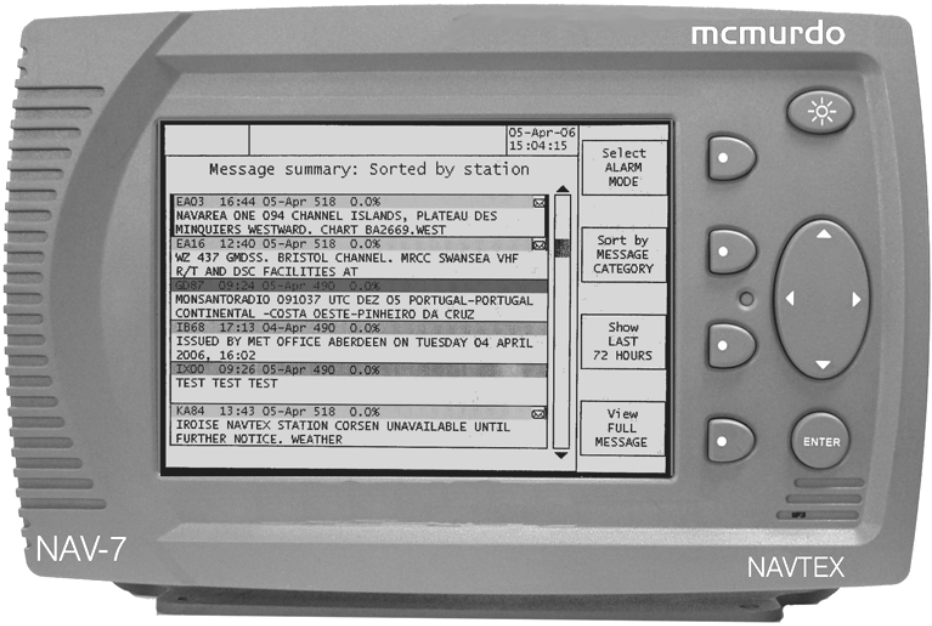
mcmurdo

NAV-7

GMDSS Tri-channel NAVTEX Receiver



User & Installation Manual

VESSEL IDENTIFICATION INFORMATION

Name		
Call Sign		
MMSI		
NAV-7 S/N		
Antenna Type		
RX frequencies supported by antenna	***518 kHz***	
	490 kHz	
	4209.5 kHz	

Safety Warnings

This instrument is for use as an aid to sailors and should not lead to a reduction in the level of good seamanship required at all times.

Reception of messages cannot always be guaranteed as this depends on local radio propagation.

Contents

Take the time to read this manual carefully. It contains some essential information regarding the operation and maintenance of the product and a useful background to the NAVTEX system.

Regular visits to the McMurdo website *www.mcmurdo.co.uk* for information on updates, the availability of software enhancements, further options and support are recommended. The support pages contain frequently asked questions about the NAV-7 that may be useful. There is also a NAVTEX database providing a list of operational NAVTEX stations and their details.

The IMO and various national coastguards also operate informative websites; see the links page at *www.mcmurdo.co.uk*.

QUICK START

This product is extremely easy to operate:

- Follow the installation guidelines
- Re-check the cable connections
- Apply power
- The NAV-7 will start up after a few seconds delay
- The NAV-7 will now receive and display NAVTEX messages

INTRODUCTION

NAVTEX is a method of transmitting navigational warnings and weather forecasts from designated coast radio stations. All English language transmissions are made on 518 kHz. Each station is allocated several time ‘slots’ during the day, when it is permitted to transmit; these are normally at four hourly intervals. The only exceptions to this are gale warnings and search and rescue messages, which may be transmitted at any time.

Reception of NAVTEX is normally limited to an area of 200 - 300 miles radius around each transmitting station, although considerably greater ranges are possible at night.

Subject to IMO approval, additional local language transmissions may be made on 490 kHz and on 4209.5 kHz.

The NAV-7 has been designed to the latest European and International specifications to provide up to date weather and marine safety information to commercial vessels. It meets IMO requirements under GMDSS and is designed for simplicity of operation. It will display reliable information day after day within designated NAVTEX coverage areas.

Installation is straightforward. Connect the NAV-7 to a 12 or 24 volt DC supply and connect a suitable antenna. Switch it on, and it will start displaying and storing NAVTEX messages without further manual intervention. Note that if there are only a couple of NAVTEX stations within range it may be several hours before the first message is received.

If you are within an area where you are able to receive from many NAVTEX stations (particularly at night), the NAV-7 may overwhelm you with information. It can therefore be set up to display only those stations and message categories you want to receive and which are applicable to the area in which you are sailing.

Normally, routine messages are repeated at four hourly intervals. Provided that the NAV-7 is left running, repeated messages are not displayed more than once. Each message is retained for three days (72 hours) after its last reception before being automatically deleted, unless the message has been marked as locked.

Permanent installation of the NAV-7 can be made with either the bulkhead-mounting bracket or the flush panel mounting kit provided.

The NAVTEX antenna should be mounted where it is elevated clear of metal objects in a location where it cannot easily be damaged.

