



OPERATOR'S HANDBOOK

NAVTEX 2

A }
B } Messages can not be rejected
D. }

NAVTEX 2

USER'S HANDBOOK

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NAVTEX TWO USER'S HANDBOOK

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Section 1: THE NAVTEX SYSTEM

Introduction

In 1977, under IMO Resolution A381(X), the decision was taken to divide the world into 16 areas for navigation purposes. In each of these Navareas, a single transmitter was allocated to provide up-to-the-minute navigation and meteorological information using morse and conventional radio broadcasting. However this system relied heavily on skilled operator interpretation and constant monitoring due to the sheer volume of information. Thus, to provide all mariners with up-to-date information in an easily-assimilated form automatically, the Navtex system was established.

Under the International Maritime Organization's 'Global Maritime Distress & Safety System', chains of coastal radio stations in each of the world's Navareas will transmit navigation and meteorological information by radio telex. To ensure that the system is truly worldwide, a single International Navtex Frequency of 518kHz was agreed by the World Authority on Radio Communication (WARC) in Geneva in 1983. All transmissions are in plain English. The vessel's Navtex receiver/teleprinter is permanently tuned to the worldwide frequency and remains 'On Standby' to print out all the messages automatically, as received. The service is free to all users and no receiving licence is required.

The International Maritime Organization (part of the U.N.) controls and supervises the Navtex system. Thus the navigational warning authorities in each Navarea combine to present a co-ordinated service, operated to agreed international standards and using a carefully structured chain of transmitters. Weather information is supplied by the various national Meteorological Offices. The actual transmitter sites in each country are normally owned and operated by the country's telecommunication authority.

Navtex messages are explained and detailed on pages 2 and 3.

As the Navtex system develops both geographically and in the extension of information categories available, this information will need to be updated by the Navtex operator. The necessary updating information will be published in marine periodicals, nautical almanacs, Notices to Mariners

and on the Navtex system itself. To obtain maximum benefit from the system, the operator should ensure that the appropriate sections of the handbook are kept up-to-date.

Message Format

Each message transmitted starts with nine particular characters which are called the 'header code'. The first 5 are always 2C2C plus space, to indicate the start of a message.

The next four characters indicate the origin, type and number of the message and are designated as characters B1, B2, B3, B4 in all technical literature on the Navtex system.

Character B1 is the code identification letter of the coast radio station transmitting the message (see Appendix One).

Character B2 is the code identification letter of the type of message, as follows:

- A: Coastal navigational warning
- B: Meteorological warning
- C: Ice report
- D: Search and Rescue Alert
- E: Meteorological forecast
- F: Pilot message
- G: Decca message
- H: Loran-C message
- I: Omega message
- J: Satnav information
- K: Other electronic Navaid system messages
- L: Navarea warnings or drilling rig information
- M to Y: No category allocated (at February, 1990)
- Z: QRU (no message on hand)

(The categories above are as defined by CCIR Rec 540-1 Annex II)

Characters B3 and B4 show the serial number of the message. Message numbers run from 01 to 99 and then start again from 01. Important emergency messages always carry the number 00 and are always printed.

Weather messages and certain other message types are dated and timed after the Header Code. Some coast stations write this in full, for example:

MONDAY 2 JANUARY 0425 GMT

Other stations may use a date-time group numerical indication as follows:

020425Z JAN

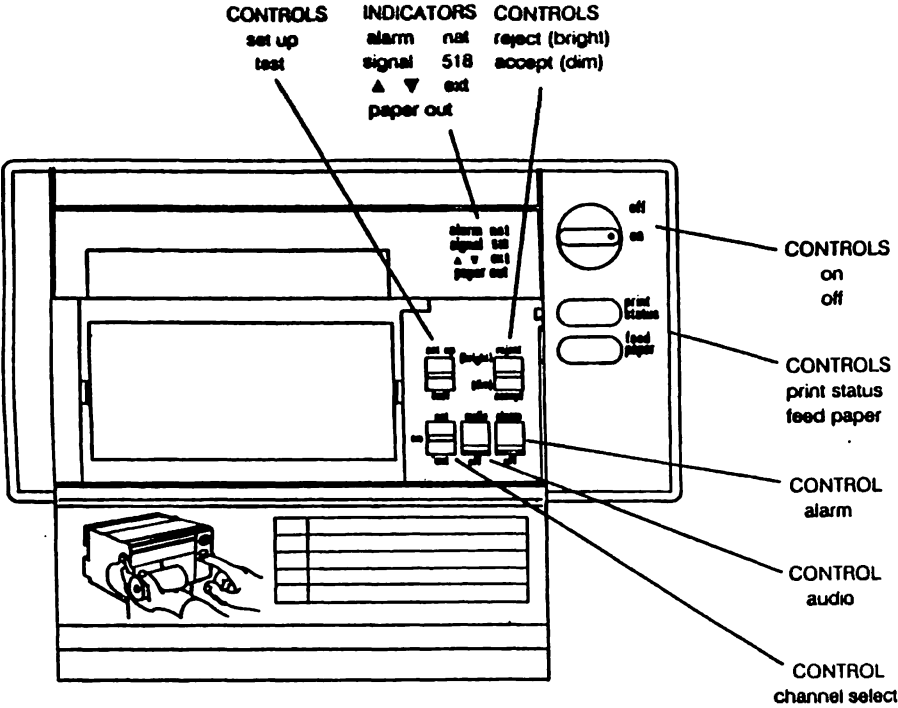
with the first two digits indicating the day of the month and the following four digits showing the time. The letter Z (or the letters U.T.C.) indicate GMT.

All Navtex messages conclude with NNNN.

The transmission format (conforming to CCIR rec 540-1) is examined by the micro-processor in the Navtex receiver before printing and any non-conforming messages or messages/transmitter codes that have been rejected by the programming are not printed. Similarly, the Header Code of each message is identified by the Navtex receiver to ensure that once a particular message has been printed, it is not reprinted. This is achieved by placing the header in a "message received store" when the message is printed. Message headers are only placed in the store if the message error rate (determined by the ratio of asterisks to good characters) is less than 4%. Message headers remain in the message received store for 72 hours or until the store becomes full. The oldest headers are then deleted to make room for new ones. The store holds 60 headers.

The message received store may be examined by using the print status key.

THE NAVTEX RECEIVER
Indicators and Controls



Section 2: THE NAVTEX RECEIVER

Introduction

Installation of the Navtex Receiver, Input Converter (if necessary) and Antenna are dealt with on individual installation sheets which are found in Appendix 1.

When installation is complete the Navtex Receiver can be switched on and is ready for operation.

Paper Loading:

Paper rolls are supplied with the Navtex receiver when purchased and replacement rolls of paper are available through your dealer. Use only printer paper which is specially formulated to give consistent print quality and smooth operation of the Navtex printer mechanism. Gently push the end of the paper up under the printer mechanism as shown in the diagram on the door. Press feed paper key repeatedly and the paper will automatically feed correctly through the printer: Absolutely no force whatsoever is required. The paper roll may be pushed gently into the compartment engaging the centre tube on the spring loaded spigot at either side of the compartment. Make sure that the plastic inserts supplied are in position in the ends of the roll, then close front panel before operation.

Self Test:

To test that the receiver is now ready to accept messages: switch on audio. You should hear either atmospheric noise or the warbling sound of an actual transmission being received. Should no sound be heard check all antenna connections. If sound is heard clearly, press test and release it: the sound will change as the receiver generates its own signal and tests the internal circuits.

