CONTENTS

Chapter 1  INTRODUCTION  ........................................ 2
           BEFORE OPERATION  .................................. 3
           FOR YOUR SAFETY  .................................. 4
           SUPPLIED COMPONENTS  .............................. 6
           INSTALLATION  ....................................... 7
           FUNCTION EXPLANATION  ............................. 11
           MODE EXAMPLE  ....................................... 12

Chapter 2  INITIAL SETTINGS ................................ 13
           FACTORY SETTINGS  .................................. 14

Chapter 3  FUNCTION SETTINGS  .......................... 17
           RANGE SETTINGS  .................................... 19
           FUNCTION SETTINGS  ................................. 21

Chapter 4  FRONT CONTROL PANEL OPERATION .............. 57
           DISPLAY MODE  ...................................... 58
           DIAL OPERATION  ..................................... 59
           KEY OPERATION  ....................................... 68

Chapter 5  OPTION  ............................................. 76
           OPTIONAL CONNECTOR KIT  ........................... 76
           INTERFACE CONNECTIONS  ......................... 77

SPECIFICATIONS  ........................................... 78
Thank you for purchasing the ES-7100.

This operation manual provides complete information on safely operating

the high performance Color Echo Sounder ES-7100
to its full potential.

Before operating this equipment, please read this manual thoroughly to understand the operation to avoid any trouble and possible injury in advance.

<table>
<thead>
<tr>
<th>BEFORE OPERATION</th>
<th>SYMBOLS</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAUTION NOTE</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>KEYBOARD DESCRIPTION</td>
<td>3</td>
</tr>
<tr>
<td>FOR YOUR SAFETY</td>
<td>ENVIRONMENTAL CONDITIONS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CONVENIENT LOCATION</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>POWER REQUIREMENTS</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>HANDLING</td>
<td>5</td>
</tr>
<tr>
<td>SUPPLIED COMPONENTS</td>
<td>COMPOSITION</td>
<td>6</td>
</tr>
<tr>
<td>INSTALLATION</td>
<td>DIMENSIONS</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>MAIN UNIT MOUNTING</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>REAR PANEL</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>CONNECTIONS</td>
<td>10</td>
</tr>
<tr>
<td>FUNCTION EXPLANATION</td>
<td>CONTROL PANEL</td>
<td>11</td>
</tr>
<tr>
<td>MODE EXAMPLE</td>
<td>DISPLAY</td>
<td>12</td>
</tr>
</tbody>
</table>
SYMBOLS

© The following conventions are used in this manual.

Before using this unit, make sure to understand the following,
which are used throughout this manual.

⚠️ DANGER ⚠️ : indicates and imminently hazardous situation which,
if not avoided, will result in death or serious injury.

⚠️ WARNINGS ⚠️ : indicates a potentially hazardous situation which,
if not avoided, will result in death or serious injury.

⚠️ CAUTIONS ⚠️ : indicates precautionary measures to avoid potential
problems.

NOTE ! : indicates contents for the user's reference.

(cf) : see the page.

CAUTION NOTE

© This manual contains important information about the ES-7100.

© In order to fully understand the operation, and know detailed
information for your safety, please read this manual carefully.

© Keep this operation manual in a safe place where it is easy to find.
When you give this unit to someone else, make sure to give this manual,
too.

© Any use other than that mentioned in this manual is not guaranteed.

© The contents in this manual are subject to change without notice or
obligation.

© Please contact us if you should have any questions regarding the use of
this equipment.

KEYBOARD DESCRIPTION

© One beep will advise you when a right function is performed.
Three beeps will advise you when a wrong operation or a wrong
key is pressed.
FOR YOUR SAFETY

ENVIRONMENTAL CONDITIONS

⚠️ WARNINGS ⚠️
- Keep the equipment away from flammable gas. It will cause fire.

⚠️ CAUTIONS ⚠️
- Pay attention to the following environmental conditions on mounting, otherwise the equipment may become heated causing trouble and malfunction.
  - It is recommended that it will be mounted in a location which provides protection from spray or heavy vibration.
  - Do not bring any other heated object close to the equipment.
- Do not bring any magnetic object close to the equipment.

CONVENIENT LOCATION

⚠️ WARNINGS ⚠️
- Find a convenient location. The ES-7100 may be mounted upright on any level surface and tighten securely.
- Make sure the following on wiring. Otherwise damage or fire may occur.
  - Take care of connecting the cables not to be disturbed the operation.
  - Do not use the cables bent, twisted or stretched by force.
  - Do not put heavy objects on the cables.

⚠️ CAUTIONS ⚠️
- When removing/plugging in cables, make sure to turn the power off. Never pull cables, otherwise it may damage the unit and result in fire or electrical shock.
POWER REQUIREMENTS

**WARNINGS**
- Operating voltage: 10.5 to 40 volts DC

  Please use correct voltage, otherwise, it will lead to fire or electric shock, or damage to the unit.

**CAUTIONS**
- Make sure to turn off the power by the power "ON/OFF" keys on the control panel. Turning on/off the power by the ships switchboard may damage the unit or cause problems with operations.
- When starting the vessel's engine, make sure the power of this unit is turned off, otherwise it may cause problems with the unit.

HANDLING

**DANGER**
- Do not control this unit while steering.

  It could result in collision and serious injury or damage.

- Do not open the main unit case.

  Otherwise electrical shock, damage, and serious bodily injury to user may result.

  For inspection/adjustment/parts installation/repair, please ask your dealer. There is a high voltage component inside, and it will result in electric shock.

- The sufficient reinforcement and water tightness should be made when installing the transducer.

  It could result in collision and serious injury or damage.

**WARNINGS**
- Please use the specified fuse.

  If not, it could result in malfunction and / or fire.

- Please use the specified power supply cable cords.

  Using cables other than those specified could generate heat and result in burns, bodily injury and fire.

- When replacing batteries,
  - Insert new batteries. Be sure that the polarity (+, -) is correct.
  - Never subject batteries to very hot or cold temperatures, or disassemble or dump into fire/water,
  - Never use batteries with fluid leaking out.
# SUPPLIED COMPONENTS

## COMPOSITION

The following items are shipped with the unit.

<table>
<thead>
<tr>
<th>CODE</th>
<th><strong>RD110</strong></th>
<th><strong>RD130</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ITEM</td>
<td>MAIN UNIT</td>
<td>MOUNTING</td>
</tr>
<tr>
<td></td>
<td>Bracket</td>
<td>PLATE</td>
</tr>
<tr>
<td>PARTS#</td>
<td>34808C</td>
<td>34556C</td>
</tr>
<tr>
<td>QTY</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CODE</th>
<th><strong>RD001</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ITEM</td>
<td>TRUSS SCREW</td>
</tr>
<tr>
<td>PARTS#</td>
<td>M8 X 15</td>
</tr>
<tr>
<td>QTY</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CODE</th>
<th><strong>RA121</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ITEM</td>
<td>MANUAL</td>
</tr>
<tr>
<td>PARTS#</td>
<td>ES7100-OPM-E</td>
</tr>
<tr>
<td>QTY</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**: The code number is shown on the packages. However, ** indicates the lot management number.
DIMENSIONS

WEIGHT : 9 kg (including mounting bracket)

TEMPLATE FOR INSTRUCTIONS
(MOUNTING PLATE)
MAIN UNIT MOUNTING

1. Using the attached tapping screws (6 pcs), secure the mounting plate to the site selected.
2. Adjust the truss screws (2 pcs) to select a comfortable viewing angle of the display unit.
3. Insert the cabinet with the bracket into the gutter of the mounting plate. Tighten 2 hexagonal bolts at the notches.

MAIN CABINET with ACCESSORIES
DISPLAY CABINET.............................. 1
BRACKET........................................ 1
MOUNTING PLATE............................... 1
TRUSS SCREW (M8-15)........................... 2
TAPPING SCREW (M5-30)....................... 6
HEXAGONAL BOLT (M6-20)..................... 2

⚠️ WARNING

○ The unit should be installed on a flat surface. Do not use the unit while tentatively installed, otherwise it may cause trouble.

⚠️ CAUTION

○ Make sure the unit is not close to any inverters, converters, or transformers that interfere with the sonar performance.
○ Install the unit in a location away from salt spray, heat sources and direct sunlight.
REAR PANEL

IN/OUT TERMINALS (OPTION)
- Refer to the page 76.

4 PIN TEMPERATURE SENSOR CONNECTOR
- To connect temp. sensor (OP-102)

EARTH TERMINAL

3 PIN TRANSDUCER CONNECTOR
- To connect transducers (high/low frequency)

FUSE HOLDER
- Please use fuses as follows:
  12V → 8A
  24V → 5A
  32V → 3A
When changing the voltage, please change to the correct fuse.

2 PIN POWER SUPPLY CONNECTOR
- Operating voltage: 10.5 to 40 volts DC
CONNECTIONS

<table>
<thead>
<tr>
<th>PIN</th>
<th>SIGNAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1</td>
<td>WHITE</td>
</tr>
<tr>
<td>No. 2</td>
<td>SHIELD</td>
</tr>
<tr>
<td>No. 3</td>
<td>NC</td>
</tr>
<tr>
<td>No. 4</td>
<td>BLACK</td>
</tr>
</tbody>
</table>

© IN THE CASE OF PIN NO. 1 AND NO. 3, CONTRARY CONNECTING IS ALLOWED. (No. 1: WHITE No. 3: BLACK)

⚠️ WARNINGS

○ Power requirement: DC10.5 - 40V, Using any power voltage other than the indicated voltage can cause it to lead to fires or electric shocks.

○ Use the indicated power supplied cables. Using any power supplied cable other than the indicated cable can cause it to lead to fires.

○ The ES-7100 must be turned off while connecting/disconnecting the cables. Otherwise the cables may be damaged and result in fires or electric shocks.

○ Do not use the cables bent, twisted or stretched by force. Do not put heavy objects on the cables. Otherwise the cables may be damaged and result in fires or electric shocks.
BETJENINGS PANEL

Lagrer bruker innstillinger.
Side.68

Ekspansjon:
Valg av øvre start punkt for ekspansjon. Side.69

Markør linje. Lager en vertikal linje på skjermen.
Side.73

Innstilling av høy frekvens.
Side.74

Innstilling av lav frekvens.
Side.74

Innstilling av frekvens.
Side.59

Far Gain:
Justerer forstærkningen på dypt vann.
Side.66/67

AV-PÅ knapp:
Hold knappen inne til bilde kommer på skjerm.

Lagrer instillinger/Leser Innst.
*Lagrer data fra Høyre side av skjerm.
*Viser data på venstre side av skjerm.
Side.68

Fasing.
Side.70

Terskel: Side.74
valg av farger som skal vises.

