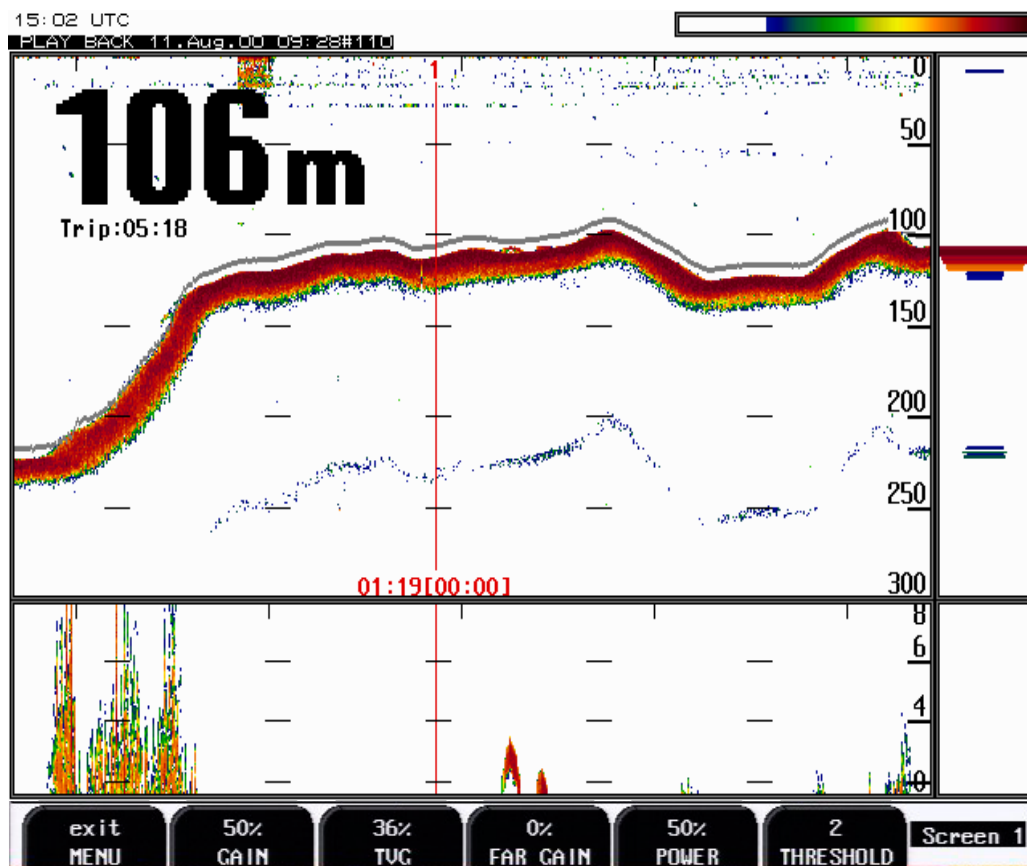


# SKIPPER GDF201

## Graphic Depth Sounder Operation and Installation Manual

Edition : 20080312 sw: 3.01.2



Skipper Electronics A/S  
Enebakkveien 150  
P.O.Box 151, Manglerud  
0612 Oslo, Norway  
www.skipper.no

Telephone +47 23 30 22 70  
Telefax +47 23 30 22 71  
E-mail: skipper@skipper.no  
Co.reg.no: NO-965378847 -MVA

**SKIPPER**

<b>1. INTRODUCTION.....</b>	<b>5</b>
SYSTEM SUMMARY.....	5
TRANSDUCERS.....	5
MAIN UNIT.....	5
HAND CONTROLLER .....	5
Data Entry.....	5
<b>INTERFACES .....</b>	<b>7</b>
<b>OPTIONS.....</b>	<b>7</b>
<b>OPERATION.....</b>	<b>8</b>
<b>PRINCIPAL FUNCTIONS .....</b>	<b>23</b>
BOTTOM DETECTION .....	23
PING TO PING FILTERING.....	23
BOTTOM SEARCH RANGE.....	23
POWER ON/OFF .....	23
ALARM ACKNOWLEDGEMENT.....	23
<b>FIXED KEY FUNCTIONS.....</b>	<b>23</b>
DEPTH RANGE .....	23
THRESHOLD KEY .....	23
MENU.....	23
CONTRAST ADJUSTMENT.....	23
<b>SOFT KEY FUNCTIONS.....</b>	<b>24</b>
GAIN .....	24
TVG.....	24
DIGITAL INDICATION.....	24
FREQUENCY .....	25
OUTPUT POWER.....	25
DRAUGHT .....	25
PRINTER OPERATION.....	25
ALARM SETTINGS .....	25
CLOCK AND CALENDAR SETTINGS .....	25
HISTORY MEMORY .....	26
SIMULATOR.....	26
STATUS SCREEN .....	26
OSCILLOSCOPE SCREEN .....	27
NON-VOLATILE PARAMETER MEMORY. ....	27
SOUND SPEED CALIBRATION .....	27
<b>OPTIONS.....</b>	<b>27</b>
REPEATERS/SLAVES.....	27
REMOTE SOUNDING CONTROL. ....	27
AUTO RANGE.....	27
<b>3. USER MAINTENANCE .....</b>	<b>28</b>
TRANSDUCER MAINTENANCE.....	28

---

<b>OPERATOR UNIT MAINTENANCE</b> .....	<b>28</b>
<b>TROUBLE SHOOTING</b> .....	<b>29</b>
<b>TYPICAL STATUS SCREEN (12) CONTENTS.</b> .....	<b>29</b>
<b>TYPICAL OSCILLOSCOPE SCREEN (13) CONTENTS.</b> .....	<b>29</b>
<b>4. INSTALLATION</b> .....	<b>30</b>
<b>STANDARD SYSTEM SUPPLY.</b> .....	<b>30</b>
<b>TRANSDUCER INSTALLATION.</b> .....	<b>30</b>
<b>INSTALLATION DETAILS.</b> .....	<b>30</b>
<b>OPERATOR UNIT INSTALLATION.</b> .....	<b>32</b>
<b>HAND CONTROLLER INSTALLATION.</b> .....	<b>34</b>
<b>INTERFACING</b> .....	<b>41</b>
<b>ALARM RELAY</b> .....	<b>41</b>
<b>LOG PULSE INPUT</b> .....	<b>41</b>
<b>EXTERNAL PRINTER CONTROL INPUT</b> .....	<b>42</b>
<b>TRANSMITTER AND BOTTOM PULSE OUTPUTS</b> .....	<b>42</b>
<b>ANALOGUE INTERFACES</b> .....	<b>42</b>
<b>NMEA INTERFACE</b> .....	<b>43</b>
<b>OPTIONS</b> .....	<b>45</b>
<b>REPEATERS/SLAVES</b> .....	<b>45</b>
<b>REMOTE SOUNDING CONTROL.</b> .....	<b>45</b>
<b>5. START-UP AND SYSTEM ADAPTION</b> .....	<b>46</b>
<b>SYSTEM ADAPTION</b> .....	<b>46</b>
<b>ANALOGUE OUTPUT AND LOG PULSE INPUT RANGE SELECTION.</b> .....	<b>46</b>
<b>CALIBRATION, SOUND SPEED</b> .....	<b>46</b>
<b>LANGUAGE AND UNITS OF MEASURE</b> .....	<b>46</b>
<b>EXTERNAL PRINTER CONTROL</b> .....	<b>46</b>
<b>NMEA SETUP</b> .....	<b>47</b>
<b>PERFORMANCE</b> .....	<b>48</b>
<b>ENVIRONMENTAL</b> .....	<b>48</b>
<b>OPTIONS</b> .....	<b>49</b>
<b>EXTERNAL PING CONTROL.</b> .....	<b>49</b>
<b>6. CONFIGURATION OF TRANSMITTED POWER LIMITS.</b> .....	<b>50</b>
<b>7. SPECIFICATIONS</b> .....	<b>51</b>
<b>DIMENSIONS</b> .....	<b>51</b>
<b>FUNCTIONAL PROPERTIES</b> .....	<b>51</b>
<b>8. SERVICE</b> .....	<b>52</b>

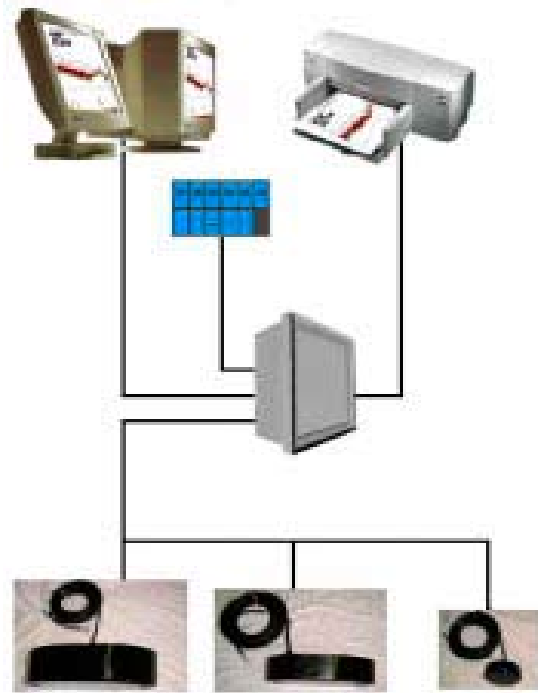
**SVGA/TFT- Screen**

**PRINTER**

**HANDCONTROLLER**

**MAIN UNIT**

**TRANSDUCERS**



**Fig 1,2          System Diagram**

# 1. INTRODUCTION

## SYSTEM SUMMARY.

GDF201 is a colour sounder with possibility for connection a TFT screen or a standard monitor. The display graphics is continuously shown on the screen along with complete fishery details.

Printer/harddisk is available when a hard copy is required. Comprehensive interfaces are available including NMEA0183 input and output.

## TRANSDUCERS.

GDF201 is prepared for connection of the following transducers: 38, 50 and 200 kHz. One or more of the transducers may be connected at the same time, and the desired transducer may be selected from the operator panel.

## MAIN UNIT

The main unit is normally mounted hidden. Power supply options are 220V AC or 24V DC. The power consumption is appx. 70 Watts at 110/220V AC or 50 Watts at 24V DC.

## HAND CONTROLLER

The function of each soft-key button depends on the active screen, and the buttons are labelled on the lower rim of the screen. The display contrast may be adjusted by the user. The echo-gram is normally displayed continuously on the screen.

### Data Entry.

Several screens may be selected to enter various settings and calibration parameters. Each screen has a selection of soft-key buttons.

Screens 1 through 3 are primary operation screens with appropriate operator controls. Screens 4 through 12 are calibration set-up and system supervision screens. The various screens will be described in detail later.

Fig. 1.1 shows the layout of a GDF201 Hand controller.

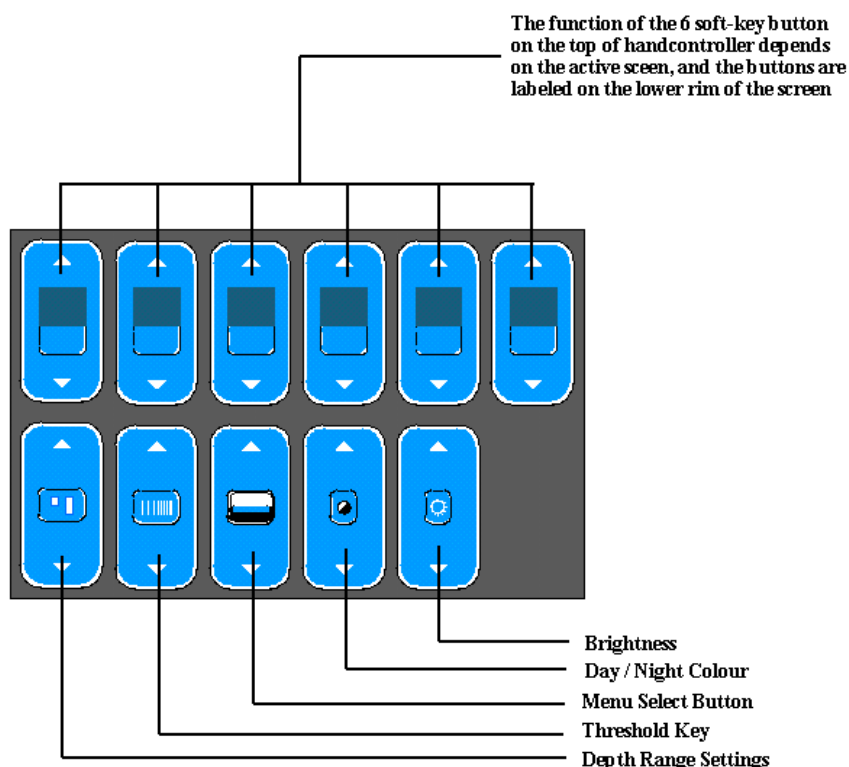
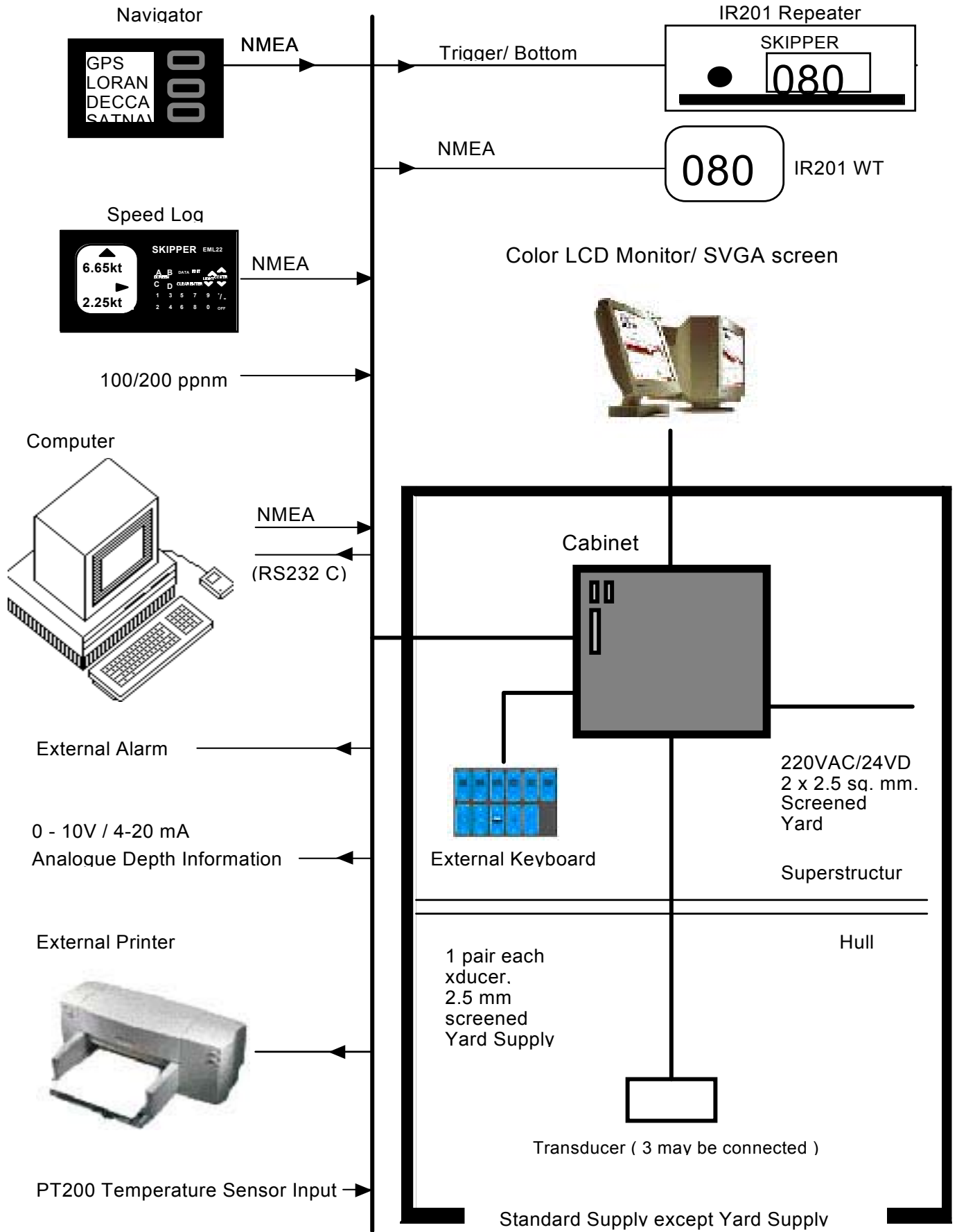


Fig. 1.1 Hand controller



**Fig.1.3 : Systemoverview**

---

## INTERFACES

The GDF201 has various interface possibilities.

### Outputs

Transmitter and Bottom Pulse Outputs.  
Analogue Output 0 - 10 V or 4 - 20 mA.  
NMEA0183 Interface Output of Depth Information  
External Alarm Relay Output.

### Inputs

Log Input 100/200 Pulses per nautical Mile.  
NMEA0183 Interface Input of Position, Heading, Speed, UTC.  
Remote Control and Synchronisation of Transmitter.

### Alarms.

Shallow and deep alarms may be selected from Screen 6. A potential free relay contact is provided in GDF201 for interface to external alarm systems.

### History Memory

GDF201 has a 30 minute history memory. Depth, time and all available navigation data are stored continuously so that the last 30 minutes of information is always available.

