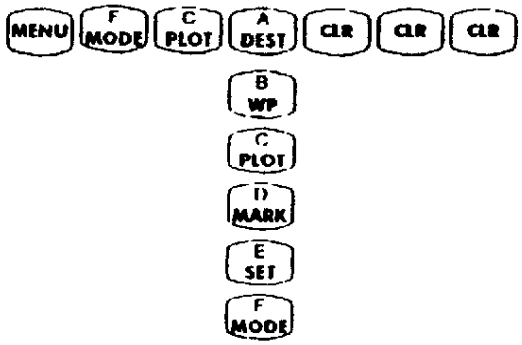
Note

When naming a file, you may have trouble finding a name that uniquely identifies the file's contents. Dates, for example, are often used in filenames; however, they take up several characters, leaving you with little flexibility. The secret is to find a compromise, a point where you can combine a date with a word, creating a unique filename. The maximum length of the filename is 8 characters. The characters may be numbers (0,...,9), letters (A,...,Z) and spaces (For example legal identifiers are "ABC", "AA", "12121212", "A B A", "1 A 1", and so on).

7.2.3) LOAD A FILE

The Load File submenu loads from user cartridge the desired group of user points, for example a file of routes. To access this function:

Selection of LOAD FILE



After doing so, the first filename isdisplayed. Use ZOOM IN and ZOOM OUT keys to select other filenames from the same type.

When you have found the desired filename, press ENT to confirm (or CLR to abort operation): displayed will be the message "LOADING DATA ..." followed by the number of stored points (for example, loading a file of Events, it is shown the number of Events points present in the file). When on the screen the message "MEMORY FULL" appears, the file is not loaded completely. Delete any unnecessary points and then repeat the operation.

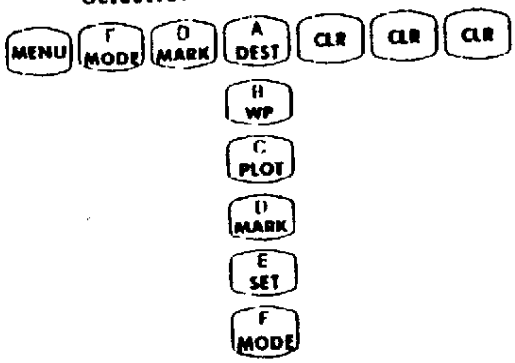
7.2.4) DELETE A FILE

Just as you may need to saving files, you may also need to remove old or unnecessary files to clean up your user cartridge.

When you want to erase a file from user cartridge, you can use the "Delete File" option. Remember, though, that this option permanently erases the file.

To access this function:

Selection of DELETE FILE



After doing so, the first filename will be displayed. Use ZOOM IN or ZOOM OUT keys to select other filenames from the same type. When you have found the desired filename, press ENT to confirm: on the screen will be displayed the message "ARE YOU SURE?", press ENT key to confirm or any key to abort function.

7.2.5) Format User Cartridge

Formatting user cartridge must be done before using a new user cartridge: this operation prepares the user cartridge to receive and store information.
A used user cartridge can also be formatted; if a used user cartridge is formatted, however, all previously stored data on the user cartridge will be lost completely.

Warning!

Formatting a user cartridge destroys all information on it. Before you format a used user cartridge, use the "Display Directory" option (See par. 7.2.1) to see what's on it. That way you won't lose any needed files.

Before you start the formatting procedure, insert a user cartridge into the slot and press the following keys:

Selection of FORMAT USER CARTRIDGE

After pressing the 'E' key, the message "ARE YOU SURE YOU WANT TO FORMAT THE USER CARTRIDGE ?" is shown: press ENT to confirm (or CLR to abort operation).
During formatting, the message "FORMATTING CARTRIDGE ...PLEASE WAIT" is displayed on the screen. Once finished, your user cartridge is formatted and ready to use. On the screen the message "DO YOU WANT TO FORMAT ANOTHER

CARTRIDGE ?" is shown. Press [ENT] if you want to format another cartridge or [CLR] to finish the format operation.
Be sure to label user cartridge; the label will remind you that you formatted the user cartridge, and will help you identify its contents.

7.2.6) CHANGE USER CARTRIDGE

To change the user cartridge follow this procedure:

Selection of CHANGE USER CARTRIDGE

[MENU] [F MODE] [F MODE] [CLR] [CLR]

Insert the desired user cartridge and then press any key when ready.

7.2.7) ERROR MESSAGES

This paragraph contains an alphabetical listing of the messages that might appear in the handling of user cartridge:

CARTRIDGE FULL
The user cartridge the chart plotter is writing to is full. Delete any unnecessary files (See par. 7.2.4) and retry, or use another user cartridge.

CARTRIDGE NOT FORMATTED
The user cartridge into the slot is not formatted. Before using it, you must format to prepare the user cartridge to receive and store information (See par. 7.2.5).

DIRECTORY FULL
The number of files is the maximum available (see par. 7.1.1). Delete any unnecessary files (See par. 7.2.4) and retry, or use another user cartridge.

FILE ALREADY EXISTS
The filename you specified in the command is the same as a filename present on the user cartridge.

FILE NOT FOUND
The file named in a function does not exist on the user cartridge in the slot. Check to see that you entered the filename correctly and try again.

USER CARTRIDGE NOT PRESENT
The user cartridge is not present into the slot. Insert the user cartridge into the slot (See par. 1.1) and retrive.

There are other types of messages that you could see on your screen:

INTERNAL ERROR: < N° system error >
A specific error number is associated with each type of system error. Write down the error number and report it to your dealer.

chapter 8
ALARMS

8.1 - CLEARING ALARMS

When there is an alarm condition, the CLR and D MARK keys reset it. The reason for the alarm is displayed in the Note Pad area (see par. 8.3), if you are in the split screen mode.

8.2 - FIX ALARM SETTINGS

The user can enable or disable the fix alarm and the auto alarm clear.
To select these options, press the following keys:

Selection of AUDIBLE ALARM

MENU B WP E SET A DEST CLR CLR CLR

The 'A' key toggles the selection On or Off.

Selection of AUTO ALARM CLEAR

MENU B WP E SET B WP (*) CLR CLR CLR

The 'B' (*) key toggles the selection On or Off.

8.3 - ALARM MESSAGES

There are five different alarm messages.
Three of them are related to the received data from the positioning instrument (see also par.1.4):

"NOT RECEIVED" : no data is received.
"NOT GOOD" : the received format is correct, but the information is declared "not good" by the positioning instrument.
"WRONG FORMAT" : the received format does not correspond to the selected format, or the received data does not have information on the ship's position.

The fourth alarm message is related to autopilot alarm range.

"AUTOPILOT ARRIVAL RANGE": when the position of the boat is within the radius that the user has set.

The fifth alarm message is the following:

"WAYPOINT REACHED": when the actual position of a Waypoint is reached and the plotter sets course to the next Waypoint.

This appendix is intended to provide a quick reference for users familiar with the chart plotter. It lists keyboard operations and the steps necessary to perform them. Menu operations are listed by key sequence. It is assumed that the user knows how to press the CLR key to back out of the menu and return to charts.
Commands that require Cross-Hair placement will indicate this with an "*". Basic operations such as power ON/OFF, Dim, and Zoom are not included.

ALARMS

Audible Alarm ON/OFF	MENU, 0 WP, E SET, A DEST par. 8.2
Auto Alarm Clear ON/OFF	MENU, 0 WP, E SET, B WP par. 8.2

AUTOPILOT

Autopilot Arrival Range	MENU, D MARK, B WP par. 6.3
Autopilot ON (With Target selected) [1]	A DEST, D MARK par. 6.2
*Autopilot ON (No Target selected) [1]	A DEST, A DEST, D MARK par. 6.2
Autopilot OFF	A DEST, D MARK par. 6.2
Output Format	MENU, D MARK, A DEST par. 6.4

DATUM WGS84

Chart	MENU, B WP, F MODE, B WP par. 2.6
Fix	MENU, B WP, F MODE, A DEST par. 2.6

EVENT

* Delete single Event	CLR, B WP par. 5.6

Deleting all Events	MENU A DEST D MARK ENT par. 5.6
Placing Event	D MARK D MARK par. 5.3

FIX

Automatic Computing Fix Error	MENU B WP A DEST B WP par. 4.4.1
Correction ON/OFF	MENU B WP A DEST A DEST par. 4.4.3
Input Format Selection	MENU B WP B WP par. 4.3.2
Input Source Selection	MENU B WP C PLOT par. 4.3.1
Manual Computing Fix Error [2]	MENU B WP A DEST C PLOT par. 4.4.2
Position Filter ON/OFF	E SET C PLOT A DEST par. 4.5.1
Speed Filter ON/OFF	E SET C PLOT B WP par. 4.5.2
Speed Filter Step [2]	E SET C PLOT C PLOT par. 4.5.2

FIX FUNCTIONS

Compass Calibration [2]	E SET D MARK B WP par. 2.5.1
Display True/Magnetic Headings	E SET D MARK A DEST par. 2.5.2
Magnetic Variation	E SET D MARK C PLOT par. 2.5.3
Magnetic Variation Step selection [2]	E SET D MARK D MARK par. 2.5.3

GPS

GPS Data Display	MENU B WP D MARK par. 4.3.4

GPS Data Page Selection	MENU B WP D MARK A DEST par. 4.3.4
Local Time Offset Setting	MENU B WP D MARK B WP par. 4.3.4

LANGUAGE

Language Selection	E SET B WP A DEST par. 1.12

MAP SETTINGS

Attention Areas ON/OFF	E SET A DEST C PLOT B WP par. 2.4.2
Bathymetric & Soundings Range	E SET A DEST B WP F MODE par. 2.3.6
Bathymetric Lines ON/OFF	E SET A DEST B WP B WP par. 2.3.2
Bottom Type ON/OFF	E SET A DEST B WP E SET par. 2.3.5
Buoys and Beacons ON/OFF	E SET A DEST C PLOT E SET par. 2.4.5
Cartographic Objects ON/OFF	E SET A DEST E SET D MARK par. 2.6.4
Chart Boundaries ON/OFF/AUTO	E SET A DEST E SET B WP par. 2.6.2
Chart Generation ON/OFF/TIMEOUT	E SET A DEST D MARK C PLOT par. 2.5.3
Compass ON/OFF	E SET A DEST D MARK B WP par. 2.5.2
Complex Object Icon SINGLE/BASIC	E SET A DEST D MARK E SET par. 2.5.5
Coordinates ON/OFF	E SET A DEST E SET A DEST par. 2.6.1
Cultural Features ON/OFF	E SET A DEST A DEST C PLOT par. 2.2.3
Info Level DETAILED/BASIC	E SET A DEST D MARK F MODE par. 2.5.6

