

4. AIS OPERATION

Note 2: AIS symbols are momentarily erased after the screen is redrawn when the heading is changed from the head-up mode.

Note 3: When no AIS data is received, the Alert "Lost AIS COM" appears in the [Alert] box. Check the AIS transponder. The priority for this alert changes as follows:

- **When the AIS function is enabled:** Prioritized as Warning.
- **When the AIS function is disabled:** Prioritized as Caution.

Note 4: An AIS object is declared a lost target if it is not detected in five consecutive reporting periods (see the table on page 4-1).

Note 5: [UNREAD MSG SYMBOL] on [TT•AIS SYMBOL] menu (radar mode) or [Unread AIS MSG] on [Targets] page (chart for radar mode) must be turned on to show the unread AIS message symbol.

Note 6: Physical and virtual AIS AtoN symbols that may appear are listed in the table on the following table.

AIS AtoN symbols

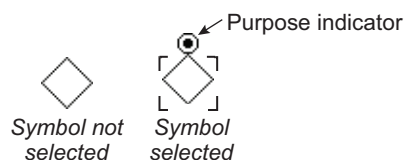
The table below shows all the AIS AtoN symbols.

Note: Synthetic AtoN is described as basic shape.

AIS Physical AtoN Symbol*1	AIS Virtual AtoN Symbol	Default Color	Meaning
		Blue	Basic shape
		Blue	RACON
		Blue	Emergency wreck mark
		Blue	North cardinal mark
		Blue	East cardinal mark
		Blue	South cardinal mark
		Blue	West cardinal mark
		Blue	Port hand mark
		Blue	Starboard hand mark
		Blue	Isolated danger

AIS Physical AtoN Symbol ^{*1}	AIS Virtual AtoN Symbol	Default Color	Meaning
		Blue	Safe water
		Blue	Special mark
	-	Line: Yellow ^{*2} Char: Yellow ^{*2}	Off position ^{*3} (Displayed with yellow line and yellow text)
	-	Line: Blue Char: Yellow ^{*2}	Light off or at reduced range (Displayed with yellow text)
	-	Line: Blue Char: Yellow ^{*2}	RACON error (Displayed with yellow text)
	-	Line: Blue Char: Yellow ^{*2}	Light error or combination of light error/off with RACON error (Displayed with yellow text)
	-	Line: Yellow ^{*2} Char: Yellow ^{*2}	Missing ^{*3} (Displayed with yellow line and yellow text)
		Blue	Mobile AtoN, basic shape
		Blue	Self-propelled, but direction not reported or unavailable mobile AtoN
		Blue	Tethered from a watercraft (e.g. cable, pipe, net)
		Blue	Mobile AtoN with COG information. Arrow mark points in course direction of COG within $\pm 22.5^\circ$ sectors.

^{*1}: The purpose indicator (for example, ◎) appears at the top of a physical AtoN symbol. The indicator is always displayed in the radar mode, and when a symbol of this type is selected in the chart mode or chart radar mode. See the example below.



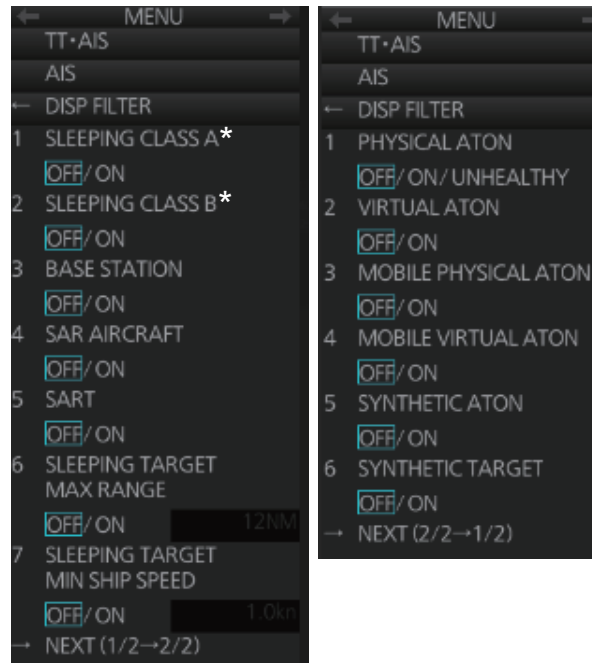
^{*2}: Color not changeable.

^{*3}: “Unlit”, “Racon err” and “Error” may be included.

4.4 How to Filter AIS Objects

If the screen becomes cluttered with AIS objects, you can filter out unnecessary AIS objects, from the [DISP FILTER] menu.

1. Right-click the AIS mode indication then click [AIS DISP filter Menu] to show the [DISP FILTER] menu.



* Not shown on IMO- or A-type specification.

2. At [1 SLEEPING CLASS A] - [5 SART] on page 1 and [1 PHYSICAL ATON] - [6 SYNTHETIC TARGET] on page 2, disable or enable tracking of respective item as appropriate. Select [ON] to filter out objects. When [1 PHYSICAL ATON] is set to [UNHEALTHY], only physical AtoN symbols with an error ("Off Posn", "Unlit", "Racon err", "Error" or "Missing") are displayed.
3. Select [6 SLEEPING TARGET MAX RANGE] and set the maximum range to display an AIS target. A sleeping AIS target not within the range set here is not displayed.
4. Set the minimum ship speed for AIS targets, with [7 SLEEPING TARGET MIN SHIP SPEED]. Any sleeping AIS target whose speed is slower than that set here will not be displayed.
5. Close the menu.

Note: This function is not available for an activated target.

4.5 How to Activate Targets

When you convert a sleeping target to an activated target, an activated target's course and speed are shown with a vector. You can easily judge target movement by monitoring the vector.

Note: You can activate only AIS targets (class A and B AIS targets and SAR vessels).

4.5.1 How to activate specific target

From the Control Unit

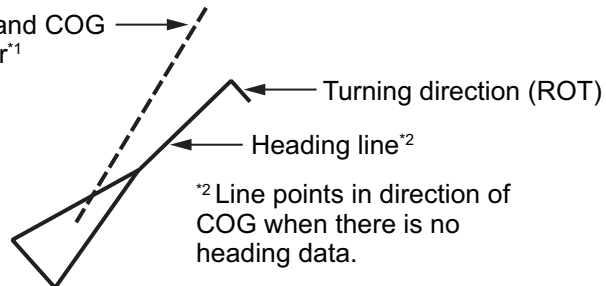
Select the target with the cursor then press the **ACQ/ACT** key.

By the trackball module

Click the AIS target symbol.

SOG (Speed Over the Ground) and COG (Course Over the Ground) vector^{*1}

^{*1} Vector shows STW (speed through the water) and CTW (course through the water) when sea stabilized mode is selected at the radar.

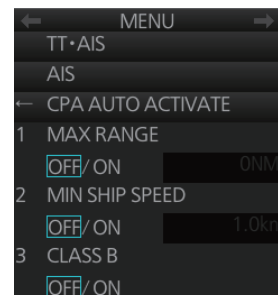


4.5.2 How to automatically activate targets

You can get automatic activation of a sleeping AIS target when its CPA/TCPA are within a preset limit. The CPA/TCPA alarm must be active to use this feature.

How to set conditions for automatic activation of AIS targets

1. Right-click the AIS mode indication then click [AIS Menu] to show that menu.
2. Open the [4 CPA AUTO ACTIVATE] menu.
3. Set each menu item, referring to the description below.
 - [1 MAX RANGE]: Set the maximum range to use. Any AIS target at a distance greater than set here will not be activated.
 - [2 MIN SHIP SPEED]: Set the minimum speed to use. Any AIS target whose speed is slower than set here will not be activated.
 - [3 CLASS B]: Select [ON] to exclude class B AIS targets.
4. Close the menu.



How to enable, disable automatic activation of AIS targets

Click the location circled in the figure below to select one of the following:

[AUTO OFF]: Disable automatic activation of AIS target by CPA.

[AUTO ACT FILT]: Activate AIS targets that fulfill the requirements set on the [CPA AUTO ACTIVATE] menu.

[AUTO ACT ALL]: Activate all AIS targets within the CPA range set.

TT	AIS	
OFF	DISP ALL	
Vector	20min	True-G
CPA/TCPA	0.5NM	3min
AIS CPA	AUTO ACT ALL	
LOST TGT	ALL	
PAST POSN	OFF	True-G
Trail	OFF	

4.6 How to Sleep Targets

Note: You can sleep only AIS targets (class A and B AIS targets and SAR vessels).

