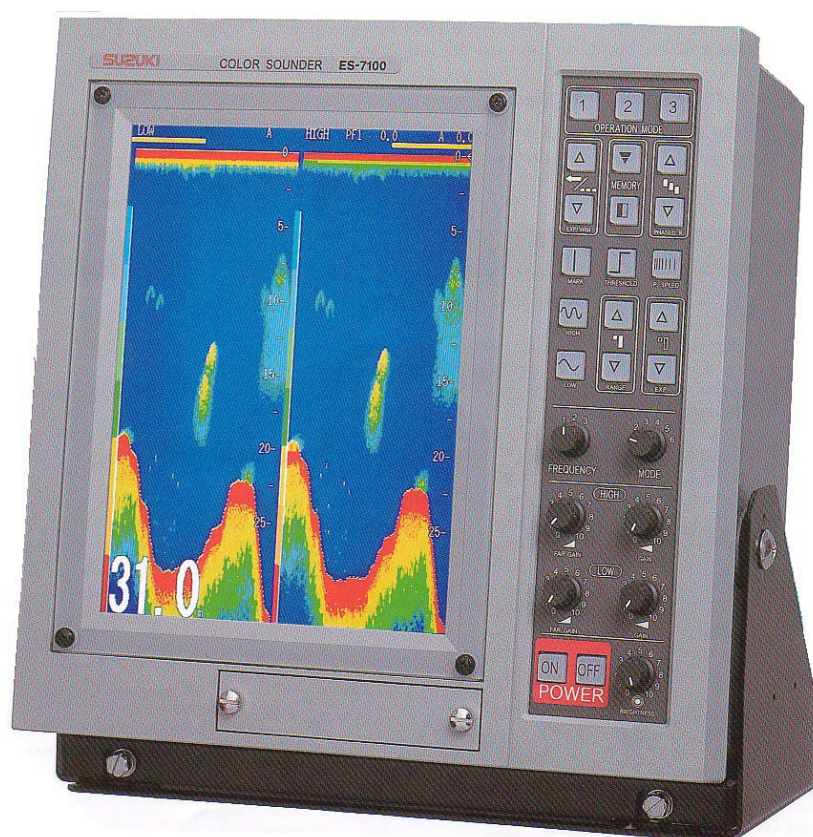# SKIPPER ES-7100

10,4" DUAL FREQUENCY LCD ECHO SOUNDER

OPERATION AND INSTALLATION MANUAL

Edition : 20040105

SKIPPER

CONTENTS

Chapter 1

INTRODUCTION

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.

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 poblems.
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 informtion 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.

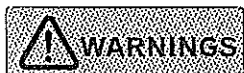◎ Please contact us if you should have any questions regarding the use of this equipment.

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
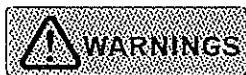
◎ Operating voltage: 10.5 to 40 volts DC

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 vessels 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.

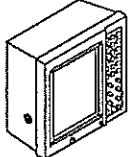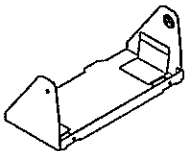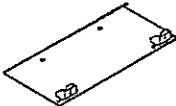It could result in collision and serious injury or damage.

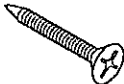**⚠ WARNINGS**
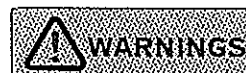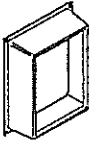
◎ Please use the specified fuse.

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,

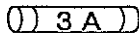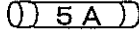• Never use batteries with fluid leaking out.
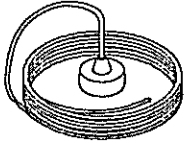
SUPPLIED COMPONENTS

COMPOSITION

The following items are shipped with the unit.

CODE		＊＊RD110			＊＊RD130
ITEM	MAIN UNIT	MOUNTING BRACKET	MOUNTING PLATE	HEXAGONAL BOLT	HOOD
PARTS#	—	34808C	34556C	M6 X 20	34535C-Assy
QTY	1	1	1	2	1

CODE	＊＊RD001				
ITEM	TRUSS SCREW	TAPPING SCREW		POWER SUPPLY CABLE	3P PLUG
PARTS#	M8 X 15	M5 X 30		31524D	HS21P-3
QTY	2	6		1	2

CODE	＊＊RA121				
ITEM	MANUAL	UNIT COVER	POWER FUSE		TRANSDUCER -ETC.
PARTS#	ES7100-OPM-E	ES7100-COV	—		TD related parts
QTY	1	1	3 EACH		when required.

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

DIMENSIONS
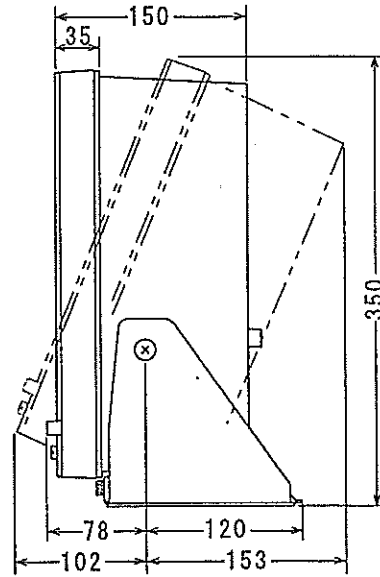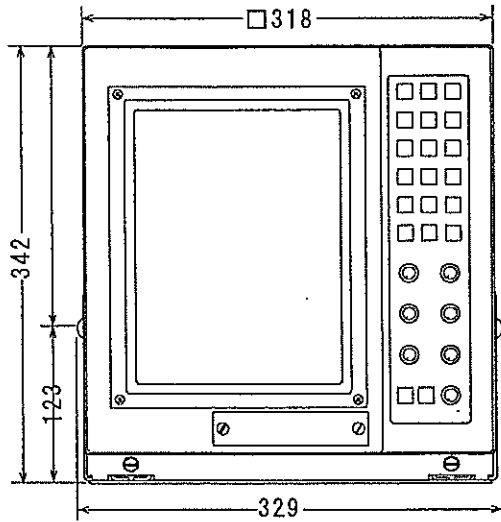
WEIGHT : 9 kg (including mounting bracket)

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.
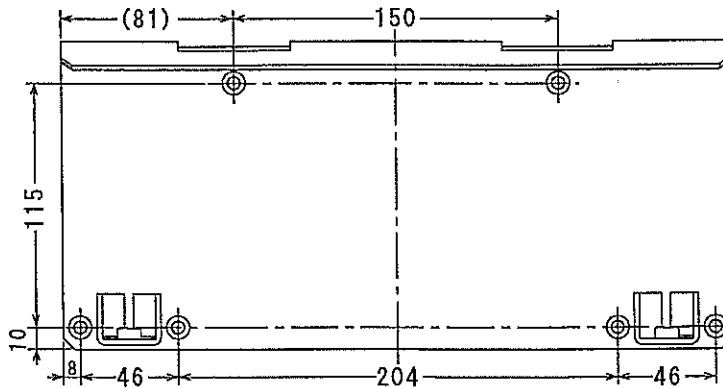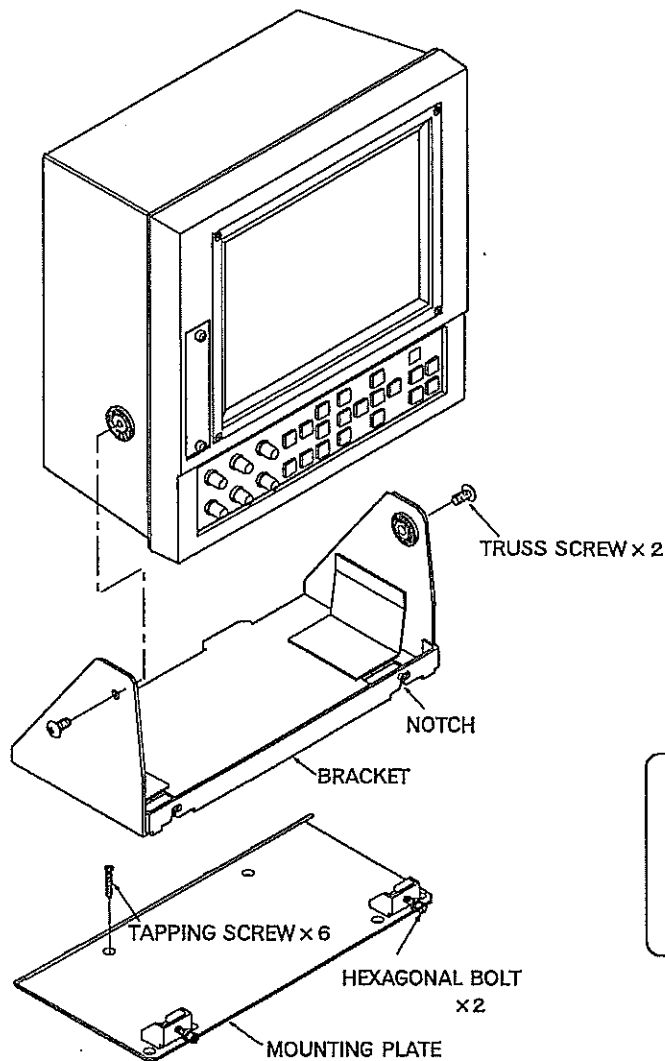
TRUSS SCREW x 2

NOTCH

BRACKET

TAPPING SCREW x 6

HEXAGONAL BOLT x 2

MOUNTING PLATE

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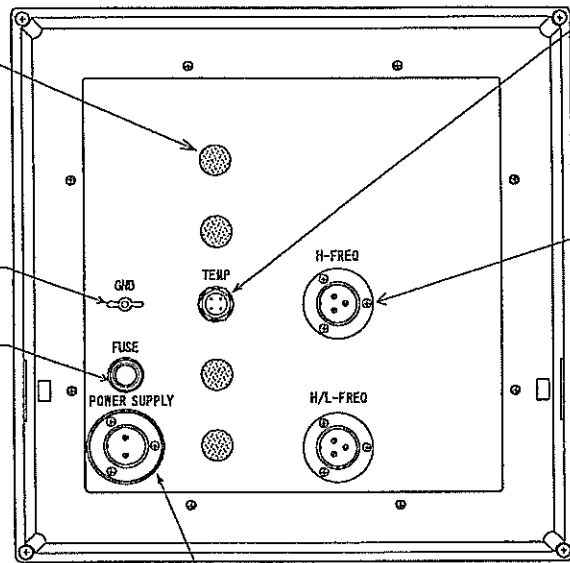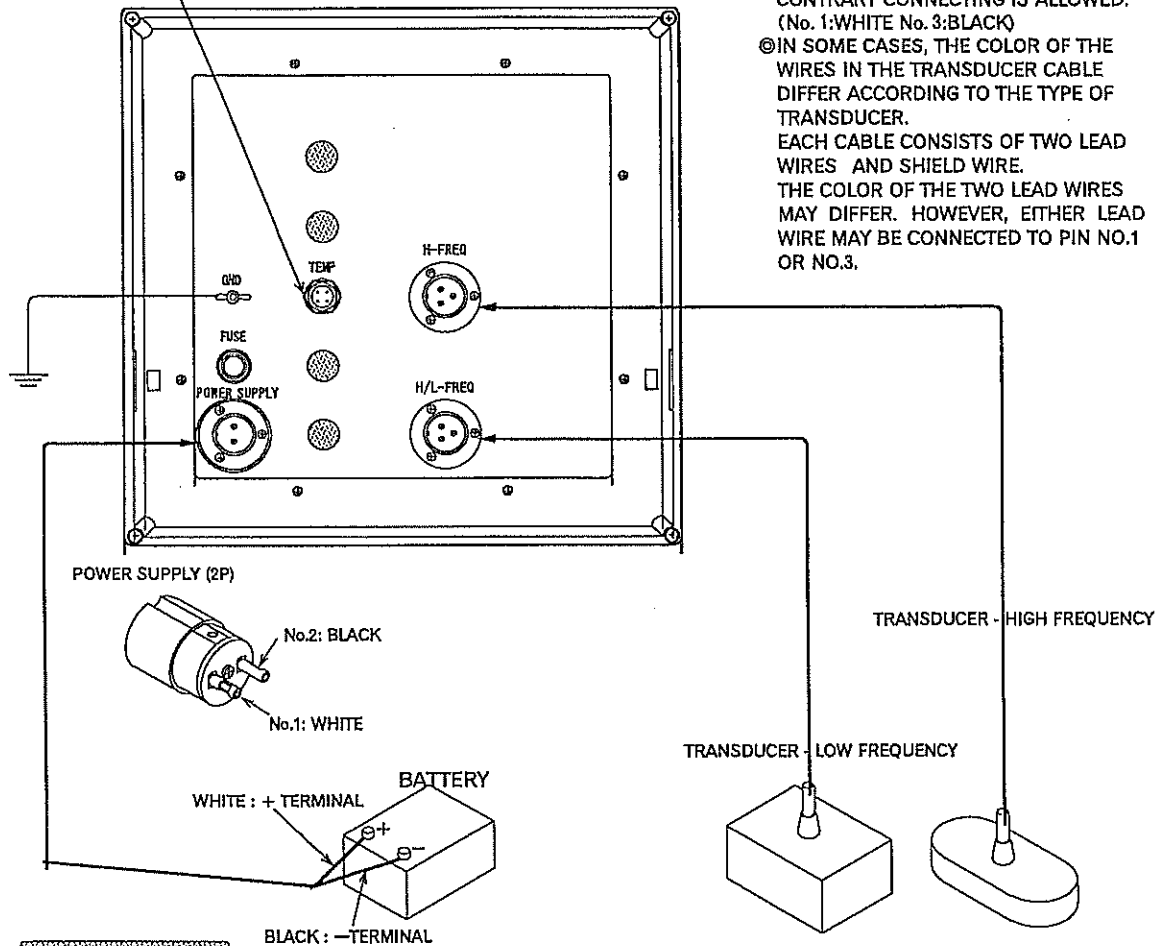
FUSE HOLDER
· Please use fuses as follows:
12V → 8A
24V → 5A
32V → 3A
When changing the voltage,
please change to the
correct fuse.

GND

TEMP

H-FREQ

FUSE

POWER SUPPLY

H/L-FREQ

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

CONNECTIONS

CONNECTION for TEMP. SENSOR (4P)

PIN	SIGNAL
No. 1	WHITE
No. 2	SHIELD
No. 3	NC
No. 4	BLACK

CONNECTION CABLE TERMINAL
for TRANSDUCER (3P)

No. 3 : WHITE

No. 1 : BLACK

No. 2 : SHIELD
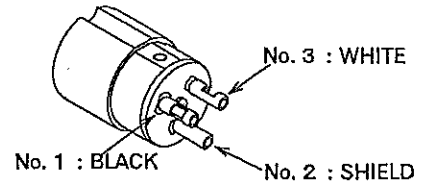
◎IN THE CASE OF PIN NO. 1 AND NO. 3,
CONTRARY CONNECTING IS ALLOWED.
(No. 1:WHITE No. 3:BLACK)

◎IN SOME CASES, THE COLOR OF THE
WIRES IN THE TRANSDUCER CABLE
DIFFER ACCORDING TO THE TYPE OF
TRANSDUCER.
EACH CABLE CONSISTS OF TWO LEAD
WIRES AND SHIELD WIRE.
THE COLOR OF THE TWO LEAD WIRES
MAY DIFFER. HOWEVER, EITHER LEAD
WIRE MAY BE CONNECTED TO PIN NO.1
OR NO.3.

GND

TEMP

H-FREQ

FUSE

POWER SUPPLY

H/L-FREQ

POWER SUPPLY (2P)

No.2: BLACK

No.1: WHITE

TRANSDUCER - HIGH FREQUENCY

TRANSDUCER - LOW FREQUENCY

BATTERY

WHITE : + TERMINAL

BLACK : —TERMINAL

⚠ WARNINGS

◎ Power reqirement: 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
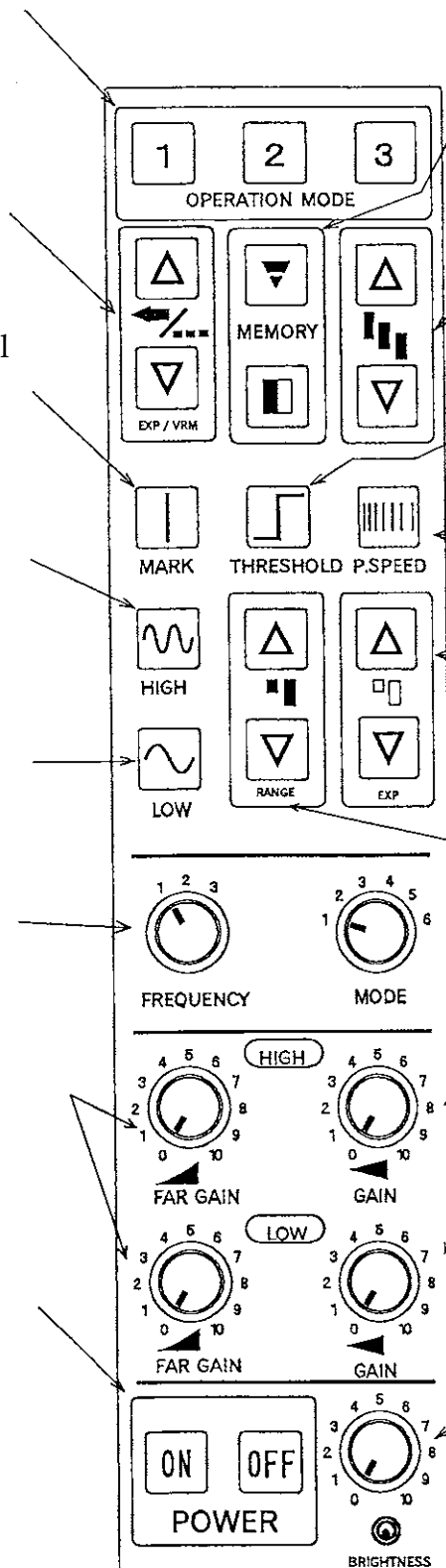valg av farger som skal vises.