The self test also checks the L.E.D. indicators, the alarm tone, the printer and the processor RAM and ROM. If Option 1 (external data interface) is fitted the self test will provide a status check of the interface circuits and will output a test message to an external printer or device.

Message Source Selection:

The standard Navtex 2 provides an internal receiver tuned to 518 kHz (the International Navtex frequency) and an audio input for connecting an external receiver. If you

have Option 2 (National Receiver) installed, there will be an additional internal receiver channel on a frequency around 490 kHz. This is called the National Receiver and is intended for local language Navtex transmissions. The exact national frequency supplied may be found by examining the serial number label. A 3-way switch controls the message source selection. The following are available:

- a) 518 kHz
- b) 518 kHz/National channel scanning
- c) 518 kHz/External receiver scanning
- d) National channel
- e) External receiver

The initial selection when the switch is moved from the centre 518 kHz position will select the appropriate scanning mode, and it is recommended that scanning is always used. In order to select fixed reception of the External receiver or National receiver return the switch to the centre position and then immediately reselect the appropriate receiver. Scanning will now be inhibited.

The 3 LED indicators on the front panel (518, nat, ext) always show the source of the Navtex transmission.

Programme Selection:

As supplied, the Navtex unit will receive and print all categories of message from all transmitters within range. While it may be of interest to leave the receiver operating in this mode for 48 hours to see the sort of information available, in normal use the operator will only require selected message types from the transmitters giving information relevant to the vessel's current position and intended passage. (See Appendix 4 for message types and Appendix 5 for transmitters).

Note that only one transmitter serves each geographical area. Although other transmitters may be received, they will not normally carry relevant information (although there is some overlap of the weather forecasts).

The Navtex receiver should be programmed to receive the one local transmitter. Prudent selection of other transmitters is advised to save paper wastage. However, the numbers of messages printed each day will tend to decrease, because once the message is printed, it will not be reprinted even if retransmitted. Navtex messages are numbered 01 to 99 and then repeated. In order to assure that wanted messages are not rejected, the message store is erased whenever the Navtex is switched off. Local

transmitter codes may be written in pencil on the pad inside the front panel for future reference.

Before starting the programming sequence, you should consult Appendices 4 and 5 to determine which categories of message and which transmitters you will need.

Transmitter Selection:

To start programming, press the set up switch up. The Navtex will give a list of currently selected transmitters. This list will show how it was last set: at manufacture the Navtex is normally set to receive all codes A-2. If you wish to change the transmitter programming press reject. If the transmitter list is correct press accept. To allow you to change the transmitter selection, the Navtex first clears out the old selection and gives a list of all possible transmitter codes A-2. Note that many of these are not yet assigned to transmitting stations; all codes have been included so the Navtex can cope with the rapidly expanding network of transmitters.

Referring to your list of wanted stations you can now work through the list printed by the Navtex, pressing accept or reject for each one in turn. The printer will confirm each choice as you do this. This procedure will take several minutes and may seem laborious but setting up is required only occasionally; the Navtex receiver memory will retain programming when power fails and when switched off.

Normally you would complete the selection/rejection of all codes through to Z. There are two quick exits from each stage of the programming, however. If you have programmed some and now wish to reject the remainder of the codes you can press set up. If you wish to accept the remainder of the codes press test. The Navtex will then proceed directly to "current selected messages...."

Message Type Selection:

The Navtex will now give the currently selected message types: if they need to be changed the procedure is exactly as described for transmitters. Again the quick exits will finish the procedure. Note that message types A, B and D (gale warnings and search and rescue alerts) cannot be rejected.

Logging Selection:

The last part of the set up procedure is for the logging function. With the logging mode accepted the Navtex receiver will print only the header code and message numbers of those messages that have been rejected. It will also print details of corrupted headers and messages that have not been printed because the error rate was greater than 33%. In some circumstances, this mode can provide a valuable indication of current Navtex messages/-transmitters available to the ship's Navtex receiver and reassurance that the receiver is operating as programmed.

For absolute minimum usage of paper, turn the function off by pressing reject. To see which messages you are missing press accept.

Print Status Confirmation:

As a final check on programming, press print status. A summary of how the Navtex is set will be printed, together with header codes of those messages which have been printed in the last 72 hours since the receiver was turned on.

Operational Indicators:

The Navtex is now operational and will print the messages required automatically, as they are transmitted. When a transmission is being received, the "signal" indicator will illuminate.

The message source LED will show the origin of the transmission and scanning will stop while the signal light is on.

Sometimes the "signal" indicator will come on and no message will be printed. This is either a rejected message or transmitter, or because the microprocessor in the receiver has evaluated the message and found more than 33 per cent errors.

If the alarm is enabled, the "alarm" light will illuminate and the audible alarm will sound after a message type A or B is printed. It may be cleared by pressing feed paper. The audible and visual alarm will always operate after printing a message type D irrespective of the position of the 'alarm enable' switch.

The Navtex printer paper roll is 35 metres long and early warning at the end of the paper roll is given by a vertical line on the last 2 metres of paper. The "Paper out"

indicator will illuminate at the end of the roll, and the audio alarm will sound if the alarm switch is on.

The Navtex printer will not operate after the paper roll has been used up so no damage will result if the receiver runs out of paper (eg overnight). If Option 1 (external data interface) is fitted data will continue to be sent to an external device.

Heater:

In temperatures below 0°C, a heater will switch on automatically to prevent condensation on the thermal paper and ensure good print quality. When in use, the heater will increase power consumption on 'Standby' by an additional 200mA.

Use with External Receiver:

An audio output from the external receiver should be connected to the audio input on the connector block. The audio level should be between 20mv and 1 volt RMS.

It is essential to use a synthesised receiver in order to obtain adequate long term frequency stability. The receiver should be set to upper sideband mode and should be tuned to a carrier frequency 1.7kHz lower than the designated Navtex frequency. In order to tune the receiver accurately, select the external receiver using the source selector switch and wait until a Navtex transmission starts. Tune the receiver using its clarifier control until the two tuning L.E.D.s on the Navtex receiver flicker with equal brightness. If the tuning is incorrect, one or other of the L.E.D.s will be fully on.

Operational Controls:

The main ON/OFF switch obviously switches the Navtex on and off. Also however, switching the unit off erases the store of messages already received although the setup data is not lost.

The alarm switch enables the audible and visual warning for message types A and B, or if the paper runs out. (Message type D will enable a warning irrespective of the position of the alarm switch.) Switching the alarm switch off cancels the audible and visual warning irrespective the source of the alarm.

The audio enable switch switches the demodulated audio from the receiver to the internal speaker so that incoming data can be audibly monitored. If the audio is enabled during self test, then the test tones can be heard after they have passed through the receiver.

The message source switch selects between 518kHz, national or external channels. It also selects scanning mode. When national or external channels are selected, the Navtex automatically scans between the selected channel and 518kHz. To disable scanning, switch quickly to 518 and then back again to the desired channel.

The setup switch starts the setup procedure which programmes the Navtex with the desired message types and transmitters. During selection, the setup key also acts as a quick exit from the current routine, rejecting the following message types or transmitters. The test key starts the self test procedure which provides a thorough check of internal systems of the Navtex. During transmitter or message selection, the test key also acts as a quick exit from the current routing, accepting the following message types and transmitters.

The accept/reject key is used in the setup procedure to accept or reject the proposal currently printed out. Accept and reject also dim or brighten respectively the non-warning indicators (i.e. all except alarm and paper out). The indicators can be dimmed/brightened in 8 steps between fully bright and extinguished by successive presses of the accept/reject key. The indicators return to full brightness at switch on.

