1.17 FTC (Fast Time Constant)

If you can not effectively suppress rain clutter with the rain clutter control, use the FTC function. In adverse weather, clouds, rain or snow produce spray-like spurious echoes which impair target detection over a long distance. These echoes can be

```
⚠ CAUTION

Switch off FTC if your objective is to
receive a radar beacon signal.
```

suppressed by turning on the FTC circuit. There are two FTC settings, [FTC1] and [FTC2]. [FTC2] provides increased rain clutter suppression.

Click the [FTC] icon at the bottom right corner on the screen to select an appropriate FTC setting.

FTC PRESET

The [FTC PRESET] function, when active, applies the FTC a little stronger than normal. The combination effect of the [FTC PRESET] and [FTC] functions is shown as below.

Effect		[FTC PRESET]	
		[OFF]	[ON]
[FTC]	[OFF]	–	low
	[FTC1]	mid-low	mid-high
	[FTC2]	mid-high	high

Set the [FTC PRESET] function as follows.

1. Open [MAIN MENU], click [ECHO].
2. Click [FTC PRESET].
3. Click [ON] to activate the [FTC PRESET] function.

1.18 How to Measure the Range to a Target (VRM)

You can measure the range to a target by two methods: fixed range rings and the VRM (Variable Range Marker).

### How to measure the range with the fixed range rings

Use the fixed range rings to get a rough estimate of the range to a target. The fixed range rings are the concentric solid circles about your ship. The number of rings changes with the selected range scale. The interval of the range ring is displayed at the upper-left corner of the screen. Count the number of rings between the center of the display and the target. Check the range ring interval and measure the distance of the echo from the nearest ring.

How to measure the range with a VRM

There are two VRMs, VRM1 and VRM2. The VRMs are dashed so that you can identify them from the fixed range rings. You can identify VRM1 from VRM2 by the lengths of their dashes. The dashes of the VRM1 are shorter than those of the VRM2.

1. Click the [VRM] icon to display the VRM. If the VRM is already shown, go to step 2.

2. Click the [VRM] icon. The icon turns yellow.

[VRM] icon
(at the bottom right of the screen)

Highlighted yellow
">" means active.
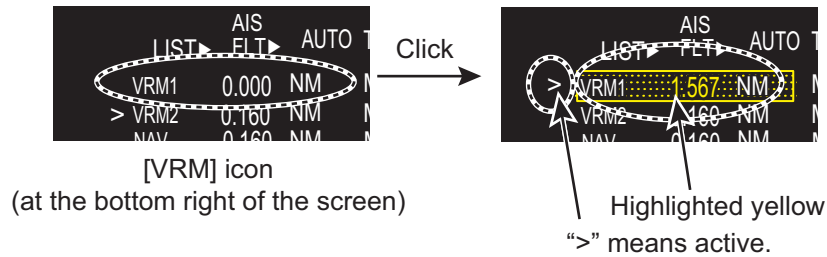
3. Move the cursor to align the VRM with the inner edge of the target then click to anchor the VRM.

4. Read the distance at the bottom of the screen. Each VRM ring (VRM1 or VRM2) remains at the same geographical distance when you change the display range. The size of the VRM ring changes in proportion to the selected range scale.

5. To delete a VRM, put the cursor on the appropriate VRM indication then long press the left button (or long press the **VRM** key).
   **Note:** If the corresponding EBL is displayed, the VRM is deleted and the value of VRM remains.

1.19   How to Measure the Bearing to a Target (EBL)

Use the Electronic Bearing Line (EBL) to take a bearing of a target. There are two EBLs, EBL1 and EBL2. Each EBL is a straight dashed line from the center of the screen to the edge. The dashes of the EBL1 are shorter than those of the EBL2.

How to measure the bearing with an EBL

1. Click the [EBL] icon to display the EBL. If the EBL already appears, go to step 2.

2. Click the [EBL] icon ([EBL1] or [EBL2]). The icon turns yellow.

[EBL] icon
(at the bottom left of the screen)

Highlighted yellow
">" means active.
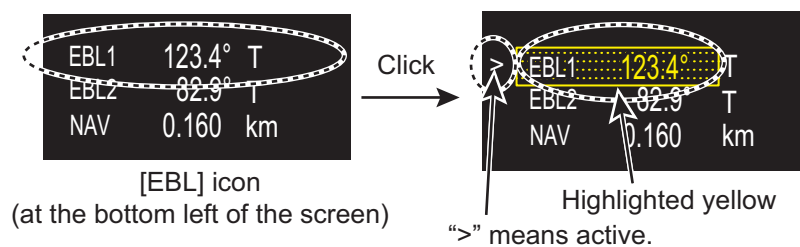
3. Put the cursor on the center of the target then click there to anchor the EBL. Read the bearing at the bottom of the screen.

4. To delete an EBL, put the cursor on the appropriate EBL indication then long press the left button (or long press the **EBL** key).

How to select bearing reference

The bearing reference can be selected to True or Relative. Click the bearing reference icon to the right of the bearing indication.
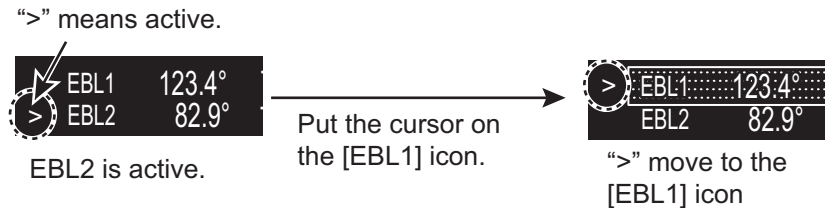

[T]: True

[R]: Relative

1.20 Offset EBL

How to offset an EBL

You can move the EBL origin to a desired location as follows:

1. Put the cursor on the appropriate [EBL] icon to activate the EBL. The mark (>), which denotes active EBL, moves to the [EBL] icon selected. The example below shows how to activate the EBL1.

"" means active.

EBL2 is active.

Put the cursor on the [EBL1] icon.

"" move to the [EBL1] icon

2. Right-click anywhere in the radar display to open [CURSOR MENU].

3. Click [EBL OFFSET].

4. Click anywhere in the radar display to move the EBL origin with cursor.

5. Click the point where to fix the EBL origin there.

6. To return the EBL origin to own ship position, click anywhere in the radar display again.

7. Right-click to quit the offset EBL.

1.20.1 How to measure the range and bearing between two targets

You can move the origin of the EBL to measure the range and bearing between two targets.

1. Click the [EBL1] icon to activate EBL1. If the EBL already appears, go to step 2.

2. Right-click anywhere in the radar display to open [CURSOR MENU].

3. Click [EBL OFFSET].

4. Click anywhere in the radar display to move the EBL origin.
   Note: If EBL1 is already off-centered, the origin of the EBL moves to own ship's position once. In this case, click anywhere in the radar display again.
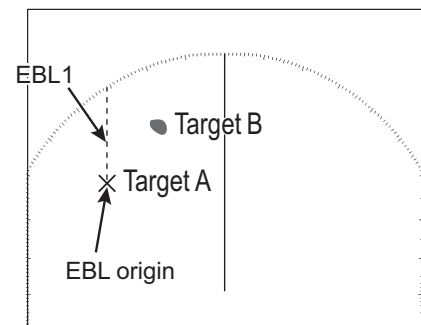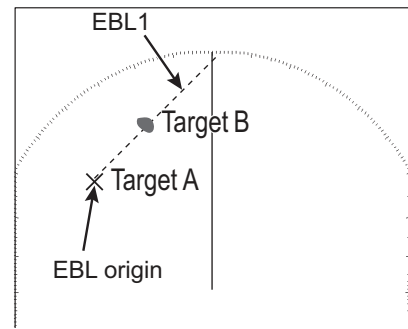

5. Click the center of the target A to fix the EBL.

6. Right-click to quit the offset EBL.

7. Click the [EBL1] icon to change the bearing. The [EBL1] icon turns yellow.

Highlighted yellow

8. Click the center of the target B. The EBL bi-sects target B.

EBL1

Target B

Target A

EBL origin

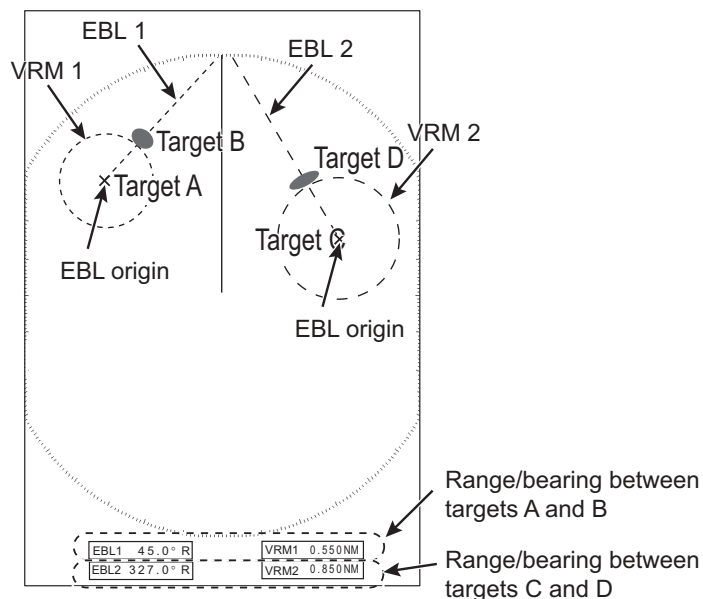9. Click the [VRM1] icon to change the range. The [VRM1] icon turns yellow. [VRM1] is linked to [EBL1]; [VRM2] is linked to [EBL2].

VRM1 0.550NM   Click   VRM1 0.550NM

Yellow

VRM1

Target B

Target A

EBL origin

10. Click the inner edge of the target B. The VRM adjusts to put the VRM ring on the target B. The point selected at step 4 is the center of VRM.

VRM1

Target B

Target A

EBL origin
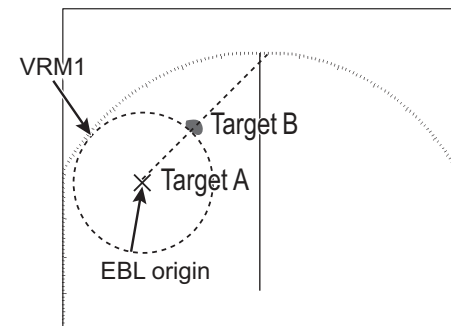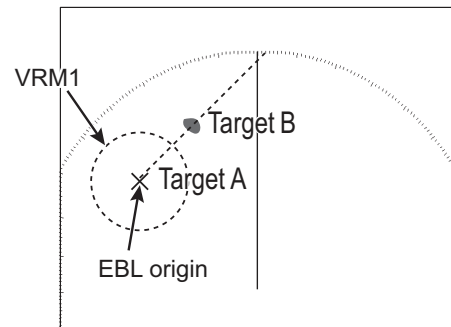
11. Read the bearing at the [EBL] icon and the range at the [VRM] icon.

