

TRACKER950

CHARTPLOTTER

Installation and Operation Manual

	English.....4
	Français.....44



Contents

1 Introduction	6
1-1 Care	6
1-2 C-MAP™ chart cartridges	7
1-3 Removing and replacing the unit	7
1-4 Navigation data	8
2 Operation	9
2-1 Front panel	9
2-2 Chart displays	10
2-3 Alarms	11
2-4 Turning on and off / Auto Power	11
2-5 Man overboard (MOB)	11
2-6 Main screens	12
2-7 Navigating	13
2-8 Simulation mode	13
2-9 PC interface	13
3 Satellite Status screen	14
3-1 GPS and DGPS worldwide navigation	14
3-2 The Satellite Status screen	15
3-3 Mapshift screen and datums	16
4 Underway screen	17
4-1 GoTo screen	18
5 Highway screen	19
6 Navigation screen	20
6-1 Waypoints	20
6-1-1 Introduction to waypoints	20
6-1-2 Waypoints screen	20
6-1-3 Create a new waypoint at the cursor or boat position	21
6-1-4 Create a new waypoint at a specified position	21
6-1-5 Find a waypoint	21
6-1-6 Edit a waypoint	21
6-1-7 Move a waypoint	22
6-1-8 Delete a waypoint	22
6-1-9 List the waypoints	22
6-2 Routes	23
6-2-1 Introduction to routes	23
6-2-2 Routes screen	23
6-2-3 Create a new route by selecting waypoints from a list	23
6-2-4 Create a new route by selecting waypoints from a chart	23
6-2-5 List the routes	24
6-2-6 Display, edit or delete a route	24
6-2-7 Start a route	24
6-3 Distance and bearing calculator	25

7 Fuel screen	26
8 Position screen	27
9 Menu screen	28
9-1 General Setup	30
9-2 Navigation Setup	30
9-3 CDI/Units/Alarms	30
9-4 Map Configuration	31
9-5 Track History	32
9-6 Fuel Settings	32
9-7 Simulation Mode	33
10 Installation	34
10-1 What comes with the TRACKER950	34
10-2 Options and accessories	34
10-3 Installation	35
Appendix A - Specifications	37
Appendix B - Troubleshooting	38
Appendix C - Glossary	40
Appendix D - Conditions of Sale & Warranty	41
Appendix E - How to contact us	42

1 Introduction

Congratulations on choosing the NAVMAN TRACKER950 chartplotter. For maximum benefit, please read this manual carefully before installing and using the unit. Special terms are explained in Appendix C.

The TRACKER950

The TRACKER950 chartplotter is a compact, ruggedly built, highly integrated navigation instrument. It has been designed to be easy to use. Complex navigation functions can be performed with a few key presses, taking the hard work out of navigation. It has an easy to read, colour display.

The TRACKER950 has a built-in chart of the world, suitable for route planning and general interest. You can see extra details by plugging in a C-MAP™ electronic chart cartridge for the region where you are navigating.

The TRACKER950 receives information from the GPS system and displays the boat's position and speed.

To navigate with the TRACKER950, you can go directly to any point on the chart or you can create routes for the boat to follow. When the boat is navigating to one of these points, the unit displays course information for the helmsman to follow.

The TRACKER950 can send data to an autopilot or radar and can repeat depth information from a depth sounder. With an optional fuel kit, the TRACKER950 becomes a sophisticated yet easy to use fuel computer. An optional PC interface kit allows you to download waypoints and routes from a Windows based PC.

Chart accuracy

C-MAP™ electronic charts are derived from geographical data (including official government charts) which are not verified or approved by Hydrographic Authorities. C-MAP™ electronic charts are designed only to simplify navigation calculations. They must be used with official charts and prudent navigation habits, rather than as a primary source of navigation information.

There is no direct relationship between the colour of water areas and their depth. The navigator shall always check depth and use official paper charts.

The GPS system

The US government is solely responsible for the operation, accuracy and maintenance of the GPS satellites. They are subject to changes that will affect the performance and accuracy of all GPS receivers.

The civilian GPS signals may very occasionally be turned off. This unit will not work if its power fails. You must guard against these events by always having another way of navigating.

1-1 Care

Cleaning and maintenance

Clean the TRACKER950 case with a damp cloth or mild detergent. Avoid abrasive cleaners and petrol or other solvents.

Keep the protective cover over the slot for the C-MAP™ cartridge at all times. If the slot gets dirty, clean it by blowing the dirt out. If it gets wet, clean it with clean fresh water and dry it with warm, dry air.

Clip the dust cover over the display when you are not using the unit or if you remove the unit from the boat.

C-MAP™ cartridges

Handle the cartridges carefully. Keep them in their protective cases when not plugged into the TRACKER950. If they get dirty or wet, clean them with a damp cloth or mild detergent.

1-2 C-MAP™ chart cartridges

A C-MAP™ electronic chart cartridge has chart details required for navigating in a particular region. When you plug the cartridge in, the extra details are automatically superimposed on the TRACKER950's built-in chart of the world. The cartridge plugs into a slot in the upper, left side of the display unit.

When you insert or remove a cartridge it does not matter if the TRACKER950 is turned on or off.

To insert a cartridge

- 1 Remove the protective cover from the C-MAP™ slot.
- 2 Take the C-MAP™ cartridge out of its case. Keep the case.
- 3 Hold the cartridge up to the slot with the label facing you and the edge with the gold contacts (on the back of the cartridge) facing the slot.
- 4 Carefully push the cartridge fully into the slot. It is shaped to prevent you from putting the cartridge in the wrong way.
- 5 Replace the protective cover over the cartridge.

To remove a cartridge

- 1 Remove the protective cover from the C-MAP™ slot.
- 2 Pull the cartridge out and put it back in its case.
- 3 Replace the protective cover over the slot.



1-3 Removing and replacing the unit

You can easily remove and replace the display unit for security or protection.

To remove the display unit

- 1 Clip the dust cover over the display unit. Loosen the knobs at each end of the unit.
- 2 The unit has some cables plugged into the back. Unplug each by turning the end of the plug a quarter of a turn anticlockwise and pulling the plug out.
- 3 Lift the unit off its cradle and store it in a safe place.
- 4 Tie a waterproof cover, such as a plastic bag, over the plugs on the cables. It is important to keep the plugs dry.

To replace the display unit

- 1 Sit the unit in its cradle with the rubber washers between the bracket and the display unit case.

- 2 Plug the cables into their sockets on the back of the unit:

- match the colour on the end of the plug to the colour of the nut on the socket
- hold the plug against the socket and rotate the plug until it slides easily into the socket
- lock the plug in place by pushing the end of the plug towards the socket and turning it a quarter turn clockwise

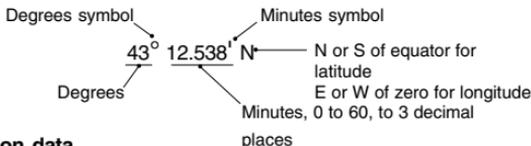
If you plug a cable into the wrong TRACKER950 socket by mistake, nothing will be damaged.

- 3 Adjust the angle of the display to be easily seen and tighten the knobs on each end of the unit. Unclip the dust cover.

1-4 Navigation data

Latitude and longitude

Latitude and longitude are displayed in degrees and minutes:

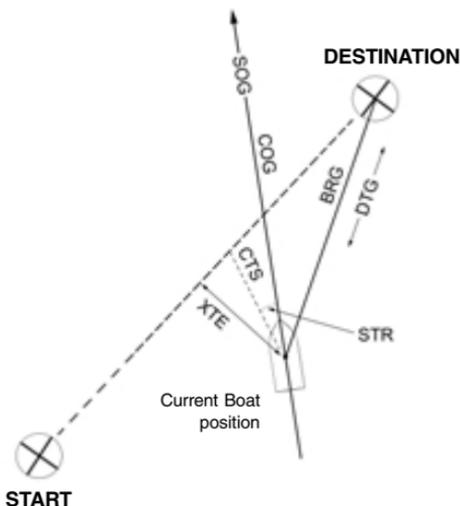


Navigation data

Data displayed on the TRACKER950 has three-letter names.

The boat is sailing from the start to the destination and has moved off the original plotted course from the start to the destination.

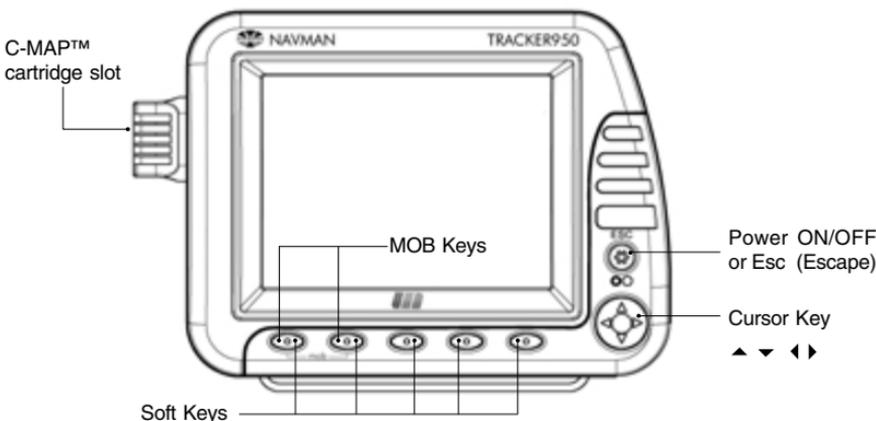
BRG	Bearing to destination	Bearing to the destination from the boat.
COG	Course Over Ground	Direction in which the boat is moving over the ground. (Note - When SOG < 0.2 knot COG is not updated.)
CTS	Course To Steer	Optimum course to steer to return to the original plotted course.
DTG	Distance To Go	Distance from the boat to the destination.
ETA	Expected Time of Arrival	At the destination, assuming that SOG and COG remain constant.
SOG	Speed Over Ground	Current boat speed over the ground. This is not necessarily the same as the boat speed through the water nor the speed at which it is approaching the destination.
STR	Steering	The difference between COG and CTS.
TTG	Time To Go	The estimated time to reach the destination.
XTE	Cross Track Error	The distance from the boat to the nearest point of the original plotted course.
VMG	Velocity Made Good	The speed at which the boat is approaching the destination.



2 Operation

This section describes the basic principles of how to operate the TRACKER950. For more detail, refer to the chapters following.

