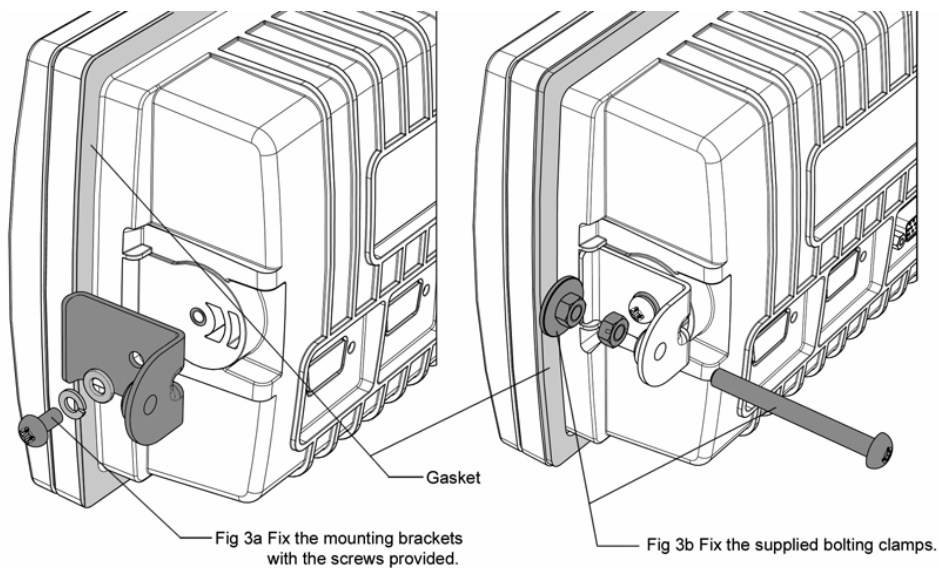




Warning: Do not mount the NAV-7 in a position where sea spray can reach it, or where it may be exposed to direct sunlight

DISPLAY ELECTRICAL INSTALLATION

This manual is concerned only with the installation of the NAV-7 and does not cover the installation of any peripheral equipment connected to the NAV-7 such as printers, navigational systems or source of NMEA data. For proper installation and connection of peripheral equipment to the NAV-7 refer to the installation manuals for these products.

The table below shows the connections that must be made to the NAV-7 for it to function correctly.

Connection	Must connect	Optional
Ship's earth connection	✓	
12V or 24 V DC power supply	✓	
NAVTEX antenna	✓	
Alarm Relay	✓	
NMEA or IBS time reference	See Note 1	See Note 1
Integrated Bridge/Navigation System		✓
External printer		✓

Note 1: Connecting a time reference (eg a GPS receiver) is highly recommended.

Ship's earth connection

The earth terminal on the rear of the NAV-7 display must be connected to ship's ground by the earth cable supplied. The earth connection should be kept as short as possible.

Safety Warning

To ensure the best possible protection of the NAV-7 from static electricity or nearby lighting strikes, the pre-fitted green grounding wire (connected to the safety earth spade) must be connected to a nearby (hull) electrical grounding point.

12V or 24 V DC power connection

A connection must be made to a 12 or 24 V DC supply via a circuit breaker capable of supplying at least 2 amps. Connection should be to the ship's radio battery and be in accordance with GMDSS requirements.

- Connections should be made using the 2 m power cable provided
- Use cable ties to restrain the wiring, and so prevent it becoming weakened by vibration. The connecting cables should be restrained by securing them to the rear of the NAV-7 bracket, or to adjacent metalwork
- The screen of the cable should be connected to ship's earth if possible. The screen of the cable **should not** be connected to ship's battery –ve

Safety Warning

The NAV-7 has been designed and manufactured to be completely safe when used in accordance with the instructions given in this manual. To ensure that the complete installation is safe, it is essential that a fuse or circuit breaker is installed in the power supply cable as described in the Installation section of this manual.

Isolation between the power supply connections and any other connection to the NAV-7 is 1 kV minimum.

The DC power source should comply with IMO guidelines for the class of vessel concerned. National authorities and classification societies may have their own power supply requirements; these should also be considered.

Signal cable connections

As shown in the table above, the NAV-7 may be connected to different types of peripheral units including IBS & INS serial ports and printers.

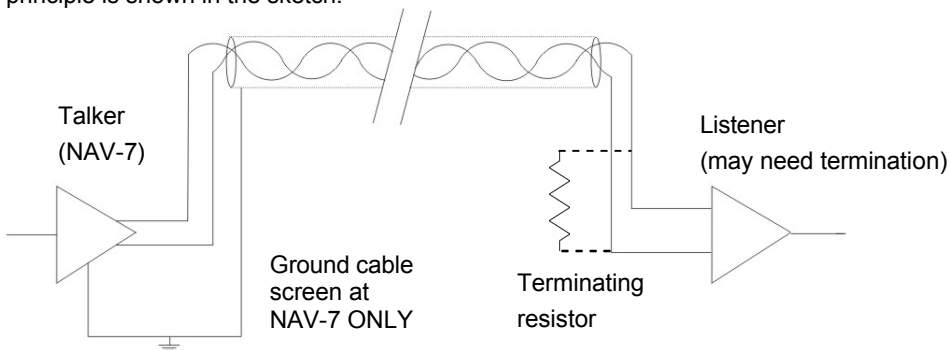
The signal connections are all connected via a serial RS422 type interface; data rates are selectable at 4800, 38400 or 115200 baud.

In some cases, particularly in retrofit installations, it may not be possible to connect the NAV-7 directly to the required source/destination for serial data, because some equipment does not provide the IEC 61162-2 (NMEA) sentences required by the NAV-7 unit. In such cases a protocol converter is required between the sensor and the NAV-7. Converters are available from different manufacturers, either as direct protocol converters or frequently as repeater instruments for the sensor.

Signal line termination

RS422 signal lines may need termination resistors at the far end of the serial cable connected to the NAV-7, depending on the length of connecting cable and the rate of data transmission. Both the IBS and the NMEA ports in the NAV-7 have inbuilt 100Ω termination resistors for both Tx and Rx.

Whether termination is required depends on many factors, particularly the length of the signal cable and the environment in which the equipment is operating. The principle is shown in the sketch:



There is only one talker per twisted pair; there can be several listeners. The intention is that terminations must be provided by the devices at the ends of the line, regardless of whether they are listeners or the talker, and that no other device should provide a termination.

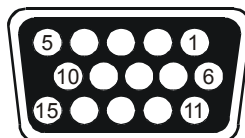
Since the NAV-7 contains internal termination, it **MUST** be at the end of the line and **NOT** in the middle.

It is good practice to use screened cables in all ship cable installations. Take care to connect the cable screen to ship's ground at one end only of the cable, as connecting at both ends may cause ground loops and interference to the signals. The cable screen should not be connected to any part of the NAV-7.

Connecting to the IBS serial interface

The display connection cable is supplied ready for use, and needs only to be plugged into the appropriate connector on the NAV-7.