### Sound Speed Calibration

This option will enable adjustment of the sound speed value used for the depth calculations.

### A Scope

It is possible to adjust A SCOPE size on the screens right side.

### Bottom Expansion

It is possible to adjust Bottom expansion size on the screens bottom or top side.

## OPTIONS.

### Repeaters.

Graphic CRT or LCD display or digital depth slave repeaters may be connected to the system. Along with the graphic display repeaters there may also be installed remote keyboards.

### Remote Sounding Control.

This option lets the GDF201 being controlled remotely in synchronised, burst or single ping modes.

### Auto Range

This option will automatically adjust the depth range to maintain the bottom contour within the middle half of the screen.

## OPERATION

When the installation is complete, and power is connected to the Operator Unit, the system is switched on by pressing any button. The unit is switched off by pressing the “SYSTEM off” soft key button on Screen 3.

### **Parameter entry**

The fixed function buttons and the soft key buttons of the various screens along with the rotating encoder, facilitates entry of parameters, setpoints and other data. The following flow chart illustrates the procedure for changing settings and entering data. The various screens are shown in detail in the Operation Section.

### **Example of parameter entry.**

Let us say you want to enter a value of **800 m** for the depth range.

Press the Depth Range button several times and observe the depth range sequencing through the standard values. Press till the range is 500 m

### **Operation Screens**

Each of the operation screens contains a graphic picture and a selection of up to 6 soft key buttons. The various screens are selected by keeping the “Menu” button pressed the screens in the sequence 1 to 13. Screens no. 1 - 4, covering the primary functions, may also be cycled by repeatedly pressing the “Menu” button.

The screen layouts are outlined in Fig. 2.1 through 2.13. The various Soft Key button functions are described with each screen.



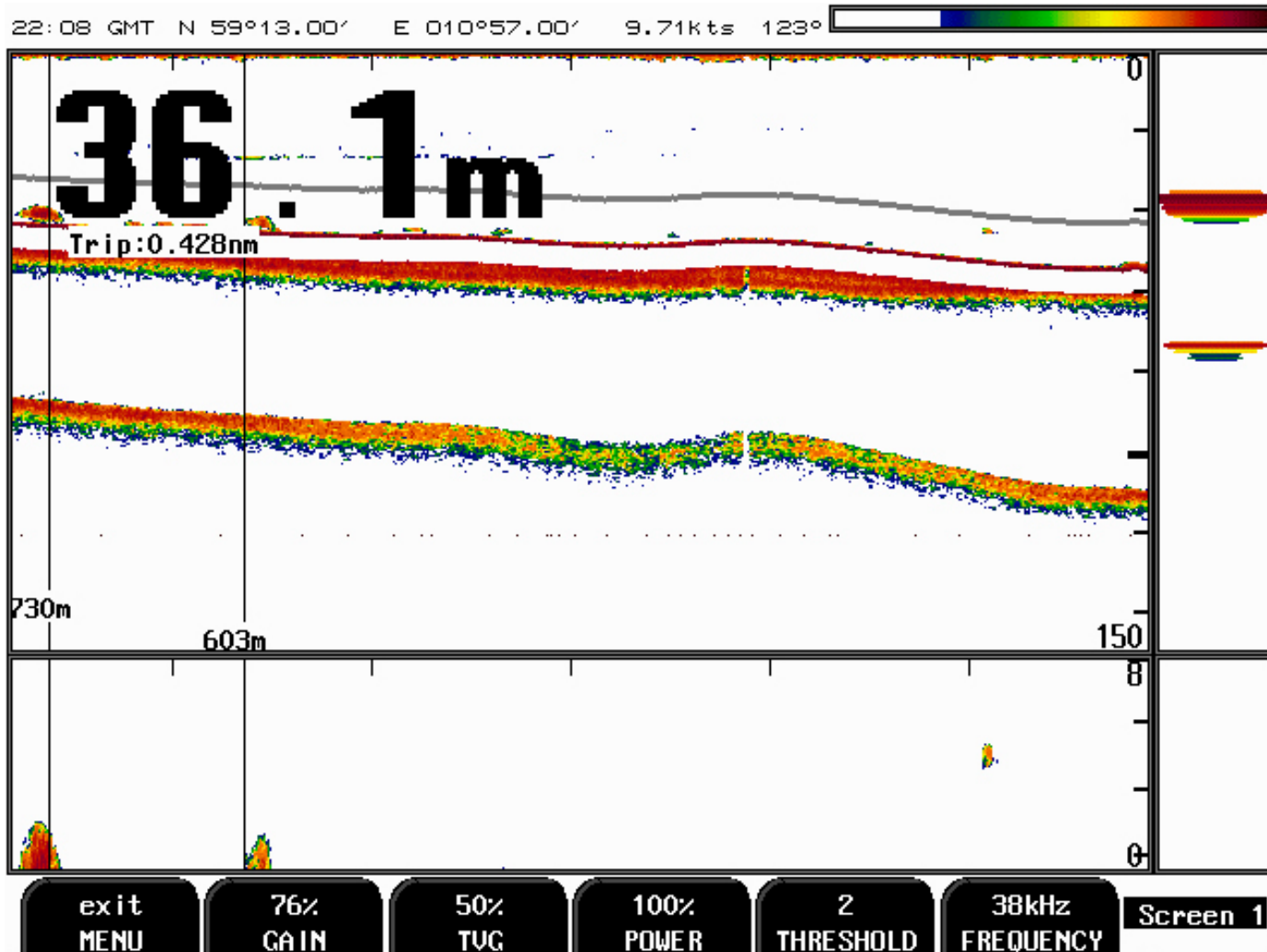


Fig. 2.1 Screen 1, Primary Operation screen.

Soft Key 1	MENU	exit	exit MENU
Soft Key 2	GAIN	0 - 100%	Gain Adjustment
Soft Key 3	TVG	0 - 100%	Time Variable Gain Adjustment
Soft Key 4	POWER	0 - 100%	Transmitter power adjustment
Soft Key 5	THRESHOLD	1-7 step	Remove " faint color "
Soft Key 6	FREQUENCY	38/50/200	Transducer selection

FACTORY SETTINGS :

GAIN	50%
TVG	50%
POWER	50%
<b>FAR GAIN</b>	<b>50% RECOMMENDED SETTING 0 - 4 %</b>

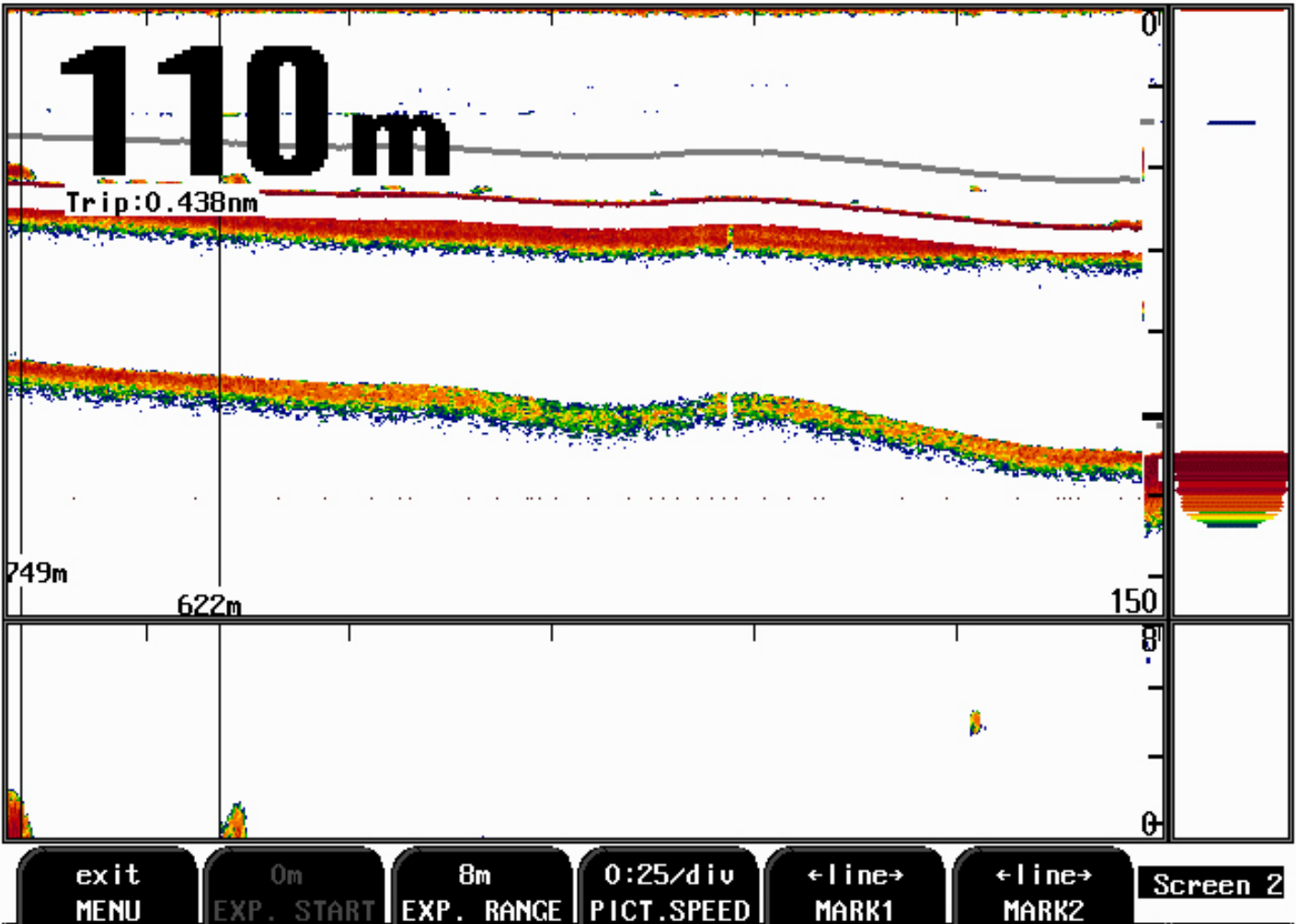


Fig. 2.2 Screen 2, 2nd Operation screen.

Soft Key 1	MENU	exit	exit MENU
Soft Key 2	EKSP.START	0.m.	aktivate with pelagic, see screen 3
Soft Key 3	EXP. RANGE	3m-100m	
Soft Key 4	PICT.SPEED	m:s/div etc.	Unit of measurement for picture speed
Soft Key 5	MARKER1		
Soft Key 6	MARKER2		

Soft Key 5 and 6 Distance between vertical marker lines is calculated in displayed in the echogram window. If vessel speed is provided fro GPS, distance is measured in meters, otherwise - in time units.

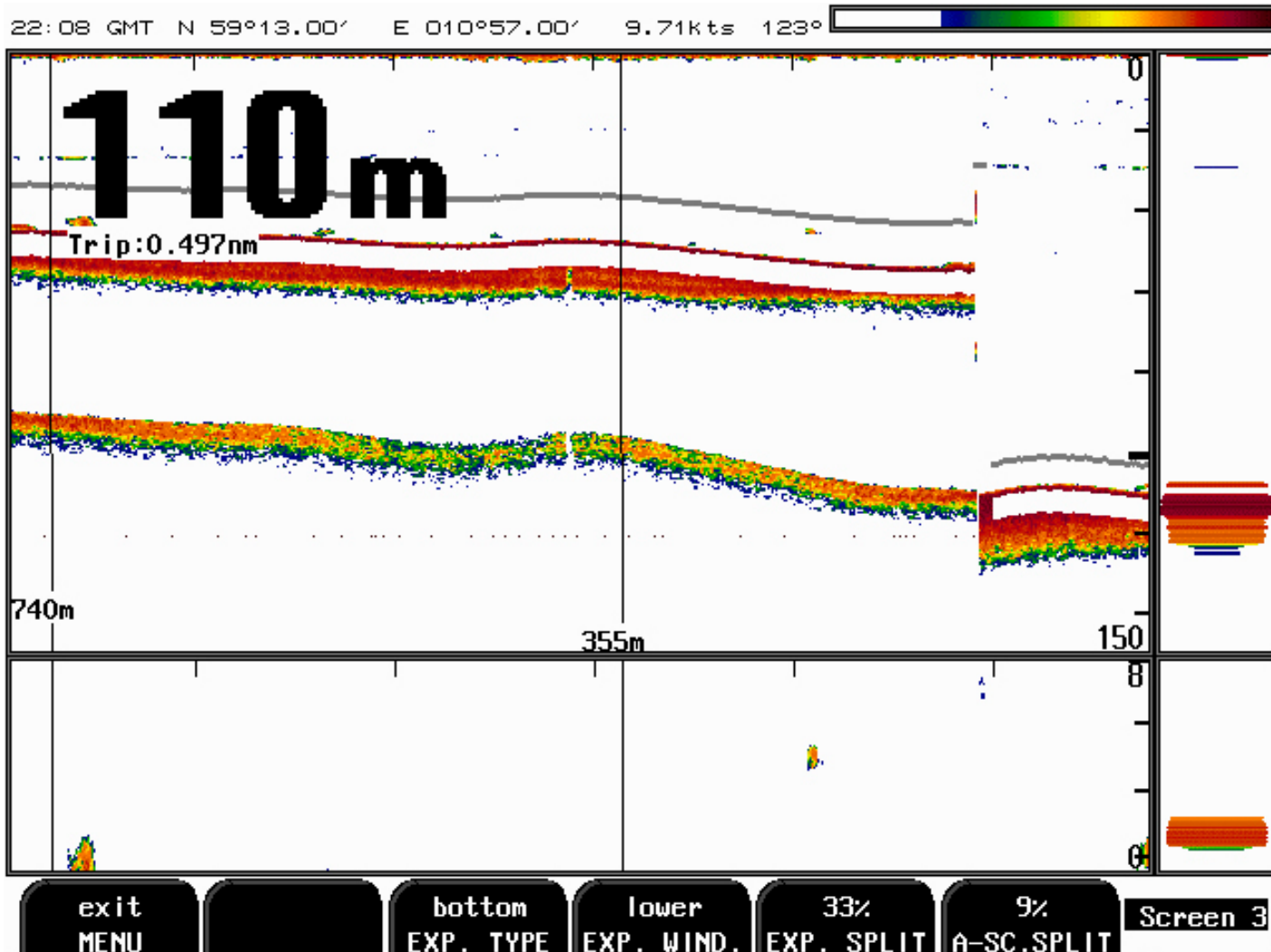
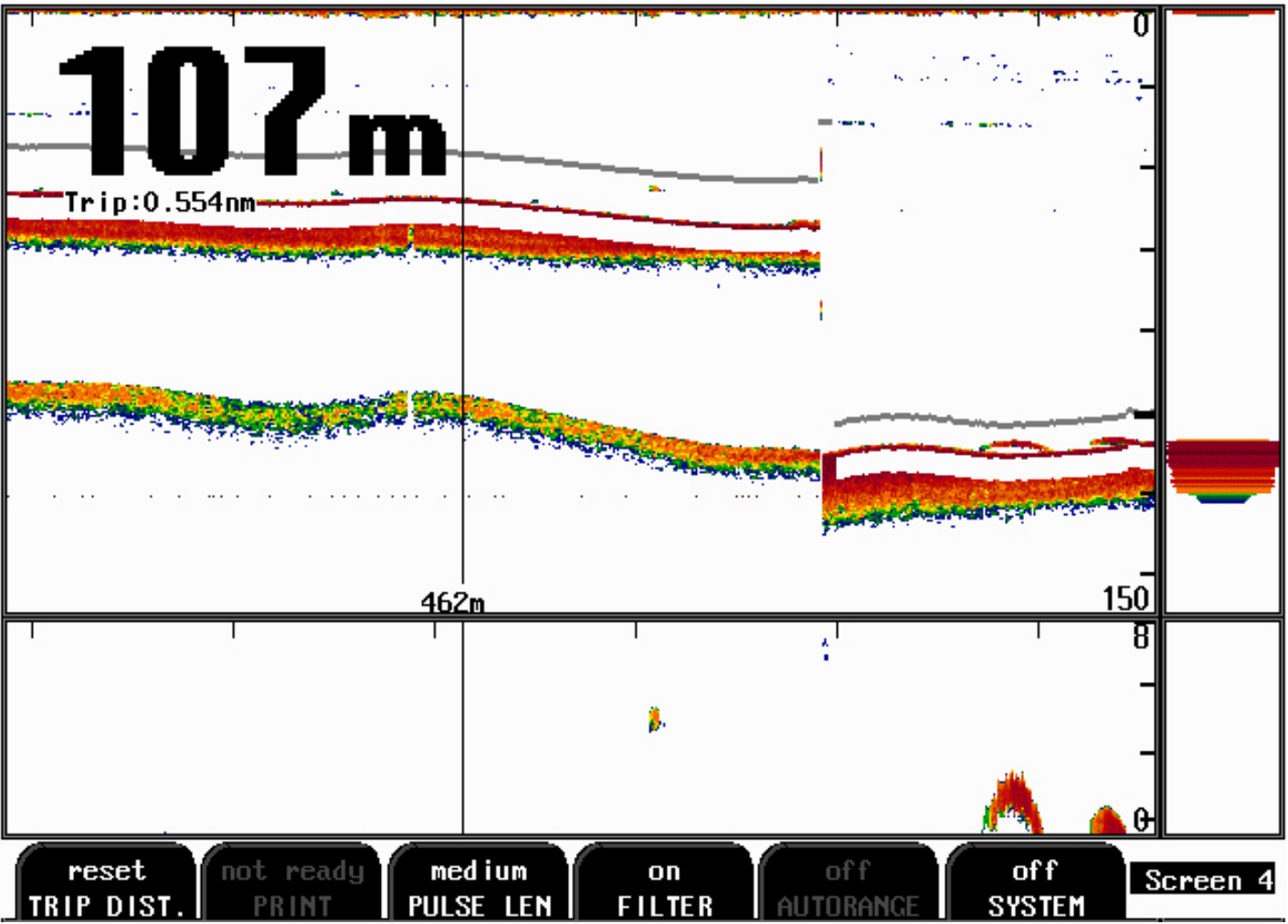


Fig. 2.3 Screen 3, 3rd Operation screen.