2-1 Front panel



Keys

Esc key

The Esc key has three different uses:

- 1 To switch the unit on and off (see section 2-4).
- 2 When the main screens are displayed, press the Esc key to move to the next main screen (see section 2-6).
- 3 Otherwise the Esc key is an 'escape' key to go from the current screen to the previous one. If you were changing some data in the current screen when you press this key, then the changes are ignored.

Cursor keys

There are four cursor keys within the one round button.

- the top of the button is CursorUp
- the bottom of the button is CursorDown
- the left side of the button is CursorLeft
- the right of the button is CursorRight

The function of a cursor key depends on what is being displayed at the time.

Softkeys

The five keys in a row under the display are called softkeys. The name of a softkey depends on the information currently being displayed on the screen. The name is displayed in a small box directly above the key; if the name is grey or the box is empty then the key is inactive.

Beeper

The TRACKER950 has an internal beeper. It beeps:

- once when you press a key
- three times when you press an inactive key
- continually when there is an alarm (see section 2-3)

External beepers can be connected to sound alarms in the boat (see section 10).

2-2 Chart displays

A typical TRACKER950 chart screen is shown below.

Chart displays can show:

- A part of the built-in worldwide chart. See Chart scale below
- Chart details from any C-MAP™ cartridge fitted.

Land is brown, water is blue. You can control the type of information displayed on the chart (see section 9-4).

- The current boat position if it is on the chart.
- A cross-shaped symbol called the cursor.

Chart scale

Press the Zoom In key to display a smaller area of the chart in more detail. Press the ZoomOut key to display a bigger area in less detail.

The chart scale is displayed on some screens (e.g. scale = 8 nm) is the vertical distance across the currently visible chart area. For example if the scale is 8 nm then a portion of chart eight nautical miles high is currently displayed.

The cursor

The cursor is used to select points on the chart.

To move the cursor across the chart, press one of the cursor keys:

- Press the cursor key which points in the direction that you want the cursor to move, for example press CursorUp to move the cursor up.
- If you hold a cursor key down, the cursor moves across the screen.

- If you press the cursor key midway between two of the marked keys, the cursor moves diagonally.

When you move the cursor to the edge of the screen the chart will scroll. For example, if you move the cursor to the top of the screen then the chart will scroll down and you will see a part of the chart that was above the rest.

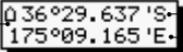
Chart symbols

The chart will show symbols, such as waypoints and C-MAP™ symbols, as shown below. To select a waypoint, move the cursor to the symbol. A white circle appears around it to show that it is selected and a window appears with information about the symbol.

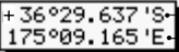
In the Underway screen, you can move the cursor to C-MAP™ chart symbols to see a window with information about the symbol.

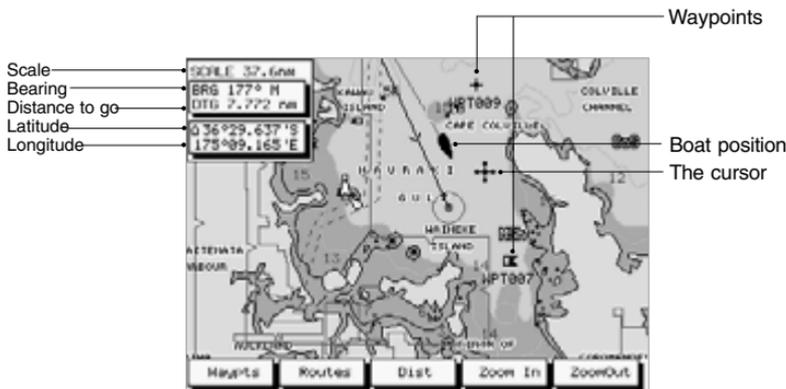
Latitude and Longitude

Latitude and longitude are displayed on navigation screens. Normally it displays the position of the boat and a boat symbol appears in front of the numbers to indicate this:

Boat symbol —  Latitude
Longitude

If you have moved the cursor in the last ten seconds, then it displays the position of the cursor and the boat symbol is not displayed:

 Latitude
Longitude



2-3 Alarms

When the TRACKER950 detects a condition outside the alarm parameters, it gives an alarm. It beeps continually and displays a warning message in a window.

To clear the alarm, press the Esc key.

The following alarms can be enabled or disabled: Arrival Radius, Anchor Alarm, XTE Alarm and Low Fuel (see section 9-3).

2-4 Turning on and off / Auto Power

Auto Power

If the TRACKER950 is wired for Auto Power (see section 10-3), then the TRACKER950 automatically turns on and off with the boat power; you can not turn the TRACKER950 on or off manually.

To turn the unit on manually

- 1 Hold the Esc key down until it beeps, then release the key. It displays a title screen for a few seconds, then beeps again and displays a navigation warning.
- 2 If you can not read the display then the screen backlight may be set too low. Press the BackLt key (the softkey furthestmost to the right) to turn the backlight on full (see section 9-1).

If the display is in the wrong language, select the right language (see section 9-1).

Read the warning and press the Confirm key.

- 3 It displays the Satellite Status screen. Wait for the GPS or DGPS receiver to start up, which should take less than three minutes.
- 4 It is then ready to use. It displays the Underway screen, the first of the main screens (see section 2-6).

To turn the unit off manually

Hold down the Esc key. The unit beeps and displays a countdown window. Continue to hold down the Esc key until the unit turns off.

2-5 Man overboard (MOB)

The MOB feature saves the boat's position and then navigates back to this point. To do this:

- 1 Either:
 - hold down the two softkeys labelled MOB at the same time for about a second
 - or press an external MOB button for about a second (if one is installed)

It beeps 4 times and boat's position is stored as the waypoint 'MOB'.

- 2 The display changes to the Underway screen, with a scale of 0.1 miles, with the MOB waypoint situated in the centre of the screen. It goes to plotter mode, with a white screen with crosshatching, rather than displaying a chart (see section 9-4).

- 3 If the NMEA output is on, you are asked: "Is Autopilot Active?" This gives you the opportunity to disengage the autopilot now before going to the MOB waypoint. Then press the Yes or No key.

Warning: If the autopilot is active and you press the Yes key then this might result in a sudden and dangerous turn.

- 4 Navigate back to the place where MOB was pressed.

To clear MOB.

- 1 Press the two MOB keys again.
- 2 A window appears asking if you want to cancel the MOB. Press Yes.

2-7 Navigating

The TRACKER950 has two ways of navigating, going straight to a point or following a route.

Waypoints

Before you start navigating, you can enter waypoints at points of interest (see section 6-1). Tip: Place a waypoint at your marina so that you can navigate back easily.

Going straight to a point

The TRACKER950 can go straight to a waypoint or to any arbitrary point. This is called GoTo:

- To start the GoTo, go to the GoTo screen (see section 4-1).
- The Underway and Highway screens will show navigation data. If the TRACKER950 is connected to an autopilot, it will start steering. The destination is displayed on the Underway and Highway screens.

If you enable the XTE alarm, it will give an alarm if the boat deviates too much from its intended course.

- When the boat comes within the arrival radius of the destination, it can give an Arrival Radius alarm to show that you have reached the destination. It will then end the GoTo automatically. To set the arrival radius and enable this alarm, see section 9-3.
- To manually stop the GoTo, go to the Underway screen, press the GoTo key and press the Cancel key.

Following a route

A route is a list of waypoints.

- You can create waypoints before you create

the route by using the Waypoints screen (see section 6-1).

- To create a route, go to the Routes screen (see section 6-2). You can create waypoints as you create the route.
- To start the route, see section 6-2-7.
- The Underway and Highway screens will show navigation data. If the TRACKER950 is connected to an autopilot, it will start steering. The waypoint which is the current destination is displayed in the Underway and Highway screens.

If you enable the XTE alarm, it will give an alarm if the boat deviates too much from its intended course.

- The boat stops going to the current waypoint in the route and starts going to the next waypoint:
 - a when the boat comes within the arrival radius of the current waypoint
 - b or when the boat passes the waypointIn these two cases, the TRACKER950 can give an Arrival Radius alarm to show that you have reached the waypoint. To set the arrival radius and enable this alarm, see section 9-3.
 - c Or if you press the Skip key in the Underway screen.
- To manually stop the boat following the route, go to the Routes screen and press the RteOff key.

2-8 Simulation mode

When the TRACKER950 is in simulation mode it simulates boat movement and satellite data. The real boat does not move. We recommend that you use the TRACKER950 in Simulation mode to familiarise yourself with the TRACKER950 before using it on the water.

To see if the TRACKER950 is in Simulation mode, go to the Satellite Status screen (see section 3-2).

If it is in Simulation mode, then it displays Simulate. To start and stop Simulation mode, see section 9-7.

Warning: Never turn on Simulation mode when you want to use the TRACKER950 to navigate on the water.

2-9 PC interface

The TRACKER950 can be connected to a Windows based PC to simplify using waypoints and routes. These can be created and changed on the PC, then downloaded to the TRACKER950 (see the PC interface kit's documentation).

3 Satellite Status screen

The satellite status screen displays the signal strengths of the visible GPS satellites, their current positions and information about the accuracy of the calculated position.

3-1 GPS and DGPS worldwide navigation

GPS and DGPS

The US Government operates the GPS system. There are twenty-four satellites orbiting the earth that broadcast position and time signals. The positions of these satellites are constantly changing. Your GPS receiver analyses the signals from the closest satellites and calculates exactly where it is on earth. This is called the GPS position.

All GPS positions have some errors, caused by small variations in the positions of the satellites and by atmospheric effects. The accuracy of the GPS position is typically better than 10 m (33 feet) for 95% of the time.

To make GPS positions more accurate, a system of land-based transmitters has been developed, called differential beacons. These transmit correction signals that a receiver can use to correct for most of the errors in the GPS position. Such a receiver is called a differential receiver and the corrected position is called the DGPS position. The accuracy of the DGPS position is typically 2 to 5 m (6 to 15 feet), depending on the distance to the nearest beacon.

Coverage

A GPS antenna can receive signals from the GPS satellites when it is almost anywhere on earth. However, differential beacons are usually only installed near ports or important waterways and each beacon only has a limited range, typically less than 400 km (220 nm).

GPS and DGPS antennas

The NAVMAN GPS antenna gives a GPS position. The unit has a high-gain antenna and a sensitive 12-channel receiver. It tracks signals from all satellites visible above the horizon and uses measurements from all satellites more than 5° above the horizon to calculate the position.

The NAVMAN differential receiver has a unique 'H-Field' toroidal antenna for high sensitivity and excellent immunity from electrical noise and which requires no grounding. The receiver has two channels and automatically selects the strongest differential beacon signal to use.

The NAVMAN DGPS antenna has both a GPS receiver and a differential receiver and automatically applies the differential corrections to the GPS position and gives a DGPS position.