Bildehastighet.
Side.72

Ekspansjon knapp.
Side.75

Dybde instilling.
Side.70

Valg av bilde på skjerm.
Side.60

FORSTERKNINGS KONTROLL.
Justering av forstærkningen på innkommende ekko.
Side.65

LYSSTYRKE.
Side.64
NB!: * Ekstra utstyr må tilkobles.
FUNCTION EXPLANATION

CONTROL PANEL

OPERATION MODE KEY:
- Calls up the user-defined setting or changes the settings.
  \[\text{CF} \text{ PAGE 68}\]

EXPANSION / VRM KEY:
- Selects the upper expansion start point for Partial expansion mode.
  \[\text{CF} \text{ PAGE 69}\]

MARK KEY:
- Enters a vertical mark on the display.
  \[\text{CF} \text{ PAGE 73}\]

HIGH FREQUENCY KEY:
- Adjusts and changes the functions of the high frequency.
  \[\text{CF} \text{ PAGE 74}\]

LOW FREQUENCY KEY:
- Adjusts and changes the functions of the low frequency.
  \[\text{CF} \text{ PAGE 74}\]

FREQUENCY SELECTION DIAL:
- Select the frequency.
  \[\text{CF} \text{ PAGE 59}\]

FAR GAIN DIAL:
- Adjusts presentation of received echo in the long range.
  \[\text{CF} \text{ PAGE 66/67}\]

POWER KEY:
- Turns on or off the power.
  To turn on the power, press and hold the ON key till a picture appears on the screen.
  To turn the power off, hold OFF key for a while.

MEMORY WRITE / READ KEY:
- MEMORY WRITE KEY inserts data of the right half of the screen.
- MEMORY READ KEY displays insertion of data on the left side of the screen.

PHASED RANGE KEYS:
- Adjust the scale/range of depth between available values.

THRESHOLD KEY:
- Displays and erases colors from the color threshold.

PICTURE SPEED KEY:
- Selects the rate of picture movement.

EXPANSION RANGE KEY:
- Selects the expansion ranges for Partial and Bottom expansion modes.

RANGE KEY:
- Selects the basic range for Normal mode.

MODE SELECTION DIAL:
- Selects the display mode.

GAIN DIAL:
- Adjusts presentation of received echo.

BRIGHTNESS DIAL:
- Select the level of brightness.

BRIGHTNESS DIAL:
\[\text{CF} \text{ PAGE 64}\]
The below shows an example for Normal mode. Bottom expansion mode and partial expansion mode are different from this display.

NOTE: * Optional equipments required
INITIAL SETTINGS

This chapter explains the initial function settings and return to factory settings of the ES-7100 Echo sounder.

INITIAL SETTINGS

FACTORY SETTINGS ------------------------ 14
RETURN TO FACTORY SETTINGS --------- 16
(INITIAL SETTINGS)
USER SETTINGS ------------------------ 16
This equipment is shipped from the factory with the functions under the following settings. The user is able to re-set these functions if/as desired with the user setting mode, MODE SELECTION DIAL 6.

<table>
<thead>
<tr>
<th>FUNCTION SET • LOW</th>
<th>FACTORY SETTING (in the box)</th>
<th>USER MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAIN UP</td>
<td>OFF • +10 • +20 • +30 • +40</td>
<td>Mode SELECTION DIAL 6</td>
</tr>
<tr>
<td>TVG</td>
<td>STC • 1 • 2 • 3 • 4</td>
<td>CF page 21-25</td>
</tr>
<tr>
<td>D RANGE (DYNAMIC RANGE)</td>
<td>-3dB • -4dB • -5dB • +6dB • +5dB • +4dB • +3dB</td>
<td></td>
</tr>
<tr>
<td>CLUTTER</td>
<td>OFF • 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10</td>
<td></td>
</tr>
<tr>
<td>TX POWER</td>
<td>A • B • C • D</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FUNCTION SET • HIGH</th>
<th>FACTORY SETTING (in the box)</th>
<th>USER MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAIN UP</td>
<td>OFF • +10 • +20 • +30 • +40</td>
<td>CF page 21-25</td>
</tr>
<tr>
<td>TVG</td>
<td>STC • 1 • 2 • 3 • 4</td>
<td></td>
</tr>
<tr>
<td>D RANGE (DYNAMIC RANGE)</td>
<td>-3dB • -4dB • -5dB • +6dB • +5dB • +4dB • +3dB</td>
<td></td>
</tr>
<tr>
<td>CLUTTER</td>
<td>OFF • 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10</td>
<td></td>
</tr>
<tr>
<td>TX POWER</td>
<td>A • B • C • D</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REDUCTION</th>
<th>FACTORY SETTING (in the box)</th>
<th>USER MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERF RED</td>
<td>OFF • LOW • MIDDLE • HIGH</td>
<td>CF page 26-28</td>
</tr>
<tr>
<td>JAMING RED</td>
<td>OFF • 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9</td>
<td></td>
</tr>
<tr>
<td>NOISE RED</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>WHITE LINE</td>
<td>OFF • LOW • MIDDLE • HIGH</td>
<td>CF page 26-28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SCREEN DIVISION</th>
<th>FACTORY SETTING (in the box)</th>
<th>USER MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTM EXPN</td>
<td>CONSTR1 • CONSTR2 • CONSTR3 • AUTO</td>
<td>CF page 29-31</td>
</tr>
<tr>
<td>SCREEN DIV</td>
<td>VERT • HORIZ</td>
<td></td>
</tr>
<tr>
<td>DUAL FREQ (VERT. SPLIT)</td>
<td>L • H • H / L</td>
<td></td>
</tr>
<tr>
<td>(HORIZ. SPLIT)</td>
<td>L / H • H / L</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DISP ITEM SEL</th>
<th>FACTORY SETTING (in the box)</th>
<th>USER MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPTH DISP</td>
<td>OFF • SMALL • MEDIUM • LARGE</td>
<td>CF page 32-39</td>
</tr>
<tr>
<td>SCALE</td>
<td>OFF • RIGHT • CENTER</td>
<td></td>
</tr>
<tr>
<td>EXPARM</td>
<td>EXP • VRM</td>
<td></td>
</tr>
<tr>
<td>TEMP DISP</td>
<td>OFF • SMALL • LARGE</td>
<td></td>
</tr>
<tr>
<td>TEMP GRAPH</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>COL. SCALE</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>LAT.LONG.</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>SPEED DISP</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>COURSE</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>VOLT DISP</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>MARK</td>
<td>MARK • TIMER</td>
<td></td>
</tr>
<tr>
<td>DISP.POS</td>
<td>LOWER • UPPER</td>
<td></td>
</tr>
<tr>
<td>DEPTH GRID</td>
<td>AUTO • 1 • 2 • 5 • 10 • 20 • 50 • 100</td>
<td></td>
</tr>
<tr>
<td>PICTURE FEED</td>
<td>AUTO • FIXED</td>
<td></td>
</tr>
<tr>
<td>A-SCOPE</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>FUNCTION</td>
<td>FACTORY SETTING (in the box)</td>
<td>USER SETTING MODE</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>UNIT - ADJUST</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEPTH UNIT</td>
<td>m • fm • br • ft</td>
<td></td>
</tr>
<tr>
<td>TEMP UNIT</td>
<td>°C • °F</td>
<td></td>
</tr>
<tr>
<td>SPEED UNIT</td>
<td>kt • k m / h</td>
<td></td>
</tr>
<tr>
<td>TEMP ADJ</td>
<td>+ 0.0 ( -9.9 ~ +9.9)</td>
<td></td>
</tr>
<tr>
<td>DRAFT</td>
<td>00.0 ( 00.0 ~ 99.9)</td>
<td></td>
</tr>
<tr>
<td>OTHERS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COLOR SET</td>
<td>A-1 • A-2 • B-1 • B-2 • C-1 • C-2</td>
<td>CF</td>
</tr>
<tr>
<td>OUTER DPTH</td>
<td>OFF • ON</td>
<td></td>
</tr>
<tr>
<td>MDR FREQ</td>
<td>LOW • HIGH</td>
<td></td>
</tr>
<tr>
<td>TRIGGER</td>
<td>INTRNL • EXTRNL</td>
<td></td>
</tr>
<tr>
<td>ECHO SIG</td>
<td>INTRNL • EXTRNL</td>
<td></td>
</tr>
<tr>
<td>OUTPUT</td>
<td>OFF • 183N • 183T • 600S</td>
<td></td>
</tr>
<tr>
<td>TRANS RATE</td>
<td>LOW • MEDIUM • HIGH</td>
<td></td>
</tr>
<tr>
<td>PULSE</td>
<td>NARROW • NORMAL • WIDE • 0.3(0.3 ~ 3.6)</td>
<td></td>
</tr>
<tr>
<td>PANEL BRIGHT</td>
<td>DARK • BRIGHT</td>
<td>CF</td>
</tr>
<tr>
<td>OPE. MODE</td>
<td>0 • 1</td>
<td></td>
</tr>
<tr>
<td>SHIFT AR</td>
<td>1 • 5 • 10 • 50 • 100</td>
<td></td>
</tr>
<tr>
<td>TEMP SENSOR</td>
<td>OP-102 • OP-41 • NMEA-0183</td>
<td></td>
</tr>
<tr>
<td>ASHIFT LIMIT</td>
<td>999 (010 ~ 999)</td>
<td></td>
</tr>
<tr>
<td>TRIG SYNC</td>
<td>OFF • ON</td>
<td></td>
</tr>
<tr>
<td>RANGE SET</td>
<td>LINKED • SINGLE</td>
<td></td>
</tr>
<tr>
<td>ALARM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHALLOW</td>
<td>OFF • 0000 (0000 ~ 3999)</td>
<td>CF</td>
</tr>
<tr>
<td>DEEP</td>
<td>OFF • 0000 (0000 ~ 3999)</td>
<td></td>
</tr>
<tr>
<td>FISH</td>
<td>OFF • 6 (1 ~ 7)</td>
<td></td>
</tr>
<tr>
<td>TEMP MAX.</td>
<td>OFF • 35.0 (00.0 ~ 35.0)</td>
<td></td>
</tr>
<tr>
<td>TEMP MIN.</td>
<td>OFF • 00.0 (00.0 ~ 34.9)</td>
<td></td>
</tr>
<tr>
<td>TEMP RANGE</td>
<td>OFF • 00.0 (00.0 ~ 09.8)</td>
<td></td>
</tr>
<tr>
<td>FISH ALARM</td>
<td>LOW • HIGH</td>
<td></td>
</tr>
</tbody>
</table>

- The range can be set freely.

<table>
<thead>
<tr>
<th>MODE SELECTION DIAL</th>
<th>OPERATION MODE</th>
<th>PHASED RANGE</th>
<th>AUTO RANGE</th>
<th>AUTO SHIFT</th>
<th>THRESHOLD</th>
<th>PICTURE SPEED</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (LOW FREQUENCY)</td>
<td>NO SETTING</td>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
<td>7 COLORS</td>
<td>PF/11</td>
<td>NO SETTING</td>
</tr>
</tbody>
</table>

CF page 40-42
CF page 43-51
CF page 52-56
CF page 19-20
CF page 16
RETURN TO FACTORY SETTINGS

Ensure the power supply switch is turned off.
Then while holding the Mark key, press ON key and keep pressing the Mark key until the beep stops.
After this operation all functions will then return to the factory setting.

