Operation Manual

UAIS Transponder System

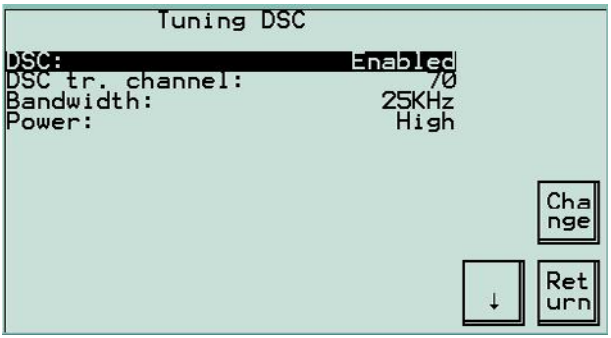
3.19 DSC Tuning Menu

UAIS can receive and process DSC information sent by Base stations. Periodically lists of geographical regions and their associated parameters are transmitted on the DSC channel. DSC is normally set to Channel 70.

Methods of tuning DSC:

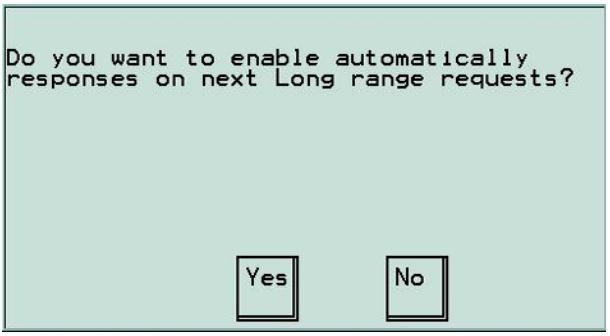
DSC command from coastal station.

Manually from the VDU.



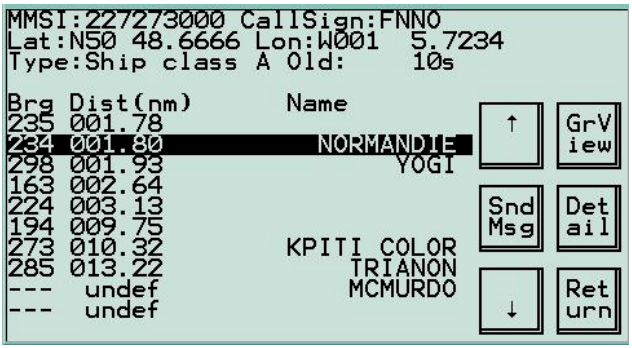
3.20 Long Range Request Menu

This feature is only available with a specialised interface to a suitable source.

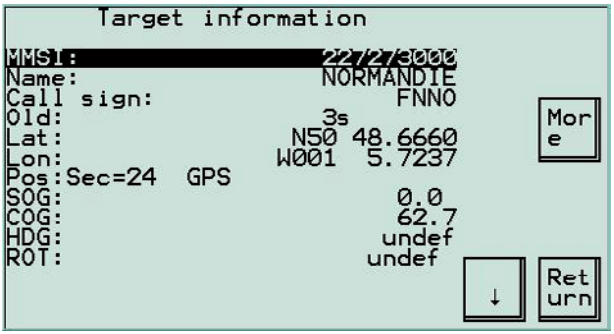


3.21 Other Stations Menu

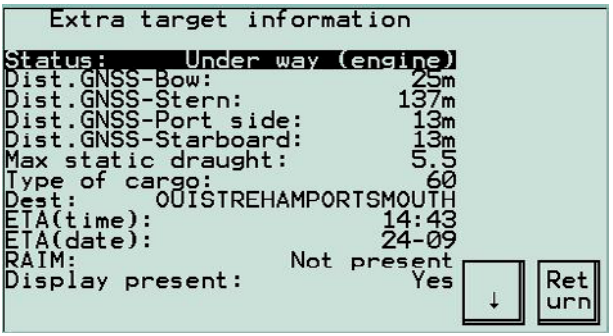
This is the main working menu that displays information on all the received targets. These targets can be viewed in three ways; as a list of vessel names along with Bearing and Distance, more detailed information about individual vessels or as a 'radar-style' overview.



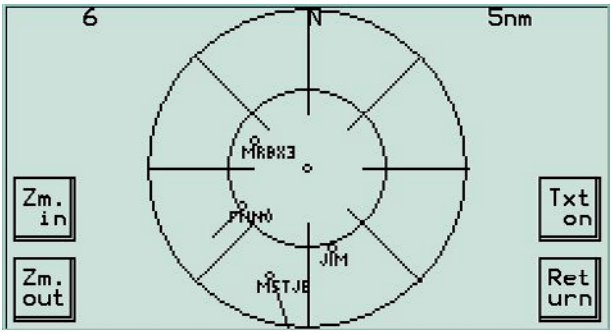
Individual targets can be viewed in more detail in 2 ways. Highlight a target; at the top of the screen more detailed information can be seen about the selected target. For full details, highlight the target and press **Detail**



Further information on the selected target is produced by selecting **More**



Press GrV iew on the Other Stations menu to view the navigational situation in a "radar-style" format.



This screen shows all received AIS stations and their velocity vector. The top left number is the number of stations within the range of the display. The range, shown at top right, corresponds with the outer ring of the displayed graphic.

