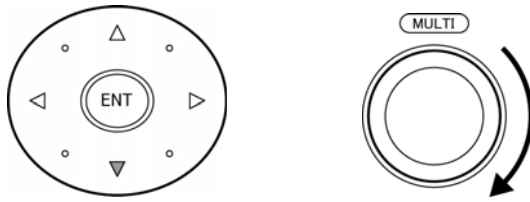


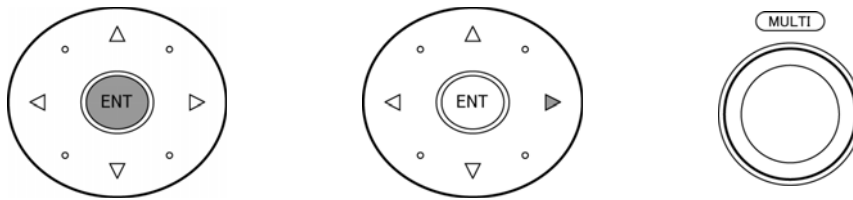
- 4 Press the cursor key (down) or turn the [MULTI] control (clockwise) to select **IR**.



"IR" is color-inverted.

RADAR Echo	
1. IR	Low
2. Target Enhance	Level 1
3. Process	PROC 1
4. Zoom	Off
5. Video Latitude	Normal
6. Video Noise Rejection	Off

- 5 Press the [ENT] key, the cursor key (right) or the [MULTI] control.



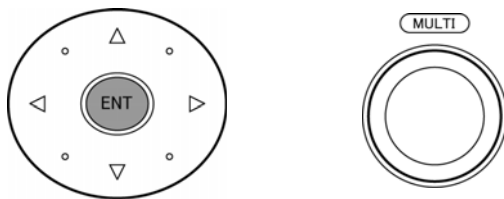
The current setting is color-inverted.

RADAR Echo	
1. IR	IR
2. Target Enhance	1 Off
3. Process	2. Low
4. Zoom	3. Middle
5. Video Latitude	4. High
6. Video Noise Rejection	

"IR" menu appears.

Selectable items are displayed on the right pane of the menu.

- 6 Select the desired item, then press the [ENT] key or the [MULTI] control.



Select the desired item.

RADAR Echo	IR ▲▼
1. IR	1. Off
2. Target Enhance	2. Low
3. Process	3. Middle
4. Zoom	4. High
5. Video Latitude	
6. Video Noise Rejection	

- 7 The setting is determined and displayed.

Setting is determined.

RADAR Echo	IR ▲▼
1. IR	1. Off
2. Target Enhance	2. Low
3. Process	3. Middle
4. Zoom	4. High
5. Video Latitude	
6. Video Noise Rejection	

● Closing the menu

Repeatedly press the [CLEAR] key or the cursor key (left) to return to the upper level and then close the menu screen.

## 2.9 RADAR ECHO SETTINGS

This function enables the setting of detail information about radar echo.

### ■ "RADAR Echo" operations

- 1 Open **RADAR Echo** from the Main Menu.

RADAR Echo	
1. IR	Off
2. Target Enhance	Off
3. Process	Off
4. Zoom	Off
5. Video Latitude	Narrow
6. Video Noise Rejection	Off

"RADAR Echo" menu appears.

Detail information about radar signal processing can be set by changing the settings of the menu items.

### Reference:

After the settings for radar signal processing are changed, small targets may not be displayed or unwanted waves may not be suppressed. Thus, do not make a significant change in the settings.

### 2.9.1 SETTING RADAR INTERFERENCE REJECTION

#### ■ Setting Radar Interference Rejection

Use this function to eliminate interference waves from other radars.

- 1 Open **RADAR Echo** - **IR**.

RADAR Echo	IR
1. IR	1. Off
2. Target Enhance	2. <b>Low</b>
3. Process	3. Middle
4. Zoom	4. High
5. Video Latitude	
6. Video Noise Rejection	

"IR" menu appears.

<b>Off</b>	:	Interference rejecter off
<b>Low</b>	:	Interference rejection level - low
<b>Middle</b>	:	Interference rejection level - moderate
<b>High</b>	:	Interference rejection level - high

When a high interference rejection level is selected, the radar's ability of detecting small targets such as buoys and small boats lowers.

In general, **Low** should be selected.

## 2.9.2 SETTING FOR ENHANCING TARGETS

### ■ Setting for Enhancing Targets

The dimension of video display is enlarged in angle and distance.

#### Note:

- When target enhancement function is used, echo displays of two targets closing in angle and distance may be displayed in PPI screen as one target.

1 Open **RADAR Echo** - **Target Enhance**.

RADAR Echo	IR
1. IR	1. Off
2. Target Enhance	2. Level1
3. Process	3. Level2
4. Zoom	4. Level3
5. Video Latitude	
6. Video Noise Rejection	

"Target Enhance" menu appears.

**Off** : Select this mode particularly when resolution is required.

**Level1** : Select this mode in general.

Expands the radar echo area at 1 step for vertical direction and at 1 step for horizontal direction.

**Level2** : Select this mode to easily view the radar video.

Expands the radar echo area at 1 step for vertical direction and at 2 steps for horizontal direction.

**Level3** : Select this mode to detect small targets such as buoys.

Expands the radar echo area at 2 steps for vertical direction and at 3 steps for horizontal direction.

---

#### Reference:

When **Level3** is selected, sea clutter returns and rain/snow clutter returns are apt to be enhanced. When using this enhance mode, operate the [SEA] control and the [RAIN] control to suppress sea clutter returns and rain/snow clutter returns.

In general, **Level1** or **Level2** should be selected.

---

## 2.9.3 PROCESS

### ■ Process

This function reduces unnecessary noise to highlight targets.

### Note:

- When viewing a radar beacon, SART signal, or fast moving target on the radar display, do not use this function.
- This function is suitable for use in TM mode.
- When used in RM mode, use with N Up or C Up. This can be used with H Up, however, the video may be blurred. Use this in TM mode.

### Reference:

The bearing data input is required for video processing.

- 1 Open **RADAR Echo** - **Process**.

RADAR Echo	Process
1. IR	1. Off
2. Target Enhance	2. 3Scan COREL
3. Process	3. 4Scan COREL
4. Zoom	4. 5Scan COREL
5. Video Latitude	5. Remain
6. Video Noise Rejection	6. Peak Hold

"Process" menu appears.

**Off** : Select this mode in general.

**3Scan COREL** : Select this mode when many rain/snow clutter returns are detected.

**4Scan COREL** : Select this mode to highlight targets while suppressing sea clutter returns.

**5Scan COREL** : Select this mode to detect small targets hidden by sea clutter returns.

**Remain** : Select this mode when own ship yaws wildly.

**Peak Hold** : Select this mode to detect small targets of which detection probability is low.

## Note:

- When "COREL" is set, the image becomes smaller.
- When "Remain" or "Peak Hold" is set, the afterimage will appear.

## 2.9.4 ZOOMING

### ■ Zooming

This function doubles the size of radar video.

- 1 Open  - .

RADAR Echo	Zoom
1. IR	1. Off
2. Target Enhance	2. On
3. Process	
4. Zoom	
5. Video Latitude	
6. Video Noise Rejection	

: Not zoomed.

: Zoomed.

## 2.9.5 VIDEO LATITUDE

### ■ Video Latitude

Select the dynamic range in which receiving signals are to be shown on the radar display.

- 1 Open  - .

RADAR Echo	Video Latitude
1. IR	1. Narrow
2. Target Enhance	2. Normal
3. Process	3. Wide1
4. Zoom	4. Wide2
5. Video Latitude	
6. Video Noise Rejection	

: Narrows the dynamic range at short range.

: Standard setting

The dynamic range varies depending on the actual range:

Short range > long range

: Use this mode when rainy weather intensifies unwanted waves.

The dynamic range is about twice as wide as when  is selected.

: Use this mode when rain clouds remain even when using .

● Video Latitude

Select **Normal** in standard, and **Wide1** in rainy weather.

**Narrow** clearly displays short-range videos when STC is used in manual mode.

## 2.9.6 VIDEO NOISE REJECTION

■ Video Noise Rejection

This function rejects signals that assumed as noise and clutter in radar videos.

1 Open **RADAR Echo** - **Video Noise Rejection**.

RADAR Echo	Video Noise Rejection
1. IR	1. Off
2. Target Enhance	2. Level1
3. Process	3. Level2
4. Zoom	4. Level3
5. Video Latitude	
6. Video Noise Rejection	

**Off** : Turns off the noise rejection function, and displays all signals. Targets are popped up from noise and displayed like analog signals.

**Level1** : Rejects the signals of definitely unwanted waves (noise and clutter). When detection of targets or unwanted waves is not definite, the signals are displayed. When detection of targets is definite, the signals are displayed.

**Level2** : Rejects the signals of definitely unwanted waves (noise and clutter). When detection of targets or unwanted waves is not definite, the signals are rejected. When detection of targets is definite, the signals are displayed.

**Level3** : Select if "Level1" and "Level2" cannot reject the signals enough.

● Video Noise Rejection

Select **Off** to display radar videos like analog signals.

Select **Level1**, **Level2** or **Level3** to suppress noise and clutter.

## 2.10 RADAR TRAIL LENGTH SETTING

"Sets the maximum time for displaying radar trails.

---

### Reference:

For details of radar trail settings, see Section "2.7.5 DISPLAYING OTHER SHIP'S TRACKS (RADAR TRAILS)".

---

### ■ "Trails" operations

- 1 Open  from the Main Menu.

Trails	
1. MAX Interval	Short

"Trails" menu appears.

### ■ Maximum value of radar trail display time (MAX Interval)

Select the maximum time for displaying radar trails.

- 1 Open  - .

Trails	MAX Interval
1. MAX Interval	1. Short
	2. Middle
	3. Long
	4. Super Long

: Sets 15 minutes as the maximum time for radar trails display.

: Sets 15 minutes as the maximum time for radar trails display.

: Sets 1 hour as the maximum time for radar trails display.

: Sets 24 hours as the maximum time for radar trails display.



● Maximum value of radar trail display time

Select **Short** when short radar trails are often used in bays and the likes.

Select **Super Long** when long radar trails are necessary for ocean navigation.

**Middle** is for specification between **Short** and **Long**.

Continuous trails are available with all the options.

Short:

Off/15sec/30sec/1min/2min/3min/4min/5min/6min/10min/15min/All

Middle:

Off/30sec/1min/2min/3min/4min/5min/6min/10min/15min/30min/All

Long:

Off/1min/2min/3min/4min/5min/6min/10min/15min/30min/1hr/All

Super Long:

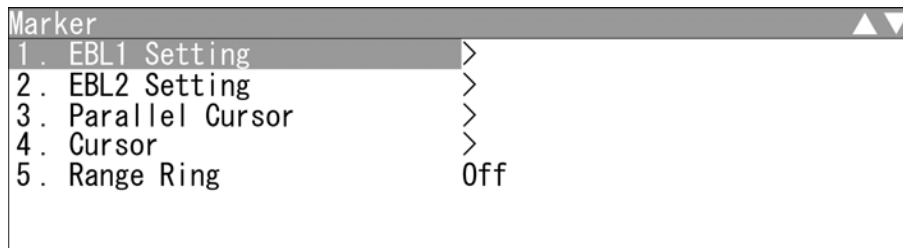
Off/30min/1hr/2hr/3hr/4hr/5hr/6hr/10hr/12hr/24hr/All

## 2.11 MARKER SETTING

Sets operations for EBLs, parallel cursors, cursors and range rings.

### ■ "Marker" operations

- 1 Open  from the Main Menu.

