## 1.38 Target Analyzer (B/W-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 1.45) 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.
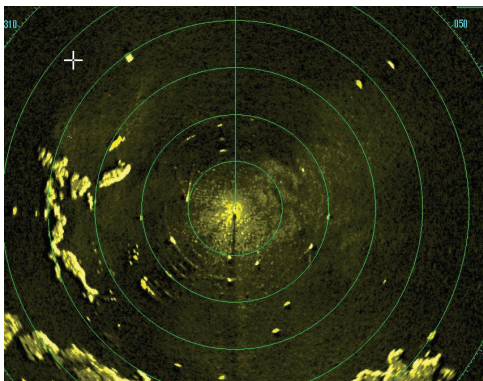
No echo adjustment
(Target analyzer off, EAV off, hatching off)
Rain, moving targets and surface reflections are all displayed with no filtering.
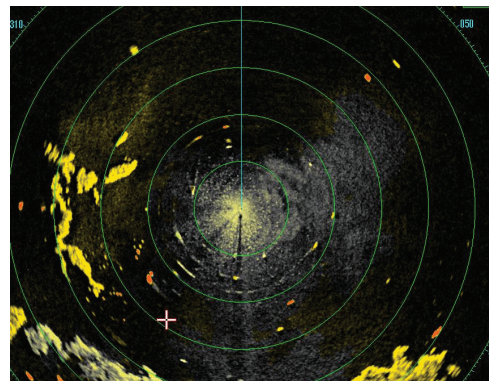
Minimal echo adjustment
(Target analyzer on, EAV off, hatching off)
Echoes are colored, surface reflections are filtered, rain is displayed.
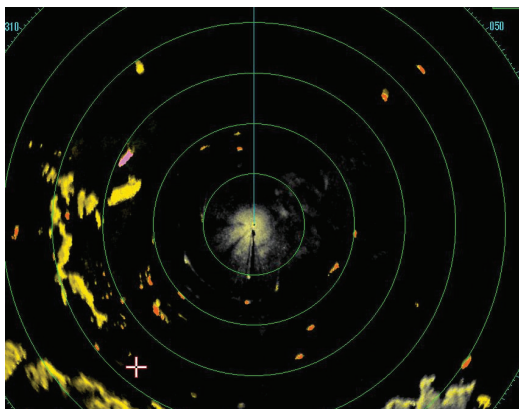
Moderate echo adjustment
(Target analyzer on, EAV on, hatching off)
Echoes are colored, surface reflections and rain are filtered.
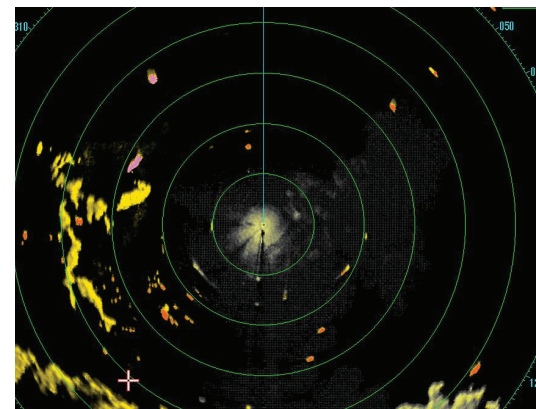
Maximum echo adjustment
(Target analyzer on, EAV on, hatching on)
Echoes are colored, surface reflections are filtered, rain is displayed in gray colored hatching.

1-69

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.

Note 5: When the high speed function mode is activated at installation, this function is automatically deactivated at a range of 2 NM or less. For details of the high speed rotation mode, contact your dealer.

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].
   Note: You can also right-click the [PICTURE] box to access this menu.
4. Select [5 TARGET ANALYZER].
5. Select [OFF] to deactivate the function, or [ON] to activate the function.
6. Select [6 RAIN ECHO HATCHING].
7. Select [OFF] to deactivate the function, or [ON] to activate the function.
8. Close the menu.

Target Analyzer indication

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 [AQUISITION 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.

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.

Click the Alarm Zone you want to set.

TGT ALR
TT / AIS
1:
2:

TGT ALR
TT / AIS
1:SET
2:

The indication changes to "SET".

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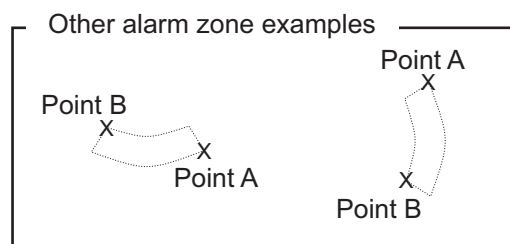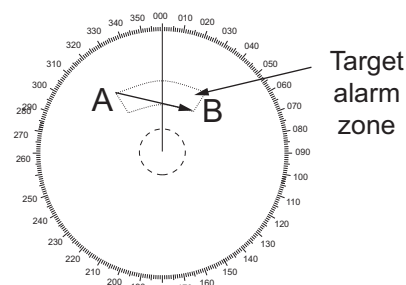
Note 1: To create a 360° alarm zone, set Point B at the same location as Point A.

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".

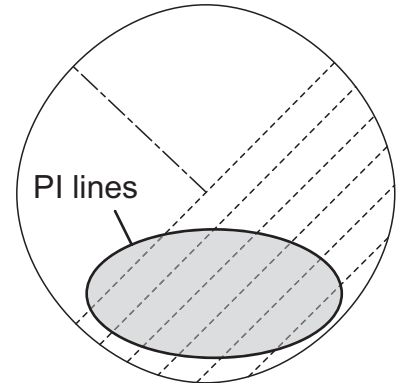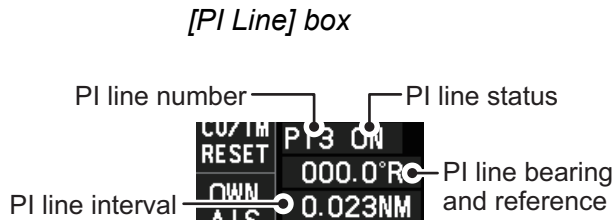## 1.39.4　How to change target alarm attributes

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.
5.　Select [IN] or [OUT] as appropriate.
　　[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. [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.
　　Note 1: This setting is applied to all alarms output from this radar system.
　　Note 2: The [OFF] options is not shown for IMO/R-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.

[PI Line] box

PI line number — ⌐ PI line status

PI line interval — CU/TM RESET OWN AIS PI3 ON / 000.0°R — PI line bearing and reference / 0.023NM

PI lines

1.40.1 How to show/hide the PI lines

You can show or hide the PI lines as required with the following procedure.
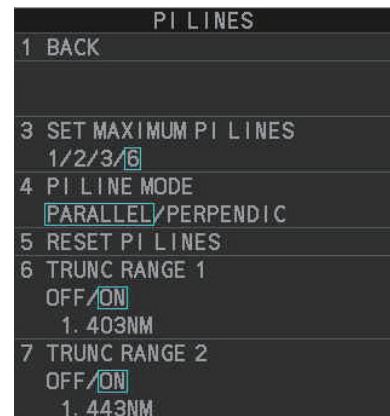
1. Place the cursor on the PI line number or PI line status in the PI line box.

2. Spin the scrollwheel to select the PI line (PI1 to PI6) you want to show or hide.
   Note 1: For IMO/A/B/R-types, PI5 and PI6 are only available when [SET MAXIMUM PI LINES] is set to [1].
   Note 2: For W-types, PI5 and PI6 are not available.

3. Left-click to toggle between [ON] (PI line is shown) or [OFF] (PI line is hidden).

1.40.2 How to set the maximum number of lines to display

The maximum number of PI lines available to display depends on your radar type. Further, the actual number of lines visible can be less depending on line interval.

IMO/A/B/R-types

1. Open the menu.

2. Select [3 NAV TOOLS].

3. Select [2 PI LINES]. The [PI LINES] menu appears.

4. Select [3 SET MAXIMUM PI LINES].
   Up to six sets of PI lines are available depending on the maximum number of PI lines selected on the menu.

