

4.10.2 How to select the number of past position points to be displayed

1. Open the menu.
2. Select [5 TT•AIS].
3. **For IMO-types**, select [4 TT•AIS SYMBOL].
For C-types, select [3 TT•AIS SYMBOL], then select [0 NEXT].
4. **For IMO-types**, select [5 TT•AIS PAST POSN POINTS].
For C-types, select [3 TT•AIS PAST POSN PTS]
5. Select [5] or [10] as appropriate.
6. Close the menu.

4.10.3 Past position display orientation

Past position orientation, true or relative, is controlled with [TRAIL MODE] in the [TRAIL] context menu. To adjust the trail orientation, see section 1.37.1.

4.10.4 Stabilization in true motion

True motion past position display can be ground stabilized or sea stabilized. The [TRAIL] box shows current stabilization as "TRUE-G" or "TRUE-S". To change stabilization mode, open the [SHIP SPEED MENU] menu and set [SHIP SPEED] to [LOG(BT)] (ground stabilization) or [LOG(WT)] (sea stabilization).

4.10.5 How to set the AIS track color (C-types only)

You can set the AIS track color with the following procedure.

1. Open the menu.
2. Select [5 TT•AIS].
3. Select [3 TT•AIS SYMBOL].
4. Select [4 AIS TRACK COLOR].
5. Select the appropriate color, then left-click.
6. Close the menu.

4.11 Lost Target

A target is declared a lost target when it fails to produce data for six minutes or five reporting intervals, whichever is the shorter. When this occurs, the target is marked with the (flashing) lost target symbol and the message "AIS TARGET LOST" appears in the Alert Box. To acknowledge a lost target, press the **ALARM ACK** key, or use the trackball to select the [ALERT] box then press the **left button**.

4.11.1 How to set the lost target filter

If there are a lot of AIS targets in your area, the lost target alert can sound frequently. In this case you may wish to have the alert ignore lost targets whose range, speed, class or length are below the threshold value you specify.

1. Open the menu.
2. Select [5 TT•AIS].
3. **For IMO-types**, select [5 AIS].
For C-types, select [4 AIS].
4. Select [0 NEXT].
5. Select [3 AIS LOST TGT FILTER].
6. Select [MAX RANGE].
7. Referring to the following table, select the appropriate filter, then press the **ENTER MARK** key.

AIS LOST TGT FILTER	
1	BACK
2	MAX RANGE OFF/ON 12NM
3	MIN SHIP SPEED OFF/ON 1. 0kn
4	EXCEPT CLASS B OFF/ON

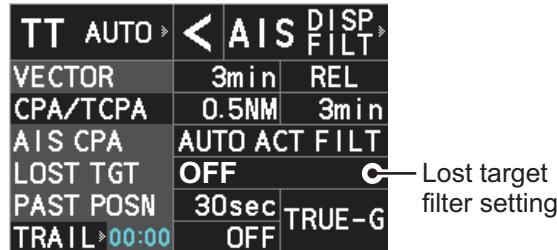
Filter type	Definition
[MAX RANGE]	Any AIS targets beyond the range set here will not trigger the lost target alert.
[MIN SHIP SPEED]	Any AIS targets slower than this setting will not trigger the lost target alert.
[EXCEPT CLASS B]	Select ON to prevent AIS targets class B triggering the lost target alert.

8. Select [ON], then press the **ENTER MARK** key. The settings can now be adjusted.
9. Spin the scrollwheel to adjust the setting as required, then left-click to apply the setting.
10. Close the menu.

4.11.2 How to enable/disable the lost target alert

The [LOST TARGET] box, located at the bottom-right corner of the screen, enables and disables the lost target alert.

Select the box with the cursor, then left-click to cycle through the settings in the following order: [OFF] → [FILT] → [ALL] → [OFF]...

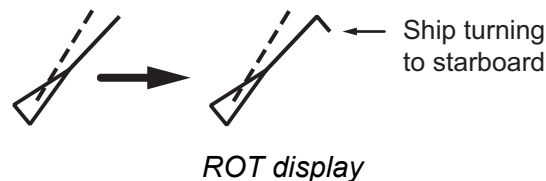


- [OFF]: Disable the alert.
- [FILT]: Enable the alert for all lost targets, excluding filtered targets.
- [ALL]: Enable the alert for all lost targets, including filtered targets.

Note: The lost target filter setting is hidden when [SIMPLE] display mode is used. To change TT settings in [SIMPLE] mode, first restore [NORMAL] display mode, adjust the settings, then return to [SIMPLE] mode. See section 1.9 for how to change the display mode.

4.12 ROT Setting

You can set the lower limit of the ROT (Rate Of Turn) at which the heading line on target symbols will point in direction which the vessel is turning.



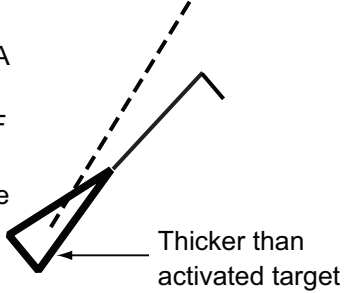
1. Open the menu.
2. Select [5 TT•AIS].
3. **For IMO-types**, select [4 TT•AIS SYMBOL].
For C-types, select [3 TT•AIS SYMBOL].
4. **For IMO-types**, select [4 AIS ROT TAG LIMIT].
For C-types, select [7 AIS ROT TAG LIMIT].
5. Spin the scrollwheel to adjust the ROT as appropriate, then left-click. The setting range is 000.0°/min to 720.0°/min.
6. Close the menu.

4.13 AIS Collision Alarm (CPA, TCPA)

This radar calculates CPA and TCPA by using own ship and relative target positions. An AIS dangerous target is one whose CPA and TCPA are within the range of the CPA and TCPA limits set in the TT/AIS box. The AIS symbol of an AIS dangerous target is red and flashing, and is announced with the Alert "AIS DANGER OF COLLISION". After the alert is acknowledged the target symbol is displayed in red color.

Dangerous target

When a sleeping or an activated target violates the CPA/TCPA alarm setting its symbol changes to the dangerous target symbol (red and flashing) and the message "AIS DANGER OF COLLISION" appears. To acknowledge the CPA/TCPA alarm, press the **ALARM ACK** key, click the [ALERT] box, or click the CPA/TCPA alarm in the ALERT LIST. The audible alarm is silenced and the symbol stops flashing. Take appropriate action to avoid collision.

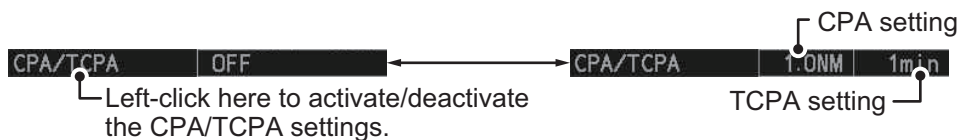


Thicker than activated target

4.13.1 How to set CPA and TCPA

The CPA/TCPA function can be activated and deactivated from the [CPA/TCPA] box at the bottom-right of the screen.

- Left-click the [CPA/TCPA] indication to activate the feature. Click the indication to toggle between active (settings are visible and can be changed) and inactive (indication shows "OFF").



Note: The [CPA/TCPA] indication is hidden when [SIMPLE] display mode is used. To change the setting in [SIMPLE] mode, first restore [NORMAL] display mode, adjust the setting, then return to [SIMPLE] mode. See section 1.9 for how to change the display mode.

- Place the cursor on the indication you wish to adjust.
- Left-click, or spin the scrollwheel, to adjust the settings as required. The settings options are outlined in the table below.

Indication	Method	Settings options
CPA	Left-click	0.5, 1, 1.5, 2, 3, 4, 5, 6 (NM)
	Scrollwheel	0.1 to 20; 0 to 10 in 0.1 NM increments, 1 NM increments thereafter
TCPA	Left-click	1, 2, 3, 4, 5, 6, 12, 15 (minutes)
	Scrollwheel	1 to 60 minutes in 1-minute increments

4.14 How to Associate TT and AIS Targets

An AIS-equipped ship is usually displayed by two symbols on the radar display. This is because the AIS ship position is measured by a GPS navigator (L/L) whereas the radar detects the same ship by PPI principle (range and bearing relative to own ship radar antenna).

To avoid the presentation of two target symbols for the same physical target, use the "association" function. If target data from both AIS and TT are available and if the association criteria are fulfilled, either the AIS or TT symbol is presented according to the association method selected.

Association will not happen between AIS and TT if the AIS target is sleeping or the AIS target is lost.

1. Confirm that the [TT ACQ MODE] indication shows "AUTO", "AUTO MAN" or "MAN".

TT ACQ MODE indication 

2. Open the menu.
3. Select [5 TT•AIS].
4. **For IMO-types**, select [7 TARGET ASSOCIATION].
For C-types, select [6 TARGET ASSOCIATION].
5. Select [2 ASSOCIATION TGT TYPE].
6. Select [OFF], [AIS] or [TT], as appropriate, to select which symbols and data to display when the association criteria are met.

TARGET ASSOCIATION	
1	BACK
2	ASSOCIATION TGT TYPE OFF/AIS/TT
3	GAP 0. 050NM
4	RANGE 0. 100NM
5	BEARING 9. 9°
6	SPEED 6. 0kn
7	COURSE 25. 0°

[OFF] : Disable association.

[AIS] : Use AIS symbols and AIS data.

[TT] : Use TT symbols and TT data.

Note: In NORMAL display mode, association can also be switched on and off from the screen by left-clicking the Association Usage icon, shown below.



Left-click the association icon to change the association setting.

>: Use TT Symbols and data.

<: Use AIS symbols and data.

No indication: Association is disabled.

7. Referring to the table below, set the association criteria. Spin the scrollwheel to adjust the value, then left-click to confirm the setting.

[3 GAP] : Range between AIS target and tracked target.
(setting range: 0.000-0.050 (nm))

[4 RANGE] : Range direction difference from own ship to AIS target and tracked target. (setting range: 0.000-0.100 (nm))

[5 BEARING] : Bearing difference from own ship to AIS target and tracked target.
(setting range: 0.0-9.9 (°))

[6 SPEED] : Speed difference between AIS target and tracked target.
(setting range: 0.0-6.0 (kn))

[7 COURSE] : Course difference between AIS target and tracked target.
(setting range: 0.0-25.0 (°))

8. Close the menu.

4. AIS OPERATION

When the association criteria (gap, range, bearing, speed, and course) is met, and the ASSOCIATION TARGET setting is [AIS], the TT symbol is erased and only the AIS symbol is displayed.

All default association settings are restored whenever the power is turned on.

To show the association information, place the cursor on the target data box at the right side of the screen, then press the **ACQ** key. The selected target's AIS and TT data are displayed together as shown in the examples below.