It is essential to read the installation section of the user guide thoroughly before attempting installation of the NAV-7.

ABOUT YOUR NAV-7

The NAV-7 has been designed to meet the requirements of IMO MSC.148 (77) and IEC 61097-6 (Ed 2.0).

The NAV-7 contains 3 receiver channels, one each tuned to 490 kHz, 518 kHz and 4209.5 kHz. The NAV-7 will receive on all 3 frequencies simultaneously in those parts of the world where transmissions are available (refer to Appendix I and to the McMurdo website at *www.mcmurdo.co.uk* for latest information).

The NAV-7 can be setup to filter out stations and/or message categories that are not required by the User.

The NAV-7 is capable of being connected to an Integrated Bridge System (IBS), transferring NAVTEX messages to other navigational aids if required. Note that the IBS must be compliant with the serial port requirements of IEC61097-6 (Ed 2.0).

The NAV-7 will accept UTC time & date information from the IBS port if available. UTC time & date will be used to timestamp received NAVTEX messages.

Recommendation

Connection of a source of UTC data to either the NMEA 0183 or the IBS port is strongly recommended for best operation of the NAV-7.

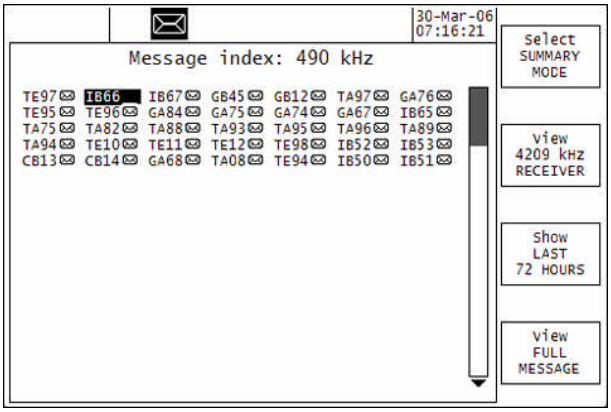
OPERATING the NAV-7

Switch on the NAV-7 by applying power via a circuit breaker or fuse.

There will be a few seconds delay whilst the software loads the contents of the NAVTEX message store during which time the front panel red LED will blink.

The NAV-7 start-up screen will now be shown.

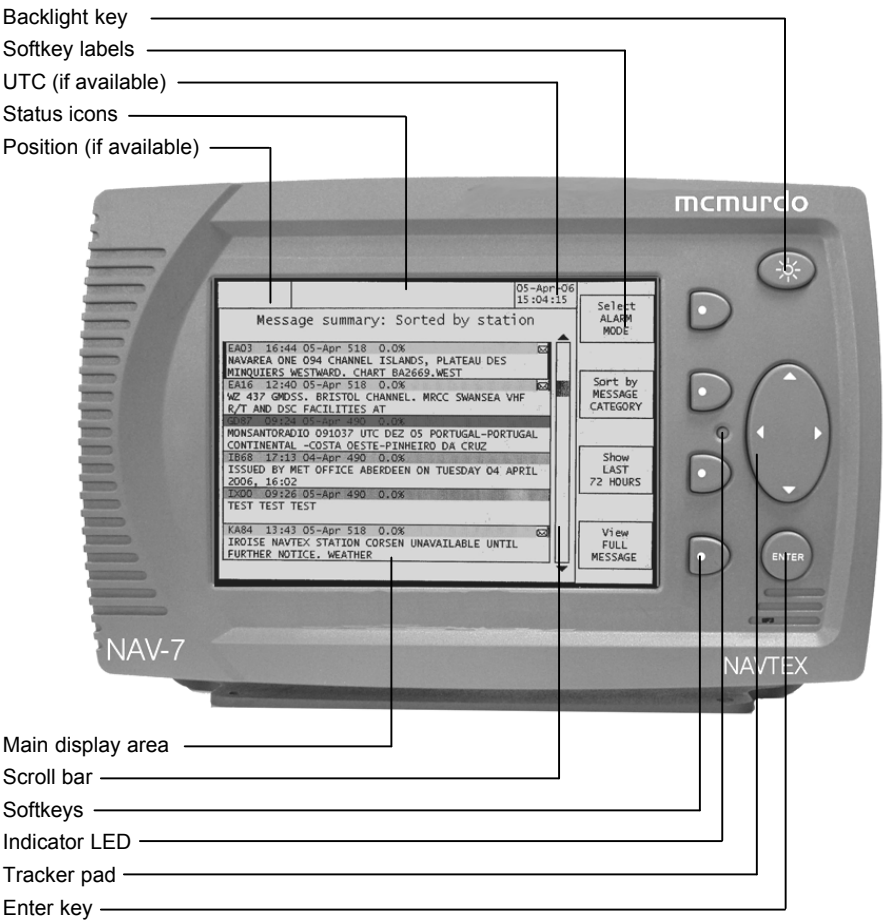
This screen disappears after 30 seconds; it may be removed sooner by pressing any key.



The NAV-7 is now ready to receive NAVTEX messages.