4.6.1 How to sleep an activated AIS target

You can “sleep” an activated AIS target as shown below when the screen becomes filled with targets that might prevent important radar and AIS targets from being identified. The targets that have been activated automatically cannot be “slept”.

From the Control Unit

Put the cursor on the AIS symbol to sleep then press the **TARGET CANCEL** key.

By the trackball module

1. Right-click the screen to show the context-sensitive menu.
2. Select [Target Cancel] and [Any] or [AIS Only] as applicable.
3. Click the AIS symbol to sleep.

4.6.2 How to sleep all activated AIS targets

Sleep all activated targets from the menu

1. Open the menu then select [2 TT•AIS] and [4 AIS].
2. Select [3 SLEEP ALL TGTS] then [YES].
3. Close the menu.

Sleep all activated targets from the AIS box

Long-click the AIS mode indication at the bottom-right position to display [FUNC OFF] then click [DISP ALL] to sleep all AIS targets redisplayed.

TT	AIS	
OFF	DISP ALL	
Vector	20min	True-G
CPA/TCPA	0.5NM	3min
AIS CPA	AUTO ACT ALL	
LOST TGT	ALL	
PAST POSN	OFF	True-G
Trail	OFF	

4.7 How to Display AIS Object Data

You can display an AIS object data by selecting it on the display.

4.7.1 AIS pop-up information

The AIS pop-up shows abbreviated AIS data (COG, SOG, CPA, TCPA and destination*) for the selected AIS object. Simply put the cursor on the AIS object to show the pop-up. The pop-up can be enabled or disabled with [AIS POP-UP INFO] in the [TT•AIS SYMBOL] menu.

*: Not displayed in CHART for RADAR mode.

VESSEL B
COG: 090.0° T
SOG: 14.00kn
CPA: 57.06NM
TCPA: 76'36"
DEST: DESTIN...

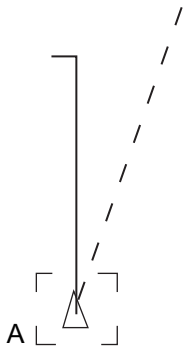
4.7.2 Basic AIS data

From the Control Unit

1. Use the trackball to put the cursor on the AIS symbol you want to know its data.
2. Press the **TARGET DATA** key.
3. The selected object is marked with a broken square and AIS data is shown in the AIS data box when the object is correctly selected.

By the trackball module

Click the AIS object. The selected object is marked with a broken square and AIS data is shown in the AIS data box when the object is correctly selected. The following figure is an display example for an AIS target. The contents on the basic AIS data changes according to the AIS type. See section 4.7.4.



					Message icon*1	
AIS no. (information display order) →	AIS					
Vessel name →	FURUNO					
Bearing →	BRG 320.7° R			HDG		← Heading
Range →	RNG 5.825NM			141.0° T		
Course over ground →	COG 141.0° T			ROT		← Rate of turn
Speed over ground →	SOG 10.00kn			+000.0° /min		
CPA →	CPA 0.047NM			STATUS		← Navigation status
TCPA →	TCPA 34'28"			Under way		
Bow crossing range →	BCR -0.238NM			using		
Bow crossing time →	BCT 34'49"			engine		
Position →	00° 04.529' N					
	000° 03.684' W					

*1. The icon appears when an AIS message is received from an AIS object. Click the icon to show the AIS message(s). A maximum of the two latest messages is displayed.

Note 1: AIS is not available in dead reckoning when the radar type is selected to [IMO] on the [INSTALLATION] menu.

Note 2: If the TCPA value is negative, this means that you have already passed the closest point and the AIS object is going away from your ship.

Note 3: For the maximum displayable number of TT•AIS boxes, see section 3.8.1.

4.7.3 Expanded AIS data

The expanded AIS data display provides additional information about an AIS object, including call sign, MMSI No., IMO No., etc. To display expanded AIS data, show the basic data for a object, right-click the AIS basic data display then select [Expanded AIS Data]. The following figure is an display example for an AIS target. The contents on the expanded AIS data changes according to the AIS type. See section 4.7.4.

	←	MENU	→
Title bar →		Target Information	×
Vessel name →		Name:	FURUNO
Call sign →		Call:	WG27CQ
Position →		L/L:	00° 04.514' N 000° 03.672' W
Type of position sensor →		POS sensor:	GPS
Position quality (HIGH or LOW)/ Availability of RAIM ^{*1}		POS QLTY.:	HIGH RAIM
Course over ground →		COG:	141.0° T
Speed over ground →		SOG:	10.00kn
Navigation status →		NAV status:	Under way using engine
MMSI No. →		MMSI No.:	123456789
IMO No. →		IMO No.:	123456789
Length of vessel →		Length:	180m
Width of vessel →		Width:	32m
Draught of vessel →		Ship draught:	8.0m
Destination →		DEST.:	KOBE
ETA at destination →		ETA:	20/JUL 19:20
AIS class/Version of AIS transponder ^{*2}		AIS class:	Class A version:0
Association (On or Off) →		Association:	Off
Ship and cargo type →		Ship and Cargo Type:	Tanker(s) All ships of this type
Number of times the AIS message was relayed →		Repeat Indicator:	0
Availability of DTE ^{*3} (Data Terminal Equipment) →		DTE:	not available

*1: "RAIM" (Receiver Autonomous Integrity Monitoring) appears after position quality indication when RAIM is in use.

*2: Version of AIS transponder is shown only for the class A AIS targets.

*3: Message sent to AIS object when DTE (Data Terminal Equipment) cannot be used.

4.7.4 AIS object type and available AIS data

The AIS data available depends on the AIS object type. The table below shows the data available for each AIS object type.

Display item	Class A	Class B	Base station	SAR aircraft	AtoN	SART	Synthetic (DISTRESS)	Synthetic (VTS)
Name	✓	✓	✓	✓	✓	✓	✓	✓
Call	✓	✓	—	✓	—	—	—	✓ ^{*1}
L/L	✓	✓	✓	✓	✓	✓	✓	✓
POS sensor	✓	✓	✓	✓	✓	—	—	—
POS QLTY.	✓	✓	✓	✓	✓	✓	—	—
POS indicator	—	—	—	—	✓	✓	—	—
COG	✓	✓	—	✓	—	✓	—	✓
SOG	✓	✓	—	✓	—	✓	—	✓
NAV status	✓	—	—	— ^{*2}	✓ ^{*3}	✓	—	—
MMSI No.	✓	✓	✓	✓	✓	✓	—	✓ ^{*4}
IMO No.	✓	—	—	—	—	—	—	✓ ^{*5}
Length	✓	✓	—	✓	✓	—	—	✓
Width	✓	✓	—	✓	✓	—	—	—
Ship draught	✓	—	—	—	—	—	—	—
DEST.	✓	—	—	—	✓	—	—	—
ETA	✓	—	—	—	—	—	—	—
Start date	—	—	—	—	—	—	✓	—
End date	—	—	—	—	—	—	✓	—
AIS class	✓	✓	—	—	—	—	—	—
Association	✓	✓	—	—	—	—	—	—
Ship and Cargo Type	✓	✓	—	—	✓	—	—	—
Repeat Indicator	✓	✓	✓	✓	✓	✓	✓	✓
DTE	✓	✓	—	—	—	—	—	—

^{*1}: Displayed when Call Sign is enabled during VTS.

^{*2}: Where the selected AIS object is an aircraft, the aircraft's altitude appears.

^{*3}: Mobile, RACON/Light (at AtoN) are used as AtoN status.

^{*4}: Displayed when MMSI No. is enabled during VTS.

^{*5}: Displayed when IMO No. is active during VTS.

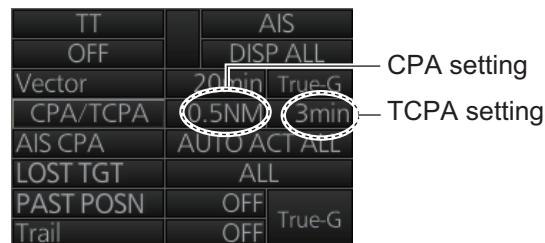
4.8 CPA/TCPA Alarm

This radar calculates CPA and TCPA by using own ship and relative target positions. An AIS dangerous object is one whose CPA and TCPA are within the range of the CPA and TCPA limits set in the TT/AIS box. The AIS symbol of an AIS dangerous object is red and flashing, and is announced with the Alert "CPA/TCPA". After the alert is acknowledged the target symbol is displayed in red color. This radar further eases the task of the operator by automatically changing non-active targets to active targets, if their CPA and TCPA are within a preset limit.