Soft Key 1	MENU	exit	exit MENU
Soft Key 2	0m VRM		line, shows depth
Soft Key 3	EXP. TYPE		pelagic,bottom,hardness
Soft Key 4	EXP. WIND		placement on screen
Soft Key 5	EXP. SPLIT	size	
Soft Key 6	A-SC. SPLIT	size	right side



**Fig. 2.4 Screen 4, 4th Operation Screen**

Soft Key 1	TRIP DIST.	reset	
Soft Key 2	PRINT		printer must be connected
Soft Key 3	PULSE LEN	short,medium,long	pulse length
Soft Key 4	FILTER	on/off	noise reduction
Soft Key 5	RANGE	auto-range (A/B) /-shift, manual	
Soft Key 6	SYSTEM	off	Switch off System

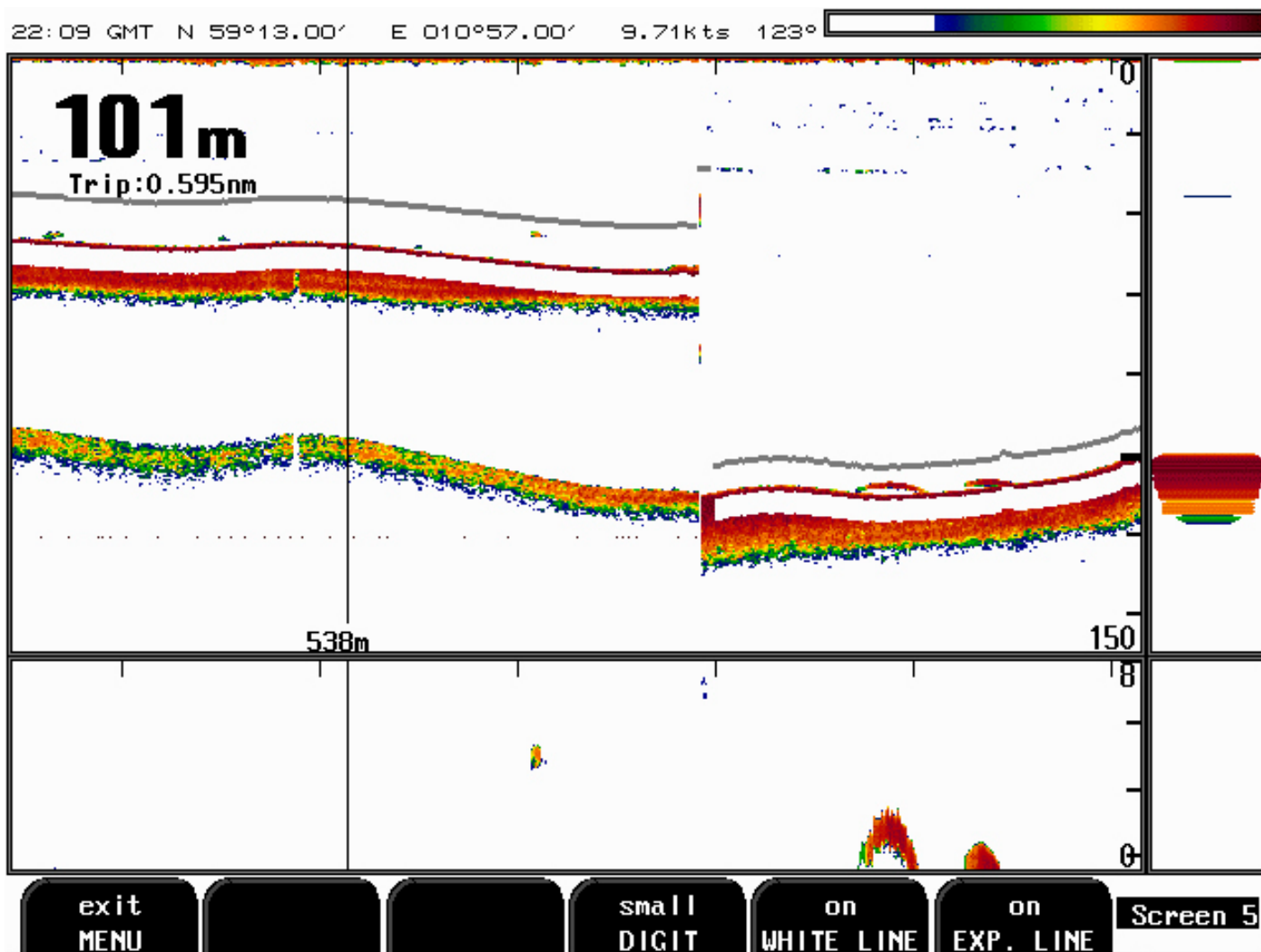


Fig. 2.5 Screen 5, Split picture composition

Soft Key 1	MENU	exit	exit MENU
Soft Key 2	not used		
Soft Key 3	TRAWL MARK		on and off
Soft Key 4	DIGIT	small/large	size of depth numbers
Soft Key 5	WHITE LINE	on/off	
Soft Key 6	EXP. LINE	on/off	

Soft Ket 3 : *Trawl depth horizontal marker is implemented.*

*If trawl-processing unit (SIMRAD ITI, IMAGENEX TS331/333) is connected, xxDBS message is processed by GDF201 software and trawl position in water column is indicated as a horizontal line across echogram window. This option is enabled/disabled on screen 5 by TRAWL MARKER [on/off] button.*

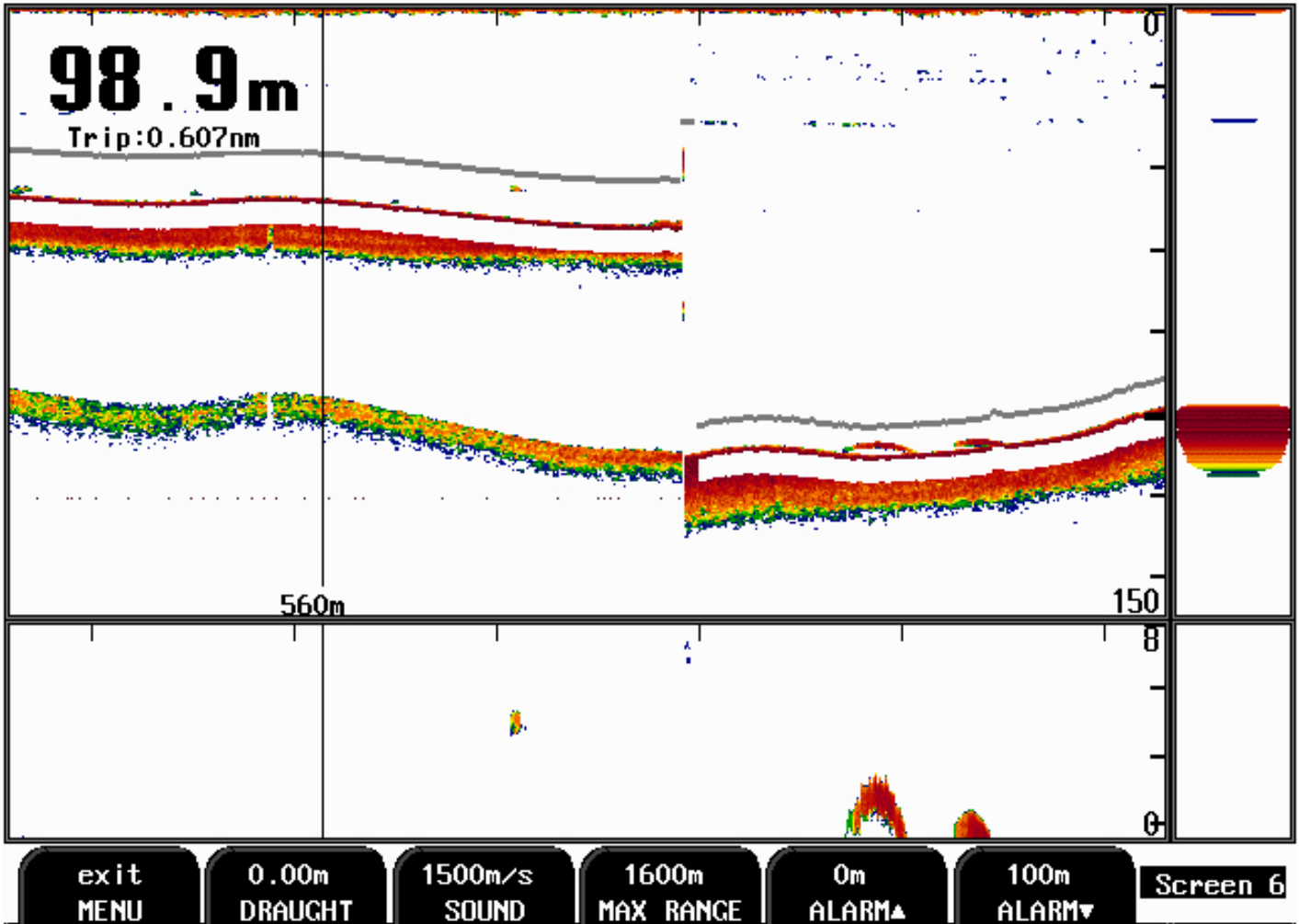


Fig. 2.6 Screen 6, Soundspeed and Alarm setting

Soft Key 1	exit MENU		exit MENU
Soft Key 2	DRAUGHT		
Soft Key 3	SOUND	1400 - 1550m/s	Sound speed setting
Soft Key 4	MAX RANGE		Faster bottomtracking
Soft Key 5	ALARM	0-100m	Shallow water
Soft Key 6	ALARM	0-200m	Deep water



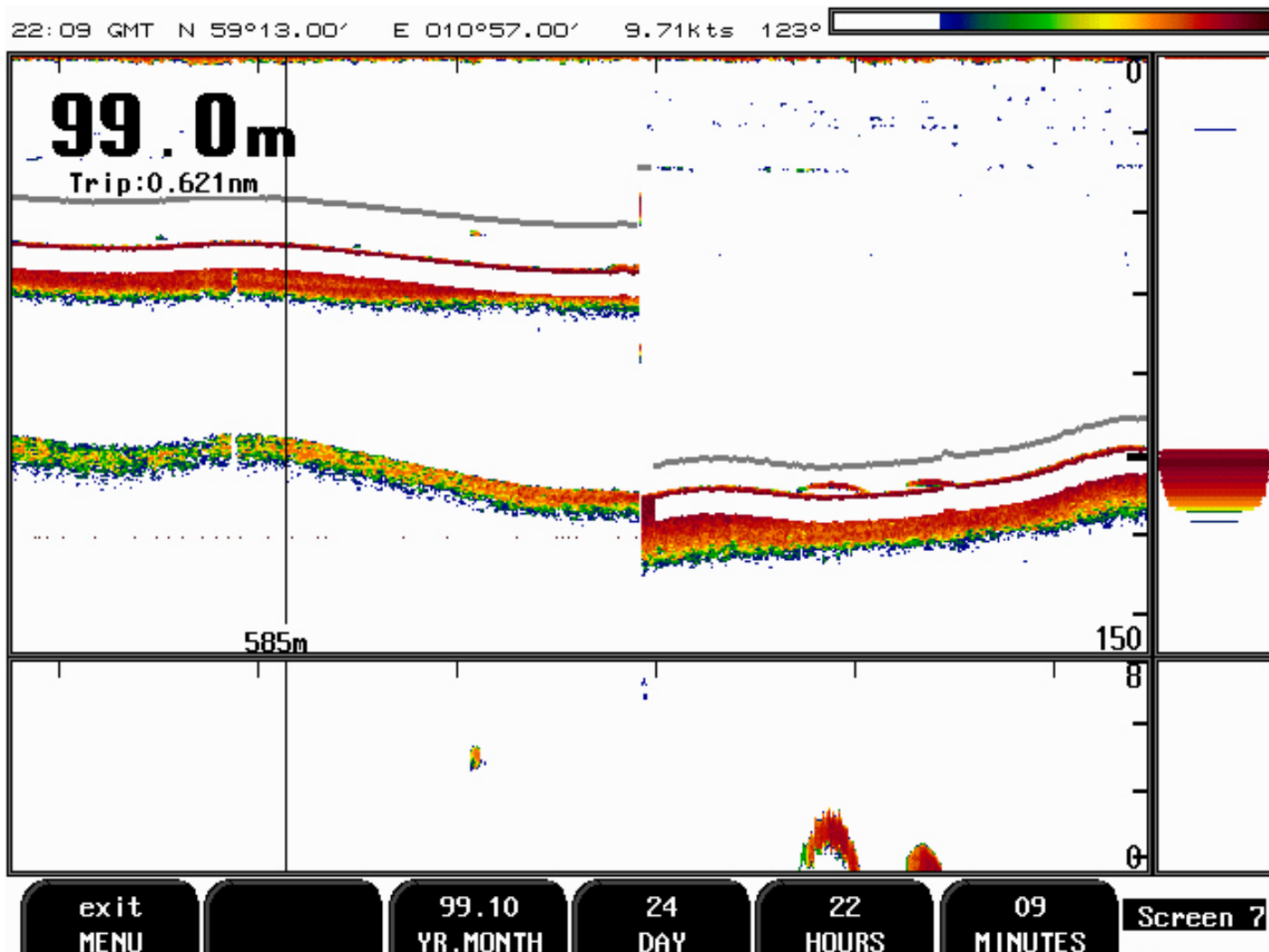


Fig. 2.7 Screen 7, Calendar and Clock setting

Soft Key 1	exit MENU	exit MENU.
Soft Key 2	LOCAL TIME	possible to adjust for local time, if gps is connected
Soft Key 3	YEAR.MONTH 97.01 ->	Calendar setting
Soft Key 4	DAY 1 - 31	Calendar setting
Soft Key 5	HOURS 0 - 23	Real time clock setting
Soft Key 6	MINUTES 0 - 59	Real time clock setting

Soft Key 2 : Local time indication option has been implemented. The Local Time Zone in whole hours is adjustable at screen 7, soft key 8. This option is activated if GPS time information is available. If Local Time Zone parameter is set to 0, UTC is indicated.