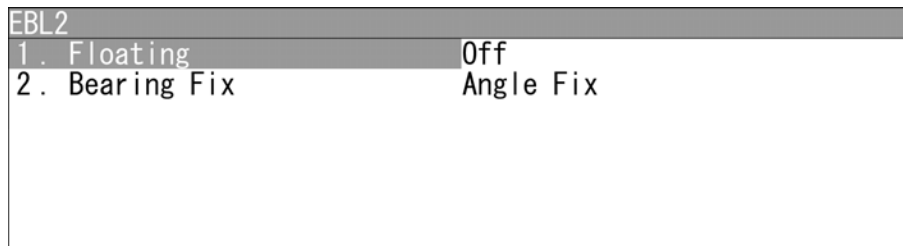
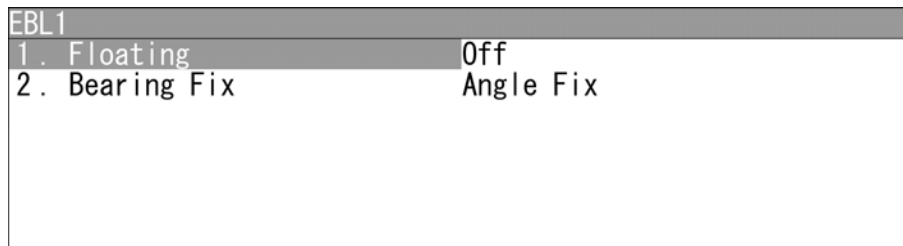


"Marker" menu appears.

### 2.11.1 SETTING OPERATIONS FOR EBLs (ELECTRONIC BEARING LINES)

### ■ "EBL" operations

- 1 Open  -  .



"EBL" menu appears.

■ Setting the mode to move the starting point of EBL (Floating setting)

**Reference:**

Course and latitude/longitude data input is required for floating setting.

The heading and latitude/longitude input are not required during floating (Screen FIX).

When this function is set to **L/L Fix** and the starting point of an EBL is moved to a position, the starting point can be fixed at the latitude and longitude of that position.

When the function is set to **Screen Fix**, the starting point of an EBL is fixed on the radar display. The starting point is always indicated at the same position on the radar display even when the own ship has moved.

1 Open **EBL1** **EBL2** - **Floating**.

<b>EBL1</b>	<b>Floating</b>
1. Floating	1. Off
2. Bearing Fix	2. Screen Fix
	3. L/L Fix

<b>EBL2</b>	<b>Floating</b>
1. Floating	1. Off
2. Bearing Fix	2. Screen Fix
	3. L/L Fix

"Floating" menu appears.

**Off** : Floating mode is disabled.

**Screen Fix** : The starting point of EBL is fixed on the radar display.

**L/L Fix** : The starting point of EBL is fixed at specific latitude and longitude.

■ Setting the EBL bearing fix mode

**Reference:**

Course data input is required for Bearing Fix setting.

While this function is set to **Angle Fix**, an EBL is fixed to the preset bearing. For example, if the true bearing 020° is preset, the EBL is fixed to the true bearing 020° even when the own ship turns.

While the function is set to **Screen Fix**, the EBL is fixed on the radar display.

- 1 Open **EBL1** **EBL2** - **Bearing Fix**.

EBL1	Bearing Fix
1. Floating	1. Angle Fix
2. Bearing Fix	2. Screen Fix

EBL2	Bearing Fix
1. Floating	1. Angle Fix
2. Bearing Fix	2. Screen Fix

"Bearing Fix" menu appears.

**Angle Fix** : EBL bearing is fixed to the preset value.

**Screen Fix** : EBL bearing is fixed on the radar display.

## 2.11.2 SETTING OPERATIONS FOR PARALLEL CURSORS

Parallel cursors can be set.

■ "Parallel Cursor" operations

- 1 Open **Marker** - **Parallel Cursor**.

Parallel Cursor	
1. Range Scale Link	Off
2. Floating	Off
3. Bearing Fix	Angle Fix
4. One/Both Sides	One Side
5. Display For Individual Line>	

"Parallel Cursor" menu appears.

■ Range Scale Link

When a range is switched, parallel cursors link to a radar range scale for display.

- 1 Open **Parallel Cursor** - **Range Scale Link**.

Parallel Cursor	Range Scale Link
1. Range Scale Link	1. Off
2. Floating	2. On
3. Bearing Fix	
4. One/Both Sides	
5. Display For Individual Line	

**Off** : If the range is switched, the width between parallel index lines changes in accordance with the radar range scale.

**On** : If the range is switched, the width between parallel index lines remains fixed.

■ Setting the mode to move the starting point of parallel cursor (Floating setting)

**Reference:**

Course and latitude/longitude data input is required for floating setting.

When this function is set to **L/L Fix** and the starting point of a parallel cursor is moved to a position, the starting point can be fixed at the latitude and longitude of that position.

When the function is set to **Screen Fix**, the starting point of a parallel cursor is fixed on the radar display. The starting point is always indicated at the same position on the radar display even when the own ship has moved.

- 1 Open **Parallel Cursor** - **Floating**.

Parallel Cursor	Floating
1. Range Scale Link	1. Off
2. Floating	2. Screen Fix
3. Bearing Fix	3. L/L Fix
4. One/Both Sides	
5. Display For Individual Line	

**Off** : Floating mode is disabled.

**Screen Fix** : Fixes the start point of parallel cursor to the radar display.

**L/L Fix** : The starting point of parallel cursor is fixed at specific latitude and longitude.

■ Setting bearing fix mode of parallel cursor

---

**Reference:**

- Course data input is required for bearing fix mode setting.
  - True bearing signal input is required for N Up.
- 

If this function is set to **Angle Fix**, the parallel cursor also rotates in accordance with the bearing while the own ship is turning.

If the function is set to **Screen Fix**, the parallel index lines are fixed within the radar display even while the own ship is turning. The parallel index lines are displayed at the same place even while the own ship is turning.

1 Open **Parallel Cursor** - **Bearing Fix**.

Parallel Cursor	Bearing Fix
1. Range Scale Link	1. Angle Fix
2. Floating	2. Screen Fix
3. Bearing Fix	3. Heading Fix
4. One/Both Sides	
5. Display For Individual Line	

**Angle Fix** : The angle of the parallel cursors is set in true bearing.  
For N Up and C Up, the cursors are displayed in true bearing irrespective of changes in the course of own ship.  
For H Up, the angle of the parallel cursors changes as the course of own ship changes.

**Screen Fix** : Fixes the parallel cursor display to the radar display.  
For H Up, N Up, and C Up, the angle of the parallel cursors stays the same on the screen.  
When own ship is engaged in TM motions, the parallel cursors move as own ship moves.

**Heading Fix** : The parallel cursors are displayed while the relative angle of the ship's heading bearing line stays the same.  
For H Up, the ship's heading bearing line does not change even though the course of own ship changes; therefore, the parallel cursors do not move.  
For N Up, the ship's heading bearing line changes as the course of own ship changes; therefore, the parallel cursors also change as the course of own ship changes.

■ Setting "One/Both Sides"

Selects "One Side" or "Both Sides" for parallel cursor display.

- 1 Open  - .

Parallel Cursor	One/Both Sides
1. Range Scale Link	1. One Side
2. Floating	2. Both Sides
3. Bearing Fix	
4. One/Both Sides	
5. Display For Individual Line	

: The parallel cursors are displayed in "One Side" mode.

: The parallel cursors are displayed in "Both Sides" mode.

■ Displaying individual parallel cursors

Individual parallel cursors can be displayed/hidden.

- 1 Open  -  - .

Display For Individual Line	
1. Line1	On
2. Line2	On
3. Line3	On
4. Line4	On
5. Line5	On
6. Line6	On
7. Line7	On

Display For Individual Line	Line1
1. Line1	1. Off
2. Line2	2. On
3. Line3	
4. Line4	
5. Line5	
6. Line6	
7. Line7	

: The parallel cursor is not displayed.

: The parallel cursor is displayed.

The line nearest to the own ship is specified as Line1.

### 2.11.3 SETTING CURSORS

This function enables the setting of detail information about cursor display.

#### ■ "Cursor" operations

- 1 Open **Marker** - **Cursor**.

Cursor	
1. Cursor Length	Long
2. Cursor Pattern	+
3. Distance Unit	NM

"Cursor" menu appears.

#### ■ Cursor Length

Sets the length of the cross cursor mark on the radar display.

- 1 Open **Cursor** - **Cursor Length**.

Cursor	Cursor Length
1. Cursor Length	1. Short
2. Cursor Pattern	2. Long
3. Distance Unit	

**Short** : Cuts the cross cursor mark in length.

**Long** : Makes the cross cursor mark twice as long as when "Short" is selected.

#### ■ Cursor Pattern

Selects the type of the cross cursor mark on the radar display.

- 1 Open **Cursor** - **Cursor Pattern**.

Cursor	Cursor Pattern
1. Cursor Length	1. +
2. Cursor Pattern	2. +
3. Distance Unit	3. +
	4. +



■ Distance Unit

Sets the distance unit for cursor.

- 1 Open  - .

Cursor	Distance Unit
1. Cursor Length	1. NM
2. Cursor Pattern	2. km
3. Distance Unit	3. sm

: The distance unit is set to NM.

: The distance unit is set to km.

: The distance unit is set to sm.

## 2.11.4 SETTING RANGE RINGS

Displays/hides the range rings.

■ Setting the range rings

- 1 Open  - .

Marker	Range Ring
1. EBL1 Setting	1. Off
2. EBL2 Setting	2. On
3. Parallel Cursor	
4. Cursor	
5. Range Ring	

: The range rings are not displayed.

: The range rings are displayed.

## 2.12 DISPLAY COLOR SETTING

This function enables the setting of detail information about radar display.

### ■ "Display Screen" operations

- 1 Open  from the Main Menu.

Display Color	
1. Day1	>
2. Day2	>
3. Day2	>
4. Dusk	>
5. Night	>

"Display Color" menu appears.

### ■ Setting each items

Sets the display color of each item.

#### ● Day1

- 1 Open  - .

Day1	
1. SoftKey	On
2. Keyboard Unit Brilliance	Level 4
3. Outer PPI	>
4. Inner PPI	>
5. Character	>
6. RADAR Echo	>
7. RADAR Trails(Time)	>

Day1	
8. RADAR Trails(All)	>
9. Own Ship's	>
10. Target(TT/AIS)	>
11. EBL/VRM/Paralell	>
12. Range Ring	>
13. Cursor	>
14. AZ/Alarm Zone	>

"Day1" menu appears.

■ SoftKey

If "Off" is selected, "Day1" is not displayed for the "Display Screen" soft keys.

1 Open  - .

Day1	SoftKey
1. SoftKey	1. Off
2. Keyboard Unit Brilliance	2. On
3. Outer PPI	
4. Inner PPI	
5. Character	
6. RADAR Echo	
7. RADAR Trails(Time)	

"SoftKey" menu appears.

: "Day1" is not displayed for the "Display Screen" soft keys.

: "Day1" is displayed for the "Display Screen" soft keys.

■ Keyboard Unit Brilliance

Adjusts the brilliance of operation panel.

Day1	Keyboard Unit Brilliance
1. SoftKey	1. Off
2. Keyboard Unit Brilliance	2. Level1
3. Outer PPI	3. Level2
4. Inner PPI	4. Level3
5. Character	5. Level4
6. RADAR Echo	
7. RADAR Trails(Time)	

"Keyboard Unit Brilliance" menu appears.

■ Outer PPI

Adjusts the background color outside the bearing scale.

1 Open  - .

Outer PPI	
1. Color	Black
2. Brilliance	Level4

"Outer PPI" menu appears.

● Display Color

- 1 Open  - .

Outer PPI	Color
1. Color	1. Black
2. Brilliance	2. Blue 3. White

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

Outer PPI	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2 3. Level3 4. Level4

"Brilliance" menu appears.