Startup

Each time a NAVMAN GPS antenna is turned on, it normally takes about 50 seconds before it outputs the first position. If it has not been turned on for several months or if it has been moved more than 1000 km (550 nm) since it was last turned off then it will take two minutes or longer.

TRACKER950 antennas

The TRACKER950 must be connected to:

- a GPS antenna
- or a DGPS antenna, which is a combined GPS and differential receiver
- or a GPS antenna and a separate differential receiver

3-2 The Satellite Status screen

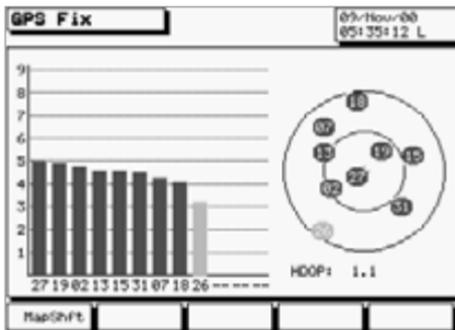
When you turn the TRACKER950 on, the Satellite Status screen is automatically displayed while the GPS receiver starts up.

To display this screen at any other time:

- press the Sat key in the Position or Fuel screen
- or choose it from the Menu screen

The satellite status screen displays information about the GPS satellites:

- The current type of GPS fix, for example Acquiring, GPS fix, DGPS fix, No GPS. If the unit is in Simulation mode it displays Simulate (see section 2-8).
- The date and time, from the GPS satellites. The time is UTC (GMT) plus the Local Time Offset (see section 9-1). You can set this offset to display local time anywhere in the world.
- The signal strengths of up to twelve visible GPS satellites are displayed as bargraphs. The higher the bar the stronger the signal; the strongest satellite is on the left.
- The current positions of the visible GPS satellites are displayed within two circles. The outer circle indicates the horizon and the inner circle 45° elevation. The centre of the circles is directly above. North is at the top of the screen.
- If the boat is moving the current COG is displayed as a line from the centre of the circles.
- The value of HDOP indicates the error in the GPS position caused by poor satellite positions. A low value indicates a more precise fix, a higher value a less accurate fix.



Esc key

Return to the previous screen.

Mapshft key

Go to the Mapshift screen to apply a correction to make the displayed position match the chart position (see section 3-3).

3-3 Mapshift screen and datums

Satellite derived positions are based on a worldwide reference (datum) known as WGS84. Some paper charts are based on datums other than WGS84. This results in an offset between a latitude and longitude plotted on the paper chart and the same latitude and longitude plotted on the TRACKER950. To match the TRACKER950 with your local charts you must enter the datum for your local area (see Appendix A for a list of available datums). Once your local datum has been entered all latitudes and longitudes, including waypoints, will match the paper charts (see section 9-2).

If you prefer to retain the WGS84 datum (no local datum) but find that the boat position is offset you can correct this offset with the mapshift function.

Warning: Mapshift is for eliminating minor offsets. It must not be used to correct positions to match local charts.

To set mapshift

- 1 Move your boat to a known point on the chart, for example a marina berth.
- 2 Press the Esc key until it displays the Fuel or Position screen. Press the Sat key to display the Satellite Status screen.
- 3 Press the Mapshft key to display the Mapshift screen.
- 4 The GPS position is shown as a cross in a circle. Press the cursor keys to move the cursor to the position on the chart where the boat actually is.
- 5 Press the Set key to set the new mapshift. The boat will now be displayed at its actual location.
- 6 The Mapshift offset is displayed in the navigation data window. Check the setting by performing the same procedure at other known locations.

To clear mapshift

- 1 Press the Esc key until it displays the Fuel or Position screen. Press the Sat key to display the Satellite Status screen.
- 2 Press the Mapshft key to display the Mapshift screen.
- 3 Press the Clear key.

4 Underway screen

The Underway screen is the main screen for displaying your current location and heading while navigating. It displays:

- The chart with the boat position and track.
- Two user-definable data fields (see section 9-2).

When you turn the TRACKER950 on and first come to the Underway screen, the boat is in the centre of the screen and Autopan is on (see below):

- If you press any other key other than Zoom In, ZoomOut or Esc then Autopan will turn off
- To turn Autopan on again, press the Centre key twice (quickly).

Esc key

Go to the Highway screen.

The left-most softkey can have two functions:

- if the boat is navigating along a route, the key is Skip
- otherwise the key is GoTo

Skip key

Stop navigating to the current waypoint on the route and start navigating to the next waypoint on the route.

GoTo key

Displays the GoTo screen. GoTo is a simple way of navigating straight to one place (see section 4-1).

Hide key

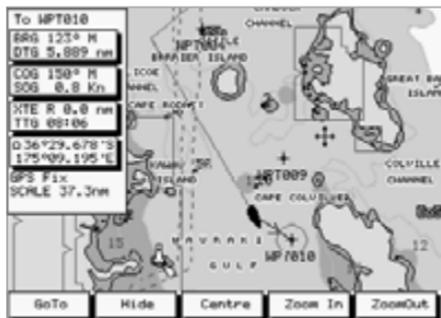
- To remove navigation data from the screen so as to display more of the chart, press the Hide key once.
- To remove the softkey names so that the chart fills the entire screen, press the Hide key again. The Hide, Zoom In and ZoomOut keys are still active even though they are not displayed.
- To restore the data, press the same key (second from the left) again.

Centre key

Moves the chart so that either the boat or cursor is in the centre of the screen:

- To centre on the cursor, press the Centre key once
- To centre on the boat, press the Centre key twice (quickly).

This turns Autopan on (see below) and temporarily moves the cursor to the boat.



After centring the screen around the boat or cursor you can change the scale by pressing the Zoom In or ZoomOut keys and the TRACKER950 will retain the scale selected. This is useful. For example, you can:

- a centre on the cursor and ZoomOut to see the entire route
- b then centre on the boat and zoom in to see more detail
- c then switch between those two displays by pressing the Centre key once or twice (quickly)

Autopan

When you centre on the boat by pressing the Centre key twice (quickly), it turns Autopan on. The chart automatically scrolls to keep the boat position in the centre of the screen.

Autopan stays on until you press any key other than Zoom In, ZoomOut or Esc.

Markers and Navigation Aids

In the Underway screen, when you move the cursor to a C-MAP™ symbol, a window appears explaining what the symbol is. If the Expand softkey is displayed you can press it to see more information about the symbol.

4-1 GoTo screen

GoTo is a simple way of navigating straight to one place: to the cursor position or to a waypoint.

To start the GoTo

- 1 In the Underway screen, zoom in or out until the boat and destination are visible.
- 2 Press the GoTo key. A dotted line joins the boat and cursor positions, showing the planned course.
- 3 Move the cursor to the destination; this can be a waypoint or just the current cursor position.

Warning: make sure that the course does not pass over land or dangerous waters.

- 4 Press the Confirm key to start the GoTo. The TRACKER950 will start navigating to the destination.



To cancel a GoTo

- 1 In the Underway screen, press the GoTo key.
- 2 Press Cancel. The TRACKER950 will stop navigating to the destination.



5 Highway Screen

The Highway screen displays a chart with your current position and heading when you are navigating to a destination:

- The destination is automatically positioned directly ahead, at the top centre of the chart.
- The boat position is automatically maintained in the centre of the chart.

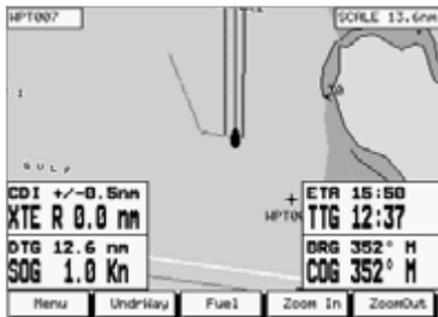
You can see on the chart where you are, where you are heading, and if you are approaching land or any dangerous water.

- It displays two vertical parallel lines, called the CDI (Course Deviation Indicator).

The straight line joining the start to the destination is the ideal course for the boat. The CDI lines are on either side of the ideal course. The distance from a CDI line to the ideal course is called the CDI Scale; set this to the maximum distance that you would like the boat to deviate from the ideal course (see section 9-3).

The CDI lines are like a highway over the water that you would like the boat to move along. As the boat moves away from the ideal course it will appear to move towards one of the CDI lines.

- It displays four user-definable data fields (see section 9-2). Two fields have large digits so they can be read from a distance.



Esc key: Go to the Navigation screen.

UnderWay key: Go to the Underway screen.

Menu key: Go to the Menu screen.

Fuel key: Go to the Fuel screen.

6 Navigation screen

Use the Navigation screen to create edit and delete waypoints and routes. You can also calculate distances and bearings along a path on the chart.

Esc key

- if fuel is enabled, go to the Fuel screen
- otherwise, go to the Position screen

Waypts key

Go to the Waypoints screen to add, change or delete waypoints (see section 6-1).

Routes key

Go to the Routes screen to add, change or delete routes (see section 6-2).

Dist key

Go to the Distance screen to calculate distances and bearings (see section 6-3).



6-1 Waypoints

6-1-1 Introduction to waypoints

Waypoints are points on the chart which you can define. They appear on the chart as shown in section 2-2. They can be created, changed and deleted.

A waypoint has a position.

- A waypoint has a name and can be specified as normal or danger:

Normal: You can navigate to a normal waypoint and it can be included in a route.

Danger: A danger waypoint is a point that you want to avoid. If the boat comes within the arrival radius of a danger waypoint the unit can give an alarm (see section 9-3). You can not navigate to a danger waypoint.

Make sure that you do not create a waypoint on land or in dangerous water if you are going to navigate to the waypoint.



6-1-2 Waypoints screen

To display the Waypoints screen:

- 1 Go to the Navigation screen and zoom in or out to display the area of the chart you are interested in.
- 2 Press the Waypts key.

The softkeys available in the Waypoints screen change according to where the cursor is:

- When the cursor is not over a waypoint, the softkeys are:
 - Save+:** Create a waypoint where the cursor is (see section 6-1-3).
 - Save@:** Create a waypoint where the boat is (see section 6-1-3)
 - Find:** Display an existing waypoint on the chart (see section 6-1-5).
 - Create:** Create a new waypoint (see section 6-1-4).
 - List:** List the waypoints (see section 6-1-9).
- When the cursor is over a waypoint, the softkeys are:
 - Edit:** Change the waypoint data (see section 6-1-6).
 - Move:** Move the waypoint (see section 6-1-7).
 - Delete:** Delete the waypoint.
 - Create:** Create a new waypoint (see section 6-1-4).
 - List:** List the waypoints (see section 6-1-9).

