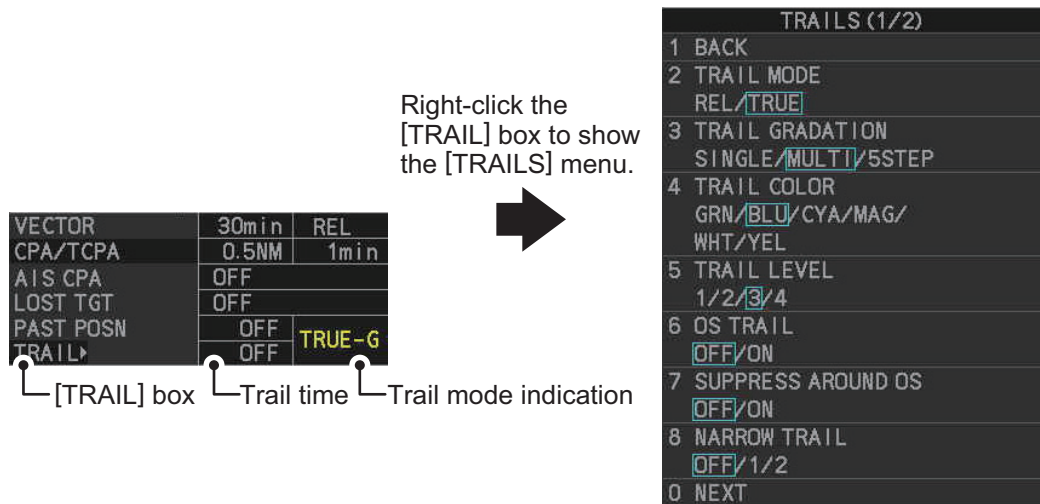


The reference for the past position displays for AIS and TT is also switched whenever the trail reference is switched.

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT] to show the next menu page.
4. Select [4 TRAILS]. The [TRAIL MENU] appears.

Note: You can also right-click the [TRAIL] box to access this menu.



5. Select [TRAIL MODE].
6. Select the appropriate trail mode, then press the **ENTER MARK** key.
 - [REL]: Relative target trails. Targets move relative to own ship and stationary targets appear smeared.
 - [TRUE]: True target trails. Targets true movements are shown, stationary targets are not smeared.
7. Close the menu.

You can also click the trail mode indication to toggle between relative and true trails.

1.37.2 Trail time

Trail time is the interval at which the trail is plotted on-screen.

Note: If the trail time is linked with the range (see section 1.9), the trail time is also automatically regulated to show a constant trail. Further, the trail time indication appears in yellow color. To link the trail time with the range, select [NORMAL] in the following procedures; range link is not available if a setting other than [NORMAL] is selected. Also, when using a range that is valid only when in stand-by mode, the trail time is automatically adjusted to match either the maximum or minimum range available in transmit mode.

You can change the trail time as follows:

Using the control unit (RCU-014/RCU-031)

1. Press the **CANCEL TRAILS** key to cycle through and select the desired setting.

For IMO-types, the cyclic order is as follows:

[OFF] → [15 sec] → [30 sec] → [1 min] → [3 min] → [6min] → [15 min] → [30 min] → [CONT] → [OFF]...

For C-types, the available options depend on the setting for [TRAIL LENGTH] in the [TRAILS] section of [ECHO] menu. To set the [TRAIL LENGTH] time, see section 1.37.12.

[TRAIL LENGTH] setting	Available options
[NORMAL]	[OFF], [15 sec], [30 sec], [1 min], [3 min], [6 min], [15 min], [30 min], [CONT].
[12H]	[OFF], [30 min], [1 hr], [3 hr], [6 hr], [12 hr], [CONT].
[24H]	[OFF], [1 hr], [2 hr], [3 hr], [6 hr], [12 hr], [18 hr], [24 h], [CONT].
[48H]	[OFF], [2 hr], [4 hr], [8 hr], [16 hr], [24 hr], [36 hr], [48 h], [CONT].

Using the on-screen box

1. Place the cursor on the trail time setting inside the [TRAIL] box, at the bottom-right of the screen.
2. Left-click the [TRAIL] box to change the trail time.

For IMO-types, the cyclic order is as follows: [OFF] → [15 sec] → [30 sec] → [1 min] → [3 min] → [6min] → [15 min] → [30 min] → [CONT] → [OFF]...

For C-types, the available options depend on the setting for [TRAIL LENGTH] in the [TRAILS] section of [ECHO] menu. To set the [TRAIL LENGTH] time, see section 1.37.12.



Spin the scrollwheel to change the trail time. The options for each [TRAIL LENGTH] setting are listed in the following table.

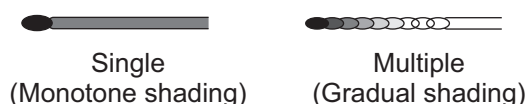
[TRAIL LENGTH] setting	Available options
[NORMAL]	[OFF], [15 sec], [30 sec], [1 min] to [30 min] at 30-second intervals, [CONT].
[12H]	[OFF], [00:30] to [12:00] at 30 minute intervals, [CONT].
[24H]	[OFF], [00:30] to [24:00] at one hour intervals, [CONT].
[48H]	[OFF], [00:30] to [48:00] at two hour intervals, [CONT].

Note 1: The timer displays the elapsed time of the selected trail. Use caution when using this feature, as the displayed time is not the overall trail time. Also, when the trail timer is displayed, the trail accuracy of other ship's echoes may be lowered. When the trail time reaches the preset interval, the timer disappears.

Note 2: The [CONT] option sets the trail time plotting as continuous. When the plotting time reaches 29:59, the timer is hidden. The timer reappears when [TRAIL ALL CLEAR] is selected, or when the range is changed.

1.37.3 Trail gradation

The trail afterglow can be displayed in a single tone or gradual time-based shading.



1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT] to show the next menu page.
4. Select [4 TRAILS]. The [TRAIL MENU] appears.
5. Select [3 TRAIL GRADATION].
6. Select the appropriate setting, referring to the following list.
 - [SINGLE]: Trails are displayed in monotone.
 - [MULTI]: Trails are displayed in multiple colors, based on time.
 - [5STEP]*: Trails are colored in 5 shades, brightest color for new trails, dullest color for old trails.

*: C-types only.
7. Close the menu.

1.37.4 Trail level

The level, or intensity, of the afterglow that extends from radar targets can be selected as below.

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT] to show the next menu page.
4. Select [4 TRAILS]. The [TRAIL MENU] appears.
5. Select [5 TRAIL LEVEL].
6. Select the appropriate setting, then press the **ENTER MARK** key. The higher the number, the greater the intensity of the afterglow.
7. Close the menu.

1.37.5 Narrow trails (C-type only)

Target trails can be painted with thinner lines if desired. This csection 1.37.2an be useful when there are a lot of targets on the screen and it is hard to distinguish one from another.

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT] to show the next menu page.
4. Select [4 TRAILS]. The [TRAIL MENU] appears.
5. Select [8 NARROW TRAIL].
6. Select the appropriate setting from [OFF], [1] or [2], then press the **ENTER MARK** key. A trail with a setting of [2] is thinner than a trail with a setting of [1].
7. Close the menu.

1.37.6 How to hide the trails temporarily

Following the procedure outlined in section 1.37.2, set the trail time to [OFF]. The trails are hidden from view, but are continued. To show the trails again, repeat the procedure, setting the trail time to any interval other than [OFF].

1.37.7 Trail stabilization in true motion

True motion trails can be ground stabilized or sea stabilized. The [TRAIL] box shows current stabilization as "TRUE-G" or "TRUE-S". You can change the stabilization mode with the following procedure.

1. Open the menu.
2. Select [7 INFORMATION BOX].
3. Select [2 OWN SHIP INFO].
4. Select [3 SPEED]. The [SPEED] menu appears.
Note: You can also access the [SPEED] menu from the on-screen box. Place the cursor on the [SPD ►] indication in the speed box at the top-right of the screen, then right-click.
5. Select [2 SHIP SPEED].
6. Select [LOG(BT)] (ground stabilization) or [LOG(WT)] (sea stabilization) as required.
7. Close the menu.

Note: The stabilization mode is applied to own ship speed and TT trails.

1.37.8 How to erase/restart trails

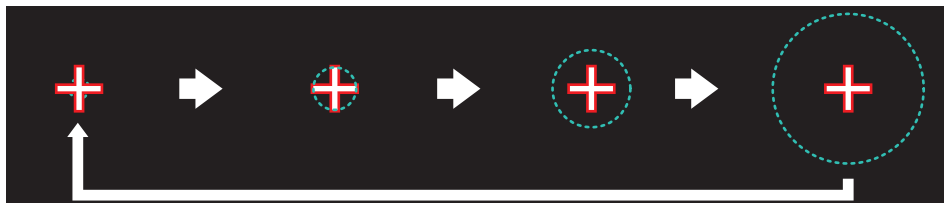
All trails can be erased (including those in the memory) and restarted to start fresh trails. There are three methods you can use to erase trails.

To erase all trails displayed in the operational display area:

- Select the [TRAIL] box, then press and hold the **left button** on the trackball; or
- Press and hold **CANCEL TRAILS** key.

To erase a section of a trail (C-types only):

1. Place the cursor inside the operational display area, then right-click to show the [CURSOR] menu.
2. Select [TRAIL ERASER]. The cursor is now displayed with a red surround and a dashed circle, indicating that [TRAIL ERASER] mode is active.
3. Press the **left button** to change the diameter of the dashed circle, as shown in the figure below.



4. Place the cursor on the trail whose section you want to erase, then press and hold the **left button**.
5. With the **left button** pressed, drag the cursor over the section of the trail you want to erase. The section of trail “covered” by the dashed circle is erased.
6. Release the **left button**.
7. Right-click to deactivate the [TRAIL ERASER] function. The cursor is no longer highlighted and the dashed circle disappears.

1.37.9 How to prevent sea clutter in true trails

You can prevent the display of sea clutter in true trails about your ship to clear the radar picture. Your ship's trails can also be shown or hidden.

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT] to show the next menu page.
4. Select [4 TRAILS]. The [TRAIL MENU] appears.
5. Select [7 SUPPRESS AROUND OS].
6. Select [OFF] or [ON] as appropriate.

Note: For IMO-types, when [6 OS TRAIL] is set to [ON], [7 SUPPRESS TRAILS] is automatically fixed at [ON]. To disable the sea clutter suppression feature, change [6 OS TRAIL] to [OFF], then change the setting for [7 SUPPRESS TRAILS].

7. Close the menu.

1.37.10 How to show/hide OS trails

To show or hide the OS trail at any time, follow the procedure below.

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT] to show the next menu page.
4. Select [4 TRAILS]. The [TRAIL MENU] appears.
5. Select [6 OS TRAIL].
6. Select [OFF] or [ON] as appropriate.

Note: For IMO-types, when [6 OS TRAIL] is set to [ON], [7 SUPPRESS AROUND OS] is automatically fixed at [ON]. To disable the sea clutter suppression feature, change [6 OS TRAIL] to [OFF], then change the setting for [7 SUPPRESS AROUND OS].

7. Close the menu.

1.37.11 How to show/hide land trails (C-type only)

You can improve the on-screen display visibility by hiding trails generated by land-masses and non-moving objects. Hiding the trails has the following possible benefits:

- Land-masses have no trail, allowing you to use relative trails near coastlines.
- Only moving echoes create a trail, improving target identification.

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT].
4. Select [4 TRAILS]. The [TRAIL MENU] appears.
5. Select [0 NEXT] to show the second page of the menu.
6. Select [2 HIDE LAND TRAILS(T)] or [3 HIDE LAND TRAILS(R)] as appropriate.
7. Referring to the table below, select the appropriate setting, then press the **ENTER MARK** key.

TRAILS (2/2)	
1	BACK
2	HIDE LAND TRAILS (T) OFF/1/2
3	HIDE LAND TRAILS (R) OFF/1/2
4	TRAIL LENGTH NORMAL/12H/24H/48H

Setting	Trails for non-moving objects		Trails for moving objects
	Large objects	Small objects	
[OFF]	Trails are shown	Trails are shown	Trails are shown
[1]	Trails are hidden	Trails are shown	Trails are shown
[2]	Trails are hidden	Trails are hidden	Trails are shown

8. Close the menu.

Note: When option [1] or [2] is selected trails for echoes outside the displayed area are not generated. It is important to note that, where the displayed area is moved by functions such as off-centering or true motion, newly displayed echoes do not have trails.

1.37.12 How to set the trail length (C-type only)

You can save up to 48 hours of trails. the [TRAIL LENGTH] can be set to one of the following lengths: [NORMAL], [12H], [24H] or [48H]. To set the trail length, follow the procedure below.

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT].
4. Select [4 TRAILS]. The [TRAIL MENU] appears.
5. Select [0 NEXT] to show the second page of the menu.
6. Select [4 TRAIL LENGTH].
7. Select the desired length.

[NORMAL]: Trails are displayed in a single, continuous line with a single color.

[12H], [24H] or [48H]: Trails appear in segments. The interval for each segment change depends on your selection, as shown below.

- 12H: One hour intervals.
- 24H: Two hour intervals.
- 48H: Four hour intervals.

Note: When a length other than [NORMAL] is selected, set [3 TRAIL GRADATION] to [SINGLE]. If you select [MULTI], the interval between each colored segment may be difficult to see clearly.

8. Close the menu.

1.37.13 How to set the trail color (C-type only)

The setting for trail coloration depends on the setting for [3 TRAIL GRADATION] and [4 TRAIL LENGTH], as shown in the following table.

Length	Gradation	Setting location
NORMAL	SINGLE	[MAIN] → [2 ECHO] → [0 NEXT] → [4 TRAILS] → [4 TRAIL COLOR]
	MULTI	
[12H], [24H], [48H]	MULTI	[MAIN] → [2 ECHO] → [0 NEXT] → [4 TRAILS] → [0 NEXT] → [6 LONG TRAIL COLOR]
	SINGLE	

Where [TRAIL LENGTH] is set to [NORMAL]

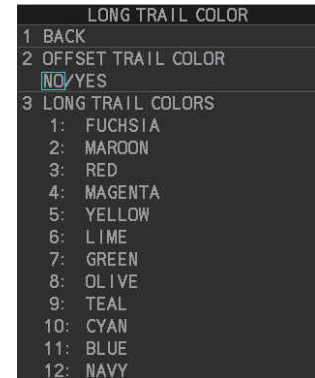
You can assign one of six colors when [4 TRAIL LENGTH] is set to [NORMAL].

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT].
4. Select [4 TRAILS]. The [TRAILS] menu appears.
5. Select [4 TRAIL COLOR].
6. Select the required color. The available colors are: [GRN] (green), [BLU] (blue), [CYA] (cyan), [MAG] (magenta), [WHT] (white) and [YEL] (yellow).
7. Close the menu.