The feed paper button feeds the printer paper a line at a time. It also sends a feed paper command to the external serial data interface. If the alarm is sounding then pressing the feed paper button will stop it without having to open the door and use the alarm enable switch. Also, feed paper provides a quick exit from the status or setup routines. Note if feed paper is pressed during the alphabetical message type or transmitter selection then a quick exit is made from the setup procedure and the remaining letters of the alphabet are accepted.

The print status button causes a status message to be printed out which indicates which transmitters and message types are currently selected, whether logging mode is on or off and the headers of messages currently received.

Summary of controls

<u>ON/OFF</u>	switches unit on and off
<u>Alarm</u>	a) enables audible and visual alarm for message type A & B and for paper out condition. b) cancels audible and visual alarm.
<u>Audio</u>	switches audio of currently selected channel to speaker.
<u>Message source</u>	a) selects 518kHz, national frequency or external receiver. b) disables and enables scanning.
<u>Setup</u>	a) starts the setup procedure. b) rejects remaining codes and goes on to next part of procedure.
<u>Test</u>	a) starts self test procedure. b) Accepts remaining codes and goes on to next part of procedure.
<u>Accept</u>	a) in setup mode accepts current proposal. b) dims indicator by one step.
<u>Reject</u>	a) in setup mode rejects current proposal. b) brightens indicator by one step.
<u>Status</u>	prints programming status and messages received.
<u>Feed paper</u>	a) feeds paper b) cancels alarm c) aborts from setup and status procedure d) sends feed paper command over serial data interface.

Appendix 1: INSTALLATION

1. INTRODUCTION:

This section comprises installation instructions for the Navtex Receiver, the Navtex Active Whip antenna and the Navtex Power Input Converter.

It is recommended that all the sections are carefully read before installation is commenced.

The final section deals with initial testing and trouble shooting.

For details of normal operation see Section 2.

2. NAVTEX RECEIVER INSTALLATION:

(a) Installation Kit:-

- 1) Navtex Receiver
- 2) Mounting Bracket
- 3) Bracket Knobs (2 off)
- 4) Plastic Washers (4 off)
- 5) Bracket Studs

Options:

- 6) Power Input Converter
- 7) Active Whip Antenna
- 8) Wire Antenna

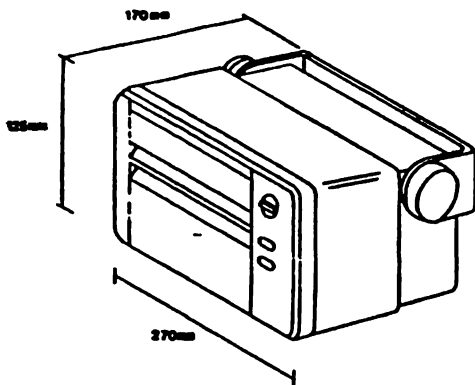
(b) Positioning:-

The Navtex receiver will normally be mounted on a bulkhead/deckhead by means of the standard bracket.

The Navtex receiver should be positioned away from spray and drips: although the electronic components are well protected, the paper itself is not waterproof and water may enter the print mechanism through the paper slot. Position the receiver to allow the panel door to be opened fully for paper changing and key operation.

Diagram 1

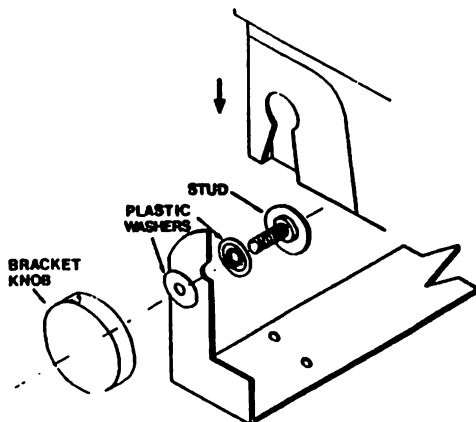
Receiver Dimensions



To check the suitability of the position chosen, it will be necessary to loosely fix the bracket to the receiver. Engage the studs into the slots on either side of the receiver and push the receiver back into the bracket (see diagram no.2). Note that for normal mounting, the notched end of the bracket will be on the right-hand side and the spigot on the right-hand end of the receiver will engage one of the notches in the bracket.

Diagram 2

Receiver Mounting Details



When the knobs are tightened, the studs will seat themselves in the widened end of the receiver slots to hold the unit securely. Test the receiver position on the bulkhead/deckhead.

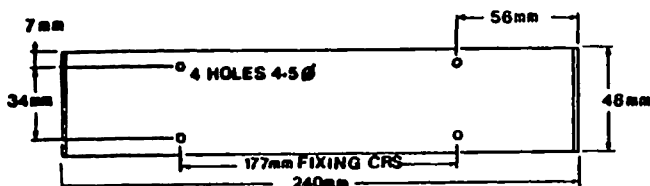
If the bracket notches give unsuitable mounting angles, the bracket may be turned around and a new notch cut.

When an acceptable receiver position and angle have been chosen, mark the bulkhead for bracket fixing and remove the receiver from the bracket by loosening the knobs and pushing them inwards to disengage the studs before removing the receiver.

Fix the bracket firmly using woodscrews, self tapping screws or through bolts. See Diagram no. 3 for drilling details.

Diagram 3

Mounting Bracket Dimensions



(c) Wiring:-

The connections to the receiver are made under the cover plate at the rear of the set. The cover is removed by undoing the three screws and lifting the plate off. Under this plate the connection strip can be seen and is labelled as in diagram No 4. After making the connections replace the cover plate.

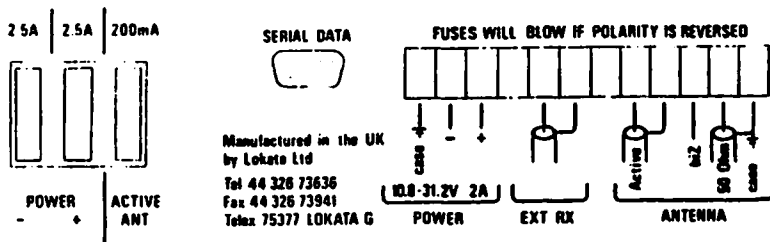
12/24 volt supply

The power needed for the standard receiver is 12 to 24v dc at 1.5A maximum. Connections may be made using 2.5 sq mm wire or heavier. Either two or three core wire can be used, but 3 core wire makes earthing the receiver more simple.

Isolate the vessel's battery. Route the power supply lead from the vessel's switch panel to the Navtex receiver, threading one of the D-shaped grommets on to the cable before making the receiver connections. The negative supply (blue) should be connected to the receiver 'power' terminal marked '-' and the positive supply (brown) to the terminal marked 'in+'. Lead the cable through the nearest slot, pushing the grommet firmly into place.

Diagram 4

Navtex Connection Strip



Earth

It is necessary to earth the Navtex receiver by connecting the 'CASE' terminal to a suitable point on the vessel structure or earth plate. Possible points are:

For a steel vessel, any part of the main structure. For a wooden or fibre glass vessel, a 'dynaplate' earth, or a metal through hull fitting. Earthing to the engine block is not recommended.

For safety, the receiver 'CASE' terminal is internally isolated from the power terminals.

Antenna

The antenna that has been installed may now be connected to the appropriate terminals on the right-hand side of the connection strip. (See section 4 - 'Antenna Installation').

3. NAVTEX POWER INPUT CONVERTER

(a) Description

The Navtex Power Input Converter will give a 12V dc output suitable for the Navtex Receiver from an ac input of 110V to 260V (50-60Hz only) or from a dc input of 24V.