Landmarks ON/OFF	E SET A DEST A DEST D MARK par. 2.2.4
Lights ON/OFF	E SET A DEST C PLOT D MARK par. 2.4.4
Names ON/OFF	E SET A DEST D MARK A DEST par. 2.5.1
Natural Features ON/OFF	E SET A DEST A DEST A DEST par. 2.2.1
New Objects ON/OFF	E SET A DEST D MARK D MARK par. 2.5.4
Ports and Services ON/OFF	E SET A DEST C PLOT A DEST par. 2.4.1
Rivers and Lakes ON/OFF	E SET A DEST A DEST B WP par. 2.2.2
Signals ON/OFF	E SET A DEST C PLOT F MODE par. 2.4.6
Smooth Scroll ON/OFF	E SET A DEST E SET C PLOT par. 2.6.3
Spot Soundings ON/OFF	E SET A DEST B WP D MARK par. 2.3.3
Tracks and routes ON/OFF	E SET A DEST C PLOT C PLOT par. 2.4.3
Water Turbolence ON/OFF	E SET A DEST B WP A DEST par. 2.3.1

MARK

* Deleting a single Mark	CLR A DEST par. 5.6
Deleting all Marks ⧖	MENU A DEST A DEST ENT
Deleting all Marks ✳	MENU A DEST B WP ENT
Deleting all Marks ⋈	MENU A DEST C PLOT ENT par. 5.6
Mark Identifier ON/OFF	E SET B WP B WP par. 5.5
Mark Autonumber ON/OFF	E SET B WP C PLOT par. 5.4

* Placing Mark ⧖	D MARK + A DEST
* Placing Mark ✳	D MARK + B WP
* Placing Mark ⋈	D MARK + C PLOT
	par. 5.2

NAVIGATION DATA PAGE

Display	ENT *for 1 second*
	par. 4.9

PLOTTING

Automatic Replot	MENU + C PLOT + A DEST
	par. 2.4.4
Plot track	C PLOT + A DEST
	par. 2.4.4

RANGE AND BEARING

Deleting A-B Line	CLR + C PLOT
	par. 3.3
* Display (Charting Mode)	R/B + *Cross-Hair* + R/B
	par. 3.3
* Display (Navigation Mode)	R/B
	par. 4.7

ROUTES

* Creating new route	B WP + C PLOT + A DEST
	par. 3.2.3
* Change route to edit	B WP + C PLOT
	par. 3.2.3
Deleting last Waypoint	B WP + B WP
	par. 3.2.2
Deleting route[1]	B WP + E SET
	par. 3.2.5
Deleting all routes	MENU + A DEST + E SET + ENT
	par. 3.2.6
* Placing Waypoint	B WP + A DEST
	par. 3.2.1
* Reverse route direction	B WP + D MARK
	par. 3.2.4

Route Data Report[9]	[WP] [MODE] par. 3.2.7

SPECIAL NAVIGATOR

Display of Special Navigator	[MENU] [WP] [MARK] par. 4.3.3
Selection of Special Navigator	[MENU] [WP] [WP] par. 4.3.3

TARGET

Deleting Target	[DEST] [WP] par. 4.6
Display distance, time or XTE	[DEST] [PLOT] par. 4.6
*Placing Target	[DEST] [DEST] par. 4.6

TRACKING

Automatic Replot	[MENU] [PLOT] [DEST] par. 2.4.4
Distance Step selection	[MENU] [PLOT] [PLOT] par. 2.4.3
Tracking Step Unit	[MENU] [PLOT] [WP] par. 2.4.2
Clear track	[MENU] [PLOT] [SET] par. 2.4.5
Time Step selection	[MENU] [PLOT] [MARK] par. 2.4.3
Track storing ON/OFF	[MODE] [WP] par. 2.4.1

USER CARTRIDGE

Change user cartridge	[MENU] [MODE] [MODE] par. 7.2.6
Delete file of Mark ⧖	[MENU] [MODE] [MARK] [DEST]
Delete file of Marks ✳	[MENU] [MODE] [MARK] [WP]

Delete file of Marks ⋈ ..... MENU F MODE D MARK C PLOT

Delete file of Events 人 ..... MENU F MODE D MARK D MARK

Delete file of routes ..... MENU F MODE D MARK E SET

Delete file of track ..... MENU F MODE D MARK F MODE

par. 7.2.4

Display directory ..... MENU F MODE A DEST

par. 7.2.1

Format user cartridge ..... MENU F MODE E SET

par. 7.2.5

Load file of Marks ⧖ ..... MENU F MODE C PLOT A DEST

Load file of Marks ✳ ..... MENU F MODE C PLOT B WP

Load file of Marks ⋈ ..... MENU F MODE C PLOT C PLOT

Load file of Events 人 ..... MENU F MODE C PLOT D MARK

Load file of routes ..... MENU F MODE C PLOT E SET

Load file of track ..... MENU F MODE C PLOT F MODE

par. 7.2.3

Save file of Marks ⧖ ..... MENU F MODE B WP A DEST

Save file of Marks ✳ ..... MENU F MODE B WP B WP

Save file of Marks ⋈ ..... MENU F MODE B WP C PLOT

Save file of Events 人 ..... MENU F MODE B WP D MARK

Save file of routes ..... MENU F MODE B WP E SET

Save file of track ..... MENU F MODE B WP F MODE

par. 7.2.2

USER POINTS

Autonumbering function ON/OFF ..... E SET B WP C PLOT

par. 5.4

Deleting all user points ..... MENU A DEST F MODE ENT

par. 5.6

User Point Identifier ON/OFF ..... E SET B WP B WP

par. 5.5

User Point List page ..... MENU E SET
par. 5.8

WAYPOINT (see also ROUTES)

Deleting last Waypoint ..... B WP B WP
par. 3.2.2

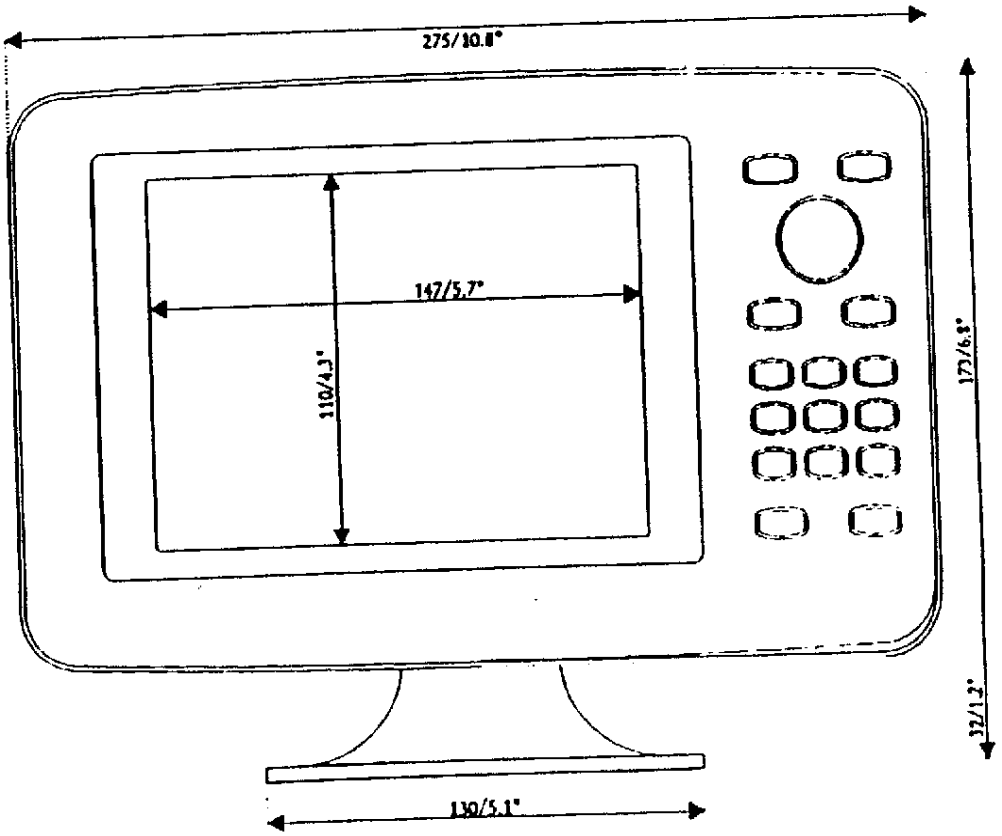
External Waypoint ON/OFF ..... E SET B WP D MARK
par. 3.2.9

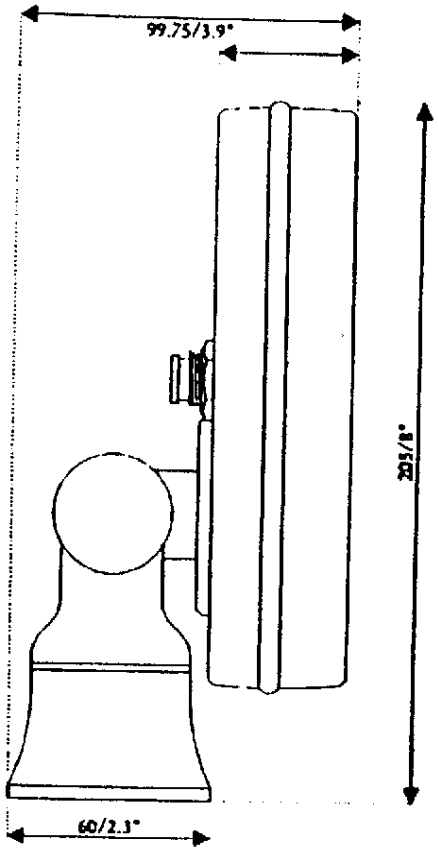
* Placing Waypoint ..... B WP A DEST
par. 3.2.1

Note

(1) The autopilot cannot be engaged without a good fix indication.
(2) Use arrow keys to select the desired value.
(3) Select route before making these commands.