Bildehastighet.
Side.72
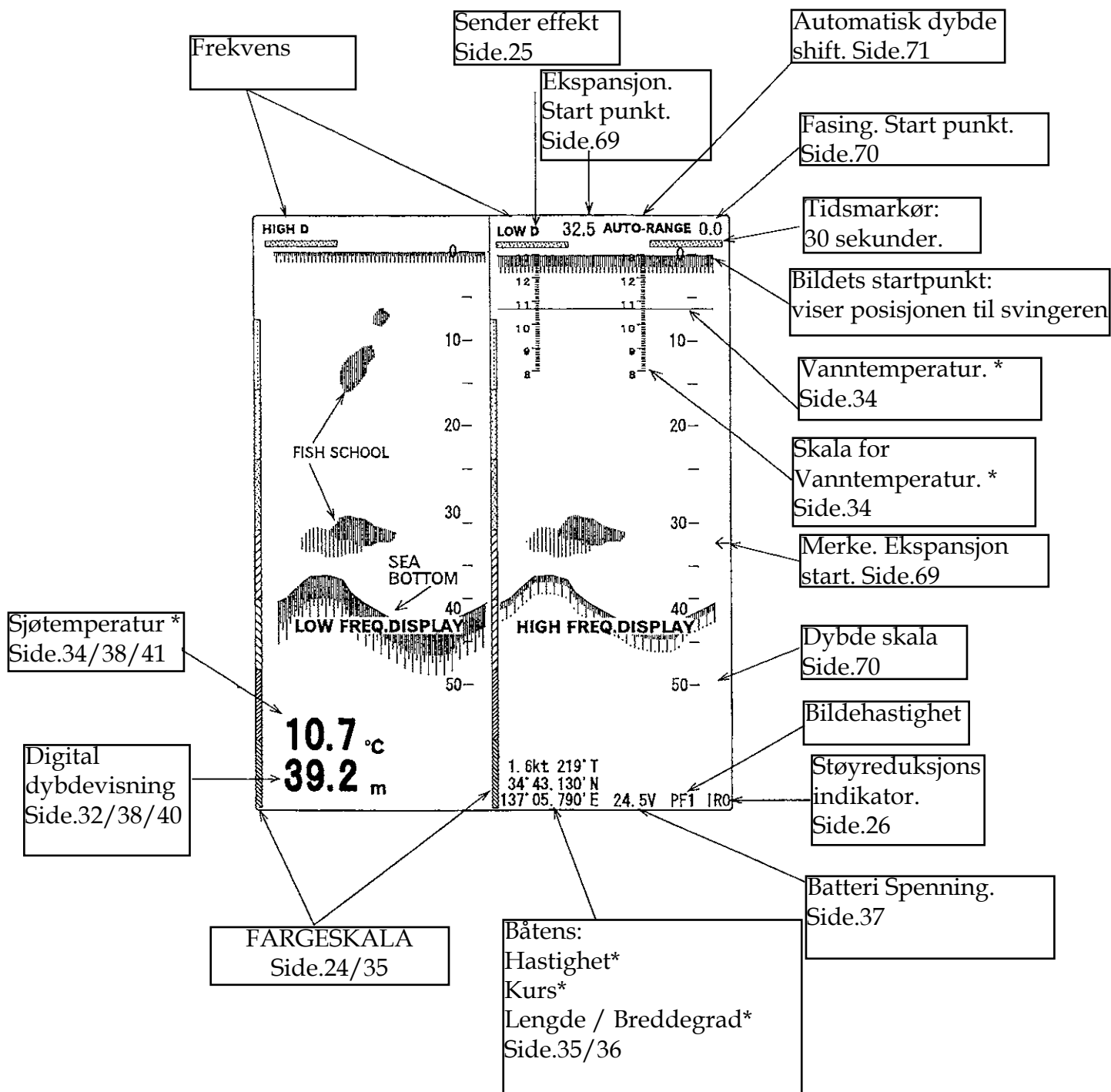
Ekspansjon knapp.
Side.75

Dybde instilling.
Side.70

Valg av bilde på skjerm.
Side.60

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

Lysstyrke.
Side.64

BILDE FORKLARING :

Frekvens

Sender effekt
Side.25

Ekspansjon.
Start punkt.
Side.69

Automatisk dybde
shift. Side.71

Fasing. Start punkt.
Side.70

Tidsmarkør:
30 sekunder.

Bildets startpunkt:
viser posisjonen til svingeren

Vanntemperatur. *
Side.34

Skala for
Vanntemperatur. *
Side.34

Merke. Ekspansjon
start. Side.69

Sjøtemperatur *
Side.34/38/41

Dybde skala
Side.70

Bildehastighet

Støyreduksjons
indikator.
Side.26

Digital
dybdevisning
Side.32/38/40

Batteri Spenning.
Side.37

FARGESKALA
Side.24/35

Båtens:
Hastighet*
Kurs*
Lengde / Breddegrad*
Side.35/36

HIGH D
LOW D   32.5   AUTO-RANGE 0.0

FISH SCHOOL

SEA
BOTTOM

LOW FREQ.DISPLAY   HIGH FREQ.DISPLAY

10.7 °C
39.2 m

1.6kt 219° T
34° 43.130' N
137° 05.790' E   24.5V   PF1 IRO

NB:! * Ekstra utstyr må tilkobles.

FUNCTION EXPLANATION

CONTROL PANEL

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

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

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

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

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

FREQUENCY SELECTION DIAL : [CF] PAGE 59
- Select the frequency.

FAR GAIN DIAL : [CF] PAGE 66/67
- Adjusts presentation of receivedecho in the long range.

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 : [CF] PAGE 68
- 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 : [CF] PAGE 70
- Adjust the scale/range of depth. between available values.

THRESHOLD KEY : [CF] PAGE 74
- Displays and erases colors from the color threshold.

PICTURE SPEED KEY : [CF] PAGE 72
- Selects the rate of picture movement.

EXPANSION RANGE KEY : [CF] PAGE 75
- Selects the expansion ranges for Partial and Bottom expansion modes.

RANGE KEY : [CF] PAGE 70
- Selects the basic range for Normal mode.

MODE SELECTION DIAL : [CF] PAGE 60
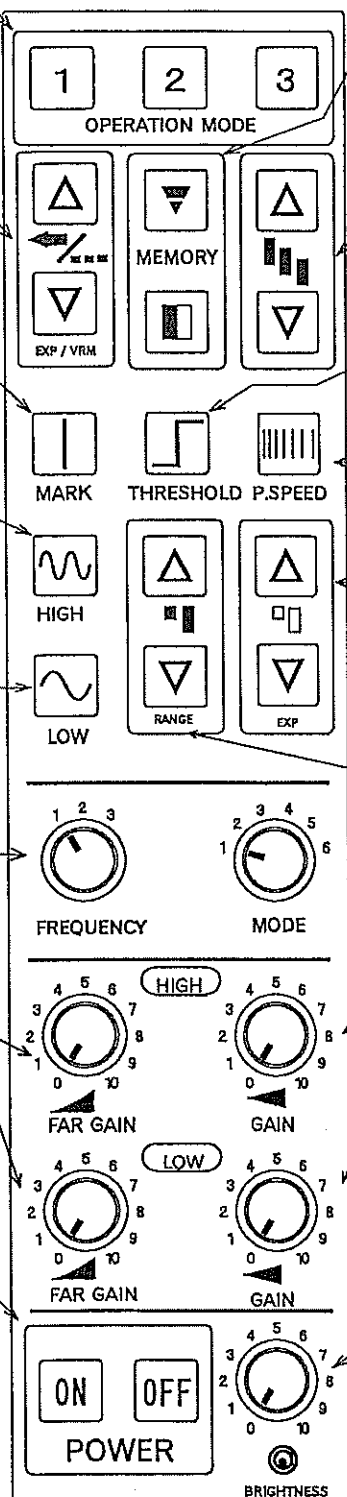- Selects the display mode.

GAIN DIAL : [CF] PAGE 65
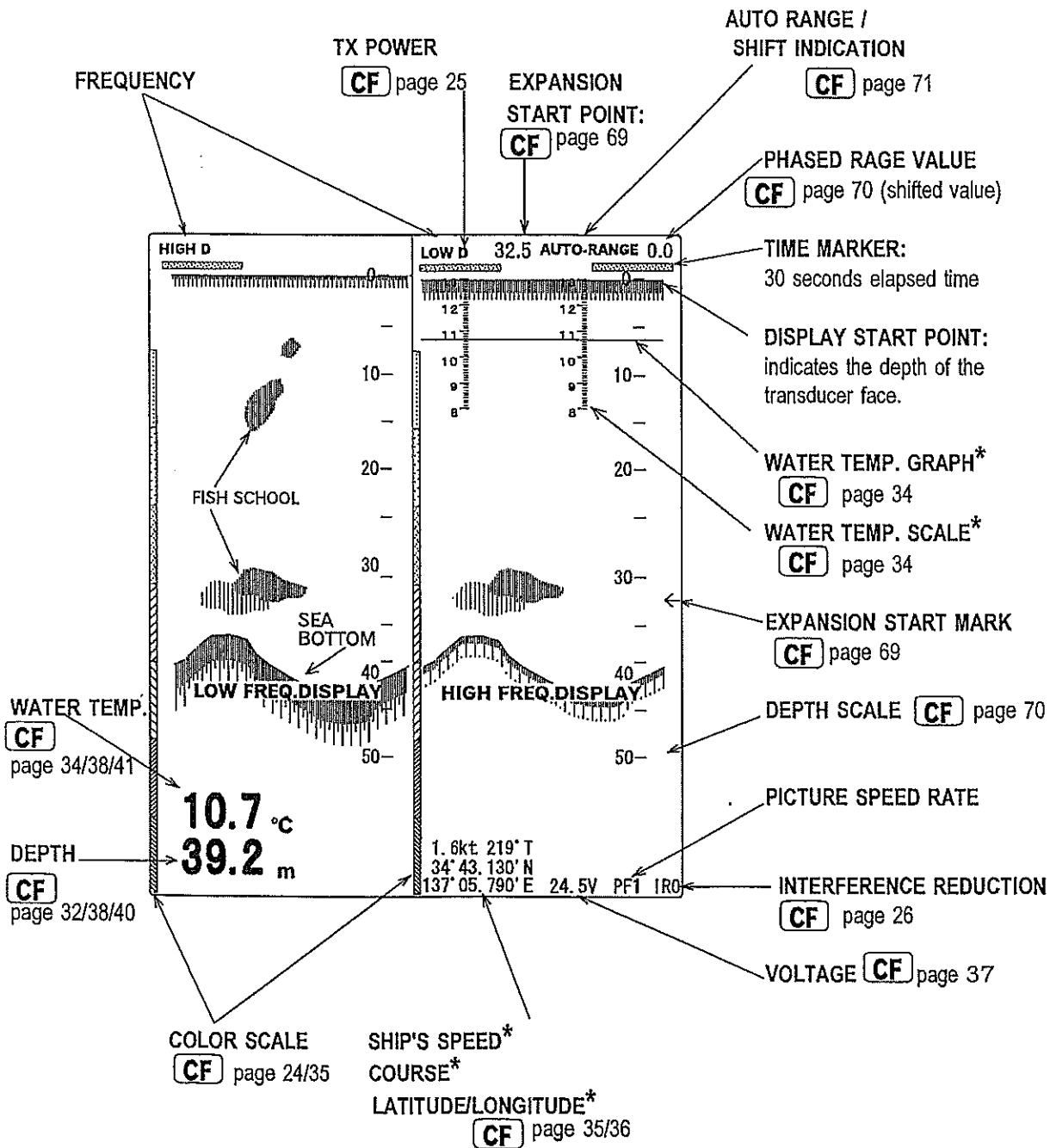- Adjusts presentation of received echo.

BRIGHTNESS DIAL : [CF] PAGE 64
- Select the level of brightness.

MODE EXAMPLE

DISPLAY

◎ The below shows an example for Normal mode.
Bottom expansion mode and partial expansion mode are
different from this display.

FREQUENCY

TX POWER
CF page 25

EXPANSION
START POINT:
CF page 69

AUTO RANGE /
SHIFT INDICATION
CF page 71

PHASED RAGE VALUE
CF page 70 (shifted value)

TIME MARKER:
30 seconds elapsed time

DISPLAY START POINT:
indicates the depth of the
transducer face.

WATER TEMP. GRAPH*
CF page 34

WATER TEMP. SCALE*
CF page 34

EXPANSION START MARK
CF page 69

DEPTH SCALE **CF** page 70

PICTURE SPEED RATE

INTERFERENCE REDUCTION
CF page 26

VOLTAGE **CF** page 37

HIGH D

LOW D   32.5 AUTO-RANGE 0.0

FISH SCHOOL

SEA
BOTTOM

LOW FREQ.DISPLAY   HIGH FREQ.DISPLAY

WATER TEMP.
CF
page 34/38/41

10.7 °c

DEPTH
CF
page 32/38/40

39.2 m

1.6kt 219°T
34°43.130'N
137°05.790'E   24.5V PF1 IR0

COLOR SCALE
CF page 24/35

SHIP'S SPEED*
COURSE*
LATITUDE/LONGITUDE*
CF page 35/36

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

INITIAL SETTINGS

FACTORY SETTINGS

◎ This equipment is shipped from the factory with the functions under the following settings. The user is able to re-set these function if/as desired with the user setting mode, MODE SELECTION DIAL 6.

FUNCTION	FACTORY SETTING (in the box)	USER MODE
FUNCTION SET · LOW GAIN UP TVG D RANGE （DYNAMIC RANGE) CLUTTER· TX POWER	OFF · +10 · [+20] · +30 · +40 STC · 1 · 2 · [3] · 4 -3dB · -4dB · -5dB · [±6dB] · +5dB · +4dB · +3dB [OFF] · 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 A · B · C · [D]	MODE SELECTION DIAL 6
FUNCTION SET · HIGH GAIN UP TVG D RANGE （DYNAMIC RANGE) CLUTTER TX POWER	OFF · +10 · [+20] · +30 · +40 STC · 1 · 2 · [3] · 4 -3dB · -4dB · -5dB · [±6dB] · +5dB · +4dB · +3dB [OFF] · 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 A · B · C · [D]	[CF] page 21-25
REDUCTION INTERF RED JAMING RED NOISE RED WHITE LINE	[OFF] · LOW · MIDDLE · HIGH [OFF] · 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 [OFF] · ON [OFF] · LOW · MIDDLE · HIGH	[CF] page 26-28
SCREEN DIVISION BTM EXPN SCREEN DIV DUAL FREQ (VERT. SPLIT) (HORIZ. SPLIT)	[CONST1] · CONST2 · CONST3 · AUTO [VERT] · HORIZ [L | H] · H | L L / H · [H / L]	[CF] page 29-31
DISP ITEM SEL DEPTH DISP SCALE EXP/VRM TEMP DISP TEMP GRAPH COL. SCALE LAT.LONG. SPEED DISP COURSE VOLT DISP MARK DISP.POS DEPTH GRID PICTURE FEED A-SCOPE	OFF · SMALL · [MEDIUM] · LARGE OFF · [RIGHT] · CENTER [EXP] · VRM [OFF] · SMALL · LARGE [OFF] · ON OFF · [ON] [OFF] · ON [OFF] · ON [OFF] · ON [OFF] · ON [MARK] · TIMER [LOWER] · UPPER [AUTO] · 1 · 2 · 5 · 10 · 20 · 50 · 100 [AUTO] · FIXED [OFF] · ON	[CF] page 32-39

FUNCTION	FACTORY SETTING (in the box)	USER SETTING MODE
UNIT・ADJUST		MODE
DEPTH UNIT	[m] ・ fm ・ br ・ ft	SELECTION
TEMP UNIT	[°C] ・ °F	DIAL 6
SPEED UNIT	[k t] ・ k m / h	[CF]
TEMP ADJ	[+ 0.0] (- 9.9 ～ + 9.9)	page 40-42
DRAFT	[00.0] (00.0 ～ 99.9)	
OTHERS		[CF]
COLOR SET	[A-1] ・ A-2 ・ B-1 ・ B-2 ・ C-1 ・ C-2	page 43-51
	D-1 ・ D-2 ・ E-1 ・ E-2	
OUTER DPTH	[OFF] ・ ON	
MJR FREQ	[LOW] ・ HIGH	
TRIGGER	[INTRNL] ・ EXTRNL	
ECHO SIG	[INTRNL] ・ EXTRNL	
OUTPUT	[OFF] ・ 183N ・ 183T ・ 600S	
TRANS RATE	LOW ・ [MEDIUM] ・ HIGH	
PULSE	NARROW ・ [NORMAL] ・ WIDE ・ 0.3(0.3 ～ 3.6)	
PANEL BRIGHT	DARK ・ [BRIGHT]	
OPE. MODE	[0] ・ 1	
SHIFT AR	[1] ・ 5 ・ 10 ・ 50 ・ 100	
TEMP SENSOR	[OP-102] ・ OP-41 ・ NMEA-0183	
ASHIFT LIMIT	[999] (010 ～ 999)	
TRIG SYNC	OFF ・ [ON]	
RANGE SET	[LINKED] ・ SINGLE	
ALARM		[CF]
SHALLOW	[OFF] ・ 0000 (0000 ～ 3999)	page 52-56
DEEP	[OFF] ・ 0000 (0000 ～ 3999)	
FISH	[OFF] ・ 6 (1 ～ 7)	
TEMP MAX.	[OFF] ・ 35.0 (00.0 ～ 35.0) ⎫	
TEMP MIN.	[OFF] ・ 00.0 (00.0 ～ 34.9) ⎬ in case of °C	
TEMP RANGE	[OFF] ・ 00.0 (00.0 ～ 09.8) ⎭	
FISH ALARM	[LOW] ・ HIGH	
MAIN RANGE	The range can be set freely.	MODE
(NORMAL RANGE)	1 (0 ～ 2 5)	SELECTION
		DIAL 5
SUB RANGE		[CF]
(EXPANSION RANGE)	1 (1)	page 19-20
FREQUENCY	1 (LOW FREQUENCY)	
SELECTION DIAL		
MODE SELECTION DIAL	1 (NORMAL DISPLAY)	CONTROL PANEL
OPERATION MODE	NO SETTING	
PHASED RANGE	0	
AUTO RANGE	OFF	
AUTO SHIFT	OFF	
THRESHOLD	7 COLORS	
PICTURE SPEED	PF1/1	
USER SETTING	NO SETTING	[CF] page 16

RETURN TO FACTORY SETTINGS

◎ Ensure the power supply switch is turned off.
Then while holding the ⎡ I ⎤ Mark key, press ⎡ON⎤ key and keep pressing the ⎡ I ⎤
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 ⎡ I ⎤ 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.

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

1. MAIN RANGE

◎ To customize the main ranges.

    Example • Factory setting ranges:

m • f m • b r :

NUMBER	RANGE
1 :	0 0 0 − 0 0 2 5
2 :	0 0 0 − 0 0 5 0
3 :	0 0 0 − 0 1 0 0
4 :	0 0 0 − 0 1 5 0
5 :	0 0 0 − 0 2 0 0
6 :	0 0 0 − 0 3 0 0
7 :	0 0 0 − 0 5 0 0

f t :

NUMBER	RANGE
1 :	0 0 0 0 − 0 0 5 0
2 :	0 0 0 0 − 0 1 0 0
3 :	0 0 0 0 − 0 1 5 0
4 :	0 0 0 0 − 0 2 0 0
5 :	0 0 0 0 − 0 3 0 0
6 :	0 0 0 0 − 0 5 0 0
7 :	0 0 0 0 − 1 0 0 0

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.
    EXP/VRM

• Use the △ or ▽ Phased range key to set the desired range values.
    PHASED R.