Display cable: *Six twisted pairs, screened, PVC sheathed. For lengths to 200 meters, use 0.22 mm² (7/32); Belden 8106 or equivalent.*



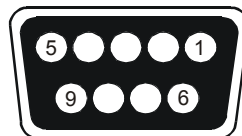
The connections to the 15-pin socket on the NAV-7 are given below. Note that the cable screen should not be connected to any part of the NAV-7.

Power, Alarm & IBS port (2m cable supplied)				
Pin Number	Connection	NAV-7	Cable Colour	Notes
1	IBS_TXA	O/P	WHITE/BLUE	O/P to IBS port
2				
3	+V (12/24 V DC nominal)	I/P	RED/BLUE	Ship's supply +ve
4	-V (0V)	I/P	BLUE/RED	Ship's supply -ve
5				
6	IBS_TXB	O/P	BLUE/WHITE	O/P to IBS port
7				
8	AUX_NC	O/P	ORANGE/WHITE	Alarm Relay NC
9	AUX_NO	O/P	WHITE/BROWN	Alarm Relay NO
10	AUX_COM	O/P	WHITE/GREY	Alarm Relay COM
11				
12	IBS_RXB	I/P	GREEN/WHITE	I/P from IBS port
13	IBS_RXA	I/P	WHITE/GREEN	I/P from IBS port
14				
15				

Connecting to the NMEA 0183 interface

If a connection to NMEA 0183 compatible equipment is required then a suitable cable has to be purchased or manufactured.

Recommended NMEA 0183 cable: *Two twisted pairs, screened, PVC sheathed. For lengths to 200 meters, use 0.22 mm² (7/32); Belden 8102 or equivalent.*



The connections to the D-Sub 9-pin socket on the NAV-7 are given below. Note that the cable screen should not be connected to any part of the NAV-7.

NMEA 0183 & printer port		
Pin Number	Connection	Notes
1		
2	SER_TXB	O/P to NMEA 0183 (printer)
3		
4	SER_RXB	I/P from NMEA 0183
5		
6		
7	SER_TXA	O/P to NMEA 0183 (printer)
8	SER_RXA	I/P from NMEA 0183
9		

Alarm relay

The NAV-7 provides a relay connection which can be selected as normally closed or normally open contacts.

The alarm relay function is configurable from within the setup pages and can be set (for example) to switch (change state) on receipt of a Search and Rescue message or for a system fault.

The red LED on the front panel of the NAV-7 mirrors the function of the alarm relay.

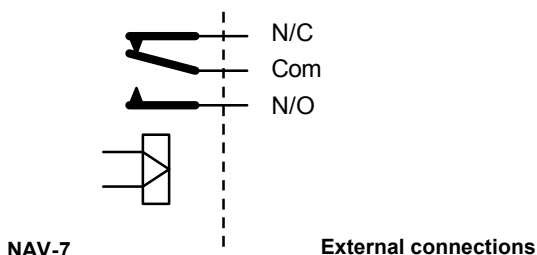
Red LED function	
LED OFF	Alarm relay NC contact closed
LED ON	Alarm relay NO contact closed

Recommended cable for connection of alarm relay:

One twisted pair, shielded, PVC sheathed. The required cable dimension is dependent on the current necessary to activate the alarm indicator.

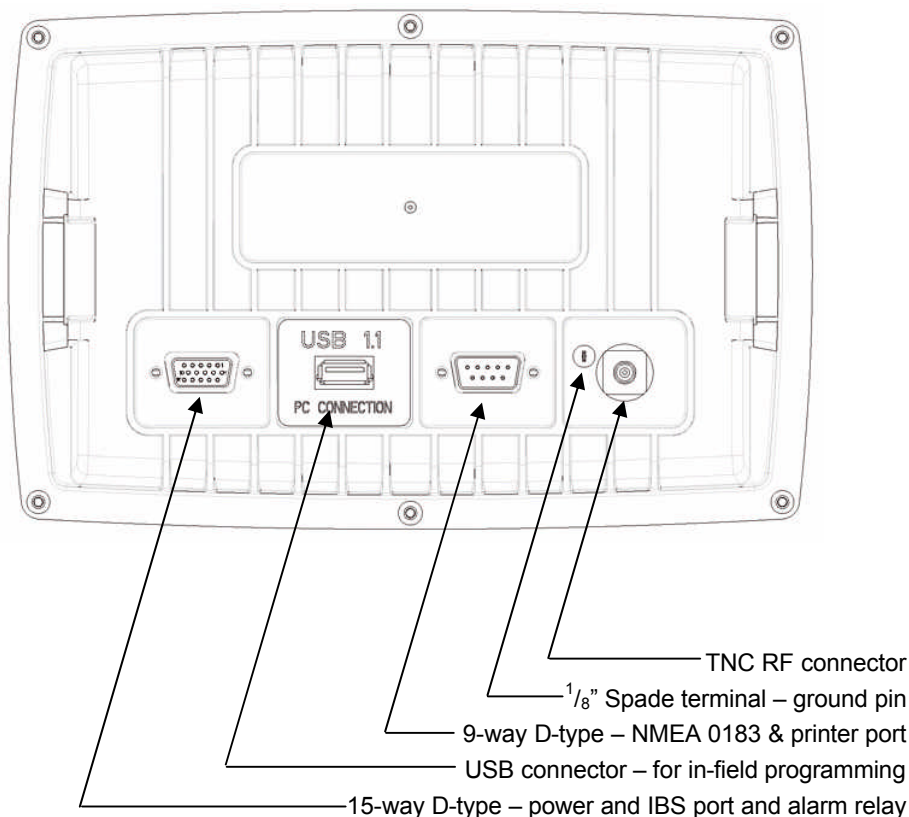
Built in alarm relay ratings:

Alarm relay absolute maximum ratings	
Maximum switching current in contacts (inductive load)	1.0 Amp
Maximum switching current in contacts (resistive load)	3.0 Amp
Maximum switching voltage	120 V AC or 24 V DC



Connector pin-outs

NAV-7 rear panel connections:



- The auxiliary alarm contact is capable of switching up to 24 V DC at up to 1 A (inductive load). The contacts are not connected to any internal voltages.
- The power supply input is isolated from the case and antenna. It must remain within the range 10.8 – 31.2 V DC (12/24 V DC nominal) at all times.