6-1-3 Create a new waypoint at the cursor or boat position

- 1 In the Waypoints screen:
 - to create the new waypoint at the cursor position, move the cursor to the desired position and press the Save+ key
 - to create it at the boat position, press the Save \uparrow key
- 2 To save as a waypoint, press the Waypt key. A waypoint edit window appears. Edit this as described in section 6-1-6, then press the Save key.
- 3 Repeat step 2 above to create more waypoints. Then press the Esc key to return to the Waypoints screen.

6-1-4 Create a new waypoint at a specified position

- 1 In the Waypoints screen, press the Create key to display a new waypoint edit window. It uses the boat's position (GPS) as the default position.
- 2 Edit the waypoint data as described in section 6-1-6, then press the Save key.

6-1-5 Find a waypoint

This moves the chart so that an existing waypoint is displayed on the chart:

- 1 In the Waypoints screen, move the cursor so that it is not over a waypoint. Press the Find key.
- 2 A window appears with a waypoint name. Use the cursor keys to select the waypoint to find. Press the Enter key.

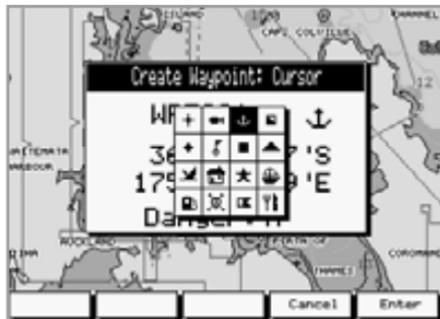
6-1-6 Edit a waypoint

You have the opportunity to edit the data for a waypoint in a number of screens. A window with the waypoint data appears:



To edit the waypoint data:

- 1 Press the CursorUp or CursorDown keys to highlight the piece of data to change.
- 2 Press the Edit key to highlight a character in the piece of data.
- 3 To change the data, press the CursorLeft or CursorRight keys to highlight the character to change, then press the CursorUp or CursorDown keys to change the character. Repeat this until all characters are correct, then press the Enter key.
- 4 Repeat steps 1 to 3 until all the data is correct.
- 5 Press the Save key.



6-1-7 Move a waypoint

- 1 In the Waypoints screen, move the cursor to the waypoint.
- 2 Press the Move key.
- 3 Move the cursor to the new position.
- 4 Press the Save key.

6-1-8 Delete a waypoint

You can not delete a waypoint if it is part of a route or if the boat is going to it.

- In the Waypoints screen: move the cursor to the waypoint, then press the Delete key.
- From the list of waypoints (see section 6-1-9): use the cursor keys to highlight the waypoint, then press the Delete key.

6-1-9 List the waypoints

In the Waypoints screen, press List to display a list of all the waypoints. Waypoints that are being used can not be edited or deleted.

Name	Lat/Lon	Danger
WPT002	38°30.204 'S 176°30.300 'W N	
WPT003	34°05.630 'S 177°40.930 'E N	
WPT004	46°44.370 'S 175°19.036 'E N	
WPT005	36°31.023 'S 175°56.041 'E N	
WPT006	37°30.305 'S 176°17.101 'E N	
WPT007	36°44.212 'S 175°19.141 'E N	
WPT000	43°31.287 'S 173°02.637 'E N	
WPT010	36°26.057 'S 175°02.002 'E N	
WPT011	33°00.301 'S 102°23.712 'E N	
WPT013	25°03.257 'S 153°38.000 'E N	
WPT030	33°10.704 'S 115°06.010 'E N	

Edit	Delete	Create	View	GoTo
------	--------	--------	------	------

Use the cursor keys to highlight a particular waypoint. These softkeys are available:

Edit: Edit the data for the highlighted Waypoint (see section 6-1-6).

Delete: Delete the highlighted Waypoint. You can not delete a waypoint if it is part of a route or the boat is going to the waypoint.

Create: Create a new waypoint (see section 6-1-4).

View: Display the chart with the waypoint in the centre of the screen.

GoTo: Start the boat going to the waypoint (see section 4-1).

6-2 Routes

6-2-1 Introduction to routes

A route is a list of waypoints that the boat can navigate along. Routes can be created, changed and deleted.

A route can have between two and fifty waypoints. A route can start and stop at the same waypoint; in this case there must be three or more waypoints in the route.

The boat can start at any waypoint in the route and can travel along a route in either direction. Waypoints on the route can be skipped.

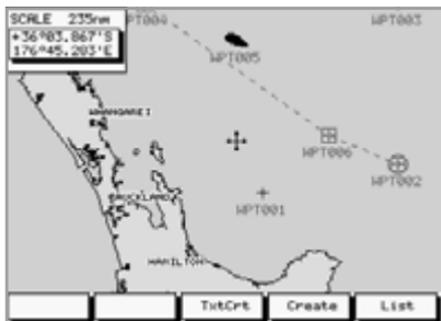
Routes are a particularly powerful feature when the TRACKER950 is connected to an autopilot, allowing the vessel to be automatically guided along the route.

Make sure that any routes that you create do not cross land or any dangerous water.

6-2-2 Routes screen

To display the Routes screen:

- 1 Go to the Navigation screen.
- 2 Press the Routes key.



The softkeys available in the Routes screen are different if the boat is navigating along a route or not:

- If the boat is not navigating a route, the softkeys are:
 - TxtCrt:** Create a new route by selecting waypoints from a list (see section 6-2-3).
 - Create:** Create a new route by selecting waypoints from a chart (see section 6-2-4).
 - List:** Display a list of the routes (see section 6-2-5).
- If the boat is navigating a route, the softkeys are:
 - RouteOff:** Stop navigating along the route.

List: Display a list of the routes, see section 6-2-5).

6-2-3 Create a new route by selecting waypoints from a list

- 1 In the routes screen, press the TxtCrt key to display a new, empty route list.
- 2 The route is given a default name. To change the name, press the Edit key and use the cursor keys to change the name, then press the Enter key.
- 3 To add a waypoint to the route, press the CursorUp or CursorDown keys to move the highlight up or down the route to where you want to add the waypoint.
Press the Insert key. A list of waypoints is displayed. Press the CursorUp or CursorDown keys to move the highlight to the waypoint, then press the Enter key.
- 4 To delete a waypoint from the route, press the CursorUp or CursorDown keys to move the highlight to the waypoint.
Press the Delete key.
- 5 Repeat this process until the route is finished. Press the Done key to save the new route.

6-2-4 Create a new route by selecting waypoints from a chart

Choose waypoints in the order in which they will be traversed. New waypoints can be created as you go.

- 1 In the routes screen, press the Create key.
- 2 Move the cursor to the start of the route.
- 3 Press the Add key.
If the cursor is over an existing waypoint it is added to the route.
If the cursor is not over an existing waypoint, it creates a new waypoint there and displays a window of data for the waypoint. You can edit this as described in section 6-1-6, then press the Save key. The waypoint is added to the route.
- 4 Repeat the step above to add the remaining waypoints to the route.
Press the Undo key to remove the last waypoint from the route.
- 5 When the route is finished, press the Save key.
- 6 It gives the route a default name. Use the

cursor keys to change the name, then press the Enter key.

6-2-5 List the routes

In the Routes screen, press the List key to display a list of all the routes.

Use the cursor keys to highlight a particular route. The softkeys keys are:

Display: display the highlighted route as a chart (see section 6-2-6).

Delete: delete the highlighted route

Start: Start the highlighted route (see section 6-2-7).

TxtCr: Create a new route by selecting waypoints from a list (see section 6-2-3).

Exit: return to the Routes screen.

6-2-6 Display, edit or delete a route

- 1 In the Routes screen, press the List key,
- 2 Use the cursor keys to highlight the route. If there is an arrow to the left of the route then it is active and can not be edited.
- 3 Press the Display key. It displays the route on a chart.
- 4 To start, edit or delete the route, move the cursor and press the required softkeys.

The available softkeys depend on where the cursor is:

- **Cursor is over a waypoint in the route**

The softkeys are:

Move: Move the cursor to move the waypoint.

Remove: Remove the waypoint from the route.

Extend (only available if the cursor is over the last waypoint of the route): Add a new way point to the end of the route.

Note that the Move and Remove keys above are the only ways to change waypoints which are used in a route. The Waypoint functions described in section 6-1 can not be used on such waypoints.

- **Cursor is over a leg of the route**

The softkey is:

Insert: Insert a new waypoint in the leg of the route. Move the cursor to

where the new waypoint should be, then press the Add key. Edit the waypoint data as described in section 6-1-6. Press the Save key.

- **Cursor is not on the route**

The softkeys are:

Start: Start the route (see section 6-2-7).

Delete: Delete the route.

- 4 Finally, press the Esc key to return to the list of routes.

6-2-7 Start a route

To start the boat navigating over a route:

- 1 Either:
 - list the routes and highlight the route (see section 6-2-5)
 - or display the route (see section 6-2-6)

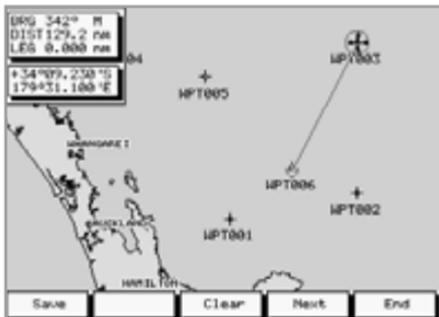
Press the Start key.

- 2 It asks if you want to traverse the route in the forward or reverse direction. The forward direction is the order that you created the route. Press the Fwd or Rev keys.
- 3 It displays a chart with the route marked.
 - Press the > key to change the start waypoint to one later in the route.
 - Press the < key to change the start waypoint to one earlier in the route.
- 4 Press the Go key to start the boat navigating along the route.

6-3 Distance and bearing calculator

The Distance screen allows you to calculate the distance and bearings over a path on the chart. To display the screen:

- 1 Press the Esc key until the Navigation screen is displayed.
- 2 Zoom in or out so that the area of interest is displayed.
- 3 Press the Dist key.



To calculate a distance and bearings over a path:

- 1 Move the cursor to the start of the path. Press the Start key.
- 2 Move the cursor to the next point on the path. Press the Next key. It displays the total distance from the start and the bearing from the previous point to the next point.
- 3 Repeat the above step to enter the whole path. The distance is the length of the whole path.
- 4 To save the new path as a route, press the Save key. This saves any new points as new waypoints with default names. To rename the new waypoints: go to the Waypoints screen, list the waypoints and edit the new waypoints (see section 6-1-9).
- 5 Move the cursor to the start of the path. Press the Start key. Repeat the above steps to find the length of other paths.