Where [TRAIL LENGTH] is set to other than [NORMAL]

When [4 TRAIL LENGTH] is set to [12H], [24H] or [48H], you can color the trails with one of two methods: one continuous color, or multicolor.

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT].
4. Select [4 TRAILS]. The [TRAILS] menu appears.
5. Select [0 NEXT] to show the second page of the menu.
6. Select [6 LONG TRAIL COLOR]. The [LONG TRAIL COLOR MENU] appears (see figure to the right).
7. Select [3 LONG TRAIL COLORS].
8. Set the colors as desired.
Left-click to move the cursor through the colors, spin the scrollwheel to change the highlighted color. The menu shows 12 colors, numbered accordingly from [1] to [12]. The first segment of the trails is assigned the color for number [1].
9. Close the menu.



1.37.14 How to remove the colors from a section of a multicolor trail (C-type only)

You can remove the color(s) from a section of a multicolor trail, leaving the selected section as a gray trail. To remove the color(s), follow the procedure below.

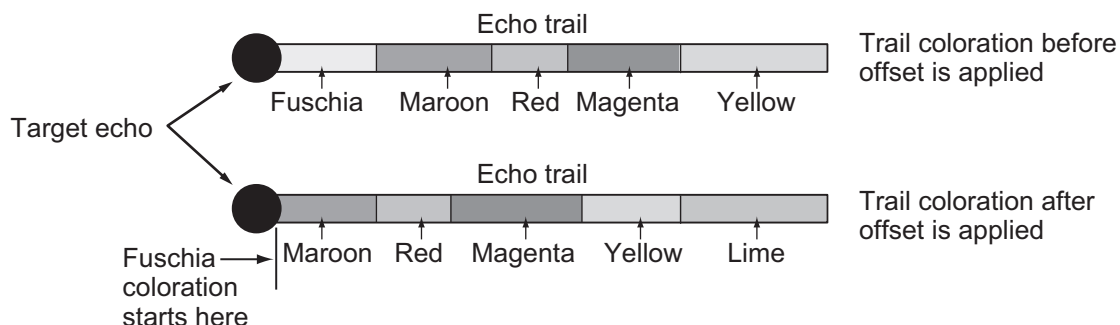
Note: This function is only available when [4 TRAIL LENGTH] is set to other than [NORMAL].

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT].
4. Select [4 TRAILS]. The [TRAIL MENU] appears.
5. Select [0 NEXT] to show the second page of the menu.
6. Select [5 TRAIL GRAY-OUT TIME].
7. Select the start and end times for the period you want to gray-out.
8. Close the menu.

1.37.15 How to offset the colors for multicolored trail (C-type only)

You can “shift” the order of the trail colors. When this function is active, the first color used to paint the trail is changed. For example if you had selected [FUSCHIA] before activating the offset feature, the start color would be [MAROON].

To offset the colors, follow the procedure below.



1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT].
4. Select [4 TRAILS]. The [TRAIL MENU] appears.
5. Select [0 NEXT] to show the second page of the menu.
6. Select [6 LONG TRAIL COLOR].
7. Select [2 OFFSET TRAIL COLOR].
8. **To offset the color by one**, select [ON].
To leave the colors in their original order, select [OFF].
9. Close the menu.

1.38 Target Analyzer (C-type only)

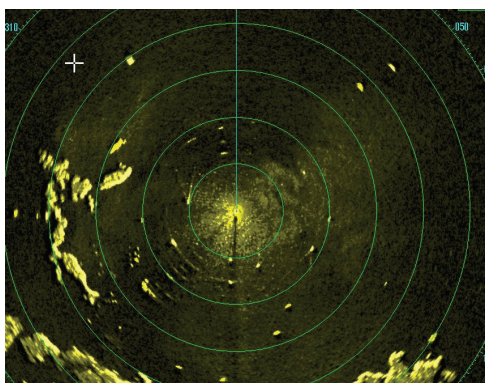
The target analyzer function analyzes echoes and assists the operator to determine dangerous targets. This function is particularly useful under heavy rain/snow or where there is surface reflection, which can cause interference and noise.

The target analyzer function can also place hatching over heavy rain areas, reducing the visible interference and allowing a clearer view of potential targets.

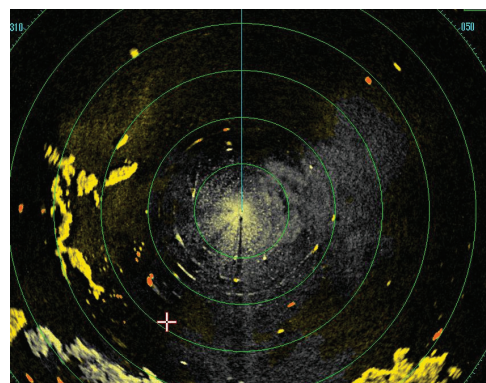
Echoes are displayed in five different colors to assist the operator in identifying targets. The colors and their respective echoes change depending on the echo color selected from the [BRILL] menu (see section 1.46) are shown in the table below.

Echo	Selected echo color					
	YEL	GRN	WHT	AMB	M-GRN	M-CYA
Surface reflection	Green	Green	Green	Green	Green	Green
Rain	Gray	Gray	Gray	Gray	Gray	Gray
Moving target	Red	Red	Red	Red	Pink	Pink
Approaching target	Pink	Pink	Pink	Pink	White	White
Other echoes	Yellow	Green	White	Amber	Red to green	Red to blue

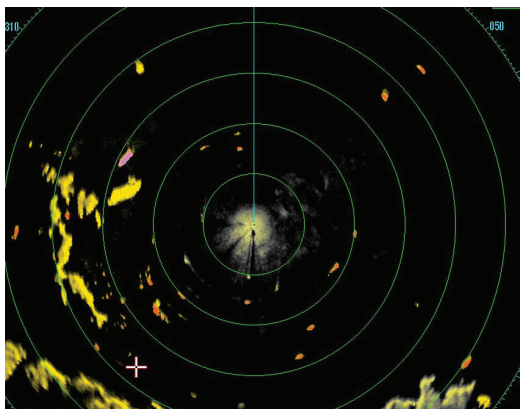
The following example figures show the manner in which this function affects displayed echoes.



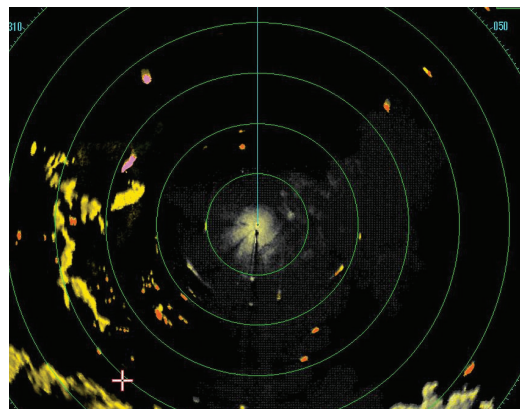
No echo adjustment
(Target analyzer off, EAV off, hatching off)
Rain, moving targets and surface reflections are all displayed with no filtering.



Minimal echo adjustment
(Target analyzer on, EAV off, hatching off)
Echoes are colored, surface reflections are filtered, rain is displayed.



Moderate echo adjustment
(Target analyzer on, EAV on, hatching off)
Echoes are colored, surface reflections and rain are filtered.



Maximum echo adjustment
(Target analyzer on, EAV on, hatching on)
Echoes are colored, surface reflections are filtered, rain is displayed in gray colored hatching.

Note 1: This function works best when the settings for [GAIN], [STC], [RAIN], [NOISE REJECT] and [VIDEO CONTRAST] are properly adjusted (surface reflections are displayed in green and rain is displayed in gray).

Note 2: This function recognizes moving targets as approaching targets. Buoys and other stationary objects are not recognized as approaching targets by this function.

Note 3: The target analyzer function requires a short period of time to analyze echoes and display them on-screen. If your antenna revolves at more than 40 rpm, moving targets may not be displayed correctly. For this reason, caution is advised when using the target analyzer function.

Note 4: The target analyzer function's performance may be affected by factors such as target size, weather and sea conditions, physical equipment configuration, offset settings and other factors.

What is "hatching"?

Where echo averaging may hide light rain on the display, the hatching feature, when activated, places a gray "veil" over the areas where rain is detected. This allows the operator to see where the rain is without affecting the quality of the displayed echoes.

1.38.1 How to activate/deactivate the target analyzer

1. Open the menu.
2. Select [1 ECHO].
3. Select [2 CUSTOMIZED ECHO].
4. Select [5 TARGET ANALYZER].
5. Select [OFF] to deactivate the function, or [ON] to activate the function.
6. Select [HATCHING].
7. Select [OFF] to deactivate the function, or [ON] to activate the function.
8. Close the menu.

1.39 Target Alarm

The target alarm serves to alert the navigator to targets (ships, landmasses, etc.) entering a specific area, with audiovisual alerts.

The operator can set the alarm zones at any location, with any size, however, the zones must be inside the operational display area.

Note: The target alarm boxes are not displayed when the setting for [AZ/ALR SELECT] in the [TT•AIS] menu is set to the default setting [ACQUISITION ZONE]. To enable this function, set [AZ/ALR SELECT] in the [TT•AIS] menu to [TARGET ALARM ZONE].



CAUTION

- ♦ The alarm should not be relied upon as the sole means for detecting possible collision situations.
- ♦ A/C SEA, A/C RAIN and GAIN controls should be properly adjusted to be sure the alarm system does not overlook target echoes.

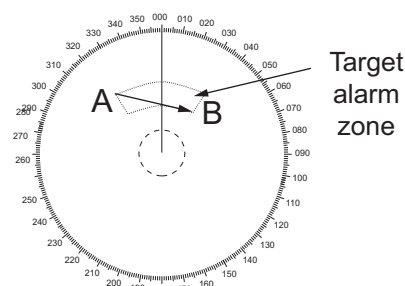
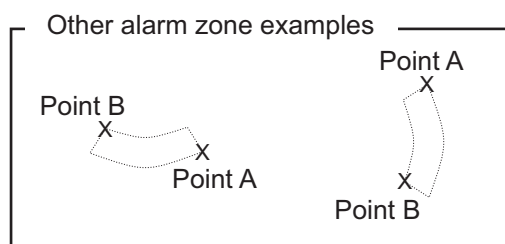
1.39.1 How to set a target alarm

The procedure below shows how to set a target alarm using the figure below as an example. The alarm boxes are labeled [1:] and [2:], and are located at the bottom-right of the screen, near the VRM boxes.



- Alarm zone 1 is selected (highlighted) and inactive.
- Alarm zone 2 is set and active.

1. Select the appropriate alarm box, then left-click. The cursor jumps into the operational display area and the indication "SET" appears inside the target alarm box selected.
2. Using the trackball, move the cursor to Point A, then left-click.
3. Using the trackball, move the cursor to Point B, then left-click. The indication "SET" is replaced with "WORK" in the box. The target alarm zone's lines are shown as dashed lines.



Note 1: To create a 360° alarm zone, set Point B at the same location as Point A.

Note 2: Two alarm zones can be set simultaneously. The second alarm zone is only available when the first alarm zone is active, however.

Note 3: When the target alarm zone is not within the range in use the indication "UP RNG" appears to the right of the target alarm box. In this case select a range that will display the target alarm zone.

1.39.2 How to mute the target alarm

A target in the target alarm zone produces both visual (flashing) and audible (beep) alarms. To silence the audio alarm select the appropriate target alarm box then left-click. The target alarm box indication shows "MUTE". This will deactivate the audio alarm but will not stop the flashing of the offending target. You can also stop the alarm by deactivating the target alarm zone (see section 1.39.3).

To reactivate the audio alarm, select the target alarm box then left-click to show "WORK" in the box.

1.39.3 How to deactivate a target alarm

Select the target box to be deactivated, then press and hold the **left button** on the Control Unit.

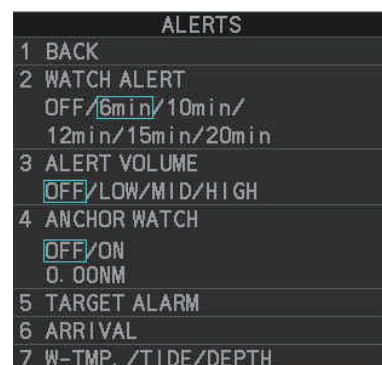
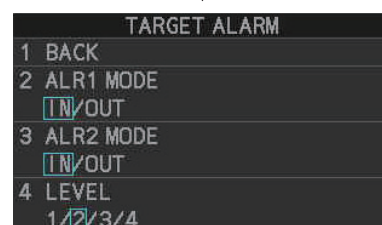
Note: When both alarm zones are active, the second ([2:]) alarm zone must be deactivated before the first ([1:]) can be deactivated.

If both zones are active when you try to deactivate zone [1:], the system releases two audible beeps and shows the message "DELETE ALR2 FIRST".

1.39.4 How to change target alarm attributes

You can select the echo strength level that triggers the alarm, the condition that generates the alarm and the volume of the audio alarm as follows:

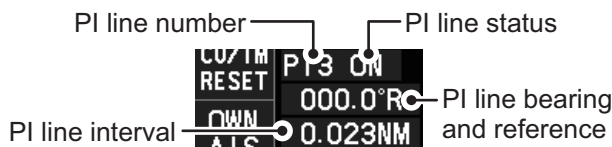
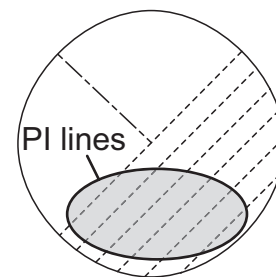
1. Open the menu.
2. Select [4 ALERTS].
3. Select [6 TARGET ALARM].
4. Select [2 ALR1 MODE] or [3 ALR2 MODE] as appropriate, then press the **ENTER MARK** key.
5. Select [IN] or [OUT] as appropriate, then press the **ENTER MARK** key.
[IN]: Targets entering the alarm zone trigger the alarm.
[OUT]: Targets leaving the alarm zone trigger the alarm.
6. Select [4 LEVEL].
7. Select the appropriate level of echo strength to trigger the alarm, then press the **ENTER MARK** key. [1]: weak echoes can trigger the alarm, [4]: only strong echoes trigger the alarm.
8. Select [1 BACK] to return to the [ALERT] menu.
9. Select [3 ALERT VOLUME].
10. Select [OFF], [LOW], [MID] or [HIGH] as appropriate, then press the **ENTER MARK** key.
Note 1: This setting is applied to all alarms output from this radar system.
Note 2: The [OFF] options is not shown for IMO-type radars.
11. Close the menu.



1.40 PI (Parallel Index) Lines

PI lines are useful for keeping a constant distance between own ship and a coastline or a partner ship when navigating.

You can control the presentation and interval of the PI lines from the [PI Line] box, which is at the lower-left corner of the screen (see example figure below).



1.40.1 How to show/hide the PI lines

You can show or hide the PI lines as required with one of the following procedures.

