5.5 MENU Operation

List of MENU
List of Main Menu

MARK (MAIN-MENU)		NAV (MAIN-MENU)		ECHO (MAIN-MENU)		SETUP (MAIN-MENU)	
EBL1	ON/OFF	MODE	HU/HS/NU/CU/TM (MANU/NMEA)	GAIN	AUTO/MAN	WINDOW	PPI / SEMI3D+PPI / PPI+PPI / PPI+NAV / ALL PPI / ALL PPI+PPI / MOB
VRM1	ON/OFF			STC	AUTO/MAN/HARBOR		
EBL2	ON/OFF	GZ	ON/OFF	FTC	AUTO/MAN		
VRM2	ON/OFF	OFF-C	ON/OFF	TUNE	AUTO/MAN	SEL WIN	
FL EBL2	ON/OFF	SLEEP	OFF/5min/10min/ 15min	ST	OFF/ST1/ST2	PICTURE	DAY/NIGHT
FL VRM2	ON/OFF			TRACK	OFF/15SEC/30SEC/ 1MIN/3MIN/6MIN/ CONT	SYSTEM CHECK	
HDG OFF	OFF					CUSTOM	KEY ASSIGNMENT PRESET1 (SUB-MENU) PRESET2 (SUB-MENU) NMEA PRESET ADJUST (SUB-MENU)
///CSR	ON/OFF			ZOOM	ON/OFF		
RINGS	ON/OFF			SL	SHORT/LONG		
VAR RNG	ON/OFF						
TARGET							
+MK LINE	ON/OFF						

List of Custom Menu

PRESET1 (SUB-MENU)		PRESET2 (SUB-MENU)	
HM FLSH	ON/OFF	GZ LEVEL	1-7
STERN M	ON/OFF	GZ MODE	IN/OUT
NORTH M	ON/OFF	HOLD	ON/OFF
ST'BY	NAVI/NOR	DISPLAY	RDR/MONI/NAV
BUZ VOL	OFF/LOW/HIGH	EXT BUZ	OFF / CONT / INT
RM UNIT	NM / KM / SM	IN P/R	1080/1024/2048/4096/360
DEPTH	M / FT / FM	OUT P/R	1080/1024/2048/4096/360
TEMP	°C / F	DEMO	ON / OFF
EBL BRG	REL / TRUE / MAG	IR	OFF / IR1 / IR2
WP BRG	TRUE / MAG	SPD SET	NMEA / MANU 0.0 KT / LOG 200P
HEAD INPUT	NMEA / SIN, COS /12BIT / 10BIT	LANGUAGE	15 countries
HEAD	TRUE / MAG	SCAN SPEED	STD / HIGH
+MK MODE	DIST/BRG / LAT/LON		
P TABLE	0 - 2		

ADJUST (SUB-MENU)	
TIMING ADJ	
HEAD ADJ	
TUNING CAL.	
ANTENNA	1-9
GAIN	1-30
STC	1-16

ATA PRESET	
CPA SET	0.0 NM
TCPA SET	0 MIN
VECT SET.	6 MIN
VECT MODE	REL/TRUE
ATA	ON/OFF

MAIN-MENU

SUB-MENU
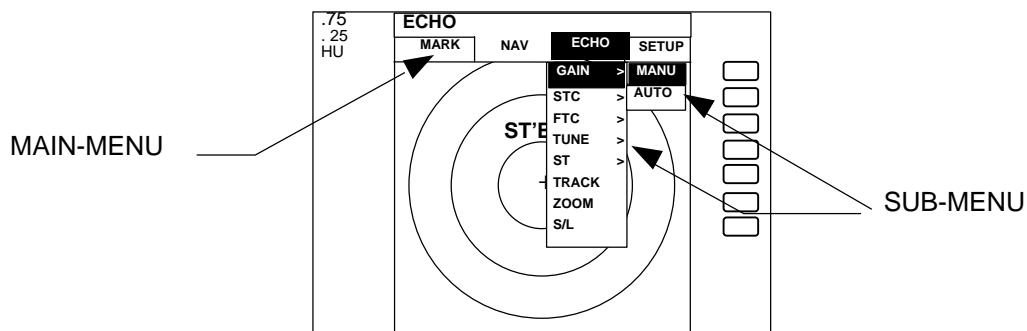
5.5.1 Mark Menu

Setting for markers and cursors

<Common operations for the MARK menu>

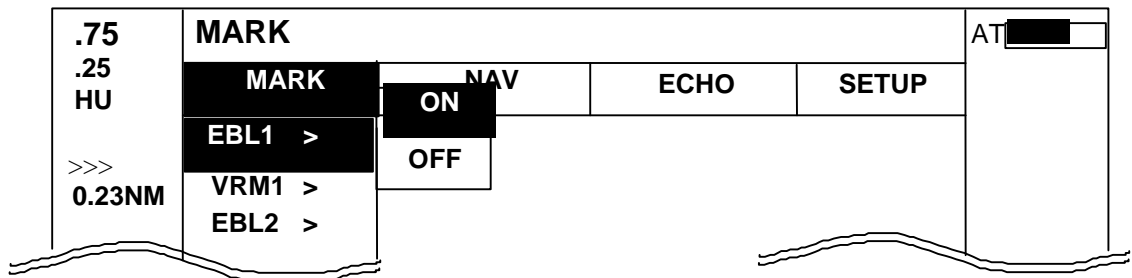(Up to the point when "MARK" menu is selected from the main menu)

Press the "MENU" key and select "MARK" from the displayed 4 main menus using the left-right cursor. (The contents of the selected MENU will appear on a pull-down display in accordance with the movement of the left-right cursor.)

$\boxed{\text{MENU}}$ → $\boxed{\text{Left/Right}}$
(Select MARK)

Further explanations on the MARK menu are made assuming that "common operation for the MARK menu" has already been completed.

5.5.1.1 Bearing measurement (EBL1)

(1) Select EBL1 from the pull-down display items using the up-down cursor key, and press the "ENT" key.

(2) When the ON/OFF sign is displayed beside the letters EBL1, select ON with the up-down cursor keys and press the "ENT" key.

.75	**MARK**				AT▮
.25 HU	**MARK**	**ON** NAV	**ECHO**	**SETUP**	
	EBL1 >	**OFF**			
>>> 0.23NM	**VRM1 >**				
	EBL2 >				

(3) When you press the "ENT" key, an electric bearing line (EBL1) appears and the angle from the direction of the ship's head which is set at 0 degree will appear in a reverse display in the lower left corner of the screen.

(4) Place the EBL on the center of the target with the rotary control and read out the bearing. You can use the EBL functions in the following modes.
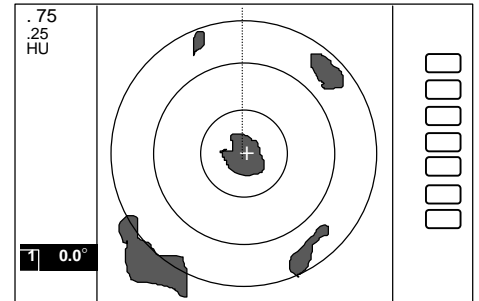
  (a) Press the "ENT" key to show the EBL1 display still on the screen.

  (b) Press the "MENU" key without the EBL1 display.

  (c) Pressing another function key will lead to the function of that key with the EBL1 display still on the screen.

Note: $\boxed{1}$ xxx.x indicates the relative bearing measured by BL1.

$\boxed{\text{Up/Down}}$ → $\boxed{\text{ENT}}$ → $\boxed{\text{Up/Down}}$ → $\boxed{\text{ENT}}$ → $\boxed{\text{Control knob}}$ → $\boxed{\text{ENT}}$ (a)

(Select EBL1)   (Select ON)   (EBL1 operation) $\vert$ → $\boxed{\text{MENU}}$ (b)

$\vert$ → $\boxed{\text{Other function key}}$ (c)

Note: The displayed EBL angle is the relative bearing to ship's heading or true bearing against true north, depending on the setting of "EBL BRG" in the "SETUP" menu.

5.5.1.2 Determining the distance (VRM1)

(1) Select VRM1 from the pull-down display items using the up-down cursor key, and press the "ENT" key.

(2) When the ON/OFF sign is displayed beside the letters VRM1, select ON with the up-down cursor keys and press the "ENT" key.

(3) If you press the "ENT" key, the variable range marker1 (VRM1) and its distance in a reverse display appear in the lower left corner of the screen (See Note).

(4) To measure the distance to a target, place the VRM1 on the front edge of the target with the rotary control and read the distance.

(5) You can use the VRM1 functions in the following modes.

    (a) Press the "ENT" key to show the VRM1 display still on the screen

    (b) Press the "MENU" key without the VRM1 display.

    (c) Pressing another function key will lead to the function of that key with the VRM1 display still on the screen.
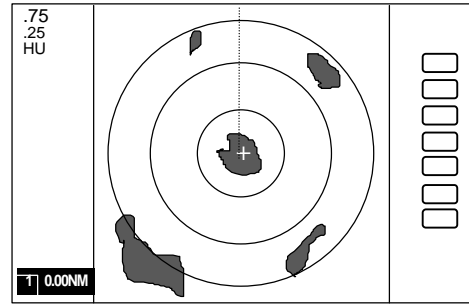
| Up/Down | → | ENT | → | Up/Down | → | ENT | → | Control knob | → | | ENT | (a) |

(Select VRM1)   (Select ON)   (VRM1 operation) |→   MENU   (b)

                                          |→   Other function key   (c)

Note: $\boxed{1}$ xx.xx NM indicates VRM1.

5.5.1.3 Bearing measurement (EBL2)

Refer to the section "Bearing measurement (EBL1)".

The "EBL2" will appear in a reverse display in the lower right corner of the screen.

Note: $\boxed{2}$ xxx.x indicates the bearing measured by EBL2.

5.5.1.4 Determining the distance (VRM2)

Refer to the section "Determining the distance (VRM1)".

The "VRM2" will appear in a reverse display at the lower right corner of the screen.

Note: $\boxed{2}$ xx.xx NM indicates the distance measured by VRM2.

5.5.1.5 Measuring the distance or angle between two points (FL EBL2, FL VRM2)

Determining the distance (VRM2)

(a) Preparation for the measurement

    (1) Use the up-down cursor keys to select FL VRM2 from the pull-down display items, and press the "ENT" key.

    (2) Use the up-down cursor keys to select ON from the ON/OFF display beside the FL VRM2 items, and press the "ENT" key. The "SET START POINT" item will be shown and a small cross mark appears. (Once this is set, the "ON" state continues unless any other change is made.)

| Up/Down | → | ENT | → | Up/Down | → | ENT | ---------------------- FL VRM2 is turned

                                                              ON and the small cross

(Select FL VRM2)   (Select ON)   mark appears.

(b) Setting a reference point for the distance measurement

    Use the left-right and up-down cursor keys to place the small cross mark on one of the two echoes whose distance is to be measured, and press the "ENT" key.
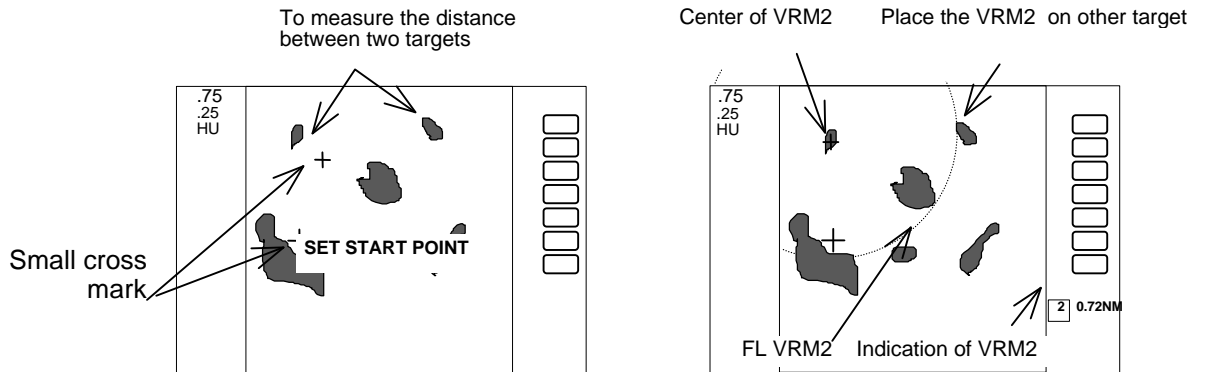
| Up/Down | & | Left/Right | → ---------------------- | ENT | Criterion of the reference point

                                                                       is set.

(Place the cross cursor on an echo)

(c) Measuring

Perform the operations in the above mentioned "Common operation for the MARK menu" and "measuring the distance(VRM2)", and place the VRM2 on other target.

VRM2 will be shown on the screen around the fixed cross cursor.

The distance display " $\boxed{2}$ xx. NM" will be shown in the lower right corner of the screen, showing the distance between the two targets.

To measure the distance between two targets

Center of VRM2   Place the VRM2 on other target

.75
.25
HU

Small cross mark

SET START POINT

.75
.25
HU

FL VRM2   Indication of VRM2

2 0.72NM

Note: EBL2 and VRM2 does not follow to "ZOOM" and "OFF-C" function.

5.5.1.6 Measuring the angle between two points (FL EBL2)

(a) Preparation for the measurement

    (1) Use the up-down cursor keys to select FL EBL2 from the pull-down display items, and press the "ENT" key.

    (2) Use the up-down cursor keys to select ON from the ON/OFF display beside the FL EBL2 items, and press the "ENT" key. "SET START POINT" is displayed and a small cross mark appears. (Once this is set, the "ON" state continues unless changes are made.)

$\boxed{\text{Up/Down}}$ → $\boxed{\text{ENT}}$ → $\boxed{\text{Up/Down}}$ → $\boxed{\text{ENT}}$ --------------------- FL EBL2 is turned

ON and

(Select FL EBL2)   (Select ON)   the small cross mark appears.

(b) Setting a reference point for measurement of the angle.