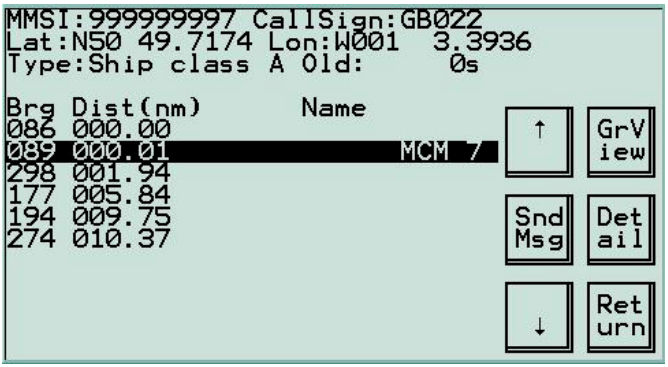
Press Zm. in or Zm. out to change range between 1nm to 100nm in 7 steps.

Press Txt on to view or hide text captions (call signs) of the displayed targets.

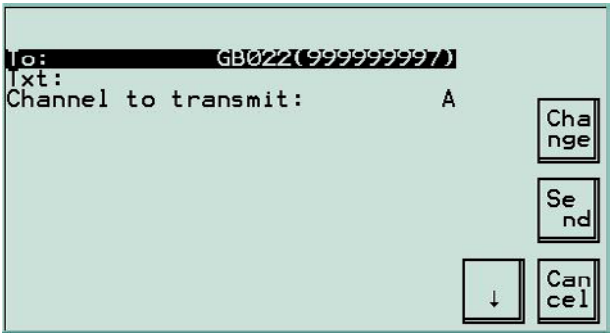
3.22 Sending messages

From the Other Stations menu, short text messages can be sent to specific vessels or groups of vessels. The text is generated using the on-screen keyboard and may be sent to any or all of the indicated targets (which may be shore based stations).

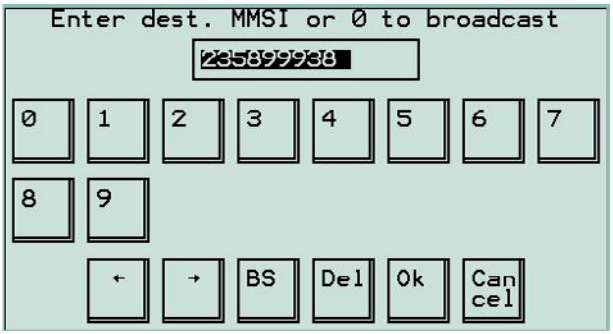
From the target list, highlight the intended destination of the message and press Snd Msg



The top line of the screen shows the destination call sign and MMSI number. The second line displays the message text and the bottom line shows the AIS channel on which the message is to be sent, A or B. Either may be used.

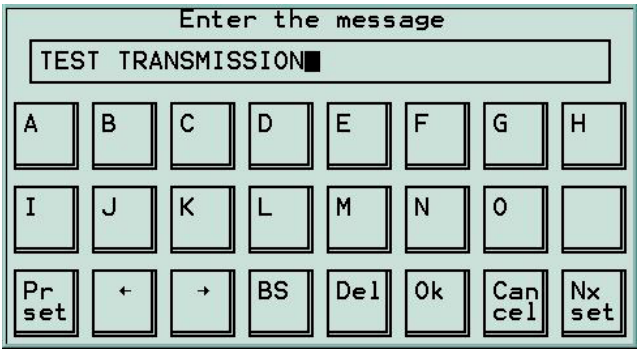


To change the destination of the message, select the **To:** line and select **Change**

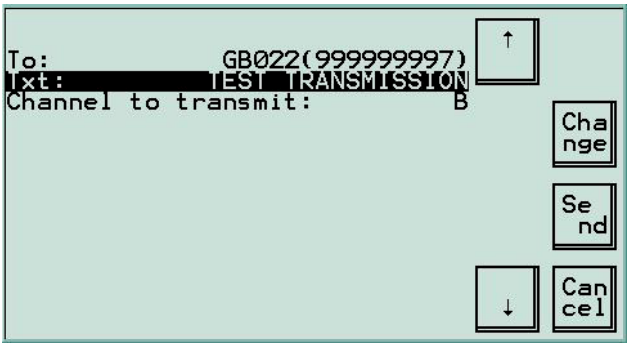


From this screen the MMSi of the recipient vessel may be changed, or a group MMSI may be used, or the message may be broadcast to all ships. **OK** returns to the previous screen.

Highlight the Txt: line and select **Change**. A keyboard entry screen appears. Enter the test to be transmitted, switching between screens to access different sections of the keyboard.



When the message has been entered correctly, select **OK**. Select **Send** to transmit the message.



To test the system, select a coast station and compose a message, for example: -

"This is an AIS test call, please acknowledge".

If no acknowledgement is received the message will be re-transmitted up to four times. If no acknowledgement is received after the four transmissions, try another station in the list.

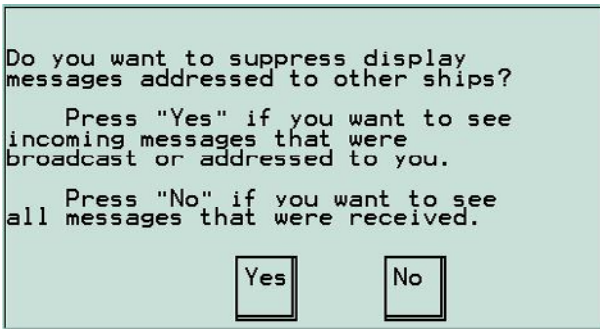
3.23 Receiving a message

When a message is received and identified as being for the particular vessel (ie it has the correct MMSI number), a screen appears to alert the operator and to display the text.