Finally, press the End key to return to the Navigation screen.

7 Fuel screen

To use the fuel features, first purchase and install the optional single or twin engine fuel kit.

If a fuel kit is installed but this fuel screen does not appear, you must enable it by setting Num Engines to 1 or 2 and setting up the other fuel data (see section 9-6).

It displays:

Used

The total fuel used since it was last cleared. This can be reset to 0 by the Clear Used command (see section 9-6).

Remaining

The amount of fuel remaining in the fuel tank(s).

Flow

The fuel consumption. For twin engine installations, the fuel flow for each engine is shown separately. This is useful for checking that both engines are under the same load.

Economy

The distance travelled per unit of fuel used. The TRACKER950 uses GPS speed over the ground and fuel consumption for this calculation. The Economy units are set by the units selected for speed and fuel. Adjust the throttle and trim for the best economy. The bigger the number the better the economy. **CAUTION: Fuel economy can change drastically depending on boat loading and sea conditions. Always carry adequate fuel for the journey plus a sufficient reserve.**

Range

The estimated distance that the boat is able to travel before running out of fuel using Economy and Remaining (see above). **CAUTION:** Range is an estimate only and should be used as an indication only. Always carry adequate fuel for the journey plus a sufficient reserve.

Esc key: Go to the Position screen.

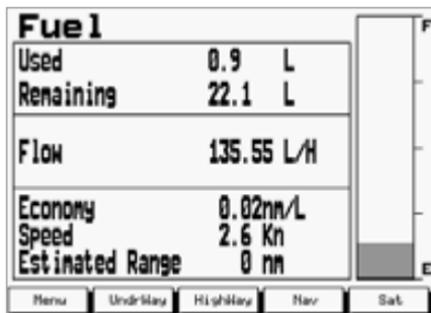
Menu key: Go to the Menu screen.

UndrWay key: Go to the Underway screen.

Highway key: Go to the Highway screen.

Nav key: Go to the Navigation screen.

Sat key: Go to the Satellite status screen.



8 Position screen

This displays navigation data, with the latitude and longitude of the boat in large numbers.

Esc key: Go to the Underway screen.

Menu key: Go to the Menu screen.

Highway key: Go to the Highway screen.

Nav key: Go to the Navigation screen.

Fuel key: Go to the Fuel screen.

Sat key: Go to the Satellite status screen.

GPS Fix	09-Nov-00 15:40:45 L			
34°41.696'S 176°50.525'E				
To WPT002				
DTG 164.7 nm	BRG 128° M			
SOG 10.0 Kn	COG 110° M			
Menu	Highway	Nav	Fuel	Sat

9 Menu screen

The TRACKER950 has a number of advanced navigation features which are set up through this menu. We recommend that you become totally familiar with the operation of the unit using the default settings before making any changes to the data in these menus.

To display the Menu, display the Position, Highway or Fuel screen and press the Menu key.

Using the Menus

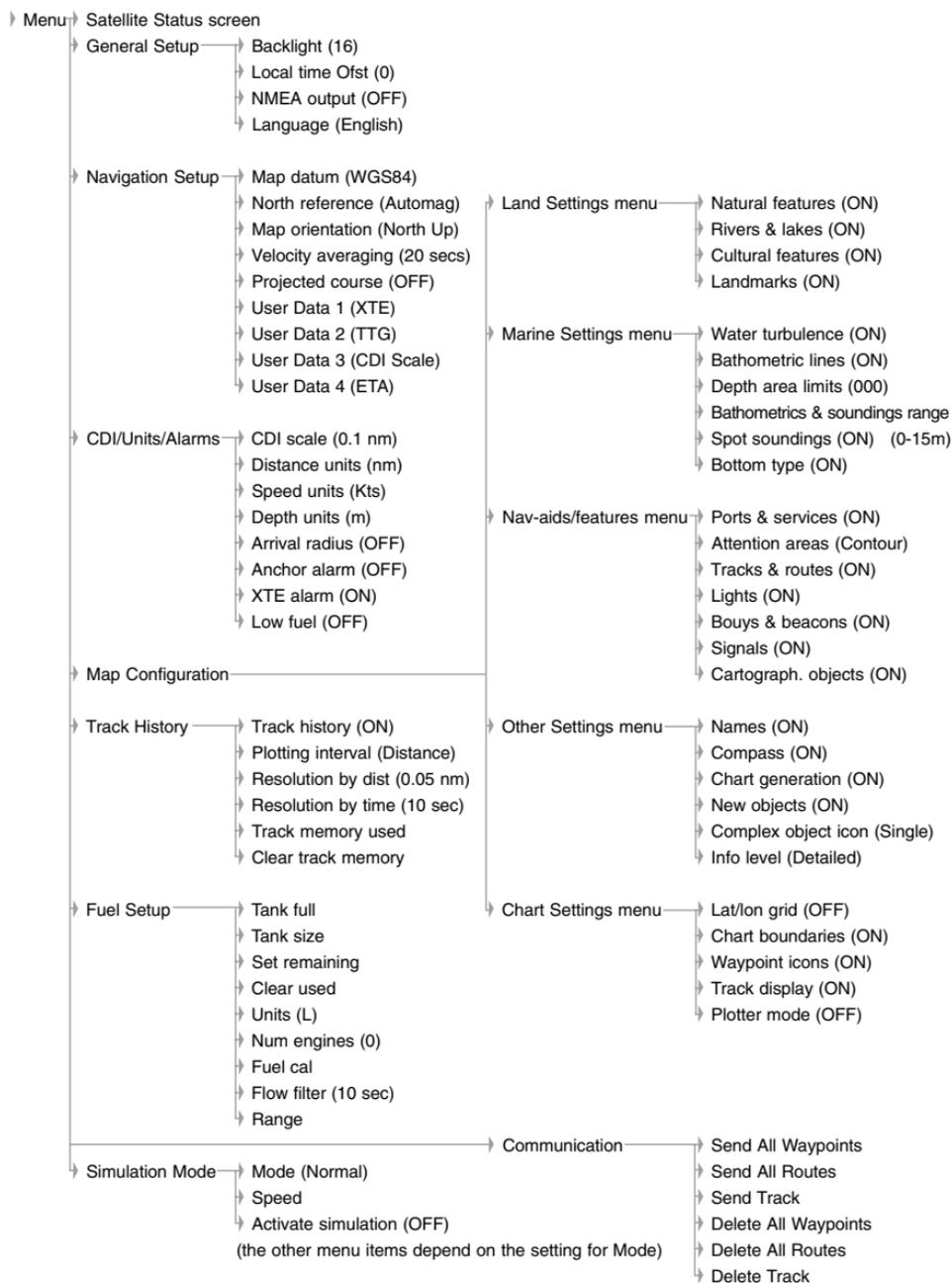
A menu is a list of items. To select an item in a menu, press the CursorUp or CursorDown key to highlight the item, then press the CursorRight key:

- If the item is another menu then the menu will be displayed. Select a further item.
- If the item is a piece of data then a small window will appear, displaying the data. Use the cursor keys to change the data, then press Enter. Press Esc to leave the data unchanged.

The first item in the first menu is Satellite. Select this to display the Satellite Status screen. The other menus are described in the following sections.



Menu map, with default settings in brackets



9-1 General Setup

Backlight

Backlight brightness, 16 Levels

Local Time Ofst

The difference between local time and UTC (GMT). You must change Local Time Ofst when daylight saving time starts and ends.

NMEA Output

Enable/Disable the NMEA0183 output for the autopilot or radar.

Language

Select the language for the screens. The options are Dutch, English, French, German, Italian, Portuguese, Spanish and Swedish.

9-2 Navigation Setup

Map Datum

128 chart datums are provided. The satellite derived positions displayed on the TRACKER950 can be adjusted to match your local paper charts by selecting the appropriate datum for your region.

North Reference

The options are True or AutoMag.

Map Orientation

The options are:

North up: North is always at the top of a chart display.

Projected Track up: The chart is automatically rotated so that the boat direction is to the top of the screen. A small square appears in the upper right corner of the LCD, indicating the direction of North. This mode is useful for navigating narrow harbours or rivers.

COG damping is also derived from this setting.

Projected Course

The TRACKER950 can estimate your course based on your current speed and heading. It can display this course as a solid line from the boat position. The length of the line is how far you will travel in a specified time and the options for this Projected Course time are 2 minutes, 10 minutes, 30 minutes, 1 hour and 2 hours or OFF.

User-definable fields

The Highway screen displays four user-definable fields: User Data 1, User Data 2, User Data 3 and User Data 4. The choices for each field are VMG, CTS, ETA, TTG, XTE, STR, Depth, Fuel Economy, Range, Scale or CDI scale.

User Data 1 and User Data 2 are also displayed on the Underway screen.

Velocity Averaging

The TRACKER950 can show instantaneous speed or speed averaged over a selected period. The options are OFF, 20 seconds and 60 seconds. The

9-3 CDI/Units/Alarms Setup

CDI Scale

The CDI Scale controls the Course Deviation Indicator (CDI) which is displayed on the Highway screen when navigating to a point (see section 5). Set the CDI Scale to the maximum distance that you would like the boat's path to deviate from the original plotted course. The options are 0.05, 0.1, 0.2, 0.5, 1.0, 2.0, 4.0 and 10.0 distance units.

Distance Units

Options are nautical miles, statute miles or kilometres.

Speed Units

Options are knots, miles per hour and kilometres per hour.

Depth Units

Options are feet, fathoms or metres.

Arrival Radius Alarm

When the Arrival Radius alarm is enabled it gives an alarm:

- when the boat comes within this distance of a waypoint, (either a normal or danger waypoint)
 - or when the boat is navigating a route to a waypoint and the boat passes the waypoint
- To enable the alarm, enter an Arrival Radius distance (up to 9.99 distance units).
 - To disable the alarm, set the Arrival Radius value to OFF.

Anchor Alarm

When the Anchor Alarm is enabled it gives an alarm when the boat moves by more than the Anchor Alarm distance.

- To enable the alarm, enter an Anchor Alarm distance (up to 9.99 distance units). The TRACKER950 saves the current boat position.
- To disable the alarm, set the Anchor Alarm value to OFF.

The accuracy of the alarm is determined by the accuracy of the positioning system: typically within 10 m for GPS and 2 to 5 m for DGPS.

XTE Alarm

When the XTE Alarm is enabled it gives an alarm when the boat is navigating to a point and the distance from the boat to the original plotted course (XTE) is more than CDI (Course Deviation Indicator) value.