Both ac and 24V supplies may be connected at the same time: the unit will normally use power from the ac supply and in case of supply failure, will automatically switch over to 24V dc.

(b) Positioning (See Diagram 5)

The unit should be located in a reasonably accessible place, with adequate ventilation. The unit is not immersion proof. The unit may be fixed to a flat surface using the holes provided under the lid. After fixing and connection of the following power supplies, secure the lid.

Diagram 5

Power Converter Dimensions

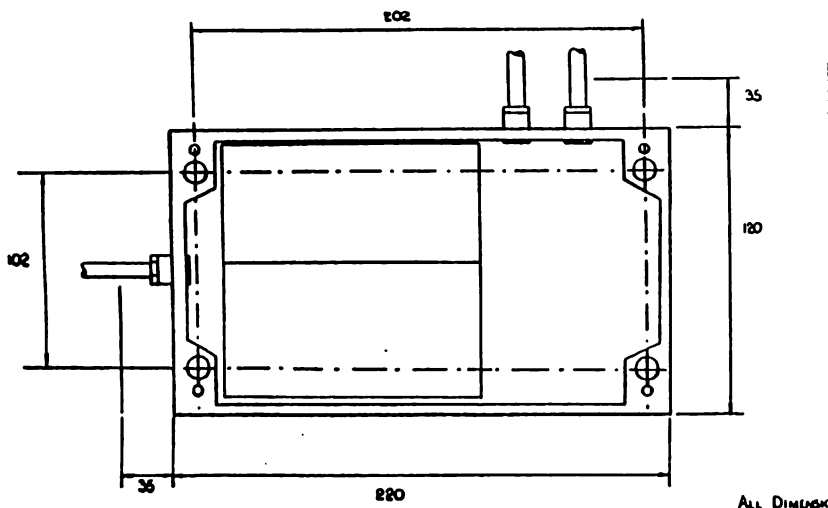
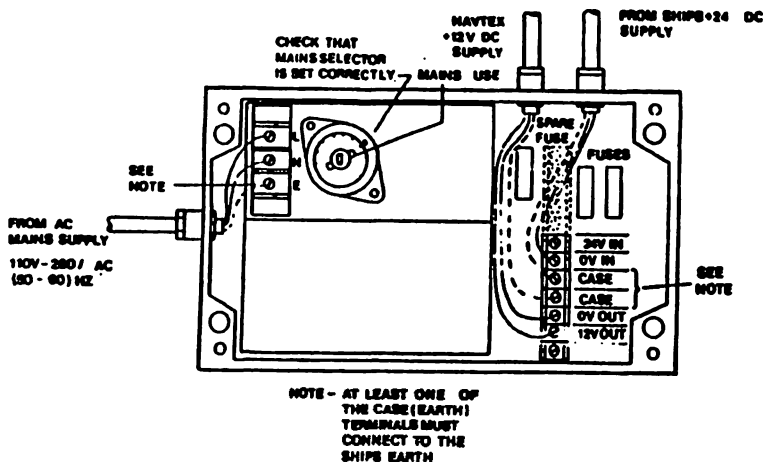


Diagram 6

Connections between Navtex and Power Converter



(c) Connecting to Navtex Receiver (see Diagram 6)

The Navtex Receiver should be connected to the input converter using either a 2- or 3-core cable. Lead the cable into the box through the appropriate gland. Screw the bared ends of the cable to the terminals marked '+12V OUT' and '0V OUT' and if 3-core cable is used, connect the third core to 'CASE'. Take care to observe polarity - cores connected to '+' terminal are normally red or brown; cores connected to 'CASE' terminal green or yellow/green.

The other end of this cable can now be connected to the Navtex receiver. Screw to the terminals marked 'in+', 'in-' and for 3-core cables, the earth lead to 'CASE'. Observe polarity throughout.

(d) Connecting to 24 V dc supply

Isolate the 24V dc source before making the connections described overleaf.

Either a two or three core cable may be used. A three core should be used if it is necessary to earth the case of the power supply; there is no internal connection between any power terminal and the outer casing. Lead the input cable through the cable gland and screw the bared ends to the terminals marked '+24v in' and 'OV in' and, for a 3-core cable, 'CASE'.

N.B. Again be careful to observe polarity.

(e) Connecting to AC supply

Isolate the supply before making the following connections:-

A 3-core cable should be used. We recommend that the earth is used and connected to an efficient and secure earthing point. Lead the cable in through the nearest gland; remove the safety cover from the ac terminal block and connect the cable. Terminal 1(L) is 'live' or 'line', Terminal 2(N) neutral, Terminal 3(E) 'Earth' or 'case'. Replace the safety cover.

IMPORTANT

Check the mains voltage selector is set correctly. To change its setting remove the fuse and turn using a coin.

Finally check that all the terminals are tight and that the fuses are in position.

Note that one of the fuses is a spare 24 volt fuse.

The cable glands may now be tightened.

The ratings of fuses are:-

24 V	2.5 A
ac supply	110, 130, 150 V - 500mA Slow Blow
	220, 240, 260 V - 250mA Slow Blow

4. ANTENNA INSTALLATION:

(a) INTRODUCTION.

The Navtex receiver can use one of three types of antenna.

(i) The optimum antenna for use on vessels where MF or HF transmitters may be used is the dedicated Navtex Active Whip Antenna. This will provide maximum rejection of transmitters on adjacent channels.

(ii) If the vessel is provided with a 50Ω receiving antenna distribution system, then the Navtex receiver may be connected to this.

(iii) In non-critical installations on fishing boats or yachts where no MF transmitter is fitted, a long wire antenna may be used.

(b) NAVTEX ACTIVE WHIP ANTENNA (Diagram 8).

This is an active antenna tuned to 518 kHz. It employs a high dynamic range preamplifier for good spurious signal rejection and its use ensures that the system sensitivity will be atmospheric noise limited.

The antenna is completely watertight. It should be mounted as high as possible on the vessel, at least 20 feet from a MF/HF transmitting antenna and at least 3 feet from a VHF antenna. The bracket (Diagram 8) may be bolted or welded to any convenient structure. An earthing bolt is provided on the base of the antenna and it is **MOST IMPORTANT** that an earth connection is made to this. The coaxial feeder cable does not act as an RF earth for this antenna. Connection between the antenna base and the bracket is not reliable as the base is anodised. The cable may be lengthened if required to a maximum of 100 metres, or the cable supplied may be cut off short and a junction box used to connect to a fitted length of 50Ω coaxial cable from the Navtex Receiver. This arrangement facilitates the removal of the antenna if a fault occurs. It is **MOST IMPORTANT** that the screen of the coaxial feeder is not earthed as it is connected to supply negative.

Special note for yachts and small vessels:-

The minimum distances specified above may be reduced to 1 foot from a VHF antenna and 6 feet from any part of an MF/HF transmitting antenna. In such cases the Navtex receiver will not receive messages while the vessel's transmitter is operating. The antenna may be mounted to within 6 feet of sea level, such as on a short pole on a yacht's stern rail, and adequate sensitivity will still be obtained.

The Navtex antenna should be connected to the terminals marked 'Lokata Navtex' as in Diagram 7. The antenna has its own 200 ma fuse, shown in Diagram 4.

c) 50Ω Input.

This antenna input may be connected to a 50Ω receiving antenna system which may already be installed in the vessel. The coaxial cable screen is connected to case earth. Not more than 30 V RMS should be applied to this input when a transmitter is operating.

