

Operating Instructions

Universal Automatic Identification System UAIS DEBEG 3400

Display and Control Unit DEBEG 3401

Software Version 1.0

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STN ATLAS Marine Electronics GmbH
D - 22763 Hamburg

Service
Customer Support Center

Phone: + 49 (0) 18 03 00 85 53
Fax: + 49 (0) 18 03 00 85 54
E-mail: shippervice@sam-electronics.de

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1 Overview

AIS Summarised Briefly

The Universal Shipborne **A**utomatic **I**dentification **S**ystem (**AIS**) automatically provides the ship's nautical officers with **important information** about nearby vessels or other relevant objects within VHF range.

The AIS system transmits own ship data cyclically via two defined VHF channels and receives the same data of the other ships and objects that are equipped with AIS systems. The VHF channels in use can be switched over by external commands via the **integrated DSC receiver**.

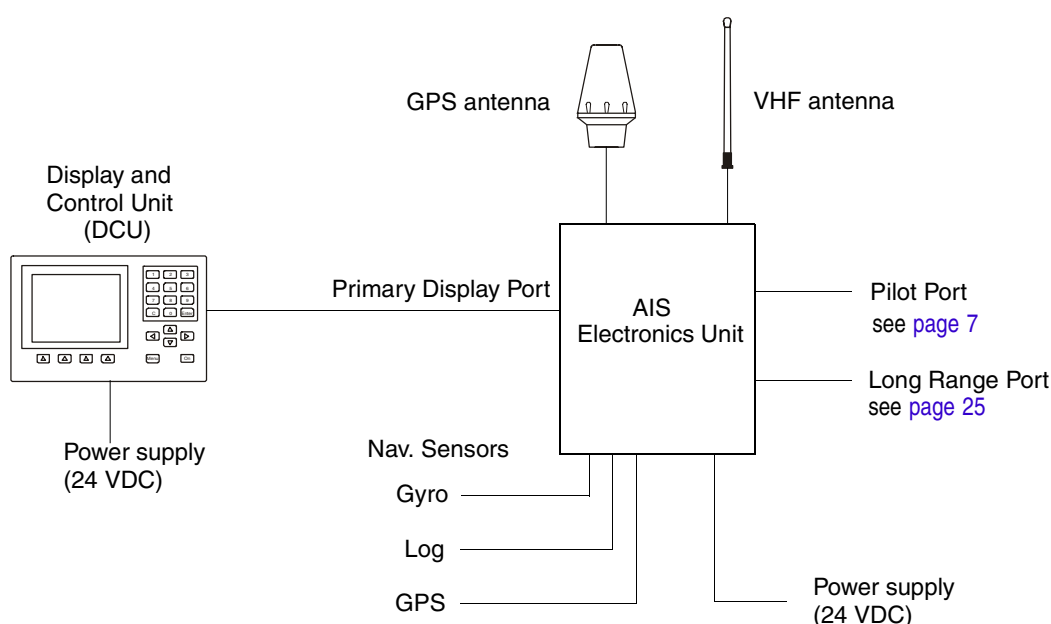
Based on SOLAS Chapter V - Safety of Navigation, a carriage requirement will enter into force for different categories of ships. This obligation will be introduced step by step for different ship classes and sizes, commencing on 1st July 2002 (all new vessels) and continuing until 1st July 2008 (all ships worldwide having gross tonnages of at least 500 tons, and ships sailing internationally with gross tonnages of at least 300 tons, but by 1st July 2007 at the latest). In addition, other vessels or objects to which the provisions of regulations do not apply may be equipped on a voluntary basis.

Depending on the number of equipped vessels the degree of nautical safety is increased by AIS.

The System Components

The equipment described in these Operating Instructions is designed for installation on ships where such installation is mandatory, and meets the relevant requirements. It consists of:

- the UAIS Electronics Unit DEBEG 3400, which contains complex electronics (including two VHF transmitters, a DSC receiver, a GPS receiver and the data processor) but no operating or display elements,
- the VHF antenna,
- the GPS antenna,
- the Display and Control Unit (DCU), on which the operating procedures described here take place, connected to the Primary Display Port, and
- the 24 VDC power supply optionally connected to the ship's emergency power supply which is necessary for the Electronics Unit and DCU.





The Display and Control Unit (DCU)

Targets and AIS Objects

With regard to the objects that can be detected by the AIS system and whose data can be displayed, a distinction is drawn between the following:

- Targets: ships that are equipped with an AIS system, divided into
 - Class A targets: ships that are subject to the SOLAS Convention (see above)
 - Class B targets: all other ships and boats, e.g. including pleasure craft
- SAR aircraft: search-and-rescue aeroplanes or helicopters
- Base stations: shore stations of the AIS system, e.g. traffic control centres

☞ In the equipment described here, SAR aircraft are treated in much the same way as AIS Class A targets, and are mentioned only in those cases where there are differences.

☞ For simplification, this Operating Instructions uses the designation "target(s)" for all ships and objects sending data via AIS.

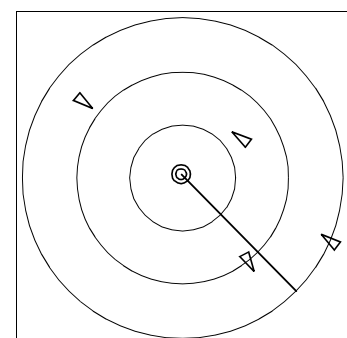
Situation Display

Targets and the own ship symbol can be displayed in a Situation Display. The triangular symbols indicate the headings of the targets.

In addition to the Situation Display, it is also possible to display the data received from a target (e.g. its position, course, speed, heading, name, destination etc.), as well as data determined by the DCU relative to the own ship (range, bearing) - see [Section 3.2](#).

Safety Messages and Long Range Interrogation

Via the, Safety Messages ¹⁾ can be communicated if necessary, which are then passed on by all receiving AIS systems as a message or an alarm to their display units. The procedures for dealing with the Safety Messages received, and for transmitting your own Safety Messages, are described in [Section 4.1](#) and [4.2](#).



Situation Display:
Own ship with heading line,
targets and range rings

¹⁾ Also called Safety Related Messages in the relevant regulations.

The AIS system can also be interrogated about ship data by an (external) system, e.g. via a SatCom system. Details of this are described in [Section 4.3](#).

Monitoring/Setting of the Own Ship Data Transmitted

Most of the information transmitted from your own AIS system is generated automatically by the system. The navigation data necessary for this are received by the AIS system from the connected sensors (e.g. gyro, log, GPS receiver). However, some items of information (e.g. ship's draught, hazardous cargo, destination, ETA) have to be defined by the operator - see [Section 5.1](#).

IMPORTANT

Because these data are voyage-dependent, their updating by the responsible navigator should be assured by including them in the Navigational Check List.

Setting of the communication technique (channel selection, bandwidth, transmission power etc.) usually takes place fully automatically. In very rare cases, however, manual setting procedures too might be necessary for this **channel management** process. For details, see [Section 5.3](#).