   • [1]: Six sets of PI lines (PI1 to PI6) are available.

   • [2], [3] or [6]: Four sets of PI lines (PI1 to PI4).

5. Select the appropriate option.

6. Close the menu.

PI LINES
1 BACK

3 SET MAXIMUM PI LINES
  1/2/3/6
4 PI LINE MODE
  PARALLEL/PERPENDIC
5 RESET PI LINES
6 TRUNC RANGE 1
  OFF/ON
    1. 403NM
7 TRUNC RANGE 2
  OFF/ON
    1. 443NM

W-types

1. Open the menu.

2. Select [3 NAV TOOLS].

3. Select [2 PI LINES]. The [PI LINES] menu appears.

4. Select [2 SET MAXIMUM PI 1•3 LINES] or [3 SET MAXIMUM PI 2•4 LINES] as required.
Up to four sets of PI lines are available depending on the maximum number of PI lines selected on the menu.

   • [1]: Not available for W-types.

   • [2], [3] or [6]: Four sets of PI lines (PI1 to PI4).

5. Select the appropriate option.

6. Close the menu.
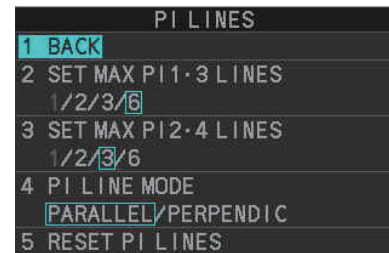
1.40.3 How to change PI line bearing and interval

1. If not already displayed, show a PI line, referring to section 1.40.1.

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.

1.40.4 How to change the PI line bearing reference (B/W-type only)

IMO/A/R-type radars' PI line bearing reference is fixed to North (True). For B/W-type radars however, PI line bearing reference can be relative to own ship's heading (Relative) or referenced to North (True) as below.

B-types

1. Open the menu.

2. Select [3 NAV TOOLS].

3. Select [2 PI LINES].

4. Select [2 PI LINE BEARING].

5. Select [REL] or [TRUE] as appropriate.

6. Close the menu.

W-types

Place the cursor on the PI line bearing and reference indication at the bottom-left of the screen, then right-click to toggle between [T] (True) and [R] (Relative).

1.40.5 How to change the PI line orientation

PI lines orientation can be selected from parallel or perpendicular.

Note: This function is only available when [SET MAXIMUM PI LINES] is set for other than [1].

1. Open the menu.
2. Select [3 NAV TOOLS].
3. Select [2 PI LINES].
4. Select [4 PI LINE MODE].
5. Select [PARALLEL] or [PERPENDIC] as appropriate.
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 (ship's heading), 0-degrees for parallel orientation, 90-degrees for perpendicular orientation. This is faster than doing it manually.

From the PI line box

Place the cursor on the PI line number box indication, then press and hold the **left button**.

From the menu

1. Open the menu.
2. Select [3 NAV TOOLS].
3. Select [2 PI LINES].
4. Select [5 RESET PI LINES]. The PI lines are reset.
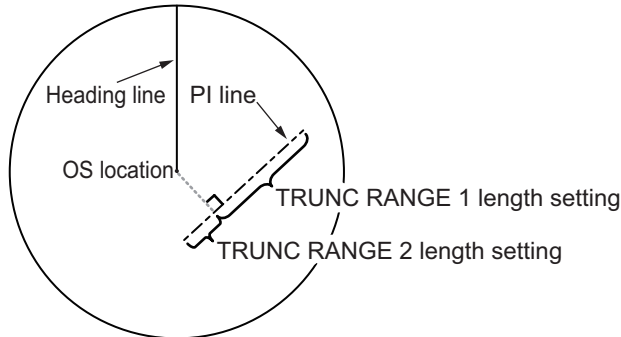5. Close the menu.

1.40.7 How to change PI line length (IMO/A/B/R-types only)

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. Select [3 NAV TOOLS].
3. Select [2 PI LINES].
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.

1.41 How to Use the Net (Diamond) Cursor (B/W-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.
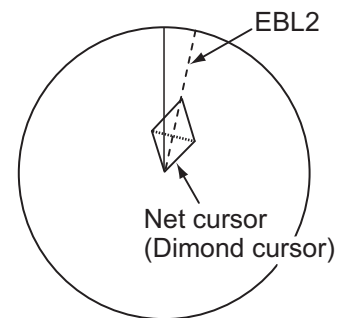
## 1.41.1 How to activate the net cursor

To activate the net cursor, do the following procedure.

1) Open the menu.
2) Select [3 NAV TOOLS].
3) Select [3 EBL•VRM•CURSOR SET].
4) Select [0 NEXT] to show the second page of the menu.
5) Select [NET CURSOR].
6) Select [NET CURSOR DISPLAY].
7) Select [ON] to activate, or [OFF] to deactivate the net cursor.
8) Close the menu.

1.41.2 How to set the net cursor dimensions and orientation

1. Open the menu.

2. Select [3 NAV TOOLS].

3. Select [3 EBL•VRM•CURSOR SET].

4. Select [0 NEXT] to show the second page of the menu.

5. [3 FRONT HALF LENGTH].

6. 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.

7. Select [4 REAR HALF LENGTH].

8. 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.

9. Select [5 NET WIDTH].

10. Rotate the **scrollwheel**, then left-click to set the net width.

11. 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.

12. Close the menu.

13. 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.

14. Rotate the **EBL** knob to adjust the orientation the net cursor until the cursor is in line with, or against, the tide direction.
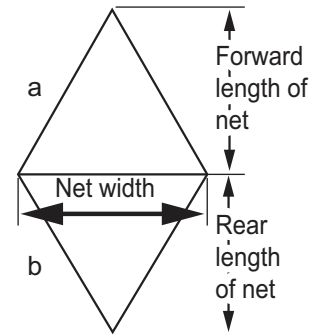
1.42 Zoom

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 1.9 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 1.47.)

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.

Cursor with zoom box

Zoom box is placed at the location to be zoomed and the cursor returns to its normal shape.
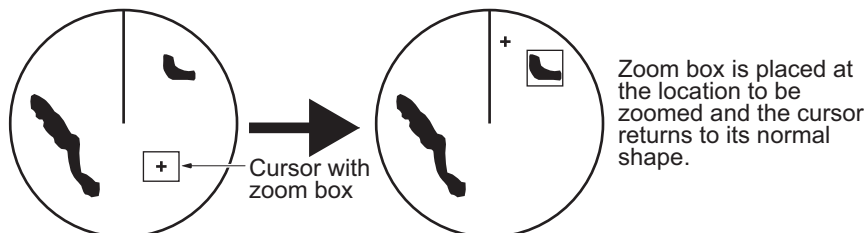
To disable the zoom function, repeat steps 1 to 3. At step 3, the zoom box is removed from the display.

Note: 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.

1.43 How to Use Marks

1.43.1 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.
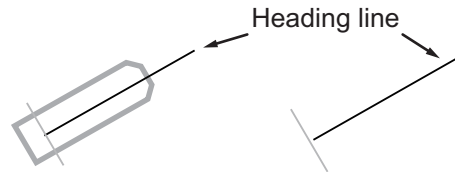
Heading line

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**.