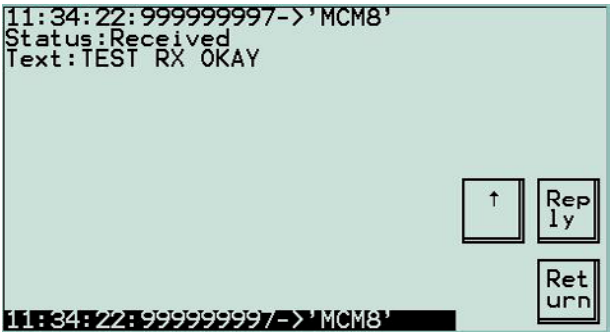
Further details of the message can be viewed by entering the Radio Exchange screen.

3.24 Radio Exchange menu

Full details of received messages can be viewed.

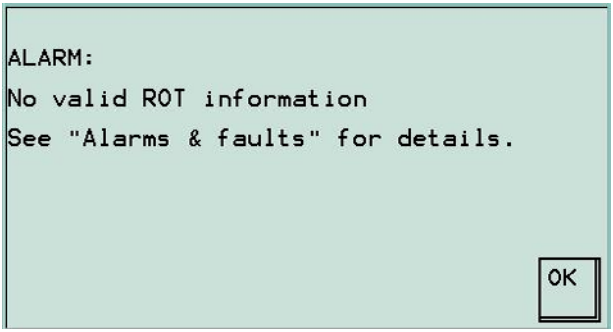


The received messages are then displayed with time and date of transmission, message text and details of the sender.



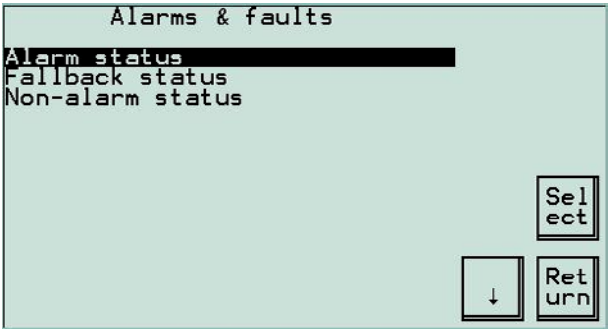
3.25 Alarms & Faults

When an alarm condition occurs a pop-up window will appear, eg



Press OK to acknowledge the alarm message.

To clear an alarm and deactivate the BIIT relay, first select **Alarms & faults** from the **Main menu** then select **Alarm status** to view all the alarm conditions.

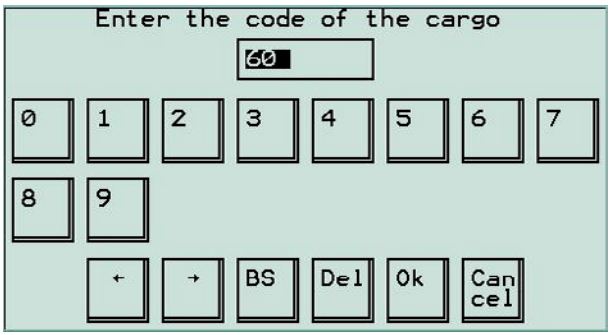


3.9 Dist.GNSS-Bow
Dist.GNSS-Stern
Dist.GNSS-Port-side
Dist.GNSS-Starboard

(Default = 0)
These values are set up during commissioning. Refer to section 4.15 for further information.

3.10 Type of Cargo

(Default = 0)
Enter to type of vessel and cargo.



Please see the tables below for details (tables are derived from the ITU-1371-1 standard).

Identifiers Used by Ships to Report Their Type	
First Digit	**Second Digit**
0 - Not used	0 - All ships of this type
1 - Reserved for future use	1 - Carrying DG, HS, or MP IMO hazard or pollutant category A
2 - WIG (Wing In Ground)	2 - Carrying DG, HS, or MP IMO hazard or pollutant category B
3 – Other ships See table overleaf	3 - Carrying DG, HS, or MP IMO hazard or pollutant category C
4 - HSC (High Speed Craft)	4 - Carrying DG, HS, or MP IMO hazard or pollutant category D
5 – Special craft See table overleaf	5 - Reserved for future use
6 - Passenger Ships	6 - Reserved for future use
7 - Cargo Ships	7 - Reserved for future use
8 - Tankers	8 - Reserved for future use
9 - Other types of Ship	9 - No additional information

DG = Dangerous Goods HS = Hazardous Substances MP = Marine Pollutants

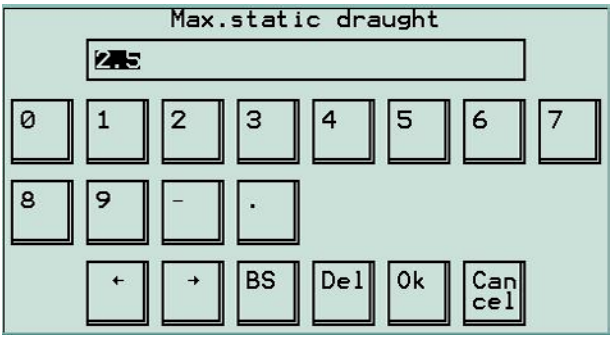
Identifiers Used by Other Ships to Report Their Type		
Identifier Number		Vessel Type
First Digit	Second Digit	
3	0	Fishing
3	1	Towing
3	2	Towing and length of the tow exceeds 200mtrs (656ft) or breadth exceeds 25mtrs (82ft)
3	3	Engaged in dredging or underwater operations
3	4	Engaged in diving operations
3	5	Engaged in military operations
3	6	Sailing
3	7	Pleasure craft
3	8	Reserved for future use
3	9	Reserved for future use

