

# Nav4plus User Guide

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## Important Information

This equipment is not approved for use by SOLAS convention vessels within the Global Maritime Distress and Safety System (GMDSS)

It is intended for use by leisure craft and other non-SOLAS vessels wishing to participate within GMDSS

## 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

***Applicable product(s) :***

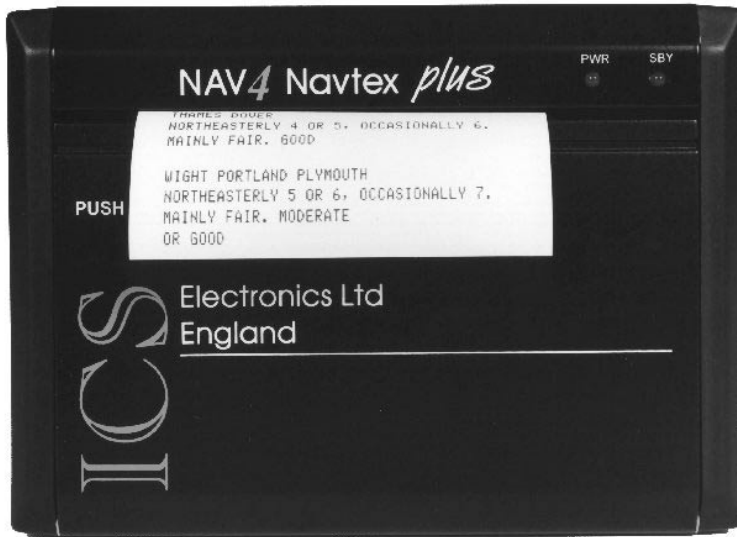
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**914.01**      ***NAV4plus NAVTEX Receiver  
software version 2.66 or later***

**913.28**      ***NAV4plus Software upgrade kit  
software version 2.66 or later***

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Congratulations on purchasing this superb **ICS Electronics Ltd** product. We hope that it gives you many years of reliable and trustworthy service. Please take the time to read this manual carefully as it contains some essential information regarding the operation and maintenance of the product and a useful background to the NAVTEX system.

We recommend that you regularly visit the ICS website [www.icselectronics.co.uk](http://www.icselectronics.co.uk) for information on updates, the availability of software enhancements, further options and support. The support pages contain frequently asked questions about the NAV4*plus* that you may find 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 that you may wish to visit; see <http://www.icselectronics.co.uk/icsnet/Links>

## QUICK START – GENERAL INSTRUCTIONS

You will find the NAV4plus extremely easy to operate.

- Follow the installation guidelines
- Attach an antenna & a suitable power supply
- Check the cable connections and apply power
- You can now receive & print NAVTEX messages and/or NMEA log data – you may wish to change the set-up of your NAV4plus in order to select specific stations and/or message types that you wish to suppress – go to the 'NAV4PLUS SET-UP' section.

## QUICK START – SOFTWARE UPGRADES

*If you have received this User Guide as part of a NAV4plus software upgrade kit, please go to the appendix headed "Installation of Replacement EPROM" located towards the end of the guide and follow the instructions printed there. Then take time to read the rest of the User Guide to familiarise yourself with the new features that we have added to your NAV4plus.*

## QUICK START – DUAL FREQUENCY OPERATION

You may be aware that in some parts of the world a new 490kHz NAVTEX service is being phased in. Your NAV4plus can support this second frequency service if you **also purchase a NAV-490 frequency converter**.

This ancillary piece of equipment converts the 490kHz 'local' NAVTEX transmissions to 518kHz so that the NAV4plus can decode them. Note that only one frequency can be received at any time, and that switching between frequencies is a manually controlled operation.

### **Changing Frequency**

This instruction only applies to installations that include a **NAV-490** frequency converter.

When changing frequency, in addition to switching the NAV-490 converter, it is also necessary to set-up the NAV4plus as follows :

Switch the NAV-490 to **490kHz**, press **N N Y** on the Nav4plus.

Switch the NAV-490 to **518kHz**, press **N Y Y** on the Nav4plus.

## INTRODUCTION

### *What Is NAVTEX?*

NAVTEX is a world-wide system for the broadcast and automatic reception of maritime safety information (MSI) in English on 518kHz (other local languages may be available on 490kHz) by means of a narrow-band direct-printing telegraphy. NAVTEX provides shipping with navigational and meteorological warnings and urgent information automatically from a dedicated receiver.

NAVTEX is a component of the IMO/IHO world-wide Navigational Warning Service (WWNWS) as defined by IMO Assembly resolution A.706(17). It is included within the Global Maritime Distress and Safety System (GMDSS). Since 1 August 1993, NAVTEX receiving capability has become mandatory equipment for certain vessels under the provisions of the International Convention for the Safety of Life at Sea (SOLAS).

NAVTEX broadcast information is available to all seafarers, free of charge.

### *How Does NAVTEX Work?*

NAVTEX transmissions are sent on 518kHz from stations situated world-wide, some of which also transmit a local language service on 490kHz. The power of each transmission is regulated so as to avoid the possibility of interference between transmitters. Each station is allocated a 10-minute time slot every 4 hours so that many stations can share the same frequency.

Nav4plus users can set-up filtering to print only specific message types from selected stations. Users can choose to print information from just the single station that serves the sea area around their position, or from a number of stations.

### *NAVTEX Message Headers*

Each NAVTEX message header has a four figure identifier eg. GA59. This defines the station that transmitted the message and the category or type of message that follows.

- The first letter tells you which NAVTEX **station** the message is from (eg. G)
- The second letter tells you the **category** of the message. (e.g. A)
- The last two digits are the individual message **serial number**

## ***What Can My Nav4plus Do?***

- Out of the box, the Nav4*plus* prints all correctly framed NAVTEX messages that it receives, regardless of station, message type or error rate (< 33%). In order to reduce the number of messages printed, the messages can be selected from the total set of received messages by applying various filter settings
- Station filters can be set-up to print messages from preferred stations – for both 490 & 518kHz stations
- Message type filters can be set-up to print only messages of selected types – for both 490 & 518kHz operation
- The NAV4*plus* has powerful automatic software features. These are available as soon as you connect the NAV4*plus* to a GPS with an NMEA data output or to an integrated navigation system with NMEA output

Connecting the NAV4*plus* to its antenna via the NAV-490 converter allows reception from either 490kHz or 518kHz. Please read the NAV-490 section for further details. It is important to ensure that the NAV4*plus* settings match the NAV-490 setting.

Connecting the NAV4*plus* to a GPS navigator will enable you to :

- Print out the vessel's position, course and speed at pre-programmed intervals
- Automatically select the in-range NAVTEX stations. This reduces the reception of unwanted distant stations (especially at night)
- Alternatively, the NAV4*plus* can be set to receive only the nearest NAVTEX station
- A list of GPS Waypoints can be printed on demand

Connect the Nav4*plus* to an integrated navigation system (which also has an inbuilt GPS receiver) in order to print a logbook at pre-programmed intervals. The information printed will include the following :

- Position
- Course & speed through the water
- Log of distance travelled
- Wind speed & direction
- Depth
- Date & time

*When you switch on the NAV4plus for the first time it will accept **all** categories of messages from **all** NAVTEX stations on the currently selected frequency.*

It is likely that you will wish to reduce the amount of information printed so that only NAVTEX messages applicable for your area are printed.

For **518kHz** operation you have two options :

1. Programme out any stations and categories that you do not want to receive so that they are ignored. Any of the NAVTEX message categories can be ignored, if required
2. Link a GPS or integrated instrument system (with GPS) and let the NAV4plus select NAVTEX stations automatically. The NAV4plus contains an internal database of 518kHz station locations.

For **490kHz** operation station selection can only be made manually – there is no internal database of 490kHz station locations. If you wish to reduce the amount of information printed then programme any stations and categories that you do not want to receive so that they are ignored. Any of the NAVTEX message categories can be ignored, if required.

Message category definitions and a world-wide list of NAVTEX stations and their identification codes can be found near the end of this user guide.



## HOW TO OPERATE YOUR NAV4PLUS

### **Control Buttons**

The NAV4plus has 4 control buttons. The control buttons are located under the paper loading door. Push the top of the door to release the locking door catch.

### **Basic Controls**

#### **F: Paper Feed**

Press and hold the **F** button to feed the paper.

#### **N: Start set-up procedure**

Press the **N** button to enter set-up mode.

#### **Y: Stop Alarm. Stop / restart printer**

When the printer is on, it can be put into / out of standby by pressing the **Y** button. This can enable print-outs to be paused if required. When in standby mode, the front red 'SBY' LED is illuminated

#### **P: Power on / off**

Once power has been applied, the NAV4plus can be switched on and off by pressing the red power **P** button.