USER SETTINGS

In addition to the factory settings ES-7100 settings may also be set to functions selected by the user. This function is called USER SETTING.
Range scales, gain control levels, color, power levels, etc. may be tailored by the user to fit his preference. The user may easily set the desired function settings by operating as explained below.
• With this function the user may return to the desired function settings if the unit should become inoperable due to mistaken use of the controls. Please be sure to memorize user settings at the time the unit is first operated. Write down your user settings in case they are accidentally changed, or you wish to use different combinations for different fisheries. i.e. midwater vs. bottom.

1. MEMORIZE USER SETTINGS
• Set all functions and display units to the desired settings.
  Once all functions have been changed, press OFF key to turn the power off.
  Next while pressing the Memory read key, hold the ON key to turn on the power and keep pressing the Memory read key until the beep stops.
• After this operation all functions will be memorized under user setting.

2. RETURN TO USER SETTING
• In case of malfunction, turn the power off once.
  Next while pressing the key, press ON key to turn on the power.
• After this operation all functions will return to the user setting.

3. REVISE USER SETTING
• Reset all functions as required and then memorize the setting using the MEMORIZE USER SETTING procedure as above in 1.

NOTE!

If the Mark key or the Memory read key is released before the beep stops, they will not return to the user setting.
Please note that the user setting will be canceled by doing the factory setting procedure.
Chapter 3

FUNCTION SETTINGS

This chapter provides you the explanation for function settings. Please set each function before using the ES-7100 to suit individual needs.

RANGE SETTINGS
RANGE SET MENU
1. MAIN RANGE --------------- 19
2. SUB RANGE --------------- 20

FUNCTION SETTINGS
SETTING MENU -------------------- 21
FUNCTION SET -------------------- 21
1. GAIN UP ------------------- 22
2. TVG ------------------------ 23
3. D RANGE ------------------- 24
4. CLUTTER ------------------- 24
5. TX POWER ------------------- 25

REDUCTION
1. INTERFERENCE REDUCTION ------- 26
2. JAMMING REDUCTION ------------ 27
3. NOISE REDUCTION -------------- 28
4. WHITE LINE ------------------ 28

SCREEN DIVISION
1. BOTTOM EXPANSION ------------ 29
2. SCREEN DIVISION -------------- 30
3. DUAL FREQUENCY --------------- 31
   DISPLAY LOCATION

<TO BE CONTINUED>
DISPLAY ITEM SELECTION

1. DEPTH DISPLAY SIZE .......................... 32
2. SCALE POSITION .............................. 33
3. EXPANSION/VRM .............................. 33
4. TEMPERATURE DISPLAY ....................... 34
5. TEMPERATURE GRAPH ......................... 34
6. COLOR SCALE ................................. 35
7. LATITUDE/LONGITUDE ......................... 35
8. SPEED DISPLAY ............................... 36
9. COURSE DISPLAY ............................. 36
10. VOLTAGE DISPLAY ............................ 37
11. MARK ....................................... 37
12. DISPLAY POSITION ........................... 38
13. DEPTH GRID ................................. 38
14. PICTURE FEED ............................... 39
15. A-SCOPE ................................... 39

UNIT • ADJUST

1. DEPTH UNIT ................................. 40
2. TEMPERATURE UNIT .......................... 41
3. SPEED UNIT .................................. 41
4. TEMPERATURE ADJUSTMENT ................. 42
5. DRAFT ....................................... 42

OTHERS

1. COLOR SET ................................. 43
2. OUTER DEPT ................................. 45
3. MIR FREQ (PRIMARY FREQUENCY) .......... 45
4. TRIGGER SIGNAL ............................ 45
5. ECHO SIGNAL ............................... 46
6. OUTPUT ..................................... 46
7. TRANSMIT RATE .............................. 47
8. PULSE WIDTH ............................... 47
9. PANEL BRIGHTNESS ......................... 48
10. OPERATION MODE ........................... 49
11. SHIFT AVERAGE ............................. 49
12. TEMPERATURE SENSOR ..................... 49
13. AUTO SHIFT LIMIT .......................... 50
14. TRIGGER SYNCHRONIZATION ............... 50
15. RANGE SET ................................ 51

ALARMS

1. SHALLOW ................................. 52
2. DEEP .................................... 53
3. FISH ...................................... 54
4. TEMPERATURE MAX. .......................... 55
5. TEMPERATURE MIN. .......................... 55
6. TEMPERATURE RANGE ....................... 56
7. FISH ALARM ............................... 56
RANGE SETTINGS

1. MAIN RANGE

© To customize the main ranges.

Example • Factory setting ranges:

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>RANGE</th>
<th>NUMBER</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 0 0 - 0 0 2 5</td>
<td>1</td>
<td>0 0 0 0 - 0 0 5 0</td>
</tr>
<tr>
<td>2</td>
<td>0 0 0 - 0 0 5 0</td>
<td>2</td>
<td>0 0 0 0 - 0 1 0 0</td>
</tr>
<tr>
<td>3</td>
<td>0 0 0 - 0 1 0 0</td>
<td>3</td>
<td>0 0 0 0 - 0 1 5 0</td>
</tr>
<tr>
<td>4</td>
<td>0 0 0 - 0 1 5 0</td>
<td>4</td>
<td>0 0 0 0 - 0 2 0 0</td>
</tr>
<tr>
<td>5</td>
<td>0 0 0 - 0 2 0 0</td>
<td>5</td>
<td>0 0 0 0 - 0 3 0 0</td>
</tr>
<tr>
<td>6</td>
<td>0 0 0 - 0 3 0 0</td>
<td>6</td>
<td>0 0 0 0 - 0 5 0 0</td>
</tr>
<tr>
<td>7</td>
<td>0 0 0 - 0 5 0 0</td>
<td>7</td>
<td>0 0 0 0 - 1 0 0 0</td>
</tr>
</tbody>
</table>

VARIABLE RANGES:
- up to 3000 (m, fm or br)
- up to 6000 feet

© Turn the Mode selection dial to “5” to display the menu below.

- Use the ▲ or ▼ EXP/VRM key to highlight the item to be set.
- Use the ▲ or ▼ Phased range key to set the desired range values.

- Use the ▲ or ▼ EXP/VRM key to highlight the item you want to change.
- Use the ▲ or ▼ Phased range key to set the desired values.
  ▲ : makes the range larger.
  ▼ : makes the range smaller.

© Continuous pressing of the ▲ or ▼ Phased range key will change the range value faster.

© Use the Memory read key to alternate Sub Range with Main Range.
2. SUB RANGE

To customize the sub ranges.
Example · Factory setting ranges:

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>RANGE</th>
<th>NUMBER</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 0 0 1</td>
<td>1</td>
<td>0 0 1 0</td>
</tr>
<tr>
<td>2</td>
<td>0 0 0 2</td>
<td>2</td>
<td>0 0 2 0</td>
</tr>
<tr>
<td>3</td>
<td>0 0 0 5</td>
<td>3</td>
<td>0 0 3 0</td>
</tr>
<tr>
<td>4</td>
<td>0 0 1 0</td>
<td>4</td>
<td>0 0 4 0</td>
</tr>
<tr>
<td>5</td>
<td>0 0 2 0</td>
<td>5</td>
<td>0 0 5 0</td>
</tr>
<tr>
<td>6</td>
<td>0 0 3 0</td>
<td>6</td>
<td>0 1 0 0</td>
</tr>
<tr>
<td>7</td>
<td>0 0 4 0</td>
<td>7</td>
<td>0 2 5 0</td>
</tr>
<tr>
<td>8</td>
<td>0 0 5 0</td>
<td>8</td>
<td>0 5 0 0</td>
</tr>
</tbody>
</table>

Turn the mode selection dial to "5" to display the RANGE SET MENU so that the MAIN RANGE and the SUB RANGE will appear on the screen.

- Use the Memory read key to alternate Sub Range with Main Range.

- Use the ▲ or ▼ EXP/VRM key to highlight the item you want to change.

- Use the ▲ or ▼ Phased range key to set the desired values.
  - ▲: makes the range larger.
  - ▼: makes the range smaller.

Continuous pressing of the ▲ or ▼ Phased range key will change the range value faster.
SETTING MENU

⊙ Turn the mode selection dial to "6" to display the MAIN MENU below.

- Use the ▲ or ◀ EXP/VRM key to highlight the item to be set and the ▲ or ◀ PHASED R. Phased range key to select the desired function setting.

<table>
<thead>
<tr>
<th>MAIN MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNCTION SET • LOW</td>
</tr>
<tr>
<td>FUNCTION SET • HIGH</td>
</tr>
<tr>
<td>REDUCTION</td>
</tr>
<tr>
<td>SCREEN DIVISION</td>
</tr>
<tr>
<td>DISP ITEM SEL.</td>
</tr>
<tr>
<td>UNIT • ADJUST</td>
</tr>
<tr>
<td>OTHERS</td>
</tr>
<tr>
<td>ALARM</td>
</tr>
<tr>
<td>VERSION</td>
</tr>
</tbody>
</table>

- After setting each function, memorize them by using "USER SETTING". [CF] page 16.

FUNCTION SETTINGS

<table>
<thead>
<tr>
<th>FUNCTION SET • ○ ○ ○</th>
</tr>
</thead>
<tbody>
<tr>
<td>RETURN MAIN MENU</td>
</tr>
<tr>
<td>GAIN UP +20</td>
</tr>
<tr>
<td>TVG CURVE 3</td>
</tr>
<tr>
<td>D RANGE ±6 dB</td>
</tr>
<tr>
<td>CLUTTER OFF</td>
</tr>
<tr>
<td>TX POWER D</td>
</tr>
</tbody>
</table>

- Use the ▲ or ◀ EXP/VRM key to highlight the item to be set.

- Use the ▲ or ◀ PHASED R. Phased range key to return to MAIN MENU.
1. GAIN UP

© This function makes it possible to display a clearer picture of the full range and control sensitivity at various depths. (page 65)

GAIN UP + 20

- Use the △ or □ Phased range key to select the gain adjust level (OFF → + 10 → + 20 → + 30 → + 40).

MENU SETTING: OFF
MENU SETTING: +10
MENU SETTING: +20
MENU SETTING: +30
MENU SETTING: +40

WEAK < GAIN > STRONG
TOTAL GAIN VOLUME RANGE

- When the menu gain adjust setting is changed from OFF to +10dB, the gain dial volume increases 3 points on the scale.

- When the menu gain adjust setting is OFF and the front panel dial is on 3, it has the same result as when the menu gain adjust setting is 10dB and the gain dial is on 0.

NOTE

© The strong echoes may be displayed in some case without increasing the control panel gain dial, when the excessive gain adjust level is selected.
2. TVG

© The TVG function may be adjusted according to the strength of the target echo.