Identifiers Used by Special Craft to Report Their Type		
Identifier Number		Vessel Type
First Digit	Second Digit	
5	0	Pilot vessel
5	1	Search and rescue vessel
5	2	Tugs
5	3	Port tenders
5	4	Vessels with anti-pollution facilities or equipment
5	5	Law enforcement vessels
5	6	Spare – for assignments to local vessels
5	7	Spare – for assignments to local vessels
5	8	Medical transports (as defined in the 1949 Geneva Conventions and Additional Protocols)
5	9	Ships according to Resolution No. 18 (Mob-83)

3.11 Max. Static Draught

(Default = 0.0)

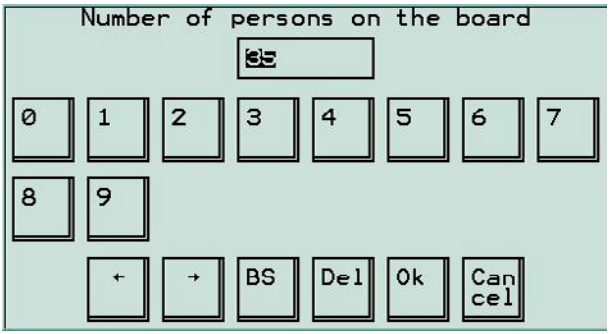
Enter the maximum static draught of vessel (in metres) during the current voyage.



3.12 Persons on Board

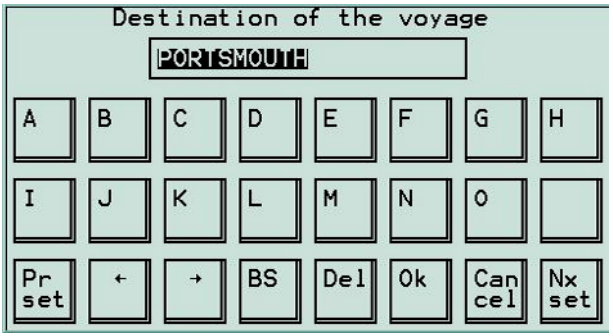
(Default = 0)

Enter the total number of persons on-board during this voyage. This information is normally provided at the Master's discretion or on request from a competent authority.



3.13 Destination

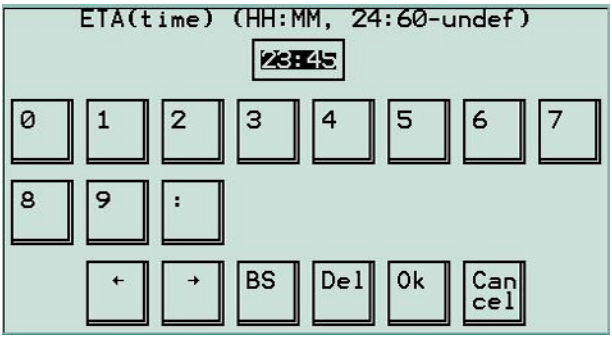
Enter the port of destination (Entered at Master's discretion).



3.14 ETA (time)

(Default = 24:60 Undefined)

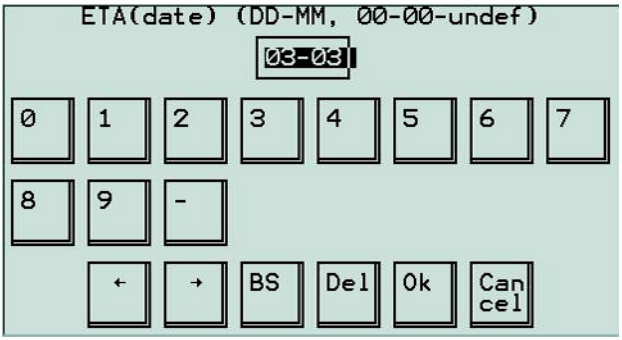
Enter the local Estimated Time of Arrival at port of destination. (Entered at Master's discretion).



3.15 ETA (date)

(Default = 00-00 Undefined)

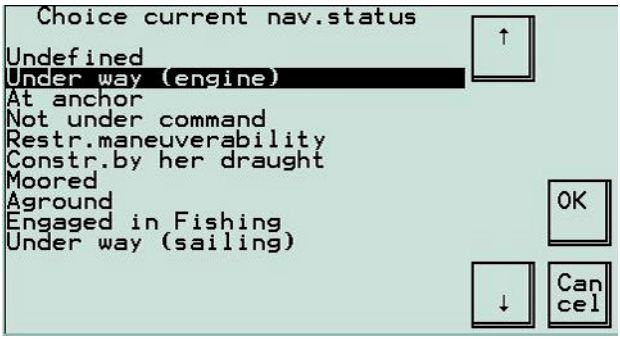
Enter the Estimated Date of Arrival at port of destination. (00-00 = undefined) (Entered at Master's discretion).



3.16 Status

(Default = Undefined)

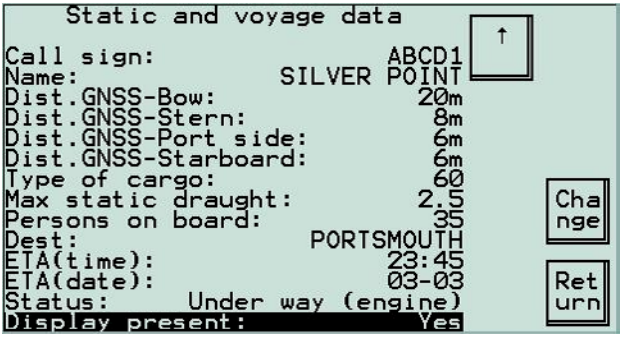
Enter the navigational status of the vessel: -