RANGE SET MENU

MAIN RANGE

NUMBER	RANGE
1	0 0 0 − 0 0 2 5
2	0 0 0 − 0 0 5 0
3	0 0 0 − 0 1 0 0
4	0 0 0 − 0 1 5 0
5	0 0 0 − 0 2 0 0
6	0 0 0 − 0 3 0 0
7	0 0 0 − 0 5 0 0

PHASED RANGE

DEPTH of
SCREEN BOTTOM

• Use the △ or ▽ EXP/VRM key
    EXP/VRM
to hightlight the item you want to change.

• Use the △ or ▽ Phased range key
    PHASED R.
to set the desired values.

△ : makes the range larger.
PHASED R.

▽ : makes the range smaller.

◎ Continuous pressing of the △
    PHASED R.
or ▽ Phased range key will change
PHASED R.
the range value faster.

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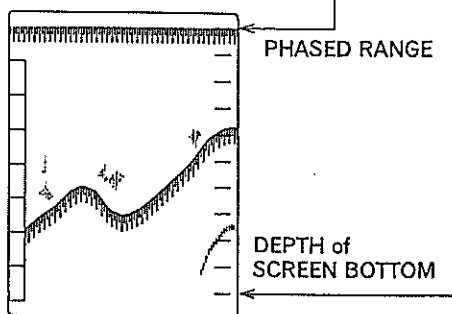
2. SUB RANGE

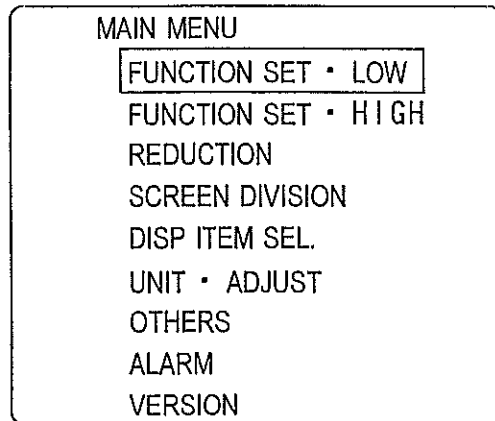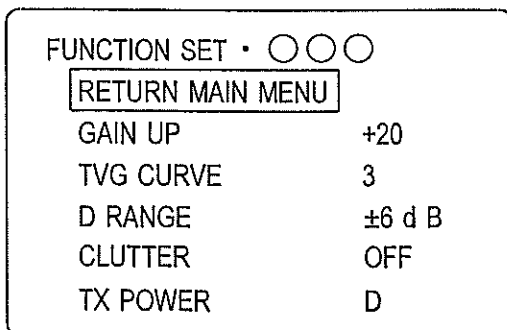◎ To customize the sub ranges.
　　Example • Factory setting ranges:

m • f m • b r :					f t :					
NUMBER	RANGE				NUMBER	RANGE				VARIABLE RANGES:
1 :	0	0	0	1	1 :	0	0	1	0	up to 250 (m,fm or br)
2 :	0	0	0	2	2 :	0 · 0	2	0		up to 500 feet
3 :	0	0	0	5	3 :	0	0	3	0	
4 :	0	0	1	0	4 :	0	0	4	0	
5 :	0	0	2	0	5 :	0	0	5	0	
6 :	0	0	3	0	6 :	0	1	0	0	
7 :	0	0	4	0	7 :	0	2	5	0	
8 :	0	0	5	0	8 :	0	5	0	0	

◎ 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 .

```
RANGE SET MENU

SUB RANGE
NUMBER          RANGE
[1]             [0  0  0  1]
 2               0  0  0  2
 3               0  0  0  5
 4               0  0  1  0
 5               0  0  2  0
 6               0  0  3  0
 7               0  0  4  0
 8               0  0  5  0
```

• Use the [△] or [▽] EXP/VRM key
　　　　　　EXP/VRM
to highlight the item you want to change.

• Use the [△] or [▽] Phased range key
　　　　　　PHASED R.
to set the desired values.

[△] : makes the range larger.
PHASED R.

[▽] : makes the range smaller.

◎ Continuous pressing of the [△]
　　　　　　　　　　　　　　　PHASED R.
or [▽] Phased range key will change
　PHASED R.
the range value faster.

SETTING MENU

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

· Use the $\triangle$ or ∇ EXP/VRM key to highlight the item to be set and the
EXP/VRM

· $\triangle$ or ∇ Phased range key to select the desired function setting.
PHASED R.

```
MAIN MENU
┌─────────────────────┐
│ FUNCTION SET · LOW  │
└─────────────────────┘
  FUNCTION SET · HIGH
  REDUCTION
  SCREEN DIVISION
  DISP ITEM SEL.
  UNIT · ADJUST
  OTHERS
  ALARM
  VERSION
```

· After setting each function, memorize them by using "USER SETTING".

CF page 16.

FUNCTION SETTINGS

```
FUNCTION SET · ○○○
┌─────────────────────┐
│ RETURN MAIN MENU    │
└─────────────────────┘
  GAIN UP          +20
  TVG CURVE        3
  D RANGE          ±6 d B
  CLUTTER          OFF
  TX POWER         D
```

· Use the $\triangle$ or ∇ EXP/VRM key to
EXP/VRM

highlight the item to be set.

· Use the $\triangle$ or ∇ Phased range key
PHASED R.

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. [CF] page 65

| GAIN UP | + 20 |

-------------- • Use the △ or ▽ Phased range key

PHASED R.

to select the gain adjust level

(OFF → + 10 → + 20 → + 30 → + 40).

GAIN DIAL VOLUME RANGE

MENU SETTING : OFF

3RD SCALE POSITION — MENU SETTING : +10

6TH SCALE POSITION — MENU SETTING : +20

9TH SCALE POSITION — MENU SETTING : +30

MENU SETTING : +40

MIN GAIN   WEAK ← GAIN → STRONG   MAX GAIN

TOTAL GAIN VOLUME RANGE
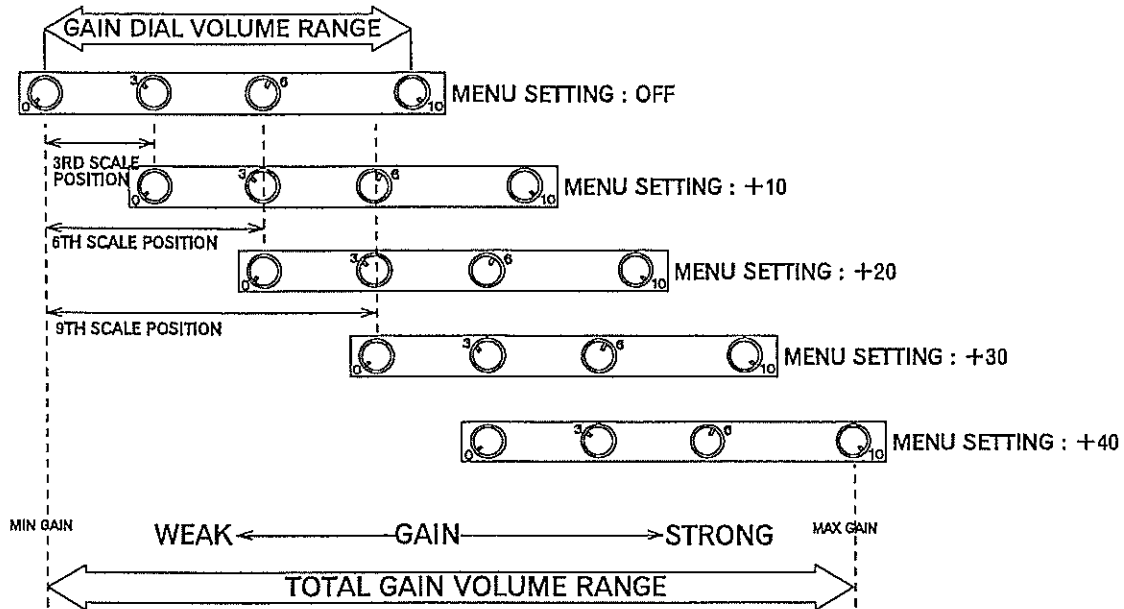
• When the menu gain adjust setting is changed from OFF to +10dB, the gain dial volume increases 3 points on the scale.

• 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
PHASED R.
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

NO TVG (TVG:OFF)

SHOWN IN RED

SHOWN IN
YELLOW

ECHOES FROM DEEP FISH
SCHOOLS WILL BE WEAKER
THAN FROM THE SCHOOLS AT A
SAME SIZE SHALLOWER DEPTH.

DEEP ECHOES
WILL BE DISPLAYED
MORE ACCURATELY

TVG: 2 OR 3

SHOWN IN RED

SHOWN IN RED

SELECT TVG ADJUST LEVEL 2 OR 3
TO SHOW DEEP ECHOES AT A MORE
ACCURATE SIZE AND DENSITY
(DYNAMIC RANGE LEVEL 6dB)

50m

SAME SIZE
FISH SCHOOL

100m
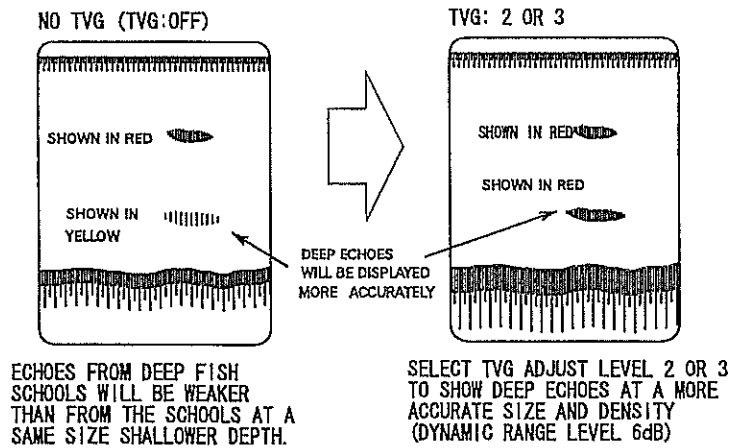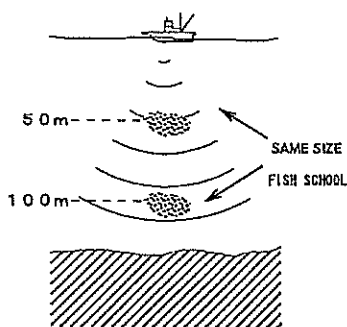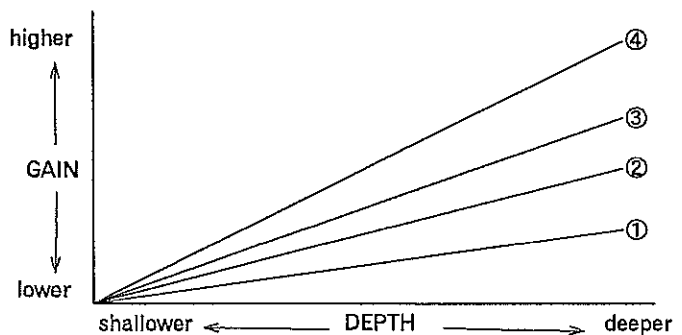
NOTE !

◎ 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.

D RANGE	±6 d B

• Each press of the △ or ▽ Phased
PHASED R.
range key changes the dynamic range level
(±6dB, → + 5dB, → + 4dB, → + 3dB,
→ − 3dB, → − 4dB, → − 5dB).

−3dB ⇒ −4dB ⇒ −5dB ⇒   ±6dB   ⇒ +5dB ⇒ +4dB ⇒ +3dB
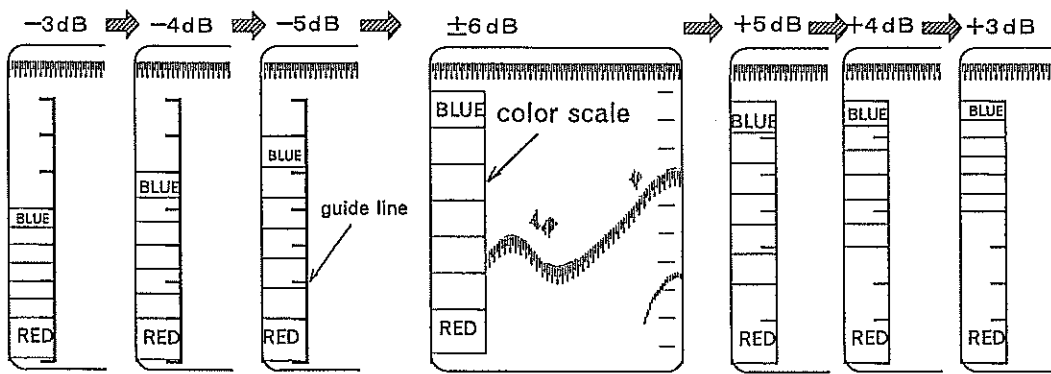
This diagram shows the comparative signal threshold levels to the standard ±6dB for the dynamic ranges.

When the dynamic range is changed from ±3dB to ±5dB, this range will be displayed in 7 colors.

4. CLUTTER

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

CLUTTER	OFF

Each press of the △ or ▽ Phased
PHASED R.
range key changes the level to reduce clutter
(OFF → 1 → 2 → 3 → 4 → 5 →
6 → 7 → 8 → 9 → 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

· Each press of △ or ▽ Phased range key
PHASED R.
changes the output power
"D...C...B...A...".
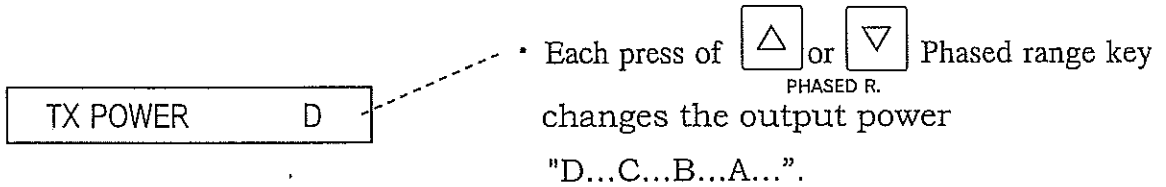
· The present level of TX POWER appears next to frequency as shown below.

TX POWER

SCREEN DIVISION : VERTICAL   SCREEN DIVISION : HORIZONTAL
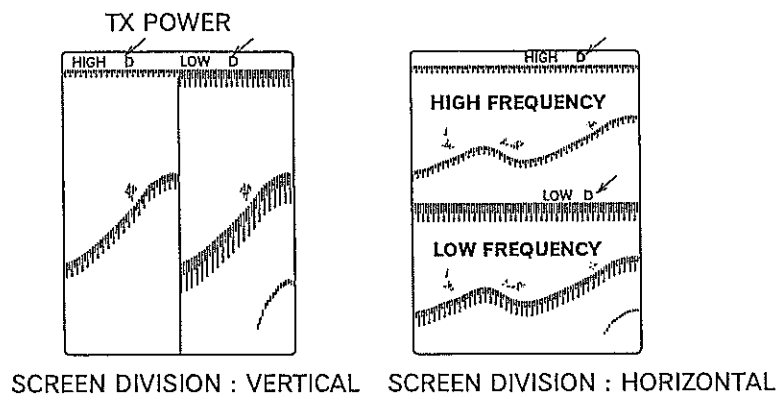
REDUCTION

```
REDUCTION
RETURN MAIN MENU
INTERF RED       OFF
JAMING RED       OFF
NOISE RED        OFF
WHITE LINE       OFF
```

• Use the △ or ▽ EXP/VRM key
  EXP/VRM

to highlight the item you want to change.

• Use the △ or ▽ Phased range key
  PHASED R.

to set the desired values.

1. INTERFERENCE REDUCTION

◎ To reduce interference from nearby fishing vessels.

```
INTERF RED           OFF
```

• Each press of the △ or ▽ Phased
  PHASED R.

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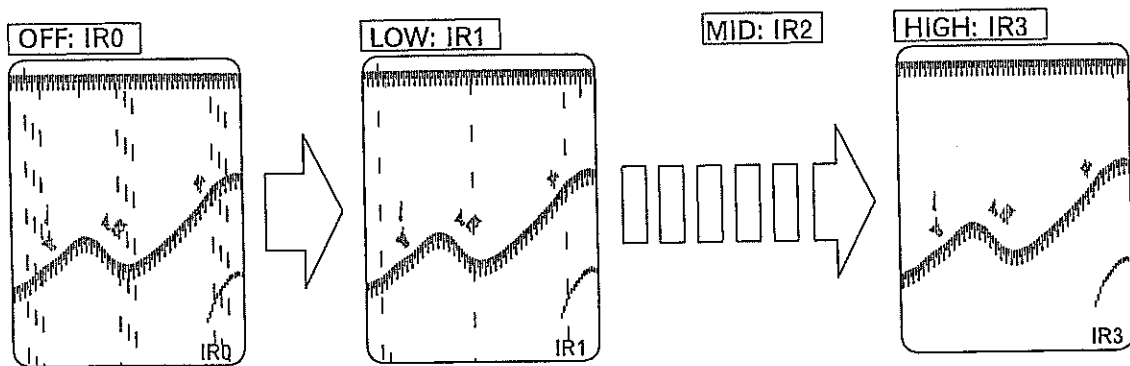
◎ Some types of noise interference may not be reduced.
◎ Do not select excessive level than the level to be needed
  since the weak echoes are erased.

2. JAMMING REDUCTION

◎   The combined use of Interference reduction and Jamming reduction

is effective in reducing noise due to jamming from other ships.

┌─────────────────────────────┐
│ JAMING RED   OFF   │ ---------- • Each press of the △ or ▽ Phased
└─────────────────────────────┘   PHASED R.
                                              range key changes the level.

