

2. INLAND AIS OPERATION

12. Select [BLUE CONES], then press the **ENT/ACK** key. The pop up window shown below appears.

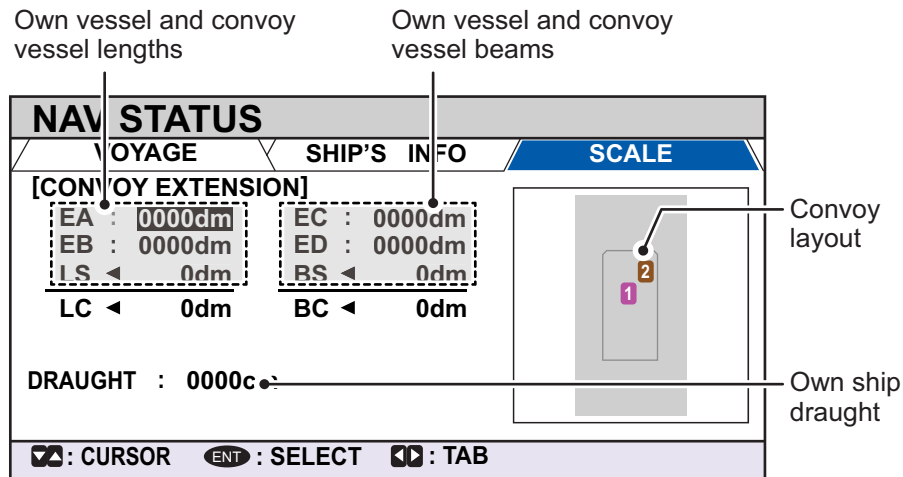
BLUE CONES	
NO . OF CONES	0
NO . OF CONES	1
NO . OF CONES	2
NO . OF CONES	3
B-FLAG	
UNKNOWN	

Depending on the cargo, up to four “cones” have to be shown on the mast, in daylight with cones and nighttime with blue lights. The greater the number of the cones the more hazardous the cargo.

- Select [NO. OF CONES 0] if your ship is not carrying hazardous cargo.
 - Select [B-FLAG] if your ship carries explosives or hazardous cargo that exceeds the hazard level expressed with cones.
 - Select [UNKNOWN] if you are unsure of cargo type.
13. Set [BLUE CONES] as necessary, then press the **ENT/ACK** key.
14. Select [UN/LOADED], then press the **ENT/ACK** key. The pop up window shown to the right appears.
15. Select [LOADED] for vessel loaded with cargo, [UNLOADED] for vessel with no cargo, or [- - -] if you are unsure of the loading status.
16. Select [CREW] is now selected, then press the **ENT/ACK** key.
17. Enter number of crew (0-254) then press the **ENT/ACK** key.
18. Select [PASSENGER], then press the **ENT/ACK** key.
19. Enter number of passengers (0-8190) then press the **ENT/ACK** key.
20. Select [PERSONNEL], then press the **ENT/ACK** key.
21. Enter number of shipboard personnel (persons other than passengers and crew, 0-254) then press the **ENT/ACK** key.
- Note:** Crew, passenger and shipboard personnel are sent in RFM55 messages.
22. [NO. OF PERSONS] is selected; press the **ENT/ACK** key.
23. Enter the total number of persons (sum of crew, passengers and shipboard personnel) on-board then press the **ENT/ACK** key.
- Note:** If the value entered for [CREW], [PASSENGER], [PERSONNEL] or [NO. OF PERSONS] exceeds the maximum setting listed in the steps above, the value appears as maximum for that item.

UN/LOADED
LOADED
UNLOADED
- - -

24. Press ► to display the [SCALE] tab.

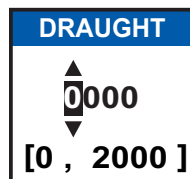


25. Referring to the table below, input the length and beam of your vessel and the convoy vessel.

Menu item	Description
[EA]	Length of convoy vessel A. Setting range [0] to [6800] dm.
[EB]	Length of convoy vessel B. Setting range [0] to [6800] dm.
[EC]	Beam of convoy vessel A. Setting range [0] to [400] dm.
[ED]	Beam of convoy vessel B. Setting range [0] to [400] dm.
[LS]	Own ship length. (Display only, not available for input.)
[BS]	Own ship beam. (Display only, not available for input.)
[LC]	Shows the total length of the convoy. (Display only, not available for input.)
[BC]	Shows the total beam of the convoy. (Display only, not available for input.)

Press the arrow keys to move the selection cursor and highlight the item you wish to edit, then press the **ENT/ACK** key. A numerical input pop up window appears for the selected item.

26. Select [DRAUGHT], then press the **ENT/ACK** key to display the [DRAUGHT] setting pop up window. The setting range is [0] cm to [2000] cm.

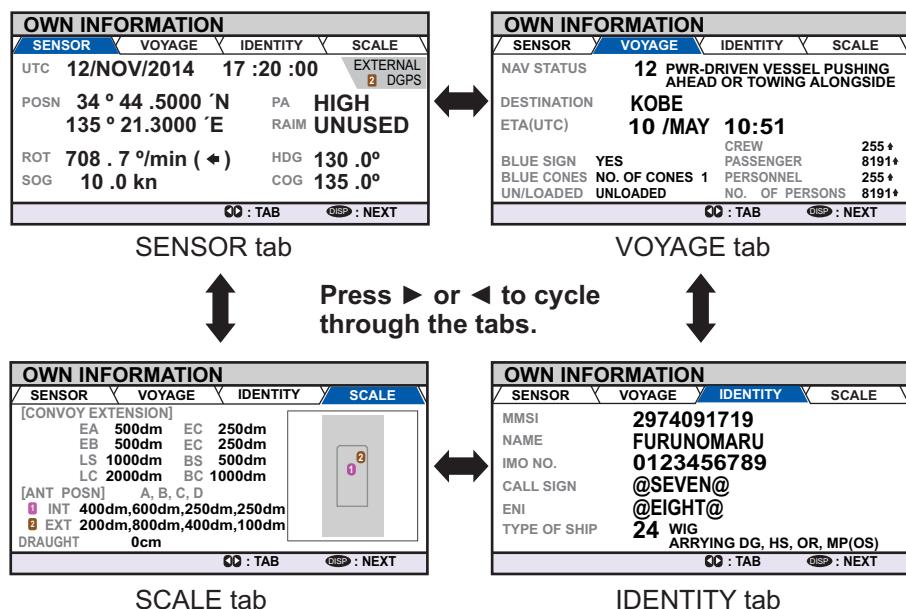


27. Input the draught, then press the **ENT/ACK** key.
 28. Press the **DISP** key to close the menu.

2.4 Static Data

The [OWN INFORMATION] display shows your ship's data across four tabs. The information displayed is shown in the figure below. This data should be checked once per voyage or once per month whichever is shorter. Data may be changed only on the authority of the master.

The Officer of the Watch should periodically check position, SOG and sensor information for quality.



Note: The [TYPE OF SHIP] indication on the [IDENTITY] tab changes to display the ERI code when INLAND mode is active.

Update rate of dynamic ship information

Ship's dynamic conditions and nominal reporting interval

Ship's dynamic conditions	Nominal reporting interval
Ship at anchor or moored or aground or not under command and not moving faster than 3 kn	3 minutes
Ship at anchor or moored or aground or not under command and moving faster than 3 kn	10 seconds
Ship operating in SOLAS mode, moving 0-14 kn	10 seconds
Ship operating in SOLAS mode, moving 0-14 kn speed and changing course	3 1/3 seconds
Ship operating in SOLAS mode, moving 14-23 kn	6 seconds
Ship operating in SOLAS mode, moving 14-23 kn and changing course	2 seconds
Ship operating in SOLAS mode, moving faster than 23 kn	2 seconds
Ship operating in SOLAS mode, moving faster than 23 kn and changing course	2 seconds
Ship operating in inland waterway mode	Assigned between 2 seconds and 10 minutes

2.5 Target List and Dangerous Target List

2.5.1 Target list

The [TARGET LIST] can store up to 2048 AIS targets and AIS-SARTs being detected by the FA-170, in the order which they are detected. The list can be sorted in range order, from closest to farthest.

1. Press the **DISP** key until the [TARGET LIST] or [DANGEROUS LIST] appears.

Time at which the list was last sorted.

Selected target is highlighted.

Target type symbols. See Appendix 5 of the operator's manual for a full list of AIS symbols and their meanings.

Currently displayed target group. Total detected targets is displayed in brackets.

NAME/MMSI/TYPE: Target's MMSI, name or type is displayed. Where name data is available, the vessel name is displayed.

RNG[km]: Range from OS to target.

BRG[°]: Bearing to target.

AGE[']: Time (in minutes) since the target data was last updated.

NAME/MMSI/TYPE	RNG[km]	BRG[°]	AGE[']
SAMPLE SHIP 002	3.3	080.0	0
SAMPLE SHIP 002	3.4	090.0	0
SAMPLE SHIP 003	3.5	100.0	0
SAMPLE SHIP 004	3.6	110.0	0
SAMPLE SHIP 005	3.7	120.0	0
SAMPLE SHIP 006	3.8	130.0	0
SAMPLE SHIP 007	3.9	140.0	0
SAMPLE SHIP 008	3.1	150.0	0

Note: The last views list ([DANGEROUS LIST] or [TARGET LIST]) is displayed.

Targets are displayed in groups of 100, however only eight targets are displayed on the screen at any time. The following operations are used in the TARGET LIST.

Operation	Description
Press ▲ or ▼.	Scroll up or down the list of targets. The selected target is highlighted.
Press ◀ or ▶.	Move to the next group of targets (next 8 targets).
Select [NEXT 100 TARGETS], then press the ENT/ACK key.	Move to the next page of the target list (next 100 targets). Note: Displayed only if more than 100 targets are detected.
Select [PREVIOUS 100 TARGETS], then press the ENT/ACK key.	Move to the previous page of the target list (last 100 targets). Note: Displayed only if more than 100 targets are detected.
Select a target, then press the ENT/ACK key.	Display the selected target's details. See section 2.5.3 for details.

The [NAME/MMSI/TYPE] column of the [TARGET LIST] displays the target vessel's type in the following formats:

For CLASS A/CLASS B/AtoN type targets

Where the vessel name is available, the name is displayed. Where no name data is available, the MMSI is displayed.

For SAR(VESSEL/AIRCRAFT)/SART/MOB/EPIRB type targets

TYPE	Display format
SAR vessel	"SAR/VESSEL"
SAR aircraft	"SAR/AIRCRAFT"
SART Active	"SART ACTIVE"
SART Test	"SART TEST"
MOB Active	"MOB ACTIVE"
MOB Test	"MOB TEST"
EPIRB Active	"EPIRB ACTIVE"
EPIRB Test	"EPIRB TEST"
AIS Base station	"BS: (station's MMSI/name)"

Note 1: If there is no data for the target selected, the fields are displayed as "=NO TARGET=".

Note 2: Targets are automatically sorted in range order (closest to furthest) when no key is operated for 30 seconds. Target order is then updated every five seconds.

Active AIS-SARTs take priority and are displayed at the top of the list.

Note 3: When [AUTO SORT] on the [USER SET] menu is [OFF], the range and bearing to a target are updated. However, target order is not updated. To manually sort targets, see step 2.

Note 4: To select a target on the plotter display, press ▲ or ▼ to select the target then press the **ENT/ACK** key. Press ▲ to cycle through targets from nearest to furthest; ▼ to cycle through targets from furthest to nearest.

- To view target data, or to sort the target list, select the desired target, then press the **ENT/ACK** key. The target list options pop up window appears.

FUNCTION		
☐ : SORT (NORMAL)	☐ : NEW MSG ENT : VIEW DETAIL ☑ : NAME REQUEST	☐ : SORT (DANGER)

- [SORT (NORMAL)]: Press ◀ to display and sort the [TARGET LIST] into range order. The closest target is displayed at the top of the list.
 - [SORT (DANGER)]: Press ▶ to display and sort the [DANGEROUS TARGET LIST] in range order. The closest target is displayed at the top of the list.
 - [VIEW DETAIL]: Press the **ENT/ACK** key to open the [TARGET DETAIL] screen.
 - [NEW MSG]: Press ▲ to open the text input window to create an AIS message to the selected target.
 - [NAME REQUEST]: Press ▼ to send a name request to the target vessel's AIS.
- Note:** Name requests cannot be sent to the same target within a short period, regardless of target. If you have requested the name of a target too soon after the last request, or the target is out of range, or the target has set their AIS to RX only mode, the pop up message "CANNOT REQUEST NAME" is displayed. Wait a short while before requesting the name again.

- Press the **DISP** key to close the menu.

2.5.2 Dangerous (target) list

Dangerous targets are targets which are calculated to be on a collision course with your vessel. When a dangerous target is detected, the target and its available details can be viewed in the [DANGEROUS TARGET LIST].

The operations available from the [DANGEROUS TARGET LIST] are the same as the [TARGET LIST] operations. See section 2.5.1 and section 2.5.3 for details.

Time at which the list was last sorted.

Selected target is highlighted.

NAME	MMSI	TYPE	RNG	BRG	AGE
SAMPLE SHIP 002	002		3.3	080.0	0
SAMPLE SHIP 003	003		3.4	090.0	0
SAMPLE SHIP 004	004		3.5	100.0	0
SAMPLE SHIP 005	005		3.6	110.0	0
SAMPLE SHIP 006	006		3.7	120.0	0
SAMPLE SHIP 007	007		3.8	130.0	0
SAMPLE SHIP 008	008		3.9	140.0	0

NAME/MMSI/TYPE: Target's MMSI, name or type is displayed. Where name data is available, the vessel name is displayed.

RNG[km]: Range from OS to target.

BRG[°]: Bearing to target.

AGE[']: Time (in minutes) since the target data was last updated.

Target type symbols. See Appendix 5 for a full list of AIS symbols and their meanings.

Note: When no dangerous targets are detected, the list shows the message "= NO TARGET =".