Several buttons have second functions. These are used when responding to the 'SET-UP' menu prompts.

### **LEDs**

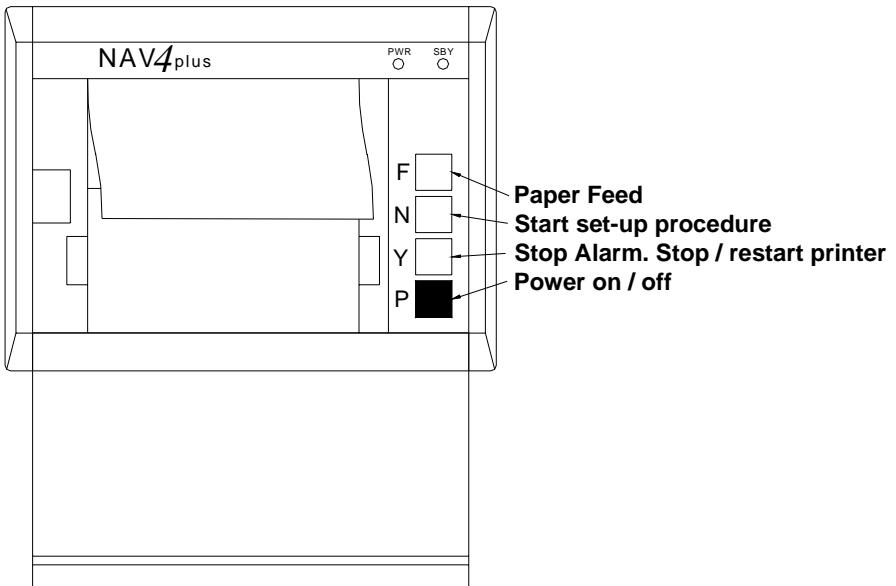
There are two LEDs along the top of the NAV4plus :

- PWR            ON when power is applied
- SBY            ON for message RX & standby mode

### **Alarms**

The alarm will sound under the following circumstances:

- Paper out
- Low battery (supply is less than 9 volts)
- Reception of a 'D' category SAR message
- Printer jammed



## **NAVTEX MESSAGE LOG**

The NAV4plus keeps an internal log of received NAVTEX message identifiers to ensure that each message is printed according to the rules below.

- If a message is received with an error rate of < 33% then it will be printed only if it hasn't already been printed with a lower error rate, within the last 72 hours.
- If a message has been printed with an error rate of < 4% then it will not be re-printed within 72 hours even if it is received again with a lower error rate.

The message log is persistent in that it remains in memory even after the power has been switched off.

Note that if a message is required to be printed after it has already been received and printed once then the message log needs to be cleared – see the section entitled 'NAV4plus Set-up'. This is true even if the power has been switched off for a period.

## INITIAL OPERATION

- Switch on the NAV4plus by applying 10 - 30V dc to its power connections and pressing the red power **P** button
- The “PWR” light will illuminate, and the NAV4plus will sound a long ‘beep’, followed by two short ‘beeps’ & then print its current set-up parameters

```

=====
AUTO NAVTEX UPDATE=====
ALL STATIONS ON(NO NMEA POSITION
DATA)
=====NAV-4 INITIAL SETUP=====
WAYPOINT PRINTOUT: OFF
POSITION LOG: 3 HOURS
CATEGORIES: A- CD - - - - -
STATIONS: ABCDEFHIJKLMNOPQRSTUVWXYZ
SELECTED FREQUENCY: 490kHz
=====ICS NAV-4 V2.65=====
    
```

- The printer will perform several line feeds
- The NAV4plus is then ready to receive & print messages

After you initially switch on the NAV4plus, you may have to wait several hours for the next scheduled NAVTEX transmission. These are at intervals of four hours, although a “safety” or meteorological message may be transmitted at any time.

***Do not assume that the unit is not working if messages are not printed straight away.***

Details of how to select NAVTEX stations and messages categories can be found in the ‘NAV4plus Set-up’ section.

## NAV4PLUS SET-UP

Press the **N** button to start the set-up procedure. You are asked which **frequency** you wish to set-up. If you do not have the NAV-490 installed then you can only receive on 518kHz and 490kHz should not be selected. For 518kHz press the **Y** button and switch the NAV-490 to 518kHz (if applicable). For 490kHz press the **N** button and switch the NAV-490 to 490kHz.

### 518kHz set-up

1. You now get a print out of the **current settings** for the selected frequency. To accept, press the **Y** button. To change any part of the settings, press the **N** button.
2. If the **N** button was pressed then **each item is printed in turn** for acceptance or rejection as follows :
3. **Closest Station.** The present setting is printed, press the **Y** button to accept or the **N** button to change. The new setting is now displayed. Press the **Y** button to accept or the **N** button to change. Cycle round the available options until the NAV4plus prints the one that you want, then press the **Y** button to accept it. The options are :

*MANUAL SELECTION*

*ALL STATIONS IN RANGE (requires a position input from GPS)*

*CLOSEST STATION (requires a position input from GPS)*

4. **Station Selection.** The present setting is printed, press the **Y** button to accept or the **N** button to change. If **N** then one or more stations may be selected, there are 26 options, one for each letter of the alphabet. 26 key presses have to be made, pressing **N** for every station that you wish to reject and **Y** for every station from which you wish to receive NAVTEX.

Button Push	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	
Station	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Y/N																										

For example, for just station S, **N** would be pressed 18 times, **Y** once and then 7 more **N**'s.

STATIONS: -----S----- (Example)

- Message Categories.** The present setting is printed, press the **Y** button to accept or the **N** button to change. If **N** then one or more message categories may be selected, there are 26 options, one for each letter of the alphabet. 26 key presses have to be made, pressing **N** for every message category that you wish to reject and **Y** for every message category which you wish to print.

Button Push	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Category	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Y/N																										

CATEGORIES: A-CD-----KLM----- (Example)

- Log Interval.** The present setting is printed, press the **Y** button to accept or the **N** button to change. Options are **Off**, **15mins**, **30 mins**, **1 hour**, **3 hours**, **6 hours** or **12 hours**. Accept **Y** or reject **N** each option in turn. Upon acceptance your selection will be printed.
- Waypoint Printing.** The present setting is printed, press the **Y** button to accept or the **N** button to change. Before selecting, ensure that your GPS fully supports the printing of waypoints.
- Clear Message Log.** Press the **Y** button to clear the list of previously printed messages or the **N** button to maintain it. If you press the **Y** button, the NAV4plus will now be ready to print messages with the same identifier & serial number log *before* the 72 hour message timeout period has passed.

### 490kHz set-up

1. You now get a print out of the **current settings** for the selected frequency. To accept, press the **Y** button. To change any part of the settings, press the **N** button.
2. If the **N** button was pressed then **each item comes up in turn** for acceptance or rejection as follows :
3. **Station Selection.** The present setting is printed, press the **Y** button to accept or the **N** button to change. If **N** then one or more stations may be selected, there are 26 options, one for each letter of the alphabet. 26 key presses have to be made, pressing **N** for every station that you wish to reject and **Y** for every station from which you wish to receive NAVTEX.

Button Push	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Station	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Y/N																										

For example, for just station S, **N** would be pressed 18 times, **Y** once and then 7 more **N**'s.

STATIONS:-----S----- (Example)

4. **Message Categories.** The present setting is printed, press the **Y** button to accept or the **N** button to change. If **N** then one or more message categories may be selected, there are 26 options, one for each letter of the alphabet. 26 key presses have to be made, pressing **N** for every message category that you wish to reject and **Y** for every message category which you wish to print.

Button Push	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Category	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Y/N																										

CATEGORIES : A - CD ----- KLM ----- (Example)

5. **Log Interval.** The present setting is printed, press the **Y** button to accept or the **N** button to change. Options are **Off, 15mins, 30 mins, 1 hour, 3 hours, 6 hours** or **12 hours**. Accept **Y** or reject **N** each option in turn. Upon acceptance your selection will be printed.
6. **Waypoint Printing.** The present setting is printed, press the **Y** button to accept or the **N** button to change. Before selecting, ensure that your GPS fully supports the printing of waypoints.
7. **Clear Message Log.** Press the **Y** button to clear the list of previously printed messages or the **N** button to maintain it. If you press the **Y** button, the NAV4plus will now be ready to print messages with the same identifier & serial number log *before* the 72 hour message timeout period has passed.

All of the programmed settings are now printed for the selected frequency. If the other frequency has to be re-programmed this sequence has to be repeated, starting at 1. above.

## TEARING OFF A PRINT-OUT

Use a **gentle** up or downward and sideways motion to tear the paper at the exit point of the NAV4plus case.