Use the left-right and up-down cursor keys to place the small cross mark on one of the two echoes whose angle will be measured, and press the "ENT" key.

$\boxed{\text{Up/Down}}$ & $\boxed{\text{Left/Right}}$ → -------- $\boxed{\text{ENT}}$ Criterion of the reference point is set.
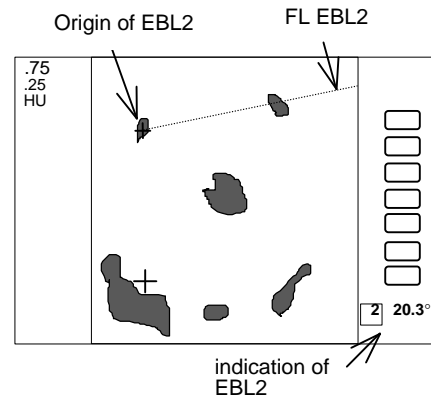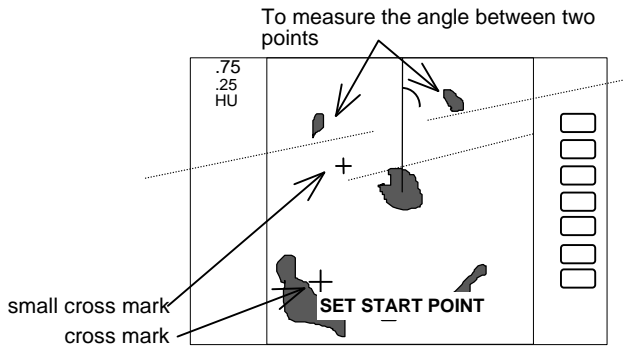
(Place the cross cursor on an echo)

(c) Measuring

Perform the operations in the above mentioned "Common operation for the MARK menu" and "measuring the distance(EBL2)", and place the EBL2 on other echo.

EBL2 is displayed on the screen based on the placed fixed cross cursor.

" $\boxed{2}$ xx. xx" which is displayed at the lower right will be the angle between the two points.

Note: The displayed EBL angle is relative to heading or true to north, depends on the setting of "EBL BRG" in the "SETUP" menu.

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To measure the angle between two points

Origin of EBL2

FL EBL2

small cross mark

cross mark

SET START POINT

indication of EBL2

2 20.3°

5.5.1.7 Erasing heading marker temporarily (HDG OFF)

(1) Use the up-down cursor key to select HDG OFF
   from the pulled down menu.
(2) Press the "ENT" key to turn off the heading marker,
   it stays off as long as you press and hold the key.

Not displayed while the ENT key is held down.
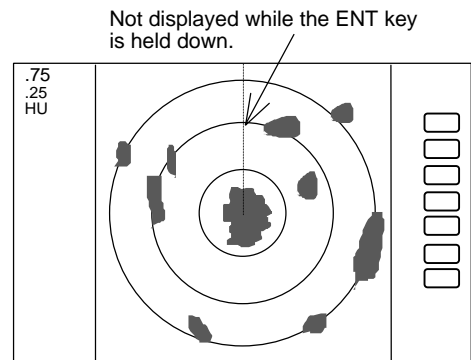
| Up/Down | → | ENT | The heading marker is off as long as you press and hold the "ENT" key down.

(Select HDG OFF)

5.5.1.8 Using parallel cursor (///CSR)

   Using the parallel cursor, you can monitor the behavior of other targets whether they are navigating
along with the course or, changing their course to someway.

(1) Use the up-down cursor key to select ///CSR from the
   pull-down menu, and press the "ENT" key (ON/OFF
   display beside the ///CSR item).
(2) Use the up-down cursor key to select ON.
(3) Press the "ENT" key. Parallel cursor will appear on the
   screen. As you move EBL, the parallel cursor also
   moves.
   To cancel the ///CSR function, select OFF in (2).

EBL1
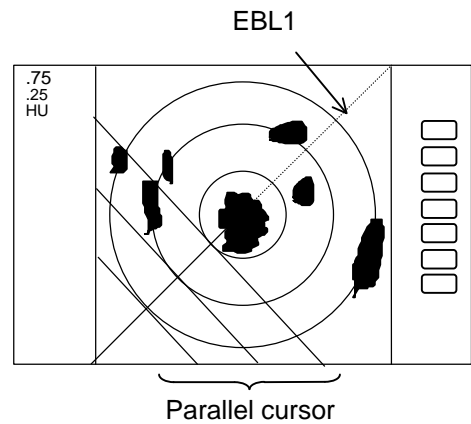
Parallel cursor

| Up/Down | → | ENT | → | Up/Down | (Select ON)   → | ENT | ---------------- Parallel cursor appears.

(Select ///CSR) |→ | Up/Down | (Select OFF)   → | ENT | ----------- Parallel cursor disappears.

   Note: Interval of ///CSR same as fixed range marker.
        ///CSR moves with EBL1.

5.5.1.9 Establishment of the indication of the RANGE RINGS (RINGS)
(1) Press the up-down cursor key to select RINGS from the pull-down menu, and then press the "ENT" key.
  (The ON/OFF sign will appear beside the letters RINGS)
(2) Use the up-down key to select ON or OFF and press the "ENT" key

Select ON	Range Rings ON
Select OFF	Range rings OFF

Up/Down → ENT → Up/Down (Select ON) → ENT ------------ Range rings appear.

(Select RINGS)   └→ Up/Down (Select OFF) → ENT -------- Range rings disappear.

\<Number of range rings and range interval\>

RA53

Range	0.125	0.25	0.5	0.75	1.5	3	6	12	24	48	64
Number of Rings	2	2	2	3	6	6	6	6	6	6	4
Interval	0.0625	0.125	0.25	0.25	0.25	0.5	1	2	4	8	16

RA54

Range	0.125	0.25	0.5	0.75	1.5	3	6	12	24	48	72
Number of Rings	2	2	2	3	6	6	6	6	6	6	6
Interval	0.0625	0.125	0.25	0.25	0.25	0.5	1	2	4	8	12
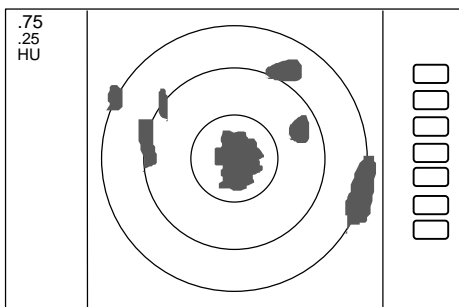
Range rings ON
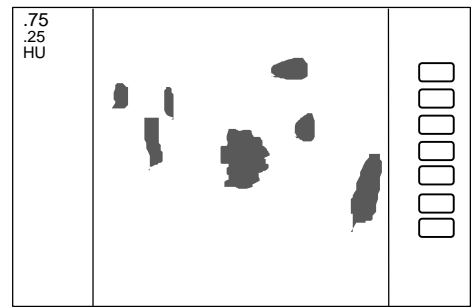
Range rings OFF

5.5.1.10 Variable range function (VAR RNG)
The range scales are allocated as 0.5--0.75--1.5--3.0--.....as standard. However, using this function, a consecutive range scaling is also available such as 0.5--0.6--0.7--0.8--..... .
(1) Use the up-down cursor keys to select VAR RNG from the pull down menu and press the "ENT" key.
(2) When you select ON with the up-down cursor key from the ON/OFF display beside the VAR RNG item, and then you press the "ENT" key, the VAR RNG function becomes valid and **VAR** will be displayed in the upper left corner of the screen (beside MODE).

Setting procedure

Up/Down → ENT → Up/Down (Select ON) → ENT VAR RNG function is
                                              turned ON.
(Select VAR RNG)   └→ Up/Down (Select OFF) → ENT VAR RNG function is
                                              turned OFF.
(3) The range changes continuously by pressing the up or down cursor key while the VAR RNG function is on, and it changes in step with the "RANGE UP" or "RANGE DOWN" key.

Method of use

Up/Down ---------------------------------- Range changes continuously

RANGE UP & RANGE DOWN --------- Range changes in step

(4) To cancel the vari-range function, press any key except the "RANGE UP" and "RANGE DOWN" keys.

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5.5.1.11 To output the Cursor (TARGET) position data to external equipment

Move the cross cursor with the up-down and left-right keys to the position which position data to be output.

Use the up-down cursor keys to select TARGET from the pull-down menu, and press the "ENT" key.
The latitude and longitude data of that position will be output to NMEA port with TLL format.

| Up/Down | → | ENT | output the L/L position of the cursor

(Select TARGET)

Note: When you activate this function, nothing happens on the screen.

5.5.1.12 Having the Distance and Bearing markers follow the cross cursor (+MK LINE)

(1) Use the up-down cursor keys to select +MK LINE from pull down menu and press the "ENT" key.
(2) Select ON with the up-down cursor key from the ON/OFF display beside the +MK LINE item.
(3) Press the "ENT" key to make the +MK LINE function valid, and the distance/bearing marker will be placed on the cross cursor.

Setting procedure

| Up/Down | → | ENT | → | Up/Down |(Select ON)   → | ENT | +MK LINE function is
                                                                turned ON.

(Select +MK LINE) |→ | Up/Down |(Select OFF)   → | ENT | +MK LINE function is
                                                                turned OFF.

(4) The distance/bearing markers will follow the cross cursor until +MK LINE function is turned OFF.

+MK LINE   OFF

+MK LINE   ON
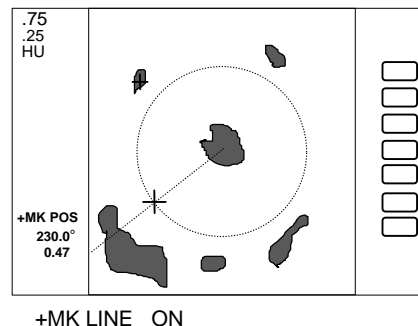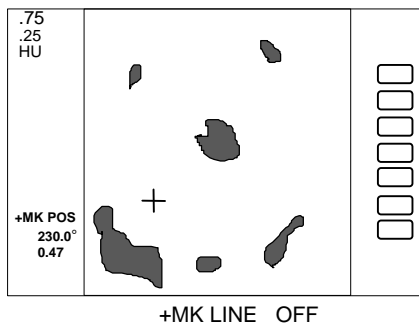
The distance/bearing marker follows to cross cursor. EBLs and VRMs can be used separately.

5.5.2 Nav (Navigation) Menu | xxx | = keys to press

Radar functions for navigation aid are in this menu.

< Common operations for the NAV menu >

(Up to the point when "NAV" menu is selected from the main menu)
Press the "MENU" key and select "NAV" from the displayed 4 main menus using the left-right cursor. (The contents of the selected MENU will appear on a pull-down display in accordance with the movement of the left-right cursor.)
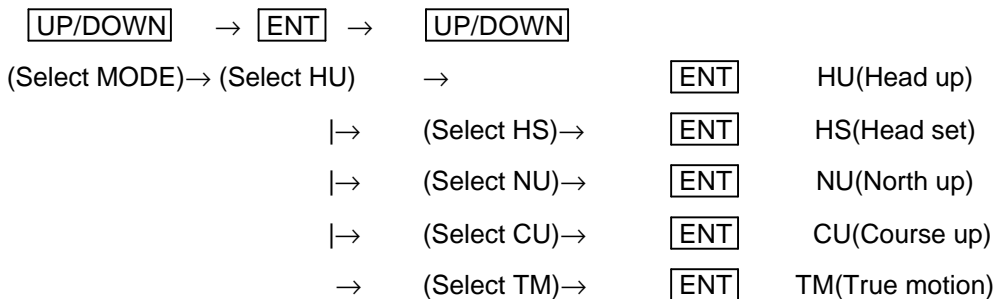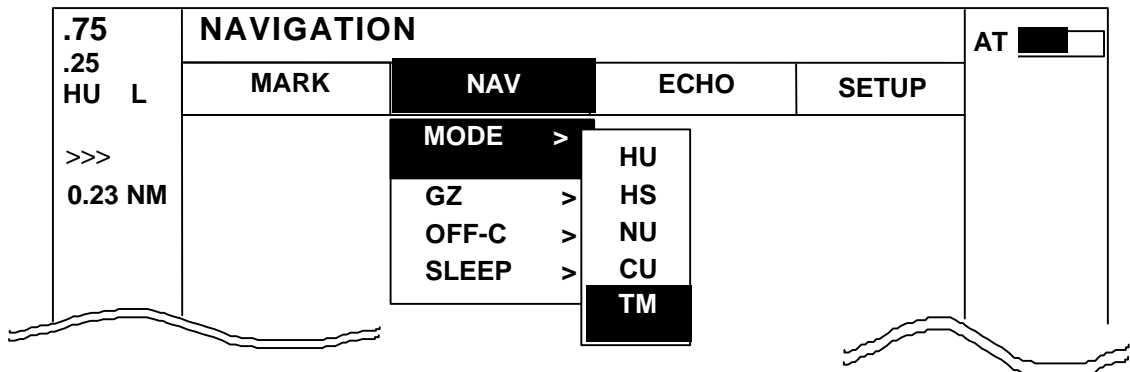
| MENU | → | Left/Right |
                (Select NAV)

Further explanation about the NAV menu will be conducted on the assumption that this "common operation for the NAV menu" has already been completed.

5.5.2.1 Changing display mode (MODE)
(1) Select MODE from the pull-down display items using the up-down cursor key, and press either the "ENT" key.

(2) When the MODE sign is displayed beside the MODE item, select a mode with the up-down cursor keys and press the "ENT" key.

(3) The display mode indicates upper-left on the screen.

```
.75      | NAVIGATION                                      | AT ▮▮▮□
.25      |-------------------------------------------------|
HU  L    |  MARK    |   NAV    |  ECHO   |  SETUP  |
         |          | MODE   > |  HU  |
>>>      |          |          |      |
0.23 NM  |          | GZ     > |  HS  |
         |          | OFF-C  > |  NU  |
         |          | SLEEP  > |  CU  |
         |          |          |  TM  |
```

UP/DOWN	→	ENT	→	UP/DOWN

(Select MODE)→ (Select HU)   →   ENT   HU(Head up)

      |→   (Select HS)→   ENT   HS(Head set)

      |→   (Select NU)→   ENT   NU(North up)

      |→   (Select CU)→   ENT   CU(Course up)

      →   (Select TM)→   ENT   TM(True motion)

Note1: Navigation equipment (gyrocompass, magnet compass, or GPS) must be connected to your radar in NU, CU and TM modes.