Other Operating Possibilities; Pilot Port

The AIS system has yet another interface, called the "Pilot Port", by means of which e.g. the pilot connects a device of his own, from which he can operate the AIS system and can read the desired data.

Scope of Applicability of these Operating Instructions

These Operating Instructions refer to the Display and Control Unit DEBEG 3401 which is approved under the software version stated on the title page in conjunction with the UAIS Electronics Unit DEBEG 3400.

The Pilot Port has the same functions as the Primary Display Port.

 On [page 32](#), there is a description of how the software version of the DCU can be displayed.

2 General Remarks about Operating Procedures and Display

The AIS Electronics Unit continually broadcasts the own ship data (i.e. position, speed, course etc.) which can be received by all other AIS stations in VHF range.

The information is displayed on the **Display and Control Unit DCU**. The Electronics Unit and the DCU are independent of each other i.e. the Electronics Unit will work (send and receive) even when the DCU is switched off.

Other installations are available, where the radar system or the ECDIS is used as display and operating unit for the AIS functions.

2.1 Switching the Display and Control Unit On and Off

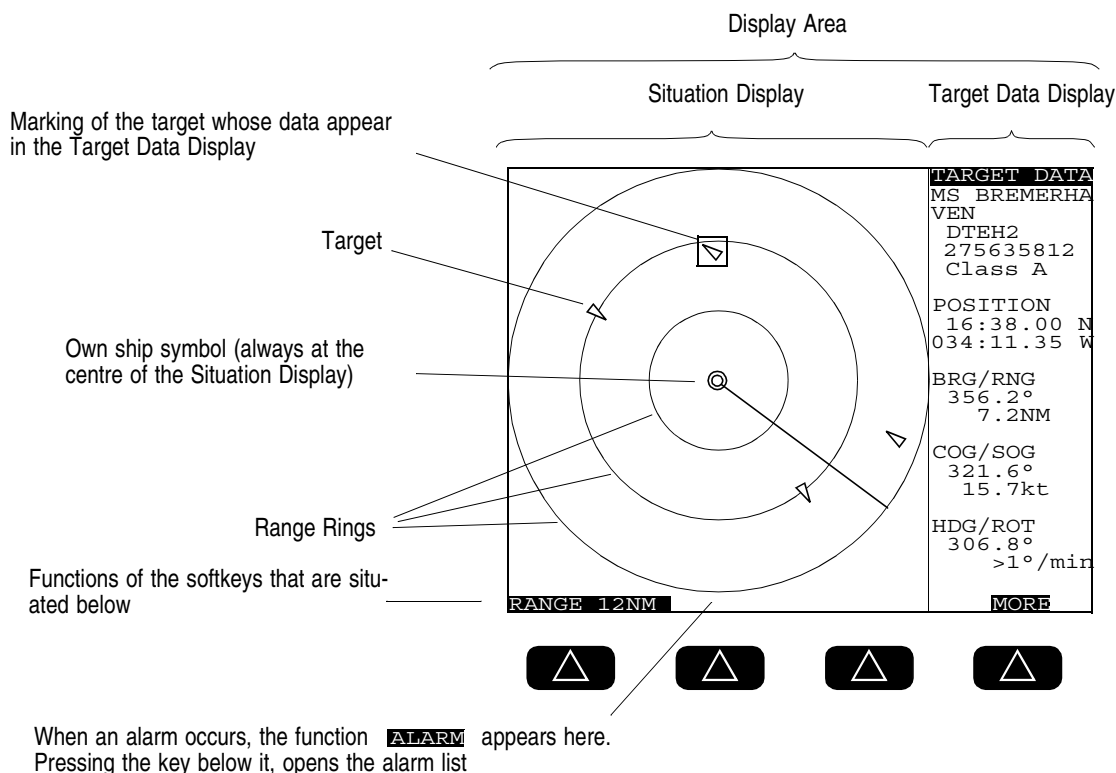
Switching the DCU on and off is done by pressing the **ON/OFF** key.

At the instant of switching on, the brightness setting that existed when the unit was switched off last is taken over. Therefore, it can happen that, after switch-on, the display remains dark and the keys are not lit up. Therefore, in a dark room it is then not possible to recognise that the unit is in the switched-on state. The display can be made brighter by pressing the **0** key; see also [Section 2.7](#).

ON/OFF

2.2 Situation Display and Target Data Display

Shortly after switching on, the operational display appears in the Display Area, showing the Situation Display and the Target Data Display:



In the Situation Display, the own ship symbol and the target symbols are displayed at the correct positions in north-up display mode. The target symbols each indicate the heading of the target (ship). The own ship symbol is always situated at the centre of the display. For details, see [Section 3.1](#).

After switch-on, the Target Data Display first shows the own ship data. It is then possible to display the data received from each target, one target at a time; for details, see [Section 3.2](#).

 The target data are transferred at defined time intervals. The interval between transfers depends on the speed and rate of turn of the target: for the data from which the DCU generates the target symbols, the interval lies between 2 seconds (the target speed exceeding 23 kt) and 3 minutes (when lying at anchor).

Setting the range: With the left-hand key of the keys situated under the display, set the desired range (1.5, 3, 6, 12 or 24 NM) by pressing that key (several times if necessary). The radius of the outer Range Ring corresponds to the set value.

2.3 Menu and Dialogs

The default information displayed on the DCU consists of the Situation Display and the Target Data Display. All other data displays and operating procedures take place in the various dialogs which can be operated via the menu.

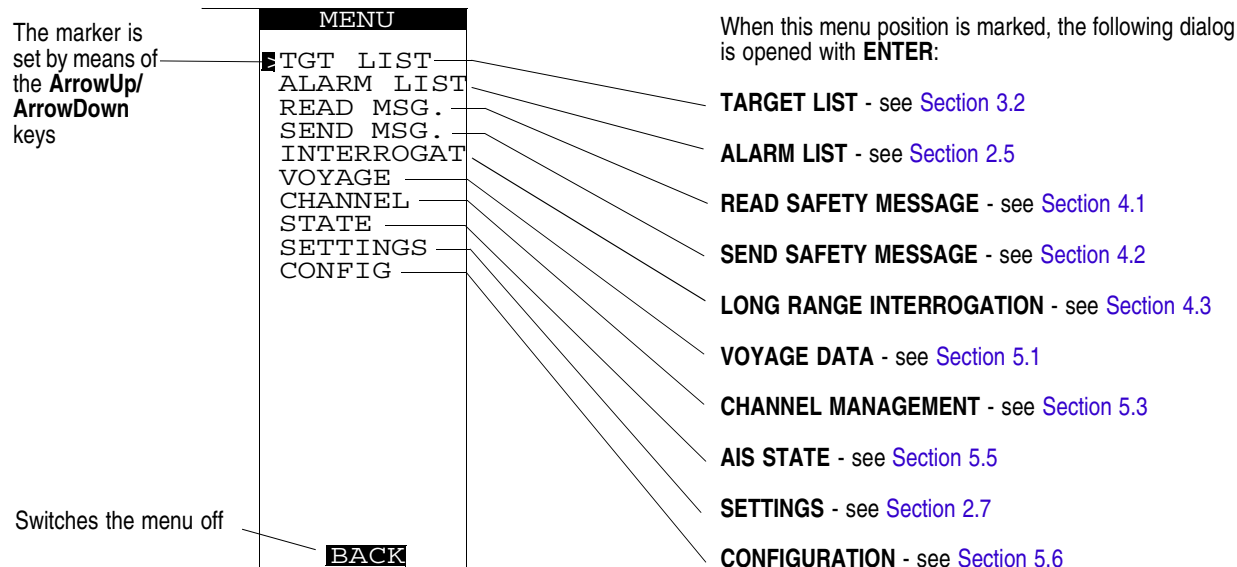
 The menu covers the Target Data Display; dialogs take up the entire display area.