TT/AIS DATA	
	TT AIS
	001 A
Bearing →	BRG 085.1°R 085.1°R
Range →	RNG 2.377NM 2.377NM
Course Over Ground →	COG 085.1°R 085.1°R
Speed Over Ground →	SOG 34.0kn 34.0kn
Closest Point of Approach →	CPA 2.377NM 2.377NM
Time to Closest Point of Approach →	TCPA 00:00 00:00
Bow Crossing Range →	BCR 2.377NM 2.377NM
Bow Crossing Time →	BCT 00:00 00:00
	AIS
Target's name →	NAME 12345678901234567890
Target's MMSI →	MMSI No. 123456789
Target's coordinates (latitude, longitude) →	LAT 12°34.567'N
	LON 123°45.678'E
Target's heading →	HDG 359.9°
Target's Rate Of Turn →	ROT +359.9°/min
Target's navigational status* →	STATUS POWER-DRIVEN VESSEL (AHEAD/ALONGSIDE)

*: Not shown for Class B targets.

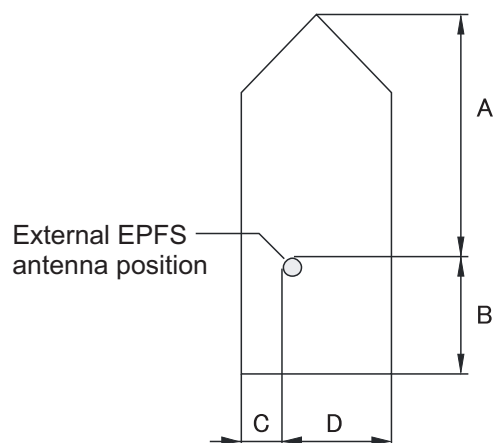
4.15 How to View Own Ship Data

Own ship's static data (type of ship, call sign, etc.) can be viewed as follows:

1. Open the menu.
2. Select [5 TT•AIS].
3. **For IMO-types**, select [5 AIS].
For C-types, select [4 AIS].
4. Select [7 OWN SHIP DATA]. The [OWN SHIP DATA] menu appears.

OWN SHIP DATA	
1 BACK	
Name of your ship	NAME FURUNOMARU
Ship's callsign	CALLSIGN AZ1234567
Current location	LAT 35°15.004'N
	LON 139°46.360'E
Course/Speed	COG 180.0°T
	SOG 12.9kn
Heading/Rate of Turn	HDG 180.0°T
	ROT 0.0°/min
Positioning source and quality of positioning data	POSN SENSOR INTERNAL GNSS
	POSN QLTY 4
Ship's MMSI number	MMSI No. 431008509
Ship's IMO number	IMO No. 009791119
Ship's dimensions	SHIP LENGTH 149m
	SHIP WIDTH 24m
	SHIP DRAUGHT 6.8m
External EPFS device's installation location	EXT EPFS ANT POSN A: 028 B: 121m
	C: 06 D: 18m
AIS transponder version	AIS VERSION 1
Ship and cargo type	SHIP AND CARGO TYPE
	CARGO SHIPS ALL SHIPS OF THIS TYPE

Note: The indications "A", "B", "C" and "D" at [EXT EPFS ANT POSN] show the location of the external EPFS antenna, calculated in the following manner:



5. Close the menu.

4.16 How to Use AIS Messages

You can transmit and receive messages via the AIS, to a specified destination (MMSI) or all ships in the area. Messages can be sent to warn of safety of navigation, for example, an iceberg sighted. Routine messages are also permitted.

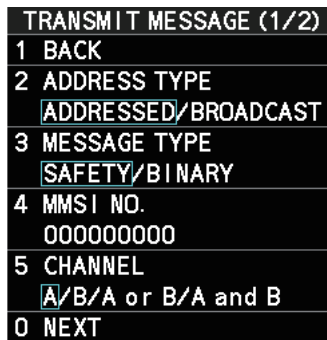
Short safety related messages are only an additional means to broadcast safety information. They do not remove the requirements of the GMDSS.

4.16.1 How to create and save messages

Up to ten messages can be saved at any time. To create and save a message, do the following:

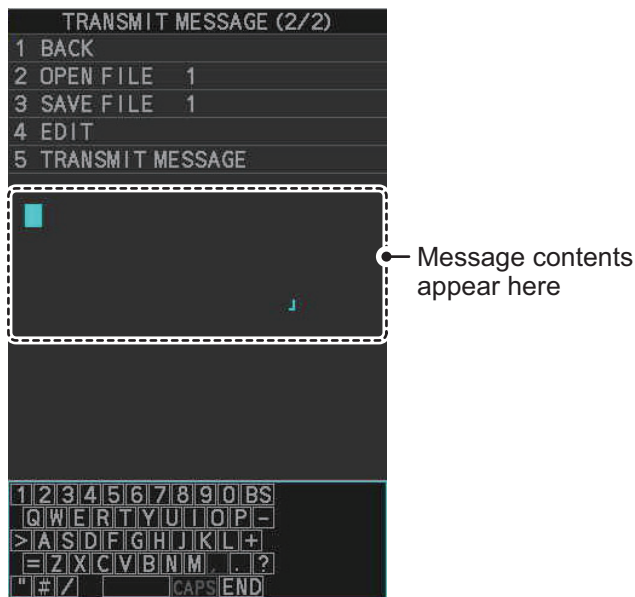
Note: The MMSI of the receiving ship can be automatically set by selecting [TRANSMIT MESSAGE] from the pop up menu. To show the pop up menu, select the receiving ship's data in the AIS data display area, then press the **right button**.

1. Open the menu.
2. **For IMO-types**, select [5 AIS].
For C-types, select [4 AIS].
3. Select [5 AIS].
4. Select [5 TRANSMIT MESSAGE].



5. Select [2 ADDRESS TYPE].
6. Select [ADDRESSED] (message for a specific MMSI. Automatically selected if the MMSI is automatically using the data display.) or [BROADCAST] (message to all AIS-equipped vessels within the area), then press the **ENTER MARK** key.
7. Select [3 MESSAGE TYPE].
8. Select [SAFETY] (for safety messages) or [BINARY] (for routine messages), then press the **ENTER MARK** key.
9. For [ADDRESSED] message, do this step. For [BROADCAST] message, or if [TRANSMIT MESSAGE] was selected from the AIS data display pop up menu, go to step 8.
 - 1) Select [4 MMSI No.].
 - 2) Use the number keys to set the receiving ship's MMSI.
10. Select [5 CHANNEL].
11. Select the AIS channel to transmit your message over: [A], [B], [A or B], or [A and B], then press the **ENTER MARK** key.
12. Select [0 NEXT] to show the next menu page.
13. Select [4 EDIT]. A software keyboard appears at the bottom of the menu.

14. Select the character desired, then left-click.
The maximum of 80 characters can be entered for the message.



15. Select [END] to complete message input, then left-click.
16. Select [3 SAVE FILE].
17. Spin the scrollwheel to select the appropriate number, then left-click.
18. Close the menu.

4.16.2 How to transmit messages

1. Do one of the following:
 - a) Create a message, as described in paragraph 4.16.1.
 - b) Use a file saved in the memory by selecting [5 TRANSMIT MESSAGE] followed by [2 OPEN FILE] from the second page of the [TRANSMIT MESSAGE] menu.
2. Select [5 TRANSMIT MESSAGE] from the second page of the [TRANSMIT MESSAGE] menu to transmit the message.
"TRANSMIT ERROR" appears in the alert box if an error occurred while transmitting the message.
3. Close the menu.

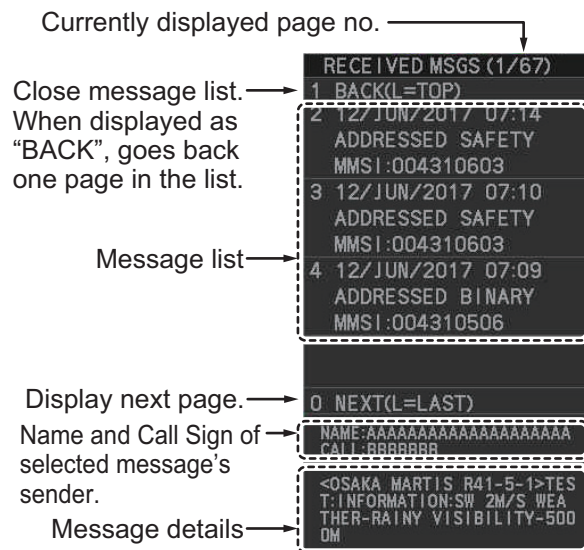
4.16.3 How to view messages

When an AIS message is received, the system automatically stores the message in the message list. If [AUTO DISP MESSAGE] in the [AIS TARGET MENU] is set to [ON], the envelope icon on the [AIS message] button, on lower half of the InstantAccess bar™, changes to a blue color to indicate a new, unread message is stored.

The system stores up to 200 AIS messages. When the storage capacity is reached the oldest AIS message is automatically erased to make room for the latest. Note that only received messages are backed up when the power is turned off. AIS alert messages are not backed up.

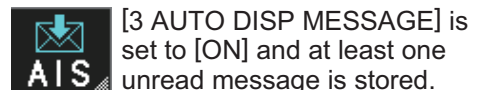
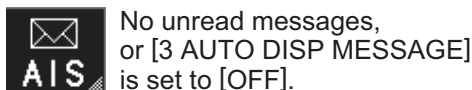
You can access the received messages from the InstantAccess bar™, or from the menu. The following procedure shows the menu method. **If you click the [AIS message] button on the lower half of the InstantAccess bar™, skip to step 5.**

1. Open the menu.
2. **For IMO-types**, select [5 AIS].
For C-types, select [4 AIS].
3. Select [5 AIS].
4. Select [4 SHOW RECEIVED MSGS].
5. Select the message to be displayed, then left-click.
6. The message details are displayed below the message list.
7. Close the menu.



4.16.4 How to set up the AIS message notification

1. Open the menu.
2. Select [5 TT•AIS].
3. **For IMO-types**, select [5 AIS].
For C-types, select [4 AIS].
4. Select [3 AUTO DISP MESSAGE].
5. Select [ON] to show the received message indication (blue envelope icon) when a new message is received, [OFF] to disable the notification.



6. Close the menu.

4.16.5 How to display AIS alert messages

The AIS transponder outputs various alert messages. To view the alert list:

1. Open the menu.
2. Select [5 TT•AIS].
3. **For IMO-types**, select [5 AIS].
For C-types, select [4 AIS].
4. Select [8 AIS ALERT MESSAGES].
5. Select the date and time of the message to display, then left-click.



6. Close the menu.

4.17 AIS System Messages

AIS system messages are displayed at the bottom right corner of the screen. The table below shows the AIS system messages, their alert priority and their meanings.