Power Consumption	Less than 6 Watt (7 for chart plotter with GPS), 10 - 35 Volt dc
Navigation interface	From Loran, GPS, Decca, Omega via NMEA 0182/0183 and others
Autopilot interface	NMEA-0180 NMEA-0180/CDX NMEA-0183 (#)
Display	Trancflective backlighted LCD 8"
Display resolution	640 x 480 pixels
Cartography	C-MAP NT C-CARD
Zoom	From 1 meter to 40 km per pixel
Operational temperature range	0/+65 degrees Celsius
Memory	Non volatile with battery back-up
Keyboard	Silicon rubber backlighted
Weight	1.5 kg
Dimensions: (mm/inch)	





Note

(#) In accordance with Standard NMEA 0183 v. 2.00.

USER POINTS

GROUPS(*): 1

RECORDABLE INDIVIDUAL POINTS(**): Wpts + Marks + Events 500

ROUTES:
- Routes ..... 500(***)
- Waypoints per Route 500
- Target 1

TRACKING:
- Track 1
- Points per Track 800
- Steps by Distance ..... 1, .5, .1, .05, .01 ..... (NM)
- Steps by Time ..... 5, 3, 1, .5 (min) ..... 5, 15 (sec)

MARK/EVENT:
- User point alphanumeric identifier
- Type of Marks 3
- Type of Events 1

FUNCTIONS

CARTOGRAPHIC FUNCTIONS:
- Worldwide chart coverage
- Depth Unit Selection (MT, FT, FM)
- Depths Areas Limit
- Bathymetrics & Soundings Range
- Natural Features, Rivers & Lakes, Cultural Features, Landmarks, Water Turbolence, Bathymetric Lines, Spot Soundings, Bottom Type, Ports & Services, Attention Areas, Tracks & Routes, Lights, Buoys & Beacons, Signals, Names, Compass, Chart Generation, New Objects, Complex Object Icon, Info Level, Coordinates, Chart Boundaries, Smooth Scroll, Cartographic Objects, Plotter Mode.
- Full screen
- WGS84 Coordinates System
- Thousand handling coordinates

FIX FUNCTIONS	: . Fix Correction . Display Headings True or Magnetic . Keypad entry to modify Fix Correction . COG vector . Position filter . Speed filter . Magnetic variation user selections
REPORT FUNCTIONS	: . Route Data Report with selectable units, fuel consumption and estimated time arrival . Extended GPS Data page . Navigation Data Display (LAT, LON, COG, SOG, BRG, XTE, TTG) . BRG/DST from ship to cursor . User Points List page
SPECIAL FUNCTIONS	: . Automatic Info on cartographic objects and user point . Multiwindow system . External waypoint
AUXILIARY MEMORY	: . User cartridge 128K

INTERFACE

I/O SUPPORT	: . Two selectable serial ports . Autopilot output
INPUT FORMATS	: . NMEA-0183 (#) (GLL, SBK, SCY, SNU, XTE, GXP, GDP, GOP, GLP, VTG, RMA, RMC, BWC, GGA) . NMEA-0183/1200 . NMEA-0182/TAIYO . KODEN 717 . KODEN 757 . FURUNO CIF . TRIMBLE-200 . DECCA MK3 . IIMORROW AVENGER . MICROLOGIC VOYAGER . TEXAS TI9900 I/II . NAVSTAR 2000D . GPS ROCKWELL
SPECIAL NAVIGATORS	: . MICROLOGIC ML 8000T . AP NAV-MK4

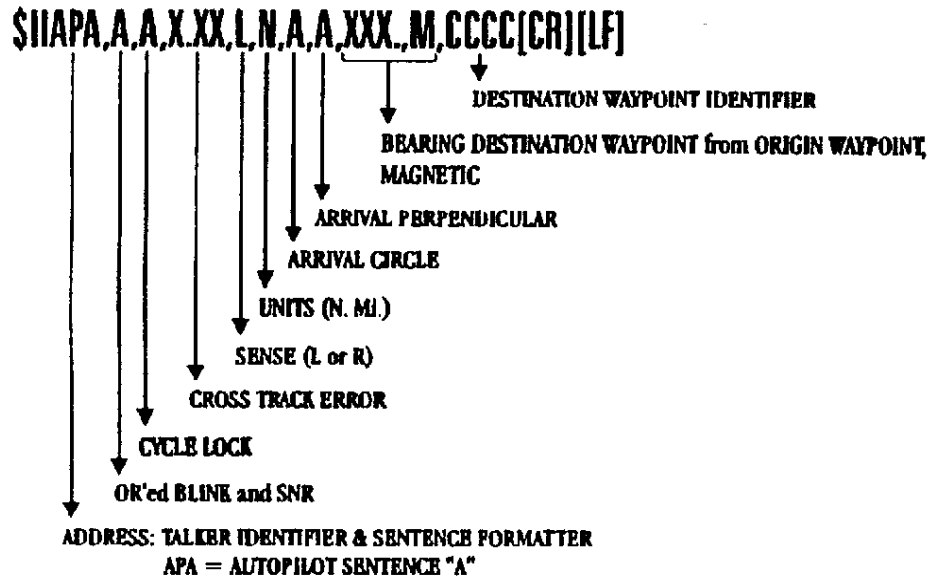
OUTPUT FORMATS : . NMEA-0180
. NMEA-0180/CDX
. NMEA-0183 (****)(#):
GLL, VTG, BWC(void)
(with Autopilot on: BWC, GLL, XTE, BOD, APB, WCV, APA, VTG)

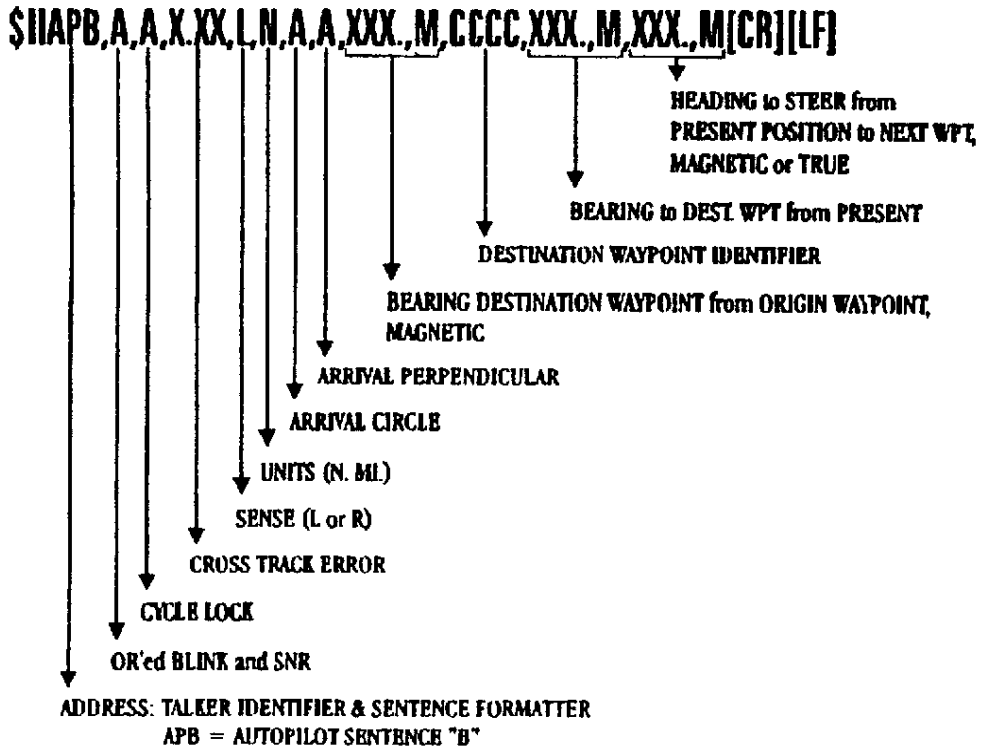
Note

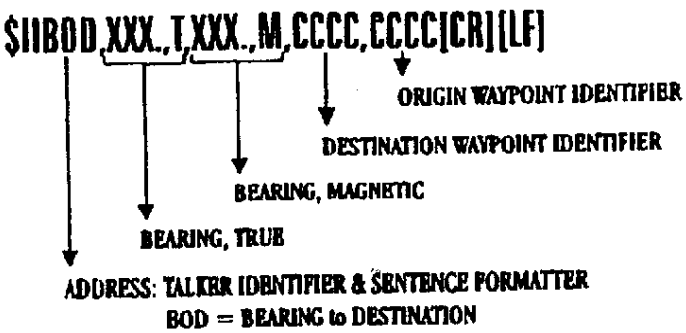
(*) Groups: number of pages of memory.
(**) For each page. The total number of points is this number times the number of pages.
(***) The number of routes is limited by the maximum number of waypoints available. Theoretically you can have 500 routes each one made of one point only.
(****) These sentences are continuously sent only if a fix is received.
(#) In accordance with Standard NMEA 0183 v. 2.00.