To set the CPA and TCPA ranges, do the following:

Note: Only AIS targets (class A and B AIS targets and SAR vessels) are subject to the CPA/TCPA alarm.

1. If the CPA and TCPA settings are not shown, click [CPA/TCPA].
Note: When clicking [CPA/TCPA], the CPA/TCPA alarm function is off.
2. Click the CPA indication to select desired CPA range.
3. Click the TCPA indication to select desired TCPA setting.



4.9 AIS Symbol Brilliance

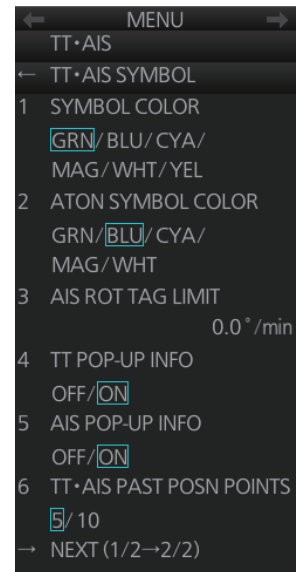
1. Right-click the [BRILL] button on the InstantAccess bar™ then select [Brill Menu].
2. Go to page 2, select [5 AIS SYMBOL] then spin the scrollwheel to adjust the brilliance.



3. Close the menu.

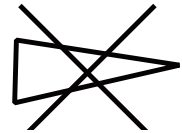
4.10 AIS Symbol Color

1. Right-click the AIS mode indication then click [Symbol Menu] to show that menu.
2. Select [1 SYMBOL COLOR] and desired color. (Yellow is not available with the IMO type.)
3. Close the menu.



4.11 AIS Lost Alert

An AIS object is declared a lost object when it fails to produce data for intervals which are based on the table on page 4-1. When this occurs, the object is marked with the lost symbol (flashing), shown in the right figure, the buzzer sounds and an appropriate alert appears.



4

AIS object type		Lost alert
AIS targets	Class A target	AIS Target Lost
	Class B target	AIS Target Lost
AIS data report	AIS base station	-
	AIS SAR aircraft	-
	Physical AIS AtoN	AIS AtoN Lost
	Virtual AIS AtoN	AIS AtoN Lost
	Mobile Physical AIS AtoN	AIS AtoN Lost
	Mobile Virtual AIS AtoN	AIS AtoN Lost
	Synthetic AIS AtoN	AIS AtoN Lost
AIS locating device	AIS-SART* (active)	AIS SART Lost
	AIS-SART* (test)	-
AIS synthetic target	AIS synthetic target	-

*: Includes AIS-SART, AIS MOB and EPRIB-AIS.

To acknowledge a lost alert, push the **ALARM ACK** key or click the [Alert] box.

Note: The AIS data transmission interval depends on object's speed. For example, the data is transmitted every 10 seconds on the ship speed of 0 to 14 kn and every two seconds on the ship speed of more than 23 knots. For details, see the owner's manual of the AIS transponder.

4.11.1 How to enable, disable the AIS lost alert

The [LOST TGT] indication (at the bottom-right position) enables, disables the lost alert. Click the indication to select [OFF], [FILT] or [ALL] as appropriate.

TT	AIS	
OFF	DISP ALL	
Vector	20min	True-G
CPA/TCPA	0.5NM	3min
AIS CPA	AUTO ACT ALL	
LOST TGT	ALL	
PAST POSN	OFF	True-G
Trail	OFF	

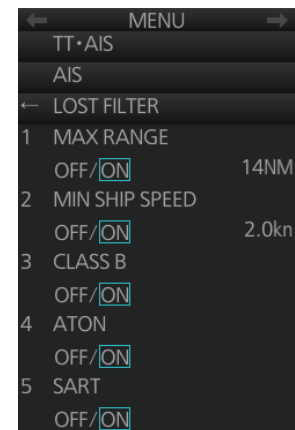
- [ALL]: Get the alert against all lost objects.
- [OFF]: Disable the lost alert. [OFF] indication is shown in yellow.
- [FILT]: Get the alert against the objects whose criteria meet the settings made in section 4.11.2. If [3 LOST FILTER MAX RNG] on the [TT] menu is set to [ON] (see section 3.13.2) or some menu item on the [LOST FILTER] menu is set to [ON], [FILT] indication changes to yellow.

Note: The [LOST TGT] setting is shared commonly between TT and AIS.

4.11.2 How to set the AIS lost filter

If you are in an area where AIS objects often become lost, the lost alert may activate frequently. In this case, you may want to specify which objects to classify as lost objects, to prevent frequent triggering of the lost alert.

1. Right-click the AIS mode indication then click [AIS Menu] to show that menu.
2. Open the [6 LOST FILTER] menu.
3. Set each menu item, referring to the description below.
 - [1 MAX RANGE]: Set the maximum range to use. Any AIS object at a distance greater than set here will not trigger the lost alert.
 - [2 MIN SHIP SPEED]: Set the minimum speed to use. Any AIS object whose speed is slower than set here will not trigger the lost alert.
 - [3 CLASS B]: Select [ON] to exclude class B AIS targets from the lost alert.
 - [4 ATON]: Select [ON] to exclude AIS AtoN from the lost alert.
 - [5 SART]: Select [ON] to exclude AIS-SART from the lost alert.



Note: If some menu item on the [LOST FILTER] menu is set to [ON], the following message appears at the bottom of the menu.

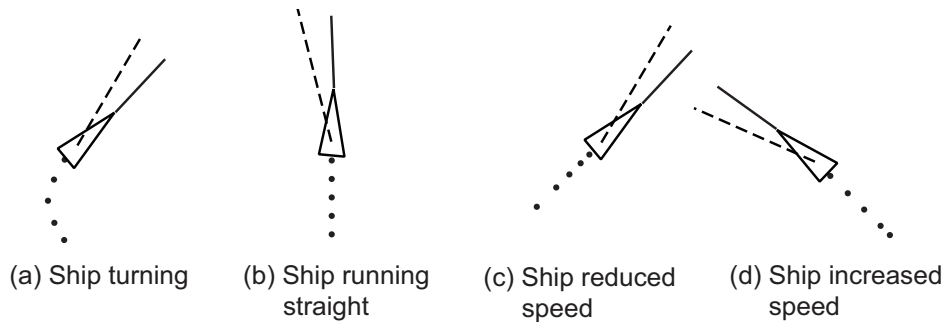
"Some lost warning function is disabled"

4. Close the menu.

4.12 How to Display AIS Past Positions

The past position display shows equally time-spaced dots marking past positions of activated class A and B AIS targets and SAR vessels. If an object changes its speed, the spacing will be uneven. If it changes course, its plotted course will not be a straight line.

Below are sample past position displays.



4.12.1 How to enable/disable the past position display, select past position reference

Click the indications circled in the figure to the right to set the plot interval (or disable the display) and the past position reference (true or relative).

TT	AIS	
OFF	DISP ALL	
Vector	20min	True-G
CPA/TCPA	0.5NM	3min
AIS CPA	AUTO	ACT ALL
LOST TGT	ALL	
PAST POSN	OFF	True-G
Trail	OFF	

Plot interval, past position display ON/OFF

Past position reference

4.12.2 Past position points

You can show 5 or 10 past position points per AIS target. Right-click the past position indication then click [PAST POSN Menu] to show that menu. Set [6 TT•AIS PAST POSN POINTS] to [5] or [10].

4.13 How to Display True or Relative Speed Vectors

AIS objects vector can be displayed relative to your ship's heading (relative) or with reference to the North (True).

Vector time (or the length of vectors) and presentation mode can be set at the bottom-right position on the screen. For further information, see section 3.9.

4.14 Association of TT and AIS Targets

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

To avoid the presentation of two target symbols for the same physical target, use the "association" function. If target data from both AIS and TT are available and if the as-

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sociation criteria are fulfilled, either the AIS or TT symbol is presented according to the association method selected.

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

All association settings, including ON/OFF, can also be controlled from the chart for radar mode, with the [TT/AIS] page in the [Overlay/NAV Tools] box. All settings are mutually shared.

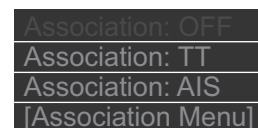
Note: Only activated class A and B AIS targets are subject to the association function.

4.14.1 How to select association method

Click the location circled below to show “<” to select AIS symbol for associated target, or “>” to select TT symbol for associated target. This setting overrides the corresponding item on the [TT•AIS] menu. To turn off association, click the location to remove the arrow.