■ Inner PPI

Adjusts the background color inside the bearing scale.

- 1 Open  - .

Inner PPI	
1. Color	Blue
2. Brilliance	Level4

"Inner PPI" menu appears.

● Display Color

- 1 Open  - .

Inner PPI	Color
1. Color	1. Black
2. Brilliance	2. Blue 3. White

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

Inner PPI	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2
	3. Level3
	4. Level4

"Brilliance" menu appears.

■ Characters

Adjusts the colors of characters and bearing scales.

- 1 Open  - .

Character	
1. Color	White
2. Brilliance	Level4

"Character" menu appears.

● Display Color

- 1 Open  - .

Character	Color
1. Color	1. White
2. Brilliance	2. Cyan
	3. Green
	4. Black
	5. Red

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

Character	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2
	3. Level3
	4. Level4

"Brilliance" menu appears.

■ RADAR Echo

Adjusts the colors of radar echoes.

- 1 Open  - .

RADAR Echo	
1. Color	Yellow
2. Brilliance	Level4

"RADAR Echo" menu appears.

● Display Color

- 1 Open  - .

RADAR Echo	Color
1. Color	1. Yellow
2. Brilliance	2. Green
	3. Blue
	4. White
	5. Magenta
	6. Color
	7. Custom

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

RADAR Echo	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2
	3. Level3
	4. Level4

"Brilliance" menu appears.

■ RADAR Trails(Time)

Adjusts the colors of radar trails (time).

- 1 Open [Day1] - [RADAR Trails(Time)].

RADAR Trails(Time)	
1. Color	Cyan
2. Brilliance	Level4

"RADAR Trails(Time)" menu appears.

● Display Color

- 1 Open [RADAR Trails(Time)] - [Color].

RADAR Trails(Time)	Color
1. Color	1. Green
2. Brilliance	2. Blue
	3. Cyan

"Color" menu appears.

● Display Brilliance

- 1 Open [RADAR Trails(Time)] - [Brilliance].

RADAR Trails(Time)	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2
	3. Level3
	4. Level4

"Brilliance" menu appears.

■ RADAR Trails(All)

Adjusts the colors of radar trails (continuous).

- 1 Open  - .

RADAR Trails(All)	
1. Color	Green
2. Brilliance	Level4

"RADAR Trails(All)" menu appears.

● Display Color

- 1 Open  - .

RADAR Trails(All)	Color
1. Color	1. Green
2. Brilliance	2. Blue 3. Cyan

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

RADAR Trails(All)	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2 3. Level3 4. Level4

"Brilliance" menu appears.



■ Own Ship's

Adjusts the colors of own ship/barge.

- 1 Open  - .

Own Ship's	
1. Color	Cyan
2. Brilliance	Level4

"Own Ship's" menu appears.

● Display Color

- 1 Open  - .

Own Ship's	Color
1. Color	1. Cyan
2. Brilliance	2. Green 3. Red 4. White

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

Own Ship's	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2 3. Level3 4. Level4

"Brilliance" menu appears.

■ Target(TT/AIS)

Adjusts the colors of TT (tracked target)/AIS symbols.

- 1 Open  - .

Target (TT/AIS)	
1. Color	White
2. Brilliance	Level4

"Target(TT/AIS)" menu appears.

● Display Color

- 1 Open  - .

Target (TT/AIS)	Color
1. Color	1. Cyan
2. Brilliance	2. Green
	3. White

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

Target (TT/AIS)	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2
	3. Level3
	4. Level4

"Brilliance" menu appears.

■ EBL/VRM/Parallel

Adjusts the colors of EBL/VRM/Parallel lines.

- 1 Open  - .

EBL/VRM/Parallel	
1. Color	Black
2. Brilliance	Level4

"EBL/VRM/Parallel" menu appears.

● Display Color

- 1 Open  - .

EBL/VRM/Parallel		Color
1. Color		1. Cyan
2. Brilliance		2. Black
		3. Pink
		4. White

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

EBL/VRM/Parallel		Brilliance
1. Color		1. Level1
2. Brilliance		2. Level2
		3. Level3
		4. Level4

"Brilliance" menu appears.

■ Range Ring

Adjusts the colors of range rings.

- 1 Open  - .

Range Ring	
1. Color	Cyan
2. Brilliance	Level4

"Range Ring" menu appears.

● Display Color

- 1 Open  - .

Range Ring	Color
1. Color	1. Cyan
2. Brilliance	2. Green
	3. Red
	4. White

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

Range Ring	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2
	3. Level3
	4. Level4

"Brilliance" menu appears.

■ Cursor

Adjusts the colors of cursors.

- 1 Open  - .

Cursor	
1. Color	Red
2. Brilliance	Level4

"Cursor" menu appears.

● Display Color

- 1 Open  - .

Cursor	Color
1. Color	1. White
2. Brilliance	2. Red
	3. Magenta
	4. Yellow

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

Cursor	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2
	3. Level3
	4. Level4

"Brilliance" menu appears.

■ AZ/Alarm Zone

Adjusts the colors of AZ/Alarm Zone.

- 1 Open  - .

AZ/Alarm Zone	
1. Color	White
2. Brilliance	Level4

"AZ/Alarm Zone" menu appears.

● Display Color

- 1 Open  - .

AZ/Alarm Zone	Color
1. Color	1. White
2. Brilliance	2. Green
	3. Orange
	4. Black
	5. Red

"Color" menu appears.

● Display Brilliance

- 1 Open  - .

AZ/Alarm Zone	Brilliance
1. Color	1. Level1
2. Brilliance	2. Level2
	3. Level3
	4. Level4

"Brilliance" menu appears.

## 2.13 CONTROL SETTING

This function enables the setting of detail information about radar echo.

### ■ "Control" operations

- 1 Open  from the Main Menu.

Control	
1. Bearing True/Relative	Relative
2. User Key	>
3. Buzzer	>
4. Output Buzzer	>

"Control" menu appears.

### 2.13.1 DISPLAYING TRUE/RELATIVE MOTION

Sets the bearing standards for the cursor, TT, AIS and MOB.

#### Reference:

Bearing signal and speed signal input are required to display true motion.

### ■ Setting Bearing

- 1 Open  - .

Control	Bearing True/Relative
1. Bearing True/Relative	1. True
2. User Key	2. Relative
3. Buzzer	
4. Output Buzzer	

"Bearing True/Relative" menu appears.

: True bearing mode is selected.

: Relative bearing mode is selected.

## 2.13.2 SETTING USER KEYS

Users can freely assign functions to the user keys.

When using this function, you can instantly open the menu screen of "VRM1 Unit", "VRM2 Unit", "Alarm" and "Display".

### ■ "User Key" operations

- 1 Open  - .

User Key	
1. User Key1	Display
2. User Key2	Off
3. User Key3	Off

"User Key" menu appears.

### ■ Factory presetting

Sets functions that can be performed with the user keys.

User Key	User Key1
1. User Key1	1. Off
2. User Key2	2. VRM1 Unit
3. User Key3	3. VRM2 Unit
	4. Alarm
	5. Display

User key items

- : No function is assigned to this user key.
- : The setting can be changed in VRM1 unit on the radar display.
- : The setting can be changed in VRM2 unit on the radar display.
- : Radar alarms can be set.
- : Display can be set.

Operate the same way for the settings of "User Key2" and "User Key3".



■ Using user keys

Operates as user keys.

- Displaying the menu assigned to the user key1



Hold down the [GAIN] control.

- Displaying the menu assigned to the user key2



Hold down the [SEA] control.

- Displaying the menu assigned to the user key3



Hold down the [RAIN] control.

### 2.13.3 ADJUSTING BUZZER VOLUME

When an alarm goes off, the operation panel of the equipment produces a sound to notify users of state changes.

Adjust the sound volume as follows.

#### ■ "Buzzer" operations

- 1 Open **Control** - **Buzzer**.

Buzzer	
1 . Key ACK	255
2 . Operation Error	255
3 . CPA/TCPA	255
4 . AZ/Alarm Zone	255
5 . Target Lost	255
6 . System Alarm	255

"Buzzer" menu appears.

#### ■ Setting volume

Sets Key ACK volume.

Buzzer	Key ACK
1 . Key ACK	0-255
2 . Operation Error	2 5 5
3 . CPA/TCPA	
4 . AZ/Alarm Zone	▲Value UP
5 . Target Lost	▼Value Down
6 . System Alarm	◀Input Figure Left
	▶Input Figure Right

Turn the [MULTI] control to adjust Key ACK volume.

Key ACK volume can be adjusted between 0 and 255.

When "0" is set, the volume is turned off.

Operate the same way for the other volume settings.

#### ■ "Output Buzzer" operations

- 1 Open **Control** - **Output Buzzer**.

Output Buzzer	
1 . CPA/TCPA	0n
2 . AZ/Alarm Zone	0n
3 . Target Lost	0n
4 . System Alarm	0n
5 . Out of Range	0n

"Output Buzzer" menu appears.

■ Setting CPAT/CPA

Sets the external buzzer for CPA/TCPA.

Output Buzzer	CPA/TCPA
1. CPA/TCPA	1. Off
2. AZ/Alarm Zone	2. On
3. Target Lost	
4. System Alarm	
5. Out of Range	

Off : Sets the external buzzer to Off.

On : Sets the external buzzer to On.

Operate the same way for the other external buzzer settings.

**Reference:**

For details of external buzzer connection, refer to "3.10 CONNECTING CONTACT SIGNALS TO EXTERNAL BUZZERS/EXTERNAL DEVICES" in the INSTALLATION MANUAL.

## 2.14 FUNCTION KEY SETTINGS

"Function Setting" is provided for always obtaining the best radar video by storing complex radar signal processing settings in the optimum status by use, and calling the setting in accordance with the conditions for using the function.

Functions are factory-set for general use, and the settings can be fine adjusted by operating the menu.

You can select one of 4 function modes. The factory presetting is shown below.

Function1 Setting: Standard Suitable for general monitoring.

Function2 Setting: Coast Useful for observing short-range videos.

Function3 Setting: Deepsea Suitable for general ocean navigation.

Function4 Setting: Fishnet Useful for small target.

### 2.14.1 FUNCTION KEY OPERATIONS

#### ■ "Function Setting" operations

- 1 Open Function Setting from the Main Menu.

Function Setting	
1. Function1 Setting	>
2. Function2 Setting	>
3. Function3 Setting	>
4. Function4 Setting	>

"Function Setting" menu appears.

- 2 Open Function Setting - Function1 Setting.

Function1 Setting	
1. Function Enable/Disable	On
2. Mode	Standard
3. IR	Middle
4. Process	Process Off
5. Target Enhance	Level1
6. AUTO STC/FTC	Off
7. Pulse Length	>

"Function1 Setting" menu appears.

■ Calling functions

- 1 Press the [FUNC] key.



Each time you press the [FUNC] key, the setting is cyclically changed in order of:

Function off → Function1 Setting → Function2 Setting → Function3 Setting  
→ Function4 Setting → Function off

The currently called function mode is indicated as the right of the screen.

● Calling function setting menu

- 1 Hold down the [FUNC] key.



"Function Setting" menu appears when holding down the [FUNC] key.

■ Changing the setting

● Temporarily changing the setting

- When radar signal processing setting is changed by using the soft key or the menu operation while function 1 to 4 is called, the change is temporarily reflected to the operating state.
- Since this method does not change the memory contents, the new setting is deleted as soon as another function is called.
- When the previous function is called again, operation is performed according to the memory contents.

● Changing memory contents

- To change the memory contents of functions 1 to 4, use [Function Setting] in the Main Menu.

**Chapter 2 OPERATIONS**  
**2.14 FUNCTION KEY SETTINGS**

**2.14.2 FUNCTION SETTING ITEMS**

The function setting menu has the items below.