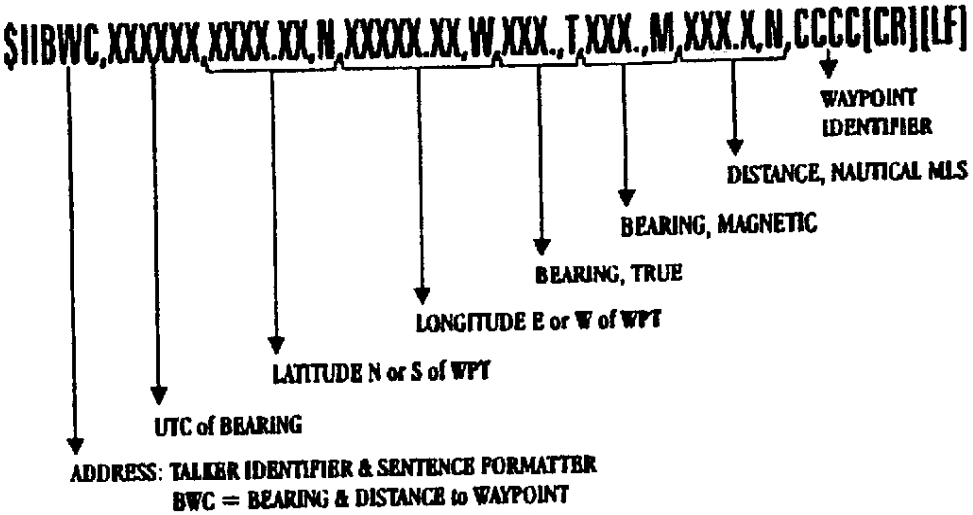
❖ appendix D - OUTPUT NMEA-0183 SENTENCES

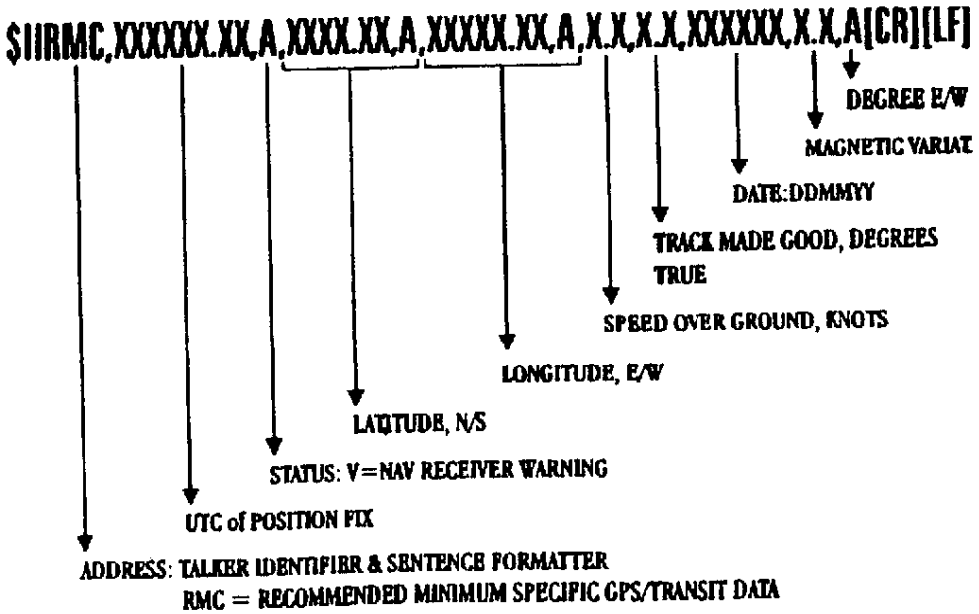
Common information:
$, II = Start of Sentence, Integrated Instrument
[CR][LF] = Sentence Terminator

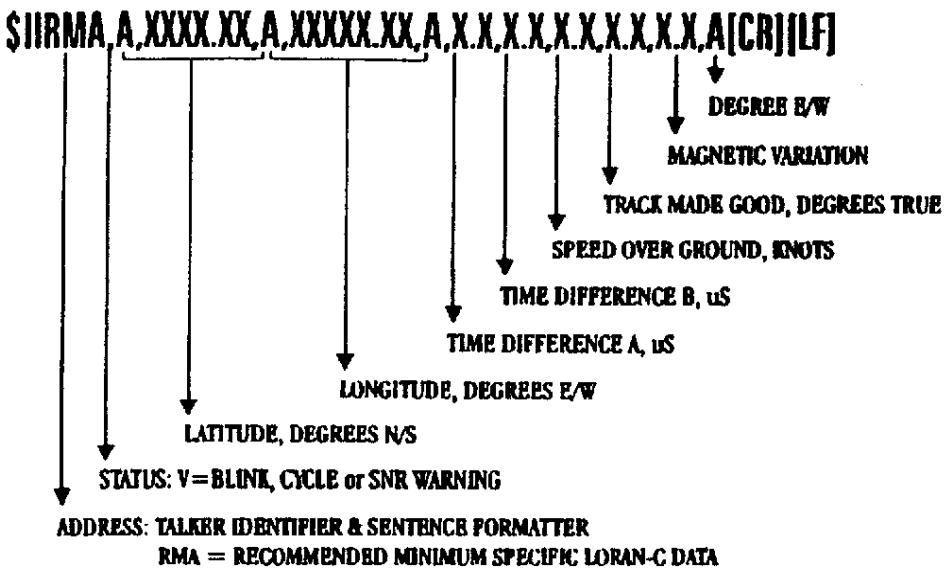


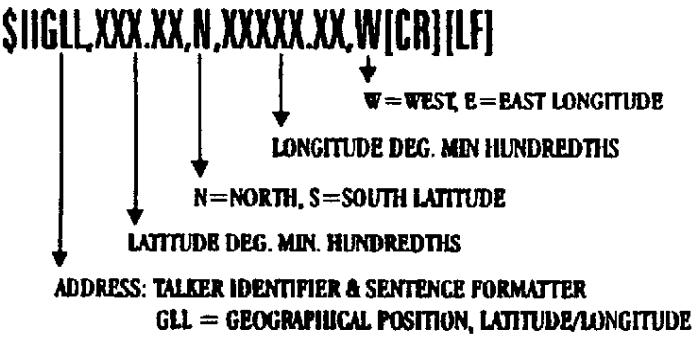


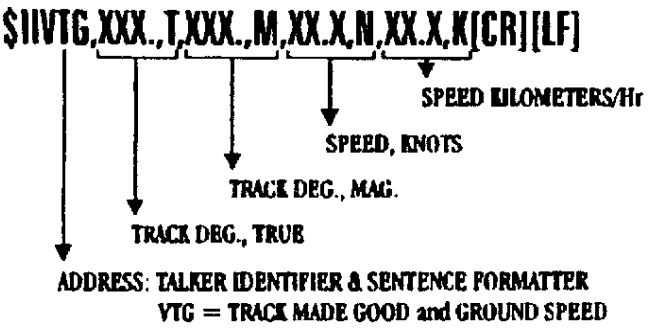

$IIBOD,XXX.,T,XXX.,M,CCCC,CCCC[CR][LF]
ORIGIN WAYPOINT IDENTIFIER
DESTINATION WAYPOINT IDENTIFIER
BEARING, MAGNETIC
BEARING, TRUE
ADDRESS: TALKER IDENTIFIER & SENTENCE FORMATTER
BOD = BEARING to DESTINATION

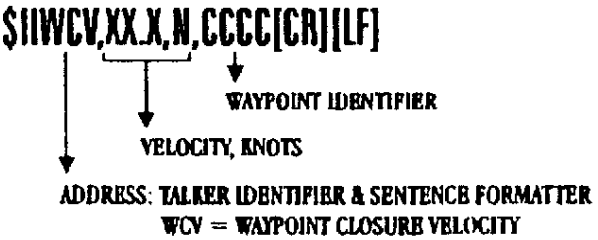

$IIBWC,XXXXXX,XXXX.XX,N,XXXXX.XX,W,XXX.,T,XXX.,M,XXX.X,N,CCCC[CR][LF]
WAYPOINT IDENTIFIER
DISTANCE, NAUTICAL MLS
BEARING, MAGNETIC
BEARING, TRUE
LONGITUDE E or W of WPT
LATITUDE N or S of WPT
UTC of BEARING
ADDRESS: TALKER IDENTIFIER & SENTENCE FORMATTER
BWC = BEARING & DISTANCE to WAYPOINT

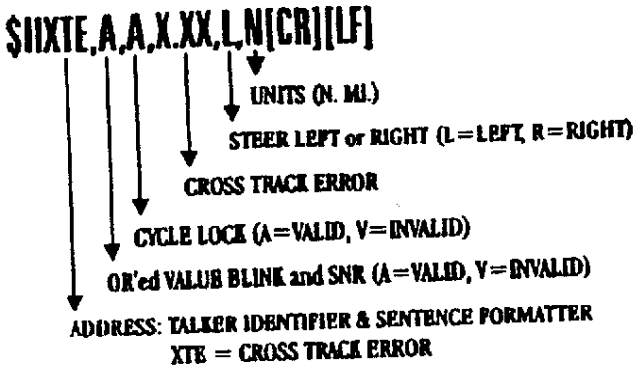

$IIRMC,XXXXXX.XX,A,XXXX.XX,A,XXXXX.XX,A,X.X,X.X,XXXXXX,X.X,A[CR][LF]
DEGREE E/W
MAGNETIC VARIAT
DATE:DDMMYY
TRACK MADE GOOD, DEGREES TRUE
SPEED OVER GROUND, KNOTS
LONGITUDE, E/W
LATITUDE, N/S
STATUS: V=NAV RECEIVER WARNING
UTC of POSITION FIX
ADDRESS: TALKER IDENTIFIER & SENTENCE FORMATTER
RMC = RECOMMENDED MINIMUM SPECIFIC GPS/TRANSIT DATA


$IIRMA,A,XXXX.XX,A,XXXXX.XX,A,X.X,X.X,X.X,X.X,X.X,X.X,A[CR][LF]
DEGREE E/W
MAGNETIC VARIATION
TRACK MADE GOOD, DEGREES TRUE
SPEED OVER GROUND, KNOTS
TIME DIFFERENCE B, uS
TIME DIFFERENCE A, uS
LONGITUDE, DEGREES E/W
LATITUDE, DEGREES N/S
STATUS: V=BLINK, CYCLE or SNR WARNING
ADDRESS: TALKER IDENTIFIER & SENTENCE FORMATTER
RMA = RECOMMENDED MINIMUM SPECIFIC LORAN-C DATA


$IIGLL,XXX.XX,N,XXXXX.XX,W[CR][LF]
W=WEST, E=EAST LONGITUDE
LONGITUDE DEG. MIN HUNDREDTHS
N=NORTH, S=SOUTH LATITUDE
LATITUDE DEG. MIN. HUNDREDTHS
ADDRESS: TALKER IDENTIFIER & SENTENCE FORMATTER
GLL = GEOGRAPHICAL POSITION, LATITUDE/LONGITUDE