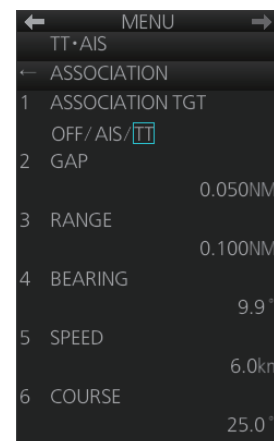


Note: You can also select the method by right-clicking the location. Click desired association method.



4.14.2 How to set the conditions for association

1. Open the menu then select [TT•AIS] and [6 ASSOCIATION].
2. Enter the association conditions, referring to the following:
 - [1 ASSOCIATION TGT]: Disable Association with [OFF], or select [AIS] or [TT]. [AIS] selects the AIS symbol for association target; [TT] selects the TT symbol for the association target.
 - [2 GAP]: Range between AIS target and TT. Setting range: 0.000 to 0.050(NM)
 - [3 RANGE]: Enter the range difference from own ship to AIS target and TT. setting range: 0.000 to 0.100(NM)
 - [4 BEARING]: Enter the bearing difference from own ship to AIS target and TT. Setting range: 0.0 to 9.9(°)
 - [5 SPEED]: Enter the speed difference between AIS target and TT. Setting range: 0.0 to 6.0(kn)
 - [6 COURSE]: Enter the course difference between AIS target and TT. Setting range: 0.0 to 25.0(°)

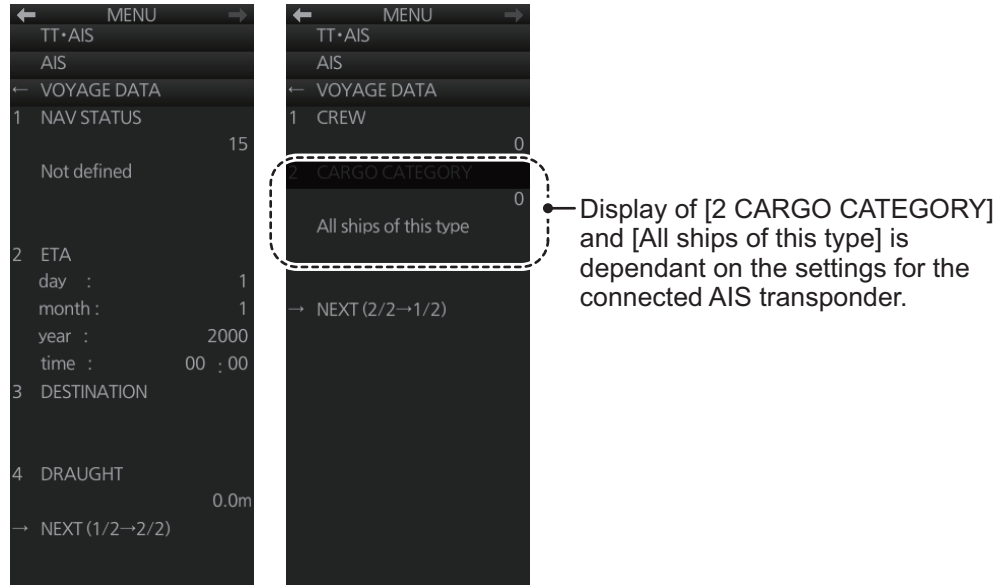


When the association criteria are met either the AIS or TT symbol is erased according to association made in section 4.14.1.

4.15 Voyage Data

Before you embark on a voyage, set your navigation status, ETA, destination, draught and the number of crew, on the [VOYAGE DATA] menu.

1. Click the [OWN AIS] button on the InstantAccess bar™ to show the [VOYAGE DATA] menu.



2. Select [1 NAV STATUS] then use the scrollwheel to set the applicable two-digit nav status code, referring to the table below.

No.	Nav status	No.	Status
00	Underway using engine	08	Under way Sailing
01	At anchor	09	Reserved for high speed craft
02	Not under command	10	Reserved for wing in ground
03	Restricted Maneuverability	11	power-driven vessel pushing ahead or towing alongside (regional use)
04	Constrained by her draught	12	power-driven vessel towing astern (regional use)
05	Moored	13	Reserved for future use
06	Aground	14	AIS SART (Active)
07	Engaged in fishing	15	Not Defined

3. Select [2 ETA] then use the scrollwheel to enter ETA: day (two digits), month (two digits), year (four digits) and time (four digits).
4. Select [3 DESTINATION] then use the software keyboard to enter the name of your destination, using a maximum of 20 characters.
5. Select [4 DRAUGHT] then use the scrollwheel to enter ship's draft (0.0 - 25.5 (m)).
6. On page 2, select [1 CREW] then use the scrollwheel to enter the number of crew (0-8191).
7. Where required, spin the wheel to enter the appropriate [CARGO CATEGORY], referring to the table below.

No.	Cargo Type	No.	Cargo Type
0	All ships of this type	5	Reserved for future use
1	Carrying DG, HS, or MP, IMO hazard or pollutant category X	6	Reserved for future use

No.	Cargo Type	No.	Cargo Type
2	Carrying DG, HS, or MP, IMO hazard or pollutant category Y	7	Reserved for future use
3	Carrying DG, HS, or MP, IMO hazard or pollutant category Z	8	Reserved for future use
4	Carrying DG, HS, or MP, IMO hazard or pollutant category OS	9	No Additional Information

8. Close the menu.

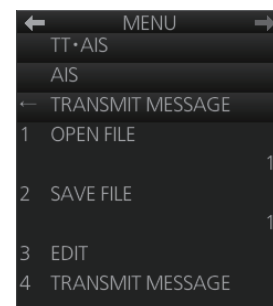
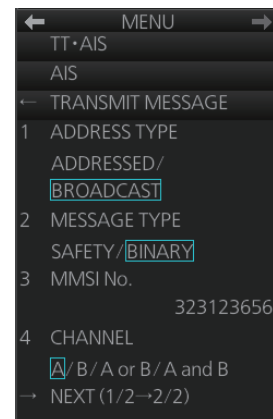
4.16 AIS Messages

You can send and receive messages via the VHF link, to a specified destination (MMSI) or all AIS-equipped ships within communication range of your ship. Messages can be sent to warn of safety of navigation, for example, an iceberg sighted. Routine messages are also permitted. Short safety-related messages are only an additional means to broadcast safety information. They do not remove the requirements of the GMDSS.

4.16.1 How to create and transmit a new AIS message

You can create and send an AIS message as follows:

1. Right-click the AIS mode indication then click [AIS Menu] to show that menu.
2. Open the [8 TRANSMIT MESSAGE] menu.
3. At [1 ADDRESS TYPE], select [ADDRESSED] to send the message to a specific AIS-equipped ship, or [BROADCAST] to send the message to all AIS-equipped ships within VHF communication range. For [ADDRESSED], enter MMSI of ship at [3 MMSI No.].
4. At [2 MESSAGE TYPE], select [SAFETY] for safety message, or [BINARY] for routine message.
5. At [4 CHANNEL], select the channel over which to broadcast your message. The choices are [A], [B], [A or B] or [A and B].
6. Click [NEXT] to go to the next page.
7. Select [3 EDIT]. A text input box appears together with the software keyboard. Use the software keyboard to enter your message. The number of characters that may be entered depends on message type, and the number of characters available appears below the text box.
 Safety message broadcast: 90 characters
 Binary message broadcast: 86 characters
 Safety message addressed to MMSI: 85 characters
 Binary message addressed to MMSI: 80 characters
8. To save the file, select [2 SAVE FILE].



9. To transmit the message, click [4 TRANSMIT MESSAGE]. The confirmation message "Attention: Do you wish to transmit AIS message?" appears. Click the [OK] button to transmit the message.

If the message could not be transmitted, the Alert "AIS MSG Send ERR" appears.

Note: If [1 ADDRESS TYPE] is set to [ADDRESSED] and you enter an MMSI for an AIS whose DTE (Data Terminal Equipment) is unavailable, the following message appears and the message cannot be sent.

"AIS messages cannot be sent because the addressed AIS has no DTE."

4.16.2 How to transmit a saved AIS message

If you have saved some previously transmitted AIS messages, you can edit one and send it as follows:

1. Right-click the AIS mode indication then click [AIS Menu] to show that menu.
2. Open the [8 TRANSMIT MESSAGE] menu.
3. Go to page 2 of the menu, select [1 OPEN FILE] then select the number of the message to transmit.
4. Select [3 EDIT] to edit the message.
5. To save the message, select [2 SAVE FILE].
6. To transmit the message, select [4 TRANSMIT MESSAGE]. The confirmation message "Attention: Do you wish to transmit AIS message?" appears. Click the [OK] button to transmit the message.

