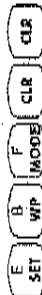


Selection of DEPTH UNIT



Every time the 'F' key is pressed, the selected unit, MT, FT, RM, is shown on the screen. Highlight your choice.

❖ 2.8 - TRACKING FUNCTIONS

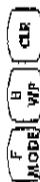
As long as the chart plotter is connected to a positioning instrument, the plotter will not only display the past course, but will store all points in its memory. A line connects such points and represents the past course.

If you are in the split screen mode, the percentage of memory still available will always be displayed right in the middle of the data area of the screen, next to the tracking status. When the memory is filled, the plotter will continue to record new positions, but the oldest part of the track will be lost as new points are added.

2.8.1) TURNING THE TRACK MEMORIZING FUNCTION ON/OFF

This function can simply be turned On or Off by following the procedure:

Selection of TRACK MEMORIZING ON/OFF



Note

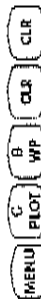
It is not possible to turn the tracking on if this chart plotter is not receiving a valid fix when you press the 'B' key the plotter emits three beeps.

If you are in the split screen mode, the track status is shown on the right part of the screen. If the tracking function is On, the chart plotter can store a fix when the distance from its last stored position is greater than a defined distance or after a defined time (See par. 2.8.3).

2.8.2) CHOOSING THE TRACK MEMORIZING TYPE

The track memorizing type can be selected by following this procedure:

Selection of TRACKING STEP UNIT



By pressing the 'B' key repeatedly, you can select the desired memorizing type, distance or time.

The chart plotter can store a plot when the distance from its last stored position is greater than a defined distance (if distance has been selected) or after a defined time (if time has been selected).

2.8.3) CHOOSING THE TRACK RECORDING SETUP

When the tracking is On and the interval of the track is Distance, the chart plotter can store a fix when the distance from its last stored position is greater than a defined distance (1.0, 0.50, 0.10, 0.05 and 0.01 nautical miles).

The tracking step can be selected by pressing the following keys:

Selection of TRACK MEMORY DISTANCE STEP



Each time the 'C' (*) key is pressed, the selected distance step is shown on the screen.

When the function of tracking is On and the interval of the track is Time, the chart plotter can store a fix after a defined time (5, 3, 1 minutes and 5, 15, 30 seconds).

The time interval can be selected by pressing the following keys:

Selection of TRACK MEMORY TIME STEP



Each time the 'D' key is pressed, the selected time step is shown on the screen.

2.8.4) PLOTTING TRACK

The chart plotter also displays the segment connecting the last memorized point with the preceding one. The past course is automatically displayed on the screen if the auto replot function is selected. The full track will be plotted gradually. Plotting starts at your present position and works backwards to fill the entire track. While sections of the track are being drawn, the user has full use of the keyboard.

To activate the automatic course replot function, follow these steps:

Selection of AUTOMATIC REPLOT



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

Otherwise, if auto replot is not chosen, the following keys must be pressed to redraw the past course:

Selection of REPLOT OF PAST COURSE



Note

If the track plotting has been made or the track is not storing in memory, when you press the 'A' key the chart plotter emits three beeps.

After screen changes, you must press 'PLOT' and then the 'A' keys again in order to obtain the complete display of the past course.
While the manual track replot is being drawn the keyboard will be deactivated.

2.8.5) DELETING THE MEMORIZED TRACK

All the stored tracks can be deleted by pressing:

Selection of DELETING TRACK



After pressing the 'E' key, press 'ENT' to confirm deletion; any other key aborts operation. If you have pressing the 'E', an "OK" message will be shown in the place of "E".

❖ 2.9. COMPASS FUNCTIONS

The user can insert data referring to compass deviation, or select between magnetic or true headings, or setting the magnetic variation.