$IIVTG,XXX.,T,XXX.,M,XX.X,N,XX.X,K[CR][LF]
SPEED KILOMETERS/Hr
SPEED, KNOTS
TRACK DEG., MAG.
TRACK DEG., TRUE
ADDRESS: TALKER IDENTIFIER & SENTENCE FORMATTER
VTG = TRACK MADE GOOD and GROUND SPEED


$IIWCV,XX.X,N,CCCC[CR][LF]
WAYPOINT IDENTIFIER
VELOCITY, KNOTS
ADDRESS: TALKER IDENTIFIER & SENTENCE FORMATTER
WCV = WAYPOINT CLOSURE VELOCITY


$IIXTE,A,A,X.XX,L,N[CR][LF]
UNITS (N. MI.)
STEER LEFT or RIGHT (L=LEFT, R=RIGHT)
CROSS TRACK ERROR
CYCLE LOCK (A=VALID, V=INVALID)
OR'ed VALUE BLINK and SNR (A=VALID, V=INVALID)
ADDRESS: TALKER IDENTIFIER & SENTENCE FORMATTER
XTE = CROSS TRACK ERROR

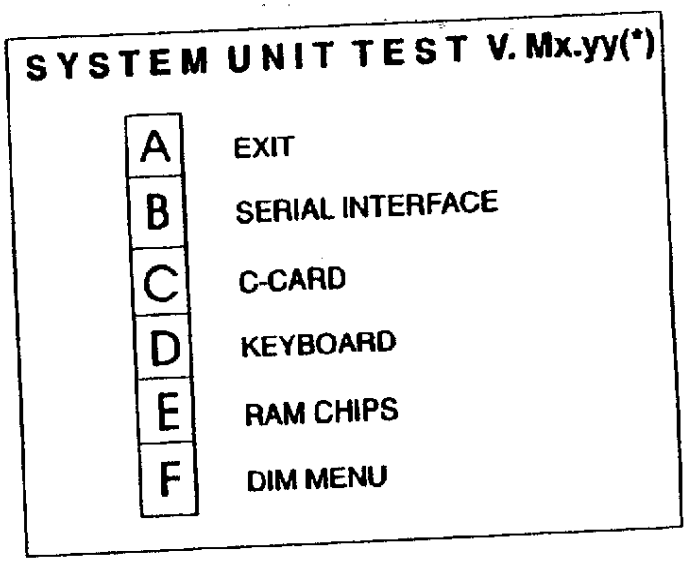
❖appendix E - INTPUT NMEA-0183 SENTENCES

Formatters of accepted sentences:

BWC	:	Bearing and Distance to selected Waypoint
GDP	:	Dead Reckoning Positions
GGA	:	Global Positioning System Fix Data
GLL	:	Geographical Position, Latitude/Longitude
GLP	:	Loran-C Positions
GOP	:	OMEGA Positions
GXP	:	TRANSIT Positions
PKMAP	:	Proprietary of King Marine
PKMLC	:	Proprietary of King Marine
RMA	:	Recommended Minimum Specific Loran-C Data
RMC	:	Recommended Minimum Specific GPS/TRANSIT Data
SBK	:	Loran-C Blink Status
SCY	:	Loran-C Cycle Lock Status
SNU	:	Loran-C SNR Status
VTG	:	Track Made Good and Ground Speed
XTE	:	Cross-Track Error, Measured

If you have connected your position-finding according to the instructions, and chosen the proper menu selection for your device, and are still having problems with your chart plotter, the extending auto-test should help determine the problem.

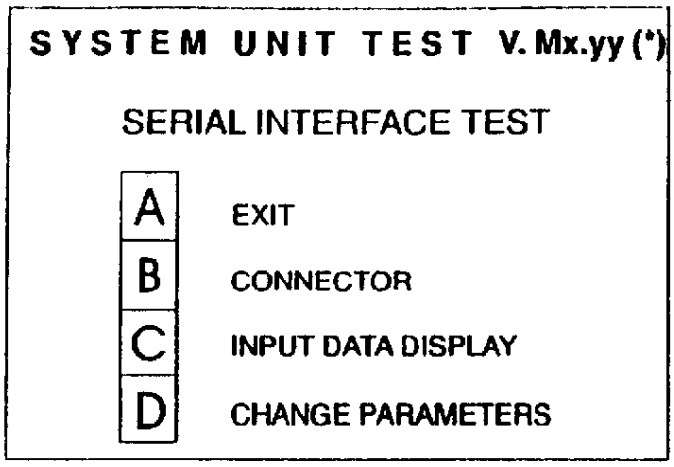
Make sure the chart plotter is turned off. While pressing and holding any other key, press the [POWER] key to turn the chart plotter on until you hear two beeps. A new menu will appear on the display:



Use the arrow keys to make your selection: as you position the cursor on the box of your choice, the chart plotter will select the item. Also you may use the indicated keys to move up and down the cursor and the [ENT] key to make the selection.

F.1) SERIAL INTERFACE TEST

If you are having problems receiving data from the position-finding instrument, the first test in the menu, the "Serial Interface Test", should help determine the problem. When you select this test a new menu will appear:



F.1.1) Connector Test

The first test in this new menu is the "Connector Test". This test will indicate if there is a malfunction in the transmitting or receiving circuitry. In order to run the "Connector Test", you need a special test output connector: contact your dealer with more information.

F.1.2) Input Data Display Test

The next test "Input Data Display" allows your chart plotter act as a computer terminal and display the incoming data exactly as it received.
If the data displayed on the screen is unrecognizable, you may have selected the wrong input parameters for your particular receiver, for example, NMEA-0183 instead of NMEA-0182. Check your receiver manual to be sure that you have selected the proper interface format. If the screen is blank, you may have a broken connection, and no data is being received.
Use the MENU key to stop (or continue after pause) data displaying, the ENT key to show data in hex or ASCII mode (normal or small) and the CLR key to exit from "Input Data Display" page.

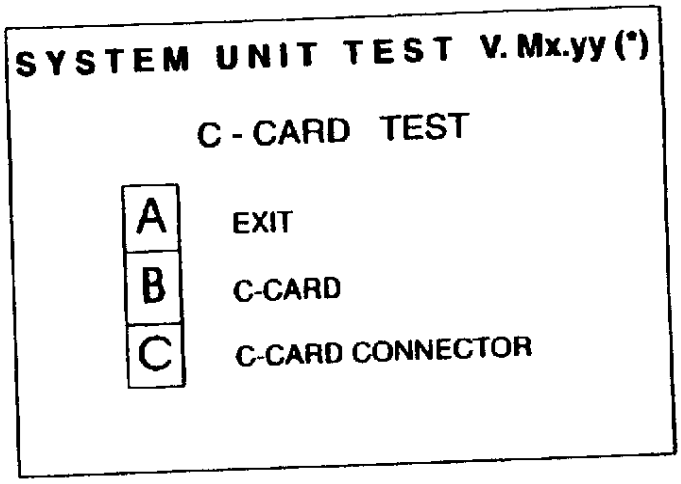
F.1.3) Change Parameter Test

You can check to make sure that the chart plotter is receiving properly, by exiting back to the "Serial Interface" Menu and selecting "Change Parameters", which allows you change the parameters of the serial interface.
You will receive a new menu, which allows you to change the Baud Rate (300, 1200, 2400, 4800 or 9600), the Word Length (7, 8), Parity (EVEN, ODD or NONE), Signal Polarity (NORMAL, INVERSE) and Signal Source (UART0, UART1). Set the parameters to those that match the navigation receiver and return to the input "Data Display Test" to

confirm that the data is correct.
These settings are only used in the "Input Data Display Test", and are ignored by the chart plotter when in its normal operation mode. It may be necessary to experiment with the input parameters to determine exactly what format your receiver is providing.

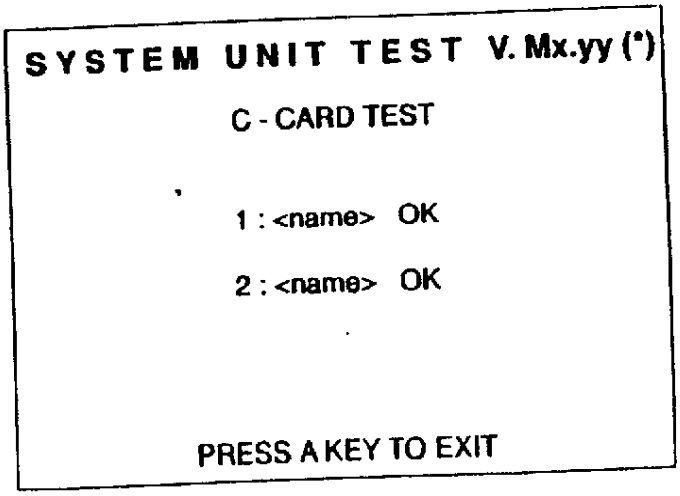
F.2) C-MAP NT C-CARD TEST

The "C-Card Test" allows you to check the C-Card and its connector.
After selecting this test, the following menu page appears on the screen:



F.2.1) C-Card Test

The first test in this new menu is the "C-Card Test". This test will indicate if there is a C-Card inserted or not in the slot and the integrity of the C-Card. When selecting this test the following page is shown on the screen:



There are four possible situations:

1. If there is a data cartridge inserted in the slot and there is not a malfunction, the name of the cartridge zone (<name>) and the message "OK" are shown.
2. If there is a data cartridge inserted in the slot, but it is a dameged cartridge, the name of the cartridge zone (<name>) and the message "ERROR 1" are shown.
3. If there is not any cartridge inserted in the slot, the message "ERROR 01" is shown.
4. If there is an user cartridge in the slot, the message "USER CARTRIDGE" is shown.

F.2.2) Connector Test

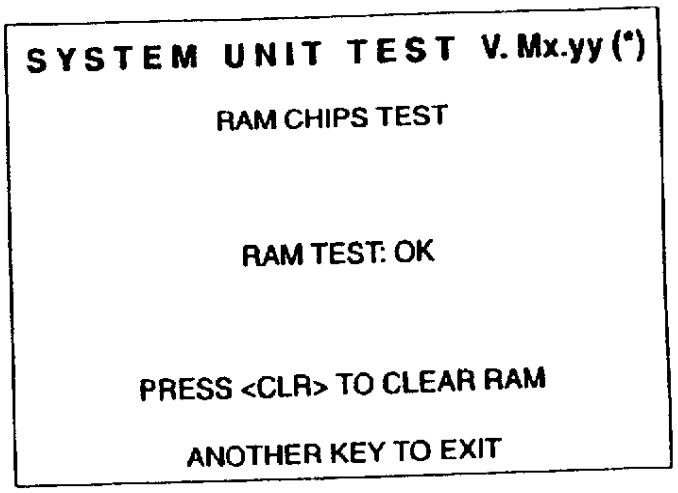
This test will indicate if there is a malfunction in the connector(s). It is used only in production.