**DO NOT PULL THE PAPER THROUGH THE PRINTER AS THIS ACTION WILL DAMAGE THE PRINTER MECHANISM**

Always use the **F** button to feed the paper clear of the mechanism.

## PAPER LOADING

The NAV4plus is supplied with one roll of paper fitted. At the end of this paper roll the NAV4plus will sound an alarm and printing will stop. Early warning that the paper is about to run out is given by red stripes on the paper.

If the paper runs out in the middle of a message, information will not be lost provided the NAV4plus is not switched off.

- To remove the remaining paper, open the paper loading door (push a top corner of the door to release the locking door catch)
- Tear off the paper where it enters the printer mechanism
- Remove the old paper roll
- Remove the plastic spindle from inside the paper roll
- Press the **F** button to feed the remaining paper through the printer mechanism

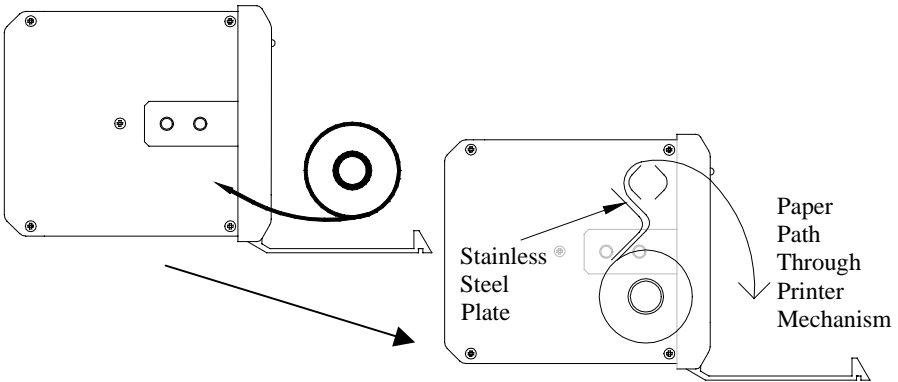
**DO NOT PULL THE PAPER THROUGH THE PRINTER AS THIS ACTION WILL DAMAGE THE PRINTER MECHANISM**

- Place the new roll onto the spindle with the paper emerging from the top of the roll pointing towards you
- Mount the new roll and spindle onto the roll bracket
- Insert the paper into the slot at the base of the printer mechanism, and feed it in above the stainless steel plate
- Press and hold the **F** button whilst the paper is pulled through the printer mechanism

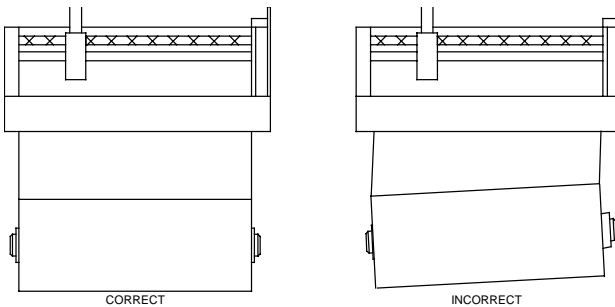
***It is important that the edge of the new paper roll is cut straight and that the paper is dry.***

***Use a pair of scissors to prepare a clean straight paper edge.***





- Check that the paper roll is correctly aligned with the print mechanism as shown below



- Press the **F** button until the paper clears the printer mechanism by at least 2cm

## AUTO LOG BOOK OPERATION

A typical GPS log printout is shown below:

```
LOG =====17:00 UTC
POSN: 5233.07'N 020°13.55'W
GROUND: 015.5kn @ 112°(T)
```

The vessel's position at the time of the printout is shown along with the vessel's speed and course over ground with reference to true north.

- The true course is indicated by (T)
- GROUND refers to the course and speed of the vessel over the ground

An integrated navigation system incorporating GPS can provide additional information. The amount of information printed is dependent on which NMEA sentences are available.

A typical example of the type of print out received from an integrated navigation system is shown below:

```
LOG =====17:00 UTC
POSN: 4833.07'N 008°13.55'W
GROUND: 014.5kn @ 112°(T)
WATER: 016.2kn @ 116°(M)
LOG: 1367.8nm
WIND: 012.4kn @ 300°(T)
DEPTH: 407.5m
```

- The vessels position at the time of the printout is shown
- A true course is indicated by (T) and a magnetic course is indicated by (M)
- GROUND refers to the course and speed of the vessel over the ground

- WATER refers to the course and speed of the vessel through the water
- LOG is a running distance total as provided by the system speed log
- WIND is displayed in the format provided by the wind instruments
- DEPTH is displayed in the format provide by the depth sounder, including any keel offset set. Some depth sounders give out several different unit values (feet, meters, and fathoms) just the first value provided is selected for printing
- When you first use the NAV4plus the position logging function is turned off

Position logging can be turned on and set to give log printout at intervals of 15 and 30 minutes or 1, 3, 6 or 12 hours. Refer to the 'NAV4plus Set-up' section for details.

The NAV4plus will automatically stop log printouts when you are alongside or at anchor, this is done by sensing that the GPS position is no longer changing.

- Log printing will resume once the vessel's movement over a 1nm line of position is detected
- If you find that the log printout continues when you are moored up, it is possible that the 'selective availability' feature of the GPS satellite system is causing the vessels position to wander across a 1nm line of position. *(Note that at the time of publishing, selective availability had been turned off by the US government).*

***Do not turn the GPS off when in port if you intend to leave the NAV4plus running in AUTO NAVTEX. If you do, be prepared for a lot of printout as without a valid GPS position ALL NAVTEX STATIONS may be automatically selected.***

## **QUIET / SILENT MODE**

If required, you can silence the printer without missing any new messages:

- Press the 'Y' button

The 'STBY' LED will light. Any new messages will be stored in memory.

- Push 'Y' once to turn off standby mode, restore normal operation and print out stored messages

***Note that the reception of a message category "D" Search and Rescue information (or a message with 00 as the message number) will sound the alarm signal and return the system to normal operation.***

*When in silent mode, NAVTEX messages, position log and Auto NAVTEX station information reports are held in memory. Approximately 300 lines of information may be stored. Once this has been exceeded the NAV4plus will return to normal operation and print all stored information.*

## **NAVTEX STATION LIST**

The NAV4plus contains a list of all NAVTEX stations (or those expected to be transmitting within six months of the software release date) together with their locations and designation letters.

To print a copy of the current NAVTEX station list:

- Turn the NAV4plus off
- Hold in the 'N' button while pressing the 'P' button
- After a short delay, release the 'P' button and then the 'N' button

Once the list is printed normal operation will resume.

## **ALARMS**

The alarm will sound under the following circumstances:

- Paper out
- Low battery (supply is less than 9 volts)
- Reception of 'D' category message
- Printer jammed

Silence the alarm by solving the problem and then pressing the 'Y' key.

## **DEFAULT RESET**

A default reset will clear all user set-up changes and reset the factory default settings.

- Turn the NAV4*plus* off
- Hold in the 'Y' button and push the 'P' button
- After a short delay, release the 'P' button and then the 'Y' button

The NAV4*plus* will sound a long bleep as default settings are loaded.

## **Message reports**

### **ERROR RATE > 4% Message not logged**

Greater than 4% but less than 33% of character errors were received within the message. The message has not been entered into the message log, if the message is repeated the NAV4*plus* will attempt to print the message again.

### **NAVTEX Message Rejected**

A message selected for printing has been rejected due to more than 33% character errors.

### **LOG ==NO NMEA DATA**

GPS or instrument system NMEA data was unavailable at the time of the log entry.

### **NAV-4 Print Buffer Full**

A message selected for printing could not be recalled from the print queue.

Turn the NAV4*plus* off and on again to resume normal operation.

## INSTALLATION

### *Mechanical Installation*

The bulkhead mounting bracket supplied can be used to mount the NAV4*plus* above or below a horizontal (or almost horizontal) surface. If the NAV4*plus* is to be mounted through a flat panel, it is advised that you purchase the FMT-4 flush mounting kit option.

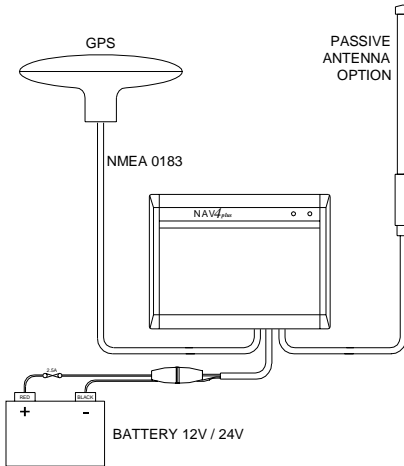
The NAV4*plus* should not be mounted in a position where spray can reach it in a rough sea, or where it is exposed to direct sunlight.