4

4.16.3 How to display received AIS messages

When you receive an AIS message, the Alert "AIS MSG Received" appears. When an unread AIS message exists, the [AIS message] button on the InstantAccess bar™ is displayed in yellow and changed as follows.



To display the message, click the [AIS message] button on the InstantAccess bar™.

AIS Received Messages list

Received AIS messages are stored in the AIS received message list. The maximum number of messages that can be stored is as follows:

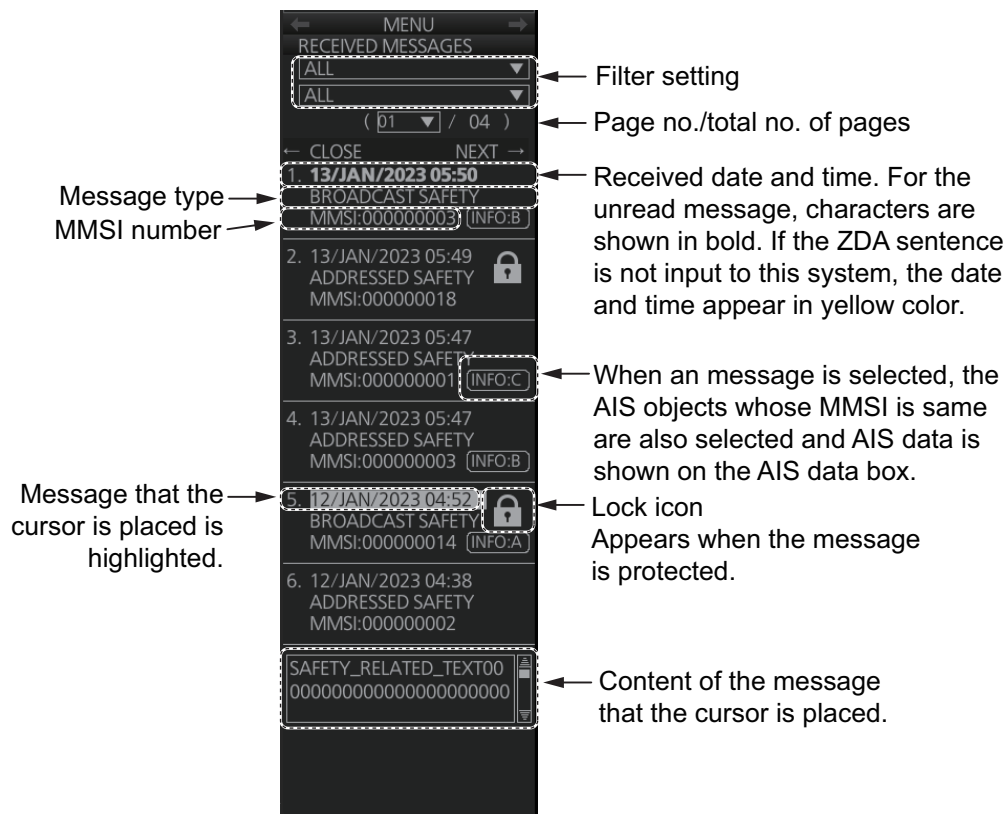
- Addressed message: Max. 100 messages (a maximum of 20 messages can be protected.)
- Broadcast message: Max. 100 messages (a maximum of 20 messages can be protected.)
- AtoN message: Max. 25 messages (message cannot be protected.)
- SART message: Max. 25 messages (message cannot be protected.)

4. AIS OPERATION

When the memory capacity is reached and a new message is received, the oldest message (excluded the protected message) is automatically deleted to make room for the latest. The AtoN messages are deleted after 18 minutes. When the AtoN or SART is lost, the messages whose MMSI is same with the lost object are automatically deleted.

Do as follows to show the AIS message.

1. Right-click the AIS mode indication then click [AIS Menu] to show that menu.
2. Select [7 RECEIVED MESSAGES] to show the received message list.

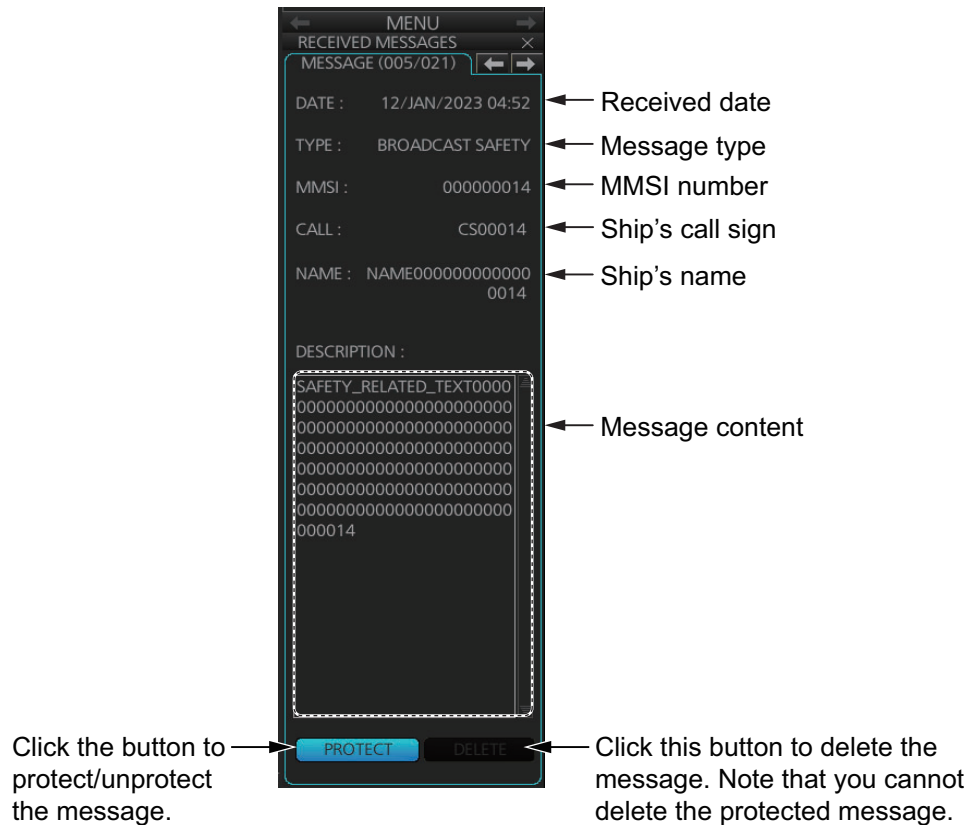


How to filter the message list

When you want to filter the message list, use the filter setting on the top of the message list.

- Upper filter setting:
 - [ALL]: Show all received messages.
 - [TARGET]: Show the AIS message from the AIS-equipped ships, SAR aircrafts and AIS base stations.
 - [SART]: Show the AIS message from the SART.
 - [ATON]: Show the AIS message from the AtoN.
- Lower filter setting:
 - [ALL]: Show all received messages.
 - [ADDRESSED]: Show only the addressed messages.
 - [BROADCAST]: Show only the broadcast messages.
 - [PROTECTED]: Show only the protected messages.
 - [UNREAD]: Show only the unread messages.

3. Click an AIS message in the list to show its contents.

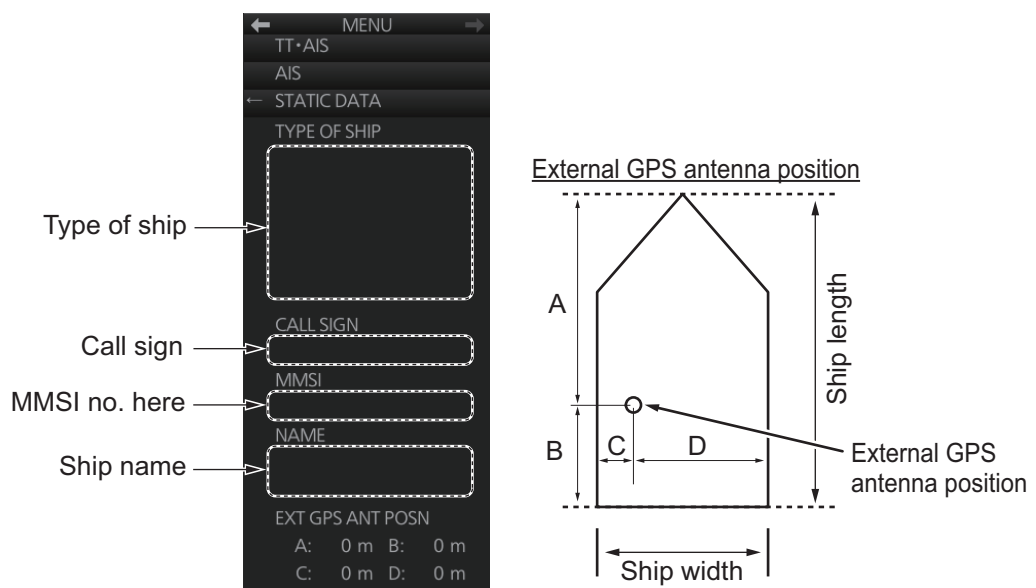


- Click the [CLOSE] window button to close the window.