2.5.3 How to interpret the [TARGET DETAIL] screen

The [TARGET DETAIL] screen shows available detailed information about the selected target.

Lost and dangerous targets have the appropriate icon displayed at the top right, as indicated in the lost target example below.

TARGET DETAIL		TYPE CLASS A	LOST
RNG	3.02NM	MMSI	201503030
BRG	225.4°	NAME	FURUNOMARU
SENSOR VOYAGE IDENTITY SCALE QUALITY			
POSN	34° 44' .5000 'N 135° 21.3000 'E		
ROT	108.7°/min (↺)	HDG	130.0°
SOG	10.0 km/h	COG	135.0°
TARGET TAB BACK			

The **LOST** icon is displayed for lost targets.

The **DANGER** icon is displayed for dangerous targets.

When data input to the FA-170 is interrupted or stopped, indications for all tabs appear as "----".

There are five tabs available for viewing; [SENSOR], [VOYAGE], [IDENTITY], [SCALE] and [QUALITY]. Press ◀ or ▶ to change the tab currently displayed.

The selected target's bearing ([BRG]), range ([RNG]), [MMSI] and [NAME] are displayed at the top of the screen regardless of the selected tab. For lost or dangerous targets, the appropriate icon is displayed at the top right of the screen.

The information displayed on each tab varies, depending on the type of target selected.

The tables on the following pages list each tab's contents, along with a brief description.

2. INLAND AIS OPERATION

SENSOR tab

Contents	Description
POSN	Target's last known position. Displayed for all target types.
ROT	Target's Rate Of Turn. Displayed only for CLASS A, SART, MOB and EPIRB target types.
ALT	Altitude. Displayed only for SAR VESSEL and SAR AIRCRAFT target types.
SOG	Target's Speed Over Ground. Displayed only for CLASS A, CLASS B, SAR VESSEL, SAR AIRCRAFT, SART, MOB and EPIB target types.
COG	Target's Course Over Ground. Displayed only for CLASS A, CLASS B, SAR VESSEL, SAR AIRCRAFT, SART, MOB and EPIB target types.
HDG	Target's last known heading. Displayed only for CLASS A, CLASS B, SART, MOB and EPIRB target types.

VOYAGE tab

The VOYAGE tab is only displayed for CLASS A target types and has two pages.

Contents	Description
NAV STATUS	Target's navigational status (see section 1.6 for details).
DESTINATION	Target's destination.
ETA	Target's Estimated Time of Arrival at the above destination.
BLUE SIGN	Indicates if the target is carrying hazardous cargo.
BLUE CONES	Indicates the number of blue cones (type of hazardous cargo) carried by the target.
UN/LOADED	Indicates if the target is loaded or unloaded.
CREW	Indicates the number of crew aboard the target.
PASSENGERS	Indicates the number of passengers aboard the target.
PERSONNEL	Indicates the number of personnel aboard the target.
NO. OF PERSONS	Indicates the total number of people aboard the target.

IDENTITY tab

The IDENTITY tab is only displayed for CLASS A, CLASS B, SAR VESSEL, SAR AIRCRAFT and AtoN target types.

Contents	Description
CALL SIGN	Target's call sign. Not displayed for AtoN target types.
IMO NO.	Target's International Maritime Organization registration number.
TYPE OF SHIP	Target's ship type. Displayed only for CLASS A and CLASS B target types.
REAL AtoN	Displayed as "YES" for physical aids to navigation, "NO" for virtual aids to navigation. Displayed only for AtoN target types.
TYPE OF AtoN	The type of aid to navigation. Displayed only for AtoN target types.
VENDER ID	Target's AIS maker's ID. Displayed only for CLASS B target types.
ENI	Target's ENI (Unique European Vessel Identification Number).
ERI CODE	Target's ERI (Electronic Reporting International ship type) code.

SCALE tab

The SCALE tab is only displayed for SAR VESSEL, SAR AIRCRAFT and AtoN target types.

Contents	Description
SHIP SIZE(LENGTH, BEAM)	Target's ship size (length, beam). Displayed for all above target types.
ANT POSN(X,Y)	Position of target's antenna. Displayed for all above target types.
DRAUGHT	Target ship's draught. Displayed only for CLASS A target types.
PI	Target's position. Displayed only for AtoN target types.
CONVOY	Target's convoy length and beam.

QUALITY tab

The QUALITY tab is displayed for all target types.

Contents	Description	
PA	Position Accuracy for target ship. (H: High accuracy, L: Low accuracy.)	
RAIM	Target's RAIM status. (USED: Using RAIM, UNUSED: Not using RAIM.).	
TIME STAMP	Time at which the target was last detected. Not displayed for AIS base stations.	
POSN QUALITY	Target's position quality. Possible position qualities are shown in the list below:	
	Quality indication	Meaning
	No position	Position data not available.
	Manual position	Position data is input manually.
	Dead reckoning position	Position calculated by dead reckoning.
	Outdated position > 200 m	More than 200 m from last estimated position.
	Position > 10 m	Difference of more than 10 m from last estimated position.
	Position with RAIM > 10 m	Difference of more than 10 m from last estimated position.
	Position < 10 m	Difference of less than 10 m from last estimated position.
	Position with RAIM < 10 m	Difference of less than 10 m from last estimated position.
	Valid position with no time stamp	No time stamp available.
HDG/SOG/ COG QUALITY	Target's sensor quality. Possible sensor qualities are shown in the list below:	
	Quality indication	Meaning
	HIGH	Target is equipped with sensors which meet the requirements of the VTT Standard for Inland Navigation.
	LOW	Target is not equipped with sensors which meet the requirements of the VTT Standard for Inland Navigation.

2.6 Inland AIS Specific Messaging

All sent and received messages are stored in their respective message box. Refer to the appropriate section below for how to view messages once they are sent or received.

2.6.1 How to send a text message

1. Press the **MENU/ESC** key to open the menu.
2. Select [MSG], then press the **ENT/ACK** key.

MSG	
1	TEXT
2	ETA/RTA
3	NO. OF PERSONS
4	EMMA WARNING BOX
5	WATER LEVEL BOX

3. [TEXT] is selected, press the **ENT/ACK** key.

TEXT	
1	NEW MSG
2	MSG BOX

4. Select [NEW MSG], then press the **ENT/ACK** key.

NEW MSG (TEXT)		<SEND MSG>
MSG TYPE	: ADDRESSED	
TO	: 000000000	
CH	: ALTERNATE	
RETRY	: 3	

TEXT	: Use the software keyboard to enter the message here.	
(0 / 85)		
: CURSOR : SELECT : BACK		

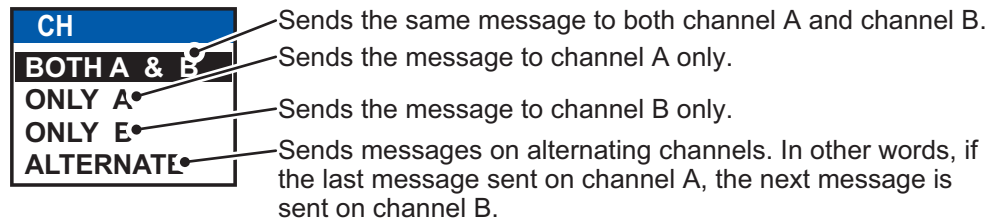
5. [MSG TYPE] is selected, press the **ENT/ACK** key to change the type of message you wish to send. The options pop up shown below appears.
6. Select the appropriate message type, then press the **ENT/ACK** key.

MSG TYPE	
BROADCAST	Message to all vessels.
ADDRESSED	Message to specified vessel only.

For broadcast messages, skip to step 9.

7. Select [TO], then press the **ENT/ACK** key. A numerical settings pop up appears.
8. Input the MMSI of the ship you wish to send this message to, then press the **ENT/ACK** key to close the pop up. See section 1.5 for how to input data.

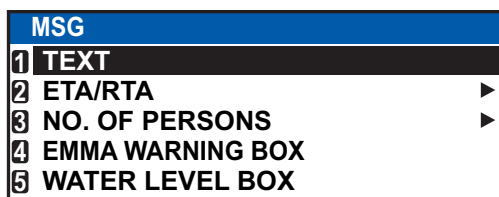
9. Select [CH] (Channel), then press the **ENT/ACK** key. The channel select options pop up appears.



10. Select the appropriate option, then press the **ENT/ACK** key.
For broadcast messages, skip to step 13.
11. Select [RETRY], then press the **ENT/ACK** key. The retry attempts setting pop up appears.
12. Press ▲ to increase the retry attempts, ▼ to decrease the retry attempts. The maximum setting for retries is 3. Press the **ENT/ACK** key to apply the setting and close the pop up.
13. Press ▼ to highlight the message text, then press the **ENT/ACK** to display the software keyboard.
14. Input the new message text, referring to section 1.5.4. The maximum number of characters allowed is as follows:
- BROADCAST: 90 characters.
 - ADDRESSED: 85 characters.
15. Press ▲ or ▼ to highlight [<SEND MSG>] at the top right of the screen, then press the **ENT/ACK** key. A confirmation pop up appears.
16. Select [YES] to send the message or [NO] to cancel the message, then press the **ENT/ACK** key.

2.6.2 How to view a sent text message

1. Press the **MENU/ESC** key to open the menu.
2. Select [MSG], then press the **ENT/ACK** key.

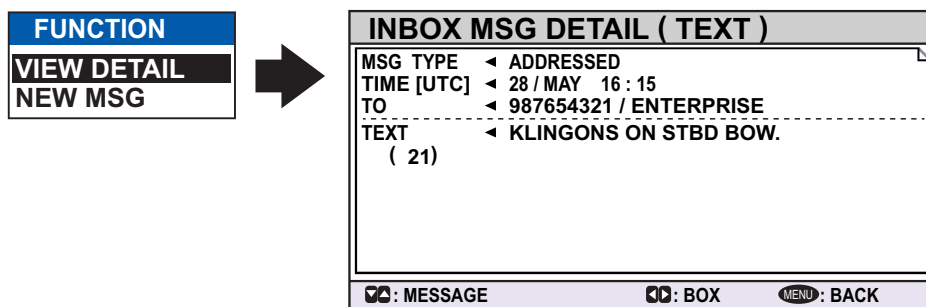


3. Select [TEXT], then press the **ENT/ACK** key.
4. Select [MSG BOX], then press the **ENT/ACK** key. The message box appears.

MSG BOX (TEXT)	
OUTBOX: 10	INBOX: 12
TIME [UTC]	TO 01 / 10
OK ← 30 / MAY 18 : 25 BROADCAST	
NG ← 29 / MAY 16 : 05 BROADCAST	
NG → 28 / MAY 16 : 15 TITANIC	
OK → 27 / MAY 17 : 20 NAUTILUS	
OK → 26 / MAY 17 : 20 BROADCAST	
NG ← 25 / MAY 17 : 20 BROADCAST	
NG → 24 / MAY 17 : 20 MUSASHIMARU	
CURSOR : ENT : FUNC TAB : MENU : BACK	

Indication	Meaning
OK	This message was sent successfully.
NG	This message was not sent.
NO ACK	Waiting for recipient to acknowledged this message.
↔	Broadcast message
→	Addressed message

5. Select the message you wish to view, then press the **ENT/ACK** key. The message options pop up window shown below appears.



Select [VIEW DETAIL], then press the **ENT/ACK** key to display the received message's contents. The figure above shows an example of a received message. Select [NEW MSG], then press the **ENT/ACK** key to send a message back to this message's sender.

6. Press ▲ or ▼ to view other messages, press ◀ or ▶ to switch between viewing an [INBOX] message and an [OUTBOX] message.
7. Press the **DISP** key to close the menu.

2.6.3 ETA and RTA messages

The purpose of an ETA message is to apply for a time slot at a lock, bridge or terminal. (Hereafter "lock" refers to lock, bridge or terminal.) The message contains your ship's ETA at the lock, air draught, the number of assisting tugboats required and the particulars of the lock (country code, location code, etc.).

Upon receipt of your ETA message, the lock authority responds with an RTA (Requested Time of Arrival) message, usually within 15 minutes of receipt of the ETA message. The RTA message contains lock operational status, requested time of arrival and the particulars of the lock (country code, location code, etc.).

How to send an ETA message

1. Press the **MENU/ESC** key to open the menu.
2. Select [MSG], then press the **ENT/ACK** key.
3. Select [ETA/RTA], then press the **ENT/ACK** key.

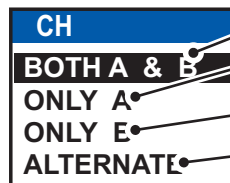


The [NEW MSG] option in the [ETA/RTA] pop up window is not available for selection in [SOLAS] mode.

4. Select [NEW MSG], then press the **ENT/ACK** key.

NEW MSG (ETA)		<SEND MSG>
TO :	00000000	
CH :	ALTERNATE	
RETRY :	3	
DESTINATION :	DE TRI 01234 1111 56789	
COUNTRY CODE ◀	DE	LOCATION CODE ◀ TRI
FAIRWAY NO. ◀	01234	TERMINAL CODE ◀ 1111
FAIRWAY HECT ◀	56789	
ETA[UTC] :	12/MAY 12:32	
AIR DRAUGHT :	0 .0cm	
NO. OF TUGBOATS :	0	
⏏: CURSOR ⏏: SELECT ⏏: BACK		

5. [TO] is selected. Press the **ENT/ACK** key. to display the MMSI settings pop up window.
6. Enter the MMSI of the lock/bridge/terminal you want to pass through then press the **ENT/ACK** key.
7. Select [CH], then press the **ENT/ACK** key.