3.17 Display Present

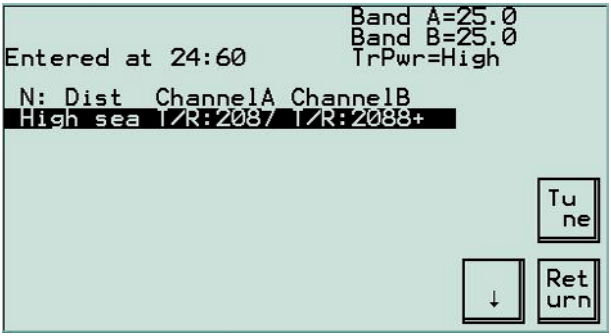
(Default = Yes)

When **Display present** is set to **Yes**, this option indicates to other UAIS stations that the VDU is capable of showing received text messages. If the UAIS Transponder is not connected to any application display (MKD, ECDIS, ARPA or ECS) this parameter must be set to “No”.



3.18 VHF Regions Menu

UAIS works on two radio channels at any time and may select those channels depending on the geographical area. A list of up to 10 regions with their associated channels can be stored in the permanent memory; if not in any of these regions, UAIS uses the default channels of 2087 and 2088.



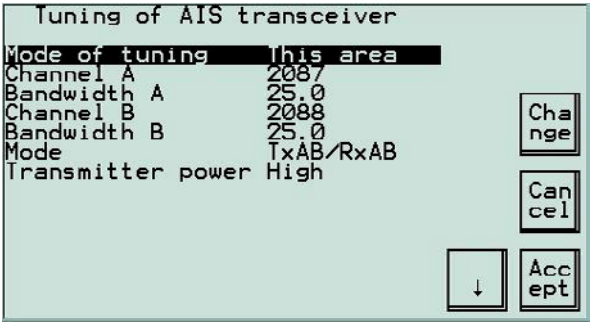
To view the region list stored in memory, select **VHF regions** option from the **Main set-up** menu. The top item as highlighted above) indicates the frequencies used outside the specified regions (ie at sea). Successive items, where present, show manually entered frequencies and their parameters (eg transmitter power). The station uses these entered frequencies within that specific region. “R” indicates the frequency is used for receiving, similarly “T” is for transmitting.

Information on a particular region is shown at the top of the screen: geographical co-ordinates, bandwidth and power of transmitter and time of entering or leaving the region.

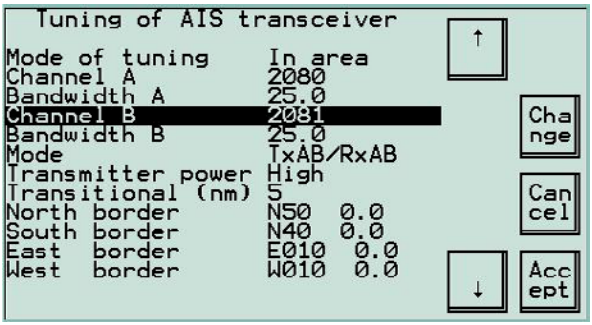
There are several ways a station can acquire region information: -

From a base station on the AIS channels.
From external devices through the input interfaces.
From a coastal station on CH70 DSC.
From an operator using the VDU.

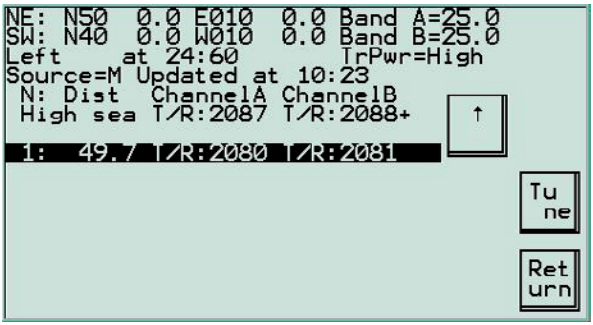
Normally it is not necessary to enter the regions manually, as the station should pick them up automatically, however it can still be done as shown in the following section by selecting **Tune** in the previous screen



Changing the geographical location defines the region, and the associated parameters may then be set.



A confirmation screen appears, then the new region and information is displayed on the main screen.



Applicability of this manual

This manual is valid for all hardware and software issues of the equipment described, and is kept current by updates.

When updates are posted, any incompatibility with earlier issues of hardware and/or software will be highlighted here.

Issue 5 of the Operation manual refers to V24 software, which is expanded over earlier issues.

Disclaimer

Information contained in this manual is supplied in good faith, but is liable to change without notice. McMurdo Limited disclaims any liability for consequences arising from omissions or inaccuracies in the manuals and documentation provided with this product.

IMPORTANT: Please take time to read this manual carefully and to understand its contents fully, so that you can operate your Transceiver correctly.

Table of Contents

1 Introduction

1.1 About this Manual

This Operation Manual has been designed to help understand how to operate an UAIS Transponder system as quickly as possible.

Please read this Manual thoroughly before attempting to use the UAIS Transponder system.

The UAIS Transponder provides Communication, Navigation and Surveillance (CNS) capabilities to either mobile or fixed stations. The primary purpose of this UAIS is as a Class A mobile Ship-borne Transponder system.. A separate Installation Manual is supplied, covering detailed information on installing and interfacing an UAIS, assuming that the appropriate external equipment has already been installed.