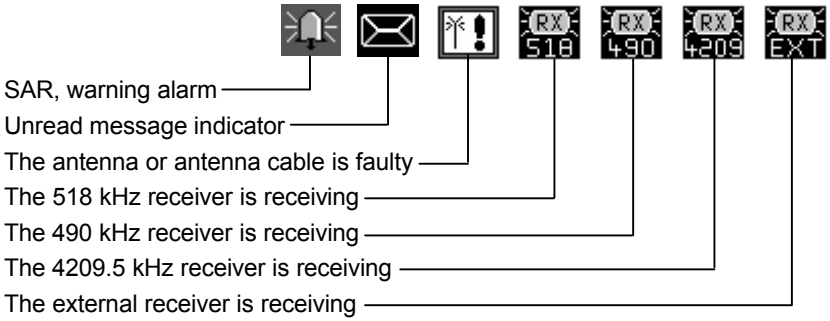
Navigating the NAV-7 user interface

The NAV-7 has been designed to be easy to use with an intuitive user interface and softkeys.



Icons

The NAV-7 displays various icons in the status bar at the top of the display.



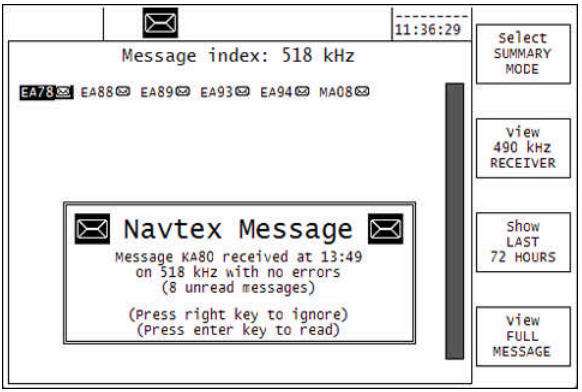
Receiving NAVTEX messages

When the NAV-7 begins to receive a signal, one or more of the receiver icons at the top of the screen will appear to indicate which of the receivers is active.

When a complete message has been received, a pop-up appears on the display indicating that a new message is available and the "unread message" icon flashes. The message can be read by pressing the Enter key, or the popup can be removed without reading the message by pressing the Right key. As each new message is received, the NAV-7 may also generate a single short beep to attract attention to the new message. This audible alert can be disabled on the Setup mode: System options page if it is not required.

Any messages that are not read immediately will be marked with the "unread message" symbol in both the Index and Summary modes. The "unread message" icon at the top of the display continues to flash until all messages have been read.

Note that while a popup is on display only the Enter or Right buttons have any effect; all other keys are disabled until the popup is removed.



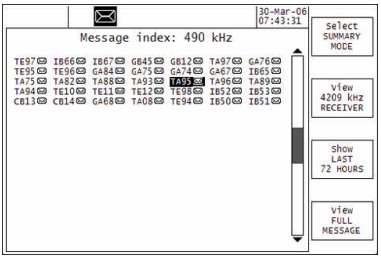
Alarms

The message category is used to classify the nature of each NAVTEX message. Of particular note are message types 'D' (search and rescue), 'A' and 'L' (navigational warnings) and 'E', 'B' and 'C' (meteorological warnings). When a message with any of these message categories is received the NAV-7 operates its alarm relay contacts and transmits an NMEA "ALR" sentence to the currently selected alarm port. The alarm relay continues to operate until the alarm is acknowledged either by removing the popup or by reception of an appropriate NMEA "ACK" sentence from another connected device. Search and rescue messages (category 'D') cannot be read later; the popup box can only be cleared by pressing the Enter key and reading the message.

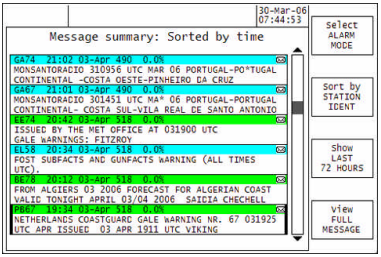
Finding and viewing NAVTEX messages

The NAV-7 displays NAVTEX messages in several ways designed to make finding and viewing particular message categories or an individual message easy and convenient.