1.43.2 How to hide/show the stern mark

The stern marker, which is a dotted line, appears opposite to the heading line.
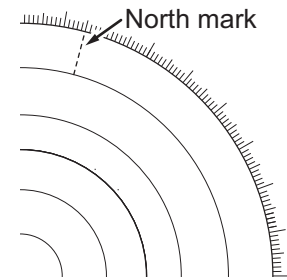
Stern line
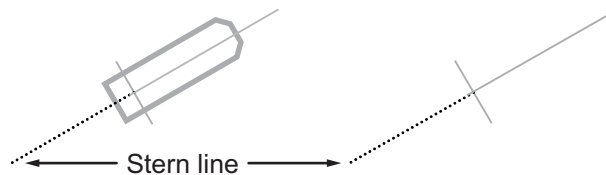
To display or erase this marker do the following:

1. Open the menu.
2. Select [2 MARKS].
    For A/B/W-types with Radar Plotter functionality, select [2 MARKS•CHART].
3. Select [3 STERN MARK].
4. Select [ON] or [OFF] as appropriate.
5. Close the menu.
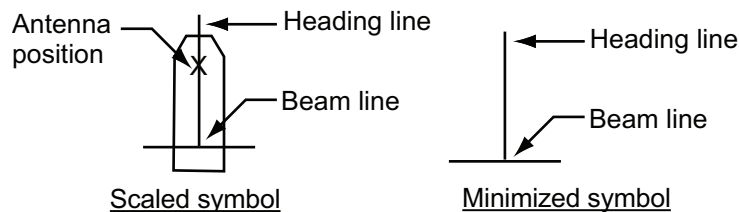
1.43.3 North mark

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

North mark

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

1.43.4 How to set up the own ship symbol

The own ship symbol marks 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.

Antenna position — Heading line — Beam line — Scaled symbol
Heading line — Beam line — Minimized symbol

1. Open the menu.
2. Select [2 MARKS].
   For A/B/W-types with Radar Plotter functionality, select [2 MARKS•CHART].
3. Select [2 OWN SHIP MARK].
4. Select [MINIMIZED] or [SCALED] as appropriate.
5. Close the menu.

1.43.5 How to set the barge marker

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

Note: 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. Select [2 MARKS].
   For A/B/W-types with Radar Plotter functionality, select [2 MARKS•CHART].
3. Select [6 BARGE MARK].
4. Select [2 BARGE MARK DISPLAY].
5. Select [ON] to display barge marks, [OFF] to hide barge marks, as appropriate.
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.

First row of barge [ARRANGEMENT] is displayed as the right side of the barge icon on-screen.

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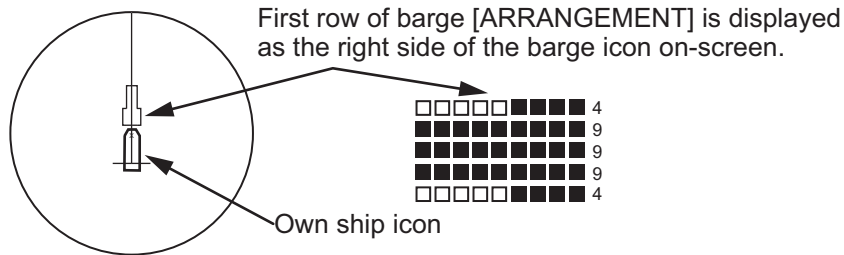
You can also use the number keys on the Control Unit to select the number of barges.

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

1.43.6 Antenna mark

When [2 OWN SHIP MARK] in the [2 MARKS] (for A/B/W-types with Radar Plotter functionality, this menu appears as [2 MARKS•CHART]) 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.

Antenna mark
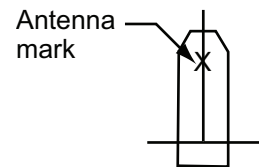
1.43.7 Latitude/longitude grid

You can show/hide the lat/lon grid to suit your preferences.

1. Open the menu.

2. Select [2 MARK].
    For A/B/W-types with Radar Plotter functionality, select [2 MARKS•CHART].

3. Select [0 NEXT] to show the next page.

4. Select [2 GRID], then select [ON] to show the grid, or [OFF] to hide the grid.

5. Close the menu.

MARK (2/2)
1 BACK
2 GRID
OFF/ON
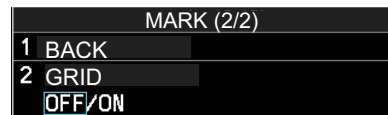
1.44   Drop Mark

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.

Drop mark

1.44.1   How to activate the drop mark

To active the drop mark feature, do the following:

1. Open the menu.
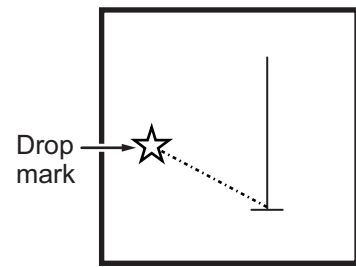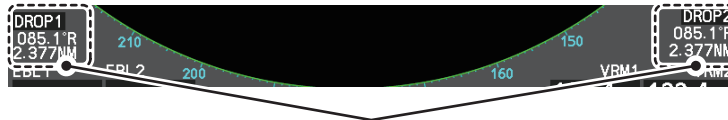2. Select [2 MARKS].
    For A/B/W-types with Radar Plotter functionality, this menu appears as [2 MARKS•CHART].
3. Select [4 DROP MARK].
4. Select [ON] to enable [DROP MARK]. Two indications appear at the bottom of the screen.

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

5. Close the menu.

1.44.2   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.

1.44.3   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.

1.45 Brilliance and Color Schemes

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

1.45.1 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 1.45.3).

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.

1.45.2 How to change the color and brilliance assigned to a palette

1. Referring to section 1.45.1, select the scheme whose settings you want to change.

2. Open the menu.

3. Select [9 INITIAL SETTINGS].

4. Select [2 BRILL]. The [BRILL] menu appears.

```
            BRILL1 (1/3)
1  BACK
2  ECHO COLOR
   YEL/GRN/WHT/
   AMB/M-GRN/M-CYA
3  PALETTE
   DAY-GRY/DAY-BLU/
   DAY-GRN/DUSK-GRY/
   DUSK-BLU/DUSK-GRN/
   NIGHT-GRY/NIGHT-BLU
4  CONTROL PANEL
5  CHARACTERS
6  CURSOR
7  ECHOES
8  TRAILS
9  HL
0  NEXT
```
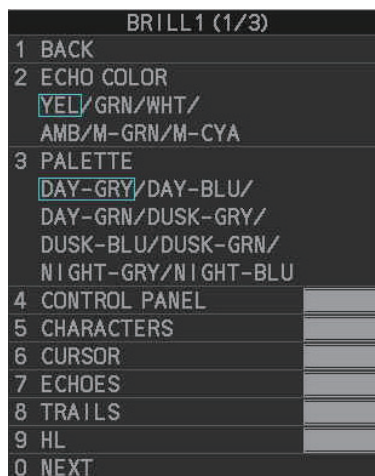
Note: You can also access this menu by right-clicking the [PLT] indication, inside the brilliance settings box at the bottom-left of the screen.

5. 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). *: Shown for B/W-types only. If you select [M-GRN] or [M-CYA], the echo color changes depending on the echo strength. • [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 1.45.3).
[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.
Page 3	
[2 MARKS]	Adjusts latitude/longitude grid brilliance.
[3 CHART]	Adjusts chart brilliance. (Appears only for A/B/W-types with Radar Plotter functionality.)

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.

1.45.3 How to change the color palette

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. Open the menu.
2. Select [9 INITIAL SETTINGS].
3. Select [2 BRILL]. The [BRILL] menu appears.
4. Select [3 PALETTE].
5. Select the appropriate palette. 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	15	15	15	15	15	15	15	15
Cursor brilliance	15	15	15	12	12	12	12	12
Echo brilliance	15	15	15	12	12	12	12	12
Trail brilliance	15	15	15	8	8	8	8	8
Heading Line brilliance	15	15	15	12	12	12	12	12
Range ring 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
Character color[*2]	White	White	Green	White	White	Green	Orange	White
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 A/B/W-types only

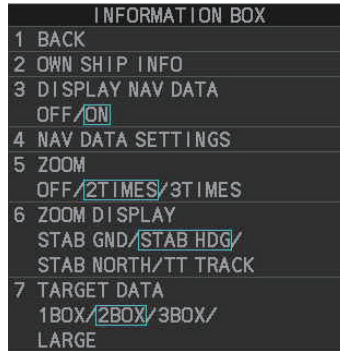[*2]: This setting is fixed and cannot be changed.