Showing a dialog: By pressing the **MENU** key, switch on the menu; in the menu, mark the desired dialog by means of the **ArrowUp/ArrowDown** keys, and press the **ENTER** key.

Switching off the dialog display: This is done in different ways in the various dialogs, depending upon whether data inputs can take place in the dialogs or whether only pure displays are involved.

In addition to these specific methods described in the following sections, a dialog can always ¹⁾ be switched off by pressing the **MENU** key. Dialogs in which data inputs are possible are aborted by this action, i.e. data that have been entered are not taken over.

The Menu



¹⁾ But not during editing

2.4 Keyboard

The keyboard consists of the following areas:

Alphanumeric Keyboard

With this keyboard, numerical values and texts can be entered (edited) in particular fields of the dialogs. For details of editing, see [Section 2.6](#).



In addition, the **ENTER** key has special significance. Generally, it activates a marked function:

- In the Situation Display, the data of the marked target or marked own ship are displayed.
- In the menu, the marked dialog is called up.
- In the dialog, the marked field is opened for editing.
- In the case of editing, the changes made in this field by editing are put into intermediate storage and this editing field is closed.

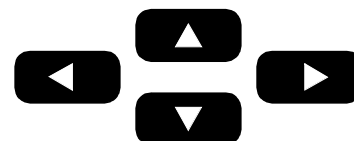
The **0** key too has another function over and above the editing function: it can be used to set the illumination of the display without opening the respective dialog- see [Section 2.7](#).



Arrow Keys

With these, a selection can be made:

- In the Situation Display, a target or own ship is marked with the aid of the four keys.
- In the menu, these keys are used to mark the dialog to be opened. In the dialogs, they are used to mark the field that is to be edited. During this process, the **ArrowUp/ArrowDown** keys make the marker jump to the previous or next field that can be marked, and (in most dialogs) the **ArrowRight/ArrowLeft** keys make the marker jump to the bottom or top field that can be marked.
- In particular editing fields, the **ArrowUp/ArrowDown** keys can be used to change the value or to select one of the possible entries.
 In these cases, the message **Use arrow keys** appears in the dialog.
- In the other editing fields, the **ArrowRight/ArrowLeft** keys can be used to change the position of the editing cursor.



The Softkeys

The four keys situated below the display possess functions which depend on the operating situation. The function involved is shown inverted in the bottom line of the display. These functions are explained in the individual sections of these Operating Instructions.



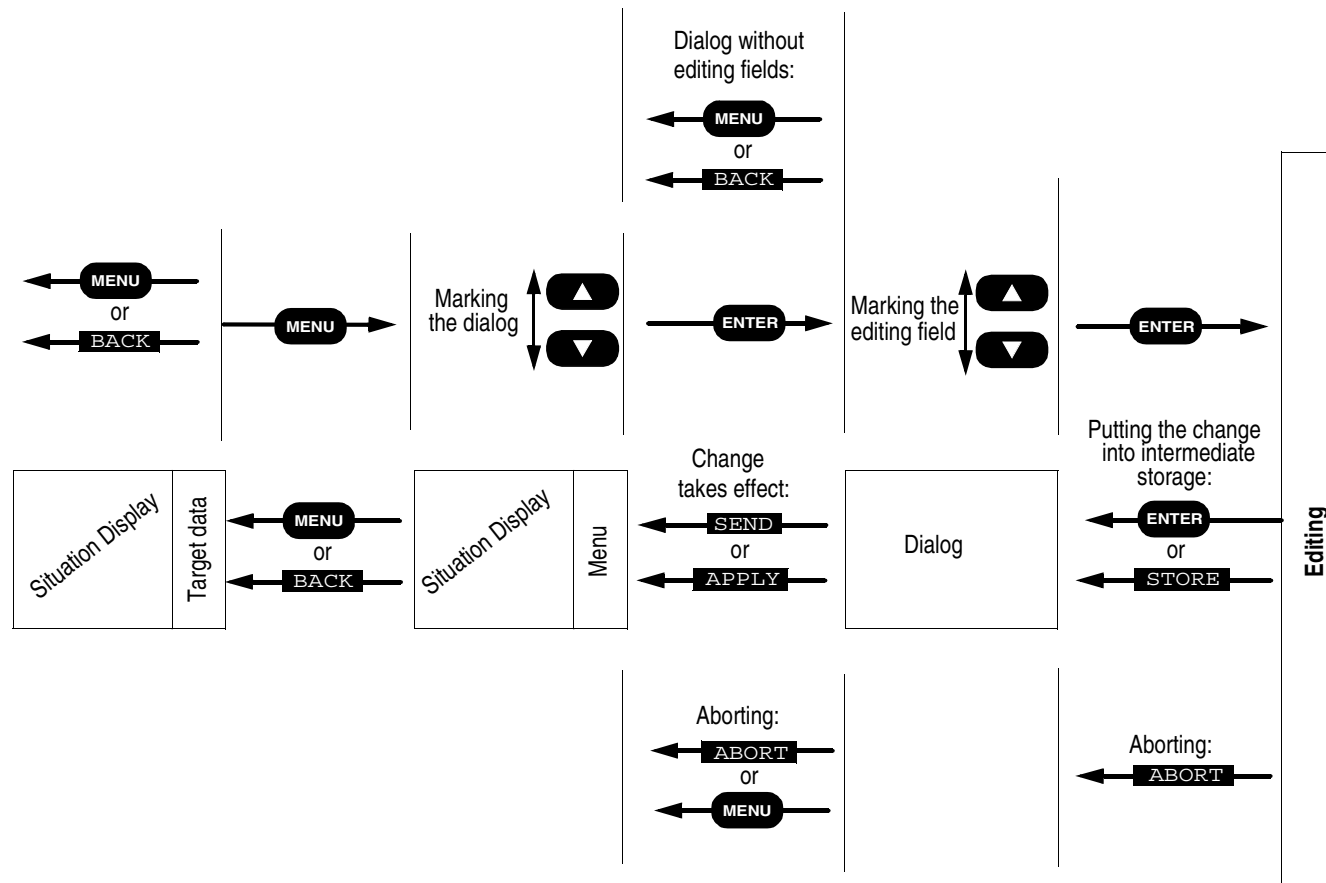
The MENU Key

With this key, the menu is switched on and off. If there is a dialog open, this key aborts it. In the case of editing, the **MENU** key has no effect.