Message	Priority	Meaning
"AIS DANGER OF COLLISION"	Alarm	CPA and TCPA of an activated AIS target are below value set on the menu.
"AIS NEW TARGET"	Warning	AIS target has entered an acquisition zone.
"AIS TARGET LOST"	Warning	Lost target. An activated target is declared a lost target when it fails to produce data for six minutes or five reporting intervals, whichever is the shorter.
"AIS DISPLAY FULL"	Warning	The radar only displays the closest 350 AIS targets from own ship.
"ACTIVE AIS FULL"	Warning	Number of active AIS targets has reached 50.
"AIS COM ERROR"	Warning	Not receiving AIS data from own AIS (VDO message). Note: When [AIS FUNC] is set to [OFF], this message is prioritized as a Caution level alert; when [AIS FUNC] is set to [ON], it is prioritized as a Warning level alert.
"AIS CAPACITY FULL"	Caution	Number of AIS targets has reached 1200.
"AIS DISPLAY 95%"	Caution	Number of displayed AIS targets has reached 333.
"ACTIVE AIS 95%"	Caution	Number of active AIS targets has reached 48.
"TRANSMIT ERROR"	Caution	Could not send AIS message.

4. AIS OPERATION

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5. PLOTTER OPERATION (IMO-TYPES)

The video plotter has the following functions:

- Enter waypoints (up to 198) and marks.
- Creates and displays radar maps.
- Own ship track plotting.
- Display charts and chart-related information (requires a valid chart card).

5.1 Orientation Modes

Five orientation modes are available: [HEAD UP RM], [STAB HEAD UP RM], [COURSE UP RM], [NORTH UP RM], [NORTH UP TM] (True Motion).

Note: The screen may flash when the heading is changed more than one degree in the [HEAD UP RM] or [STAB HEAD UP RM] mode.

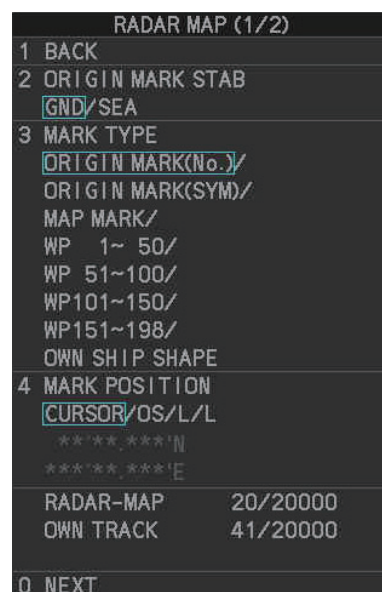
Automatic resetting of own ship mark in true motion mode

In the true motion mode, the own ship mark is automatically returned stern-ward 75% from the screen center when it reaches a location 50% of the display radius.

To select an orientation mode, see section 1.30.

5.2 How to Select a Mark Type

1. Open the menu.
2. Select [2 MARKS].
3. Select [5 RADAR MAP].
The [RADAR MAP] menu appears.
Note: You can also right-click the [MARK] box to open the [RADAR MAP] menu.
4. Select [3 MARK TYPE].
5. Select the appropriate type of marker, referring to the list below.
 - [ORIGIN MARK(No.)]: Inscribes the standard origin mark symbol (\diamond), with mark number (1 to 10). For detailed information regarding origin marks, see section 5.5.



5. PLOTTER OPERATION (IMO-TYPES)

- [ORIGIN MARK(SYM)]: Inscribes an origin mark symbol, with no mark number. You can set one of the following symbols as the origin mark. See section 5.5 for details.



- [MAP MARK]: Inscribes the selected map mark.
 - [WP1-50], [WP51-100], [WP101-150], [WP151-198]: Inscribes a waypoint marker number within the selected range. For detailed information regarding waypoints, see section 5.9.
 - [OWN SHIP SHAPE]: Inscribes a mark with the same shape as own ship. For detailed information regarding the own ship mark, see section 5.6.
6. Close the menu.

5.3 How to Select the Mark Inscription Position

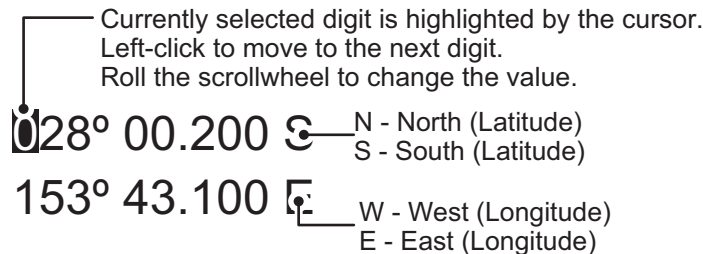
You can select the location at which the marker is inscribed from the following:

Location	Description
[CURSOR]	You can select the location using the Control Unit.
[OWN SHIP]	Marker is placed at own ship position.
[L/L]	Marker is placed at the co-ordinates selected.

1. Open the menu.
2. Select [2 MARKS].
3. Select [5 RADAR MAP].
The [RADAR MAP] menu appears.
Note: You can also right-click the [MARK] box to open the [RADAR MAP] menu.
4. Select [4 MARK POSITION].
5. Referring to the table above, select the appropriate location, then press the **ENTER MARK** key.

How to set the co-ordinates

Where [4 MARK POSITION] is set to [L/L], the co-ordinates settings are displayed. Co-ordinates can be set one digit at a time, as shown in the figure below.



- 1) Spin the scrollwheel to change the value, then left-click to move to the next digit.
 - 2) Repeat step 1 to adjust the Latitude and Longitude as appropriate.
6. Close the menu.

5.4 Radar Map

A radar map is a combination of map lines and symbols whereby the user can define and input the navigation data, route planning and monitoring data. The radar map can contain 20,000 points of data. Inscribed marks are retained when the power is turned off.

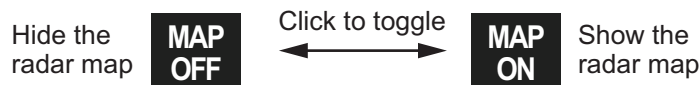
The radar map is referenced to the WGS-84 datum and appears only when there is valid position data input. The radar map does not affect any radar functions.

Note: The location and orientation of mark symbols and mark lines can change, depending on the display presentation mode, as shown in the table below.

Presentation mode	Mark symbol	Mark line
HEAD UP RM/STERN UP RM/STAB HEAD UP RM	Location is changed according to heading and own ship position. Orientation is unchanged.	Location and orientation are changed according to heading and own ship position.
COURSE UP RM/NORTH UP RM/NORTH UP TM	Location is changed according to own ship position. Orientation is unchanged.	Location and orientation are changed according to own ship position.

5.4.1 How to show/hide the radar map

You can show or hide the radar map from the InstantAccess bar™. Click the [Radar Map] button to toggle between show and hide.



You can also show or hide the radar map from the menu. Open the [MAIN MENU] then select [2 MARKS] → [0 NEXT] → [2 RADAR MAP]. Select [OFF] or [ON] as appropriate.

5.4.2 How to inscribe marks

You can inscribe marks anywhere inside the operational display area, however, marks cannot be inscribed in the same location as a menu box.

Depending on the setting for [4 MARK POSITION] the method to inscribe a mark is slightly different.

Where [4 MARK POSITION] is set to [CURSOR]

1. Referring to section 5.2, select the mark type you want to use.
2. Place the cursor on the [MARK] box, at the bottom-left of the screen.
3. Spin the scrollwheel to select the appropriate mark, then left-click. The cursor moves inside the operational display area.
4. Place the cursor on the location (inside the operational display area) you wish to inscribe the mark, then left-click to anchor the mark.
5. Repeat steps 3 to 4 for multiple mark inscription.
6. Right-click to complete the procedure.

5. PLOTTER OPERATION (IMO-TYPES)

Where [4 MARK POSITION] is set to [OWN SHIP]

1. Referring to section 5.2, select the mark type you want to use.
2. Place the cursor on the [MARK] box, at the bottom-left of the screen.
3. Spin the scrollwheel to select the appropriate mark, then left-click. The selected mark is inscribed at the OS position.
4. Repeat steps 1 to 2 for multiple mark inscription, or right-click to complete the procedure.

Where [4 MARK POSITION] is set to [L/L]

1. Referring to section 5.2, select the mark type you want to use.
2. Place the cursor on the [MARK] box, at the bottom-left of the screen.
3. Spin the scrollwheel to select the appropriate mark, then left-click. [RADAR MAP] menu appears and the first digit of the latitude is selected.
4. Referring to section 5.3, set the latitude and longitude.
5. Repeat steps 1 to 3 for multiple mark inscription, or right-click to complete the procedure.

Note: You can see the number of radar map marks, lines used, on the [RADAR MAP] menu: [MENU]→[2 MARKS]→[5 RADAR MAP].



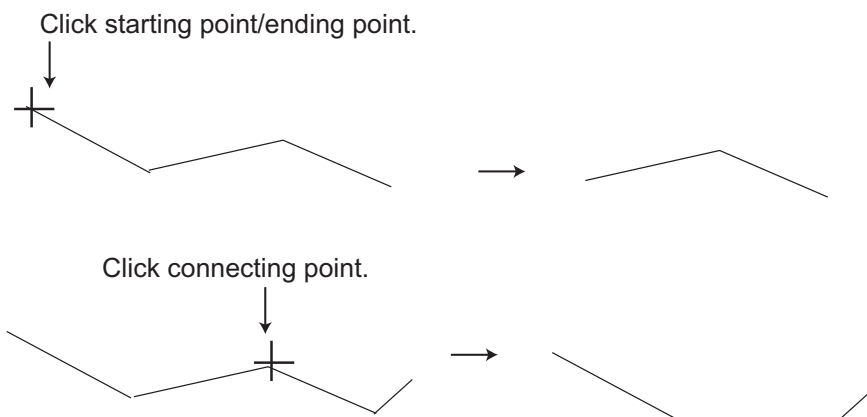
← Radar map marks, lines entered/total number of marks, lines available

5.4.3 How to delete marks

Marks can be deleted one at a time, or all at once.

How to delete marks individually

1. Select the operational display area, then right-click to show the [CURSOR] context menu.
2. Select [MARK DELETE]. The cursor changes to a highlighted cursor.
3. Place the highlighted cursor on the mark to be deleted, then left-click.
Note: The position of the cursor determines how lines are deleted. To delete a line segment, put the cursor on the starting point (or end point). To delete consecutive line segments, put the cursor on the connecting point.