- As the echoes returning from the bottom and from fish targets get weaker as the depth increases it is advantageous to have a Time Variable Gain that automatically compensates for the loss in signal strength.

| T V G 3 |

- Use the △ or ▽ Phased range keys to select the TVG adjust level (1 → 2 → 3 → 4 → STC).

STC : STC function
1 : TVG CURVE ①
2 : TVG CURVE ②
3 : TVG CURVE ③
4 : TVG CURVE ④

NOTE!

© Note the TVG function setting influences the far gain adjust and the gain adjust functions.
3. D RANGE (DYNAMIC RANGE)

By shifting the dynamic range, the operator is able to discriminate more precisely the size, depth and density of the fish school.

Experimenting with this function will give you the best setting for various fishing operations.

Each press of the \( \triangle \) or \( \nabla \) Phased range key changes the dynamic range level 

\((-\text{dB}, \rightarrow +\text{5dB}, \rightarrow +\text{4dB}, \rightarrow +\text{3dB}, \rightarrow -\text{3dB}, \rightarrow -\text{4dB}, \rightarrow -\text{5dB})\).

This diagram shows the comparative signal threshold levels to the standard \( \pm 6\text{dB} \) for the dynamic ranges.

When the dynamic range is changed from \( \pm 3\text{dB} \) to \( \pm 5\text{dB} \), this range will be displayed in 7 colors.

4. CLUTTER

By using this function the unwanted weak echo can be get rid of.

Each press of the \( \triangle \) or \( \nabla \) Phased range key changes the level to reduce clutter

\((\text{OFF} \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 10)\).
5. TX POWER

© The output power of the ultrasonic soundwave may be selected.

• In crowded fishing areas, this function may be used to reduce power and avoid interference to other Fishing boat's Sonars and Echo Sounders.

• "D" indicates maximum power and then gradually reduced by moving from "C", "B" to "A" which is minimum power.

![TX POWER D][1]

• Each press of $\Delta$ or $\nabla$ Phased range key changes the output power "D...C...B...A...".

• The present level of TX POWER appears next to frequency as shown below.

![TX POWER Diagram][2]

SCREEN DIVISION: VERTICAL

SCREEN DIVISION: HORIZONTAL
**FUNCTION SETTINGS**

**REDUCTION**

<table>
<thead>
<tr>
<th>REDUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RETURN MAIN MENU</td>
</tr>
<tr>
<td>INTERF RED</td>
</tr>
<tr>
<td>JAMING RED</td>
</tr>
<tr>
<td>NOISE RED</td>
</tr>
<tr>
<td>WHITE LINE</td>
</tr>
</tbody>
</table>

- Use the \( \text{△} \) or \( \text{▼} \) EXP/VRM key to highlight the item you want to change.
- Use the \( \text{△} \) or \( \text{▼} \) Phased range key to set the desired values.

**1. INTERFERENCE REDUCTION**

- To reduce interference from nearby fishing vessels.

| INTERF RED | OFF |

- Each press of the \( \text{△} \) or \( \text{▼} \) Phased range key changes the level of reduction.
  (OFF → LOW → MIDDLE → HIGH)

- OFF indicates no reducing function.
- As the level of the setting closes to HIGH, higher level of reduction is set and the level of reducing interference (IR0 → IR1 → IR2 → IR3) appears on the bottom screen.

**CAUTIONS**

- Some types of noise interference may not be reduced.
- Do not select excessive level than the level to be needed since the weak echoes are erased.
2. JAMMING REDUCTION

- The combined use of Interference reduction and Jamming reduction is effective in reducing noise due to jamming from other ships.

- Off indicates no reducing function and the higher level it is set, the more irregular data appears like below.

- After the irregular data is set, reduce noise by combining of interference reduction and jamming reduction.

**CAUTIONS**

- Do not use INTERFERENCE RED combined with excessive level of JAMING RED, since the weak echoes are erased.
- Do not select an excessive level of INTERFERENCE RED, since the weak echoes are erased.

**WHAT IS "JAMMING"?**

- By receiving sound waves from a neighboring ship's equipment of which frequencies are the same or similar, they influence each other and appear on the screen. Their change occasionally are seen doubled, up and down or the counter direction as Jamming.
3. NOISE REDUCTION

- To reduce the noise cluttering the entire screen.

- Each press of the \( \Delta \) or \( \nabla \) Phased range key alternates OFF with ON.

- OFF: The noise suppressing action is disabled.

4. WHITE LINE

- The function of the White Line is to help in discriminating the bottom and fish lying on or very close to the bottom.

- Each press of the \( \Delta \) or \( \nabla \) Phased range key changes the White Line control level. (OFF \( \rightarrow \) LOW \( \rightarrow \) MIDDLE \( \rightarrow \) HIGH)

- OFF: The White Line control is disabled.
SCREEN DIVISION

- Use the \( \Delta \) or \( \nabla \) EXP/VRM key
  to highlight the item you want to change.
- Use the \( \Delta \) or \( \nabla \) Phased range key
  to set the desired values.

1. BOTTOM EXPANSION

© When you activate the Bottom Expansion Mode, as in the drawing in the
next page, the areas of the bottom contour can be selected by the following
shifts and displayed across the screen for close observation of the echoes of
interest on or near of the bottom.

- Each press of the \( \Delta \) or \( \nabla \) Phased
  range key changes the setting.

(CONST 1 \( \rightarrow \) CONST 2 \( \rightarrow \) CONST 3 \( \rightarrow \) AUTO)

CONST 1 : The upper part of the bottom is displayed with
the expansion range.

CONST 2 : Display position is shifted deeper than CONST 1.

CONST 3 : Display position is shifted deeper than CONST 2.

AUTO : To detect the bottom automatically with the bottom
expansion range.

<TO BE CONTINUED>
2. SCREEN DIVISION

To select the screen division either VERTICAL or HORIZONTAL. Each press of the △ or ▽ Phased range key alternates HORIZ with VERT.

HORIZONTAL: displays the picture which is divided into horizontally. (upper/lower)

VERTICAL: displays the picture which is divided into vertically. (left/right)
3. DUAL FREQUENCY DISPLAY LOCATION

© Dual frequency display location is selected as shown the below drawings when Frequency Selection Dial "2" is activated.

- DUAL FREQ  L | H

- Each press of the △ or □ Phased range key alternates in the following items.

When "VERT" (vertical) is selected, "L | H , H | L" will be displayed.

When "HORIZ" (horizontal) is selected, "H / L , L / H" will be displayed.

**SCREEN DIVISION : VERTICAL**

| L | H    | Left side; Low freq. Right side; High freq. |
| H | L    | Left side; High freq. Right side; Low freq. |

**SCREEN DIVISION : HORIZONTAL**

| H / L | Upper half; High freq. Lower half; Low freq. |
| L / H | Upper half; Low freq. Lower half; High freq. |
DISPLAY ITEM SELECTION

<table>
<thead>
<tr>
<th>DISP ITEM SEL.</th>
<th>RETURN MAIN MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPTH DISP</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>SCALE POS.</td>
<td>RIGHT</td>
</tr>
<tr>
<td>EXP/VRM</td>
<td>EXP</td>
</tr>
<tr>
<td>TEMP DISP</td>
<td>OFF</td>
</tr>
<tr>
<td>TEMP GRAPH</td>
<td>OFF</td>
</tr>
<tr>
<td>COL. SCALE</td>
<td>ON</td>
</tr>
<tr>
<td>LAT.LONG.</td>
<td>OFF</td>
</tr>
<tr>
<td>SPEED DISP</td>
<td>OFF</td>
</tr>
<tr>
<td>COURSE</td>
<td>OFF</td>
</tr>
<tr>
<td>VOLT DISP</td>
<td>OFF</td>
</tr>
<tr>
<td>MARK</td>
<td>MARK</td>
</tr>
<tr>
<td>DISP.POS</td>
<td>LOWER</td>
</tr>
<tr>
<td>DEPTH GRID</td>
<td>AUTO</td>
</tr>
<tr>
<td>PICTURE FEED</td>
<td>AUTO</td>
</tr>
<tr>
<td>A:SCOPE</td>
<td>OFF</td>
</tr>
</tbody>
</table>

- Use the $\uparrow$ or $\downarrow$ EXP/VRM key to highlight the item you want to change.
- Use the $\uparrow$ or $\downarrow$ Phased range key to set the desired values.

1. DIGITAL DEPTH DISPLAY SIZE

○ To select the size of the digital display for depth.

| DEPTH DISP | MEDIUM |

- Each press of the $\uparrow$ or $\downarrow$ Phased range key changes the size of digital display for depth. (OFF → SMALL → MEDIUM → LARGE)
2. SCALE POSITION

To select the depth scale position.

Each press of the \( \triangle \) or \( \nabla \) Phased range key changes the Scale position display.

(OFF → RIGHT → CENTER)

You can select the center or right of scale position display.

3. EXP/VRM (VRM EXPANSION)

To activate the Expansion start point or the horizontal dotted line for digital depth on the screen.

Each press of the \( \triangle \) or \( \nabla \) Phased range key alternates EXP with VRM.

(EXP → VRM)

EXP : activates the Expansion start point
VRM : activates the Dotted line for digital depth
4. TEMPERATURE DISPLAY SIZE

To select the size of digital display for water temperature when an optional water temperature sensor is connected.

TEMP DISP OFF

- Each press of the \( \Delta \) or \( \nabla \) Phased range key alternates the size. (OFF \( \rightarrow \) SMALL \( \rightarrow \) MLARGE)

![Temperature Display Illustration]

5. TEMPERATURE GRAPH

To select the display of the Temperature Graph either ON or OFF when an optional water temperature sensor is connected.

TEMP GRAPH OFF

- Each press of the \( \Delta \) or \( \nabla \) Phased range key alternates On with OFF.

![Temperature Graph Illustration]

⚠️ CAUTIONS

- To present a temperature will require that the ES-7100 is connected to an optional temp. sensor (OP-102 or OP-41) or via the NMEA-0183 input port.
- Please select OFF while disconnecting the temp. sensor.
6. COLOR SCALE

☑ To select Color Scale display either ON or OFF.

<table>
<thead>
<tr>
<th>COL. SCALE</th>
<th>ON</th>
</tr>
</thead>
</table>

- Each press of the \( \Delta \) or \( \nabla \) Phased range key alternates ON with OFF.

ON : Color Scale appears on the screen.
OFF : Color scale disappears from the screen.

7. Ship's position in LATITUDE/LONGITUDE

☑ To present ship's position in the ES-7100 display will require that a navigator is connected via the NMEA (NMEA-0183) input port.

<table>
<thead>
<tr>
<th>LAT.LONG</th>
<th>ON</th>
</tr>
</thead>
</table>

- Each press of the \( \Delta \) or \( \nabla \) Phased range key alternates On with OFF.

ON : Position in three decimals in minutes appears on the screen.
OFF : Position (latitude/longitude) presentation disappears from the screen.

NOTE!

The interface cable for NMEA-0183 input port is an option.

[CF] page 76/77
8. SPEED DISPLAY

To present ship's speed in the ES-7100 display will require that a navigator is connected.