Summary

For the opening and closing of the dialogs and of the editing fields, the statements made above can be summarised schematically as follows:



2.5 Alarm Handling

When a Safety Message or a Long Range Interrogation is received, for example, or if a technical fault occurs, an alarm will be displayed.

Alarm handling is identical for all alarms:

Operating Sequence

1. When an alarm occurs, a softkey acquires the function **ALARM**.
2. After this softkey is pressed, the dialog **ALARM LIST** and the alarm message will be displayed.

If further alarms exist that have not yet been acknowledged or if the causes of acknowledged alarms still exist, these alarm messages are likewise contained in the list. Alarms that have not yet been acknowledged are indicated with **not** in the **ACK** column.
3. By pressing **ACKNOWLEDGE**, the selected alarm will be acknowledged. This is normally the alarm on top of the list. Other alarms can be selected by pressing the **arrow** keys.

To leave the alarm list, **BACK** has to be pressed.



The **ALARM LIST** dialog can also be viewed at any time irrespective of the occurrence of an alarm:

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **ALARM LIST** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.

Back: Press **BACK** twice.

List of Alarm Messages

Channel management changed:	see page 28
Long range interrogation:	see page 26
New safety message:	see page 21
Safety msg transmission failed:	see page 24
Target display overflow:	see page 17
Target overflow:	see page 19

If other alarms appear, they indicate technical faults; see also [page 32](#).

2.6 The Editor; Entering Numbers and Texts

Dialog fields whose content can be edited can be marked with the prefixed character **■** by means of the **arrow** keys.

In general:

- For data input press **ENTER**. The field to be edited is marked by means of a frame.
- During data input, pressing **ENTER** causes take-over (intermediate storage) of the content and closing of the editing field.
- During data input, pressing **ABORT** causes rejection of the content and closing of the editing field. The previous content is inserted again.

Other possibilities for changing the content of the editing field are:

Selection Fields

These fields can be recognised from the fact that the message **Use arrow keys** appears in the line above the softkey names.

With the **ArrowUp/ArrowDown** keys, you can select between the possible settings.

Numerical Input Fields

In the editing field that is open, the (flashing) editing cursor indicates the place at which input takes place by means of the numerical keyboard.

With the **C** key, the character at the cursor position is replaced by a blank (Clear function).

With the **ArrowRight/ArrowLeft** keys, the position of the editing cursor can be changed.

With **CLEAR ALL**, the content of the editing field is deleted.

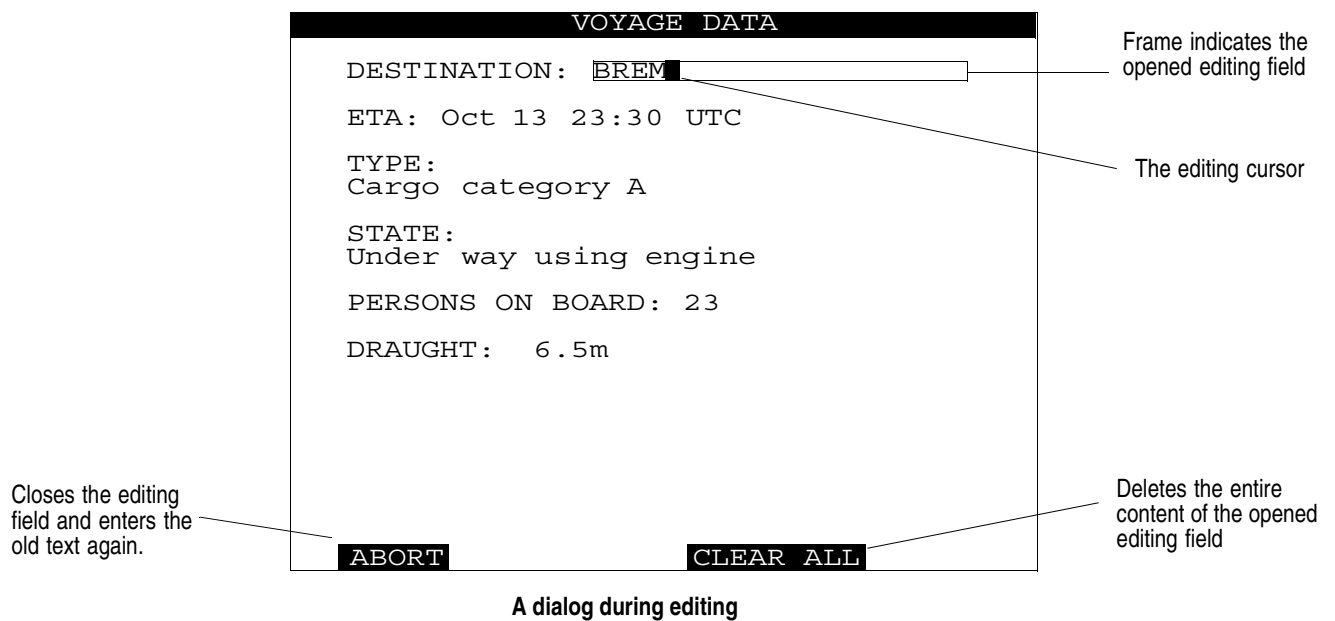
Fields for Text Input

The editing possibilities are the same as for the numerical fields.

By the pressing of an alphanumeric key, the first of the letters shown on the key is written first of all. By the pressing of this key repeatedly in rapid succession, the other characters can be written instead.

The **blank** and the **characters . , ? : " () 0** are entered with the key **0**.

The **characters - + = > < @ 1** are entered with the key **1**.



2.7 Setting the Brightness

The background illumination of the display and of the keyboard can be set separately. The setting procedure is performed in the **SETTINGS** dialog by means of the **ArrowUp/ArrowDown** keys in the fields **KEYBOARD BRIGHTNESS** and **DISPLAY BRIGHTNESS**.

Operating Sequence

1. Press **MENU**.
 2. In the menu, mark **SETTINGS** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
 3. In the **SETTINGS** dialog, mark the field **KEYBOARD BRIGHTNESS** or **DISPLAY BRIGHTNESS** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
 4. Set the brightness by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
- Back: Press **BACK** twice.

If the display is dimmed too dark it can be illuminated again by pressing the **0** key.

Switches the transmitter on and off - see [Section 5.4](#)

Switches the display of Equipment Class B on and off - see [Section 3.3](#)

Setting the keyboard brightness

Setting the display brightness

SETTINGS	
TRANSMITTER COMPLETELY:	On
DISPLAY CLASS B TARGETS:	On
☒ KEYBOARD BRIGHTNESS:	1
DISPLAY BRIGHTNESS:	9
BACK	

3 Target Handling

3.1 Display of the Targets in the Situation Display

When a target enters the range of the Situation Display, it appears there as a sharply pointed triangle. The orientation of the symbol indicates the heading of the target.