Using the on-screen box

1. Place the cursor on the PI line number or PI line status in the PI line box.
2. Spin the scrollwheel to select the PI line (PI1 to PI6) you want to show or hide.
Note: PI5 and PI6 are only available when [SET MAXIMUM PI LINES] is set to [1].
3. Left-click to toggle between [ON] (PI line is shown) or [OFF] (PI line is hidden).

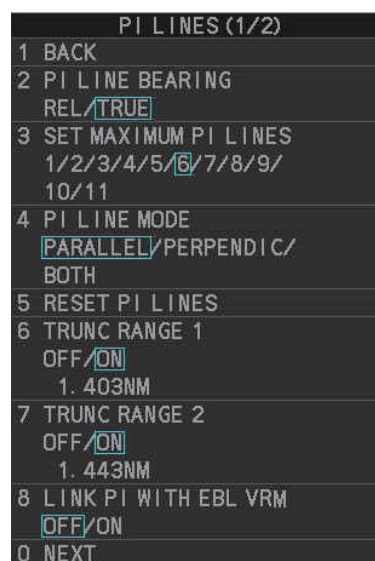
Using the control unit (RCU-031 only)

1. Press **6 INDEX LINE** to select the PI line you want to use (PI1 to PI6).
Note: PI5 and PI6 are only available when [SET MAXIMUM PI LINES] is set to [1].
2. Press and hold **6 INDEX LINE** to toggle the selected PI line on or off.

1.40.2 How to set the maximum number of lines to display

You can select the maximum number of PI lines to display. The actual number of lines visible depends on the line interval (see section 1.40.3).

1. Open the menu.
2. **For IMO-types**, select [3 NAV TOOLS].
For C-types, select [3 CURSOR•EBL•VRM].
3. Select [2 PI LINES]. The [PI LINES] menu appears.
4. Select [3 SET MAXIMUM PI LINES].
5. Select the appropriate option.
For IMO-types, the maximum number of PI lines available is 6.
For C-types, the maximum number of PI lines available is 11.
If you set [1] as the maximum, PI1 through PI6 are available for use. For all other options, only PI1 through PI4 are available for use. This setting is applied to all PI lines.
6. Close the menu.



1.40.3 How to change PI line bearing and interval

1. If not already displayed, show a PI line, referring to section 1.40.2.
2. Place the arrow on the PI line bearing and reference indication in the [PI Line] box.
3. Spin the scrollwheel to adjust the PI line bearing, between 000.0° to 359.9°.
4. Place the cursor on the PI line interval.
5. Spin the scrollwheel to adjust the PI line interval.
A negative interval value moves to the PI line to one side of the line which intersects the own ship position. A positive interval value moves the line to the other side of the own ship position.

How to link PI lines with the EBL and VRM (C-types only)

You can link the PI line bearing with the EBL's bearing and the PI line interval with the VRM distance; this allows you to adjust the PI lines with the EBL and VRM controls. To link the PI lines with the EBL/VRMs, do the following:

1. Open the menu.
2. Select [3 CURSOR•EBL•VRM].
3. Select [2 PI LINES]. The [PI LINES] menu appears.
4. Select [8 LINK PI WITH EBL VRM].
5. Select [ON] to link the PI lines with the EBL/VRMs, select [OFF] to disable the feature.
If you selected [ON], the PI line bearing and interval indications, in the PI line box, are hidden. To adjust the PI line bearing or interval, adjust the EBL or VRM accordingly.
6. Close the menu.

1.40.4 How to change the PI line bearing reference (C-type only)

PI line bearing reference can be relative to own ship's heading (Relative) or referenced to North (True) as below.

Note: For IMO-types, PI line bearing reference is fixed to North (True).

1. Open the menu.
2. Select [3 CURSOR•EBL•VRM].
3. Select [2 PI LINES]. The [PI LINES] menu appears.
4. Select [2 PI LINE BEARING].
5. Select [REL] or [TRUE] as appropriate, then press the **ENTER MARK** key.
6. Close the menu.

1.40.5 How to change the PI line orientation

PI lines orientation can be selected from parallel or perpendicular. This function is available when [SET MAXIMUM PI LINES] is set for other than [1].

1. Open the menu.
2. **For IMO-types**, select [3 NAV TOOLS].
For C-types, select [3 CURSOR•EBL•VRM].
3. Select [2 PI LINES]. The [PI LINES] menu appears.
4. Select [4 PI LINE MODE].
5. Select [PARALLEL], [PERPENDIC], or [BOTH]* as appropriate, then press the **ENTER MARK** key.
 - [PARALLEL]: when the PI line bearing is set to 0°, the lines are parallel with the heading line.
 - [PERPENDIC]: when the PI line bearing is set to 0°, the lines are perpendicular with the heading line.
 - [BOTH]: shows PI lines on both sides of the heading line. When the PI line bearing is set to 0°, the lines are perpendicular with the heading line.
6. Close the menu.

1.40.6 How to reset the PI lines to default (ship's heading)

You can automatically return PI lines to default orientation. The PI lines are reset in the following manner:

- [PARALLEL] or [BOTH] set as PI line orientation: parallel with the heading line.
- [PERPENDIC] set as PI line orientation: perpendicular with the heading line.

From the PI line box

1. Place the cursor on the PI line number or PI line status in the PI line box.
2. Spin the scrollwheel to select the PI line (PI1 to PI6) whose default orientation you want to reset.
3. Press and hold the **left button**. PI lines which are displayed on-screen are re-stored to their default orientation.

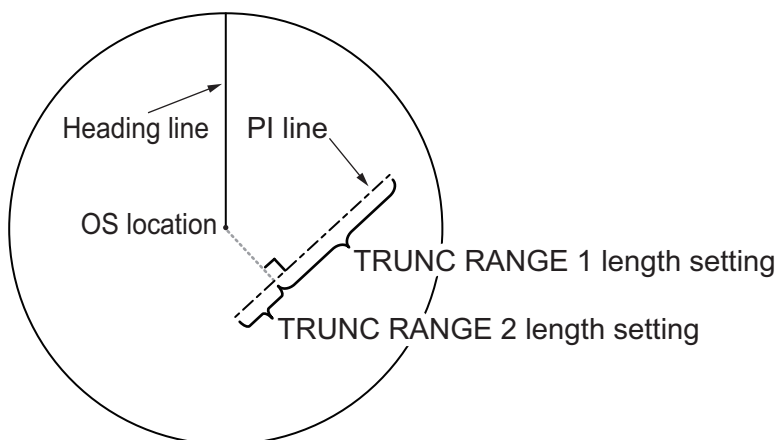
From the menu

1. Open the menu.
2. **For IMO-types**, select [3 NAV TOOLS].
For C-types, select [3 CURSOR•EBL•VRM].
3. Select [2 PI LINES]. The [PI LINES] menu appears.
4. Select [5 RESET PI LINES]. All PI lines are reset.
5. Close the menu.

1.40.7 How to change PI line length

You can change the length of the PI lines. This function is only available when [SET MAXIMUM PI LINES] is set to [1]. If not already displayed, you can show PI lines for which you wish to change the length by referring to section 1.40.2.

1. Open the menu.
2. **For IMO-types**, select [3 NAV TOOLS].
For C-types, select [3 CURSOR•EBL•VRM].
3. Select [2 PI LINES]. The [PI LINES] menu appears.
4. Select [6 TRUNC RANGE 1].
5. Select [ON].
6. Spin the scrollwheel to adjust the front PI line length. The available range is 0.000 NM to 24.000 NM. All PI lines beyond this mark will be hidden.
7. Left-click to confirm the setting.
8. Select [7 TRUNC RANGE 2].
9. Select [ON].
10. Spin the scrollwheel to adjust the front PI line length. The available range is 0.000 NM to 24.000 NM. All PI lines beyond this mark will be hidden.
11. To change the length of other PI lines, activate the line you wish to adjust, then repeat steps 1 through 10.
12. Close the menu.



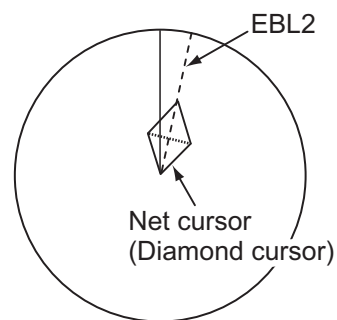
1.40.8 How to change the PI line color (C-types only)

You can change the PI line color with the following procedure.

1. Open the menu.
2. Select [3 CURSOR•EBL•VRM].
3. Select [2 PI LINES].
4. Select [0 NEXT] to show the second page of the menu.
5. Select [2 PI LINE COLOR].
6. Select the desired color from the menu. The options are: [RED] (red), [GRN] (green), [BLU] (blue), [YEL] (yellow), [CYA] (cyan), [MAG] (magenta), [WHT] (white), [ORG] (orange, default).
7. Close the menu.

1.41 How to Use the Net (Diamond) Cursor (C-type only)

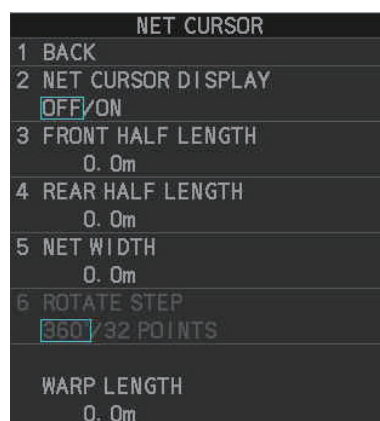
The net cursor is used to depict your fishing net on the radar display. It is especially useful for bottom trawlers for knowing where the net is located. Enter the dimensions of your net in the menu to show the net in scale on the display.



1.41.1 How to activate the net cursor

To activate the net cursor, do the following procedure.

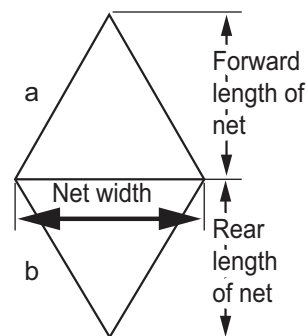
1. Open the menu.
2. **For IMO-types**, select [3 NAV TOOLS].
For C-types, select [3 CURSOR•EBL•VRM].
3. Select [5 NET CURSOR]. The [NET CURSOR] menu appears.



4. Select [2 NET CURSOR DISPLAY].
5. Select [ON] to activate, or [OFF] to deactivate the net cursor.
6. Close the menu.

1.41.2 How to set the net cursor dimensions and orientation

1. Open the menu.
2. **For IMO-types**, select [3 NAV TOOLS].
For C-types, select [3 CURSOR•EBL•VRM].
3. Select [5 NET CURSOR].
4. [3 FRONT HALF LENGTH].
5. Rotate the **scrollwheel**, then left-click to set the length of selected net section.
Note: The length appears in the [WARP LENGTH] indication. Adjust the values so that the total length for front and rear is equal to, or less than 3000m.
6. Select [4 REAR HALF LENGTH].
7. Rotate the **scrollwheel**, then left-click to set the length of selected net section.
Note: The length appears in the [WARP LENGTH] indication. Adjust the values so that the total length for front and rear is equal to, or less than 3000m.
8. Select [5 NET WIDTH].
Select [360°] or [32 POINTS], then left-click.
The net cursor moves in the same manner as EBL2 moves. Select [360°] to move with 0.1° steps, or select [32 POINTS] to move with 11.25° steps.
9. Rotate the **scrollwheel**, then left-click to set the net width.
10. Select [6 ROTATE STEP].
Select [360°] or [32 POINTS], then left-click.
The net cursor moves in the same manner as EBL2 moves. Select [360°] to move with 0.1° steps, or select [32 POINTS] to move with 11.25° steps.
11. Close the menu.
12. Insert the net cursor at the location of the net with the EBL offset function.
 - 1) Press the **EBL OFFSET** key.
 - 2) Move the cursor onto the net location, then left-click.
13. Rotate the **EBL** knob to adjust the orientation the net cursor until the cursor is in line with, or against, the tide direction.

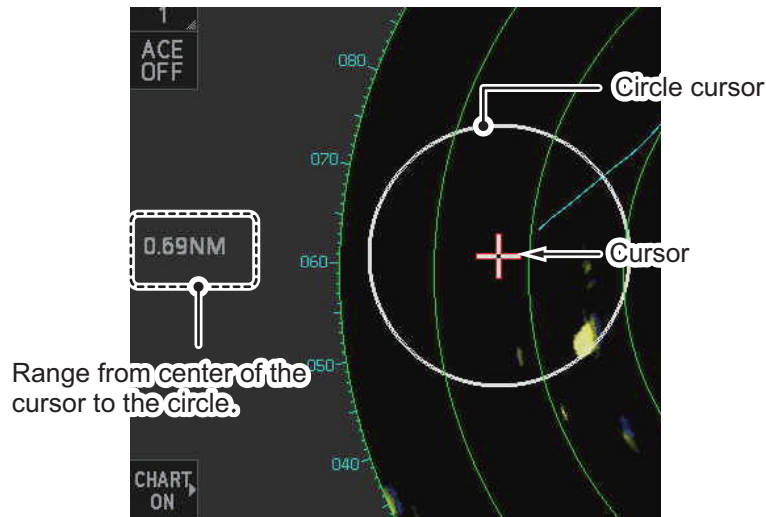


1.42 Circle Cursor (C-types only)

The CIRCLE cursor is a handy measuring tool which works similar to a VRM, in that the circle itself can be used to measure distance. However, where the VRM is fixed to a location on the screen, the circle cursor can be fixed to a geographical location or even another vessel's echo.

Note: Before using this feature, make sure the [MAP ON/OFF] button on the Instant-Access bar™ is set to [ON]. This feature is not available when the map is turned off.

1. If the cursor is hidden, show the cursor. For how to show the cursor, see section 1.7.1.
2. Place the cursor inside the operational display area, then right-click to show the [CURSOR] menu.
3. Select [0 NEXT], then select [4 CIRCLE CURSOR].
The cursor now appears with a large white circle, as shown in the following example.



4. Move the cursor to the location where you want to start measuring from.
5. Spin the scrollwheel to adjust the size (distance) of the circle cursor. The radius (distance from the cursor to the circle cursor) appears at the left-center of the screen.

Note: The size of the circle cursor is directly related to the range at the time it was inserted. If you increase/decrease the range after inserting the circle cursor, the on-screen size of the cursor also changes accordingly.

6. Left-click to fix the circle cursor to that location/echo.
To remove the circle cursor, repeat steps 2 and 3, then right-click.