Item	Description	Setting
1. Function Enable/Disable	The mode of FUNC key	Off / On
2. Mode	The setting of function mode	
3. IR	The setting of radar interference rejection level	Off / Low / Middle / High
4. Process	The setting of process level	Off / 3Scan COREL / 4Scan COREL / 5Scan COREL / Remain / Peak Hold
5. Target Enhance	The setting of target enhance level	Off/Level1/Level2/Level3
6. AUTO STC/FTC	The setting of automatic STC/FTC	Off/AUTO STC/AUTO FTC
7. Pulse Length		
0.5 NM	Standard pulse length of 0.5 NM range	SP/MP1
0.75/1NM	Standard pulse length of 0.75 NM range	SP/MP1
1.5NM	Standard pulse length of 1.5/2 NM range	SP/MP1
2/3/4NM	Standard pulse length of 3/4 NM range	MP1/MP2
6/8NM	Standard pulse length of 6/8 NM range	MP2/LP1
12/16NM	Standard pulse length of 12/16 NM range	LP1
8. Video Latitude	The dynamic range setting	Narrow / Normal / Wide1 / Wide2
9. Video Noise Rejection	The setting of video level not displayed on the radar display.	Off / Level1 / Level2 / Level3
10. Trails Interval	The setting of display time of radar trails	Off / 15sec / 30sec / 1min / 2min / 3min / 4min / 5min / 6min / 10min / 15min / CONT
11. Trails Mode	The setting of true/relative mode of radar trails	TM / RM
12. Trails REF Level	The setting of echo level which generates radar trails	Level1 / Level2 / Level3 / Level4
13. Time/All Combine	The setting of superimpose-display of time radar trails and continuous radar trails	Off / On
14. MAX Interval	The setting of maximum display time of radar trails	Short / Middle / Long / Super Long
15. PRF	The setting of data output cycle of scanner	Normal/Economy / High Power
16. Antenna Height	The setting of antenna height	Default/~5m/5~10m/10~20m/20m~
17. Save Present State	Saving the setting values of the other menu as those of Function Setting	Yes/No
18. Set Mode Default	Setting the current Function Setting as the default settings	Yes/No
19. Initialize	Initializing the value of Function Setting	Yes/No

## 2.14.3 OVERVIEW OF FUNCTION SETTING ITEM OPERATIONS

The following outlines the operation of each function selected from the function setting menu.

### ■ From "Function Enable/Disable" to "Pulse Length"

Function Setting	
1. Function Enable/Disable	On
2. Mode	Standard
3. IR	Middle
4. Process	Process Off
5. Target Enhance	Level1
6. AUTO STC/FTC	Off
7. Pulse Length	>

#### ● Function Enable/Disable

If "Function Enable/Disable" is set to "Off", this mode is not displayed when switching operation mode of function key.

#### ● Mode

- Selects the function name to be indicated at the lower left of the radar display when the function is selected.
- When the setting is changed back to the factory setting, the initial value of the selected mode is called.
- The following 12 modes are provided:
  - Standard: Use this mode for general purpose. This is suitable to monitor a relatively short range.
  - Coast: Use this mode to monitor a relatively short range, for example, bays and coasts where many boats and ships are running. (Importance is attached to resolution.)
  - Deepsea: Use this mode to monitor a relatively long range, for example, the open sea. (Importance is attached to long-range sensitivity.)
  - Fishnet: Use this mode to detect small targets such as fishnets of round haul netters hidden by sea clutter returns. (Importance is attached to sea clutter suppression, and sensitivity to moving targets lowers.)
  - Storm: Use this mode when many rain/snow clutter returns or sea clutter returns are detected in stormy weather. (Importance is attached to rain/snow clutter and sea clutter suppression, and sensitivity slightly lowers.)

Bonden:	Use this mode when rain/snow clutter which cannot to be suppressed is strong, such as a lot of floats of fixed net around the ship.
Rain:	Use this mode when sea clutter is not strong but rain/snow clutter is strong. (Importance is attached to rain/snow clutter suppression, and sensitivity slightly lowers.)
US River:	Use this mode when adjusting the functions mainly suitable for rivers in the United States. Use this mode to reduce sea clutter returns (less effective than EU river setting).
Long:	Use this mode to detect small targets at relatively long distance in the open sea.
EU River:	Use this mode when adjusting the functions mainly suitable for rivers in Europe. Use this mode to reduce sea clutter returns.
User1:	General mode used when the nine modes above are not applicable.
User2:	General mode used when the nine modes above are not applicable.

● **IR (Interference rejection)**

Operate the same way for the interference rejection settings in the menu.

For details of operations, see Section "■ Setting Radar Interference Rejection" of "2.9 RADAR ECHO SETTINGS".

● **Process**

Operate the same way for the process settings in the menu.

For details of operations, see Section "■ Process" of "2.9 RADAR ECHO SETTINGS".

● **Target Enhance**

Operate the same way for the target enhance settings in the menu.

For details of operations, see Section "■ Setting for Enhancing Targets" of "2.9 RADAR ECHO SETTINGS".



● AUTO STC/FTC (Automatic clutter suppression)

- Detects unwanted waves such as rain/snow clutter and sea clutter and automatically suppresses them.
- When the sea state or weather changes, this function automatically performs suppression processing in accordance with the situation.
- Suppression processing is not full automatic, and requires the operator to control the afterimages of unwanted waves.
- To control the afterimage of sea clutter, use the [SEA] control.
- To control the afterimage of rain/snow clutter, use the [RAIN] control.
- In areas where the density of unwanted waves is low, unwanted waves may remain being judged as targets. Thus, use the automatic clutter suppression mode together with the video process mode.
- Characteristics of the automatic clutter suppression function:

Off: Disables the automatic clutter suppression function.  
Select "Off" when rain/snow clutter and sea clutter are not strong or when the ship is in a bay.

AUTO STC: Automatically detects the strength of sea clutter, and performs the most suitable sea clutter suppression processing.  
Even when the strength of sea clutter varies depending on the wind direction, AUTO STC performs the most suitable suppression processing.  
Land like islands can be displayed naturally.  
Since rain clouds outside sea clutter areas are recognized as land, there is no effect of suppressing rain/snow clutter.  
Use the [RAIN] control to set the rain/snow clutter suppression function.

AUTO FTC: Along with AUTO STC, this function automatically detects the strength of rain/snow clutter, and performs the most suitable rain/snow clutter suppression processing.  
Since land is recognized as rain clouds, land videos become obscure.

● Pulse Length

- Sets the standard transmitter pulse length in each range.
- When the range is called, the pulse length is used.

■ From "Video Latitude" to "MAX Interval"

Function	Setting	
8.	Video Latitude	Wide1
9.	Video Noise Rejection	Level1
10.	Trails Interval	Off
11.	Trails Mode	True
12.	Trails REF Level	Level4
13.	Time/All Combine	Off
14.	MAX Interval	Short

● Video Latitude

Operate the same way for the video latitude settings in the menu.

For details of operations, refer to "2.9.5 VIDEO LATITUDE".

● Video Noise Rejection

Operate the same way for the video latitude settings in the menu.

For details of operations, refer to "2.9.6 VIDEO NOISE REJECTION".

● Trails Interval

Operate the same way for the trail interval settings in the soft key menu.

For details of operations, refer to "2.7.5 DISPLAYING OTHER SHIP'S TRACKS (RADAR TRAILS)".

● Trails Mode

Operate the same way for the trail interval settings in the soft key menu.

For details of operations, refer to "2.7.5 DISPLAYING OTHER SHIP'S TRACKS (RADAR TRAILS)".

● Trails REF Level

Operate the same way for the trail interval settings in the soft key menu.

For details of operations, refer to "2.7.5 DISPLAYING OTHER SHIP'S TRACKS (RADAR TRAILS)".

● Time/All Combine

Operate the same way for the trail interval settings in the soft key menu.

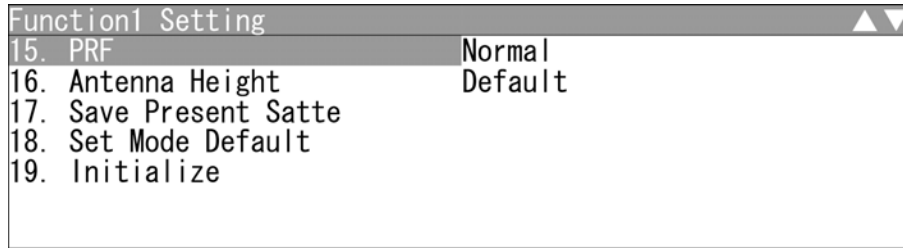
For details of operations, refer to "2.7.5 DISPLAYING OTHER SHIP'S TRACKS (RADAR TRAILS)".

● MAX Interval

Operate the same way for the trail interval settings in the menu.

For details of operations, refer to "2.10 RADAR TRAIL LENGTH SETTING".

■ From "PRF" to "Initialize"



● PRF

Operate the same way for the scanner settings in Adjust Menu.

For details of operations, see Section "4.6 SCANNER" of INSTALLATION MANUAL.

● Antenna Height

- Changes the antenna height setting.
- The STC/FTC curve is changed.

Default: Activates the general signal processing mode.

-5m: Set the antenna height under 5 m.

5-10m: Set the antenna height 5m to 10m.

10-20m: Set the antenna height 10 m to 20 m.

20m-: Set the antenna height over 20 m.

● Save Present State

Registers the currently used settings as function settings.

● Set Mode Default

Sets the initial value of a selected function setting mode. Select this item to change the current function mode to the initial value.

● Initialize

Sets the function settings to the factory-set values. Select this item to change all the function settings to the factory-set values.

## 2.15 SETTING TT/AIS

This section describes the operations of TT and AIS.

### 2.15.1 COLLISION AVOIDANCE

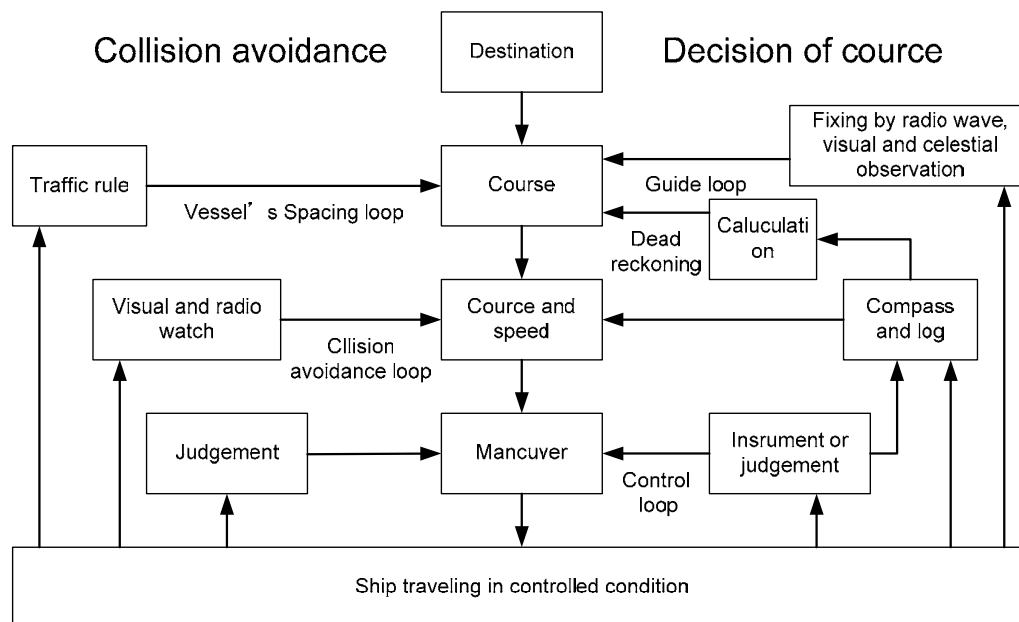
#### ■ Problems of Collision Avoidance in Navigation

Marine collision avoidance is one of the problems that have been recognized from of old. Now, it will be described briefly who the collision avoidance is positioned among the navigational aid problems.