Note2: In TM modes it is necessary to set as follow (1) or (2).

    (1) Input of speed information from NMEA.   (2) Set your ship's speed manually.

Note3: TM mode is only available on single PPI screens (PPI and All PPI modes). If the screen type in TM mode switches to dual PPI modes, such as PPI/PPI and Semi 3D/PPI, the TM screen mode will be automatically changed to NU mode.
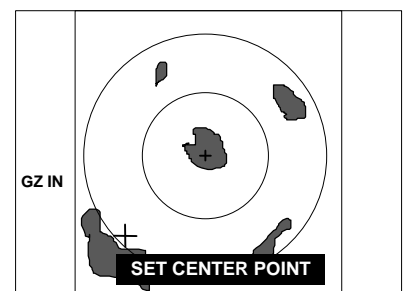
5.5.2.2 Setting the Guard Zone (GZ)

The following procedure sets up the distance, depth and the width of the guard zone. Once set, the guard zone detects the existence of echoes exceeding a prefixed level and then generates an audio alarm (IN MODE) or, it detects non-existence of echoes that has left the guard zone (OUT MODE).

(1) Select GZ from the pull-down menu using the up-down cursor keys, and press the "ENT" key. The ON/OFF sign is displayed beside the letters GZ.
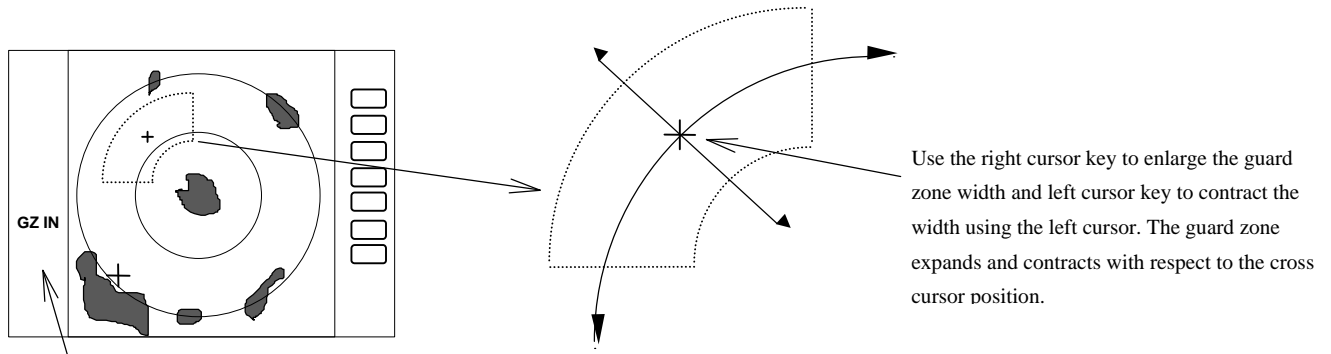
Up/Down	→	ENT

ON/OFF sign is displayed.

(2) Select "ON" by "common operation for the GZ menu", and press the "ENT" key.
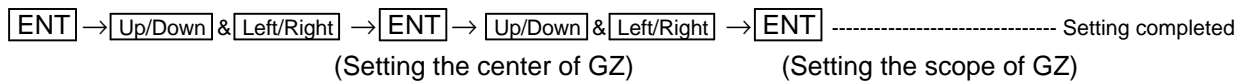

GZ IN

SET CENTER POINT

(3) The GZ IN sign appears in the left side of the screen, showing the present mode setting. A small cross cursor appears on the screen center for setting up the guard zone. A prompt "SET CENTER POINT appears at the bottom, requesting to define the center of the guard zone.

(4) Move the cross cursor to the center of the warning zone to be set, using the up-down and left-right cursor keys, and then press the "ENT" key. The guard zone appears now.

(5) From the cross cursor position as set in step (4), expand the guard zone as follows.

GZ IN

Use the right cursor key to enlarge the guard zone width and left cursor key to contract the width using the left cursor. The guard zone expands and contracts with respect to the cross cursor position.

The mode (IN or OUT) is displayed when the state is ON. Nothing is displayed when it is OFF.

(6) After setting the guard zone, fix it by pressing the "ENT" key. To cancel the guard zone function, select "OFF" by "common operation for the GZ menu", and press the "ENT" key.

$\boxed{\text{ENT}} \rightarrow \boxed{\text{Up/Down}} \& \boxed{\text{Left/Right}} \rightarrow \boxed{\text{ENT}} \rightarrow \boxed{\text{Up/Down}} \& \boxed{\text{Left/Right}} \rightarrow \boxed{\text{ENT}}$ ------------------------------- Setting completed

                (Setting the center of GZ)   (Setting the scope of GZ)

Stop the alarm tone

To momentarily silence the audio alarm, press any key on the control panel. In this state, the guard zone function is still operative. To permanently turn off the guard zone function, select "OFF" from the GZ menu.

Note1: To switch the IN or OUT mode, refer to "Guard Zone Mode" in section 5.5.4.5.3 "Changing the content of settings 2 (PRESET2)"

Note2: To set the guard zone level, refer to "Guard Zone LeveL" in section 5.5.4.5.3 "Changing the content of settings 2 (PRESET2)"

### 5.5.2.3 Shifting display in specific direction (OFF-C)

Displaying the location specified by the cross cursor as the vessel's location.

(1) Select OFF-C from the pull-down display items using up-down cursor key, and press the "ENT" key.

(2) When the ON/OFF sign is displayed beside the OFF-C item, select ON with the up-down cursor keys and press the "ENT" key.

(3) **OFF-C** is displayed in the upper right corner of the screen and "SET OFF CENTER POINT" at the bottom of the screen, and setting is ready to be entered. Move the cross cursor with the cursor keys to move own ship's position to an intended location, and press the "ENT" key. Own ship's position will be moved to cursor's location. The reversed OFF-C sign will be put back to normal display, indicating the off-centered screen is now set up.

(4) To cancel "OFF-C" function, either select OFF in (2)

Up/Down → ENT → Up/Down

(Select OFF-C) |→(Select ON) ENT→Left/Right & Up/Down→ENT ------- Set OFF-C

                      →(Select OFF) ENT ------------------------------------- Cancel OFF-C

Note: The VRM2 and EBL2 do not follow the OFF-C function while they are floated.
The function operates only on PPI screen.

Move the cross cursor

indicates "OFF-C" state is entered

.75
.25
HU

SET OFF-C POINT

.75
.25
HU

OFF-C
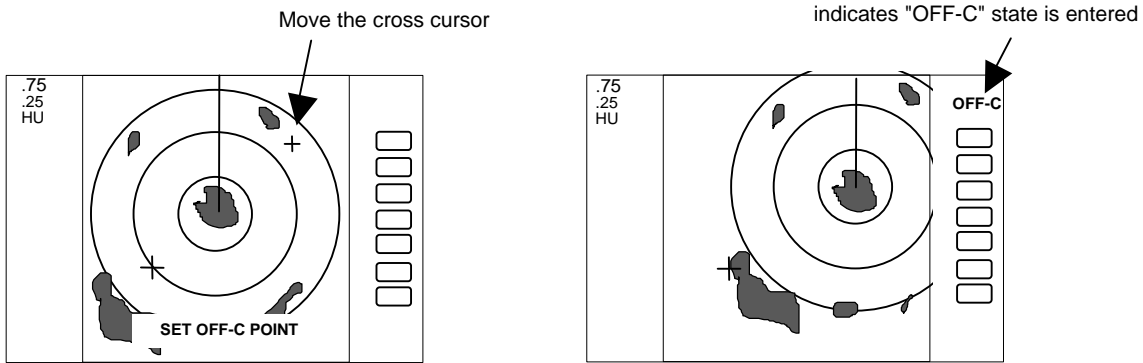
5.5.2.4 Setting of the SLEEP function(SLEEP)

This function allows a 30-second-transmission during pre-fixed times. Following the transmission cycle, a power-saving mode will be activated with the screen display put into ST'BY state (the scanner-OFF state) and the LCD backlighting turns off, accordingly. This action is repeatedly executed.
For practicing purpose, set a guard zone and have the warning signal automatically activated every prefixed period.

(1) Use the up-down cursor keys to select SLEEP from the pull-down menu, and press the "ENT" key.
(2) When the OFF/5min/10min/15min display appears beside the SLEEP item, select a time to be set with the up-down cursor keys.
(3) Press the "ENT" key to complete the setting. To cancel the SLEEP function, select OFF in step (2).

After setting a SLEEP mode, a transmission takes place and 30 seconds later the ST'BY state is established, turning the backlight off. (Power-saving mode). Two minutes before the prefixed time the backlight turns on again and the 2-minute timer starts. Then, at the fixed time another 30-second-transmission starts. This series of actions are repeated. If you press any key during the course of this action, the SLEEP function will be canceled.

(a) Setting procedure

Up/Down → ENT → Up/Down →(Select OFF) → ENT ----------------------------- SLEEP function is turned OFF

(Select SLEEP) →(Select 5min.) → ENT → POWER ------- 30-second-transmission every 5 min.

                →(Select 10min.) → ENT → POWER ------30-second-transmission every 10 min.

                →(Select 15min.) → ENT → POWER ----- 30-second-transmission every 15 min.

Transmission

Setting completed

(b) Action after setting

SLEEP setting (5min.) (Operation)

^ (Under Tx) ^ (Under power-saving mode) ^ (2min. timer in use) ^ (Under Tx) ^ (Under power-saving mode)

0 sec. 30 sec. 3 min. 5min. 5and a half min. (Time used)
TX Start TX OFF Backlight ON Tx Start TxOFF (Action)
                                    Countdown start

-- What happens if a key is pressed after a SLEEP mode setting?
      If a transmission has started and you press a key after setting a SLEEP mode, power-saving mode will
      be activated 30 seconds after a key is pressed.
-- What happens if a key is pressed during the SLEEP mode?
          a)If you press a key during the power-saving mode, the SLEEP function will be canceled and
             the 2-minute timer starts.
          b) If you press a key while the 2-minute timer is in active, or during transmission, the SLEEP
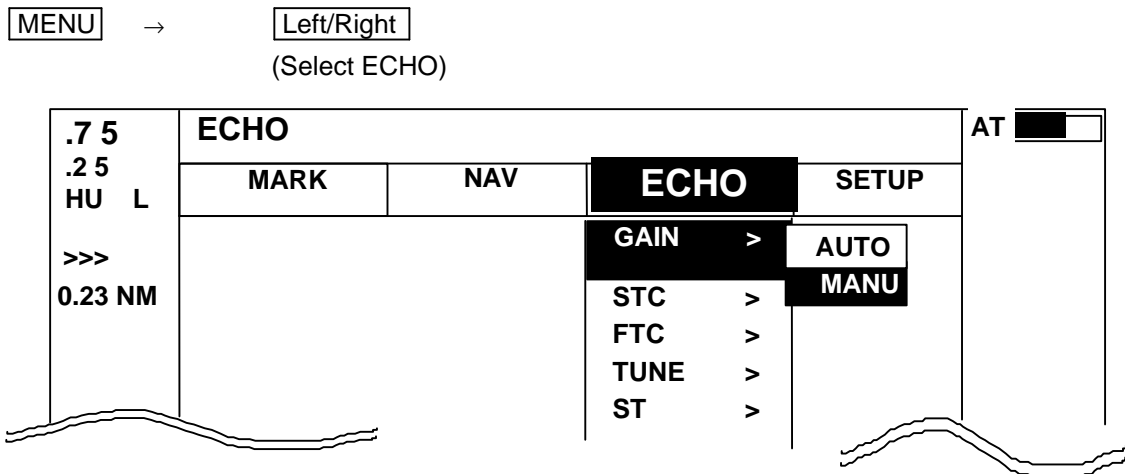   function will be canceled.

5.5.3 Echo Menu   xxx = Keys to press

    This pull-down menu provides various pre-settings for the radar PPI video shown on the screen.

**<Common operations for the ECHO menu >**
      Press the "MENU" key and select "ECHO" from the displayed 4 main menus using the left-right cursor.
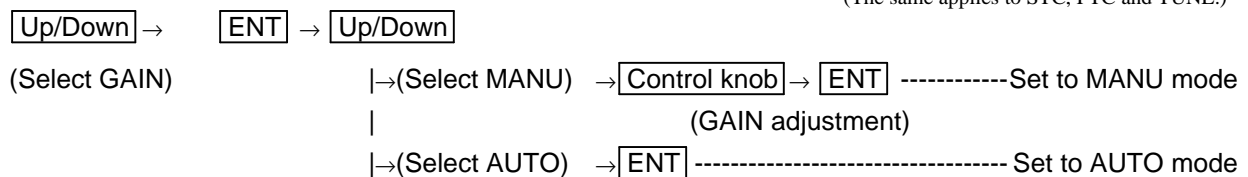All items of the ECHO menu will be shown in a pull-down form as shown below.

MENU   →   Left/Right
                    (Select ECHO)

5.5.3.1 Sensibility adjustment (GAIN)
(1) Use the up-down cursor keys to select GAIN from the pull-down display items, and press either the
      "ENT" key or the right cursor key.
(2) Select MENU from the MANU/AUTO display beside the GAIN item using the up-down cursor keys,
      and press the "ENT" key.
(3) The present state of GAIN is displayed in reverse form on the
      left side of the screen as **G 35** , showing the gain setting is
      ready for entry.
(4) Turn the rotary control, observing the screen. The figure shown
      on the screen changes within a range of 0 and 99.
(5) The GAIN adjustment completes by pressing the "ENT" key
      after the setting.
    When you wish to enter the AUTO function, select AUTO
    in step (2) and press the "ENT".
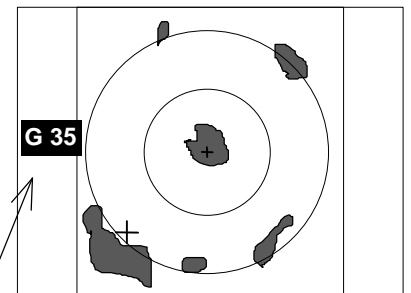
The setting value is displayed during MANUAL op-
eration. AT is displayed during AUTO operation.
(The same applies to STC, FTC and TUNE.)