2.9.1) COMPASS CALIBRATION

The variation table is used to have a Magnetic value readout on the chart plotter comparable to the value given by the compass of the boat. In other words, because of the compass of the boat must be compensated (due to iron masses, etc., ...), we use the same values to compensate (in the opposite direction) the values given by the chart plotter. This means that, for example, if the BRG to next waypoint readout in the chart plotter display is "X" Mag. degree, if you steer the boat reading "X" Mag. degree from the

compass, you are steering toward the next waypoint as well. The following keys must be pressed to select this option:

Selection of COMPASS CALIBRATION



After pressing the 'B' key, the following table will appear on the screen:

COMPASS CALIBRATION										
DEVIATION TABLE										
HEADING	N	N/E	E	S/E	S	S/W	W	N/W		
DEVIAT.	00	00	00	00	00	00	00	00	00	00
▲ INCREASE VALUE ▼ DECREASE VALUE ◀ AND ▶ MOVE CURSOR PREVIOUS MENU: 'CLR'										

The deviation table can be updated by following this procedure for every sector of the above display:











- to move the cursor into the chosen square, the left and right arrow keys is pressed;
- to change the number in the square, the up and down arrow keys are pressed (compass deviation at the angle).

2.9.2) TRUE OR MAGNETIC HEADINGS AND BEARINGS

The chart plotter can work in either magnetic or true (geographic) headings. If magnetic readings are selected the variation is computed automatically for every zone as soon as the chart is displayed. You can toggle between the Magnetic Heading display mode and the True Heading display mode by pressing the following keys:















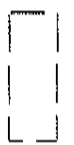
❖ 2.11 SYMBOLS AND ABBREVIATIONS

CE-95 TECHNOLOGY

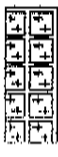









Symbols	Category Objects
	Areas, Limits Cargo transshipment area; Contiguous zone; Continental shelf area; Custom zone; Dumping ground; Exclusive economic zone; Fishery zone; Fishing ground; Free port area; Harbour area (administrative); Incineration area; Log pond; Military practice area; National territorial area; Restricted area; Sea area; Sea-plane landing area; Spoil ground; Straight territorial sea baseline; Submarine transit lane; Territorial sea area; No data area.
	
	Airport area Airport area.
	
	Anchorage area Anchorage area.
	Anchor Anchor.
	Anchor berth Anchor berth.
	
	Beacon Beacon, cardinal <type>; Beacon, isolated danger <type>; Beacon, lateral <type>; Beacon, safe water <type>; Beacon, special purpose <type>; Beacon, generic <type>; type: Lattice to be continued
	

Cont.

DEPENDS ON ORIGINAL CHART DATA	CHART DATUM UNKNOWN		USER SELECTABLE	CHART DATA INFORMATION	FIX STATUS INFORMATION (In CORRECTION OFF)
	WGS 84 CORRECTION NOT PRESENT	WGS 84 CORRECTION PRESENT			
CHART DATUM KNOWN	CHART DATUM = WGS 84 set ON	CHART DATUM = WGS 84 set OFF	FIX DATUM = WGS84 NO	"DATUM NOT AVAILABLE"	"FIX: LOCAL DATUM"
			FIX DATUM = WGS84 YES	"DATUM NOT AVAILABLE"	"FIX: WGS84"
			FIX DATUM = WGS84 NO	"WGS84 DATUM SELECTED"	"FIX: LOCAL DATUM"
			FIX DATUM = WGS84 YES	"WGS84 DATUM SELECTED"	"FIX: WGS84"
	CHART DATUM = WGS 84 set ON	CHART DATUM = WGS 84 set OFF	FIX DATUM = WGS84 NO	"CHART DATUM UNKNOWN"	"FIX: LOCAL DATUM"
			FIX DATUM = WGS84 YES	"CHART DATUM UNKNOWN"	"FIX: LOCAL DATUM"
			FIX DATUM = WGS84 NO	"WGS84 DATUM SELECTED"	"FIX: WGS84"
			FIX DATUM = WGS84 YES	"WGS84 DATUM SELECTED"	"FIX: WGS84"
WGS 84 CORRECTION PRESENT	CHART DATUM = WGS 84 set ON	CHART DATUM = WGS 84 set OFF	FIX DATUM = WGS84 NO	"CHART DATUM <name datum>"	"FIX: <name datum>"
			FIX DATUM = WGS84 YES	"CHART DATUM <name datum>"	"FIX: <name datum>"
	CHART DATUM = WGS 84 set ON	CHART DATUM = WGS 84 set OFF	FIX DATUM = WGS84 NO	"WGS84 DATUM SELECTED"	"FIX: WGS84"
			FIX DATUM = WGS84 YES	"WGS84 DATUM SELECTED"	"FIX: WGS84"