Special note for yachts and small vessels:-

The Lokata wide band antenna may be used to supply an MF/HF receiver as well as the Navtex receiver. This will reduce the number of separate antennas that have to be installed.

(d) Wire Antenna

The Navtex receiver will work well from a wire antenna of between 20 and 40 feet in length. This should be connected to the terminal marked 'hi Z'. (Diagram 4). The susceptibility to interference pickup will be increased.

The antenna should be routed as far as possible from sources of interference, and should be as near vertical as possible. When using a wire antenna, it is especially important to use a good earth.

Diagram 7 Navtex Active Antenna Connections

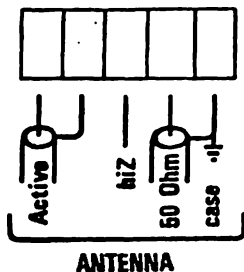
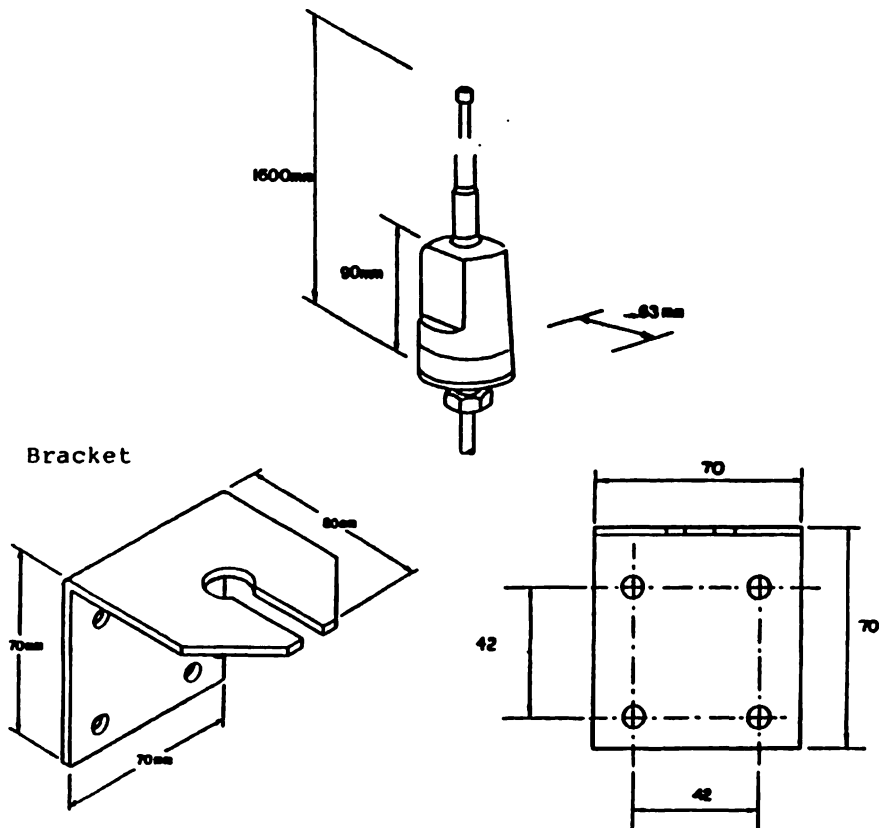


Diagram 8 Navtex Active Whip Antenna Dimensions



5. TESTING AND FAULT FINDING:

After installation switch on all power supplies and switch on the Navtex Receiver. If a roll of paper is not fitted, see Section 2 for instructions on loading the paper.

Press the Feed Paper button on the front panel. The paper should advance one line. If this does not happen check the power supplies.

Now open the door and press and release the Test key. The receiver should go through its internal test procedure. If a 'Fail' message results from any of the tests, then the receiver is faulty and should be returned for service. All indicators on the front panel should light in sequence after the 'indicator test' and a short tone should be

emitted from the loudspeaker after the 'speaker test'. The print quality should be examined for missing dots.

If the self test is satisfactory, then the receiver may be programmed to receive the desired stations and message types, although it is recommended that for the first few days of operation all message types and stations are accepted. The messages received will give an indication of the quality of the antenna installation.

If after 12 hours no messages have been received, then the antenna should be checked by the following method:-

(a) Navtex Active Antenna

Switch on the audio and note the level of atmospheric noise. Now momentarily disconnect the 200 mA antenna fuse. The noise level should drop considerably. If no difference is noted check the 200 mA fuse.

(b) 50Ω Antenna

Proceed as (a) but short between the 50Ω antenna terminal and the case terminal. The noise level should drop.

(c) Wire Antenna

Proceed as (a) but momentarily disconnect the wire antenna for a drop in noise level.

When a transmission is being received from a strong station, atmospheric noise will disappear and a warble tone will be heard. The 'signal' indicator should light after a few seconds.

Interference from other electrical equipment on the vessel may reduce the sensitivity of the receiver. If interference is suspected, switch off the offending equipment while listening to the background noise from the receiver. If the noise level drops, then interference is occurring. The interfering equipment should be suppressed and/or the Navtex antenna installation should be improved.

Normal daylight range from a Navtex transmitter is approximately 500 miles over a sea path. Range may be reduced when in harbour due to signal propagation over land and/or the presence of large metal objects such as storage tanks, cranes or metal-framed buildings.

Appendix 2: TECHNICAL SPECIFICATION:

Navtex Receiver

Receiver Frequency

518kHz. Signalling Type: 7 unit Forward Error
Correcting mode, conforming to CCIR Rec 476-2 mode B.

Format

Conforming to CCIR Rec 540.

Sensitivity for Zero Error Rate

50 Ω input - <1 μ V emf from 50 Ω .
Hi-Z input - <5 μ V emf from 10 Ω /220pF
Active antenna input - <2 μ V emf from 50 Ω .

Adjacent Channel Selectivity

(Measured with signal on channel of 20dB μ V for
zero error rate). >30dB at $\pm$ 500 Hz off channel.

Spurious Response Rejection

(Measured with signal on channel of 20dB μ V for
zero error rate.) >80 dB over 0.1-30 MHz.
(except for band 515-521kHz)

Protection of Antenna Input

Withstands 30V emf continuous.

Emission from Antenna Input

< 0.4nW

External LF Input Available for Use With Other Receivers

Impedance >600 Ω .

Level >20mV

Centre frequency 1700Hz.

Environmental

Generally to MPT1204B.

Operating Temperatures

-15° to +55°C.

Relative Humidity

95%.

Weight

3kg(ex-antenna).

Size

270 x 165 x 125mm.

Alarms

Visible warning for paper out. Switch-selectable Warning light and Audible Alarm for urgent messages.

Controls (Front Panel)

On/off

Print Status: Gives summary of accepted transmitters and message types.

Feed Paper: Also cancels alarm.

Controls (Behind door)

Test: On demand, the receiver will separately check operation of receiver, decoder processor and printer subsystems.

Set Up: Allows user selection of transmitters and message types.

Accept/Reject: Used in set-up procedure.

Alarm: Enables alarm on message types A and B. (Alarm always selected for message type D).

Audio: Connects incoming signal to speaker to check signal quality.

Bright/Dim ext/518/nat Controls intensity of L.E.D. indicators
Source selector switch

Power Supply:

Nominal 12-24Vdc (10.8-31.2Vdc).

Consumption Standby <200mA

Printing <1A

Navtex Active Antenna

Type

Whip antenna with high dynamic range pre-amplifier.

Frequency

518kHz.

3dB Bandwidth

25kHz

Output Impedance

50 Ω

Maximum Output at 1dB Gain Compression

+12dBm

3rd Order Output Intercept

+27dBm (unwanted signals at 520 and 522kHz).