4. Repeat step 3 to delete another mark, or press the **right button** to return the cursor to normal function.

How to delete all marks

1. Open the menu.
2. Select [2 MARKS].
3. Select [8 DELETE DATA].

DELETE DATA	
1	BACK
2	ALL MARKS NO/YES
3	ALL WAYPOINTS NO/YES
4	ALL NAV LINES NO/YES
5	OS TRACK-COLOR/TIME RED/GRN/BLU/YEL/ CYA/MAG/WHT/30%/ 50%/80%/ALL

4. Select [2 ALL MARKS].
5. Select [YES], then press the **ENTER MARK** key.
6. Close the menu.

5.4.4 How to align the radar map

When there is positional error between the radar screen and radar map marks and lines, do the following to correct it.

1. Right-click the operational display area to show the [CURSOR MENU].
2. Select [MAP ALIGN]. The cursor is now highlighted and the [MAP ALIGN] function is active.
3. Left-click the map at the location you want to move. The map is now "anchored" to the cursor.
4. Move the cursor to align the radar map with the radar screen, then left-click. The indication "MAP ALIGN" appears on the right side of the operational display area.
5. Right-click to deactivate the [MAP ALIGN] function.

Display indications affected by map alignment

The following items are also re-aligned when the [MAP ALIGN] function is activated.

- Map marks
- Drop marks
- Anchor watch settings
- Target tracks
- AIS symbols
- EBL offsets (STAB GND mode only)
- Origin marks
- NAV lines and waypoints
- MOB marks
- Own ship tracks
- Latitude/Longitude Grid
- AIS symbol vector display
- Zoom window display (STAB GND mode only)
- Cursor position coordinates (when CURSOR L/L ALIGN is set to [ON] only)

Display indications unaffected by map alignment

The following items are not re-aligned when the [MAP ALIGN] function is activated.

- Radar echoes
- TT symbol vector display
- PI lines
- Own ship mark
- TT symbols
- EBL/VRM reference point
- OS coordinates ([POSN]) display
- Barge mark

How to disable the map alignment

1. Right-click the operational display area to show the [CURSOR MENU].
2. Select [MAP ALIGN], then left-click. The cursor is now highlighted and the [MAP ALIGN] function is active.
3. Press and hold the **left button**. The "MAP ALIGN" indication is cleared and the map alignment is cleared.
4. Right-click to deactivate the [MAP ALIGN] function.

5.5 Origin Mark

You can mark any prominent target or a point of particular interest using the origin mark feature. When an origin mark is entered, the distance and bearing from the cursor position to the mark are shown at the bottom of the screen, as in the figure below. Twenty origin marks may be entered.



5.5.1 How to inscribe origin marks

The method in which an origin mark is inscribed depends on the setting of [MARK POSITION] (section 5.3). Below are the procedures for each method.

Heading and position inputs are necessary to inscribe an origin mark.

Where [MARK POSITION] is set to [CURSOR]

1. Referring to section 5.2, set [3 MARK TYPE] to [ORIGIN MARK No.] or [ORIGIN MARK SYM].
2. Put the cursor on the [MARK] box at the bottom of the screen.
3. Spin the scrollwheel to select the origin mark to inscribe.
4. Click the [MARK] box.
5. Click the location where to put the origin mark.
The origin mark is inscribed at the location selected. To re-inscribe the origin mark at a different location, click the desired location for the mark.
6. To enter an origin mark at another location, spin the scrollwheel to change the origin mark, then click the desired location for the origin mark.
7. Right click to finish.

Where [MARK POSITION] is set to [OWN SHIP]

1. Referring to section 5.2, set [3 MARK TYPE] to [ORIGIN MARK No.] or [ORIGIN MARK SYM].
2. Put the cursor on the [MARK] box at the bottom of the screen.
3. Spin the scrollwheel to select the origin mark to inscribe.
4. Click the [MARK] box.
The origin mark is inscribed at own ship position.
5. Right click to finish.

5. PLOTTER OPERATION (IMO-TYPES)

Where [MARK POSITION] is set to [L/L POSITION]

1. Referring to section 5.2, set [3 MARK TYPE] to [ORIGIN MARK No.] or [ORIGIN MARK SYM].
2. Put the cursor on the [MARK] box at the bottom of the screen.
3. Spin the scrollwheel to select the origin mark to inscribe.
4. Click the [MARK] box.
The [RADAR MAP] menu appears with a window for entering latitude and longitude position.
5. Referring to section 5.3, enter latitude and longitude position of the origin mark.
After the position is entered, the origin mark appears at the position entered.
6. To continue inscribing origin marks in this method, do steps 2 to 5.

5.5.2 How to set origin mark stabilization

Origin marks can be geographically fixed (ground stabilized) or moving (sea stabilized).

1. Select the [MARK] box at the bottom-left of the screen then right-click to open the [RADAR MAP] context menu.
2. Select [2 ORIGIN MARK STAB].
3. Select [GND] or [SEA] as appropriate, then press the **ENTER MARK** key.
4. Close the menu.

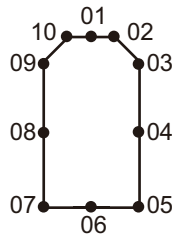
5.5.3 How to delete origin marks

Origin marks can be erased as follows.

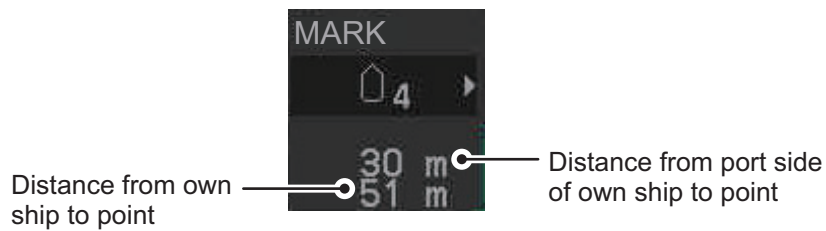
1. Right click anywhere within the radar effective inside diameter to show the [CURSOR MENU].
2. Select [MARK DELETE].
3. Click the origin mark to delete.
4. To delete another origin mark, repeat step 3.
5. Right click to finish.

5.6 How to Change the Shape of the Own Ship Mark

Ten locations on the own ship mark (section 1.44.5) can be adjusted to depict the shape of own ship more realistically. The ten points are as shown below.



1. Referring to section 5.2, set [3 MARK TYPE] to [OWN SHIP SHAPE].
2. Put the cursor in the [MARK] box at the bottom of the screen.
3. Spin the scrollwheel to select the point no. to change.
The cursor moves to the selected point position.
4. Use the trackball to move the point to the position desired, then click.
Point position information appears in the [MARK] box, as shown in the figure below.



5. Repeat steps 3 to 4 to adjust other points.

5.7 How to Use ECDIS Chart Marks

Note: This function is only available if [ECDIS] is set to [SERIAL] or [LAN] at installation. Consult your dealer for details.

You can display marks received from an ECDIS on the radar screen. If the received mark also contains predicted position data, the predicted position is also displayed on-screen.

1. Open the menu.
2. Select [2 MARKS].
3. Select [6 ECDIS MARKS DISPLAY].
4. Select the appropriate item.
 - [2 USER CHART]: Shows/hides received user charts.
 - [3 CURVED EBL]: Shows/hides the received Curved EBL.
 - [4 CHART SYMBOL]: Shows/hides the received chart symbols.
 - [5 NOTE BOOK]: Shows/hides the received notes. [ON] shows notes only when they are received. [DISPLAY] shows notes continuously. The notes are shown in the information box at the right-side of the screen.
 - [6 ROUTE]: Shows/hides the received route. [CENT] shows only the route line; [ALL] shows both the route line and the route width.
 - [7 PREDICTOR]: Shows/hides the received predicted position with a symbol (dotted line) of the same size as the own ship.
5. Select [ON] or [OFF] as appropriate, then press the **ENTER MARK** key. [ON] shows the selected item's ECDIS mark when received, [OFF] hides the ECDIS mark.
6. Close the menu.

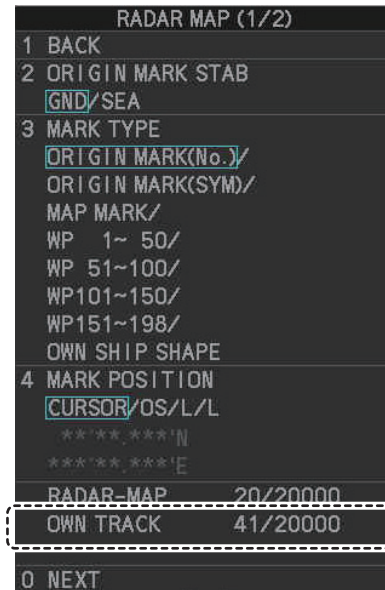
ECDIS MARKS DISPLAY	
1	BACK
2	USER CHART OFF/ON
3	CURVED EBL OFF/ON
4	CHART SYMBOL OFF/ON
5	NOTE BOOK OFF/ON/DISPLAY
6	ROUTE OFF/CENT/ALL
7	PREDICTOR OFF/ON

5.8 Own Ship Track

A total of 20,000 points are allotted for storage of own ship's track, marks and lines.

When this memory becomes full, the oldest track is deleted to make room for the latest. For that reason you may want to adjust the recording interval to conserve the memory.

Note: You can check how many tracks have been used at any time from the [RADAR MAP] menu. The number of points used and the total number available are shown at the bottom of the [RADAR MAP] menu's first page.

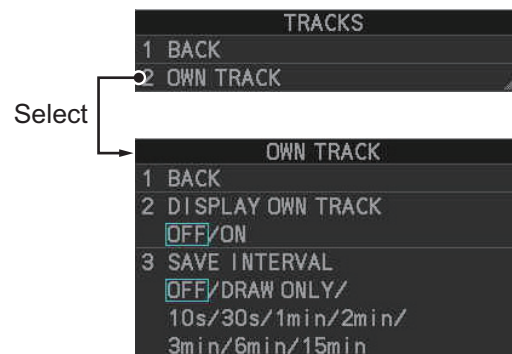


Own ship track points used/total number of own ship track points available

5.8.1 How to show/hide tracks

You can show or hide tracks for own ship.

1. Open the menu.
2. Select [2 MARKS].
3. Select [7 TRACKS].
4. Select [2 OWN TRACK].
5. Select [2 DISPLAY OWN TRACK].
6. Select [ON] to show tracks, or [OFF] to hide tracks.
7. Close the menu.



5.8.2 How to set the plotting interval

The system plots tracks at regular intervals in order to “paint” the track. You can adjust this interval. A shorter interval gives a “smoother” track, however the maximum recording time is reduced.

1. Open the menu.
2. Select [2 MARKS].
3. Select [7 TRACKS].
4. Select [2 OWN TRACK].
5. Select [3 SAVE INTERVAL].
6. Select the appropriate setting, then left-click.

The table below shows the relation between plotting interval settings and maximum track recording time.