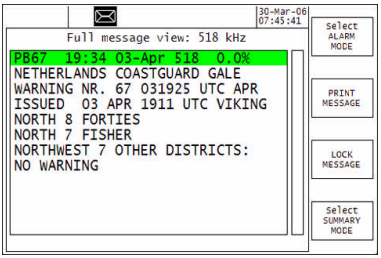
Message Index



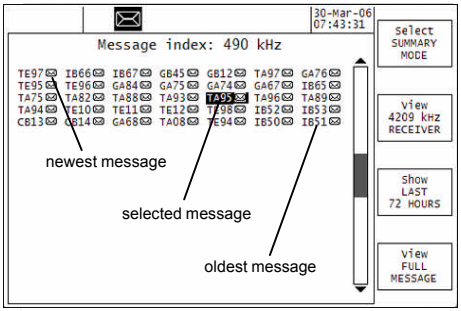
Message Summary

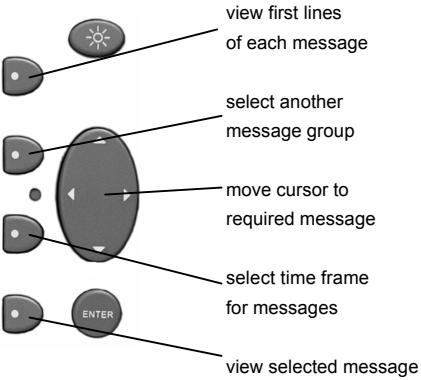


Full Message

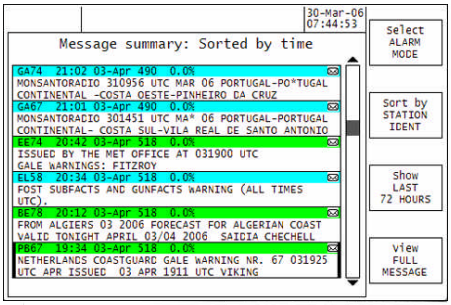


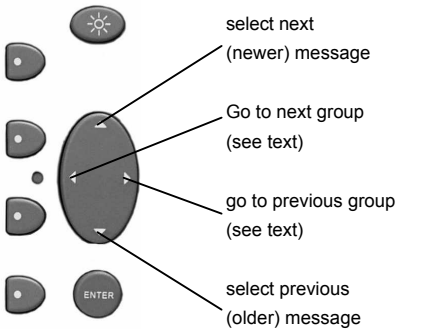
Message displays



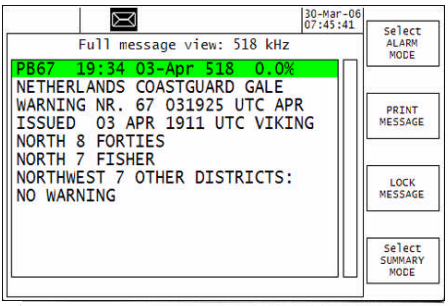


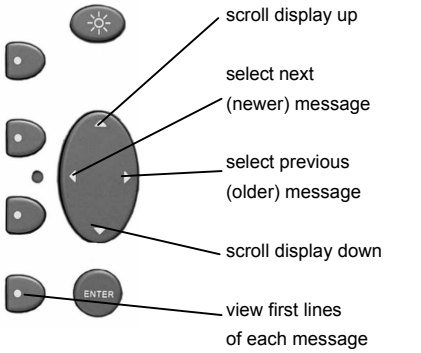
Message index display





Message summary display





Full message display

Message index display

The Message index display shows the identifiers of messages from a specific receiver. Unread messages have an “envelope” (✉) mark; locked messages (see Full message display) have a “key” (🔑) mark.

Message identifiers can be expanded to show either the first two lines or the full message by selecting the desired message and pushing the appropriate softkey.

Messages from another receiver can be displayed using the View softkey, which cycles through the available sources.

Messages are grouped by time interval. The Show softkey cycles through the set intervals.

Message summary display

The Message summary display shows the first two lines of each message, selected by various criteria.

Selection criteria are time, station identity and message type. The Sort by softkey cycles through these criteria.

Depending on the selection, the “group” is a 4-hour period, a station or a message type.

The Show softkey controls the total number of messages displayed by suppressing messages which are older than the selected time frame.

A message can be shown in full by selecting it and pushing the View softkey.

Full message display

Because messages are automatically erased 72 hours after they are received, it is necessary to take action to retain an important message beyond this time. Displaying the message and pressing the Lock softkey causes the message to be retained indefinitely. A locked message is identified by a “key” (🔑) mark in the Index display.

A locked message is unlocked by displaying it (in this view) and pressing the Unlock softkey.

Up to 250 messages can be saved for long term retention; once the limit has been reached, operating the Lock softkey will not lock any more messages until some are unlocked again.

Minimising the number of NAVTEX messages displayed

After the NAV-7 has been switched on for a while there will be a large number of NAVTEX messages stored in memory. These can be quite overwhelming if the user is looking for particular message categories or an individual message.

Several design features have been incorporated into the NAV-7 to make day to day operation easier:

- **Separate frequency channel pages**
- **Station filtering**
- **Message category filtering**
- **Time-limited display of messages**

Separate frequency channel pages

A separate NAVTEX message display is provided for each of the 3 receiver channels. All 518 kHz messages appear together, all 490 kHz messages appear together and all 4209.5 kHz messages appear together. Switch between these displays by using the View softkey.

Station filtering

NAVTEX transmitting stations that are not required can be de-selected by making the appropriate selections in the Setup Screens.

Message category filtering

NAVTEX message categories that are not required can be de-selected by making the appropriate selections in the Setup Screens.