- To enable the alarm, set the XTE Alarm value to ON.
- To disable the alarm, set the XTE Alarm value to OFF.

Low Fuel Alarm

When the Low Fuel alarm is enabled it gives an alarm when the fuel remaining in the tank is less than the Low Fuel value.

- To enable the alarm, enter a Low Fuel value. Ensure
- To disable the alarm, set the Low Fuel value to OFF.

To turn off a TRACKER950 alarm, press the Esc key

9-4 Map Configuration

The Map Configuration screen provides access to menus allowing you to enable or disable an extensive range of chart features. You can configure a display format that best suit your needs. Some important points to note are:

Plotter Mode

Occasionally it is desirable to zoom in to a scale smaller than the available chart resolution. Examples of this are if you wish to track very small movements of the boat or if you do not have a C-MAP™ chart for an area.

If you turn Plotter Mode ON, then when you zoom in beyond the chart limits the TRACKER950 will enter track plot mode and will only display the boat position and track (if enabled). Chart and map information will no longer be displayed and the display is white with black crosshatch lines.

For normal use, turn Plotter mode OFF.

Bathometric Lines and soundings

C-MAP™ cartridges contain a large amount of spot sounding and depth contour data. This can be selectively displayed by turning Bathometric Lines and Spot Soundings off or on, then selecting the ranges to display with Depth Area Limits and Bathometrics & Soundings Range.

Attention Areas

Areas of importance, such as restricted anchorages and shallow areas, are highlighted as Attention Areas. Three options are available for displaying Attention Areas:

ON displays attention areas as a dot pattern and displays information (!) icons.

Contour does not display attention areas, only the information (!) icons.

OFF does not display the attention areas or the information (!) icons.

Note:

- a Detailed Attention Area information is only available in the Underway screen.
- b In some earlier C-MAP™ cartridges the information (!) icons are inactive.

9-5 Track History

The Track History function plots the track of the boat on the chart. The TRACKER950 saves the boat's position to memory at regular intervals, which can be:

- time intervals, from 1 second to 1 minute
- or distance intervals, from 0.01 to 10.0 distance units

Up to 2000 positions can be stored and they are retained when the unit is turned off. This menu displays the amount of memory used to store the track. To delete the track, select Clear Track Memory.

9-6 Fuel Setup

To use these fuel features first purchase and install the optional single or twin engine fuel kit.

Whenever you add or remove fuel from the tank you must come to this menu and adjust the level or the Low Fuel alarm will be meaningless. To adjust the level:

- If you fill the tank, use Tank Full.
- If you partly fill the tank or remove fuel:
 - 1 Before you add or remove the fuel, go to the Fuel screen and note how much fuel is in the tank.
 - 2 Note how much fuel you add or remove.
 - 3 Calculate how much fuel is now in the tank by adding the two figures.
 - 4 Come to this menu and enter how much fuel is now in the tank in Set Remaining.

Tank Full

Select Yes each time you fill the tank full.

IMPORTANT: Do this each time the fuel tank is refilled or the low fuel alarm will be meaningless! When partially filling the fuel tank use Set Remaining.

Tank Size

Enter the capacity of the fuel tank into the unit for use with the Tank Full option. Enter the manufacturer's specified capacity.

Set Remaining

Enter the amount of fuel now in the tank after it has been partly filled or fuel removed.

Clear Used

Select Clear Used to set Used (the amount of fuel used) to zero. Do this to restart measuring the amount of fuel used.

Units

Options are L (Litres), USGAL (US Gallons) or IMPGAL (Imperial Gallons)

Num Engines

Set the number of engines to 1, 2 or 0. If 0 is selected the fuel features are turned off and the Fuel screen no longer appears.

Fuel Cal

Calibrating the fuel usage can increase the accuracy of fuel measurements from +/- 10% to better than +/- 2%. For twin engine installations calibration of each transducer is required.

Calibrating the fuel transducer requires accurate measurement of the fuel used. This is easiest with a small portable tank. It should be noted that due to air pockets, it is very difficult to fill underfloor tanks to the same level twice. At least 15 litres should be used to ensure an accurate calibration. (The more fuel used, the more accurate the calibration will be.) Each transducer in a twin engine installation must be calibrated separately. This may be done at the same time with two portable tanks, or at different times using one tank at a time.

The procedure is as follows:

- 1 Select Clear Used to set the set Fuel Used to zero.
- 2 Connect the measurement tank(s) to the engine(s) via the fuel transducer(s).
- 3 Run the engine(s) at normal cruising speed until at least 15 litres is indicated (30 for twin engines).
- 4 Check the actual amount of fuel used per engine. The easiest way to do this is to refill the tank(s) to the original level(s) and record the value(s) shown on the fuel dispenser.
- 5 Select Fuel Cal on the fuel menu. The amount of fuel that the TRACKER950 has recorded will be displayed. Use the CursorLeft or CursorRight key to change this to the actual fuel amount used, then press the Menu key. (Repeat for the other engine in a twin engine installation).

Flow Filter

Sets the period over which the fuel flow is averaged. Averaging can be set from 1 to 180 seconds.

Normally engines do not draw fuel from the tank at a steady rate. They draw fuel at a high rate for a few seconds until the carburettor bowl or fuel injection reservoir is full, then draw no fuel for a few seconds. If the true flow rate were displayed, it would be too erratic to read.

Usually a value of 10-15 seconds will give a

satisfactory result for carburettor engines. Fuel injected engines may require a larger value.

This setting affects the flow rate and Economy displays. It does not affect the fuel used measurement.

9-7 Simulation Mode

Simulation mode is a way of becoming familiar with the TRACKER950 functions. Boat movement and satellite data are simulated. The real boat does not move.

Activate simulation

Enter On to turn simulation mode on, enter Off to turn it off.

Warning: Never turn Simulation mode on when you want to use the TRACKER950 to navigate on the water.

Speed

The simulated boat speed to use.

Mode

There are two choices for Mode:

Normal mode

Simulates the boat moving between two waypoints at a given speed. The other options are:

Heading: The bearing for the boat to follow. You can calculate this from the distance and bearing calculator (see section 6-3).

Starting waypoint: The start waypoint for the simulation.

Destination waypoint: The end waypoint for the simulation.

As the boat moves, you can vary Heading to simulate the boat moving off course.

Demo mode

Simulates the boat moving along a route at a given speed. When it reaches one end it retraces the route in the other direction. Before setting this mode you must enter a route (see section 6-2). The other option is:

Route: The route to follow.

10 Installation

Correct installation is critical to the performance of the unit. There are two components to install, the TRACKER950 and a GPS or DGPS antenna. In addition, you can install an optional fuel kit in order to use the unit as a fuel computer.

The TRACKER950 can:

- drive external beepers to repeat the TRACKER950 internal beeper; use this to sound alarms through the boat
- have external MOB switches
- send NMEA data to an autopilot, radar or similar device
- accept and display NMEA data from a depth sounder

The TRACKER950 can be wired for Auto Power so that it automatically turns on and off with the boat power and you can not turn it on or off manually. Wire Auto Power if you install the fuel option, so that the TRACKER950 records all the fuel that is used, or for convenience (see section 10-3).

It is vital to read the entire installation section of this manual and the documentation that comes with your antenna and any other units before starting installation.

10-1 What comes with the TRACKER950

Standard configuration

- TRACKER950 display unit, with protective cover for the C-MAP™ slot.
- Mounting Bracket, 2 mounting knobs and 2 rubber washers.
- Dust cover for display unit.
- Power/NMEA cable.
- NAVMAN 1220 GPS antenna with 10 m of cable and its own Installation and Operation manual.
- This Installation and Operation manual.

10-2 Options and accessories

- a C-MAP™ electronic charts cartridges for regions where you will be navigating.
- b For DGPS positioning:
 - NAVMAN DGPS-1 DGPS antenna (this replaces the standard NAVMAN 1220 GPS antenna).
 - Or a compatible differential receiver from another manufacturer.
- c Fuel kit for single or twin petrol engines.
Single-engine kit:
 - Fuel transducer with 8 m of cable to connect to the TRACKER950.Twin-engine kit:
 - Two fuel transducers, each with 8 m of cable.
 - Y-cable to connect the transducers to the TRACKER950.
 - T junction connector.
- d Depth sounder with transducer and NMEA output.
- e One or more external MOB switches: momentary push-to-make switches which are suitably waterproof and rugged.
- f One or more external beepers with built-in drivers. The TRACKER950 output is 12 V DC, 250 mA maximum.
- g PC Interface Kit

If you install a fuel kit, you should wire Auto Power on so that the TRACKER950 is on all the time the engine is on and no fuel consumption is missed (see section 10-3).

10-3 Installation

Display unit

- 1 Keep the dust cover on the display unit during installation. Choose a location for the unit that is easily seen and is not exposed to the direct sun or water. To the left of the helm is preferred for when the helmsman is wearing polarised sunglasses.
- 2 Screw the mounting bracket to the boat with four screws.
- 3 Loosen the knobs at each end of the display unit and sit the unit in the bracket, with the rubber washers between the bracket and the case.

Power/NMEA cable

- 4 Connect the Power/NMEA cable power wires to a DC power supply between 11 and 16.6 V DC as shown. This power supply must be protected with a fuse or circuit breaker of between 2 and 3 A. If it does not have this, fit a 2 A fuse in the power supply line.
- 5 To enable Auto Power (see section 10), connect the yellow Power/NMEA cable wire to the positive power supply as shown.
If you do not want Auto Power, leave the wire disconnected; make sure it can not touch any other conductor.
- 6 Fit any external beepers and connect to the Power/NMEA cable as shown. If the beepers require more than 250 mA DC total, fit a relay.
- 7 Fit any external MOB switches and connect to the Power/NMEA cable as shown.

Antenna

- 8 Install the GPS or DGPS antenna following the instructions that come with the antenna. The antenna must be placed so that it has a clear view of the sky.

You can cut the antenna cable to lead it through glands or to make it shorter. Or you can extend it by up to 30 m (100 ft):

- Before cutting it, install the cable temporarily, finish installation and test the system (follow steps 9 to 16).
- Cut the cable some distance from a connector. Install the cable in its final place.
- Reconnect the wires and braid, matching the wire colours. Ensure the joint is waterproof and strong; we recommend fitting heatshrink to each wire and over the whole joint.

Do not cut the cable near a connector and do not try to disassemble a connector.

- Test the system again.