- Each press of the \( \uparrow \) or \( \downarrow \) Phased range key alternates On with OFF.

- ON: Speed presentation appears on the screen.
- OFF: Speed presentation disappears from the screen.

9. COURSE DISPLAY

To present ship's course in the ES-7100 display will require that a navigator is connected.

- Each press of the \( \uparrow \) or \( \downarrow \) Phased range key alternates ON with OFF.

- ON: Course presentation appears on the screen.
- OFF: Course presentation disappears from the screen.
10. VOLTAGE DISPLAY

To present the voltage the ES-7100 uses.

- Each press of the Phased range key alternates ON with OFF.

11. MARK

To place a vertical line on the screen for use as an echo mark.

- Each press of the Phased range key alternates MARK with TIMER.

MARK : To place a vertical line on the screen.

TIMER : To time between the two lines.

Every time MARK key is pressed, the following procedure is performed.

It displays a line and starts to time between two lines.

- The count is taken by the second.
- It stops to time.
- It erases the display of timer.

The maximum timing display is 60 minutes.

It starts to display from 1 second, after it times 60 minutes.

Timer stops and is erased when other function settings are changed.

Page 73
12. DISPLAY POSITION for DEPTH and TEMPERATURE.

To select the position for Depth and Temperature presentation on the screen.

- Each press of the $\uparrow$ or $\downarrow$ Phased range key alternates LOWER with UPPER.

13. DEPTH GRID

To adjust Depth scale unit with $\uparrow$ or $\downarrow$ Phased range key.

- Each press of the $\uparrow$ or $\downarrow$ Phased range key change the value.

(AUTO → 1 → 2 → 5 → 10 → 20 → 50 → 100)
14. PICTURE FEED

You can select Picture feed control either AUTO or FIXED.

- Each press of the \( \triangle \) or \( \nabla \) Phased range key alternates Picture feed control AUTO with FIXED.

"AUTO" : Picture moves to the left by the speed rate changes dependently of the range in use.

"FIXED" : Picture moves to the left by the speed rate independently of the range in use. The rate value is entered by Picture Speed key marked \( \square \).

15. A-SCOPE

The amplitude scope which appears in the right side of the echo display, can be turned on and off.

- Each press of the \( \triangle \) or \( \nabla \) Phased range key alternates ON with OFF.

ON  : A-Scope appears in the right side.
OFF : A-Scope disappears from the screen.
UNIT ADJUSTMENT

- Use the \(\triangle\) or \(\nabla\) EXP/VRM key to highlight the item you want to change.
- Use the \(\triangle\) or \(\nabla\) Phased range key to set the desired values.

1. DEPTH UNIT

© The unit of depth may be selected.

- Each press of the \(\triangle\) or \(\nabla\) Phased range key changes the depth unit.
  \((m \rightarrow br \rightarrow fm \rightarrow ft)\)

- \(m\) : To display the unit meters.
  \(1m: 1.8288m\)

- \(fm\) : To display the unit fathom.
  \(1fm: 1.8288m\)

- \(br\) : To display the unit braccia.
  \(1br: 1.65m\)

- \(ft\) : To display the unit feet.
  \(1ft: 0.3048m\)
2. TEMPERATURE UNIT

© To select the unit of Water temperature display and Water temperature graph.

TEMP UNIT °C

• Each press of the or Phased range key alternates °C with °F.

°C : centigrade
°F : Fahrenheit

3. SPEED UNIT

© To select the unit of Speed unit.

SPEED UNIT kt

• Each press of the or Phased range key alternates kt with km/h.

kt : Speed can be shown in knots.
1kt=1.852km/h

km/h : Speed can be shown in kilometers /hour.
4. TEMPERATURE ADJUSTMENT

To adjust the water temperature displayed on the screen with an optional water temp. sensor connected.

- Every time the $\triangle$ or $\nabla$ Phased key is pressed, it is adjusted by 0.1° in the range from $-9.9$ to $+9.9$.

$+9.9$: The maximum temperature adjustment
$0.0$: No adjustment
$-9.9$: The minimum temperature adjustment

5. DRAFT

The ES-7100 provides the draft height adjust control for displaying the depth readout from sea level. Usually, the ES-7100 shows up the depth readout from transducer surface to the bottom. When your ship's draft height is 1 meter and actual depth from sea level is 5 meters, the display of depth readout is normally 4 meters. If necessary, you can change the difference by the following adjust.

- To enter the draft range value press the $\triangle$ or $\nabla$ Phased range key.

$00.0$: Draft adjust is disabled.
$99.9$: The maximum adjusted draft range

$\triangle$: Every time this Phased range key is pressed, it increases the range by 0.1.
$\nabla$: Every time this Phased range key is pressed, it decreases the range by 0.1.

Page 70
OTHERS

• Use the \( \triangle \) or \( \triangledown \) EXP/VRM key to highlight the item you want to change.

• Use the \( \triangle \) or \( \triangledown \) Phased range key to set the desired values

1. COLOR SELECTION (COLOR PALETTE)

© The following basic color settings are available on the color select function.
(A-1 • A-2 • B-1 • B-2 • C-1 • C-2 • D-1 • D-2 • E-1 • E-2)

COLOR SET A-1

• Each press of the \( \triangle \) or \( \triangledown \) Phased range key changes the color setting.

\[
\begin{align*}
\text{A-1} & \quad \text{A-2} & \quad \text{B-1} & \quad \text{B-2} & \quad \text{C-1} & \quad \text{C-2} & \quad \text{D-1} & \quad \text{D-2} \\
\text{E-1} & \quad \text{E-2} & \quad & \quad & \quad & \quad & \quad & \quad
\end{align*}
\]

: Set color options.

: Colors may be freely set.

<TO BE CONTINUED>
How to select the color

○ To freely set the colors for E-1 and E-2, first highlight COLOR SET and specify E-1 or E-2 with the \[\Delta\] or \[\nabla\] Phased range key and press the \[\int\] Threshold key to display the menu below.

- Use the \[\Delta\] or \[\nabla\] EXP/VRM key to move the frame to the level to be set. Each numeral color intensity (R: red, G: green, B: blue) will be displayed on the menu.
- Use the \[\int\] Threshold key to highlight the color to be changed and select the color intensity (1: weakest ~ 15: strongest) with the \[\Delta\] or \[\nabla\] Phased range key.
- Once the color palette has been set, return to sounder display by using the Mode selection dial. The colors selected will be displayed on the screen and memorized under E1 or E2.

• Press either \[\Delta\] or \[\nabla\] key to return to MENU display.

WHAT IS "COLOR PALETTE"?

○ There are three basic colors (red, green and blue).

Each color has 15 intensity levels. By mixing the different colors and intensity levels the desired color tones may be created for the display.
2. OUTER DEPTH

◎ To display the bottom depth in digits by setting this function ON
   even if the bottom depth is out of the set range.

<table>
<thead>
<tr>
<th>OUTER DPTH</th>
<th>OFF</th>
</tr>
</thead>
</table>

- Each press of the [△] or [▽] Phased range key alternates ON with OFF.

OFF : No digit depth display in case the bottom depth is out of the range.
ON  : The bottom depth is displayed at the bottom of the screen in digits even if the bottom depth is out of the set range.
   However the processor in the ES-7100 automatically adjusts the transmit pulse rate "MEDIUM" to allow for the longer travel time to the bottom and return.

3. PRIMARY DEPTH MEASURING FREQUENCY
   for DIGITAL DISPLAY

◎ To select main frequency to measure the depth while performing dual frequency.

<table>
<thead>
<tr>
<th>MJR FREQ</th>
<th>LOW</th>
</tr>
</thead>
</table>

- Each press of the [△] or [▽] Phased range key alternates LOW with HIGH.

4. TRIGGER SIGNAL

◎ To select where the trigger signal is taken from, either INTRNL or EXTRNL.
   This function is used when using ES-7100 as a slave display to other sounding equipment.

<table>
<thead>
<tr>
<th>TRIGGER</th>
<th>INTRNL</th>
</tr>
</thead>
</table>

- Each press of the [△] or [▽] Phased range key alternates INTRNL with EXTRNL.

INTRNL  : To select when using only the signal of the ES-7100
EXTRNL  : To select when using the signal from the external unit.
5. ECHO SIGNAL

To select where the echo signal is taken from, either INTRNL or EXTRNL.

This function is used when using ES-7100 as a slave display to other sounding equipment.

| ECHO SIG | INTRNL |

Each press of the \( \Delta \) or \( \nabla \) Phased range key alternates INTRNL with EXTRNL.

INTRNL : To select when using only the signal of the ES-7100.
EXTRNL : To select when using the signal from the external unit.

6. OUTPUT

On installing optional kit serial output data is selected in the following sentences.

| OUTPUT | OFF |

By pressing the \( \Delta \) or \( \nabla \) Phased range key the desired output sentence is selected from the followings:

- OFF : No output
- 183N : To output data of DBT, TLL and MTW every 2 seconds.
- 183T : To output data of DBT every one second.
- 600S : To output data of depth at transfer rate of 600bps every one second.

NOTE !

- DBT : Depth below transducer.
- TLL : Latitude/Longitude when a navigator is connected.
- MTW : Water temperature when a temperature sensor is connected.
- Data transmitted rate: indicates the data transfer rate.
7. TRANSMIT RATE (PULSE REPETITION RATE)

○ The transmit rate of the sound waves from the transducer can be selected.

TRANS RATE MEDIUM -------------- Each press of the \( \Delta \) or \( \nabla \) Phased range key changes the transmit rate.

HIGH : can be set the highest rate according to the range.
MEDIUM : can be set the standard rate according to the range.
LOW : can be reduced the standard rate by half.

8. PULSE WIDTH

○ The transmitted pulse width can be set.

• The transmitted pulse can be set to these three (narrow • normal • wide), where the optimum setting will be applied according to the range automatically. Or it can be set manually, if a specific pulse width (0.3 ～ 3.6 msec) is required.

• Select the optimum width of the transmitting pulse by \( \nabla \) or \( \square \) key.

PULSE NORMAL -------------- Each press of \( \Delta \) or \( \nabla \) Phased range key changes the setting.
(NARROW → NORMAL → WIDE → 0.3 ms)

• Use \( \nabla \) key to select the larger values.
• Use \( \square \) key to select the smaller values.

<TO BE CONTINUED>
NORMAL : Setting NORMAL changes the value automatically according to the range. Refer to the list below.

NARROW : When the searching range is short and higher resolution is required, the pulse width should be set NARROW. Normal pulse width x 0.5

WIDE : The longer range gives less resolution. Normal pulse width x 1.5

0.3 : The pulse width is independently of the range in use and its initial value of the pulse width is 0.3 msec. The pulse width is to be set every 0.05 msec unit from 0.3 to 3.6 msec.