1.43 Zoom

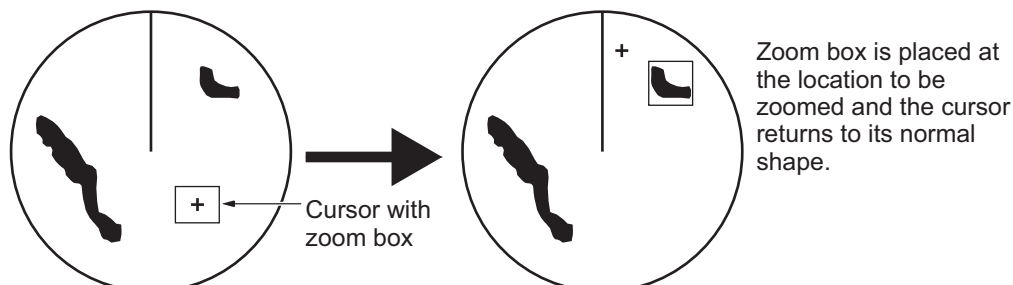
The zoom function enlarges an area of interest as large as twice the normal viewing size, in the [INFORMATION BOX]. Zoom can be selected using the control unit or from a preset function key (see section 1.8 for how to assign functions to the function keys).

Zoom is not available when the [INFORMATION BOX] setting for [TARGET DATA] is [LARGE].

To enable/disable the zoom magnification, select the appropriate zoom setting ([2TIMES]: Enables magnification at 2×, or [3TIMES]: Enables magnification at 3×) from the [ZOOM] option in the [INFORMATION BOX] menu. (See section 1.48.)

Note: The zoom function is not available when the [TRUE VIEW] located on the second page of the [ECHO] menu) is set to [ON].

1. Select the operational display area, then right-click to show the [CURSOR] context menu.
2. Select [ZOOM].
3. Place the cursor inside the operational display area, then left-click. The cursor is now displayed with a zoom box.
4. Place the cursor and zoom box at the location you wish to zoom, then left-click to anchor the box.
If the zoom box is not placed where you intended to place it, left-click twice, then move the box to the correct place. Left-click to anchor the box.
5. Right-click to complete the procedure. The selected area is displayed on the right-side of the screen and the cursor returns to normal shape.



To disable the zoom function, repeat steps 1 to 3. At step 3, the zoom box is removed from the display.

Note 1: Where the zoom function is assigned to a function key, press the function key to cycle through the zoom settings in the following order: [OFF] → [2TIMES] (2× magnification) → [3TIMES] (3× magnification) → [OFF]...

This operation works in direct relation with the settings selected from the [ZOOM] option in the [INFORMATION BOX] menu. To use the zoom function on a different area, do the procedure (step 1 to step 5) listed above.

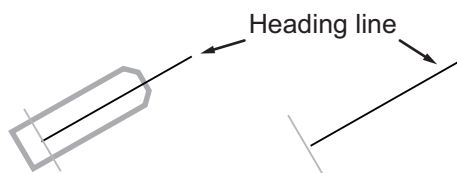
Note 2: For C-types only, some marks can be inserted from the zoom window. Marks inserted in this manner appear on the main screen and are not shown in the zoom window. See the list below for mark availability with this feature.

- **Available:** TT, map mark, waypoints, GOTO point (requires [SET GOTO METHOD] to be set as [1POINT])
- **Not available:** Nav line, drop mark, origin mark, area mark, MOB, GOTO point (when [SET GOTO METHOD] is set as [100POINTS]), mark received from an external source.

1.44 How to Use Marks

1.44.1 Heading line mark

The heading line is a line from the own ship position to the outer edge of the radar display area and appears at zero degrees on the bearing scale in HEAD UP mode. The orientation of the line changes depending on the ship orientation in NORTH UP and True Motion modes.



How to hide the heading line temporarily

To temporarily extinguish the heading line to look at targets existing dead ahead of own ship, press and hold the **HL OFF** key, or place the cursor on the [HL OFF] box in the InstantAccess bar™ then left-click and hold.

In addition to the heading line, the stern marker and all graphics within the operational display area are also erased. To redisplay the heading line, etc., release the key or the **left button**.

How to change the heading line thickness (C-types only)

You can change the thickness of the heading with the following procedure.

1. Open the menu.
2. Select [2 MARKS•PLOTTER], then select [0 NEXT].
3. Select [2 HEADING LINE WIDTH].
4. Select the desired thickness.
 - [NORMAL]: the heading line appears at standard width.
 - [X3]: the heading appears three times thicker than at [NORMAL].
 - [X5]: the heading appears five times thicker than at [NORMAL].
 - [X7]: the heading appears seven times thicker than at [NORMAL].
5. Close the menu.

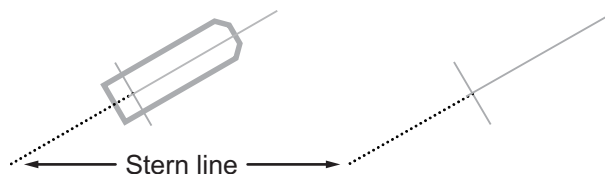
MARKS•PLOTTER (2/2)	
1	BACK
2	HEADING LINE WIDTH NORMAL/X3/X5/X7
3	HEADING LINE COLOR RED/GRN/BLU/YEL/ CYA/MAG/WHT
4	GRID COLOR RED/GRN/BLU/YEL/ CYA/MAG/WHT
5	NORTH MARK WIDTH NORMAL/X3/X5/X7

How to change the color of the heading line (C-types only)

1. Open the menu.
2. Select [2 MARKS•PLOTTER], then select [0 NEXT].
3. Select [3 HEADING LINE COLOR].
4. Select the desired color.
5. Close the menu.

1.44.2 How to hide/show the stern mark

The stern marker, which is a dotted line, appears opposite to the heading line.



To display or erase this marker do the following:

1. Open the menu.
2. **For IMO-types**, select [2 MARKS]
For C-types, select [2 MARKS•PLOTTER].
3. **For IMO-types**, select [3 STERN MARK].
For C-types, select [7 STERN MARK].
4. Select [ON] or [OFF] as appropriate.
5. Close the menu.

1.44.3 North mark

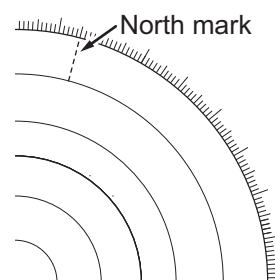
The north mark is displayed as a short dotted line on the inside edge of the operational display area. In HEAD UP mode, the north mark moves according to the own ship bearing.

The north mark is hidden when the radar is in standby mode.

How to change the mark thickness (C-types only)

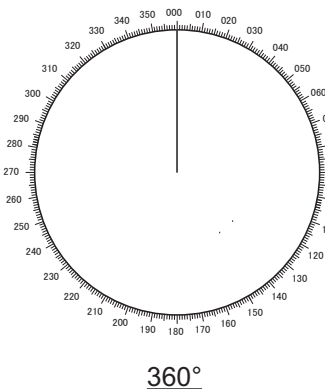
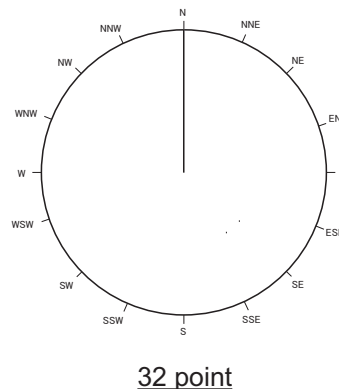
If your radar is a C-type, you can change the thickness of the north mark with the following procedure.

1. Open the menu.
2. Select [2 MARKS•PLOTTER], then select [0 NEXT].
3. Select [5 NORTH MARK WIDTH].
4. Select the desired width.
 - NORMAL: North mark is display with the normal width.
 - X3: Increase width to three times the size of normal.
 - X5: Increase width to five times the size of normal.
 - X7: Increase width to seven times the size of normal.
5. Close the menu.



1.44.4 Bearing ring

The bearing ring appears on the outer edge of the operational display area and is used to estimate the bearing of echoes on the screen.



For IMO-types, the display format for the bearing ring is fixed at [360°] and cannot be changed. **For C-types**, you can select either [360°] or [32 POINTS], however, when using HEAD UP or STERN UP orientation mode, this setting is fixed at [360°].

Changing the display format of the bearing ring (C-types only)

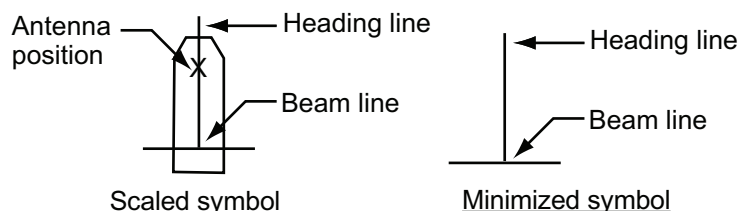
1. Open the menu.
2. Select [3 CURSOR•EBL•VRM].
3. Select [7 BEARING CURSOR].
4. Select [360°] or [32 POINTS] as desired.
5. Close the menu.

Changing the color of the bearing ring (C-types only)

1. Open the menu.
2. Select [3 CURSOR•EBL•VRM], then select [0 NEXT].
3. Select [2 BEARING CURSOR COLOR].
4. Select the desired color.
If you select [OFF], the cursor color is determined by the selected color scheme in use (see section 1.46).
5. Close the menu.

1.44.5 How to set up the own ship mark

The own ship mark indicates own position on the display. It can be turned on or off and its configuration selected from the [MARK] menu. Two configurations are available: minimized symbol and scaled symbol. If the largest dimension of the symbol gets smaller than 6 mm, the scaled symbol will disappear and the own ship mark will be shown as a minimized symbol. The scaled symbol is scaled to indicate the length and beam of the vessel. Ship's dimensions should be entered at installation to use the scaled ship symbol.



1. Open the menu.
2. **For IMO-types**, select [2 MARKS]
For C-types, select [2 MARKS•PLOTTER].
3. **For IMO-types**, select [2 OWN SHIP MARK].
For C-types, select [6 OWN SHIP MARK].
4. Select [MINIMIZED] or [SCALED] as appropriate.
5. Close the menu.

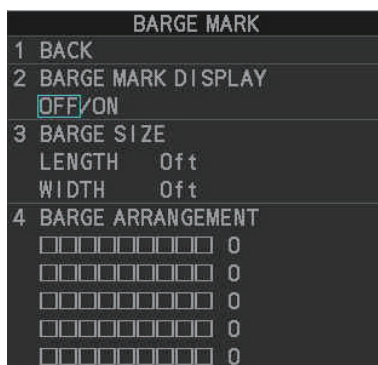
1.44.6 How to set the barge marker

You can mark the locations of barges on the display with icons.

Note: For IMO-types, this function is not available if [ECDIS] is set to [SERIAL] or [LAN] at installation. Consult your dealer for details.

Set up barge information as follows:

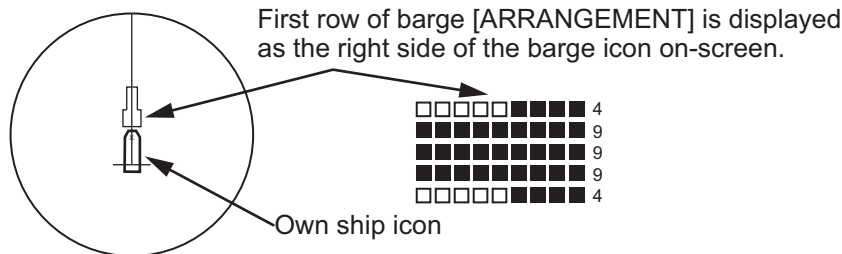
1. Open the menu.
2. **For IMO-types**, select [2 MARKS].
For C-types, select [2 MARKS•PLOTTER].
3. **For IMO-types**, select [6 BARGE MARK].
For C-types, select [9 BARGE MARK].
4. Select [2 BARGE MARK DISPLAY].



5. Select [ON] to display barge marks, [OFF] to hide barge marks, as appropriate, then press the **ENTER MARK** key.

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6. Select [3 BARGE SIZE]. Spin the scrollwheel, then left-click to enter the [LENGTH] and [WIDTH] of the barge.
7. Select [4 BARGE ARRANGEMENT]. This item lets you set a single barge or a barge chain. Spin the scrollwheel to select a value, then left click to move the cursor to the next line. Select number of barges (max. 9) to display. As you spin the scrollwheel the squares light or extinguish and the number of barges selected appears at the right side.

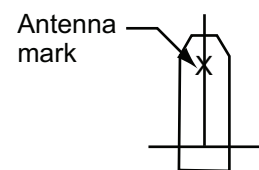


You can also use the number keys on the Control Unit to select the number of barges.

8. Close the menu. The barge mark is now displayed as shown in the example figure on the previous page.

1.44.7 Antenna mark

When the own ship mark menu is set to [SCALED], the antenna location is shown as a blue cross. The location of the antenna, and therefore the antenna mark, is set at installation.

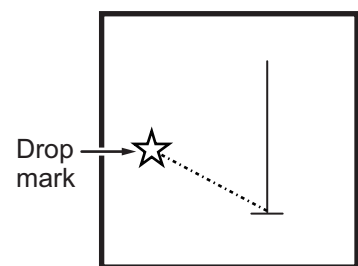


1.45 Drop Mark

The operator can inscribe a drop mark at a selected location to find the range and bearing from own ship to the mark. This can be useful for marking a point to avoid while navigating to a destination.

To active the drop mark feature, do the following:

1. Open the menu.
2. **For IMO-types**, select [2 MARKS].
For C-types, select [2 MARKS•PLOTTER].
3. **For IMO-types**, select [4 DROP MARK].
For C-types, select [8 DROP MARK].
4. Select [ON] to enable [DROP MARK]. Two indications appear at the bottom of the screen.



Drop mark boxes show the mark number, bearing and range to the mark.

5. Close the menu.

1.45.1 How to inscribe a drop mark

1. Select a drop mark box, then left-click.
2. Place the cursor at the location to inscribe the drop mark, then left-click.
The drop mark box shows the range and bearing to the marked location.

1.45.2 How to erase drop marks

Select the drop mark to be erased, then press and hold the **left button**. The mark is erased and the range/bearing indications are no longer shown.

1.46 Brilliance and Color Schemes

Brilliance and color schemes are preset “palettes” that let you change the brilliance and color of on-screen data together.

1.46.1 How to select a brilliance and color scheme

The system has four presets of brilliance and color settings to choose from. Each preset is customizable (see section 1.46.3).

The following list shows each preset along with their default settings.

- [PLT1] (default [DAY-GRY]): preset for use in daylight with a gray background.
- [PLT2] (default [DAY-BLU]): preset for use in daylight with a blue background.
- [PLT3] (default [DUSK-BLU]): preset for use at dusk with a blue background.
- [PLT4] (default [NIGHT-GRY]): preset for use at night with a gray background.

To change the current scheme, do the following:

1. Place the cursor on the [PLT] indication, inside the brilliance settings box at the bottom-left of the screen.

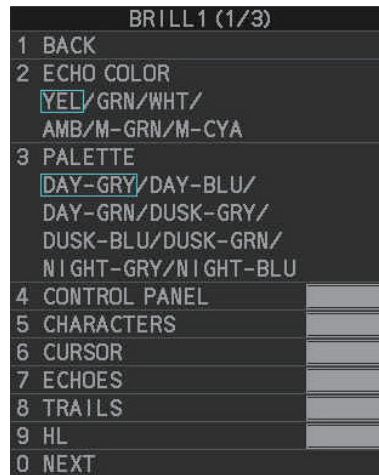
Place cursor here, then left-click to change brilliance preset, right-click to open the [BRILL] menu.