                                              (OFF → 1..... → 9)

• Off indicates no reducing function and the higher level it is set,

the more irregular data appears like below.
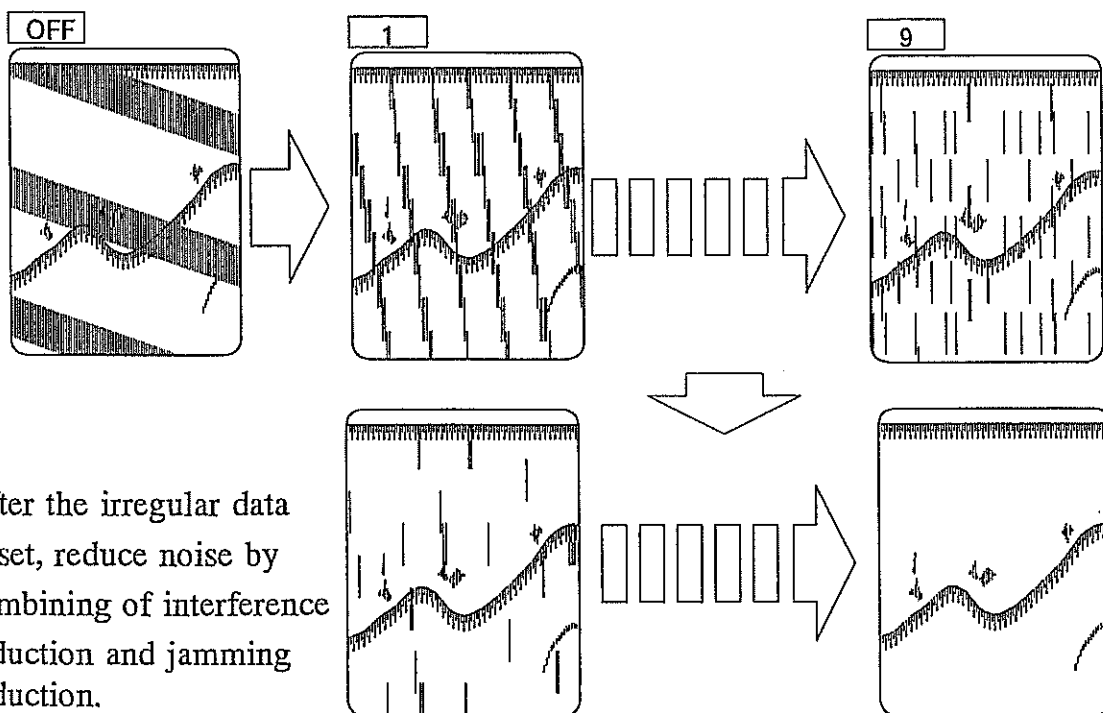
• After the irregular data
is set, reduce noise by
combining of interference
reduction and jamming
reduction.

⚠ 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.

```
┌──────────────────────────────────┐
│ NOISE RED          OFF           │ --- ---- · Each press of the △ or ▽ Phased
└──────────────────────────────────┘                         PHASED R.
                                       range key alternates OFF with ON.
```

· OFF: The noise suppressing action is disabled.
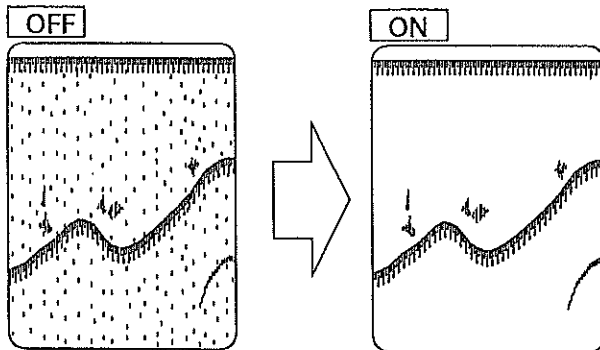
┌─────────────┬──┐
│ ⚠ CAUTIONS │ ◎ Some noise reflections may not be reduced. │
└─────────────┴──┘

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.

```
┌──────────────────────────────────┐
│ WHITE LINE         OFF           │ ---- -------- · Each press of the △ or ▽ Phased
└──────────────────────────────────┘                             PHASED R.
                                       range key changes the White Line
                                       control level.
                                       (OFF → LOW → MIDDLE → HIGH)
```

· OFF: The White Line control is disabled.
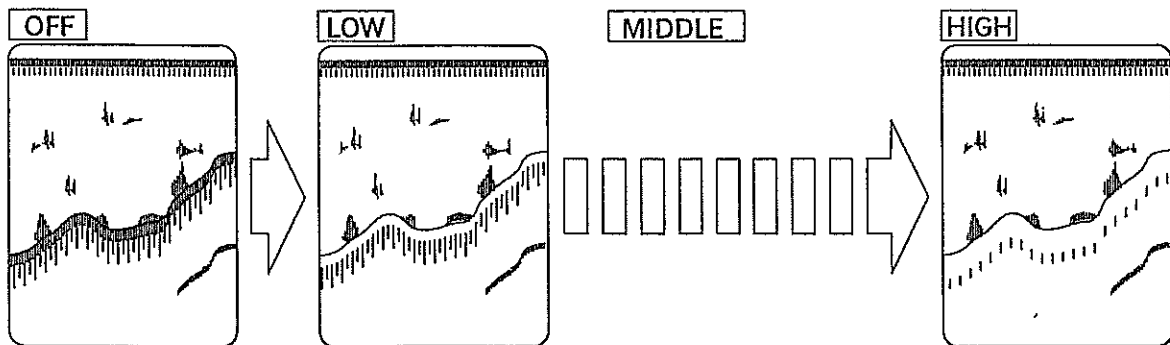
SCREEN DIVISION
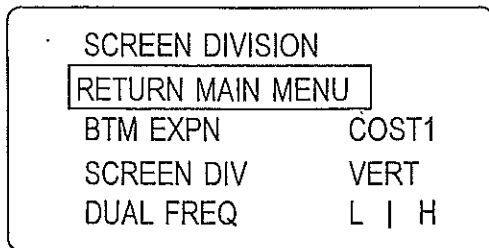
```
·  SCREEN DIVISION
  RETURN MAIN MENU
   BTM EXPN        COST1
   SCREEN DIV      VERT
   DUAL FREQ       L | H
```

· Use the △ or ▽ EXP/VRM key
  EXP/VRM

to highlight the item you want to change.

· Use the △ or ▽ Phased range key
  PHASED R.

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.

```
 BTM EXPN        CONST1   ----|----------
```

· Each press of the △ or ▽ Phased
  PHASED R.

range key changes the setting.
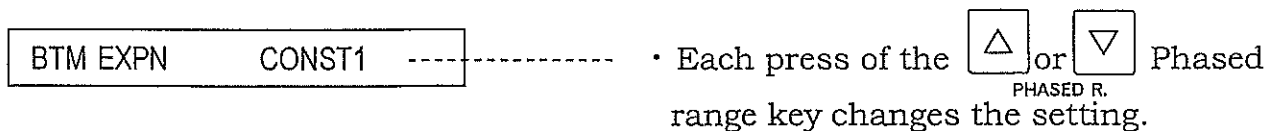
(CONST 1 → CONST 2 → CONST 3 → AUTO)

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>

SCREEN DIVISION : HORIZONTAL
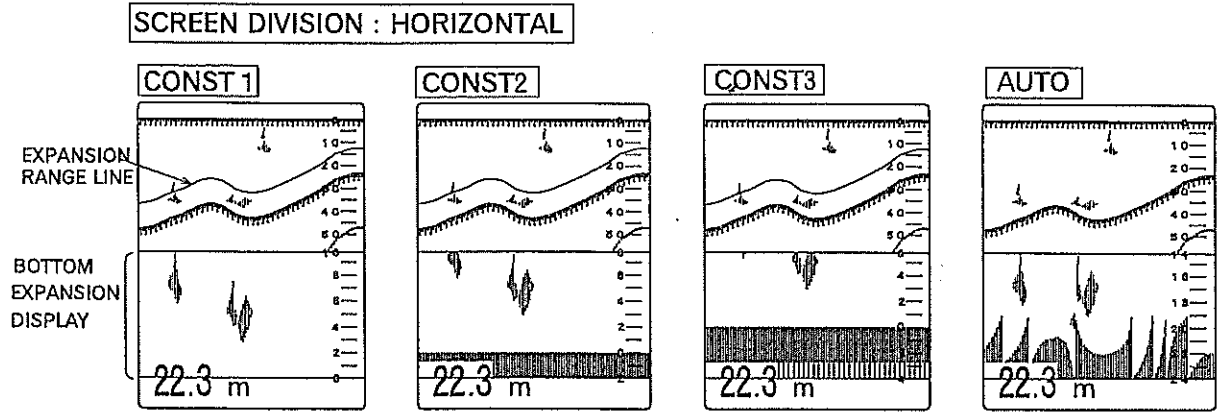
2. SCREEN DIVISION

◎ To select the screen division either VERTICAL or HORIZONTAL.

SCREEN DIV   HORIZ   -- ┤----------- • Each press of the △ or ▽ Phased

PHASED R.

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)

EXAMPLES
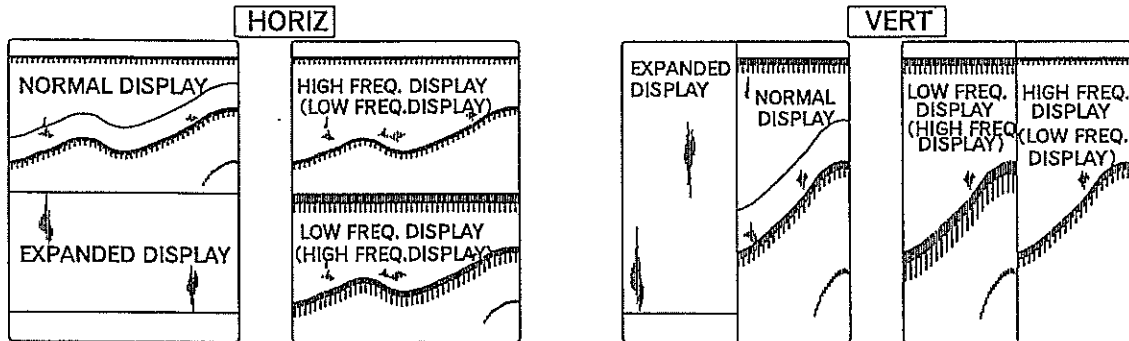
3. DUAL FREQUENCY DISPLAY LOCATION

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

| DUAL FREQ   L | H |
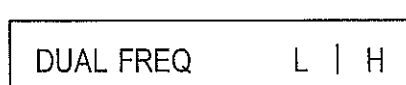
-------------- • Each press of the △ or ▽ Phased

PHASED R.

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.
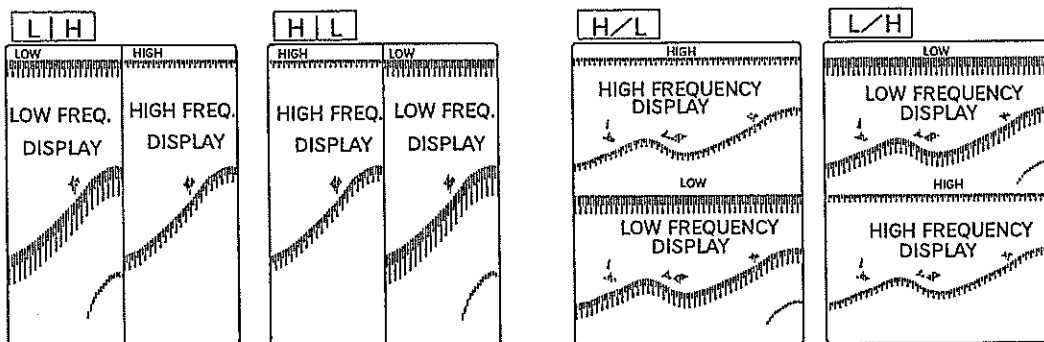
SCREEN DIVISION: VERTICAL   SCREEN DIVISION: HORIZONTAL

DISPLAY ITEM SELECTION

```
DISP ITEM SEL.
┌─────────────────────┐
│ RETURN MAIN MENU    │
└─────────────────────┘
  DEPTH DISP        MEDIUM
  SCALE POS.        RIGHT
  EXP/VRM           EXP
  TEMP DISP         OFF
  TEMP GRAPH        OFF
  COL. SCALE        ON
  LAT.LONG.         OFF
  SPEED DISP        OFF
  COURSE            OFF
  VOLT DISP         OFF
  MARK              MARK
  DISP.POS          LOWER
  DEPTH GRID        AUTO
  PICTURE FEED      AUTO
  A-SCOPE           OFF
```

• 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.

1. DIGITAL DEPTH DISPLAY SIZE

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

┌─────────────────────────────┐
│ DEPTH DISP   MEDIUM   │------------ • Each press of the △ or ▽ Phased
└─────────────────────────────┘
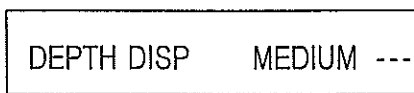
range key changes the size of digital

display for depth.
(OFF → SMALL → MEDIUM → LARGE)

OFF   SMALL   MEDIUM   LARGE
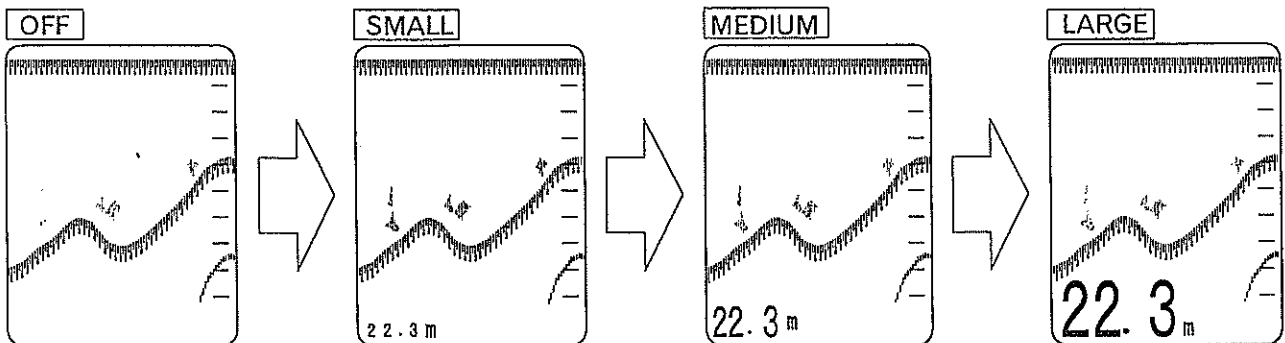
2. SCALE POSITION

◎ To select the depth scale position.

SCALE	RIGHT ----

------- • Each press of the △ or ▽ Phased
PHASED R.
range key changes the Scale position display.
(OFF → RIGHT → CENTER)

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

RIGHT / CENTER / OFF

Scale in the right   Scale in the center   No scale
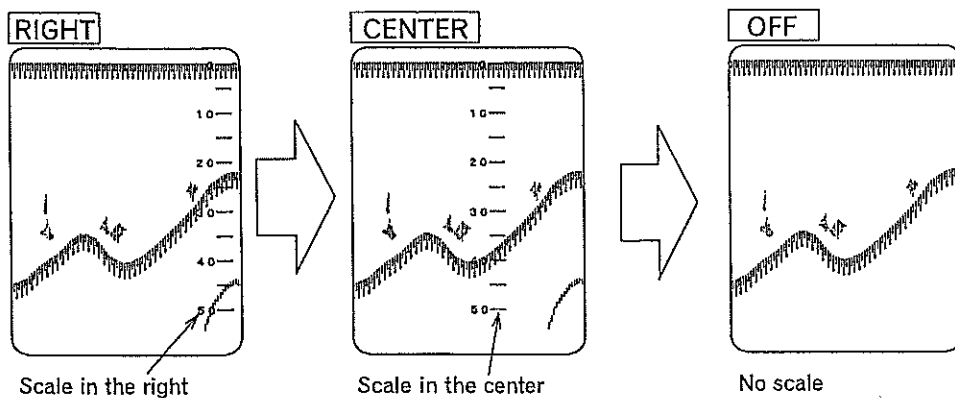
3. EXP/VRM (VRM EXPAINSION)

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

EXP/VRM	EXP ---

---------------- • Each press of the △ or ▽ Phased
PHASED R.
range key alternates EXP with VRM.
(EXP → VRM)

EXP   : activates the Expansion start point
VRM   : activates the Dotted line for digital depth

EXP

EXPANSION
START POINT

SCREEN DIVISION : VERTICAL

VRM

LINE for DEPTH
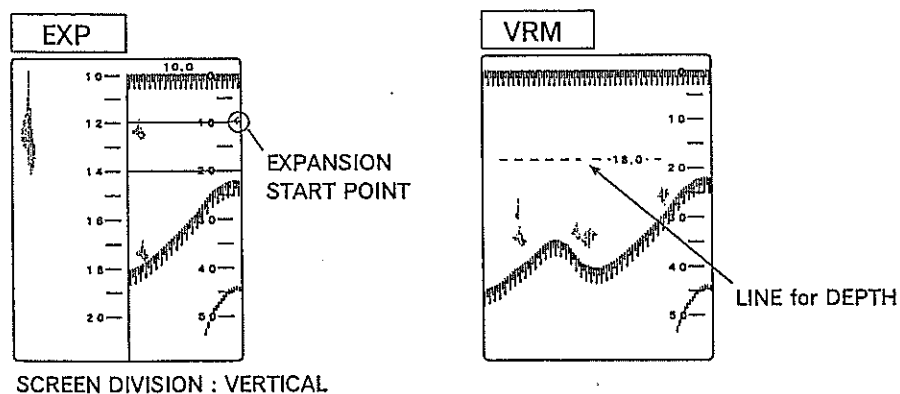
4. TEMPERATURE DISPLAY SIZE

◎ 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 △ or ▽ Phased
PHASED R.
range key alternates the size.
(OFF → SMALL → MLARGE)

NO TEMP. DISPLAY   TEMP.DISPLAY IN SMALL   TEMP.DISPLAY IN LARGE
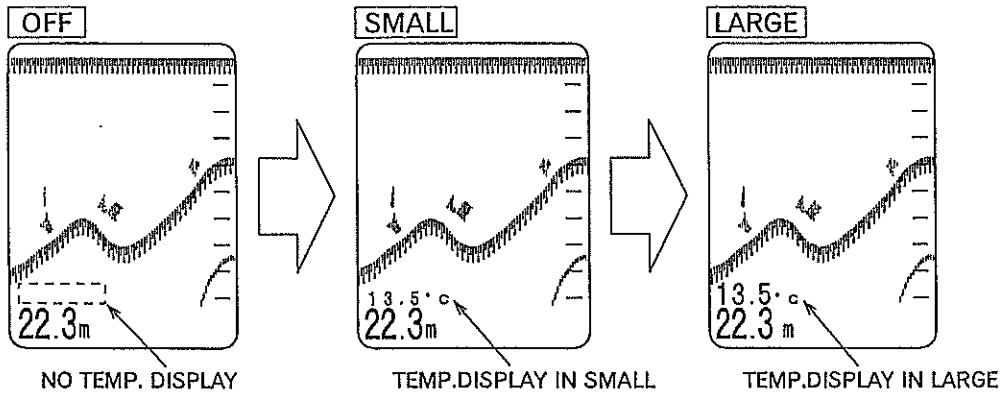
5. TEMPERATURE GRAPH

◎ 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 △ or ▽ Phased
PHASED R.
range key alternates On with OFF.