4.17 How to View Own Ship Data

Own ship's static data (type of ship, call sign, MMSI, name and position of external GPS antenna) can be viewed as follows:

1. Right-click the AIS mode indication then click [AIS Menu] to show the AIS menu.
2. Select [STATIC DATA].

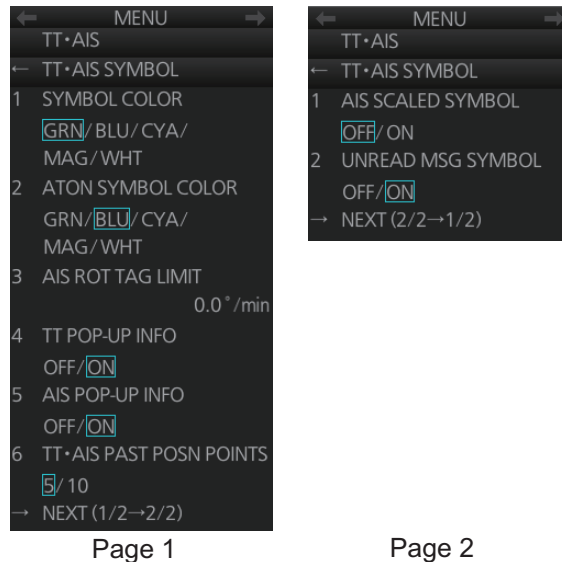


3. Close the menu.

4.18 Other AIS Features

The [TT•AIS SYMBOL] menu additionally provides the features described below.

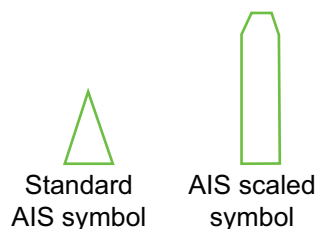
To show the [TT•AIS SYMBOL] menu, right-click the AIS mode indication on the bottom-right of the screen then select [Symbol Menu].



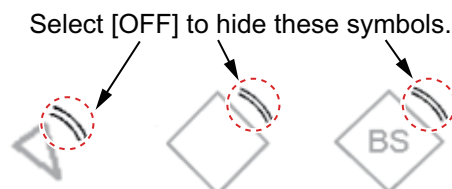
[2 ATON SYMBOL COLOR]: Select the AtoN symbol color.

[3 AIS ROT TAG LIMIT]: The ROT marker appears on the heading line of an AIS object and points in the direction of the turn when the ship's rate of turn is greater than that set here.

[1 AIS SCALED SYMBOL]: The AIS symbol can be shown as a simple triangle or a symbol scaled according to a vessel's dimensions. Select [ON] to show the scaled symbol.



[2 UNREAD MSG SYMBOL]: Select [OFF] to hide the unread message or message displaying symbols.



4.19 Risk Visualizer™ (FAR-30x5 Series Only)

The Risk Visualizer™ function identifies AIS targets (and TT) which may be on collision course with own ship. See section 3.18 for details.

5. RADAR MAP AND TRACK

5.1 What is a Radar Map?

A radar map consists of a layer of marks and lines overlaid on the radar display. A map is intended for indicating safety-related areas and objects. Ten radar maps can be made and each map can have a total of 4,000 lines and marks. The map data can be saved to facilitate repeated use on a routine navigation area. The user can create a radar map in real time while using the radar for navigation or at leisure time at anchor or while the radar is not being used. Waypoints, events and user charts from the chart can be shown or hidden on the radar map display.

The radar map does not affect any radar function.

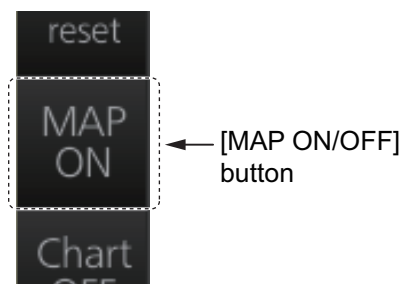
5.2 Presentation Modes

Six presentation modes are available: North-up, Course-up, Head-up, STAB Head-up, Stern-up and North-up TM. To select a mode, use the **MODE** key on the Control Unit or click the [Range/Presentation mode] box.

Note: Chart data is not displayed in the Head-up and STAB Head-up modes.

5.3 How to Show, Hide the Radar Map Display

Click the [MAP ON/OFF] button to display [MAP ON] or [MAP OFF] as appropriate.



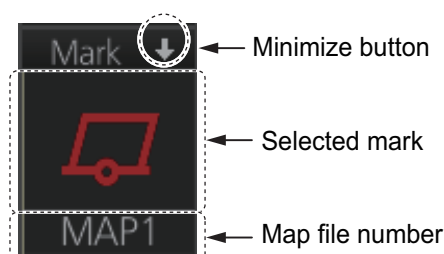
5.4 How to Enter Radar Map Marks and Lines

Marks and lines can be entered in the radar mode. (Marks cannot be entered in the chart radar mode.) These marks and lines can be displayed in red, green, blue, cyan, magenta, yellow or white. (Some marks, lines and colors may not be available depending on the specifications of your radar.)

The capacity for map storage is 10 maps/4,000 points per map. When 4,000 marks and lines have been entered into a map, the message "MARK FULL" replaces the mark icon in the [Mark] box and no more marks and lines can be entered into that map. In this case save the marks/lines to another map file or erase some marks from the full map file in order to save the mark.

The procedure below shows how to enter a mark, including mark selection, mark entry method, and save location. You can skip steps in the procedure where it is not necessary to complete the corresponding action.

1. Put the cursor on the mark shown in the [Mark] box at the bottom-left position on the display.

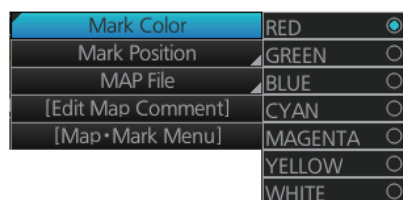


2. Spin the scrollwheel to select a mark. The name of the mark appears to the right of the mark.



3. Select mark color (B-type only), mark position, and where to save the mark as follows:

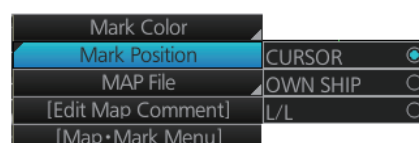
- 1) Right-click the [Mark] box to show the context-sensitive menu then click [Mark Color].



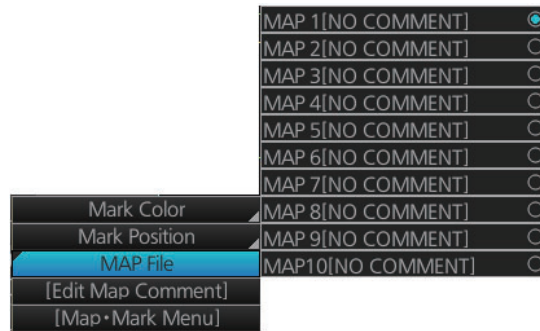
- 2) Click the mark color desired.

- 3) At the context-sensitive menu, click [Mark Position] to select the mark input method. The choices are [CURSOR], [OWN SHIP] and [L/L].

For L/L, the mark is entered at the L/L position entered at [MAP MARK L/L] on the [MAP•MARK] menu.



- 4) At the context-sensitive menu, click [MAP File] then click the map file number where to save the mark.



4. **For entry with the cursor**, use the trackball to put the cursor on the location desired. (You can see the range and bearing from own ship to the cursor location by monitoring the Cursor position box.) Push the left button or the **MARK** key on the Control Unit to inscribe the mark or line point.

Note: To continue entering the same mark or line under the same conditions, do the following at the next time of entry.

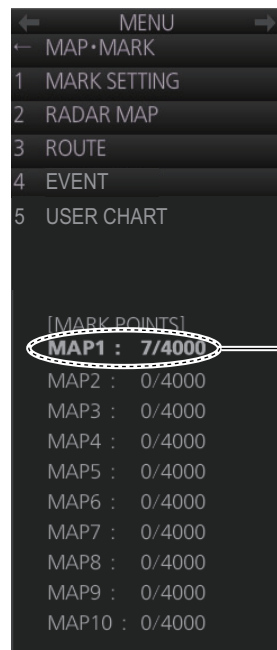
Entry by cursor: Click the location where to put a mark.