The navigation pattern of all mobile craft constitutes a system with some closed loops regardless of the media through which the mobile craft travels, whether air, water, the boundary between air and water, or space. This pattern consists of two closed loops in principle, one of which is a collision with another mobile craft and the other is a loop of finding a right and safe way to reach a predeterminate destination.

Fig. 2.15-1 shows the conceptual diagram of navigation pattern by MR. E.W. Anderson. The closed loop of collision avoidance is shown on the left side and the closed loop of finding a right course on the right side.

Fig. 2.15-1 Navigation Pattern



■ Marine Accidents and Collisions

Among marine accidents, collision accidents have been highlighted as the tonnages and speeds of ships become higher along with the increase in traffic at sea.

If a tanker carrying dangerous articles such as crude oil collides with any other vessel, then not only the vessels involved with the accident but other vessels in the vicinity, port facilities, inhabitants in the coastal area as well as marine resources may also suffer immeasurable damages and troubles.

Collision accidents have a high percentage of the marine accidents that have occurred in recent years. To cope with these problems, any effective measures are needed and some equipment to achieve collision avoidance requirements have been developed at rapid strides.

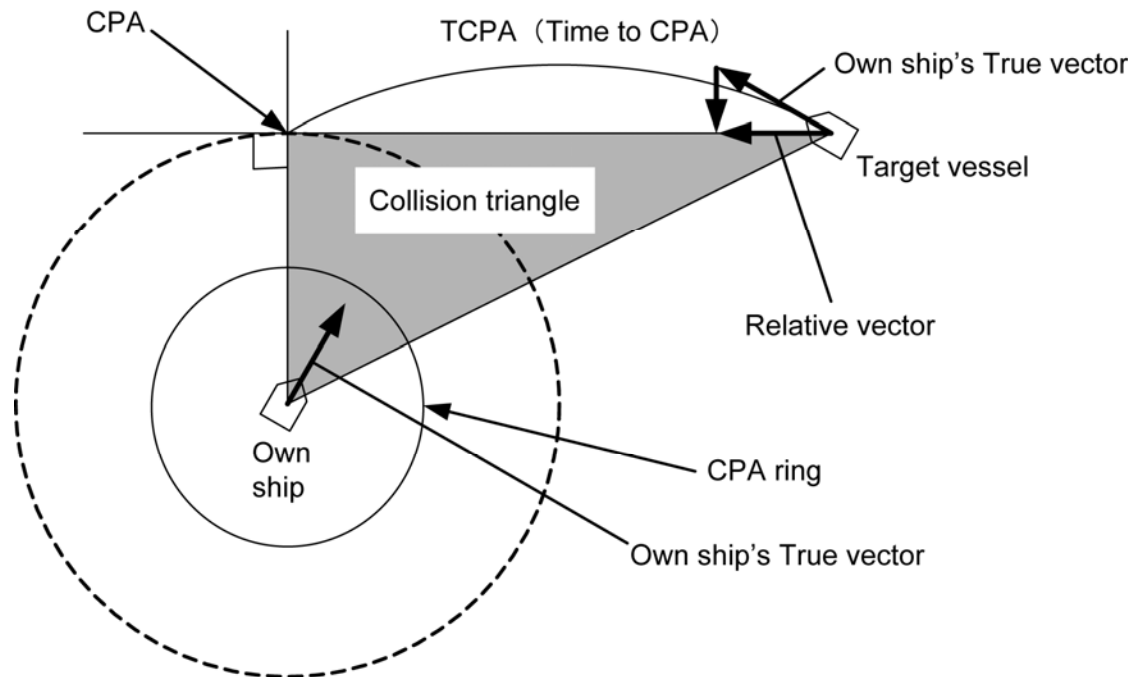
■ Basic Concept of Collision Avoidance

There are two aspects in collision avoidance: collision prediction and avoidance.

Collision prediction is to predict that two or more vessels will happen to occupy the same point at the same time, while collision avoidance is to maneuver vessels not to occupy the same point at the same time.

In practical operation of vessels, a spot of collision has to be deemed to be a single point but a closed zone. This closed zone is conceptually defined as a CPA (Closest Point of Approach). In collision prediction, the time to be taken until a ship reaches the CPA is defined as a TCPA (Time to CPA). Fig. 2.15-2 shows a diagram called "Collision Triangle".

Fig. 2.15-2 Collision Triangle



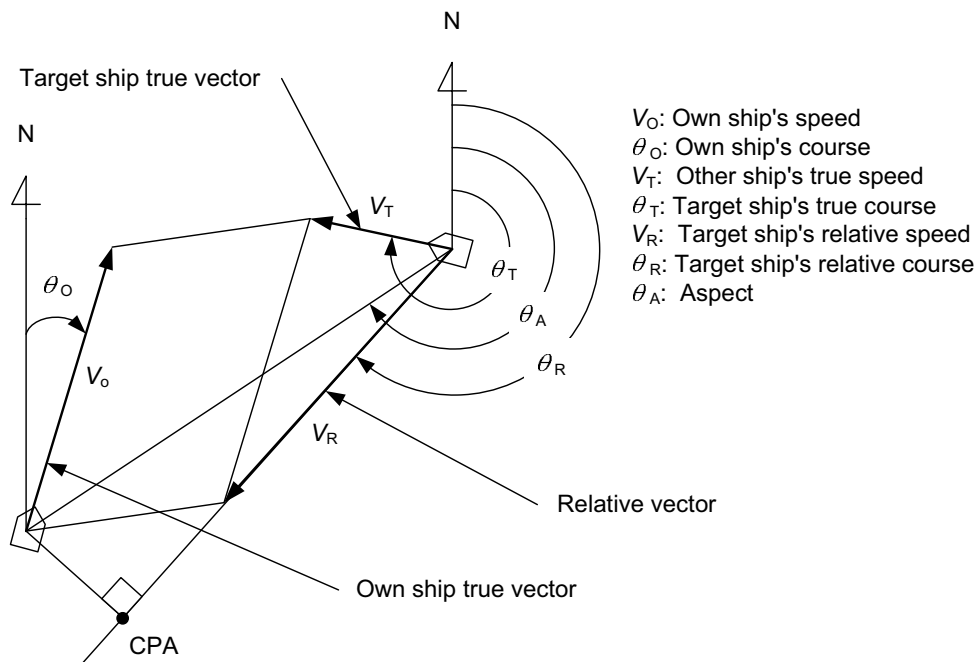
■ Relative Vector and True Vector

From two points of view, collision prediction and avoidance, it is necessary to obtain the relative vector of other ship for prediction and the true vector of other ship for collision avoidance in order to grasp other ship's aspect.

The relationship between the relative vector and true vector is shown in Fig. 2.15-3. Furthermore, the meanings of both vectors are described.

Both rough CPA and TCPA can be obtained easily from the relative speed vector of other ship. This method has an advantage that the risks of collision with all other ships within the radar range can be seen at a glance. On the other hand, the course and speed of other ship can easily be obtained from its true speed vector, enabling other ship's aspect to be seen at a glance. Thus, the aspects of other ships (transverse, outsail, parallel run, reverse run, etc. ) as described in the act of prevention of collision at sea can be readily grasped. If there is a risk of collision with other ship, the operator can determine which rule to be applied and how to operate own ship.

Fig. 2.15-3 Relative Vector and True Vector



■ Radar and Collision Avoidance

Radar is still playing an important roll for collision prevention and positioning. A plotter is used to further enhance the radar functionality. The plotter is capable of plotting other positions of other ships in 3 to 6 minute intervals to monitor their movement. The plots of other ships represent their tracks relative to own ship, and it is shown whether there is a risk of collision, namely CPA and TCPA can be obtained. This method using a plotter is fairly effective, but the number of target ship, which are manually plotted, is limited and it takes several minutes to measure those.

## 2.15.2 PREPARATION

Initializes Tracking Target and AIS Function

### ■ "Target" operations

- 1 Open **Target** from the Main Menu.

Target	
1. Function On/Off	>
2. CPA Limit	1.5NM
3. TCPA Limit	10min
4. CPA Ring	On
5. Target Number Display	>
6. Target Number Allocation	>
7. ALR Alarm From AIS	Off

"Target" menu appears.

### ■ Turning On/Off the Function

Turns on/off tracking target and AIS function.

- 1 Open **Target** - **Function On/Off**.

Function On/Off	
1. TT	On
2. AIS	Of

"Function On/Off" menu appears.

### ● Turning on/off the tracking target function

- 1 Open **Function On/Off** - **TT**.

Function On/Off	TT
1. TT	1. Off
2. AIS	2. On

"TT" menu appears.

**Off** : Turns off the TT function.

**On** : Turns on the TT function.

● Turning on/off the AIS function

- 1 Open  - .

Function On/Off	TT
1. TT	1. Off
2. AIS	2. On

"AIS" menu appears.

- : Turns off the AIS function.  
 : Turns on the AIS function.

■ Setting Collision Decision Criteria

Set and check collision decision criteria before operating.

Target	TCPA Limit
1. Function On/Off	0. 1-9. 9
2. CPA Limit	<input type="text" value="1."/> <input type="text" value="5"/> NM
3. TCPA Limit	
4. CPA Ring	▲Value Up
5. Target Number Display	▼Value Down
6. Target Number Allocation	◀Input Figure Left
7. ALR Alarm From AIS	▶Input Figure Right

Input the CPA Limit value.

Turn the [MULTI] control to set the CPA Limit value.

The CPA Limit value can be set between 0.1 and 9.9 NM.

Target	TCPA Limit
1. Function On/Off	1-99
2. CPA Limit	<input type="text" value="1"/> <input type="text" value="0"/> min
3. TCPA Limit	
4. CPA Ring	▲Value Up
5. Target Number Display	▼Value Down
6. Target Number Allocation	◀Input Figure Left
7. ALR Alarm From AIS	▶Input Figure Right

Input the TCPA Limit value.

Turn the [MULTI] control to set the TCPA Limit value.

The TCPA Limit value can be set between 1 and 99 min.



■ Setting CPA Ring

Sets the CPA ring display.

Target	CPA Ring
1. Function On/Off	1. Off
2. CPA Limit	2. On
3. TCPA Limit	
4. CPA Ring	
5. Target Number Display	
6. Target Number Allocation	
7. ALR Alarm From AIS	

Off : The CPA ring is not displayed.

On : The CPA ring is displayed.

While the distance of the specified CPA Limit value is used as the radius, the CPA ring is displayed with a white circle of which center is the own ship's position.

**Reference:**

The CPA ring is not displayed when the true vector mode is selected.

See "2.7.4 SETTING VECTORS" to change the settings.

### 2.15.3 SETTING TARGET NUMBER DISPLAY

A target ID number is a value displayed beside the target symbol or AIS symbol. These numbers are assigned to targets in acquisition order. The numbers 1 to 10 are automatically assigned. Each target is identified by the assigned ID number until it is lost or its acquisition is canceled.

■ "Target Number Display" operations

- 1 Open  Target -  Target Number Display.

Target Number Display	
1. TT	On
2. AIS	On

"Target Number Display" menu appears.

■ Turning On/Off the Number of Tracking Target and AIS

Turns on/off the number of tracking target and AIS symbol.

- 1 Open  -  .

Target Number Display	TT
1. TT	1. Off
2. AIS	2. On

: Target numbers of TT/AIS are not displayed.

: Target numbers of TT/AIS are displayed.

---

**Reference:**

An ID number is always displayed for only targets with which numeric data is displayed.