Time-limited display of messages

In order to access recent messages quickly the Show softkey can be used to show only NAVTEX messages that have been received in the selected time period (last 1 hour, 4 hours etc)

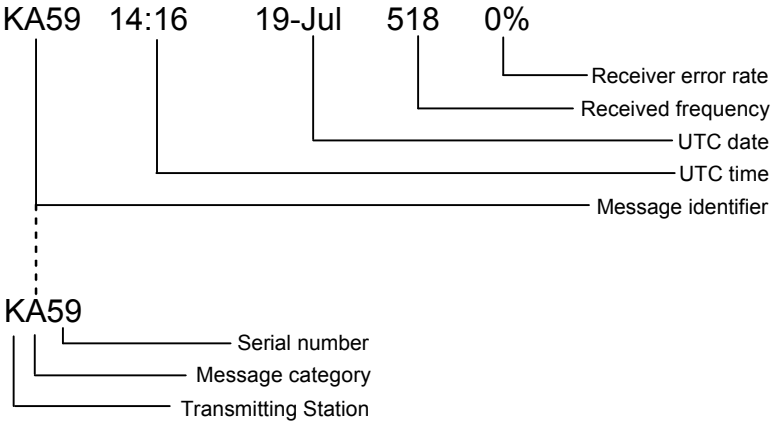
SETUP

To enter Setup mode, press and hold the ENTER key. This returns to the last page used for Setup the previous time.

Understanding NAVTEX message headers

At the beginning of each NAVTEX message there is a message header which identifies the source and nature of message, time and date of reception, received frequency and error rate.

For example:



In the Message Index display only the message identifier is visible.

It is recommended that the User or Installer takes time to set up the NAV-7 to filter out those stations and message categories that are not required. In this way the display is kept uncluttered; only those messages that are required will be visible.

Messages are selected for display by the NAV-7's software comparing the Station and Message Category information encoded into the message identifier (eg KA in the diagram above) with the filter settings entered by the user during setup.

Colour coding of NAVTEX message headers

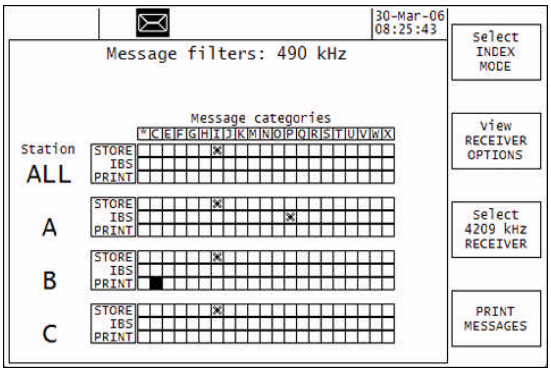
The NAVTEX message information bars are colour coded for each type of message as defined in the table below.

ID	*Message category*	*Colour*
A	Navigational warning	CYAN
B	Meteorological warning	GREEN
C	Ice report	GREEN
D	Search and rescue information	RED
E	Meteorological forecast	GREEN
F	Pilot service message	MAGENTA
G	AIS	BROWN
H	LORAN message	BROWN
I	Reserved, presently not used	BROWN
J	SATNAV message	BROWN
K	Other electronic navaid system message	BROWN
L	Navigational warning (additional)	CYAN
M to Y	Reserved, presently not used	BROWN
Z	No message on hand	BROWN

Message filters

To enter setup mode, press and hold the ENTER key. After a few seconds the `Message filters` page will be displayed.

This page can be used to indicate that messages from specified Transmitting Stations or of specified Message Categories should NOT be displayed, stored or output as required.



Each receiver has its own separate set of message filters; pressing the `Select XXXX kHz RECEIVER` softkey cycles round the available receivers. The message filter settings are all non-volatile and will be unchanged after a power cycle.

By default all Transmitting Stations and Message Categories are selected for display – this is indicated by all the check boxes being empty.

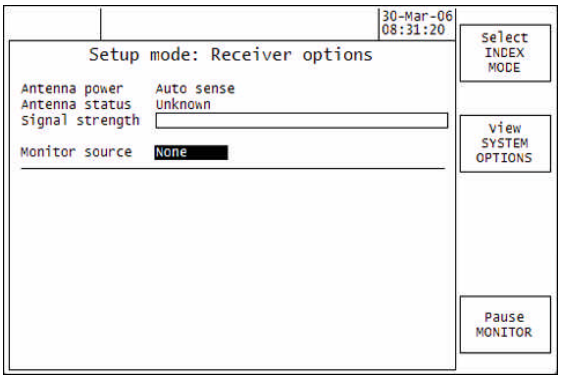
In order to deselect a Transmitting Station or Message Category, navigate to the relevant checkbox using the pad (◀, ▶, ▲ and ▼ keys) and press ENTER. The checkbox will then be marked to indicate that the Transmitting Station (or Message Category, as appropriate) is now deselected and will not appear on the display.

Note that deselecting a Message Category (say 'I') in the top row (labelled 'All') will remove Message Category 'E' from all Transmitting Stations. To disable message categories from a specific station identity (eg 'K'), scroll down until the selection panel for 'K' is displayed, then select the appropriate checkbox as shown below. Deselecting the first message category (labelled '*') will disable all Message Categories from the selected Station – take care not to select this option in the All Stations panel!

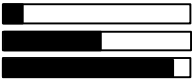
There are three sets of message filter options for every Transmitting Station and Message Category. The 'STORE' filter indicates that the selected message shall be neither displayed nor stored in the non-volatile memory. The 'IBS' filter indicates that the message shall not be sent to the IBS port on reception (if output of NRX sentences to the IBS port is enabled). The 'PRINT' filter indicates that the selected message should not be sent to the printer on reception (if printer output is enabled).