Installation of the NAV4*plus* is straightforward and can be carried out with just a drill and screwdriver.

- Use cable ties to restrain the wiring from any vibration that might weaken it over a prolonged period
- The connecting cables should be restrained from movement by securing them to the rear of the NAV4*plus* or to adjacent woodwork

## Electrical Installation

An overview of the NAV4plus system connections is shown below:



### Connecting to a Power Supply

The NAV4plus should be powered from a nominal 12Vdc or 24Vdc switched supply, capable of providing a continuous 2A

To allow the unit to be isolated for service, a 2.5A circuit breaker (or a 2.5A fuse and switch) should switch the power supply to the printer.

- The connection to the boats power supply should be made with the cable supplied, which may be extended if required
- Use RED and BLACK wires for connection to the boat's power supply
- Connect the RED wire to boat's positive (12Vdc or 24Vdc) supply
- Connect the BLACK wire to negative (0V) supply
- Carefully check all connections before applying power
- Note that vessels that require isolation may need to install a DC to DC converter – if in doubt ask your dealer

### Safety Warning

The ICS NAV4plus has been designed and manufactured to be completely safe when installed in accordance with these installation instructions.

It is essential that a fuse or circuit breaker be installed in the supply cable. The NAV4plus is supplied with a DC power cable and in-line 2.5 amp fuse. It is essential that this fuse is included in the finished installation.

### NAV4plus Interface Connections

The Nav4plus rear panel connections are :

Pin	Function
1	Antenna
2	Antenna ground
3	Not used
4	Not used
5	NMEA B (negative)
6	NMEA A (positive)
7	0V power input
8	12V/24V power input
9	Not used
10	Not used

- The label on the rear of the Nav4plus identifies each connection
- Pin 1 is located closest to the edge of the NAV4plus case
- The power supply input should be within the range 10 – 30Vdc

A grounding link wire is fitted between the antenna cable screen (pin 2) and the battery negative input (pin 7).

- You may need to remove the grounding link wire altogether if the vessel has an isolated battery supply fitted with an earth leakage alarm circuit. In this case a 0.1 $\mu$ F capacitor should be connected between pin 2 and pin 7 on the connector block. An automotive style capacitor of the type normally used to suppress interference from electric motors with a rating of at least 50Vdc is suitable. This will provide an effective antenna ground connection
- without grounding out the vessel's battery supply



## NMEA CONNECTIONS

A two wire cable should be used to connect a GPS receiver or integrated instrument system's NMEA output to the NAV4plus NMEA input.

NAV4plus Pin	Function
5	NMEA B (negative) from GPS
6	NMEA A (positive) from GPS

NAV4plus firmware version 2.08 and later supports NMEA 0183 Version 2

### GPS Receiver

The GPS receiver must be able to provide at least the following NMEA 0183 Version 2 sentences:

**RMC**  
or  
**GGA** and **VTG**  
or  
**GLL** and **VTG**

Older systems providing NMEA 0183 version 1.5 data *may* be used if **ZDA** and **VTG** sentences are provided in addition to the **GLL** sentence.

Some GPS units may need to be user-programmed before they will output suitable sentences. Consult the GPS unit's handbook for further information.

Please study carefully the list of NMEA sentences needed by the NAV4plus.

ICS Electronics Ltd. cannot accept responsibility for incorrect operation if NMEA sentences are incorrectly formatted by the GPS

## Integrated Navigation or Instrument Systems with GPS

The following NMEA 0183 Version 2 sentences are supported:

<b>sentence</b>	<b>description</b>
<b>VLW</b>	Distanced travelled
<b>VHW</b>	Speed through water & magnetic course
<b>MWV, VWR</b>	Wind speed and direction
<b>DBT</b>	Water depth
<b>WPL</b>	Waypoint printouts

*Note that exporting a list of Waypoints from a GPS to the NAV4plus must be controlled from the GPS / Navigator.*

### Testing the NMEA Interface Connections

The NMEA data interface may be tested by putting the NAV4plus into 'NMEA Test' mode. The raw NMEA data string is printed as presented by the equipment connected.

To enter NMEA test mode:

- Push the 'Y' button three times in rapid succession
- The NAV4plus will start to "tick"
- All the NMEA sentences that the NAV4plus can decode will be printed
- To cancel the test, turn the NAV4plus off and back on again

*If no information is printed, the connection wires between the GPS and the NAV4plus should be checked.*

### Notes for Raymarine (Autohelm) Instrument System Users

'SeaTalk' data is not directly compatible with the NMEA 0183 data format. Because of this Raymarine make an 'NMEA Bridge' interface box option, this allows connection of a NMEA device such as the NAV4plus to most 'SeaTalk' instrument systems. For further information, contact your Raymarine dealer.

## **ANTENNA INSTALLATION**

Several different types of antenna can be used with the NAV4plus. Recommended antenna types include :

- **ANT4w passive antenna**  
This is a suitable antenna for sailing boats and power craft alike, rail or deck mounted via a threaded base fitting. The ANT4w has 10m of cable pre-fitted
- **NAV-ACTIVE broad band active antenna**  
This is a low profile, stainless steel whip antenna suitable for power craft, supplied with side mounting bracket and a DC power supply unit. The NAV-ACTIVE has 20m of cable pre-fitted
- **BB-1 backstay long wire coupling transformer**  
This allows an insulated backstay to be used as a NAVTEX antenna, although this is not possible if it is also being used for transmitting. The BB-1 backstay must be used with 6m+ of insulated rigging as the actual antenna. The BB-1 has 15m of cable pre-fitted
- One of the many multi-output 'active antennas' on the market may be suitable provided that the NAVTEX frequency of 518 kHz is within its frequency coverage range. As power for an active antenna is not directly provided by the NAV4plus a separate antenna power supply unit will be needed

*Full antenna installation instructions are supplied packed with each antenna option*

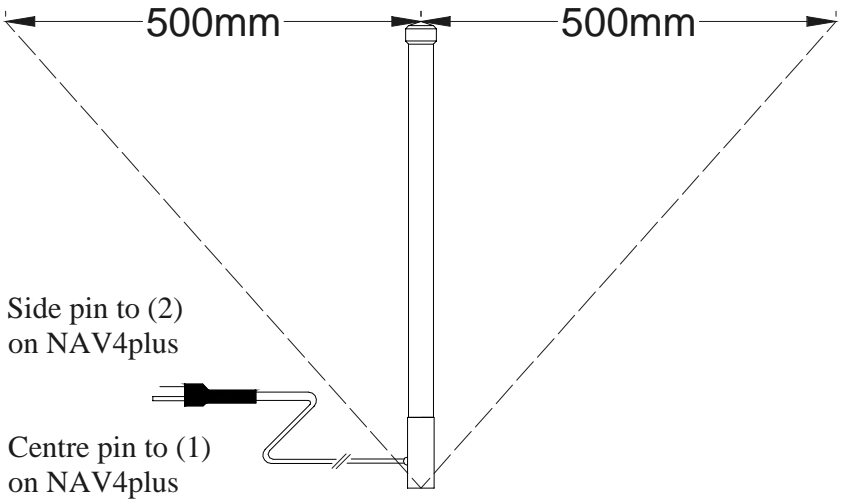
**INSTALLATION: ANT4w NAVTEX ANTENNA**

The ANT4w NAVTEX antenna should be mounted clear of metal rigging and at least 0.5 metres from other antennas. Ensure that it cannot be snagged by mooring warps, running rigging or engulfed by green water. It should be mounted so that the antenna is pointing upwards with the connecting lead exiting from the bottom.

**ANT4w**

The ANT4w passive NAVTEX antenna will mount on a standard 1" x 14 T.P.I. marine GPS/VHF antenna base or pole fitting, these are available from marine supply shops. The optional ANT-CLAMP is recommended if you intend to mount the ANT4w antenna directly onto a 25mm stainless steel rail.

NO-GO cone – keep this area clear of obstructions



- Mount the antenna in an elevated position, well clear of rigging and obstructions
- Metal rigging or other antennas must be located outside of the 'NO GO cone' surrounding the upper part of the ANT4w antenna
- Pass the coaxial antenna cable through a waterproof deck gland and connect it to the rear connector of the NAV4plus
- The centre pin of the cable connects to pin 1 and the side pin to pin 2 of the NAV4plus rear connector

If it is necessary to lengthen the antenna cable, standard Marine VHF type 50ohm coaxial cable is recommended. A terminal strip connector may be used to make the join but ensure that joints are well protected with 'self-amalgamating tape' and that the cable is secured against vibration with tie-wraps.