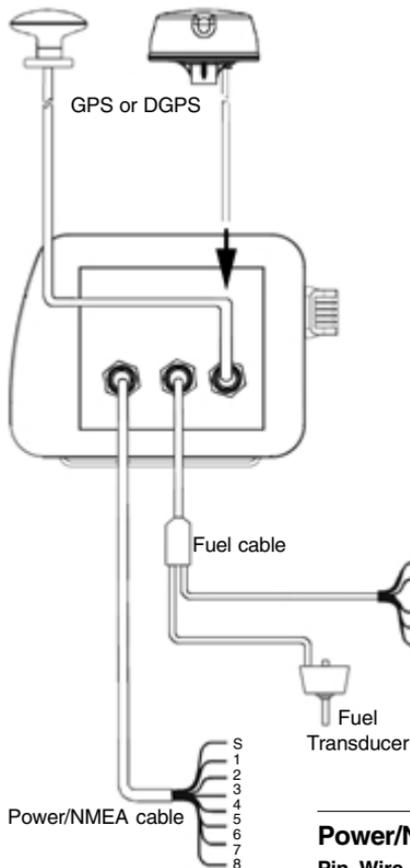
Optional fuel kit

- 9 Fit the fuel kit following the instructions that come with the kit. You can cut the transducer wires; follow the suggestions for cutting the antenna cable.

Setup and test

- 10 Plug the cables into the back of the unit:
 - match the colour on the end of the plug to the colour of the nut on the socket
 - lock the plug in place by pushing the locking ring towards the socket and turning it a quarter turn clockwise

If you plug a cable into the wrong TRACKER950 socket by mistake, nothing will be damaged.
- 11 Insert a C-MAP™ cartridge (see section 1-2).
- 12 Unclip the dust cover. Turn the TRACKER950 on (see section 2-4). Adjust the angle of the display unit to be easily seen. Tighten the mounting knobs.
- 13 At the Satellite Status screen, check that it displays GPS satellites (see section 3). Wait for the GPS receiver to start up and the fix type to change from 'Acquiring' to 'GPS fix' or 'DGPS fix'. This should take less than two minutes (see section 3-1). Note that it will only give a DGPS fix if a DGPS antenna is fitted and it is in range of a differential beacon.
- 14 Set up the TRACKER950:
 - Enter Local Time Ofst and Language (see section 9-1).
 - Enter Map Datum and set up the four user-definable fields (see section 9-2).
- 15 Set up the TRACKER950 for any options you have installed:
 - **Fuel:** enter data in the Fuel Setup menu (see section 9-6).
 - **Autopilot or radar output:** enable NMEA output (see section 9-1).
 - **Depth sounder:** choose Depth for one of the user-definable fields (see section 9-2).
- 16 Go on a test run to check that the navigation equipment works correctly, particularly when you use any radio transmitter or radar.



Fuel cable

Pin	Wire	Signal
1	Black	Ground / Fuel Transducer
2	-	Fuel Transducer
3	White	Ground
4	-	Fuel Transducer
5	Red	Do not connect
6	-	Fuel Transducer
7	Yellow	Differential Correction (IN)
8	Green	Spare

Power/NMEA cable

Pin	Wire	Signal
S	Black	Connect with 1 (Ground)
1	Black	Ground, Power negative
2	Brown	+13.8 V DC out for external MOB switch, protected
3	White	NMEA out, to autopilot/radar
4	Blue	NMEA in/out, depth sounder input
5	Red	Positive power in, 11 to 16.6 V DC
6	Orange	External MOB switch in
7	Yellow	Auto Power in, 12 V for Auto Power
8	Green	External beeper out, 12 VDC, 250 mA

Note: shield is connected to pin 1, black wire

Appendix A - Specifications

General

Waypoints

- 500, with default or user-defined alphanumeric names

Routes

- 25 reversible routes, with up to 50 points each

Plotter log

- Plots by time or distance, saves up to 2000 points

Alarms

- Arrival Radius, Anchor Alarm, XTE Alarm, Low Fuel (optional); individually controlled

Chart datums

- 128 chart datums
- One user-defined map shift

Chart cartridges

- C-MAP™ NT-Cards (16Mbit memory, 48Mbit max)

Plotting scales

- 1/8 nm to 4096 nm with push-button zoom (chart dependent)

Operation features

- One button boat or cursor centring
- Dual speed, 8-way cursor control.

Petrol Computer (Optional fuel transducer required)

- Outboard petrol engines 30 - 300HP*
- Inboard engines 45 450 HP*
(*minimum flow rate is approx. 8 litres per hour)

PC interface

- Refer to the documentation with the TRACKER950 PC interface kit

NMEA interfaces

- NMEA 0183 standard
- Input, from GPS or DGPS receiver.
- Input, from a differential receiver: RTCM 104 ver 2.0
- Input, from a depth sounder: SDDPT (preferred) or SDDBT
- Output, for autopilot or radar: GPAPA, GPAPB, GPGLL, GPVTG, GPRMC, GPBWC, GPXTE, GPRMB

Physical

Size

- 138 mm H x 180 mm W x 67 mm D (5.4" x 7.1" x 2.6")

Weight

- Display unit 0.98 kg (2.2 lb)

Display

- 5" diagonal, TFT, colour (320 x 232 pixels)

Environmental

- Waterproof to IP-66 standard with C-MAP™ cover in place

Power

- 11.0 to 16.5 VDC at 500 mA typical (with backlight on full)

Output for external beeper

- Switched to Gnd, sink 250mA max, 30V max

Operating Temperature

- 0 °C to 50 °C (32 °F to 122 °F)

List of datums

ADINDAN	CORR. ALEGRE	ISTS 73 AS.69	O.S. IRELAND	SELVAGEM 1938	AFGOOYE
DABOLA	ISTS AS. 1968	O.S.G.B. 1936	SOUTH ASIA	AIN EL ABD 70	DJAKARTA
JOHNSTON 1961	OBSERVAT.1996	SWEDISH	ANNA 1 AS. 65	DOS 1968	KANDEWALA
OLD EGYPTIAN	SWISS CH-1903	ANTIGUA AS. 43	EASTER ISL.67	KERGUELEN 1949	OLD HAWAIIAN
TANANARIVE25	ARC 1950	EUROPEAN 1950	KERTAUA 1948		TIMBALAI 1948
ARC 1960	EUROPEAN 1979	KUSAIE AS. 51	PTE. NOIRE	TOKYO	AS.BEACON 'E'
F.THOMAS 1955	L.C. 5 ASTRO	P.TO SANTO	TRISTAN 1968	AS.DOS 71/4	FINNISH (KKJ)
LEIGON	PICO NIEVES	VITI LEVU 16	AS.STATION 52	GAN 1970	LIBERIA 1964
PITCAIRN 1967	VOIROL 1875	AS.TERN ISL	GEOD 1949 (NZ)	LISBOA	POINT 58
WAKE ISL. 1952	ASCENS. ISL.58	GRACIOSA BASE	LUZON	POLISH	WAKE-ENIWETOK
AUS.GEOD. 66	GUAM 1963	M. MERCURY 68	POTSDAM	WGS 1972	AUS.GEOD.84
GUNJUNG SEGARA	MAHE 1971	PRV.S.AMER.56	WGS84	AYABELLE	GUX 1 ASTRO
MASSAWA	PRV.S.CHIL.63	YACARE	BELLEVUE (IGN)	HERAT NORTH	MERCHICH
PUERTO RICO	ZANDERIJ	BERMUDA 1967	HERMANSKOGE	MERCURY 1960	PULKOVO 1942
BISSAU	HJORSEY 1955	MIDWAY AS. 61	QATAR NATION.	BOGOTA OBS.	HONG KONG 63
MINNA	QOFNOQ	BUKIT RIMPAH	HU-TZU-SHAN	MONTSERRAT 58	REUNION
C. CANAVERAL	IGN 1954	MPORALOKO	REV. KERTAUA	CAMP AREA AS.	IGN47
NAD 1927	REV. NAHRWAN	CANTON AS. 66	IGN47-51	NAD 1983	ROME 1940
CAPE	IGN72	NAHRWAN	S. AMERICAN 69	CARTHAGE	INDIAN
NANKING 1960	SANTO(DOS) 65	CHATHAM 1971	INDIAN 1954	NAPARIMA, BWI	SAO BRAZ
CHAU ASTRO	INDIAN 1975	NEW P. SANTO	SAPPER H. 43	CMPINCHAUSPE	IRELAND 1965
NORWEGIAN	SCHWARZECK				

Appendix B - Troubleshooting

This troubleshooting guide assumes that you have read and understood this manual.

It is possible in many cases to solve difficulties without having to send the unit back to the manufacturer for repair. Please follow this troubleshooting section before contacting the nearest NAVMAN dealer.

There are no user serviceable parts. Specialised methods and testing equipment are required to ensure that the unit is reassembled correctly and is waterproof. Users who service the TRACKER950 themselves will void the warranty (see appendix D).

Repairs to the TRACKER950 must only be carried out by a service centre approved by Talon Technology. If the unit must be sent to a service centre for repair, you must send in any antennas and fuel transducers as well.

More information can be found on our website: www.navman.com.

1 TRACKER950 will not switch on:

- a Cables not connected or plugged into wrong sockets in display unit. Match the colours.
- b Backlight too low. Turn on full (see section 2-5).
- c Fuse blown or circuit breaker tripped.
- d Faulty wiring.

2 TRACKER950 turns off unexpectedly:

- a Power/NMEA cable not plugged in properly.
- b Loose or corroded connection in Power/NMEA cable. Check cable.

3 The language on the screen is wrong:

- Choose the correct language (see section 9-1).

4 No GPS or DGPS fix:

- a May occur occasionally if the antenna does not have a clear view of the sky. The satellite positions are constantly changing.
- b Cables not connected or plugged into wrong sockets in display unit. Match the colours.

5 Takes long time to get fix at startup:

5 Takes long time to get fix at startup:

6 TRACKER950 position different from same position on local charts:

- Incorrect chart datum. Select the correct chart datum (see section 9-1).

7 TRACKER950 GPS position different from true position by more than 10 m:

- a The normal error in GPS position will exceed

10 m for about 5 % of the time.