2nd Order Output Intercept

>60dBm

Cable

50 Ω co-ax, any length (20m supplied)

Power

Supplied From Navtex Receiver

Active antenna increases power consumption by 100mA

Navtex Input Converters

- (a) 110/240v AC (with 24v DC automatic back-up
if power fails)

Appendix 3: Navtex 2 - Option 1

External Data Interface

If Option 1 is fitted, then as well as printing the messages, the Navtex receiver is able to send them out via a serial interface. It would therefore be possible, for example, to drive an additional printer mounted some distance away from the main Navtex unit. Also, data from an external device can be sent to the Navtex receiver via the serial interface and printed out. It is therefore possible to produce a hard copy of data from an electronic navigator (Satnav, Decca, etc.)

The serial interface is electrically RS232 compatible with one fixed configuration for both receive and send:- 4800 baud, 8 data bits, no parity, 1 or more stop bits. This is compatible with the NMEA 0183 interface, so that the Navtex is able to print out data produced by any NMEA 0183 compatible instrument.

The serial data receive input (RxD) is isolated from the supply and from the instrument case (as specified in NMEA 0183) and should be driven with reference to the RxD return connection. The interface lead from the sending device should be twin screened lead with the two leads going to RxD and RxD return only. The screen should be connected to the chassis of the sending device and left unconnected at the Navtex end.

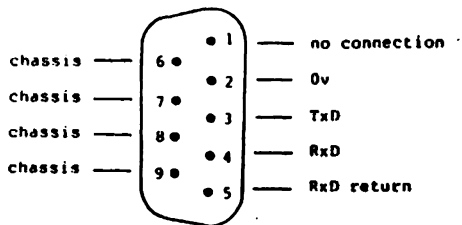
The transmit data (TxD) is isolated from the chassis, but not from the supply. To avoid possible earth loop or electrolysis problems it is recommended only to connect the serial data output to instruments with isolated serial inputs. The interface lead to the receiving device should be twin screened lead with the two leads going to TxD and 0v only. The screen should be connected to one of the chassis connections on the Navtex. The chassis connection should not be connected to the 0v connection and the cable screen should be left unconnected at the receiving device end.

The external data interface socket is a 9 way D-socket located on the rear of the Navtex beneath the terminal cover plate (see Figure 1). The 9 way D-plug used to connect to this socket should be either a solder bucket type or Insulation Displacement (IDC) type which should be used with ribbon cable.

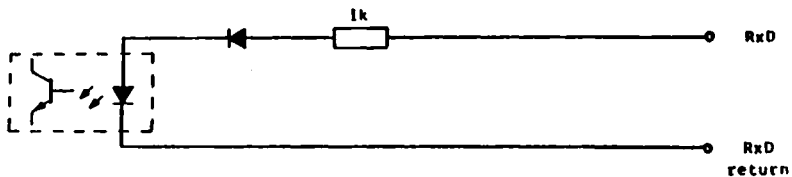
Text sent to the Navtex via the External Data Interface is printed in a block bordered top and bottom with a row of asterisks to differentiate it from the Navtex messages. Because the printer prints in reverse the Navtex accumulates a block of data before starting to print. It will start printing when either a form feed character is received (ASCII code 12) or until 10 seconds has elapsed since a character was received. The printing of Navtex messages has priority over external data so that no external messages are printed while Navtex messages are being received or printed out. External data will be kept in an buffer however and printed out after the Navtex messages. There is no handshaking over the external data interface, and if the internal buffer fills up its contents are erased. Therefore if a lot of data is input while Navtex messages are being printed, earlier data may be lost and only later data will be printed out.

Only Navtex messages are sent out via the External Data Interface. Status, Setup and Self Test messages are not sent and the rows of dashes bordering messages are not sent. The character set for both input and output is the standard ASCII character set.

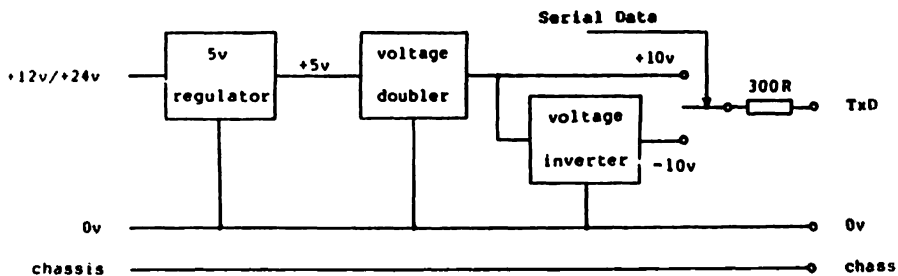
Figure 1 External Data Interface



Serial Data Receiver - Equivalent Circuit



Serial Data Transmitter - Equivalent Circuit



Appendix 4: Navtex Message Types

Important note: as the Navtex system is developed to provide more information and give worldwide coverage, the following information will require amendment and updating. Every effort has been made to ensure that the information below is accurate but navtex operators should update these pages referring to current publications by national hydrographic departments.

Message Type A

Coastal navigation and hazard warnings: including buoys out of position, light buoys unlit, new wrecks, floating debris, naval exercises etc.

Message Type B

Gale Warnings: broadcast immediately on receipt from meteorological office and repeated in next scheduled transmission.

Message Type C

Ice warnings: in relevant area only.

Message Type D

Search and Rescue Alerts: initial warning of any casualty/vessels in distress is transmitted from the nearest Navtex transmitter; subsequent information will be broadcast on the normal radio distress frequencies VHF Ch 16, 2182kHz and 500kHz.

Message Type E

Shipping forecasts: The pattern of scheduled meteorological information will vary from Navarea to Navarea. A synopsis and area forecast will be available in any sea area within the Navarea but not always from the nearest transmitter. Some transmitters (e.g. all UK and Rogaland, Norway) issue scheduled area forecasts, whereas other stations only issue Gale Warnings.

Message Type F

Pilot Warnings: messages issued under this category advise mariners of unscheduled alterations to offshore pilot stations e.g. due to weather.

Message Type G

Decca messages: information on irregularities in Decca Navigator Chains usually for breakdowns of longer than 30 mins.

Message Type H

Loran C messages: information of irregularities in Loran C Chains for breakdowns longer than 1 hour.

Message Type I

Omega messages: information of irregularities in Omega system for breakdowns longer than four hours.

Message Type J

SATNAV messages: information on irregularities in the various satellite navigation systems for breakdowns longer than 4 hours.

Message Type L

Navarea Warning: UK transmitters currently transmit Navarea warnings under letter L. Message type A will be restricted to Coastal Navigation warnings. Mariners should note that Navarea warnings will be just as vital as Coastal Warnings and the Navtex should be programmed for Message types A and L in UK waters.

Message Type Z

'QRU' or 'No messages on hand' may be broadcast when applicable to confirm correct operation of receiver.