Up/Down →   ENT → Up/Down

(Select GAIN) |→(Select MANU) → Control knob → ENT ------------Set to MANU mode
                   | (GAIN adjustment)
                   |→(Select AUTO) → ENT --------------------------------- Set to AUTO mode

5.5.3.2 Removing sea clutter (STC)
Refer to the section, "Sensibility adjustment (GAIN)".

Up/Down → ENT → Up/Down

(Select STC) |->(Select MANU) → ENT → Control knob → ENT - Set to MANU mode
                   | (STC adjustment)
                   |->(Select AUTO) → ENT -----------------------------------Set to AUTO mode

Note: When you select the MANU mode, the GAIN and FTC functions will be switched to MANU mode, too.
Note: When you select the HARBOR mode, FTC will be switched to MANU mode.

5.5.3.3 Removing rain and snow clutter (FTC)
Refer to the section, "Sensibility adjustment (GAIN)".

Up/Down → ENT → Up/Down

(Select FTC) |->(Select MANU) → ENT → Control knob → ENT -- Set to MANU mode
                   | (FTC adjustment)
                   |->(Select AUTO) → ENT -----------------------------------Set to AUTO mode

5.5.3.4 Adjusting the receiver tuning (TUNE)
Refer to the section, "Sensibility adjustment (GAIN)".
Use the following key operations to set up the tuning.

Up/Down → ENT → Up/Down

(Select TUNE) |->(Select MANU) → ENT → Control knob → ENT ---- Set to MANU mode
                   | (TUNE adjustment)
                   |->(Select AUTO) → ENT -----------------------------------Set to AUTO mode

Indicated setting value on manual mode,
AT on auto mode

5.5.3.5 Echo expansion (ST)
This function stretches the echo towards range, for easy recognition of the target on the screen.

Two types of the echo expansion is available. Select ST1 or ST2 from the menu.
(1) Use the up-down cursor keys to select ST from the pull-down display items, and press the "ENT" key.
(2) Select ST1 or ST2 from the display beside the ST item using the up-down cursor keys, and press the "ENT" key.

Up/Down → ENT → Up/Down → (select ST1) → ENT set ST1
                                      |→ (select ST2) → ENT set ST2
                                      |→ (select OFF) → ENT ST OFF

(expansion rate ST1<ST2)

.75
.25
HU

.75
.25
HU

ST1

ST function is OFF

ST1, or ST2 display,
no display on OFF state

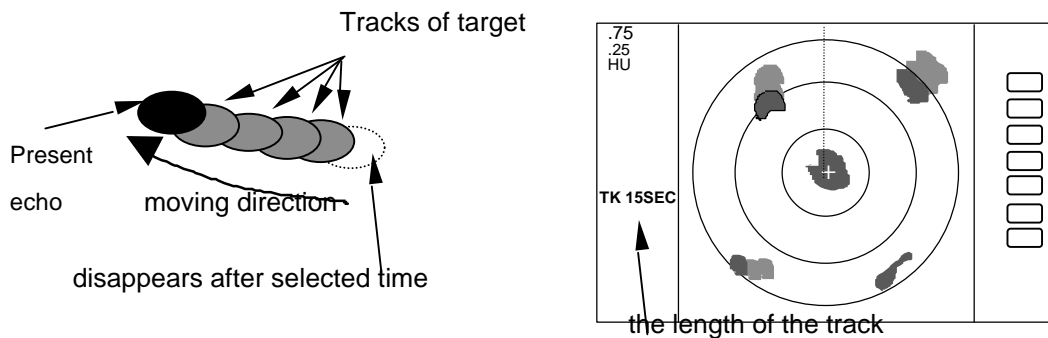The picture to display echoes
expanded in the direction of
the distance

5.5.3.6 Displaying the target track (TRACK)

(1) Use the up-down cursor keys to select TRACK from the pull-down display items, and press the "ENT" key.
(2) Select 15SEC, 30SEC, 1MIN, 3MIN, 6MIN, or CONT from the display beside the TRACK item using the up-down cursor keys, and press the "ENT" key.
(3) If you select 15SEC, the sign "TRK 15S" appears on the left side of the screen, entering the assigned track interval. The "TRK 15S" indicates the length of the track, displaying a 15-second-long sailing track at maximum.

Note: When PPI+PPI or ALL PPI+PPI screen mode is used, TRACK function can be used only on CONT mode.

Tracks of target

Present

echo   moving direction

disappears after selected time

.75
.25
HU

TK 15SEC

the length of the track

The key sequence for setting up the ship's track

| up/down | → | ENT → | up/down | →(select OFF)→ | ENT | TRACK OFF

|→(select 15SEC)→ ENT set 15sec. track

|→(select 30SEC)→ ENT set 30sec. track

|→(select 1MIN) → ENT set 1 min. track

|→(select 3MIN) → ENT set 3 min. track

|→(select 6MIN) → ENT set 6 min. track

|→(select CONT)→ ENT set continue track

5.5.3.7 Enlarging the selected areas (ZOOM)

Using this function, you can enlarge the selected zone around the cross cursor twice as large as the one displayed on the screen.

(1) Use the up-down cursor keys to select ZOOM from among the pull-down display items, and press the "ENT" key.
(2) Select the ON using up-down cursor keys from the ON/OFF display beside the ZOOM item, and press the "ENT" key.

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(3) A small cross cursor and the prompt "SET ZOOM POINT" will be displayed on the screen center and at the bottom respectively.

(4) Use the cursor keys to move the cross cursor to the point to be magnified, and press the "ENT" key to complete the setting. The area around the cross cursor is displayed in 2x magnification, with blinking "ZOOM" displayed in the upper right corner of the screen, indicating that a ZOOM display is shown.

(5) To cancel the ZOOM function, select OFF in step (1) or begin operation of range.

| Up/Down |→| ENT |→| Up/Down | (Select ON) →| ENT |→| Up/Down |&| Left/Right |→| ENT | ZOOM
                                                                                        Setting
(Select ZOOM) | (Move cross cursor)
                      |→ (Select OFF) →| ENT | -------------------------------------ZOOM canceled
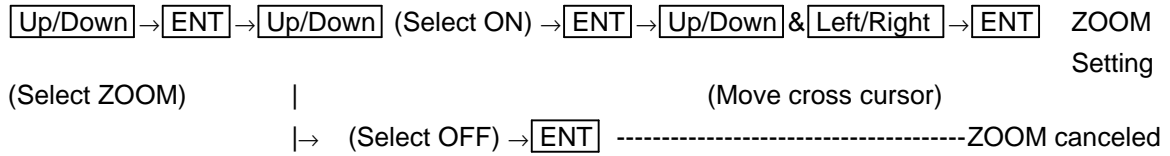
Note 1) VRM2 and EBL2 do not follow the ZOOM function during they are floated.
Note 2) Normal screen returns when you change the range scale.
Note 3) ZOOM function is usable only in PPI screen mode.
Note 4) ZOOM function is unusable in OFF-C.
Note 5) The ZOOM center can be set any desired position within the set range.

blinking "ZOOM"
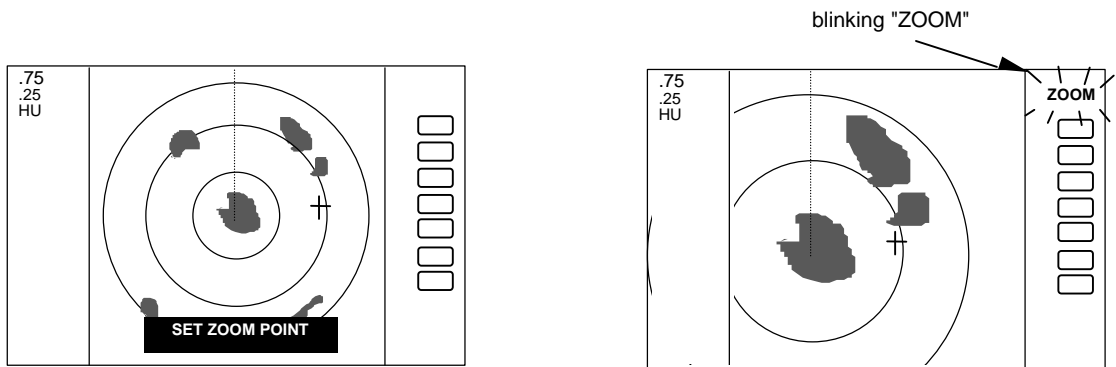
5.5.3.8 Increasing the sensitivity (S/L)

The pulse length is automatically changed as you change the range scale. However, if you wish to increase the sensitivity or to improve the picture definition, change the pulse length according to your need. If you select the short pulse (SHORT), the picture will become more definite, giving higher range discrimination. If you select the long pulse (LONG), the picture will be stretched towards range, providing better recognition of the targets shown, in contrast, the range discrimination will be sacrificed.

(1) Use the up-down cursor keys to select S/L from among the pull-down display items, and press the "ENT" key.

(2) Select Pulse length (SHORT or LONG) using the up-down cursor keys from the SHORT/LONG display beside the S/L item.

(3) The setting will be completed when the "ENT" key is pressed after the selection.

S or L display

| Up/Down | → | ENT | →(Select SHORT)   → | ENT | ------------------------ Set to short pulse
                       |→(Select LONG)   → | ENT | ------------------------- Set to long pulse

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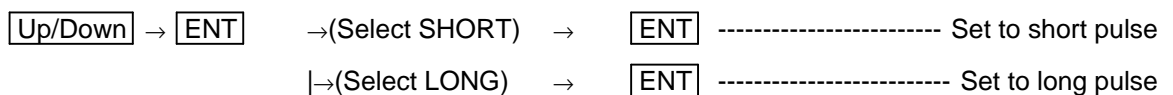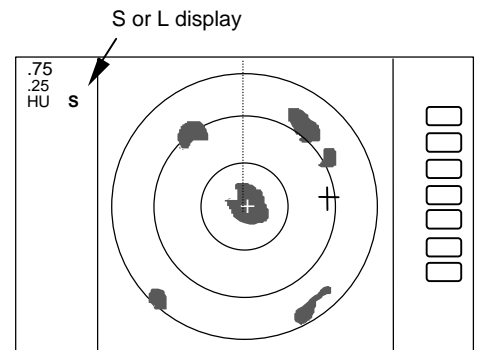
5.5.4 SETUP Menu

Using this menu, you can select and set up the following picture presentation modes:

(1) PPI: A basic presentation mode composed of a complete PPI screen, with status displays on the left side, and an array of the soft keys on the right side of the screen.

(2) SEMI3D/PPI: A small complete PPI on the left side and a semi-3D screen on the right side.

(3) PPI/PPI: Two small complete PPI screens on both sides, with the status display and the soft keys at the bottom and in the right side, respectively.

(4) PPI/NAV: A small PPI screen on the left side and the NAV information on the right side. The status display and an array of the soft keys are positioned at the bottom and in the right side of the screen, respectively.

(5) ALL PPI: A single, largest PPI screen is shown. The top and the bottom parts of the PPI screen are truncated, while the right and left sides of PPI are fully displayed.

(6) ALL PPI/PPI: Two larger PPI screens with truncated bottom.

(7) MOB: A Nav display, showing the position of MOB (Man Over Board) and present ship's position in latitude and longitude coordinate.

<Common operations for the SETUP menu>

(Up to the point when "SETUP" menu is selected from the main menu)

Press the "MENU" key and select "SETUP" from the displayed 4 main menus using the left-right cursor. (The contents of the selected MENU will appear on a pull-down display in accordance with the movement of the left-right cursor.)
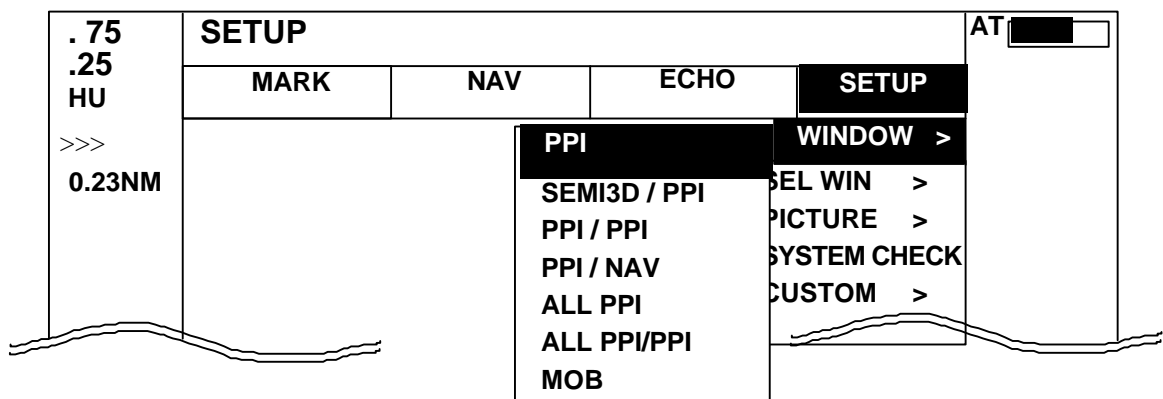
| MENU | → | Left/Right |

(Select SETUP)

Further explanation about the SETUP menu will be conducted on the assumption that this "common operation for the SETUP menu" has already been completed.

5.5.4.1 Selecting and setting up the screen mode (WINDOW)

(1) Use the up-down cursor keys to select WINDOW from among the pull-down display items, and press the "ENT" key.