2. Spin the scrollwheel to show the scheme you want to use, then left-click.
You can also left-click the indication to cycle through the schemes.

1.46.2 How to change the color schemes settings

- Referring to section 1.46.1, select the scheme whose settings you want to change.
- Open the menu.
- Select [9 INITIAL SETTINGS].
- Select [2 BRILL]. The [BRILL] menu appears.



- Select the appropriate item to adjust.

Menu item	Description
Page 1	
[2 ECHO COLOR]	Changes the color used to display echoes. The available colors are: [YEL] (yellow), [GRN] (green), [WHT] (white), [AMB] (amber), [M-GRN]* (mutli-green), [M-CYA]* (multi-cyan). *: [M-GRN] and [M-CYA] are not shown on IMO-types. If you select [M-GRN] or [M-CYA], the echo color changes depending on the echo strength. <ul style="list-style-type: none"> [M-GRN]: red for strong echoes, ranging through to green for weak echoes. [M-CYA]: red for strong echoes, ranging through to green for weak echoes.
[3 PALETTE]	Changes the color scheme (see subsection 1.46.3).
[4 CONTROL PANEL]	Adjusts control panel back-light brilliance.
[5 CHARACTERS]	Adjusts on-screen text brilliance.
[6 CURSOR]	Adjusts cursor brilliance.
[7 ECHOES]	Adjusts the echo brilliance.
[8 TRAILS]	Adjusts echo trail brilliance.
[9 HL]	Adjusts heading line brilliance.
Page 2	
[2 RANGE RINGS]	Adjusts range ring brilliance.
[3 BEARING CURSOR]	Adjusts bearing cursor brilliance.
[4 EBL]	Adjusts EBL line brilliance.
[5 VRM]	Adjusts VRM line brilliance.
[6 PI LINES]	Adjusts PI line brilliance.
[7 TT SYMBOLS]	Adjusts target trail symbol brilliance.
[8 AIS SYMBOLS]	Adjusts AIS symbol brilliance.
[9 L/L GRID]	Adjusts latitude/longitude grid brilliance.
Table continued on the following page.	

Menu item	Description
<i>Table continued from the previous page.</i>	
Page 3	
[2 PLOTTER]	Adjusts latitude/longitude grid brilliance.
[3 CHART]	Adjusts chart brilliance. (C-types only.)
[4 DEPTHLINE]	Adjusts depth line (bathymetry) brilliance. (C-types only.)

6. Spin the scrollwheel, or press the appropriate menu number to change or adjust the settings, then left-click, or press the **ENTER MARK** key to confirm the setting.
7. Close the menu.

1.46.3 How to change the color schemes settings

This radar provides eight sets of color and brilliance schemes to match any ambient lighting condition and can be assigned to a [BRILL] box preset.

1. Place the cursor on the [PLT] indication, inside the brilliance settings box at the bottom-left of the screen.
The indication appears highlighted with a light-blue colored box.
Right-click to show the [BRILL1] box menu.
2. Select [3 PALETTE].
3. Select the appropriate palette, then press the **ENTER MARK** key. The default settings for each palette are shown in the following table.

Display item	Palette							
	DAY-GRY	DAY-BLU	DAY-GRN	DUSK-GRY	DUSK-BLU	DUSK-GRN	NIGHT-GRY	NIGHT-BLU
Screen brilliance	100	100	100	40	40	40	4	4
Panel brilliance	15	15	15	7	7	7	3	3
Character brilliance	8	8	8	8	8	8	8	8
Cursor brilliance	15	15	15	12	12	12	12	12
Echo brilliance	15	15	15	12	12	12	12	12
Trail brilliance	9	9	9	9	9	9	9	9
Heading Line brilliance	15	15	15	15	15	15	15	15
Stern Line brilliance	15	15	15	7	7	7	15	15
Bearing ring brilliance	15	15	15	6	6	6	15	15
EBL brilliance	15	15	15	12	12	12	12	12
VRM brilliance	15	15	15	12	12	12	12	12
PI Line brilliance	15	15	15	12	12	12	12	12
TT symbol brilliance	15	15	15	12	12	12	12	12
AIS symbol brilliance	15	15	15	12	12	12	12	12
LL Grid brilliance	15	15	15	12	12	12	12	12
Mark brilliance	15	15	15	12	12	12	12	12
Chart brilliance ^{*1}	7	7	7	6	6	6	6	6
Depth line brilliance ^{*1}	7	7	7	6	6	6	6	6
Character color ^{*2}	White	White	Green	White	White	Green	Orange	White
<i>Table continued on the following page.</i>								

1. OPERATIONAL OVERVIEW

Display item	Palette							
	DAY-GRY	DAY-BLU	DAY-GRN	DUSK-GRY	DUSK-BLU	DUSK-GRN	NIGHT-GRY	NIGHT-BLU
<i>Table continued from the previous page.</i>								
Background color* ²	Gray/black	Blue/dark blue	Gray/black	Dark gray/dark blue	Dark blue/blue	Dark gray/black	Dark gray/black	Dark blue/blue
ODA color* ²	Black	Dark blue	Black	Dark blue	Blue	Black	Black	Blue
* ¹ : Available for C-types only								
* ² : This setting is fixed and cannot be changed.								

4. Close the menu.

1.47 How to Display and Set Up Navigational Data

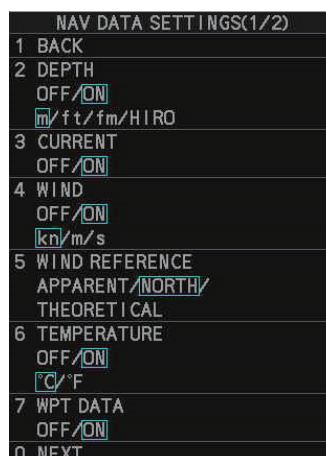
Wind, depth, ocean current, water temperature, date and time and waypoint data can be displayed on this radar, however appropriate sensors are required.

1.47.1 How to set up the navigational data

1. Open the menu.
2. Select [7 INFORMATION BOX].



3. Select [4 NAV DATA SETTINGS].



4. Referring to the table below, set the appropriate menu item(s).

Menu item	Available settings
[DEPTH]	[OFF], [ON]; [m], [ft]
[DEPTH GRAPH SCALE]* ¹	[10], [20], [50], [100], [200], [500] (m)
[DEPTH MARK]* ¹	[000] to [500] (m)
[CURRENT]	[OFF], [ON]
[WIND]	[OFF], [ON]; [kn], [m/s]
[WIND REFERENCE]	[APPARENT], [NORTH], [THEORETICAL]
[TEMPERATURE]	[OFF], [ON]; [°C], [°F]
[WPT DATA]* ¹	[OFF], [REL], [TRUE]
[MOB DATA]* ²	[OFF], [ON]
[HIRO SETTING]* ²	[1.0000] to [1.9999]
* ¹ : IMO-types only; * ² : C-types only.	

5. Close the menu.

1.47.2 How to display navigational data

1. Open the menu.
2. Select [7 INFORMATION BOX].
3. Select [3 DISPLAY NAV DATA].
4. Select [ON] to display navigational data, [OFF] to hide navigational data, then press the **ENTER MARK** key.
5. Close the menu.

1.48 How to Use the Information Box

The information box shows target data, navigational data and zoomed areas of the radar display. To set up the information box, do the following:

1. Open the menu.
2. Select [7 INFORMATION BOX].
3. Select and set the appropriate menu item, referring to the table below.
4. Close the menu.

Menu item	Settings	Description
[2 OWN SHIP INFO]	See section 1.10, section 1.11 and section 1.12 for details.	Set up various own ship information, such as sensors used for position fix, date and time format/offsets, heading and speed sensors used.
[3 DISPLAY NAV DATA]	<ul style="list-style-type: none"> • OFF • ON 	<ul style="list-style-type: none"> • Disable navigational data display. • Enable navigational data display.
[4 NAV DATA SETTINGS]	See section 1.47 for details.	Set up the format in which various navigational data is displayed in the [INFORMATION BOX].
[5 ZOOM]	<ul style="list-style-type: none"> • OFF • 2TIMES • 3TIMES 	<ul style="list-style-type: none"> • Disable zoom magnification. • Set zoom magnification at 2× • Set zoom magnification at 3×
<i>Table continued on the following page.</i>		

1. OPERATIONAL OVERVIEW

Menu item	Settings	Description
<i>Table continued from the previous page.</i>		
[6 Z O O M D I S P L A Y]	<ul style="list-style-type: none"> • STAB GND • STAB HDG • STAB NORTH • TT TRACK 	<ul style="list-style-type: none"> • Ground stabilized zoom (Geographically fixed). • Heading stabilized zoom (Relative). • North stabilized zoom (True). • Tracked targets are zoomed.
[7 TARGET DATA]	<ul style="list-style-type: none"> • 1BOX • 2BOX • 3BOX • LARGE • TT 5BOX 	See the figure on the following page.
[8 DISPLAY TT COORDS]	<ul style="list-style-type: none"> • OFF • ON 	<ul style="list-style-type: none"> • Disable coordinates display for TT targets. • Enable coordinates display for TT targets. When enabled, the data fields for CPA, TCPA, BCR and BCT are replaced with the coordinates for the TT target:
[9 NAV DATA COLOR]	<ul style="list-style-type: none"> • STD • CHART COLOR 	<ul style="list-style-type: none"> • Data appears in green color. • Data color is based on chart. <p>Note: When CHART COLOR is selected, invalid data and low-integrity data appear in orange or yellow color respectively, regardless of the chart color.</p>

Zoom and navigational data are displayed here.	Zoom and navigational data are displayed here.	Zoom and navigational data are displayed here, but can be hidden by TT/AIS data.	Zoom and navigational data are displayed here.	Only TT Data is displayed
Zoom and navigational data are displayed here.	Zoom and navigational data are displayed here, but can be hidden by TT/AIS data.	Zoom and navigational data are displayed here, but can be hidden by TT/AIS data.		Only TT Data is displayed
Zoom can be displayed here, but can be hidden by TT/AIS data.	Zoom can be displayed here, but can be hidden by TT/AIS data.	Zoom can be displayed here, but can be hidden by TT/AIS data.	Only TT/AIS Data is displayed in the large box. Up to three AIS targets or up six TT targets. For MU-270W configurations, up to two TT targets can be shown.	Only TT Data is displayed
1BOX	2BOX	3BOX	LARGE	TT 5BOX (C-types only)

- TT/AIS data displayed in the information box is shown in order of acquisition in the bottom half of the box.
 - When the target data is no longer displayed (TT is cancelled, etc.) in the upper box, the previous display is restored.
- When using the 2BOX or 3BOX setting and the bottom half of the information box is full, the upper half is overlaid with the newly aquired TT/AIS target data.
- Each box may display up two TT targets or one AIS target. (For MU-270W configurations, up to 3three TT targets can be shown)
 - When TT 5 BOX is selected, only TT data is displayed. AIS data, ZOOM and other data are not displayed.

1.49 Interswitch

The interswitch of this radar uses an Ethernet to transfer video and control signals. A digital signal transfers the video and control signals. You can connect up to four antennas and four display units. Set radar display and antenna groups from the [ANTENNA SELECT] display.

When you switch to a different antenna, the heading skew and timing adjustment (set at installation) for that antenna are automatically applied.

The [ANTENNA] box at the upper left position shows current antenna selection.



Antenna box

ANTx: "x" indicates antenna selected.

(M) or (S): indicates antenna is (M)aster or (S)lave.

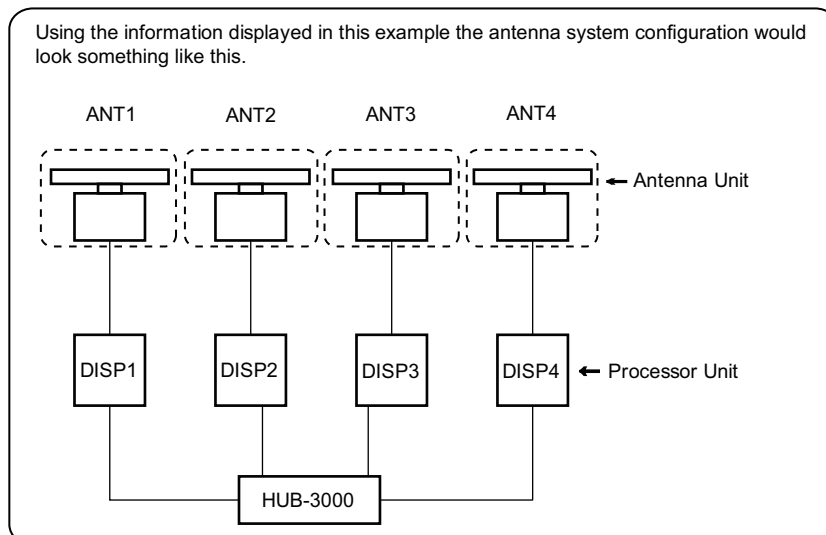
X-Band or S-Band: indicates antenna bandwidth.

1.49.1 How to display antenna information

1. Open the menu.
2. Select [9 INITIAL SETTINGS].
3. Select [3 SELECT ANTENNA]. The [SELECT ANTENNA] menu appears.

Note: You can also access the [SELECT ANTENNA] menu by right-clicking the [ANTENNA] box at the top-left of the screen.

SELECT ANTENNA	
1	BACK
ANT 1 :	X-BAND
25UP	Main Top
ANT 2 :	S-BAND
30UP	Main 2nd
ANT 3 :	X-BAND
12	Fore
ANT 4 :	X-BAND
12	Aft
OWN RADAR NO.1	
2 DISP1	ANT1
	MASTER
DISP2	ANT2
	MASTER
DISP3	ANT3
	MASTER
DISP4	ANT4
	MASTER
9	SAVE INTER-SWITCH
	NO / YES
0	CLEAR INTER-SWITCH
	NO / YES



The following information is displayed in the [SELECT ANTENNA] menu:

- Radar band, output power and antenna position of each antenna currently powered. (If an antenna is not powered, its data area is blank.)
- Own ship radar number (radar in use).
- Current antenna and display combinations.

Note: For configurations with processors assigned as DISP5/DISP6/DISP7/DISP8 at installation, the processor unit automatically connects to the system as [SLAVE] when first turned on. You can change this setting after the first connection. See section 1.49.2.

1.49.2 How to preset antenna and display combinations

You can preset the antenna and display combinations for each antenna and display in the radar system. As an example, the procedure below shows how to select the no. 1 antenna unit for the no. 2 display unit.