Entry by ship's position, or manual input of latitude and longitude: Click the mark icon.

5.5 How to Find Number of Map Points Used

You can show the number of points used in each radar map file.

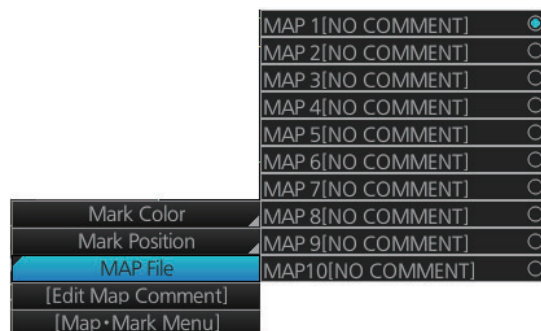
Right-click the [Mark] box then select [Map•Mark Menu]. See [MARK POINTS] at the bottom of the menu to see how many mark points have been used per map file. In the example below 7 points out of 4,000 points have been used in Map 1.



Map no., no. of points used/total no. of points

5.6 How to Select the Radar Map to Display

1. Right-click the [Mark] box to show the context-sensitive menu.
2. Click [MAP File] and then click the map no. you want to display.

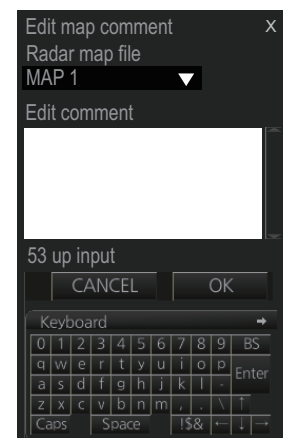


5.7 How to Attach a Comment to a Radar Map, Find Comment for a Map

5.7.1 How to attach a comment to a radar map

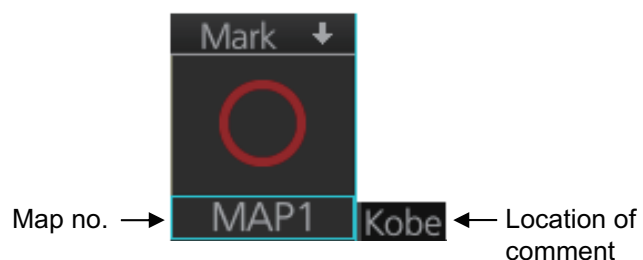
You can attach a comment to radar maps you have created, to help you distinguish your maps.

1. Right-click the [Mark] box to show the context-sensitive menu.
2. Click [Edit Map Comment]. A text input box appears together with the software keyboard, as shown in the right figure.
3. Select the map no. with the [Radar map file] drop-down list.
4. Enter your comment in the text input box. The number of characters available appears below the box.
5. Click the [OK] button to finish.



5.7.2 How to find the comment for a map

Put the cursor on the map no. indication. The comment is displayed to the right of the map no. In the example below the comment is "Kobe".

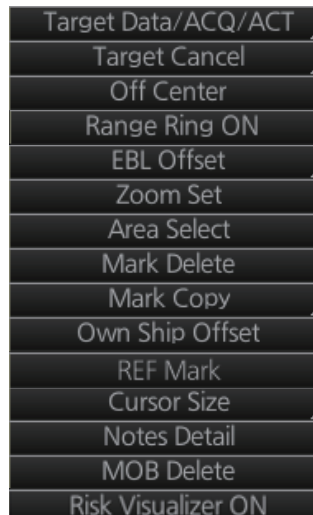


5.8 How to Erase Radar Map Marks and Lines

A total of 4,000 marks and lines is allotted per map. When this amount is exceeded in a map, no more map marks or lines may be entered into the map unless you erase some unnecessary marks or lines.

5.8.1 How to erase individual radar map marks and lines

1. Right-click the display area to show the context-sensitive menu.

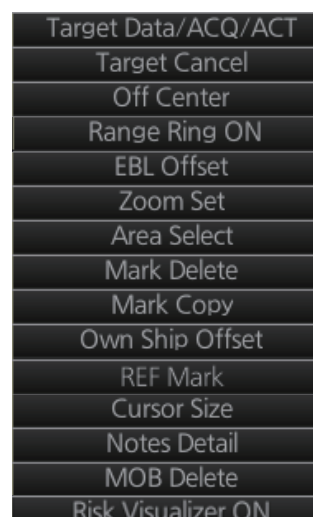


2. Click [Mark Delete].
3. Click the mark or line to erase.

5.8.2 How to erase map marks and lines in an area

You can erase all marks and lines within an area as follows:

1. Right-click the display area to show the context-sensitive menu.

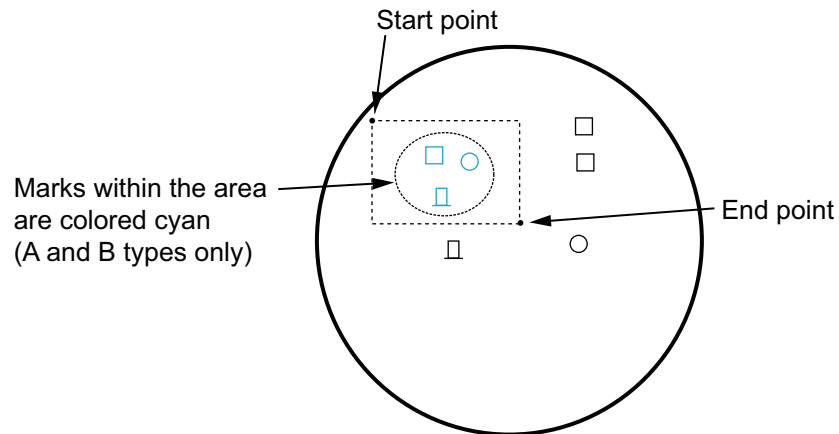


2. Click [Area Select].

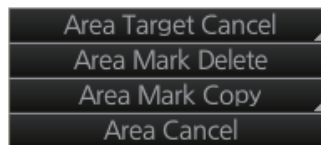
5. RADAR MAP AND TRACK

3. Specify the area as follows:

- 1) Put the cursor on the start point and push the left button.
- 2) Drag the cursor diagonally to the end point and push the left button.



4. Right-click the display area to show the context-sensitive menu.



5. Click [Area Mark Delete] to delete the marks and lines in the area selected.

5.8.3 How to erase all radar map marks and lines in a map file

You can erase all radar map marks and lines in the map file currently displayed. Be absolutely sure you want to erase the marks and lines - erased marks and lines cannot be restored.

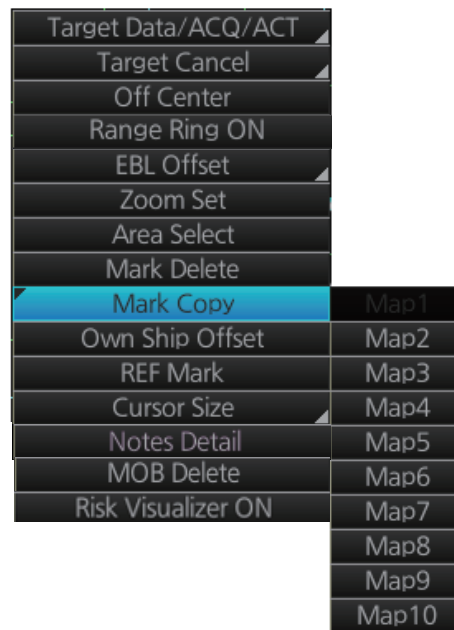
1. Right-click the [Mark] box, select [Map•Mark Menu] and [1 MARK SETTING].
2. Select [8 MAP MARK ALL DELETE]. The confirmation message "Attention: Do you wish to delete all map mark?" appears. Click the [OK] button to erase all marks and lines.
3. Close the menu.

5.9 How to Copy Radar Map Marks and Lines

5.9.1 How to copy individual radar map mark and line to another map file

You can copy individual mark and line from the currently displayed radar map to the radar map file of your choice.

1. Right-click the display area to show the context-sensitive menu.
2. Click [Mark Copy] then click the map file no. where to copy the mark.



3. Put the (light-blue) cursor on the mark or line then click.

5.9.2 How to copy radar map marks and lines within an area to another map file

You can copy radar map marks and lines within an area of the currently displayed radar map to the radar map file of your choice.