### **Self Test**

The self test procedure tests the operation of the Nav4plus and prints a status report. To start the self test:

- Turn off the Nav4plus
- Hold in the **F** button and switch on the power by pressing the **P** button
- After a short delay, release the **P** button and then the **F** button
- A long 'beep' will sound, followed by two short 'beeps' and a test report is printed
- Once the test results are printed normal operation will resume

If all tests are successfully completed, the following is printed:

```

pqrstuvwxyz{"}@
HIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqkl
!"#$%&'()*+,-./0123456789:;<=>?@ABCD

ROMDATE      :      Sep 06 2001
ROM          :      ICS NAV-4 V2.66
RAM          :      PASS
CPU         :      PASS
RXA-I       :      PASS
RXA-Q       :      PASS
PAPER SENSOR :      PASS
HEAD RESISTANCE :      B
=====NAV-4 INITIAL SETUP=====
WAYPOINT PRINTOUT: OFF
POSITION LOG: 3 HOURS
CATEGORIES: A-CD-----
STATIONS: ABCDEFGHIJKLMNPOQRSTUVWXYZ
SELECTED FREQUENCY: 490kHz
=====ICS NAV-4 V2.65=====

```

←Note 1:  
either A, B  
or C will  
show here.

- The HEAD RESISTANCE letter is for service use only, and should match the head resistance marked on the printer assembly (see note 1)
- The PAPER SENSOR tests whether the NAV4plus can recognise the presence of paper in the roll holder
- The RXA-I & RXA-Q tests the receiver channels
- CPU and RAM lines test the memory and central processor
- ROM and ROMDATE lines may change in line with product development
- The last three lines of this printout test the printer

A shortened version of the self test is carried out automatically each time the NAV4plus is switched on, but the results are not reported unless a fault is detected

## MAINTENANCE AND TROUBLE SHOOTING

### *Cleaning*

The Nav4plus may be cleaned when necessary by wiping with a cloth dampened with fresh water. Do not use solvents.

### **FAULT FINDING GUIDE**

If the Nav4plus does not operate as expected :

- Check that the Nav4plus is connected to a power supply (10 V<sub>dc</sub> -30 V<sub>dc</sub>) as detailed in the installation section of this user guide. Check that the in-line fuse has not blown
- Check that the antenna is mounted vertically with a clear all round field of view, and correctly connected to the Nav4plus rear connector
- Check that you are within the coverage area of an operational NAVTEX station (range is approximately 100 miles per 1kW transmit power over a sea path). You may have to wait up to four hours for the next regular a transmission
- Check that the correct NAVTEX station categories are set, refer to 'Set Up' section for details

### **RECEIVER TEST**

Check that the '**STBY**' LED flashes at the expected NAVTEX transmission time for your area, even if the station or message category is not selected for printing the LED should flash. If the LED fails to flash when expected then check the antenna.

### **ANTENNA TEST - general**

Check the cable between the NAVTEX antenna and the Nav4plus, ensure that it is not damaged. NAVTEX antennas must be mounted in an elevated position clear of obstructions.

If you are a long way from a NAVTEX transmitting station and you are obtaining poor print outs with lots of asterisks, consider mounting the antenna in a more elevated position.

### **ANT4w**

Using a multi-meter, check the impedance of the ANT4w. The correct reading is between 4 and 6 ohms across the disconnected antenna cable. This will confirm that the antenna cable and the ANT4w are good.

### **NAV-ACTIVE**

Check that the power supply unit has the necessary voltage available and that the fuse in the power supply unit has not blown.

### **PRINTER**

If there is no sign of life from the printer, check that a small piece of paper is not jammed under the print head.

If the printer operates but nothing is printed, check that the paper roll is of a type recommended by ICS and that the heat sensitive side of the paper is uppermost.

### **PAPER OUT ALARM**

Check that the paper roll is correctly fitted.

### **NMEA LOG PRINTING**

Run the NMEA test mode to determine if valid data is available from the GPS or instrument system – date & time data is essential. Refer to section 'NMEA test mode' for full details.

If your NMEA log prints out repeatedly, then your GPS is incompatible with this NAV4*plus* feature. Turn off Log Printing in the NAV4*plus* set-up menu.

### **SELF TEST**

Run a system self test. Refer to 'self test' section for details.

Should any item on the self test fail, turn the NAV4*plus* off and on again and repeat the self test. If any item on the self test fails a second time, contact your supplier for advice or call the ICS technical help line for assistance.



### ***Printer Jam***

Mishandling of the paper when installing a new paper roll can sometimes cause the printer to jam.

If the moving printer head is allowed to catch the edge of the paper roll the printer mechanism may stall. This will result in a 'printer fault' being reported by the unit (alarm : 'bleep', 'bleep', 'bleep').

This condition may be avoided by first ensuring that the new paper roll has a flat cleanly cut edge.

- Consult the 'Paper Loading' instructions for details of the paper load procedure

Should a paper jam occur, do not pull on the paper or try to force the printer head sideways as such action will cause damage to the printer and will invalidate your warranty.

### ***Clearing a Paper Jam***

As the procedure to clear a 'stalled printer' involves disassembly of the main unit it is recommended that this should only be attempted by authorised service personnel.

In the first instance :

Contact the dealer who supplied your unit for further instructions.

If you are still not satisfied contact the ICS Electronics Technical Helpline for assistance.

**Telephone +44 (0)1903 738706**

**Facsimile +44 (0)1903 738747**

**Email: [support@icselectronics.co.uk](mailto:support@icselectronics.co.uk)**

## WARRANTY

ICS Electronics Ltd warrants to the original end-user that this product will be free from defects in materials and workmanship for a period of one year from the date of purchase. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with the same or a similar model, which may be a refurbished model) at ICS Electronics' option, without charge for either parts or labour. For warranty repair, the unit must be returned, carriage pre-paid, to the ICS Electronics Ltd. dealer from whom it was first purchased. This limited warranty shall not apply if the product is modified, tampered with, misused, subjected to abnormal working conditions (including, but not limited to lightning and immersion in water) and use with power supplies and other options not specifically recommended by ICS Electronics Ltd.

Please contact us for further details of our warranty repair procedure.

## PACKING LIST AND OPTIONS

### *Packing List*

For the Nav4plus contents – please see the packing list enclosed.

### *Options*

<b>Installation Options</b>	<b>ICS Part Number</b>
FMT-4: Flush panel mounting kit	913.19
NAV-490: 490kHz to 518kHz converter enabling 490kHz transmissions to be received by a NAV4plus	913.18
NAV-ROLLS: Box of eight paper rolls	913.13
NAV-PSX: Mains/battery auto standby power unit (220/110V AC and 24V DC input with 13.8V DC output)	913.07

<b>Antenna Options</b>	<b>ICS Part Number</b>
NAV-ACTIVE: Broadband active antenna	905.02
BB-1: Backstay/long wire coupling transformer	BB-1
ANT4w : 490/518kHz remote passive antenna with 10metre of cable	904.02
ANT-CLAMP: ANT4w antenna mounting clamp for 25mm pushpit rails	903.03

**New supplies of paper rolls can be ordered from ICS dealers or directly from ICS in the UK.**

**Tel +44 (0) 1903 731101**

**Fax +44 (0) 1903 731105**

The paper roll size is 80mm x 20m with a maximum diameter of 42mm and an internal spindle (hole) diameter of 12mm. The paper must be suitable for use with a thermal printer.

*Specifications may be changed without notice.*

## SPECIFICATIONS

<b>RECEIVER</b>	
Receive Frequency	518kHz (490kHz option when used with NAV-490)
Sensitivity	< 2 microvolts
Frequency Stability	± 10Hz
Antenna input	50 ohms
<b>DATA DECODING</b>	In accordance with ITU-RM540-2
<b>PRINTER</b>	
Type	Thermal, 40 characters per line
Character Matrix	7 x 5
Paper Roll	80mm wide x 20mm long
Paper Out	Audible alarm
Front Panel	Four push-button switches under the paper load door
<b>NMEA INPUT</b>	NMEA 0183 version 2
<b>CONTROLS</b>	Power ON / OFF
	Paper feed
	Two menu set-up keys
<b>REAR CONNECTIONS</b>	10 way plug-in connector block with screw terminals
<b>ALARMS</b>	Vital message receipt
	Paper Out
	Low battery supply <9Vdc
	Printer jammed
<b>TEMPERATURE RANGE</b>	0 to +40 degrees Celsius
<b>HUMIDITY</b>	0 to 95%, non-condensing
<b>MOUNTING</b>	Shelf / bulkhead
	FMT-4 panel mount option
<b>WEIGHT</b>	1.2 kg
<b>POWER</b>	10 – 30 Vdc
	1.5 watts in standby
	2.5 watts printing

## APPENDIX I : NAV-490 NAVTEX CONVERTER

*Note: the NAV-490 should not be used by GMDSS -NAVTEX mandatory fit vessels.*

The NAV-490 converter is designed for use with ICS NAV4 and NAV4plus NAVTEX receivers.