	Generic Tower
	Bottom type Sealed area.
	Building, religious Building, religious.
	Building, single Building, single.
	Buoys Buoy, cardinal <type>; Buoy, installation <type>; Buoy, isolated danger <type>; Buoy, lateral <type>; Buoy, safe water <type>; Buoy, special purpose <type>; Buoy, generic <type>.
	Spars Barrel
	Can, cylindrical
	Corkal
	Pillar
	Spar, Spindle
	Spherical
	Super
	Caltn Caltn.
	Cartographic objects Closing line; Cartographic symbol; Cartographic line; Cartographic area, TEXT; Line, generic Text; Area, generic; National Character Set Text; Incomplete survey area.
	Caution Areas Caution area.

Cont.

	Cemetery Cemetery.
	Chimney Chimney.
	Coastguard station Coastguard station.
	Compass Compass.
	Compass, Distance Local magnetic anomaly.
	Composite objects Airport; Anchorage; Channel edge; Deep water route; Defined water; Harbour; Range system; Lighthouse; Mooring trot; Navigation mark, afloat; Navigation mark, fixed; Traffic Separation Scheme System.
	Control point Control point.
	Crane Crane.
	Cultural Dashed Cable, overhead; Fence, Pipeline, overhead; Pylon; Telephetic; Tunnel entrance.
	Cultural Features Bridges; Built-up area; Railway; Road crossing; Road part; Runway; Sloping ground; Square.

Cont.

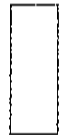
Depths 1 (Shallow)
Depth area; Depth contour.



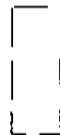
Depths 1 (Medium)
Depth area; Depth contour.



Depths 1 (Deep)
Depth area; Depth contour.



Depths 2
Dredged area; Spot Soundings; Shallow water blue.



Depths 3
Intertidal area; Zero meter contour.



Dich aerial
Dich aerial.



Extended navigational
Extended navigational.



Flagstaff/Flagpole
Flagstaff/Flagpole.



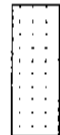
Flare stack
Flare stack.



Fish haven
Fish haven.



Fishing facility
Fishing facility.



Fog signal
Fog signal.



Cont.

Fortified structure
Fortified structure.



Lake
Lake.



Landmarks
Tower.



Light
Light.



Light vessels
Light vessels.



Lights House(*)
Light House.



Marine farm/culture
Marine farm/culture.



Mast
Mast.



Meta objects
Accuracy of data; Compilation scale of data; Horizontal datum of data; Nautical publication information; Production information; Sounding datum of data; Survey reliability; Survey source; Units of measurement of data; Vertical datum of data.



Mooring/Warping facility
Mooring/Warping facility.



Monument
Monument.

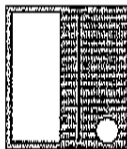


Cont.

Natural Features
Coastline; Dune; Hill; Lake shore; Land area; Land elevation;
Land region; Salt Pan; Slope Topline; Tree; Vegetation area.



Natural Features (ICE)
Ice area; Piango.



Natural Features (RIVERS)
Canal; Canal bank; Rapids; River; River bank; Waterfall.



Navigation aid, generic
Navigation aid, generic.



Navigation mark fixed(*)
Navigation mark fixed.



Navigation mark floating(*)
Navigation mark floating.



Offshore Installation

Cable, submarine; Cable area; Diffuser; Obstruction; Offshore
production area; Pipeline, submarine/oil land; Pipeline area;
Production installation.



Offshore platform
Offshore platform.



Pile
Pile.

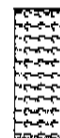


Ports

Berthing facility; Causeway; Checkpoint; Dam; Distance mark;
Dock area; Dry dock; Dyke area; Dyke crown; Floating dock;
Gate; Griddiron; Harbour facility; Hulk; Landing place; Landing
stairs; Lock basin; Oil barrier; Pontoon; Ramp; Shoreline
construction; Slipway; Weir; Small craft facility.



Production Objects
Correction marker.



Cont.

Radar dome
Radar dome.



Radar, Radio, Electronic Positioning System
Radar station; Radar transponder beacon; Radio station; Radio.