Setup mode: Receiver options

The `Setup mode: Receiver options` page contains diagnostics to assist with installing and fault finding the NAV-7.



The lower part of the display is a monitor area which shows all received NAVTEX characters in real time from the receiver selected as the monitor source, including the phasing character (?) and receive character error symbol (✳), regardless of transmitting station and message category filter settings.

Setup parameter	Comment
Antenna power	Enabled for *active* antenna or Disabled for *passive* antenna or Auto sense allows the NAV-7 to detect the antenna type
Antenna status	Unknown: see Troubleshooting guide Active: an *active* antenna is connected Passive: a *passive* antenna is connected Overload: excessive current; see Troubleshooting guide Error: see Troubleshooting guide
Signal strength	 The size of the bar indicates the highest signal strength being currently received by any of the three receivers
Monitor source	Selects receiver to monitor

Using Setup mode: Receiver options screen

The `Setup mode: receiver options` page can be used to help install the NAV-7 and to diagnose receiver faults.

Operation of the Signal strength bar:

The signal strength bar gives an approximate indication of the highest signal level being received on any frequency.

When a NAVTEX signal is being received, the appropriate receiver frequency icon appears at the top of the display. If the *Monitor source* is set to this frequency then the received data will appear in the *Monitor window*.

Installation of the antenna:

You may wish to check that the NAVTEX antenna position is suitable by inspecting the signal strength during a known NAVTEX transmission from a local station.

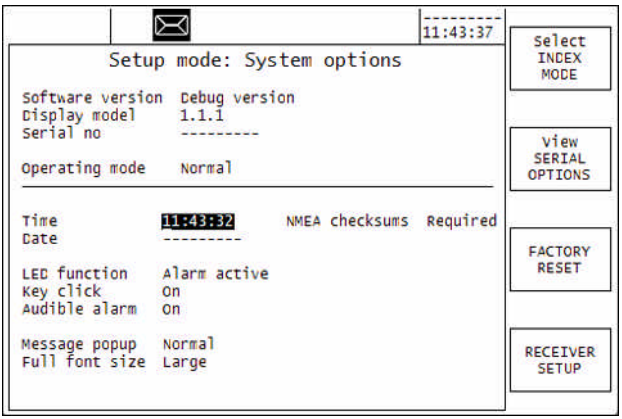
Interpreting the diagnostics aids:

Use the *Receive icon, Signal strength* bar and *Monitor window* to help diagnose installation problems and/or as a check that your NAV-7 is working correctly.

Receive icon	Signal strength bar	Monitor window	Comments
OFF		No new chars being received	No current NAVTEX transmission
OFF		No new chars being received	Local in-band interference present, or NAVTEX station transmitting un-modulated RF
		Set monitor source to 518 kHz	Correct operation, NAVTEX data will be shown in monitor window

Setup mode: system options

The `Setup mode: system options` page contains general information about the NAV-7 and allows control over several aspects of the user interface and external interfaces.

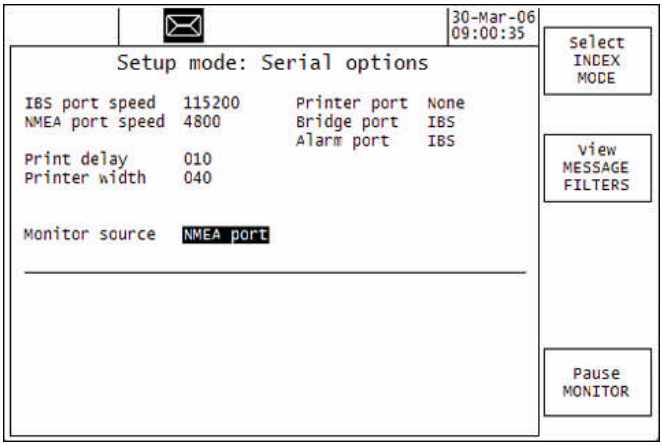


Setup parameter	*Description*
Operating Mode	Normal – normal use aboard vessel Shore Station – displays all messages including repeats, ignoring filters and 72-hour limit Demonstration – for use at exhibitions, etc.
Time	Allows time to be set manually
Date	Allows date to be set manually
LED function	Causes LED to flash on new message or when alarm is active or never
Key click	Allows key click sound to be disabled
Audible alarm	Allows audible alarm to be disabled
Message popup	Allows message popups to be disabled or confined to SAR messages only
Full font size	Offers three choices of message font size in Full Message view
NMEA checksums	Controls if incoming NMEA sentences require checksums (for compatibility with older equipment)

WARNING: Because messages are automatically deleted after 72 hours, changing time or date may cause stored messages to be lost.

Setup mode: serial options

The `Setup mode: Serial options` page contains setup and configuration parameters for the two serial ports on the NAV-7 unit. The lower section of the display provides a monitoring facility for incoming messages on the selected port.