12. Do the same procedure for [EBL2] and [VRM2] to measure the range and bearing between two other targets (target C and D), use EBL2 and VRM2 similarly.

EBL 1

VRM 1

EBL 2

VRM 2

Target B

Target D

Target A

Target C

EBL origin

EBL origin

Range/bearing between targets A and B

Range/bearing between targets C and D

EBL1 45.0° R   VRM1 0.550NM
EBL2 327.0° R   VRM2 0.850NM

1.20.2 Collision assessment by offset EBL

The origin of the EBL can be moved to enable measurement of range and bearing between any targets. This function is also useful for assessment of the potential risk of collision.

1. Move the EBL origin on the target A, following "How to offset an EBL" on page 1-23.
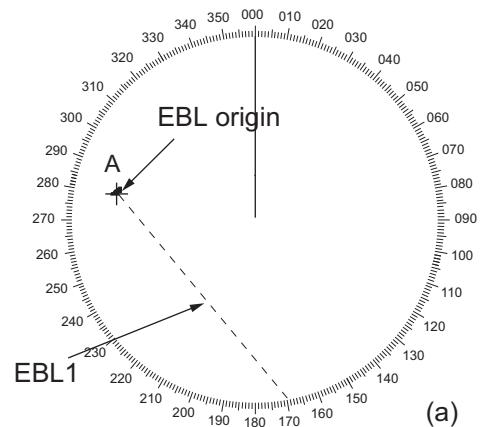
2. Right-click to quit the offset EBL.

3. After waiting for a few minutes, click the appropriate EBL icon to operate the EBL. The icon turns yellow.

4. Click the new target position (A'). The EBL is considered as the course of the target.
   Note: If the EBL passes through the own ship's position, the target ship is on a collision course.
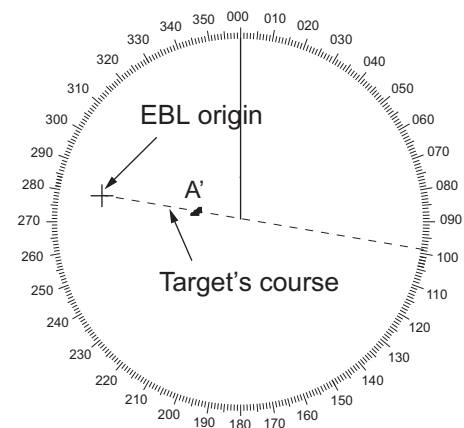
5. To return the EBL origin to the own ship's position, do the following procedure.
   1) Right-click inside the display area to open [CURSOR MENU].
   2) Click [EBL OFFSET].
   3) Click the anywhere in the radar display area. The EBL origin moves to the own ship's position.

6. Right-click to quit the offset EBL.

1.20.3 Point of reference for origin point of offset EBL

The origin point of the offset EBL can be ground stabilized (geographically fixed), north stabilized (true) or referenced to own ship's heading (relative). This menu is available in [SEA] mode only. However, the setting is applied in [RIVER] mode also.

1. In the [SEA] mode, open [MAIN MENU], click [MARK] to show the [MARK] menu.

```
[MARK]

1   BACK
2   OWN SHIP MARK
    MIN/RECTANGLE/
    PENTAGON
3   STERN MARK
    OFF/ON
4   EBL OFFSET BASE
    STAB GND/STAB HDG/
    STAB NORTH
5   VRM SYNC OFFSET EBL
    OFF/ON
```

[MARK] menu ([SEA] mode)

2. Click [EBL OFFSET BASE].

3. Click the origin point of the offset EBL.
   [STAB GND]: Reference to latitude and longitude of the origin position. Origin position is always fixed regardless of your ship's movement.
   [STAB HDG]: Reference to heading. The relationship between origin position and own position is always kept.
   [STAB NORTH]: Reference to North. The origin position changes with North position.

4. Click outside the menu window to close the menu.

1.21 How to Off-center the Display

Own ship position, or sweep origin, can be moved to expand your field of view without switching to a larger range scale. The sweep origin can be off-centered to the cursor position, but not more than 60% of the range in use; if the cursor is set beyond 60% of the range scale, the sweep origin will be off-centered to the point of 60% of the limit. You can select the off-centering rate among, 20%, 40% or 60%.
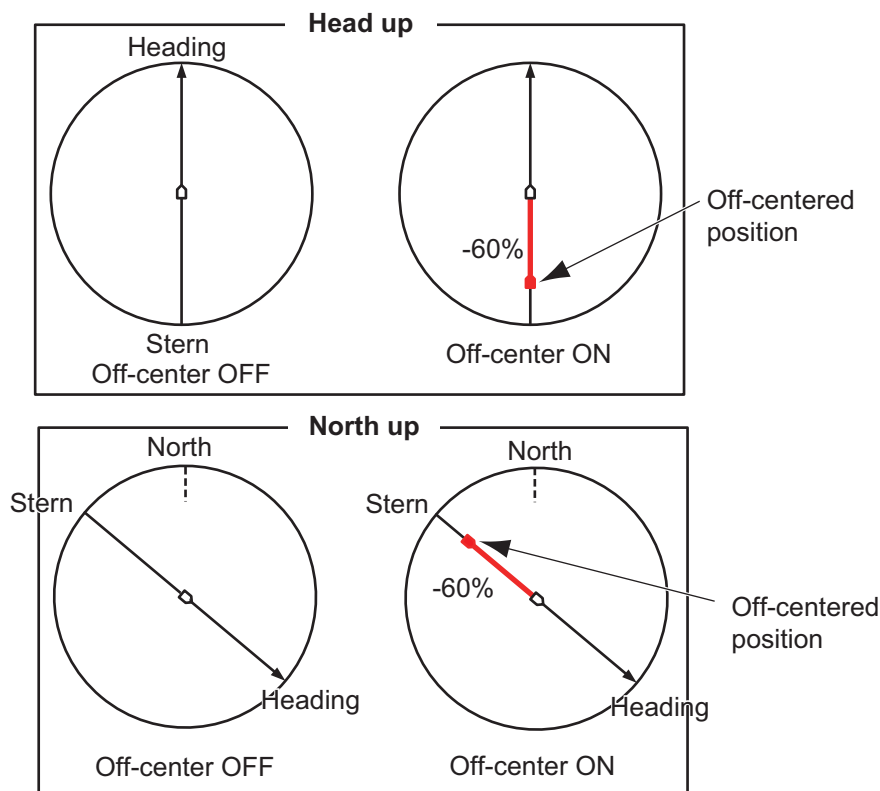
How to select the off-centering rate

1. Click the [OFFCENT] (Off-center) icon at the top left corner of the screen.

2. Click to switch the off-centering rate, [-20%], [-40%], [-60%] or [OFF].
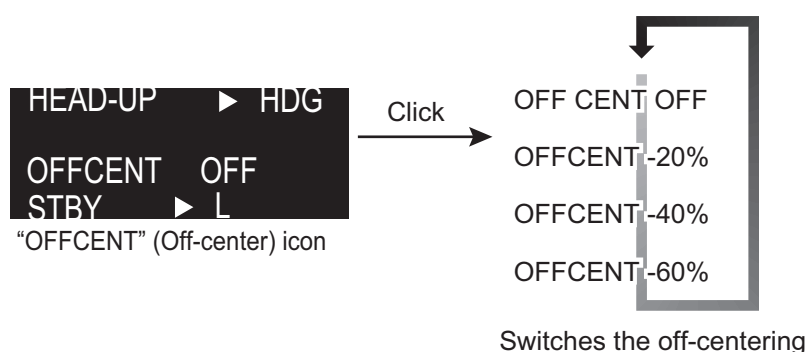
How to off-center the display

1. Click inside the effective display area to open [CURSOR MENU].

2. Click [OFF CENTER].

3. Click the off-center point to be the center of the radar display.

4. Right-click to complete the off-center the display.

1.22 Interference Rejecter

The radar interference can occur when your ship is near the radar of another ship that operates on the same frequency band with your radar.
The interference appears on the screen as many bright dots. The dots can be random or in the shape of dotted lines that run from the center to the edge of the display. Interference is easily identifiable because it does not appear in the same location on the next sweep. When this feature is turned on, "IR 1", "IR 2" or "IR 3" appears at the bottom right corner on the screen.
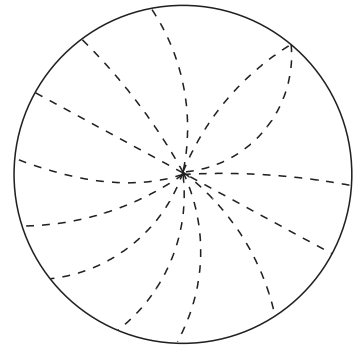
Click the IR (Interference Rejection) icon to switch the setting among [IR OFF], [IR 1], [IR 2], [IR 3]. [IR 3] provides the highest degree of interference rejection.

"IR" (Interference rejection) icon
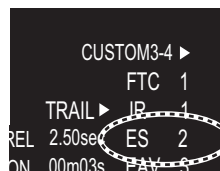(at the bottom right corner on the screen)

Note: When there is no interference, turn off the interference rejecter so that you do not miss small targets.

1.23 Echo Stretch

The echo stretch feature enlarges the targets in the range and bearing directions to make the targets easier to see. This feature is available on any range. There are three levels of echo stretch, [1], [2] and [3]. [3] enlarges the targets the most.

Note: The echo stretch magnifies the targets, sea and rain clutters, and radar interference. Correctly adjust the sea clutter, rain clutter and radar interference before you activate the echo stretch.

Click the [ES] (echo stretch) icon to switch the setting among [ES OFF], [ES 1], [ES 2] and [ES 3].

"ES" (Echo stretch) icon
(at the bottom right corner on the screen)

1.24 Echo Averaging

To identify true target echoes from sea clutter, echoes are averaged over successive picture frames. If an echo is solid and stable, the echo is shown in its normal intensity. The brilliance of sea clutter is reduced to easily identify true targets from the sea clutter.

Note 1: Do not use the echo average function under heavy pitching and rolling to prevent loss of targets.

Note 2: This feature requires a heading signal and position data. When either signal becomes lost, echo average is deactivated.

To correctly use the echo average function, first reduce the sea clutter properly. Leave a little sea clutter on the screen so as not to erase weak targets. Then, do as follows:

Click the [EAV] (echo average) icon to switch the setting among [EAV OFF], [EAV 1], [EAV 2], [EAV 3].