1. Open the menu.
2. Select [9 INITIAL SETTINGS].
3. Select [3 SELECT ANTENNA]. The [SELECT ANTENNA] menu appears.
4. Select the display unit for which to select an antenna (at the next step). For the purpose of this example, select [DISP2] to select the no. 2 display unit. The indication for the antenna is highlighted.
5. Spin the scrollwheel to toggle between [MASTER] and [SLAVE]. The MASTER system passes on settings such as [CPA], [TCPA] and alarm settings to SLAVE radars connected to the same network.
6. Repeat steps 2 and 3 to set other display and antenna combinations.
7. Select [SAVE INTER-SWITCH], then select [YES] to save your selections.
8. Close the menu.

Antenna selection considerations

- The Inter-switch feature for this radar is available only with other radars of the same series. Do not connect radars from other series (EG: FAR-3000, FAR-2××7, etc.).
- An antenna unit cannot be controlled from multiple display units. Select one Master display unit for one antenna unit. If two antenna units are set as masters, the display last-set as master becomes the master and all other displays are automatically changed to slave.
- An antenna unit without a Master display cannot be selected on the sub display units. If there is no antenna unit set as master, the lowest number display is automatically set as master.
- If the Alert "EXT RADAR ERROR" appears, do one of the following, as applicable:
 - If only your antenna is not displayed on the [ANT SELECT] display, the LAN line in the Processor Unit may be faulty. In this case, use the standalone mode.
 - If the antenna that was in use does not appear on the [ANT SELECT] display, the LAN line in other Processor Unit may be faulty. In this case, see the preceding page for how to select a different antenna unit
- When the Network fails, the Interswitch does not work, but standalone operation is possible.
- Radar functions are controlled independently, dependently or commonly depending on selection as [MASTER] or [SLAVE] (see the table on the following page).

1. OPERATIONAL OVERVIEW

Radar Functions	Control	Master Display Option	Slave Display Option
AIS function	Independent	Desired value can be set	Desired value can be set
Brilliance			
Echo trails			
EBL			
Lat/long data			
Presentation mode			
Speed data			
Target alarm			
TT, AIS on/off			
TT, AIS track interval			
Vector mode			
Vector time			
VRM			
Wiper			
Zoom			
TT COLLISION alarm			
Range* ² (Sampling at Master)			
A/C SEA	Desired value can be set		
A/C RAIN			
Automatic Clutter Elimination (ACE)			
Gain			
IR* ¹	Dependent Control	Desired value can be set	Cannot control
Echo stretch	Independent	Desired value can be set	Desired value can be set
Echo averaging	Independent	Desired value can be set	Desired value can be set
Picture setting (Customize echo)	Dependent Control	Desired value can be set	Cannot control
STBY/TX			
Tuning			
Reference Point	Independent	Desired value can be set	Desired value can be set
TT LOST warning	Common Control	Item Commonly Controlled	Item Commonly Controlled
TT alerts ACK			
TT acquire			
TT/AIS AZ			
*1: When the connected radar antenna is a FAR-3xx0/FAR-2xx8 series magnetron-type, and the radar is assigned as “Slave”, the desired value can be set for this functions. For FAR-3xx0/FAR-2xx8 series SSD-types, this functions cannot be controlled.			
*2: The desired value can be set when the radar is assigned as “Slave”, however the maximum displayable range is dependent on the setting at the “Master” radar.			

1.49.3 How to clear the interswitch

You can clear the interswitch settings by following the procedure below.

1. Open the menu.
2. Select [9 INITIAL SETTINGS].
3. Select [3 SELECT ANTENNA]. The [SELECT ANTENNA] menu appears.
4. Select [0 CLEAR INTER-SWITCH].
5. Select [YES] to clear the interswitch settings. The antenna settings are restored to default.

1.50 Performance Monitor

The performance monitor, installed in the antenna unit, produces a visual indication on the radar display screen when the radar transmitter power and radar receiver sensitivity are within the prescribed limits.

Note 1: The performance monitor and related features are not available from FAR-2x58 monitors which are assigned as [SUB] at installation.

Note 2: The performance monitor and related features are not available from FAR-2268DS monitors.

1.50.1 How to activate/deactivate the performance monitor

1. Set the radar to TX (transmit) mode.
2. Open the menu.
3. Select [1 ECHO].
4. Select [5 PERFORMANCE MONITOR].
5. Select the appropriate setting, then press the **ENTER MARK** key.
 - [OFF]: Deactivate the performance monitor.
Note: You can also deactivate the performance monitor by adjusting the range manually.
 - [ON]: Activate the performance monitor and show the graph.
 - [GRAPH ONLY]: Show the performance monitor graph, however the performance monitor is not activated.
6. Close the menu.

When the performance monitor is active, the indication "PM" appears in yellow characters at the top of the display.

Note: If the blind sector and the direction of the PM antenna overlap one another, turn off the blind sector in order to display echoes correctly.

1. OPERATIONAL OVERVIEW

The radar is automatically set as follows when the performance monitor is activated.

Setting	Setting at PM activation	Adjustable while PM is active	Setting at PM deactivation
[GAIN]	70 * ¹	Yes * ³	Setting before PM activation.
[SEA]	0	No	Setting before PM activation.
[SEA AUTO]	MAN	No	Setting before PM activation.
[RAIN]	0	No	Setting before PM activation.
[RAIN AUTO]	MAN	No	Setting before PM activation.
[TUNE] (Shown for magnetron radars only)	AUTO	No	Setting before PM activation.
[TX CH] (Shown instead of [TUNE] for solid-state radars only)	CH1	No	Setting before PM activation.
[ACE]	OFF	No	Setting before PM activation.
[ES]	OFF	No	Setting before PM activation.
[EAV]	OFF	No	Setting before PM activation.
[IR]	2	No	Setting before PM activation.
[NOISE REJECT]	OFF	No	Setting before PM activation.
[VIDEO CONTRAST]	4-B	No	Setting before PM activation.
[PULSE]	LONG	No	Setting before PM activation.
[2ND ECHO REJ]	OFF	Yes	Setting before PM activation.
[LOW LEVEL ECHO]	Previous setting kept, fixed.	No	Setting before PM activation.
[WIPER]	OFF	No	Setting before PM activation.
[CUSTOMIZED ECHO]	Previous setting kept, fixed.	No	Return to active display.
[PRESENTATION MODE]	No change. * ²	Yes	Setting at PM deactivation.
[RANGE]	24 NM, 24 SM, 48 km, 48 kyd (Settings other than NM are available for C-types only.)	Yes * ⁴	Setting before PM activation.
[OFF CENTER]	OFF	Yes	Setting at PM deactivation.
ANT REVOLUTION	24 rpm	No	Setting before PM activation.

*¹: Gain is automatically set according to [PM GAIN ADJ], if it was adjusted at installation.

*²: [NORTH UP RM] is selected when the [PRESENTATION MODE] is set to [NORTH UP TM].

*³: The setting is not memorized.

*⁴: The performance monitor is deactivated if the range is changed manually.

1.50.2 How to check the radar's performance

The range scale is automatically set to 24 NM. The radar screen will show arcs. If the radar transmitter and receiver are in good working conditions in as much as the original state when the monitor was turned on, the innermost arcs should appear between 8.0 NM to 19.8 NM. The performance monitor can observe a total of 10 dB loss in transmitter and receiver.

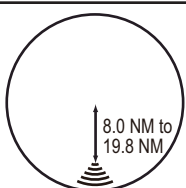
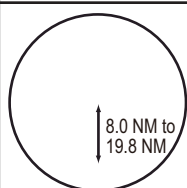
Note 1: The performance monitor and related features are not available from FAR-2x58 monitors which are assigned as [SUB] at installation.

Note 2: The performance monitor and related features are not available from FAR-2268DS monitors.

How to set the number of arcs

1. Open the menu.
2. Select [1 ECHO].
3. Select [6 PM ARC].
4. Select [2], [3], [5] or [6] as appropriate, then press the **ENTER MARK** key.
5. Close the menu.

The figure belows shows an example where [PM ARC] is set to [5].

Display	Radar State	Display	Radar State
	Transmitter: normal Receiver: normal		Transmitter and receiver: No arc indicates 10 dB loss. Contact your dealer for advice. (For magnetron radars, have a technician check the magnetron.

Note 1: The lengths of the arcs can vary according to installation environment. Judge the strength of the echo that appears within 60° from the arc location to confirm if the radar is working properly or not.

Note 2: The location of the arcs changes according to the [PM ARC] setting.

Turn the performance monitor off when finished.

1.51 How to Change the Reference Position

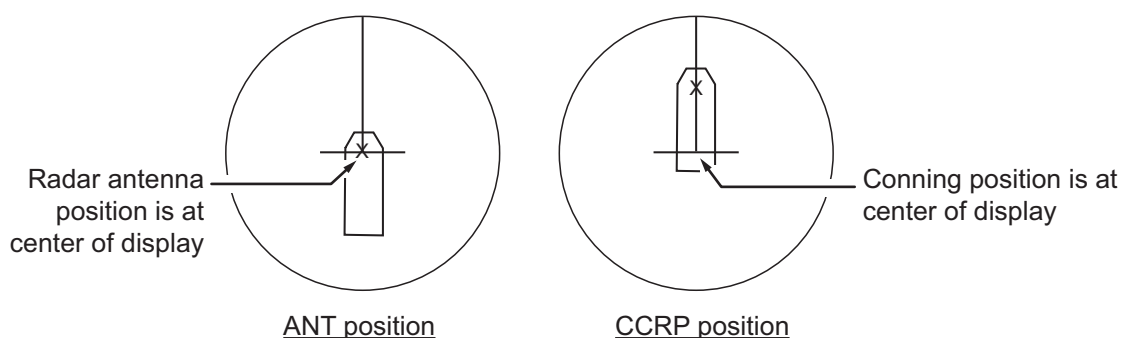
The reference position for measurements (range, bearing, etc.) and markers (heading line, stern mark, etc.) can be the radar antenna position ([ANT]) or the consistent common reference point ([CCRP]).

The reference position is a location on own ship to which all horizontal measurements, for example range, bearing, relative course, relative speed, closest point of approach (CPA) or time to closest point of approach (TCPA), are normally referenced.

[CCRP] for this series of radars is fixed at the conning position and [ANT] is fixed at the radar antenna position.

To change the reference position, use the trackball to place the cursor over the "REF POINT" indication at the top of the screen, then left-click to select [ANT] or [CCRP] as required. You can also change the reference by spinning the scrollwheel when the cursor is placed over the indication.

The position of the own ship marker changes according to reference position as shown below. If the CCRP is positioned outside of the effective display area, the bearing scale is indicated with the appropriate reduced detail.



Range and bearing are measured and graphics are drawn according to reference position as in the table below.

Category	Item	Reference point	
		ANT	CCRP
Range and bearing measurements	EBL	Range and bearing measured from antenna position.	Range and bearing measured from CCRP.
	VRM		
	Cursor		
	PI line		
	Range ring		
	Drop mark		
Graphics	Heading line	Drawn from antenna position.	Drawn from CCRP.
	Stern mark		
	Beam line		
	Own ship vector		
	Own ship track		
Bearing cursor		Drawn with antenna position at center.	Drawn with CCRP at center.
Course, speed		Calculated with antenna position at center.	Calculated with CCRP at center.
Table continued on following page			

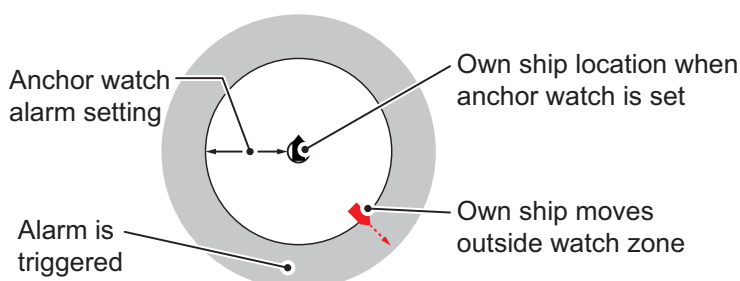
Category	Item	Reference point	
		ANT	CCRP
Table continued from previous page			
CPA, TCPA		Calculated with antenna position at center.	Calculated with CCRP at center.
BCR, BCT		Calculated from bow position.	
Own ship data	Heading	Data is taken from respective sensors, regardless of reference point selected.	
	Speed		
	Course over ground		
	Speed over ground		
	Own L/L	Location of the CCRP.	

Note: When the antenna is located some distance from the CCRP, the CCRP can be outside the bearing cursor in true-motion or off-center. Also, when the CCRP is set as a reference point, some parts of the bearing cursor are not displayed.

1.52 Anchor Watch

The anchor watch feature alerts you when your ship has traveled a distance greater than a threshold value, when it should be at rest. When the anchor watch is active, an orange dashed circle marks the anchor watch range.

If your ship drifts more than the anchor watch setting, the alert "ANCHOR WATCH" appears in the [ALERT] box. The alert is escalated from warning level to alarm level if the alert is not acknowledged within one minute. Also, if your vessel returns to within the tolerable radius, the alert status is automatically changed to rectified.



1. Open the menu.
2. Select [4 ALERTS].
3. Select [4 ANCHOR WATCH].
4. Select [ON] to enable [ANCHOR WATCH], then press the **ENTER MARK** key.
5. Spin the scrollwheel to set the distance for the alert. Press the **ENTER MARK** key to apply the setting.
6. Close the menu.

1.53 Alerts

1.53.1 What is an alert?

“Alert” is a generic name for a notice to any unusual or potentially dangerous situation generated within the system.

For detailed information regarding specific alerts and alert codes, including possible remedies, see "ALERT CODES, MESSAGES & MEANINGS" on page AP-17.

Alerts are classified according to priority and category.

Alert priority

The level of priority, from highest to lowest, is ALARM → WARNING → CAUTION.

Alarm: Situations or conditions which require immediate attention, decision and (if necessary) action by the bridge team to avoid any kind of hazardous situation and to maintain the safe navigation of the ship.

Warning: Conditions or situations which require immediate attention for precautionary reasons, to make the bridge team aware of conditions which are not immediately hazardous, but may become so.

Caution: Awareness of a condition which continues to require attention out of the ordinary consideration of the situation or of given information.

Note: All active-unacknowledged warnings, except ANCHOR WATCH, are repeated as warnings after 60 seconds (manufacturer's fixed time period). The ANCHOR WATCH alert is escalated from warning level to alarm level if it is not acknowledged within 60 seconds.

Alert category

An alert is further classified by category, A, B or C, according to its degree of severity or source.

Category	Description
A	Category A alerts include alerts indicating <ul style="list-style-type: none"> • Danger of collision • Danger of grounding
B	Category B alerts are alerts where no additional information for decision support is necessary. Category B alerts are all alerts not falling under category A.
C	Engine-related alert

1.53.2 Alert box overview

When an alert condition is found, the applicable alert message appears in the [ALERT] box. A buzzer sounds for alarm and warning alerts.