This Manual is a step by step guide to the procedures needed to successfully operate an UAIS and will explain how to: -

- View received targets
- Check the status of the system and connected sensors
- Enter the static & voyage related data
- View VHF regions
- Respond to Long Range requests
- Filter incoming messages
- Check the status of alarms & faults
- Commission an installation

1.2 Safety Summary

⚠ **WARNING: ENSURE THAT THE UAIS HAS BEEN CORRECTLY INSTALLED IN ACCORDANCE WITH IMO GUIDELINES AND INSTALLATION MANUAL BEFORE SWITCHING ON**

⚠ **WARNING:** Transponder chassis can become hot during extended periods of operation, avoid touching this when the Transponder is operating.

⚠ **WARNING:** Do not touch the VHF antenna or connecting cable when the Transponder is in operation.

⚠ **WARNING:** Unauthorised opening of the Transponder system will invalidate the warranty.

⚠ **WARNING:** Avoid using chemical solvents to clean the VDU as they can damage the casing material.

⚠ **WARNING:** The use and operation of a UAIS transponder is legislated and forms a part of the ship's mandatory navigation equipment. It is therefore necessary that the installation is certified (commissioned) and that certain information has to be available before full operation of the transponder can take place. The ship's IMO and MMSI number has to be programmed into the transponder, as these form part of the mandatory information that is transmitted.

⚠ **WARNING:** This product is sold or provided as merely an aid to navigation. It is the responsibility of the user to exercise discretion and proper navigational and seamanship skills.

⚠ **WARNING:** NOT ALL SHIPS CARRY AIS. The Officer of the Watch (OOW) should always be aware that other ships and, in particular, leisure craft, fishing boats and warships, and in some cases coastal shore stations (including Vessel Traffic Systems (VTS) centres), might not be fitted with UAIS. The OOW should always be aware that UAIS that is fitted on other ships as a mandatory carriage requirement, might, under certain circumstances, be switched off based on the Master's professional judgement.

⚠ **WARNING**: The use of a Megger (High Voltage Insulation Tester) may damage the equipment and therefore should not be used.

⚠ **WARNING:** Do not operate the equipment when persons are closer than 3 metres from the antenna. If any person (e.g. the operator) must be closer, then a grounded RF shield should be interposed between that person and the antenna.

1.3 Rules of Operation Licensing

IMPORTANT: Operation of the UAIS Transponder is a part of the international radio regulations and therefore the ship must possess a current VHF radio telephone licence listing the UAIS system, and the equipment must be registered (Call Sign and MMSI number). Please contact the relevant authority in your country for further information.

1.4 Disclaimer

Information contained in this manual is correct at time of going to print, but is liable to change without notice. McMurdo Limited disclaims any liability for consequences arising from omissions or inaccuracies in the manuals and documentation provided with this product.

2 Product Definition

2.1 System Overview

Universal Automatic Identification System (UAIS) is a maritime VHF based transponder system that provides high-speed automated communication from ship-to-ship and ship-to-shore, of vessel, voyage and safety related data. This UAIS transponder and touch screen VDU display system is the latest in state-of-the-art technology and is designed to meet the latest IMO SOLAS requirements. The UAIS transponder transmits the ship's navigational data to other vessels, as well as shore based VTS systems. Utilising marine VHF channels, UAIS is primarily designed as a ship-borne mobile station and consists of an integral GNSS engine used for timing, one VHF transmitter, three VHF receivers and a computer unit. Interfacing to external GNSS used for navigation, a VHF antenna, a gyrocompass, and an optional ECDIS or ARPA display system is made easy by the built-in screw terminal board and the intuitive operating menu system on the touch-screen display unit. The VDU is designed to fulfil the minimum SOLAS requirements for system set-up and display of the received target information. However the large LCD touch screen display also gives the user easy access to the menu system that displays the received targets on a graphical, radar-like display.

The UAIS Transponder transmits the following information, which is separated into three basic information groups:

Static - Vessel name, type, length and breadth, MMSI and IMO numbers and GNSS antenna location.

Dynamic – Position, accuracy and integrity, time, course and speed over ground and navigational status.

Voyage – Cargo, draft, port of destination and estimated time of arrival.

- In addition to this information, UAIS can transmit and receive short text messages regarding navigation safety that include, warnings of floating objects, collisions, meteorological situation, etc.

- Differential correction information for GNSS can also be conveyed through the UAIS, increasing the accuracy of positional information between 2 and 10 metres. This significantly increases vessel safety, thus improving the marine environment as well as the safety of life at sea.

2.2 Compliance

This UAIS is designed to comply with international standards and is approved in accordance with the high standards of the European Marine Equipment Directive:

- MSC.74(69)
- ITU-R M.1371, ITU-R M.1084-4, ITU-R M.823-3, ITU-R M.493-9
- IEC 60945, IEC 61993-1,2, IEC 61162-1,2,3, IEC 61108
- ETS 300 113

2.3 UAIS Key Functions

- Automatic identification of other UAIS equipped vessels.
- Self-organising control of access to the radio channels.
- Reception of data via the radio channels from other vessels and coast centres.
- Transmission of own vessel data via the radio channels for use by other vessels and coast centres.
  NOTE: Two channels, A and B, are used for transmission.
- Storage of static data intended for automatic transmission via the radio channels.
- Output of data received via the radio channels from other UAIS objects for presentation on the minimum display.
- Determination of the position and motion of own vessel if the external GNSS receiver fails by utilising the internal timing GNSS receiver.
- Application of GNSS differential corrections using information supplied from a supplementary receiver.
- The application of GNSS differential corrections using information received from a controlling station via the VDL (VHF Data Link) channel.
- The output of Built-In-Integrity Test (BIIT) information regarding the UAIS status on the main (e.g. ECDIS) display interface, auxiliary (e.g. Pilot) display interface and also the minimum display.
- Delivery to the display of bearings and distances to the vessels, calculated from their co-ordinates, obtained via the VDL channel.