"EAV" (Echo average) icon
(at the bottom right corner on the screen)

1.25 Target Trails

The trails of the radar targets can be shown simulated in afterglow to check target movement. The target trails are referenced as either relative or true. True trails require a heading signal and position data.

1.25.1 How to start, stop the trails

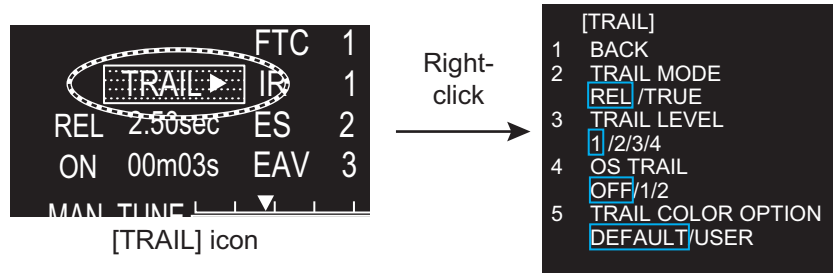Click the trail display icon to switch between [ON] and [OFF].
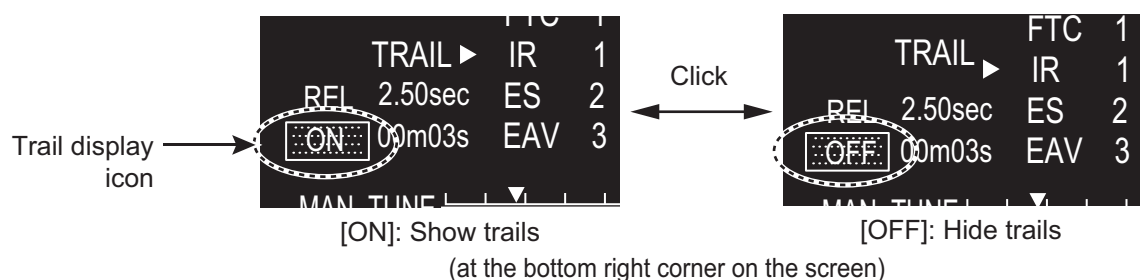
[ON]: Show trails   [OFF]: Hide trails
(at the bottom right corner on the screen)

1.25.2   [TRAIL] menu

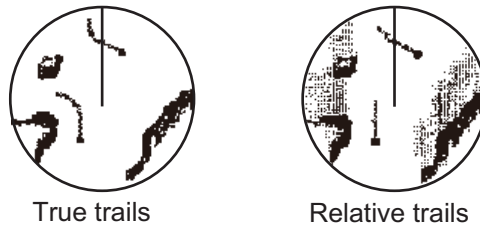You can adjust the detail setting for trails on the [TRAIL] menu.

1.   Right-click the [TRAIL] icon to show the [TRAIL] menu.

[TRAIL] icon

2.   Click the required menu item.
3.   Click an option for each menu.
4.   Click outside the menu window to close the menu.

1.25.3   Trail mode

You can display the echo trails in true or relative motion.
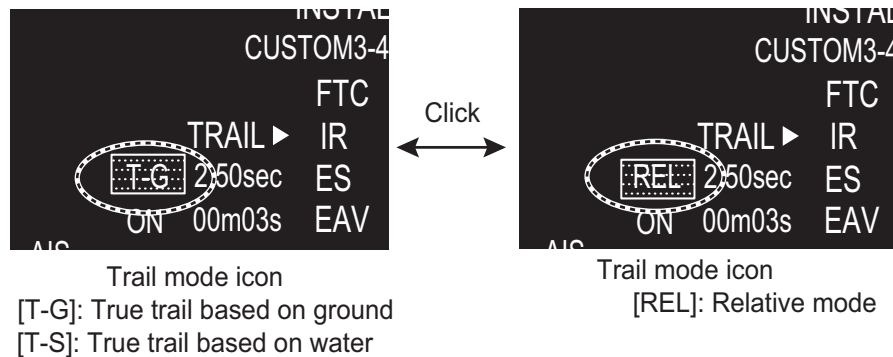

True trails   Relative trails

True mode

The true trails show true target movements according to their over-the-ground speeds and courses. The stationary targets do not show the trails. The true trails require a heading signal and position data.

Relative mode

The relative trails show other ships' movements relative to your ship. The stationary targets also show the trails.

(at the bottom right corner on the screen)

Trail mode icon
[T-G]: True trail based on ground
[T-S]: True trail based on water

Trail mode icon
[REL]: Relative mode

To select the trail mode, select the trail mode icon to switch the mode, [T-G], [T-S] (True mode) or [REL] (Relative mode). For the ship speed mode ([T-G], [T-S]), see "Speed menu" on page 1-52.

**Note:** [T-S] is available only when [SHIP SPEED] is set to [STW].

1.25.4 Trail level

The level (intensity) of the afterglow that extends from radar targets may be selected as below.

1. Right-click the trail icon to show the [TRAIL] menu.
2. Click [TRAIL LEVEL].
3. Select the trail level among 1 to 4.
   The higher the number the greater the intensity of the afterglow.
4. Click outside the menu window to close the menu.

1.25.5 Trail time

Trail time, the trail plotting interval, is selected as follows. The elapsed time since the start of the trail appears below the trail time.

(at the bottom right corner on the screen)
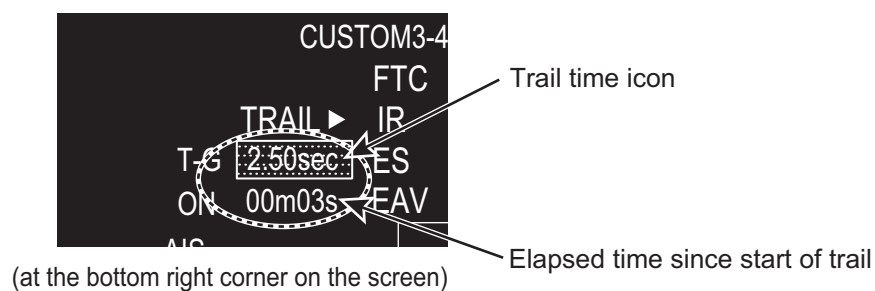
To change the trail time, select the trail time icon. The options for trail time are different according to the operation mode.

- [RIVER] mode: 1.25 sec*, 2.5 sec, 5 sec
  *: When the antenna rotation speed is 26 rpm, the [1.25 sec] is the same picture as the [2.5 sec].
- [SEA] mode: 5 sec, 15 sec, 30 sec, 1 min, 3 min, 6 min

1.25.6 Own ship trail

You can show the trail of own ship as follows:

1. Right-click the [TRAIL] icon to show the [TRAIL] menu.
2. Click [OS TRAIL].
3. Click the option among [OFF], [1] or [2].
   [OFF]: Hide the trail of own ship.
   [1]: Show the trail of own ship.
   [2]: Show the trail of own ship, but hide the trail of sea clutter near own ship.
4. Click outside the menu window to close the menu.

1.25.7 Trail color modes

There are two color modes for the trail color, [DEFAULT] and [USER].

- [DEFAULT]: The trail color becomes the same color as the echo color.
- [USER]: The trail color is set on [TRAIL COLOR] in [BRILL MENU]. See "How to edit [BRILL MENU]" on page 1-8

The trails always begin with the [DEFAULT] color mode. The [USER] color mode is not saved after the power turns off.

1. Right-click the [TRAIL] icon to show the [TRAIL] menu.
2. Click [TRAIL COLOR OPTION].
3. Click the desired color mode, [DEFAULT] or [USER].
4. Click outside the menu window to close the menu.

1.26   Target Alarm

The target alarm, available in the [SEA] mode, serves to alert the navigator to targets (ships, landmasses, etc.) entering or leaving the specified area, with audio-visual alarms.

⚠ **NOTICE**

· **The alarm should not be relied upon as the sole means for detecting possible collision situations.**

· **[STC], [RAIN] and [GAIN] controls should be properly adjusted to be sure the alarm system does not overlook target echoes.**

1.26.1   How to set a target alarm

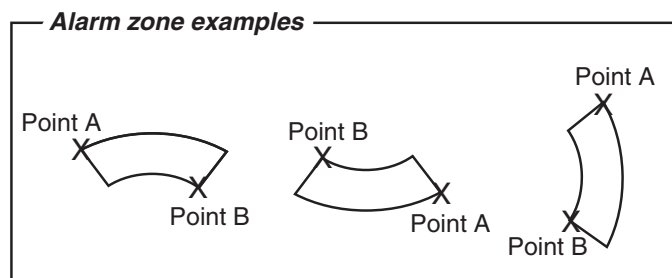The procedure below shows how to set a target alarm using the figure below as an example.
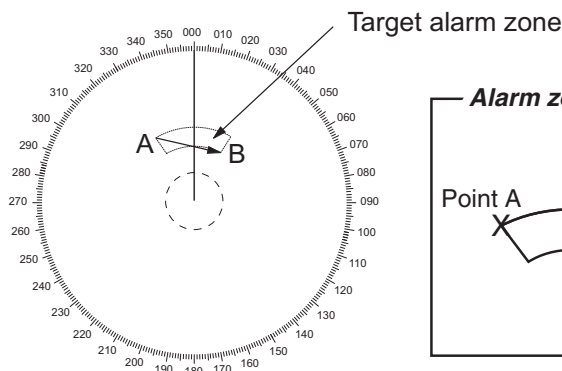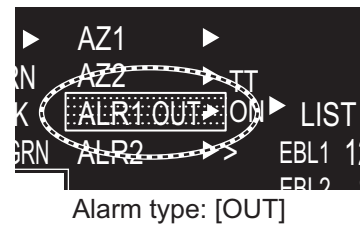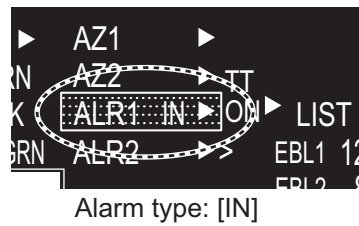
1. Click the [ALR1] or [ALR2] icon. [SET] appears in the [ALR] icon.

(at the bottom left corner on the screen)

ALR1: [SET]
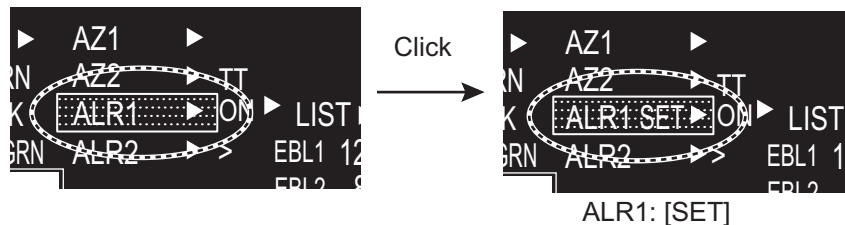
2. Use the touch pad to select the point "A" on the radar screen then push the left button.