Own track recording times

Interval	Max. Recording Time	Interval	Max. Recording Time
10 s	56 hours	3 min	1000 hours
30 s	167 hours	6 min	2000 hours
1 min	333 hours	15 min	5000 hours
2 min	667 hours	DRAW ONLY	No track data recorded.

Set the interval to [OFF] to hide tracks made from the time you make this setting. To hide both new and old tracks, set [2 DISPLAY OWN TRACK] to [OFF].

7. Close the menu.

5.8.3 How to delete tracks

Track can be deleted partially (based on length) or completely, as follows.

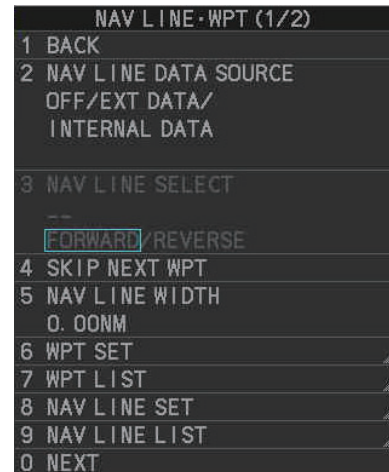
1. Open the menu.
2. Select [2 MARKS].
3. Select [8 DELETE DATA].
4. Select [5 OS TRACK-COLOR/TIME].
5. Select the percentage of the track you wish to delete, then left-click. The available options are: [30%], [50%], [80%] or [ALL].
6. Close the menu.

5.9 How to Use Waypoints

A particular location is known as a “waypoint”, whether it be a starting point, a destination point or an intermediate point on a voyage. This radar system can store 200 waypoints. Waypoints 1 to 198 are user set waypoints, waypoint 199 is reserved for external input, waypoint 200 is reserved for MOB (Man Over Board). Waypoints can be entered with the cursor, or from the menu (manual input of latitude and longitude). Waypoints 1 to 198 can be edited from the menu.

5.9.1 How to set the data source for waypoints

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [2 NAV LINE DATA SOURCE].
4. Select the appropriate data source, referring to the list below.
 - [OFF]: Waypoints and nav lines (such as tracks) are not shown.
 - [EXT DATA]: Use navigational data from an external EPFS device for waypoints and nav lines (waypoint 199).
 - [INTERNAL DATA]: Use waypoints and nav lines saved internally (waypoints 1 to 198).
5. Close the menu.



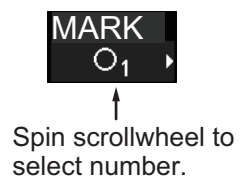
5.9.2 How to enter waypoints

A waypoint can be entered two ways: with the cursor or manual entry of latitude and longitude position. After a waypoint is entered, the distance and bearing from own ship to the waypoint are shown in the [MARK] box.



How to enter waypoints with the cursor

1. Referring to section 5.2, select the appropriate waypoint number group. The available groups are: [WP1 to WP50], [WP51 to WP100], [WP101 to WP150] or [WP151 to WP198].
2. Place the cursor on the [MARK] box. Spin the scrollwheel to select the waypoint number for new waypoint, then left-click. The cursor jumps inside the operational display area.
3. Place the cursor on the location to inscribe the waypoint, then left-click.
4. Repeat steps 2 to 3 to inscribe other waypoints.
5. Right-click the operational display area to complete waypoint inscription.



5. PLOTTER OPERATION (IMO-TYPES)

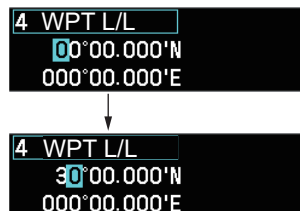
How to enter/edit waypoints from the menu

Note: A waypoint cannot be edited if it is part of an active route.

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [2 WPT SET].



4. Select [2 WPT NO. SELECT].
5. Spin the scrollwheel, or use the control unit numbered keys, to select a waypoint number, then left-click.
To edit or input a waypoint name, go to step 6.
To skip naming the waypoint, go to step 7.
6. Select [3 WPT NAME], then left-click. The software keyboard appears. Referring to section 1.5.3, name the waypoint.
7. Select [4 WPT L/L]. The latitude and longitude settings can now be adjusted.
8. Input the latitude and longitude with the number keys, or spin the scrollwheel to select a digit, then left-click to move to the next digit.



Use the scrollwheel to select a numeral, then left-click. The cursor jumps to the next right place. Repeat to enter the latitude and longitude.

9. Close the menu.

5.9.3 How to edit waypoints

Note: A waypoint cannot be edited if it is part of an active route.

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [2 WPT SET].
4. Select [2 WPT NO. SELECT].
5. Select the waypoint number to edit.
6. Select the waypoint data to edit, then make necessary changes.
 - [WPT NAME]: Use the software keyboard to change the name.
 - [WPT L/L]: Spin the scrollwheel to change the latitude and longitude position of the waypoint.
7. Close the menu.

5.9.4 How to erase waypoints

There are two methods to erase individual waypoints: cursor selection or from the menu.

How to erase a waypoint by cursor selection

1. Place the cursor inside the operational display area, then right-click.
2. Select [MARK DELETE]. The mark delete function is activated and the cursor is highlighted when inside the operational display area.
3. Select the waypoint you wish to delete, then left-click.
4. Right-click inside the operational display area to deactivate the mark delete function.

How to erase a waypoint from the menu

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [6 WPT SET].
4. Select [2 WPT NO. SELECT]. Then select the waypoint to erase.
5. Select [5 CLEAR DATA].
6. Select [YES] or [NO] as appropriate, then left-click.
7. Close the menu.

How to erase all waypoints

You can erase all waypoints from the menu. If there is an active route, this procedure cannot be completed.

1. Open the menu.
2. Select [2 MARKS].
3. Select [8 DELETE DATA].
4. Select [3 ALL WAYPOINTS].
5. Select [YES] to erase all waypoints. Select [NO] to cancel the procedure.
Note: All routes are also deleted with this procedure.
6. Close the menu.

5. PLOTTER OPERATION (IMO-TYPES)

5.9.5 How to display the waypoint list

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [7 WPT LIST] to show the [WPT LIST].

- Click while on page No.1 to close the list.
 - Click while on page No.2 or after to go back on page.
 - Long-push the left button to go to page No.1.

Displayed page/Total no. of pages

WPT No., WPT name

Latitude and longitude position of waypoint

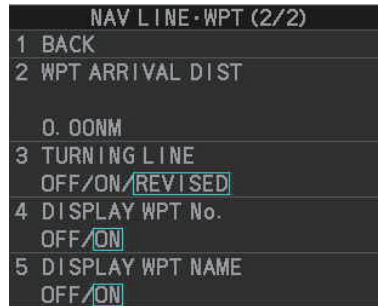
- Go to next page.
 - Long-push the left button to go to last page.

WPT No.	WPT name	Latitude	Longitude
001	WP1	35°20.561'N	139°41.386'E
002	WP2	35°20.257'N	139°41.023'E
003	WP3	35°20.691'N	139°40.494'E
004	WP4	35°21.111'N	139°40.231'E
005	WP5	35°21.509'N	139°40.176'E

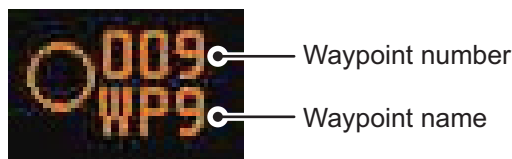
4. Close the menu.

5.9.6 How to show/hide the waypoint name/number

1. Open the menu.
2. Select [8 NAVLINE•WPT], then select [0 NEXT] to show the next page.



3. Select [4 DISP WPT NO.] or [5 DISP WPT NAME] as appropriate.
4. Select [ON] to show the waypoint name/number, or [NO] to hide the waypoint name/number, then left-click. The waypoint number and/or waypoint name appear to the right of the waypoint mark.



5. Close the menu.

5.10 Routes

You can display one route (NAV LINE), which is either received from a connected EPFS device (GPS, etc), or stored internally.

5.10.1 How to set/edit an internal route

You can store up to 30 routes, each with up to 30 waypoints, in the internal memory.

The procedure for new routes and route editing is the same. To edit a route, you can skip setting other items and only edit the items you wish to change.

Note: While a route is active, tracks and waypoints cannot be deleted and data cannot be loaded from an SD card.

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [8 NAV LINE SET] to show the [NAV LINE SET] menu.
4. Select [2 SELECT NAV LINE].
5. Spin the scrollwheel, or input the number from the keyboard, to assign a number to the route. The input areas for [3 NAV LINE], [4 NAV LINE ENTRY] and [5 CLEAR DATA] become active.
6. Select [3 NAV LINE NAME].
7. Referring to section 1.5.3, assign a name to the route. You can use up to 15 characters in the name.
8. Select [4 NAV LINE ENTRY].
9. Spin the scrollwheel to select a waypoint, then left-click.
10. Repeat step 9 until all waypoints for the route are entered.

NAV LINE SET			
1	BACK		
2	SELECT NAV LINE 02		
3	NAV LINE NAME FURUMO TEST RUN		
4	NAV LINE ENTRY		
	001 -	002 -	003 -
	004 -	005 -	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
5	CLEAR DATA NO/YES		

When the last waypoint is entered, move the cursor to the next blank input area, then left-click, or assign the last waypoint as "000" using the numeric keys. If 30 waypoints are entered, the setting process for waypoints is automatically completed.

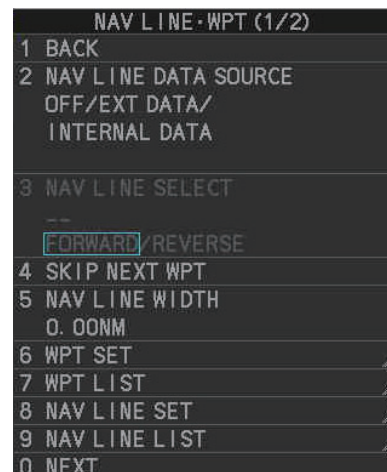
11. Close the menu.

5. PLOTTER OPERATION (IMO-TYPES)

5.10.2 How to display routes

To display internal routes or received routes, follow the procedure below.

1. Open the menu.
2. Select [8 NAV LINE•WPT]. The [8 NAV LINE•WPT] menu appears.
3. Select [2 NAV LINE DATA SOURCE].
4. Select the desired source, referring to the list below.
 - [OFF]: No routes are displayed.
 - [EXT DATA]: Routes received from external sources are displayed.
 - [INTERNAL DATA]: Routes saved in the internal memory are displayed.