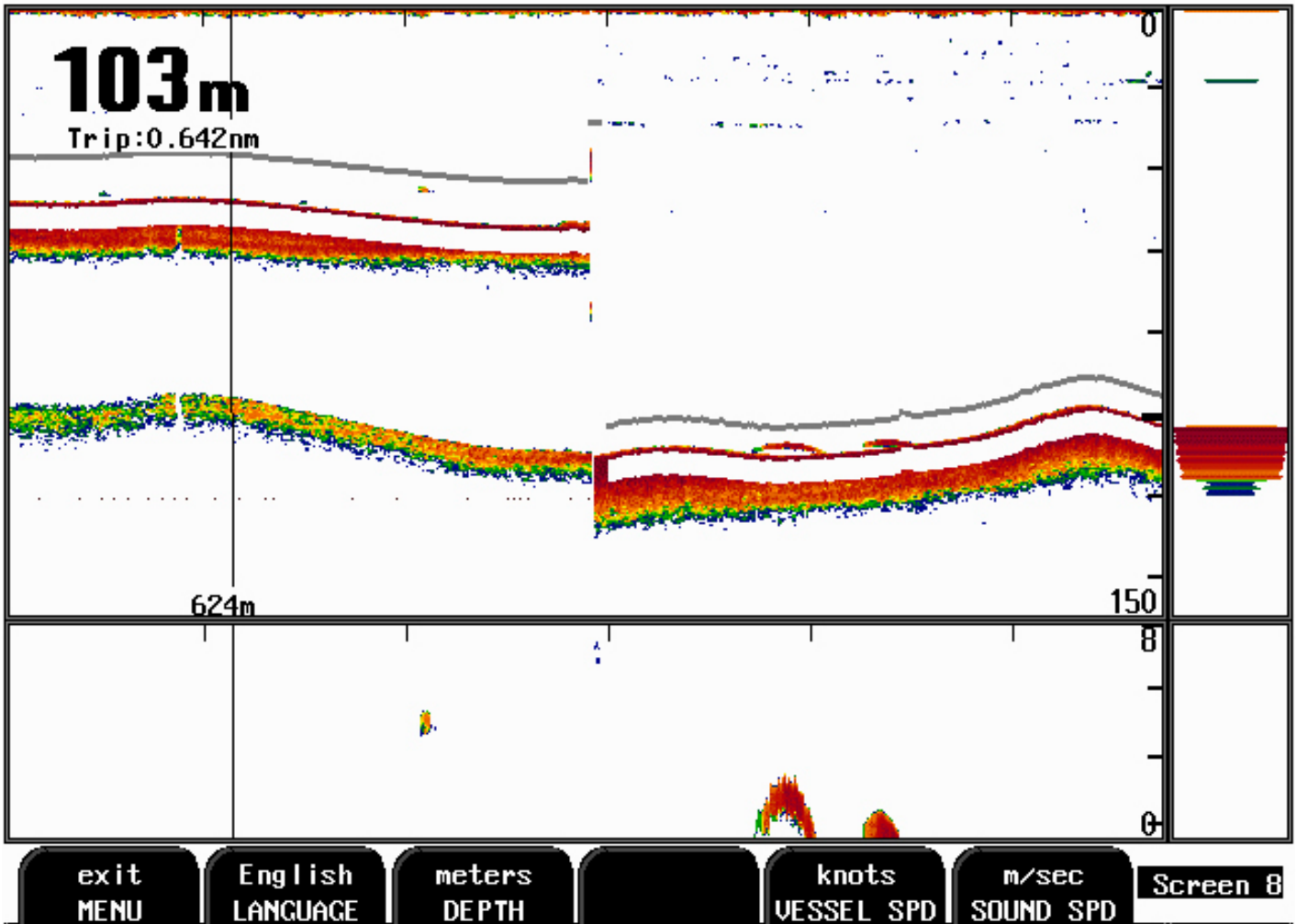


Fig. 2.8 Screen 8, Language and Measurement setting

Soft Key 1.	MENU	exit	exit MENU
Soft Key 2	LANGUAGE	English etc.	Screen language selection
Soft Key 3	DEPTH	m etc.	Unit of measurement for depth
Soft Key 4	not used		
Soft Key 5	VESSEL SPD	knots etc.	Unit of measurement for vessel speed
Soft Key 6	SOUND SPD	m/s etc.	Unit of measurement for sound speed



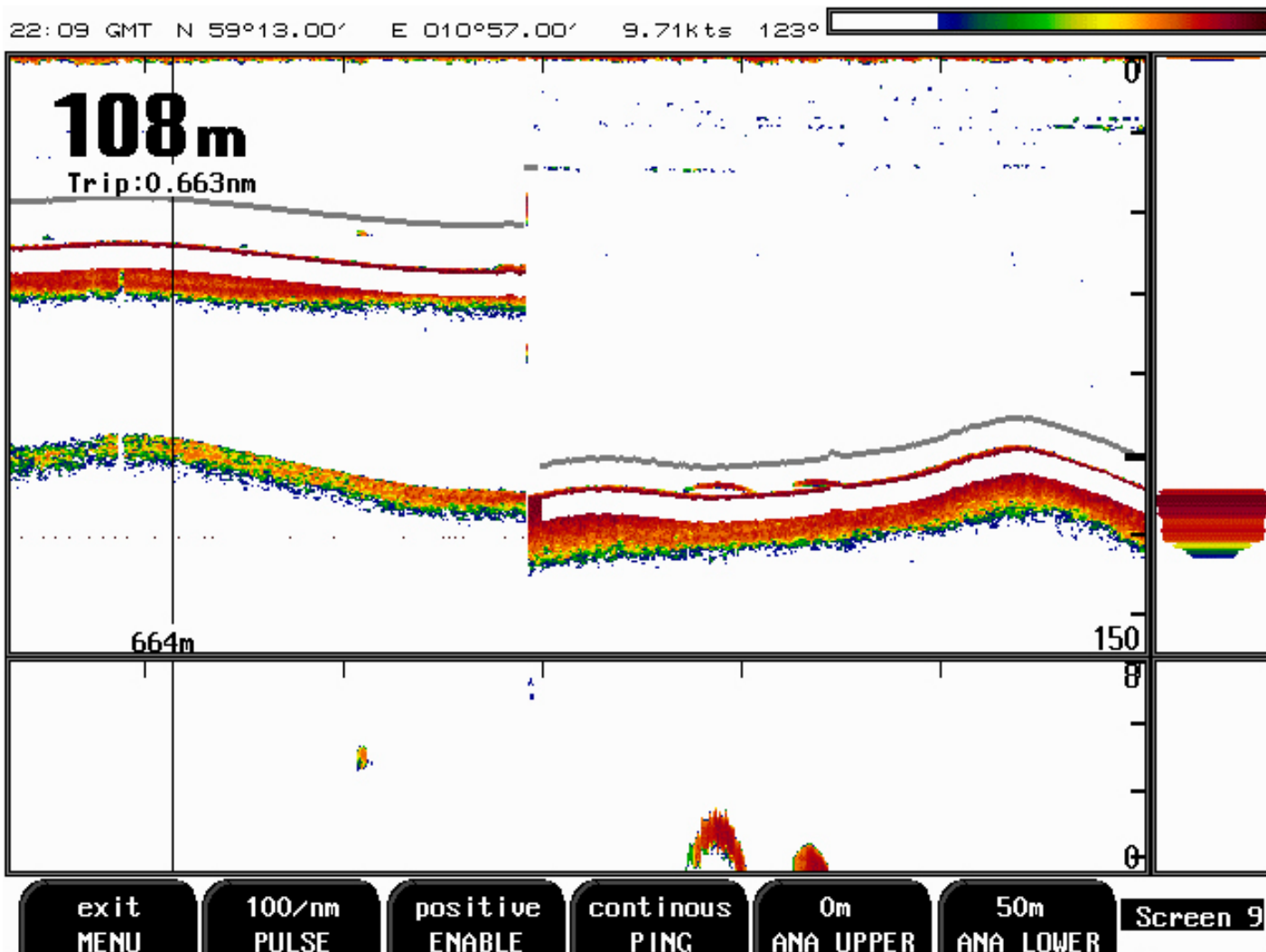
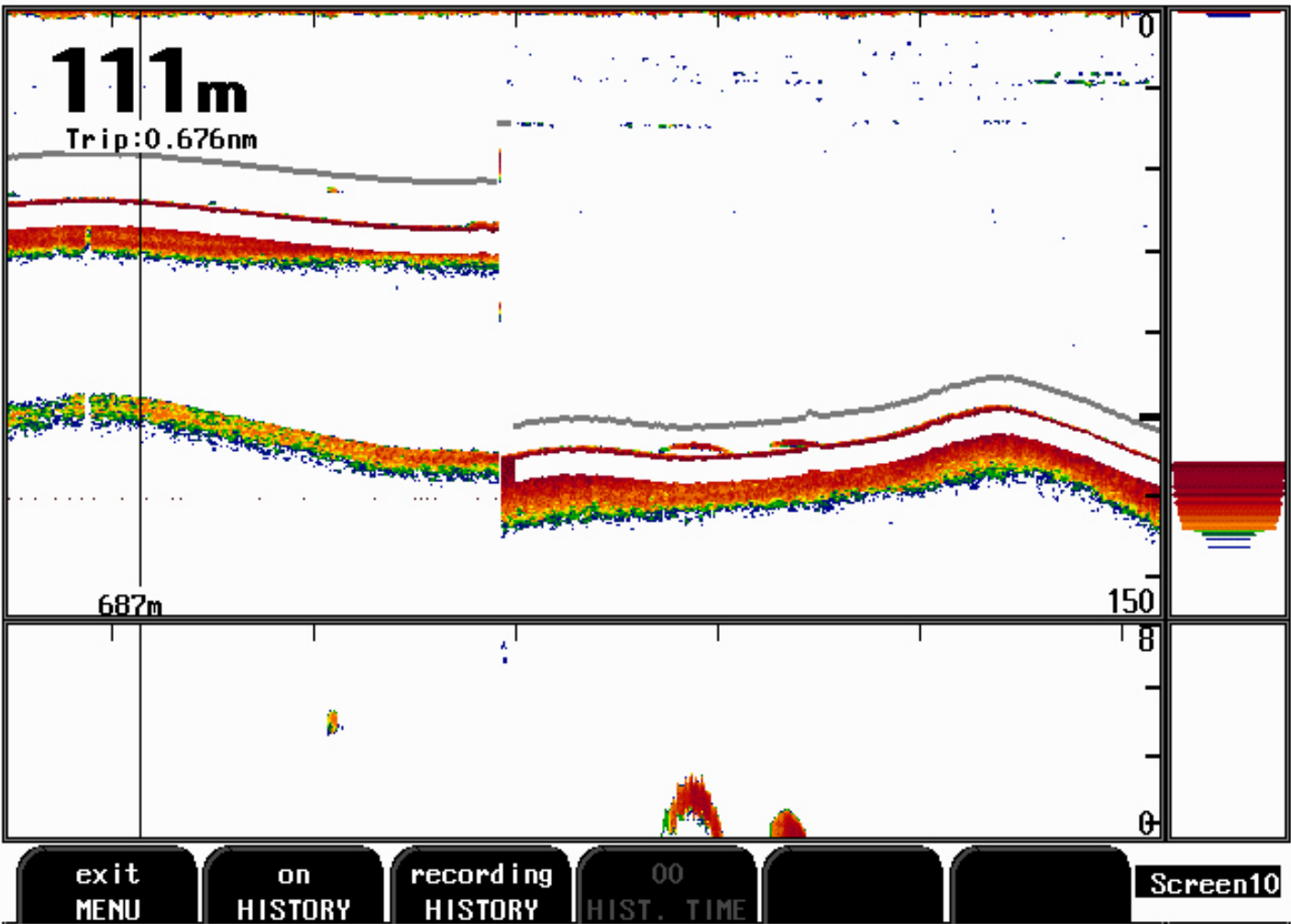


Fig. 2.9 Screen 9, Output and Transmit Control

Soft Key 1	MENU	exit	exit MENU
Soft Key 2	SLOW PRF		on slow prf. removes
Soft Key 3	H LEVEL		
Soft Key 4	L LEVEL		
Soft Key 5	UPPER	0 - 98m	Analogue output shallow limit = 0V
Soft Key 6	LOWER	0 - 99m	Analogue output deep limit = 10V

Soft Key 2 : Slower PRF option is implemented to avoid secondary bottom reflection indicated in the upper part of the echogram. If this phenomenon is observed (at certain combination of water depth and range setting), one should set SLOW PRF [on] on screen 9. Factory setting: SLOW PRF [off]

Soft Key 3 and 4 : Bottom signal level (hardness) message is implemented on the serial output. It can be activated on NMEA screen 12 by setting MESSAGE DBS\* [on]. The format is: \$SDDBS,,x.x,M,,F,s<cr><lf>. Where x.x, is depth value in meters and s is a signal strength value(hardness) in a range of 1-9. Current hardware provides 8-bit digitized range. It is possible to calibrate signal strength values on screen 9. L LEVEL button allows adjusting signal amplitude (in the range of 0-255), which corresponds to value 1, while H LEVEL defines amplitude value, corresponding to level 9.



**Fig. 2.10 Screen 10, Screen History Memory Control**

This screen shows list of received NMEA messages and half screen echo-gram.

Soft Key 1	REC.HOUR	select hour on the list
Soft Key 2	REC. MIN	select hour on the list
Soft Key 3	SELECT first	select playback of history
Soft Key 4	SELECT last	select playback of history
Soft Key 5	RECORDING	recording of history
Soft Key 6	PLAY BACK	play of recorded history

Soft key 1 - 6 is OPTION

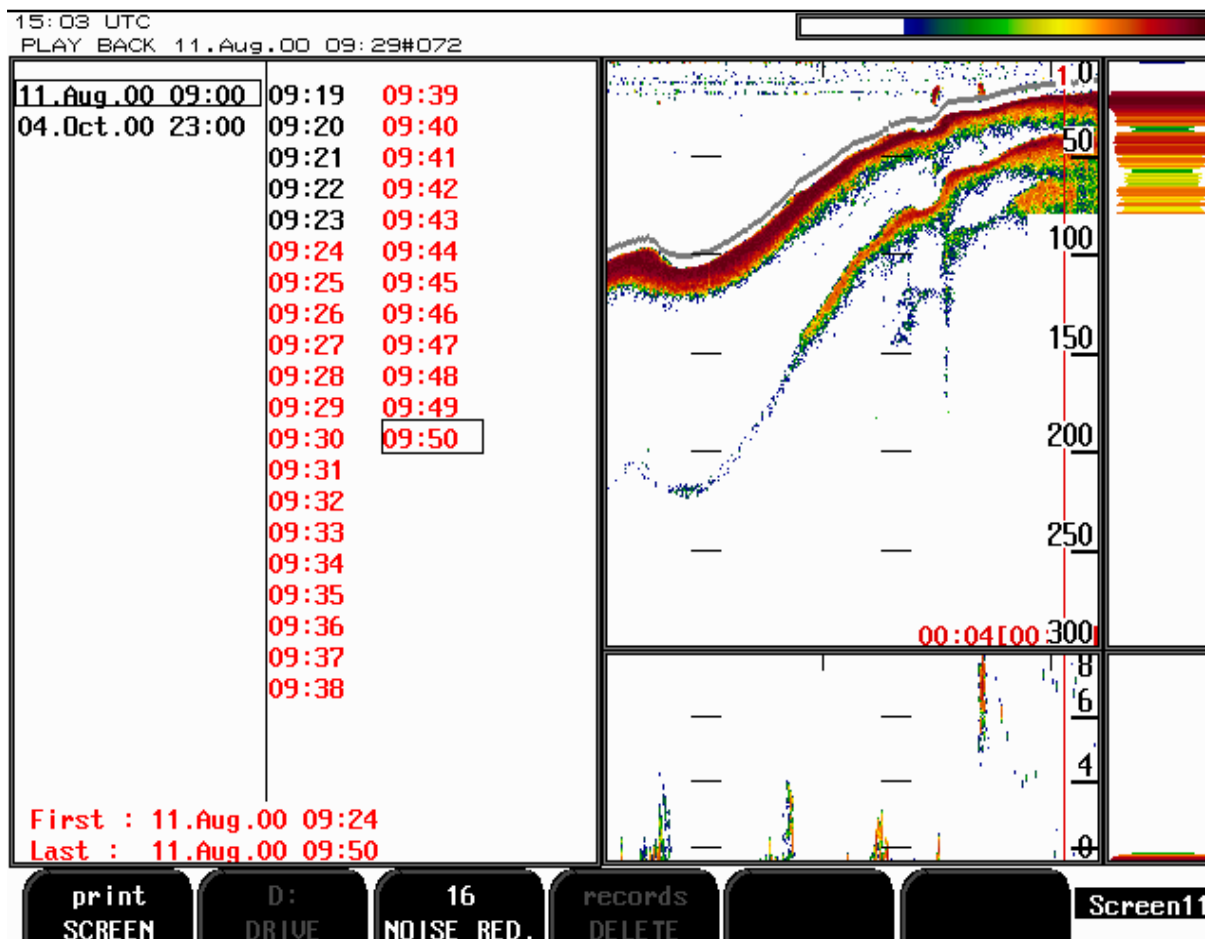


Fig. 2.11 Screen 11, Screen History Memory Control

This screen shows list of received NMEA messages and half screen echo-gram.

Soft Key 1	SCREEB	print screen
Soft Key 2	DRIVE	memory choice a/b/c/d
Soft Key 3	NOISE RED.	recording noise select
Soft Key 4	DELETE	deletes recorded history
Soft Key 5	not in use	
Soft Key 6	not in use	

HISTORY IS A OPTION



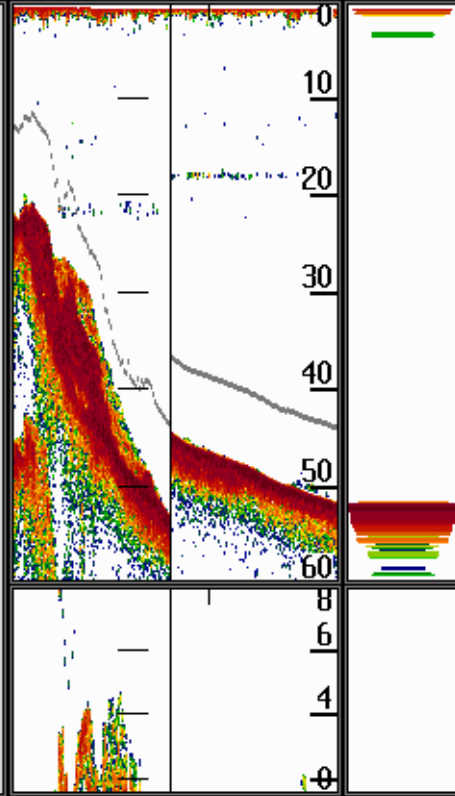
```

NMEA sentences transmit
$SDBT,0164.1,f,0050.0,M,0027.3,FJ
$SDBS,0164.1,f,0050.0,M,0027.3,FJ
$SDBS,,0050.0,M,,9J
$SDBK,0164.1,f,0050.0,M,0027.3,FJ

$SDDPT,0050.5,+00.0J
$SDBT,0165.9,f,0050.5,M,0027.6,FJ
$SDBS,0165.9,f,0050.5,M,0027.6,FJ
$SDBS,,0050.5,M,,8J
$SDBK,0165.9,f,0050.5,M,0027.6,FJ

$SDDPT,0051.0,+00.0J
$SDBT,0167.4,f,0051.0,M,0027.8,FJ
$SDBS,0167.4,f,0051.0,M,0027.8,FJ
$SDBS,,0051.0,M,,9J
$SDBK,0167.4,f,0051.0,M,0027.8,FJ

$SDDPT,0051.5,+00.0J
$SDBT,0169.0,f,0051.5,M,0028.1,FJ
$SDBS,0169.0,f,0051.5,M,0028.1,FJ
$SDBS,,0051.5,M,,9J
$SDBK,0169.0,f,0051.5,M,0028.1,FJ
    
```



print SCREEN	4800 BAUD	NMEA183 IN/OUT	DPT MESSAGE	on STATUS	output DISPLAY	Screen12
-----------------	--------------	-------------------	----------------	--------------	-------------------	----------

**Fig. 2.12 Screen 12, Screen History Memory Control**

This screen shows list of received NMEA messages and half screen echo-gram.