3 Operation

Please read all the warning notices at the front of this manual before turning on the Transponder.

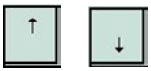
3.1 Activation

It is recommended that UAIS should not be switched off and should remain in operation continuously. However, based on the Master's professional judgement, either transmission may be inhibited or the UAIS may be switched off entirely if continuous operation might compromise the ship's safety or security. Reactivation must take place as soon as the source of danger has disappeared. This might be necessary in waters where pirates or armed robbers are known to operate. It might also be necessary to switch off UAIS during some cargo handling operations. Actions of this nature should always be recorded in the ship's logbook.

3.2 Menu Navigation

The "keyboard" is the touch-sensitive screen of the VDU. The keys displayed change according to the other information on the screen. Touch a key square to use that key function.

All on-screen menus follow the same basic principles to navigate around them.



Using the up and down arrows allows the operator to move quickly and easily through the current menu system.

Once the required item is highlighted PRESS either: -

to enter a sub-menu.

or

to change the data in the selected field.

or

to confirm the change.

or

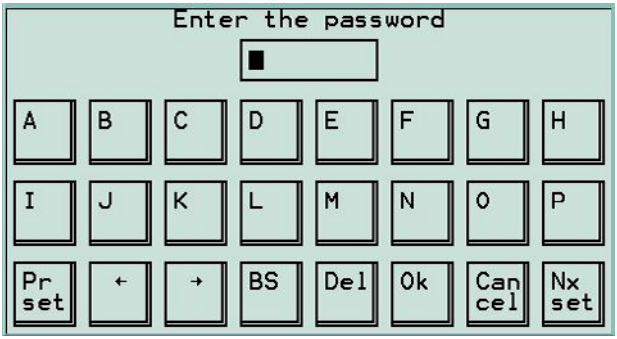
to stop the action and return to the previous command.

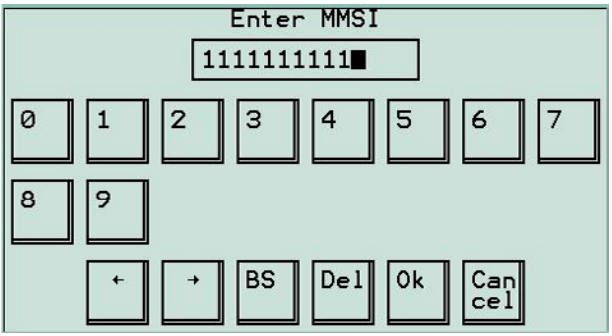
or

to go to the previous menu.

Some menu options are automatically selected depending upon the input data available.

The data entry keyboard is divided into three screens as shown overleaf.





Press Pr set to move to the previous character set

Press Nx set to move to the next character set

Press BS to Back Space

Press 

to Delete a character

Press  or  to move the cursor

3.3 Initial Start-up

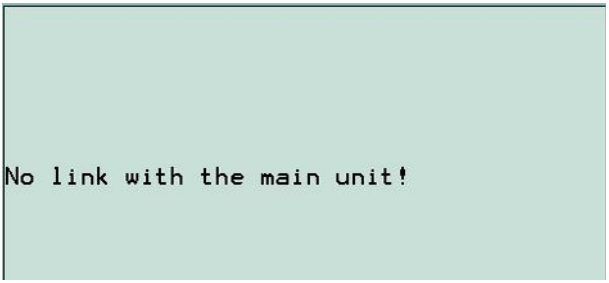
Ensure that power is available to the Transponder unit and that the main power on/off switch, located to the left side of the cable entry of the Transponder, is switched to the “on” position (green LED illuminated). At this point the Transponder is active and will wait for 1 minute before entering the network and starting transmission as it is listening to other stations to determine its own transmission time slot sequence schedule.

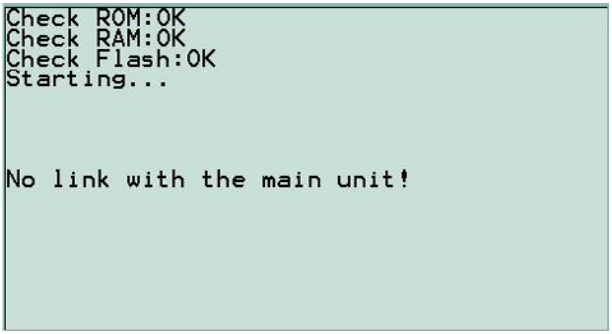
Press  to switch on VDU. To switch off, press and hold for 2 seconds.

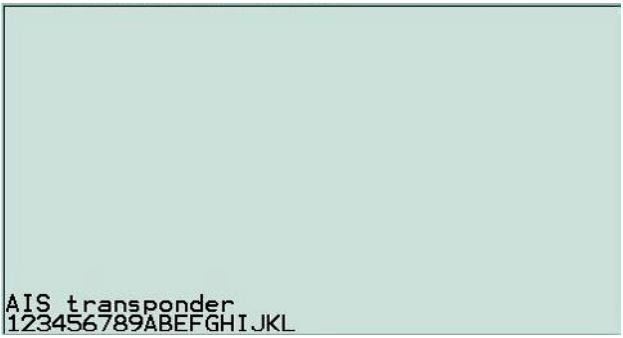
NOTE: When re-starting the VDU, the screen displayed will be that when the VDU was switched off.

For a complete overview of the operating menu structure, please refer to Appendix 1 “UAIS Operating Menu Hierarchy” at the back of this Manual.