F.3) KEYBOARD TEST

The "Keyboard Test" allows you check your keyboard for malfunctions. As you press the keys, an "X" will appear on the keyboard diagram and the chart plotter will beep. Contact your dealer if there seems to be a faulty keyboard.
As soon as you position the cursor on the box with label "EXIT", the chart plotter returns to "System Unit Test" page.

F.4) RAM CHIP TEST

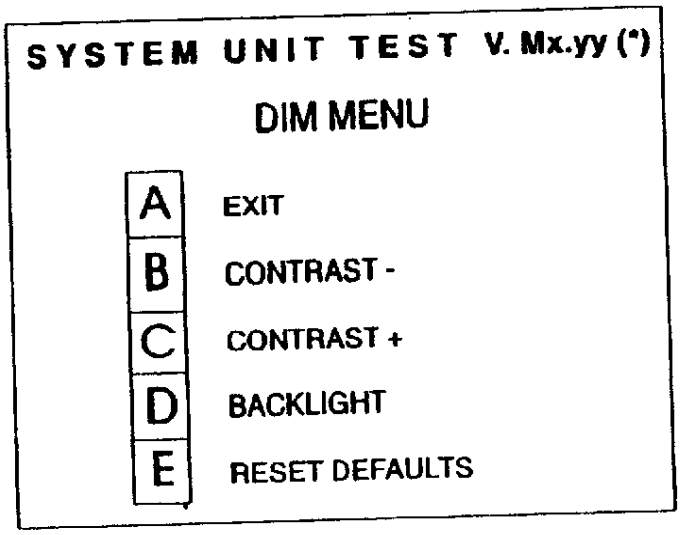
This test verifies the integrity of the memories and if desired during this test all the internal memory can be erased and the default setting restored.
If the chart plotter exhibits unusual behavior, or appears to be malfunctioning, it may be possible to correct the problem by clearing RAM.
This operation will erase all Marks, Events, Routes, stored track plots and destinations. It will also return all selections (Input Data Format, Autopilot selection, etc.) to original default values.
To clear system RAM, select the "RAM Chip Test" option from the "System Unit Test" menu. The chart plotter will run an automatic test; on the screen the following menu will appear:



When the automatic test is finished, press the indicated key to clear RAM. The chart plotter will ask you to confirm your decision to clear RAM by pressing the [CLR] key. If at this time you do not wish to clear RAM, press any other key.

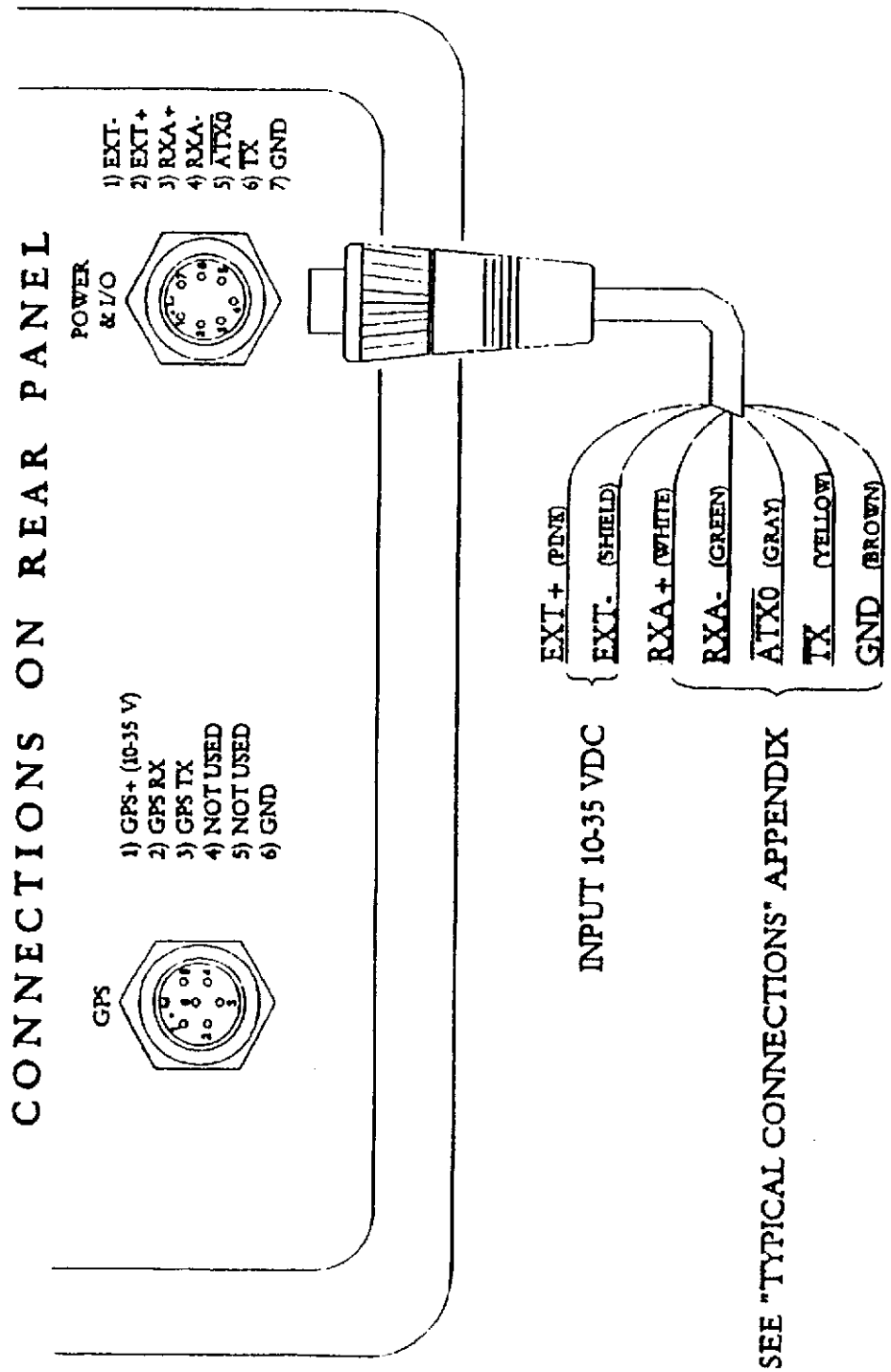
F.5) DIM TEST

When you select Dim menu, the following menu will appear:



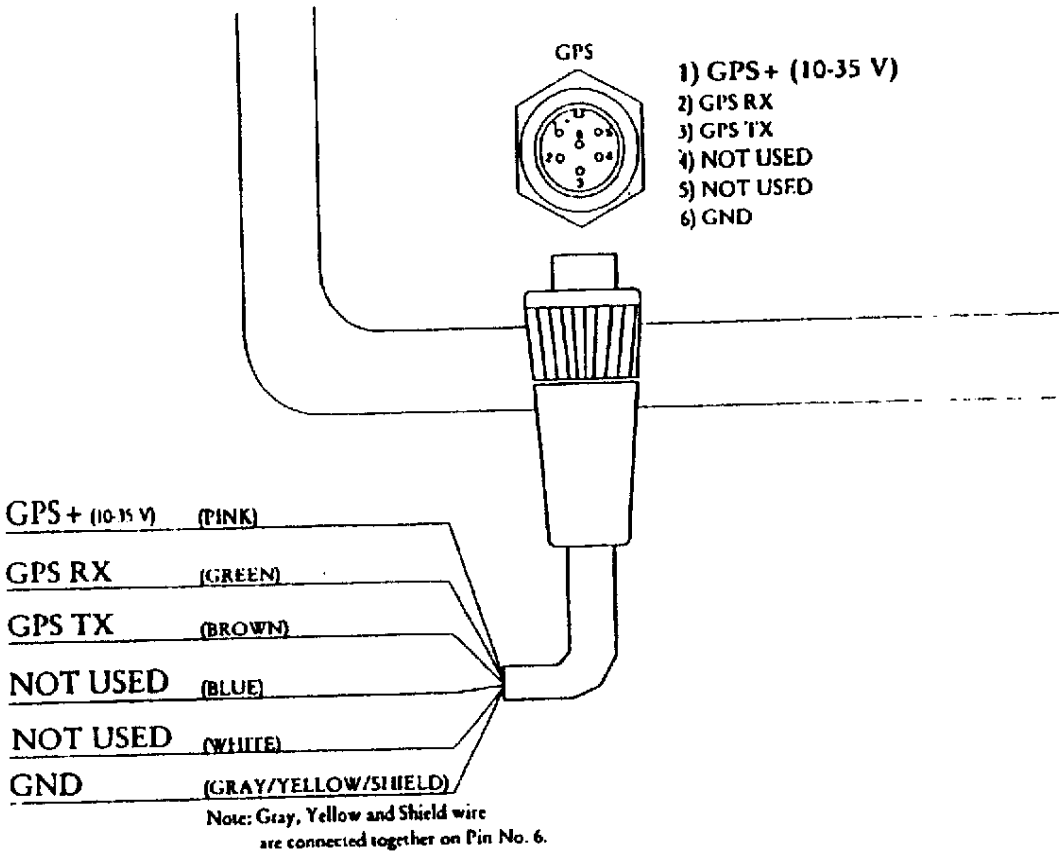
Note (*)

The number of version displayed in the top right corner indicates the system program version


CONNECTIONS ON REAR PANEL
POWER & I/O
1) EXT-
2) EXT+
3) RXA+
4) RXA-
5) ATX0
6) TX
7) GND
GPS
1) GPS+ (10-35 V)
2) GPS RX
3) GPS TX
4) NOT USED
5) NOT USED
6) GND
INPUT 10-35 VDC
EXT+ (PINK)
EXT- (SHIELD)
RXA+ (WHITE)
RXA- (GREEN)
ATX0 (GRAY)
TX (YELLOW)
GND (BROWN)
SEE "TYPICAL CONNECTIONS" APPENDIX

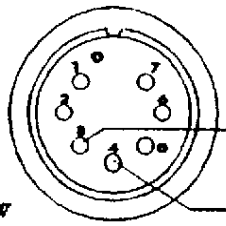
In this unit the "GPS Port" supplies (on Pin No. 1) a 10-35Vdc voltage for "GPS Sensor" power supply.