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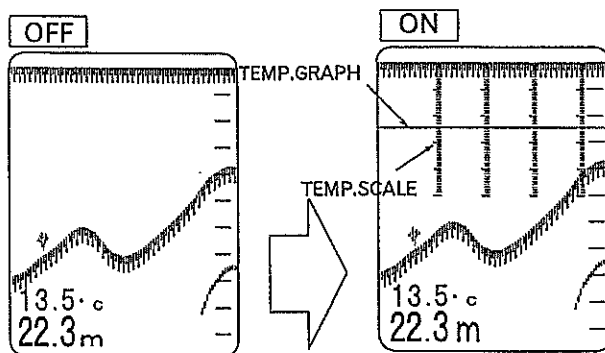
◎ To present a temperature will require that the ES-7100 is connected to an optional temp. sensor (OP-102 or OP-41) or via the NMEA-0183 input port.
• Please select OFF while disconnecting the temp.sensor.

6. COLOR SCALE

◎ To select Color Scale display either ON or OFF.

COL. SCALE   ON ---- ----------- • Each press of the $\boxed{\triangle}$ or $\boxed{\triangledown}$ Phased
PHASED R.
range key alternates ON with OFF.
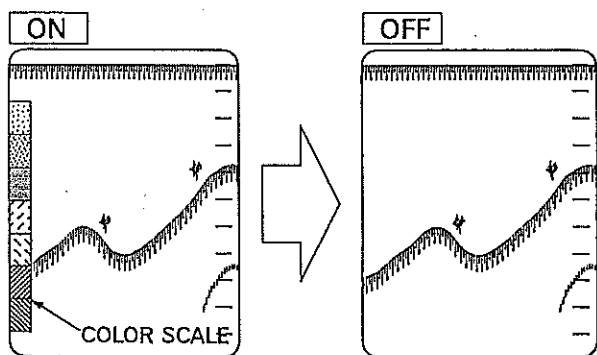
ON   : Color Scale appears on the screen.

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.

LAT.LONG.   ON -- -------------- • Each press of the $\boxed{\triangle}$ or $\boxed{\triangledown}$ Phased
PHASED R.
range key alternates On with OFF.
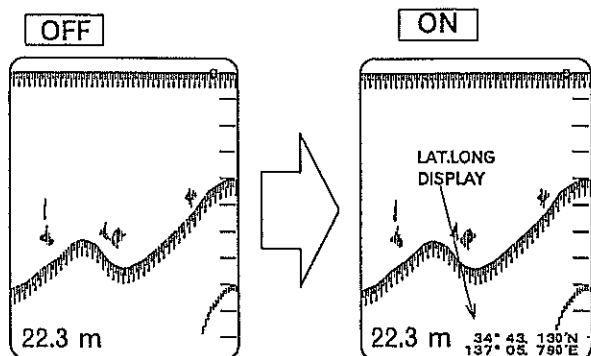
ON   : Position in three decimals in
        minutes appears on the screen.

OFF : Postion (lattitude/longitude) presentation
        disappearsfrom the screen.

NOTE !

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

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8. SPEED DISPLAY

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

SPEED DISP	ON

----- · Each press of the △ or ▽ Phased
PHASED R.
range key alternates On with OFF.
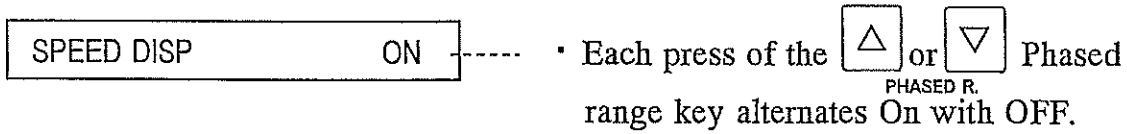
ON   : Speed presentation appears on the screen.

OFF   : Speed presentation disappears from the screen.

with LAT.LONG.
presentatin

with no LAT.LONG.
presentatin
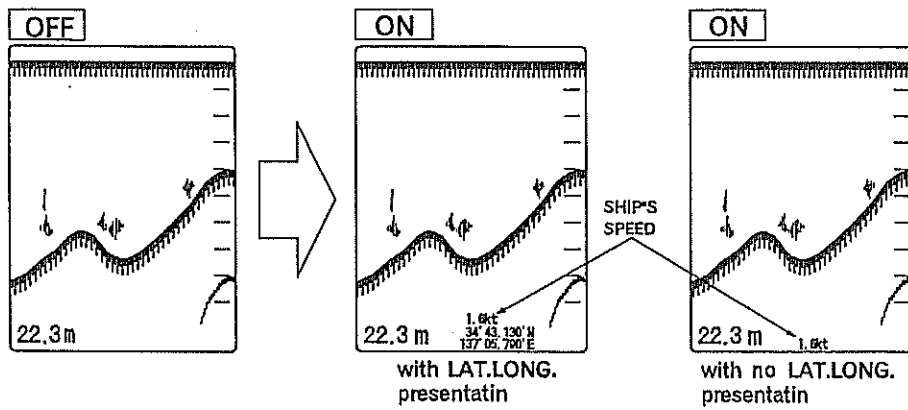
9. COURSE DISPLAY

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

COURSE	ON

------------ · Each press of the △ or ▽ Phased
PHASED R.
range key alternates ON with OFF.
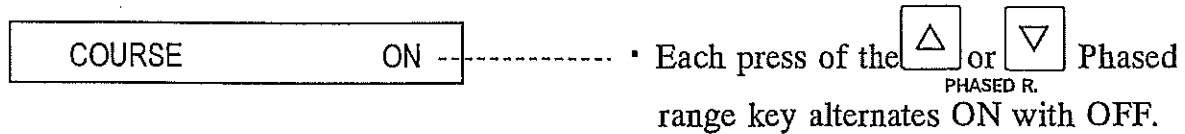
ON   : Course presentation appears on the screen.

OFF   : Course presentation disappears from the screen.

with LAT.LONG.
presentatin

with no LAT.LONG.
presentatin
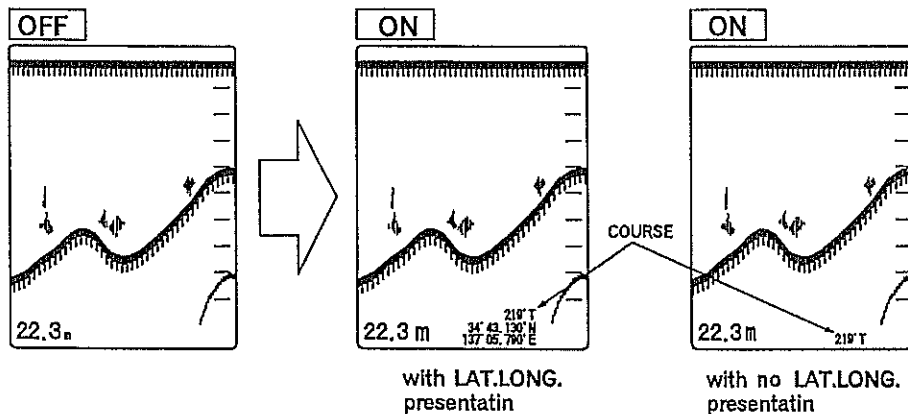
10. VOLTAGE DISPLAY

◎ To present the voltage the ES-7100 uses.

| VOLT DISP | OFF | ----┼-------- |

· Each press of the △ or ▽ Phased
PHASED R.

range key alternates ON with OFF.

OFF

ON

22.3 m

22.3 m   24.0V
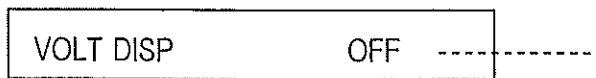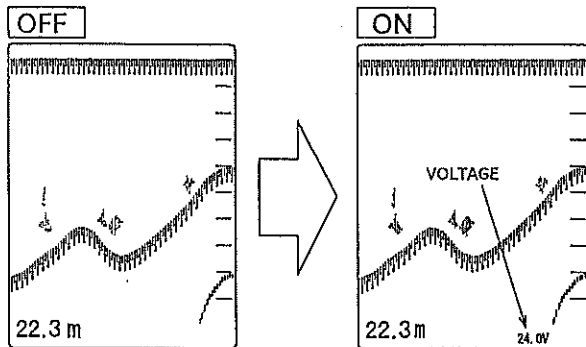
11. MARK

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

| MARK | MARK --┼---------- |
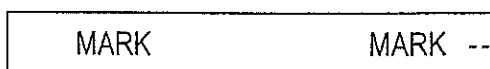
· Each press of the △ or ▽ Phased
PHASED R.

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.
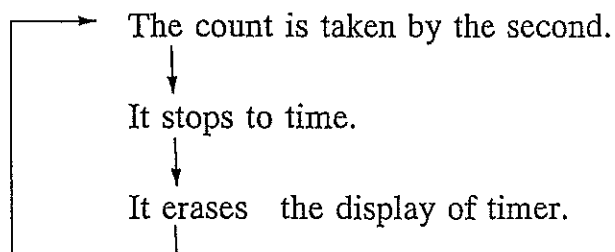
◎ The maximum timing display is 60 minutes.
It starts to display from 1 second, after it times 60 minutes.

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

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12. DISPLAY POSITION for DEPTH and TEMPERATURE.

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

DISP.POS   LOWER   ┤-------- · Each press of the △ or ▽ Phased

PHASED R.

range key alternates LOWER

with UPPER.

DIS. POSITION : LOWER
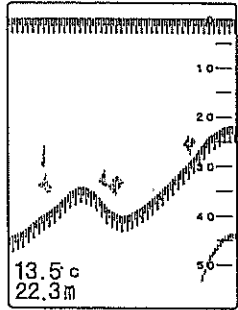
DIS. POSITION : UPPER
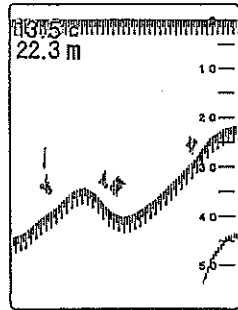
13. DEPTH GRID

◎ To adjust Depth scale unit with △ or ▽ Phased range key.

PHASED R.

DEPTH GRID   AUTO   ┤-------- · Each press of the △ or ▽ Phased

PHASED R.

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.

PICTURE FEED	AUTO

-------- • Each press of the △ or ▽ Phased

PHASED R.

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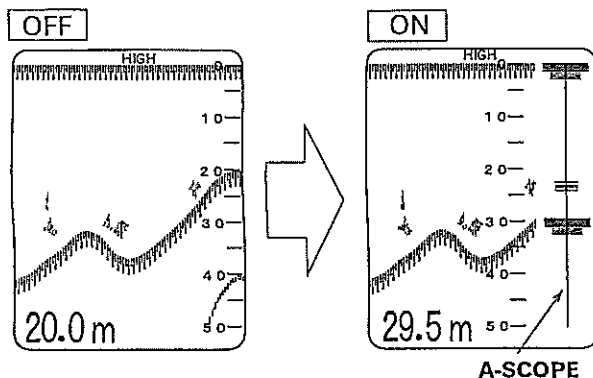
"FIXED" : Picture moves to the left by the speed rate independently of the range in use.
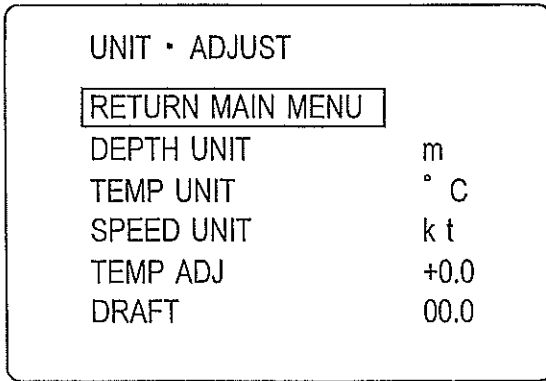The rate value is entered by Picture Speed key marked ▥ .

15. A-SCOPE

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

A-SCOPE	OFF

---------- • Each press of the △ or ▽ Phased

PHASED R.

range key alternates ON with OFF.

⌈ ON : A-Scope appears in the right side.
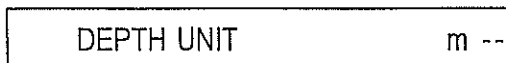⌊ OFF : A-Scope disappears from the screen.


A-SCOPE

UNIT ADJUSTMENT

```
UNIT · ADJUST

RETURN MAIN MENU
DEPTH UNIT        m
TEMP UNIT        ° C
SPEED UNIT        k t
TEMP ADJ         +0.0
DRAFT            00.0
```

· Use the $\triangle$ or $\triangledown$ EXP/VRM key to
              EXP/VRM
highlight the item you want to change.

· Use the $\triangle$ or $\triangledown$ Phased range key
           PHASED R.
to set the desired values

1. DEPTH UNIT

◎   The unit of depth may be selected.

```
DEPTH UNIT                    m
```

· Each press of the $\triangle$ or $\triangledown$ Phased
              PHASED R.
range key changes the depth unit.
(m → br → fm → ft)

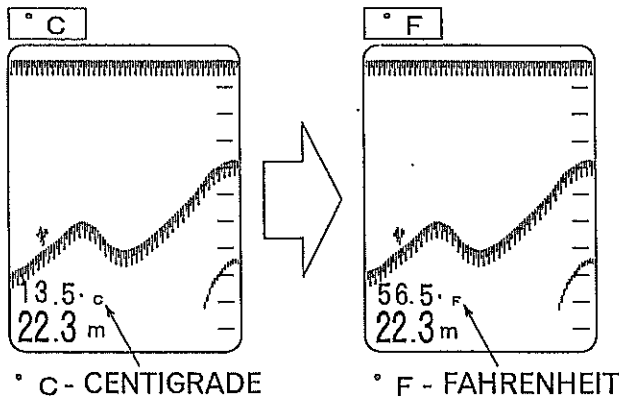
meters

fathom
1 fm : 1.8288m

BOTTOM DEPTH
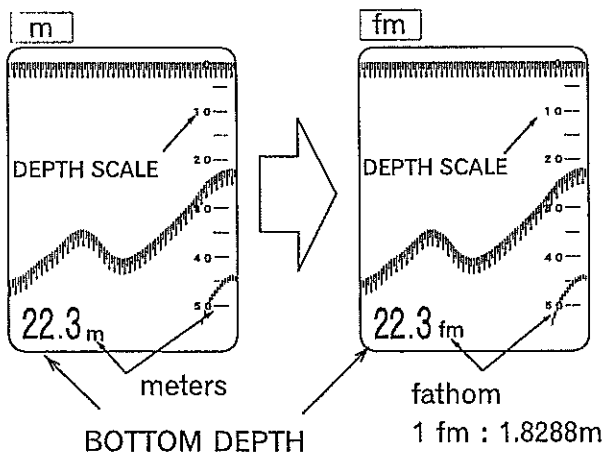
m   : To display the unit meters.

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

PHASED R.

range key alternates °C with °F.

° C - CENTIGRADE   ° F - FAHRENHEIT

⎰ °C : centigrade
⎱ °F : Fahrenheit

3. SPEED UNIT

◎ To select the unit of Speed unit.

SPEED UNIT	k t

----------- · Each press of the △ or ▽ Phased

PHASED R.

range key alternates kt with km/h.

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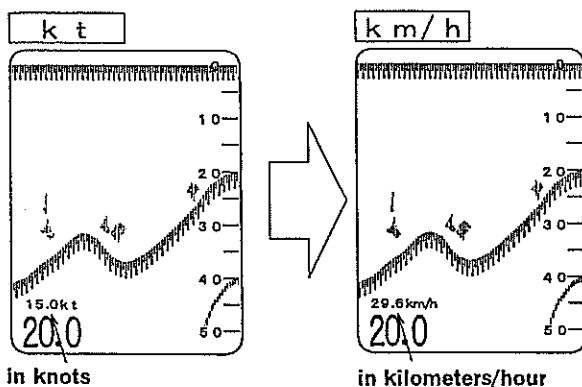
kt   : Speed can be shown in knots.
        1kt=1.852km/h

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 ⬚△ or ⬚▽ Phased key
PHASED R.
is pressed, it is adjusted by 0.1° in
the range from − 9.9 to + 9.9.

TEMP ADJ	0.0

+ 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
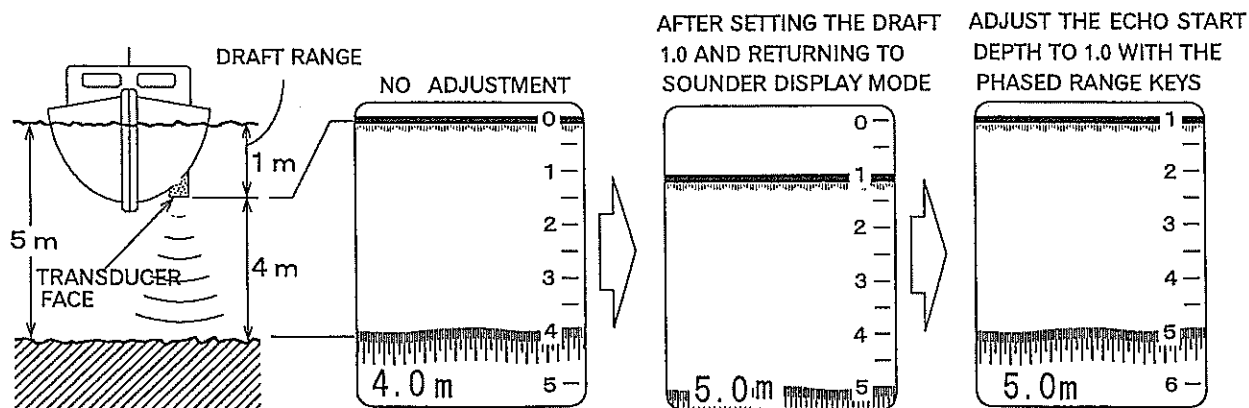can change the difference by the following adjust.

DRAFT	0.0
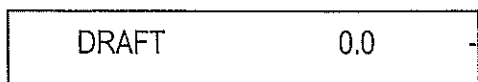
· To enter the draft range value

press the ⬚△ or ⬚▽ Phased range key.
PHASED R.

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

⬚△ :Every time this Phased range key is pressed, it increases the range by 0.1.
PHASED R.

⬚▽ :Every time this Phased range key is pressed, it decreases the range by 0.1.
PHASED R.