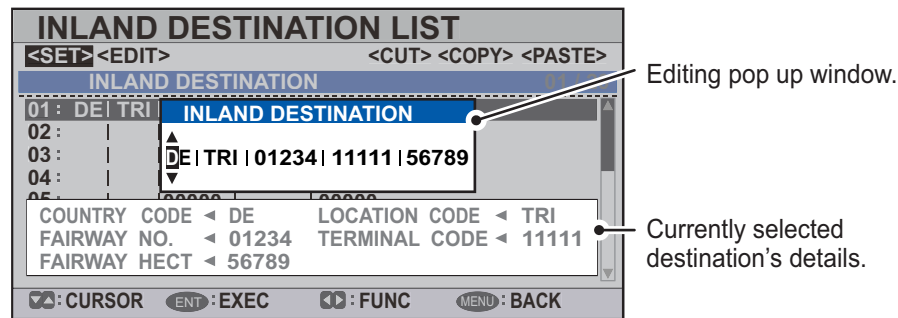
- Sends the same message to both channel A and channel B.
- Sends the message to channel A only.
- Sends the message to channel B only.
- Sends messages on alternating channels. In other words, if the last message sent on channel A, the next message is sent on channel B.

8. Select the channel over which to send the message then press the **ENT/ACK** key.
9. Select [RETRY], then press the **ENT/ACK** key. The retry attempts setting pop up appears.
10. Press ▲ to increase the retry attempts, ▼ to decrease the retry attempts. The maximum setting for retries is 3. Press the **ENT/ACK** key to apply the setting and close the pop up.
11. Select [DESTINATION] then press the **ENT/ACK** key. The [INLAND DESTINATION LIST] appears.

INLAND DESTINATION LIST				
<SET> <EDIT>		<CUT> <COPY> <PASTE>		
INLAND DESTINATION 01 / 20				
01:	DE TRI 01234 1111 56789			
02:	00000	00000		
03:	00000	00000		
04:	00000	00000		
05:	00000	00000		
06:	00000	00000		
07:	00000	00000		
08:	00000	00000		
⏏: CURSOR ⏏: EXEC ⏏: FUNC ⏏: BACK				

2. INLAND AIS OPERATION

12. Referring to section 2.3, select or edit an existing destination or create a new destination. The figure below shows an example destination and the edit pop up windows.



When setting an destination for the [INLAND DESTINATION LIST] the following details are required.

- Country code: The UN country code of your destination. (Referring to ISO 3166.)
- Three letter location code.
- Fairway number and hectometer.
- Terminal code.

Note: For location codes, fairway numbers (and hectometers) and terminal codes, refer to the ERI (Electronic Reporting International) Guide Part IV Annex 2 for examples.

13. Input or edit the destination as appropriate, then press the **ENT/ACK** key. Press ▲ to increase the value (or the next character, in alphabetical order), press ▼ decrease the value (or the previous character, in alphabetical order). Press ► to move the selection cursor to the right, ◀ to move the cursor to the left.
14. Select [<SET>], then press the **ENT/ACK** key.
15. Select [ETA (UTC)], then press the **ENT/ACK** key. The settings pop up window shown below appears.



16. Select [AIR DRAUGHT], then press the **ENT/ACK** key.
17. Enter your ship's air draught then press the **ENT/ACK** key. (Air draught is the vertical distance measured from the ship's waterline to the highest point on the ship.)
18. Select [NO. OF TUGBOATS], then press the **ENT/ACK** key.
19. Enter the no. of assisting tugboats (0-6) your ship requires then press the **ENT/ACK** key. Enter [0] for none.
20. Press ▲ or ▼ to highlight [<SEND MSG>] at the top right of the screen, then press the **ENT/ACK** key. The system will now attempt to send the message.

How to view sent ETA messages and received RTA messages

A lock authority responds to an ETA message with an RTA message. An RTA message contains the date and time the lock authority requests that your ship arrive to the lock, lock status and the particulars of the lock (country code, location code, etc.)

When an RTA message is received, a pop up showing the message "RTA MESSAGE RECEIVED." appears. The pop up also shows the sender's MMSI ID, or the sender's name if it is included in the message.

To view past messages, do the following:

1. Press the **MENU/ESC** key to open the menu.
2. Select [MSG], then press the **ENT/ACK** key.
3. Select [ETA/RTA], then press the **ENT/ACK** key.
4. Select [MSG BOX], then press the **ENT/ACK** key. The message box appears.

MSG BOX (ETA/RTA)			
OUTBOX(ETA): 10		INBOX(RTA): 12	
TIME [UTC]		FROM	
01 / 10			
	30 / MAY 17 : 20	BROADCAST	
	29 / MAY 16 : 05	BROADCAST	
	28 / MAY 16 : 15	ENTERPRISE	
	27 / MAY 17 : 20	BROADCAST	
	26 / MAY 17 : 20	NEPTUNE	
	25 / MAY 17 : 20	BROADCAST	
	24 / MAY 17 : 20	NAUTILUS	
CURSOR ENT : FUNC TAB MENU : BACK			

Indication	Meaning
	This message has been viewed.
	This message is unviewed.
	Broadcast message
	Addressed message

Press ◀ or ▶ to switch between the [OUTBOX(ETA)] and [INBOX(RTA)] tabs.

5. Select the message you wish to view, then press the **ENT/ACK** key. The message options pop up window shown below appears.

FUNCTION	
VIEW DETAIL	
NEW MSG	

➡

INBOX MSG DETAIL (RTA)	
MSG TYPE	◀ RTA
TIME [UTC]	◀ 30 / AUG 18 : 30
FROM	◀ MMSI / Sender's name appears here
DESTINATION	◀ DE TRI 01234 1111 56789
COUNTRY CODE	◀ DE
LOCATION CODE	◀ TRI
FAIRWAY NO.	◀ 01234
TERMINAL CODE	◀ 1111
FAIRWAY HECT	◀ 56789
ETA[UTC]	◀ 12/MAY 12:32
STATUS	◀ LIMITED OPERATION
MESSAGE : BOX : MENU : BACK	

Select [VIEW DETAIL], then press the **ENT/ACK** key to display the received message's contents. The figure above shows an example of a received message.

Select [NEW MSG], then press the **ENT/ACK** key to send a message back to this message's sender.

6. Press ▲ or ▼ to view other messages, press ◀ or ▶ to switch between viewing an [INBOX] message and an [OUTBOX] message.
7. Press the **DISP** key to close the menu.

2.6.4 No. of persons message

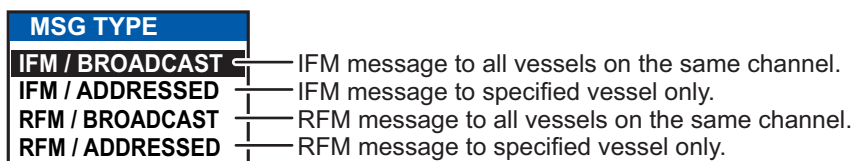
A number of persons message informs authorities or ships how many persons (passengers, crew, shipboard personnel) you have on board your ship. Send this message on request or in case of an event.

1. Press the **MENU/ESC** key to open the menu.
2. Select [MSG] then press the **ENT/ACK** key.
3. Select [NO. OF PERSONS] then press the **ENT/ACK** key.

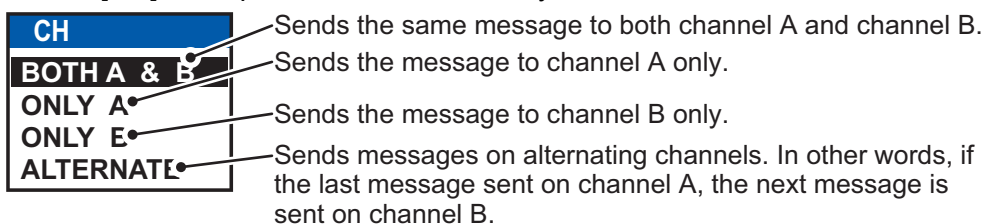


4. Select [NEW MSG], then press the **ENT/ACK** key.

5. [MSG TYPE] is selected; press the **ENT/ACK** key.



6. Select the appropriate message type, then press the **ENT/ACK** key.
IFM messages require the total number of people on board.
RFM messages require a breakdown of the total people on board (No. of crew, passengers and personnel).
7. Select [CH], then press the **ENT/ACK** key.



8. Select the channel to use to send the message then press the **ENT/ACK** key.
9. Select [RETRY], then press the **ENT/ACK** key. The retry attempts setting pop up appears.
10. Press ▲ to increase the retry attempts, ▼ to decrease the retry attempts. The maximum setting for retries is 3. Press the **ENT/ACK** key to apply the setting and close the pop up.
11. Select and enter the total number for [NO. OF PERSONS] (IFM message) or [CREW], [PASSENGER] and [PERSONNEL] (RFM message), then press the **ENT/ACK** key.
12. Press ▲ or ▼ to highlight [<SEND MSG>] at the top right of the screen, then press the **ENT/ACK** key. The system will now attempt to send the message.

2.6.5 EMMA warning message

EMMA (European Multiservice Meteorological Awareness) warnings are sent by base stations to skippers to inform them of special meteorological situations. EMMA does not provide continuous weather information, but only warnings of wind, rain, snow and ice, thunderstorm, fog, extreme temperatures (low and high), flood, fire in the forest. These messages are additional to the Notices to Skippers warnings.

The information includes the following:

- Start time of validity
- End time of validity
- Fairway section start and end co-ordinates
- Type of weather warning
- Minimum value
- Maximum value
- Classification of warning
- Wind direction

When you receive an EMMA warning, the "EMMA WARNING RECEIVED" pop up window appears and shows the MMSI or name of the sending agency. To see the contents of the message, do the following:

1. Press the **MENU/ESC** key to open the menu.
2. Select [MSG] then press the **ENT/ACK** key.
3. Select [EMMA WARNING BOX] then press the **ENT/ACK** key.
4. Select a message then press the **ENT/ACK** key.

The EMMA warning message looks something like example below. To view the other messages, press ▲ or ▼.

EMMA WARNING MSG DETAIL	
TIME [UTC] ◀ 30 /SEP 17: 20	} Time and date the message was received.
FROM ◀ 123456789 / NAUTILUS	
TERM [UTC] ◀ 26 /JAN 15: 00 ~ 26 / JAN 18 :00	} Time frame (from date/time to date/time) and area (coordinates) of the warning.
AREA ◀ 34 °25 .0000 'N 34 °35 .0000 'N ◀ 134 °25 .0000 'E ~ 134 °35 .0000 'E	
TYPE ◀ WIND	} Type of weather warning, class of warning and other details of the warning.
VALUE (MIN~MAX) ◀ 36 ~ 50 [km/h]	
CLASS ◀ MEDIUM	
WIND DIRECTION ◀ NORTH EAST	
☑ : MESSAGE	MENU : BACK

Item	Description
TYPE	[FIRE IN THE FORESTS], [FOG], [FLOOD], [HIGH TEMPERATURE], [LOW TEMPERATURE], [RAIN], [SNOW AND ICE], [THUNDERSTORM], [WIND] Units of measurement are as follows: • km/h (wind) • °C (temperature) • cm/h (snow) • l/m²h (rain) • m (visibility distance in fog)
MIN, MAX VALUE	The minimum and maximum value of respective item over one hour. For example, if the minimum and maximum values for snow and ice are 1 and 4 respectively, this means that 1-4 cm of snow or ice has fallen in one hour. The indication range is -254 to +254, or "- - - -" in case where a value is not reported, for example, fire in the forests and flood.
CLASS	Weather classification: [SLIGHT], [MEDIUM], [STRONG/HEAVY] or "- - - -" (unknown)
WIND DIRECTION	[NORTH], [NORTH EAST], [EAST], [SOUTH EAST], [SOUTH], [SOUTH WEST], [WEST], [NORTH WEST] or "- - - -" (Where no wind data is available.)

5. Press the **MENU/ESC** key to close the message.

2.6.6 Water level message

The water level message is sent by base stations to inform skippers about actual water levels in their area. It is additional short-term information to the water levels distributed via Notices to Skippers. The message contains the country code (location), gauge ID and water level.

When you receive a water level message, a pop up displays "WATER LEVEL MESSAGE RECEIVED."

To see the contents of the message, do the following:

1. Press the **MENU** key to open the menu.
2. Select [MSG] then press the **ENT/ACK** key.
3. Select [WATER LEVEL BOX] then press the **ENT/ACK** key.
4. Select a message then press the **ENT/ACK** key.