---

## 2.15.4 SETTING TARGET NUMBER ALLOCATION

The start number of target can be specified for the target symbol or AIS symbol.

■ "Target Number Allocation" operations

- 1 Open  - .

Target Number Allocation	
1. TT	1
2. AIS	11
3. Own	0
4. Cursor	99

"Target Number Allocation" menu appears.

■ Target Number Allocation

Turns on/off the start number of target for tracking.

1 Open  -    .

Target Number Allocation	TT
1. TT	0-90
2. AIS	<input type="text" value="1"/>
3. Own	
4. Cursor	
	▲Value Up ▼Value Down ◀Input Figure Left ▶Input Figure Right

Turn the [MULTI] control to set the start number of target.

Operate the same way for the other target numbers.

: The start number of target can be adjusted between 0 and 90.

: The start number of target can be adjusted between 0 and 50.

: The start number of target can be adjusted between 0 and 99.

: The start number of target can be adjusted between 0 and 99.

**Reference:**

Set the target number of TT/AIS not to overlap each other.

## 2.15.5 SETTING AIS ALARM

Sets the display of NMEA ALR sentence received from AIS.

■ Setting AIS Alarm

1 Open  - .

Target	
1. Function On/Off	>
2. CPA Limit	1.5NM
3. TCPA Limit	10min
4. CPA Ring	On
5. Target Number DISP	>
6. Target Number Allocation	>
7. ALR Alarm From AIS	Off

: ALR alarm is turned off.

: ALR alarm is turned on.



## 2.15.8 SETTING AIS RETRIEVED VESSEL

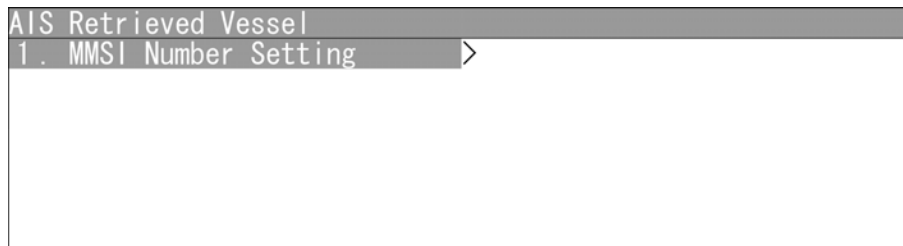
AIS retrieved vessel is the function to preferentially display the user-specified ship.  
If MMSI of AIS target is set, the retrieved vessel can be specified.

### Reference:

AIS retrieved vessel can be set up to 10 vessels.

### ■ "AIS Retrieved vessel" operations

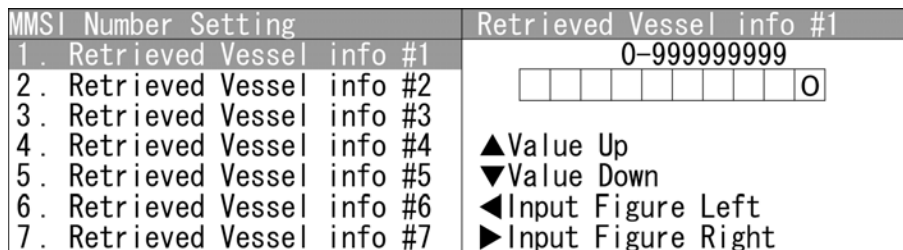
- 1 Open **Target** - **AIS Retrieved Vessel**.



"AIS Retrieved Vessel" menu appears.

### ■ MMSI Number Setting

- 1 Open **AIS Retrieved Vessel** - **MMSI Number Setting** - **Retrieved Vessel info #1**.



Turn the [MULTI] control to set MMSI number.

MMSI number can be adjusted between 0 and 999999999.

Operate the same way for the other retrieved vessels.

## 2.15.9 SETTING AIS FILTER

Sets the range for AIS filter.

### Reference:

For details of AIS filter, refer to "2.7.22 SETTING AIS FILTER".

### ■ Setting AIS Filter

- 1 Open [Target] - [AIS Filter].

Target	AIS Filter
8. AIS Display Target	0.0-72.0
9. AIS Destination Ship	[2][0].[0] NM
10. AIS Retrieved Vessel	
11. AIS Filter	▲Value Up
12. File Operation	▼Value Down
	◀Input Figure Left
	▶Input Figure Right

Turn the [MULTI] control to set the range for AIS filter.

The range can be set between 0 and 72.0 NM.

## 2.15.10 FILE OPERATION

The stored MMSI number setting of AIS retrieved vessel is output via USB.

### ■ File Operation

- 1 Open [Target] - [File Operation].

File Operation	
1. Save	>
2. Load	>
3. Erase	>

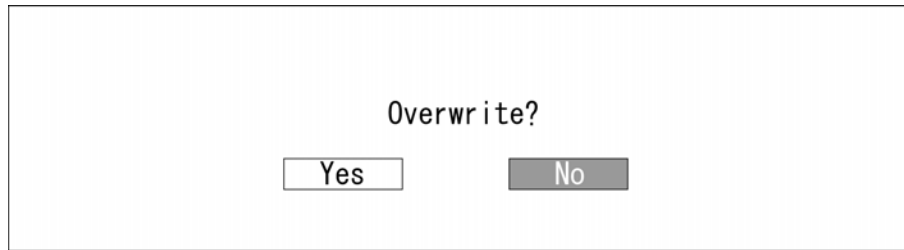
"File Operation" menu appears.

■ Saving MMSI number setting

- 1 Open  - .



"Save" menu appears.



When opening "AIS Retrieved vessel", the dialog box "Overwrite?" appears.

- : Saves via USB.  
 : Does not save via USB.

**Note:**

- After saving data to a USB memory, move the data to a storage, such as PC, that can store the data with password to prevent data leakage.

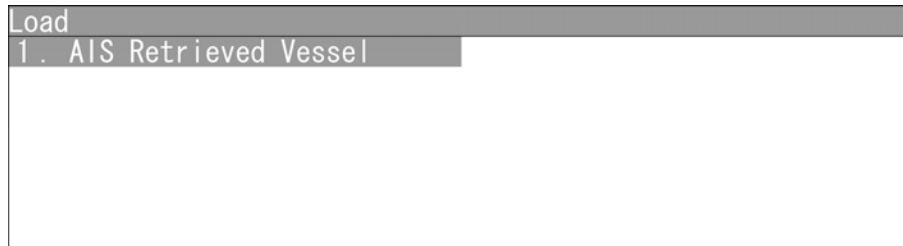
When selecting "Yes", "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Save" menu.

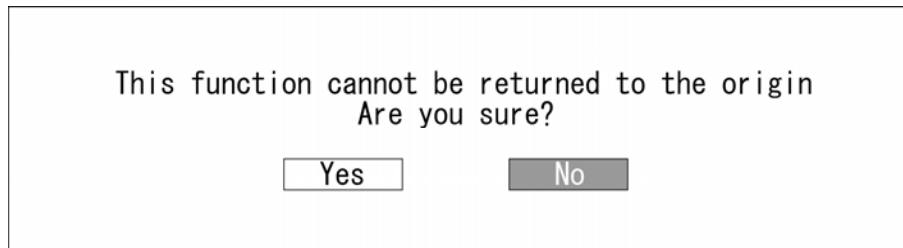
When selecting "No", the screen returns to "Save" menu.

■ Loading MMSI number setting

- 1 Open  - .



"Load" menu appears.



When opening "AIS Retrieved vessel", the dialog box "This function cannot be returned to the origin. Are you sure?" appears.

- : Loads via USB.
- : Does not load via USB.

When selecting "Yes", "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Load" menu.

After saving is finished, the screen returns to "Load" menu.

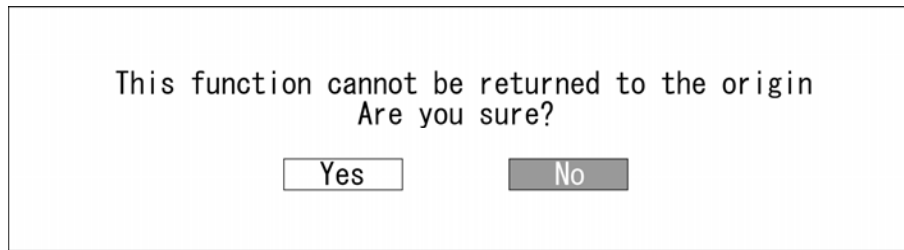


■ Clearing MMSI number setting

- 1 Open  - .



"Erase" menu appears.



When opening "AIS Retrieved vessel", the dialog box "This function cannot be returned to the origin. Are you sure?" appears.

- : Erases data via USB.
- : Does not erase data via USB.

When selecting "Yes", "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Erase" menu.

When selecting "No", the screen returns to "Erase" menu.

## 2.16 SETTING DETECTION LEVELS OF RADAR ALARM

Detection levels can be set to issue alarms from the radar alarm.

---

### Reference:

For details of display settings for radar alarm, see "2.7.8 DISPLAYING THE RADAR ALARM AND AUTOMATIC ACQUISITION OPERATIONS".

---

### ■ "RADAR Alarm" operations

- 1 Open **Main Menu** - **RADAR Alarm**.

RADAR Alarm	
1. RADAR Alarm1 Level	Level 4
2. RADAR Alarm2 Level	Level 4

"RADAR Alarm" menu appears.

### ■ Setting Detection Level

- 1 Open **RADAR Alarm** - **RADAR Alarm1 Level**.

RADAR Alarm	RADAR Alarm1 Level
1. RADAR Alarm1 Level	1. Level 1
2. RADAR Alarm2 Level	2. Level 2
	3. Level 3
	4. Level 4

"RADAR Alarm1 Level" menu appears.

Select Level1, Level2, Level3 or Level4.

Operate the same way for the settings of "RADAR Alarm2 Level".

### Note:

- Select Level1, Level2, Level3 or Level4 for alarm level.  
When setting to lower level of detection, the alarm operates for weaker targets.  
When setting to higher level of detection, be careful because the alarm may not operate properly.

## 2.17 PLOTTER UNIT

Sets the plotter unit.

### ■ "Plot" operations

- 1 Open  - .

Plot	
1. Waypoint Display	On
2. Mark	>
3. Line	>
4. Own Track	>
5. File Operation	>

"Plot" menu appears.

### 2.17.1 DISPLAYING WAYPOINT MARKS

When waypoint information is received from the navigation equipment, the waypoint mark appears on the radar display.

"○" is indicated as the waypoint mark on the radar display.

### ■ Setting for Waypoint Display

- 1 Open  - .

Plot	Waypoint Display
1. Waypoint Display	1. Off
2. Mark	2. On
3. Line	
4. Own Track	
5. File Operation	

: The waypoint marks are not displayed.

: The waypoint marks are displayed.

Waypoint marks are displayed only when NMEA/RMB/BWC sentences are used to receive Waypoint information.

### Reference:

To display Numerical INFO of waypoint, see "4.13.7 LOCATION CHANGE" in "INSTALLATION MANUAL".

## 2.17.2 SETTING MARK FUNCTIONS

Sets the mark functions.

### ■ "Mark" operations

- 1 Open  - .

Mark	
1. Mark Size	Large
2. Display Mark Color	>
3. Display Mark Type	>
4. Mark List	

"Mark" menu appears.

### ■ Setting Mark Symbol Size

Sets the mark symbol size.

- 1 Open  - .

Mark	Mark Size
1. Mark Size	1. Small
2. Display Mark Color	2. Large
3. Display Mark Type	
4. Mark List	

: Small marks are used.

: Large marks are used.

### ■ Display Mark Color

Displays the marks with the specified color.

- 1 Open  - .