(2) Select a screen to be displayed with the up-down cursor keys from among the above 7 items shown beside the WINDOW item.

(3) The setting will be completed when you press the "ENT" key after the selection.

| Up/Down | → | ENT | → | Up/Down | → (Select PPI) | → | ENT (a) |

(select WINDOW)

→ (Select PPI+SEMI3D) → ENT (b)

→ (Select PPI+PPI) → ENT (c)

→ (Select PPI+NAV) → ENT (d)

→ (Select ALL PPI) → ENT (e)

→ (Select ALL PPI+PPI) → ENT (f)

→ (Select MOB) → ENT (g)

-Available functions on each screen mode

SCREEN ITEM	PPI	PPI/SEMI3D PPI/NAV	PPI+PPI	ALL PPI	ALL PPI PPI	MOB
RANGE	○	○	◎	○	◎	X
VRM1, EBL1	○	○	□	X	X	X
VRM2, EBL2	○	○	□	X	X	X
FL VRM2/EBL2	○	X	X	X	X	X
RINGS ON/OFF	○	○	○	○	○	X
ZOOM, OFF CENT	○	X	X	X	X	X
///CSR	○	○	□	○	○	X
HDG OFF	○	○	○	X	○	X
STERN M	○	○	○	○	○	X
NORTH M	○	○	○	○	○	X
GAIN, STC, FTC	○	○	◎	X	X	X
TUNE	○	○	○	X	X	X
ST	○	○	○	X	X	X
GZ	○	○	◎	X	X	X
SEL WIN	X	X	○	X	○	X
TXON/OFF	○	○	○	○	○	X

◎ : The control available on active screen only. To use the function on another screen, switch the active screen using the SEL WIN function.

○ : Simultaneous control is possible for dual screen.

□ : The function is available only on PPI screen.

X : The function not available.

- Screen modes and Operations

(a) PPI Screen

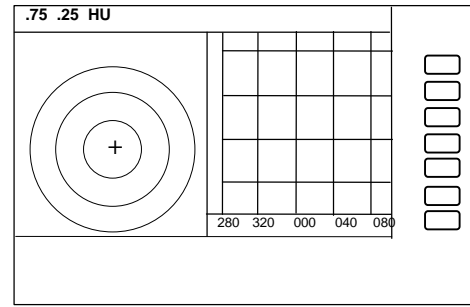All functions can be used on this screen.

.75
.25
HU
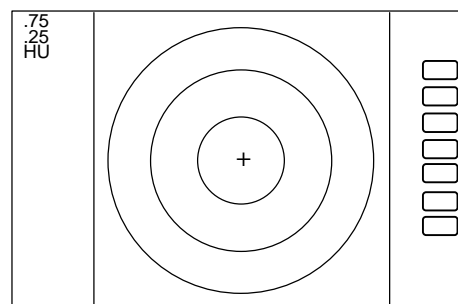
PPI Screen

(b) PPI/SEMI3D Screen

All controls, such as EBLs, VRMs are active on both screen.
The functions such as ZOOM, OFF-C, FL EBL2, and FL VRM2 are not availabel in this mode. In the "SEMI3D" screen, ship's heading direction always stays on the center vertical line denoted 000.
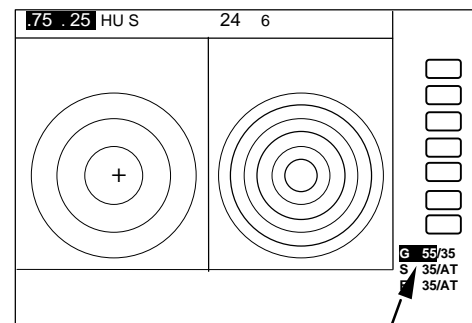

PPI/SEMI3D Screen

(c) PPI/PPI Screen

Each radar screen is updated one then the another on every two antenna scans, as shown in the following illustration. The unupdated picture remains frozen while another screen is in process.
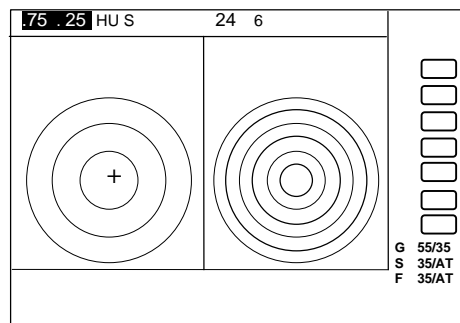
LEFT screen selected

LEFT GAIN is active

Left GAIN in reverse

Note: When your ship navigates at high speed, use a single PPI screen mode to obtain faster picture update.

Note: Functions including ZOOM, OFF-C, FL-EBL2, and FL-VRM2 are not available in this screen mode.

Note: The functions including RANGE, GAIN, STC, FTC, and GZ can be used independently for each screen. The screen with reversed range display, as selected in "**SEL WIN**", is an active display, in which you can operate available functions.

Note: The cross cursor will be displayed only on a selected screen.

-Operation

picture drawing(refreshed)

LEFT screen	/--------/******/-------/******/--------/******
RIGHT screen	******/--------/******/--------/****/--------/

t®

displayed previous picture (held)
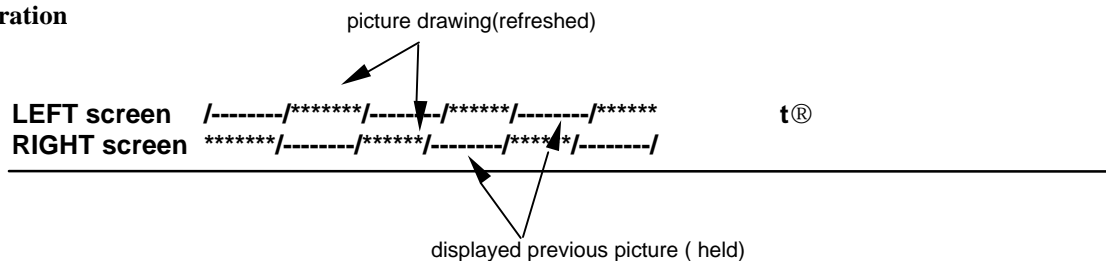
a) Changing the RANGE scale in LEFT screen
1) When the RIGHT range scale indicator is reversed, use the "SEL WIN" function to make the LEFT screen to be active.
2) Press the "RANGE UP" or "RANGE DOWN" key to change the RANGE scale.

b) Adjusting GAIN of LEFT screen.
   1) When the RIGHT range indicator is displayed reverse, use the "SEL WIN" function to make the LEFT screen to be active.
   2) Press the "GAIN" key and the letters "**G50**" will be displayed in reverse, indicating the GAIN adjustment is available.
   3) Adjust GAIN with the rotary control.
      Adjust STC and FTC in the same manner as GAIN.

      Note: While the adjustment of GAIN, STC, or FTC is in process, the radar picture update will be frozen. In approximately 5 seconds after the adjustment, the radar picture update will be resumed.

c) Using VRM1 on LEFT screen.
   1) When the RIGHT range indicator is displayed in reverse, change the active screen to LEFT screen with "SEL WIN" function.
   2) Press the "VRM1" key and " 1 0.00NM " will be displayed in reverse, indicating the VRM1 is available.
   3) Rotate the rotary control to measure the distance.
   4) The same procedure applies to VRM2, EBL1, or EBL2.
   NOTE: To use the VRM1 on the RIGHT side screen, first switch the active display to RIGHT side, then press the VRM1 key.
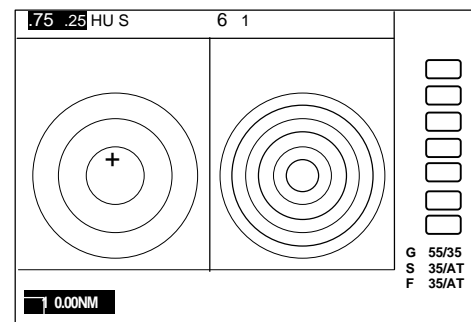
Determining the distance with VRM1
on LEFT screen

(d) PPI/NAV Screen

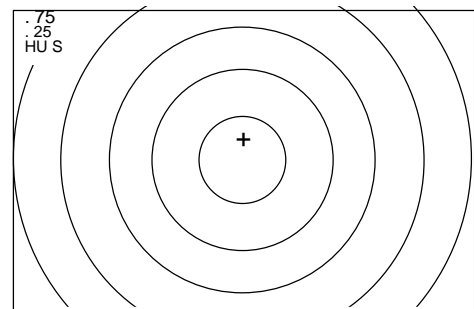   Note: The ZOOM, OFF-C, FL EBL2, and FL VRM2 are not available in this screen mode.
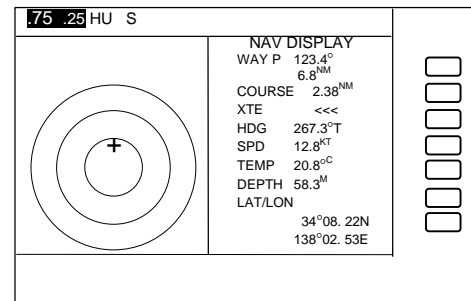
PPI/NAV screen

(e) ALL PPI Screen

Note1: The status display such as RANGE, RINGS interval, and Display mode are displayed in the upper-left corner of the screen.
Note2: When you press any key except "MENU", "RANGE UP/DOWN", "BRILL", and "POWER", the screen will return to the PPI mode.
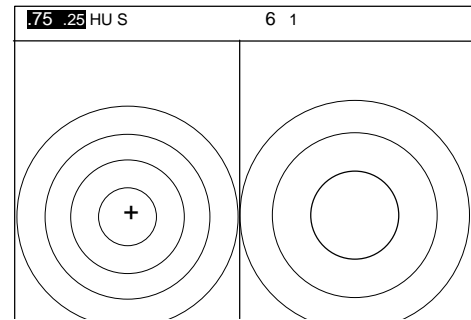
ALL PPI screen

(f) ALL PPI/PPI Screen

Note1: The RANGE, RINGS interval, and Display mode are shown on
top of the screen.

Note2: When you press any key except "MENU", "RANGE
UP/DOWN", "BRILL", and "POWER", the screen will return
to PPI/PPI mode.

**Note3: Each radar picture is updated every two antenna scans. The
right screen picture is frozen while the left screen is updated, and
vice versa. When your ship navigates at high speed, use a single
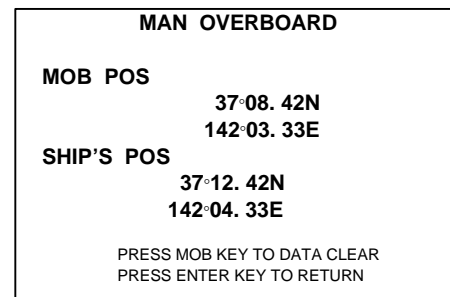PPI screen to obtain faster picture update.**

ALL PPI PPI screen

(g) MOB Screen

The MOB key has been pressed, the MOB position and ship's
position are displayed. If not, MOB position will be displayed with
bars(--.-)

Press MOB key to clear the MOB position and return to previous
screen. Press ENT key to return previous screen with keeping the MOB
position data.

```
        MAN OVERBOARD

MOB  POS
            37°08. 42N
            142°03. 33E
SHIP'S  POS
            37°12. 42N
            142°04. 33E

    PRESS MOB KEY TO DATA CLEAR
    PRESS ENTER KEY TO RETURN
```

### 5.5.4.2 Switching screens on PPI/PPI screen (SEL WIN)
Switching to the desired screen for activation on a PPI/PPI screen display.

The "SEL WIN" function switches the activated screen to effect the operation such as, RANGE, GAIN, STC, FTC, VRM1/2, EBL1/2, and guard zone. The range indicator of activated screen is displayed in reverse.

When "SEL WIN" is selected with the up-down cursor keys from among the pull- down display items and the "ENT" key is pressed, activated screen will be changed to the opposite screen.

Up/Down → ENT   the opposite screen activated
(select SEL WIN)

Range display on the active screen become a reverse display

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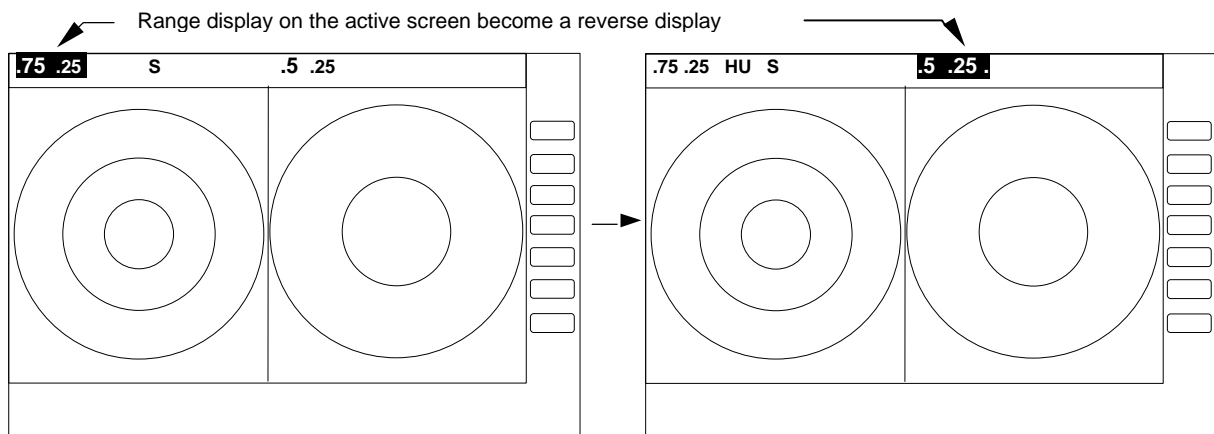
5.5.4.3 Changing the color of screen (PICTURE)

Changing the color of screen depending on weather and day / night environment conditions will be effective for easy viewing .