WATER LEVEL MSG DETAIL			
TIME [UTC] ◀ 30 /SEP 17: 20	Time/date received, sender's details and country code.		
FROM ◀ 123456789 / NAUTILUS			
COUNTRY CODE ◀ JP			
	GAUGE ID	WATER LEVEL	
National unique gauge ID {	0007	4 . 24m	} Positive or negative value
	0015	5 . 33m	
	0255	1 . 23m	
	2047	- 1 . 22m	
MESSAGE		MENU : BACK	

5. Press the **MENU/ESC** key to close the message.

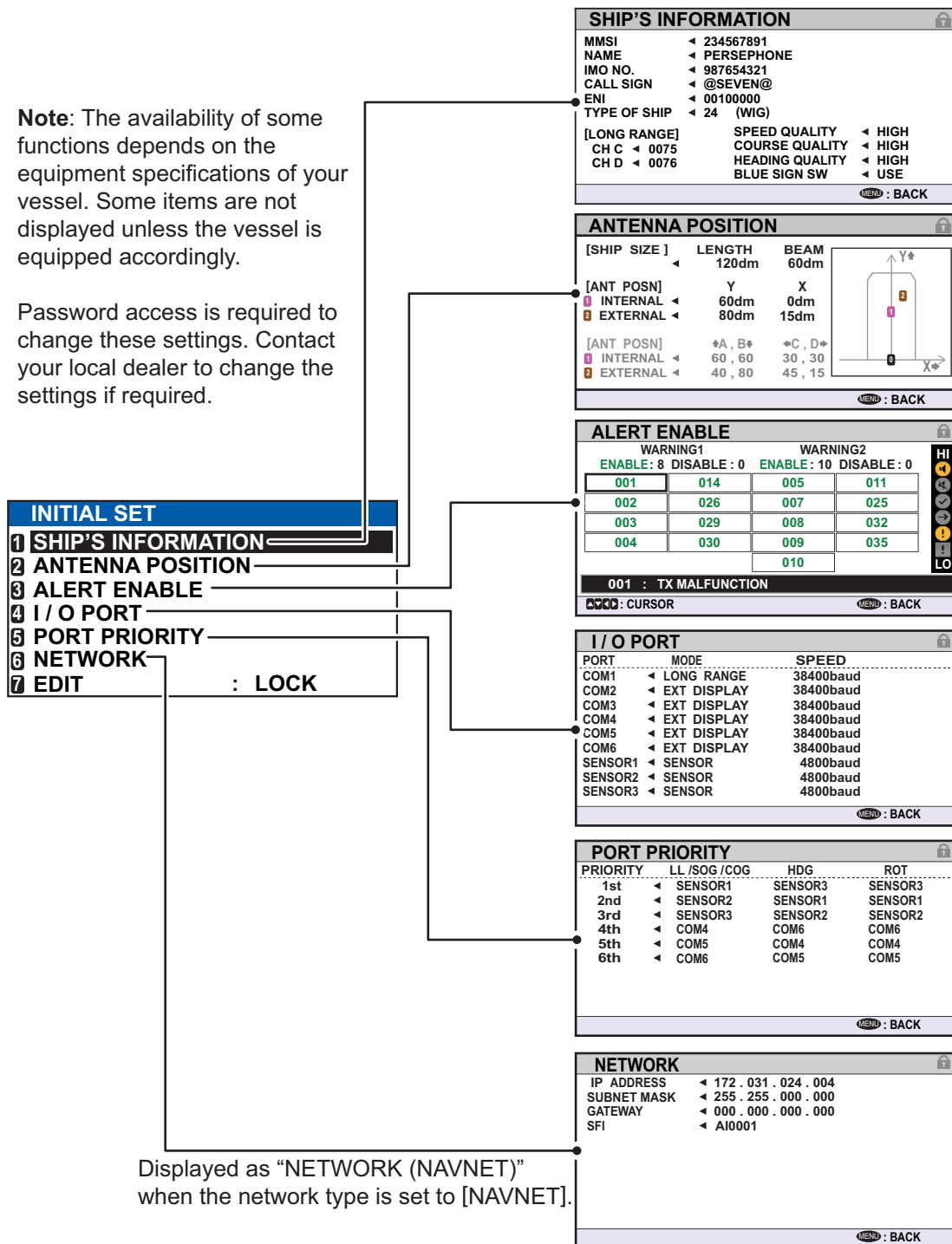
2.7 Viewing Initial Settings

The [INITIAL SET] menu, which is locked with a password to prevent accidental changes to the ship's details, is where the installer enters ship's MMSI, internal and external antenna positions, ship type, I/O port settings and network settings. You can view the settings on this menu as follows.

1. Press the **MENU/ESC** to open the menu.
2. Press the **ENT/ACK** key twice.
3. Select item to view then press the **ENT/ACK** key.

Note: The availability of some functions depends on the equipment specifications of your vessel. Some items are not displayed unless the vessel is equipped accordingly.

Password access is required to change these settings. Contact your local dealer to change the settings if required.



4. Press the **DISP** key to close the menu.

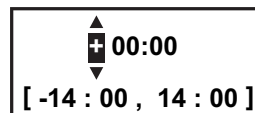
2.8 Setting for Time Difference

You can set the time differences from UTC (Coordinated Universal Time) to show the local time.

1. Press the **MENU/ESC** key to open the menu.
2. Select [USER SET] then press the **ENT/ACK** key.

USER SET		
1	KEY BEEP	: ON
2	TIME DIFF	: +00 : 00
3	AUTO SORT	: ON
4	SART TEST	: HIDE
5	LR RESPONSE	: AUTO
6	LR BROADCAST	: ON
7	NOTIFICATION SET	
8	ACTIVATE	

3. Select [TIME DIFF], then press the **ENT/ACK** key. The settings pop up window is displayed.



4. Select the desired time difference then press the **ENT/ACK** key. You can change the value with ▲ or ▼, the digit with ► or ◀ The setting range is -14:00 to +14:00.
5. Press the **DISP** key to close the menu.

Note: When a UTC time offset is set, the time display indication for messages and NAV STATUS screen is indicated as "LT" (Local Time). When there is no offset, the time display indication for messages and the NAV STATUS screen is indicated as "UTC" (Coordinated Universal Time).

3. MAINTENANCE, TROUBLE-SHOOTING

**WARNING**



ELECTRICAL SHOCK HAZARD
Do not open the equipment.

Only qualified personnel should work inside the equipment.

NOTICE

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

3.1 Maintenance

Regular maintenance is necessary to maintain performance. A monthly maintenance program should be established and should at least include the items listed in the table below.

Item	Check point
Connectors	Check that all connectors on the rear panel of the transponder unit and monitor unit are firmly connected.
Cabling	Check cabling for damage. Replace if damaged.
Ground terminal	Check the ground terminal on the monitor unit and transponder unit for rust. Clean if necessary.
Ground wire	Check that the ground wire on the monitor unit and transponder unit is firmly fastened.
Monitor unit, Transponder unit.	Dirt and dust should be removed from units with a soft, dry cloth. For the LCD, wipe it carefully to prevent scratching, using tissue paper and an LCD cleaner. To remove dirt or salt deposits, use an LCD cleaner, wiping slowly with tissue paper so as to dissolve the dirt or salt. Change paper frequently so the salt or dirt will not scratch the LCD. Do not use solvents such as thinner, acetone or benzene for cleaning any unit; they can remove paint and marks and deform the equipment.

3.2 Replacement of Fuse

The transponder unit contains a 8A fuse which protects the equipment from overvoltage, reverse polarity and equipment fault. If the power cannot be turned on, the fuse may be blown. Contact your local dealer for advice.

Unit	Fuse type	Specification	Code No.
Transponder unit FA-1701	FGMB 125V 8 A PBF	12 to 24VDC	000-191-004



WARNING

Use the proper fuse.

Use of a wrong fuse can cause fire or result in damage to the equipment.

3.3 Troubleshooting

The troubleshooting table below provides common symptoms of trouble and the means to rectify them. If you cannot restore normal operation, do not attempt to check inside the equipment. Refer any repair work to a qualified technician.

Symptom	Remedy
Power	
Cannot turn on the power.	• Check that the power cable between the transponder and monitor units for damage. • Check the power supply.
Transmitting, receiving messages	
Cannot transmit or receiver.	• Check that the VHF antenna cable is firmly fastened. • Check the VHF antenna for damage. • For TX messages, try a different TX channel. CLASS A: See section 1.9.1. INLAND: See section 2.6.1.
Can transmit but message is sent to wrong party.	Check that the [MSG TYPE] is set to [ADDRESSED] and the MMSI entered at [TO] is correct. For CLASS-A, see section 1.9.1. For INLAND: See section 2.6.1.
Position data	
No position data.	• Check the GPS antenna for damage. • Check the GPS antenna cable and its connectors.

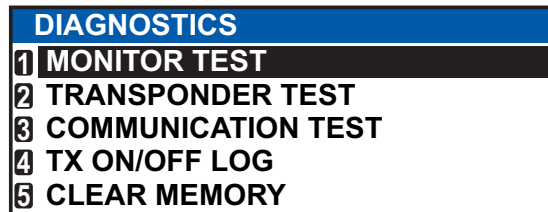
3.4 Diagnostics

The FA-170 provides diagnostic tests to check the monitor unit and transponder unit for proper operation.

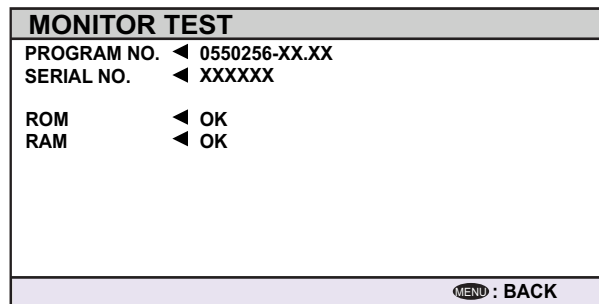
3.4.1 Monitor unit test

The monitor unit test shows program no., and checks the ROM, RAM, LCD and controls.

1. Press the **MENU/ESC** key to open the main menu.
2. Select [DIAGNOSTICS] then press the **ENT/ACK** key.



3. [MONITOR TEST] is already selected; press the **ENT/ACK** key.



"XX.XX" indicates software version number.

- a) The screen in the test displays the monitor unit's program number and serial number.
- b) The ROM and RAM are checked. The results of the ROM/RAM check are shown as "OK" or "NG" (No Good). If "NG" appears, try the test again. If "NG" still appears, contact your dealer for advice.

3.4.2 Transponder test

The transponder tests two aspects of the transponder: transponder memory and internal GPS receiver.

To run this test, do the following:

1. Press the **MENU/ESC** key to open the main menu.
2. Select [DIAGNOSTICS] then press the **ENT/ACK** key.
3. Select [TRANSPONDER TEST] then press the **ENT/ACK** key.
4. The transponder program number and serial number are displayed and the ROM and RAM are checked. The results of the ROM and RAM check are displayed as "OK" or "NG" (No Good). For any "NG", contact your dealer for advice.

TRANSPONDER TEST	
PROGRAM NO.	◀ 0550255-XX.XX
SERIAL NO.	◀ 1000-42xx-xxx
ROM	◀ OK
RAM	◀ OK
GPS	◀ OK
MENU : BACK	

The GPS test results are displayed the format shown below.

OK: Normal

NG: No Good - Appears along with reason for NG.

- ROM ERROR
- RAM ERROR
- MEMORY ERROR
- COM ERROR
- ANTENNA ERROR

5. Press the **MENU/ESC** key to return to the [DIAGNOSTICS] sub-menu.

3.4.3 VHF communication test

The VHF communication test checks for proper transmission and reception over the VHF channel.

1. Press the **MENU/ESC** key to open the main menu.
2. Select [DIAGNOSTICS] then press the **ENT/ACK** key.
3. Select [COMMUNICATION TEST] then press the **ENT/ACK** key.

COMMUNICATION TEST < START >

TEST TARGET : 000000000 [15NM-25NM TARGETS]

CH A RESULT ◀ -- MMSI RNG

CH B RESULT ◀ --

[NG REASONS]

1=NO RESPONSE

2=NO MMSI

3=RECEIVE ONLY

4=SILENT MODE

5=OTHER

1: 111111110 15NM

2: 222222220 16NM

3: 333333330 17NM

4: 444444440 17NM

5: 555555550 19NM

6: 666666660 20NM

7: 777777770 20NM

8: = NO ENTRY =

⏏: CURSOR ENT: SELECT MENU: BACK

Select [START], then press the **ENT/ACK** key to begin the communications test.

Available test targets list showing the MMSI of each target and range to target.

The FA-170 automatically selects targets with a range of 15 NM to 25 NM for this list with CLASS A type targets listed above other types.

4. Input the required MMSI, referring to the list at the right of the screen. You can also select the test target from the list at the right of the screen using the arrow keys, then press the **ENT/ACK** key.
5. Select [START] then press the **ENT/ACK** key.

When the test is complete, the results are displayed for both channel A and B, along with a reason for test failure where applicable.

"OK": Normal

"NG": No Good. Unable to communicate with specified vessel's (MMSI) channel.

The result "NG" appears with a number explaining the failure. The number and meanings are listed in the table below.

COMMUNICATION TEST < STOP >

TEST TARGET : 000000000 [15NM-25NM TARGETS]

CH A RESULT ◀ ☐ MMSI RNG

CH B RESULT ◀ ☐

[NG REASONS]

1=NO RESPONSE

2=NO MMSI

3=RECEIVE ONLY

4=SILENT MODE

5=OTHER

1: 111111110 15NM

2: 222222220 16NM

3: 333333330 17NM

4: 444444440 17NM

5: 555555550 19NM

6: 666666660 20NM

7: 777777770 20NM

8: = NO ENTRY =

⏏: CURSOR ENT: SELECT MENU: BACK

Number	Reason	Measures
1	No response. The message was not acknowledged by the test target.	Change targets, then repeat the test.
2	Own ship MMSI is not set.	Refer to the installation manual for this equipment and input the MMSI.
3	The FA-170 is set to "receive only" and cannot send a test message.	Change the setting for [CH INFO] to [TX/RX AorB] from the [REGION LIST]. See section 1.10.2. Note: The system automatically transmits when the setting is changed to [TX/RX AorB].
4	The FA-170 is in silent mode and cannot send a test message.	Disable silent mode.
5	Less than one minute interval between messages sent.	Wait for more than one minute, then repeat the test.
6	Failed for an unknown reason. (Other than those above.)	There may be an obstacle (land mass, etc.) between your vessel and the test vessel. Manually input a different test target MMSI then repeat the test.

6. Press the **MENU/ESC** key to return to the [DIAGNOSTICS] sub-menu.

3.4.4 TX on/off log

The [TX ON/OFF LOG] shows the date and time at which transmissions were started or stopped. The time and date at which unit was turned off is also displayed.

1. Press the **MENU/ESC** key to open the main menu.
2. Select [DIAGNOSTICS] then press the **ENT/ACK** key.
3. Select [TX ON/OFF LOG] then press the **ENT/ACK** key.

TX ON/OFF LOG		
↑ TX-OFF	TIME [UTC]	REASON
↓ TX-ON		
-- / -- / -- -- -- : -- : --		EQUIPMENT MALFUNCTION
30/APL/2015	8:35:00	
29/APL/2015	17:20:00	CH MANAGEMENT COMMAND
29/APL/2015	8:35:00	
28/APL/2015	17:20:00	CH MANAGEMENT COMMAND
38/APL/2015	8:35:00	
27/APL/2015	17:20:00	CH MANAGEMENT COMMAND
37/APL/2015	8:35:00	
CURSOR		ENT : BACK

The reasons which may be displayed are listed in the table below, along with their meaning.