AFTER SETTING THE DRAFT   ADJUST THE ECHO START
1.0 AND RETURNING TO   DEPTH TO 1.0 WITH THE
SOUNDER DISPLAY MODE   PHASED RANGE KEYS

DRAFT RANGE
NO ADJUSTMENT

OTHERS

```
OTHERS

┌─────────────────────────┐
│ RETURN MAIN MENU        │
└─────────────────────────┘
  COLOR SET        A-1
  OUT.DPTH         OFF
  MJR FREQ         LOW
  TRIGGER          INTRNL
  ECHO SIG         INTRNL
  OUTPUT           OFF
  TRANS RATE       MEDIUM
  PULSE            NORMAL
  PANEL BRIGHT     BRIGHT
  OPE.MODE         0
  SHIFT AR         1
  TEMP SENSOR      OP-102
  ASHIFTLIMIT      999
  TRIG SYNC        ON
  RANGE SET        LINKED
```

· 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

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        │
└──────────────────────────────────┘
```
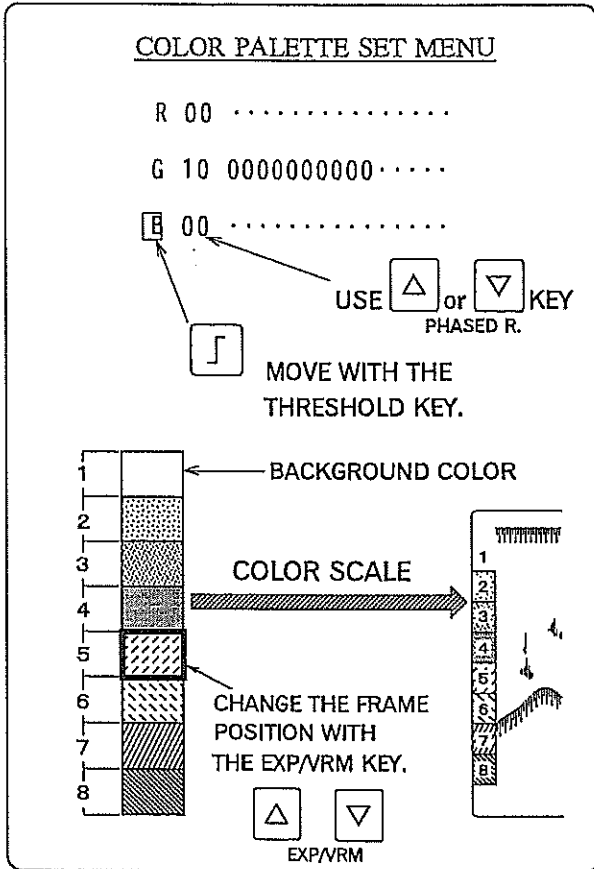· Each press of the △ or ▽ Phased

range key changes the color setting.

A-1 ·   A-2 ·   B-1 ·   B-2 · C-1 ·   C-2 · D-1 · D-2 : Set color options.

E-1 · E-2   : Colors may be freely set.

<TO BE CONTINUED>

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How to select the color

◎ To freely set the colors for E-1 and E-2, first hightlight COLOR SET and specify E-1 or E-2 with the △ or ▽ Phased range key and press the Ⅎ Threshhold key to display the menu below.
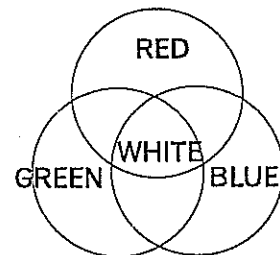
PHASED R.

COLOR PALETTE SET MENU

R 00 · · · · · · · · · · · · · ·

G 10 0000000000· · · · ·

B 00 · · · · · · · · · · · · · ·

USE △ or ▽ KEY

PHASED R.

Ⅎ MOVE WITH THE THRESHOLD KEY.

BACKGROUND COLOR

COLOR SCALE

CHANGE THE FRAME POSITION WITH THE EXP/VRM KEY.

△ ▽

EXP/VRM

· Use the △ or ▽ EXP/VRM key

EXP/VRM

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 Ⅎ Threshold key to highlight the color to be changed and select the color intensity (1: weakest ~ 15: strongest) with the △ or ▽ Phased range key.

PHASED R.

· 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 ▣ or ▼ 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.

RED

WHITE

GREEN BLUE

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.

| OUTER DPTH | OFF |

-------------- • Each press of the △ or ▽ Phased
PHASED R.
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.

| MJR FREQ | LOW |

-------------- • Each press of the △ or ▽ Phased
PHASED R.
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.

| TRIGGER | INTRNL |

-------------- • Each press of the △ or ▽ Phased
PHASED R.
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 △ or ▽ Phased
PHASED R.

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 △ or ▽ Phased
PHASED R.

range key the desired output sentence

is selected from the followings.

OFF   : No output

1 8 3 N   : To output data of DBT, TLL and MTW every 2 seconds.

1 8 3 T   : To output data of DBT every one second.

6 0 0 S   : 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 temeprature when a temperature sensor is connected.

◎ Data   : indicates the data transfer rate.
   transmitted 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 △ or ▽ Phased
PHASED R.

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 ▼ or ▐ key.

PULSE   NORMAL ---┤----------- · Each press of △ or ▽ Phased range
PHASED R.

key changes the setting.
(NARROW → NORMAL → WIDE → 0.3 ms)

· Use ▼ key to select the larger values.

· Use ▐ 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.

RANGE DEPTH (m)	PULSE (msec)
0 ~ 40	0.3
~ 80	0.6
~ 240	1.2
~ 640	2.4
641 ~	3.6

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

PHASED R.

range key alternates DARK with BRIGHT.

10. OPERATION MODE

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

OPE. MODE	0

---------- · Each press of the △ or ▽ Phased
PHASED R.
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.

SHIFT AR	1

---------- · Each press of the △ or ▽ Phased
PHASED R.
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.

TEMP SENSOR	OP-102

---------- · Each press of the △ or ▽ Phased
PHASED R.
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.

ASHIFT LIMIT	999

---------- · Each press of the △ or ▽ Phased
PHASED R.
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.

TRIG SYNC	ON

---------- · Each press of the △ or ▽ Phased
PHASED R.
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
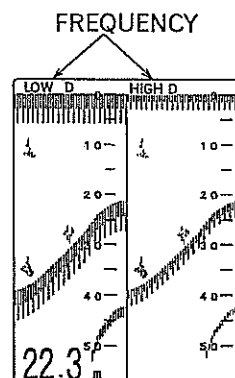
· In case of SINGLE the above items will be usable in the settings

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.

RANGE SET   LINKED --- |----------- · 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.

RANGE:50m   RANGE:30m
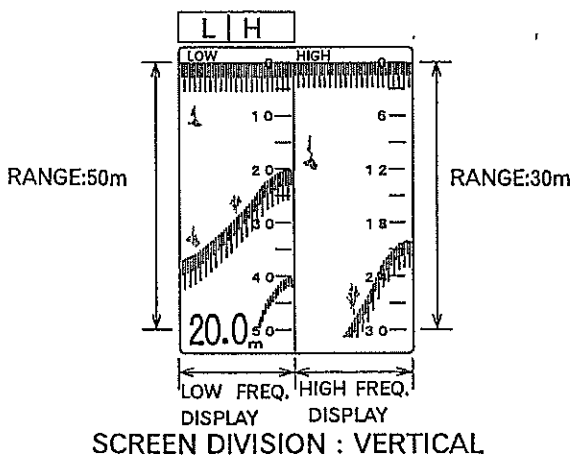
· As shown left the different

range in each frequency is

functioned simultaneously.

SCREEN DIVISION : VERTICAL

ALARMS

```
ALARM
┌─────────────────────┐
│ RETURN MAIN MENU    │
└─────────────────────┘
    SHALLOW          OFF
    DEEP             OFF
    FISH             OFF
    TEMP MAX.        OFF
    TEMP MIN.        OFF
    TEMP RANGE       OFF
    FISH ALARM       LOW
```

- Use the △ or ▽ EXP/VRM key to highlight the item you want to change.

EXP/VRM

- Use the △ or ▽ Phased range key to set the desired values

PHASED R.

1. SHALLOW ALARM

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

```
┌─────────────────────────────┐
│ SHALLOW              OFF     │
└─────────────────────────────┘
```
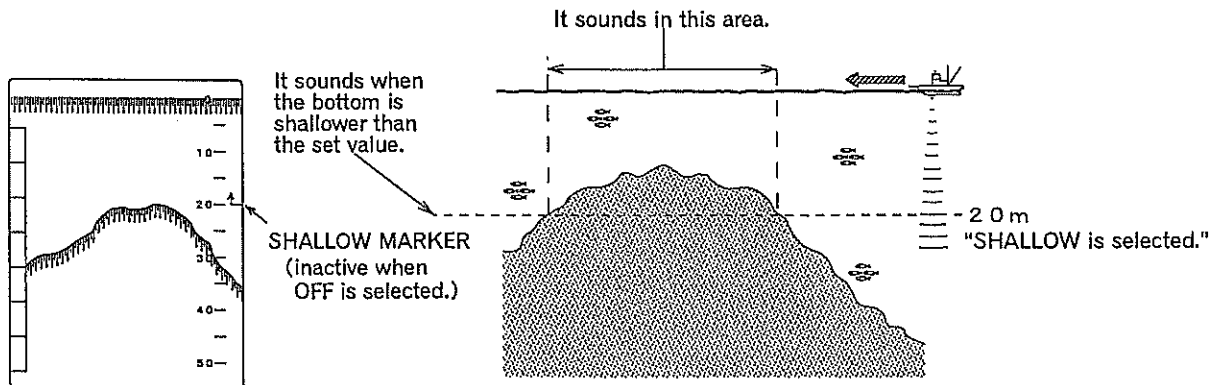
- Each press of the △ or ▽ Phased range key alternates OFF with 0000.

PHASED R.

- To access the alarm setting and set the value from "0000" into the desired alarm depth value by pressing the ▼ or ▦ key.

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

▼ key : increases the value. (The position of the marker is deeper.)

▦ key : decreases the value. (The position of the marker is shallower.)

It sounds in this area.

It sounds when the bottom is shallower than the set value.

SHALLOW MARKER (inactive when OFF is selected.)
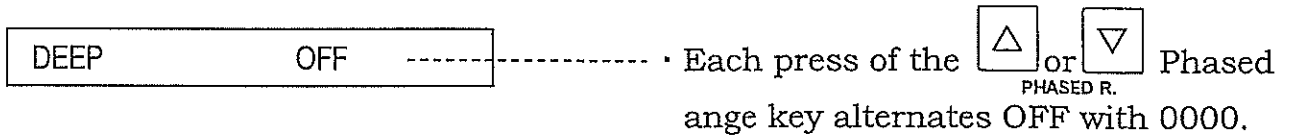
- 2 0 m
"SHALLOW is selected."

◎ 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. ʳ

DEEP	OFF

------------------ · Each press of the △ or ▽ Phased

PHASED R.

ange 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 ▼ or ▮ key.

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

▼ key : increases the value. (The position of the marker is deeper.)

▮ key : decreases the value. (The position of the marker is shallower.)
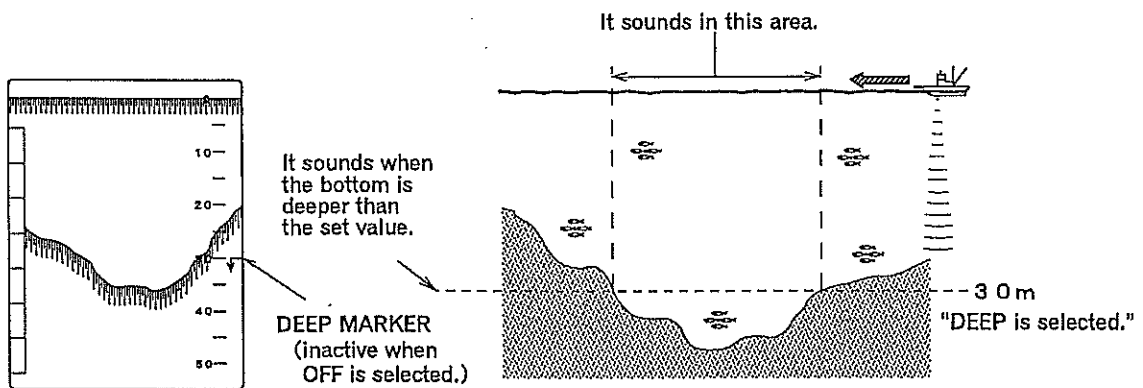
◎ Select "OFF" in case of not utilizing the alarm functions.

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.

FISH	OFF

· Each press of the △ or ▽ Phased range key alternates OFF with 6.

PHASED R.

OFF : disable Fish alarm
1 : color scale 1-7
2 : color scale 2-7 — The alarm sounds
3 : color scale 3-7 — in relation to
4 : color scale 4-7 — the color scale No.
5 : color scale 5-7
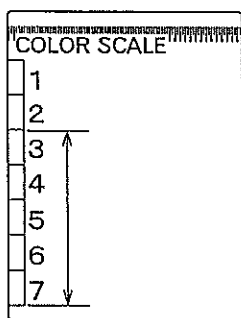6 : color scale 6-7
7 : sounds in relation to color scale No.7

· The desired level can be selected by pressing the ▼ or ▮ key after entering 6 (initial value).
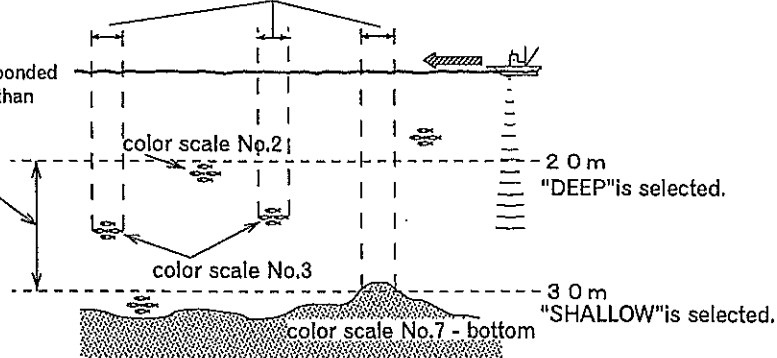
▼ key : increases the value.

▮ key : decreases the value.

FOR EXAMPLE:
set value - color scale 3

It sounds if the responded color level is more than the set value.

It sounds in these areas.

color scale No.2

color scale No.3

color scale No.7 - bottom

2 0 m
"DEEP"is selected.

3 0 m
"SHALLOW"is selected.

◎ 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
PHASED R.
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
PHASED R.
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.

TEMP RANGE.	OFF

---------- · Each press of the △ or ▽ Phased
PHASED R.

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.

TEMP RANGE	OFF

-------- · Each press of the △ or ▽ Phased
PHASED R.

range key alternates LOW with HIGH.

FRONT CONTROL
PANEL OPERATION

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

DISPLAY MODES

◎ 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.

MODE SELECTION			NOARMAL DISPLAY	NORMAL/BOTTOM EXPANSION DISPLAY	NORMAL/PARTIAL EXPANSION DISPLAY	NORMAL/NAVIGATION DISPLAY
FREQ. SELECT. DIAL	SCREEN DIVISION					
SINGLE FREQUENCY (LOW) OR (HIGH)	HORIZ	– –				
	VERT	– –				
DUAL FREQUENCY	HORIZ	L/H				
		H/L				
	VERT	L I H				
		H I L				

L : LOW FREQUENCY H: HIGH FREQUENCY   PART.EXP. : PARTIAL EXPANSION DISPLAY
NORMAL : NORMAL 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.

MODEL SELECTION DIAL

NORMAL MODE

SCREEN DIV : VERT

LOW FREQ. DISPLAY   HIGH FREQ DISPLAY

SCREEN DIV : HORIZ

LOW FREQUENCY

22.3ₘ

LOW FREQUENCY

HIGH FREQUENCY

LOW FREQUENCY

DUAL-SPLIT DISPLAY

HIGH FREQUENCY

22.3ₘ

HIGH FREQUENCY

DUAL FREQUENCY

LOW FREQUENCY   HIGH FREQUENCY

FREQUENCY SELECTION DIAL
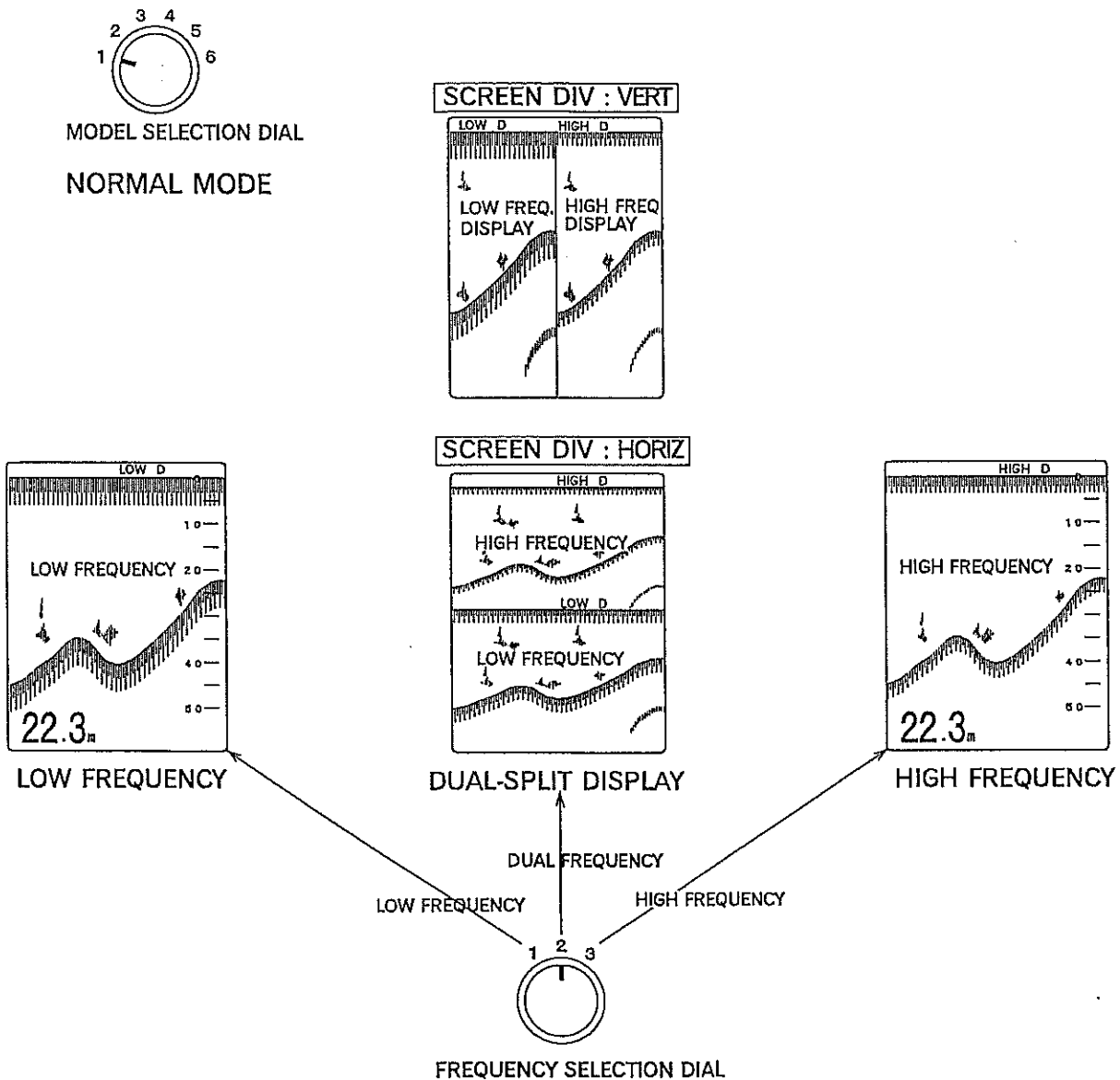
• Refer to the Display Modes in page 58 for the combination screens.

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
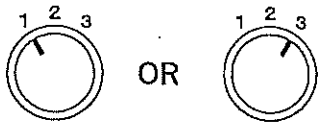
```
1 2 3          1 2 3
 (O)    OR      (O)          LOW FREQUENCY or HIGH FREQUENCY
FREQUENCY SELECTION DIAL
```
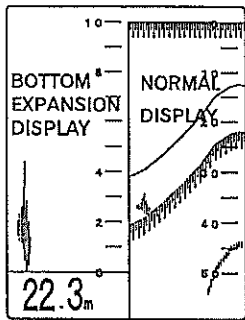
```
BOTTOM      NORMAL
EXPANSION   DISPLAY
DISPLAY
22.3m
```
NORMAL + BOTTOM
EXPANSION
SPLIT DISPLAY
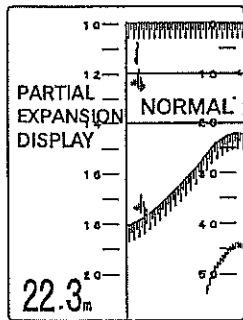
```
PARTIAL     NORMAL
EXPANSION
DISPLAY
22.3m
```
NORMAL + PARTIAL
EXPANSION
SPLIT DISPLAY
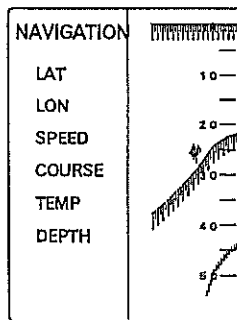
```
NAVIGATION
LAT
LON
SPEED
COURSE
TEMP
DEPTH
```
NORMAL + NAVIGATION
SPLIT DISPLAY
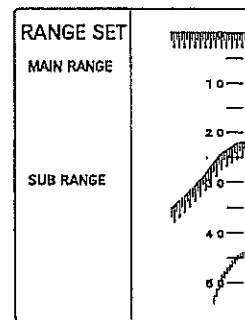
```
RANGE SET
MAIN RANGE