ANTENNA INSTALLATION

Selecting a suitable antenna

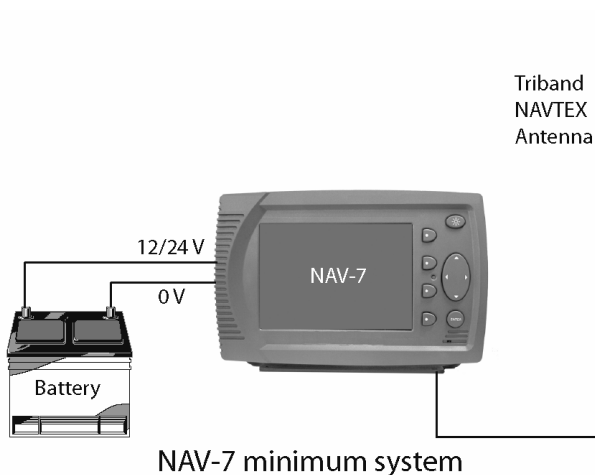
The NAV-7 receives transmissions on three frequencies. 518 kHz transmissions are in International English; 490 kHz and 4209.5 kHz transmissions may be in a local language.

To receive on all frequencies the NAV-7 must be used with a wide frequency (400kHz to 5MHz) antenna that covers 518 kHz, 490 kHz and 4209.5 kHz.

If you have purchased the NAV-7 receiver without an antenna then a suitable active NAVTEX antenna should be used. McMurdo supplies a suitable wide frequency antenna with the NAV-7 System; this antenna can be purchased separately as Part No. 905-05.

If the Installer is supplying an alternative antenna, note that the NAV-7 must be used with a low impedance 50 ohm antenna or an antenna with a 50 ohm matching network. A mis-matched or high impedance whip or wire antenna should not be used as the operational range of NAVTEX reception may be greatly reduced; it is also important that the antenna is capable of reception over the frequency range specified above.

If a Wire or long whip antenna is used with the NAV-7 it must be fitted with a 50 ohm matching transformer. Take care that the antenna power is disabled – refer to Setup – Receiver mode for details. A qualified installer should be consulted.



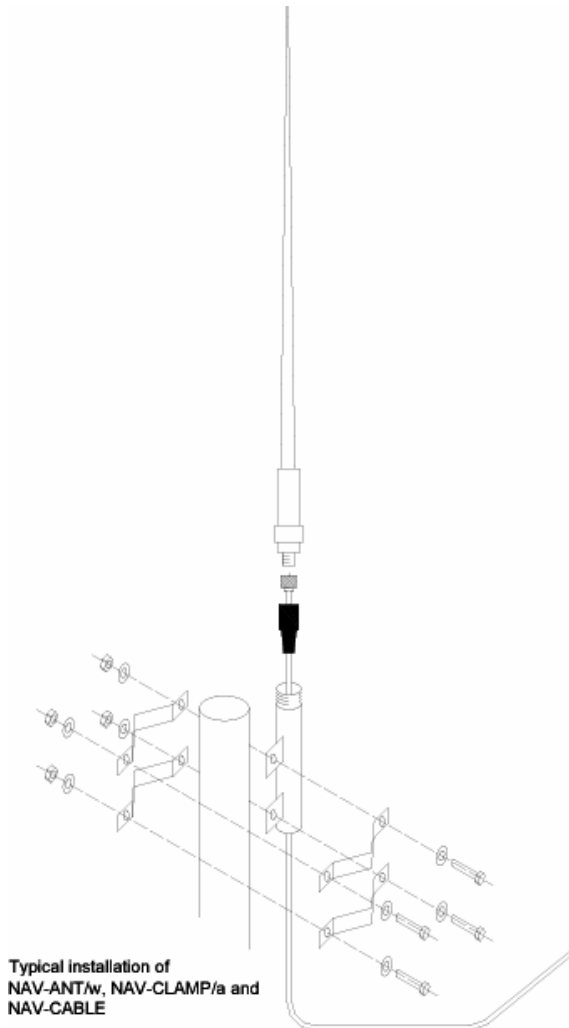
Important

NAVTEX antennas must be mounted clear of obstructions and at least 0.5 metres away from other antennas.

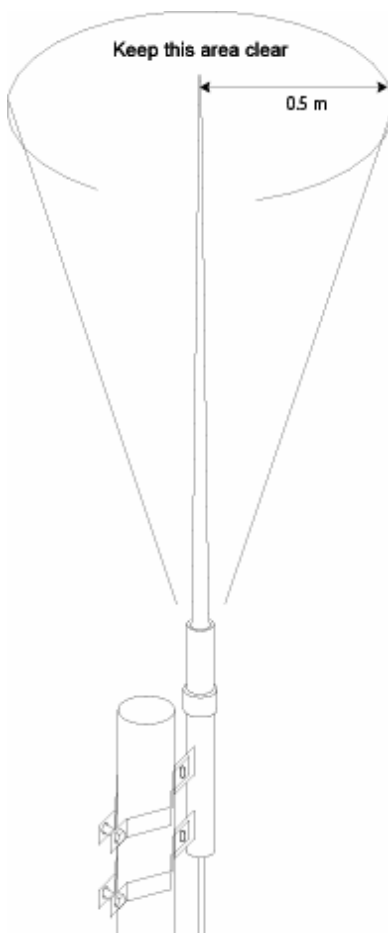
Where practical avoid locating the NAVTEX antenna close to MF / HF transmitting antennas or VHF / AIS antennas.

Ensure that antennas cannot be snagged by mooring warps or running rigging or engulfed by green water.

Antennas should always be mounted vertically.



Installation of the tri-channel NAVTEX antenna



The NAVTEX antenna should be mounted vertically, in an elevated position. Metal, rigging or other antennas must not be located in the 'NO GO cone' surrounding the upper part.

Use the mounting bracket supplied; an alternative mounting kit may be purchased if the mounting arrangement is unsuitable for your installation.

Attach the clamping brackets to the antenna mounting adapter and use the clamping arrangement to fix to a suitable vertical tube.

Thread the PL259 connector end of the coax cable through the antenna mounting adapter and secure the connector to the antenna 1" threaded adapter.

Slide the rubber boot over the PL259 connector; if desired, it may be filled with silicone grease for a better weatherproof seal.

Screw the antenna down into the antenna mounting adapter.

Ensure that the mounting adapter is connected to ground. If necessary, connect a grounding wire, 2.5 mm² minimum, to a suitable ground point.

Installation of the antenna cable

Start routing the antenna cable at the antenna end.

Where the cable passes through bulkheads or decks, waterproof deck glands should be installed. Securely fasten the cable against vibration using plastic cable tie wraps.

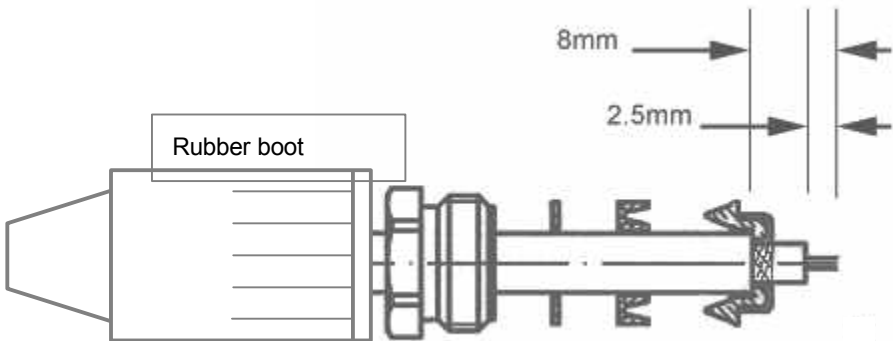
Complete routing of the antenna cable at the NAV-7 TNC connector.