In the Situation Display, a maximum of 30 targets can be displayed simultaneously. If the Electronics Unit is receiving data from more than 30 targets, the 30 targets nearest to own ship are displayed (provided that they are situated within the range shown by the Situation Display) and the alarm **Target display overflow** appears.

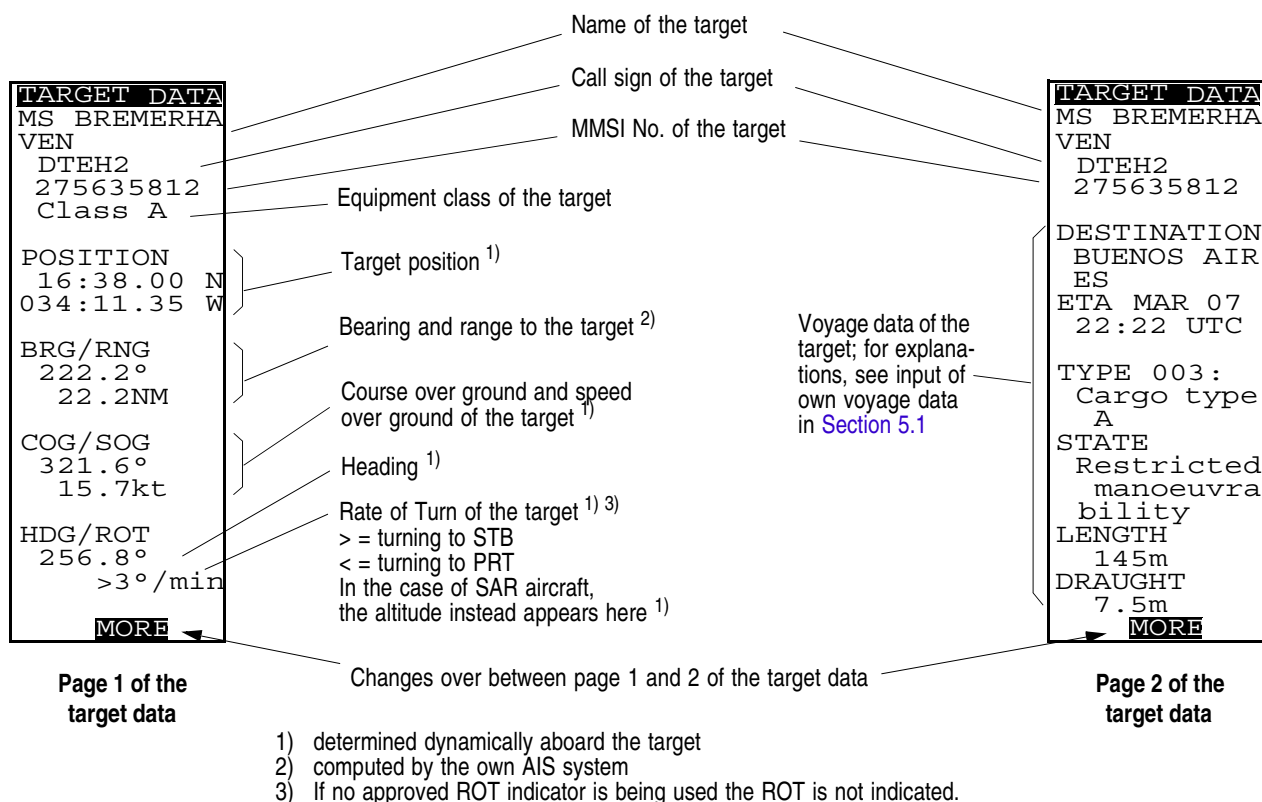
Targets, not displayed graphically can be accessed via the Target List.



3.2 Displaying Data of a Target in the Target Data Display

Except the menu or a dialog is displayed, the data of a target (or own AIS data) are shown in the Target Data Display.

In the Situation Display, the selected target (or own ship) display is marked with an additional square.



Initially, the first data page of the selected target is displayed. The change-over to the second data page and back again takes place with **MORE**.

To specify the source of the data that are to be displayed, there are two possible operating procedures:

Selection by means of the ENTER key:

By repeated pressing of **ENTER**, the displayed targets (and own ship) are marked one after another and the corresponding data are displayed.

Selection by means of arrow keys:

Press one of the **arrow** keys. As a result, the cursor appears in the Situation Display. The point of intersection between both lines is cursor position. To select the target move the cursor to the target by means of the **arrow** keys, and press **ENTER**.

 If the interval between the pressing of the keys is longer than 5 seconds, the cursor disappears.

3.3 Displaying Targets of Equipment Class B

The display of the Class A targets (ships to which the provisions of the SOLAS Convention apply) is always switched on and cannot be deactivated.

Class B targets too (ships to which the provisions of the SOLAS Convention not apply and which are equipped with an AIS system) can be displayed.

Switching the display of Class B targets on and off is done in the **SETTINGS** dialog, in the field **DISPLAY CLASS B TARGETS**.

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **SETTINGS** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
3. In the **SETTINGS** dialog, mark the field **DISPLAY CLASS B TARGETS** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
4. Set the entry to **On** or **Off** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.

Back: Press **BACK** twice.

The restricted number of displayable targets includes also Class B targets i.e. thus, when the Class B targets are switched on, this can make Class A targets disappear from the displays. Depending on the nautical situation it may be recommendable to deselect the Class B targets.

3.4 Listing All Targets

All targets from which data are being received are listed in the dialog **TARGET LIST**. In that list, not only the name ¹⁾ but also the range, bearing and equipment class of each target are stated.

If data are being received from more than 15 targets, the list is organized in pages. Turn over the pages by means of **NEXT**.

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **TGT LIST** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.

Back: Press **BACK**.

The maximum length of the Target List is limited to 300 targets. If more targets than that are received, the alarm **Target overflow** appears.

1/5 = page 1 of 8

TARGET LIST 1/8				
NAME OR MMSI	RNG	BRG	CLASS	
MS ETAGAS	0.9NM	036°	A	
MS RHONESTEIN	6.3NM	245°	A	
223782659	11.6NM	013°	B	
MS PURPLE BEACH	4.8NM	345°	A	
337289165	5.4NM	167°	B	
MS PACIFIC DISCOVERY	3.9NM	235°	A	
MS MERCS KOMARI	22.1NM	189°	A	
TMS WELLS	16.1NM	311°	A	
272839973	14.6NM	320°	A	
MS MARITTIMA	2.8NM	022°	A	
MS DIAMOND STAR	0.5NM	274°	A	
MS GRACE CHURCH METE	1.3NM	046°	A	
MS MEKONG MEKONG	2.6NM	267°	A	
MS ORION	4.8NM	156°	A	
MS SUNBAY	16.9NM	026°	A	

Equipment class of the target

Back to the menu

NEXT **BACK**

Page selection
NEXT exists only if more than 15 targets are being received

All targets from which data are being received

¹⁾ If the target is not transmitting the ship's name (because that name has not been entered as voyage data - see [Section 5.1](#)), the MMSI number of the target appears here.