Radar Reflector
Radar Reflector.



Rescue station
Rescue station.



Rocks
Underwater rock.



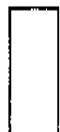
Sand waves
Sand waves.



Services
Pilot boarding place.



Signals
Chain/Wire; Top mark.



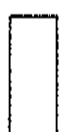
Signal station
Signal station, traffic; Signal station, warning.



Silo
Silo.



Source of data
Source of data.

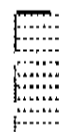


Spring
Spring.



Tracks, Routes

Deep water route part; Deep water route centreline; Fairway;
Ferry route; Navigation line; Precautionary area; Radar line;
Radar range; Radio calling-in point; Recommended route
centreline; Recommended track,
to be continued

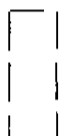


Cont.

Recommended traffic lane part; Traffic separation line; Traffic separation scheme boundary; Traffic separation scheme crossing; Traffic separation scheme lane part; Traffic separation scheme round about; Traffic separation zone; Two-way route part.



Tank
Tank.



Water Turbulence
Tide-way; Water turbulence.



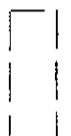
Weed/Kelp
Weed/Kelp.



Windmill
Windmill.



Windmotor
Windmotor.



Wreck
Wreck.



Note

In the "Symbol" column of the previous table, the categories are identified by one or more symbols. See, for example, Wrecks category: it can be shown on the electronic chart by area a, line (—) or exact point (##) if you are respectively in the area, line or exact point.
Buoys, Tower, Light, Fog signal can be displayed in two different modes: as single object or as composition of various single icon objects.

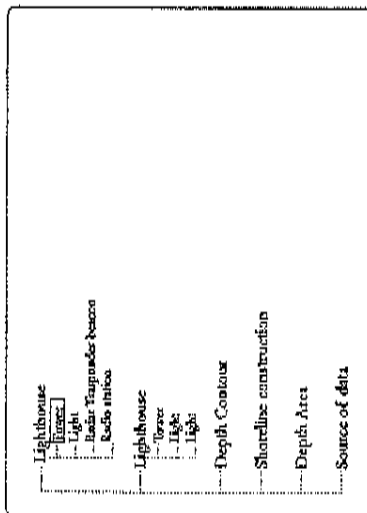
2.11.1) INFORMATION ABOUT CARTOGRAPHIC OBJECTS

Detailed information is available for any object present on the chart. To obtain information about an object follow the procedure:

Selection of INFORMATION PAGE

1. Press **INFO** to select the Info option. If in the range of the Cross-Hair there is present a cartographic object, a page is opened at whole screen where a list of all objects (in a tree structure) found in the range of the Cross-Hair, is displayed; if there are complex objects (i.e. it is a collection of objects logically related) there is also a list of the component objects.
2. To select the desired object, use the up and down arrow keys; the object appears in a square.
3. When the desired object has been selected, press the **ENT** key to expand the information on it. If the information is contained in several pages, press the **MENU** key to select the following pages and the **CLR** key to return to previous page.
5. Press the **CLR** key to exit from information page.

An example of information page is the following:



Here two complex objects, Lighthouse, each one is represented by the list of related components (Tower, Light, Radar Transponder beacon, Radar station for the first and Tower, Light, Light for the second) and four not complex objects, Depth Contour, Shoreline construction, Depth Area, Source of Data, appear. Moving by the up and down arrow keys to select the desired object (the first Tower in the example) that appear in a square, and then pressing **ENT** the desired information is displayed on the screen:



Lighthouse Tower	
Object name LIVORNO FARO	
Information LIVORNO FARO RESERVE LIGHT RANGE 13M LACONDAQUUS 1954	

Note that for some objects ("point" objects, i.e. objects that are not lines or areas) an automatic info-option is available. After 1 second of the last Cross-Hair moving, if in the range of the Cross-Hair (a square of 7 pixels side) there are any objects, an information window is opened on the screen. In the first row, near the "OBJECTS" indication, the total number of objects (max 20) is shown; in the following rows are displayed what objects they are (if the object is complex, an short info is displayed). To obtain all information press the **ENT** key.