Fitting the TNC connector

A TNC connector is supplied as part of the NAV-7 Receiver Kit.

Fit the TNC connector as shown below:

- Place the rubber boot, gland nut, washer and rubber seal onto cable. Remove the outer insulation for a distance of 8mm.
- Slide the cable braid sleeve over the screen braid, fold the braid back and trim off extra braid.
- Strip 2.5mm of the inner insulation to expose the centre conductor.
- Solder the pin onto the centre conductor.
- Assemble the connector and tighten the gland nut. Push the rubber boot securely over the gland nut.



Extending the antenna coax cable

If required, the coaxial cable may be extended with 50 ohm coaxial cable and connectors. The maximum cable length should not exceed 100 m. Ensure that any cable joints are well secured and waterproofed using self-amalgamating (rubber) tape.

Cable should be RG-58 / RG-67 / RG-213 / RG-214 grade or better; connectors should be suitable RF types (TNC, BNC, etc).

Testing the tri-channel active antenna installation

By default the NAV-7 provides a regulated 12 V DC (nom) 100 mA output to provide power for an active antenna such as the one supplied as part of a NAV-7 System.

If you are using an alternative active antenna please check that it is compatible with this power output. If it is not, then an external power supply interface will be required. Your antenna supplier should be able to provide this.

WARNING

**Take care not to apply power to the antenna TNC connector
from an external supply**

Switch on the NAV-7 by applying power (12 V DC or 24 V DC) via a circuit breaker or fuse.

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

The LCD display backlight will come on and the NAV-7 start-up screen will be shown.

If the antenna fault icon appears along the top of the display, switch off immediately and check for a short circuit at the antenna, the TNC connector or any other RF connections in-between. If the fault persists then please follow the trouble shooting guide in this manual.

Testing the Bantén active antenna

If it is suspected that reception is being compromised by the antenna performance, the antenna should be checked for electrical damage.

Disconnect the antenna from the NAV-7 by unscrewing the TNC connector at the back of the NAV-7.

Using a DVM set on resistance, measure across the TNC RF connector from the centre pin to the outer ferrule, looking back up towards the antenna. **DO NOT ATTEMPT TO MEASURE THE RESISTANCE OF THE TNC SOCKET ON THE NAV-7.**

A good antenna will show a reading in the range 1500 – 2000 ohms.

A failed antenna will show a reading < 1000 ohms.

If a reading of greater than 5000 ohms is measured, then there is a continuity problem with the connector or cable; these should be checked for damage or misconnection.

Note that these resistance values only apply to a Bantén active antenna as supplied by McMurdo. Other active antennas will have different resistance readings; consult the supplier in order to check such antennas.

Testing a passive antenna installation

The NAV-7 regulated 12 V DC 100 mA output can be disabled for passive antenna installations or for installations using a matching transformer.

NOTE: This should be done the first time that power is applied to the NAV-7 BEFORE the antenna is connected.

Switch on the NAV-7 by applying power (12 V DC or 24 V DC) via a circuit breaker or fuse.

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

The LCD display backlight will come on and the NAV-7 start-up screen will be shown.

If the antenna fault icon appears along the top of the display, switch off immediately and check for a short circuit at the antenna, the TNC connector or any other RF connections in-between. If the fault persists then please follow the trouble shooting guide in this manual.

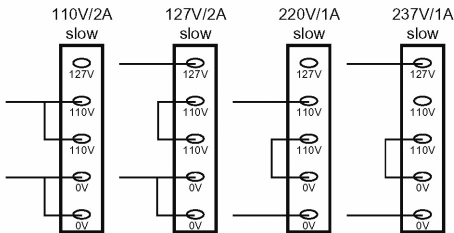
OPTIONAL POWER SUPPLY UNIT 89-029

Consult the installation instructions packed with the power supply.

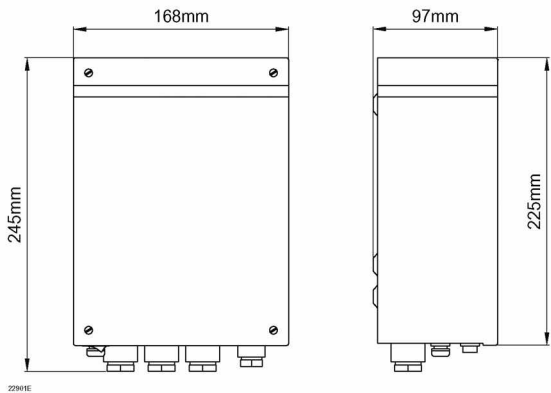
An additional ground wire may be connected between the green safety earth wire on the NAV-7 and the ground terminal on the NAVTEX Power Supply Unit.

Mains Voltage/Fuse Rating

(Wired and fused for 220V from factory)

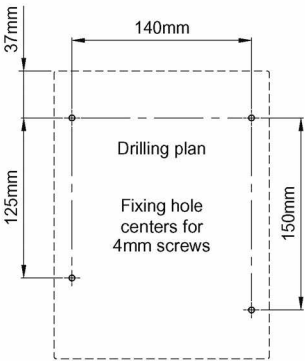


Solder strip on transformer



Weight 5 kg

Dimensions and drilling plan



Technical specification Power supply wiring

110 V AC 1.6 A	110 V AC 2 x 1.5 mm ²
230 V AC 0.8 A	230 V AC 2 x 0.7 mm ²
24 V DC 7.0 A	24 V DC 2 x 6.0 mm ²

Maintenance Guide

General Points to Check

- Periodically make sure that the antenna connector is well sealed and that there isn't sign of corrosion around the PL259 connector
- Make sure connections to the back of the NAV-7 display are secure

Cleaning Instructions

- Periodically clean the LCD front window with a soft lint-free cloth (such as those supplied by opticians to clean spectacles)
- Do not use cleaning solvents on any part of the NAV-7

Disposal at end of life

At the end of its life dispose of this product in accordance with local regulations.