6. Close the menu.

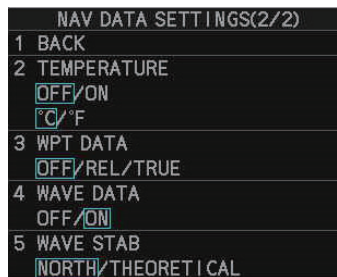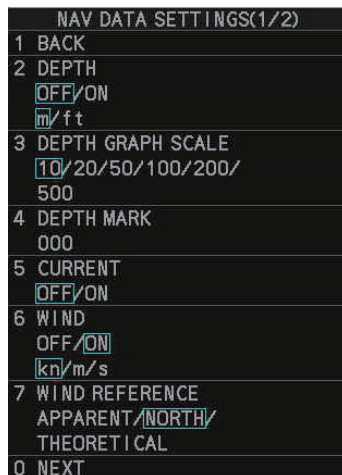## 1.46 How to Display and Set Up Navigational Data

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

1.46.1 How to set up the navigational data

1. Open the menu.

2. Select [7 INFORMATION BOX].

```
INFORMATION BOX
1 BACK
2 OWN SHIP INFO
3 DISPLAY NAV DATA
  OFF/ON
4 NAV DATA SETTINGS
5 ZOOM
  OFF/2TIMES/3TIMES
6 ZOOM DISPLAY
  STAB GND/STAB HDG/
  STAB NORTH/TT TRACK
7 TARGET DATA
  1BOX/2BOX/3BOX/
  LARGE
```

3. Select [4 NAV DATA SETTINGS].

```
NAV DATA SETTINGS(1/2)
1 BACK
2 DEPTH
  OFF/ON
  m/ft
3 DEPTH GRAPH SCALE
  10/20/50/100/200/
  500
4 DEPTH MARK
  000
5 CURRENT
  OFF/ON
6 WIND
  OFF/ON
  kn/m/s
7 WIND REFERENCE
  APPARENT/NORTH/
  THEORETICAL
0 NEXT
```

```
NAV DATA SETTINGS(2/2)
1 BACK
2 TEMPERATURE
  OFF/ON
  °C/°F
3 WPT DATA
  OFF/REL/TRUE
4 WAVE DATA
  OFF/ON
5 WAVE STAB
  NORTH/THEORETICAL
```

4. Referring to the table below, select the appropriate menu item, then press the **ENTER MARK** key.

Menu item	Available settings
Page 1	
[2 DEPTH]	[OFF], [ON]; [m], [ft]
[3 DEPTH GRAPH SCALE]	[10], [20], [50], [100], [200], [500] (m)
[4 DEPTH MARK]	[000] to [500] (m)
[5 CURRENT]	[OFF], [ON]
[6 WIND]	[OFF], [ON]; [kn], [m/s]
[7 WIND REFERENCE]	[APPARENT], [NORTH], [THEORETICAL]
Page 2	
[2 TEMPERATURE]	[OFF], [ON]; [°C], [°F]
[3 WPT DATA]	[OFF], [REL], [TRUE]
[4 WAVE DATA]	[OFF], [ON]
[5 WAVE STAB]	[NORTH], [THEORETICAL]

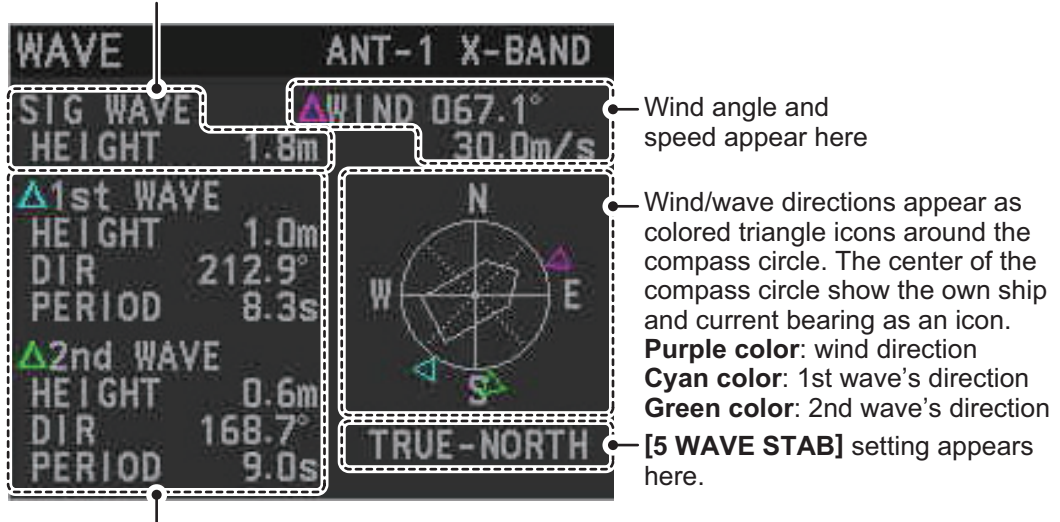**Note 1:** [4 WAVE DATA] requires connection to a PC with the wave analysis software installed.

Note 2: [4 WAVE DATA] can only be active at one radar at any time. If [4 WAVE DATA] is turned [ON] at another radar in the same network, it is automatically turned [OFF] at this radar.

5. Referring to the table above, select the appropriate setting, then press the **ENTER MARK** key.

6. Close the menu.

<u>**Wave data display**</u>

You can view wave data when a PC with the wave analysis software installed is connected to the same network as this radar. When [4 WAVE DATA] is set to [ON], the wave data appears in the information box in a manner similar to that shown below.

Significant wave height appears here.

Wind angle and speed appear here

Wind/wave directions appear as colored triangle icons around the compass circle. The center of the compass circle show the own ship and current bearing as an icon.
Purple color: wind direction
Cyan color: 1st wave's direction
Green color: 2nd wave's direction

[5 WAVE STAB] setting appears here.

Wave information appears here.
[HEIGHT]: Wave height
[DIR]: Direction from which the wave is approaching.
[PERIOD]: Time until the wave meets own ship.

Note: Analysis data which has low integrity or reliability is displayed in yellow text.

For further details regarding the wave analysis data, see the operator's manual (OMC-36181) supplied with the wave analysis software.

1.46.2 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.

5. Close the menu.

1.47 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 1.11, section 1.12 and section 1.13 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]	• [OFF] • [ON]	• Disable navigational data display. • Enable navigational data display.
[4 NAV DATA SETTINGS]	See section 1.46 for details.	Set up the format in which various navigational data is displayed in the [INFORMATION BOX].
[5 ZOOM]	• [OFF] • [2TIMES] • [3TIMES]	• Disable zoom magnification. • Set zoom magnification at 2×. • Set zoom magnification at 3×.
[6 ZOOM DISPLAY]	• [STAB GND] • [STAB HDG] • [STAB NORTH] • [TT TRACK]	• Ground stabilized zoom (Geographically fixed). • Heading stabilized zoom (Relative). • North stabilized zoom (True). • Tracked targets are zoomed.
[7 TARGET DATA]	• [1BOX] • [2BOX] • [3BOX] • [LARGE]	See the figure on the following page.

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.
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/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.
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.	
1BOX	2BOX	3BOX	LARGE

• 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 overlayed 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 three TT targets can be shown)

1.48 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.