4 AIS Messages

4.1 Receiving Safety Messages

When the AIS system receives a Safety Message from another ship or base station, the alarm **New safety message** appears.

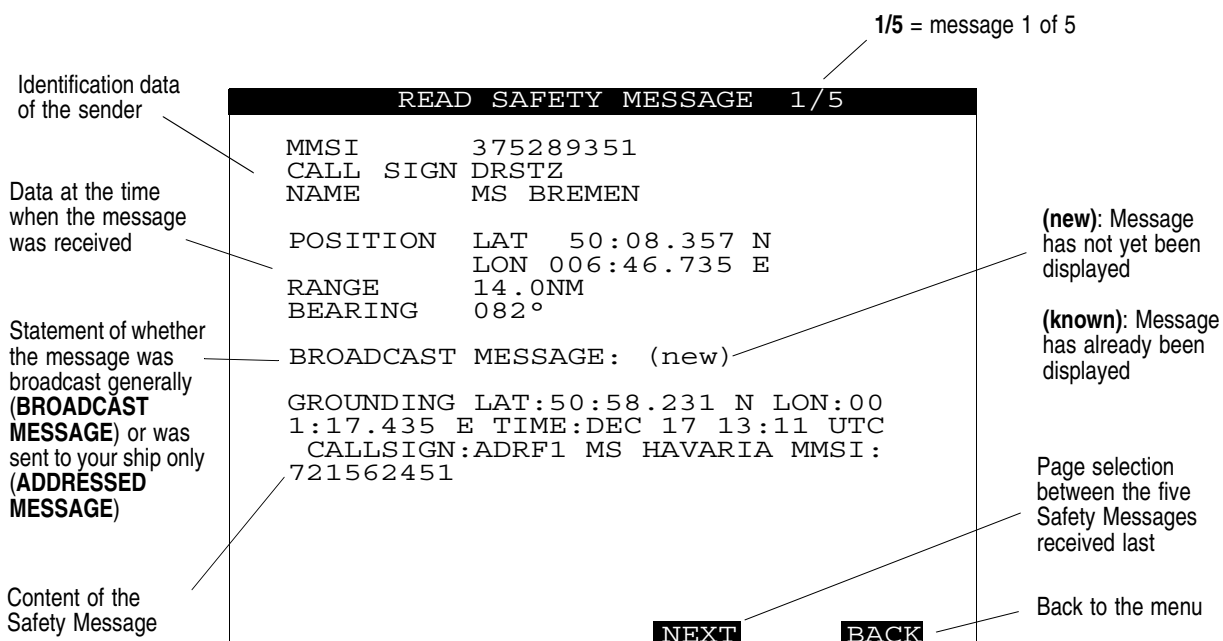
After the alarm acknowledgement, the received message is displayed in the dialog **READ SAFETY MESSAGE**, together with the identification data of the sender.

Operating Sequence

1. Press **ALARM**.
2. In the dialog **ALARM LIST**, acknowledge the marked alarm-message **New safety message** by pressing **ACKNOWLEDGE**.

As a result, the dialog **READ SAFETY MESSAGE** opens up, in which the received message is displayed together with the identification data of the sender.

Back: Press **BACK** twice.



Display of the Messages Received Last

The last received five Safety Messages can be displayed. Switch-over is performed by means of **NEXT**. Messages that have not yet been displayed are marked (new). Messages which have already been displayed are marked (known).

☞ If several messages have been received before the alarm list is opened, no alarm repetition takes place for the messages which have already been viewed in this way.

The dialog **READ SAFETY MESSAGE** can also be viewed at any time irrespective of the occurrence of a new safety message:

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **READ MSG.** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.

Back: Press **BACK** twice.

4.2 Transmitting Safety Messages

If necessary, a Safety Message can be transmitted to targets, SAR aircraft and base stations. This Safety Message is a freely edited text (max. 160 characters per message). The message can be broadcast generally or transmitted to a particular AIS object.

4.2.1 Broadcasting a Message

In the **SEND SAFETY MESSAGE** dialog, set the entry **TO ALL** to **On**, edit the message in the message field, and send the message by pressing **SEND**.

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **SEND MSG.** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
3. Then, in the **SEND SAFETY MESSAGE** dialog:
4. If **Off** is entered in the **TO ALL** field:
 - Mark the **TO ALL** field by means of the **ArrowUp/ArrowDown** keys; press **ENTER**;
 - with one of the **arrow** keys, set the entry to **On**; and press **ENTER**.
5. With the **ArrowUp/ArrowDown** keys, mark the **MESSAGE** field, and edit the message. Complete the editing process by means of **ENTER**.
6. Press **SEND**.

Back: Press **BACK**.

TO ALL: On: The message is broadcast to all ships.
TO ALL: Off: The message is sent to the receiver entered in the line **ADDRESSED TO MMSI**; there, enter the desired MMSI if appropriate

Input-field for the message (continuous text, max. 160 characters)

During editing: Aborts the editing.
 Otherwise: Back to the menu; the edited message is not sent

The message is sent

SEND SAFETY MESSAGE

TO ALL: Off

ADDRESSED TO MMSI: 472819522

MESSAGE :

ABORT
SEND

4.2.2 Sending an Addressed Message

The addressee can be selected graphically in the Situation Display or by means of a dialog entry.

Graphical Selection of the Addressee

Display target data of the addressee in the Target Data Display - see [Section 3.2](#). Call up the dialog **SEND SAFETY MESSAGE** and set the entry **TO ALL** to **Off** ¹⁾. In the message field, edit the message; and by pressing **SEND**, send the message.

Operating Sequence

1. Display the target data of the addressee in the Target Data Display - see [Section 3.2](#).
 2. Press **MENU**.
 3. In the menu, mark **SEND MSG.** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
- Then, in the **SEND SAFETY MESSAGE** dialog:
4. If **On** is entered in the **TO ALL** field:
 - Mark the **TO ALL** field by means of the **ArrowUp/ArrowDown** keys and press **ENTER**
 - with one of the **arrow** keys, set the entry to **Off** and press **ENTER**.
 5. With the **ArrowUp/ArrowDown** keys, mark the **MESSAGE** field, and edit the message. Complete the editing process by means of **ENTER**.
 6. Press **SEND**.
- Back: Press **BACK**.

¹⁾ If **TO ALL** is at **Off**, the line **ADDRESSED TO MMSI** appears. This line initially shows the MMSI number of the target whose data were displayed in the Target Data Display before the menu was opened.

Alphanumeric Selection of the Addressee

Call up the dialog **SEND SAFETY MESSAGE**, and set the entry **TO ALL** to **Off**. In the **ADDRESSED TO MMSI** field which is displayed, enter the MMSI number of the addressee. In the message field, edit the message; and by pressing **SEND**, send the message.