OPTIONS

NAV-7 ancillary parts:

Model	Description	Code
Active NAVTEX antenna	518 – 490 kHz + 4209.5 kHz, PL Socket, white glass fibre construction with 1inch nut fitting	905-05
NAV-CLAMP	Pole mount stand-off bracket for NAVTEX Antenna, 1inch bolt mount fitting.	903-01
NAV-CLAMP /b	Pole or Wall mount stand-off bracket for NAVTEX Antenna, 1inch bolt mount fitting	903-02
NAV-CLAMP /c	Deck mount for NAVTEX antenna, 1inch bolt mount fitting	903-04
NAV-CABLE 20	20 m antenna cable kit	35-820
External Power Supply Unit	AC/DC + auto changeover to reserve power 110 / 220 V AC input	89-029

TROUBLESHOOTING GUIDE

General Points to Check

- Make sure that the antenna is mounted vertically, and is sited clear of obstructions
- Make sure the vessel is operating within the coverage area of a NAVTEX transmitter
- When the NAVTEX station(s) selected are transmitting, icons for 490, 518 and 4209.5 kHz show whenever a NAVTEX signal is received
- Ensure that the required NAVTEX station and message categories have not been deselected in the NAV-7 setup menu

Antenna fault icon appears at the top of the display: active antenna

- 1 Turn off the NAV-7
- 2 Disconnect the active antenna and check that there is not a short across the antenna's TNC connector
- 3 Turn on the NAV-7, apply a 120 ohm 5 W resistor across the TNC connector. If there is 12 V DC across the TNC then either the antenna or coax cable is faulty
- 4 If there is not 12 V DC across the TNC connector then check that Antenna power : Enabled is selected in the setup screens
- 5 If these instructions do not work then please contact your service agent

Antenna fault icon appears at the top of the display: passive antenna

- 1 Turn off the NAV-7
- 2 Disconnect the passive antenna and check that there is not a short across the antenna TNC connector
- 3 Check that Antenna power : Disabled is selected in the setup screens
- 4 If these instructions do not work then please contact your service agent

The NAV-7 is not receiving

- 1 Are you within range of a NAVTEX transmitting station?
- 2 Has there been a scheduled transmission since the NAV-7 was first switched on?
- 3 Check that the antenna is clear of obstructions and has not suffered external damage
- 4 Check that the antenna cable is not damaged
- 5 Check that the antenna fault icon is not being displayed on the status bar at the top of the display
- 6 From within the setup screens, check that the NAVTEX transmitting stations and message categories are correctly selected and that they have not all been disabled
- 7 From the Setup mode: receiver options screen check that there isn't a strong local interfering signal
- 8 Please contact your service agent

Software upgrade

From time to time software upgrades may be available. Check our website for information on new releases.

External receiver

The NAV-7 has the capability to receive from an external receiver (not supplied) on an additional NAVTEX frequency should such an additional frequency be mandated by the IMO in the future.

NAVTEX messages from the external receiver appear on the View EXTERNAL RECEIVER page.

The external NAVTEX data must be presented as a stream of NMEA NRX sentences as defined in Annex C of the IEC61097-6 Ed.2 (2005) specification.

The external receiver may be another NAV-7; in such a case, a single antenna may serve several displays. For more information, contact McMurdo Customer Service.

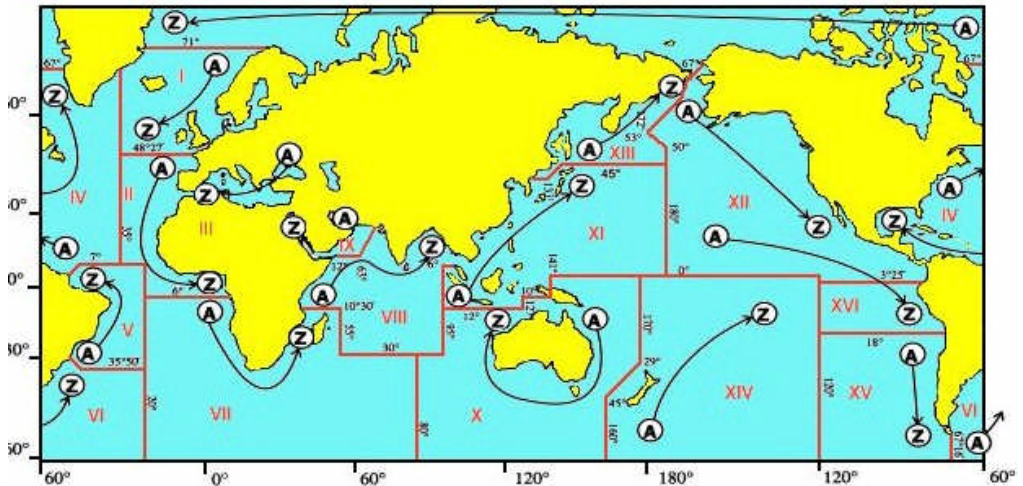
SPECIFICATIONS

Complies with technical standards:	IMO Resolutions MSC.148(77) A.2.1, A694 (17) SOLAS Regulation IV/7.1.4 ITU-R M.540-2, ITU-R M.625-3, IEC 60945-4 IEC 61162-1,-2, IEC 61097-6
Receivers	
RxA Receiver Frequency	518 kHz
RxB Receiver Frequency	490 kHz
RxC Receiver Frequency	4209.5 kHz
Sensitivity	<2 microvolts
Frequency stability	+/- 10 Hz
Antenna Input	50 ohms
NAVTEX Reception	conforms to ITU-R 540-2, IEC 61097-6
NAVTEX message memory	Stores at least 1000 x 500 character messages
Environmental	Meets the relevant parts of IEC60197-2 and IEC 60945-4 for 'protected' equipment
Compass safe distance	0.87 metres
Display	½ VGA (480 x 320 pixels) Colour STN CCFL backlight
Controls	LCD backlight dim/contrast 'Enter' key Four soft keys Tracker pad
Menu languages supported	English
Alphabets supported	English, Cyrillic
Rear Connections	Power, Alarm & IBS port NMEA 0183 port USB port (unused) Antenna connector Earth stud
IBS Port Serial Interface	15 way D-type Conforms to IEC 61162-2 8 data, 1 stop, no parity Baud rates 4800, 38400, 115200 Supports (in priority order) RMC, GLL, ZDA for date and time Supports NRX, NRQ, NMK, ACK, ALR for NAVTEX functions

MEA 0183 / Printer Serial Interface	9 way D-type Conforms to IEC 61162-1 8 data, 1 stop, no parity Baud rates 4800, 38400, 115200 Supports (in priority order) RMC, GLL, ZDA for date and time Supports NRX, NRQ, NMK, ACK, ALR for NAVTEX functions
USB Serial Interface	Type A connector USB 1.1 (device) interface (unused)
Antenna connector	TNC connector 50 ohms 12 V DC @ 100 mA for active antennas, auto-sensing
Alarms (internal buzzer)	Vital message receipt Antenna fault alarm
Alarm Relay Rating	1A @ 120 V AC / 24 V DC (max)
Operating Temperature Range	-15° to +55° C
Storage Temperature Range	-20° to +55° C
Humidity	0 to 95%, non-condensing
Mounting	Below decks, desk-top, bulkhead or panel mount
Weight including bracket	1100 g
Dimensions	219 mm W x 151 mm H x 76 mm D
Mounting	Shelf/bulkhead or panel mount (both kits provided)
Power	
Voltage range	12/24 V DC nominal (10.8 V to 31.2 V)
Consumption, backlight dimmed	5.7 W @ 24 V DC
Consumption, backlight full on	8.6 W @ 24 V DC
Fused internally	1.8 A resettable type

McMurdo reserves the right to change specifications without notice.