Soft Key 1	SCREEN	print screen
Soft Key 2	BUAD	4800/9600 baud rate
Soft Key 3	IN / OUT	nmea 0183 / rs232 choise
Soft Key 4	MESSAGE	DPT/DBS/DBT/DBK/DBS*
Soft Key 5	STATUS	on / off status of MESSAGE
Soft Key 6	DISPLAY	output / input displays on the screen

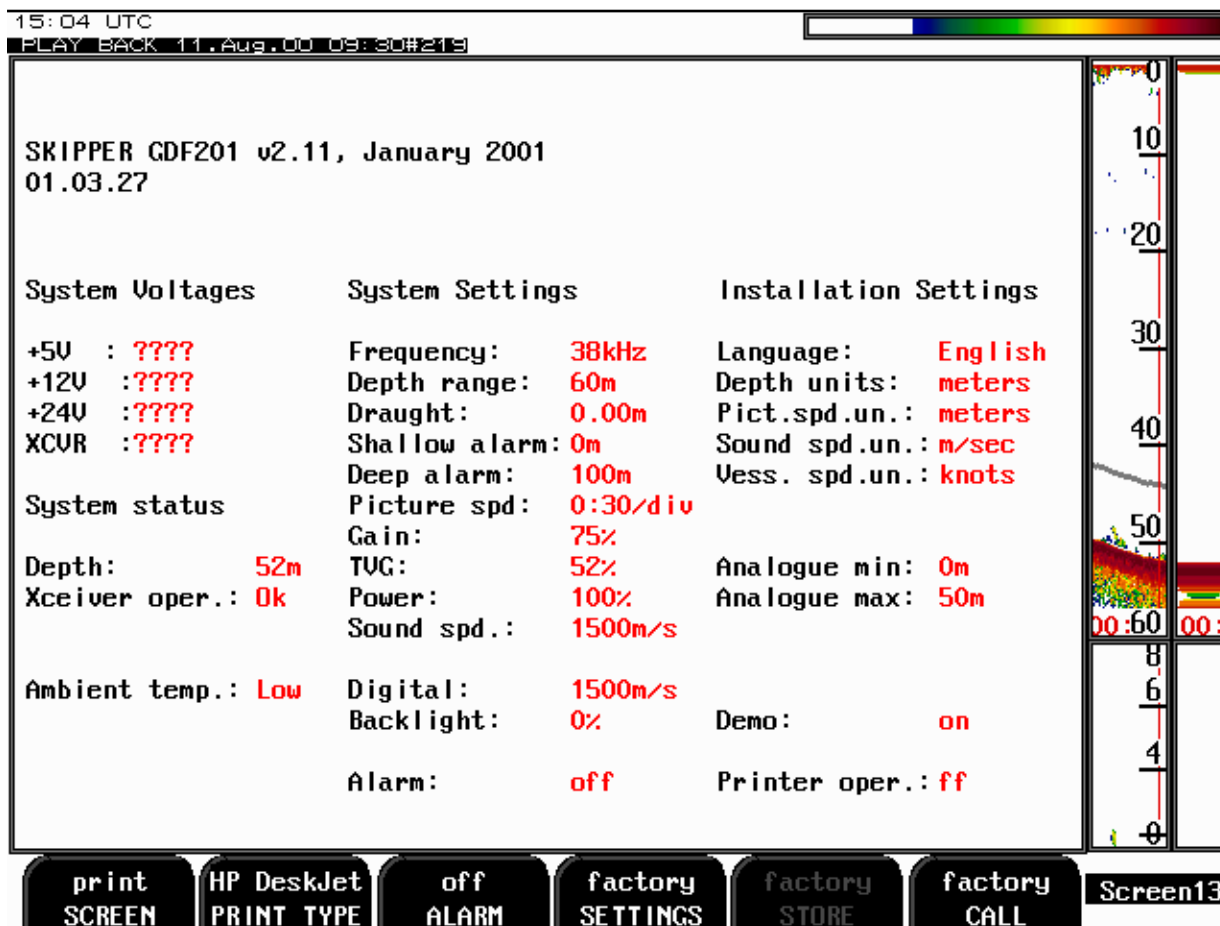
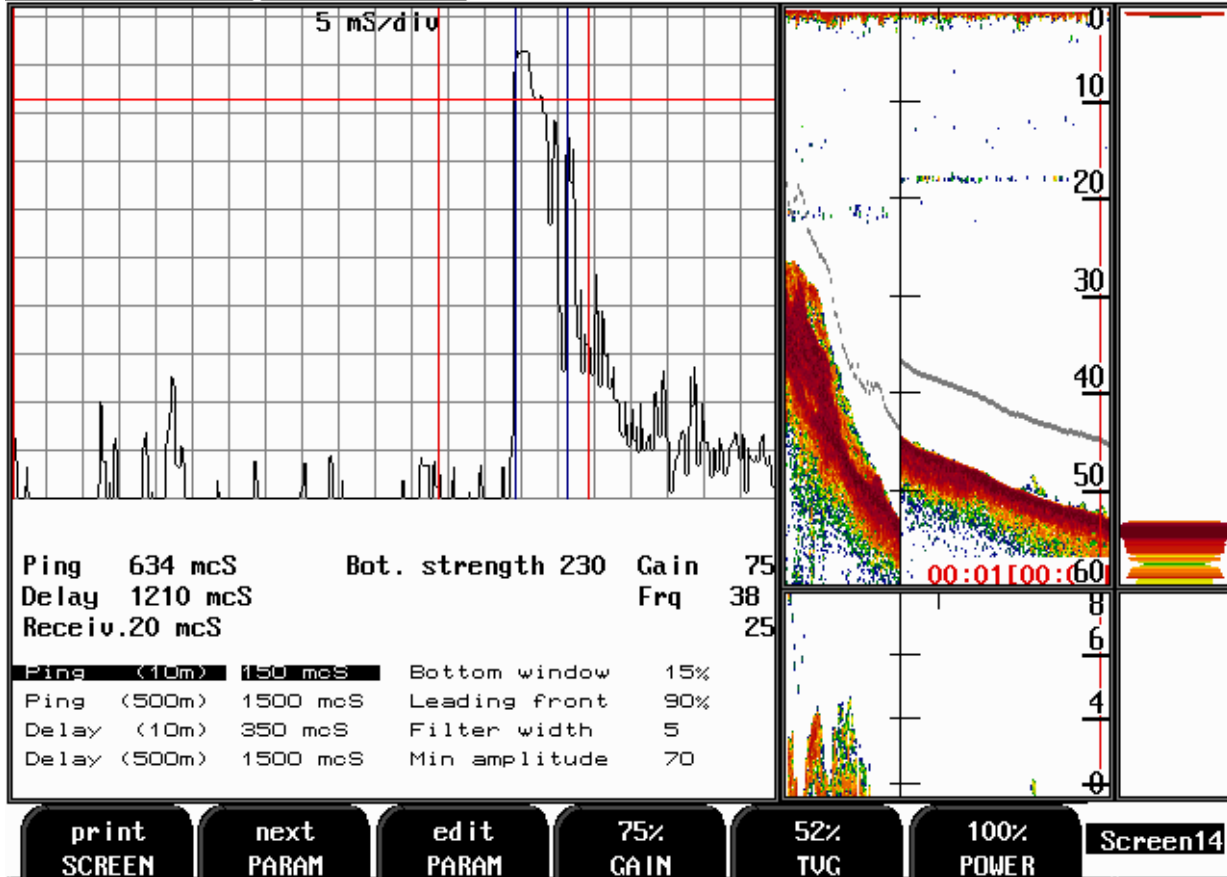


Fig. 2.13 Screen 13, Screen History Memory Control

This screen shows list of received NMEA messages and half screen echo-gram.

Soft Key 1	SCREEN	print screen
Soft Key 2	PRINT TYPE	HP / BJC printer type
Soft Key 3	ALARM	internal alarm on / off
Soft Key 4	SETTINGS	factory/user1/user2/user3
Soft Key 5	STORE	save settings you have made
Soft Key 6	CALL	back to factory settings



**Fig. 2.14 Screen 14, Screen History Memory Control**

This screen shows list of received NMEA messages and half screen echo-gram.

Soft Key 1	SCREEN	print screen
Soft Key 2	PARAM	jump to next parameter
Soft Key 3	PARAM	change parameter settings
Soft Key 4	GAIN	change of settings
Soft Key 5	TVG	change of settings ( 0% = max TVG )
Soft Key 6	POWER	change of settings

# 1. PRINCIPAL FUNCTIONS

## BOTTOM DETECTION

GDF201 employ a bottom detection algorithm that will try to extract the bottom signal from all kinds of noise and secondary echoes. When GDF201 is tracking the bottom normally, a thick black line is shown, and below that, a ribbon with a hatched pattern. This pattern has two levels of hatching. The darkest represent strong and unambiguous bottom echoes. The lighter hatching represents weaker signals possibly occasional detection misses. If the software can detect no bottom for several pings, the hatched ribbon disappears.

During normal bottom tracking, a digital value is shown by the bottom contour at the right side of the screen. If the software algorithm loses track of the bottom altogether, a warning beep is heard and the black line and hatching band disappears. A warning message: "Lost bottom" is shown in the screen's lower right corner.

## PING TO PING FILTERING

Part of the bottom detection algorithm is the ping to ping filtering. The next bottom is searched for in a time and strength window based on the strength and timing of the previous bottom echoes. This procedure reduces the probability of tracking schools of fish or secondary echoes as bottom.

If no bottom is detected in the calculated window, the window is gradually increased in size until the full time and strength window is used.

## BOTTOM SEARCH RANGE

The FIX RANGE function in Screen 12 is used to control the search range for the bottom detection algorithm. When this function is on, bottom is only searched for within the selected display range. When the function is off, bottom is searched for within the entire functional range of the echo sounder.

## POWER ON/OFF

During normal daily operation, the system may be switched off from Screen 4. This operation does not disconnect the system from the power supply, but all power consuming components are switched off. The system may be switched on again by pressing any button.

Do not run the sounder for a long time without a submerged transducer connected.

## ALARM ACKNOWLEDGEMENT

When the depth alarm is activated, the alarm may be acknowledged by pressing any button.

## FIXED KEY FUNCTIONS.

### DEPTH RANGE

The Depth Range button can be used to set the depth limit between 10 and 1600 m.

### THRESHOLD KEY

To display and erase colours from threshold.

### MENU

The menu button facilitates selection of one of the 13 screens and soft key layouts. The 4 primary operation screens may be cycled by repeatedly pressing the MENU button. Access to the remaining screens is hold the press on MENU button.

### CONTRAST ADJUSTMENT

Contrast button, for selected between Day/ Night colour.

## **SOFT KEY FUNCTIONS.**

### **GAIN**

**Gain** may be adjusted from 0 to 100% to allow for optimal echo levels from bottom and other objects. The GAIN setting affects signals from all depths.

### **TVG**

**Time Variable Gain** may be adjusted from 0 to 100 % to allow for detailed echo control from the 0 - 50 m depth range.

A low setting will reduce the gain in the area near the surface to suppress noise and unwanted echoes from this area.

TVG 100% is min TVG

TVG 0% is max TVG

### **DIGITAL INDICATION**

On the operation screens, one size of large digital depth indicators.



---

**FREQUENCY**

The Frequency selector toggles among 38, 50 and 200 kHz. On systems with the Dual Screen option installed, 50 and 200 kHz may be selected simultaneously (Dual) and signals from both transducers are shown on a split screen or printout.

**OUTPUT POWER**

Power may be adjusted from 1 to 100 % in case of difficult shallow water conditions. Too high power in such cases will possibly saturate the receiver or cause detection of unwanted secondary bottom or surface echoes.

When a range of 10m is selected, Output Power is automatically limited to 10%.

**DRAUGHT**

Draught may be compensated to allow real depth from surface to be shown on the screen and printout.

Negative draught values may be entered to compensate for transducers fitted above the keel.

This setting also affects the NMEA transmitted values.

Draught compensation is indicated on the screen by a flashing number to alert the operator to the fact that the shown depth value is adjusted.

**PRINTER OPERATION**

The printer is started and stopped by the **Print** buttons.

The **Print** buttons switch continuous printing on and off.

**ALARM SETTINGS**

Depth alarm settings are performed from Screen 6. Alarm limits are referred to the indicated depth.

The local alarm buzzer may be disabled from screen 12, but the external alarm relay will always operate.

The only way to disable the alarms completely, is to reduce the shallow alarm to zero depth and increase the deep alarm to maximum range.

An active shallow alarm limit must be less than an active deep alarm limit. Alarm limits are enforced with hysteresis.

A depth alarm may automatically start the printer if this function is enabled on Screen 4.

**CLOCK AND CALENDAR SETTINGS**

Manual Clock and Calendar adjustments are carried out in Screen 7. If a Satellite navigator giving UTC messages is connected to the NMEA input, the clock and calendar will be automatically updated and manual adjustment is not required.

## **HISTORY MEMORY**

History function is a option, we need to install a Disk on module device.  
The length of recorded history depend of the size of the disk.

GDF201 has a 30 minute history memory. Depth, time and all available navigation data are stored continuously so that the last 30 minutes of information is always available.  
The history memory is controlled from Screen 10.

The normal history modes are “on” and “recording”. New depth information is continuously stored in the memory while the oldest samples are discarded. Only bottom information is stored along with time and whatever navigational information is available in the GDF201 (Position, Speed, Heading).

By switching history “off”, the stored 30 minutes will be kept in the memory and no new samples will be written. As a warning that the memory is not recording, “History off” is flashing at the bottom of the screen.

## **SIMULATOR**

The GDF201 contains a built in simulator to exercise the screen and printer and various interface signals.  
The simulator may be switched on and off on Screen 12.

When the simulator is operating, “Demo” is flashing at the bottom of the screen.

## **STATUS SCREEN**

The Status screen, Screen 12 shows a list of various system parameters useful for documenting system set-up and system operating status. The contents of this screen will be valuable information in situations where manufacturer support is required.

---

**OSCILLOSCOPE SCREEN**

The Oscilloscope screen, Screen 13 is useful when monitoring transducer performance. The oscillogram shows the signal returned from the transceiver plotted against time and will enable service personnel to evaluate system performance and facilitate any troubleshooting.

**NON-VOLATILE PARAMETER MEMORY.**

The system contains non-volatile memory to maintain installation and user parameters like Language and unit of measurement selection, Contrast and Backlight settings, etc.

These parameters are kept in EEPROM memory and are automatically restored on power up. If the user parameters have never been set, default values are used.

**SOUND SPEED CALIBRATION**

This option will enable adjustment of the sound speed value used for the depth calculations. The standard value is 1500 m/s, but the user may set values from 1400 to 1550 m/s to accommodate accurate propagation speed in known water conditions. If installed, this option is accessible on Screen.

**2. OPTIONS.****REPEATERS/SLAVES**

Graphic display or digital depth slave repeaters may be connected to the system. Along with the graphic display repeaters there may also be installed remote keyboards.

**REMOTE SOUNDING CONTROL.**

This option lets the GDF201 being controlled remotely in synchronised, burst or single ping modes. If installed, this option is accessible on Screen 9.

**AUTO RANGE**

This option will automatically adjust the depth range to maintain the bottom contour within the middle half of the screen height. If installed, this option is accessible on Screen 4.

When the printer is started, Auto Range is automatically disabled, and the present depth range is selected as fixed.

### **3. USER MAINTENANCE**

#### **TRANSDUCER MAINTENANCE.**

The transducers are virtually maintenance free, but occasional cleaning may be necessary depending on sea water conditions.

#### **OPERATOR UNIT MAINTENANCE.**

Apart from the printer, the operator unit contains no user serviceable parts, and requires no maintenance apart from occasional cleaning of the front panel. Please use a soft cloth and no chemicals except cleaning alcohol.

---

## TROUBLE SHOOTING

### TYPICAL STATUS SCREEN (12) CONTENTS.

The Status Screen (12) contain information that will facilitate analysis and correction of several problems. A printout of the Status and Oscilloscope Screens should be sent by fax with any report about functional Disturbances. This will greatly facilitate remote failure Analysis.

If it is at all possible to cycle through the screens and observe this information, several assumptions may be made regarding operation of the **GDF201** System. Although some of the subsystems necessary for this basic system operation may still suffer from minor or intermittent operation disorders, the fact that it is possible to select and observe this screen, indicate correct operation of the following GDF201 Subsystems:

1. The Computer is operating.
2. The Screen Interface (VGA) Board is working.
3. The Keyboard interface Board with Backlight and LCD power supplies is working.
4. The Keyboard Interface Part of the I/O Board is working.
5. The Power Supplies on the terminal board are basically working.

Further, if it is possible to press the “Print Screen” Softkey button and obtain a Hard copy of the Screen Contents, the following Subsystems also operate correctly:

6. The Printer Interface part of the I/O Board is working.
7. The printer interconnect Board is working.
8. The thermal Printer including Printhead and Paper Feed is operating.