- b Under special circumstances the US Department of Defence may introduce a deliberate and changing error in the GPS positions of up to 300 m (1000 ft). This is called Selective Availability. The error is minimised if a DGPS antenna or differential receiver is installed.
- ### 8 TRACKER950 navigating in wrong region:
- In simulation mode. Turn simulation mode off (see section 9-7).
- ### 9 The time or date on Satellite Status screen is wrong or off:
- a No GPS or DGPS fix.
 - b In simulation mode. Turn simulation mode off (see section 9-7).
 - c Local Time Offset is wrong. The time displayed is UTC (GMT) from the GPS Satellites plus the Local Time Offset. Check that the offset is correct (see section 9-1). You must change the Local Time Offset when daylight saving time starts and ends.
- ### 10 Autopilot not responding to TRACKER950; no output to radar:
- NMEA output disabled. Select NMEA Output ON in the General Setup menu (see section 9-1).
- ### 11 Depth not displayed:
- a Set a user definable field to Depth (see section 9-2).
 - b Check depth sounder is working.
- ### 12 No fuel functions available:
- a Fuel kit not installed.
 - b Fuel functions not enabled. Set Num Engines to 1 or 2 (see section 9-6).
 - c Cables not connected or plugged into wrong sockets in display unit. Match the colours.
- ### 13 Fuel Used or Remaining seem wrong:
- a The engine has been run while the TRACKER950 is turned off and it has not recorded the fuel use. Wire the Auto power option (see section 10-3).
 - b Fuel may be surging back and forward through a transducer in rough seas. Try installing a one way valve between the fuel transducer and the fuel tank.
 - c You have not set Tank Full or Set Remaining every time you have refuelled.

- d When refuelling, air pockets may have prevented the tank filling completely.
- e Recalibrate the fuel transducer after 100 litres have been used - so the turbine shaft has bedded into the bearings correctly.
- f Fuel transducers wear out over time and should be replaced every 5000 litres of fuel as a guide.

14 No or low fuel flow reading:

- a Check the fuel cable connectors are securely plugged in and the locking ring is locked in place.
- b Clogged fuel transducer. To unclog a transducer, remove it from the line and gently blow through it in the opposite direction to the fuel flow. Fit a fuel filter before the transducer.
- c Inspect the fuel cable(s) for damage.
- d Dirty fuel filter.
- e Fuel transducer has been exposed to excessive heat or vibration.

15 Only one flow rate value shown for a twin engine installation:

- Set Num Engines to 2 (see section 9-6).

16 Erratic fuel flow readings:

- a The fuel transducer must not be mounted too close to the fuel pump(s) and not subject to excess vibration.
- b Check for air leaks in the fuel hose(s) or fuel pick-up(s) in the tank(s).
- c The Flow Filter has not been set to suit the engine(s) (see section 9-6). Increase the Flow Filter value until a steady flow rate is indicated.

Appendix C - Glossary

⬆ The symbol for the boat on the display.

⬆ The symbol for the cursor on the display.

Attention Area: An important area on a C-MAP™ chart, such as a restricted anchorage or a shallow area (see section 9-4).

BRG - Bearing to destination. Bearing to the destination from the boat.

CDI - Course Deviation Indicator. On the Highway screen, a graphical indication of the distance from the boat to the original plotted course (XTE) (see section 5).

COG - Course Over Ground. Direction in which the boat is moving over the ground.

C-MAP™: An electronic chart module (see section 1-2).

CTS - Course To Steer. Optimum course to steer to return to the original plotted course.

Cursor: A cross-shaped symbol on the screen (see section 2-2).

Depth Sounder: A device for measuring the depth using ultrasonics.

DGPS - Differential Global Positioning System. A satellite and land-based navigational tool (see section 3).

Differential beacon: Part of the DGPS system (see section 3).

DTG - Distance To Go. Distance from the boat to the destination.

ETA - Expected Time of Arrival at the destination, assuming that SOG and COG remain constant.

GoTo - A simple way of navigating straight to a waypoint or to the cursor position (see section 4-1).

GMT - see UTC.

GPS - Global Positioning System. A satellite-based navigation tool (see section 3).

Legs are the straight segments of a route between waypoints. A route consisting of four waypoints will have three legs.

MOB function: Starts navigating back to the place where someone fell overboard (see section 2-5).

NMEA - National Marine Electronics Association.

NMEA 0183: A standard for interfacing marine electronic devices.

NVM - Non Volatile Memory. Stores the settings and data in your TRACKER950. This data is stored while the unit is turned off, so the data is retained when you switch it on.

Route: Two or more waypoints linked in sequence to form a path for the boat. The route has a start and end waypoint and can be traversed from start to finish or in reverse. There can be up to 25 routes, each with up to 50 waypoints (see section 6-2).

SOG - Speed Over Ground. Current boat speed over the ground. This is not necessarily the same as the boat speed through the water nor the speed at which it is approaching the destination.

STR - Steering. The difference between COG and CTS.

TTG - Time To Go. The estimated time to reach the destination.

UTC - Universal Time Coordinated or Coordinated Universal Time. A standard world time, formerly called Greenwich Mean Time (GMT).

Waypoint - A user-definable chart position. Waypoints are displayed on the chart as one of 12 icons with the name below. There can be up to 500 waypoints (see section 6-1).

XTE - Cross Track Error. The distance from the boat to the original plotted course.

VMG - Velocity Made Good. The speed at which the boat is approaching the destination.

Appendix D - Conditions of Sale & Warranty

IMPORTANT: Some of the following terms and conditions vary from country to country. Please check with your NAVMAN dealer from whom you purchased your product.

A. Conditions of Sale

Except to the extent otherwise required by the laws of the country in which the accompanying product ("the product") is sold the manufacturer of the product Talon Research & Development Co. Limited ("Talon Technology") - has no liability in respect of the product beyond the warranty hereunder provided. Where liability may not be excluded but may be limited to repair or replacement or the supply of equivalent goods or for the payment of the cost of replacing the goods or of acquiring equivalent goods, liability is so limited.

B. Manufacturers warranty

Warranty Period - 1 year from the date of purchase.

Extent of warranty - Subject to the following conditions Talon Technology will rectify any defect occurring in the product of which notice in writing is received by Talon Technology or its approved distributor within the Warranty Period.

Conditions:

- 1) Repairs may only be carried out by a Service Centre approved by Talon Technology.

- 2) Repairs as above will be carried out at no cost to the owner subject to these conditions.
- 3) The cost of returning the goods to an approved dealer shall be met by the owner.
- 4) Warranty does not extend to accessories or defects or injuries caused or resulting from causes not attributable to faulty parts or the manufacturer of the product including, but not limited to, defect or injuries caused by or resulting from misuse, abuse, neglect, accidental damage, incorrect installation, water damage, use of consumables other than those approved by Talon Technology or any alterations to the product not approved by Talon Technology.
- 5) No warranty claim accepted without sales documentation.
- 6) Talon Technology may, at its discretion, replace the product instead of repairing it.

C. Acceptance of Conditions of Sale

In consideration of this warranty the purchaser accepts the limitations of liability as set out in the conditions of sale.

Appendix E - How to contact us

More information is available on-line at our website www.navman.com

Distributors:

Argentina

HERBY Marina S.A.
Costanera UNO, 1425 Buenos Aires,
Argentina
Tel: (54) 11 4312 4545 Fax: (54) 11 4312 5258
e-mail: herbymarina@ciudad.com.ar

Australia

Talon Technology Australia PTY. Ltd.
2/340 Darling Street,
Balmain NSW 2041, Australia
Tel: (61) 2 9818 8382 Fax: (61) 2 9818 8386
Toll free fax 1300 303 105
e-mail: sales@navman.com.au

China

Peaceful Marine Electronics Co., Ltd.
PO Box 109 Shipai, Guangzhou, China
Tel: (86) 20 38698784 Fax: (86) 20 38698780
Web site: www.peaceful-marine.com
e-mail: sales@peaceful-marine.com

Europe:

PLASTIMO INTERNATIONAL

15, rue Ingenieur Verriere, B.P.435
56325 LORIENT CEDEX -FRANCE
Tel: (33) 02 97873636 Fax: (33) 02 97873649
e-mail: plastimo.france@wanadoo.fr

PLASTIMO UK Ltd

School Lane, Chandlers Ford Industrial Estate
EASTLEIGH - HANTS S053 4DG
Tel : (44) 023 8026 2211 Fax : (44) 023 8026 63
e-mail : sales@plastimo.co.uk

PLASTIMO ESPANA SA

Avenida Narcis Monturiol 17
08339 VILASSAR DE DALT (Barcelona)
Tel: (34) 93 7507504 Fax: (34) 93 7507534
e-mail: info@plastimo-sp.com

PLASTIMO NORDIC AB

Box 28-Lundenvagen 2
47321 HENAN
Tel: (46) 30436060 Fax: (46) 30430743
e-mail: info@plastimo.se

PLASTIMO GERMANY

15 rue Ingenieur Verriere, 56100 LORIENT
Tel: (49) 061 05921010 Fax: (49) 061 05921011
e-mail: kontakt@plastimo.de

PLASTIMO HOLLAND BV

Slootweg 12, 2871 RP SCHOONHOVEN
Tel: (31) 182 320522 Fax: (31) 182 320519
e-mail: info@plastimo.nl

PLASTIMO ITALIA

Nuova rade spa, Via del Pontasso 3
I-16015 CASELLA SCRIVIA (GE)
Tel : (39) 010968011 Fax : (39) 0109670577
e-mail : info@nuovarade.com

Malaysia

Advanced Equipment Co
43A, Jalan Jejaka 2,
Taman Maluri, Cheras
55100 Kuala Lumpur,
Malaysia.
Tel: 603 9858062 Fax: 603 9850162
e-mail: ocs@pc.jaring.my or
aeco@pd.jaring.my

New Zealand

Absolute Marine Ltd.
Unit B, 138 Harris Road,
East Tamaki, Auckland, New Zealand
Tel: (64) 9 273 9273 Fax: (64) 9 273 9099
e-mail: navman@absolutemarine.co.nz

South Africa

Pertec (Pty) Ltd Coastal Division
(Cape Town Office)
No. 16 Paarden Eiland Road
Paarden Eiland, 7405
Postal Address: PO Box 527
Paarden Eiland 7420
Cape Town,
South Africa.
Tel: +27 21 511 5055 Fax: +27 21 511 5022
e-mail: info@kfa.co.za



NAVMAN is a registered trademark of Talon Research and Development Company Limited. All rights reserved.

Manufacturers:

Talon Technology Limited.
PO Box 68155 Newton, Auckland, New Zealand.
Tel: (64) 9 481 0500 Fax: (64) 9 480 3176
e-mail: sales@talon.co.nz



TALON
TECHNOLOGY

Designers and manufacturers of GPS, communication and marine products.

Made in New Zealand
1951060A MN000084

TRACKER950



Lon 174° 44.535' E

Lat 36° 48.404' S



TALON
TECHNOLOGY

Designers and manufacturers of GPS, communication and marine products.