3. Use the touch pad to select the point "B" then push the left button. [IN] (or [OUT]) replaces [SET] in the [ALR] icon. The target alarm zone's lines are shown in dashed lines.

Alarm type: [IN]

Alarm type: [OUT]

Target alarm zone

Alarm zone examples

Point A

Point B

Point B

Point A

Point A

Point B

Note 1: If you wish to create a target alarm zone having a 360-degree coverage around own ship, set point "B" in almost the same direction as point "A".

Note 2: Two target alarm zones may be set. Note however that the 2nd target alarm zone is available only when the 1st target alarm zone is active.

1.26.2 How to select the alarm type

You can set the target alarm to activate against targets entering or exiting the alarm zone.
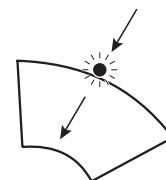
Target "IN" alarm   Target "OUT"alarm
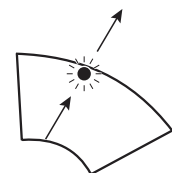
1. Open [MAIN MENU], click [ALARM] to show the [ALARM] window.

[ALARM]
1 BACK
2 [TT•AIS]
3 [TARGET ALARM]

2. Click [TARGET ALARM].

[TARGET ALARM]
1 BACK
2 ALR1 MODE
   IN /OUT
3 ALR2 MODE
   IN /OUT
4 LEVEL
   1 /2/3/4
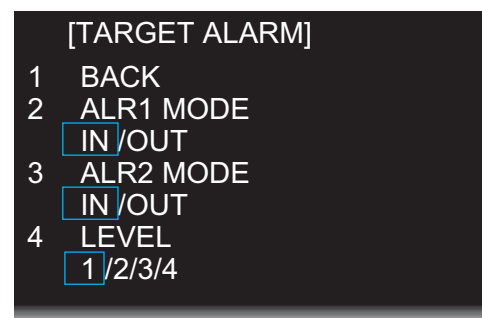
3. Click [ALR1 MODE] or [ALR2 MODE].
4. Click the alarm type, [IN] or [OUT].
5. Click outside the menu window to close the menu.

1.26.3 How to select the target strength which triggers a target alarm

You can select the target strength which triggers the target alarm as follows.

1. Open [MAIN MENU], click [ALARM].
2. Click [TARGET ALARM].
3. Click [LEVEL].
4. Click the alarm echo strength level, [1] to [4]. [4] is the strongest.
5. Click outside the menu window to close the menu.

1.26.4 How to acknowledge the target alarm

A target in the target alarm zone produces both visual (flashing) and audible (beep) alarms. To silence the audio alarm, press the left button or click the appropriate [ALARM ACK] icon. This deactivates the audio alarm but does not stop flashing of the offending target.

1.26.5 How to sleep a target alarm temporarily

You can sleep a target alarm zone when its use is not immediately needed. The alarm zone remains on the screen, but any targets that enter (or exit) the alarm zone do not trigger the audio and visual alarms.

1. Click the [ALR1] or [ALR2] icon until the icon reads "ALR1 ACK" or "ALR2 ACK".
2. To activate a sleeping target alarm zone, press the [ALR1] or [ALR2] icon until the alarm indication changes to "ALM1 (or 2)_IN(or OUT)".
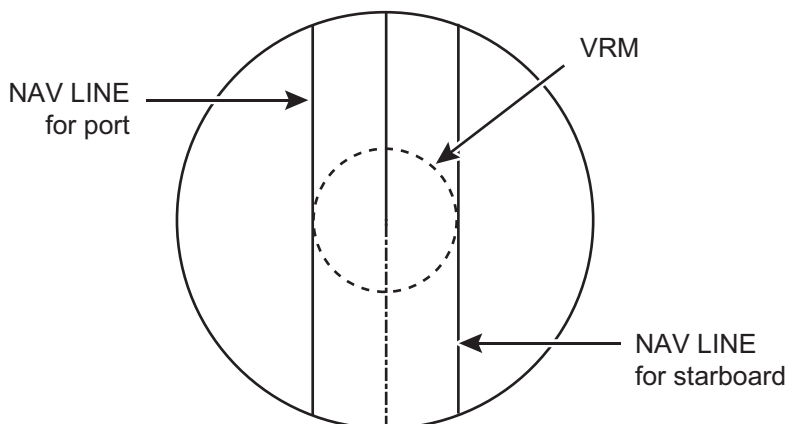
1.26.6 How to delete a target alarm

1. Click the appropriate [ALR] icon.
2. Press and hold down the left button until the [ALR] icon goes blank. The target alarm is deleted from the screen.

Note: If both acquisition zones are active [ALR1] can not be deleted unless [ALR2] is deleted.

1.27 NAV Lines

There are two NAV lines for port and starboard.

How to display the NAV lines

Click the appropriate [NAV] icon at the bottom of the screen.

[NAV] icon for port   [NAV] icon for starboard
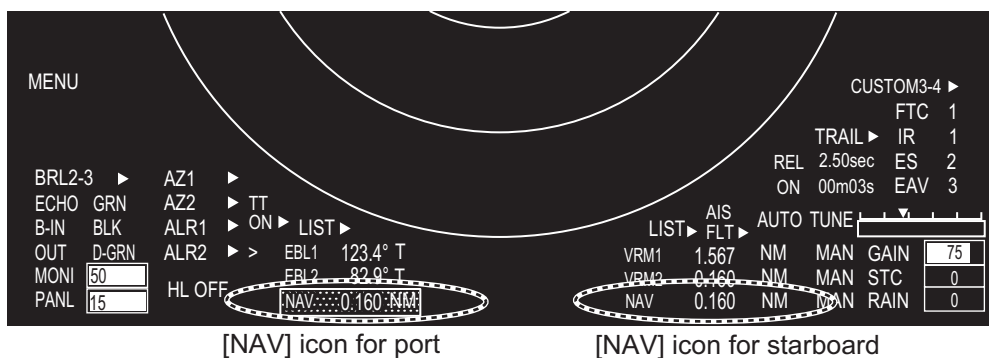
How to set the NAV lines

NAV lines are set on both sides of own ship. The distance to port or starboard is individually determined.

1. Click the appropriate [NAV] icon to display a NAV line. If the NAV line is already displayed, go to step 2.

2. Click the [NAV] icon to activate the NAV line. The icon turns yellow.

Highlighted yellow
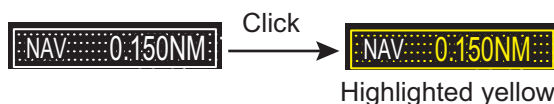
3. Click the position where you want to put the NAV line in the radar display area.

How to turn off the NAV lines

Long press the appropriate [NAV] icon with the left button. The location of the line is retained in the memory when the power is turned off.

1.28   Alarms, Error Messages

1.28.1   Alarm indication

When the alarm is generated, the [ALARM] icon flashes (in red) and the audio alarm sounds.
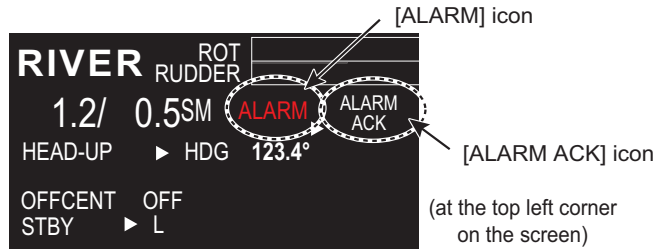
Icon indication	Status	Meaning
ALARM ▶		No alarm.
ALARM ▶	Red character and flashing.	An alarm is active.
ALARM ▶	Red character and not flashing.	All active alarms are acknowledged. Or all alarms are not in alarm status but not acknowledged.

How to acknowledge the alarm

Click the [ALARM ACK] icon to acknowledge the alarm and silence the audio alarm. The [ALARM] icon continues flash until the cause of the alarm is cleared.

1.28.2 Alarm description

Alarm description

| Alarm type	Alarm message	Meaning
COLLISION ALARM	TT DANGEROUS	CPA and TCPA of a TT is within a preset limit.
	AIS DANGEROUS	CPA and TCPA of an AIS target is within a preset limit.
	DEPTH LIMIT	The depth measured by the depth sensor(s) is within a preset limit.
	TARGET ALARM	A target has entered (or exited) a target alarm zone.
SYSTEM ERROR	NO VIDEO	Loss of video signal.
	NO AZIMUTH	Loss of azimuth signal.
	NO HEADLINE	Loss of heading signal.
	CONTROL HEAD COMMUNICATION ERROR	No communication between control unit and UIP (Control unit may not be connected.)
	CPU TEMPERATURE	CPU has overheated.
	TUNE CONTROL	Radar tuning problem.
	FAN MOTOR	Fan motor has stopped.
SENSOR ERROR	NO GYRO	Loss of gyrocompass (heading) signal.
	NO LOG	Loss of log (speed) signal.
	NO EPFS	No position data.
	NO ECHO SOUNDER	No depth data from echo sounder.
	NO WIND SENSOR	No wind data.
	SPEED	No VTG signal.
	ROT	Abnormal ROT signal.
	EPFS FRONT (AFT) ERROR	GPS sensor is not received.
	ECHO SOUNDER FRONT (AFT) ERROR	Depth data at front or aft sensor is not received.
AIS ALARM	NO CPA/TCPA FOR AIS	No COG or SOG for AIS.
	AIS RECEIVE ERROR	No VRM or VDO sentences for 30 seconds (or the AIS function).
	AIS ACTIVATE 100%	The maximum number of AIS targets has been activated.
OTHER WARNING	TUNE INITIALIZE	Tuning is being initialized.
	RD DATA ERROR	Data of SD card is corrupted.
	WR DATA ERROR	Data of SD card was not written correctly.
	SERVICE ENTRY	Service menu enabled (by serviceman).

1.28.3 Alarm summary

When an alarm is generated the color of the [ALARM] icon (top of display) turns red. You can see what alarms have been generated in the [ALARM SUMMARY] menu.

1. Right-click the [ALARM] icon to show the [ALARM] menu.
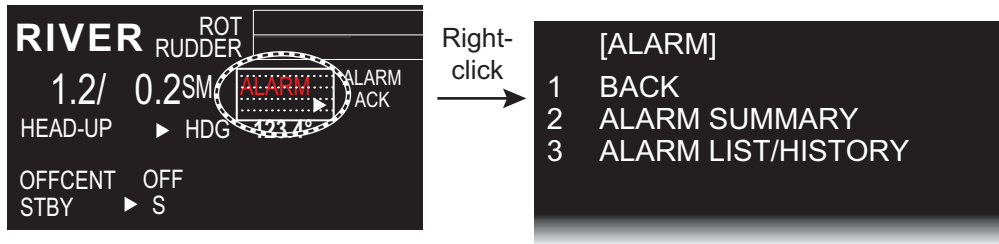
2. Click the [ALARM SUMMARY]. Active alarms are shown in red.
   Red, flashing: Active and not acknowledged.
   Red, not flashing: Active and acknowledged.