Reason	Meaning
POWER OFF	Transmission disabled due to unit power off.
SILENT MODE	Transmission disabled due to unit operating in SILENT mode.
CH MANAGEMENT COMMAND	Transmission disabled due to CH INFO receive mode.
EQUIPMENT MALFUNCTION	Transmission disabled due to equipment malfunction.
INVALID CONFIGURATION	Transmission disabled due to invalid settings.

4. Press **▲** or **▼** to move the cursor and display other log entries.
The cursor selects two lines, as shown in reverse video in the figure above. The contents of each log entry are:
 - Top line: Date and time at which transmission was turned off and reason transmission was turned off.

Note: If transmission is turned off for more than 15 minutes, one of the reasons listed below is displayed.

Reason	Meaning
"POWER OFF"	Transmission ceased as the power was turned off.
"SILENT MODE"	Transmission ceased due to activation of [SILENT] mode.
"CH MANAGEMENT COMMAND"	Transmission ceased due to current channel settings.
"EQUIPMENT MALFUNCTION"	Transmission ceased due to equipment fault.
"INVALID CONFIGURATION"	Transmission ceased due to invalid settings.

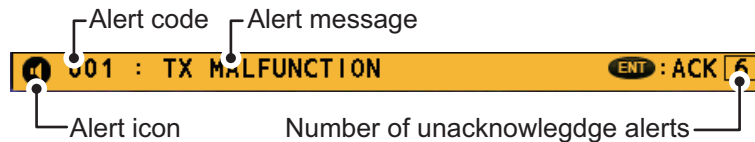
- Bottom line: Date and time at which transmission was turned on.
5. Press the **MENU/ESC** key to return to the [DIAGNOSTICS] sub-menu.

3.5 Alerts

The buzzer sounds for equipment errors and is accompanied by a flashing indication at the bottom of the screen. Press the **ENT/ACK** key to silence the buzzer and acknowledge the alert.

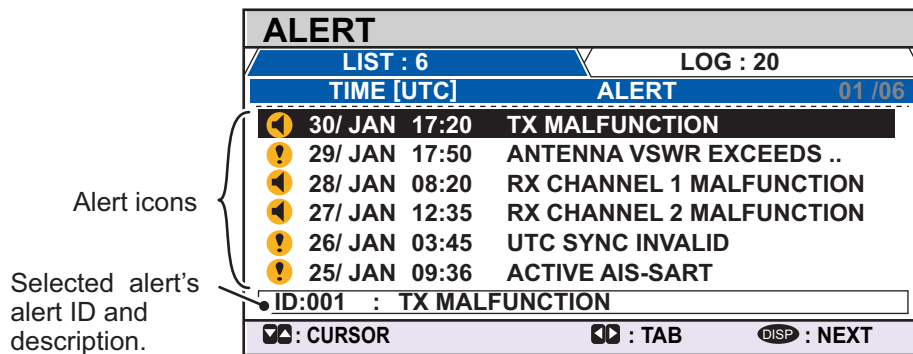
If there are multiple alerts, each alert must be acknowledged individually.

The indication at the bottom of the screen remains until the alert cause is removed or rectified.



To see which alert(s) has been violated, display the [ALERT] log as shown in the procedure below.

1. Press the **DISP** key to show the [ALERT] log.



2. Use **▲** or **▼** to select an alert. Each alert is displayed with the date and time at which it was generated. Where there is no date/time data available, the date/time indication appears as "- /- - - - -".
Select an alert to display the alert ID and brief description a box at the bottom of the screen, as shown in the example above.
3. Press **◀** or **▶** to change the displayed tab.
The [LIST] tab shows active alerts only, in order from newest to oldest.
The [LOG] tab shows the latest 20 alerts which have been acknowledged and rectified.

Each active alert entry is accompanied by an alert icon, indicating the state of the alert. The alert icons displayed on the FA-170 are listed in the table below with a brief description.

Icon	Priority	Meaning	Icon	Priority	Meaning
	Warning	Active-unacknowledged notification, icon is flashing.*		Warning	Active-responsibility transferred notification, icon is lit steadily.
	Warning	Active-silenced notification, icon is flashing.*		Warning	Active-acknowledged notification, icon is lit steadily.
	Warning	Rectified-unacknowledged notification, icon is flashing.*		Caution	Active, icon is lit steadily.

*: Flashing at 0.5 second intervals.

See "ALERTS, IDS, MEANINGS AND MEASURES" on page AP-7 for a full list of alerts, alert IDs, their meanings and possible counter-measures.

3.6 GPS Monitor

The GPS monitor display shows information about the built-in GPS receiver, including position, speed over ground, course over ground, date, time, mode position accuracy, position-fixing status and RAIM status.

1. Press the **MENU/ESC** key to open the menu.
2. Select [STATUS], then press the **ENT/ACK** key.
3. Select [INTERNAL GPS], then press the **ENT/ACK** key.

INTERNAL GPS		
UTC	◀	28/NOV/2014 16:26:15
LAT	◀	34°44.5000'N
LON	◀	135°21.3000'E
SOG	◀	110.9kn
COG	◀	350.0°
MODE	◀	DGPS
STATUS	◀	NO FIX
PA	◀	HIGH
RAIM	◀	UNUSED
MENU : BACK		

Indication	Description	Indication	Description
UTC	Date and time	MODE	Selected GPS mode • [GPS]: GPS is used for position fix. • [DGPS]: DGPS is used for position fix. • [NO FIX]: The system is unable to calculate a position fix.
LAT	Latitude of current position	STATUS	GPS status • [2D]: Two dimensional GPS fix. • [3D]: Three dimensional GPS fix. • [D2D]: Two dimensional DGPS fix. • [D3D]: Three dimensional DGPS fix. • [DOP]: Dilution of precision fix. • [NO FIX]: The system is unable to calculate a position fix.
LON	Longitude of current position	PA	Position accuracy (HIGH = Less than 10 m, LOW = more than 10m)
SOG	Speed Over Ground	RAIM	Current RAIM status (USED or UNUSED)
COG	Course Over Ground		

4. Press the **DISP** key to close the display.

3.7 Displaying Sensor Status

The [SENSOR STATUS] screen shows currently connected sensors' status.

1. Press the **MENU/ESC** key.
2. Select [STATUS], then press the **ENT/ACK** key.
3. Select [SENSOR STATUS] then press the **ENT/ACK** key.

SENSOR STATUS	
01 / 04	
01 : No. 1	EXTERNAL DGNSS IN USE
02 : No. 4	INTERNAL DGNSS IN USE (MESSAGE 17)
03 : No. 7	INTERNAL SOG / COG IN USE
04 : No. 10	OTHER ROT SOURCE IN USE
 : CURSOR  : BACK	

4. Press the **DISP** key to close the display. The table on the following page lists the possible sensor status messages and their meanings.

Sensor Status Message	Meaning
EXTERNAL DGNSS IN USE	Using external DGNSS
EXTERNAL GNSS IN USE	Using external GNSS
INTERNAL DGNSS IN USE (BEACON)	Using internal DGNSS beacon
INTERNAL DGNSS IN USE (MESSAGE 17)	MSG 17 corrects internal GNSS with differential correction
INTERNAL GNSS IN USE	Using internal GNSS
EXTERNAL SOG/COG IN USE	Using external SOG/COG
INTERNAL SOG/COG IN USE	Using internal SOG/COG
HEADING VALID	Heading data normal
RATE OF TURN INDICATOR IN USE	ROT data normal
OTHER ROT SOURCE IN USE	Value calculated from HDT, or ROT device used and talker is other than TI.
CHANNEL MANAGEMENT PARAMETERS CHANGED	Channel changed (displayed about 30 s)

3.8 How to Restore Default Settings

You may clear all or specific settings to start afresh with default settings. When all data is cleared, the default settings for all items in the [USER SET] menu restored, all messages and the alert history are cleared. GPS data is also cleared; however, MMSI and IMO numbers, ship's name and call sign are not cleared.

1. Press the **MENU/ESC** key to open the menu.
2. Select [DIAGNOSTICS] then press the **ENT/ACK** key.
3. Select [CLEAR MEMORY] then press the **ENT/ACK** key.
4. Select [CLEAR ALL], [CLEAR MONITOR SET] or [CLEAR GPS] as appropriate then press the **ENT/ACK** key. A confirmation pop up window appears.

CLEAR MEMORY
CLEAR ALL
CLEAR MONITOR SET
CLEAR GPS

CLEAR ALL	Restores all settings to default, except items in the [INITIAL SET] menu (MMSI No., IMO No., ship's name and call sign, etc.)
CLEAR MONITOR SET	Restore default settings for dimmer, contrast, key beep and notifications.
CLEAR GPS	Clears GPS Almanac to receive latest Almanac.

5. Select [YES] then press the **ENT/ACK** key.
For [CLEAR ALL] and [CLEAR MONITOR SET], a beep sounds then the equipment restarts.

3.9 AIS-SART Test Indication in Target List

The FA-170 can confirm if an AIS-SART station is functioning correctly. This test requires message 1 data or Message 14 data. Note that this setting is deactivated when the power is turned off.

Note: This function tests if an AIS-SART station is functioning correctly, it is not a SART diagnostic tool for FA-170.

1. Press the **MENU/ESC** key to open the menu.
2. Select [USER SET], then press the **ENT/ACK** key.

USER SET	
1 KEY BEEP	: ON
2 TIME DIFF	: +00 : 00
3 AUTO SORT	: ON
4 SART TEST	: HIDE
5 LR RESPONSE	: AUTO
6 LR BROADCAST	: ON
7 NOTIFICATION SET	
8 ACTIVATE	



3. Select [SART TEST], then press the **ENT/ACK** key.
4. Select [SHOW], then press the **ENT/ACK** key.
5. Press the **DISP** key to close the menu.
6. Press the **DISP** to show the [TARGET LIST]. If the [DANGEROUS TARGET] is displayed, switch to the [TARGET LIST], referring to step 3 of section 1.8.2.
7. Select [SART] then press the **ENT/ACK** key to show detailed information for the AIS-SART station.
8. Confirm that the [STATUS] field is showing "SART TEST".

APPENDIX 1 MENU TREE

Class-A Menu Tree

MAIN MENU

- | 1 MSG
- | 2 STATUS
- | 3 USER SET ***Bold Italic*** : Default
- | 4 INITIAL SET
- | 5 CH INFO
- | 6 DIAGNOSTICS
- | 7 SERVICE (For service personnel only)

1 MSG

- | NEW MSG
- | MSG BOX
 - | INBOX
 - | OUTBOX

2 STATUS

- | INTERNAL GPS
- | SENSOR STATUS

3 USER SET

- | KEY BEEP (***ON***, OFF)
- | TIME DIFF (-11:00 to +14:00, default: ***+00:00***)
- | AUTO SORT (***ON***, OFF)
- | SART TEST (SHOW, ***HIDE***)
- | LR RESPONSE (***AUTO***, MANUAL)
- | LR BROADCAST (***ON***, OFF)
- | NOTIFICATION SET
 - | ALERT — BUZZER (***ON***, OFF)
 - | RX MESSAGE
 - | ADDRESSED (***POPUP+BUZZER***, POPUP, OFF)
 - | BROADCAST (***POPUP+BUZZER***, POPUP, OFF)
 - | COLLISION DETECT
 - | INDICATION (***POPUP+BUZZER***, POPUP, OFF)
- | ACTIVATE

4 INITIAL SET

- | SHIP'S INFORMATION
 - | MMSI (000000000 to 999999999, default: -----)
 - | NAME (Maximum 20 characters, default: ***BLANK***)
 - | IMO NO. (***0000000000*** to 1073741823)
 - | CALL SIGN (Maximum 7 characters, default: ***BLANK***)
 - | TYPE OF SHIP (***00*** to 99)
 - | LONG RANGE
 - | CH C (0075, ***1075***, 0076, 1076)
 - | CH D (0075, 1075, 0076, ***1076***)
- | ANTENNA POSITION
 - | SHIP SIZE
 - | LENGTH (***0m*** to 800m)
 - | BEAM (***0m*** to 100m)
 - | ANT POSN
 - | INTERNAL Y (***0m*** to 511m)
 - | INTERNAL X (-31m to 32 m, default: ***0m***)
 - | EXTERNAL Y (***0m*** to 511m)
 - | EXTERNAL X (-31m to 32m, default: ***0m***)

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- ALERT ENABLE
 - WARNING1 (001,002,003,004,014,026,029,030) (**ON**, OFF)
 - WARNING2 (005,007,008,009,010,011,025,032,035,BAM*) (**ON**, OFF)
- I/O PORT

*: Displayed only when connected to BAMS.