1.48.1 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 right-click the [ANTENNA] box to access this menu.

```
        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
```

Using the information displayed in this example the antenna system configuration would look something like this.
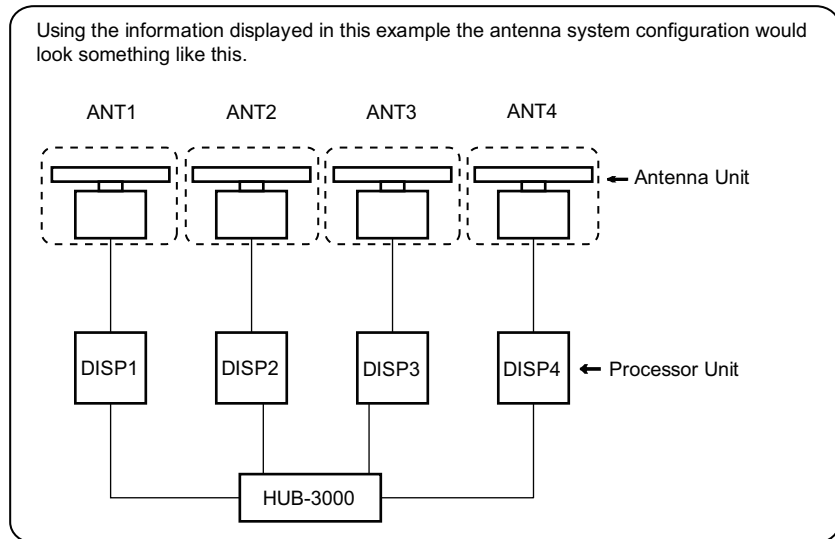
The following information is displayed in the [SELECT ANTENNA] menu:
• Radar band, output power and antenna position of each antenna currently powered. (If an antenna is not powered, its data area is blank.)
• Own ship radar number (radar in use).
• Current antenna and display combinations.

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 1.48.2.

1.48.2 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.
   Note: You can also right-click the [ANTENNA] box to access this menu.

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

- 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 "LOST ISW FUNC" 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.
- Disable the Dual Radar function from the [RADAR INSTALLATION] menu (see the Installation manual IME-36520) before setting up the Interswitch feature.
- Interswitch connection is NOT available between the different softwares (ex.: 02.×× version and 50.×× version) even the connections between FAR-2××8 radars.
- When using a FAR-2xx7 series radar for Interswitch connection, the following settings must be done from the FAR-2xx7 [RADAR INSTALLATION] menu.
  - Set [SCANNER] → [DUAL RADAR SETTINGS] → [DUAL RADAR] to [OFF].
  - Set [NETWORK] → [LAN1•3 IP ADDRESS] → CLASS to [C].
- When using a FAR-3xx0 series radar for Interswitch connection, the following settings must be done from the FAR-3xx0 [RADAR INSTALLATION] menu.
  - Set [SCANNER] → [OTHERS] → [COMBINE FUNC] to [OFF].
  - Set [NETWORK] → [LAN1•3 IP ADDRESS] → CLASS to [C].
  - Set the radar number as [1], [2], [3] or [4].
  - Disable the [Icing Prevention] feature.

- Radar functions are controlled independently, dependently or commonly depending on selection as [MASTER] or [SLAVE] (see the following table).

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*3			
A/C SEA*1	Dependent Control		Cannot control
A/C RAIN*1			
Automatic Clutter Elimination (ACE)*1			
Gain*1			
IR*2			
Echo stretch*1			
Echo averaging*1			
Picture setting*1 (Customize echo)			
STBY/TX			
Tuning			
Reference Point	Independent		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 is a FAR-2xx8/FAR-3xx0 series radar, these items can be adjusted from the "Slave" radar.

*2: 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 these functions. For FAR-3xx0/FAR-2xx8 series SSD-types, these functions cannot be controlled.

*3: 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.

Compatibility of display and operation

When connecting with FAR-2xx7 series radar

When switching the antenna from FAR-2xx8 to FAR-2xx7, the image for FAR-2xx7 is displayed on the screen and each function is operative. However, when switching the antenna from FAR-2xx7 to FAR-2xx8, the following functions are not operative.

• Automatic Clutter Elimination (ACE) function.

• Selection of the transmit frequency by the [TX CH] button for solid state radar.

• Target Analyzer function.

• Hatching.

• Berthing STC.

1.48.3 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.
   Note: You can also right-click the [ANTENNA] box to access this menu.

4. Select [0 CLEAR INTER-SWITCH].

5. Select [YES] to clear the interswitch settings. The antenna settings are restored to default.

1.49 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.

1.49.1 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 ×ARCS" (×: setting value of [6 PM ARC]) 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.

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	No	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*[5]	Yes *[4]	Setting before PM activation.
[OFF CENTER]	OFF	Yes	Setting at PM deactivation.
Antenna revolution	24 rpm	No	Setting before PM activation.
[VIDEO CONTRAST TYPE]	4-B*[6]	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.

*[5]: Range units other than NM are available for B/W-types only.

*[6]: When Ice Mode is enabled, the video contrast setting for Ice Mode is used.
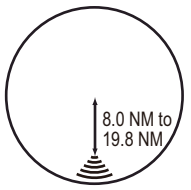
1.49.2 How to check the radar's performance

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.

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
8.0 NM to 19.8 NM	**Transmitter:** normal **Receiver:** normal	8.0 NM to 19.8 NM	**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.

1.50 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.

Radar antenna position is at center of display — ANT position

Conning position is at center of display — CCRP position
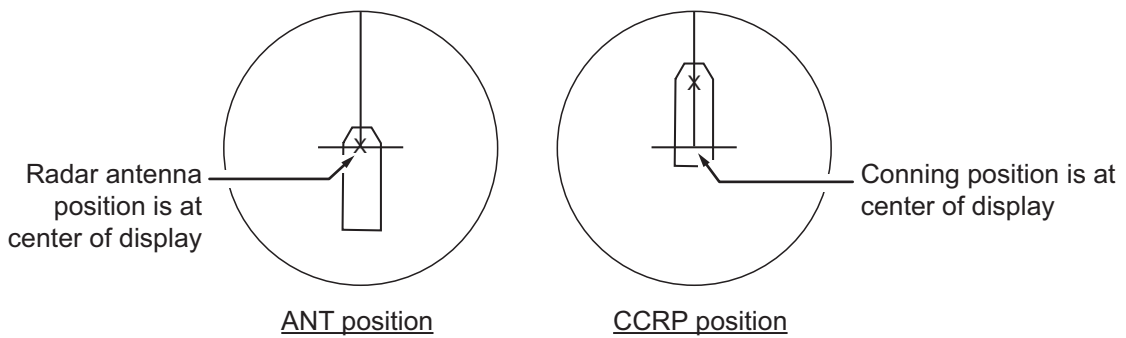
Range and bearing are measured and graphics are drawn according to reference position as in the table below.

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.

1.51 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. Also, if your vessel returns to within the tolerable radius, the alert status is automatically changed to rectified.
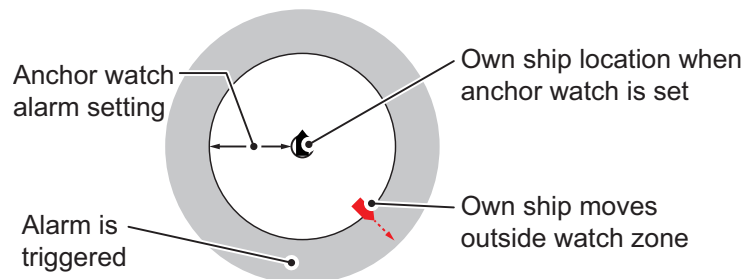
1. Open the menu.
2. Select [4 ALERTS].
3. Select [4 ANCHOR WATCH].
4. Select [ON] to enable [ANCHOR WATCH], then press the **ENTER MARK** key.
5. Spin the scrollwheel to set the distance for the alert. Press the **ENTER MARK** key to apply the setting.
6. Close the menu.

1.52 Alerts

1.52.1 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 LIST" on page AP-11.

Alerts are classified according to priority and category.

Note 1: This equipment does not provide the functional alert group function.

Note 2: The reserved cluster identifier for this equipment, which is defined in IEC62923-2 is "Nav".

Alert priority

The level of priority, from highest to lowest, is ALARM $\rightarrow$ WARNING $\rightarrow$ 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 are repeated as warnings after 60 seconds (manufacturer's fixed time period).

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 the following, and must be confirmed from the equipment that generated the alert. • Danger of collision
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	Category C alerts are not shown on this equipment.