(at the bottom left corner on the screen)

Alarm indication	Meaning	Alarm indication	Meaning
[TRIG]	No trigger	[GYRO]	No gyro
[VIDEO]	No video	[LOG]	No log
[AZ]	No azimuth	[EPFS]	No EPFS
[HL]	No heading	[ROT]	No ROT (Rate of turn)

1.28.4 Alarm list/history

The alarm list displays the names of violated alarms, including the time and date violated. Unacknowledged alarms are displayed first in the list (in red text), in order from latest to earliest. When the cause of an alarm is removed, the alarm buzzer stops and the indication stops flashing. However, the alarm remains in the list until it is acknowledged. Acknowledged alarms which are rectified are moved to [Alarm History].

Alarm list:
Shows active alarms and unacknowledged alarms.

[SW] icon

Click [SW] icon to switch between alarm list and history.

Alarm history:
Shows alarms that have been rectified and acknowledged.
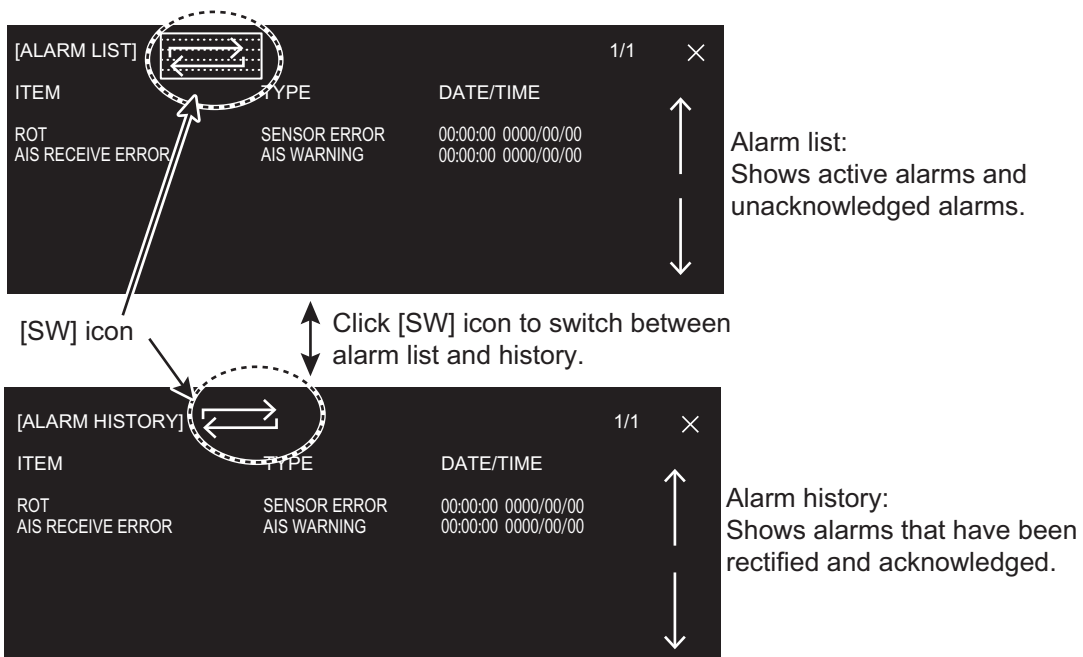
1.28.5   Depth alarm

The depth alarm warns you when the depth is shallower than the preset depth value. To change the depth, follow the steps below.

1. Open [MAIN MENU], click [NAV DATA].

2. Click [DEPTH].

3. Click [DEPTH ALARM VALUE] then set the value by rotating the setting knob. The setting range is 0.00 to 9.99 m.
   Note: When the setting is 0.00, the alarm is not generated.

4. Click outside the menu window to close the menu.

1.28.6   ROT alarm

The ROT graph displays ship's rate of turn (degrees/min) using the ROT signal fed from an ROT sensor. If the ROT data is lost, the indication "ROT ALARM" appears in [ALARM LIST] and the audio alarm sounds. To acknowledge loss of the ROT signal, click the [ALARM ACK] icon.

1.29   Docking Mode

The docking mode provides;

• Depth at the fore and aft

• Speed and movement at the fore, midpoint and aft
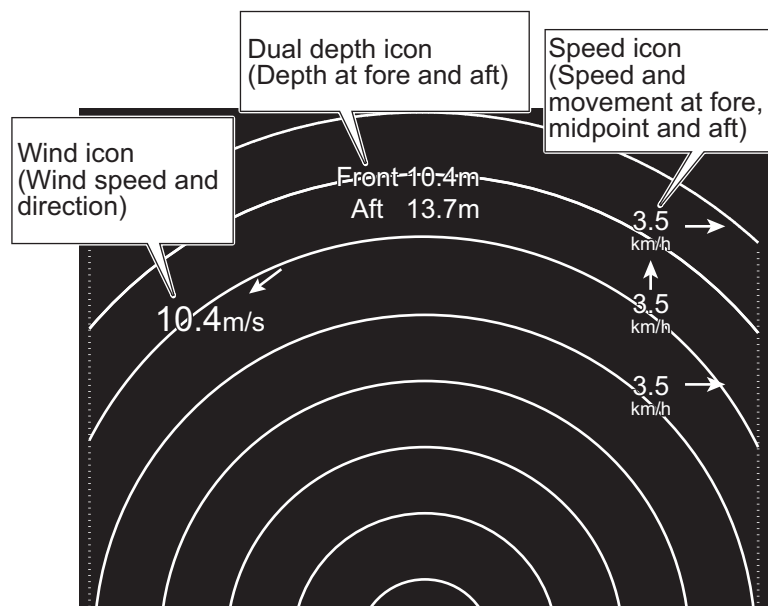
• Wind speed and direction

1.29.1 How to activate the docking mode

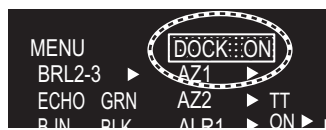The docking mode can be shown in TX mode.

1. Open [MAIN MENU], click [DISPLAY].
2. Click [DOCKING MODE].
3. Click [ON] to display the docking icon at the minimum range among the available ranges. The docking icon [DOCK] is shown at the bottom left corner on the screen.
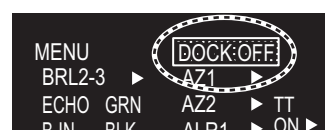
DOCKING MODE: [OFF]

```
MENU
BRL2-3    ▶    AZ1    ▶
ECHO GRN       AZ2    ▶    TT
B IN  BLK      ALR1   ▶  ON ▶
```
Docking icon is hidden.

DOCKING MODE: [ON]

```
MENU              DOCK:::ON
BRL2-3    ▶    AZ1    ▶
ECHO GRN       AZ2    ▶    TT
B IN  BLK      ALR1   ▶  ON ▶
```
[DOCK ON]
Docking information is shown.

```
MENU              DOCK:OFF
BRL2-3    ▶    AZ1    ▶
ECHO GRN       AZ2    ▶    TT
B IN  BLK      ALR1   ▶  ON ▶
```
[DOCK OFF]
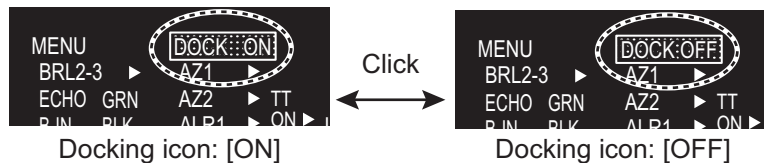Docking information is hidden.

4. Click outside the menu window to close the menu.

1.29.2 How to show or hide the docking information display

You can show the docking information automatically at the following ranges. When you show the docking information, the radar display is shown at the minimum range.

- [RIVER] mode: 0.125 SM to 0.25 SM
- [SEA] mode: 0.125 NM to 0.25 NM, 0.125 SM to 0.25 SM, 0.125 km to 0.5 km, 0.125 kyd to 0.5 kyd

The docking information appears at the top of the radar screen. You can show or hide the information with the [DOCK] icon as shown below.

```
MENU              DOCK:::ON              MENU              DOCK:OFF
BRL2-3    ▶    AZ1    ▶                   BRL2-3    ▶    AZ1    ▶
ECHO GRN       AZ2    ▶    TT     Click   ECHO GRN       AZ2    ▶    TT
B IN  BLK      ALR1   ▶  ON ▶     ⟷      B IN  BLK      ALR1   ▶  ON ▶
```
Docking icon: [ON]   Docking icon: [OFF]

(at the bottom right corner on the screen)

1.29.3 Wind speed and direction

Wind speed and direction are provided with the docking information display. Relative speed is indicated digitally and direction is shown with an arrow.
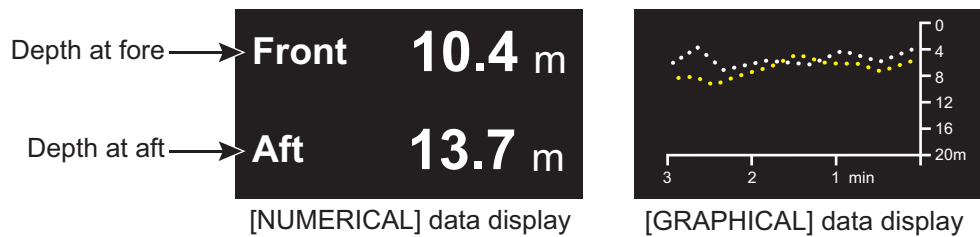
10.4 m/s

The wind of 10.4 m/s coming from 45° (relative)

1.29.4 Depth data

Depth at the fore and aft are shown with the docking information display. This feature requires fore and aft depth data.
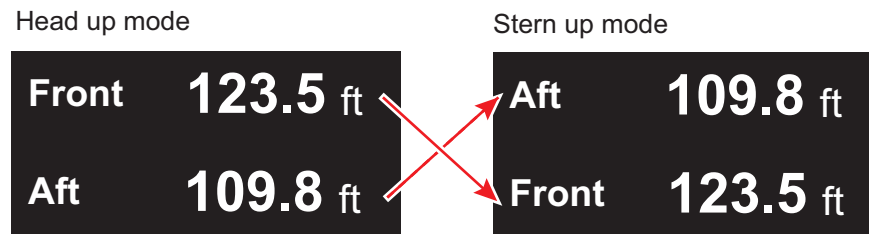
Note: Dual depth requires two transducers.