When "PICTURE" is selected with the up-down cursor keys from among the pull- down display items, select "DAY" and press "ENT" key to set to day display. Night display appears if "NIGHT" is selected

Up/Down → ENT → Up/Down → (select DAY) → ENT → day display
(select PICTURE) → (select NIGHT)→ ENT → night display

DAY display

Blue   Yellow   White

NIGHT display

Black   Green   Red
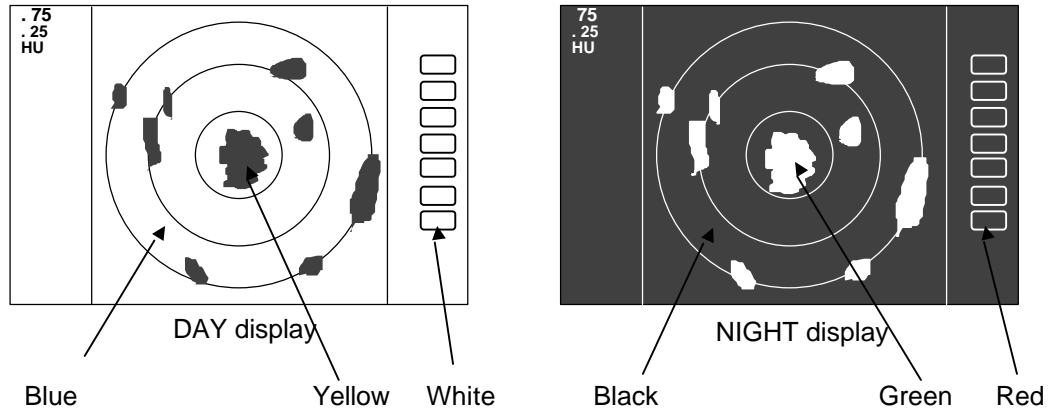
5.5.4.4 Fault Diagnosis by Self Check (SYSTEM CHECK)

Verifying the problem point by SYSTEM CHECK when, for example, some abnormality has occurred.

(1) Select SYSTEM CHECK from the pull-down display items using up-down cursor key, and press the "ENT" key.

(2) The system check screen will appear.

```
                        SYSTEM CHECK

              MEMORY CHECK
a) ROM --------------------------------- > ROM            OK
b) RAM--------------------------------- > RAM            OK
c) Backup memory---------------------- > BACKUP          OK

              SIGNAL CHECK
d) Transmit trigger ---------------------- > (1) TRIGGER      OK
e) Bearing pulse -------------------------- > (2) AZIMUTH      OK
f) Heading pulse ------------------------- > (3) HM           OK
g) +5Vvoltage(at video circuit) ----- > (4) +5V         OK     5.2V
h) High voltage(at scanner) ---------- > (5) H.T. AT SU   OK     253.2V
i) High voltage(at display) ------------- > (6) H.T. AT DU   OK     253.2V
j) Magnetron current-------------------- > (7) MAG. CUR.   OK     2.1
k) Tuning voltage------------------------ > (8) TUNE        OK
l) Motor power (6 kW/12 kW only)----- > (9) MOTOR       OK     40.0 V

m) Cumulative usage time --------> HOURMETER
      Operation time -------------------- > OPERATE        12.0H
      Transmit time  ---------------------- > TRANSMIT       10.3H

n) ROM version ------------------------> ROM VERSION        V1.00
o) Scanner type ------------------------> 4 KW OPEN
                    PRESS POWER KEY TO RETURN
```

| MENU | ENT |

Indicates the cursor status.

TGT N	ACQ
1	RNG U
2	RNG D
3	BRILL
4	AUTO
5	GAIN
6	STC
7	FTC

CONTROL KNOB

p) Indicates the operation status of front-panel keys.

| POWER | MOB |

Indicates the control knob status.

SYSTEM CHECK screen

While watching the screen , check the following:

   i)   Whether all items are marked "OK". (If any item is marked "NG", the indicated location may be faulty.)

   ii) Press a front-panel key and see if the corresponding display on the screen is highlighted.

   iii) Turn the control knob and see if the lower-right indicator move to right or left.

   (3) Press the POWER key to return to the previous screen

a) ROM	Indicates the ROM status**.**
b) RAM	Indicates the RAM status.
c) Backup memory	Indicates the backup memory status.
d) Transmit trigger	Indicates the signal line status for the trigger signal sent from the scanner unit.
e) Bearing pulse	Indicates the signal line status for the bearing signal sent fron the scanner unit.
f) Heading pulse	Indicates the signal line status for the bow signal sent from the scanner unit.
g) +5V voltage	Indicates the reference voltage status of the video circuit and its voltage value.
(at video circuit)	(normally about 5 V)
h) High voltage(at SU)	Indicates the status of the high voltage supplied from the display unit to the scanner unit and its voltage value (normally about 250 V) at scanner unit.
i) High voltage(at DU)	Indicates the status of the high voltage supplied from the display unit to the scanner unit and its voltag value (normally about 250 V) at display unit.
j) Magnetron current	Indicates the status of the anode current flowing in the magnetron and its current value.
k) Tuning voltage	Indicates the status of the voltage used for tunning and its voltage value.
l) Motor	Indicates the status of the scanner motor power (normally about 40 V)
m) Cumulative usage time	Indicates the cumulative time your radar is used.
OPERATE	: Duration of time during which the power supply is turned on.
TRANSMIT	: Duration of time transmitting.
n) ROM version	Indicates the ROM software version.
o) Scanner type	Indicates the Scanner type ex. 4 KW OPEN
p) Front-panel keys	As you press any front-panel key when the SYSTEM CHECK screen is on, the corresponding key is highlighted on the screen by displaying it in reverse video.

5.5.4.5 Changing the content of the setting (CUSTOM)

Note）The items included in the CUSTOM menu are the settings and adjustments to be carried out during installation. These items are not required during normal operations.
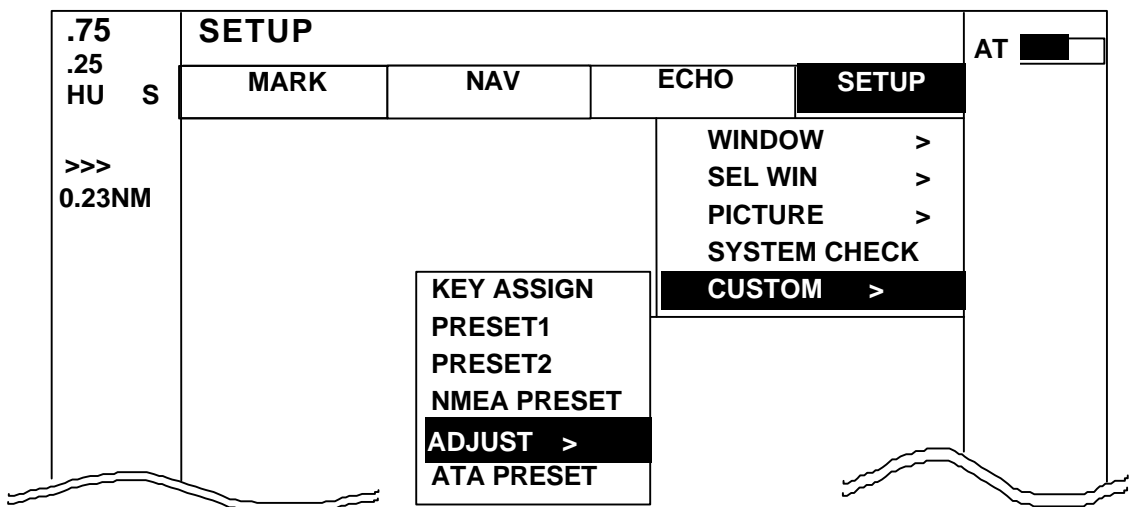
-Common operations for CUSTOM

Use the up-down cursor keys to select CUSTOM after "the common operations for the SETUP" menu, and press the "ENT" key.

MENU	→	Left/Right	→		Up/Down	→		ENT
		(Select SETUP)			(Select CUSTOM)			

Common operation for SETUP
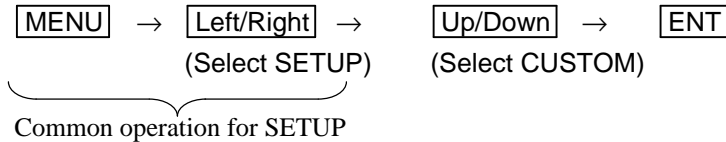
When the above operations are completed, the following 4 items will be displayed beside the CUSTOM item, namely "KEY ASSIGN", "PRESET1", "PRESET2" and "ADJUST".

Further explanation concerning the CUSTOM menu items will be made assuming that the above "common operations for CUSTOM" have already been conducted.

```
.75        SETUP                                    AT ▮▮  ▯
.25      ┌─────────┬─────────┬─────────┬─────────┐
HU  S    │ MARK    │  NAV    │  ECHO   │  SETUP  │
         └─────────┴─────────┴─────────┼─────────┤
>>>                                    │ WINDOW        > │
0.23NM                                 │ SEL WIN       > │
                                       │ PICTURE       > │
                                       │ SYSTEM CHECK    │
                          ┌────────────┤ CUSTOM    >     │
                          │ KEY ASSIGN │                 │
                          │ PRESET1    │
                          │ PRESET2    │
                          │ NMEA PRESET│
                          │ ADJUST   > │
                          │ ATA PRESET │
                          └────────────┘
```

5.5.4.5.1 Changing the settings of the soft keys (KEY ASSIGN)

To change the function settings that have been assigned to soft keys, numbered 1 to 7, use the following procedures.

(1) Screen display for the setting

KEY ASSIGNMENT

EBL1	EBL2	DATA	PPI	**1**
VRM1	VRM2	DEL	PPI/3D	**2**
VAR RNG	FL EBL2	ALL DEL	PPI/PPI	**3**
TRACK	FL VRM2	TRACK	PPI/NAV	**4**
TARGET	GZ	ZOOM	ALL PPI	**5**
SEL WIN	OFF-C	PICTURE	ALL PPI2	**6**
NEXT	NEXT	NEXT	NEXT	**7**
SET1	SET2	SET3	SET4	

MARK:
☑ EBL1
☑ VRM1
☑ EBL2
☑ VRM2
☑ FL EBL2
☑ FL VRM2
☐ HDG OFF
☐ ///CSR
☐ RINGS
☑ VAR RNG
☑ TARGET
☐ +MK LINE

NAV:
☐ MODE
☑ GZ
☑ OFF-C
☐ SLEEP

ECHO:
☐ TUNE
☐ ST
☑ TRACK
☑ ZOOM
☐ S / L

SETUP:
☑ SEL WIN
☑ PICTURE
☑ PPI
☑ PPI/3D
☑ PPI/PPI
☑ PPI/NAV
☑ ALL PPI
☑ ALL PPI2
☑ NEXT

ATA:
☑ DATA
☑ DEL
☑ ALL DEL

Move with up-down cursor

Key Groups
Move with right-left cursor

Mark is displayed when the function is set to a key.   Operation panel Keys 1 - 7

Soft Key Setting Screen

Select KEY ASSIGN from the CUSTOM items and press the "ENT" key. The following screen will be shown. (See chart below)

(2) Selecting functions

Reverse the items to be set using the up-down cursor keys. (The items become reverse in accordance with the moving cursor.)

(3) Key settings

(3)-1 Allocating a new function to a soft key (Example 1)

Upon reversing the item with up or down key, press the key to be allocated. The selected item will be displayed beside the key, which indicates that the setting has been completed.

(3)-2 Changing the function of a key with an preset function (Example 2)

When the allocated key is pressed, its function will be altered to the one selected in (1) above and the previous function will be canceled.

The current setting item numbers as SET1-4 are always displayed below the letters NEXT. In order to switch the settings SET1-4, use the right-left cursor keys.

NOTE: Double settings, setting 1 item for more than 1 key, are possible.

When you wish to assign the functions for more than 1 key, repeat the operations (3)-1 to (3)-2. (Example 3)

(4) To complete the settings
   After you have finished the settings, press the ENT key to exit from KEY ASSIGNMENT.

Example of an operation
   (The process up to the selection of KEY ASSIGNMENT from the SETUP menu is omitted. Only the process after the above chart will be described.)

Example 1) Changing the OFF-C function, allocated to key 6 in setting 2, to the HDG OFF function.

| Up/Down | → | 6 | → | ENT | ---------------Key 6 altered from |

Select HDG OFF   The display beside key 6   Exit from   OFF-C to HDG OFF
                  changes to HDG OFF   KEY ASSIGNMENT

Example 2) Re-allocate SEL WIN to key 1 in setting 2.

| Left/Right | → | Up/Down | → | 1 | → | ENT | Key 1 in setting 2 |

From SET1   Select SEL WIN   SEL WIN is displayed   is altered to SEL WIN.
to SET2   beside key 1.   Exit from
                                                             KEY ASSIGNMENT

Example 3) Changing the ST function, allocated to key 1 in setting 1, to HDG OFF and then reset the key 1 in setting 2 as SEL WIN.

| Up/Down | → | 6 | Key 6 altered from

Select HDG OFF   The display beside key 6   ST to HDG OFF
                  changes to HDG OFF

| Left/Right | → | Up/Down | → | 1 | → | ENT | Key

                  Select SEL WIN   SEL WIN is displayed   Exit fromis altered to SEL WIN
From SET1   beside key 1.   KEY ASSIGNMENT
to SET2

5.5.4.5.2 Changing the content of settings 1(PRESET1)

(1) Select PRESET1 from CUSTOM items and then press the "ENT" key to show the PRESET1 screen (See chart below).