Display Mark Color	
1. All	All
2. White	On
3. Cyan	On
4. Blue	On
5. Green	On
6. Yellow	On
7. Magenta	On

When "All" is set to  :

The setting of "All" is prior to individual settings.

When "All" is set to  :

Individual settings are prior to the setting of "All".

: Displays the marks with the specified color.

: Does not display the marks with the specified color.

■ Display Mark Type

Displays the marks with the specified type.

- 1 Open **Mark** - **Display Mark Type**.

Display Mark Type	
1. All	All
2. X	On
3. +	On
4. Y	On
5. ⌘	On

When "All" is set to **All** :

The setting of "All" is prior to individual settings.

When "All" is set to **Individual** :

Individual settings are prior to the setting of "All".

**On** : Displays the marks with the specified type.

**Off** : Does not display the marks with the specified type.

■ Mark List

Displays the mark list screen.

Mark List			
No.	Type	Color	LAT/LON
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

	<b>N</b>	Add	0° 00. 0216'	<b>E</b>	0° 00. 0054'	Delete	<b>EBL1</b>	45. 0°	<b>R</b>	Edit	<b>EBL2</b>	135. 0°	<b>R</b>
							<b>VRM1</b>	0. 10NM			<b>VRM2</b>	0. 20NM	



Mark List			
No.	Type	Color	LAT/LON
1	x	White	N 0° 00.0000' E 0° 00.0000'

A new mark appears in the mark list.

Soft key 2:

Erases marks.

Turn the [MULTI] control to select a mark list.

Press the soft key 2 "Erase" to erase the mark.

Soft key 3:

Edits marks.

Turn the [MULTI] control to select a mark.

Press the soft key 3 "Edit".

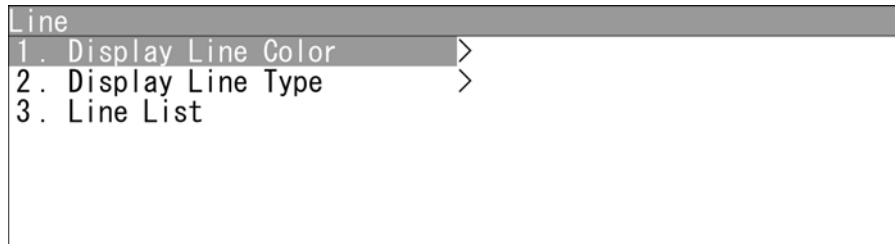
Use the cursor keys to edit ,  and , then press the .

## 2.17.3 SETTING LINE FUNCTIONS

Sets the line functions.

### ■ "Line" operations

- 1 Open  - .

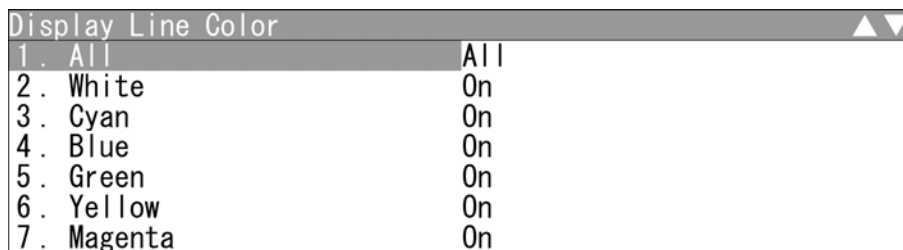


"Line" menu appears.

### ■ Display Line Color

Displays the lines with the specified color.

- 1 Open  - .



When "All" is set to  :

The setting of "All" is prior to individual settings.

When "All" is set to  :

Individual settings are prior to the setting of "All".

: Displays the lines with the specified color.

: Does not display the lines with the specified color.



■ Display Line Type

Displays the lines with the specified type.

1 Open  - .

Display Line Type	
1. All	All
2. _____	On
3. - - - -	On
4. - - - - -	On

When "All" is set to  :

The setting of "All" is prior to individual settings.

When "All" is set to  :

Individual settings are prior to the setting of "All".

: Displays the lines with the specified type.

: Does not display the lines with the specified type.

■ Line List

Displays the line list screen.

Line List			
No.	Type	Color	LAT/LON
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

<input type="button" value="Home"/>	<input type="button" value="N E"/>	Add 0° 00. 0216'	<input type="button" value="Delete"/>	EBL1 45. 0°	<input type="button" value="R"/>	Edit	EBL2 135. 0°	<input type="button" value="Insert"/>	<input type="button" value="R"/>
		0° 00. 0054'		VRM1 0. 10NM			VRM2 0. 20NM		

**Chapter 2 OPERATIONS**  
**2.17 PLOTTER UNIT**

Soft key 1: **Add**

Creates lines.

Press the soft key 1 "Add".

Line List					
1	<table border="1"> <tr><td>Type</td></tr> <tr><td>Color</td></tr> <tr><td>LAT/LON</td></tr> </table>	Type	Color	LAT/LON	
Type					
Color					
LAT/LON					
	<table border="1"> <tr><td>White</td></tr> <tr><td>N 0°00.0000'</td></tr> <tr><td>E 0°00.0000'</td></tr> <tr><td>Enter</td></tr> </table>	White	N 0°00.0000'	E 0°00.0000'	Enter
White					
N 0°00.0000'					
E 0°00.0000'					
Enter					

"Add" menu appears.

Use the cursor keys to input **Type**, **Color** and **LAT/LON**, then press the **Enter**.

Line List	Type				
1	1.				
<table border="1"> <tr><td>Type</td></tr> <tr><td>Color</td></tr> <tr><td>LAT/LON</td></tr> </table>	Type	Color	LAT/LON	2.	
Type					
Color					
LAT/LON					
<table border="1"> <tr><td>White</td></tr> <tr><td>N 0°00.0000'</td></tr> <tr><td>E 0°00.0000'</td></tr> <tr><td>Enter</td></tr> </table>	White	N 0°00.0000'	E 0°00.0000'	Enter	3.
White					
N 0°00.0000'					
E 0°00.0000'					
Enter					

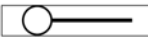

Use the cursor keys to select the **Type**.

Line List	Color				
1	1. White				
<table border="1"> <tr><td>Type</td></tr> <tr><td>Color</td></tr> <tr><td>LAT/LON</td></tr> </table>	Type	Color	LAT/LON	2. Cyan	
Type					
Color					
LAT/LON					
<table border="1"> <tr><td>White</td></tr> <tr><td>N 0°00.0000'</td></tr> <tr><td>E 0°00.0000'</td></tr> <tr><td>Enter</td></tr> </table>	White	N 0°00.0000'	E 0°00.0000'	Enter	3. Blue
White					
N 0°00.0000'					
E 0°00.0000'					
Enter					
	4. Green				
	5. Yellow				
	6. Pink				
	7. Red				

Use the cursor keys to select the **Color**.

Line List	LAT/LON											
1	Input LAT/LON											
<table border="1"> <tr><td>Type</td></tr> <tr><td>Color</td></tr> <tr><td>LAT/LON</td></tr> </table>	Type	Color	LAT/LON	<table border="1"> <tr><td>N</td><td>0°</td><td>00.</td><td>0000'</td></tr> <tr><td>E</td><td>0°</td><td>00.</td><td>0000'</td></tr> </table>	N	0°	00.	0000'	E	0°	00.	0000'
Type												
Color												
LAT/LON												
N	0°	00.	0000'									
E	0°	00.	0000'									
<table border="1"> <tr><td>White</td></tr> <tr><td>N 0°00.0000'</td></tr> <tr><td>E 0°00.0000'</td></tr> <tr><td>Enter</td></tr> </table>	White	N 0°00.0000'	E 0°00.0000'	Enter	▲ Push key select N							
White												
N 0°00.0000'												
E 0°00.0000'												
Enter												
	▼ Push key select S											
	◀ Input Figure Left											
	▶ Input Figure Right											

Use the cursor keys to select the **LAT/LON**.

Line List			
No.	Type	Color	LAT/LON
<input type="text" value="1"/>		<input type="text" value="White"/>	N 0° 00.0000' E 0° 00.0000'
<input type="text" value="2"/>		<input type="text" value="White"/>	N 0° 00.0000' E 0° 00.0000'
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

A new line appears in the line list.

Soft key 2:

Erases lines.

Turn the [MULTI] control to select a line list.

Press the soft key 2 "Erase" to erase the mark.

Soft key 3:

Edits lines.

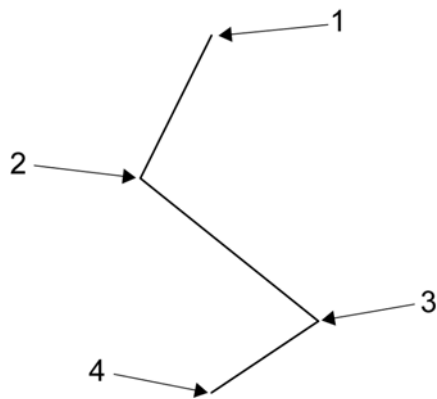
Turn the [MULTI] control to select a line.

Press the soft key 3 "Edit".

Use the cursor keys to edit ,  and , then press the .

Soft key 4:

Inserts lines.



Turn the [MULTI] control to select lines 2 to 4. (Line 1 cannot be selected.)

Press the soft key 4 "Insert".

Use the cursor keys to edit ,  and , then press the .

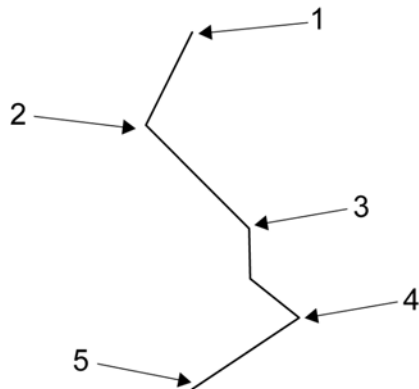


Figure shows the state when line 2 is selected.

### 2.17.4 DISPLAYING OWN SHIP'S TRACK

Sets the own ship's track display.

#### ■ "Own Track" operations

- 1 Open  - .

```
Own Track
1. Display Own Track Color >
2. Display Own Track Type >
3. Clear Own Track Color/Type>
```

"Own Track" menu appears.

### ■ Display Own Track Color

Displays the own tracks with the specified color.

- 1 Open  - .

Display Own Track Color	
1. All	All
2. White	On
3. Cyan	On
4. Blue	On
5. Green	On
6. Yellow	On
7. Magenta	On

"Display Own Track Color" menu appears.

When "All" is set to  :

The setting of "All" is prior to individual settings.

When "All" is set to  :

Individual settings are prior to the setting of "All".

: Displays the own tracks with the specified color.

: Does not display the own tracks with the specified color.

### ■ Display Own Track Type

Displays the own tracks with the specified type.

- 1 Open  - .

Display Own Track Type	
1. All	All
2. _____	On
3. - - - - -	On
4. - - - - -	On

"Display Own Track Type" menu appears.

When "All" is set to  :

The setting of "All" is prior to individual settings.

When "All" is set to  :

Individual settings are prior to the setting of "All".

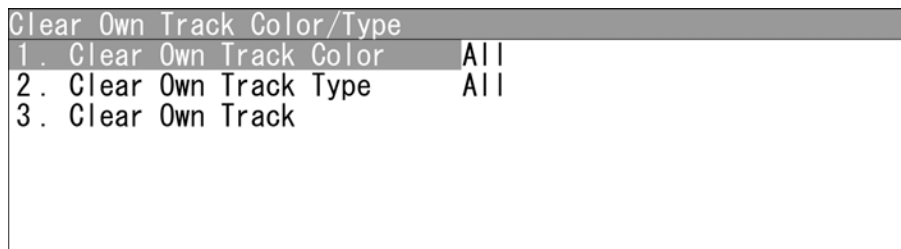
: Displays the own tracks with the specified type.

: Does not display the own tracks with the specified type.