<table>
<thead>
<tr>
<th>RANGE DEPTH (m)</th>
<th>PULSE (msec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ~ 40</td>
<td>0.3</td>
</tr>
<tr>
<td>~ 80</td>
<td>0.6</td>
</tr>
<tr>
<td>~ 240</td>
<td>1.2</td>
</tr>
<tr>
<td>~ 640</td>
<td>2.4</td>
</tr>
<tr>
<td>641 ~</td>
<td>3.6</td>
</tr>
</tbody>
</table>

NOTE!

© In actual practice, the short pulse width gives better resolution, and less noise in shallow water. A long pulse will reach deeper but give less resolution.

9. PANEL BRIGHTNESS

© To select the level of brightness.

```
| PANEL BRIGHT | MEDIUM       |
```

Each press of the [△] or [▽] Phased range key alternates DARK with BRIGHT.
10. OPERATION MODE

◊ To select one of the Operation modes that was stored in the memory.

<table>
<thead>
<tr>
<th>OPE. MODE</th>
<th>0</th>
</tr>
</thead>
</table>

- Each press of the △ or ▼ Phased range key alternates 0 with 1.

- Each of the setting 0 and 1 can store 3 kinds of operation mode you have created, that is, in total 6 kinds of operation mode can be stored in the memory.

11. SHIFT AVERAGE - Scale increment

◊ A different shift can be set for the display in the depth range.

<table>
<thead>
<tr>
<th>SHIFT AR</th>
<th>1</th>
</tr>
</thead>
</table>

- Each press of the △ or ▼ Phased range key changes the value.

(1 - 5 - 10 - 50 -100)

- For example in the SHIFT AR 1, the depth on the screen moves by 1 depth unit and in the SHIFT AR 5 does by 5 depth unit.

12. TEMPERATURE SENSOR

◊ To select one of the inerfacing connections for temperature sensor.

<table>
<thead>
<tr>
<th>TEMP SENSOR</th>
<th>OP-102</th>
</tr>
</thead>
</table>

- Each press of the △ or ▼ Phased range key changes the item.

(OP-102 → OP-41 → NMEA-0183)

- To present a temperature via the NMEA-0183 input port, the NMEA IN terminal kit (OP-305) is required.
13. AUTO SHIFT LIMIT

◎ To select the upper limit of the depth value for automatic bottom tracking.

<table>
<thead>
<tr>
<th>ASHIFT LIMIT</th>
<th>999</th>
</tr>
</thead>
</table>

- Each press of the $\Delta_{\text{PHAED R}}$ or $\nabla_{\text{PHAED R}}$ Phased range key changes the depth value between 010 and 999 by 1 unit.

For AUTO SHIFT info. [CF] Page 71

14. TRIGGER SYNCHRONIZATION

◎ To select the high/low frequency sound wave transmitting simultaneously or separately.

<table>
<thead>
<tr>
<th>TRIG SYNC</th>
<th>ON</th>
</tr>
</thead>
</table>

- Each press of the $\Delta_{\text{PHAED R}}$ or $\nabla_{\text{PHAED R}}$ Phased range key alternates ON with OFF.

- **ON**: transmits the high/low frequency sound waves at the same speeds and synchronizes the transmit cycle for deep range.

- **OFF**: transmits the high/low frequency sound waves separately and is the same use in the single frequency mode.

In this case it sometimes generate interference that degrades the sounder's performance.
15. RANGE SET

© To activate the various functions regardless of each frequency.

- In case of LINKED the following items will be functioned under the same settings.
  - RANGE (NORMAL MODE)
  - SHIFT (UPPER DEPTH)
  - SUB RANGE (EXPANSION MODE)
  - AUTO RANGE
  - AUTO SHIFT
  - PICTURE SPEED
  - INTERFERENCE REDUCTION
  - JAMMING REDUCTION
  - NOISE REDUCTION

- In case of SINGLE the above items will be usable in the settings differently in each frequency. Selecting SINGLE, the one of the frequencies displayed on the upper screen will be highlighted.

Note that both HIGH and LOW will not highlighted in case of LINKED.

<table>
<thead>
<tr>
<th>RANGE SET</th>
<th>LINKED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>------</td>
</tr>
</tbody>
</table>

- Each press of the △ or ▽ Phased range key alternates LINKED with SINGLE.

- By pressing this key "HIGH" on the top of the screen is highlighted and enables the settings for high frequency presentation to change.
  While activating this key, the settings in the low frequency on the screen are unable to be changed.

- By pressing this key "LOW" on the top of the screen is highlighted and enables the settings for low frequency presentation to change.

- As shown left the different range in each frequency is functioned simultaneously.
ALARMS

- Use the $\Delta$ or $\nabla$ EXP/VRM key to highlight the item you want to change.
- Use the $\Delta$ or $\nabla$ Phased range key to set the desired values

1. SHALLOW ALARM

To set to sound a "beep" if the echo sounder detects the sea bottom above (shallower than) the set alarm depth.

- Each press of the $\Delta$ or $\nabla$ Phased range key alternates OFF with 0000.

To access the alarm setting and set the value from "0000" into the desired alarm depth value by pressing the $\nabla$ or $\bigcirc$ key.

The active zone is indicated by a Shallow marker on the right side of the screen.

- $\nabla$ key : increases the value. (The position of the marker is deeper.)
- $\bigcirc$ key : decreases the value. (The position of the marker is shallower.)

Select "OFF" in case of not utilizing the alarm functions.

Refer to the next page for the way of inactivating this function.
2. DEEP ALARM

To set to sound a "beep" if the echo sounder detects the sea bottom below (deeper than) the set alarm depth.

- Each press of the \( \triangle \) or \( \nabla \) Phased angle key alternates OFF with 0000.

To access the alarm setting and set the value from "0000" into the desired alarm depth value by pressing the \( \nabla \) or \( \text{[1]} \) key.

The active zone is indicated by a Deep marker on the right side of the screen.

- \( \nabla \) key : increases the value. (The position of the marker is deeper.)
- \( \text{[1]} \) key : decreases the value. (The position of the marker is shallower.)

Select "OFF" in case of not utilizing the alarm functions.

How to Inactivate the Alarms

- Once the alarm starts to sound, press any key to disable the alarm.

Pressing any key will silence the alarm and will not cause a menu change.
3. FISH ALARM

The Fish alarm mode will alert you if any object appears between the two set points (Deep alarm and Shallow alarm). This sets the level of the alarm sounding.

- Each press of the \( \triangle \) or \( \nabla \) Phased range key alternates OFF with 6.

\[
\begin{align*}
\text{OFF} & : \text{disable Fish alarm} \\
1 & : \text{color scale 1-7} \\
2 & : \text{color scale 2-7} \\
3 & : \text{color scale 3-7} \\
4 & : \text{color scale 4-7} \\
5 & : \text{color scale 5-7} \\
6 & : \text{color scale 6-7} \\
7 & : \text{sounds in relation to color scale No. 7}
\end{align*}
\]

- The desired level can be selected by pressing the \( \nabla \) or \( \square \) key after entering 6 (initial value).

\( \nabla \) key : increases the value.
\( \square \) key : decreases the value.

FOR EXAMPLE:
set value - color scale 3

To operate Fish alarm turn both Shallow alarm and Deep alarm OFF after setting both desired alarm depth.

Select "OFF" in case of not utilizing the alarm functions.

Refer to the previous page for the way of inactivating this function.
4. TEMPERATURE MAXIMUM ALARM

© The alarm will sound when the water temperature goes above the set degree
that can be set from 0.0 to 35.0 by 0.1 unit (°C) in this case.

An optional temp. sensor is required to activate TEMP MAX alarm.

TEMP MAX OFF  - ----  Each press of the △ or ▽ Phased
range key alternates OFF with 35.0.

- The desired value can be selected by pressing the ▽ or ▼ key.

after entering 35.0 (initial value). ▽ key: increases the value.

□ key: decreases the value.

© Select "OFF" in case of not utilizing the alarm functions.

5. TEMPERATURE MINIMUM ALARM

© The alarm will sound when the water temperature goes below the set degree
that can be set from 0.0 to 34.9 by 0.1 unit (°C) in this case.

An optional temp. sensor is required to activate TEMP MIN. alarm.

TEMP MIN. OFF  - ----  Each press of the △ or ▽ Phased
range key alternates OFF with 00.0.

- The desired level can be selected by pressing the ▽ or ▼ key.

after entering 00.0 (initial value). ▽ key: increases the value.

□ key: decreases the value.

© Select "OFF" in case of not utilizing the alarm functions.

Refer to the next page for the way of inactivating this function.
6. TEMPERATURE RANGE ALARM

○ The alarm will sound when the water temperature goes above the set degree
  the defined changed value compared to the change of the last 1 minute,
  ranging from 00.0 to 09.8 by 0.1 unit (°C) in this case.

An optional temp. sensor is required to activate TEMP RANGE alarm.

<table>
<thead>
<tr>
<th>TEMP RANGE</th>
<th>OFF -------</th>
</tr>
</thead>
</table>

• Each press of the Δ or ▼ Phased range key alternates OFF with 00.0.

• The desired level can be selected by pressing the ▼ or ▼ key.

  after entering 00.0 (initial value).

  ▼ key : increases the value.

  ▼ key : decreases the value.

○ Select "OFF" in case of not utilizing the alarm functions.

How to Inactivate the Alarms

○ Once the alarm starts to sound, press any key to disable the alarm.
  Pressing any key will silence the alarm and will not cause a menu change.

7. FISH ALARM FREQUENCY

○ To select frequency on sounding the Fish alarm.

<table>
<thead>
<tr>
<th>TEMP RANGE</th>
<th>OFF -------</th>
</tr>
</thead>
</table>

• Each press of the Δ or ▼ Phased range key alternates LOW with HIGH.
Chapter 4

FRONT CONTROL PANEL OPERATION

This chapter explains how to operate the front control panel of the ES-7100 Echo sounder.

DISPLAY MODES

DIAL OPERATION
- FREQUENCY SELECTION DIAL ------------------------ 59
- MODE SELECTION DIAL --------------------------- 60
- 1. NORMAL MODE --------------------------------- 61
- 2. BOTTOM EXPANSION MODE ---------------------- 61
- 3. PARTIAL EXPANSION MODE ---------------------- 62
- 4. NAVIGATION DISPLAY MODE --------------------- 62
- 5. RANGE SETTINGS ------------------------------ 63
- 6. MAIN MENU ----------------------------------- 63
- BRIGHTNESS DIAL -------------------------------- 64
- GAIN DIAL --------------------------------------- 65
- FAR GAIN DIAL ---------------------------------- 66
  1. TVG ------------------------------------------ 66
  2. STC ------------------------------------------ 67

KEY OPERATION
- OPERATION MODE --------------------------------- 68
- MEMORY WRITE / READ KEY ------------------------ 68
- EXP/VRM KEY ------------------------------------ 69
  1. EXPANSION START POINT ----------------------- 69
  2. VRM LINE ------------------------------------ 69
- RANGE KEY --------------------------------------- 70
- PHASED RANGE KEY -------------------------------- 70
- AUTO RANGE ------------------------------------- 71
- AUTO SHIFT ------------------------------------- 71
- PICTURE SPEED KEY ------------------------------- 72
- MARK KEY --------------------------------------- 73
  1. MARK ---------------------------------------- 73
  2. TIMER ---------------------------------------- 73
- THRESHOLD KEY ----------------------------------- 74
- HIGH/LOW FREQUENCY KEY -------------------------- 74
- EXPANSION RANGE KEY ----------------------------- 75
The ES-7100 can display the data in a number of different ways. Depending on your requirements you can select one using Mode selection dial, Frequency selection dial and the menu system.