 - COM1
 - MODE (**EXT DISPLAY**, LONG RANGE, BEACON, MONITOR, SERVICE, DISABLE)
 - SPEED (57600baud, **38400baud**, 4800baud)
 - COM2 (SAME AS COM 1)
 - COM3 (SAME AS COM 1)
 - COM4
 - MODE (**EXT DISPLAY**, LONG RANGE, SENSOR, BEACON, MONITOR, SERVICE, DISABLE)
 - SPEED (57600baud, **38400baud**, 4800baud)
 - COM5 (SAME AS COM 4)
 - COM6 (SAME AS COM 4)
 - SENSOR1
 - MODE (**SENSOR**, DISABLE)
 - SPEED (Fixed at 4800baud)
 - SENSOR2 (SAME AS SENSOR 1)
 - SENSOR3 (SAME AS SENSOR 1)
- PORT PRIORITY
 - 1st
 - LL/SOG/COG (**SENSOR1**, SENSOR2, SENSOR3, COM4, COM5, COM6)
 - HDG (SENSOR1, SENSOR2, **SENSOR3**, COM4, COM5, COM6)
 - ROT (SENSOR1, SENSOR2, **SENSOR3**, COM4, COM5, COM6)
 - 2nd
 - LL/SOG/COG (SENSOR1, **SENSOR2**, SENSOR3, COM4, COM5, COM6)
 - HDG (**SENSOR1**, SENSOR2, SENSOR3, COM4, COM5, COM6)
 - ROT (**SENSOR1**, SENSOR2, SENSOR3, COM4, COM5, COM6)
 - 3rd
 - LL/SOG/COG (SENSOR1, SENSOR2, **SENSOR3**, COM4, COM5, COM6)
 - HDG (SENSOR1, **SENSOR2**, SENSOR3, COM4, COM5, COM6)
 - ROT (SENSOR1, **SENSOR2**, SENSOR3, COM4, COM5, COM6)
 - 4th
 - LL/SOG/COG (SENSOR1, SENSOR2, SENSOR3, **COM4**, COM5, COM6)
 - HDG (SENSOR1, SENSOR2, SENSOR3, COM4, COM5, **COM6**)
 - ROT (SENSOR1, SENSOR2, SENSOR3, COM4, COM5, **COM6**)
 - 5th
 - LL/SOG/COG (SENSOR1, SENSOR2, SENSOR3, COM4, **COM5**, COM6)
 - HDG (SENSOR1, SENSOR2, SENSOR3, **COM4**, COM5, COM6)
 - ROT (SENSOR1, SENSOR2, SENSOR3, **COM4**, COM5, COM6)
 - 6th
 - LL/SOG/COG (SENSOR1, SENSOR2, SENSOR3, COM4, COM5, **COM6**)
 - HDG (SENSOR1, SENSOR2, SENSOR3, COM4, **COM5**, COM6)
 - ROT (SENSOR1, SENSOR2, SENSOR3, COM4, **COM5**, COM6)
- NETWORK
 - IP ADDRESS (000.000.000.000 to 255.255.255.255, default: **172.031.024.004**)
 - SUBNET MASK (000.000.000.000 to 255.255.255.255, default: **255.255.000.000**)
 - GATEWAY (**000.000.000.000** to 255.255.255.255)
 - SFI (AI0001 to AI9999)

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- | NETWORK (NAVNET)
 - | | IP ADDRESS (000.000.000.000 to 255.255.255.255, default: **172.031.024.004**)
 - | | SUBNET MASK (000.000.000.000 to 255.255.255.255, default: **255.255.000.000**)
 - | | GATEWAY (**000.000.000.000** to 255.255.255.255)
 - | | NAVNET PORT (**10000** to 30000)
 - | | HOST NAME (**AIS0** to AIS9)
 - | | AIS INFO (**ON**, OFF)
 - | | ZDA INFO (ON, **OFF**)
 - | | GPS INFO (ON, **OFF**)
- | EDIT

5 CH INFO

- | REGION LIST
 - | | AREA (top right corner coordinates)
 - | | | LAT; default: --° --.'-' - (**current coordinates**)
 - | | | LON; default: --° --.'-' - (**current coordinates**)
 - | | AREA (bottom left corner coordinates), same as top right coordinates.
 - | | ZONE (1 to 8, default: **5**)
- | CH
 - | | PWR (**HIGH**, LOW)
 - | | CH A (Channel no./TXRX, RX, OFF); default: **2087/TXRX**.
 - | | CH B (Channel no./TXRX, RX, OFF); default: **2088/TXRX**.

6 DIAGNOSTICS

- | MONITOR TEST
- | TRANSPONDER TEST
- | COMMUNICATION TEST
- | TX ON/OFF LOG
- | CLEAR MEMORY (**CLEAR ALL**, CLEAR MONITOR SET, CLEAR GPS)

7 SERVICE (Requires password access. For service personnel only)

Inland Menu Tree

MAIN MENU

- | 1 MSG
- | 2 STATUS ***Bold Italic***: Default
- | 3 USER SET
- | 4 INITIAL SET
- | 5 CH INFO
- | 6 DIAGNOSTICS
- | 7 SERVICE (For service personnel only)

1 MSG

- | TEXT
 - | NEW MSG
 - | MSG BOX
- | ETA/RTA
 - | NEW MSG* *: Not available in SOLAS mode.
 - | MSG BOX
- | NO. OF PERSONS
 - | NEW MSG
 - | MSG BOX
- | EMMA WARNING BOX
- | WATER LEVEL BOX

2 STATUS

- | INTERNAL GPS
- | SENSOR STATUS

3 USER SET

- | KEY BEEP (***ON***, OFF)
- | TIME DIFF (-11:00 to +14:00), default: ***+00:00***
- | AUTO SORT (***ON***, OFF)
- | SART TEST (SHOW, ***HIDE***)
- | LR RESPONSE (***AUTO***, MANUAL)
- | LR BROADCAST (***ON***, OFF)
- | NOTIFICATION SET
 - | ALERT — BUZZER (***ON***, OFF)
 - | RX MESSAGE
 - | ADDRESSED (***POPUP+BUZZER***, POPUP, OFF)
 - | BROADCAST (***POPUP+BUZZER***, POPUP, OFF)
 - | COLLISION DETECT
 - | INDICATION (***POPUP+BUZZER***, POPUP, OFF)
- | ACTIVATE

4 INITIAL SET

- | SHIP'S INFORMATION
 - | MMSI (000000000, 200000000 to 799999999 or 982000000 to 987999999, default: -----)
 - | NAME (Maximum 20 characters, default: ***BLANK***)
 - | IMO NO. (***0000000000*** to 1073741823)
 - | CALL SIGN (Maximum 7 characters, default: ***BLANK***)
 - | ENI (Maximum 8 characters, default: ***BLANK***)
 - | TYPE OF SHIP (***00*** to 99)
 - | LONG RANGE
 - | CH C (0075, ***1075***, 0076, 1076)
 - | CH D (0075, 1075, 0076, ***1076***)
 - | SPEED QUALITY (HIGH, ***LOW***)
 - | COURSE QUALITY (HIGH, ***LOW***)
 - | HEADING QUALITY (HIGH, ***LOW***)
 - | BLUE SIGN (***USE***, UNUSE)

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- ANTENNA POSITION
 - SHIP SIZE
 - LENGTH (**0dm** to 800dm)
 - BEAM (**0dm** to 100dm)
 - ANT POSN
 - INTERNAL Y (**0dm** to 5110dm)
 - INTERNAL X (-310dm to 302dm, default: **0dm**)
 - EXTERNAL Y (**0dm** to 5110dm)
 - EXTERNAL X (-310dm to 320dm, default: **0dm**)
 - ALERT ENABLE
 - WARNING1 (001,002,003,004,014,026,029,030)*
(501,502,503,504,514,526,529,530)**
 - WARNING2 (005,007,008,009,010,011,025,032,035)*
(505,507,508,509,510,511,525,532,535,BAM)**
- | | |
|---|---|
| *: Displayed for alert modes
other than ALERT IF2. | **: Displayed only for
ALERT IF2 alert |
|---|---|
- I/O PORT
 - COM1
 - MODE (**EXT DISPLAY**, LONG RANGE, BEACON, MONITOR, SERVICE, DISABLE)
 - SPEED (57600baud, **38400baud**, 4800baud)
 - COM2 (SAME AS COM 1)
 - COM3 (SAME AS COM 1)
 - COM4
 - MODE (**EXT DISPLAY**, LONG RANGE, SENSOR, BEACON, MONITOR, SERVICE, DISABLE)
 - SPEED (57600baud, **38400baud**, 4800baud)
 - COM5 (SAME AS COM 4)
 - COM6 (SAME AS COM 4)
 - SENSOR1
 - MODE (**SENSOR**, DISABLE)
 - SPEED (Fixed at 4800baud)
 - SENSOR2 (SAME AS SENSOR 1)
 - SENSOR3 (SAME AS SENSOR 1)
 - PORT PRIORITY
 - 1st
 - LL/SOG/COG (**SENSOR1**, SENSOR2, SENSOR3, COM4, COM5, COM6)
 - HDG (SENSOR1, SENSOR2, **SENSOR3**, COM4, COM5, COM6)
 - ROT (SENSOR1, SENSOR2, **SENSOR3**, COM4, COM5, COM6)
 - 2nd
 - LL/SOG/COG (SENSOR1, **SENSOR2**, SENSOR3, COM4, COM5, COM6)
 - HDG (**SENSOR1**, SENSOR2, SENSOR3, COM4, COM5, COM6)
 - ROT (**SENSOR1**, SENSOR2, SENSOR3, COM4, COM5, COM6)
 - 3rd
 - LL/SOG/COG (SENSOR1, SENSOR2, **SENSOR3**, COM4, COM5, COM6)
 - HDG (SENSOR1, **SENSOR2**, SENSOR3, COM4, COM5, COM6)
 - ROT (SENSOR1, **SENSOR2**, SENSOR3, COM4, COM5, COM6)
 - 4th
 - LL/SOG/COG (SENSOR1, SENSOR2, SENSOR3, **COM4**, COM5, COM6)
 - HDG (SENSOR1, SENSOR2, SENSOR3, COM4, COM5, **COM6**)
 - ROT (SENSOR1, SENSOR2, SENSOR3, COM4, COM5, **COM6**)
 - 5th
 - LL/SOG/COG (SENSOR1, SENSOR2, SENSOR3, COM4, **COM5**, COM6)
 - HDG (SENSOR1, SENSOR2, SENSOR3, **COM4**, COM5, COM6)
 - ROT (SENSOR1, SENSOR2, SENSOR3, **COM4**, COM5, COM6)
 - 6th
 - LL/SOG/COG (SENSOR1, SENSOR2, SENSOR3, COM4, COM5, **COM6**)
 - HDG (SENSOR1, SENSOR2, SENSOR3, COM4, **COM5**, COM6)
 - ROT (SENSOR1, SENSOR2, SENSOR3, COM4, **COM5**, COM6)

Continued on following page

APPENDIX 1 MENU TREE

Continued from previous page

- | NETWORK
 - | | IP ADDRESS (000.000.000.000 to 255.255.255.255, default: **172.031.024.004**)
 - | | SUBNET MASK (000.000.000.000 to 255.255.255.255, default: **255.255.000.000**)
 - | | GATEWAY (**000.000.000.000** to 255.255.255.255)
 - | | SFI (AI0001 to AI9999)
- | NETWORK (NAVNET)
 - | | IP ADDRESS (000.000.000.000 to 255.255.255.255, default: **172.031.024.004**)
 - | | SUBNET MASK (000.000.000.000 to 255.255.255.255, default: **255.255.000.000**)
 - | | GATEWAY (**000.000.000.000** to 255.255.255.255)
 - | | NAVNET PORT (**10000** to 30000)
 - | | HOST NAME (**AIS0** to AIS9)
 - | | AIS INFO (**ON**, OFF)
 - | | ZDA INFO (ON, **OFF**)
 - | | GPS INFO (ON, **OFF**)
- | EDIT

5 CH INFO

- | REGION LIST
 - | | AREA (top right corner coordinates)
 - | | | LAT; default: --° --.'-' - (**current coordinates**)
 - | | | LON; default: --° --.'-' - (**current coordinates**)
 - | | AREA (bottom left corner coordinates), same as top right coordinates.
 - | | ZONE (1 to 8, default: **5**)
- | CH
 - | | PWR (**HIGH**, LOW)
 - | | CH A (Channel no./TXRX, RX, OFF); default: **2087/TXRX**.
 - | | CH B (Channel no./TXRX, RX, OFF); default: **2088/TXRX**.

6 DIAGNOSTICS

- | MONITOR TEST
- | TRANSPONDER TEST
- | COMMUNICATION TEST
- | TX ON/OFF LOG
- | CLEAR MEMORY (**CLEAR ALL**, CLEAR MONITOR SET, CLEAR GPS)

7 SERVICE (Requires password access. For service personnel only)

APPENDIX 2 ALERTS, IDS, MEANINGS AND MEASURES

The FA-170 displays alerts at the bottom of the screen, as they occur. You can see all alerts, current and past, from the [ALERT LIST] screen. The ID for each alert is different, depending on whether there is a BAM (Bridge Alert Management) system or an AMS (Alert Management System) connected.

The table on the following page shows the alert ID, displayed message, meaning and measures for each alert.

Note 1: Detection of RX malfunction

1) Detection of TDMA RX malfunction

Frequency error

PLL chip on TRX-PWR board generates lock or unlock signal for synthesizer.

MPU watches and sets status flag which reflects data of ALR sentence.

ID 003 for RX1, ID 004 for RX2

2) Detection of DSC RX malfunction

General error

A DSC error will occur when the FA-170 cannot detect a correct signal strength from the DSC receive circuit 120 seconds.

Note 2: Detection of TX malfunction

MPU detects TX malfunction (ID:001) in the following cases:

- 1) The signal indicated "LOCK" is not received from the PLL chip on the TRX-PWR board.
- 2) The voltage of monitoring signal on the TRX-PWR board is abnormal. The reason for TRX-PWR board malfunction can be a hardware problem or software problem causing a continuous transmission that exceeds 250 msec.
Note: The hardware stops automatically because of the continuous transmission.
- 3) Invalid MMSI
- 4) An excessively high VSWR (Voltage Standing Wave Ratio) for the AIS antenna detected.

Each active alert entry is accompanied by an alert icon, indicating the state of the alert. The alert icons displayed on the FA-170 are listed in the table below with a brief description.

Icon	Priority	Meaning	Icon	Priority	Meaning
	Warning	Active-unacknowledged notification, icon is flashing.*		Warning	Active-responsibility transferred notification, icon is lit steadily.
	Warning	Active-silenced notification, icon is flashing.*		Warning	Active-acknowledged notification, icon is lit steadily.
	Warning	Rectified-unacknowledged notification, icon is flashing.*		Caution	Active, icon is lit steadily.

*: Flashing at 0.5 second intervals.