1.52.2   How to interpret the [ALERT] box

When an alert condition is found, the applicable alert message appears in the [ALERT] box. A buzzer sounds for alarm and warning alerts. When no active alert and indication occurs, "NO ACTIVE ALERTS" appears in the [ALERT] box.

The [ALERT] box is composed of three lines of text information, and several icons, as shown below.
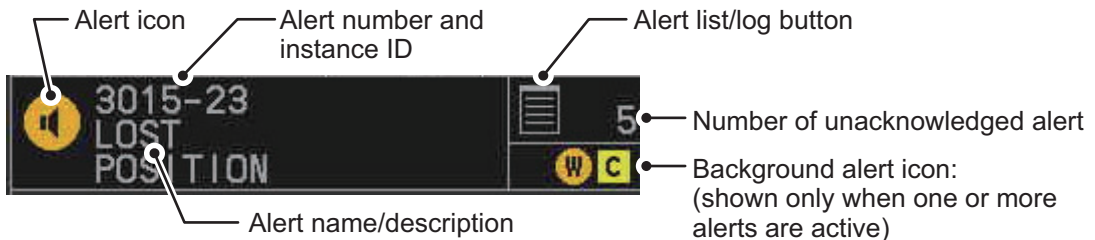
The alert icon shows the level of the alert (alarm, caution, warning or indication) and the active alert counter shows how many alerts are unacknowledged.

When an Alarm or Warning level alert is released, the alert message flashes in the [ALERT] box. The message is accompanied by the appropriate alert icon and the buzzer sounds. The buzzer and alert continue to flash and sound until the buzzer is silenced or the alert condition is rectified.

The alert also appears in the [ALERT LIST] (see section 1.52.5) until acknowledged and rectified.

1.52.3   How to acknowledge an alert

Alerts can be acknowledged in one of the following manners:

• Press the **ALARM ACK** key.
• Click the alert name in the [ALERT] box.
• Click the alert name in the [ALERT LIST].

The icon for an acknowledged alert changes as shown in section 1.52.6.

1.52.4   How to silence the alert buzzer

You can temporarily silence the buzzer by menu operation or the function key. The icon for a silenced alert also changes, as show in section 1.52.6.

To silence the buzzer by the function key, assign the buzzer stop function to the function key, referring to section 1.9. For the menu operation, do as follows.

1.   Open the menu.
2.   Select [4 ALERTS].
3.   Select [6 BUZZER STOP].
4.   Close the menu.

1-99

1.52.5 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.

Indications are displayed with a yellow "i" surrounded with a yellow box.

To display the alarm list, place the cursor on the alert list/log button in the [ALERT] box then left-click.

*: The date and time of alert is synchronized with UTC, using the ZDA sentence. If the ZDA sentence is lost, the date and time cannot be synchronized with UTC.

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 refresh the alert list, select [9 REFRESH DATA], then press and hold the **left button**.

Detailed alert information

To view detailed information for an alert, open the alert list, place the cursor on the alert you want to view detailed information for, then press and hold the **left button**.

Go back to the alert list. ——— 1 BACK

ALERT DETAIL DATA

ID   3015-27 ——— Alert code

TITLE   LOST
         COG/SOG SIG ——— Alert message

STATUS
         ACTIVE -
              UNACKNOWLEDGED ——— Alert status

PRIORITY
              WARNING ——— Alert priority

CATEGORY   B ——— Alert category

TIME   12:34 05/JUN ——— Date and time of alert

SOURCE   RADAR1 ——— Radar which output this alert

DESCRIPTION

Alert details ——— CHECK POSITION SENSOR OR
                  SENTENCE MONITOR

Select to refresh the ——— 9 REFRESH DATA
information.

1-101

1.52.6   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, flashing	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, flashing	Silent
	Caution	Yellow	Silent
	Indication	Yellow	Silent

1.52.7   Responsibility transfer alert

MSC302(87) requires the use of the "responsibility transfer alert" which functions in the multiple sensor, multiple equipment installation. When one sensor or one equipment fails but does not disturb the system operation (other sensor or equipment is normal), the AMS automatically sends the "responsibility transfer alert" (ACN sentence) to the sensor or equipment that generated the alert.

If the sensor or equipment refuses the responsibility transfer, normal operation is restored.
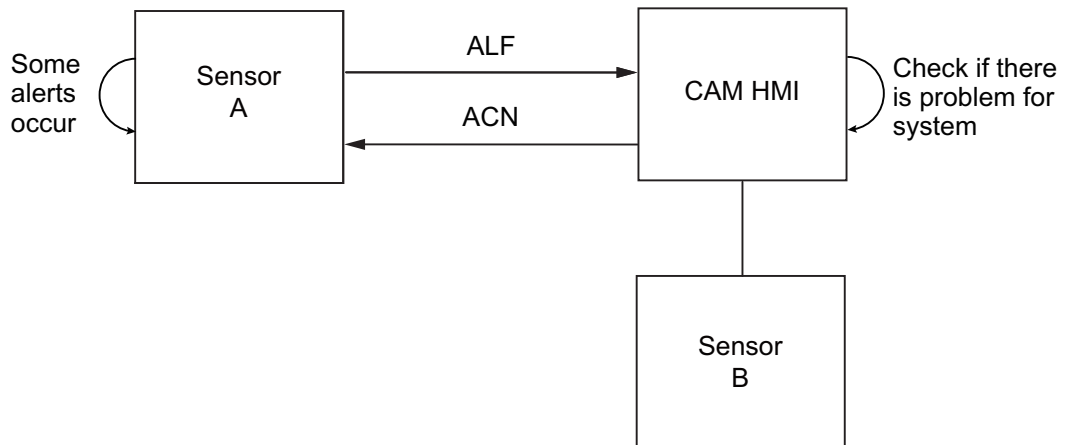

If the HBT sentence is not received from the AMS within the prescribed time interval, the alert processed as responsibility transfer alert is made active.
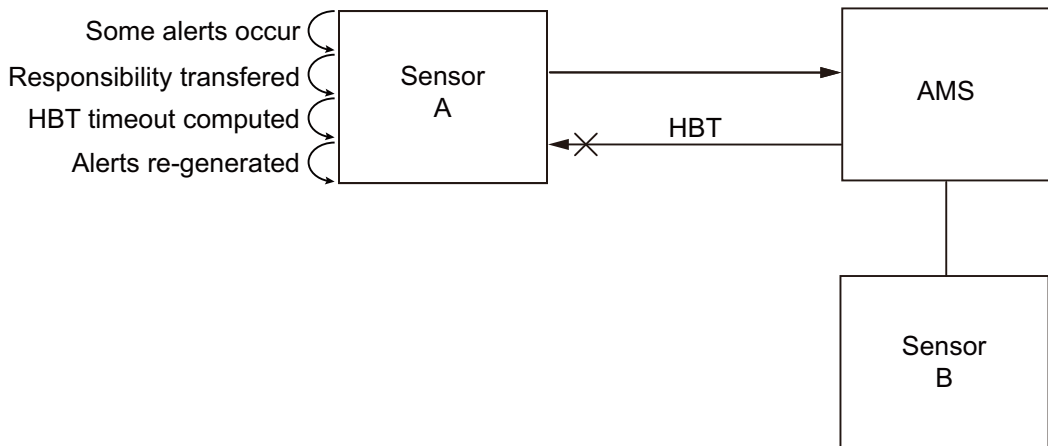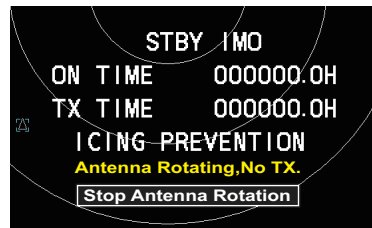
1.53 Icing Prevention

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.".
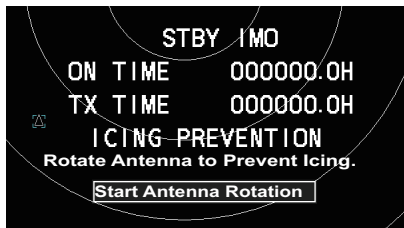
When the antenna stops   When the antenna rotates

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.