Operating Sequence

1. Press **MENU**.
 2. In the menu, mark **SEND MSG.** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
- Then, in the **SEND SAFETY MESSAGE** dialog:
3. If **On** is entered in the **TO ALL** field:
 - Mark the **TO ALL** field by means of the **ArrowUp/ArrowDown** keys and press **ENTER**
 - with one of the **arrow** keys, set the entry to **Off** and press **ENTER**.
 4. With the **ArrowUp/ArrowDown** keys, mark the **ADDRESSED TO MMSI** field and press **ENTER**.
 5. Enter the MMSI number of the addressee there, and press **ENTER**.
 6. With the **ArrowUp/ArrowDown** keys, mark the **MESSAGE** field, and edit the message. Complete the editing process by means of **ENTER**.
 7. Press **SEND**.

Back to the Situation Display: Press **BACK**.

If, after the pressing of **SEND**, the transmission of the message fails to take place, the alarm **Safety msg transmission failed** appears.

-  The cause of this can be that an incorrect MMSI number has been entered and that, as a result, no confirmation of reception has been received from the addressee.

4.3 Long Range Interrogation

The AIS system can also be interrogated about own ship data by other systems than AIS via SatCom. Because this interrogation can take place over longer distances than the VHF range, it is called "Long Range Interrogation".

The interrogating station specifies which data are requested. ¹⁾

The required reaction of the AIS system can be set by means of the Reply Mode, see [Section 4.3.1](#).

Display of the Interrogation Received

The interrogation received last can be displayed in the dialog **LONG RANGE INTERROGATION**.

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **INTERROGAT** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**. The interrogation received last is displayed.

Back: Press **BACK** twice.

Here, the behaviour on receiving a Long Range Interrogation is specified with the Reply Mode (**Off**, **Manual**, **Auto** - see below).

The requesting party

Data requested

Exists only in Reply Mode Manual:
Prevents answering of the interrogation

LONG RANGE INTERROGATION	
☒	REPLY MODE: Manual
INTERROGATOR:	
MMSI: 352771827	
NAME:	
REQUESTED INFORMATION: (not replied)	
Ships's: name, call sign, IMO No.	
Date and time	
Position	
Course over ground	
Speed over ground	
Destination and ETA	
Draught	
Ship/Cargo	
Ship's: length, breath, type	
Persons on board	
NO REPLY	REPLY

(not replied): The interrogation has not been answered

In Reply Mode Manual: Button **REPLY** exists. It answers the interrogation.

In Reply Mode Auto: Button **BACK** exists. The interrogation has already been answered; back by means of **BACK**.

¹⁾ Such interrogations can take place from shore stations, e.g. from shipping companies, traffic control centres or governmental organisations, but not from the AIS systems that are usually found on board.

4.3.1 Setting of the Reply Mode

In the **REPLY MODE** field, it is possible to select between:

Off: The Electronics Unit only registers (and stores) the interrogation. No alarm appears, and no reply is sent.

Manual: in the case of an interrogation, the alarm **Long range interrogation** appears. By acknowledgement, the dialog **LONG RANGE INTERROGATION** appears showing the data of the interrogator and the requested information. The reply is sent by means of **REPLY** or is instead prevented by means of **NO REPLY**.

Auto: In the case of an interrogation, the reply is sent automatically. For the purpose of information, the alarm **Long range interrogation** appears. By acknowledgement, the dialog **LONG RANGE INTERROGATION** appears showing the data of the interrogator and the requested information.

In the dialog **LONG RANGE INTERROGATION**, the Reply Mode is set and activated by pressing **BACK**.

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **INTERROGAT** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**. The interrogation received last is displayed.
3. In the **LONG RANGE INTERROGATION** dialog, mark the **REPLY MODE** field by means of the **ArrowUp/ArrowDown** keys. Press **ENTER**.
4. With the **ArrowUp/ArrowDown** keys, set the Reply Mode. Press **ENTER**.

Back: Press **BACK** twice.

4.3.2 The Alarm Long Range Interrogation

When an interrogation is received, the alarm **Long range interrogation** appears (unless the Reply Mode is set to **Off**). By acknowledgement of the alarm, the interrogation is displayed.

If the Reply Mode is set to **Manual**, the reply can be prevented by means of **NO REPLY** or can be triggered by means of **REPLY**.

If the Reply Mode is set to **Auto**, the displayed interrogation has been answered already is merely registered.

Operating Sequence in Case of an Alarm

1. Press **ALARM**.
2. In the **ALARM LIST** dialog, acknowledge the marked alarm message **Long range interrogation** by pressing **ACKNOWLEDGE**.
3. As a result, the dialog **LONG RANGE INTERROGATION** opens up.
 - Press **REPLY** if the interrogation is to be answered, or
 - press **NO REPLY** if the interrogation is not to be answered, or (if the Reply Mode **Auto** is switched on)
 - press **BACK**.

Back: Press **BACK**.

5 AIS Settings, Voyage Data and Other Displays

5.1 Setting the Voyage Data

Most of the data that are sent by your own AIS system for the purpose of target data display on other ships are generated automatically by the system (e.g. identification data, position etc.). However, some items of information (e.g. ship's draught, cargo, destination, ETA) are of varying nature and therefore have to be defined by the operator.

IMPORTANT

The following data must be entered at the beginning of every voyage, and must (if necessary) be updated during the voyage.

The screenshot shows a dialog box titled "VOYAGE DATA" with the following fields and values:

- DESTINATION:** BREMEN
- ETA:** Oct 13 23:30 UTC
- TYPE:** Cargo category A
- STATE:** Under way using engine
- PERSONS ON BOARD:** 23
- DRAUGHT:** 6.5m

Annotations on the left side of the dialog box:

- A bracket on the left side of the dialog box points to the fields and contains the text: "These data must be entered at the beginning of every voyage, and must be updated during the voyage (if necessary)."
- A line points from the text "During editing: Aborts the editing. Otherwise: Alterations made are rejected" to the **ABORT** button.
- A line points from the text "Alterations become active." to the **APPLY** button.

Input of the voyage-dependent own data takes place in the dialog **VOYAGE DATA**:

DESTINATION: Destination of this voyage

ETA: Estimated time of arrival at the specified destination

TYPE: Ship type and (if applicable) the hazardous cargo

STATE: Navigational state

PERSONS ON BOARD: The number of persons on board.

DRAUGHT: The existing draught

 In the display fields **TYPE** and **STATE**, it is only possible to choose between specified entries which are defined by the relevant authorities. This selection is done by means of the **arrow** keys after the appropriate field has been opened by means of **ENTER**.

Operating Sequence

1. Press **MENU**.
 2. In the menu, mark **VOYAGE** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
 3. In the **VOYAGE DATA** dialog, use the **ArrowUp/ArrowDown** keys to mark the field that is to be altered, and alter the content. Complete the editing process by means of **ENTER**.
 4. If necessary, repeat the process for other fields as well.
- Back: Press **APPLY**, and then press **BACK**.

5.2 Displaying Own AIS Data

The AIS data currently being sent by own system can be partially viewed in the Target Data Display. The display occurs if, in the Situation Display, the own ship symbol is marked instead of a target (see [Section 3.2](#)).