(2) Select the item with up or down key and then contents with left or right key.
   The selected item will be enclosed by a rectangular and the contents will appear in reversed display.
   (a)
   Repeat the above procedures for the rest of settings.

```
                                    PRESET1
a) Heading Flash
b) Stern Mark        ►  HM FLASH          ON    OFF                          (a)
c) North Mark        ►  STERN M           ON    OFF
d) ST'BY screen      ►  NORTH M           ON    OFF
e) Buzzer Volume     ►  ST'BY             NAVI  NOR
f) VRM Unit          ►  BUZ VOL           OFF  LOW  HIGH
g) Water temperature ►  RM UNIT           NM    KM    SM
h) Depth Unit        ►  TEMP              °C    °F
i) EBL Mode          ►  DEPTH             M     FT    FM
j) WayPoint Mode     ►  EBL BRG           REL  TRUE MAG
k) Heading Input     ►  WP BRG            TRUE  MAG
l) Heading Type      ►  HEAD INPUT        NMEA  SIN/COS 12BIT 10BIT
m) Cursor position   ►  HEAD              TRUE  MAG
n) TX Pulse          ►  +MK MODE          DIST / BRG  LAT / LON
                     ►  P TABLE           0    1    2
        (b)

                                          .5   .75   1.5    3     6
                     ►  P TABLE   1    SHORT   0    0     0     1     1
                                       LONG    0    1     1     2     2
```

PRESS ENTER KEY TO RETURN

(3) After the setting is completed, exit from the PRESET1 screen with the "ENT" key.

Note) The contents will be displayed in (b) together with the numbers selected in P TABLE.

|	
a) HM Flash ON/OFF	To Set up HM presentation mode, either FLASH or CONTINUOS.
	ON: Heading Mark flashes every time the antenna is directed to ship's bow.
	OFF: Heading Marker is continuously shown.
b) Stern Mark ON/OFF	To turn ON or OFF the Stern Mark.
c) North Mark ON/OFF Mark.	To turn ON or OFF the North
d) ST'BY screen	To set up the stand-by screen mode as follows:
	NAVI: Navigation Data screen
	NOR: Normal screen
e) Buzzer Volume	To set up audio sound level of electronic buzzer
f) VRM Unit	To select VRM distance unit NM: Nautical mile

Heading Marker

.75
.25
HU

Stern Marker
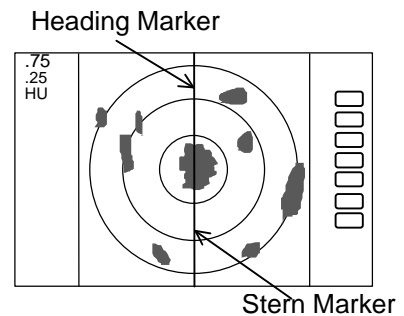
KM: Kilometer

SM: Statute mile

g) Water temperature   To select water temperature unit

C: Celsius

F: Fahrenheit

h) Depth Unit   To select Depth unit

M: Meter

FT: Feet

FM: Fathom

i) EBL Mode   To select Mode of EBL

REL: Relative bearing from HM

TRUE: True bearing

MAG: Magnetic bearing

j) WayPoint Mode   To select WayPoint bearing mode

TRUE: True bearing

MAG: Magnetic bearing

k) Heading Source   To select the source of bearing information.

NMEA

SIN/COS: Compass Data with SIN/COS signal

12BIT: Compass Data with 12bits serial signal

10BIT: Compass Data with 10bits serial signal

l) Heading Type   Heading Information Type setting

MAG: Magnetic bearing

TRUE: True bearing

m) Cross cursor position display Mode

DIST/BRG: Range and Bearing indication

LAT/LON: Latitude and Longitude indication

n) Transmitting pulse width   Pulse length setting for Range Scale (Note:)

Note: P TABLE

P TABLE 0

PULSE TYPE	<=0.25 NM	0.5 NM	0.75 NM	1.5NM	3 NM	6 NM	>=12 NM
SHORT	0	0	0	0	0	1	3
LONG	0	0	0	1	1	2	3

P TABLE 1

PULSE TYPE	<=0.25 NM	0.5 NM	0.75 NM	1.5NM	3 NM	6 NM	>=12 NM
SHORT	0	0	0	0	1	1	3
LONG	0	0	1	1	2	2	3

P TABLE 2

PULSE TYPE	<=0.25 NM	0.5 NM	0.75 NM	1.5NM	3 NM	6 NM	>=12 NM
SHORT	0	0	0	1	1	2	3
LONG	0	1	1	2	2	3	3

Note: Pulse width   0 : 0.08 uS,   1 : 0.3 uS,   2 : 0.6 uS,   3 : 1.0 uS

5.5.4.5.3 Changing the content of settings 2 (PRESET2)

Refer to the section, "Changing the content of setting 1(PRESET1)".

```
                                    PRESET2

a) Guard Zone Level
b) Guard Zone Mode      GZ LVL          1 2 3 [4] 5 6 7
c) Hold                 GZ MODE         [IN]  OUT
d) Display Unit Mode    HOLD            ON  [OFF]
e) External Buzzer      DISPLAY         [RDR]  MONI      NAVI
f) Bearing pulse/rot(IN)  EXT BUZ       [OFF]      CONT   INT
g) Bearing pulse/rot(OUT) IN P /R       [1080]    1024   2048   4096   360
h) Built-in Simulator   OUT P/R         [1080]    1024   2048   4096   360
i) Interference Rejection  DEMO         ON  [OFF]
j) Ship's Speed         IR              OFF   [IR1]    IR2
k) Indication Language  SPD SET         [NMEA]  MANU  [0.0KT]  LOG   200P
                        LANGUAGE        CHI   DAN   [ENG]   FRE   GER
                                        GRE   ITA   JPN   KOR   NOR
l) Scan speed                           POR   RUS   SPA   SWE   TUR
m) Color                SCAN SPEED      [STD] HIGH
                        COLOR           [MONO] MULTI

                    PRESS ENTER KEY TO RETURN
```

a) Guard Zone Level	Guard Zone Detection Level setting
	1: High Sensitivity, .. 7: Large Target Only
b) Guard Zone Mode	Guard Zone Detection Mode setting
	IN: To detect entry of a target
	OUT: To detect leaving of a target
c) Hold	To hold the radar picture presentation for 30 seconds after switching to ST'BY
	The EBL and VRM can be used in HOLD state.(Note1:)
d) Display Unit Mode	Display Unit Operation Mode setting
	RDR: Radar mode (normal)
	MONI: Monitor mode (for slave display use)
	NAV: Navigation mode (for DATA indicator use)
e) External Buzzer	External Buzzer control setting
	OFF: Buzzer off
	CONT: Continuous tone
	INT: Intermittent tone
f) Bearing pulse/rot.(IN)	Change the setting when connected to the other type of radar
g) Bearing pulse/rot.(OUT)	Change the setting when connected to the other type of radar
h) Built-in simulator	To display stored radar picture for presentaion purposes.
i) Interference Rejection	Reject the interference from other radar transmissions
	OFF: IR OFF
	IR1: ON level 1
	IR2: ON level 2

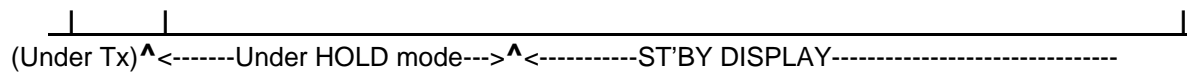| j) Ship's Speed	Own ship's speed setting	
	NMEA:	The speed data fed from an external speed sencor in NMEA sentence form.
	MANU:	MANUAL speed input set by an operator using the rotary control.
	LOG:	The speed is calculated by log pulse. Set the pulse rate with the rotary control.
k) On-screen Language	To select the language used for MENU and SOFT KEY (Note2:)	
l) Scan Speed	Scanning speed setting	
	STD:	Standard
	HIGH:	High speed
	(The setting can be changed in stand-by mode only.)	
m) Color	Video presentation switch	
	MONO:	Yellow or Green monochrome
	MULTI:	Red to Green multi-color

Note 1: HOLD function $\boxed{\text{POWER}}$ = POWER key to press

The HOLD function is only available in standby mode that momentarily freezes the radar picture. In this mode, you can use VRMs and EBLs and, as far as the operation continues the picture stays frozen. If you leave these controls, the timer starts to count and after 30 seconds the screen will be put back automatically to normal transmitting mode.

Setting HOLD $\boxed{\text{POWER}}$ (Operation)

```
        |        |                                                              |
(Under Tx)^<-------Under HOLD mode--->^<-----------ST'BY DISPLAY----------------------------
          Turn to transmission off
                        EBL,VRM operation:X seconds          X + 30seconds          (Time used)
```
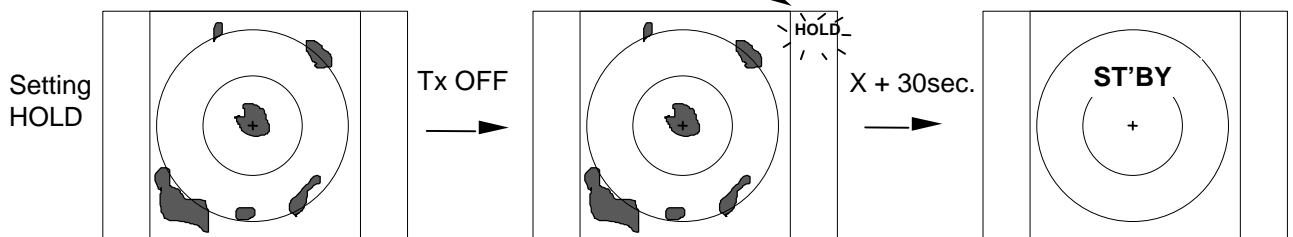NOTE) EBL and VRM function is usable in HOLD state.

"HOLD" is displayed and blinks.

Setting HOLD   Tx OFF →   HOLD   X + 30sec. →   ST'BY

EBLs and VRMs can be used
to locate a target.

Note 2: 15 languages

CHI	: Chinese	KOR	: Korean
DAN	: Danish	NOR	: Norwegian
ENG	: English	POR	: Portuguese
FRE	: French	RUS	: Russian
GER	: German	SPA	: Spanish
GRE	: Greek	SWE	: Swedish
ITA	: Italian	TUR	: Turkish
JPN	: Japanese		

5.5.4.5.4 Changing the content of priority for NMEA input(NMEA PRESET)

(1) (1) When NMEA PRESET is selected from CUSTOM items and the "ENT" key is pressed, the NMEA PRESET screen (See chart below) appears.

(2) (2) Select items with up-down cursor keys and contents of NMEA formatter with left-right cursor keys.

(3) (3) Change the priority of NMEA formatter with encoder knob.

(4) (4) The formatter in the left position has a higher priority than that of the right position.
Repeat this operation when multiple settings are necessary.

a)Lat/Lon	**NMEA PRESET**
b) Heading	**L/L** **GGA>GLL>RMA>RMC**
c) Ship's speed	**HEAD** **HDT>HDG>HDM>HSC>VHW>VTG**
d) Way point	**SPEED** **VHW>VTG>RMA>RMC**
e)Depth of water	**WAY POINT** **BEC>BWC>BWR>BER>BPI>RMB**
f) Cross track error	**DEPTH** **DBT>DPT**
	XTE **RMB>XTE**
	SET WITH CONTROL KNOB
	PRESS ENTER KEY TO RETURN
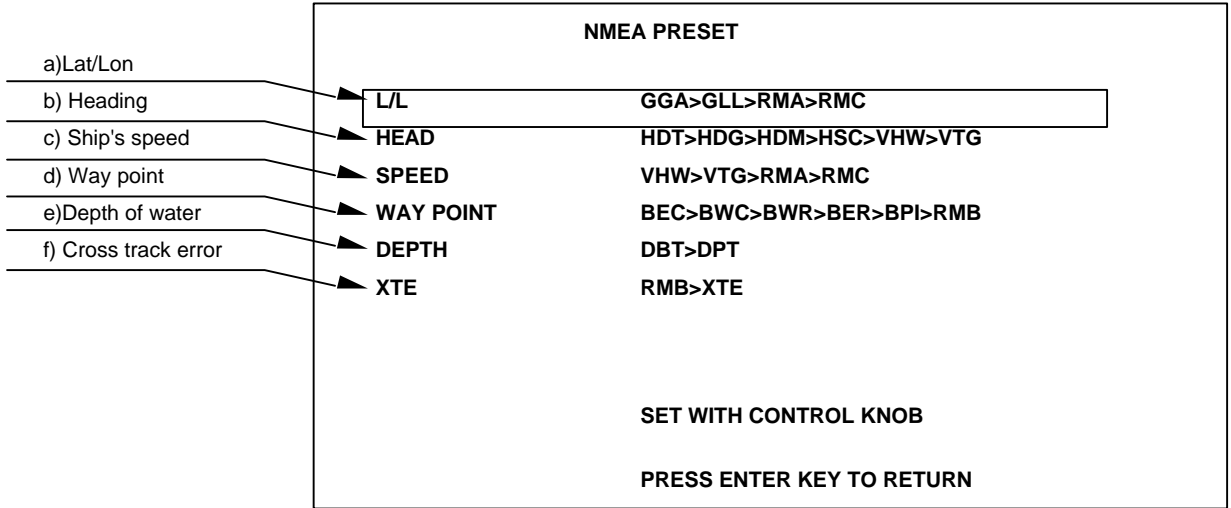
(5) After the setting is completed, exit from the NMEA PRESET screen with the "ENT" key. To suspend the changes press the ENT key. All newly set items will be cancelled.

5.5.4.5.5 Changing the content of settings (ADJUST)

The items in the ADJUST menu are used for setting up the equipment at installation, retrofitting, etc. where various functional parameters need to be set up or reset. Once set up, resetting may be not necessary.
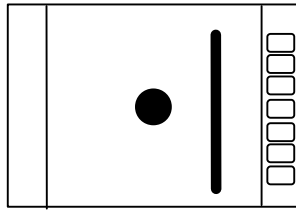
(1) Adjusting distance (TX TIME DELAY ADJ)

This adjustment is necessary to set up the distance to targets to within the specified accuracy. Before proceeding to adjustment, set respective controls as follows:
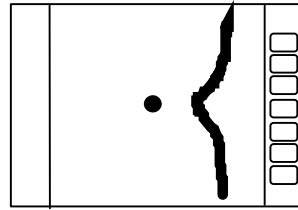
(5) First, set the range scale to 0.25 NM, FTC to minimum, and GAIN to optimum level. Then adjust STC to minimize the center spot (a split of transmission energy shown like a sun) to a single dot.

(2) Adjusting the distance.