An example of short information window is the following:

OBJECTS:	02
LIVORNO FARO	
Tr Racon RC	
F1 (4) W20s 24M	
LIVORNO DCU	
Tr	
F1 (4) WR3s 9M	
'ENT' EXPAND	
'CLR' EXIT	

In the example two "point" objects are found in the range of the Cross-Hair, each one complex. A short info is displayed. Pressing the **ENT** key the first page indicated above is displayed.

chapter 3 CHARTING MODE

❖ 3.1 - INTRODUCTION

The chart plotter features two different modes of operation: the Charting mode, in which all operations refer to the position of the Cross-Hair (this is used to prepare the navigation) and the Navigation mode, in which all operations refer to the ship's position (which is used to monitor the navigation, provided that a positioning instrument is connected and working properly).

Charting and Navigation modes are entered by pressing the following keys:

Selection of OPERATION MODE



By pressing the 'A' key, alternately, the plotter will operate on Charting or on Navigation mode.

Note

It is not possible to enter Navigation mode if you are not receiving a valid fix.

The actual operating status of the plotter is shown on the screen: if you are in the split mode it appears in the top right side of the screen, and if you are in full screen it is represented by a symbol in the left top side of the screen (the Charting Mode as the Cross-Hair symbol, the Navigation Mode as the ship symbol).

The Charting mode allows you to plan your course. You do not need to have a position finding device connected to your plotter in order to use this mode of operation.

❖ 3.2 - PLANNING COURSES

The number of routes is only limited by the number of the available waypoints. Of all these routes, only one is the active route: this is called the route "in edit" and it is drawn with a dotted line with the last waypoint shown as a full dot. This is the one from where new waypoints are added or old ones deleted.

3.2.1) ADDING WAYPOINTS

In navigational terms, a "waypoint" is any point on earth to which one intends to navigate at some time. A sequence of waypoints makes up a route plan, sometimes called a planned route.

A route plan can be created by pressing the **[WP]** key, moving the Cross-Hair to a desired location and pressing the **[DEST]** key. A waypoint will appear on the screen on the position identified by the Cross-Hair.

By moving the Cross-Hair and pressing the **[DEST]** key a route is created on the display. Dashed segments connecting the new point and the last one of the route will be shown. This symbol, a full dot indicating the last point of the route, will be moved to the last new point.

Note

If the "User Point Identifier" option in the Screen Setting Menu is set ON (See par. 3.2.3), waypoints appear on screen identified by a number; in each route there is a waypoint number 1 (001), a waypoint number 2 (002), and so on. These numbers are the same that the user finds in the Route Data Report (See par. 3.2.7).

The user may also create waypoints at specific points by latitude and longitude. Once in the Route Menu, move the Cross-Hair to any position desired. Now hold the **[DEST]** key for more than one second, release it and the coordinates of the point identified by the Cross-Hair will appear on the screen. The Latitude and the Longitude of the point are shown on the screen, and the user can change them, by moving the cursor with the left and right arrow keys and defining values with the up and down arrow keys. Press the **[ENT]** key.

The **[CLR]** key aborts the operation.

Note

The "Adding waypoint" option has two possible effects: a new route will be created or an old one will be extended (if you edit an old route (See par. 3.2.3) before pressing the 'A' key).

3.2.2) DELETING WAYPOINTS

By pressing the **[WP]** and then the **[WP]** key, the user can delete the last waypoint of the route "in edit" (see par. 3.2.3), that is identified by a full dot. The dashed segment connecting the last waypoint and the previous waypoint is deleted.

and the full dot is moved to this point, that becomes the new last waypoint of the route.

3.2.3) CHANGING THE ACTIVE ROUTE (ROUTE "IN EDIT")

After pressing the **[WP]** key to change the active route, place the Cross-Hair on any waypoint of the route you want to edit, and then press the **[WP]** key. The desired route becomes the route "in edit" and it is shown with a dot line.

Note

Only the route "in edit" is shown with a dashed line. The others are displayed with straight line.

To create a new route, the user must press the **[WP]** and then the **[DEST]** keys (See par. 3.2.1).

3.2.4) REVERSING ROUTE DIRECTION

If the user wishes to follow a route plan in reverse, the chart plotter will allow this by pressing the **[WP]** and the **[WP]** keys to edit the desired route and pressing the **[MARK]** key. Reversing the direction of the route "in edit" allows the user to edit the other side of the route. In this case, the first waypoint becomes the last waypoint of the route, marked by the full dot.