Appendix 5: WORLDWIDE NAVTEX TRANSMITTERS

(Transmitters in operation, trials or planned, March 1990)

NAVAREA I

		Station identity letter
United Kingdom	Cullercoats	G
	Niton	S
	Portpatrick	O
Netherlands	Scheveningen	P
Iceland	Reykjavik	R
Norway	Bodo	B ✓
	Rogaland	L
	Vardoe	V
Belgium	Ostende	T
Baltic		
Sweden	Haernoessand	H
	Stockholm	J
USSR	Tallin	U

NAVAREA II

France	Le Conquet	A ✓
	Brest	F
(until Le Conquet operational)		
Portugal	Lisbon	R
	Azores	F
Spain	Finisterre	D
	Canary Islands	I

NAVAREA III

Black Sea

USSR	Odessa	C
	Zhdanov	B
	Novorossisk	A
Bulgaria	Varna	J
Turkey	Samsun	E

Mediterranean

Turkey	Izmir	I
	Istanbul	D
	Antalya	F
Greece	Limnos	L
	Iraklion	H
	Kerkyra	K
Spain	La Tarifa	G
	Cabo La Nao	Z
France	Toulon	
Yugoslavia	Split	Q
Cyprus	Troodos	M
Egypt	Alexandria	N

NAVAREA IV

United States	Boston	F
	New Orleans	G
	Portsmouth	N
	Miami	A
	San Juan, Puerto Rico	R
Canada	Sydney, Nova Scotia	K
Bermuda	St Georges	B

NAVAREA V

Uruguay

Colonia
Laguna del Sauce
La Paloma
Montevideo
Punta del Este
Salto

planned

NAVAREA VI

Argentina

Bahia Blanca
Buenos Aires
Comodoro Rivadavia
Mar del Plata
Rio Gallegos
Rosario
UshuaiaD
F
C
E
B
G
A**NAVAREA VIII**

India

Madras
BombayP
G**NAVAREA IX**

Egypt

Ismailia

X

Saudi Arabia

Dammam
JeddahG
H

Bahrain

Hamala

NAVAREA XI

P.R.China

Zhanjiang
Quangzhou
Fuzhou
Shanghai
Dalian
TianjinM
N
O
Q
R
S

Hong Kong

Hong Kong

L

cont/

NAVAREA XI continued:

Japan	Otaru Kushiro Yokohama Moji Naha	planned
United States	Guam	V

NAVAREA XII

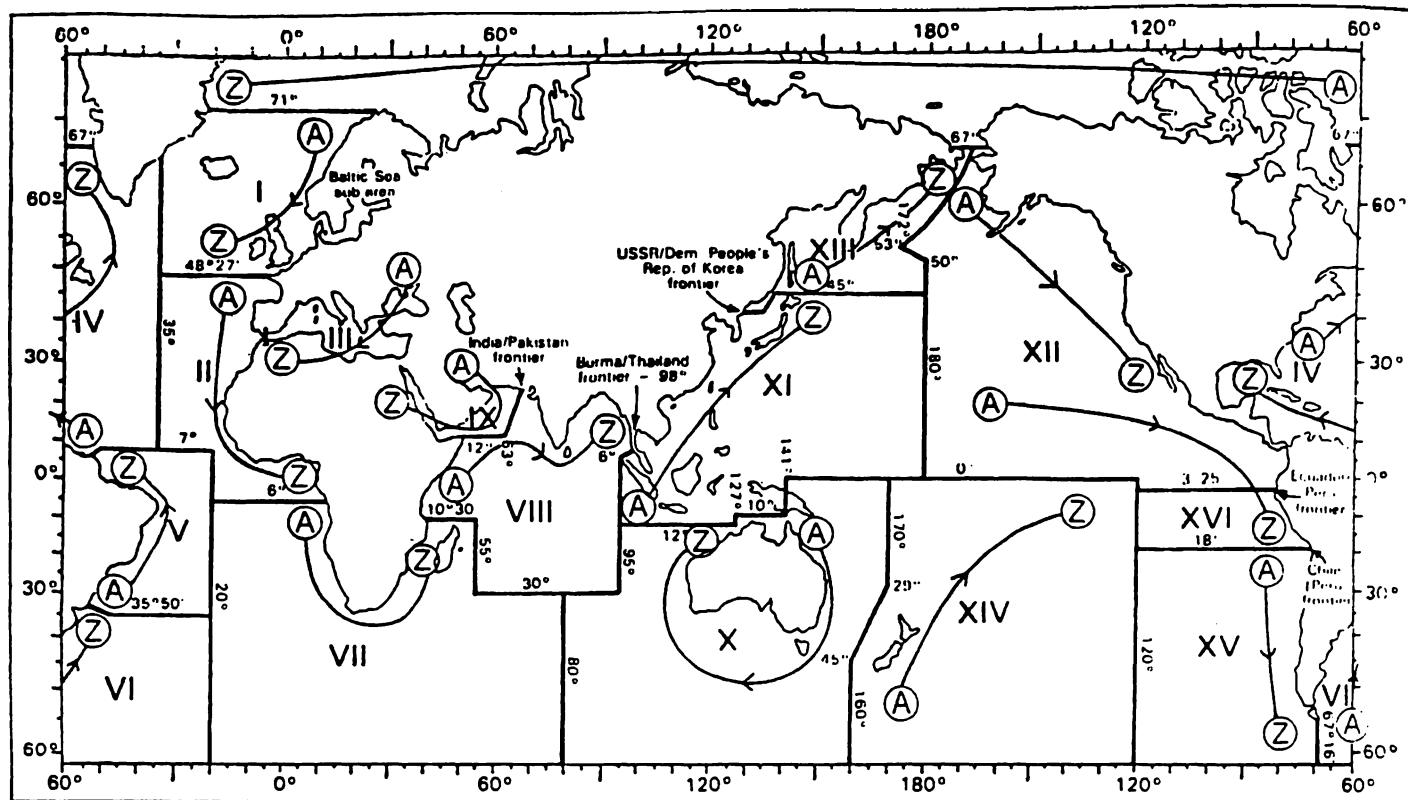
United States	San Francisco	C
	Astoria	W
	Long Beach	Q
	Kodiak	J
	Honolulu	O
	Adak (Aleutians)	X
	Guam	V

NAVAREA XIII

USSR	Murmansk	C
	Arkhangelsk	F
	Kholmsk	C
	Petropavlovsk	P
	Vladivostok	A
	Providenia	