The other information on the Status screen is a collection of information which may be observed and manipulated with the various screen softkey selections. As a reference, it will often be more convenient to observe the various settings together on this screen than to cycle from screen to screen to check on the softkey texts.

### TYPICAL OSCILLOSCOPE SCREEN (13) CONTENTS.

This Oscilloscope Screen (13) show a typical oscillogram of a bottom echo (the tall peak in the centre of the diagram) and a weaker fish echo to the left of it. The horizontal axis represent time for the sound to travel down and back from an object. The vessel is located at the left edge of the grid, and the right edge represent the deep range. The vertical axis represent the magnitude of the echo signal received.

## 4. INSTALLATION

### STANDARD SYSTEM SUPPLY.

A Basic GDF201 system consists of the following units. See **Fig. 4.1**:

Pos.	Description
1	Operator Unit
2	Handcontroller
3	TFT or SVGA monitor.
4	Transducer (s)

### TRANSDUCER INSTALLATION.

#### **Location.**

Single transducers are normally installed in the foreship. Larger vessels are often fitted with two transducers, one fore and one aft.

Optimal system operation is achieved by fitting the transducer as deep as possible on the hull. The transmitting surface of the transducer must be installed horizontal. On vessels with a deep keel, if the transducer must be fitted higher than the keel, it should be fitted towards the side, as far from the keel as possible to avoid false keel echoes.

Do not mount transducers close to the propeller or aft of other hull installations (outlets, vents or other protruding details).

It is of course necessary to select a part of the hull that is submerged under all load and speed conditions, and to avoid positions where air is trapped in heavy weather.

If a flat, horizontal section is not available for transducer fitting, the shipyard must construct a suitable bed.

Protect the active element of the transducer and do not paint the surface.

### INSTALLATION DETAILS.

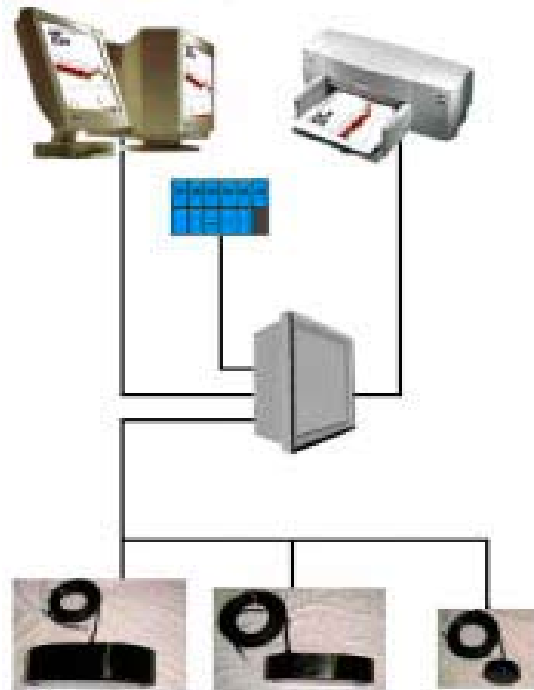
Refer to SKIPPER's standard installation procedures in the appendix regarding tank installation, welding, Cable glands etc.

TFT or SVGA monitor.

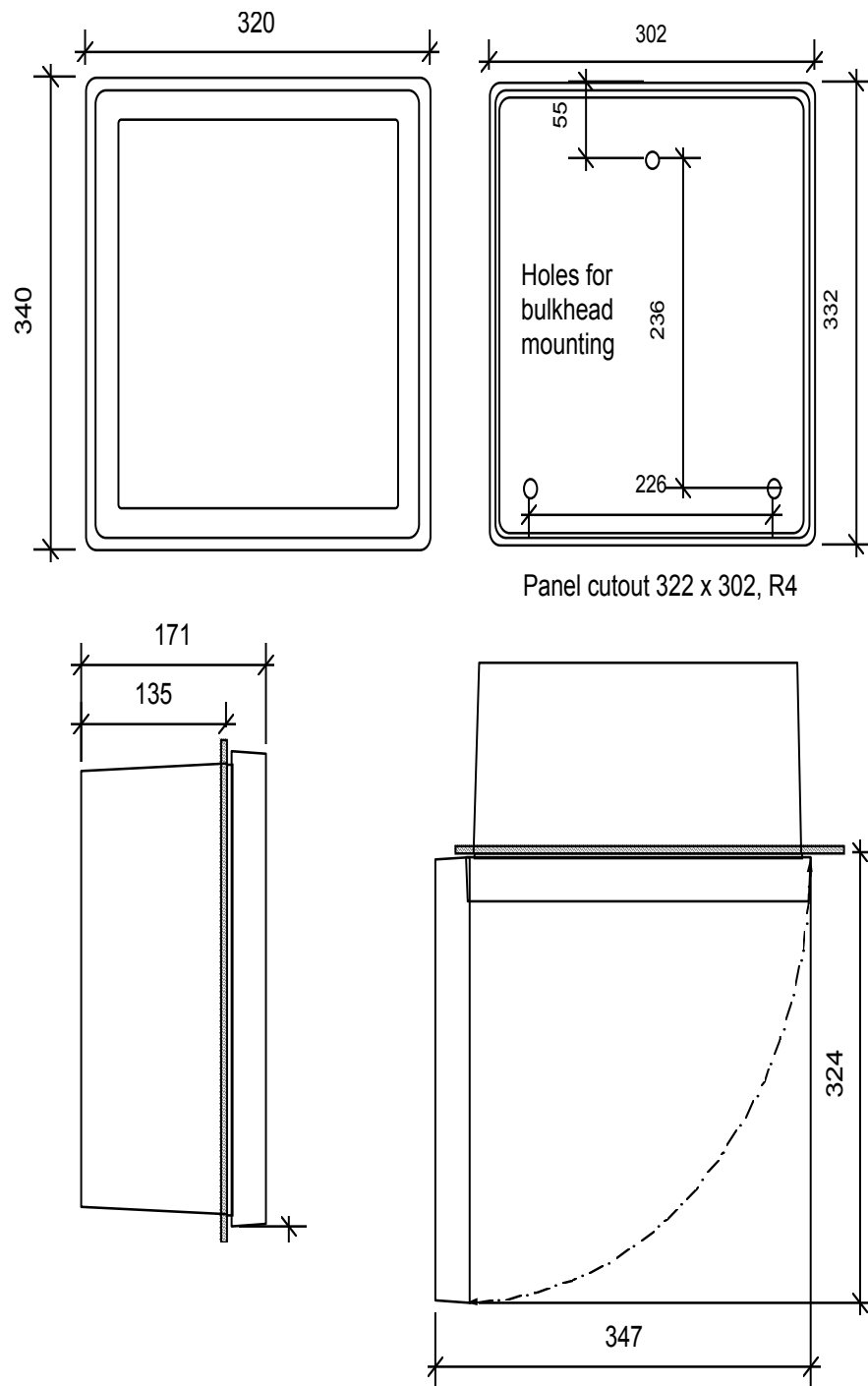
Handcontroller

Operator Unit

Transducer (s)



**Fig. 4.1 Basic System Configuration.**

**OPERATOR UNIT INSTALLATION.**

**Fig 4.2 Operator Unit, Dimensions.**



Select a position to provide free view of the panel as well as easy access during operation and service. The operator unit may be mounted flush in a panel or directly onto a bulkhead. Fig. 4.3 shows the operator unit along with the main installation dimensions. If the unit is to be flush mounted, the shown cut-out and recession depth dimensions must be observed.

Remember to leave room in front of the unit to open the door a full 90°.

**Also observe that there must be at least 70 mm free space available below the opened door to facilitate replacement of the printer paper.**

**Do not perform installation work with system power applied!!**

Cables are led through the appropriate cable glands as follows:

The cable from the transducer(s) should normally occupy the left gland. The right gland is used for power supply connection whereas the centre ones are used for any interface signals connected.

Power supply may be either 220V/110V AC or 24V DC. Power consumption is appx. 50 W at 24V, appx. 70W at 110/220V.

The transducer is always connected with 1 pair plus screen. See Fig 4.7.

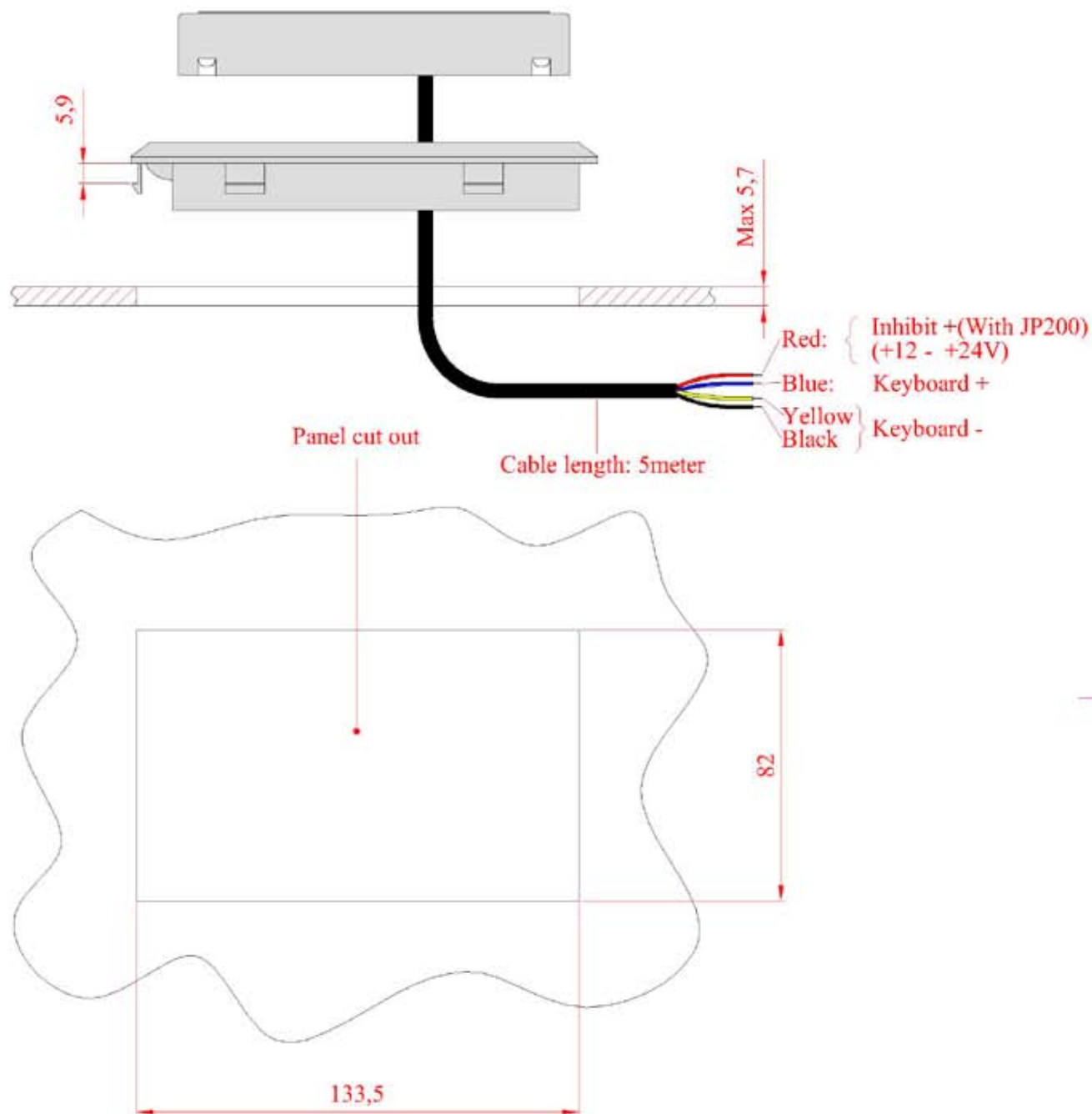
If the AC power system is 110V, GDF201 may be prepared for 110V AC by re-connecting the connectors J102, J103 as shown in Fig. 4.4

This diagram also shows position of fuses for 220/110 VAC and 24 V DC. These fuses are normal 5 x 20 mm glass fuses.

AC supply:	FS100, FS101	220V	0.5A
		110V	1A
DC supply:	FS102		3.15A

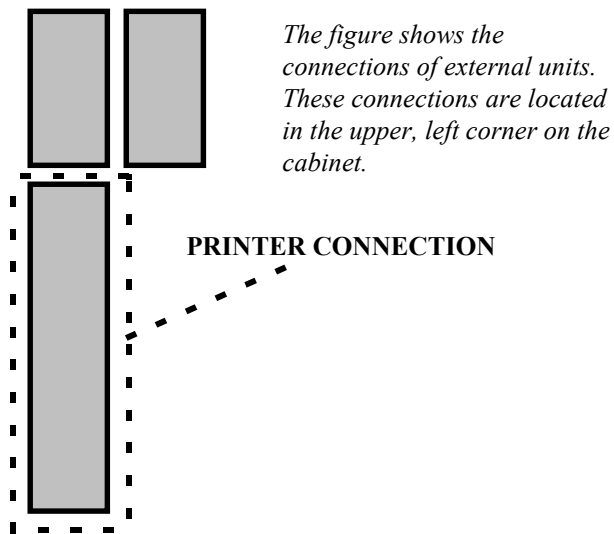
When the installation is complete, and power is connected to the Operator Unit, the appropriate power switch by the power terminals is switched on. For daily operation, these switches may stay on and the unit is switched off by pressing the “SYSTEM off” button on Screen 4. The unit is switched on by pressing any button.

## HAND CONTROLLER INSTALLATION.



Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference	
Designed by A Matre	Checked by XXX	Approved by - date XXX - 00/00/00	File name XXX	Date 2008.01.23	Scale	
SKIPPER Electronics A/S			Cut out RP200			
			TB-3017-Rev-00	Edition 0	Sheet 1/1	
					4	

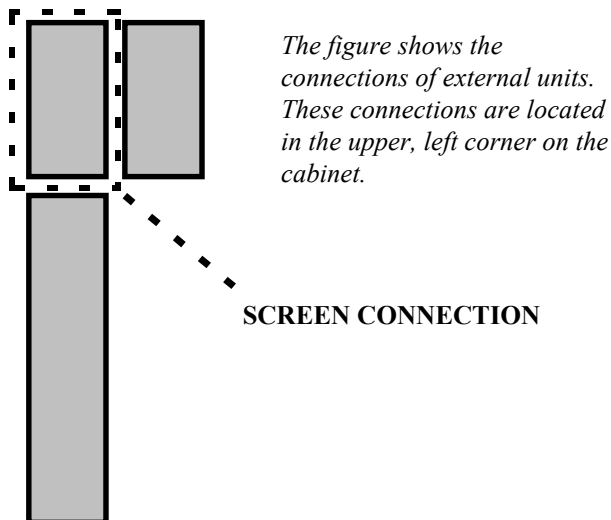
## EXTERNAL PRINTER



**Fig. 4.4 External Printer connection**

Use standard printer cable when connecting a external printer.