Reversing a route plan is most typically used to return to where the voyage originally started, perhaps several days after having arrived at the final destination.

3.2.5) DELETING A ROUTE

After pressing the **[WP]** key, press the **[SET]** key to delete the route "in edit". This route will disappear from the screen.

If you have planned several routes and you want to delete any of them, just put the routes to delete "in edit" and go through the same procedure. If you want to delete only the last part of the route instead of the 'E' key, press the 'B' key (See par. 3.2.2).

3.2.6) DELETING ALL ROUTES

It is possible to delete all routes at once. The Clear Routes option can be selected by pressing the following keys:

Selection of DELETING ALL ROUTES



After pressing the "ENT" key to confirm the deleting, the message "OK" is shown on the screen in the place of "E" in the displayed menu.

Press the CLR key to abort operation.

3.2.7) ROUTE DATA REPORT

To display the navigation data of the route "in edit", press the WP and then the F (word) keys. Data will be displayed on separate pages (screens): to proceed from one page to the other, the ENT key must be pressed, and to exit from this function, press the CLR key. At the beginning of the first page there will be information on speed and fuel consumption. At first the speed field is displayed in reverse video: press the INFO key to change the unit, from knots (knots) to kilometers per hour (km/h) or vice versa; then insert the value by pressing the arrow key and then the ENT key to confirm the input.

The reverse video is shifted on the consumption field, press the INFO key to change the unit from liter per hour (l/h) to Gallon per hour (Gall/h) or vice versa, then press the arrow key to change value and the ENT key again.

Now, displayed, is the information about the waypoints of the active route (the route "in edit"). Every page shows information about 11 waypoints: if the active route has less than 11 waypoints, the next pages are not displayed on the screen (and the message "ENT TO PROCEED" is not shown). The coordinates of each waypoint from number 1 to number 11 with data regarding distances and headings will be displayed in the first page. In the second page the information will be the same, but with regards to waypoints from number 12 to number 22, and so on for the other pages (their number depending on the number of waypoints of the route "in edit"). The data is displayed as follows:

WP NO. : waypoint number
 LATITUDE DEG. MIN. : Latitude in degrees
 LONGITUDE DEG. MIN. : Longitude in degrees
 TRUE HEAD : true heading
 CPAS HEAD : compass heading
 LEG DIST. : distance in nautical miles between waypoints of each segment of the course
 TOT. DIST. : total distance from the first waypoint, calculated in nautical miles
 TIME ENROUTE : total navigation time from the starting waypoint, at set speed and power
 FUEL CONS. : total fuel consumption from the starting waypoint, at set speed and power

The measurement unit is selected by the plotter on the basis of total consumption. The time and the consumption of fuel for each segment of a course are computed on the basis of average speed and fuel consumption previously selected.

ROUTE DATA REPORT											
SPEED = 01 kts			CONSUMPTION = 0000 l/h								
WP NO.	LONGITUDE DEG MIN	TIME H:M:S	LEG DIST	WP NO.	LONGITUDE DEG MIN	TIME H:M:S	LEG DIST	WP NO.	LONGITUDE DEG MIN	TIME H:M:S	LEG DIST
001	43 55.853 N	009 33.540 E		002	43 57.337 N	010 05.070 E	002.7	003	43 58.774 N	011 07.444 E	003.0
002	43 57.337 N	010 05.070 E	002.7	003	43 58.774 N	011 07.444 E	003.0	004	43 59.401 N	010 11.430 E	003.8
003	43 58.774 N	011 07.444 E	003.0	004	43 59.401 N	010 11.430 E	003.8	005	43 59.401 N	010 11.430 E	003.8
004	43 59.401 N	010 11.430 E	003.8	005	43 59.401 N	010 11.430 E	003.8	006	43 59.401 N	010 11.430 E	003.8

10.20 10.21

3.2.8) INFORMATION ABOUT A DESIRED WAYPOINT

On the screen is displayed the waypoint coordinates and distance and bearing to the next waypoint. If the waypoint is the last point of route, on the screen the message "TO END" is not shown, if it is the first of the route the message "PAST" is not displayed.