Alert ID (BAM ID)	Displayed message	Meaning	Measures
001 (501)	TX MALFUNCTION	Transmission stopped due to a failure.	Check antenna and FA-170 connections. Check that the Own Ship MMSI is set. Consult your dealer if the problem is not rectified.
002 (502)	LEGACY/ALERT IF1: ANTENNA VSWR EXCEEDS LIMIT ALERT IF2: ANTENNA MALFUNCTION	High VSWR for the AIS antenna detected.	Check the antenna. Consult your dealer if the problem is not rectified.
003 (503)	RX CHANNEL 1 MALFUNCTION	RX1 failure.	Circuit board may be damaged. Contact your dealer.
004 (504)	RX CHANNEL 2 MALFUNCTION	RX2 failure.	
005 (505) *1	RX CHANNEL 70 MALFUNCTION	Failed to receive DSC message.	
007 (507) *1	UTC SYNC INVALID	No synchronization with UTC.	Internal GPS has no fix. Check weather and surrounding for obstacles. If the error appears frequently, contact your dealer.
008 (508) *1	MKD CONNECTION LOST	Communication failure between the transponder and the monitor unit.	Check connection between units. Consult your dealer if the problem is not rectified.
009 (509) *1	INT/EXT GNSS POSITION MISMATCH	Mismatch of position data between internal GNSS and external GNSS. After taking into account the antenna position, there is a difference of over 100 m.	Check calibration and location setting for both GPS antennas.
010 (510) *1	NAV STATUS INCORRECT	Mismatch between ship's speed and [NAVSTATUS] information.	Check [NAV STATUS] menu settings. Adjust settings appropriately.
011 (511) *1	LEGACY/ALERT IF1: HEADING SENSOR OFFSET ALERT IF2: MISMATCH BETWEEN HDG AND COG	Mismatch between COG and HDT. There is a difference of over 45° for more than five minutes at a speed of over five knots.	Check connection to sensor.
014 (514)	ACTIVE AIS-SART	AIS-SART message received	Check the message.
025 (525)	EXTERNAL EPFS LOST	Signal from external navigational aids lost or interrupted.	Check connection to EPFS devices.

Alert ID (BAM ID)	Displayed message	Meaning	Measures
026 (526)	NO POSITION SENSOR IN USE	No position data available.	Check connection to sensor.
029 (529)	NO VALID SOG INFORMATION	SOG information is invalid.	
030 (530)	NO VALID COG INFORMATION	COG information is invalid.	
032 (532) * ¹	HEADING LOST / INVALID	HDG information is lost or invalid.	
035 (535) * ¹	NO VALID ROT INFORMATION	No ROT information available.	
600950	BAM COM ERROR	Communication failure between the BAMS and the transponder unit.	Check connection between unit and BAM.

Note 1: The Alert IDs listed in parentheses are output when the FA-170 is connected to a BAM (Bridge Alert Management) system.

Note 2: Alert ID 600950 is only output when a BAM (Bridge Alert Management) is connected and is given “Caution” priority level.

Note 3: Where the [ALERT MODE] is set to [Legacy Ed.1/Ed.2], alert priority level for all alerts is fixed at “Warning”.

Note 4: Where the [ALERT MODE] is set to [ALERT IF1] or [ALERT IF2] the alerts shown with “*¹” in the table above are assigned “Caution” priority level.

APPENDIX 3 PARTS LIST/LOCATION

Parts List

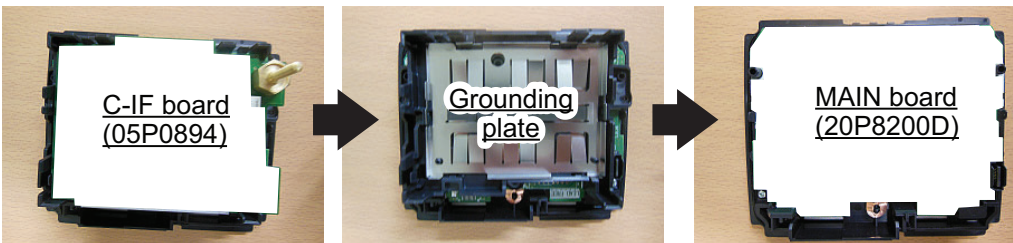
This equipment contains complex modules in which fault diagnosis and repair down to component level are not practical (IMO A.694(17)/8.3.1). Only some discrete components are used. FURUNO Electric Co., Ltd. believes identifying these components is of no value for shipboard maintenance; therefore, they are not listed in the manual. Major modules can be located on the parts location photo on the following pages.

FURUNO ELECTRICAL PARTS LIST	Model	FA-170	
	Unit	MONITOR UNIT, TRANSPONDER UNIT	
	Blk.No.		
TYPE, NAME	LOCATION		
PRINTED CIRCUIT BOARD			
20P8200D, MAIN		MONITOR UNIT FA-1702	
05P0894, C-IF		MONITOR UNIT FA-1702	
05P0893, TRX-PWR		TRANSPONDER UNIT FA-1701	
05P0891, T-IF		TRANSPONDER UNIT FA-1701	
20P8211, GPS		TRANSPONDER UNIT FA-1701	
05P0892, R-MOD		TRANSPONDER UNIT FA-1701	

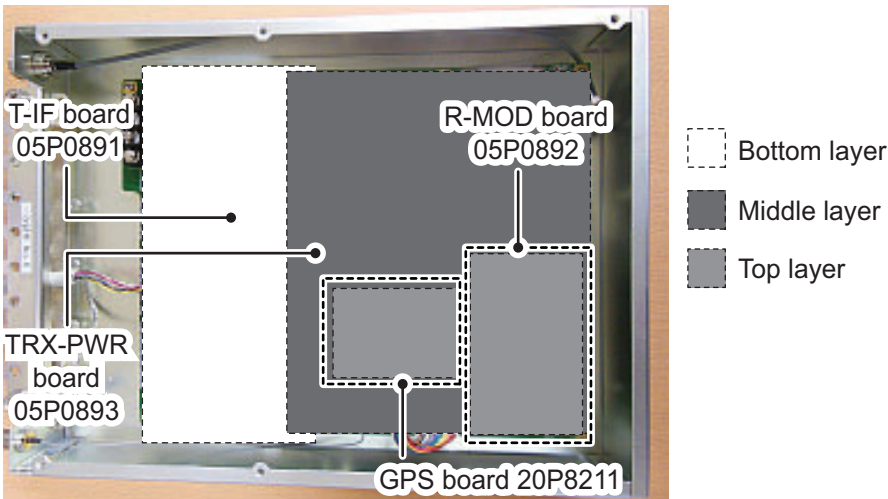
Parts Location

Monitor Unit

Remove the C-IF board, then remove the grounding plate to expose the main board.



Transponder unit



APPENDIX 4 CHANNEL LISTS AND ERI CODES

International mode VHF channel list

Ch No.	Freq.	Ch No.	Freq.	Ch No.	Freq.	Ch No.	Freq.
1001	156.05	1065	156.275	1088	157.425	2024	161.8
1002	156.1	1066	156.325	2001	160.65	2025	161.85
1003	156.15	67	156.375	2002	160.7	2026	161.9
1004	156.2	68	156.425	2003	160.75	2027	161.95
1005	156.25	69	156.475	2004	160.8	2028	162
6	156.3	70	156.525	2005	160.85	2060	160.625
1007	156.35	71	156.575	2007	160.95	2061	160.675
1018	156.9	72	156.625	8	156.4	2062	160.725
1019	156.95	73	156.675	9	156.45	2063	160.775
1020	157	74	156.725	10	156.5	2064	160.825
1021	157.05	75	156.775	11	156.55	2065	160.875
1022	157.1	76	156.825	12	156.6	2066	160.925
1023	157.15	77	156.875	13	156.65	2078	161.525
1024	157.2	1078	156.925	14	156.7	2079	161.575
1025	157.25	1079	156.975	15	156.75	2080	161.625
1026	157.3	1080	157.025	16	156.8	2081	161.675
1027	157.35	1081	157.075	17	156.85	2082	161.725
1028	157.4	1082	157.125	2018	161.5	2083	161.775
1060	156.025	1083	157.175	2019	161.55	2084	161.825
1061	156.075	1084	157.225	2020	161.6	2085	161.875
1062	156.125	1085	157.275	2021	161.65	2086	161.925
1063	156.175	1086	157.325	2022	161.7	2087	161.975
1064	156.225	1087	157.375	2023	161.75	2088	162.025

USA mode VHF channel list

Ch No.	Freq.	Ch No.	Freq.	Ch No.	Freq.	Ch No.	Freq.
1001	156.05	1065	156.275	1088	157.425	2024	161.8
		1066	156.325	2001	160.65	2025	161.85
1003	156.15	67	156.375	2002	160.7	2026	161.9
		68	156.425	2003	160.75	2027	161.95
1005	156.25	69	156.475	2004	160.8	2028	162
6	156.3	70	156.525	2005	160.85	2060	160.625
1007	156.35	71	156.575	2007	160.95	2061	160.675
1018	156.9	72	156.625	8	156.4	2062	160.725
1019	156.95	73	156.675	9	156.45	2063	160.775
1020	157	74	156.725	10	156.5	2064	160.825
1021	157.05	75	156.775	11	156.55	2065	160.875
1022	157.1	76	156.825	12	156.6	2066	160.925
1023	157.15	77	156.875	13	156.65	2078	161.525
1024	157.2	1078	156.925	14	156.7	2079	161.575
1025	157.25	1079	156.975	15	156.75	2080	161.625
1026	157.3	1080	157.025	16	156.8	2081	161.675
1027	157.35	1081	157.075	17	156.85	2082	161.725
1028	157.4	1082	157.125	2018	161.5	2083	161.775
		1083	157.175	2019	161.55	2084	161.825
1061	156.075	1084	157.225	2020	161.6	2085	161.875
		1085	157.275	2021	161.65	2086	161.925
1063	156.175	1086	157.325	2022	161.7	2087	161.975
1064	156.225	1087	157.375	2023	161.75	2088	162.025

Note: 1 W power on CH13 and CH67.

ERI Codes

ERI code			AIS code	
Full code	U	Ship name (EN)	First digit	Second digit
8000	No	VESSEL., TYPE UNKNOWN	9	9
8010	V	MOTOR FREIGHTER	7	9
8020	V	MOTOR TANKER	8	9
8021	V	MOTOR TANKER, LIQUID CARGO, TYPE N	8	0
8022	V	MOTOR TANKER, LIQUID CARGO, TYPE C	8	0
8023	V	MOTOR TANKER, DRY CARGO AS IF LIQUID (E.G. CEMENT)	8	9
8030	V	CONTAINER VESSEL	7	9
8040	V	GAS TANKER	8	0
8050	C	MOTOR FREIGHTER, TUG	7	9
8060	C	MOTOR TANKER, TUG	8	9
8070	C	MOTOR FREIGHTER WITH ONE OR MORE SHIPS ALONGSIDE	7	9
8080	C	MOTOR FREIGHTER WITH TANKER	8	9
8090	C	MOTOR FREIGHTER PUSHING ONE OR MORE FREIGHTERS	7	9
8100	C	MOTOR FREIGHTER PUSHING AT LEAST ONE TANK-SHIP	8	9
8110	No	TUG, FREIGHTER	7	9
8120	No	TUG, TANKER	8	9
8130	C	TUG, FREIGHTER, COUPLED	3	1
8140	C	TUG, FREIGHTER/TANKER, COUPLED	3	1
8150	V	FREIGHTBARGE	9	9
8160	V	TANKBARGE	9	9
8161	V	TANKBARGE, LIQUID CARGO, TYPE N	9	0
8162	V	TANKBARGE, LIQUID CARGO, TYPE C	9	0
8163	V	TANKBARGE, DRY CARGO AS IF LIQUID (E.G. CEMENT)	9	9
8170	V	FREIGHTBARGE WITH CONTAINERS	8	9
8180	V	TANKBARGE, GAS	9	0
8210	C	PUSHTOW, ONE CARGO BARGE	7	9
8220	C	PUSHTOW, TWO CARGO BARGES	7	9
8230	C	PUSHTOW, THREE CARGO BARGES	7	9
8240	C	PUSHTOW, FOUR CARGO BARGES	7	9
8250	C	PUSHTOW, FIVE CARGO BARGES	7	9
8260	C	PUSHTOW, SIX CARGO BARGES	7	9
8270	C	PUSHTOW, SEVEN CARGO BARGES	7	9
8280	C	PUSHTOW, EIGHT CARGO BARGES	7	9
8290	C	PUSHTOW, NINE CARGO BARGES	7	9
8310	C	PUSHTOW, ONE TANK/GAS BARGE	8	0
8320	C	PUSHTOW, 2 BARGES AT LEAST ONE TANKER/GAS BARGE	8	0
8330	C	PUSHTOW, 3 BARGES AT LEAST ONE TANKER/GAS BARGE	8	0
8340	C	PUSHTOW, 4 BARGES AT LEAST ONE TANKER/GAS BARGE	8	0
8350	C	PUSHTOW, 5 BARGES AT LEAST ONE TANKER/GAS BARGE	8	0
8360	C	PUSHTOW, 6 BARGES AT LEAST ONE TANKER/GAS BARGE	8	0
8370	C	PUSHTOW, 7 BARGES AT LEAST ONE TANKER/GAS BARGE	8	0
8380	C	PUSHTOW, 8 BARGES AT LEAST ONE TANKER/GAS BARGE	8	0
8390	C	PUSHTOW, 9 OR MORE BARGES AT LEAST ONE TANKER/GAS BARGE	8	0
8400	V	TUG, SINGLE	5	2
8410	No	TUG, ONE OR MORE TOWS	3	1
8420	C	TUG, ASSISTING A VESSEL OR LINKED COMBINATION	3	1
8430	V	PUSHBOAT, SINGLE	9	9
8440	V	PASSENGER SHIP, FERRY, CRUISE SHIP, RED CROSS SHIP	6	9
8441	V	FERRY	6	9
8442	V	RED CROSS SHIP	5	8
8443	V	CRUISE SHIP	6	9
8444	V	PASSENGER SHIP WITHOUT ACCOMMODATION	6	9
8450	V	SERVICE VESSEL, POLICE PATROL, PORT SERVICE	9	9
8460	V	VESSEL, WORK MAINTENANCE CRAFT, FLOATING DERRICK, CABLE SHIP, BUOY SHIP, DREDGE	3	3
8470	C	OBJECT, TOWED, NOT OTHERWISE SPECIFIED	9	9
8480	V	FISHING BOAT	3	0
8490	V	BUNKERSHIP	9	9
8500	V	BARGE, TANKER, CHEMICAL	8	0
8510	C	OBJECT, NOT OTHERWISE SPECIFIED	9	9
1500	V	GENERAL CARGO VESSEL MARITIME	7	9
1510	V	UNIT CARRIER MARITIME	7	9
1520	V	BULK CARRIER MARITIME	7	9
1530	V	TANKER	8	0
1540	V	LIQUIFIED GAS TANKER	8	0
1850	V	PLEASURE CRAFT, LONGER THAN 20 METRES	3	7
1900	V	FAST SHIP	4	9
1910	V	HYDROFOIL	4	9

Note: ERI codes 8070, 8440 and 8460 are displayed in abbreviated format.