Setup parameter	*Comment*
IBS port speed NMEA port speed	Selects the baud rate for each serial port.
Print delay Printer width	Formats output to suit printer type
Monitor source	Selects serial interface for monitoring
Printer port	Selects which serial port is used for printing
Bridge port	Selects which port transmits NRX sentences
Alarm port	Selects which port transmits ALR sentences

SYSTEM ALARMS

An alarm will always generate a message, and will actuate the relay contacts.

The front panel LED and the buzzer are programmable – see `Setup mode: system options`. Consequently, these indicators may or may not activate to indicate an alarm.

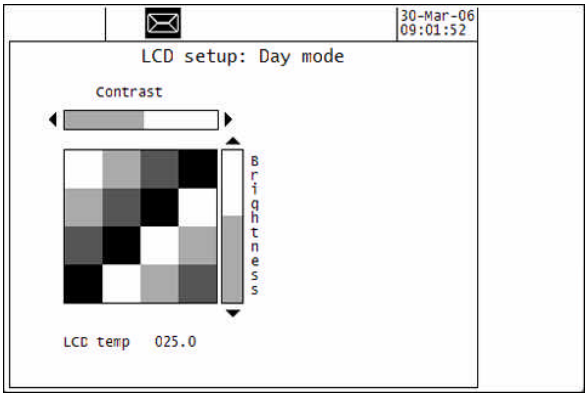
SIGNAL MONITOR

The NAV-7 continuously monitors the signals being received, and generates an alarm should any signal channel give indication of malfunctioning.

LCD SETUP

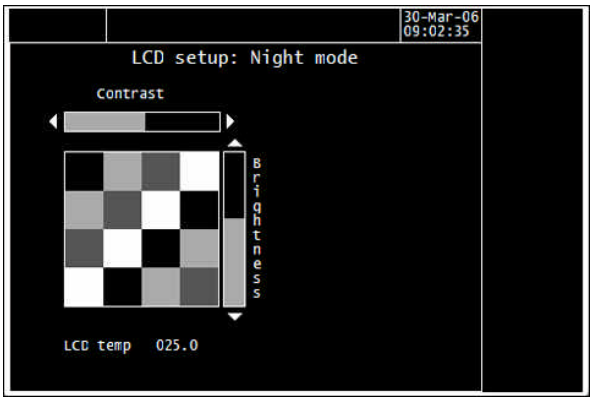
LCD setup day & night modes

To enter LCD setup mode, press and hold the illumination key. After a few seconds the `LCD setup: Day mode` page will be displayed.



Use the left and right (◀ and ▶) keys to adjust the LCD contrast.
Use the up and down (▲ and ▼) keys to adjust the LCD brightness.

To change the night mode settings, briefly press the illumination key. The `LCD setup: night mode` page will be displayed.



Note: These settings are non-volatile and will be unchanged after a power cycle.

SERIAL INTERFACES

The NAV-7 has an IEC 61162-2 compatible serial interface which can be used to connect the NAV-7 to other equipment such as an integrated bridge system or a PC running charting software.

The interface operates all the time that the NAV-7 is switched on – there is no ON/OFF control for the interface.

The IEC 61162-2 compatible serial interface also allows the connection of a serial printer.

Connecting a Printer

The recommended external printer is the Seiko DPU-414; the default printer parameters are set correctly for this model. The printer should be connected to the NMEA port of the NAV-7 (the 9-way D-type socket at the rear):

DPU-414 pin 3 (RxD) to NAV-7 pin 7 (TxA)
DPU-414 pin 5 (Gnd) to NAV-7 pin 2 (TxB)

After connecting the printer, set the 'Printer port' parameter to 'NMEA port' on the `Setup mode : Serial options` page and ensure that the 'Bridge port' and 'Alarm port' parameters are set to either 'IBS' or 'None'. Set the ‘NMEA port speed’ to 4800.

The printer is powered by the mains adaptor supplied.

The printer must be configured for correct operation. The standard default settings for the printer should be used, except for the following:

SW-1 Set for serial interface (not parallel)
SW-2 Set for English (not Japanese)
SW-3 Set for XON/XOFF control (not H/W BUSY)
SW-3 Set for 4800bps (not 75bps)

Refer to the DPU-414 manual for details of how to set these parameters.

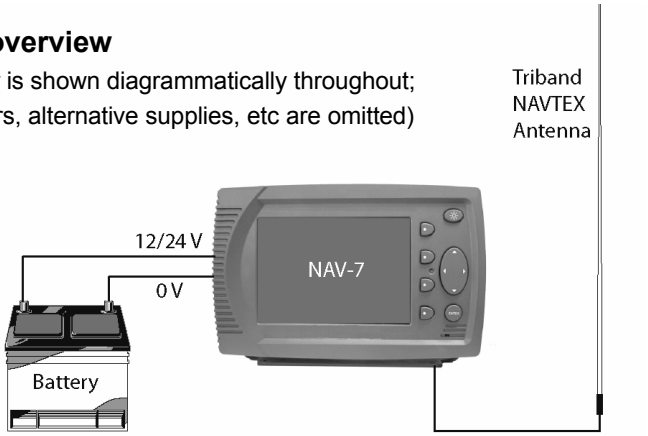
The compass safe distance for the printer is 1.0 m.