Depth at fore → **Front** **10.4** m

Depth at aft → **Aft** **13.7** m

[NUMERICAL] data display   [GRAPHICAL] data display

Depth data example

How to select the depth sensor

1. Open [MAIN MENU], click [NAV DATA].
2. Click [DEPTH].
3. Click [DUAL SENSOR].
4. Click the required sensor.
   [BOTH]: Both fore and aft depths.
   [FRONT]: Fore depth only.
   [AFT]: Aft depth only.

Depth indications and orientation mode

The stern mode shows aft depth on top.

Head up mode   Stern up mode

Front **123.5** ft   **Aft** **109.8** ft

Aft **109.8** ft   **Front** **123.5** ft

Depth display format

Depth can be shown digitally or in graph form.

1. Open [MAIN MENU], click [NAV DATA].
2. Click [DEPTH].
3. Click [GRAPH TYPE].
4. Click a required option.
   [NUMERICAL]: Displays the depth data digitally.
   [GRAPHICAL]: Displays the depth data graphically.

```
[DEPTH]

1   BACK
2   GRAPH TYPE
    NUMERICAL /GRAPHICAL
3   DUAL SENSOR
    BOTH /FRONT/AFT
4   [DEPTH SCALE]
5   TIME SCALE
    15sec/30sec /1min/3min
6   DEPTH ALARM VALUE
    5. 00m
```
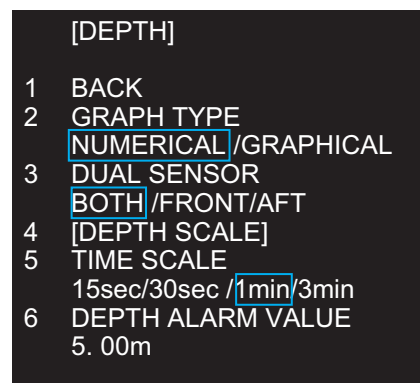
1.29.5 Depth graph

You can see the depth data in graph format by setting [GRAPH TYPE] to [GRAPHI-CAL] (see step 3 in "Depth display format" on page 1-41). The depth graph shows the depth history with dots, not a line.
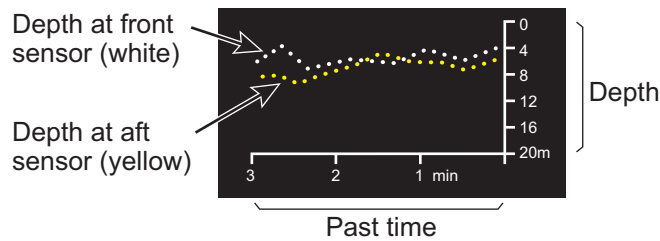

Depth graph example

How to set depth graph

1. Open [MAIN MENU], click [NAV DATA].

2. Click [DEPTH].

3. Click [DEPTH SCALE].

4. Click [SCALE TYPE].

5. Click the scale to use, [RIVER] or [SEA].

6. Click an appropriate option for the scale selected at step 5.
   [RIVER]: 4, 10, 40
   [SEA]: 10, 20, 50, 100, 200, 500

7. Click [BACK] to go back the [DEPTH] window.

8. Click [TIME SCALE].

9. Click the time scale (horizontal axis) for the depth graph, among 15 sec, 30 sec, 1 min and 3 min.

10. Click outside the menu window to close the menu.
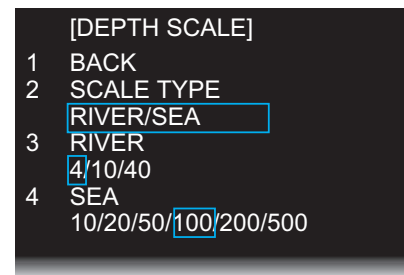
How to select the depth sensor(s)

The depth graph can show depth data from the front and/or aft. The front data is shown in white; aft data is yellow. See "Depth menu" on page 1-52 to select the depth sensor.

1.29.6 Speed and movement indications

The docking mode provides speed and movement indications at the fore, midpoint and aft. This feature requires data from a GPS sensor or satellite compass.

How to select the speed sensor

1. Open [MAIN MENU], click [NAV DATA].

2. Click [PREDICTION].

3. Click [OWN SHIP POSITION].

4. Click a sensor.
   [DUAL-GPS]: Display fore-aft and port-starboard speeds, fed from GPS navigator.
   [SC]: The speed data from satellite compass.

5. Click outside the menu window to close the menu.

Speed and movement indications and orientation mode

The stern mode shows aft speed on top.

Head up mode
FRONT

Stern up mode
AFT

7.4 → kn

← 3.5 kn

↑

5.7 kn

5.7 kn

↓

3.5 → kn

← 7.4 kn

AFT

FRONT
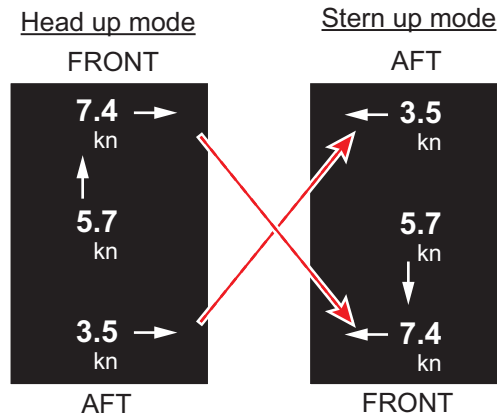
1.30   How to Predict Own Ship's Position

You can predict ship's position in the vector time selected. This function requires two GPS sensors and heading data. Some settings for own ship vector are required as follows:

Menu items	Settings	Reference
[OWN SHIP VECTOR]	[COURSE]	paragraph 1.37.4
[VECTOR TIME]	Set a time between 30 seconds to 6 minutes. **Note:** The shorter the time the more accurate the prediction. [30sec] or [1min] is recommended.	paragraph 2.10.2

Prediction line from GPS-1

× GPS-1

× GPS-1

× GPS-1

× GPS-1

Prediction line from GPS-2

× GPS-2

× GPS-2

× GPS-2

× GPS-2

Ship is running straight ahead

Ship's course is approx. 45°.

Ship's predicted position in a turn
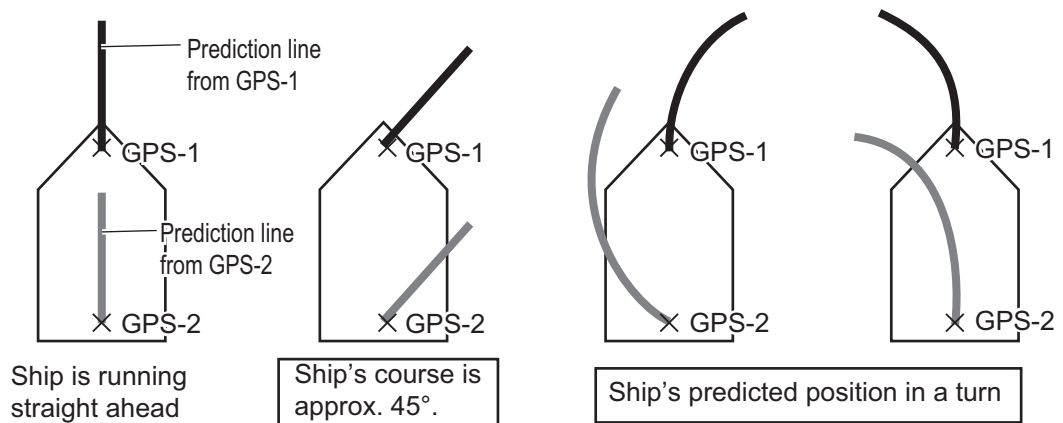
# 1.31 How to Program Function Keys (F1 and F2)

You can program function keys (**F1** and **F2**) to provide one-touch access to a required function. To activate a function, press the applicable function key, **F1** or **F2**.
The default settings for the **F1** and **F2** keys are [ORIENTATION MODE] and [DOCK-ING] respectively.
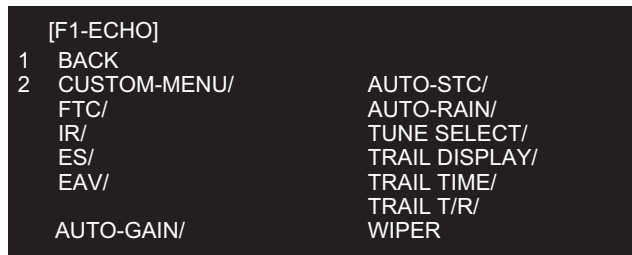
How to program a function key

1. Open [MAIN MENU], click [CONFIGURATION].

2. Click [FUNCTION KEY].

3. Click the function key ([F1] or [F2]) to program.

```
        [F1]
1   BACK
2   [ECHO]
3   [STD KEY]
4   [TT·AIS]
5   [OPERATION]
6   [BRILL]
7   [CUSTOM]
```
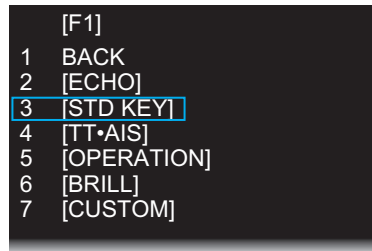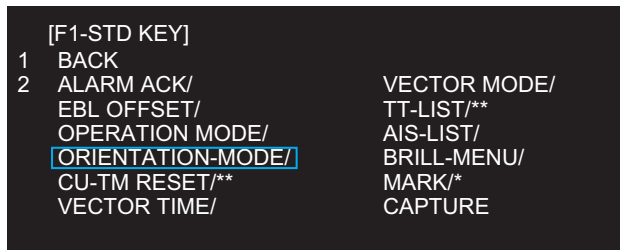
4. Click the appropriate category. The options for each category are shown on the below and on the next page. Some items have multilevel options.