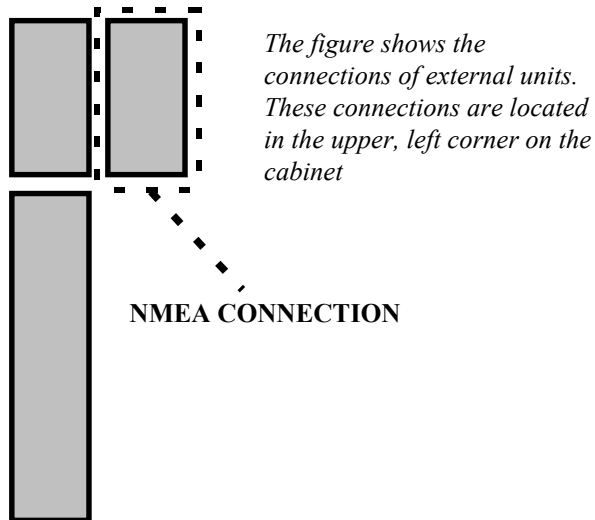
## Color LCD Monitor/ SVGA Screen



**Fig. 4.5 Color LCD Monitor/ SVGA Screen connection**

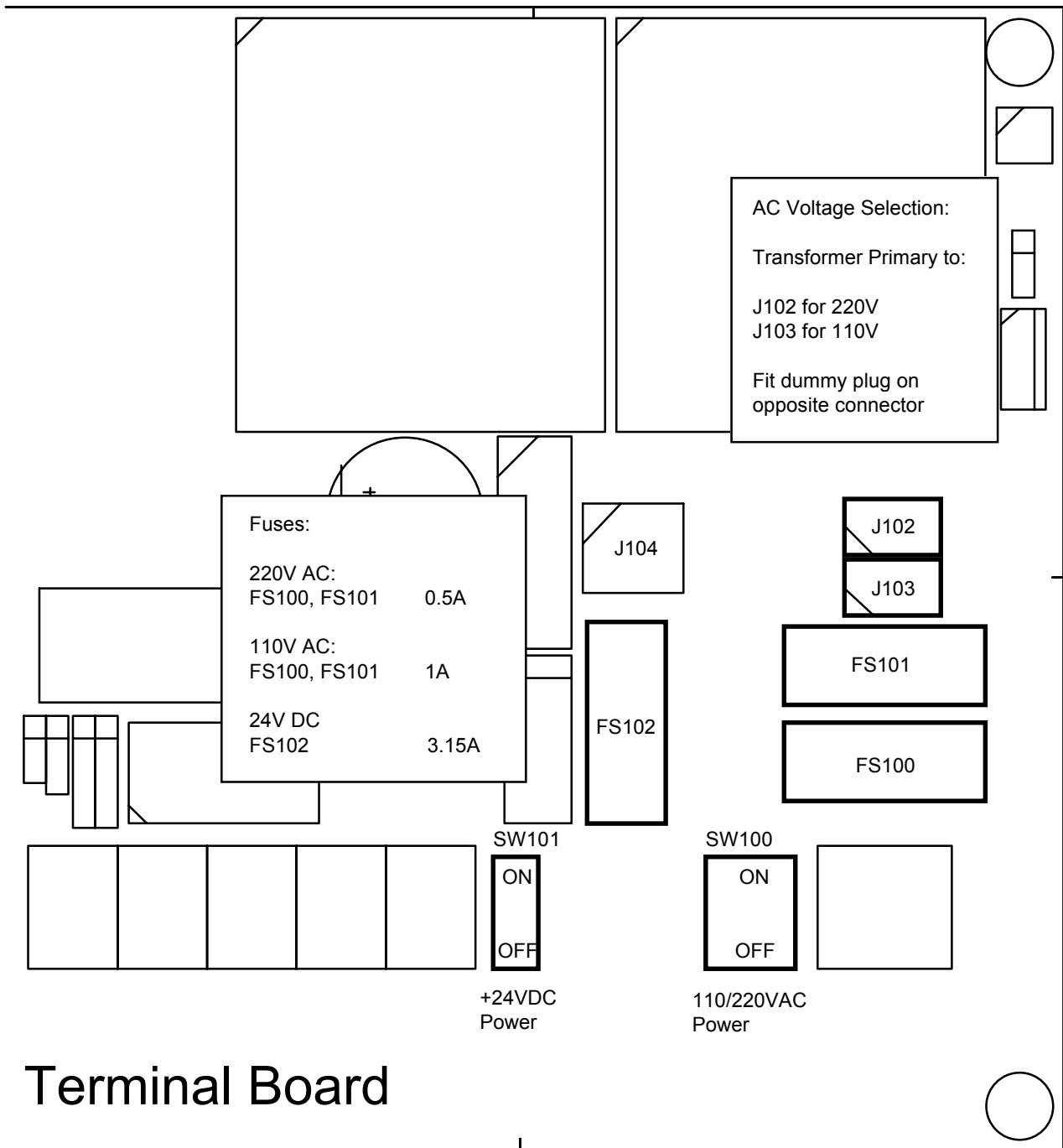
Connection through a 15-pins standard screen cable.

## NMEA Connection



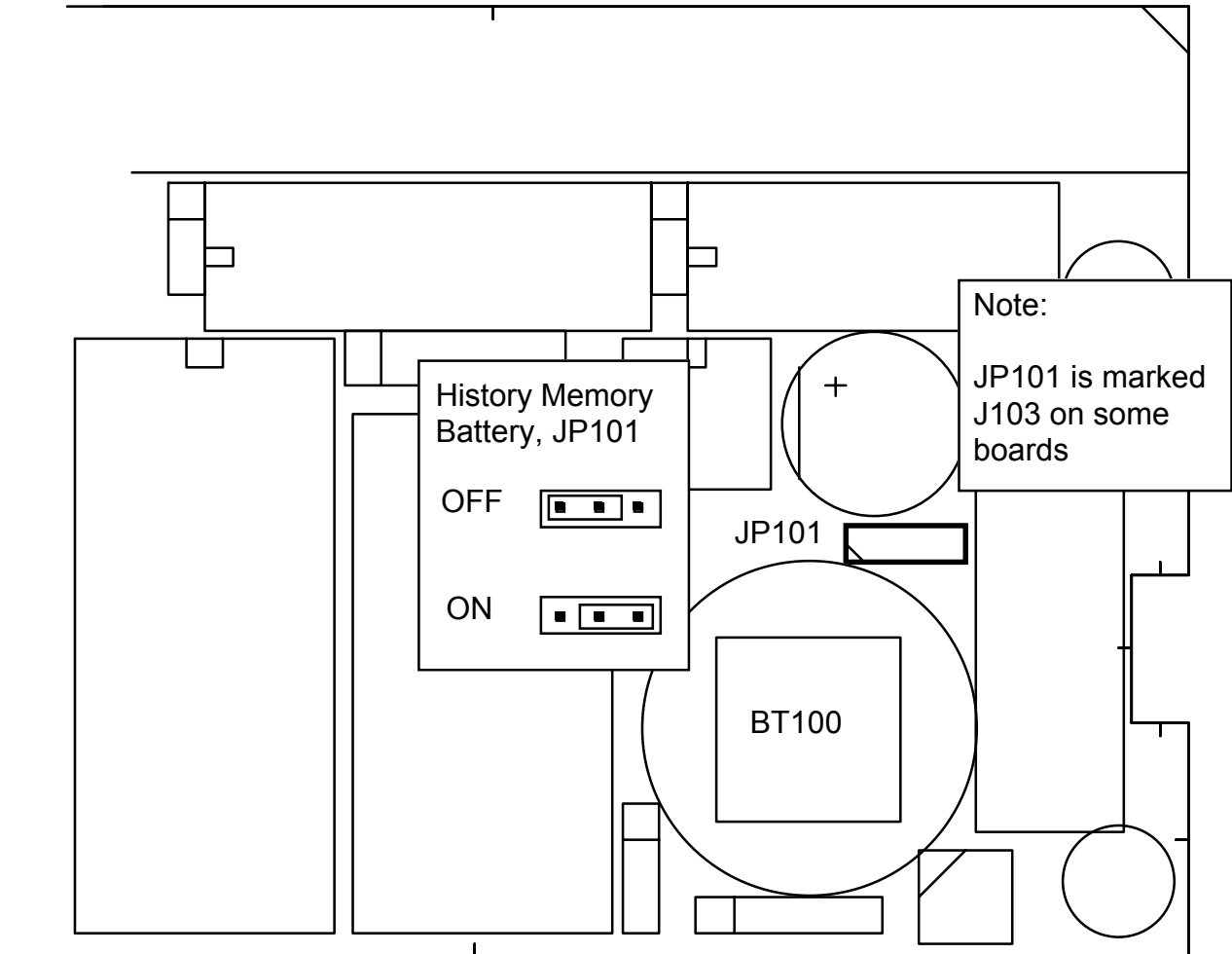
**Fig. 4.6 NMEA Connection**

This connection gives the opportunity to receive information concerning position, course, speed and UTC from external sources through the NMEA0183- protocol.



# Terminal Board

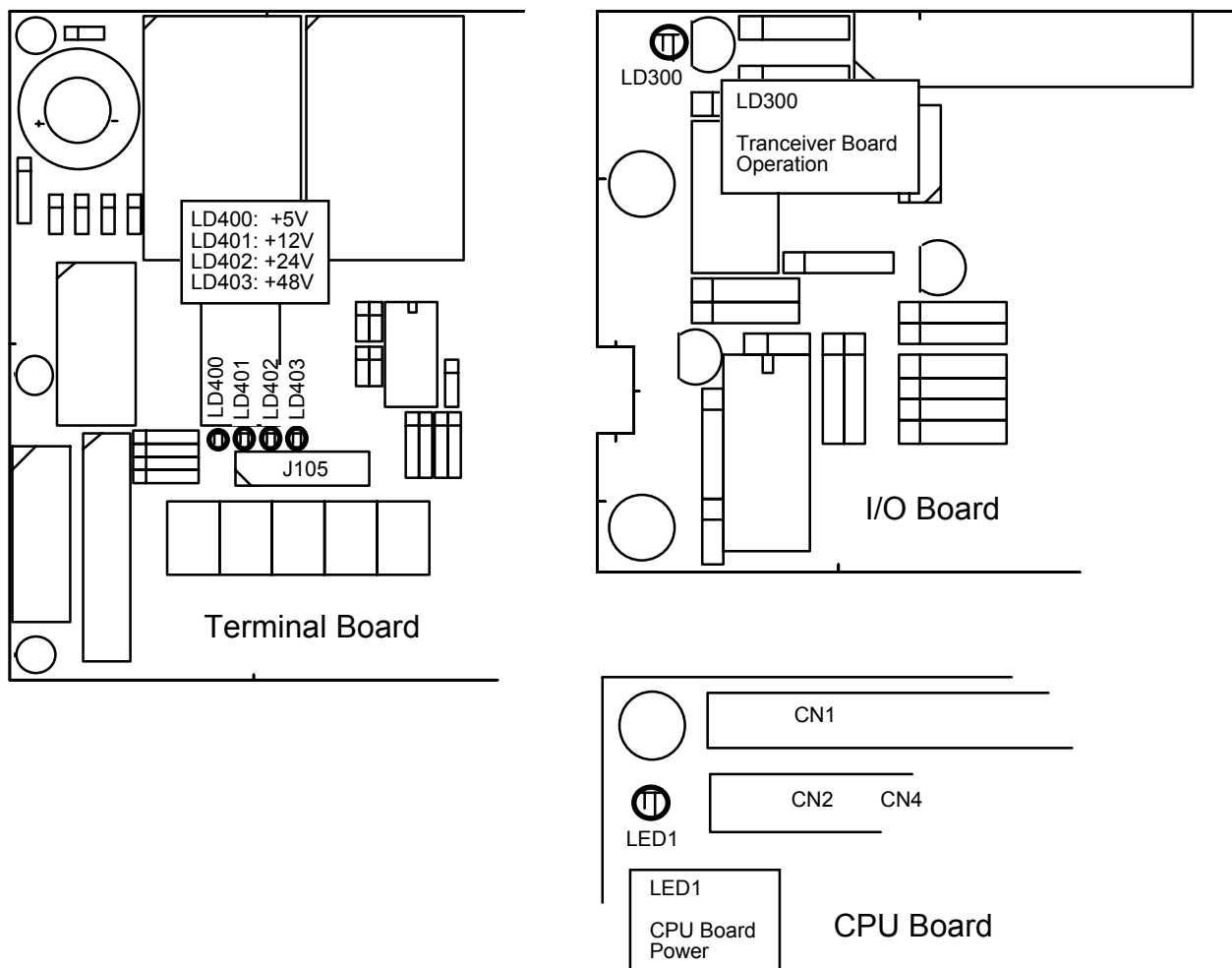
**Fig. 4.4 Voltage selection connectors and fuses, Terminal Board.**



**Fig. 4.5 History Memory Battery Jumper, I/O Board.**

### **Back-up Battery Jumper**

After installation is complete and system power is applied, it is necessary to connect the history memory battery to provide power to the History Memory during system power failure. Refer to Fig. 4.5 for the correct setting of the History Memory battery jumper "ON" position. This jumper should be set to the "OFF" position only during extended unit storage periods. The onboard battery is loaded only when no power is applied to the power terminals.



**Fig. 4.6 Function LED's, Terminal, I/O and CPU Boards.**

### Power Indication and function LED's.

The following LED's are located on the Terminal Board:

LD400	+5V
LD401	+12V
LD402	+24V
LD403	+48V

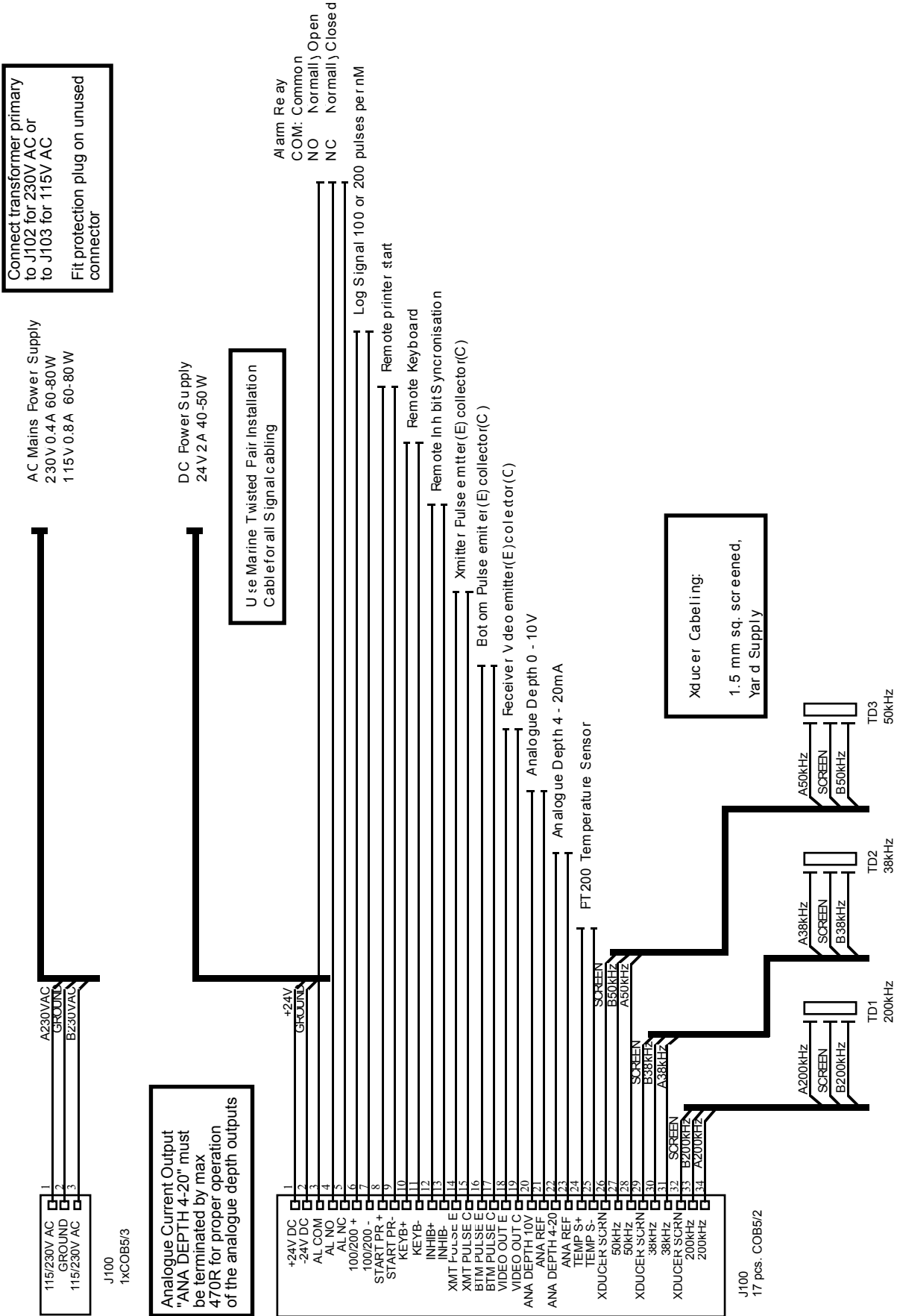
The following function LED is located on the I/O Board:

LD300	Tranceiver board operation
-------	----------------------------

There is one function LED on the CPU board

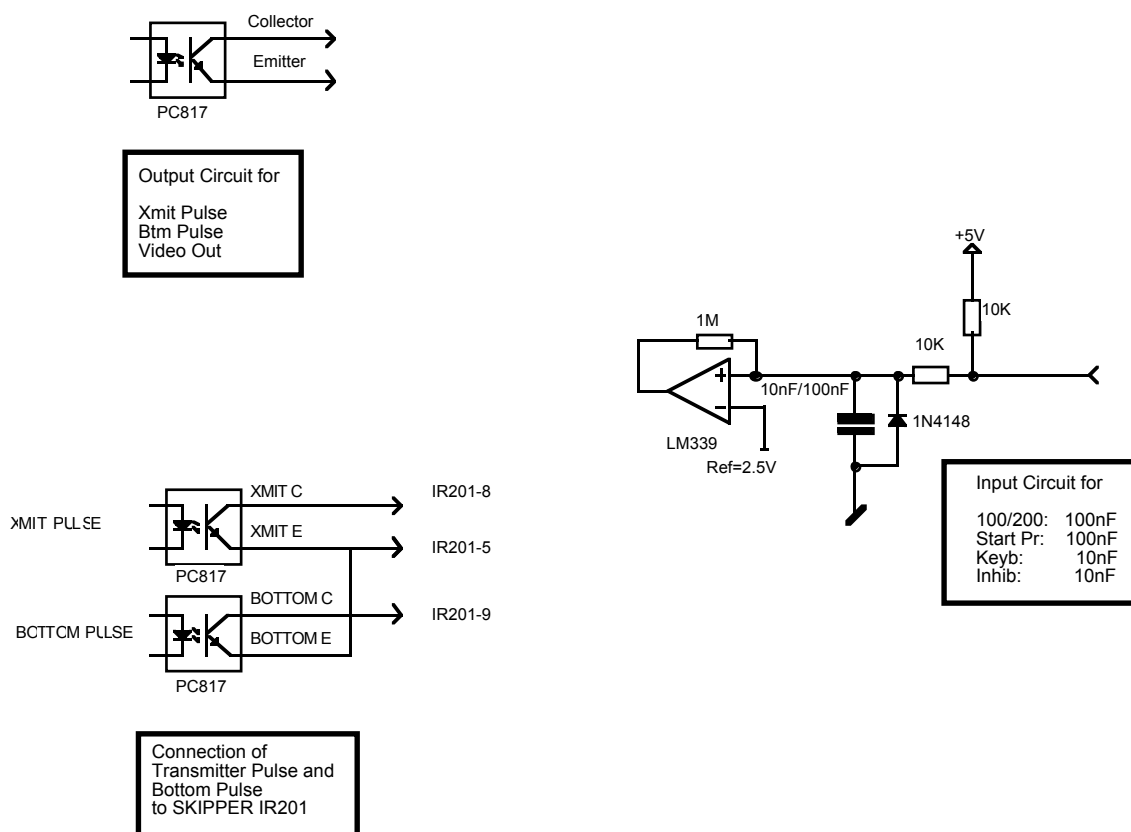
LED1	CPU board power
------	-----------------

Fig. 4.6 indicates position of these LED's.