The printer should be secured to prevent it moving during operation. The use of adhesive foam pads is recommended.

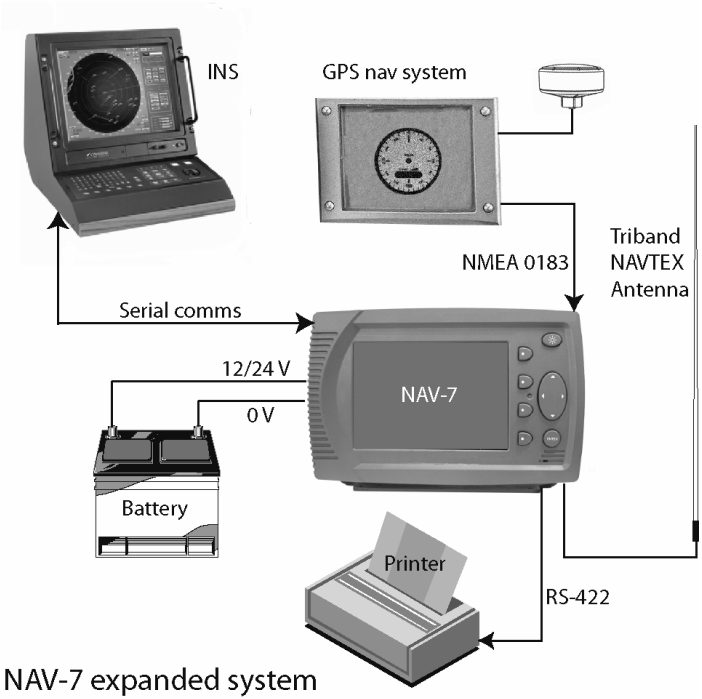
DISPLAY PHYSICAL INSTALLATION

NAV-7 system overview

(for simplicity, power is shown diagrammatically throughout; fuses, circuit breakers, alternative supplies, etc are omitted)



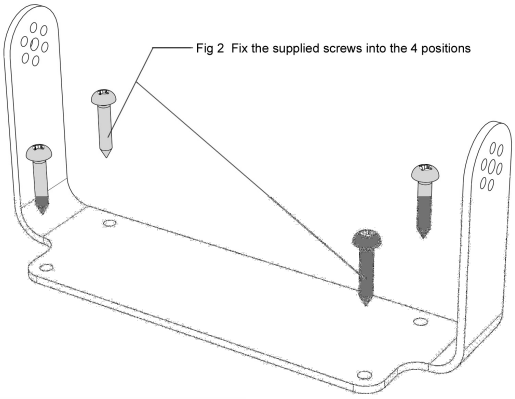
NAV-7 minimum system



NAV-7 expanded system

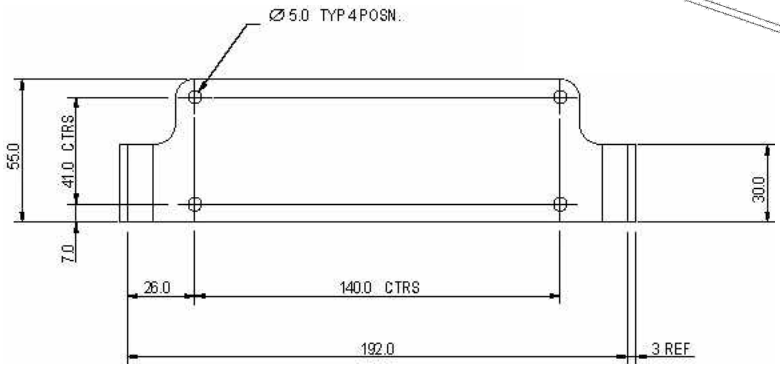
Trunnion mounting the display

The standard bulkhead mounting U-Bracket can be used to mount the NAV-7 above or below a horizontal (or near horizontal) surface.



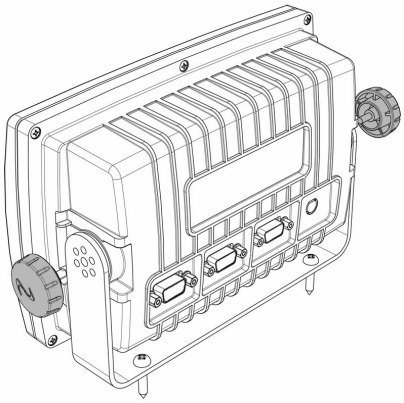
Hole size

to fit #10 screw:
3.5mm



Drilling drawing (mm)

Select hole size to suit method of fixing mountings – clear or tapped holes.



Rear view of trunnion bracket assembly

Ensure that rubber washers are fitted between the trunnion bracket and the plastic enclosure.

Tilt the display to the correct viewing angle.

Tighten the two thumbwheels.

Flush mounting the display

If the NAV-7 is to be mounted through a flat panel, use the flush mounting kit provided.

A cutting template is supplied with the flush mounting kit. This template carries full fitting instructions.