SUB RANGE
```
RANGE SETTINGS

```
NORMAL DISPLAY
22.3m
```
NORMAL DISPLAY

```
           NAVIGATION
       PARTIAL EXPANSION
   BOTTOM EXPANSION    RANGE SETTINGS
              3  4
            2       5
  NORMAL DISPLAY    6 —FUNCTION SETTINGS
```
MODEL SELECTION DIAL
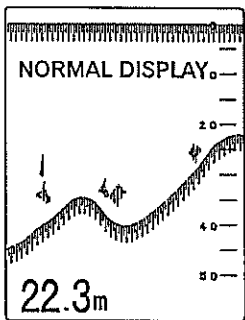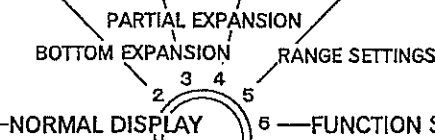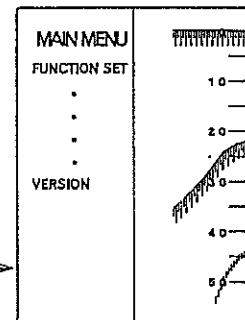
```
MAIN MENU
FUNCTION SET
 .
 .
 .
VERSION
```
FUNCTION SETTING MENU

· Refer to the Display Modes in page 58 for the combination screens.

1. NORMAL MODE
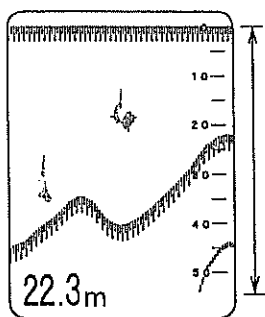
NORMAL MODE

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

△

▽

RANGE

22.3m

◎ Normal mode is displayed
on the full screen.

This is the standard presentation.

2. BOTTOM EXPANSION MODE

SCREEN DIV: HORIZ
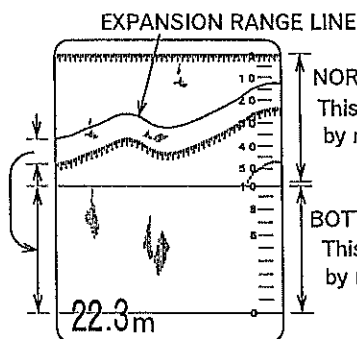
EXPANSION RANGE LINE

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

BOTTOM EXPANSION MODE
This range can be adjusted
by means of the Exp.Range keys.

22.3m

◎ 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.

SCREEN DIV: VERT
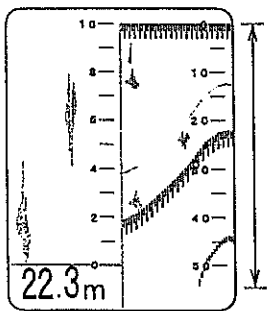
The range of the right side of
the screen (Normal mode) can
be adjusted by means of the
Range keys.

The range of the left side of
the screen (Bottom expansion mode)
can be adjusted by means of the
Exp. Range keys.

22.3m

BOTTOM   NORMAL MODE
EXPANSION
MODE

△

▽

EXP

3. PARTIAL EXPANSION MODE

SCREEN DIV:HORIZ

EXPANSION RANGE LINES

EXPANSION START MARK

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

PARTIAL EXP.MODE
This range can be adjusted
by means of the Exp.Range keys.

22.3 m

◎ 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.

SCREEN DIV: VERT

The range of the right side of
the screen (Normal mode) can
be adjusted by means of the
Range keys.

The range of the left side of
the screen (Partial expansion mode)
can be adjusted by means of the
Exp. Range keys.

22.3m

PARTIAL   NORMAL
EXPANSION MODE
MODE
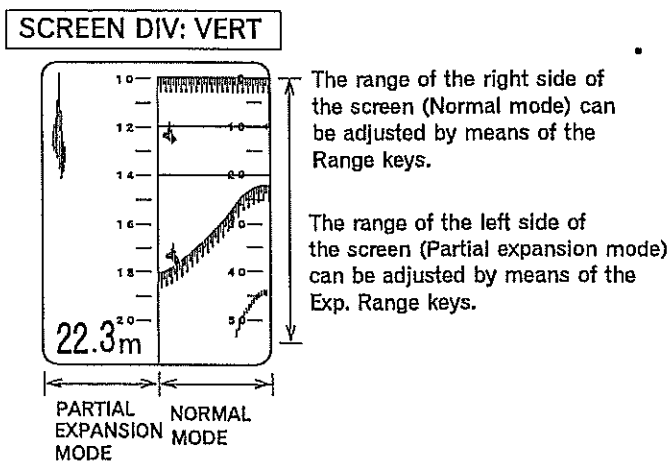
• The range of the expansion display is
indicated on the normal display by
two lines indicting the upper and lower
limits. The upper limit can be adjusted
with the Expansion start mark.

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

4. NAVIGATION (DATA) DISPLAY MODE

NAV DISP

LATITUDE
LONGITUDE   NORMAL
SPEED   DISPLAY
COURSE
WATER TEMP.
WATER DEPTH
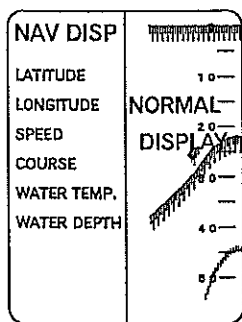
◎ Normal mode is displayed
on the right half of the screen.
Navigation data is displayed
on the left half of the screen.

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 customized 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 nit, if any changes are required.

```
RANGE SET MENU

MAIN RANGE
  NUMBER  RANGE
    |1|    |0 0 0|  — 0 0 2 5
     2      0 0 0   — 0 0 5 0
     3      0 0 0   — 0 1 0 0
     4      0 0 0   — 0 1 5 0
     5      0 0 0   — 0 2 0 0
     6      0 0 0   — 0 3 0 0
     7      0 0 0   — 0 5 0 0

SUB RANGE
  NUMBER  RANGE
     1      0 0 0 1
     2      0 0 0 2
     3      0 0 0 5
     4      0 0 1 0
     5      0 0 2 0
     6      0 0 3 0
     7      0 0 4 0
     8      0 0 5 0
```

6. MAIN MENU

◎ To display the Main Menu.

· To set up a fundamental function.

· To customized the functions, set the desired functions by calling up the proper display before operating this unit.