490 or 518kHz NAVTEX services may be selected using the selection switch. A second, remotely mounted switch (not supplied) may also be installed.

The 490 kHz NAVTEX frequency has been designated worldwide as a 'local language' frequency and is already in use for French language transmissions from France. The International Maritime Organisation has asked all other countries to commence transmissions by 2005.

In the UK, the availability of 490 kHz has given the opportunity to provide dedicated Forecasts for waters up to 12 miles offshore. Regular transmissions covering the UK coastal waters are now made from three transmitters twice per day and include a very useful 3-day outlook.

### ***Controls***

Toggle switch allows either 490kHz or 518kHz transmissions to be selected.

### ***Mounting***

Designed for flush mounting on a flat panel with plug in connector strip protruding from the rear.

### ***Connections***

Eight way, two part screw terminal connector.

### **Connection pin assignments**

<b>Pin</b>	<b>Function</b>
1	490 / 518kHz antenna
2	Antenna ground
3	518kHz output to NAVTEX receiver
4	Output ground
5	Power supply ground
6	Power supply input 10-30VDC
7	Remote switch ground
8	Remote switch contact, OPEN = 490 kHz reception

### **Installation**

Locate the NAV-490 in a 'dry' location close to the NAV4plus. Two x 4.5mm diameter fixing holes are provided at each end.

To gain access to the rear holes you may need to unplug the orange connector.

Connect the ANT4/w (904.02) dual frequency' NAVTEX antenna to the orange connector. Pin 1 - antenna signal, pin 2 - antenna ground.

Connect the coaxial 'link' cable to the NAVTEX receiver antenna input (NAV4 pins 1 & 2, remove the existing antenna first). The 'red spot' on the connector identifies the antenna signal pin, which must be connected to NAV4 pin 1.

Connect the power wires to a 'SWITCHED' 10 -30 VDC supply or via a 1 Amp circuit breaker.

RED wire to POSITIVE, BLACK wire to NEGATIVE.

### **Dual Frequency NAVTEX antenna**

ICS recommends the 'ANT4w' dual frequency passive antenna for use with the NAV-490. Existing users of a single frequency ICS passive antenna should upgrade to ANT4w or NAVTEX reception range may be reduced.

Correct operation can not be guaranteed if other antennas are used, however, most wide band 'active' (with in-built PSU), long wire or whip antenna (with a 50 ohm matching transformer) may be suitable.

### **Remote Switch**

A remotely mounted NAVTEX frequency selection switch (not supplied) may be fitted to allow remote frequency switching. To use this feature, connect a 'single pole' switch across connection pins 7 & 8. The remote switch cable should not exceed 2M in length.

- The remote switch 'contact closed' selects 518kHz
- The remote switch 'contact open' selects 490kHz

To enable the remote switch, always leave the in-built switch in the 490 position.

### **Operation**

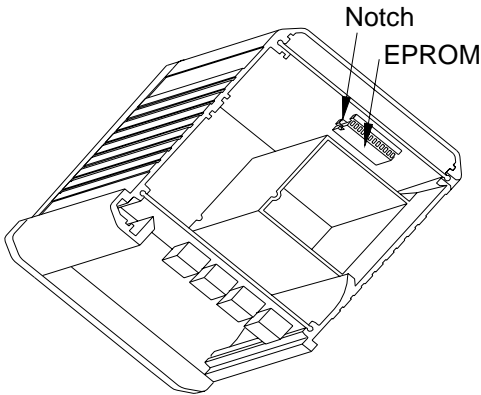
- Confirm that the NAV-490 power LED is ON
- Use the frequency selection switch to select the required NAVTEX service
- Confirm that the NAV4*plus* is switched on and the appropriate NAVTEX frequency, station and message categories are selected

## **APPENDIX II : INSTALLATION OF REPLACEMENT EPROM**

Before changing the EPROM, switch on the NAV4*plus* and press the **N** button to print out a list of the station and message selections.

- Switch off and unplug the orange connector at the rear of the unit
- Remove the five screws from the right hand end cheek (the end cheek nearest to the 4 pushbutton switches)
- Remove the right hand end cheek and door. Take note of the position of any washers between the end cheeks and the door
- Remove the four outer screws from the left hand end cheek, leave the centre screw in place
- Pull the left hand end cheek out by no more than 25mm so that the internal printer support slides clear of the EPROM chip which is on the edge of the printed circuit board. Do not allow the door and door rod to angle away from the end cheek as this will

damage the rod hole in the end cheek



- Remove the old EPROM chip from its socket by inserting a screwdriver under each end in turn until the chip can be removed by hand. Note the location of the notch in the end of the chip
- Check that the two lines of pins on the new chip are parallel and the same distance apart as those of the old chip. The

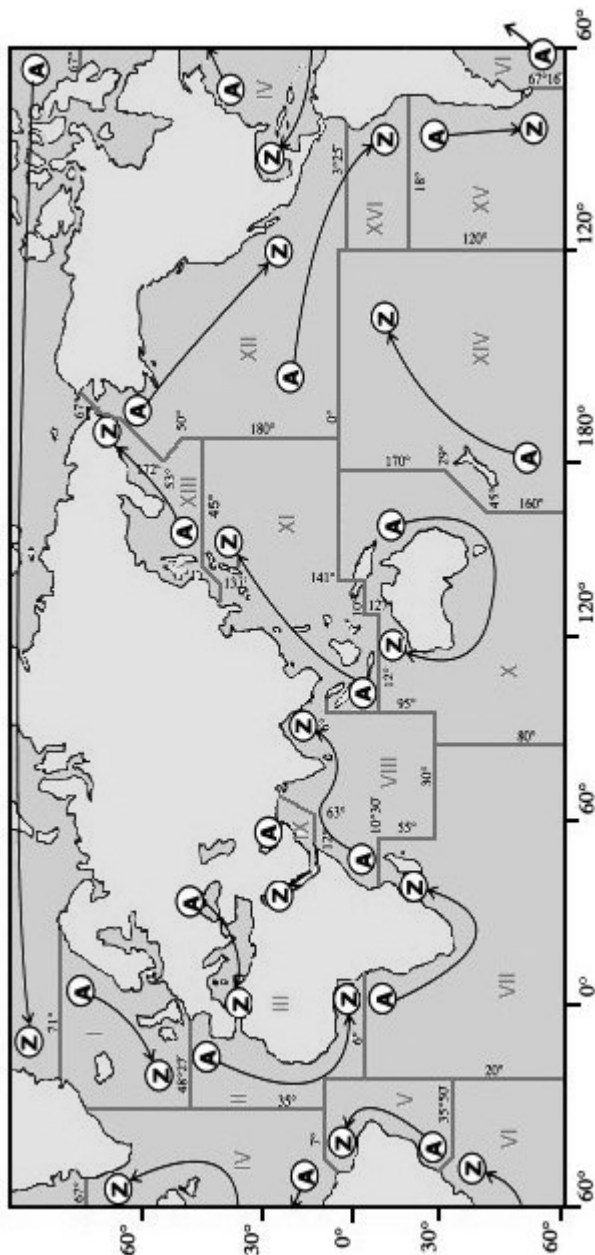
pins can be bent slightly if necessary by pressing against a flat surface

- Insert the new chip into the socket, taking care that the notch in the end is the same way around as the notch in the old chip
- Re-assemble in reverse order
- Replace the two cheeks, making sure that the washers and door hinge rod are firmly engaged in the holes in each end cheek
- Plug in the orange connector
- Press and hold the **Y** button as you switch on the unit for the first time, release the **Y** button and the NAV4plus will sound a long 'beep'
- Finally, re-enter the station and message selections and the log setting by pressing the **N** button and following the setup instructions as described in this handbook



## APPENDIX III : NAVTEX STATION DATABASE

World-wide Chart showing 518kHz NAVTEX transmitting station identifier allocations