Normal display mode (IMO/C-types)

The [ALERT] box is composed of three lines of text information, and several icons, as shown below.



Simple display mode (C-types only)

The icon for the highest priority alert appears at the bottom-right corner of the screen.



1.53.3 How to silence the buzzer

Place the cursor on the buzzer silence icon in the alert box, then left-click. The alert buzzer is temporarily silenced. When the buzzer is silenced, the alert status is also changed (see section 1.53.6).

Note: The buzzer silence box is not visible for C-types using [SIMPLE] display mode.

1.53.4 How to acknowledge an alert

You can acknowledged alerts with one of the following methods:

- Press the **ALARM ACK** (RCU-014) or **ALERT ACK** (RCU-031) key.
- Left-click the alert name in the alert box.
Note: The alert box is not visible for C-types using [SIMPLE] display mode.
- Left-click the alert icon (C-types using [SIMPLE] display mode only)
- Open the alert list and left-click the alert in the list.

When the buzzer is silenced, the alert status is also changed (see section 1.53.6).

1.53.5 Alert list

The alert list displays the names of violated alerts, including the time and date violated. Up to 100 alerts are stored in the internal memory. Unacknowledged alarms are displayed first in the list (in red text), in the order in which they appear in the [ALERT] box. Unacknowledged warnings are displayed in the list (in yellow-orange text), in the order in which they appear in the [ALERT] box.

Cautions are displayed in the list (in yellow text), in the order in which they appear in the [ALERT] box.

You can show the alert list with one of the following methods.

- **IMO/C-types using NORMAL display mode:** place the cursor on the alert list/log button in the [ALERT] box then left-click.
- **C-types using SIMPLE display mode:** place the cursor on the alert icon then left-click.

The screenshot shows the 'ALERT LIST (1/2)' screen. At the top, it says 'ALERT LIST (1/2)' and '194' (total alerts). The list contains four entries, each with an alert icon (yellow circle with an exclamation mark), an alert code, an alert message, a date, and a time. The first entry is '194 MTR-DRV COM ERROR' with date '03/FEB' and time '23:15'. The second entry is '52601 NO GYRO SIGNAL' with date '01/FEB' and time '20:25'. The third entry is '52001 RPU:FAN2 SPD ERROR' with date '01/FEB' and time '12:18'. The fourth entry is '52001 RPU:FAN2 SPD ERROR' with date '01/FEB' and time '12:18'. At the bottom, there are two buttons: '9 REFRESH DATA(L=CLR)' and '0 NEXT(L=LAST)'. Annotations explain the functions of these buttons and the layout of the list.

Alert icon	Alert code and alert message	Date and time of alert	Radar which output this alert
!	194 MTR-DRV COM ERROR	03/FEB 23:15	RADAR1
!	52601 NO GYRO SIGNAL	01/FEB 20:25	RADAR1
!	52001 RPU:FAN2 SPD ERROR	01/FEB 12:18	RADAR1
!	52001 RPU:FAN2 SPD ERROR	01/FEB 12:18	RADAR1

Annotations:

- Displayed page/Pages available: 1/2
- Alert icon: !
- Alert code and alert message: 52601 NO GYRO SIGNAL
- Date and time of alert: 01/FEB 12:18
- Radar which output this alert: RADAR1
- Buttons:
 - 1 BACK(L=TOP)
 - 9 REFRESH DATA(L=CLR)
 - 0 NEXT(L=LAST)

Functions:

- When selected at page 1, closes the list.
- When selected at page 2 or later, goes back to the previous page.
- Long-press the **left button** to go to page 1.
- Select to refresh the list.
- Long-press the **left button** to remove acknowledged and rectified alerts from the list.
- Select to go to the next page
- Long-press the **left button** to go to the last page.

An unacknowledged alert can be acknowledged from the list by selecting it, then left-clicking. To erase the data for the number selected, left-click again. To erase all alert indications, select [9 REFRESH DATA], then press and hold the **left button**.

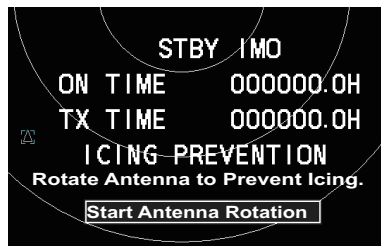
1.53.6 Alert icons and their meanings

Icon	Status	Visual indication	Audible alert
	Active - unacknowledged alarm	Red, flashing	3 short, audible alerts repeated every 7 seconds.
	Active - silenced alarm	Red, flashing	Silent
	Active - acknowledged alarm	Red	Silent
	Active - responsibility transferred alarm	Red	Silent
	Rectified - unacknowledged alarm	Red	Silent
	Active - unacknowledged warning	Yellow-orange, flashing	2 short, audible alerts repeated every 60 seconds.
	Active - silenced warning	Yellow-orange, flashing	Silent
	Active - acknowledged warning	Yellow-orange	Silent
	Active - responsibility transferred warning	Yellow-orange	Silent
	Rectified - unacknowledged warning	Yellow-orange	Silent
	Caution	Yellow	Silent

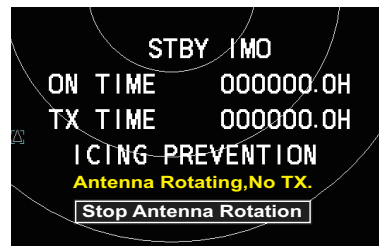
1.54 Icing Prevention

You can rotate the antenna (24 rpm) without transmission to keep the antenna from freezing.

1. Open the menu.
2. Select [9 INITIAL SETTINGS].
3. Select [5 OPERATION].
4. Select [7 ICING PREVENTION].
5. Select [ON] or [OFF] as appropriate. If you select [ON], the message "Rotate Antenna to Prevent Icing." appears at the bottom of the screen.
6. Click [Start Antenna Rotation] to rotate the antenna without transmission. The message changes to read "Antenna Rotating, No TX."



When the antenna stops



When the antenna rotates

To stop the antenna rotation, left-click [Stop Antenna Rotation].

With this feature active and the antenna stopped, pushing the **STBY TX** key on the Control Unit or click the [STBY TX] button on the Status bar rotates the antenna and transmits pulses. Operating one of the above-mentioned controls again stops transmission but the antenna rotates.

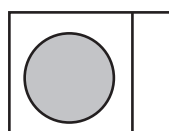
1.55 How to Select an Echo Display Area (C-type Only)

C-type radars of this series have three echo display modes available:

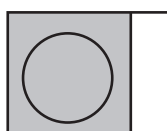
- [CIRCLE] mode: The echoes are displayed inside a circle on the screen. This is the default (IMO compliant) mode.
- [WIDE] mode: The echoes are displayed in a square area, but are not displayed in the data display area.
- [ALL] mode: The echoes are displayed across the entire screen.

Follow the procedure below to change display modes.

1. Open the menu.
2. Select [1 ECHO]. The [ECHO] menu appears.
3. Select [8 ECHO AREA].
4. Select the appropriate setting, then press the **ENTER MARK** key.



CIRCLE



WIDE



ALL

5. Close the menu.

1.56 How to Use the Watch Alert

The watch alert provides a visual alert at regular intervals to remind you to monitor the radar picture for safety or other purposes. When the watch alert is enabled, the WATCH box appears at the top of the screen.



When the timer reaches 00:00, an audible alert is released. To silence the buzzer, click the watch box. The timer is reset and begins to countdown again. You can reset the timer at any time by clicking the watch box.

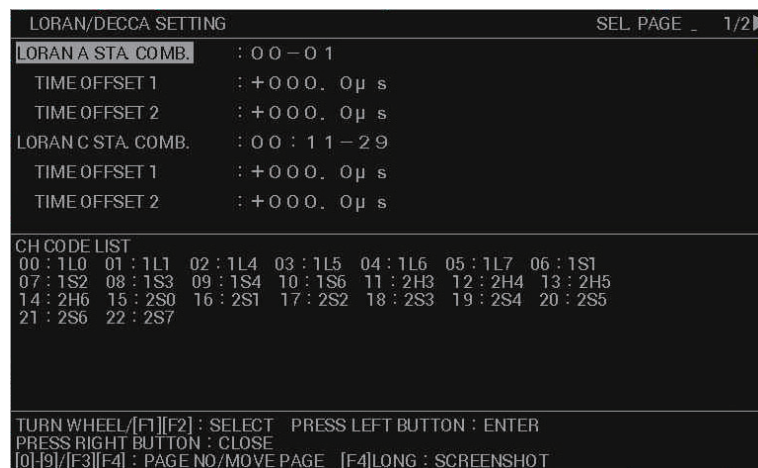
To enable or disable the watch alert, follow the procedure below.

1. Open the menu.
2. Select [4 ALERTS]. The [ALERTS] menu appears.
3. Select [2 WATCH ALERT].
4. Select the [OFF] to disable the alert, or select the required interval at which the alert is released.
The available intervals are: [6min], [10min], [12min], [15min] and [20min].
5. Close the menu.
6. Left-click the watch box to start the watch timer. You can also reset the countdown by left-clicking the watch box at any time.

1.57 Loran Decca Setup (C-types Only)

When using Loran A time offset

1. Open the menu.
2. Select [9 INITIAL SETTINGS].
3. Select [9 LORAN•DECCA].
The [LORAN•DECCA] menu appears.
4. Select [3 LORAN/DECCA SELECT].
5. Select [LORAN A].
6. Select [2 LORAN•DECCA SETTING]. The setting window appears.



Note: There are two pages for the [LORAN/DECCA SETTING] menu. If page 2 appears, press the **F3** key to go back to page 1.

7. Select [LORAN A STA. COMB.], then press the **left button**.
8. Set the station combination referring to the [CH CODE LIST] in the lower half of the window.
9. Select [TIME OFFSET 1].
10. Rotate the **scrollwheel** and press the **left button** to set the time offset value.
11. Select [TIME OFFSET 2].
12. Rotate the **scrollwheel** and press the **left button** to set the time offset value.
13. Close the menu.

When using Loran C time offset

1. Open the menu.
2. Select [9 INITIAL SETTINGS].
3. Select [9 LORAN•DECCA].
4. Select [3 LORAN/DECCA SELECT].
5. Select [LORAN C].
6. Select [2 LORAN•DECCA SETTING]. The setting window appears.

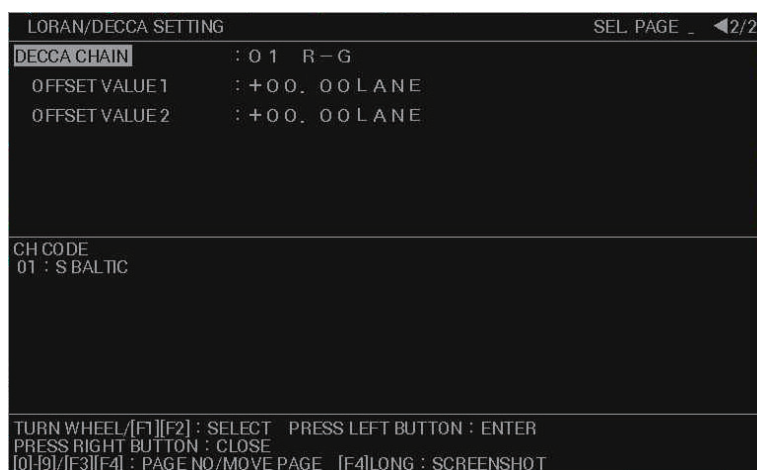
Note: There are two pages for the [LORAN/DECCA SETTING] menu. If page 2 appears, press the **F3** key to go back to page 1.

7. Select [LORAN C].

8. Set the station combination referring to the [CH CODE LIST] in the lower half of the window.
9. Select [TIME OFFSET 1].
10. Rotate the **scrollwheel** and press the **left button** to set the time offset value.
11. Select [TIME OFFSET 2].
12. Rotate the **scrollwheel** and press the **left button** to set the time offset value.
13. Close the menu.

When using Decca chain offset

1. Open the menu.
2. Select [9 INITIAL SETTINGS].
3. Select [9 LORAN•DECCA].
4. Select [3 LORAN/DECCA SELECT].
5. Select [DECCA].
6. Select [2 LORAN•DECCA SETTING]. The setting window appears.
Note: There are two pages for the [LORAN/DECCA SETTING] menu. If page 2 appears, skip to step 8.
7. Press the **F4** key to show the second page of the setting window.



8. Select [DECCA CHAIN].
9. Set the station combination referring to the [CH CODE] in the lower half of the window.
10. Select [OFFSET VALUE 1].
11. Rotate the **scrollwheel** and press the **left button** to set the time offset value.
12. Select [TIME OFFSET 2].
13. Rotate the **scrollwheel** and press the **left button** to set the time offset value.
14. Close the menu.

1.58 How to Manage SD Card Data

For IMO-types, the following data can be stored on a SD Card: map marks/lines, user settings, installation settings, own track, alert history and some logs (for example, the alert log).



For C-types, the SD Card is used to store screenshots (see section 1.61).

Note: The procedures and operations outlined in this section are only available when a SD Card is inserted. When there is no SD Card inserted, the operations and procedures are not available. SD Cards must be formatted as FAT32. Other formats are not usable.

1.58.1 Formatting the SD card

You do not normally need to format a SD card. If the card becomes unreadable, format the card with a formatting program that is compatible with the specifications of the card.

1.58.2 Cautionary notes on handling SD cards

- Handle the cards carefully. Improper use can damage the card and destroy its contents.
- Make sure the card slot cover is closed, unless removing/inserting a card.
- Remove or insert a card using only your fingers. Do not use metal instruments (such as tweezers) to remove the card.
- Do not remove the card when data is loading from, or saving to, the card.

1.58.3 Compatible SD cards

The table below lists the micro SD cards that have been verified as compatible for use with this equipment.

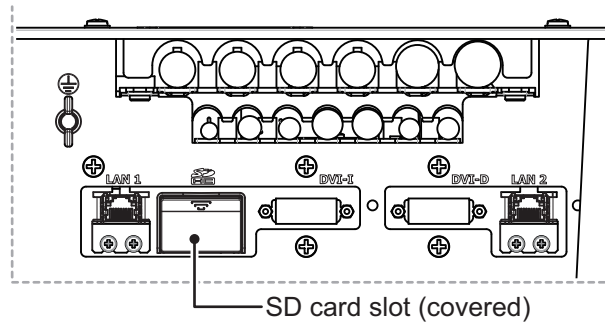
Note 1: The cards were verified using basic functions. All functions were not verified. FURUNO does not guarantee card operations.

Note 2: SD cards other than those listed below have not been verified.