**Fig. 4.7 Main Wiring Diagram.**





**Fig. 4.8 Input/Output Circuitry.**

## INTERFACING

### ALARM RELAY

An alarm relay is provided for interconnection to external alarm systems. This relay is normally energised, and is released by alarm conditions or power failure/power off. See Fig. 4.7.

The terminals have the following significance:

- ALCOM Common Terminal.
- ALNC Normally closed Contact (Normal = “No alarm” condition)
- ALNO Normally open Contact

### LOG PULSE INPUT

See Fig. 4.7 and 4.8.

Pulse input terminals are as follows:

- 100/200 + Log Pulse Input +.
- 100/200 - Log Pulse Input -.

Refer to Screen 9 for selection of the log pulse rate.

## EXTERNAL PRINTER CONTROL INPUT

See Fig. 4.7 and 4.8.

Printer control input terminals are as follows:

STPRINT +      Printer Control Input +.  
STPRINT -      Printer Control Input -.

Refer to Screen 4 for selection of the printer control signal polarity and function option. Function options are described in chapter 3.

## TRANSMITTER AND BOTTOM PULSE OUTPUTS

See Fig. 4.7 and 4.8.

Pulse output terminals are as follows:

XMIT C          Collector of Output Opto Coupler, Transmitter Pulse.  
XMIT E          Emitter of Output Opto Coupler, Transmitter Pulse..

BOTTOM C      Collector of Output Opto coupler, Bottom Pulse.  
BOTTOM E      Emitter of Output Opto coupler, Bottom Pulse.

## ANALOGUE INTERFACES

GDF201 is equipped with analogue outputs to supply analogue repeaters or other equipment with analogue inputs. The signals are galvanically connected to the GDF201. Standard range is 0 - 10V or 4 - 20mA corresponding to Shallow Max, Deep Max Settings. These settings may be accessed on Screen 9.  
See Fig. 4.7.

Analogue outputs from the GDF201 have the following significance:

ANA 10V        Positive analogue voltage output  
ANA REF        Negative analogue reference

ANA 20MA      Positive analogue current output  
ANA REF        Negative analogue reference

---

## NMEA INTERFACE

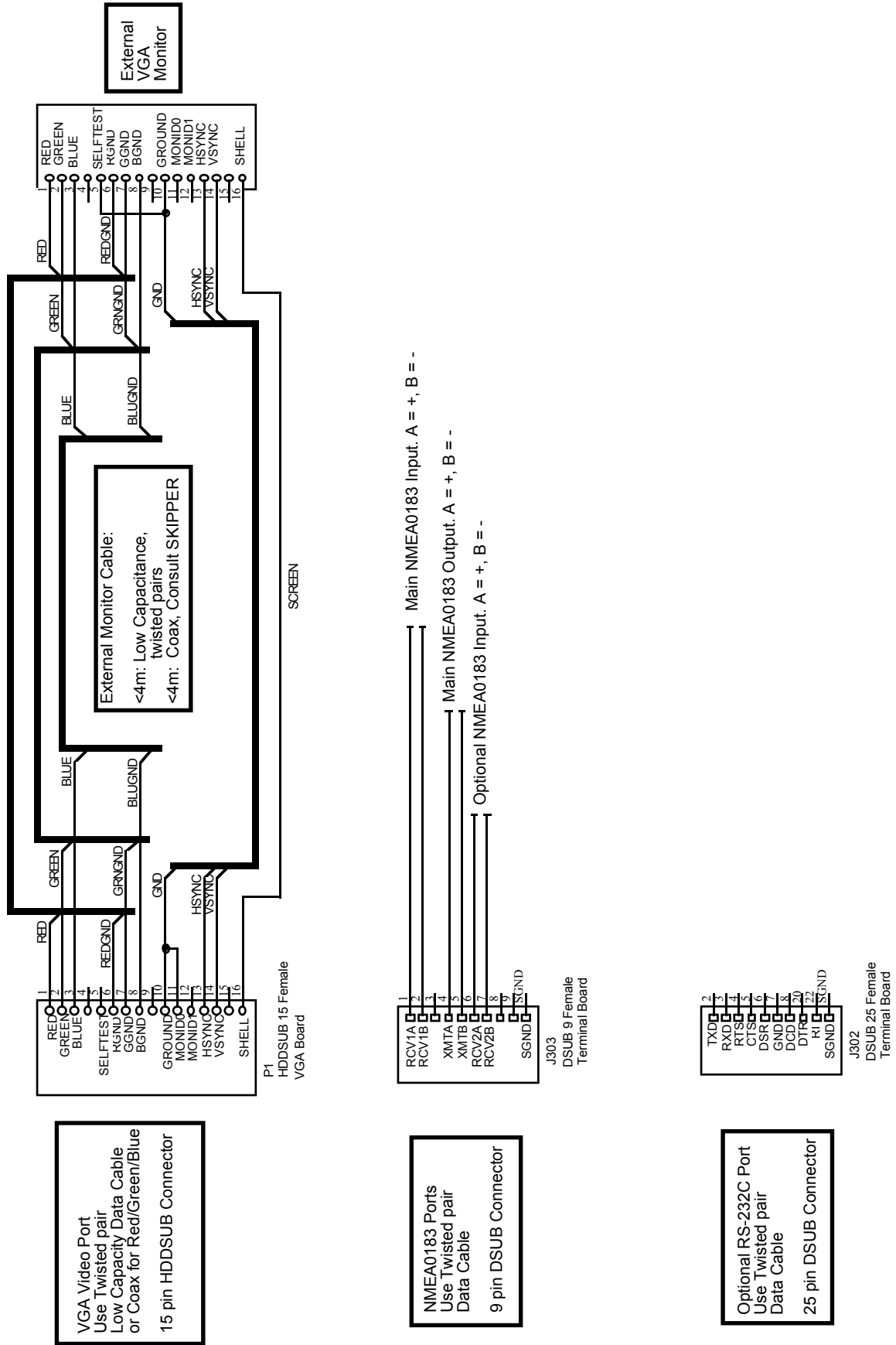
The NMEA output provides NMEA0183 format depth information for other equipment with NMEA0183 inputs. Baud rate is 4800 or 9600, 8 bit, No parity. Several messages may be selected on Screen 11 and the enabled messages are transmitted every second.

The NMEA inputs accept position, speed, heading and UTC time messages from various navigators, compasses or speed logs.

The two inputs provided may be connected to different talkers, and both data streams will be received. There is one output that will drive minimum of 10 standard NMEA0183 inputs

The NMEA0183 output and inputs are available on the J303 connector according to the diagram in fig. 4.9.

See Section **5, Start-up and system adaption**, for a complete list of transmitted and received messages.



**Fig. 4.9 Data Communication Interfaces.**

---

## OPTIONS.

### REPEATERS/SLAVES

Graphic CRT(VGA) or LCD displays or digital depth slave repeaters may be connected to the system. The graphic repeaters require the installation of line driver units dependant on the distance between the main system and the repeater. See Fig. 4.7 and 4.9.

### REMOTE SOUNDING CONTROL.

This option lets the GDF201 being controlled remotely in synchronised, burst or single ping modes. If installed, these options are accessible on Screen 9. See Fig. 4.7 and 4.8.

Sounder remote control terminals are as follows:

INHIB +	Control Signal Input +.
INHIB -	Control Signal Input -.

Refer to Screen 9 for selection of the control signal polarity.

---

## 5. START-UP AND SYSTEM ADAPTION

### SYSTEM ADAPTION

#### ANALOGUE OUTPUT AND LOG PULSE INPUT RANGE SELECTION.

From Screen 9 it is possible to set number of pulses per nautical mile (100 or 200) for the log pulse input. Shallow and deep range limits for the analogue output may also be set, e.g.

50 m corresponding to 10V or 20 mA and  
0 m corresponding to 0V or 4 mA.

#### CALIBRATION, SOUND SPEED.

The only calibration activity necessary is when the Sound Speed option is installed. In this case, set the required sound Speed value in Screen 6.

#### LANGUAGE AND UNITS OF MEASURE

From Screen 8 it is possible to select different languages and units of measure for the screen and printer character strings.

The available languages are: English, French, Spanish, Russian, German and Norwegian.

Units of measure may be selected for:

Depth: meters, feet, fathoms, braccias.  
Picture Speed: min:sec, nm/div, km/div, miles/div.  
Vessel Speed: knots, km/h, miles/h.  
Sound Speed: m/s, feet/s.

#### EXTERNAL PRINTER CONTROL

The printer operation may be controlled from an external system, e.g. manoeuvre recorder. The following function options are available on Screen 9:

STPRINT	positive/negative	Select Polarity of active Control Signal.
STPRINT	continuos	The printer is only controlled locally and is not affected by the external signal.
	edge	The printer is started by an active signal edge and will run until it is stopped locally.
	level	The printer is controlled by the signal level. An active level keeps the printer running, a passive level stops the printer.

## NMEA SETUP

Screen 11 is used for verification of received NMEA messages and control of transmitted NMEA depth messages. The baud-rate may be set to 4800 or 9600, 4800 being the more common.

When a NMEA talker is connected to one of the GDF201 inputs, all received messages will be displayed on the screen.

If no messages are displayed, check the signal polarity and the baud-rate.

The following messages are accepted for input to GDF201 and interpreted by the program. The talker identifier is ignored:

### Time

Universal Time	ZZU,xxxxxx
Universal Time & Local	ZLZ,xxxxxx,xxxxxx,-xx
Day, Month, Year	ZDA,xxxxxx,xx,xx,xxxx,-xx

### Position

Geographical Lat/Lon	GLL,xxxx.xx,N,xxxx.xx,W
Geographical Fix, present	GXP,xxxxxx,xxxx.xx,N,xxxx.xx,W,cccc,x
Omega Fix, present	GOP,xxxxxx,xxxx.xx,N,xxxx.xx,W,cccc
Loran C Fix, present	GLP,xxxxxx,xxxx.xx,N,xxxx.xx,W,cccc
GPS Position	GGA,xxxxxx,xxxx.xxx,N,xxxx.xxx,W,x

### Heading

Heading, true, present	HDT,xxx.,T
Heading, magnetic, present	HDM,xxx.,M
Heading, compass	HCC,xxx.

### Speed

Dual Doppler Vector	VBW,uxx.xx,uxx.xx,a,uxx.xx,uxx.xx,a
---------------------	-------------------------------------

### Composite

Loran C specific	RMA,a,xxxx.xx,N,xxxx.xx,W,,xx.x,xxx.,*xx
GPS, Transit specific	RMC,xxxxxx,a,xxxx.xx,N,xxxx.xx,W,xx.x,xxx.,xxxxxx.,*xx
Vessel Identification	IMA,aaaaaaaaaaaa,aaaxxxx,xxxx.xx,N,xxxx.xx,W,xxx.x,T,xxx.,M,xx.x,N
Track & Ground speed	VTG,xxx.,T,xxx.,M,xx.x,N,xx.x,K
Heading & Water speed	VHW,xxx.,T,xxx.,M,xx.x,N,xx.x,K

The following messages may be transmitted (Selected from Screen 11 and dependant on the DRAUGHT setting). The messages are enabled individually. Transmitted talker identifier is SD, **S**ounder **D**epth:

Depth & Draught	SDDPT,xxxx.x,xxxx.x
Depth below surface	SDDBS,xxxx.x,f,xxxx.x,M,xxx.x,F
Depth below transducer	SDDBT,xxxx.x,f,xxxx.x,M,xxx.x,F
Depth below keel	SDDBK,xxxx.x,f,xxxx.x,M,xxx.x,F

**PERFORMANCE**

Depth Range:	10 - 1600 m	
Graphic resolution:	0.5% of Range	
Digital resolution:	<10 m: 0.1 m	
	≥10 m: 1 m	
Max. Power	2kW	
Transducer, 38 kHz	Effective Range	1600m
Transducer, 50 kHz	Effective Range	1000m
Transducer, 200 kHz	Effective Range	500m

**ENVIRONMENTAL****Transducer**

Operating temperature	0 - 50°C
Storage temperature:	-20 - 70°C
Protection, Transducer:	6 bar
Protection, parts inside hull:	IP66

**Operator Unit Cabinet**

Supply voltage:	24V DC (20-32V)
Power consumption:	50W at 24V, 70W at 220V
Alarm relay:	Change-over contact, max. 24V 300 mA
RS232 port:	Standard 25 pin D-Sub Connector.
NMEA port:	9 pin D-Sub. 2 Inputs, 1 Output.
Operating temperature:	0 - 40 °C
Storage temperature:	-20 - +70 °C
Humidity:	10 - 90% relative, no condensation.



---

**OPTIONS****EXTERNAL PING CONTROL.**

When this option is installed, transmitter operation may be controlled by the external INHIBIT signal. The active polarity of this signal may be set on Screen 9. The following function options are available on Screen 3:

PING	continuous	Transmitter operation is continuous and not affected by the external signal.
	edge	The transmitter is activated <u>once</u> by an active signal edge.
	level	The transmitter is controlled by the external signal level. An active level keeps the transmitter running, a passive level stops the transmitter.
	single	The transmitter is activated ping by ping by pressing the PICTURE SPEED button on the Operator panel. The external INHIBIT signal is disabled.

## 6. CONFIGURATION OF TRANSMITTED POWER LIMITS.

Some Transducers will not tolerate the power (Voltage levels) given by the GDF 201 . The Units with serial number 081163 onwards have a facility to force the maximum power settings. Reducing the risk of causing damage.

Software requirements:

GDF201 sw version from 3.01.02

STARTUP.EXE utility version from 1.01.12

1. To enter GDF201 configuration mode:

- Switch off the mains inside the cabinet.
- Press “Brightness” key on the remote keyboard, switch on the mains and keep the brightness key pressed until you see the message “You may release hidden button” on the screen.

2. After few diagnostic messages, 6 soft-keys will appear in the lower part of the screen. Five soft keys (1-5) allow setting the maximal transmitted power at each of 3 transceiver channels (38/50/200 KHz).

3. The softkeys on the screen correspond to the push buttons in the upper row of the remote keyboard. Note, that it does not matter which key (“up” or “down” is pressed).

4. By setting ON “-3db” softkey, the maximal transmitted power, will be reduced by the factor of 2 (50% of maximal). By setting ON “-6db” softkey, the maximal transmitted power will be reduced by the factor of 4 (25% of maximal). By setting ON both “-3db” and “-6db” softkeys, the maximal transmitted power will be reduced by the factor of 8 (12,5% of maximal). Note, that by maximal transmitted power is meant the power, which corresponds to 100% setting on GDF201 operator panel

-3dB	-6dB	% of full power
OFF	OFF	100%
ON	OFF	50%
OFF	ON	25%
ON	ON	12.5%

5. Note, that for channel 38KHz only “-6db” selection is available.

6. After the power limits have been set as desired, press “Continue” button. Configuration will be written into the executable file and will not be changed by Master Reset procedure.

## 7. SPECIFICATIONS

### DIMENSIONS

Operator unit cabinet	Height, front	340 mm
	Width	320 mm
	Depth	170 mm
	Weight	appx.10 kg
Hand controller	Height, front	87 mm
	Width	147 mm
	Depth	26 mm
	Weight	appx.0,2 kg
Operator Unit Cabinet, Cut-out for flush Mounting	H x W	322 x 302 mm
	Corner Radius	4 mm
Operator Unit Cabinet, Space for Paper Replacement	Below opened Door	70 mm

### FUNCTIONAL PROPERTIES

A-Scope	A-Scope on the right side	
Bottom Expansion	Bottom expansion on the screen	
Depth Alarms	Deep and shallow Limits.	
Sound speed	Sound speed calibration	
Calendar/Clock	Year-Month-Day / Hours-Minutes-Seconds (24 hour system).	
Interface Outputs	Trigger- and Bottom-Pulses.	
	analogue 4-20 mA and 0 - 10 V for Depth. Detected Video.	
	NMEA 0183 for Depth.	
	Alarm Relay.	
	Output for VGA Repeater.	
	RS-232 C.	
	100/200 Pulses for Speed.	
	NMEA0183 for Speed, Position, Heading and Time.	
	Temp. Sensor Input.	
	Remote Printer Start.	
Interface Inputs	English, French, Spanish, Russian, German and Norwegian.	
	SKIPPER IR201 digital remote depth Indicator.	
	LCD Repeater.	
	Remote Keyboard for use with Repeater.	
	Dual Frequency Screen.	
	Remote Sounding Control.	
	Auto Range	
	Supply voltage:	220V or 110V AC
	Languages	
	Options	

## **8. SERVICE**

All service requests should be made to the local SKIPPER representative.

Adjustments and repairs should only be performed by qualified service engineers, and unqualified repair attempts will void the warranty.

Please find your local dealer at **[www.skipper.no](http://www.skipper.no)**.