1.54 How to Select a Display Mode (B/W-type Only)

B/W-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.

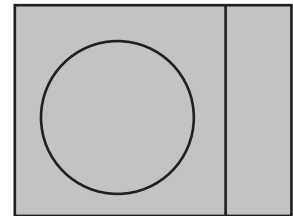Follow the procedure below to change display modes.

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.
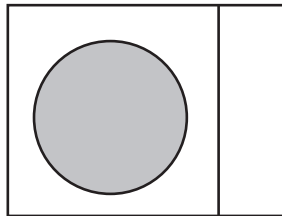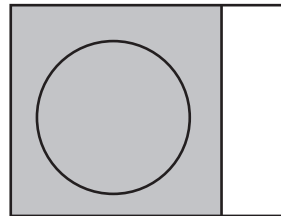
CIRCLE   WIDE   ALL

5. Close the menu.

1.55 How to Manage SD Card Data

The following data can be stored on a SD Card: marks, lines, user settings, installation settings, own track, target track (for A/B/W-types only), alert history and some logs (for example, the alert log).

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

1.55.1 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.

1.55.2 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.

1.55.3 Compatible SD cards

The table below lists the 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

1.55.4 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.

SD card slot (covered)
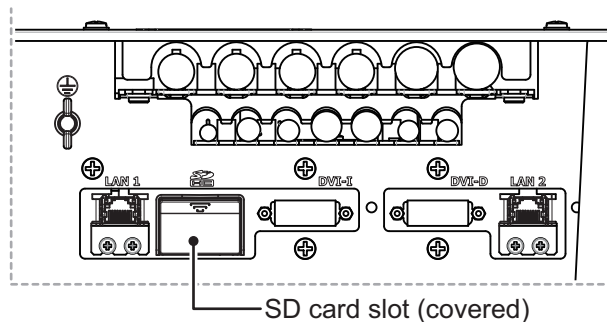
Note: Do not use any instruments to insert the card.

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.

1.55.5 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.

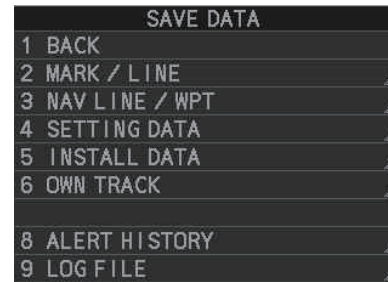**Note 2:** Do not use any instruments/tools top insert or remove the SD card.

1. Open the menu.

2. Select [6 FILES]. The [FILES] menu appears.

3. Select [REMOVE EXT MEDIA], 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.

1.55.6   How to save data to an SD card

1. Open the menu.

2. Select [6 FILES]. The [FILES] menu appears.

3. Select [2 SAVE DATA].

4. Select the data to save.
    The software keyboard appears.

5. Using the software keyboard, name the file, then select [END] to start saving data. The file name can be up to seven characters in length.
    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
    - Target track[*1]: A
    - Alert history: H
    - Log file[*2]: L
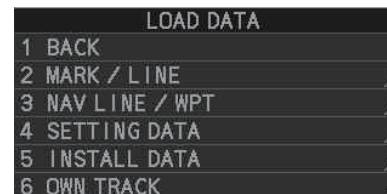
    [*1]:   Shown only for A/B/W-types.

    [*2]:   Setting data, install data and maintenance logs are also saved to the SD card.

    The indication "WR CARD DATA" appears during the save process and the menu closes automatically.
    When the process is complete, the indication "COMPLETED" appears in the guidance box and the menu automatically closes.

## 1.55.7   How to read (load) data from an SD card

1. Open the menu.

2. Select [6 FILES]. The [FILES] menu appears.

3. Select [3 LOAD DATA].

4. Select the data to load.
    The indication "RD CARD DATA" appears during the read process and the menu closes automatically.
    When the process is complete, the menu closes automatically.

1.55.8   How to delete data from an SD card

1. Open the menu.

2. Select [6 FILES]. The [FILES] menu appears.

3. Select [4 DELETE DATA].

4. Select the data to delete.
    The indication "DELETE CARD DATA" appears during the delete process.
    When the process is complete, the menu automatically closes.
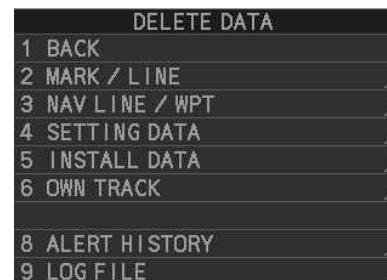
1.56   How to Take a Screenshot

The system has an in-built screenshot feature. To use the feature, a SD Card must be inserted in the Processor Unit. If there is no card inserted, the screenshot button on the screen is not active.
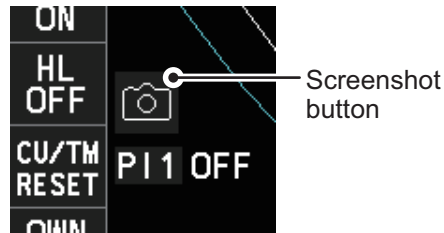
Screenshot button

To take a screenshot of the currently displayed screen, click the screenshot button.

Note: The screenshot function can also be assigned to a function key. For how to set up the function keys, see section 1.9

1.57   How to Use the Watch Alert (A/B/W-types only)

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. The watch alert function is available only for A/B/W-types.

Watch box

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.

1.58 Dual Radar (A/B-types only)

When installing two FAR-2xx8 series radars, the image from both radars (main radar and external radar) may be shown together on one radar display. This allows you to take advantage of the best characteristics each type of radar has to offer. The dual radar function is available only for A/B-types.

The following should be done from the [DUAL RADAR SETTINGS] menu, located in the [RADAR INSTALLATION] → [SCANNER] menu, at the time of installation in order to enable the dual radar display:

• Set the number of the radar to use for external input at [6 EXT RADAR].

• Set [2 DUAL RADAR] to [COMBINE]. This enables the dual radar function.

• Set the sector and range to combine radar images at [4 COMBINE SECTOR] and [5 COMBINE RANGE] respectively.

• Set the radar image you want to show in the sector at [3 COMBINE MODE]. The manner in which the radar images appear on-screen depends on the combination mode selected.
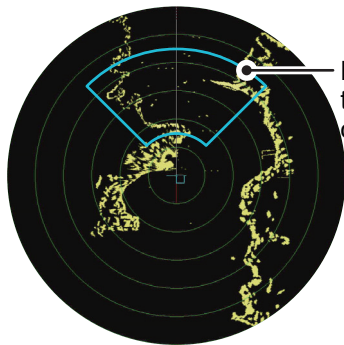
Dual radar function's display area (set at installation). Images shown in this area change depending on the setting for [COMBINE MODE] as follows:
•[OWN] : Own radar images appear inside the display area, external images appear outside the display area.
•[EXT] : External radar images appear inside the display area, own images appear outside the display area.

TT information

When a TT target crosses over the boundary line of the display area, its information is passed to the other radar display. Tracking of the TT continues. The TT number changes depending on the number of the antenna which acquires the TT target.
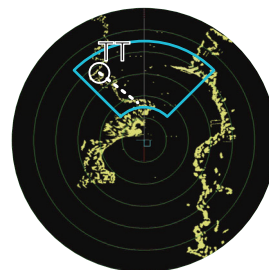
The lowest numbered Processor Unit assigns TT numbers "001" to "100", the other Processor Unit assigns "101" to "200".

Note: Only manually acquired target data is transferred.

TT target crosses over the boundary line of the display area.
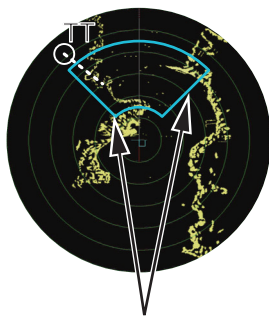
Boundary lines of display area

TT information is passed to the other radar display. Tracking on the TT continues.