Not connect to this port a "5V Sensor" to avoid sensor break-off.



POSITIONING DEVICE

I/O



7 PIN CONNECTOR

EXTERNAL VIEW

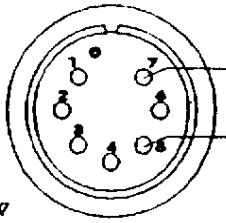
DEVICE TX SIGNAL (WHITE)

DEVICE TX RETURN (GREEN)

NOTE: POSITIONING DEVICE = GPS, LORAN, ECC.

AUTOPILOT

I/O



7 PIN CONNECTOR

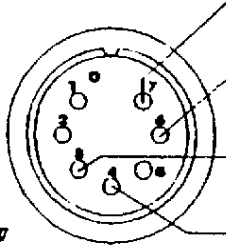
EXTERNAL VIEW

DEVICE TX RETURN (BROWN)

DEVICE TX SIGNAL (GRAY)

BIDIRECTIONAL COMMUNICATION

I/O



7 PIN CONNECTOR

EXTERNAL VIEW

DEVICE RX RETURN (BROWN)

DEVICE RX SIGNAL (YELLOW)

DEVICE TX SIGNAL (WHITE)

DEVICE TX RETURN (GREEN)

Note

Wire colors are referred to the supplied 7-wires cable.

I.1) GLOBAL POSITION SYSTEM (GPS)

The Global Positioning System (GPS) is a space-based radio positioning system which provides suitably equipped users with accurate position, velocity and time data.
Originally the GPS was conceived for military purpouses, but now it is used in civilian applications as surveying, marine, aviation, ...

The GPS constellation consists of 24 orbiting satellites, four equally spaced around each of six different orbital plane. These satellites provide anywhere on earth, 24 hour a day, under all weather conditions, three dimensional (3D) coverage.
The GPS receiver can compute an accurate position calculating the distance to the GPS satellites that orbite the earth. This is called Satellites Ranging. So a 2D position calculation requires three Satellites Ranges, a 3D position calculation requires four Satellites Ranges.

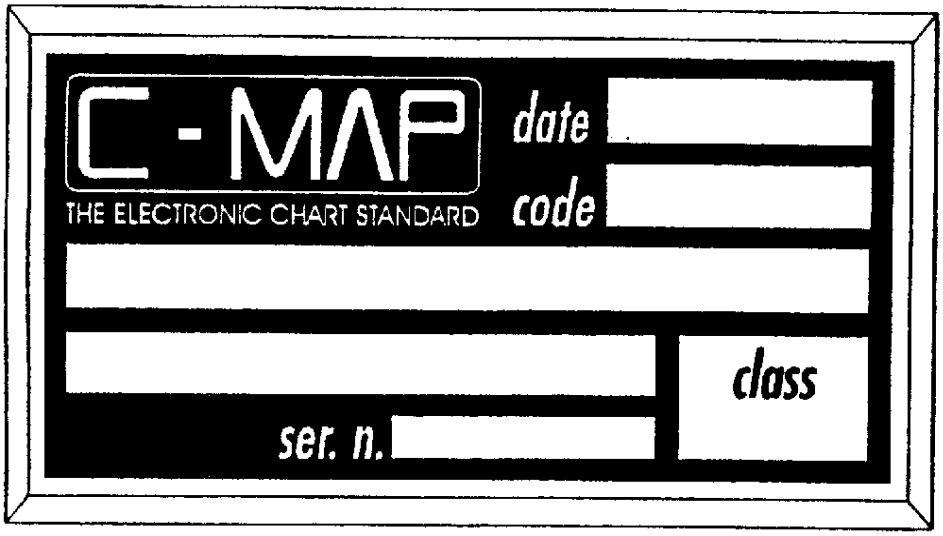
I.2) GPS DIFFERENZIALE (DGPS)

Differential GPS (DGPS) is an accurate form of GPS navigation which may be used to correct certain errors in the GPS signals (errors in GPS measuraments are due to the atmosphere, the ionosphere and the SA - Selective Availability) enabling a highly accurate position calculation.

DGPS uses pseudorange errors recorded at known location to improve the measurements made by other standard GPS receivers within the same general geographic area.

DGPS relies on error corrections transmitted from a GPS receiver placed at known location. This receiver, called reference station, measures ranges from all visible satellites to its surveyed position. The differences between the measured and estimated ranges are computed, comparated and transmitted via radio or other signals to differential equipped receivers in a local area. The DGPS receiver applies the corrections received to achieve accurate position and velocity,measurements.

appendix L - NOTE ON DATA CARTRIDGE



where:

date : appears on the cartridge and in the plot catalog. It identifies the release date of the cartridge.

code : indicates the geographic area and product code of the cartridge (see cartridge code details below).

class : identifies the quantity of cartographic data present in a cartridge. This varies according to the area covered by the charts and in particular on the complexity of the cartography itself. This size identifies the price class of the cartridge.

ser.n. : indicates the cartridge serial number.

C-MAP cartridges contain a number of charts and subcharts to cover a wide geographical area with a variety of scales (from 2 up to 90 charts, with an average of 40).
Coast lines, landmark names, lighthouses, depth lines, restrictions and other data normally available on nautical maps are all stored in the cartridge.
Chart selection is completely automatic and is performed by pointing the Cross-Hair and selecting the zoom level of the charts and subcharts.

C-CARDs are identified as follows:

XX-Yxxx.yy

Where: XX : identifies the geographical area;
Y : identifies the C-CARD generation (incremental lettering indicates new data types, compression, etc... Current generation is "B" - as of October 1996);
xxx : identifies the specific product code;
yy : identifies the revision number (in case cartography is modified - for updates and/or corrections - and released).

For example, the chart with the code EM-A002.01 indicates:

EM : Mediterranean Europe;
A : First generation C-CARD.
002 : Product code 2;
01 : First revision.

If you are in Split screen mode, reference to the official HO (Hydrographic Offices) chart code is always displayed in the data window just below the screen scale.

"See chart: AA2345" means refer to the British Admiralty (AA) chart # 2345.

Examples of abbreviations you may find include:

AA	:	British Admiralty
ISTIDR	:	Istituto Idrografico Italiano
NOAA	:	National Oceanic Atmospheric Administration (USA)
SHF	:	Service Hydrographique Francaise
DMA	:	Defense Mapping Agency

appendix M - COMMAND TREE

In this appendix you can find how the chart plotter works following the available menu, using the "command tree" structure. It is also indicated the "key path" necessary to activate a special menu. The keys are indicated by the picture of the real key shown on the keyboard. The three dots "..." shown in the command tree indicate that the item activates a menu explained in the following pages.

Warning Page

ENT *Maps displaying*

- A DEST — DEST PAD MENU ...
- B WP — ROUTE PAD MENU ...
- C PLOT — PLOT PAD MENU...
- D MARK — MARK PAD MENU ...
- E SET — SETTINGS MENU ...
- F MODE — MODE PAD MENU ...
- CLR — CLEAR PAD MENU ...
- MENU — AUXILIARY FUNCTIONS MENU ...
- ENT — if pressed for 1 second displays Navigation Data Page
- DIM — LCD PAD MENU ...
- INFO — Info on points. 1 sec. pressed selects Split or Full Screen
- ZOOM IN — Shows more details of a smaller area
- ZOOM OUT — Shows fewer details of a larger area
- R/B — Displays distance and bearing between two points

A DEST *DEST PAD MENU*

- A DEST — Insert Target
- B WP — Delete Target
- C PLOT — Display [XTE/Dist/Time]

D MARK — Set Autopilot (On/Off)

CLR — Exit from Dest Pad Menu

B WP ROUTE PAD MENU

A DEST — Insert a Waypoint

B WP — Delete the last Waypoint

C PLOT — Change route to edit

D MARK — Reverse the route direction

E SET — Delete route

F MODE — Select the Route Data Report

CLR — Exit from Route Pad Menu

C PLOT PLOT PAD MENU

A DEST — Plots past course

CLR — Exit from Plot Pad Menu

D MARK MARK PAD MENU

A DEST — Set Mark ⧖ on Cross-Hair coordinates

B WP — Set Mark ⋈ on Cross-Hair coordinates

C PLOT — Set Mark ✳ on Cross-Hair coordinates

D MARK — Set Event ⅄ on ship position

CLR — Exit from Mark Pad Menu

E SET SETTINGS MENU

A DEST — MAP SETTINGS MENU ...

B WP — SETUP MENU ...

C PLOT — FILTERS MENU ...

D MARK COMPASS FUNCTIONS ...

CLR Returns to charts

E SET SETTINGS MENU

A DEST *MAP SETTING MENU*

A DEST LAND SETTINGS MENU ...

B WP MARINE SETTINGS MENU ...

C PLOT NAVAL AIDS MENU ...

D MARK OTHER SETTINGS MENU ...

E SET CHART SETTINGS MENU ...