Appendix I: NAVTEX station database



518kHz NAVTEX stations

Id	Area	Country	Name	Latitude	Longitude	Range (NM)
A 15	Chile		Antofagusta	23°40' S	70°25' W	300
A 09	Iran		Bushehr	28°58' N	50°50' E	300
A 02	France		Corsen	48°28' N	5°3' W	300
A 11	Indonesia		Jayapura	2°31' S	140°43' E	300
A 04	USA		Miami	25°30' N	80°23' W	240
A 03	Russia		Novorossiysk	44°43' N	37°47' E	300
A 01	Norway		Svalbard	78°4' N	13°38' E	450
A 13	Russia		Vladivostok	43°7' N	131°53' E	280
B 11	Indonesia		Amboina	3°42' S	128°12' E	300
B 09	Bahrain		Bahrain	26°9' N	50°28' E	300
B 04	Bermuda		Bermuda Harbour	32°23' N	64°41' W	280
B 01	Norway		Bodo	67°16' N	14°23' E	450
B 13	Russia		Kholmsk	47°2' N	142°3' E	300
B 03	Ukraine		Mariupol	47°6' N	37°33' E	280
B 15	Chile		Valparaiso	32°48' S	71°29' W	300
B 07	Namibia		Walvis Bay	23°3' S	14°37' E	380
C 07	South Africa		Cape Town	33°41' S	18°43' E	500
C 08	Mauritius		Mauritius	20°10' S	57°28' E	400
C 01	Russia		Murmansk	68°58' N	33°5' E	140
C 03	Ukraine		Odessa	46°29' N	30°44' E	280
C 13	Russia		Petropavlosk	53°0' N	158°40' E	280
C 12	USA		San Francisco	37°55' N	122°42' W	350
C 04	Canada		Sept -Iles	50°11' N	66°7' W	300
C 11	Singapore		Singapore	1°20' N	103°42' E	400
C 15	Chile		Talcahuano	36°42' S	73°6' W	300
D 02	Spain		Coruna	43°22' N	8°27' W	400
D 01	Sweden		Grimeton	57°6' N	12°23' E	299
D 03	Turkey		Istanbul	41°4' N	28°57' E	300
D 13	Russia		Maqadan	59°40' N	151°1' E	000

ID	Area	Country	Name	Latitude	Longitude	Range (NM)
D	12	Canada	Prince Rupert	54°18' N	130°25' W	300
D	15	Chile	Puerto Montt	41°29' S	72°57' W	300
D	04	Canada	Sept -Iles	50°11' N	66°7' W	300
D	11	Indonesia	Ujungpandang	5°6' S	119°26' E	300
E	13	Russia	Beringovski	64°10' N	179°02' W	000
E	11	Indonesia	Jakarta	6°7' S	106°52' E	300
E	15	Chile	Magallanes	52°56' S	70°54' W	300
E	01	UK	Niton	50°35' N	1°18' W	270
E	03	Turkey	Samsun	41°17' N	36°20' E	300
E	12	USA	Savannah	32°8' N	81°42' W	200
F	03	Turkey	Antalya	36°53' N	30°42' E	300
F	01	Russia	Arkhangelsk	64°33' N	40°32' E	300
F	09	Iran	Bandar Abbas	27°8' N	57°4' E	300
F	04	USA	Boston (Ice Rep)	41°43' N	70°31' W	200
F	02	Accores	Horta	38°32' N	28°38' W	640
F	15	Chile	Isla De Pascua	27°9' S	109°25' W	300
F	11	Thailand	Krung Thep	13°44' N	100°34' E	200
F	06	Uruguay	La Paloma	34°40' S	54°9' W	280
F	13	Russia	Providenia Bukhta	64°10' N	173°10' W	000
G	01	UK	Cullercoats	55°4' N	1°28' W	270
G	09	Saudi Arabia	Damman	26°26' N	50°6' E	390
G	15	Chile	Isla De Pascua	27°9' S	109°25' W	300
G	08	India	Mumbai	19°5' N	72°50' E	299
G	11	Japan	Naha	26°9' N	127°46' E	400
G	04	USA	New Orleans	29°53' N	89°55' W	200
G	02	Spain	Tarifa	36°1' N	5°34' W	400
H	15	Chile	Antofagusta	23°40' S	70°25' W	300
H	01	Sweden	Bjuroklubb	64°28' N	21°36' E	300
H	06	Dutch Antilles	Curacao	12°10' N	68°52' W	250
H	03	Greece	Iraklion	35°20' N	25°7' E	280
H	09	Saudi Arabia	Jeddah	21°23' N	39°11' E	390
H	11	Japan	Moji	33°52' N	130°36' E	400
H	04	Canada	Prescott	44°20' N	81°10' W	300
H	12	Canada	Tofino	48°56' N	125°32' W	300
I	03	Turkey	Izmir	38°21' N	26°35' E	300
I	02	Islas Canarias	Las Palmas	28°9' N	15°25' W	400
I	07	South Africa	Port Elizabeth	33°57' S	25°31' E	500
I	15	Chile	Valparaiso	32°48' S	71°29' W	300
I	11	Japan	Yokohama	35°22' N	139°36' E	400
J	01	Sweden	Gislovshammer	55°29' N	14°19' E	300
J	12	Alaska	Kodiak	57°46' N	152°34' W	200
J	11	Japan	Otaru	43°12' N	141°0' E	400
J	04	Canada	Sydney	46°11' N	59°54' W	300
J	15	Chile	Talcahuano	36°42' S	73°6' W	300
J	03	Bulgaria	Varna	43°4' N	27°46' E	350
K	03	Greece	Kerkyra	39°45' N	19°52' E	280
K	11	Japan	Kushiro	42°59' N	144°23' E	400
K	01	UK	Niton (N.France)	50°35' N	1°18' W	270
L	11	Hong Kong	Hong Kong	22°13' N	114°15' E	299
L	03	Greece	Limnos	39°52' N	25°4' E	280
L	15	Chile	Magallanes	52°56' S	70°54' W	300
L	01	Norway	Rogaland	58°39' N	5°36' E	450
M	02	Morocco	Casablanca	33°36' N	7°38' W	180
M	03	Cyprus	Cyprus	35°10' N	33°26' E	200
M	09	Oman	Muscat	23°37' N	58°31' E	270
M	01	Belgium	Oostende (Thames)	51°11' N	2°48' E	150
M	11	China	Sanya	18°14' N	109°30' E	250
M	06	Argentina	Ushuaia Prefectur	54°48' S	68°18' W	280
N	03	Egypt	El Iskandariya	31°12' N	29°52' E	350
N	11	China	Guangzhou	23°9' N	113°29' E	250
N	01	Norway	Orlandet	63°40' N	9°33' E	450

Id	Area	Country	Name	Latitude	Longitude	Range (NM)
N	04	USA	Portsmouth	36°44' N	76°1' W	280
N	06	Argentina	Rio Gallegos	51°37' S	69°3' W	280
O	06	Argentina	Comodoro Rivadavi	45°51' S	67°25' W	280
O	07	South Africa	Durban	29°48' S	30°49' E	500
O	11	China	Fuzhou	26°2' N	119°18' E	250
O	12	Hawaiian Islands	Honolulu	21°22' N	158°9' W	350
O	03	Malta	Malta	35°49' N	14°32' E	400
O	01	UK	Portpatrick	54°51' N	5°7' W	270
O	04	Canada	St Johns	47°37' N	52°40' W	300
P	06	Argentina	Bahia Blanca	38°43' S	62°6' W	280
P	11	Vietnam	Hai Phong	20°43' N	106°44' E	400
P	03	Israel	Hefa	32°49' N	35°0' E	200
P	01	Netherlands	Ijmuiden	52°27' N	4°35' E	110
P	09	Pakistan	Karachi	24°51' N	67°3' E	400
P	11	Taiwan	Keelung	25°8' N	121°45' E	540
P	11	Taiwan	Lintou	23°33' N	119°38' E	350
P	11	Taiwan	Linyuan	22°29' N	120°25' E	540
P	08	India	Madras	13°8' N	80°17' E	299
P	11	Taiwan	Meilung	23°59' N	121°37' E	350
P	04	Canada	Thunder Bay	48°26' N	89°13' W	300
Q	12	USA	Long Beach	35°31' N	121°3' W	350
Q	01	Ireland	Malin Head	55°22' N	7°21' W	400
Q	06	Argentina	Mar Del Plata	38°3' S	57°32' W	280
Q	11	China	Shanghai	31°7' N	121°33' E	250
Q	03	Croatia	Split	43°30' N	16°29' E	085
Q	04	Canada	Sydney	46°11' N	59°54' W	300
R	06	Argentina	Buenos Aires	34°27' S	58°37' W	560
R	11	China	Dalian	38°52' N	121°31' E	250
R	02	Portugal	Monsanto	38°44' N	9°11' W	530
R	01	Iceland	Reykjavik	64°5' N	21°51' W	550
R	04	Greenland	Reykjavik	64°5' N	21°51' W	550
R	03	Italy	Roma	41°48' N	12°31' E	320
R	12	Puerto Rico	San Juan	18°28' N	67°4' W	200
S	04	Canada	Iqaluit	63°44' N	68°33' W	200
S	11	Malaysia	Labuan	5°54' N	118°0' E	350
S	16	Peru	Paíta	5°5' S	81°7' W	200
T	03	Italy	Cagliari	39°14' N	9°14' E	320
T	04	Canada	Iqaluit	63°44' N	68°33' W	200
T	11	Malaysia	Kuching	4°27' N	114°1' E	350
T	01	Belgium	Oostende	51°11' N	2°48' E	050
U	16	Peru	Calleo	12°3' S	77°9' W	200
U	04	Canada	Fundy	43°45' N	66°10' W	300
U	11	Malaysia	Port Kelang	5°25' N	100°24' E	350
U	01	Estonia	Tallinn	59°30' N	24°30' E	300
U	03	Italy	Trieste	45°41' N	13°46' E	320
V	03	Italy	Augusta	37°14' N	15°14' E	320
V	11	South Korea	Chukpyon	37°3' N	129°26' E	200
V	04	Canada	Fundy	43°45' N	66°10' W	300
V	11	Mariana Islands	Guam	13°34' N	144°50' E	100
V	01	Norway	Vardo	70°22' N	31°6' E	450
W	12	USA	Astoria	46°10' N	123°49' W	216
W	11	Vietnam	Da Nang	16°5' N	108°13' E	400
W	04	Greenland	Kook Islands	64°4' N	52°1' W	400
W	03	France	La Garde	43°6' N	5°59' E	250
W	16	Peru	Mollendo	17°1' S	72°1' W	200
W	11	South Korea	Pyonsan	35°36' N	126°29' E	200
W	01	Ireland	Valentia (Dublin)	51°27' N	9°49' W	400
X	11	Vietnam	Ho Chi Minh-City	10°47' N	106°40' E	400
X	12	Alaska	Kodiak	57°47' N	152°32' W	200
X	04	Canada	Labrador	53°18' N	60°33' W	300
X	09	Egypt	Serapeum	30°28' N	32°22' E	200

Id	Area	Country	Name	Latitude	Longitude	Range (NM)
X	03	Spain	Valencia	38°43' N	0°9' E	300

490 kHz NAVTEX stations

Id	Area	Country	Name	Latitude	Longitude	Language
C	01	UK	Portpatrick	54°51' N	05°07' W	English
I	01	UK	Niton	50°35' N	01°18' W	English
R	01	Iceland	Reykjavik	64°05' N	21°51' W	Icelandic
T	01	UK	Niton	50°35' N	01°18' W	French
U	01	UK	Cullercoats	55°02' N	01°26' W	English
E	02	France	Corsen	48°28' N	05°03' E	French
G	02	Portugal	Monsanto	38°44' N	09°11' W	Portuguese
J	02	Azores	Horta	38°32' N	28°38' W	Portuguese
A	03	Turkey	Samsun	41°17' N	36°20' E	Turkish
B	03	Turkey	Istanbul	41°04' N	28°56' E	Turkish
C	03	Turkey	Izmir	38°21' N	26°35' E	Turkish
D	03	Turkey	Antalya	36°53' N	30°42' E	Turkish
L	03	Romania	Constanta	44°06' N	28°37' E	Romanian
S	03	France	La Garde (Toulon)	43°06' N	05°59' E	French
D	04	Canada	Rivière-au-Renard, QC (Sept-Îles)	50°11' N	66°06' W	French
J	04	Canada	Sydney	46°11' N	59°54' W	French
S	04	Canada	Iqaluit	63°44' N	68°33' W	French
V	04	Canada	Fundy, NB (Yarmouth, NS)	43°44' N	66°07' W	French
K	11	Korea	Chukp'y on	37°03' N	129°26' E	Korean
K	11	Korea	P'y ongsan	35°36' N	126°29' E	Korean
V	11	Taiwan	Lintou	23°33' N	119°38' E	Chinese
X	11	Taiwan	Yenliaoken	23°54' N	121°36' E	Chinese

4209.5 kHz NAVTEX stations

Id	Area	Country	Name	Latitude	Longitude	Language
M	03	Turkey	Istanbul	41°04' N	28°56' E	Turkish
X	09	Egypt	Ismailia	30°35' N	32°17' E	English
P	11	Taiwan	Chi-lung (Keelung)	25°08' N	121°45' E	English
P	11	Taiwan	Linyuan	22°29' N	120°25' E	English
V	11	Taiwan	Chi-lung (Keelung)	25°08' N	121°45' E	Chinese
X	11	Taiwan	Linyuan	22°29' N	120°25' E	Chinese

Notes:

No liability can be accepted for any inaccuracies or omissions in this NAVTEX stations table, although every care has been taken to make it as complete and accurate as possible.

Check our website www.mcmurdo.co.uk for information on updates to the station database.

For updated NAVTEX station listings information refer to the current UK 'Admiralty List of Radio Signals, Volume 5' or equivalent national publications.

All 518 kHz NAVTEX transmissions should be in English language.

Local language NAVTEX services are available in some parts of the World on 490 kHz and 4209.5 kHz.

Appendix II: 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 (Note: OMEGA has been 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

STATION	TRANSMISSION TIMES (UTC)					
A	00:00	04:00	08:00	12:00	16:00	20:00
B	00:10	04:10	08:10	12:10	16:10	20:10
C	00:20	04:20	08:20	12:20	16:20	20:20
D	00:30	04:30	08:30	12:30	16:30	20:30
E	00:40	04:40	08:40	12:40	16:40	20:40
F	00:50	04:50	08:50	12:50	16:50	20:50
G	01:00	05:00	9:00	13:00	17:00	21:00
H	01:10	05:10	9:10	13:10	17:10	21:10
I	01:20	05:20	9:20	13:20	17:20	21:20
J	01:30	05:30	9:30	13:30	17:30	21:30
K	01:40	05:40	9:40	13:40	17:40	21:40
L	01:50	05:50	9:50	13:50	17:50	21:50
M	02:00	06:00	10:00	14:00	18:00	22:00
N	02:10	06:10	10:10	14:10	18:10	22:10
O	02:20	06:20	10:20	14:20	18:20	22:20
P	02:30	06:30	10:30	14:30	18:30	22:30
Q	02:40	06:40	10:40	14:40	18:40	22:40
R	02:50	06:50	10:50	14:50	18:50	22:50
S	03:00	07:00	11:00	15:00	19:00	23:00
T	03:10	07:10	11:10	15:10	19:10	23:10
U	03:20	07:20	11:20	15:20	19:20	23:20
V	03:30	07:30	11:30	15:30	19:30	23:30
W	03:40	07:40	11:40	15:40	19:40	23:40
X	03:50	07:50	11:50	15:50	19:50	23:50

Appendix III: Declaration of Conformity

mcmurdo

Silver Point
 Airport Service Road
 Portsmouth
 Hampshire UK
 PO3 5PB
 Int + 44 (0)23 5262 3900
 www.mcmurdo.co.uk

EC DECLARATION OF CONFORMITY

We declare that the following products comply with the essential requirements of Council Directive 96/98/EC on the approximation of the laws of the member States relating to Marine Equipment as amended by Commission Directives 98/85/EC, 2001/53/EC, 2002/75/EC and 2002/84/EC, as evidenced by a EC Type Examination Certificate as detailed overleaf.

Products covered by this Declaration

Product Type: GMDSS NAVTEX receiver
 (Commission Directive 2002/75/EC, Item A.1(5.3))

Models : **McMurdo NAV-7**

Intended usage of products

All vessels which must comply with IMO SOLAS regulations in coastal or International waters.

Surveillance conformity assessment is undertaken in accordance with Production Quality Assurance Module D by:

QinetiQ (No. 0191)
 Cody Technology Park
 Ivelly Road,
 Farnborough GU14 0LX
 United Kingdom

The product will carry this Conformity Marking:



XX = last two digits of year mark affixed

Issued on behalf of McMurdo Limited

Signed :

Name: **R N Taylor**
 Title: **Engineering Manager**

Date: **14 JUNE 06**

See overleaf for technical information

Page 1 of 2

EC Type Examination Certificate:

Name of Notified Body: QinetiQ (No. 0191)
 Address of Notified Body: Ivelly Road, Farnborough GU14 0LX, UK

Certificate: QQ-MED-12/06-01 15 June 2006

Regulations and Standards complied with:

IEC 61097-6 : 1995
 BS EN 60945 : 2002

Additionally, the equipment is certified as complying with IEC61097-6 :2005, and is recognised as complying with IMO Resolutions A.525(13), as amended by MSC.146(77), and with A.594(17).

Technical Construction File held by:

McMurdo Limited
 Silver Point, Airport Service Road, Portsmouth PO3 5PB UK

ATTENTION

The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when the product is taken into service to maintain compliance with the above directive. Details of these special methods and limitations to use are available on request, and are also contained in the product owner manual.

This Declaration complies with EN ISO/IEC 17050-1:2004



BS EN ISO 9001 and CAA approved
 Quality Management System
 Registered Office: 1650 Parkway, Whiteley, Fareham, Hampshire, PO15 7AH
 VAT No: GB 4271355 92



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McMurdo Limited Product Warranty

Subject to the provisions set out below McMurdo Limited warrants that this product will be free of defects in materials and workmanship for a period of 24 months from the date of purchase.

McMurdo Limited will not be liable to the buyer under the above warranty:-

for any defect arising from fair wear and tear, wilful damage, negligence, abnormal working conditions, failure to follow McMurdo Limited's instructions (whether oral or in writing) including a failure to install properly and/or to use batteries recommended and/or supplied by McMurdo Limited, misuse or alterations or repair of the product by persons other than McMurdo Limited or an Approved Service Agent;

for parts, materials or equipment not manufactured by McMurdo Limited in respect of which the buyer shall only be entitled to the benefit of any warranty or guarantee given by the manufacturer to McMurdo Limited;

for the battery storage life which is specifically excluded from this warranty;

if the total price for the product has not been paid.

THE LIMITED WARRANTY STATED ABOVE IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. McMurdo will not be liable for indirect, special, incidental or consequential damages of any kind sustained from any cause. In no event shall McMurdo be liable for any breach of warranty or other claim in an amount exceeding the purchase price of the product. This warranty does not affect any statutory rights of the consumer.

In order to be valid, claims must be made under the above warranty in writing as soon as practicable after discovery of the defect or failure and within the warranty period referred to above. Proof of purchase will be required. The claim should be sent together with the product in question to the address set out below or to an Approved Service Agent.

Following a valid warranty claim McMurdo Limited shall be entitled to repair or replace the product (or part) in question free of charge, or at McMurdo Limited's sole discretion to refund to the buyer the price of the product (or a proportional part of the price). McMurdo Limited shall not be liable to a buyer who is not a consumer for any other loss or damage (whether indirect, special or consequential loss of profit or otherwise) costs, expenses or other claims for compensation which arise out of or in connection with this product. In the case of a consumer McMurdo Limited shall only be liable where other loss or damage is foreseeable.

Nothing shall limit McMurdo Limited's liability for death or personal injury caused by its negligence.

This warranty is to be interpreted under English law.

All enquiries relating to this warranty or Approved Service Agents should be sent to:

McMurdo Limited

Silver Point, Airport Service Road, Portsmouth, Hampshire, PO3 5PB UK

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Fax: Int + 44 (0) 23 9262 3998
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