3.2.9) EXTERNAL WAYPOINT OPTION

The coordinates of a waypoint, received from a GPS or a Loran connected to the plotter, can be stored into the plotter, if the GPS or the Loran are NMEA/0183 protocol compatible and support the \$BWC sentence (this symbol remains on the screen for 30 seconds).

The user may save it by placing a waypoint or a Mark on that symbol.

As soon as the unit receives another \$BWC sentence with the coordinates of a new waypoint, the symbol moves to the new point.

This feature is available only if the option External Waypoint is set On.

The external waypoint feature can be selected by pressing:



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

❖ 3.3. DISTANCE AND BEARING BETWEEN TWO POINTS ON THE MAP

The distance and bearing between two given points can be immediately obtained by the following procedure:

- the Cross-Hair must be placed over the first point;
- press the **A/B** key;
- move the Cross-Hair to the second point;
- press the **A/B** key again.

The first point is marked by an "A", while the second by a "B", and the two points are connected by a straight line. A cross will identify the beginning and the end of the "A-B" line. The distance, in nautical miles, between "A" and "B" and the bearing is displayed.

To cancel the "A/B" segment press the **CLR** and then the **PLT** key: the point "A" and "B" and the line connecting these two points will disappear from the screen.

chapter 4 NAVIGATION MODE

❖ 4.1. INTRODUCTION

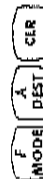
The chart plotter features two different modes of operation: the Charting mode, in which all operations refer to the position of the Cross-Hair and the Navigation mode, in which all operations refer to the ship's position. It is used to monitor the conduct of the navigation, provided that a positioning instrument is connected and working properly.

The **F** key commands the Navigation and the Charting modes: if you are in the split screen mode the word "NAVIGATION" or "CHARTING" appears in the Data Window of the screen, in the upper right corner, if you are in the full screen mode the Cross-Hair symbol **(#)**, for Charting, or the ship symbol **(#)**, for Navigation, are shown at the left top side of the screen.

A blinking circled cross indicates the ship's position in both Navigation and Charting modes. Its dimensions are slightly smaller compared to those of the Cross-Hair and a short line indicates the ship heading.

When the plotter is turned On, it is always set to Charting mode. It may happen that the ship's position is out of the chart shown in the screen. To find the chart with the ship's position on it, simply press the following keys:

Selection of OPERATION MODE



By pressing the 'A' key, alternately, the plotter will operate in Charting or Navigation mode.

Note

It is not possible to enter Navigation mode if it is not receiving a valid fix.

When in Navigation mode, all the operations and calculations refer to the ship's position and not to the Cross-Hair anymore.

The zoom functions in Navigation mode are always related to the ship's position.

Unlike the Charting mode, when the Cross-Hair "bumps" the edge of the chart, no

redraw will take place. However, a redraw will take place if your vessel position nears the edge of the display, showing you the next section of the chart, and keeping your vessel in view. Your boat will never leave the chart while in the Navigation mode.

❖ 4.2. INCOMING SIGNAL STATUS INDICATION

The chart plotter also indicates the quality of incoming information from the positioning instrument. If the positioning system is properly connected, and the data received is valid, the coordinates of the ship's position will be shown on the screen, and a crossed circle, representing the ship's position on the screen, will blink. The following messages might appear:

- **CORRECTION ON** : the format is correct and understood and the fix correction is active.
- **CORRECTION OFF** : the format is correct and understood but the fix correction function is not active.

Note

The message "CORRECTION OFF" appears only in cartography off. In cartography on the chart plotter substitutes the message "CORRECTION OFF" with one of the following: "CHART DATUM", "WGS84", "< Datum Name >".

If the ship is sailing in a area not covered by the chart digitized into the data cartridge, the chart plotter displays "OUT OF MAPS" instead of "CORRECTION ON/OFF". With the return of the ship in the covered area, the proper information will be shown again.

If there are problems with the information received, the chart plotter will display one of the following:

- **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.
- **NOT GOOD** : the received format is correct but the information is declared "invalid" by the positioning instrument.
- **NOT RECEIVED** : no data is received.