CLR Returns to Settings Menu

E SET SETTINGS MENU

A DEST MAP SETTING MENU

A DEST *LAND SETTINGS MENU*

A DEST Natural Features [On/Off]

B WP Rivers and Lakes [On/Off]

C PLOT Cultural Features [On/Off]

D MARK Landmarks [On/Off]

CLR Returns to MapSetting Menu

E SET SETTINGS MENU

A DEST MAP SETTING MENU

A DEST *MARINE SETTINGS MENU*

A DEST Water Turbolence [On/Off]

B WP Bathymetric Lines [On/Off]

C PLOT Depth Areas Limit [1]

D MARK Spot Soundings [On/Off]

E SET Bottom Type [On/Off]

F MODE — Bathymetrics & Soundings Range [1]

CLR — Returns to Map Settings Menu

E SET — SETTINGS MENU

A DEST — MAP SETTING MENU

C PLOT — *NAVAL AIDS MENU*

A DEST — Ports and Services [On/Off]

B WP — Attention Areas [On/Off]

C PLOT — Tracks and Routes [On/Off]

D MARK — Lights [On/Off]

E SET — Buoys and Beacons [On/Off]

F MODE — Signals [On/Off]

CLR — Returns to Map Setting Menu

E SET — SETTINGS MENU

A DEST — MAP SETTING MENU

D MARK — *OTHER SETTINGS MENU*

A DEST — Names [On/Off]

B WP — Compass [On/Off]

C PLOT — Chart Generation [On/Off]

D MARK — New Objects [On/Off]

E SET — Complex Object Icon [Single/Multiple]

F MODE — Info Level [Detailed/Basic]

CLR — Returns to Map Setting Menu

E SET — SETTINGS MENU

A DEST — MAP SETTING MENU

E SET — *CHART SETTINGS MENU*

A DEST — Coordinates [On/Off]

D WP — Chart Boundaries [On/Off/Auto]

C PLOT — Smooth Scroll [On/Off]

D MARK — Cartographic [On/Off]

E SET — Plotter Mode [On/Off]

CLR — Returns to Map Setting Menu

E SET SETTINGS MENU

B WP *SETUP MENU*

A DEST — Language [Eng/Ita/Fra/Deu/Esp]

B WP — User Point Identifier [On/Off]

C PLOT — User Point Autonumber [On/Off]

D MARK — External Waypoint [On/Off]

E SET — Cog Line at Boat [On/Off]

F MODE — Depth Unit [Mt/Ft/Fm]

CLR — Returns to Settings Menu

E SET SETTINGS MENU

C PLOT *FILTERS MENU*

A DEST — Position Filter [On/Off]

B WP — Speed Filter [On/Off]

C PLOT — Filter Step [2]

CLR — Returns to Settings Menu

E SET SETTINGS MENU

D MARK *COMPASS FUNCTIONS*

A DEST — Heading [Mag/True]

B WP — Calibrate Compass [3]

C PLOT — Magnetic Variation [Auto/Manual]

D MARK — Magnetic Variation [4]

CLR Returns to Settings Menu

MODE PAD MENU

F MODE *MODE PAD MENU*

A DEST Set Charting or Navigation Mode

B WP Set track [On/Off]

CLR Exit from Mode Pad Menu

CLEAR PAD MENU

CLR *CLEAR PAD MENU*

A DEST Delete Mark selected by the Cross-Hair

B WP Delete Event selected by the Cross-Hair

C PLOT Delete A-B line

D MARK Delete alarms

CLR Exit from Clear Pad Menu

AUXILIARY FUNCTIONS MENU

MENU *AUXILIARY FUNCTIONS*

A DEST CLEAR USER POINTS ...

B WP FIX/COMPASS FUNCTIONS ...

C PLOT TRACKING MENU ...

D MARK AUTOPILOT MENU ...

E SET Displays User Points List

F MODE USER DATA-GROUP SELECTION ...

CLR Exit from Auxiliary Functions Menu

MENU AUXILIARY FUNCTIONS

A DEST *CLEAR USER POINTS*

A DEST Clear all Marks ⧖

B WP Clear all Marks ⋈

C PLOT Clear all Marks ✳

D MARK — Clear all Events

E SET — Clear all routes

F MODE — Clear all points

CLR — Returns to Auxiliary Functions Menu

MENU AUXILIARY FUNCTIONS

B WP *FIX/COMPASS FUNCTIONS*

A DEST — FIX CORRECTION MENU ...

B WP — Data Format [Nmea-0183/Nmea-0182/...]

C PLOT — Input Source [Gps/I-O]

D MARK — Special Navigator selection (5)

E SET — FIX ALARM SETTING ...

F MODE — WGS84 SETTINGS MENU ...

CLR — Returns to Auxiliary Functions Menu

MENU AUXILIARY FUNCTIONS

B WP FIX/COMPASS FUNCTIONS

A DEST *FIX CORRECTION MENU*

A DEST — Fix correction [On/Off]

B WP — Compute Fix Error

C PLOT — Change Fix Error (6)

CLR — Returns to Fix/Compass Menu

MENU AUXILIARY FUNCTIONS

B WP FIX/COMPASS FUNCTIONS

E SET *FIX ALARM SETTING*

A DEST — Audible Alarm [On/Off]

B WP — Auto Alarm Clear [On/Off]

CLR — Returns to Fix/Compass Menu

MENU AUXILIARY FUNCTIONS

B WP FIX/COMPASS FUNCTIONS

F MODE *WGS84 SETTINGS MENU*

A DEST Fix Datum WGS84 [On/Off]

B WP Chart Datum WGS84 [On/Off]

CLR Returns to Fix/Compass Menu

MENU AUXILIARY FUNCTIONS

C PLOT *TRACKING MENU*

A DEST Automatic Replot [On/Off]

B WP Tracking Step Unit [Distance/Time]

C PLOT Distance Step [0.01/0.05/0.1/0.5/1 Nm]

D MARK Time Step [5/15/30 Sec/1/3/5 Min]

E SET Clear Track

CLR Returns to Auxiliary Functions Menu

MENU AUXILIARY FUNCTIONS

D MARK *AUTOPILOT MENU*

A DEST Output Format [Nmea-0183/Nmea-0180/Nmea-0180-Cdx]

B WP Arrival Range [0.1/0.25/0.5/1/2/3/5 Nm]

CLR Returns to Auxiliary Functions Menu

MENU AUXILIARY FUNCTIONS

F MODE *USER DATA-GROUP SELECTION*

A DEST Display Directory

B WP SAVE FILE ...

C PLOT LOAD FILE ...

D MARK DELETE FILE ...

E SET Format User Cartridge

F MODE Change User Cartridge

CLR Returns to Auxiliary Functions Menu

MENU AUXILIARY FUNCTIONS

F MODE USER DATA-GROUP SELECTION

B WP *SAVE FILE MENU*

A DEST Save file of Marks ⧖

B WP Save file of Marks ⋈

C PLOT Save file of Marks ✳

D MARK Save file of Events ⅄

E SET Save file of Routes

F MODE Save file of Track

CLR Returns to User Data-Group Selection Menu

MENU AUXILIARY FUNCTIONS

F MODE USER DATA-GROUP SELECTION

C PLOT *LOAD FILE MENU*

A DEST Load file of Marks ⧖

D WP Load file of Marks ⋈

C PLOT Load file of Marks ✳

D MARK Load file of Events ⅄

E SET Load file of Routes

F MODE Load file of Track

CLR Returns to User Data-Group Selection Menu

MENU AUXILIARY FUNCTIONS

F MODE USER DATA-GROUP SELECTION

D MARK *DELETE FILE MENU*

A DEST Delete file of Marks ⧖

B WP Delete file of Marks ⋈

C PLOT Delete file of Marks ✳

D MARK Delete file of Events ⅄

E SET Delete file of Routes

F MODE Delete file of Track

CLR Returns to User Data-Group Selection Menu

DIM *LCD BRIGHTNESS MENU*

A DEST Dim +

B WP Dim -

D MARK Backlight

CLR Exit from Dim Pad Menu

Note

(1) After pressing the key, use the 'A' and 'B' keys to change the value, and then the 'ENT' key to confirm or the 'CLR' key to abort.

(2) After pressing the key, use the up or down arrow keys to change the value, and then the 'ENT' key to confirm or the 'CLR' key to abort.

(3) To move cursor into the chosen square, press the left and right arrow keys; to change the number in the square, press the up and down arrow keys.

(4) Use the left and right arrow keys to insert the desired value, and then the 'ENT' key to confirm or the 'CLR' key to abort.

(5) The Special Navigator Selection Menu is available only if MICROLOGIC ML 8000 T or AP NAV-MK4 are selected. If GPS-NMEA/0183 or GPS ROCKWELL are selected, this item selects the GPS Data Page.

(6) The latitude value is modified by the left and right arrow keys, and the longitude value by the left and right arrow keys. Press 'ENT' to confirm or 'CLR' to abort.

GLOSSARY

BEARING (BRG): the horizontal direction of one terrestrial point from another, expressed as the angular distance from a reference direction, usually measured from 000 degrees at the reference direction clockwise through 360 degrees.

CHARTING: mode of operations in which all operation refer to the position of the Cross-Hair.

COURSE OVER GROUND (COG): term used to refer to the direction of the path over ground actually followed by a vessel.

CROSS TRACK ERROR (XTE): the distance from the vessel's present position to the closest point on a line between the origin and destination waypoints of the navigation leg being travelled.

DEFAULT: indicates a value when the user has not defined a particular value.

DEPTH LINES: lines that connect points at the same depth.

DEVIATION: the angle between meridian and the axis of a compass card, expressed in degrees east or west to indicate direction in which the northern end of the compass card is offset from magnetic north.

EVENT: user point refers to the ship's position.

FULL SCREEN: screen mode that displays maps at full screen.

GPS: Global Positioning System.

HEADING: the horizontal direction in which a ship actually points or heads at any istant, expressed in angular units from a reference direction, usually from 000 degrees at the reference direction clockwise through 360 degrees.

MAGNETIC BEARING: bearing relative to magnetic north; compass bearing corrected for deviation.

MAGNETIC HEADING: heading relative to magnetic north.

MARK: user point refers to the Cross-Hair position.

NAVIGATION: mode of operations in which all operation refer to the ship's position.

ROUTE: sequence of waypoints connected by segments.

SPEED OVER GROUND (SOG): the speed of a vessel along the actual path of travel over the ground.

TARGET: special Mark point that indicates the position where the ship goes to.

TRACKING: past course represented by a line that connects the stored positions.

TRUE BEARING: bearing relative to true north; compass bearing corrected for compass error.

TRUE HEADING: heading relative to true north.

USER POINT: point placed permanently on the chart with a graphic symbol (Mark, Event, Waypoint).

VARIATION: the angle between the magnetic and geographic meridians at any place, expressed in degrees and minutes east or west to indicate the direction of magnetic north from the true north.

WAYPOINT: any point on earth to which one intends to navigate at some time.

ANALITYCAL INDEX

D

E

F