1. Right-click the display area to show the context-sensitive menu.
2. Click [Area Select].
3. Specify the area as follows.
 - 1) Put the cursor on the start point and push the left button.
 - 2) Drag the cursor diagonally to the end point and push the left button.
All marks and lines within the area selected are highlighted in blue (A and B types only).
4. Right-click to show the context-sensitive menu.

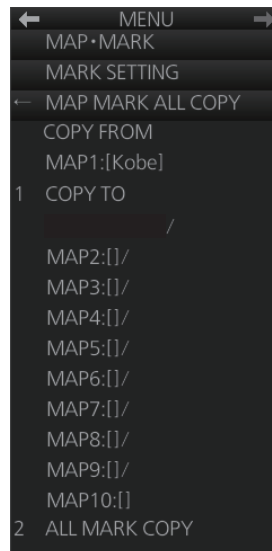


5. Click [Area Mark Copy] then click the map file number where to copy the marks and lines.

5.9.3 How to copy all radar map marks and lines in a map file to another map file

You can copy all radar map marks and lines in the currently displayed radar map to the radar map file of your choice.

1. Display the map file of which to copy all its marks and lines. See section 5.6.
2. Right-click the [Mark] box then click [Map•Mark Menu].
3. Select [1 MARK SETTING].
4. Select [9 MAP MARK ALL COPY].



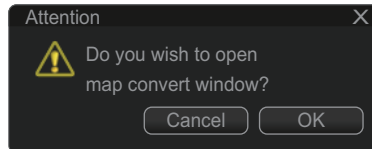
5. Select [1 COPY TO] then select where to copy the map marks and lines.
6. Select [2 ALL MARK COPY]. The confirmation message "Attention: Do you wish to copy all map mark?" appears. Click the [OK] button to copy.
7. Close the menu.

5.10 How to Export Radar Map

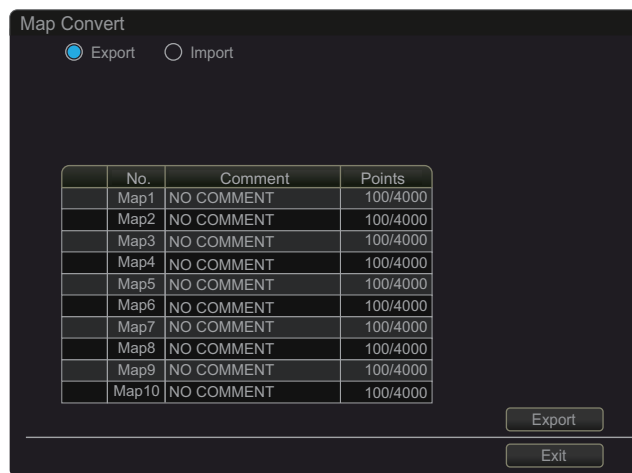
You can export a radar map to a USB flash memory. For safety, only export radar maps while the radar is in standby.

1. Set the USB flash memory in the USB port on the Control Unit.
2. Open the menu then select the [5 MAP•MARK] and [1 MARK SETTING] menus.
3. Go to page 2 of the menu, select [1 MAP MARK MANAGE]. The confirmation message appears.

Note: The [1 MAP MARK MANAGE] menu appears only when the radar is in standby.



4. Click the [OK] button to show the [Map Convert] dialog box.

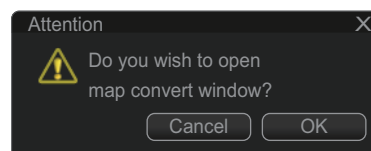


5. Check [Export] at the top-left position of the dialog box.
6. Check the radar map(s) (Map1 to Map10) to export.
7. Click the [Export] button to show the [Save file] dialog box.
8. Select the USB flash memory as the destination to save then click the [Save] button. After the data export is completed, the message "x file(s) have exported success." appears (x is the number of the radar map(s)).
9. Click the [OK] button.

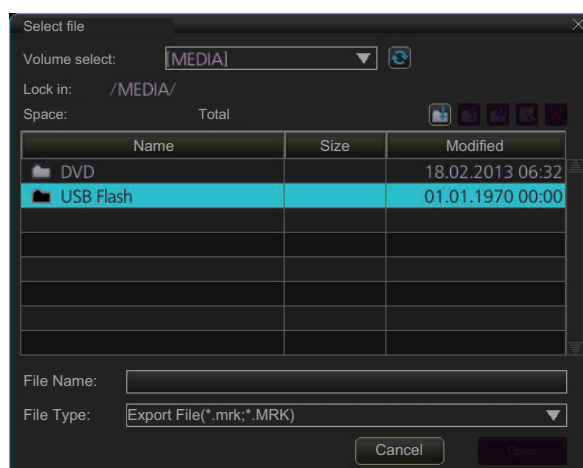
5.11 How to Import Radar Map

You can import a radar map created on another equipment (FAR-3xxx, FAR-2xx7). For safety, only import radar maps while the radar is in standby. Copy the radar maps to a USB flash memory.

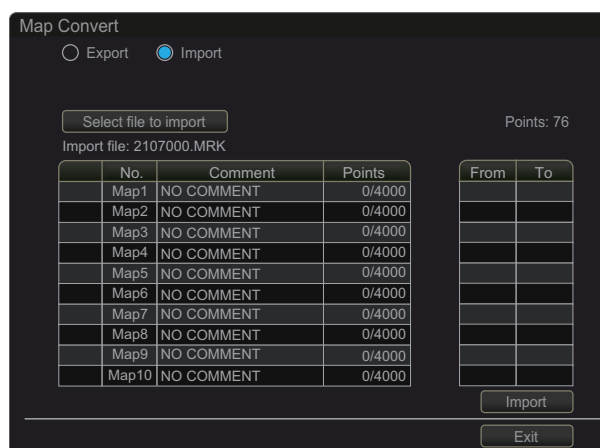
1. Set the USB flash memory that contains the radar map(s) to import in the USB port on the Control Unit.
2. Open the menu then select the [5 MAP•MARK] and [1 MARK SETTING] menus.
3. Go to page 2 of the menu, select [1 MAP MARK MANAGE]. The confirmation message appears.
Note: [1 MAP MARK MANAGE] is only available when the radar is in standby.



4. Click the [OK] button to show the [Map Convert] dialog box.
5. Check [Import] at the top-left position of the dialog box then click the [Select file to import] button to show the [Select file] dialog box.



6. Select the folder that contains the file to import then click the [Open] button to show the [Map Convert] dialog box.



7. Check the radar map(s) (Map1 to Map10) to which the data created on another unit are imported.
8. Click the [Import] button to import the data to the radar map(s) selected at step 7.

Note: When importing a radar map created on another FAR-2xx7, the radar maps marks and lines are converted. See the tables on pages 5-11 and 5-12.

The list of the radar map marks and lines

The radar map marks and lines created on another FAR-2xx7 are converted to ones on the FAR-3xxx series as below.

Marks

FAR-2xx7			FAR-3xxx					
Symbol	Color	Name	IMO or A type			B type		
			Symbol	Color	Name	Symbol	Color	Name
	Red	Buoy		Red	Buoy		Red	Buoy
	Green	Buoy		Green	Buoy		Green	Buoy
	Red	Buoy		Red	Buoy		Red	Buoy
	Green	Buoy		Green	Buoy		Green	Buoy
	Red	Buoy		Red	Buoy		Red	Buoy
	Green	Buoy		Green	Buoy		Green	Buoy
	Red	Buoy		Red	Buoy		Red	Buoy
	Green	Buoy		Green	Buoy		Green	Buoy
	*	Buoy		Red	Buoy		*	Buoy
	*	Buoy		Red	Buoy		*	Buoy
	*	Buoy		Red	Buoy		*	Buoy
	*	Buoy		Red	Buoy		*	Buoy
	*	Danger		Magenta	Danger		*	Danger
	*	Danger		Magenta	Danger		*	Danger
	Magenta	Danger		Magenta	Danger		Magenta	Danger
	*	Mark		Yellow-orange	Mark		*	Mark
	*	Mark		Yellow-orange	Mark		*	Mark
	*	Mark		Yellow-orange	Mark		*	Mark
	*	Mark		Yellow-orange	Mark		*	Mark
	*	Mark		Yellow-orange	Mark		*	Mark
	*	Mark		Yellow-orange	Mark		*	Mark
	*	Mark		Yellow-orange	Mark		*	Mark
Other	-	-		Yellow-orange	Mark		*	Mark

*: The display color is selectable. See "Contrast table for the display colors" on page 5-12.