   • Options available in the [ECHO] menu

```
[F1-ECHO]
1   BACK
2   CUSTOM-MENU/          AUTO-STC/
    FTC/                  AUTO-RAIN/
    IR/                   TUNE SELECT/
    ES/                   TRAIL DISPLAY/
    EAV/                  TRAIL TIME/
                          TRAIL T/R/
    AUTO-GAIN/            WIPER
```

   • Options available in the [STD KEY] menu

```
[F1-STD KEY]
1   BACK
2   ALARM ACK/            VECTOR MODE/
    EBL OFFSET/           TT-LIST/**
    OPERATION MODE/       AIS-LIST/
    ORIENTATION-MODE/     BRILL-MENU/
    CU-TM RESET/**        MARK/*
    VECTOR TIME/          CAPTURE
```

   *: [RIVER] mode only
   **: [SEA] mode only

   • Options available in the [TT·AIS] menu

```
[F1-TT·AIS]
1   BACK
2   TT-DISP/**
    AIS-DISP/
    PAST POSN INTERVAL/
    REF MARK/**
    CPA LIMIT/
    CPA/
    TCPA/
    AZ1/**
    AZ2/**
    AIS SCALED SYMBOL
```

   **: [SEA] mode only

• Options available in the [OPERATION] menu

```
[F1-OPERATION]
1   BACK
2   ECHO COLOR/              MARK/LINE-ON/*
    MONITOR BRILL/          BARGE-ON/*
    PANEL DIMMER/           MAP ALIGN/*
    TRANSPARENCY/           MARK/LINE ALL DELETE/*
    ALARM1/**               BARGE ALL DELETE*
    ALARM2/**
    ECHO AREA/**
    DOCKING/
```

 *: [RIVER] mode only
**: [SEA] mode only

• Options available in the [BRILL] menu

```
[F1-BRILL]
1   BACK
2   USER NAME 1        4   USER NAME 3
    BRL1-1/                BRL3-1/
    BRL1-2/                BRL3-2/
    BRL1-3/                BRL3-3/
    BRL1-4                 BRL3-4
3   USER NAME 2        5   USER NAME 4
    BRL2-1/                BRL4-1/
    BRL2-2/                BRL4-2/
    BRL2-3/                BRL4-3/
    BRL2-4                 BRL4-4
```

• The available function to program in the [CUSTOM] menu

```
[F1-CUSTOM]
1   BACK
2   USER NAME 1        4   USER NAME 3
    CUSTOM1-1/             CUSTOM3-1/
    CUSTOM1-2/             CUSTOM3-2/
    CUSTOM1-3/             CUSTOM3-3/
    CUSTOM1-4              CUSTOM3-4
3   USER NAME 2        5   USER NAME 4
    CUSTOM2-1/             CUSTOM4-1/
    CUSTOM2-2/             CUSTOM4-2/
    CUSTOM2-3/             CUSTOM4-3/
    CUSTOM2-4              CUSTOM4-4
```

5. Click outside the menu window to close the menu.

1.32 Markers

1.32.1 [MARK] menu

The [MARK] menu lets you:

- Change the configuration of the own ship mark

- Show or hide the stern mark

- Set the reference point for the offset EBL

- Activate VRM with the offset EBL

1. Open [MAIN MENU], click [MARK].

```
[MARK]

1   BACK
2   OWN SHIP MARK
    MIN/RECTANGLE/
    PENTAGON
3   STERN MARK
    OFF/ON
```

```
[MARK]

1   BACK
2   OWN SHIP MARK
    MIN/RECTANGLE/
    PENTAGON
3   STERN MARK
    OFF/ON
4   EBL OFFSET BASE
    STAB GND/STAB HDG/
    STAB NORTH
5   VRM SYNC OFFSET EBL
    OFF/ON
```

[MARK] menu ([RIVER] mode)   [MARK] menu ([SEA] mode)

2. Click the item.

[OWN SHIP MARK]	Select the shape of own ship mark.
[STERN MARK]	Select on/off the stern mark display.
[EBL OFFSET BASE] ([SEA] mode only)	See paragraph 1.20.3.
[VRM SYNC OFFSET EBL] ([SEA] mode only)	Turn this feature on to automatically activate applicable VRM when using an offset EBL.

3. Click the required option.

4. Click outside the menu window to close the menu.

1.32.2 Heading line

The heading line indicates the ship's heading in all orientation modes. 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. It changes its orientation depending on the ship orientation in north-up and true motion modes.

How to hide the heading line temporarily

To temporarily hide the heading line to look at targets existing dead ahead of own ship, press the **HL OFF** key on the control unit. Release the key to redisplay the heading line, etc.

1.32.3 Stern mark

The stern marker, which is a dot-and-dash line, appears opposite to the heading line. To display or erase this marker do the following:

1. Open the [MARK] menu, click [STERN MARK].

2. Click [OFF] or [ON] as appropriate.

3. Click outside the menu window to close the menu.

1.32.4 North mark

The north mark appears as a short dashed line. The north mark moves around the bearing scale in accordance with the compass signal in the head-up, head-up (TB) or stern-up mode.
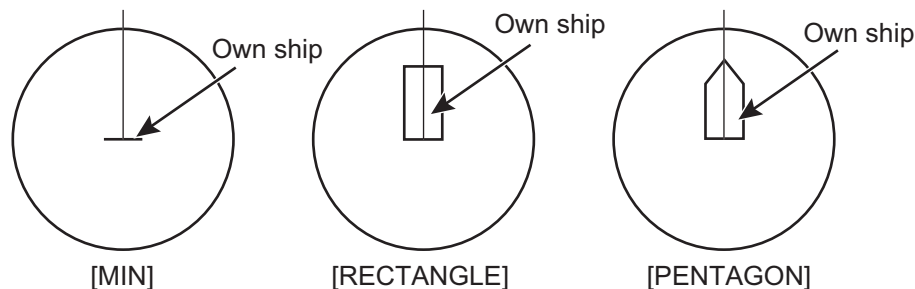

Head-up mode,
Head-up (TB) mode

North-up mode
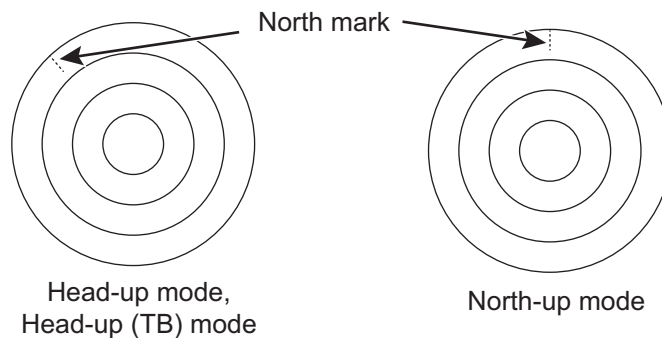
Note: It is not possible to delete the north mark. The north mark is always indicated while heading data is input.

1.32.5 Own ship mark

The own ship symbol marks own position on the display. The symbol is selected from the [MARK] menu.

1. Open the [MARK] menu, click [OWN SHIP MARK].

2. Click the own ship mark shape to use.

[MIN]　　　　　[RECTANGLE]　　　　　[PENTAGON]

3. Click outside the menu window to close the menu.

1.32.6 Barge mark

You may mark the locations of barges on the display with barge mark. This function is available for [RIVER] mode only.
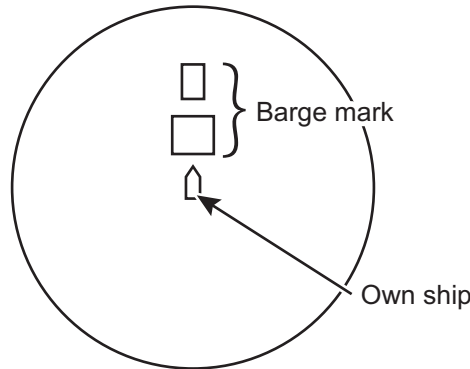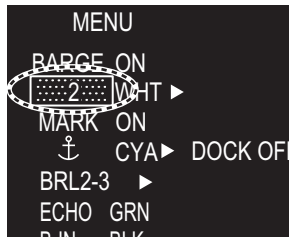

The barge mark is a set of rectangles drawn to indicate the outline of barges. You can create a max. total of 10 barge marks. There are four icons for the barge mark as follows:
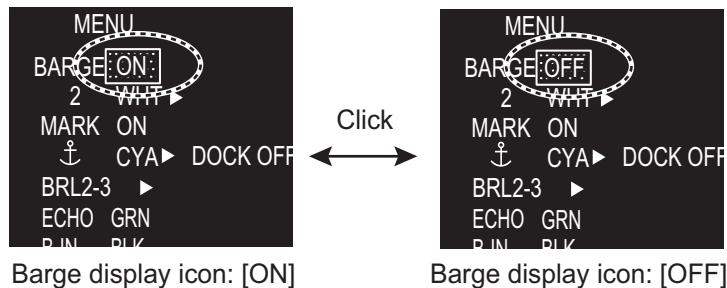

(at the bottom left corner on the screen)
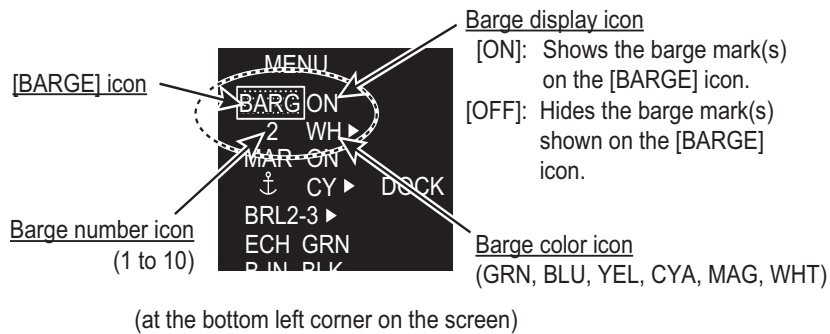
How to show a barge mark on the screen

1. Click the barge number icon then rotate the setting knob to select the barge number (1 to 10).

2. Click the barge display icon to show or hide.

Barge display icon: [ON]   Barge display icon: [OFF]

How to create a barge mark on the screen

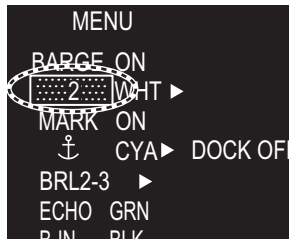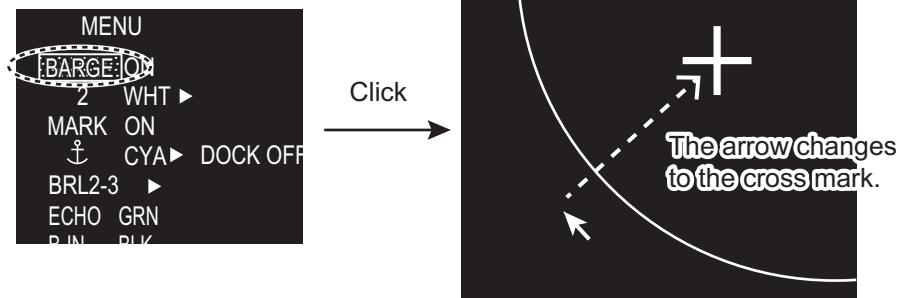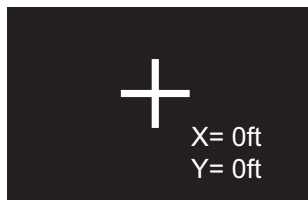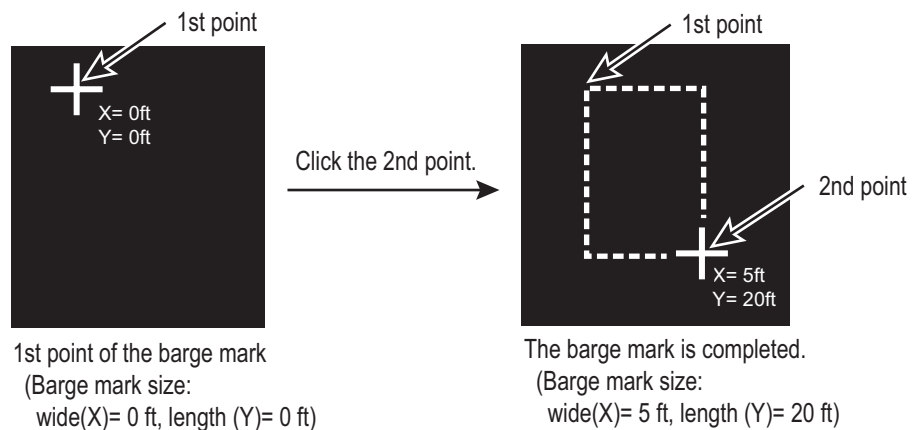1. Click the barge number icon then rotate the setting knob to select the barge number (1 to 10).