■ Clear Own Track Color/Type

Sets to clear the own tracks by specifying color/type.

- 1 Open **Own Track** - **Clear Own Track Color/Type**.



"Clear Own Track Color/Type" menu appears.

"Clear Own Track Color" : Specifies the color of the own tracks to be cleared.

"Clear Own Track Type" : Specifies the type of the own tracks to be cleared.

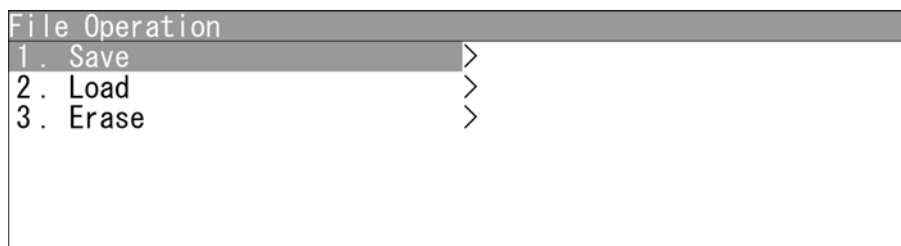
"Clear Own Track" : Clears the own tracks according to the setting of "Clear Own Track Color" and "Clear Own Track Type".

## 2.17.5 FILE OPERATIONS

Marks, lines and own tracks stored in the equipment can be output via USB terminal.

■ "File Operation" operations

- 1 Open **Plot** - **File Operation**.

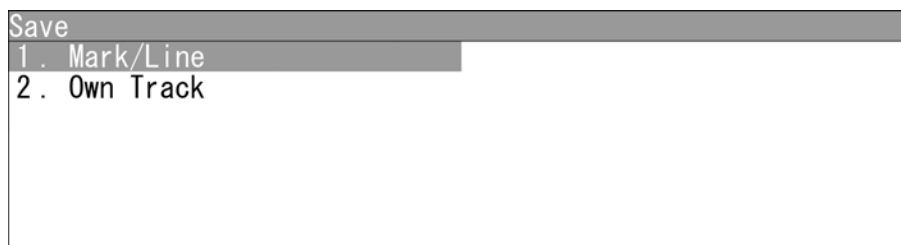


"File Operation" menu appears.

■ Saving Marks/Lines/Own Tracks

Marks, lines and own tracks stored in the equipment can be output via USB terminal.

- 1 Open **File Operation** - **Save**.



"Save" menu appears.

● Saving Mark/Line

1 Open  - .

Save	Mark/Line
1. Mark/Line	Input File No. <input type="text" value="0"/>
2. Own Track	▲Value Up ▼Value Down ◀Input Figure Left ▶Input Figure Right

"Mark/Line" menu appears.

Turn the [MULTI] control to set the file number.

After inputting, "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Save" menu.

Exist Same File  
Overwrite?

When overwriting, the dialog box "Exist Same File. Overwrite?" appears.

When selecting "Yes", "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Erase" menu.

When selecting "No", the screen returns to "Erase" menu.

**Note:**

- After saving data to a USB memory, move the data to a storage, such as PC, that can store the data with password to prevent data leakage.

● Saving Own Track

1 Open  - .

Save	Own Track
1. Mark/Line	Input File No.
2. Own Track	<input type="text" value="0"/>
	▲Value Up ▼Value Down ◀Input Figure Left ▶Input Figure Right

"Own Track" menu appears.

Turn the [MULTI] control to set the file number.

After inputting, "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Save" menu.

Exist Same File  
Overwrite?

When overwriting, the dialog box "Exist Same File. Overwrite?" appears.

When selecting "Yes", "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Erase" menu.

When selecting "No", the screen returns to "Erase" menu.

**Note:**

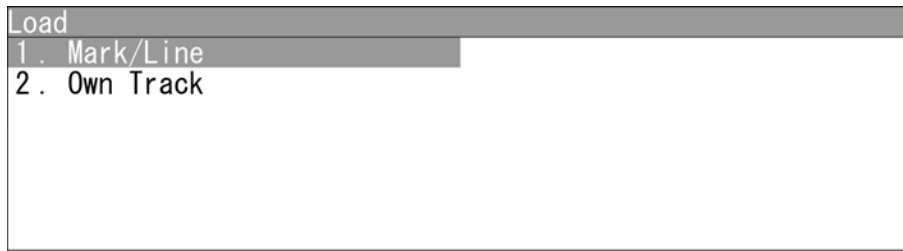
- After saving data to a USB memory, move the data to a storage, such as PC, that can store the data with password to prevent data leakage.



■ Loading Marks/Lines/Own Tracks

Loads marks, lines and own tracks from USB.

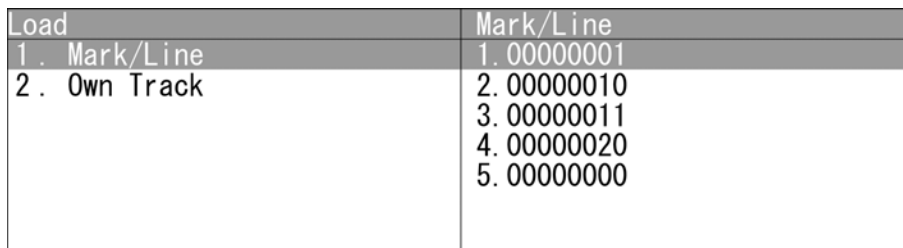
- 1 Open  - .



"Load" menu appears.

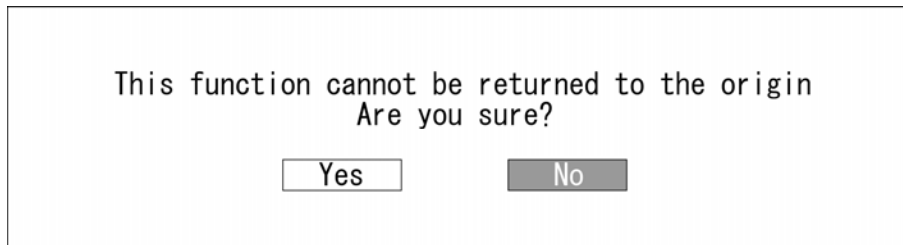
● Loading Mark/Line

- 1 Open  - .



"Mark/Line" menu appears.

Turn the [MULTI] control to select the file number.



When selecting the file, the dialog box "This function cannot be returned to the origin. Are you sure?" appears.

: Loads data via USB.

: Does not load data via USB.

When selecting "Yes", "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Erase" menu.

When selecting "No", the screen returns to "Erase" menu.

● Loading Own Track

1 Open  - .

Load	Own Track
1. Mark/Line	1.00000000
2. Own Track	

"Own Track" menu appears.

Turn the [MULTI] control to select the file number.

This function cannot be returned to the origin  
Are you sure?

When selecting the file, the dialog box "This function cannot be returned to the origin. Are you sure?" appears.

: Loads data via USB.

: Does not load data via USB.

When selecting "Yes", "Processing." appears on the radar screen.

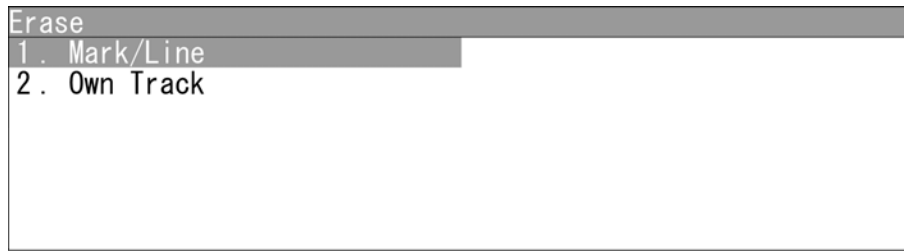
After saving is finished, the screen returns to "Erase" menu.

When selecting "No", the screen returns to "Erase" menu.

■ Erasing Marks/Lines/Own Tracks

Erases marks, lines and own tracks via USB.

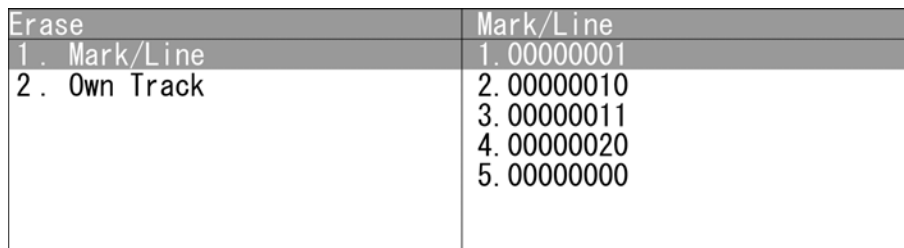
- 1 Open  - .



"Erase" menu appears.

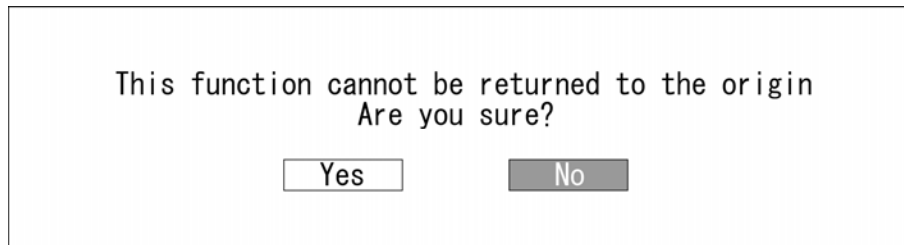
● Erasing Mark/Line

- 1 Open  - .



"Mark/Line" menu appears.

Turn the [MULTI] control to select the file number.



When selecting the file, the dialog box "This function cannot be returned to the origin. Are you sure?" appears.

When selecting "Yes", "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Erase" menu.

When selecting "No", the screen returns to "Erase" menu.

● Erasing Own Track

1 Open  - .

Erase	Own Track
1. Mark/Line	1.00000000
2. Own Track	

"Own Track" menu appears.

Turn the [MULTI] control to set the file number.

This function cannot be returned to the origin  
Are you sure?

When selecting the file, the dialog box "This function cannot be returned to the origin. Are you sure?" appears.

When selecting "Yes", "Processing." appears on the radar screen.

After saving is finished, the screen returns to "Erase" menu.

When selecting "No", the screen returns to "Erase" menu.

## 2.18 SETTING TIMED TX

Sets timed TX function.

### ■ Timed TX

This function reduces power consumption.

When using timed TX function, the operation state is repeatedly changed between TX and standby state.

The timed TX function can set TX time and standby time as desired.

### ■ "Timed TX" operations

- 1 Open  - .

Timed TX	
1. Timed TX	Off
2. TX Time	10Scan
3. Standby Time	3min

"Timed TX" menu appears.

### ■ Turning on/off Timed TX Function

Turns on/off the timed TX function.

Timed TX	Timed TX
1. Timed TX	1. Off
2. TX Time	2. On
3. Standby Time	

: Sets the timed TX function to Off.

: Sets the timed TX function to On.

### Reference:

The timed TX function can be turned off only in TX state. It cannot be turned off in standby state.

■ Setting TX Time

Sets the number of antenna rotation.

Timed TX	TX Time
1. Timed TX	1-99
2. TX Time	<input type="text" value="10"/> Scan
3. Standby Time	▲Value UP ▼Value Down ◀Input Figure Left ▶Input Figure Right

Turn the [MULTI] control to set the TX time.

TX time can be adjusted between 0 and 99Scan.

■ Setting Standby Time

Sets the time for standby state.

Timed TX	Standby Time
1. Timed TX	1-99
2. TX Time	<input type="text" value="3"/> min
3. Standby Time	▲Value UP ▼Value Down ◀Input Figure Left ▶Input Figure Right

Turn the [MULTI] control to set the Standby Time.

The standby time can be adjusted between 0 and 99min.