Maker	SD card type	Capacity
Panasonic	RP-SDUC16GJK	16GB
	RP-SDUC32GJK	32GB
	RP-SDWA16GJK	16GB
	RP-SDWA-32GJK	32GB
SanDisk	SDSDB-016G-J35U	16GB
	SDSDC-032G-J35U	32GB
	SDSDXPA-016G-JU3	16GB
	SDSDXPA-032G-JU3	32GB
	SDSDXVE-032GB-JNJIP	32GB
Toshiba	SDAR40N16G	16GB
	SDAR40N32G	32GB
	SD-L016G4	16GB
	SD-L032G4	32GB
	SDXU-B016G	16GB
	SDXU-B032G	32GB

1.58.4 How to insert SD cards

The SD card slot is located on the front face of the processor unit, between the LAN1 port and the DVI-I port.



Note: Do not use any instruments to insert the card.

1. Remove the rubber cover on the SD card slot.
2. To insert a card, gently push the card into the slot, making sure that the card connectors are facing downwards.
3. Close the rubber cover.

1.58.5 How to remove SD cards

Follow the procedure below to safely remove an SD card.

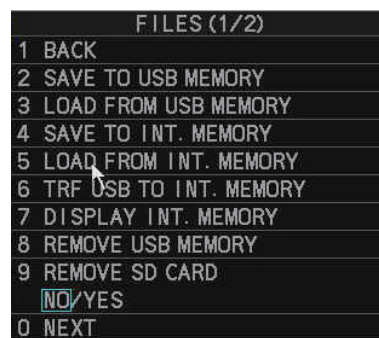
Note 1: When the system power is turned off, skip steps 1 to 3.

Note 2: Do not use any instruments/tools to insert or remove the SD card.

1. Open the menu.
2. Select [6 FILES]. The [FILES] menu appears.



IMO-types

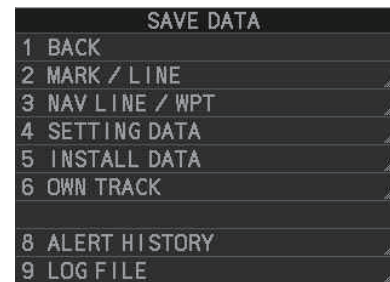


C-types

3. **For IMO-types**, select [REMOVE EXT MEDIA], then select [YES].
For C-types, select [REMOVE SD CARD], then select [YES].
You can now remove the SD card safely.
4. Remove the rubber cover on the SD card slot.
5. Gently push the SD cards to release the card from the card slot.
6. Remove the SD card. Do not use any instruments to remove the card.
7. Close the menu.

1.58.6 How to save data to an SD card (IMO-types only)

1. Open the menu.
2. Select [6 FILES]. The [FILES] menu appears.
3. Select [2 SAVE DATA].
4. Select the data to save, then press the **ENTER MARK** key.
The software keyboard appears.
5. Using the software keyboard, name the file, then select [END] to start saving data.



Note: Depending on the data saved, the first letter of the filename is preset and cannot be changed. The presets are listed below.

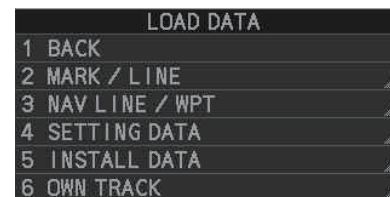
- Marks/Lines: M
- Nav lines/Waypoints: W
- Setting data: S
- Install data: I
- Own track: T
- Alert history: H
- Log file: L

The indication "WR CARD DATA" appears during the save process and the menu closes automatically.

6. When the process is complete, the indication "COMPLETED" appears on the screen.

1.58.7 How to read (load) data from an SD card (IMO-types only)

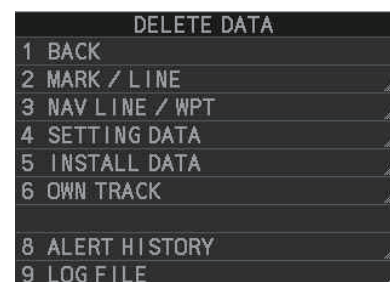
1. Open the menu.
2. Select [6 FILES]. The [FILES] menu appears.
3. Select [3 LOAD DATA].
4. Select the data to load, then press the **ENTER MARK** key.
The indication "RD CARD DATA" appears during the read process and the menu closes automatically.



5. When the process is complete, the indication "COMPLETED" appears on the screen.

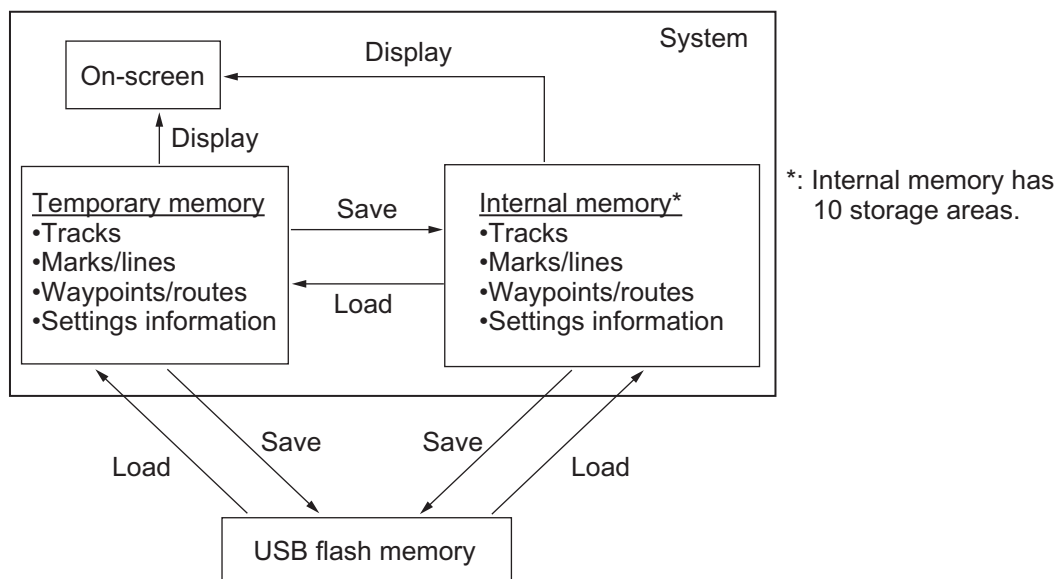
1.58.8 How to delete data from an SD card (IMO-types only)

1. Open the menu.
2. Select [6 FILES]. The [FILES] menu appears.
3. Select [4 DELETE DATA].
4. Select the data to delete, then press the **ENTER MARK** key.
The indication "DELETE CARD DATA" appears during the delete process.
5. Close the menu.



1.59 Internal Memory (C-types only)

The system's internal memory stores data such as own track, other ship's track, marks, lines, routes, waypoints and some settings. When the temporary memory becomes full, the oldest data are deleted and the newest data is stored. You can save data to a USB flash memory, or to the internal memory. The process of saving and loading data uses internal, temporary and USB flash memory in the following manner.



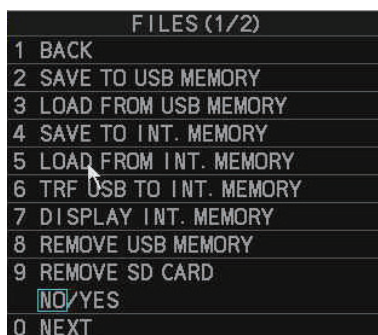
Note: The procedures in this section must be done with the radar in STBY. If the radar is set to transmit, the [FILES] menu is not available.

1.59.1 How to save data to the internal memory

You can save data from the temporary memory to the internal memory. The internal memory has 10 storage areas and each area has the following storage capacity.

- Own ship tracks: 30,000
- Marks/lines: 30,000
- Waypoints: 3,500
- Routes: 200
- Area marks: 50
- Other tracks: 40,000, comprised of:
 - Consort vessels: 10,000;
 - AIS targets: 10,000;
 - TT targets: 10,000;
 - GPS buoys: 10,000.

1. Open the menu.
2. Select [6 FILES]. The [FILES] menu appears.



1. OPERATIONAL OVERVIEW

3. Select [4 SAVE TO INT. MEMORY]. The [INTERNAL MEMORY RECORDING] window appears.

INTERNAL MEMORY RECORDING					
REC OWN TRK	:	YES	<input type="button" value="NO"/>		
REC OTHER TRK	:	YES	<input type="button" value="NO"/>		
RECORD MARK/TRACK	:	YES	<input type="button" value="NO"/>		
RECORD ROUTE/WPT	:	YES	<input type="button" value="NO"/>		
DOWNLOAD SETTING	:	YES	<input type="button" value="NO"/>		
DATA SELECTION					
DATA	OWN TRK	OTR TRK	MARK	WPT	ROUTE
1:NO DATA					
2:NO DATA					
3:NO DATA					
4:NO DATA					
5:NO DATA					
6:NO DATA					
7:NO DATA					
8:NO DATA					
9:NO DATA					
0:NO DATA					
CURRENT USAGE	OWN TRK	:	2154	/30000	
	OTHER TRK (CONS)	:	0	/10000	
	OTHER TRK (AIS)	:	2358	/10000	
	OTHER TRK (TT)	:	0	/100000	
	OTHER TRK (GPS BUOY)	:	0	/10000	
	MARK/LINE	:	30	/30050	
TURN WHEEL/[F1][F2] : SELECT PRESS LEFT BUTTON : ENTER PRESS RIGHT BUTTON : CLOSE SELECT THE FILE TO RECORD [F4]LONG : SCREENSHOT					

4. Select an item, then select [YES] to save the item to the internal memory.
5. To save other items, repeat step 4 as required.
6. Select an area to save the data. A pop up window appears showing the file name for the saved data. The default name is the date and time at which the data was saved.
7. **To change the filename**, go to the next step.
To keep the default filename, close the menu.
8. Referring to section 1.5.3, enter the desired filename. A confirmation message appears.

	RECORD CURRENT DATA TO INTERNAL MEMORY. ARE YOU SURE?
	<input type="button" value="RUN"/> <input type="button" value="CANCEL"/>
PRESS LEFT BUTTON : ENTER [F4]LONG : SCREENSHOT TURN WHEEL/[F1][F2] : SELECT	

9. Select [ENTER] to save the data, or select [CANCEL] to cancel the procedure.
If you selected [ENTER], a progress window appears to show the save progress.
When the save is completed, a message appears.
10. Select [OK].
11. Close the menu.

1.59.2 How to view the contents of the internal memory

You can view (replay) items stored in the internal memory.

1. Open the menu.
2. Select [6 FILES]. The [FILES] menu appears.
3. Select [7 DISPLAY INT. MEMORY]. The [DISPLAY INTERNAL MEMORY] window appears.

DISPLAY INTERNAL MEMORY		SEL PAGE _ 1/3▶	
INTERNAL MEMORY 1			
ADD OWN TRACK DISP	☒ YES	☐ NO	522/30000
ADD OTHER TRCK DISP	☐ YES	☒ NO	0/40000
ADD MARK/LINE DISP	☐ YES	☒ NO	0/30000
INTERNAL MEMORY 2			
ADD OWN TRACK DISP	☐ YES	☒ NO	0/30000
ADD OTHER TRCK DISP	☐ YES	☒ NO	0/40000
ADD MARK/LINE DISP	☐ YES	☒ NO	0/30000
INTERNAL MEMORY 3			
ADD OWN TRACK DISP	☐ YES	☒ NO	0/30000
ADD OTHER TRCK DISP	☐ YES	☒ NO	0/40000
ADD MARK/LINE DISP	☐ YES	☒ NO	0/30000
INTERNAL MEMORY 4			
ADD OWN TRACK DISP	☐ YES	☒ NO	0/30000
ADD OTHER TRCK DISP	☐ YES	☒ NO	0/40000
ADD MARK/LINE DISP	☐ YES	☒ NO	0/30000
TTL ADD DISP OWN TRK : 522 /30000 OTHER TRK (CONS) : 0 /10000 (AIS) : 0 /10000 (TT) : 0 /10000 (GPS BUOY) : 0 /10000 MARK/LINE : 0 /30000			
TURN WHEEL/[F1][F2] : SELECT PRESS LEFT BUTTON : ENTER PRESS RIGHT BUTTON : CLOSE [0]-[9]/[F3][F4] : PAGE NO/MOVE PAGE [F4]LONG : SCREENSHOT			

The internal memory areas (1 through 10) appear across three pages. Press **F3** or **F4** to change pages.

4. Select the items whose contents you want to view, then select [YES].
5. Repeat step 4 to add other items you want to view.

Note: The total number of selected items appears at the bottom of the window. If the selected number exceeds the maximum, the indication appears in yellow color and items which are in excess of the maximum are not displayed.

6. Close the window.

The items you selected to view appear on the screen. Displayed tracks, marks and lines cannot be edited or deleted, as this feature only displays these items.

To remove the stored items from the screen, repeat the above procedure, then select [NO] at step 4.

1.59.3 How to load the contents of the internal memory

You can load the data from the internal memory, however, this procedure replaces the temporary memory contents with the contents of the internal memory. If you want to keep the contents of the internal memory, save the contents before continuing with this procedure.

1. Open the menu.
2. Select [6 FILES]. The [FILES] menu appears.
3. Select [5 LOAD FROM INT. MEMORY]. The [INTERNAL MEMORY PLAYBACK] window appears.

INTERNAL MEMORY PLAYBACK					
PLAY OWN TRK	:	ADD	<input type="button" value="NO"/>		
PLAY OTHER TRK	:	ADD	<input type="button" value="NO"/>		
PLAY MARK/TRACK	:	OVERWRITE	ADD	<input type="button" value="NO"/>	
PLAY ROUTE/WPT	:	OVERWRITE	<input type="button" value="NO"/>		
UPLOAD SETTING	:	OVERWRITE	<input type="button" value="NO"/>		
DATA SELECTION					
DATA	OWN TRK	OTR TRK	MARK	WPT	ROUTE
CURRENT USAGE	OWN TRK	:	2197	/30000	
	OTHER TRK (CONS)	:	0	/10000	
	OTHER TRK (AIS)	:	2358	/10000	
	OTHER TRK (TT)	:	0	/100000	
	OTHER TRK (GPS BUOY)	:	0	/10000	
	MARK/LINE	:	30	/30050	
TURN WHEEL/[F1][F2] : SELECT PRESS LEFT BUTTON : ENTER					
PRESS RIGHT BUTTON : CLOSE					
SELECT THE FILE TO PLAY BACK					
[F4]LONG : SCREENSHOT					

4. Select the item you want to load.
5. Depending on the item selected at step 4, select [ADD], [OVERWRITE] or [NO] as appropriate.
 - [ADD]: selected data is added to the temporary data. Temporary data is not overwritten.
 - [OVERWRITE]: replace (overwrite) the temporary data with the selected data.
 - [NO]: selected data is not used.

Note 1: When [ADD] is selected for [PLAY MARK/TRACK], a limit of 30,050 items applies. When this limit is reached, no more items can be added.

Note 2: When [ADD] is selected for [PLAY OWN TRK] or [PLAY OTHER TRK] and the limit is reached, the oldest items are deleted to make way for new items. For example, if you have 10,000 tracks already saved and add 25,000, the oldest 5,000 tracks from those already saved are deleted.