2. Click the [BARGE] icon to enable creation of the barge mark. The cursor shape changes from an arrow to a cross mark.

Click

The arrow changes to the cross mark.

3. Click the start point (X-axis and Y-axis) of the barge mark.

X= 0ft
Y= 0ft

4. Select the 2nd point of the barge mark. As you drag the cursor, the width of the X-axis and Y-axis are displayed and the barge mark is drawn with a dashed line.

1st point

X= 0ft
Y= 0ft

Click the 2nd point.

1st point

2nd point

X= 5ft
Y= 20ft

1st point of the barge mark
(Barge mark size:
   wide(X)= 0 ft, length (Y)= 0 ft)

The barge mark is completed.
(Barge mark size:
   wide(X)= 5 ft, length (Y)= 20 ft)

5. Click the 2nd point to complete the barge mark. The mark changes to a rectangle with the solid line.

How to create a barge mark from the [BARGE ICON] menu

1. Right-click the any icon of barge mark to show the [BARGE NUMBER] menu.
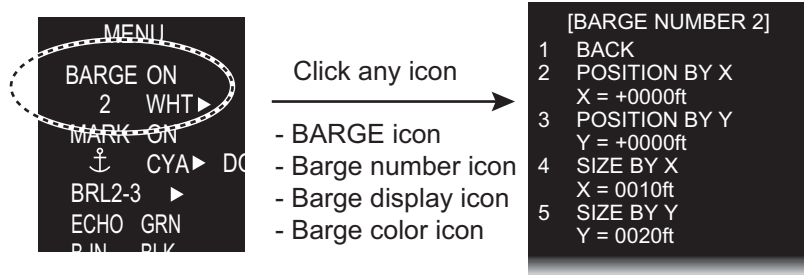
2. Click [POSITION BY X].

3. Set start point in X-axis for drawing the barge mark with the left and right buttons.

4. Click [POSITION BY Y].

5. Set start point in Y-axis for drawing the barge mark with the left and right buttons.

6. Click [SIZE BY X].

7. Set the width of the barge mark with the left and right buttons.

8. Click [SIZE BY Y].

9. Set the length of the barge mark with the left and right buttons.

### How to edit a barge mark on the screen

If the barge mark is currently displayed, go to step 3.

1. Select the barge number icon to show the barge number to edit. Also, you can select the barge mark directly by putting the cursor on the line of the barge mark (In this case, go to step 3).

2. Set [ON] at the display icon to display the barge mark to edit. The selected barge mark turns red.

3. Right-click the barge mark.

4. Click the required action and its option.
   [COLOR]: Change the color of the barge mark.
   [MOVE]: Drag and drop the barge mark by the touch pad.
   [DELETE]: Delete the barge mark.

How to delete barge marks by color

1. Open [MAIN MENU], click [RADAR MAP].

```
[RADAR MAP]
1   BACK
2   MAP ALIGN
    OFF/ON
3   [MARK/LINE INFO]
4   [DATA DELETE]
```

2. Click [DATA DELETE].

```
[DATA DELETE]
1   BACK
2   [MARK/LINE DELETE]
3   [BARGE DELETE]
```

3. Click [BARGE DELETE].

```
[BARGE DELETE]
1   BACK
2   COLOR
    GRN/BLU/YEL/CYA/
    MAG/WHT
3   BARGE ALL DELETE
    NO/YES
```

4. Click [COLOR].

5. Click the barge color to delete.

6. Click outside the menu window to close the menu.
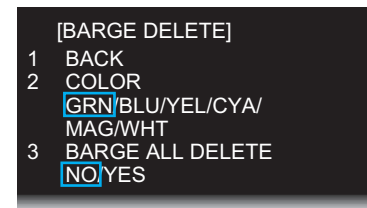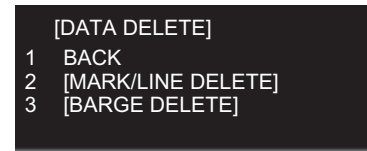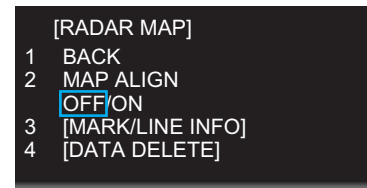
How to delete all barge marks

1. Do the procedure from step 1 to step 3 in "How to delete barge marks by color" on page 1-51.

2. Click [BARGE ALL DELETE].

3. Click [YES].

4. Click outside the menu window to close the menu.

1.33 NAV Data

The following navigation data may be set up on the menu.

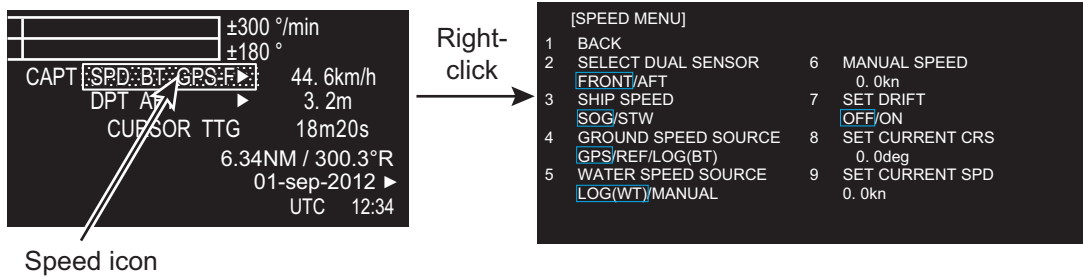|		
- Speed	- Depth	- Own ship position
- Time to the cursor position	- Wind	- Date
- ROT graph	- Rudder graph	- AUTOPILOT graph

1.33.1 How to show ship's position or speed and depth alternately

At the top right corner on the screen, click the icon below to switch between "Speed and Depth" and "Own ship position".

"speed" and "depth"   "latitude and longitude"
                                        (own ship position)
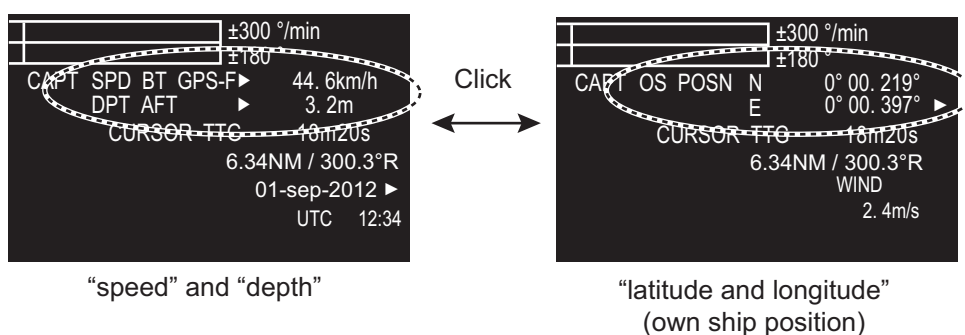
Speed menu

Right-click the speed icon ([SPD]) to show [SPEED MENU].

Speed icon

Right-click

```
[SPEED MENU]
1   BACK
2   SELECT DUAL SENSOR    6   MANUAL SPEED
    FRONT/AFT                 0. 0kn
3   SHIP SPEED            7   SET DRIFT
    SOG/STW                   OFF/ON
4   GROUND SPEED SOURCE   8   SET CURRENT CRS
    GPS/REF/LOG(BT)           0. 0deg
5   WATER SPEED SOURCE    9   SET CURRENT SPD
    LOG(WT)/MANUAL            0. 0kn
```

- [SELECT DUAL SENSOR]: Select the sensor data, [FRONT] or [AFT].
- [SHIP SPEED]: Select the speed indication format, [SOG] (speed over ground) or [STW] (speed towards water).
- [GROUND SPEED SOURCE]: Select the input source for SOG.
- [WATER SPEED SOURCE]: Select the input source for STW.
- [MANUAL SPEED]: Input the speed manually.
- [SET DRIFT]: Turn on or off drift.
- [SET CURRENT CRS]: Set the direction of the tide.
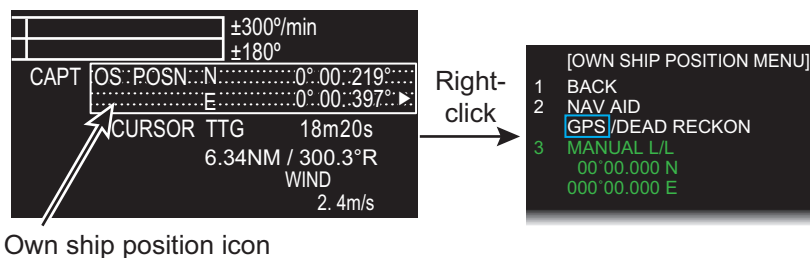- [SET CURRENT SPD]: Set the speed of the tide.

Depth menu

Right-click the depth icon ([DPT]) to show [DEPTH MENU].

Depth icon

Right-click

```
[DEPTH MENU]
1   BACK
2   SELECT DUAL SENSOR
    FRONT/AFT
```

Click [SELECT DUAL SENSOR]. Then, click the depth sensor to use to show depth data, [FRONT] or [AFT].

Own ship position menu

Own ship position icon

Right-click

```
[OWN SHIP POSITION MENU]
1   BACK
2   NAV AID
    GPS/DEAD RECKON
3   MANUAL L/L
    00°00.000 N
    000°00.000 E
```

Right-click the own ship position icon to show [OWN SHIP POSITION MENU].

- [NAV AID]: Click the source of ship position data, [GPS] or [DEAD RECKON] (dead reckoning).
- [MANUAL L/L]: For [DEAD RECKON], enter the latitude and longitude, using the software keyboard.