## 518kHz NAVTEX Stations

Id	Area	Country	Name	Latitude	Longitude	Range (NM)	Op
A 01	Norway	Norway	Svalbard	78°4'N	13°38'E	450	Yes
A 02	France	France	Corsen	48°28'N	5°3'W	300	Yes
A 03	Russia	Russia	Novorossiysk	44°43'N	37°47'E	300	Yes
A 04	USA	USA	Miami	25°30'N	80°23'W	240	Yes
A 09	Iran	Iran	Bushehr	28°58'N	50°50'E	300	Yes
A 11	Indonesia	Indonesia	Jayapura	2°31'S	140°43'E	300	Yes
A 13	Russia	Russia	Vladivostok	43°7'N	131°53'E	280	No
A 15	Chile	Chile	Antofagusta	23°40'S	70°25'W	300	Yes
B 01	Norway	Norway	Bodo	67°16'N	14°23'E	450	Yes
B 03	Ukraine	Ukraine	Mariupol	47°6'N	37°33'E	280	Yes
B 04	Bermuda	Bermuda	Bermuda Harbour	32°23'N	64°41'W	280	Yes
B 07	Namibia	Namibia	Walvis Bay	23°3'S	14°37'E	380	Yes
B 09	Bahrain	Bahrain	Bahrain	26°9'N	50°28'E	300	Yes
B 11	Indonesia	Indonesia	Amboina	3°42'S	128°12'E	300	Yes
B 13	Russia	Russia	Kholmsk	47°2'N	142°3'E	300	Yes
B 15	Chile	Chile	Valparaiso	32°48'S	71°29'W	300	Yes
C 01	Russia	Russia	Murmansk	68°58'N	33°5'E	140	Yes
C 03	Ukraine	Ukraine	Odessa	46°29'N	30°44'E	280	Yes
C 04	Canada	Canada	Sept -Iles	50°11'N	66°7'W	300	Yes
C 07	South Africa	South Africa	Cape Town	33°41'S	18°43'E	500	Yes
C 08	Mauritius	Mauritius	Mauritius	20°10'S	57°28'E	400	Yes
C 11	Singapore	Singapore	Singapore (Jurong)	1°20'N	103°42'E	400	Yes
C 12	USA	USA	San Francisco	37°55'N	122°42'W	350	Yes
C 13	Russia	Russia	Petropavlosk	53°0'N	158°40'E	280	No
C 15	Chile	Chile	Talcahuano	36°42'S	73°6'W	300	Yes
D 01	Sweden	Sweden	Grimeton	57°6'N	12°23'E	299	Yes
D 02	Spain	Spain	Coruna	43°22'N	8°27'W	400	Yes
D 03	Turkey	Turkey	Istanbul	41°4'N	28°57'E	300	Yes
D 04	Canada	Canada	Sept-Iles	50°11'N	66°7'W	300	Yes
D 11	Indonesia	Indonesia	Ujungpandang	5°6'S	119°26'E	300	Yes
D 12	Canada	Canada	Prince Rupert	54°18'N	130°25'W	300	Yes
D 13	Russia	Russia	Magadan	59°40'N	151°1'E	000	No
D 15	Chile	Chile	Puerto Montt	41°29'S	72°57'W	300	Yes
E 03	Turkey	Turkey	Samsun	41°17'N	36°20'E	300	Yes
E 11	Indonesia	Indonesia	Jakarta	6°7'S	106°52'E	300	Yes
E 12	USA	USA	Savannah	32°8'N	81°42'W	200	Yes
E 13	Russia	Russia	Beringovskiy	64°10'N	179°02'W	000	No
E 15	Chile	Chile	Magallanes	52°56'S	70°54'W	300	Yes
F 01	Russia	Russia	Arkhangelsk	64°33'N	40°32'E	300	Yes
F 02	Acores	Acores	Horta	38°32'N	28°38'W	640	Yes
F 03	Turkey	Turkey	Antalya	36°53'N	30°42'E	300	Yes
F 04	USA	USA	Boston (Ice Rep)	41°43'N	70°31'W	200	Yes
F 06	Uruguay	Uruguay	La Paloma	34°40'S	54°9'W	280	Yes
F 09	Iran	Iran	Bandar Abbas	27°8'N	57°4'E	300	Yes
F 11	Thailand	Thailand	Krung Thep	13°44'N	100°34'E	200	Yes
F 13	Russia	Russia	Providenia Bukhta	64°10'N	173°10'W	000	No
F 15	Chile	Chile	Isla De Pascua	27°9'S	109°25'W	300	Yes
G 01	UK	UK	Cullercoats	55°4'N	1°28'W	270	Yes
G 02	Spain	Spain	Tarifa	36°1'N	5°34'W	400	Yes
G 04	USA	USA	New Orleans	29°53'N	89°55'W	200	Yes
G 08	India	India	Mumbai	19°5'N	72°50'E	299	Yes
G 09	Saudi Arabia	Saudi Arabia	Damman	26°26'N	50°6'E	390	Yes
G 11	Japan	Japan	Naha	26°9'N	127°46'E	400	Yes
G 15	Chile	Chile	Isla De Pascua	27°9'S	109°25'W	300	Yes
H 01	Sweden	Sweden	Bjuroklubb	64°28'N	21°36'E	300	Yes
H 03	Greece	Greece	Iraklion	35°20'N	25°7'E	280	Yes
H 04	Canada	Canada	Prescott	44°20'N	81°10'W	300	Yes
H 06	Dutch Antilles	Dutch Antilles	Curacao	12°10'N	68°52'W	250	Yes
H 09	Saudi Arabia	Saudi Arabia	Jeddah	21°23'N	39°11'E	390	Yes
H 11	Japan	Japan	Moji	33°52'N	130°36'E	400	Yes
H 12	Canada	Canada	Tofino	48°56'N	125°32'W	300	Yes
H 15	Chile	Chile	Antofagusta	23°40'S	70°25'W	300	Yes

Id	Area	Country	Name	Latitude	Longitude	Range (NM)	Op
I	02	Islas Canarias	Las Palmas	28°9'N	15°25'W	400	Yes
I	03	Turkey	Izmir	38°21'N	26°35'E	300	Yes
I	07	South Africa	Port Elizabeth	33°57'S	25°31'E	500	Yes
I	11	Japan	Yokohama	35°22'N	139°36'E	400	Yes
I	15	Chile	Valparaiso	32°48'S	71°29'W	300	Yes
J	01	Sweden	Gislovshammer	55°29'N	14°19'E	300	Yes
J	03	Bulgaria	Varna	43°4'N	27°46'E	350	Yes
J	04	Canada	Sydney	46°11'N	59°54'W	300	Yes
J	11	Japan	Otaru	43°12'N	141°0'E	400	Yes
J	12	Alaska	Kodiak	57°46'N	152°34'W	200	Yes
J	15	Chile	Talcahuano	36°42'S	73°6'W	300	Yes
K	01	UK	Niton (N.France)	50°35'N	1°18'W	270	Yes
K	03	Greece	Kerkyra	39°45'N	19°52'E	280	Yes
K	11	Japan	Kushiro	42°59'N	144°23'E	400	Yes
L	01	Norway	Rogaland	58°39'N	5°36'E	450	Yes
L	03	Greece	Limnos	39°52'N	25°4'E	280	Yes
L	11	Hong Kong	Hong Kong	22°13'N	114°15'E	299	Yes
L	15	Chile	Magallanes	52°56'S	70°54'W	300	Yes
M	01	Belgium	Oostende (Thames)	51°11'N	2°48'E	150	Yes
M	02	Morocco	Casablanca	33°36'N	7°38'W	180	No
M	03	Cyprus	Cyprus	35°10'N	33°26'E	200	Yes
M	06	Argentina	Ushuaia Prefectur	54°48'S	68°18'W	280	Yes
M	09	Oman	Muscat	23°37'N	58°31'E	270	Yes
M	11	China	Sanya	18°14'N	109°30'E	250	Yes
N	01	Norway	Orlandet	63°40'N	9°33'E	450	Yes
N	03	Egypt	El Iskandariya	31°12'N	29°52'E	350	Yes
N	04	USA	Portsmouth	36°44'N	76°1'W	280	Yes
N	06	Argentina	Rio Gallegos	51°37'S	69°3'W	280	Yes
N	11	China	Guangzhou	23°9'N	113°29'E	250	Yes
O	01	UK	Portpatrick	54°51'N	5°7'W	270	Yes
O	03	Malta	Malta	35°49'N	14°32'E	400	Yes
O	04	Canada	St Johns	47°37'N	52°40'W	300	Yes
O	06	Argentina	Comodoro Rivadavi	45°51'S	67°25'W	280	Yes
O	07	South Africa	Durban	29°48'S	30°49'E	500	Yes
O	11	China	Fuzhou	26°2'N	119°18'E	250	Yes
O	12	Hawaiian Islands	Honolulu	21°22'N	158°9'W	350	Yes
P	01	Netherlands	Ijmuiden	52°27'N	4°35'E	110	Yes
P	03	Israel	Hefa	32°49'N	35°0'E	200	Yes
P	04	Canada	Thunder Bay	48°26'N	89°13'W	300	Yes
P	06	Argentina	Bahia Blanca	38°43'S	62°6'W	280	Yes
P	08	India	Madras	13°8'N	80°17'E	299	Yes
P	09	Pakistan	Karachi	24°51'N	67°3'E	400	Yes
P	11	Taiwan	Meilung	23°59'N	121°37'E	350	Yes
P	11	Taiwan	Lintou	23°33'N	119°38'E	350	Yes
P	11	Taiwan	Linyuan	22°29'N	120°25'E	540	Yes
P	11	Taiwan	Keelung	25°8'N	121°45'E	540	Yes
P	11	Vietnam	Hai Phong	20°43'N	106°44'E	400	No
Q	01	Ireland	Malin Head	55°22'N	7°21'W	400	Yes
Q	03	Croatia	Split	43°30'N	16°29'E	085	Yes
Q	04	Canada	Sydney	46°11'N	59°54'W	300	Yes
Q	06	Argentina	Mar Del Plata	38°3'S	57°32'W	280	Yes
Q	11	China	Shanghai	31°7'N	121°33'E	250	Yes
Q	12	USA	Long Beach	35°31'N	121°3'W	350	Yes
R	01	Iceland	Reykjavik	64°5'N	21°51'W	550	Yes
R	02	Portugal	Monsanto	38°44'N	9°11'W	530	Yes
R	03	Italy	Roma	41°48'N	12°31'E	320	Yes
R	04	Greenland	Reykjavik	64°5'N	21°51'W	550	Yes
R	06	Argentina	Buenos Aires	34°27'S	58°37'W	560	Yes
R	11	China	Dalian	38°52'N	121°31'E	250	Yes
R	12	Puerto Rico	San Juan	18°28'N	67°4'W	200	Yes
S	01	UK	Niton	50°35'N	1°18'W	270	Yes
S	04	Canada	Iqaluit	63°44'N	68°33'W	200	No
S	11	Malaysia	Labuan	5°54'N	118°0'E	350	Yes
S	16	Peru	Paita	5°5'S	81°7'W	200	Yes
T	01	Belgium	Oostende	51°11'N	2°48'E	050	Yes