APPENDIX 5 ABBREVIATIONS, UNITS AND SYMBOLS

Numerical abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
2D	Two Dimensional Positioning	3rd	Third
3D	Three Dimensional Positioning	4th	Fourth
1st	First	5th	Fifth
2nd	Second	6th	Sixth

A:

Abbreviation	Meaning	Abbreviation	Meaning
ACK	Acknowledge	ANT	Antenna
AGE	Time elapsed from acquisition.	APR	April
AIS	Automatic Identification System	AtoN	Aids to Navigation
ALARM	Alarm	AUG	August
ALT	Altitude	AUTO	Automatic

B:

Abbreviation	Meaning	Abbreviation	Meaning
BAM	Bridge Alert Management	BRG	Bearing
BASE	Base Station	BRILL	Brilliance
baud	Baud rate	BS	Beam of ship, Back Space, Base Station
BC	Beam of convoy		

C:

Abbreviation	Meaning	Abbreviation	Meaning
CH	Channel	CONT	Contrast
COG	Course Over the Ground	CPU	Central Processing Unit
COM, COMM	Communication		

D:

Abbreviation	Meaning	Abbreviation	Meaning
D2D	Differential and 2D	DGNSS	Differential GNSS
D3D	Differential and 3D	DGPS	Differential GPS
DATE	Date	DIFF	Difference
DAY	Day	DISP	Display
DEC	December	DNGR	Danger
DEL	Delete	DOP	Dilution Of Precision
DEST	Destination	DPTH	Depth
DG	Dangerous Goods	DSC	Digital Selective Calling

E:

Abbreviation	Meaning	Abbreviation	Meaning
E	East	ENI	Unique European Vessel Identification Number
EA	Extension A	ENT	Enter
EB	Extension B	EPIRB	Emergency Position Indicating Radio Beacon
EC	Extension C	EPFS	Electronic Position Fixing System
ECDIS	Electronic Chart Display Information System	ERI	Electronic Reporting International (ship type) code
EMMA	European Multiservice Meteorological Awareness system	ESC	Escape
		ETA	Estimated Time of Arrival
		EXT	External

F:

Abbreviation	Meaning	Abbreviation	Meaning
FEB	February	FL	Flood
FI	Fire in the forests	FO	Fog
FIX	Fix	FUNC	FUNCTION

G:

Abbreviation	Meaning	Abbreviation	Meaning
GNSS	Global Navigation Satellite System	GPS	Global Positioning System

H:

Abbreviation	Meaning	Abbreviation	Meaning
H	Height	HI	High
HDG	Heading	HS	Harmful Substances (applies to AIS)
HDT	Data sentence (Heading-true)	HSC	High Speed Craft
HECT	Hectometer		

I:

Abbreviation	Meaning	Abbreviation	Meaning
ID	Identification	INFO	Information
IEC	International Electrotechnical Commission	INT	Internal
IF	Interface	I/O	Input/Output
IFM	International Function Message	IP	Internet Protocol (Address)
IMO	International Maritime Organization	ISO	International Standards Organization

J:

Abbreviation	Meaning	Abbreviation	Meaning
JAN	January	JUN	June
JUL	July		

L:

Abbreviation	Meaning	Abbreviation	Meaning
L	Low, left	LO	Low
LAN	Local Area Network	LOG	Log
LAT	Latitude	LON	Longitude
LC	Length of convoy	LR	Long Range
LCD	Liquid Crystal Display	LS	Length of ship
L/L	Latitude/Longitude	LT	Local Time
LL	Latitude/Longitude		

M:

Abbreviation	Meaning	Abbreviation	Meaning
MAR	March	MMSI	Maritime Mobile Services Identity number
MAX	Maximum	MP	Maritime Pollutant (applies to AIS)
MAY	May	MPU	Micro processing Unit
MENU	Menu	MSG	Message
MIN	Minimum	MOB	Man Overboard
MKD	Minimum Keyboard Display		

N:

Abbreviation	Meaning	Abbreviation	Meaning
N	North	NIGHT	Night
NAME	Name	NG	No Good
NAV	Navigation	NO.	Number
NAV STATUS	Navigational status	NOV	November
NE	Northeast	NW	Northwest

O:

Abbreviation	Meaning	Abbreviation	Meaning
OCT	October	ON	On
OFF	Off	OS	Other Substances, Own Ship
OK	O.K.		

P:

Abbreviation	Meaning	Abbreviation	Meaning
PA	Position Accuracy	PORT	Port
PI	Position Indicator	POSN	Position
PLL	Phase Locked Loop	PWR	Power

R:

Abbreviation	Meaning	Abbreviation	Meaning
RA	Rain	ROM	Read Only Memory
RAIM	Receiver Autonomous Integrity Monitoring	ROM(M)	ROM (Monitor Unit)
RAIN	Rain	ROM(T)	ROM (Transponder Unit)
RAM	Random Access Memory	ROT	Rate Of Turn
RAM(M)	RAM (Monitor Unit)	RSSI	Received Signal Strength Indication
RAM(T)	RAM (Transponder Unit)	RTA	Requested Time of Arrival
RFM	Regional Function Message	RX	Receive
RNG	Range		

S:

Abbreviation	Meaning	Abbreviation	Meaning
S	South	SFI	System Function ID
SAR	Search And Rescue	SIM	Simulation
SART	Search And Rescue Transponder	SN	Snow and Ice
SART ACT.	SART active	SOG	Speed Over the Ground
SE	Southeast	SOLAS	Safety Of Life At Sea
SEP	September	STW	Speed Through the Water
SET	Set (i.e., set and drift, or setting a value)	SW	Southwest, Switch
		SYNC	Synchronization

T:

Abbreviation	Meaning	Abbreviation	Meaning
TEST	Test	TOW	Vessel engaged in towing operations
TH	Thunderstorm	TRANS	Transition
TI	Turn rate Indicator	TRX	Transceiver
TIME	Time	TX	Transmit

U:

Abbreviation	Meaning	Abbreviation	Meaning
UN/LOADED	LOADED or UNLOADED	UTC	Universal Coordinated Time

V:

Abbreviation	Meaning	Abbreviation	Meaning
VHF	Very High Frequency	VSWR	Voltage Standing Wave Ratio

W:

Abbreviation	Meaning	Abbreviation	Meaning
W	West, Wide	WI	Wind
WARNING	Warning	WIG	Wing In Ground

Units

Abbreviation	Unit	Abbreviation	Unit
°	degree(s)	kn	knot(s)
°C	degree(s)	kpbs	kilo bit per second
bps	bit per second	l/m ² h	liter per square meter hour
cm	centimeter	m	meter
cm/h	centimeter per hour	min	minute(s)
dm	decimeter	msec	millisecond
hr	Hour(s)	NM	nautical mile(s)
km	kilometer	s	second(s)
km/h	kilometer per hour		

Symbols

Symbol	Description	Symbol	Description
	Own ship symbol		AIS AtoN (physical)
	Selected target		AIS AtoN (virtual)
	Unselected target		AIS SART/AIS MOB/EPIRB AIS
	AIS Base Station		SAR vessel
	SAR aircraft		

SPECIFICATIONS OF U-AIS TRANSPONDER FA-170

1 TRANSPONDER UNIT

1.1	TX/RX frequency	156.025 MHz to 162.025 MHz
1.2	Output power	1 W or 12.5 W selectable
1.3	Impedance	50 ohms
1.4	DSC receiver	CH70 fixed, 156.525 MHz
1.5	Bandwidth	25 kHz

2 MONITOR UNIT

2.1	Screen	4.3-inch color LCD, 480 x 272 dots (WQVGA)
2.2	Brilliance control	18 steps
2.3	Visible distance	0.7 m nominal
2.4	Buzzer volume	75 to 85 dB (A)

3 GPS RECEIVER

3.1	Receiving frequency	1575.42 MHz
3.2	Tracking code	C/A code
3.3	Number of channel	12 channels parallel, 12 satellites
3.4	Accuracy (dependent on ionospheric activity and multipath)	
	GPS	13 m max. (2drms, HDOP < 4)
	DGPS	5 m max. (2drms, HDOP < 4)
3.5	Tracking speed	1000 kn
3.6	Position fixing time	Warm start: 12 s, Cold start: 90 s
3.7	Position update interval	1 second typical
3.8	DGPS data receiving	RTCM SC-104 ver-2.1

4 INTERFACE

4.1	Number of ports	
	Serial	6 ports, IEC61162-1 Ed.4 or IEC61162-2 Ed.1
	Sensor input	3 port, IEC61162-1 Ed.4, 4800 bps
	Alarm I/O	1 port, Contact closure (normal close or open)
	LAN	1 port, Ethernet, 100Base-TX, RJ45 connector, Auto MDI/MDIX, for IEC61162-450 Ed.1
	BLUESIGN input	1 port, Relay contact
4.2	Data sentences	IEC61162-1/2
	Input	ABM, ACA, ACK, ACM, ACN, AIQ, AIR, BBM, DTM, EPV, GBS, GGA, GLL, GNS, HBT, HDT, LRF, LRI, OSD, PIWWIVD, PIWWSPW, PIWWSSD, PIWWVSD, RMC, ROT, SPW, SSD, THS, VBW, VSD, VTG
	Output	ABK, ACA, ACS, ALC, ALF, ALR, ARC, EPV, HBT, LR1, LR2, LR3, LRF, LRI, NAK, PIWWIVD, PIWWSPR, PIWWSSD, PIWWVSD, SSD, TRL, TXT, VER, VDM, VDO, VSD

- 4.3 Proprietary sentences (output only)
 - PFEC LBK, Alcmd, idatr, ident, idfnc, pidat, pireq
- 4.4 IEC61162-450 transmission group
 - Input MISC, TGTD, SATD, NAVD, PROP
 - Output Arbitrary (default: TGTD)
- 4.5 Network function (except IEC61162-450)
 - Data format SNMP, HTTP, Syslog, Furuno Management Protocol (FMP)
 - Data sentences same as 4.2 sentences

5 POWER SUPPLY

- 3.1 Transponder unit 12-24 VDC: 6-3 A
- 3.2 Monitor unit 12 VDC: 0.3 A max. (supplied from transponder unit)
- 3.3 AC/DC power supply unit (PR-240, option)
 - 100-115/200-230 VAC, 1 phase, 50/60 Hz

6 ENVIRONMENTAL CONDITIONS

- 6.1 Ambient temperature
 - GPS/VHF antenna -30°C to +70°C (storage: -30°C to +85°C)
 - Other units -15°C to +55°C
- 6.2 Relative humidity 93% or less at +40°C
- 6.3 Degree of protection
 - GPS/VHF antenna IP56
 - Transponder unit IP20, IP22 (bulkhead mount)
 - Monitor unit IP22, IP35 (option)
 - Pilot plug unit IP22 (front panel), IPX0 (chassis)
- 6.4 Vibration IEC 60945 Ed.4

7 UNIT COLOR

- 7.1 GPS/VHF antenna N9.5
- 7.2 Transponder/ Monitor unit N2.5
- 7.3 Pilot plug unit N2.5

INDEX

A

AIS-SART test indication	3-10
ALERT display	1-19
ALERT LIST	3-7
ALERT LOG	3-7
Alert status	3-7

C

Channels	
setting	1-25
viewing	1-24
Contrast	1-3
Controls	1-1

D

Dangerous (target) list	1-15, 2-11
Default settings	3-10
Diagnostics	
monitor unit test	3-3
TX on/off log	3-6
VHF communication test	3-5
Dimmer	1-3
DISP key	1-11
Display	
icons	1-4
key guidance	1-4
status bar	1-4

E

EMMA warning message (inland AIS)	2-21
ETA message (inland AIS)	2-16

F

Fuse replacement	3-2
------------------------	-----

G

GPS monitor	3-8
-------------------	-----

I

Initial settings	
class A	1-31
inland AIS	2-23
Inland AIS	
activating	2-1
EMMA warning message	2-21
ETA message	2-17
mode selection	2-2
no. of persons message	2-20
RTA message	2-19
static data	2-8
text message	2-14
time difference setting	1-32, 2-24
voyage-related data entry	2-3
water level message	2-22

K

Key beep	
on/off	1-28

L

Long range mode	1-28
-----------------------	------

M

Maintenance	3-1
Memory clear	3-10
Menu	
entering alphanumeric data	1-6
selecting an option	1-6
MENU key	1-5

Messages

EMMA warning (inland AIS)	2-21
ETA (inland AIS)	2-17
receive text, class A	1-22
received message pop up window	1-22
RTA (inland AIS)	2-19
send text message, class A	1-20
water level (inland AIS)	2-22
Monitor unit test	3-3

N

NAV STATUS	
entering voyage-related data	1-7
NAV STATUS key	1-7, 2-3
No. of persons message (inland AIS)	2-20
Notifications	1-10
alert buzzer	1-10
collision detection	1-10
received messages	1-10

P

Plotter display	1-12
Power on/off	1-2

R

RTA message (inland AIS)	2-19
--------------------------------	------

S

Sensor status	3-9
Static data display	1-18
System overview	iii

T

Target list	1-14, 2-9
Troubleshooting	3-2