5.3 Channel Management

The AIS Electronics Unit has two redundant VHF transceivers ¹⁾ (Channel A and Channel B), by which all AIS data described are transmitted and received. For the communication, various VHF channels are possible.

The AIS system cannot function unless all AIS systems communicate on the same VHF channels and unless the communication bandwidth and the transmission level are correctly set. The settings needed for this are normally made automatically as described in the following. It is also possible to make a setting manually, but this should only be done in exceptional cases after the ship's command personnel have been informed accordingly.

Automatic Setting Procedure

As default values, **VHF channels 2087 and 2088** are used, the bandwidth setting is **Auto**, and transmission is performed with power level **High**; transmission and reception take place on both channels.

In particular situations or geographical regions, it is necessary to deviate from these settings. The necessary values are received by the AIS system from a base station either

- via DSC (VHF channel 70). For this purpose, each AIS system has an additional DSC receiver or
- via one of the VHF transceivers.

The data set received in this way also contains the information about the region in which these settings are to be used, including the **transition zone** surrounding that region.

As soon as the ship reaches one of the regions defined in the stored data sets, the AIS system uses the settings of the relevant data set. When the ship leaves the transition zone defined in that data set, there is a switch-over back to the default values or a switch-over to the data defined for that region.

 As soon as the Electronics Unit uses a different data set, this fact is indicated by the alarm **Channel management changed**.

¹⁾ In fact, it contains two receivers and only one transmitter. By automatic frequency-selection, the transmitter can, in effect, be operated with both receivers simultaneously. Therefore, for the sake of simplicity, it is possible to speak of "two transceivers" here.

Viewing of Data Sets for the Electronics Unit Settings

The data set that is currently being used by the Electronics Unit is displayed if the **CHANNEL MANAGEMENT** dialog is opened.

In the top line, the status of the displayed data set is indicated there:

Before **DATA SET**:

- **DEFAULT**: Default values
- **AIS**: Data have been received via one of the VHF transceivers.
- **DSC**: Data have been received via the DSC transceiver.
- **MANUAL**: Data have been entered manually.

After **DATA SET**:

- **USED**: The data currently being used by the Electronics Unit
- **NOT USED**: Data are currently not being used by the Electronics Unit.
- **EDITED**: The displayed data have been altered manually but have not yet been stored.

Below that, the settings of the two VHF transceivers are shown, as well as the geographical region and the transition zone.

If the transceiver has stored several data sets, these can be displayed by means of **NEXT**.

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **CHANNEL** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
3. If necessary, display the other data sets by means of **NEXT**.

Back: Press **ABORT**, and then press **BACK**.

1/5 = data set 1 of 3

Changes occur only in exceptional cases after the ship's command personnel have been informed; for explanations, see text

Changes over to the other data sets. Bottom exists only if several data sets are available.

Alterations made are rejected

CHANNEL MANAGEMENT 1/3		
DEFAULT DATA SET USED		
	CHANNEL A	CHANNEL B
TRANSMITTER:	On	On
RECEIVER:	On	On
CHANNEL No.:	2086	2087
BANDWIDTH:	12.5kHz	12.5kHz
TRANSMISSION POWER LEVEL: High		
REGION:	NORTHEAST	SOUTHWEST
LAT	55:34.00 N	55:30.00 N
LON	037:48.00 W	037:44.00 W
TRANSITION ZONE: 1NM		
ABORT	NEXT	APPLY

Generates a new data set. Bottom exists only if data has been changed.

Entering a Data Set Manually

WARNING

Changes of the VHF channels in use (by entering a data set) shall be done by authorised and well skilled personnel only. Each change may have a serious influence on the VHF communication between AIS systems.

A new data set occurs when, in the **CHANNEL MANAGEMENT** dialog, values are changed in the data set currently being used (status ... **DATA SET USED**) and the dialog is closed by means of **APPLY**.

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **CHANNEL** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
3. In the **CHANNEL MANAGEMENT** dialog, use the **ArrowUp/ArrowDown** keys to mark the field that is to be altered, alter the content. Complete the editing process by means of **ENTER**.
4. If necessary, repeat the process for other fields as well.

Back: Press **APPLY**, and then press **BACK**.

5.4 Switching Off the Transmitter

If necessary, the transmitting of AIS data can be completely prevented without generating a Channel Management data set. This is done in the **SETTINGS** dialog by setting the field **TRANSMITTER COMPLETELY** to **Off**.

CAUTION

The transmitter should not be switched off except in justified exceptional cases, because when it is switched off, own ship can no longer be detected as a target by other ships and cannot participate in the communication between ships, equipped with AIS.

 The status **TRANSMITTER COMPLETELY On/Off** is stored with date and time and can also be called up after an accident at sea.

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **SETTINGS** by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.
3. In the **SETTINGS** dialog, use the **ArrowUp/ArrowDown** keys to mark the field **TRANSMITTER COMPLETELY** and press **ENTER**.
4. Alter the content by means of the **ArrowUp/ArrowDown** keys and press **ENTER**.

Back: Press **BACK** twice.

5.5 Displaying the AIS State

The status of the sensors connected to the Electronics Unit is displayed in the dialog **AIS STATE**.

External means that the GPS receiver connected externally to the AIS Electronics Unit is being used for this purpose.

Internal means that the internal GPS receiver in the AIS Electronics Unit is being used for this purpose.

ROT: Other source means that an approved ROT sensor is not being used, and so only the direction but not the rate of the heading change is transmitted. In this case, only the direction of turn (port/starboard manoeuvre) is displayed.

AIS STATE	
UTC:	Clock OK
POSITION:	External DGNSS
SOG/COG:	External
HEADING:	Valid
ROT:	Other source
BACK	

Operating Sequence

1. Press **MENU**.
 2. In the menu, mark **STATE** by means of the **ArrowUp/ArrowDown** keys; press **ENTER**
- Back: Press **BACK** twice.

5.6 Determining the Versions of the Software

In the dialog **CONFIGURATION**, among other things the version of the unit's software can be indicated.

Operating Sequence

1. Press **MENU**.
2. In the menu, mark **CONFIG** by means of the **ArrowUp/ArrowDown** keys; press **ENTER**
3. Press **NEXT** several times until the page with the entry of the software version of the DCU and of the AIS Electronics Unit.

Back: Press **ABORT**, and then press **BACK**.

 On the other pages of this dialog, settings are displayed which have been made during installation of the equipment or during a later service activity - see the Technical Manual of the DCU. These settings can only be altered after the service password has been entered.

5.7 Built-in Test Equipment

If any failure or malfunction is detected by the built-in test equipment that could reduce integrity or stop operation of the AIS Electronics Unit or the DCU, an alarm with an appropriate message or the alarm **Fault xxxx** is displayed. Here, **xxxx** stands for a four-figure number, the **Fault Code**. This number is listed in the Technical Manual of the DCU. There, the measures that might be necessary are also described.

Notes

Space for your notes:

