



communications

ELAC Nautik

NAVIGATION ECHOSOUNDER

LAZ 500

Technical Handbook

TH 52 590 8001 E

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Fundamental Safety Instructions

General remark to hydroacoustic equipment LAZ 5000

Even with a carefully selected transducer position and proper installation, the function of hydroacoustic equipment can be impaired by turbulence, acoustic noise or aerated water.

As main causes, the following can be stated:

- Propeller(s) running reversed;
- Thruster(s) in operation, especially at low speed ahead;
- Engine noise, transferred to the transducer either by the hull structure or through the water, the latter especially as bottom- reflection in shallow water.
- Losing contact with the water extremely bad weather, as a result of violent pitching;
- Hot water discharges from power plants;
- Rising cold water in several sea areas.

The list above is not complete; we will be pleased to assist with further information on request, see also chapter 3.1 Installation.

The LAZ 5000 Echosounder has been built in accordance with state of the art standards and recognised safety regulations. Nevertheless, it may constitute a risk to life or limb of the user and or third parties, or cause damage to the vessel and or other material property if the following rules are not complied with.

The LAZ 5000 Echosounder must only be used in a technically flawless condition in accordance with it's designated use and the instructions contained within this Technical Handbook and only by safety conscious persons who are fully aware of the risks involved in operating such a system.

The LAZ 5000 Echosounder is designed exclusively for use as a navigational echosounder. Using the system for purposes other than this is considered contrary to it's designated use. The manufacturer can not be held responsible for any damage resulting from such misuse. The risk of such misuse lies entirely with the user.

Personnel entrusted with operating the system must have read the Technical Handbook, in particular the section on safety measures before and during operation. Reading these instructions after starting the system is too late. This applies especially to persons who only work with the system occasionally, e.g. during setting up or maintenance.

Always observe the maintenance/inspection intervals laid down in this Technical Handbook.

Use only authorised spare parts and never replace defective fuses by those of any other rating than specified.

Switch the system OFF immediately if trouble occurs with the electrical system.

Work on the system must only be carried out by a qualified technician or a specially trained person working under the supervision of such a technician. Electrical engineering regulations must be observed at all times.

Observe all safety instructions and warnings attached to the system. Ensure that such safety instructions and warnings are always complete, visible and perfectly legible.

Never make any modifications, additions or conversions to the system without the manufacturers full approval.

If the system is shut down for maintenance or repair, it must be secured against inadvertent switching ON by isolating the system from the mains power supply and attaching a sign to the front plate of the display and control unit stating that the unit must not be switched ON because maintenance or repair work is being carried out.

Always check tighten any screwed connections, e.g. plugs, sockets and terminals, which may have been loosened during maintenance or repair work.

Always dispose of replaced parts in accordance with local environmental regulations.

Check the system regularly for defective cables, connections etc.

Alterations within the SERVICES menu must only be made by qualified persons. Altering setting within this menu may lead to incorrect depth readings which in turn may lead to loss of life or limb.

Service technicians opening the Display and Control unit for repair purposes must observe the tightening torque of the capped nut and washer, see items 17, 27 in drawing: ECHOLOT LAZ 5000-01 to 10, no. 52 590 8001 to 8010 in Chap. 4 "DRAWINGS" of this Handbook.

Echosounding Systems and remote indicators which detect and display the water depth from a single momentary value per transmission pulse, e.g. digital and pointer displays, can, over a period of time display false readings. This is primarily valid in shallow water areas. For this reason, water depths displayed in this manner must be compared with the graphic presentation at such intervals as to guarantee the ship's safety.

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1 TECHNICAL DESCRIPTION

1.1 GENERAL

The LAZ 5000 Navigation Echosounder is a compact, processor controlled, state of the art system. Presentation of the water depth is made on a Liquid Crystal Display (LCD) as either:

- depth below the keel (DBK)
- depth below the transducer (DBT)
- depth below surface (DBS)

Logically structured MENUS assist the user when selecting the operating parameters required. Built to the highest standards, it is certified to meet all requirements laid down by the BSH (German Hydrographic Institute).

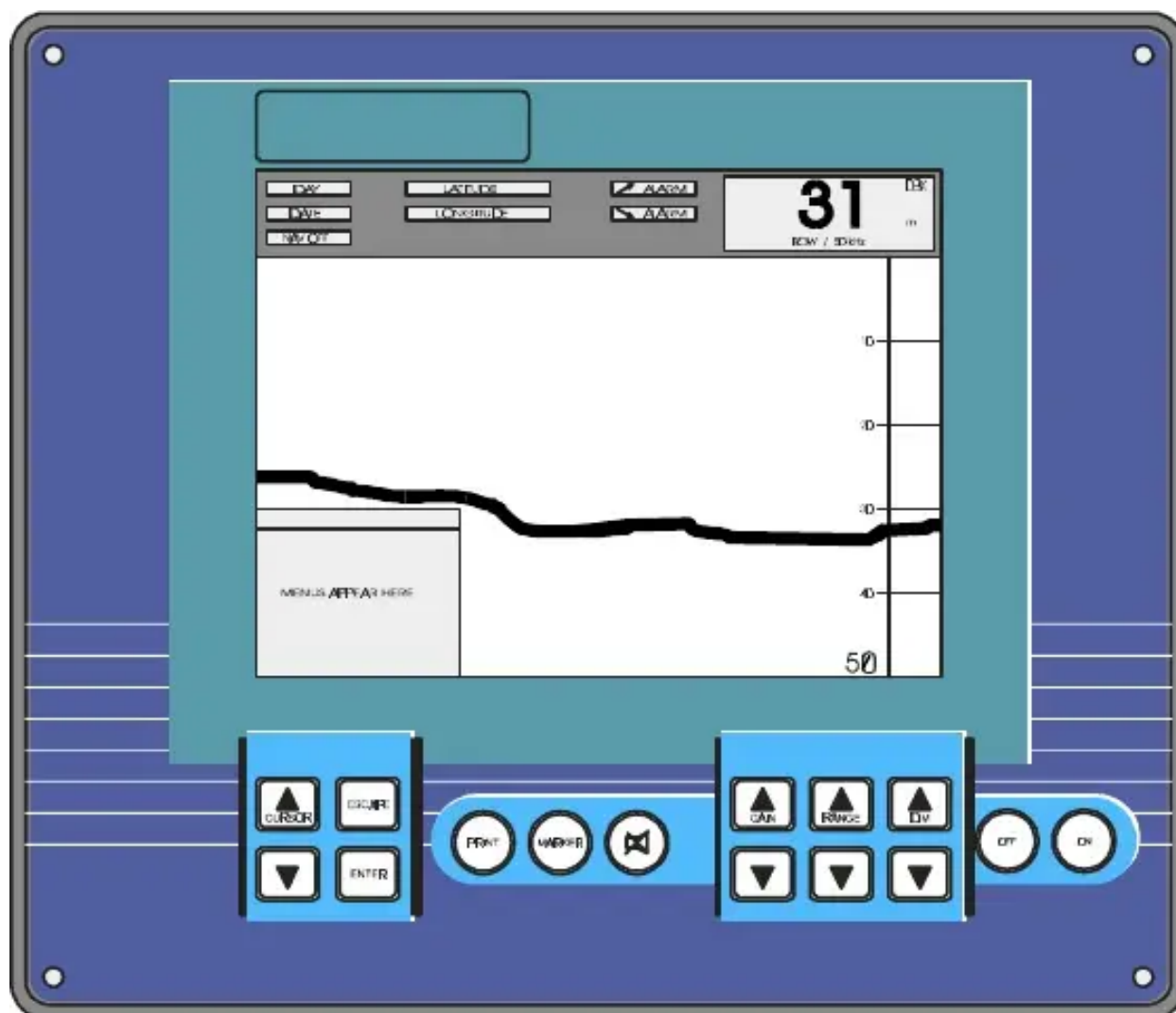


Figure 1-1 LAZ 5000 Display and Control Unit

1.2 SYSTEM CONFIGURATION

NOTE: See also Figure 1-2, System Configuration with Options.

The basic system configuration is as follows:

- 1 x Display and Control Unit LAZ 5000
- 1 x Connection Box
- 1 x Transducer

1.2.1 Display and Control Unit

The Display and Control Unit will normally be installed on the bridge, either mounted in a console or bracket mounted to the deckhead or bulkhead. It is made up of a display area and a keypad which is used to alter system parameters and settings.

The unit can be a one or two channel unit, working with different transducers on different frequencies, see Technical data.

When used with only one transducer (see Figure 1-1), the display area shows the following:

- Water depth
- Range scale
- Time and Date
- Latitude and Longitude (if connected to a Navigation system with a standard NMEA 0183, version 2.0 interface)
- Minimum and maximum depth alarm settings (if activated)
- A trace of the sea bed

With two channels, a vertical split display shows left half channel 2 information, right half channel 1 information. Instead of LAT/ LONG a second water depth indication appears.

A built-in ring memory continually stores system data, this allows the user to recall data to the screen, or print out a hard copy of any or all events occurring within the last 24 operating hours (if a printer is connected).

1.2.2 Transducer Connection Box

This will usually be installed near the transducer, to allow a defective transducer to be replaced without having to replace the complete cabling to the Display and Control Unit.

1.2.3 Transducer

The transducer converts electrical energy to sound energy and transmits this towards the sea bed. Sound energy returning from the sea bed, in the form of echoes, is converted into electrical energy by the transducer and fed to the Display and Control Unit for evaluation and presentation.

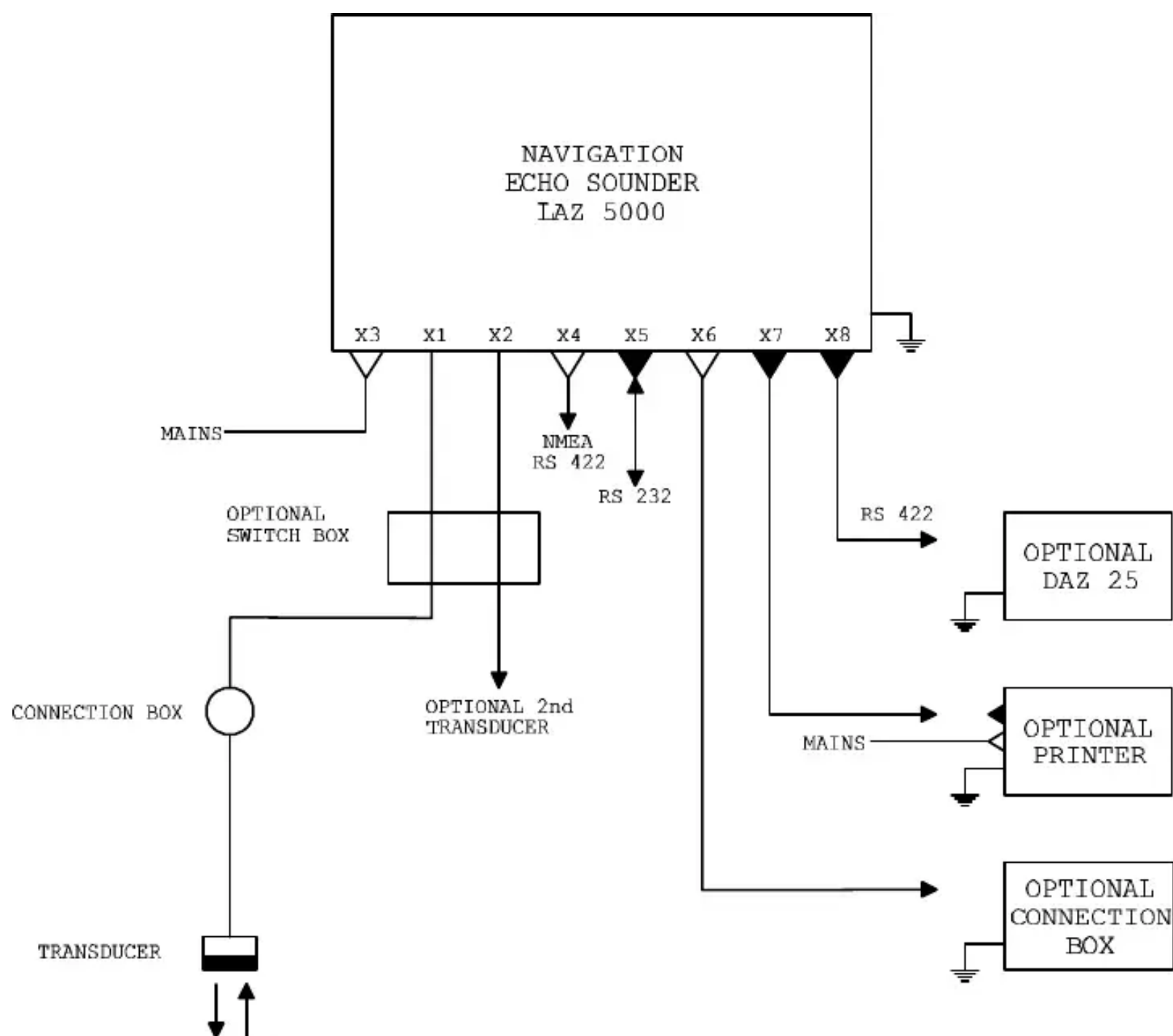


Figure 1-2 System Configuration with Options

1.3 OPTIONAL EQUIPMENT

The following optional equipment is available to broaden the system capabilities:

- Digital Slave Display(s)
- Printer
- Connection Box
- Transducer(s)
- Switch box

1.3.1 Digital Slave Display(s)

These are used to repeat water depth information at other parts of the ship where such information is needed. A total of two Digital Slave Displays can be connected to the system.

NOTE: Echosounding Systems and remote indicators which detect and display the water depth from a single momentary value per transmission pulse, e.g. digital and pointer displays, can, over a period of time display false readings. This is primarily valid in shallow water areas. For this reason, water depths displayed in this manner must be compared with the graphic presentation at regular intervals in order to guarantee the ship's safety.

1.3.2 **Printer**

A Printer can be connected to give a continuous hard copy of data presented on the display area or to print out a hard copy of events from any time within a previous 24 operating hour period.

1.3.3 **Connection Box**

The Connection Box is connected up to the Display and Control Unit and provides the following connections:

- a 2nd Digital Slave Display
- a blanking pulse output
- depth alarm relay contacts (potential free)

1.3.4 **Transducer Options**

If a 2 channel module is installed, the system is capable of accommodating two transducers without further modification, e.g. one fore and one aft, one port and one starboard. Information received from either or both transducer(s) can be called up for display.

1.3.5 **Switch Box**

If no 2 channel module is installed, a switch box can be used for the connection of two transducer of the same type (frequency). Information of the transducer selected by the switch box will be shown on the display.

1.4 TECHNICAL DATA

Supply voltage, nominal	: 95 - 240 V AC, 50 - 400 Hz (min. 85 V AC, max. 264 V AC) 10 - 30 V DC (option, via power pack)
Power consumption	: Approx. 25 W
Operating temperature range	: -15°C - +55°C
Storage temperature	: -20°C - +60°C
Housing	: Cast aluminium
Protection code	: IP 53
Transducer impedance	: 50 - 150 Ohms
Pulse length	: 0.3, 1, 3 ms, (automatically switches to suit range selected)
Measurement ranges	: 0 - 10, 50, 250, 500, 2000 m (or the equivalent in feet or fathoms)
Digital Depth Information	: 150% of measurement range for 0 - 10m 0 - 50m 120% for other ranges
Resolution	: 1% of range selected
Measuring accuracy	: 2.5% of depth reading
Display	: Liquid Crystal Display,
Display size	: 192 mm X 144 mm
Pixels	: 640 (hor.) x 480 (vert.)
Minimum sounding depth	: 0,5 m or equivalent (Transducer depended)
Depth corrections	Transducer-surface : up to 9.9 m
Starting with software version 1.82	: : up to 29,9 m Transducer-keel : up to 4.9 m
Standard frequencies (kHz)	: 28, 30, 33, 38, 50, 100, 200, 210 (selectable)
2 Channel version	: any combination of the frequencies above
Output power	: 1000 W Max. dependent upon range selected and transducer installed
Compass Safety Distance	: Magnetic compass : 0.5m : Steering compass : 0.3m
Dimensions	: Height =288 mm Width =336 mm Depth =156 mm
Weight	: Approx. 8 kg

1.4.1 Electromagnetic Compatibility

The LAZ 5000 conforms with specifications laid down in DIN * EN 60945 (IEC945+A1) Navigation equipment for Shipping; all editions up to March 1994. A declaration of conformity, in accordance with European Community guideline 89/336/EG, can be found at the page 1 - 11 of this Chapter.

* DIN (**D**eutsches **I**nstitut für **N**ormung) = German Standards Institute

1.5 INTERFACES

The LAZ 5000 has the following interfaces:

- RS 422, NMEA, for Navigation data input (X4)
- RS 232, Personal Computer connection for testing (X5)
- Centronics, parallel Printer connection (X7)
- RS 422, Digital Slave Display connection and potential free relay contacts for alarm ACTIVE (X8)
- RS 422, Power supply for a 2nd Digital Slave Display, and blanking pulse output (X6)

Interface connections are made at the rear of the unit. Figure 1-3 below shows which connector belongs to which interface.

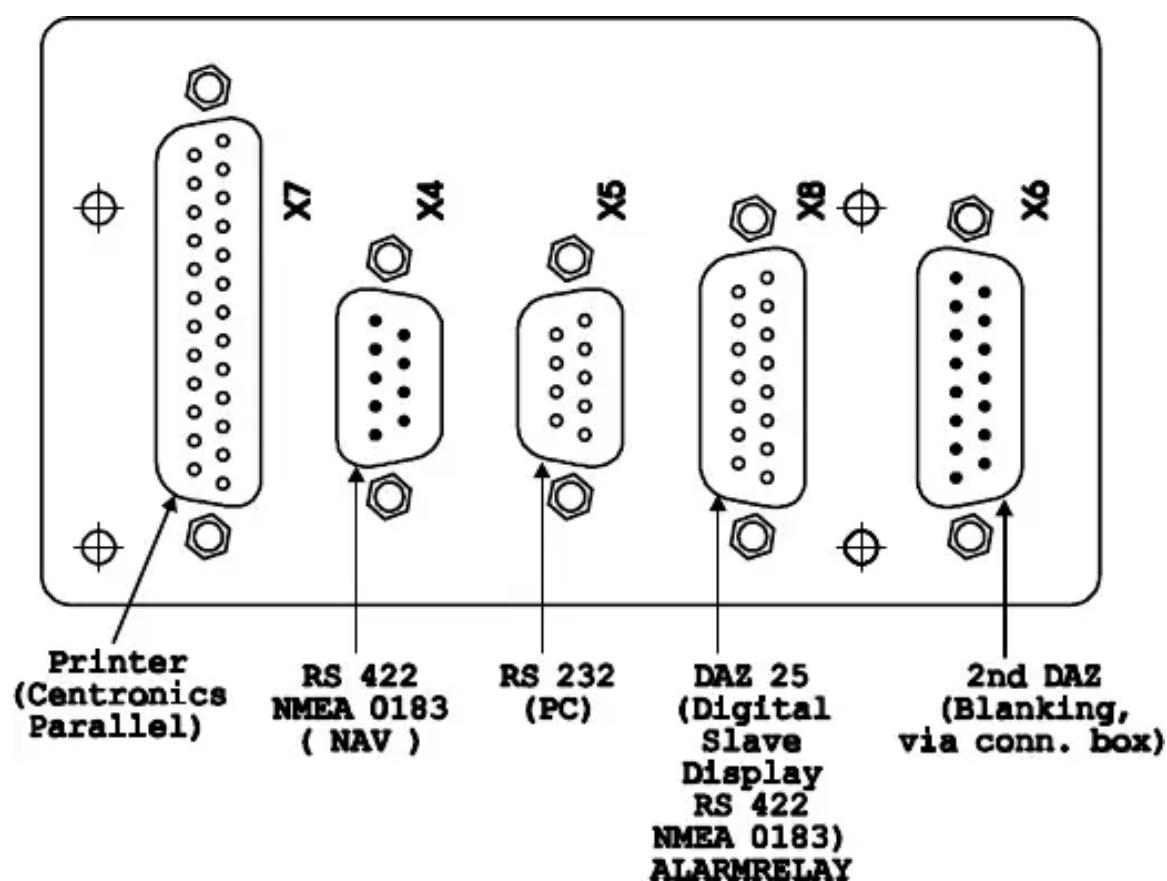


Figure 1-3 LAZ 5000 Interface Connector Plate

NOTE: For pin connections, see Table 1 at the end of this Chapter.

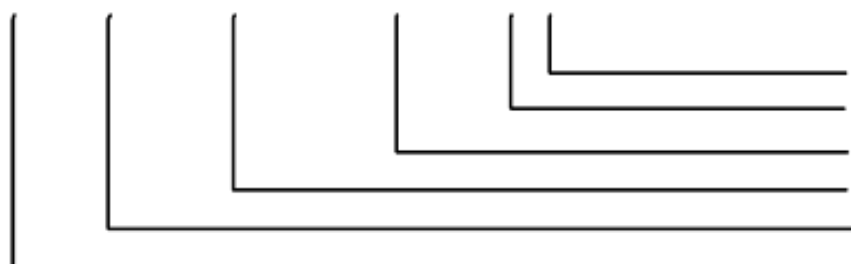
1.5.1 Description of Interfaces

(X4)

A navigation system can be connected to this interface so that the ship's co-ordinates are displayed by the LAZ 5000. The system will accept and evaluate data sentences in NMEA 0183, Version 2.00, GLL and ZDA formats, as follows:

GLL Format

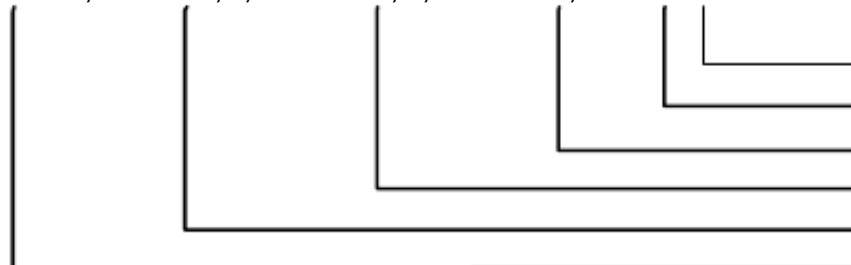
~~\$-GLL,lll,la,yyyy.yy,ahmmss.ss,A*hh<CR><LF>~~



Checksum
Status: A=Data valid
UTC at this position
Longitude, E/W
Latitude, N/S
Talker identification

Example:

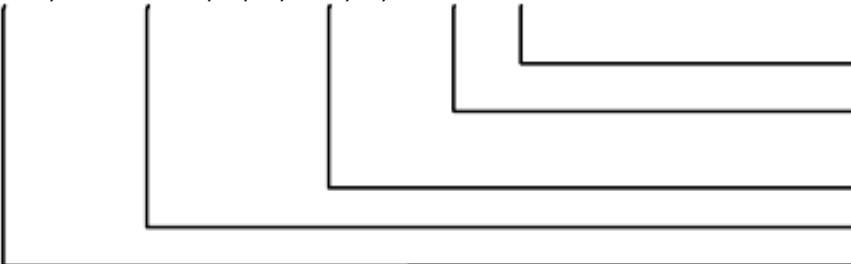
~~\$GPGLL,5420.549,N,01007.192,E,201533.25,A*02<CR><LF>~~



Checksum
Data valid
UTC=20:15:33.25
Longitude=10° 07.192'E
Latitude=54° 20.549'N
Data are being received from
a Global Positioning System

ZDA Format

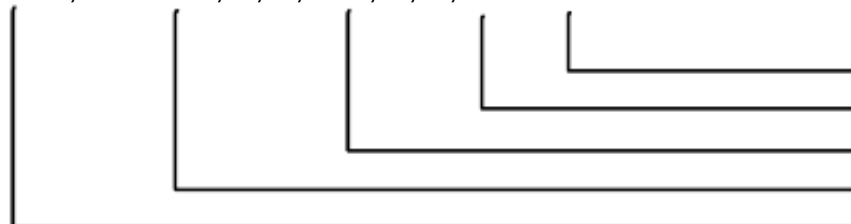
~~\$-ZDA,hmmss.ss,xx,xx,xxxx,xx,xx*hh<CR><LF>~~



Checksum
Difference between UTC and
GMT
Day, Month, Year
UTC
Talker identification

Example:

~~\$ZAZDA,184533.20,20,12,1995,12,15,*62<CR><LF>~~



Checksum
Difference=12 hrs 15 mins
Date=20th Dec 1995
UTC=18:45:33.20s
Data are being received from
an atomic clock

(X5)

Reserved for service technicians for testing purposes and transferring data to a PC (special software required).

(X6)

This interface provides a power supply and serial Data output for a second Digital Slave Display and a blanking pulse output.

(X7)

This Centronics interface allows an EPSON LX 300 (or compatible) printer to be connected to the system

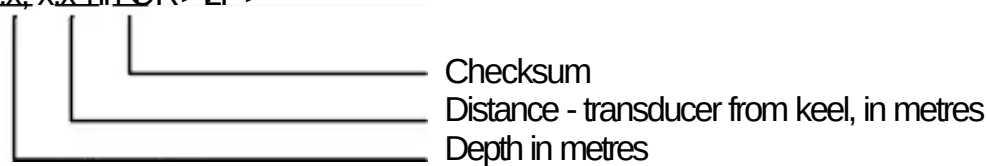
(X8)

Interface for START/STOP - SLAVE indicator, potential free alarm relay contacts and Digital Slave Indicator.

After each sounding the LAZ 5000 transmits depth information to the Digital Slave Display interface (15 to 60 times per minute, depending upon the measuring range selected) in NMEA, Version 2.00 format. The DPT (Depth) and DBT (Depth Below Transducer) sentences are as follows:

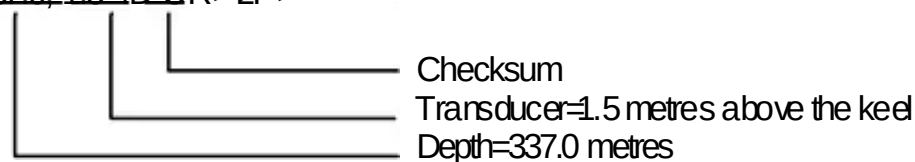
DPT (Depth)

\$SDDPT,x.x,-x.x*hh<CR><LF>



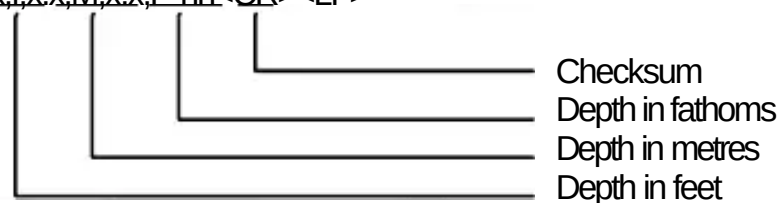
Example:

\$SDDPT,0337.0,-1.5*4D<CR><LF>



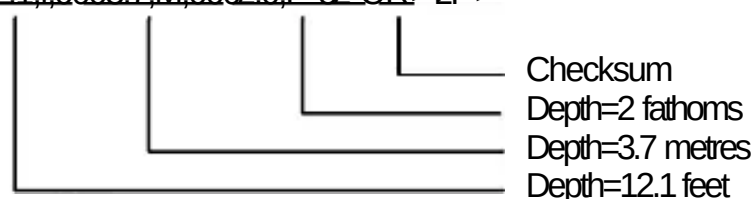
Depth Below Transducer (DBT)

\$SDDBT,x.x,f,x.x,M,x.x,F*hh<CR><LF>



Example:

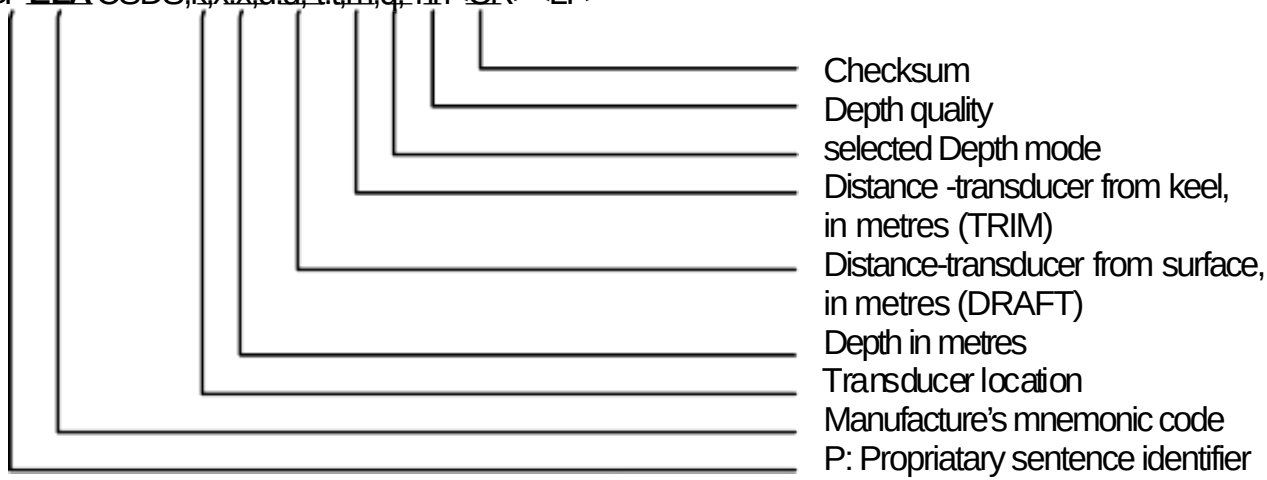
\$SDDBT,0012.1,f,0003.7,M,0002.0,F*32<CR><LF>



Starting with serial number 430 a NMEA proprietary sentence ELAC is available to allow the transfer of dual channel depth information, including transducer mounting position.

ELA (Manufacture's Mnemonie Code)

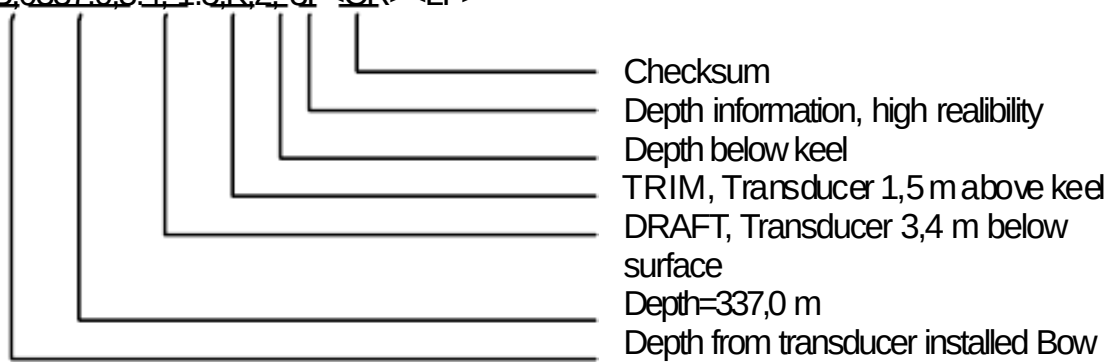
\$PELA CSDS,k,x,x,d,d,-t,t,m,q,*hh<CR><LF>



- k: S=Starboard, P=Port, B=Bow, A=Aft, 0=not selected
- m: K=DBK (Depth below Keel), S=DBS (Depth below Surface), T=DBT (Depth below Transducer)
- q: Quality of digital depth reading:
- 0=no depth information available
 - 1=no depth information available, poor quality
 - 2=depth information available, high reliability

Example:

\$PELA CSDS,B,0337.0,3.4,-1.5,K,2,*3F<CR><LF>



To activate the Protocol ELAC see chapter 3.1.1 Initial System Set-up.

	NMEA IN	PC	2nd DAZ	Printer	DAZ 25
Pin	X4	X5	X6	X7	X8
1	n.c.	n.c.	n.c.	Strobe	n.c.
2	RxD+	RxD	n.c.	Data 0	n.c.
3	n.c.	TxD	TXD +	Data 1	TXD +
4	n.c.	n.c.	n.c.	Data 2	n.c.
5	n.c.	Ground	n.c.	Data 3	Alarm A **
6	n.c.	n.c.	n.c.	Data 4	START
7	RxD-	n.c.	n.c.	Data 5	STOP
8	n.c.	n.c.	TXD -	Data 6	TXD -
9	n.c.	n.c.	Blanking -*	Data 7	Alarm B
10	---	---	Blanking +*	ACK	n.c.
11	---	---	DAZ 25 Power +	BUSY	DAZ 25 Power +
12	---	---	n.c.	PAPER END	n.c.
13	---	---	n.c.	SELECT	n.c.
14	---	---	n.c.	n.c.	n.c.
15	---	---	DAZ 25 Power -	ERROR	DAZ 25 Power -
16	---	---	---	RESET	---
17	---	---	---	n.c.	---
18	---	---	---	Ground	---
19	---	---	---	Ground	---
20	---	---	---	Ground	---
21	---	---	---	Ground	---
22	---	---	---	Ground	---
23	---	---	---	Ground	---
24	---	---	---	Ground	---
25	---	---	---	Ground	---

Table 1, Pin Connections

LEGEND: nc = not connected

--- = not available

Potentialfree Transistor output * Blanking + : open Collector

Blanking - : open Emitter

** Alarmrelais, normal open; Contact rating : Umax 28 VDC

I_{max} 1 A

Max. switching Power: 5W

EC-Approval

This is to confirm that the product

LAZ 5000
(navigation echosounder)

is manufactured according to the essential protection regulations regarding electromagnetic compatibility issued by the Council of the European Community for alignment with the individual statutory orders of the several EC members (89/336/EEG).

This declaration is valid for all units manufactured according to the actual valid production drawings at the issuing date of this approval.

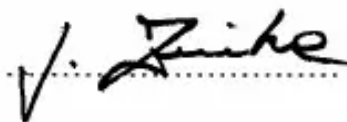
The following standards have been applied regarding the electromagnetic compatibility of the product:

DIN EN 60945; edition September 1997
Navigation and communication units and -systems for seagoing vessels

This declaration is issued for

L-3 Communications ELAC Nautik GmbH
Neufeldtstraße
D-24118 Kiel

Gerhard Zinke
(EMV-Manager)



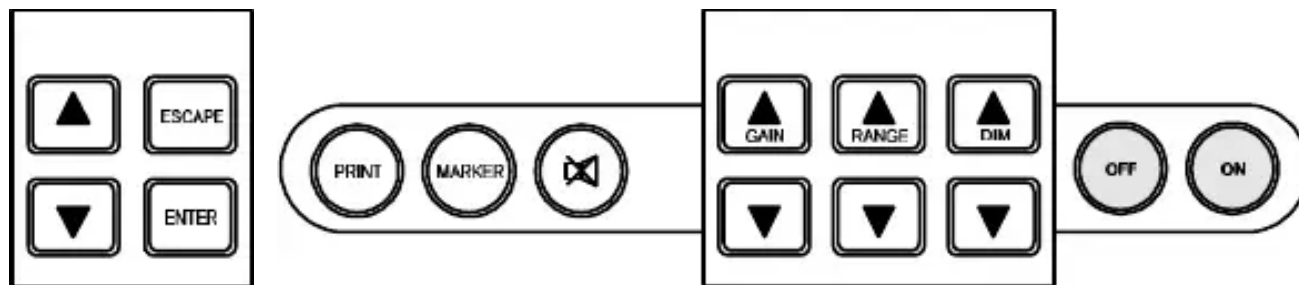
Kiel,
August 99


Dr. L. Hogrefe/General Manager

Copy of the Original Declaration of Conformity

2 OPERATING INSTRUCTIONS

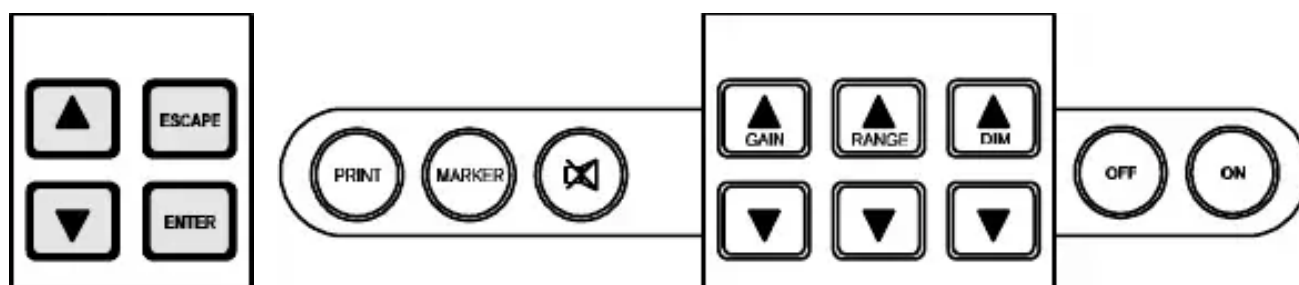
2.1 SWITCHING THE SYSTEM ON/OFF



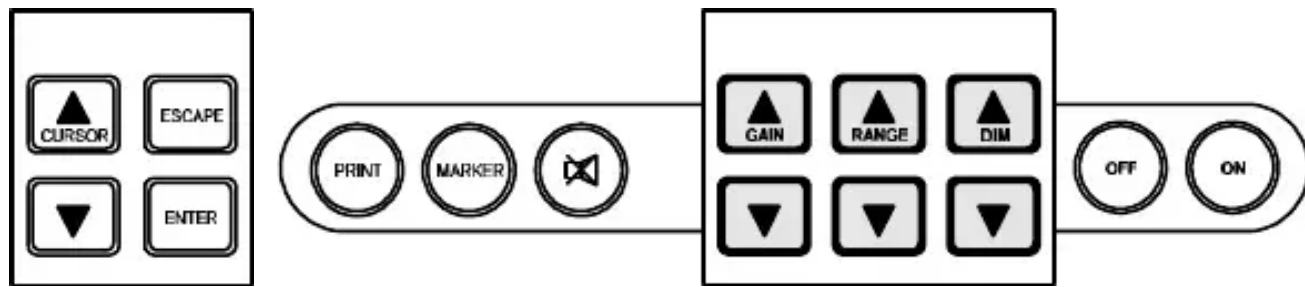
To switch the System **ON**, press the far right-hand key marked "**ON**". The system will switch **ON** and assume the parameter settings which were selected when the system was last switched **OFF**.

To switch the system **OFF**, press and **hold** the second key from the right, marked "**OFF**", the system will switch **OFF** after about 3 to 5 seconds. This is a built-in safety feature to prevent accidental switching **OFF**.

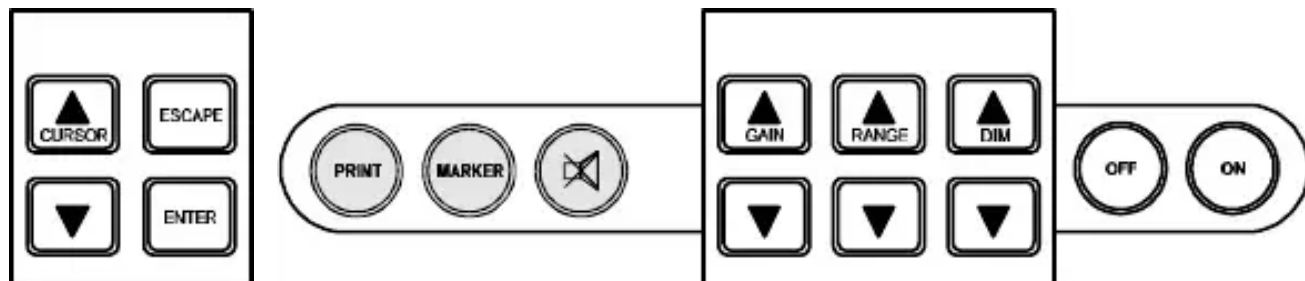
2.2 BRIEF EXPLANATION OF CONTROLS



- **CURSOR** : The **CURSOR** keys allow the user to move the cursor within a **MENU** and alter parameters. The position of the cursor can easily be seen, the word, letter or digit marked by the cursor appears inverse (dark background, light text). Parameters to be altered must first be "marked" by the cursor.
- **ESCAPE** : The **ESCAPE** key is used to leave a **MENU** or to abort parameter alterations.
- **ENTER** : The **ENTER** key is used to call up **MENUS** and confirm parameter alterations within **MENUS**.



- **GAIN** : The **GAIN** keys are used to alter the system gain, otherwise known as amplification, to achieve a clearer presentation.
- **RANGE** : The **RANGE** keys are used to set the depth range of the system.
- **DIM** : The **DIM** keys are used to set the display backlighting level to suit the user.

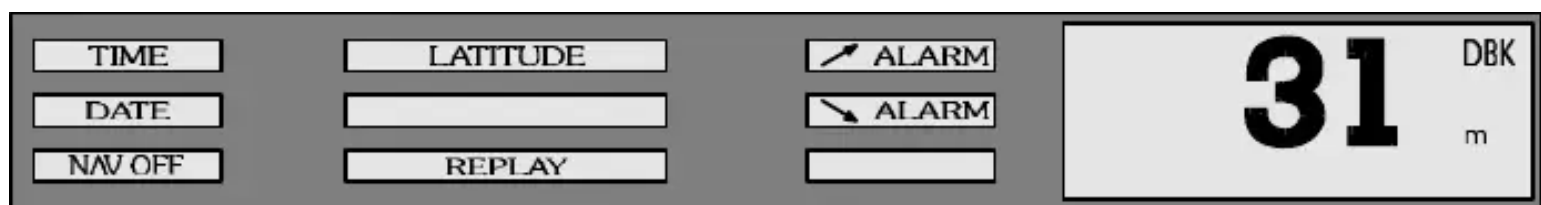


- **PRINT** : The PRINT key is used when the user wishes to make a simultaneous hard copy of the echogramme. This is only possible if a printer is connected to the system.
- **MARKER** : When the MARKER key is pressed, a vertical dotted line appears on the screen and moves with the presentation from right to left. At the same time all relevant information is stored in the system's 24 hour memory. This memory stores data from the previous 24 system operating hours.
- **SYMBOL** : The key marked with a loudspeaker symbol is used to acknowledge acoustic depth alarms.

2.3 DISPLAY AREA

2.3.1 Single Channel Display

The Display Area is used to present the user with all relevant information. The screen is divided into two areas. The lower, main area is used to present an echogramme of the scenario beneath the ship. It is provided with a scale and time markings. The range in use is displayed beside the scale markings, at the bottom right of the screen. The time markings appear at 3 minute intervals at the bottom edge of the screen. As explained previously, when MENUS are called up, they will appear at the bottom left-hand side of this area. The smaller strip across the top of the screen provides the user with various system and depth information (see illustration below).



Explanation of information contained in the illustration above (from left to right):

TIME : Shows the actual time

DATE : Shows the actual date

NAV OFF : Flashes to indicate that the Navigation mode is **not** in use i.e. the user has selected other units, sound velocity or depth mode. When the user returns to the Navigation mode, by selecting NAV Defaults, this window will disappear (see also Sect. 2.5.1, NAV-Defaults). If the echosounder is in the two channel mode (only if the second channel and a second transducer is fitted), NAV - OFF is activated without flashing.

LONGITUDE : These windows will display the actual Lat. and

LATITUDE Lon. **only if the system is connected up to the ship's navigation system** .

Printing : This window is usually blank. If the user chooses to make a hard copy of the echogramme, by pressing the **PRINTER** key (a printer must be connected) the word "Printing" will appear here.

ALARM : These windows show the depth alarm settings. The upper window shows the minimum depth alarm, the lower window shows the maximum depth alarm. If the alarms are not activated, e.g. Status = OFF, the relevant window(s) will remain blank. If an alarm condition is present, the relevant window will flash

REPLAY : When the user chooses to display information stored over the previous 24 operating hours (using the LOG DATA MENU), the word "REPLAY" will appear here.

The large window at the right-hand side of the information area is used to display the actual water depth, the measurement mode, units of measurement. The measurement mode can be either:

- Depth Below the Keel =DBK (as shown)
- Depth Below the Surface =DBS
- Depth Below the Transducer =DBT

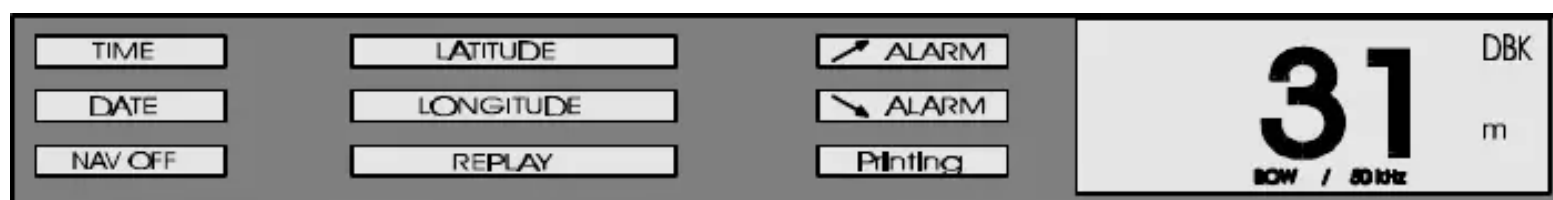
The units of measurement can be either:

- Metres = m (as shown)
- Feet = ft
- Fathoms = ftn

If instead of the depth value a ? appears, make sure, that the echo signal will be in the range selected.

2.3.2 2 Channel Display

In the 2 channel mode information of the transducer location and frequency of the transducer in use is added.

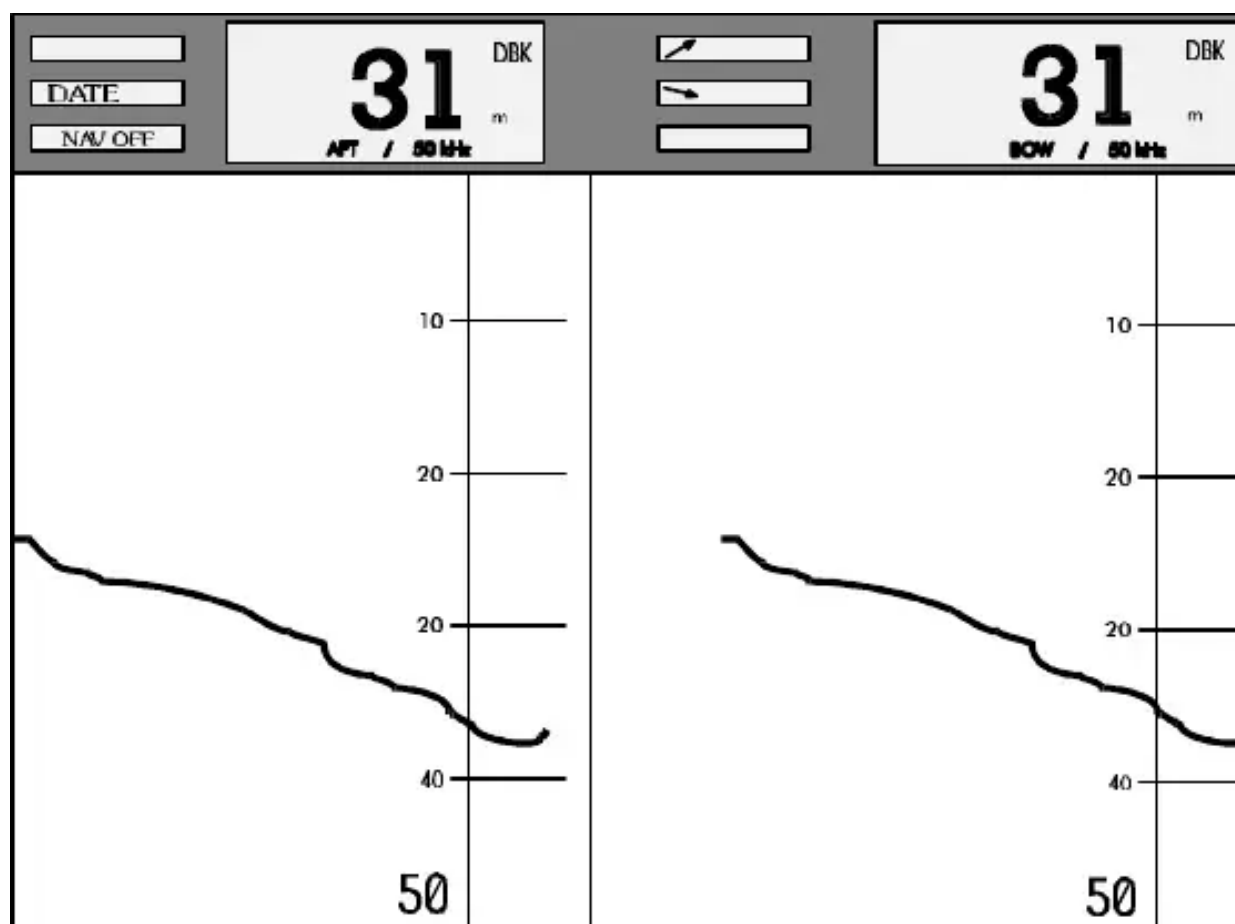


If the presentation channel 1/2 is selected, Information of both channels are shown in a vertical split display.

The indication NAV OFF is activated without flashing to indicate, that all parameters are mode of presentation is non standart.

For each transducer depth location and frequency is shown.

For transducer location and frequency ; see section 3.1.1 Initial System Set - up.



2.4 ALTERING SYSTEM PARAMETERS AND SETTINGS

When the system is switched OFF, parameters selected are stored in the system's memory.

When the system is switched ON again, these parameters will be re-called and used (see NOTE below).

NOTE: The "DIM" setting is not stored, a pre-set default setting is used when the system is switched ON. With two channel systems, channel 1 is the default channel at start-up.

2.4.1 GAIN, RANGE and DIM Settings

GAIN (amplification), **RANGE** (depth range) and **DIM** (display area backlighting) settings are made by pressing the relevant keys. There are two keys for each setting, one marked with an arrow pointing upwards and one marked with an arrow pointing downwards. Pressing these keys as described below will alter the present setting. The new setting will appear briefly on the display area directly above the key which was pressed and the effects of a change can be observed directly on the display area. Pressing the key a second time will alter the setting by a further unit.

GAIN:

The unit is fitted with an automatic gain control circuit for the data processing.

GAIN only influences the displayed echo information.

The **GAIN** setting can be altered between 0 and 10 whereby 0 is the lowest and 10 the highest gain (amplification) factor.

If the sea bed trace appears too weak, the **GAIN** level must be increased to give a clear presentation. If there is a lot of "noise" to be seen on the display area, the **GAIN** level

must be decreased. To **increase** the GAIN level, press the **GAIN key** **s** . To **decrease** the **GAIN** level, press the **GAIN key** **t** . The value set will appear on the display area above the key (between 0 and 10). Pressing the same key a second time will cause the value to increase or decrease by one further unit. Repeat the procedure until a satisfactory sea bed trace is achieved.

RANGE:

The **RANGE** can be set to suit the circumstances e.g. if a water depth of 35m is indicated, the 50m range will give a better resolution and accuracy than the 250m range. The range can be altered in the same way as the gain, except that here, pressing the **RANGE key** **s** will **decrease** the range and pressing the **RANGE key** **t** will **increase** the range. There are 5 ranges to choose from, 10, 50, 250, 500 and 2000 m (or the equivalent in fathoms or feet). Selecting the unit of measurement is described in Section 2.

NOTE: When DBS is used, the range 0-10 m is not available, only 0-50 m.

DIM:

The display backlighting can be set in 32 steps to suit the ambient light. To **increase** the display backlighting, press the **DIM key** **s** . To decrease the display backlighting, press the **DIM key** **t** (see NOTE below).

NOTE: When the backlighting is decreased to below a value of 17, the display area will appear inverse i.e. dark background and light text. This is foreseen for use during the hours of darkness.

All other parameters and settings are altered within so called **MENUS** , as described in Sections 2.4.2 and 2.5.

2.4.2 General Information Regarding MENUS

The **ENTER** key is used to call up the various **MENUS** in sequence. The order in which they appear is as follows:

- Press the **ENTER** key 1x - **ALARM MENU**
- Press the **ENTER** key 2x - **PARAMETER MENU**
- Press the **ENTER** key 3x - **LOG DATA MENU**
- Press the **ENTER** key 4x - **SYSTEM SET-UP MENU**

If the **ENTER** key is pressed 5x, the **ALARM MENU** will re-appear.

When a **MENU** is called up, the title will be highlighted i.e. it will appear in inverse text, this means light text on a dark background or vice versa, depending upon the **DIM** setting. During daylight use, the text will be light on a dark background and during darkness, when the screen is dimmed, the text will be dark on a light background.

When the title line of a **MENU** is highlighted, it is possible to leave that **MENU** by pressing the **ESCAPE** key 1x, or to change to another **MENU** by pressing the **ENTER** key 1x or more until the desired MENU appears. If parameters or settings have been altered within a **MENU** ,

the **ESCAPE** key may have to be pressed more than 1x in order to either return to the title line or to leave the **MENU** completely. The **ESCAPE** key can also be used to abort parameter selections. A detailed example of altering system settings and parameters within a **MENU** can be seen in Section 2.4.3 "Altering System Settings/Parameters Within a Menu". It is advisable that the user reads this Section thoroughly and practices making the alterations described in order to become more familiar with the system.

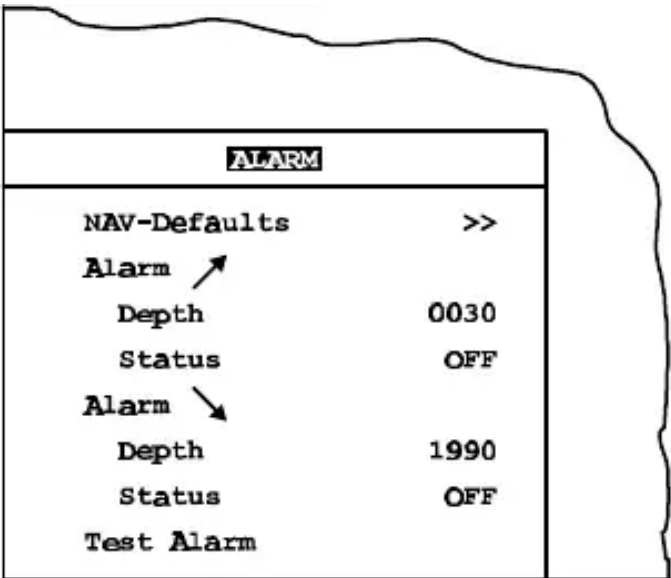
WARNING: Do not alter parameters within the SERVICE SUB-MENU unless authorised to do so. See also WARNING given in Section 2.5.4, "The SYSTEM SET-UP MENU".

2.4.3 Altering System Settings/Parameters Within a Menu

When a **MENU** is called up, it will appear at the bottom left-hand side of the display area. There are 4 main **MENUS** available. These can be called up by pressing the **ENTER** key.

Example: The user wishes to change the MINIMUMDEPTH ALARM from 30m to 20m and activate it (Status = ON) and to change the MAXIMUM DEPTH ALARM to 610m and activate it.

Press the **ENTER** key once to call up the **ALARM MENU**. The **ALARM MENU** as shown below, appears at the bottom left-hand side of the display area.

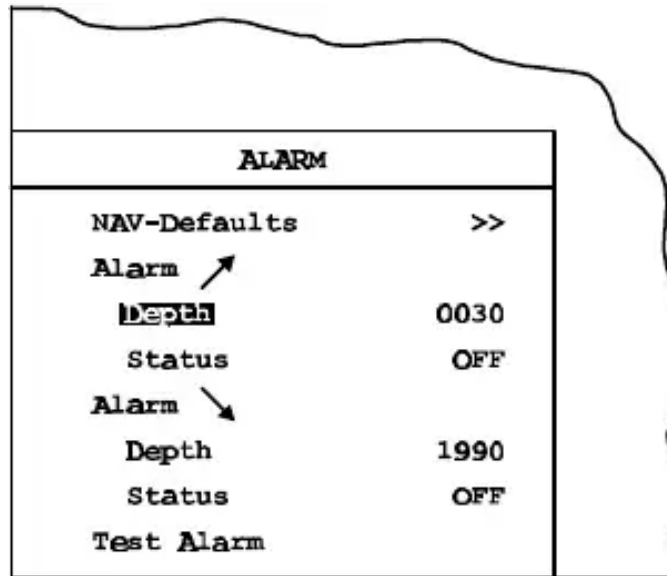


The word **ALARM** is marked by the so called cursor and appears inverse, i.e. dark background, light text.

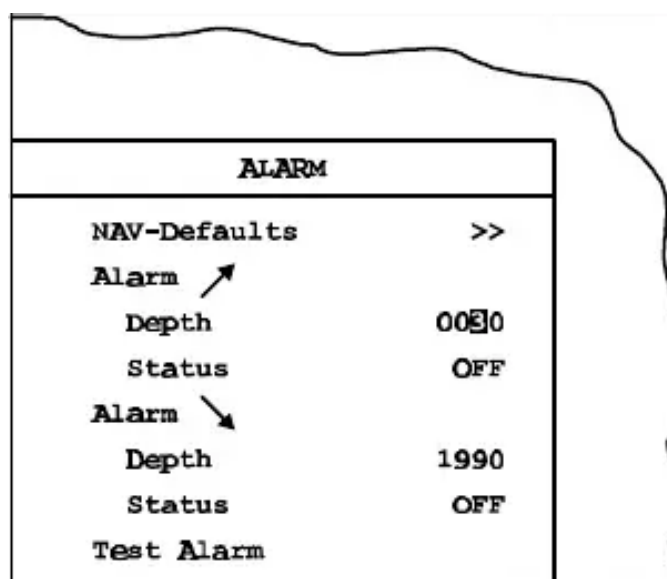
In order to alter the **MINIMUM DEPTH ALARM** setting within this **MENU**, the value to be altered must be marked by the cursor. This is done by using the **CURSOR** keys. The **CURSOR** key with the arrow pointing downwards (**t**) is used to move the cursor down and the **CURSOR** key with the arrow pointing upwards (**s**) is used to move the cursor up. Press the **CURSOR t** key twice to mark the word "Depth".

The **MENU** below shows that the cursor has been moved down to mark the word "Depth" which

now appears inverse.



Now press the **ENTER** key. The cursor will jump from the word "Depth" to the first digit of the alarm setting, in this case a zero. Press the **ENTER** key twice more and the cursor will move to the right and mark the figure 3, as shown in the **MENU** below.



Press the **CURSOR** key once. The figure 3 will change to a 2.

Press the **ENTER** key to confirm the new setting. The cursor will jump one digit to the right. Press the **ENTER** key once more and the cursor will move to mark the word "Status" as shown in the **MENU** overleaf.

ALARM	
NAV-Defaults	>>
Alarm ↗	
Depth	0020
Status	OFF
Alarm ↘	
Depth	1990
Status	OFF
Test Alarm	

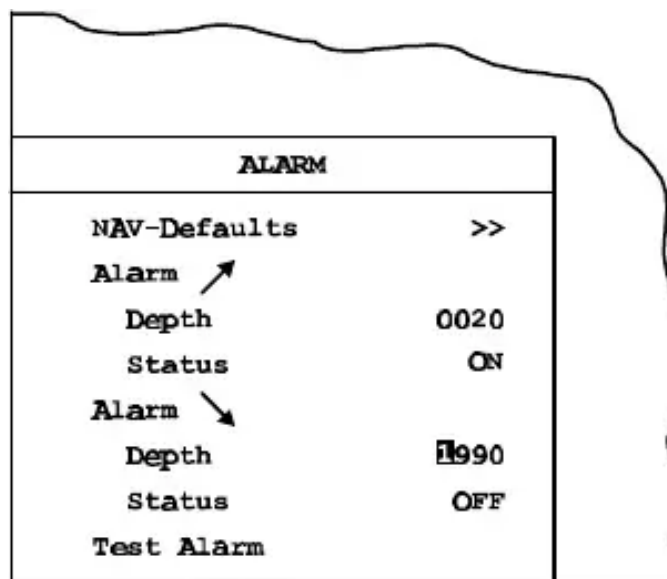
Press the **ENTER** key and the cursor will jump to the word "**OFF**". Press a **CURSOR** key (**s** or **t**) to toggle from **OFF** to **ON**. The **MENU** will appear as below.

ALARM	
NAV-Defaults	>>
Alarm ↗	
Depth	0020
Status	ON
Alarm ↘	
Depth	1990
Status	OFF
Test Alarm	

Press the **ENTER** key to confirm the setting. The cursor will jump to the word "Depth" as shown in the **MENU** below.

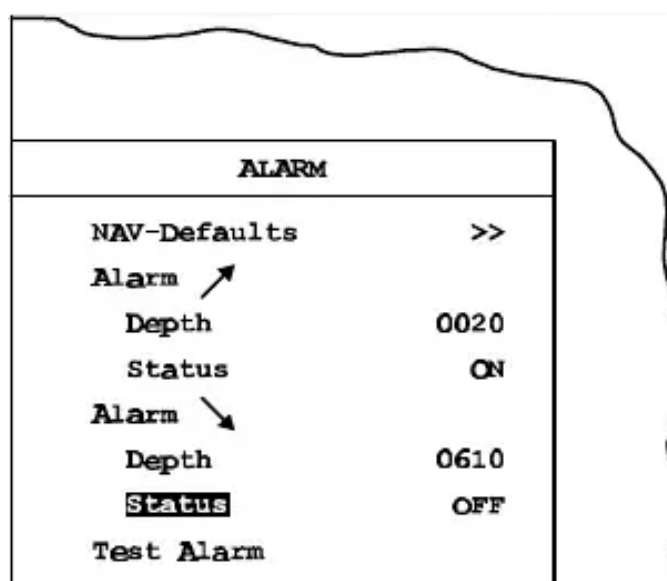
ALARM	
NAV-Defaults	>>
Alarm ↗	
Depth	0020
Status	ON
Alarm ↘	
Depth	1990
Status	OFF
Test Alarm	

Press the **ENTER** key and the cursor will jump to the first digit of the alarm setting, in this case a 1, as shown in the **MENU** below.



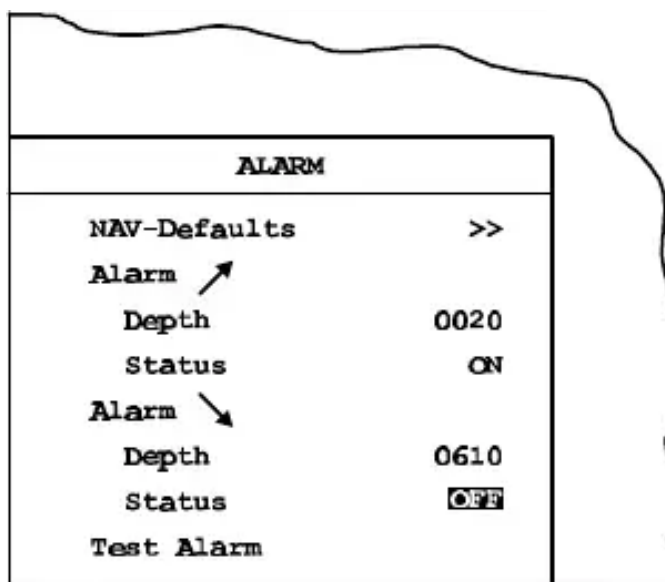
ALARM	
NAV-Defaults	>>
Alarm ↗	
Depth	0020
Status	ON
Alarm ↘	
Depth	11990
Status	OFF
Test Alarm	

Change the 1 to a 0 by pressing the **CURSOR** $\leftarrow$ key. Press the **ENTER** key to confirm. The cursor will jump to the next digit, a 9. Repeatedly press the **CURSOR** $\leftarrow$ key until the desired value is reached, in this case a 6. Press the **ENTER** key to confirm. The cursor will jump to the next digit, again a 9. Set this to 1 using the **CURSOR** $\leftarrow$ key. Press the **ENTER** key to confirm, the cursor jumps to the 0 which need not be altered. Now that the desired value, 610m, has been set, press the **ENTER** key to confirm. The cursor will jump to the word "Status" as shown in the **MENU** below.



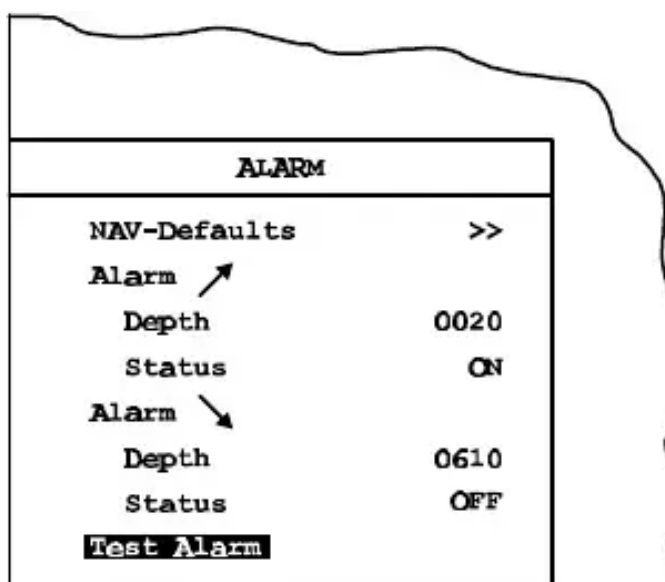
ALARM	
NAV-Defaults	>>
Alarm ↗	
Depth	0020
Status	ON
Alarm ↘	
Depth	0610
Status	OFF
Test Alarm	

Press the **ENTER** key and the cursor will jump to the word "**OFF**". The **MENU** will appear as shown overleaf.



Alter the Status to **ON** as described for the minimum depth alarm. Press the confirm. The cursor will jump to the words "Test Alarm", as shown in the

ENTER key to
MENU below.



A functional test of the audio/visual alarm can now be carried out by pressing the **ENTER** key. The audio alarm must sound and the field(s) showing the alarm setting(s) on the display area must blink.

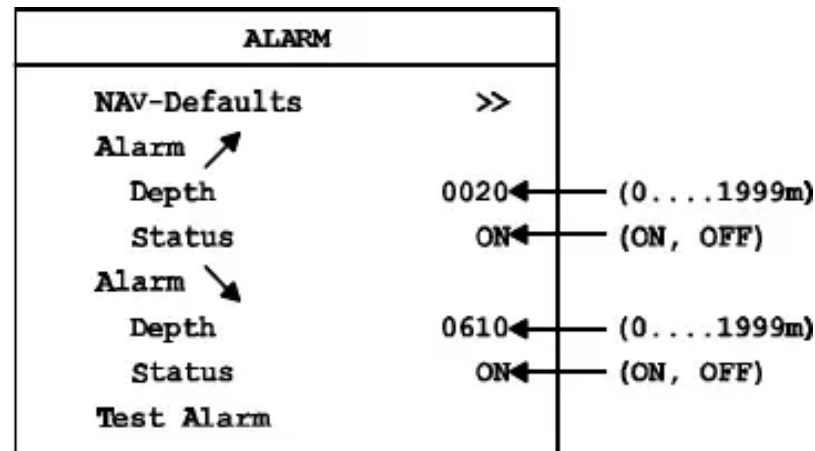
Now that the settings have been altered and the alarm tested by pressing the **ENTER** key, leave the **MENU** by pressing the **ESCAPE** key twice.

ENTER key, leave

2.5 MENU DESCRIPTION

2.5.1 The ALARM Menu

To call up the **ALARM MENU**, press the **ENTER** key once.



This **MENU** is used to set, select or test the following:

- Select NAV-Defaults
- Set Minimum Depth Alarm
- Set Maximum Depth Alarm
- Test the Alarm system

NAV-Defaults

NAV (igation)- **Defaults** are basic compulsory settings which must be used when operating the system for navigational purposes. These are laid down by the International Maritime Organisation (IMO) and state that:

- The system must operate with one channel only
- The sound velocity must be set to 1500 m/s
- The unit of measurement must be metric (metres)
- Water depth must be measured below the keel (DBK)

If the system is being operated in any other mode, e.g. units selected are feet, water depth from the surface is selected etc. the user can return to the **NAV** mode by calling up this **MENU** and selecting **NAV-Defaults**. A sub menu will appear in which the user can choose between selecting **NAV-Defaults**, or returning to the **ALARM MENU**. The sub menu can be seen overleaf.

WARNING!	
This function will set the sounder to NAV-Defaults !	
Continue ?	NO ← (NO, YES)

To set the system back to **NAV defaults** , call up the **ALARM MENU** and press the following keys:

- **CURSOR** t (1x, to mark **NAV-Defaults**)
- **ENTER** (1x, to call up **SUB-MENU**)
- **CURSOR** s or t (to select **YES**)
- **ENTER** (to confirm selection and exit **SUB-MENU**)
- **ESCAPE** (1x, to leave the **MENU**)

Maximum and Minimum Depth Alarms

The user can set the system alarm so that an audio/visual alarm occurs if the water becomes shallower than a set minimum or if the water becomes deeper than a set maximum. This depth is always measured from the ship's keel. An Alarm Test facility is available so that the alarm function can be periodically tested. These settings are made as described in Section 2.4.3.

2.5.2 The PARAMETER Menu

To call up the **PARAMETER MENU**, press the **ENTER** key twice.

PARAMETER		
Channel Select	1	← (1, 2, 1/2)
Sound Velocity	1500	← (1400...1699)
Units	m	← (m, ftm, ft)
Depth Mode	DBK	← (DBK, DBT, DBS)

The **PARAMETER MENU** is used to select system parameters which vary from those laid down by the IMO. The following and settings can be made within this **MENU** :

- Channel selection
- Sound velocity setting
- Unit of measurement selection
- Depth mode selection

Channel Select

The Channel Select function is only operative if the system is fitted with two transducers. When the system is switched on, channel 1 is the default setting. This function is used to select the channel to be presented on the display area. Presentation of either Channel 1, Channel 2, or both is possible. If both channels are selected, they will appear side by side on the display area, Channel 1 to the right and Channel 2 to the left. Call up the **PARAMETERS MENU** and press the following keys to make a selection:

- **CURSOR** **t** (1x, to mark **Channel Select**)
- **ENTER** (1x, to mark Channel number)
- **CURSOR** **s** or **t** (to make selection)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

Sound Velocity

Sound travels at varying speeds in water, depending upon the salinity, temperature and density.

The standard NAV(igation) default setting for sound velocity is 1500 m/s. If a sound velocity measuring system is available and the user wishes to adjust the sound velocity of the depth sounder, call up the **PARAMETERS MENU** and press the following keys:

- **CURSOR** **t** (2x, to mark **Sound Velocity**)
- **ENTER** (1x, to mark 2nd digit)
- **CURSOR** **s** or **t** (to alter 2nd digit)
- **ENTER** (1x, to confirm selection and jump to 3rd digit)
- **CURSOR** **s** or **t** (to alter 3rd digit)
- **ENTER** (1x, to confirm selection and jump to 4th digit)
- **CURSOR** **s** or **t** (to alter 4th digit)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

Units

The standard default unit of measurement is metres. It is however possible, if the user wishes, to choose either fathoms or feet. In order to alter the unit of measurement, call up the

PARAMETERS MENU and press the following keys:

- **CURSOR** **t** (3x, to mark the word **Units**)
- **ENTER** (1x to mark units selected)
- **CURSOR** **s** or **t** (to make selection)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

Depth mode

The standard default depth measurement mode is **DBK** (depth below the keel). It is however

possible to change this mode to either **DBT** (depth below the transducer) or

DBS (depth below

the surface). In order to alter the mode of depth measurement, call up the

PARAMETERS MENU

and press the following keys:

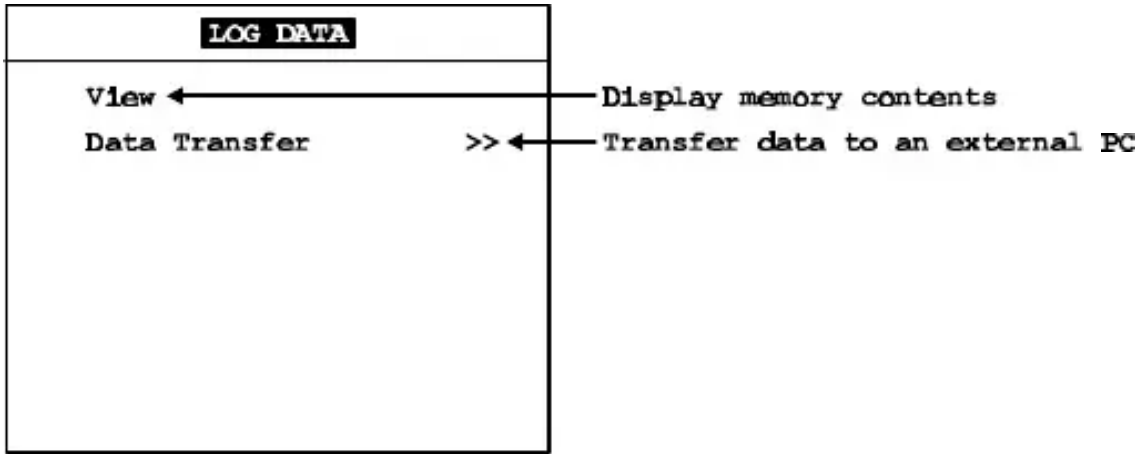
- **CURSOR** **t** (4x, to mark **Depth Mode**)
- **ENTER** (1x, to mark the mode selected)
- **CURSOR** **s** or **t** (to make selection)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

NOTE: When the NAV-Defaults are selected within the ALARM MENU, the system returns to the navigation mode, using the default values , i.e.:

- Channel Select = 1
- Sound Velocity = 1500 (m/s)
- Units =m
- Depth Mode =DBK

2.5.3 The LOG DATA Menu

To call up the LOG DATA MENU , press the ENTER key three times. The MENU as shown below will appear.

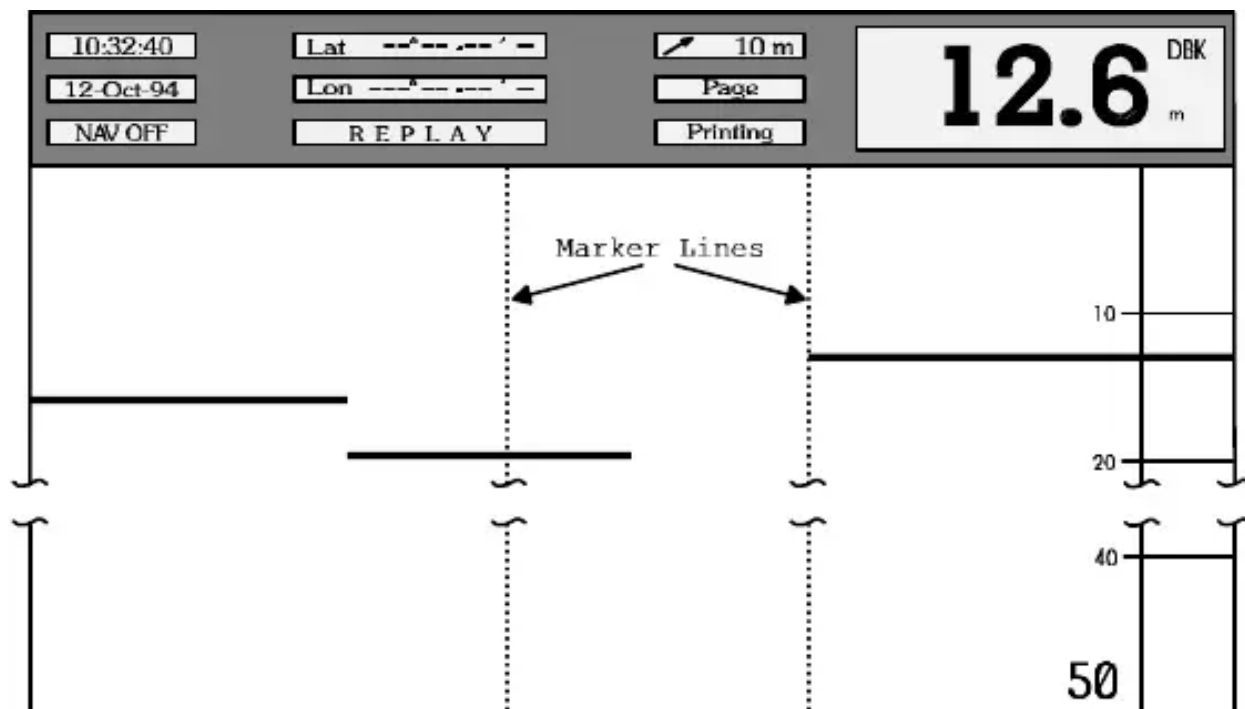


The LOG DATA MENU is used to gain access to data stored in the system's built-in 24 hour ring memory. This data can then be viewed on the display area and printed out in full or in part (if an external printer is connected). The contents of the memory can also be transferred to a personal computer for further analysis (special software is required in order to transfer and analyse data).

WARNING: During this mode, the echo sounder is not in operation and no actual depth data will be given. ALARM functions will not be in effect. No data will be stored.

To view stored data

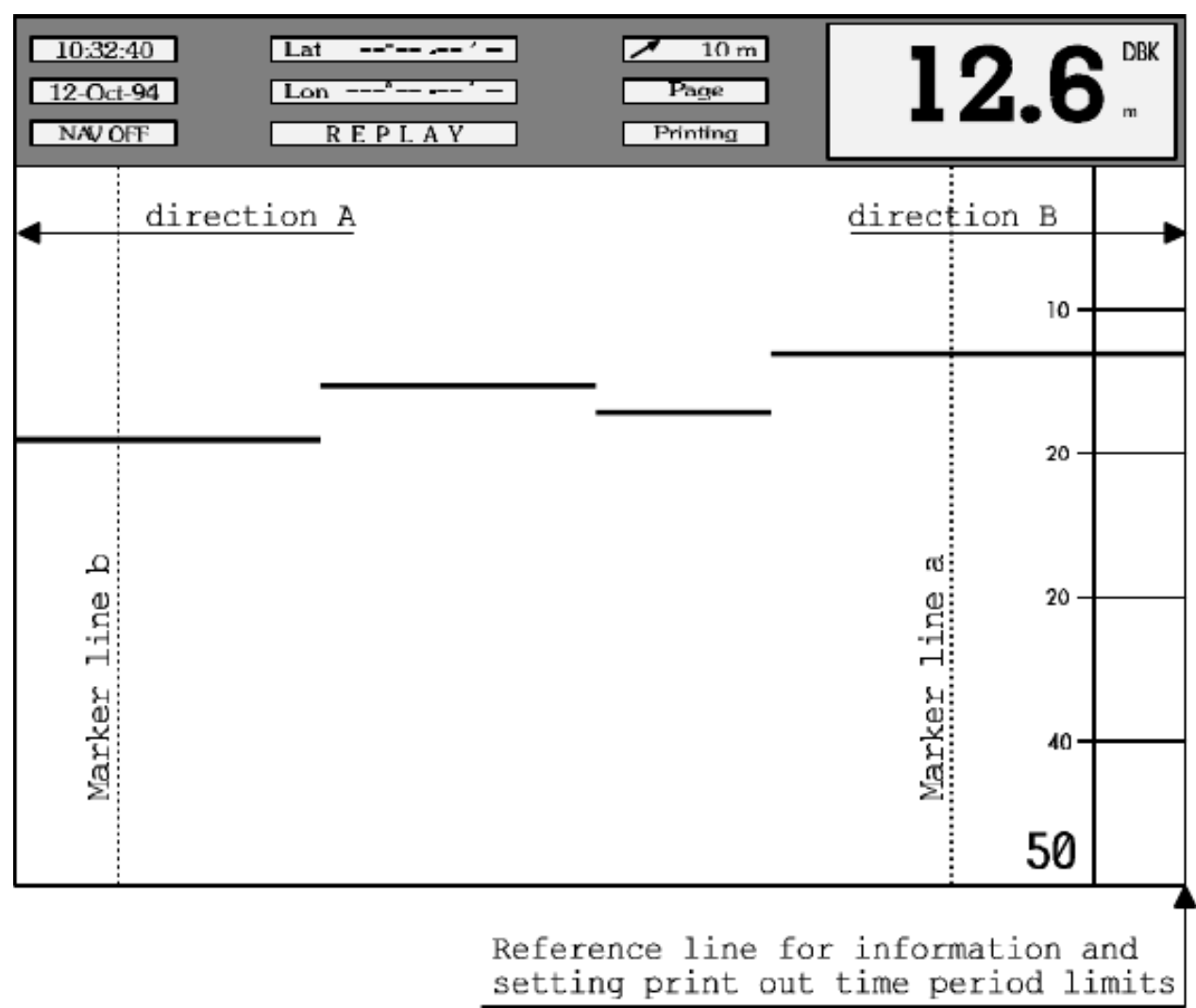
Call up the **LOG DATA MENU** as described previously. Press the **CURSOR** key once to mark the word "**VIEW**", followed by the **ENTER** key. The **MENU** will disappear from the screen and stored data will appear. A typical Viewed Data display area can be seen below.



The upper part of the display area contains the following information which is always related to the 1st data block on the extreme right of the display area:

- Time (10:32:40) and date (12-Oct.-94) of stored data
- NAV Mode ON or OFF (if the NAV mode was ON when data was stored, this window will not be present)
- Latitude and Longitude (only if the system was connected to an external navigation system)
- The window showing REPLAY indicates that stored data is being viewed
- Depth setting of the shallow water alarm (10m) (if this function was selected)
- Depth, unit (m) and mode (DBK) of measurement
- Depth range (50m)
- the "Page" and "Printing" windows will be explained later

Explanation of controls for viewing data



Key	Function
CURSOR s	Scrolls forwards in time (direction A)
CURSOR t	Scrolls backwards in time (direction B)
ENTER	Toggles page scroll option (for faster scrolling)
MARKER	Marks one limit of the time period to be printed out (start or finish)
PRINT	Marks the other limit of the time period to be printed out and simultaneously activates the printer (if connected)
ESCAPE	Exit, return to the echosounding mode

Figure 2-1 Controls for Viewing Data

NOTE: With the exception of the DIM and OFF keys, all other keys are inoperative

Scrolling through memory data

To scroll the display to a certain time in the memory at which events that occurred earlier (relative to time shown in "time" window) wish to be viewed, press and hold the **CURSOR** $\leftarrow$ key until nearing the desired time (shown in the "time" window). Finely adjust the desired time by pressing the **CURSOR** $\leftarrow$ or $\rightarrow$ key momentarily, each time a key is pressed, the time will advance by a 5 second period. If the event to be viewed occurred a lot earlier, scrolling can be accelerated by using the "Page scroll" option. Press the **ENTER** key and the word "Page" will appear in the window beneath the "Depth Alarm" window. When the **CURSOR** $\leftarrow$ or $\rightarrow$ keys are now pressed momentarily, the display will be shifted by approx. three quarters of a page backwards or forwards (pressing and holding these keys scrolls continuously).

EXAMPLE: (Refer also to Figure 2-1)

To view data at the time "Marker line a" was set, press and hold the **CURSOR** $\leftarrow$ key until the marker line is almost at the right-hand side of the display area. Finely adjust by pressing the **CURSOR** $\leftarrow$ repeatedly until the marker is at the extreme right-hand side of the display area. The data will now be presented in the upper part of the display area. To move "Marker line b", press the **ENTER** key. The word "Page" will appear in the window below the alarm window showing that the "Page scroll" option is activated. When the **CURSOR** $\leftarrow$ is now pressed once, the marker line will jump to the right. Press the **ENTER** key to return to the "slow scroll" option and finely adjust as previously described for "Marker line a".

NOTE: **Depth, scale and position information will not be updated during scrolling**
 (only time and echogramme) except when a marker line passes the right-hand
 border of the display area.

The following information can be read off the display area for any given time during the previous 24 system operating hours:

- Water depth at that time
- Units and mode of measurement at that time
- Range in use at that time
- Time and date at which the information was stored
- Whether the NAVIGATION mode was in use at that time
- Latitude and Longitude at which the information was stored (if connected to a nav. system)
- Whether a shallow water alarm was activated at that time

Printing data from the memory

In order to make a print-out of all or part of the data stored in the memory, so called "limit markers" must be set. Only data within these limit markers will be printed out. To set these limit markers and print the data within them, proceed as follows:

- Scroll the display area until one limit is reached (the time can be seen in the 'time window').
- Press the **MARKER** key (the time of the right hand side of the display appears in a window below the depth alarm window)
- Scroll the display area until the other limit is reached (the time can be seen in the 'time window').
- Press the **PRINT** key, the time in the window below the depth alarm window will be replaced by the word 'Wait', followed after a short time by the word 'Printing'.

During printing, the user may scroll further within the memory. The print-out can be stopped at any point by pressing the **PRINT** key for a second time.

Fault conditions

When the **PRINT** key is pressed, a fault condition may exist. If so, one of the 3 fault conditions shown below will be indicated in the window beneath the depth alarm window:

- **PERIOD ?** : This indicates that the user has set the both limit markers to the same time. The limit markers must be set to different times.
- **PAPER OUT** : The printer has run out of paper
- **ERROR** : The printer is not connected, not switched ON, or otherwise defective

Making a hard copy of the screen

In order to make a hard copy of data displayed on the screen, scroll to the desired position and press the **PRINT** key. A window will appear containing the word "Hardcopy". The print-out will be an exact reproduction of the screen at the time the **PRINT** key was pressed.

NOTE: **With the exception of the PRINT and ESCAPE push-buttons, all other controls are "dead" during the time it takes to print out a hard copy of the screen. The PRINT push-button will stop the printing process and the ESCAPE push-button will exit the LOG-DATA feature and return the system to Echo-sounding operation.**

2.5.4 The SYSTEM SET-UP Menu

WARNING: With the exception of the time, date and contrast, no other parameters must be altered unless modifications are made to the system, e.g. altering the installation depth of the transducer, replacing the transducer for one of a different frequency. Alteration of such parameters must only be made by an experienced service technician.

PARAMETER ALTERATIONS MADE BY NON-QUALIFIED PERSONS MAY LEAD TO INCORRECT DEPTH READINGS WHICH IN TURN CAN LEAD TO MATERIAL DAMAGE AND TO THE LOSS OF LIFE AND LIMB

To call up the **SYSTEM SET-UP MENU**, press the **ENTER** key four times. The **MENU** as shown below will appear.

SYSTEM-SETUP	
Date	29.06.94
Time	12:34
Contrast up	
Contrast down	
Service >>	
Version	
Version number and date	

The **SYSTEM SET-UP MENU** is used to set the Time and Date and to gain access to the **SERVICE** and **INTERFACE SUB MENUS** to allow the service technician to alter installation and interface parameters (see above warning).

Changing the Date and Time

To change the system **DATE**, call up the **SYSTEM SET-UP MENU** and press the following keys:

- **CURSOR** t (1x, to mark the word **Date**)
- **ENTER** (1x, to mark the day setting)
- **CURSOR** t or s (to alter the day setting)
- **ENTER** (1x, to confirm selection and jump to the month setting)
- **CURSOR** t or s (to alter the month setting)
- **ENTER** (1x, to confirm selection and jump to the year setting)
- **CURSOR** t or s (to alter the year setting)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

To change the system **TIME** , call up the **SYSTEM SET-UP MENU** and press the following keys:

- **CURSOR** **t** (2x, to mark the word **Time**)
- **ENTER** (1x, to mark the hour setting)
- **CURSOR** **t** or **s** (to alter the hour setting)
- **ENTER** (to confirm selection and jump to the minutes setting)
- **CURSOR** **t** or **s** (to alter the minutes setting)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

To change the display **CONTRAST** , for adapting the display readability to the ambient light conditions call up the **SYSTEM SET-UP MENU** and press the following keys:

- **CURSOR** **t** (3x or 4x, to mark the word **Contrast up or down** as required)
- **ENTER** (as often as required to acquire the desired Contrast level)
- **ESCAPE** (2x, to leave the **MENU**)

Installation settings are made within the **SERVICE** and **INTERFACE SUB-MENUS** which are described in Chapter 3 of this Handbook.

3 INSTALLATION, CARE AND MAINTENANCE

3.1 INSTALLATION

The display and control unit can be panel, bulkhead, deckhead or console mounted. The system is delivered with mounting brackets as specified by the user. Install the display and control unit in accordance with the relevant section of the Installation Drawing Number EZ 52 590 8001 to 8010 which can be found in Chapter 4 "DRAWINGS" of this Handbook.

The mounting place should assure, that no direct sun influences the visibility of the display and for clear display readings a viewing angle of $\pm 50^\circ$ perpendicular to the Display is recommended.

The Transducer must be installed near the ship's keel. Points to remember when installing a transducer are:

- Turbulence in the water can affect the reliability of measurement. Choose a location for installation where turbulence is at a minimum i.e. the hull surface in the area ahead of the transducer is smooth, there are no waste or other outlets ahead of the transducer.
- Never paint the radiating surface of the transducer.

Once the transducer has been installed, the system must be set up to take certain factors into consideration. These are:

- Transducer installation depth beneath the surface.
- Transducer installation height relative to the lowest part of the ship's keel.
- Blocking depth, a setting to prevent false digital depth readings caused by resonance of non-ELAC transducers . **This setting need not be altered from ZERO if using ELAC transducers.**
- Frequency of the transducer.
- Installation position of the transducer, e.g. BOW, AFT, Pt., Stb, (if 2 transducers are installed).

When a transducer is installed, i.e. before the ship is launched, measure the height difference between the radiating surface of the transducer and the lowest part of the keel and the distance between the waterline and the radiating surface of the transducer. These measurements are needed to compensate the differences when the system is initially set up. The transducer frequency can be found in the delivery papers.

Connect the system up in accordance with the connection diagram which can be found in Chap. 4 "DRAWINGS" of this Handbook.

Connect up peripheral equipment, i.e. external P C, printer, remote display unit etc. in accordance with the above mentioned connection diagram and referring to Figure 1-3, "LAZ 5000 Interface Connector Plate" in Chapter 1.

3.1.1 Initial System Set-up

Once the system has been correctly installed, the initial set-up can be carried out. Call up the **SYSTEM SET-UP MENU** by pressing the **ENTER** key four (4) times. When the **SYSTEM SET-UP MENU** appears on the display area, press the **CURSOR** $\leftarrow$ key three (3) times so that the word **Service** is highlighted as shown below.

SYSTEM-SETUP	
Date	29.06.94
Time	12:34
Contrast up	
Contrast down	
Service	>>
Version	
Version number and date	

Press the **ENTER** key and the **WARNING** shown below will appear.

WARNING!	
Changing parameters in the following menus should only be done by qualified persons	
Continue ?	☐ NO $\leftarrow$ NO/YES, select YES for SERVICE menu

WARNING: Only qualified service technicians are allowed to alter these system settings. If you are not authorised to alter these settings, DO NOT continue. Press either the ENTER or ESCAPE key to return to the SYSTEM SET-UP menu.

UNAUTHORISED ALTERATION OF THESE SETTINGS CAN ENDANGER THE SAFETY OF THE SHIP AND LEAD TO LOSS OF LIFE AND LIMB.

If not authorised to make alterations, press the ESCAPE or ENTER key to return to the SYSTEM SET-UP menu.

Access to the **SERVICE MENU** is gained by pressing any **CURSOR** key. The word **NO** will change to **YES** . Press the **ENTER** key and the **SERVICE MENU** , shown below, will appear.

SERVICE	
Channel 1	>> ← To call up Channel 1 parameter MENU
Channel 2	>> ← To call up Channel 2 parameter MENU
Interfaces	>> ← To call up interface parameter MENU
Test mode	OFF ← To select Test mode (for Factory use only)

The **SERVICE MENU** allows the service technician to access the following sub-MENUS:

- **Channel 1** - allows selection of **Draft** , **Trim** , **Blocking Depth** , **Frequency** and **Location** for the **Channel 1** transducer.
- **Channel 2** - allows selection of **Draft** , **Trim** , **Blocking Depth** , **Frequency** and **Location** for the **Channel 2** transducer, if fitted. If no 2nd Channel is fitted, this **MENU** is not available
- **Interfaces** - allows selection of parameters for data transfer.
- **Test mode** - this is a test facility for factory alignment of the system and must not be altered .

In order to set or alter the parameters for Channel 1, call up the CHANNEL 1 MENU, as follows:

- Call up the **SERVICE MENU** as previously described
- **CURSOR** t (1x, to mark **Channel 1**)
- **ENTER** (1x, to call up the Channel 1 parameters **MENU** as seen below)

CHANNEL 1	
Draft	0.0 ← (0.0...9.9 m)
Trim	0.0 ← (0.0...4.9 m)
Blocking Depth	0.0 ← (0.0...2.9 m)
Freq	←
ocation	BOW ← (BOW, AFT, Stb., Pt.)

The **CHANNEL 1 MENU** allows the service technician to set the following parameters:

- **Draft** the transducer installation depth is entered here, i.e. the depth of the transducer below the waterline, e.g. 5.6 m. This compensation allows accurate surface to sea bed measurements..
- **Trim** the distance between the transducer and the lowest part of the keel is entered here, e.g. 0.3 m. This compensation allows accurate keel to sea bed measurements.
- **Blocking depth** this setting is to prevent false digital depth readings caused by the effects of resonance of non-ELAC transducers. If the water depth is less than the depth set here, the digital display will show a „?“ but the analogue depth reading will be displayed correctly.
- **Frequency** the transducers working frequency is entered here, e.g. 50 kHz.
- **Location** the position where the transducer is installed is entered here, e.g. BOW . **This parameter can not be altered for single channel systems** .

To alter the Draft setting, press the following keys:

- Call up the **CHANNEL 1 SUB MENU** as described previously
- **CURSOR** t (1x, to mark the word **Draft**)
- **ENTER** (1x, to mark the 1st digit)
- **CURSOR** t or s (to alter the metre (1st digit) setting)
- **ENTER** (1x, to confirm selection and jump to 2nd digit)
- **CURSOR** t or s (to alter the 1/10th of a metre (2nd digit) setting)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

To alter the Trim setting, press the following keys:

- Call up the **CHANNEL 1 SUB MENU** as described previously
- **CURSOR** t (2x, to mark the word **Trim**)
- **ENTER** (1x, to mark the 1st digit)
- **CURSOR** t or s (to alter the metre (1st digit) setting)
- **ENTER** (1x, to confirm selection and jump to 2nd digit)
- **CURSOR** t or s (to alter the 1/10th of a metre (2nd digit) setting)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

To alter the Blocking Depth setting, press the following keys:

- Call up the **CHANNEL 1 SUB MENU** as described previously
- **CURSOR** $\leftarrow$ (3x, to mark the word **Blocking Depth**)
- **ENTER** (1x, to mark the 1st digit)
- **CURSOR** $\leftarrow$ or $\rightarrow$ (to alter the metre (1st digit) setting)
- **ENTER** (1x, to confirm selection and jump to 2nd digit)
- **CURSOR** $\leftarrow$ or $\rightarrow$ (to alter the 1/10th of a metre (2nd digit) setting)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

To alter the Frequency setting, press the following keys:

- Call up the **CHANNEL 1 SUB MENU** as described previously
- **CURSOR** $\leftarrow$ (3x, to mark the word **Frequency**)
- **ENTER** (1x, to mark the frequency selected e.g. 200)
- **CURSOR** $\leftarrow$ or $\rightarrow$ (to alter the setting)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

NOTE: The new setting can only be activated by re-starting the system (i.e. switch the system OFF and then ON again).

To alter the Location setting, press the following keys:

- Call up the **CHANNEL 1 SUB MENU** as described previously
- **CURSOR** $\leftarrow$ (5x, to mark the word **Location**)
- **ENTER** (1x, to mark the location selected e.g. BOW)
- **CURSOR** $\leftarrow$ or $\rightarrow$ (to alter the setting)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

In order to set or alter the parameters for Channel 2, call up the CHANNEL 2 MENU, as follows:

- Call up the **SERVICE MENU** as previously described
- **CURSOR** t (2x, to mark **Channel 2**)
- **ENTER** (1x, to call up the Channel 1 parameters **MENU** as seen below)

CHANNEL 2		
Draft	0.0 ←	(0.0...9.9 m)
Trim	0.0 ←	(0.0...4.9 m)
Blocking Depth	0.0 ←	(0.0...2.9 m)
Frequency	50 ←	(28, 33, 38, 50, 100, 200, 210 kHz)
Location	BOW ←	(BOW, AFT, Stb., Pt.)

Proceed from here in exactly the same way as described for **Channel 1** settings.

To call up the INTERFACE MENU, proceed as follows:

- Call up the **SERVICE MENU** as described previously
- **CURSOR** t (3x, to mark the word Interfaces)
- **ENTER** (1x, to call up the **INTERFACES SUB-MENU**)

The **INTERFACE MENU** shown below will appear.

INTERFACES		
External PC		
Mode	8N1 ←	(7E1, 7E2, 8N1, 8E1, 8N2, 8E2)
Baud	19200 ←	(1200, 2400, 4800, 9600, 19200, 38400 Baud)
NMEA/DAZ 25		
Mode	8N1 ←	(7E1, 7E2, 8N1, 8E1, 8N2, 8E2)
Baud	4800 ←	(1200, 2400, 4800, 9600, 19200, 38400 Baud)
Rep. rate	SLOW ←	(SLOW, FAST)
Protocol	DPT/DBT ←	(DPT/DBT, ELAC)

This menu allows the service technician to assign the interfaces to fit to other peripheral equipment, e.g. a personal computer or digital slave indicators.

To alter the External PC Mode, press the following keys:

- Call up the **INTERFACES SUB-MENU** as described previously
- **CURSOR** t (1x, to mark the word **Mode**)
- **ENTER** (1x, to mark the selected mode)
- **CURSOR** t or s (to alter the mode)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

To alter the External PC Baud rate, press the following keys:

- Call up the **INTERFACES SUB-MENU** as described previously
- **CURSOR** **t** (2x, to mark the word **Baud**)
- **ENTER** (1x, to mark the selected Baud rate)
- **CURSOR** **t** or **s** (to alter the Baud rate)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

To alter the NMEA/DAZ 25 Mode, press the following keys:

WARNING: The NMEA/DAZ 25 interface Mode and Baud rate are laid down by the National Marine Electronics Association. If these are altered, the interface will no longer be to this NMEA standard.

- Call up the **INTERFACES SUB-MENU** as described previously
- **CURSOR** **t** (3x, to mark the word **Mode**)
- **ENTER** (1x, to mark the selected mode)
- **CURSOR** **t** or **s** (1x, to alter the mode)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

To alter the NMEA/DAZ 25 Baud rate, press the following keys:

- Call up the **INTERFACES SUB-MENU** as described previously
- **CURSOR** **t** (5x, to mark the word **Baud**)
- **ENTER** (1x, to mark the selected Baud rate)
- **CURSOR** **t** or **s** (to alter the Baud rate)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

To alter the Protocol, press the following keys:

- Call up the **INTERFACES SUB-MENU** as described previously
- **CURSOR** **t** (6x, to mark the word **Protocol**)
- **ENTER** (1x, to mark the selected Protocol)
- **CURSOR** **t** or **s** (to alter the Protocol)
- **ENTER** (1x, to confirm selection)
- **ESCAPE** (2x, to leave the **MENU**)

Note, that the Protocol ELAC is only applicable for dual channel units, see also chapter 1.5.1 Description of Interfaces.

Once the initial system settings have been made they need only be altered if for example a 2nd transducer is added or the original transducer is replaced for one of a different frequency.

If a 2nd transducer is added at a later date, parameters must be entered in the Channel 2 sub-menu. The parameters for Channel 1 must not be altered. (See installation instruction UN 52 590 4001 for the integration of the second channel).

If the original transducer is replaced and the replacement is fitted at a different location, the parameters must be altered accordingly.

3.2 CARE AND MAINTENANCE

The LAZ 5000 Navigation Echo Sounder is largely maintenance free. The transducer(s) should be cleaned whenever an opportunity arises, e.g. when the ship is in dock. The Transducer(s) can be cleaned using a plastic scraper or scrubbing brush, see note below.

NOTE: Never use metal scrapers or wire brushes to clean the transducer(s). Never paint the radiating surface of the transducer(s).

The housing of the control and display unit can be cleaned using a non-abrasive household cleaning agent. Use window/glass cleaning fluid to clean the display area screen. **Do not apply unnecessary pressure to the screen area when cleaning** .

If the system cables are exposed, i.e. are not run in ducts or tubes, check them at monthly intervals for insulation damage.

If the system defective and requires repair, onboard service is normally not possible because of the high density electronics. Onboard service is done by exchanging PCB's (Printed Circuit Board's), a list of spare parts available can be seen overleaf. Order spares from the address below stating part(s) required and ident. number(s).

L-3 Communications ELAC Nautik GmbH
Neufeldtstrasse
24118 Kiel
Germany

3.3 SPARE PARTS LIST

Spare Part	Ident No.
Power supply unit.....	06 990 1112
Printed circuit board A3.....	52 590 1803
Fuses (line) F 1, F 2, T 2A.....	06 710 1200
Main board P SE 33.....	57 299 8001
Frontpanel complete	52 590 1001

4 **RELEVANT DRAWINGS**

Dimensional drawing	: MB 52 590 8001 to 8010 : MB 54 555 8002 to 8004
Installation drawing	: EZ 52 590 8001 to 8010 : EZ 54 555 8002 to 8004
Connection Diagram	: VE 44 390 8001
Cable Joining List	: KA 44 390 8001