1.58.1 How to toggle control of each dual radar display

Note: Dual radar mode must be enabled and both radars must be turned on.

You can switch between radars to control either your own, or the external radar from the antenna box. Left-click to toggle control.

Place the cursor on the [CONTROL] box, then left-click. The indication toggles between "M" (Master) and "S" (Slave) to show the level of control you have for the radar you are currently controlling.

The radar numbers for "Own" and "External" radars appear here. The currently controlled radar's number appears to the left.

Click the box to toggle the level of control of the radars. "M": Main (Master); "S": Sub (Slave)

There can be only one Master radar at any time. If the radar in operation is set to Slave and the operator switches to Master, the other radar is automatically changed to Slave.

Depending on your level of control, available operations are as follows:

Radar Functions	Control	Master	Slave
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**			
A/C SEA			
A/C RAIN			
Automatic Clutter Elimination (ACE)			
Gain adjustment			
Echo stretch			
Echo averaging			
Picture setting (Customize echo)			
STBY/TX			
TT/AIS AZ			

Radar Functions	Control	Master	Slave
IR*	Dependent Control	Desired value can be set	Cannot control
Tuning			
TT LOST warning	Common Control	Item Commonly Controlled	Item Commonly Controlled
TT alerts ACK			
TT acquire			

*: When the connected radar antenna is a magnetron-type, and the radar is assigned as "Slave", the desired value can be set for these functions. For SSD-types, this function cannot be controlled.

**: The desired value can be set when the radar is assigned as "Slave", however the maximum displayable range is dependent on the pulse setting at the "Master" radar.

1.58.2 Operating considerations for the dual radar display

You can toggle each radar between standby and TX in the dual radar display. When switching to standby on either radar, the "ISW: STBY" indication appears and the radar echoes from the radar in standby are not displayed. Further, when switching to standby, all TT targets are removed and tracking stops on the radar which is in standby. However if a TT target is acquired on the radar which is not in standby, the TT information is passed to the radar which is in standby.

Either radar enters STBY mode
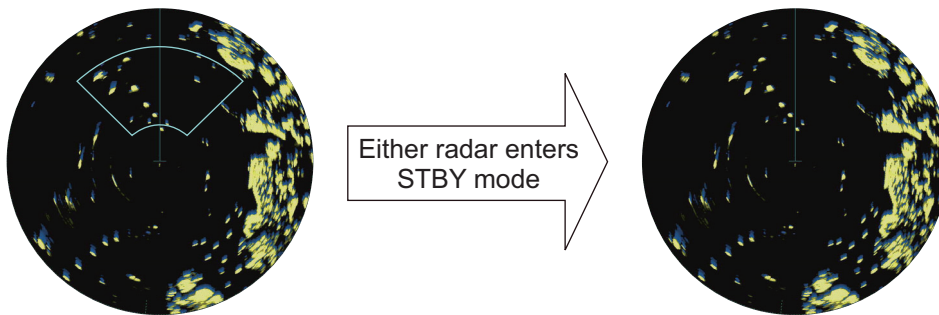
Boundary line is removed and display shows only the Own radar echoes.

Changes made to the following functions are applied to both the own radar echoes and the external echoes, on the display of the radar which made the changes. These settings are not applied to the display of the external radar.

- Off-center display
- CU/TM reset
- Presentation mode
- Range scale
- Electronic chart on/off
- Wiper

- Trail settings
- Echo stretch
- Echo Average
- Color Erase
- TT lost target filter

Notes regarding dual radar operations

- The dual radar function is available between two FAR-2xx8 series radars using the LAN. FAR-2xx7 and FAR-3xx0 series radars are not compatible.

- When a transmission error occurs between two radars in the dual radar mode, the Alert "LOST ISW FUNC" appears and the dual radar function is turned off.

- The dual radar display is not available on external equipment (such as ECDIS, etc) which overlays the main radar image, even though the dual radar is turned on.

- If a TT target passes between the two radars (see page 1-110) while the dual radar function is active, TT data (TTD/TTM) is shared and tracking is continued.

- If the Alert "TT TGT 95%(AUTO)" is released while the dual radar function is active, disable tracking for unnecessary targets until the Alert condition is rectified. Continuing automatic acquisition after this Alert is released and is still active may cause discrepancies between TT targets on the connected radars.

Restrictions during dual radar operations

The following restrictions are applicable when using the dual radar function.

- A REF (reference) mark can be entered on the display of the main radar but not the external radar.

- Targets acquired and/or tracked prior to activating dual radar mode are all released when dual radar mode is activated.

- Targets acquired and/or tracked prior to deactivating dual radar mode are all released when dual radar mode is deactivated.

- If either radar enters standby mode, all TT targets acquired while the Dual Radar function was active are released (removed).

- TT targets can be acquired manually or automatically. TT target data sharing between the radar in dual radar mode is restricted to manually acquired targets. See "TT information" on page 1-110.

- The reference position is fixed at [CCRP] (see section 1.50) when dual radar mode is enabled. Set the same CCRP position between two radars at the time of installation.

- The following functions are not available in the dual radar mode.

  - Performance monitor
  - SART
  - ICE mode
  - Target Analyzer (B-type only)

  - TT simulation mode
  - Icing prevention
  - Interswitch
  - Hatching (B-type only)

- If the distance between the Own radar antenna and the External radar antenna is larger than 125 meters, the dual radar display area and the sweep area are reduced. In this case, if the range is decreased, only the own radar echoes are displayed on the screen. Further, the following occurs when only the own radar is shown under these circumstances:

  - Dual radar boundary line is not shown.
  - Antenna selection is unavailable (on-screen box and menu item are gray and inactive).
  - Trails are all cleared (removed).

  No alerts is released under these circumstances, however normal dual radar display is restored when the range is increased again.

1-113

1.59 Wave Mode

You can output echo data from this radar to a PC with the wave analysis software installed. The wave analysis software calculates incoming waves and gives you an on-screen indication as to wave size, direction and time between waves.

This section covers how to use the wave mode and related functions on your FAR-2xx8 series radar. For details regarding the analysis software and PC indications, see the manual supplied with the software.

Preparations and cautions for wave mode

- Wave mode requires the connection of a PC to the same network as the FAR-2xx8 series radar to be used for data input.
- The connected PC must have the wave analysis software installed. See the software manual for how to install the software.
- Wave mode may only be active on one radar at any time. If a second radar has wave mode activated, wave mode is disabled on the first radar.
- One ore radars must set [8 OUTPUT TO WAVE PC] to [ON]. If all radars set [8 OUTPUT TO WAVE PC] to [OFF], the "LOST WAVE UNIT" indication may appear.
- Wave analysis and the output data are intended for reference purposes only, as an aid to safe navigation. Always confirm conditions, visually and with other methods.

1. Establish a LAN connection with the analysis PC.
2. Open the menu.
3. Select [1 ECHO]
4. Select [0 NEXT] to show the second page of the menu.
5. Select [7 WAVE MODE].
6. Select [ON] or [OFF] as appropriate.
   Select [ON] to output echo data to analysis PC.
7. Select [7 WAVE MODE].
8. Select [ON] or [OFF] as appropriate.
   Select [ON] to output navigational data to analysis PC.
9. Close the menu.

1.60 Doppler Feature (X-band Solid State Radars only)

When activated, the doppler feature can help with clutter reduction, making targets easier to find. This feature is only available with FAR-2228-NXT, FAR-2228-NXT-BB or FAR-2328-NXT.

To activate and use the feature, follow the procedure below.

1. Open the menu.
2. Select [1 ECHO].
3. Select [0 NEXT] to show the second page of the menu.
4. Select [9 DOPPLER].
5. Select the required setting, referring to the table below.
   - [0]: Disables the doppler feature.
   - [1]: Reduces noise, making weak targets easier to find.
   - [2]: Reduces clutter from rain, etc., making it easier to find targets previously hidden by clutter.
6. Close the menu.