```
MAIN MENU
|FUNCTION SET · LOW |
 FUNCTION SET · HIGH
 REDUCTION
 SCREEN DIVISION
 DISP ITEM SEL.
 UNIT · ADJUST
 OTHERS
 ALARM
 VERSION
```

BRIGHTNESS DIAL

◎ You can change the brightness with this dial.

Further turning in a clockwise direction increases screen brightness.

BRIGHTNESS
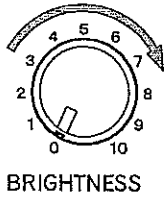
GAIN DIAL

◎ 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 LEVEL OF GAIN IS TOO LOW. | THIS PICTURE SHOWS THE CORRECT GAIN LEVEL. | THIS PICTURE IS AT THE CORRECT GAIN LEVEL, BUT THE WATER IN THE MIDDLE LAYER IS FULL OF UNWANTED ECHOES DUE TO DIRT. | THE LEVEL OF GAIN IS TOO HIGH. |
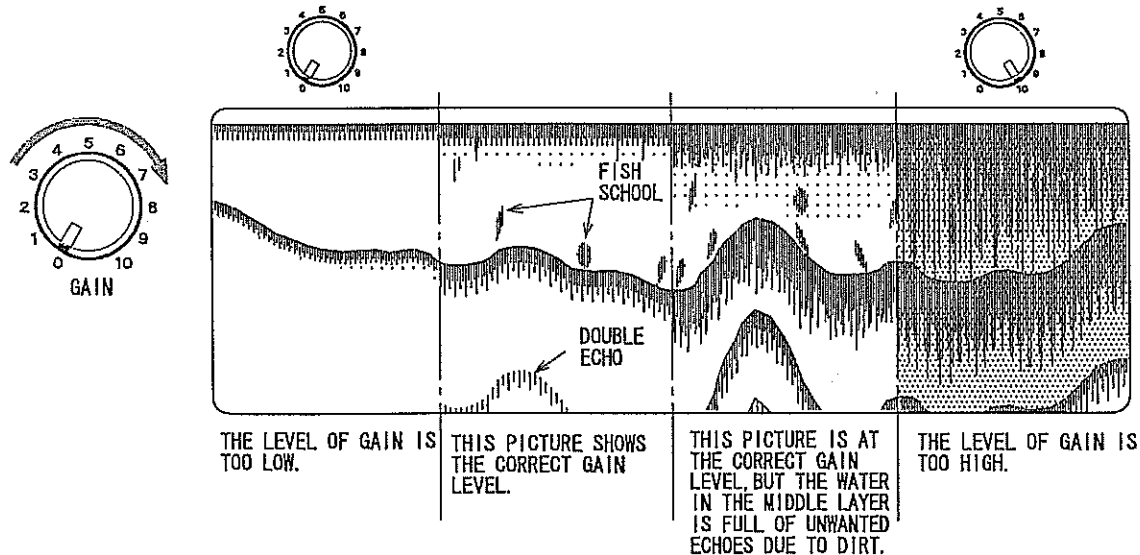
· The strongest echoes are displayed in red and as the received echoes get weaker they are indicated as follows; red → orange → yellow → green → light green → blue → light blue (when color scale A1 or A2 is selected).

· 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.

FAR GAIN : OFF　　FAR GAIN : MEDIUM　　FAR GAIN : HIGH
TURNING THE FAR GAIN DIAL CLOCK-
WISE INCREASES THE GAIN FOR DEEP
ECHOES.
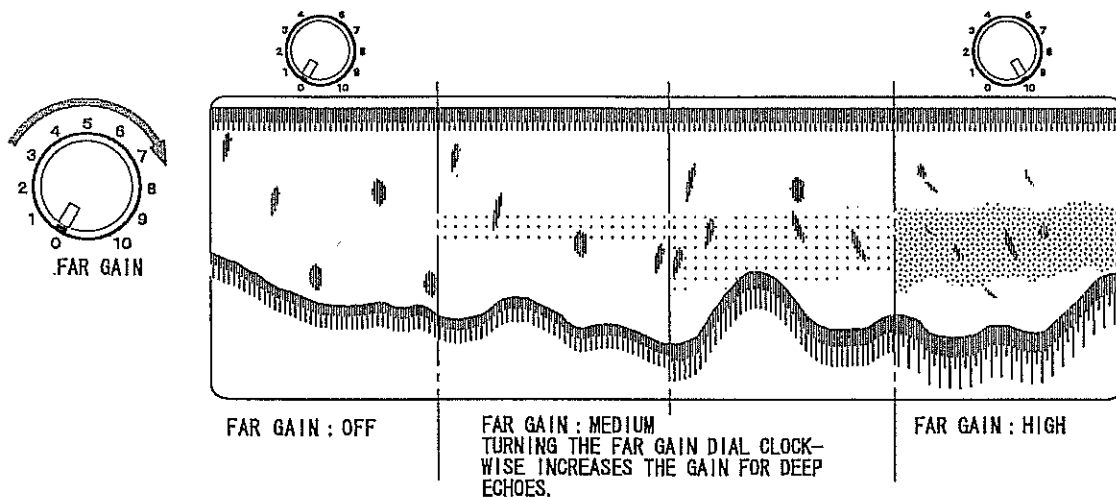
WHAT IS "FAR GAIN"?

◎ 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.

| FAR GAIN : OFF (NO STC) | TURNING THE FAR GAIN DIAL COUNTER-CLOCKWISE INCREASES THE STC. | IT IS TURNED TOO MUCH. EVEN FISH SCHOOL AND BOTTOM ARE SUPPRESSED. |

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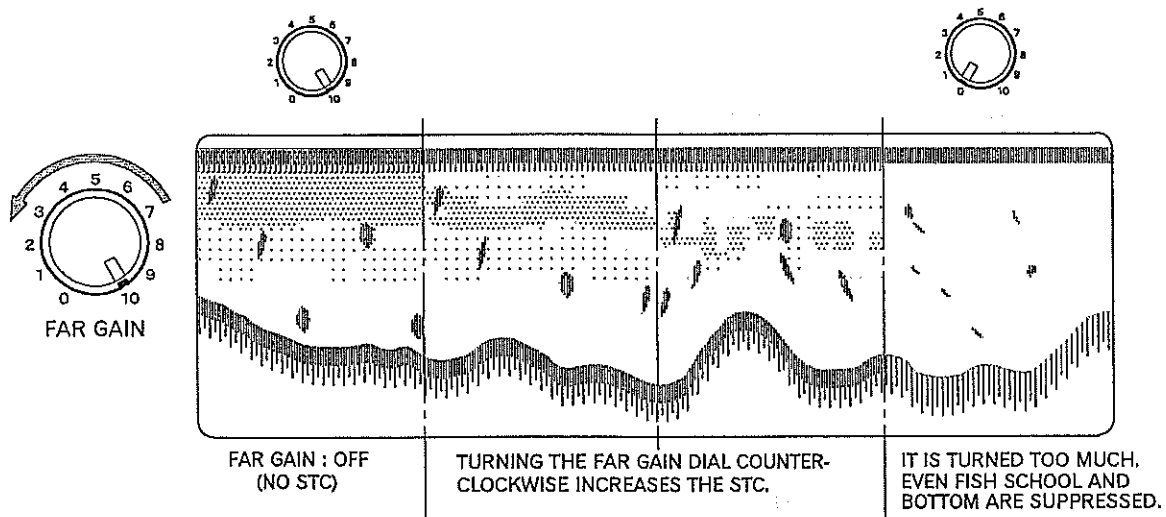
◎ In case of using FAR GAIN DIAL as STC function there is no effect at the dial 10 and increase the effect as turning the dial into the dial 0.

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.　　　　　　　　　　　　(CF) Page 49
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
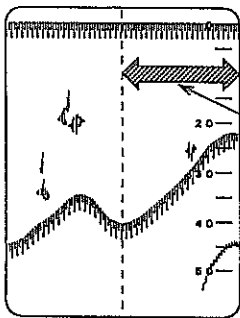
PRESS THIS KEY TO MEMORIZE THIS HALF OF THE SCREEN.

MEMORY WRITE KEY

◎ 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.
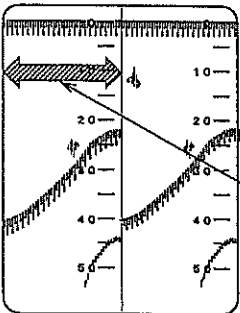
WHEN THIS KEY IS PRESSED, THE MEMORIZED DATA WILL BE DISPLAYED HERE.

MEMORY READ KEY

◎ 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 active 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.

EXPANSION
RANGE LINE

EXPANSION
START DEPTH

PRESS THIS KEY
TO PULL POINT UP.

△

▽

PRESS THIS KEY
TO PULL POINT DOWN.

← EXPANSION START MARK

EXP.MODE   NORMAL MODE

SCREEN DIV : VERT
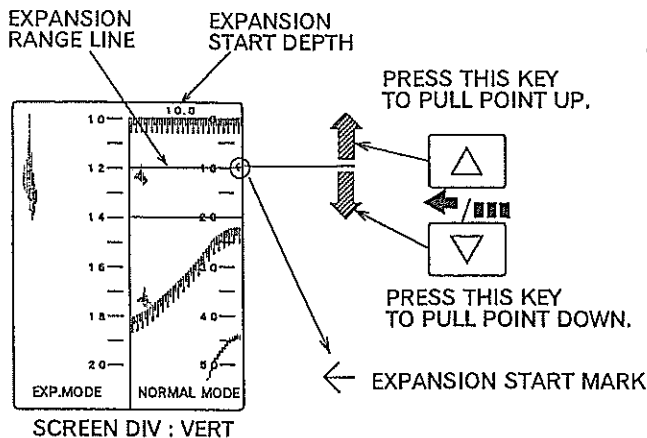
• The numeral expansion start depth will be displayed on the upper corner of the screen.

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.

EXP/VRM

VRM LINE

DEPTH

PRESS THIS KEY
TO PULL VRM LINE UP.

△

▽

PRESS THIS KEY
TO PULL VRM LINE DOWN.
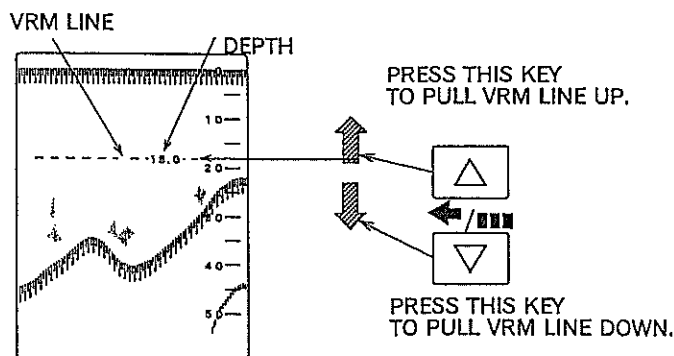
Pressing both △ & ▽ keys at the same
EXP/VRM
time alternates VRM line on with off.

RANGE KEYS
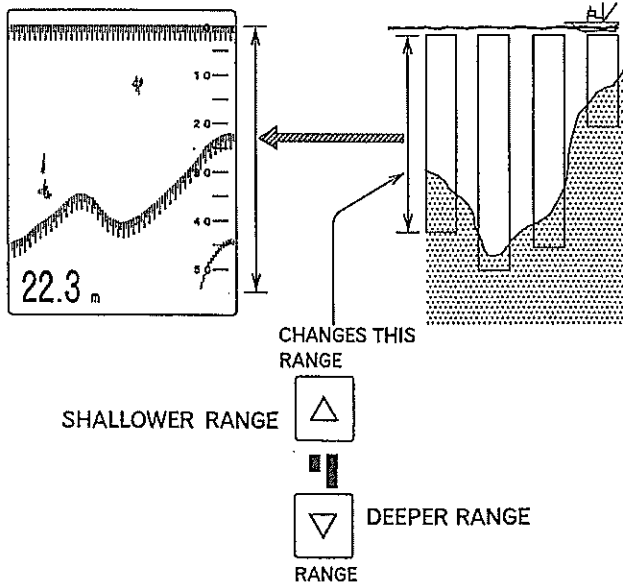
◎ The level can be slected in seven steps.
[CF] Page 19

• 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

CHANGES THIS
RANGE

SHALLOWER RANGE △

▽ DEEPER RANGE

RANGE

22.3 m

• Auto range will be explained in the next page.

PHASED RANGE KEYS

PHASED R.

WHEN THIS KEY IS
PRESSED, THE DISPLAY
OF START DEPTH WILL
BECOME SHALLOWER.

△

▽

WHEN THIS KEY IS PRESSED,
THE DISPLAY OF START DEPTH
WILL BECOME DEEPER.

CHANGES THIS
DISTANCE

22.3m

THIS DISTANCE IS SELECTED
WITH THE RANGE DIAL.
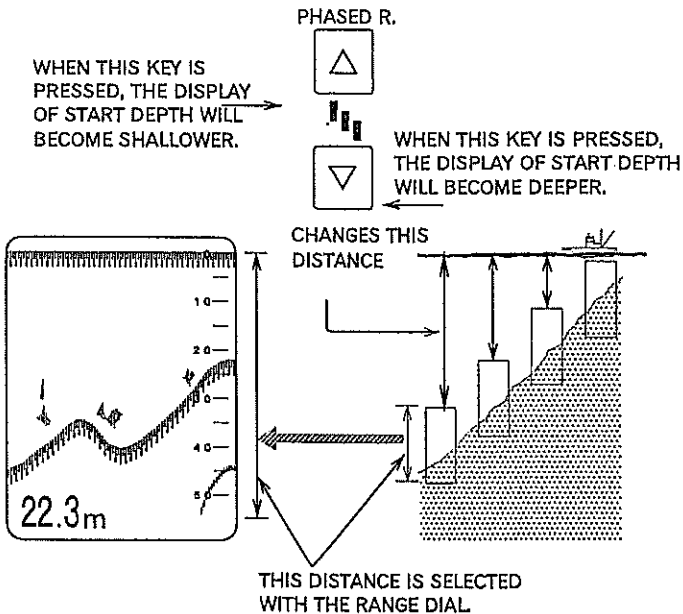
◎ For the selection of the depth
start point at the top of the screen.

• 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.

RANGE
PRESS THESE KEYS
AT THE SAME TIME

THIS RANGE
CHANGES
AUTOMATICALLY

SINGLE FREQUENCY
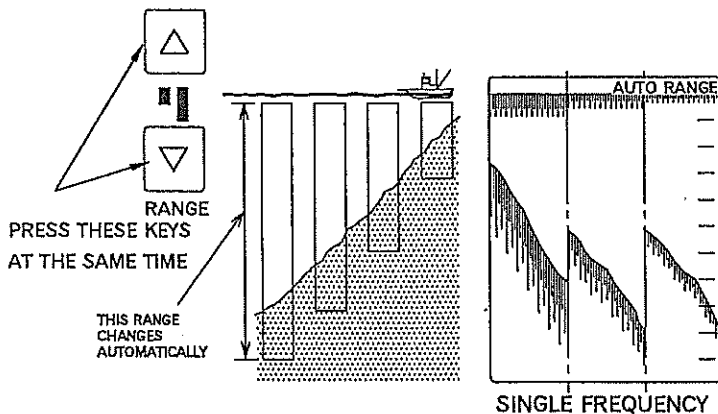
· Press both $\triangle$ & $\triangledown$ range keys at the same time to start the auto range function.

· When this function is activated, "AUTO RANGE" will be displayed in the right of the top screen.

· Press both $\triangle$ & $\triangledown$ 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.

PHASED R.

PRESS THESE KEYS
AT THE SAME TIME

THIS RANGE
CHANGES
AUTOMATICALLY

SINGLE FREQUENCY
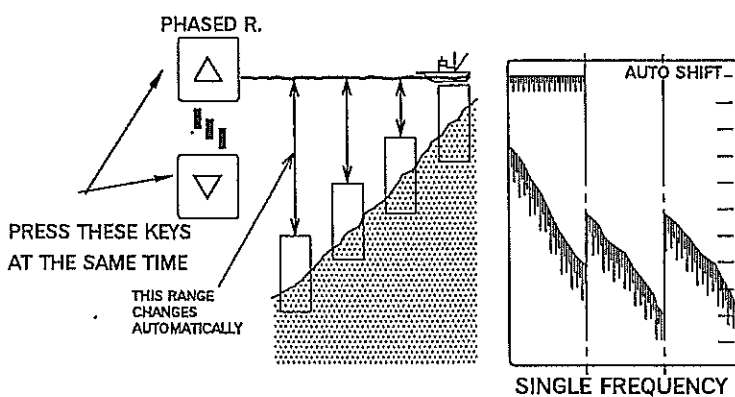
· Press both the $\triangle$ & $\triangledown$ Phased range keys at the same time to start the auto shift function. When this function is activated, "AUTO SHIFT" will be displayed in the right of the top screen.

· Press both $\triangle$ & $\triangledown$ Phased range keys at the same time to release the auto shift function.

· Refer to ASHIFT LIMIT Page 50 **CF**

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 ⬚ key changes the setting.

| P F 0
(stop) | P F 1
(1/1) | P F 2
(1/2) | P F 3
(1/4) | P F 4
(1/8) | P F 5
(1/4+1/1) | P F 6
(1/8+1/2) | P F 7
(1/16+1/4) | P F 8
(1/32+1/8) |

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

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

| P F 2 X
(2/1) | P F 3 X
(3/1) | P F 4 X
(4/1) |

on the full display screen (Fig. 5)

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

Fig. 1   Fig. 2   Fig. 3
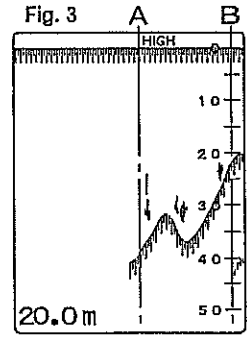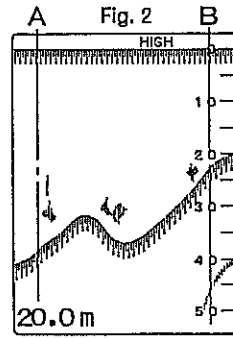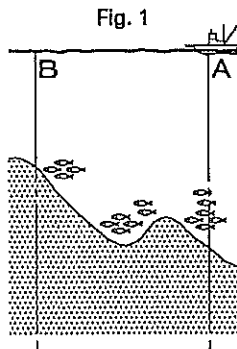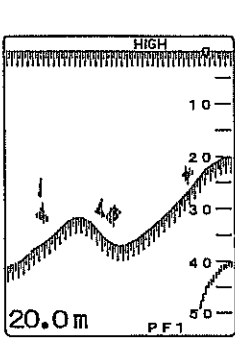
· 〔Selection of PF 1 ～ PF 4 (1/1 ～ 1/8) 〕

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)

· 〔Selection of PF 2X ～ PF 4X〕
(2/1 ～ 4/1)

Fig. 4
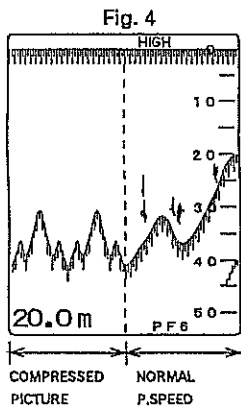
Normal P. speed on the
right half of the screen.
Lower than the rate of
the right half is available
on the left half of the screen.

COMPRESSED   NORMAL
PICTURE   P.SPEED
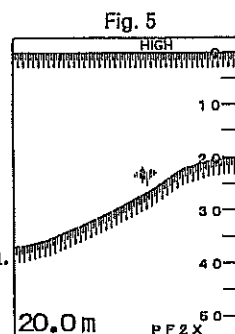
Fig. 5

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.   **cf** Page 37

1. MARK
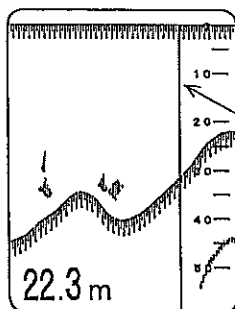
PRESS THIS KEY TO DISPLAY A LINE AT THE RIGHT EDGE OF THE DISPLAY.

22.3 m

◎ 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 DISPLAY TIME.
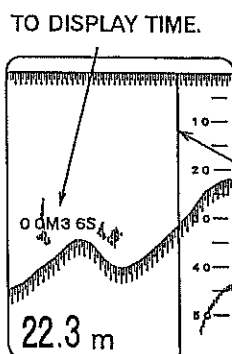
PRESS THIS KEY TO START TO TIME.

22.3 m

◎ 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.

COLOR SCALE

PRESS THIS KEY
TO ERASE WEAKER
ECHO COLORS AS
ABOVE.

7 COLORS   6 COLORS   5 COLORS   4 COLORS   3 COLORS
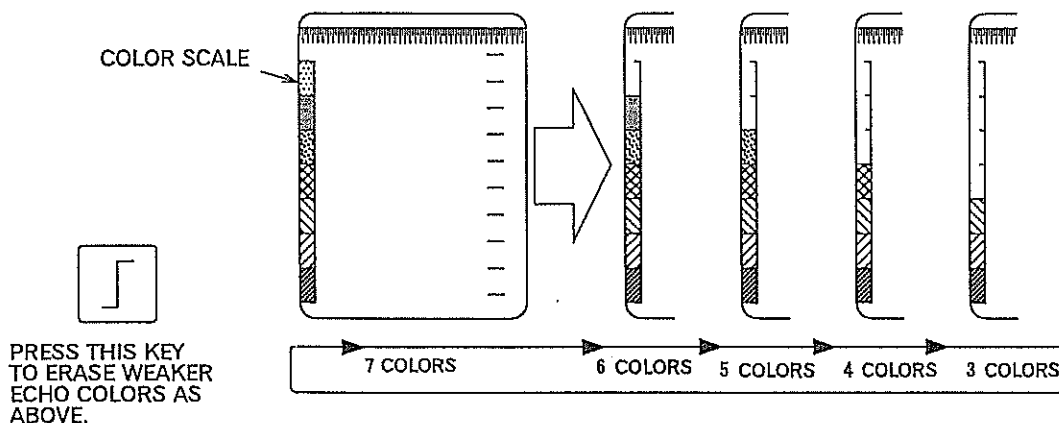
WHAT IS "THRESHOLD" ?

◎ 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.

NORMAL MODE

BOTTOM
EXPANSION MODE

22.3 m
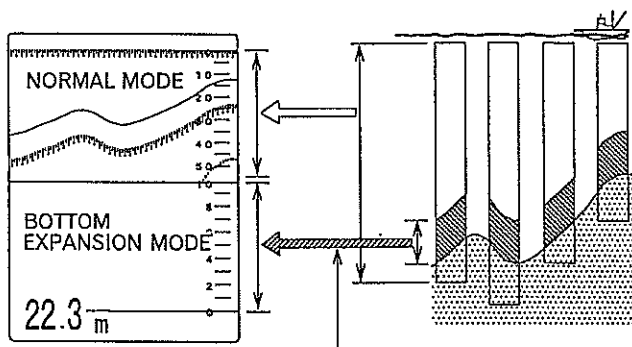
VARIABLE RANGE

SHORTEN THE RANGE △

EXPANSION RANGE KEY

▽ WIDEN THE RANGE

NORMAL MODE

PARTIAL
EXPANSION MODE

22.3 m
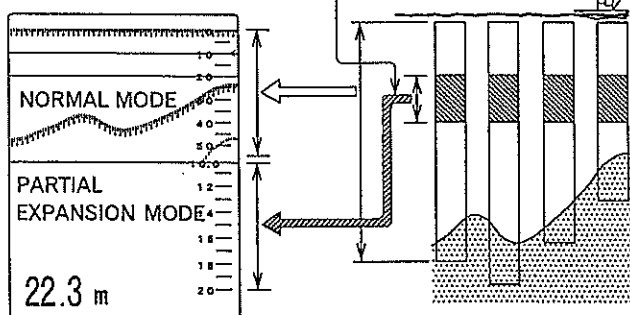
- 8 expansion ranges may be selected with the Expansion range keys as follows.

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.

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.

NAME		DETAILS	CONNECTION	
OP-305	NAV-IN CONNECTOR KIT	NMEA-0183 input sentences or connecting an external navigational equipment.	No 1: SIGNAL IN + No 2: SIGNAL IN - No 3: SHIELD	No 4: SIGNAL OUT + No 5: SIGNAL OUT -
OP-296	NMEA-OUT CONNECTOR KIT	NMEA-0183 output sentences (depth/water temperature)	No 1: NC No 2: NC No 3: SHIELD	No 4: SIGNAL OUT + No 5: SIGNAL OUT - No 6: NC
OP-298	EXTERNAL SOUNDER CONNECTOR KIT	received signal trigger signal	No 1: TRIGGER IN No 2: TRIGGER OUT No 3: H.FREQ.SIG.IN No 4: H.FREQ.SIG.OUT	No 5: GND No 6: L.FREQ.SIG.IN No 7: L.FREQ.SIG.OUT No 8: SHIELD

INTERFACE CONNECTIONS

◎ The ES-7100 must be turned off while connecting/disconnecting
   the interface cables.

① 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.

② Release the canoe clip and the cap on IN/OUT terminal.
   Refer to Fig. 2.

③ Insert the receptacle of the terminal from the inside of the rear
   plate and secure them with the nuts and the screws.

④ 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

⑤ Return the chassis and tighten with 8 screws released above.

Fig.1

Fig.2

Main board

Thread the terminal
cable here.

CONNECTOR

TERMINAL KIT

RELEASE

RELEASE

J14

No.696

MAIN BOARD

J9 J2 J11

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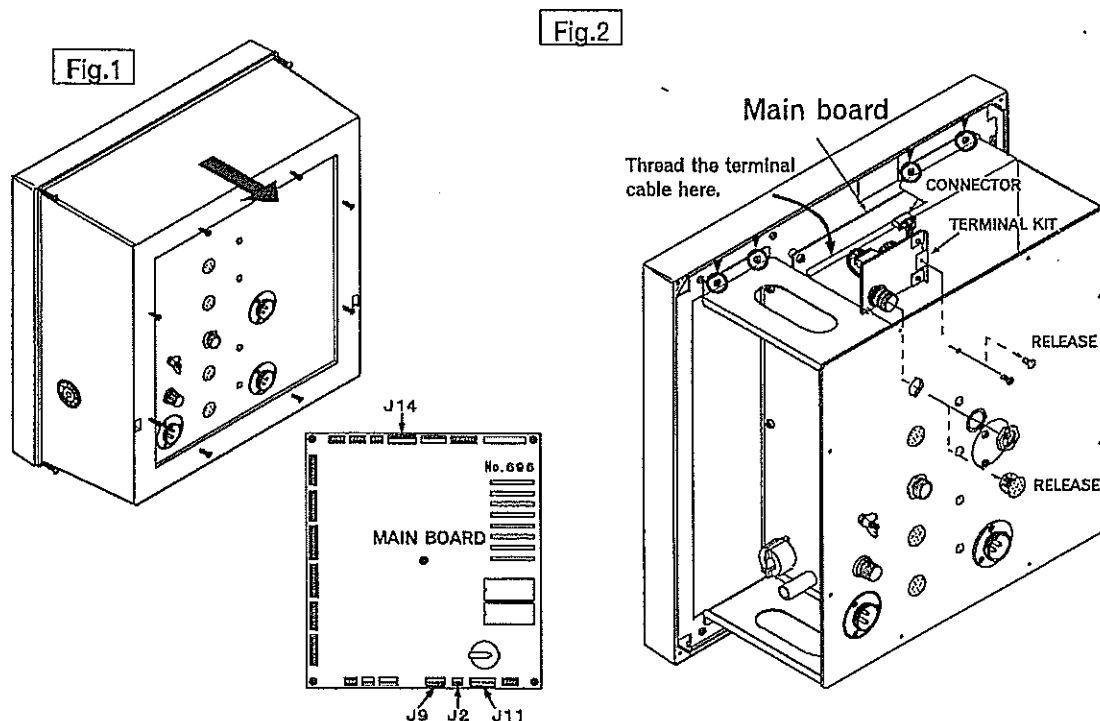
◎ Never open the main unit case.
   Electrical shock, damage, and serious bodily injury to user
   may result. If the ES-7100 requires servicing or installing
   the terminals, call your authorized SUZUKI dealers.

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**   1 unit (m, fm and br.) in 8 steps freely.
   PARTIAL EXPANSION   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**   Picture speed · Interference reduction · High/Low frequency · Auto range
   DISPLAY   Auto shift

8. **ADDITIONAL DISPLA**   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.