Id	Area	Country	Name	Latitude	Longitude	Range (NM)	Op
T 03	Italy		Cagliari	39°14'N	9°14'E	320	Yes
T 04	Canada		Iqaluit	63°44'N	68°33'W	200	No
T 11	Malaysia		Kuching	4°27'N	114°1'E	350	Yes
U 01	Estonia		Tallinn	59°30'N	24°30'E	300	Yes
U 03	Italy		Trieste	45°41'N	13°46'E	320	Yes
U 04	Canada		Fundy	43°45'N	66°10'W	300	Yes
U 11	Malaysia		Port Kelang	5°25'N	100°24'E	350	Yes
U 16	Peru		Calleo	12°3'S	77°9'W	200	Yes
V 01	Norway		Vardo	70°22'N	31°6'E	450	Yes
V 03	Italy		Augusta	37°14'N	15°14'E	320	Yes
V 04	Canada		Fundy	43°45'N	66°10'W	300	Yes
V 11	South Korea		Chukpyon	37°3'N	129°26'E	200	Yes
V 11	Mariana Islands		Guam	13°34'N	144°50'E	100	Yes
W 01	Ireland		Valentia (Dublin)	51°27'N	9°49'W	400	Yes
W 03	France		La Garde	43°6'N	5°59'E	250	Yes
W 04	Greenland		Kook Islands	64°4'N	52°1'W	400	No
W 11	Vietnam		Da Nang	16°5'N	108°13'E	400	Yes
W 11	South Korea		Pyonsan	35°36'N	126°29'E	200	Yes
W 12	USA		Astoria	46°10'N	123°49'W	216	Yes
W 16	Peru		Mollendo	17°1'S	72°1'W	200	Yes
X 03	Spain		Valencia	38°43'N	0°9'E	300	Yes
X 04	Canada		Labrador	53°18'N	60°33'W	300	Yes
X 09	Egypt		Serapeum	30°28'N	32°22'E	200	Yes
X 11	Vietnam		Ho Chi Minh-City	10°47'N	106°40'E	400	Yes
X 12	Alaska		Kodiak	57°47'N	152°32'W	200	Yes

## 490kHz NAVTEX Stations

Id	Area	Country	Name	Latitude	Longitude	Range (NM)	Op
A 06	Uruguay		La Paloma	34°40'S	54°9'W	280	Yes
C 01	UK		Portpatrick	54°51'N	5°7'W	270	Yes
E 02	France		Corsen	48°28'N	5°3'W	300	Yes
G 02	Portugal		Monsanto	38°44'N	9°11'W	530	Yes
I 01	UK		Niton	50°35'N	1°18'W	270	Yes
J 02	Acores		Horta	38°32'N	28°38'W	640	Yes
J 11	South Korea		Chukpyon	37°3'N	129°26'E	200	Yes
K 11	South Korea		Pyonsan	35°36'N	126°29'E	200	Yes
S 03	France		La Garde	43°6'N	5°59'E	250	Yes
S 04	Canada		Iqaluit	63°44'N	68°33'W	200	No
U 01	UK		Cullercoats	55°4'N	1°28'W	270	Yes
W 11	Vietnam		Hai Phong	20°43'N	106°44'E	400	No

Note : 490kHz stations are only available to NAV4plus owners if they also purchase the NAV-490 option.

Note: all NAVTEX station database information was correct on the date of publication.

## APPENDIX IV : MESSAGE TYPE INDICATORS

NAVTEX broadcasts use following message type letter:

A	Navigational warnings
B	Meteorological warnings
C	Ice reports
D	Search and rescue information, and pirate warnings
E	Meteorological forecasts
F	Pilot service messages
G	DECCA messages
H	LORAN messages
I	OMEGA messages (now discontinued)
J	SATNAV messages (i.e. GPS or GLONASS)
L	Navigational warnings - additional to letter A
V	Notice to Fishermen (U.S. only)
W	Environmental (U.S. only)
X	Special services - allocation by IMO NAVTEX Panel
Y	Special services - allocation by IMO NAVTEX Panel
Z	No message on hand

## APPENDIX V : NMEA SENTENCES SUPPORTED

<i>Data Item</i>	<i>Taken from NMEA Sentences</i>
Time	RMC or GGA or GLL or ZDA
Date	RMC or ZDA
Position	RMC or GGA & VTG or GLL* & VTG
Log travelled	VLW
Speed through water & magnetic course	VWH
Wind speed & direction	MWV or VWR
Water depth	DBT
Waypoint list	WPL

\* Note older GPS systems providing NMEA 0183 version 1.5 GLL may be used if ZDA & VTG are also provided

Note that the if a data item is present in more than one sentence, then it is taken from the leftmost sentence in the table entry above.

I.e. if Date is available in RMC and ZDA, it will be taken from RMC.

## APPENDIX VI : DECLARATION OF CONFORMITY

### DECLARATION OF CONFORMITY

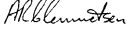
We, ICS Electronics Ltd.  
Unit V Rudford Industrial Estate  
Ford  
Arundel  
West Sussex  
BN18 0BD

declare under our sole responsibility that the product

ICS NAV 4 (name, type or model, lot, batch or serial number)

to which this declaration relates conforms to the protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the member States relating to Electromagnetic Compatibility.

Ford, Arundel 23 March 1994  
*Place & date of issue*

 Managing Director  
A R Clemmetsen B.Eng., C.Eng., M.I.E.E.

*Name and signature of  
manufacturer of responsible  
person. Identification of signatory.*

NAV 4 is in general conformity with the following standard(s) or other normative documents(s).

IEC945: 1988	General requirements for marine navigational equipment
ETS 300 065	September 1992 - Radio Equipment and systems (RES): Narrow-band direct printing telegraph equipment for receiving meteorological or navigation information (NAVTEX) . Technical characteristics and methods of measurement.
ETS 300 339	June 1993 - Radio Equipment and Systems (RES) ; General Electro-Magnetic Compatibility (EMC) for radio equipments.
IEC 1000-4-2	Electrostatic discharges.
IEC 1000-4-3	Radiated, radio frequency electromagnetic field.
IEC 1000-4-6	Conducted disturbances induced by radio frequency fields.

IMMUNITY GRADE - Category C (ETS 300 339).

TECHNICAL CONSTRUCTION FILE Ref. 94/6                      Date. 07 March 1994

TECHNICAL REPORT / CERTIFICATE                              Date. 21 March 1994

COMPETENT BODY.	JRS Associates (Wireton Ltd) 59 Titchfield Road Stubbington Fareham Hants PO14 2JF	Tel / Fax +44 (0) 329 665549
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(In accordance with provisions of EN 45014 and UK EMC Regulations, Statutory Instrument 1992 No. 2372).