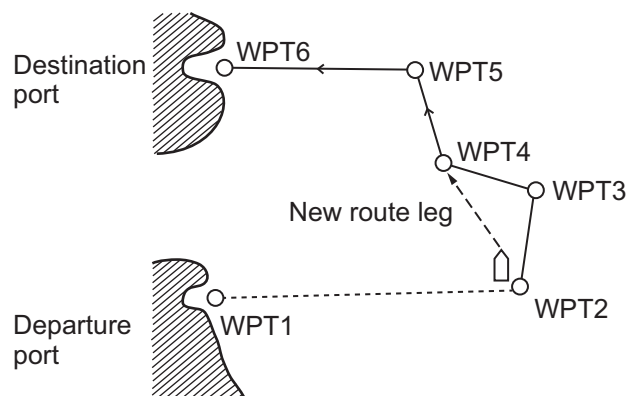


For [INTERNAL DATA], see step 5; for [EXT DATA], see step 8.

5. Select [NAV LINE SELECT].
6. Spin the scrollwheel to select the desired route number, then left-click.
7. Select the direction you want to navigate the route in.
 - [FORWARD]: Navigate the route in the direction in which it was created.
 - [REVERSE]: Navigate the route in reverse of the direction in which it was created.
8. Close the menu.

5.10.3 How to skip a waypoint

On a voyage similar to the below example, you may want to skip a waypoint to save time. You can skip the next waypoint on the current leg of your route by using the procedure below.



1. Open the menu.
2. Select [8 NAV LINE•WPT] to show the [8 NAV LINE•WPT] menu.
3. Select [4 SKIP NEXT WPT].
4. Close the menu.

5.10.4 How to set the route width

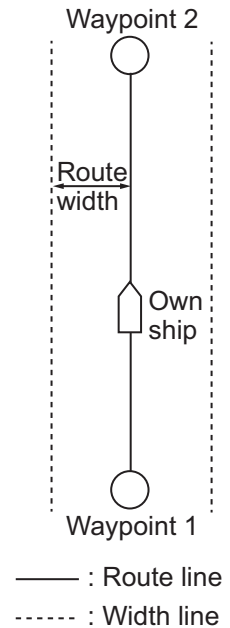
You can set a width for each route (NAV LINE). For example, if you set a 5 NM route width, the route width is 5 NM to port and starboard, with the own ship as the center. The route width is displayed as orange dotted lines to either side of the route line.

To set a route width, do the following:

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [5 NAV LINE WIDTH].
4. Spin the scrollwheel, or use the numeric keys, to set a width for the route. To disable the route width alert and hide the route width lines, set the width to [0.00 NM].

Note: This width is applied to all routes.

5. Close the menu.

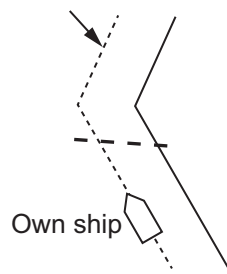


5.10.5 How to show/hide the turning line

You can show or hide the turning line, the point at which your vessel starts a turn in a route.

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [0 NEXT].
4. Select [3 TURNING LINE].
5. Select the appropriate setting, referring to the list below.
 - [OFF]: Turning line is hidden.
 - [ON]: Turning line is displayed.
 - [REVISED]: Turning line is displayed, but offset based on the route and current own ship position.
6. Close the menu.

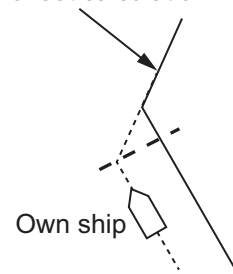
Estimated course with no offset calculation*



[TURNING LINE] set to [ON]

—— : Route
 : Track
 - - - - : Turning line

Estimated course with offset calculation*

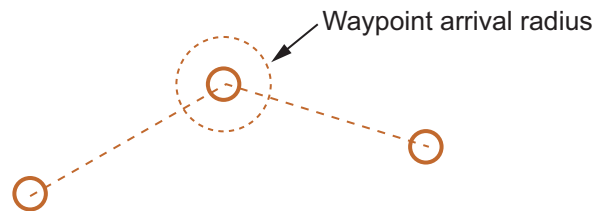


[TURNING LINE] set to [REVISED]

*: Estimated course is not displayed on-screen.

5.10.6 How to use the waypoint arrival distance function

The waypoint arrival distance function lets you know when you are within a preset distance from the next waypoint. When the waypoint arrival area is set, the next waypoint is shown circumscribed with a dashed orange-colored circle, whose radius is equivalent to waypoint arrival distance setting. When your vessel comes within the destination arrival radius, the system places the arrival radius marker on the next destination.



To set and use the waypoint arrival area function, follow the procedure below.

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [0 NEXT] to show the second page of the [NAVLINE•WPT] menu appears.
4. Select [2 WPT ARRIVAL DIST].
5. Set the width (radius) of the arrival area.
6. Close the menu.

5.10.7 How to delete internal routes

You can delete a specified route, or all routes.

Note: Active routes and routes from external sources cannot be deleted.

How to delete individual internal routes

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [8 NAVLINE SET].
4. Select [2 SELECT NAV LINE].
5. Spin the scrollwheel, or input the number from the keyboard, to select the route you want to delete.
6. Select [5 CLEAR DATA].
7. Select [YES] to delete the selected route.
8. Close the menu.

How to delete all internal routes

1. Open the menu.
2. Select [2 MARKS].
3. Select [8 DELETE DATA].
4. Select [4 ALL NAV LINES].
5. Select [YES] to delete all internal routes.
6. Close the menu.

5.10.8 How to view the routes list

Routes saved to the internal memory can be view by following the procedure below.

1. Open the menu.
2. Select [8 NAVLINE•WPT].
3. Select [9 NAVLINE LIST] to show the [NAVLINE LIST]

- Click while on page No.1 to close the list.
- Click while on page No.2 or after to go back on page.
- Long-push the left button to go to page No.1.

Displayed page/Total no. of pages

Route number/
route name*

Waypoints registered
to the route

- Go to next page.
- Long-push the left button
to go to last page.

* Route name is blank if no name is registered.

4. Close the menu.

5.11 How to Show/Hide Grid Lines

1. Open the menu.
2. Select [2 MARK].
3. Select [0 NEXT] to show the next page.
4. Select [2 GRID], then select [ON] to show the grid, or [OFF] to hide the grid.
5. Close the menu.

MARK (2/2)	
1	BACK
2	GRID
	OFF/ON

5. PLOTTER OPERATION (IMO-TYPES)

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6. PLOTTER OPERATION (C-TYPES)

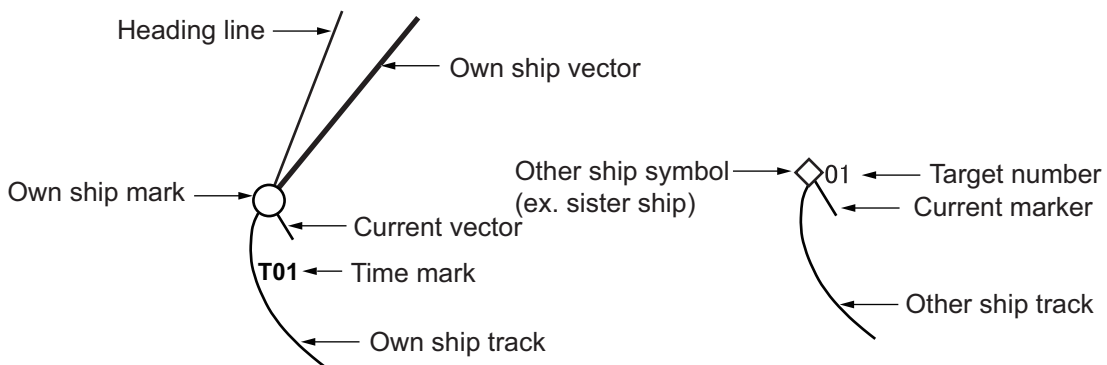
Plotter operation is available in both IMO- and C-type specifications, with the functions and menus different for each type. This chapter covers the operations for the C-type. For the IMO-type, see chapter 5.

The following plotter functions are available with the C-type radar:

- Display own ship track and other ship track.
- Enter waypoints.
- Enter marks.
- Create routes.
- Set destination.
- Display charts and chart-related information (requires a valid chart card).

6.1 Tracks

Own ship track is traced on the display based on position data sent from position-fixing equipment. Additionally, with connection of a AIS transponder or GPS buoy, other ships' tracks can also be shown

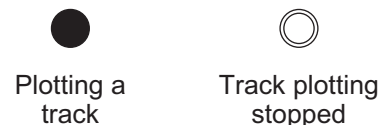


Own ship track and other ship track can be saved as a route. For details see "Creating a route from existing tracks" on page 6-54.

6.1.1 Symbols

Own ship mark

The own ship mark appears at current position. The mark changes as shown in the figure to the right, depending on whether you are plotting a track.



In addition to marking own ship position, the mark has the following functions:

- The **own ship vector** line (thick, white) points in the direction of ship's course.
- The **heading line**, colored light blue, points in the direction of ship's heading.
- The **current vector** points in the direction of the tide flow for a maximum of five depth layers. (Layer #1, yellow; layer #2, purple; layer #3, blue; layer #4, green, layer #5, white.). Requires tide data in NMEA 0183 format.

6. PLOTTER OPERATION (C-TYPES)

How to show/hide the own ship vector

Follow the procedure below to show or hide the own ship vector.

1. Open the menu.
2. Select [9 INITIAL SETTINGS].
3. Select [5 OPERATION].
4. Select [4 OWN SHIP VECTOR].
5. Select one of the following:
 - [OFF]: Hide the own ship vector.
 - [HDG]: The own ship vector points in heading direction.
 - [COURSE]: The own ship vector points in course direction.
6. Close the menu.

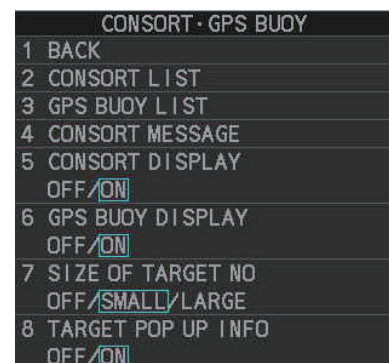
How to show/hide other ships' tracks

The following are required in order to show other ships' tracks.

- A AIS transponder or GPS buoy
- Own ship position data
- Set up on this radar
- See "SYMBOLS" on page AP-32 for TT and AIS symbols.

Do the following to show or hide the consort symbol, GPS buoy symbol.

1. Open the menu.
2. Select [5 TT•AIS].
3. Select [5 CONSORT•GPS BUOY].
4. Select [5 CONSORT DISPLAY] or [6 GPS BUOY DISPLAY].
5. Select [ON] or [OFF] as appropriate. The following symbols may appear when [ON] is selected.
 - : GPS buoy symbol
 - : Consort ship symbol
6. Close the menu.



How to change the size of the target no. display for consort ship, GPS buoy

Do the following to change the size of the target no. display for consort ship, GPS buoy.