Following is a description of each of the modes available.

<table>
<thead>
<tr>
<th>MODE SELECTION</th>
<th>NORMAL DISPLAY</th>
<th>NORMAL/BOTTOM EXPANSION DISPLAY</th>
<th>NORMAL/PARTIAL EXPANSION DISPLAY</th>
<th>NORMAL/NAVIGATION DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE FREQUENCY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HORIZ (LOW)</td>
<td>LOW or HIGH</td>
<td>BOTTOM EXP. DISPLAY</td>
<td>PART. EXP.</td>
<td>NAV. NAVIGATION DISPLAY</td>
</tr>
<tr>
<td>VERT (HIGH)</td>
<td>NORMAL</td>
<td>BOTTOM EXP. DISPLAY</td>
<td>PART. EXP.</td>
<td>NAV. NAVIGATION DISPLAY</td>
</tr>
<tr>
<td>DUAL FREQUENCY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HORIZ</td>
<td>NORMAL</td>
<td>BOTTOM EXP. DISPLAY</td>
<td>PART. EXP.</td>
<td>NAV. NAVIGATION DISPLAY</td>
</tr>
<tr>
<td>VERT</td>
<td>NORMAL</td>
<td>BOTTOM EXP. DISPLAY</td>
<td>PART. EXP.</td>
<td>NAV. NAVIGATION DISPLAY</td>
</tr>
<tr>
<td>H/L</td>
<td>NORMAL</td>
<td>BOTTOM EXP. DISPLAY</td>
<td>PART. EXP.</td>
<td>NAV. NAVIGATION DISPLAY</td>
</tr>
<tr>
<td>L/H</td>
<td>NORMAL</td>
<td>BOTTOM EXP. DISPLAY</td>
<td>PART. EXP.</td>
<td>NAV. NAVIGATION DISPLAY</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>NORMAL</td>
<td>NORMAL</td>
<td>Bottom EXP.</td>
</tr>
<tr>
<td>H</td>
<td>L</td>
<td>NORMAL</td>
<td>NORMAL</td>
<td>Bottom EXP.</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>NORMAL</td>
<td>NORMAL</td>
<td>Bottom EXP.</td>
</tr>
<tr>
<td>H</td>
<td>L</td>
<td>NORMAL</td>
<td>NORMAL</td>
<td>Bottom EXP.</td>
</tr>
</tbody>
</table>

L: LOW FREQUENCY
H: HIGH FREQUENCY
NORMAL: NORMAL DISPLAY
PART.EXP.: PARTIAL EXPANSION DISPLAY
BOTTOM EXP.: BOTTOM EXPANSION DISPLAY
NAV.: NAVIGATION DISPLAY
FREQUENCY SELECTION DIAL

Depending on your requirements you can select one of the following combination screen using Frequency selection dial.

Following is a description of each of the modes available and the actual displays are relevant to the settings of the menu system and Mode selection dial.

- Refer to the Display Modes in page 58 for the combination screens.
MODE SELECTION DIAL

Depending on your requirements you can select one using Mode selection dial.

Following is a description of each of the modes available and the actual displays are relevant to the settings of the menu system and Frequency selection dial.

SCREEN DIV : VERT

LOW FREQUENCY or HIGH FREQUENCY

NORMAL DISPLAY

- Refer to the Display Modes in page 58 for the combination screens.
1. NORMAL MODE

 Comparator

 This range can be adjusted by means of the Range keys.

 Normal mode is displayed on the full screen.

 This is the standard presentation.

2. BOTTOM EXPANSION MODE

 Comparator

 Normal mode is displayed on the upper half of the screen, and Bottom expansion mode is displayed on the lower half.

 - When SCREEN DIVISION - VERTICAL is selected, you will see Normal mode on the right half of the screen and Bottom expansion mode on the left half of the screen.

 - The range of the expansion display is indicated on the normal display by a line.

 The expansion range can be adjusted with the expansion range key.
3. PARTIAL EXPANSION MODE

Normal mode is displayed on the upper half of the screen, and Partial expansion mode is displayed on the lower half.

- When SCREEN DIVISION - VERTICAL is selected, you will see Normal mode on the right half of the screen and Partial expansion mode on the left half of the screen.

- The range of the expansion display is indicated on the normal display by two lines indicating the upper and lower limits. The upper limit can be adjusted with the Expansion start mark.

The lower limit can be adjusted with the Expansion range key. [CF] Page 69/75

4. NAVIGATION (DATA) DISPLAY MODE

Normal mode is displayed on the right half of the screen.

Navigation data is displayed on the left half of the screen.

NOTE!

- Navigation data is only available when ES-7100 is connected to an optional equipment.

- Water temperature data is only available when the ES-7100 is connected to an optional water temperature sensor.
5. RANGE SETTINGS

© To display the RANGE SET MENU.
- To customize the ranges of the Main range for Normal mode and Sub range for Partial expansion mode in split screen, the desired ranges can be adjusted by means of the Range keys and the Exp. range keys. Open "RANGE SET MENU" and set the desired ranges before operating this unit, if any changes are required. [CF] Page 19/20

![RANGE SET MENU]

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0000</td>
</tr>
<tr>
<td>2</td>
<td>0000</td>
</tr>
<tr>
<td>3</td>
<td>0000</td>
</tr>
<tr>
<td>4</td>
<td>0000</td>
</tr>
<tr>
<td>5</td>
<td>0000</td>
</tr>
<tr>
<td>6</td>
<td>0000</td>
</tr>
<tr>
<td>7</td>
<td>0000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0001</td>
</tr>
<tr>
<td>2</td>
<td>0002</td>
</tr>
<tr>
<td>3</td>
<td>0005</td>
</tr>
<tr>
<td>4</td>
<td>0100</td>
</tr>
<tr>
<td>5</td>
<td>0200</td>
</tr>
<tr>
<td>6</td>
<td>0300</td>
</tr>
<tr>
<td>7</td>
<td>0400</td>
</tr>
<tr>
<td>8</td>
<td>0500</td>
</tr>
</tbody>
</table>

6. MAIN MENU

© To display the Main Menu.
- To set up a fundamental function.
- To customize the functions, set the desired functions by calling up the proper display before operating this unit. [CF] Page 21

![MAIN MENU]

- FUNCTION SET • LOW
- FUNCTION SET • HIGH
- REDUCTION
- SCREEN DIVISION
- DISP ITEM SEL.
- UNIT • ADJUST
- OTHERS
- ALARM
- VERSION

- 63 -
BRIGHTNESS DIAL

⊙ You can change the brightness with this dial.

Further turning in a clockwise direction increases screen brightness.
GAIN DIAL

© To adjust the level of sensitivity of the received echo signal.

- Turning the dial clockwise increases the gain level, keep turning the dial until the sea bottom is shown in red.

- The strongest echoes are displayed in red and as the received echoes get weaker they are indicated as follows; red → orange → yellow → green → light green → blue → light blue (when color scale A1 or A2 is selected).

- When the target is the sea bottom the gain level setting can be low because the echo from the sea bottom is very strong. However, when the target is fish the level of gain must be increased to pick up the weaker echo. Increasing the gain too much will display unwanted echoes from bubbles and plankton etc.

- If the sea bottom echo is weak due to seaweed, mud etc. adjust the gain level to pick up the weaker echo.

- When passing over the transducer face, bubbles reflect the sound wave and appear as echoes on the screen. In this case, no echoes (fish school) may be displayed even though at a maximum gain level.

NOTE!

© Use GAIN UP on the FUNCTION SET MENU to control the variable gain ranges. (CF) Page 22
FAR GAIN DIAL

© To adjust the level of TVG CURVE selected in the function set menu.

1. Selection of TVG CURVE (1 ~ 4)

© To control the level of the sensitivity of the received deep echo signal.

- Turning the dial clockwise does not increase the gain level close to the transducer but increases the gain level as the depth increases.

- For further true display, it corrects the display differences between the shallow echo and the deep echo.

- The sensitivity achieved using this dial influences the sensitivity achieved using the GAIN DIAL and TVG CURVE function on FUNCTION SET MENU.

WHAT IS "FAR GAIN"?

© The power of the sound wave is absorbed at a certain rate when travel through the water. The higher the frequency, the higher the rate of absorption. For example after travelling 1 kilometer the power of a 50kHz sound wave will decrease to 1/8 of its original strength. The power of a 200kHz sound wave will decrease to 1/300 of its original strength. Use this FAR GAIN dial to counteract the absorption effect by increasing received echo signal of deep echoes.
2. Selection of " STC - Sensitivity Time Control ".

○ To reduce receiver gain for shallow water echoes and restores it with depth in such a manner as to equalize echo strengths at different depths.

- This initial gain suppression is at maximum in the fully counterclockwise position.
- Use this function effectively by adjusting gain value and GAIN UP function.

![Diagram of dial operation]

In case of using FAR GAIN DIAL as STC function there is no effect at the dial 10 and increase the effect as turning the dial into the dial 0.

At this time turning too much to counterclockwise suppresses even fish school or bottom signal.
KEY OPERATION

OPERATION MODE KEYS

© Use these keys to select one of the 3 kinds of operation mode you have selected. In addition to these 3 kinds 3 more kinds are available by accessing MAIN MENU-OTHERS-OPE.MODE. By pressing one of these keys the desired operation mode can be set immediately.

The time when holding one of these 3 keys for two seconds until a beep sounds, the presented setting menu will be stored in the memory. Note that they will not be stored if you release the key before a beep sounds.

Press one of the keys to activate this function, however it will not be accessed and 3 beeps will sound if the pressed key has no data.

During the operation the settings can be changed by using menu or keys, however note that they will not be stored and return to the previous operation mode by pressing one of these 3 keys again.

MEMORY WRITE / READ KEYS

© To memorize the right half of the screen.

- Each press of the ↓ Memory write key will memorize the right half of the screen, erasing the last memorized data.

© To display the memorized data above.

- Pressing the ↑ Memory read key will display the above memorized data on the left half of the screen.
- When the ↑ Memory read key is pressed again the data will be erased from the screen.

⚠️ CAUTIONS

© The memorized data will be erased when the power is turned off.
EXPANSION / VRM KEY

To activate the settings adjusted by MAIN MENU - DISP ITEM SEL, EXP/VRM. [CF] Page 33

1. EXPANSION START POINT

To set the expansion start point for Partial expansion mode.

- The numeral expansion start depth will be displayed on the upper corner of the screen.

2. VRM line

If you want to monitor a particular depth in greater detail then the marker line is a very convenient method. It also allows you to change the depth monitored merely by changing the marker line position using the [△] or [▽] EXP/VRM key.