The "WRONG FORMAT" and "NOT RECEIVED" messages appear after 15 seconds that the condition persists, the "NOT GOOD" message appears after 30 seconds. The specific alarm is set when a good fix is not received for 1 minute. On the screen diamond symbols appear in place of the last decimal digits in the fix, the symbol representing the ship's position stops flashing remaining fixed, and the chart plotter emits a series of beeps. If a fix has never been received, diamond symbols are displayed. If a fix has been received, the chart plotter will display the coordinates of the last position memorized with the last

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

❖ 4.3. INPUT FORMATS

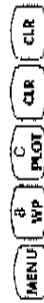
The chart plotter accepts several input formats:

- 1) NMEA-0183/1200
- 2) NMEA-0183
- 3) NMEA-0182/TAIYO
- 4) KODEN 717
- 5) KODEN 757
- 6) FURUNO CIP
- 7) TRIMBLE-200
- 8) DECCA MK3
- 9) H 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 format, the serial interface is automatically set and the parameters selected turn 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

[MENU] [WP] [B] [WP] [B] [CLR] [CLR]

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

[MENU] [WP] [B] [WP] [B] [CLR] [CLR]

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

- press the [DEST] key to set the transmission of Cross-Hair coordinates;
- press the [WP] key to set the transmission of chain numbers.

After pressing 'B', the message "CHAINNUMBER" 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] [WP] [B] [WP] [B] [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] [WP] [B] [WP] [B] [CLR] [CLR]

The following data page is shown on the screen:

UTC Time (hhmm:ss): 1644:11		Date [ddmm]: 00-05-00	
SAT NO.	ELEVATION	AZIMUTH	SNR
01	900	000	90
02	45	045	75
03	78	044	44
04	62	023	32
05	33	066	56
06	60	025	15
07	77	008	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	
PREVIOUS MENU: 'CLR'			
1) 000000 00 000			
2) 000000 00 000			

Two options are available:

- the [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 [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

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

After pressing the 'C' key, the latitude value may be modified by the and keys, and the longitude value may be modified by the and keys. When the desired values have been inserted, press the key to confirm or the 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

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 to confirm the value or 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** **PLT** 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** **PLT** 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.

NAVIGATION DATA DISPLAY			
LAT	02	22.775 N	
LOX	031	26.664 W	
SOG	105-	KN	COG 221.0 MAG
TO TARGET			
TTG	042:01		RH:NM
DST	4413	NM	BRS 121.3 MAG
XTE	---		NM
'CLR' TO EXIT			

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.

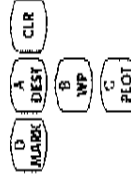
The Marks are reference points, that can be set either in Charting or in Navigation mode, related to Cross-Hair position. Three types of Marks are available.

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** or **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.

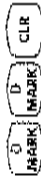
Note

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 Autounumbering option is On, after pressing 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 Autounumbering 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 this 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.

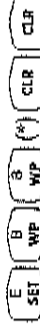
Note

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



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.

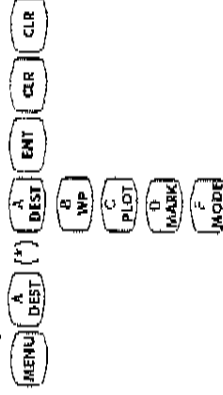
❖ 5.6. DELETING MARKS/EVENTS OFF THE CHART

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



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 X;
- the 'B' key to clear all Marks X;
- the 'C' key to clear all Marks X;
- the 'D' key to clear all Events X;
- 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.

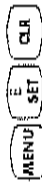
❖ 5.7 - INFORMATION ABOUT AN USER POINT

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



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

USER POINTS LIST				
IDENTIFIER	LATITUDE	LONGITUDE	DIST NM	BRG mag.
X 001	44 26.130 N	024 10.010 W	883.1	338°
Y 003	55 00.240 N	022 55.000 W	1281	352°
PAG.: 01/01				
DST/BRG FROM CURSOR			44 02.830 N	
"ENT" FIND POINT			008 17.010 E	
"CLR" PREVIOUS MENU			AT MOVE CURSOR	

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.

❖ 6.1 - INTRODUCTION

The chart plotter can be connected to an autopilot through a standard interface NMEA-0183, NMEA-0180/CDX or NMEA-0181.

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.

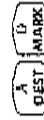
Note

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).

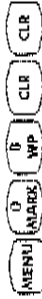
Note

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