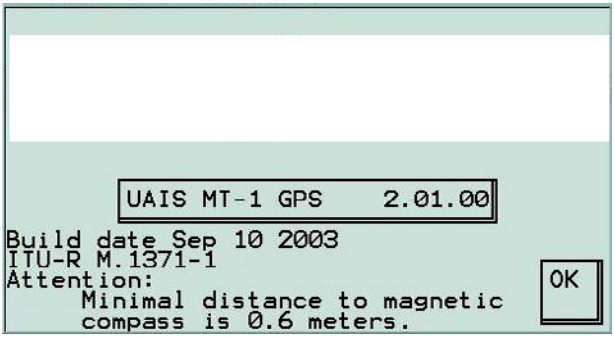
At power-up the system conducts a series of self-tests and the results are displayed on-screen as follows:-







After successful completion of the self-test and communication between the VDU and the transponder has been established the following screen will appear.



The welcome screen giving the GNSS type (GPS or GLONASS), software version, and software build date then appears, which confirms that the VDU is ready for operation.

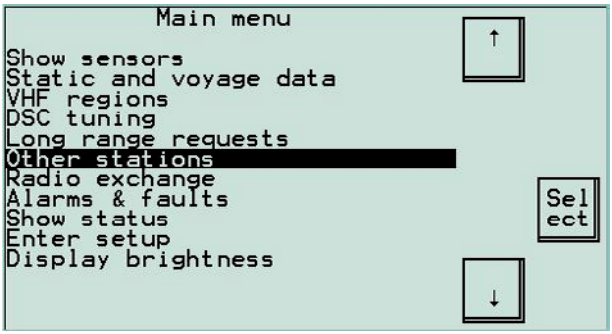
Press OK to enter the Main Menu.

3.4 Set to Work

NOTE: If the display is not easy to read, refer to section 3.35 which details how to adjust the display.

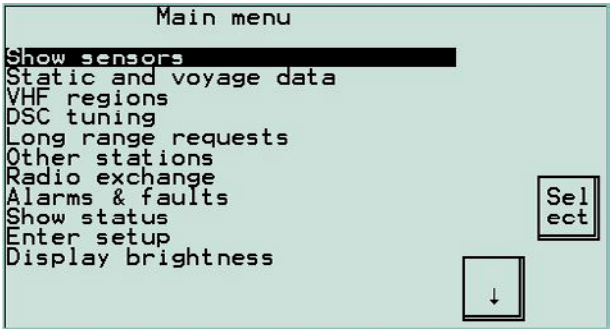
The next screen to appear is the **Main menu** that contains all the basic functions required to successfully operate a class A UAIS ship-borne station.

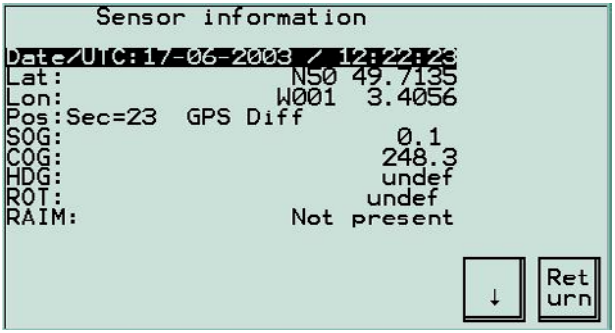
The **Other stations** option in this menu is where all received target information can be monitored. (See section 3.21 on page 20)



When in operation mode the **Main menu** appears with the following options: -

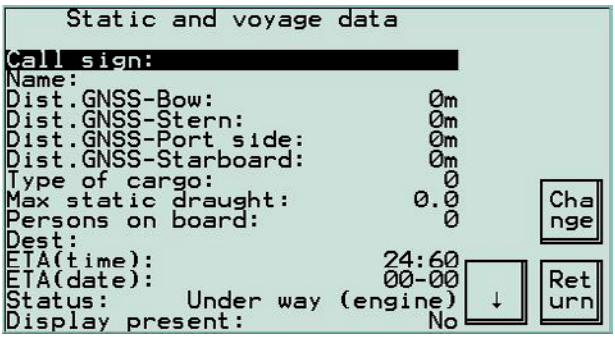
3.5 Show Sensors Menu





This screen will display navigation data used by UAIS. Normally the navigation data is received via the input ports Sens1, Sens2 and Sens3 as well as the RTCM port for differential corrections. If the data is not being received via these interfaces, UAIS can use it's own internal GNSS, providing this facility has been enabled (see section 4.14 on page 38). Co-ordinates for non-mobile stations may be pre-set during commissioning.

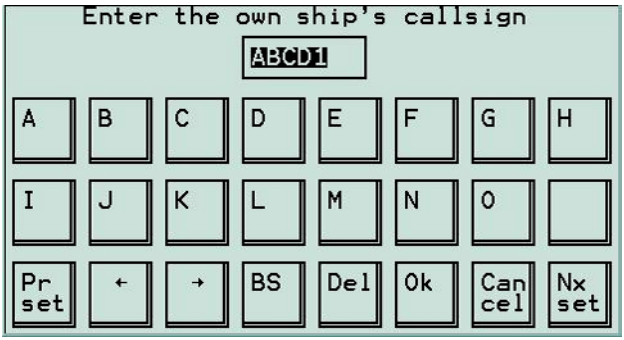
3.6 Static & Voyage Data Menu



In this menu, the static and voyage related data may be reviewed or changed. This is not password protected, allowing ship's information to be entered or changed at any time.

3.7 Call Sign

Enter the Ships radio call sign.



3.8 Name

Enter the Ship's registered name (maximum 20 characters).

To confirm the change in ship's name the system password must be entered. (See section 4.8 Setup System Password on page 36)