1. Open the menu.
2. Select [5 TT•AIS].
3. Select [5 CONSORT•GPS BUOY].
4. Select [7 SIZE OF TARGET NO].
5. Select [OFF] (hide target no. display), [SMALL] or [LARGE] as appropriate.
6. Close the menu.

6.1.2 How to show/hide ships' tracks

Show/hide own ship's tracks

Do the following to show or hide own ship's tracks.

1. Open the menu.
2. Select [2 MARKS•PLOTTER].
3. Select [3 TRACK].
4. Select [8 OWN TRACK SETTINGS].
5. Select [2 OWN TRACK DISPLAY].
6. Select [ON] or [OFF] as required. For [ON], the cursor moves to the [MAX. POINTS] indication.
7. You can set the max. number of track points to save. Spin the scrollwheel to set desired value.
8. Close the menu.

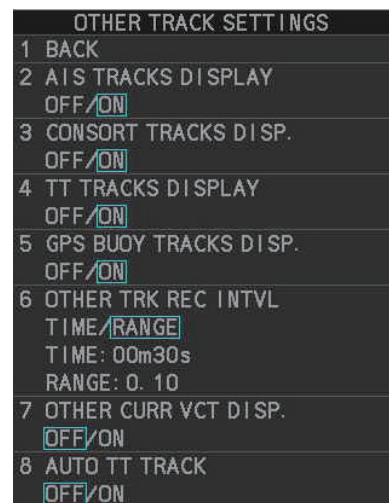


Note: Time can be marked hourly with the time mark (T). Set [7 TIME MARK DISPLAY] to [ON] to show the time mark. The time is updated every hour, on the hour and appears as two digits (T01, T02, etc.), in 24-hour format, regardless of the setting selected in the [DATE] menu.

Show/hide other ships' tracks

Do the following to show or hide other ships' tracks.

1. Open the menu.
2. Select [2 MARKS•PLOTTER].
3. Select [3 TRACK].
4. Select [8 OTHER TRACK SETTINGS].
5. Select [2 AIS TRACK DISPLAY], [3 CONSORT TRACK DISPLAY], [4 TT TRACK DISPLAY], or [5 GPS BUOY TRACK DISPLAY].
6. Select [ON] or [OFF] as required.
7. Close the menu.



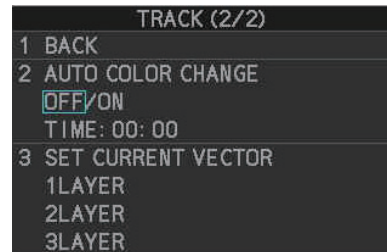
Show/hide current vector display on other ships' tracks

Do the following to show or hide the current vector display on other ships' tracks.

1. Open the menu.
2. Select [2 MARKS•PLOTTER].
3. Select [3 TRACK].
4. Select [8 OTHER TRACK SETTINGS].
5. Select [2 AIS TRACK DISPLAY], [3 CONSORT TRACK DISPLAY], [4 TT TRACK DISPLAY], or [5 GPS BUOY TRACK DISPLAY].

6. PLOTTER OPERATION (C-TYPES)

6. Select [ON] or [OFF] as required.
7. Select [1 BACK] to return to the [TRACK] menu.
8. Select [8 OTHER TRACK SETTINGS].
9. Select [7 OTHER CURR VCT DISP.].
10. Select [ON] or [OFF] as required. For [ON], go to the next step to set the current measuring layers to use.
11. Select [1 BACK] to return to the [TRACK] menu.
12. Select [0 NEXT].
13. Select [3 SET CURRENT LAYER].
14. Select [1LAYER]. Spin the scrollwheel to set the measuring layer (1 to 5) to use.
15. Do the same for [2LAYER], [3LAYER].
16. Close the menu.



How to automatically display the tracks of acquired TT

You can automatically display the tracks of acquired TT as follows.

1. Open the menu.
2. Select [2 MARKS•PLOTTER].
3. Select [3 TRACK].
4. Select [9 OTHER TRACKS DISPLAY].
5. Select [4 TT TRACKS DISPLAY].
6. Select [ON] or [OFF] as required.
 - [ON]: Track of all TT is displayed.
 - [OFF]: Track of TT is not displayed. To show the track of a TT, do the following:
 - 1) Put the cursor within the radar effective radius, then right click to show the [CURSOR] menu.
 - 2) Select [TRACK ON-OFF].
 - 3) Click the TT whose track you want to show.
 - 4) Right-click to finish.
7. Close the menu.

6.1.3 How to set own ship track recording

How to start/stop recording own ship track

You can stop recording own ship track when the ship is anchored for an extended period or in port. This will help prevent unnecessary recording of track points.

1. Put the cursor within the radar effective radius, then right click.
2. Select [TRACK ON-OFF].
3. Right-click within the radar effective radius until the “Hold” icon (**H**) appears. Each click selects a track recording interval or stops recording in the following sequence.



When recording is stopped, the appearance of the own ship mark changes from filled circle (●) to a pair of concentric circles (○).

4. Right-click to finish.

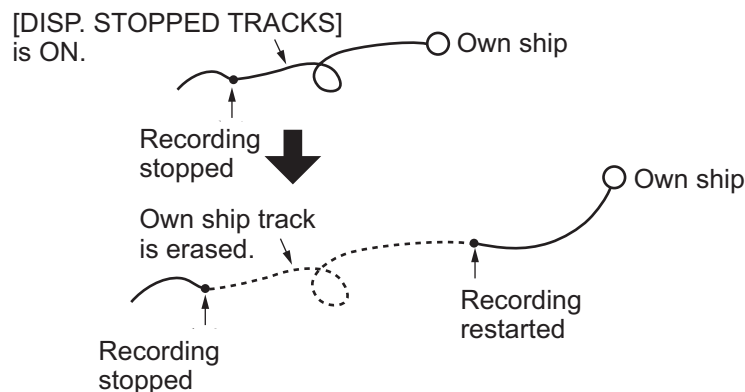
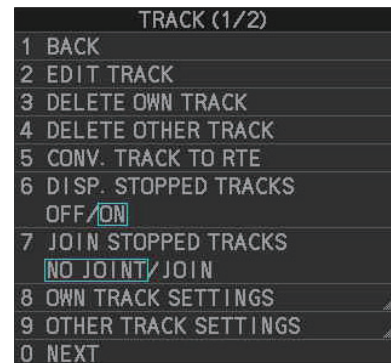
To restart recording, repeat the above procedure to show the recording interval 1 icon (**1**) or recording interval 2 icon (**2**). The own ship mark changes from (○) to (●).

Note: For RCU-031 users, you can also press **TRACK ON/OFF** to toggle recording.

How to show/hide track without recorded them

1. Open the menu.
2. Select [2 MARKS•PLOTTER].
3. Select [3 TRACK].
4. Select [6 DISP. STOPPED TRACKS].
5. Select [ON] or [OFF] as required.

- [OFF]: Tracks made while recording is off are not shown.
- [ON]: Tracks made while recording is off are shown. However, since tracks are not recorded, tracks are erased when the power is turned off or the track is not within the display area. Also, own ship tracks made while recording is off are erased whenever recording is restarted, or the display is zoomed in or out.

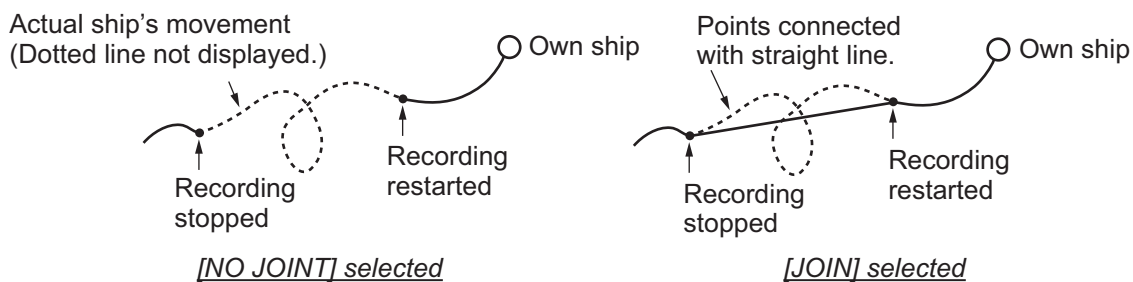


6. Close the menu.

6. PLOTTER OPERATION (C-TYPES)

How to connect non-recorded tracks after restarting recording

1. Open the menu.
2. Select [2 MARKS•PLOTTER].
3. Select [3 TRACK].
4. Select [7 JOIN STOPPED TRACKS].
5. Select [NO JOINT] or [JOIN] as required.
 - [NO JOINT]: The point where recording was stopped is not connected to the point where recording was resumed.
 - [JOIN]: The point where recording was stopped is connected to the point where recording was resumed.



6. Close the menu.

6.1.4 How to stop and re-start tracks

You can stop, or “pause” tracks, then re-start the same track as desired.

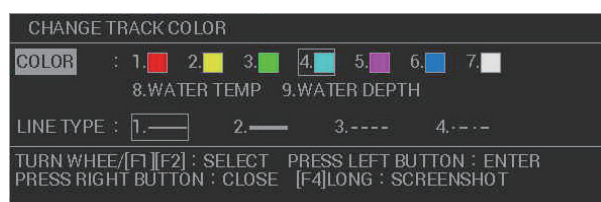
1. Right-click within the radar effective radius to show the [CURSOR] menu.
2. Select [TRACK ON-OFF].
3. Select the vessel whose tracks you want to stop (or re-start), then left-click.
4. Right-click within the radar effective radius to complete the procedure.

6.1.5 How to change track color

Track color is available in seven colors: red, yellow, green, light blue, purple, blue, and white. For example, you may want to show track in red on the day you leave port to distinguish from track related to other activities. The own ship track color can be automatically changed according to water temperature or depth.

How to change own ship's track color

1. Right-click within the radar effective radius to show the [CURSOR] menu.
2. Select [TRACK COLOR].
3. Click within the radar effective radius. The [CHANGE TRACK COLOR] window appears.



Note: For RCU-031 users, you can also press **TRACK COLOR** to open the [CHANGE TRACK COLOR] window.

4. Select [COLOR].
5. Select desired reference for track color.
 [WATER TEMP]: The track color changes according to water temperature. (Requires water temperature data.)
 [WATER DEPTH]: The track color changes according to depth. (Requires depth data.)
 The color of the track changes at the point when the new color is selected.
6. Close the window.

Note: You can also change the color partially, from the [EDIT TRACK] menu. See "How to change own ship's track color" on page 6-6.