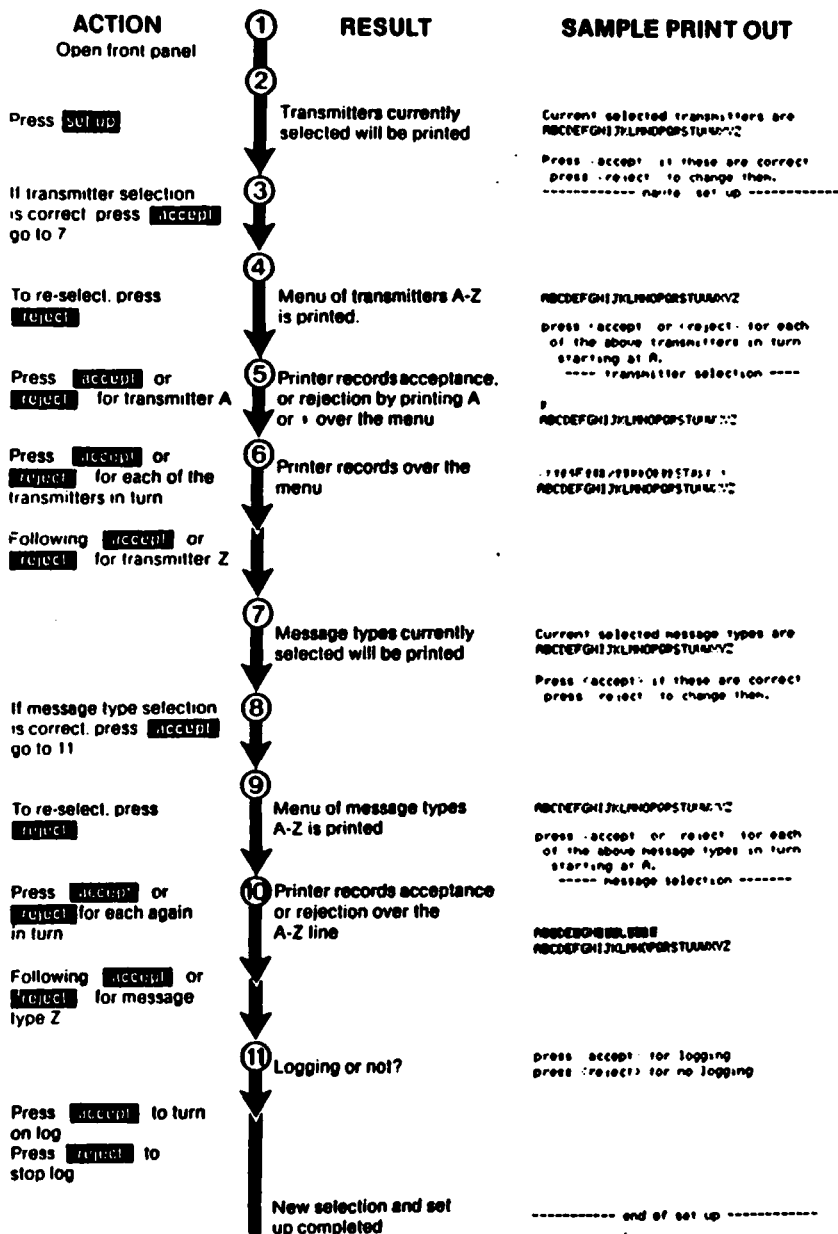
NAVAREA XV

Chile	Valparaiso	B
Antofagasta		
Talcahuano		
Puerto Montt		
Punta Arenas		

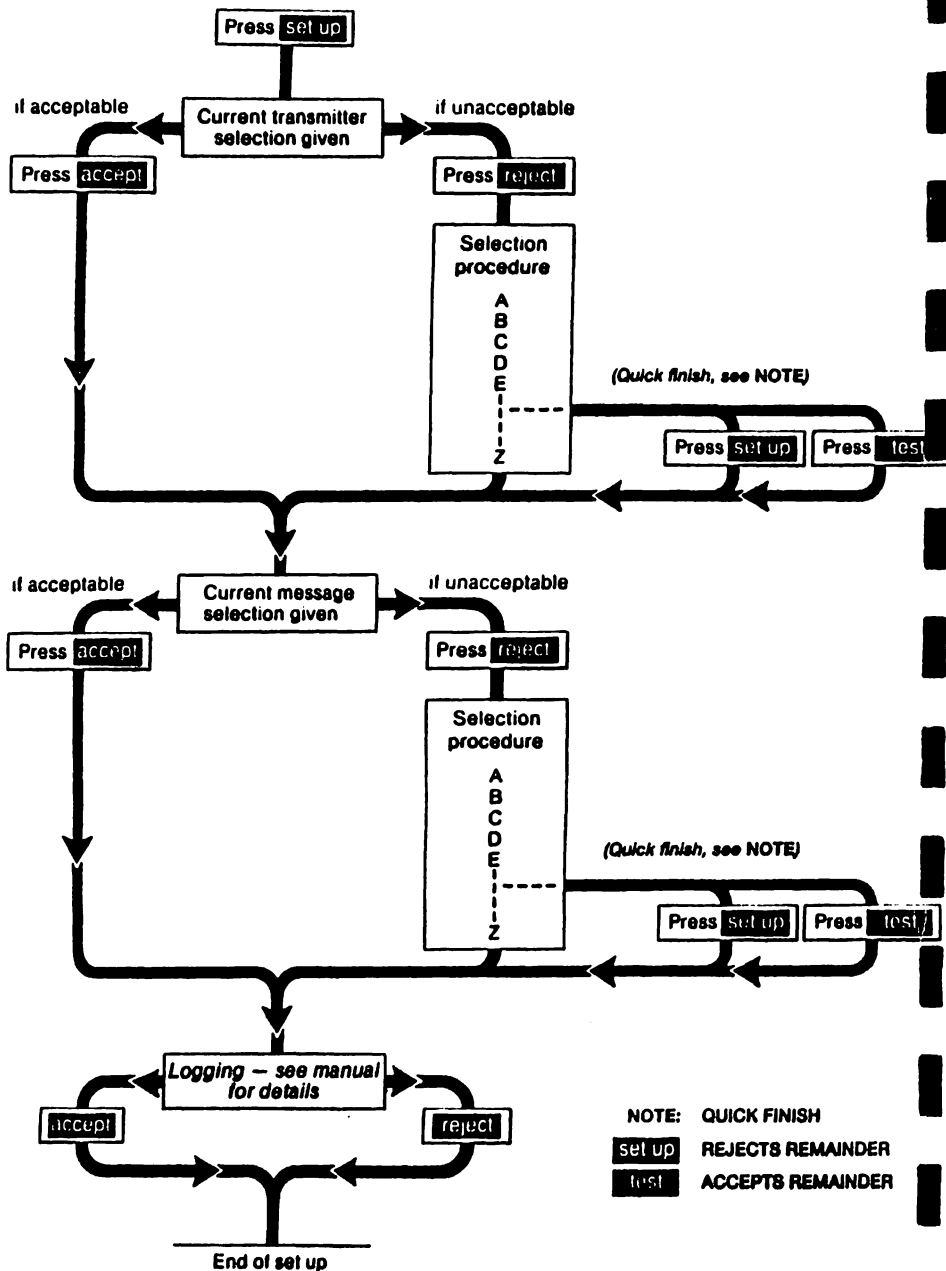


NAVAREAS showing the basic scheme for allocation of
transmitter identification characters

NAVTEX: PROGRAMMING INSTRUCTIONS



NAVTEX: PROGRAMMING FLOW CHART



Appendix 6: Maintenance Instructions

1. There will be no Diagnostic Maintenance.
2. There will be no Corrective Maintenance.
3. There will be no Preventative Maintenance.

Design Authority Maintenance Schedule

Issued for the guidance of those organisations not in receipt of schedules from a Service Maintenance Authority

Maint Op No	Job Description	Per
1	Self Test as detailed in Section 2, Page 5 of User Handbook	D
2	Inspection should be made of the list of Navtex transmitter stations and a local station selected together with its transmitting times. The receiver should be inspected at the selected time to ensure messages are received and printed.	D

Appendix 7: Parts Catalogue

Man Code	NATO Stock Number	Item Name and Description
0559	1195124	Fuse 24V 2.5A
0559	6433920	Fuse 110V 500mA Slow Blow
0559	7444026	Fuse 240V 350mA Slow Blow
Temp.Stock No TM-1002800		Navtex Thermal Paper

Demands for the above are to be submitted in accordance with normal naval stores procedures.

Appendix 8: Repair Procedure

1. Apart from replacing blown fuses, there will be no onboard repairs to the equipment.

2. Should the NAVTEX 2 develop a fault during service, the following steps should be taken:

- a) switch NAVTEX 2 off and on;
- b) check fuses located inside terminal cover on rear of unit;
- c) check antenna installation and antenna cable run;
- d) check connections to input converter and NAVTEX 2 connector strip in accordance with Diagram 4, Page 15 of User's Handbook;
- e) carry out test and fault finding procedures as detailed in Section 2, Page 5 of the User's Handbook.

3. If the fault cannot be cleared by the above methods the manufacturer should be advised. A replacement unit will then be supplied either by the manufacturer or the manufacturer's agent within 1 working day in the UK or within 2 working days to any ship operating outside UK waters.

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