Pressing both [△] & [▽] keys at the same time alternates VRM line on with off.
RANGE KEYS

- The level can be selected in seven steps. [CF] Page 19

- The following shows Factory setting range.
  1: 0 ~ 25
  2: 0 ~ 50
  3: 0 ~ 100
  4: 0 ~ 150
  5: 0 ~ 200
  6: 0 ~ 300
  7: 0 ~ 500

- Auto range will be explained in the next page.

PHASED RANGE KEYS

- For the selection of the depth start point at the top of the screen.
- Phased range is available in 1 unit step (0 to 999).
  This function may be used to show the desired area expanded on the screen. [CF] Page 49

- Auto shift will be explained in the next page.
AUTO RANGE FUNCTION

- The range will change automatically to always show the full depth from transducer face to sea bottom regardless of changes in depth.
- Press both \( \triangle \) & \( \nabla \) range keys at the same time to start the auto range function.
- When this function is activated, "AUTO RANGE" will be displayed in the right of the top screen.
- Press both \( \triangle \) & \( \nabla \) range keys at the same time to release the auto range function.

AUTO SHIFT FUNCTION

- The phased range will change automatically to always track the bottom in the specified range.
- Press both the \( \triangle \) & \( \nabla \) Phased range keys at the same time to start the auto shift function. When this function is activated, "AUTO SHIFT" will be displayed in the right of the top screen.
- Press both \( \triangle \) & \( \nabla \) Phased range keys at the same time to release the auto shift function.
- Refer to ASHIFT LIMIT Page 30

NOTE!

- For auto range and auto shift functions to work successfully, the sea bottom echo must be in red or orange which are the strongest scale colors.
- Even when the sea bottom echo is in red or orange, if there is interference due to bubbles etc., the function may not be able to track the bottom. In this case, if the bottom is not located after 16 transmissions, the depth scale will return to 0 and start searching again. If the function is unable to locate the bottom the scale will continue to fluctuate.
PICTURE SPEED KEY

© The picture speed rate may be selected from the following.

- Each press of the \[ \text{[PF]} \] key changes the setting.
  
  
  \[
  \begin{array}{ccccccc}
  \text{PF} 0 & \text{PF} 1 & \text{PF} 2 & \text{PF} 3 & \text{PF} 4 & \text{PF} 5 & \text{PF} 6 & \text{PF} 7 & \text{PF} 8 \\
  \text{stop} & (1/1) & (1/2) & (1/4) & (1/8) & (1/4+1/1) & (1/8+1/2) & (1/16+1/4) & (1/32+1/8)
  \end{array}
  \]

  on the full display screen (Fig. 1 ~ 3)

  \[
  \begin{array}{cccc}
  \text{PF} 2 \times & \text{PF} 3 \times & \text{PF} 4 \times \\
  (2/1) & (3/1) & (4/1)
  \end{array}
  \]

  on the full display screen (Fig. 5)

  Standard picture speed on the right half of the screen and the compressed picture on the left half of the screen. (Fig. 4)

  However this function is not available on an expansion display in split display.

- [Selection of PF 1 ~ PF 4 (1/1 ~ 1/8)]
  
  As you see in the Fig.1 the ship travels from point A to B.
  In case of the higher rate of movement of the targets on the display screen, moving from right to left, it will be adjusted like Fig.2. and in case of the lower rate of movement of the targets on the display screen, it will be adjusted like Fig.3.

- [Selection of PF 5 ~ PF 8]
  
  (1/4+1/1 ~ 1/32+1/8)

  Normal P. speed on the right half of the screen.
  Lower than the rate of the right half is available on the left half of the screen.

- [Selection of PF 2X ~ PF 4X]
  
  (2/1 ~ 4/1)

  In case of the higher rate of movement than 1/1, the horizontally expanded picture will be displayed as you see in Fig.5.
WHAT IS PICTURE SPEED?

Picture speed rate refers to the speed the picture travels from right to left on the screen. 1/1 refers to 1 vertical line of picture per 1 sound transmission, and 1/2 refers to 1 vertical line of picture per 2 sound transmissions. Furthermore 2/1 refers to 2 vertical lines of picture per 1 sound transmission, and 4/1 refers to 4 vertical lines of picture per 1 sound transmission. There is no relation to ship speed.

MARK KEY

Select "MARK" from DISP ITEM SEL. (DISPLAY ITEM SELECTION) to set the desired functions.  

1. MARK

To mark a line on the display.

- Pressing this key [ ] will set a yellow vertical line at the right edge of the display.

2. TIMER

To time between the two lines.

- Pressing this key [ ] will start to time.
- On the second pressing this key [ ] it stops to time.
- On the third pressing this key [ ] it erases the display of timer.
THRESHOLD KEY

To remove and recall weaker echoes by color scale from the screen.
- Each time this key is pressed the weakest color will be erased.

WHAT IS "THRESHOLD"?

The equipment will pick up and display unwanted echoes from small objects in the water. With the threshold function it is possible to eliminate these unwanted echoes from the screen.

HIGH/LOW FREQUENCY KEYS

The most settings for adjusting the presentation of the high or low frequency echo picture are accessed by these keys individually.

Select "MAIN MENU - OTHERS - RANGE SET - SINGLE"

By pressing this key "HIGH" on the top of the screen is highlighted and enables the settings for high frequency presentation to change.

By pressing this key "LOW" on the top of the screen is highlighted and enables the settings for low frequency presentation to change.

In case of "MAIN MENU - OTHERS - RANGE SET - LINKED" neither HIGH nor LOW is highlighted.
EXPANSION RANGE KEY

© For selection of the expansion range for Partial or Bottom expansion modes.

- 8 expansion ranges may be selected with the Expansion range keys as follows:

1: 1  
2: 2  
3: 5  
4: 10 
5: 20 
6: 30 
7: 40 
8: 50

The range values can be changed as shown in the page 20.
Chapter 5

OPTION

This chapter explains optional connections.

OPTION & OPTIONAL CONNECTOR KIT

To meet various purposes the following connector kits are available as options.

- These kits are intended for connection of the ES-7100's internal PCB to the rear panel and for carrying the signal from external equipment's connection point to the ES-7100's PCB.

<table>
<thead>
<tr>
<th>NAME</th>
<th>DETAILS</th>
<th>CONNECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP-305 NAV-IN</td>
<td>NMEA-0183 input sentences or connecting an external navigational equipment.</td>
<td>No 1: SIGNAL IN + No 4: SIGNAL OUT + No 2: SIGNAL IN - No 5: SIGNAL OUT - No 3: SHIELD No 6: NC</td>
</tr>
<tr>
<td>CONNECTOR KIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONNECTOR KIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OP-298 EXTERNAL</td>
<td>received signal trigger signal</td>
<td>No 1: TRIGGER IN No 5: GND No 2: TRIGGER OUT No 6: L.FREQ.SIG.IN No 3: H.FREQ.SIG.IN No 7: L.FREQ.SIG.OUT No 4: H.FREQ.SIG.OUT No 8: SHIELD</td>
</tr>
<tr>
<td>SOUNDER CONNECTOR KIT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
INTERFACE CONNECTIONS

① The ES-7100 must be turned off while connecting/disconnecting the interface cables.
② Release the 4 tapping screws securing the case cover and the front case and the 8 screws securing the case cover and the rear case. Pull the case cover into the direction of an arrow (the rear of the main unit). Refer to Fig. 1.
③ Release the canoe clip and the cap on IN/OUT terminal. Refer to Fig. 2.
④ Insert the receptacle of the terminal from the inside of the rear plate and secure them with the nuts and the screws.
⑤ Release the 8 screws (4 on the upper and 4 on the lower) marked ○ in the Fig. 2 and then remove the chassis from the front case so that the Main board can be easily connected to each terminal.
NMEA OUT terminal → J2         NAV-IN terminal → J9
TRIGGER/SIGNAL IN/OUT terminal → J14
⑥ Return the chassis and tighten with 8 screws released above.

⚠️ DANGER

① Never open the main unit case.
Electrical shock, damage, and serious bodily injury to user may result. If the ES-7100 requires servicing or installing the terminals, call your authorized SUZUKI dealers.
SPECIFICATIONS

Specifications 1)

1. DISPLAY RANGES: in 7 steps. (m, fm, br and ft can be selected in Menu freely to Max 3000m)
   FACTORY SETTING:
   25 · 50 · 100 · 150 · 200 · 300 · 500 m, fm, br.
   50 · 100 · 150 · 200 · 300 · 500 · 1000 ft.

2. PHASED RANGES: from 0 to 999 m, fm and br. from 0 ~ 2999 ft.

3. BOTTOM EXPANSION
   PARTIAL EXPANSION
   1 unit (m, fm and br.) in 8 steps freely.
   5 unit (ft.) in 8 steps freely.

4. FREQUENCY
   20, 24, 28, 40, 38, 45, 50, 60, 68, 75, 80, 150, or 200kHz (Dual frequency)

5. DISPLAY MODES
   High frequency only, Low frequency only, Dual display (Vertical/Horizontal)
   Normal/Bottom expansion mode, Normal/Partial expansion mode,
   - A scope mode, Navigation/sounder dual display, Range setting/sounder display,
   Function settings/sounder display. + Color Palette.

6. DISPLAY DATA
   Depth scale • Depth (3 steps) • Water temp.* (2 steps)
   Water temp. scale • Expansion start depth • VRM • Marker line
   Lat/Long * • Ship's speed * • Course

7. FUNCTION SET DISPLAY
   Picture speed • Interference reduction • High/Low frequency • Auto range
   Auto shift

8. ADDITIONAL DISPLAY
   Second Interval Mark • Color scale • Water temp graph • Marker line
   Expansion range line • Expansion start marker • TX power

9. OTHER FUNCTIONS
   Operation mode (3 kinds in 2 segments) • Major measuring frequency
   TVG curve • Gain • Far gain • Interference reduction • Jamming reduction
   Noise reduction • White line • STC • Clutter control • Threshold key
   Auto range • Auto shift • Display position • Depth grid • Draft adjust
   Water temp. adjust • Outer depth • Pulth width • Screen memory
   Stop watch function • TX power • Brightness • Depth/Temp. display position
   User setting • Expansion mode (4 modes) • Color selection • Color palette
   Alarms (shallow/deep/fish) • Alarms (temperature) • Data backup system

Specifications 2)

1. DISPLAY
   TFT color, 10.4 inch=480x640 pixels

2. POWER SUPPLY
   10.5-40Vdc 30 Watts

3. INPUT
   Temp. sensor (OP-102 or OP-41) * Temp. data (vis NMEA-0183) *
   Navigation data (via NMEA-0183) *
   External sounder (Trigger signal, Signal IN-OUT)

4. OUTPUT
   Depth data (via NMEA-0183) *
   Water Temp. data (via NMEA-0183)
   External sounder (Trigger signal, Signal IN-OUT)

NOTE: Functions marked with an asterisk * require optional equipment.