How to change own ship's track color according to water temperature

If you selected [WATER TEMP] as the track color reference, the track changes color according to temperature changes in the water. This makes it easier to find changes in the temperature, which makes it easier to find specific fishing areas. There are two methods to change the track color:

- Method 1: change the color based on a temperature range
- Method 2: change the color based on a preset difference

Note: This feature requires valid water temperature data input.

Method 1: temperature-range-based color change

1. Open the menu.
2. Select [MARKS•PLOTTER].
3. Select [TRACK].
4. Select [OWN TRACK SETTINGS].
5. Select [NEXT].
6. Select [TRACK COLOR BY TEMP].
7. Select [RANGE].
8. Set the color for the temperature range.
 For example, to show water temperatures above 20 degrees centigrade in red color, do the following:

- 1) Select [RED].
- 2) Rotate the **scrollwheel** to set "+20.0", then press the **left button**.
- 3) Set the other colors in a similar manner.

Note 1: The water temperature steps should be ascending order.

Note 2: Temperatures below the [BLUE] setting appear in white color.

9. Select [TEMP DATA DISPLAY].

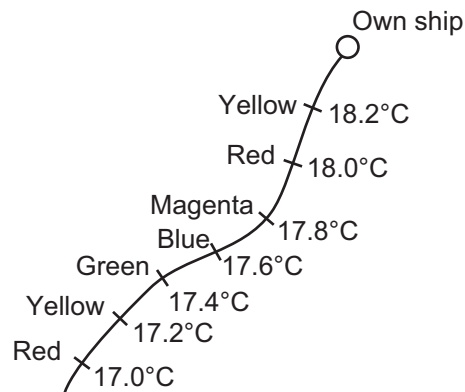
OWN TRACK SETTINGS (2/3)	
1	BACK
2	TRACK COLOR BY TEMP
	[RANGE]/EV. 0.2/EV. 2.0
3	BLUE
	+05.0
4	MAGENTA
	+10.0
5	CYAN
	+12.5
6	GREEN
	+15.0
7	YELLOW
	+17.5
8	RED
	+20.0
9	TEMP DATA DISPLAY
	OFF/ON
0	NEXT

6. PLOTTER OPERATION (C-TYPES)

10. Select [ON] or [OFF] as required.
 - [ON]: Show water temperature on the track.
 - [OFF]: Hide water temperature on the track.
11. Close the menu.

Method 2: preset-difference-based color change

According to the setting, there are five colors which are used in a cycle to color the track. In the example figure below, the preset difference is set to [EV. 0.2] and the temperature ranges from 17.0°C to 18.2°C. The color changes every 0.2°C.



1. Open the menu.
2. Select [MARKS•PLOTTER].
3. Select [TRACK].
4. Select [OWN TRACK SETTINGS].
5. Select [NEXT].
6. Select [TRACK COLOR BY TEMP].
7. Select [EV. 0.2] or [EV. 2.0] as required.
 - [EV. 0.2]: changes the color with every temperature increase/decrease of 0.2°C.
 - [EV. 2.0]: changes the color with every temperature increase/decrease of 2.0°C.
8. Set the color for the temperature range.
For example, to show water temperatures above 18 degrees centigrade in red color, do the following:
 - 1) Select [RED].
 - 2) Rotate the **scrollwheel** to set "+18.0", then press the **left button**.
 - 3) Set the other colors in a similar manner.

Note 1: The water temperature steps should be in ascending order.

Note 2: Temperatures below the [BLUE] setting appear in white color.
9. Select [TEMP DATA DISPLAY].
10. Select [ON] or [OFF] as required.
 - [ON]: Show water temperature on the track.
 - [OFF]: Hide water temperature on the track.
11. Close the menu.

How to change own ship's track color according to depth

If you selected [WATER DEPTH] as the track color reference, the track changes color according to depth changes in the water. This makes it easier to see changes in depth directly below your boat. there are two methods to change the track color:

- Method 1: change the color based on a depth range
- Method 2: change the color based on a preset difference

Note: This feature requires valid depth data input.

Method 1: depth-range-based color change

This method gives depths within the same range the same color. For example, if you set the range between 200 m and 300 m, and the depth remains shallower than 300 m and deeper than 200 m, the color remains the same.

1. Open the menu.
2. Select [MARKS•PLOTTER].
3. Select [TRACK].
4. Select [OWN TRACK SETTINGS].
5. Select [NEXT] twice.
6. Select [TRACK COLOR BY DEPTH].
7. Select [RANGE].
8. Set the color for the depth range.
For example, to show depths from 400 m and below in red color, do the following:
 - 1) Select [RED].
 - 2) Rotate the **scrollwheel** to set "0400.0", then press the **left button**.
 - 3) Set the other colors in a similar manner.

Note 1: The depth intervals should be in ascending order.

Note 2: Depths below the [BLUE] setting appear in white color.
9. Select [DEPTH DATA DISPLAY].
10. Select [ON] or [OFF] as required.
 - [ON]: Show water temperature on the track.
 - [OFF]: Hide water temperature on the track.
11. Close the menu.

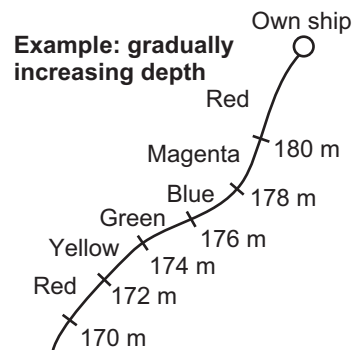
OWN TRACK SETTINGS (3/3)	
1	BACK
2	TRACK COLOR BY DEPTH
	RANGE/EV. 2/EV. 20/ EV. 200
3	BLUE 0010. 0
4	MAGENTA 0050. 0
5	CYAN 0100. 0
6	GREEN 0200. 0
7	YELLOW 0300. 0
8	RED 0400. 0
9	DEPTH DATA DISPLAY OFF/ON

6. PLOTTER OPERATION (C-TYPES)

Method 2: preset-difference-based color change

According to the setting, there are five colors which are used in a cycle to color the track. In the example figure below, set the preset difference is set to [EV. 2] and the Depth ranges from 170 m to 180 m. The color changes every 2 m.

1. Open the menu.
2. Select [MARKS•PLOTTER].
3. Select [TRACK].
4. Select [OWN TRACK SETTINGS].
5. Select [NEXT] twice.
6. Select [TRACK COLOR BY DEPTH].
7. Select [EV. 2], [EV. 20] or [EV. 200] as required.



- [EV. 2]: changes the color with every depth increase/decrease of 2 m.
 - [EV. 20]: changes the color with every depth increase/decrease of 20 m.
 - [EV. 200]: changes the color with every depth increase/decrease of 200 m.
8. Select [DEPTH DATA DISPLAY].
 9. Select [ON] or [OFF] as required.
 - [ON]: Show water temperature on the track.
 - [OFF]: Hide water temperature on the track.
 10. Close the menu.

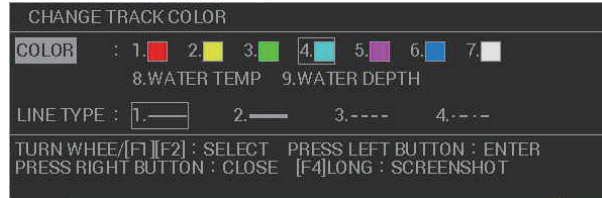
How to change own ship's track color based after a specified time

You can use the [AUTO COLOR CHANGE] feature to change your track color at a specific time.

1. Open the menu.
2. Select [MARKS•PLOTTER].
3. Select [TRACK].
4. Select [NEXT].
5. Select [AUTO COLOR CHANGE].
6. Select [ON] or [OFF] as required.
If you select [ON], the cursor moves to the time indication.
7. Set the time at which you want the track to change color.
Tracks will change colors every day at this time.
8. Close the menu.

How to change the color of other ships' tracks

1. Right-click within the radar effective radius to show the [CURSOR] menu.
2. Select [TRACK COLOR].
3. Select the ship whose track color you want to change. The [CHANGE TRACK COLOR] window appears.

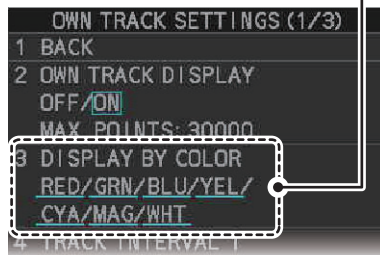


4. Select [COLOR].
5. Select the color used for the other ship's track.
Track color changes at this point, the previous color is retained for past tracks.
6. Close the menu.

6.1.6 How to show/hide own track based on color

You can show/hide sections of your track, based on the track color, with the following procedure.

Only tracks with the underlined colors are displayed on-screen.



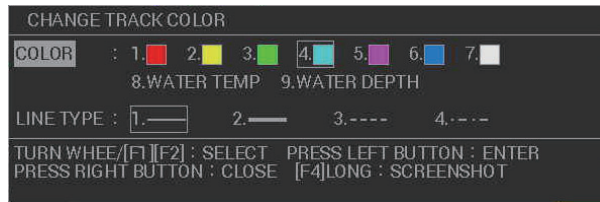
1. Open the menu.
2. Select [MARKS•PLOTTER].
3. Select [TRACK].
4. Select [OWN TRACK SETTINGS].
5. Select [DISPLAY BY COLOR].
6. Select the track color to show or hide.
Track colors indicated with a blue underline are shown, track colors with no underline are hidden.
7. Close the menu.

6.1.7 How to change the track line

You can select one of four line types for your own ship tracks and for other ship's tracks. The available line types are: normal (—), thick (—), dashed (----) and dash-dotted (-.-).

How to change line type for own ship's track

1. Right-click within the radar effective radius to show the [CURSOR] menu.
2. Select [TRACK COLOR].
3. Click within the radar effective radius to show the [CHANGE TRACK COLOR] window.

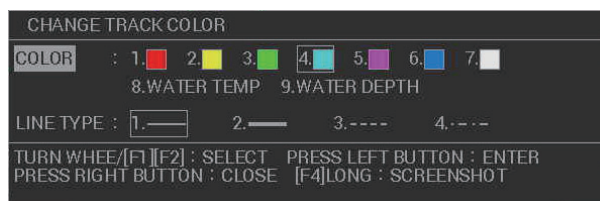


4. Select [LINE TYPE].
5. Select desired line type for own ship track.
The track line changes at this point, the previous line type is retained for past tracks.
6. Close the window.

Note: You can also change the line type partially, from the [EDIT TRACK] menu. See section 6.1.10.

How to change the color of other ships' tracks

1. Right-click within the radar effective radius to show the [CURSOR] menu.
2. Select [TRACK COLOR].
3. Click the ship whose track line you want to change. The [CHANGE TRACK COLOR] window appears.



4. Select [LINE TYPE].
5. Select desired line type for own ship track.
The track line changes at this point, the previous line type is retained for past tracks.
6. Close the window.