    (2)-1 Select ADJUST by "common operations for CUSTOM". Use the up or down cursor key to select TIMING ADJ from the pull-down menu and press the "ENT" key.

    (2)-2 Find a straight linear target such as a jetty, bridge, etc.

    (2)-3 Turn the rotary control either CW or CCW to obtain a linear echo shown like the one in Figure b).

    (2)-4 Press the "ENT" key to exit from this menu.

Up/Down	→	ENT	→	Control knob	→	ENT
To select TIMIG ADJ Delay				Do Timing adjustment		Fix TX Timing
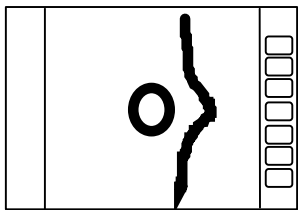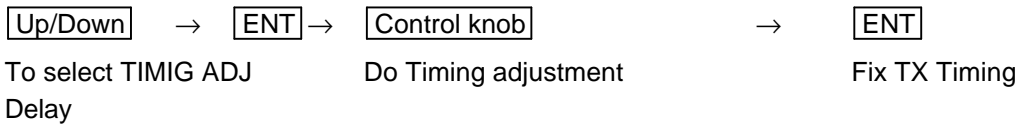
a) Pushing echo
(TX delay too much)

b) Properly set

c) Pulling echo
(TX delay too short)

(2) Adjusting angle (HEAD ADJ)

The purpose of this adjustment is to exactly orient the Heading Mark on the screen with the ship's bow direction.

Note: Heading offset value for open antenna is different from that of a radome antenna.

(1) In preparation for adjusting the angle, the following adjustments are to be conducted.

(1)-1 Find one small target within a 0.5 to 1.5 NM range which, lying in the bow direction, can be visually observed and is clearly recognized on the radar screen.

(1)-2 Measure the bearing of this target from the bow direction using a compass. Let it be θc.

(1)-3 Measure the bearing of the above target in head up (HU) mode using EBL. Let it be θr.

(1)-4 Calculate the following:

$\theta c - \theta r$	: if θc is greater than θr
$360 - (\theta r - \theta c)$	: if θr is greater than θc

The obtained value is the azimuth error of your radar at installation. If θc and θr are equal, the adjustment described below is unnecessary.
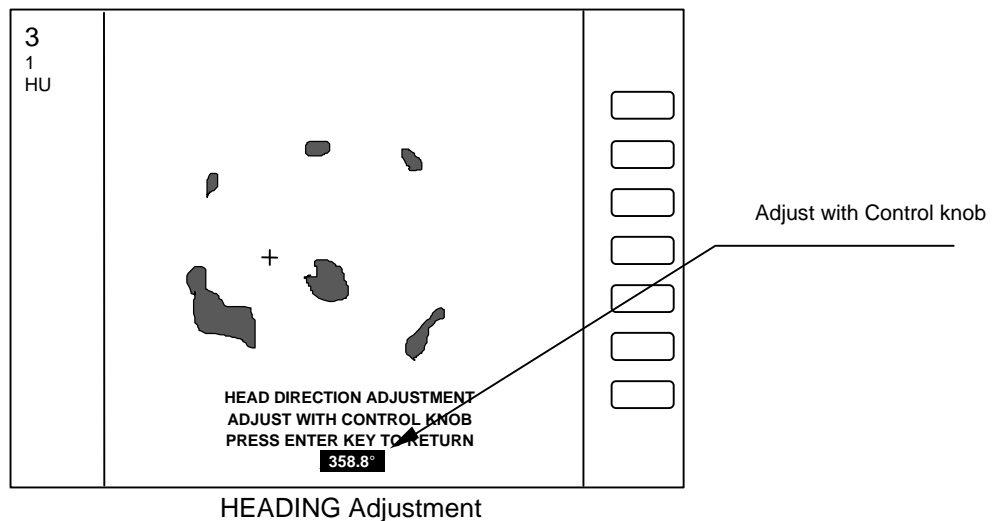
(2) Adjustment procedure

(2)-1 Select ADJUST by "common operations for CUSTOM" and select HEAD ADJ from among the pull-down menu using the up or down cursor key. Press the "ENT" key to fix the HEAD ADJ item.

(2)-2 Rotate the rotary control to set the value calculated.

(2)-3 When the adjustment is finished, press the "ENT" key to exit from this menu.

Up/Down	→	ENT	→	Control knob	→	ENT
Select HEAD ADJ.				Set a value to .		


```
3
1
HU

              HEAD DIRECTION ADJUSTMENT
              ADJUST WITH CONTROL KNOB
              PRESS ENTER KEY TO RETURN
                   358.8°
```

Adjust with Control knob

HEADING Adjustment

(3) Adjusting receiver tuning (TUNING CAL)

Normally you do not need to make this adjustment. This adjustment may be necessary to ensure normal automatic tuning operation. However, if the echo sensitivity is poor or there is any symptom suggesting improper tuning, you may need to re-adjust the tuning by the following procedures.
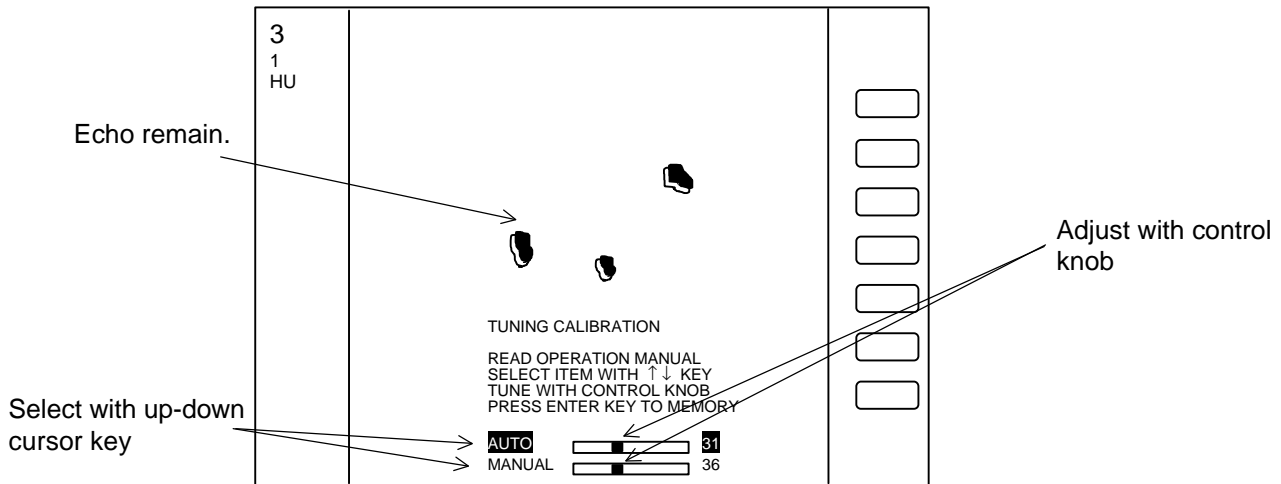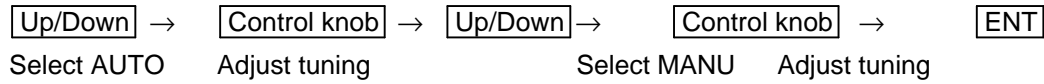
(1) Choose several stable video images in the 3 NM range or more.

(2) Select ADJUST by "common operations for CUSTOM", and select TUNING CAL using the up or down cursor key from the pull-down menu. Press the "ENT" key to fix the selection.

(3) The tuning adjustment screen (TUNING CALIBRATION) will appear, and then select AUTO with up-down cursor key.

(4) Rotate the rotary control either CW or CCW to obtain the largest echo presentation on the screen.
(5) Select MANUAL with the down cursor key.
(6) Rotate the rotary control again to obtain the largest echo presentation.
(7) When the adjustment is finished, press the "ENT" key to exit from the TUNING CALIBRATION screen.

Operate of (3) to (7)

| Up/Down | → | Control knob | → | Up/Down | → | Control knob | → | ENT |
| Select AUTO | | Adjust tuning | | Select MANU | | Adjust tuning | | |

(4) Adjusting the antenna height (ANTENNA)

Depending on the position at which the antenna is installed, the STC level may need to changed. Use the following procedures to set up. To obtain the best result, we suggest consulting your local SIMRAD dealer for proper setting.

(1) Select ADJUST by "common operations for CUSTOM", and then select ANTENNA from the pull-down menu using up or down cursor key. Press the "ENT" key to fix the selection.
(2) The adjustment screen will be shown. Set an appropriate value using the rotary control to choose the value from 1 to 9.
(3) Press the "ENT" key to exit from this menu.

| Up/Down | → | ENT | → | Control knob | → | ENT |
| Select ANTENNA | | | | Choose value | | Complete |
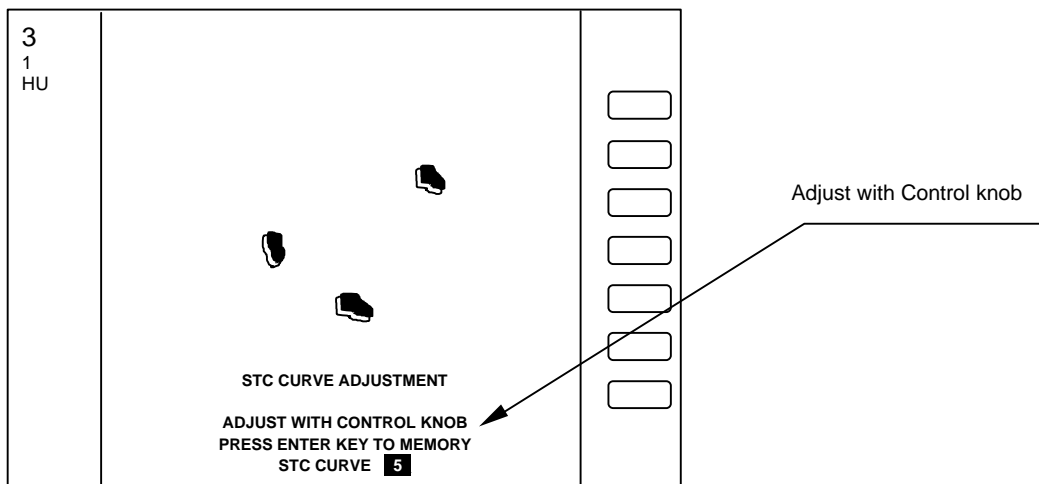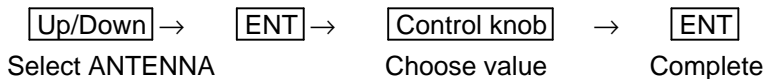
ANTENNA Adjustment

(5) Setting the receiver GAIN (GAIN)

Using this function, you can set up the automatic and manual gain level. As widely accepted convention, the receiver gain should be set to the level that the noise speckles is slightly shown on the screen.

There are two modes of setting for AUTO and MANUAL, to each mode you can independently set the GAIN level. Use the following procedure to set up.

In MANUAL mode, you can preset the MANUAL GAIN to current MANUAL gain level as standard. When you enter "G60" as gain level, for instance, "G60" will be preset as standard MANUAL level.
(1) Select ADJUST by "common operations for CUSTOM" and select GAIN from the pull-down menu items. Press the "ENT" key to fix the selection.
(6) Turn the rotary control to set the desired level from 1 to 30.
(7) Press the "ENT" key to fix the setting.

Up/Down	→	ENT	→	Control knob	→	ENT
Select GAIN				Choose value		Complete

(6) Setting the STC level (STC)

Using this function, you can set up the STC level to your needs. Proper STC setting should be such that small targets such as buoy and small craft are clearly shown while slight sea clutter appears on the screen. In AUTO mode, you can preset the AUTO STC level and AUTO FTC level as well. When entered at HARBOR (HBR) mode, you can preset the HARBOR STC level.

In MANUAL mode, you can preset the best suited STC level as standard MANUAL STC level.
(1) Select ADJUST by "common operations for CUSTOM", and select STC from the pull-down menu. Press the "ENT" key to fix the selection.
(2) The set up screen will be displayed. Rotate the rotary control to obtain an appropriate STC level on the screen. The STC digital value will change from 1 to 16.
(3) Press the "ENT" key to exit from the adjustment screen.

Up/Down	→	ENT	→	Control knob	→	ENT
Select STC				Choose value		Complete

5.5.4.5.6 ATA preset (ATA PRESET)

Before using the ATA function, the settings described below are necessary.
Note: Use the ATA function in either the PPI or ALL PPI mode. Even if other modes are used, the ATA still continues tracking though the symbols and data are not displayed on the radar.

Select the ATA PRESET items from the SET UP/CUSTOM menu. The menu contents are as follows.
(1) When ATA PRESET is selected from CUSTOM items and the "ENT" key is pressed, the ATA PRESET screen (See chart below) appears.
(2) Select items with up-down cursor keys and change the value of each item with encoder knob.
(3) Change the item of VECT(vector) MODE with right-left cursor keys.
(4) Change the item of ATA with right-left cursor keys.

```
-----------------------------------------------------------
CPA SET                      0.0 NM
TCPA SET          0 MIN
VECT SET          6 MIN
VECT MODE         REL        TRUE
ATA               ON         OFF
-----------------------------------------------------------
```

Check that ON in the ATA items is highlighted. If OFF is highlighted (selected), the ATA does not function.
* Unless the ATA board is installed properly, the ATA PRESET items are not displayed on the above SET UP/CUSTOM menu.

5.6 ATA Operation

5.6.1 ATA Board Specifications

(1)	Acquisition	Manual
		A target is acquired manually by a cross cursor driven by the Pointing Device.
(2)	Tracking	Automatic
(3)	Number of tracked targets	10 targets maximum
(4)	ATA data output	Target Number, distance, bearing, speed, course, CPA and TCPA
(5)	Alarm	Collision alarm, activated when a target enters the preset CPA and TCPA ranges.
		Lost alarm, activated when a target can no longer be tracked.
(6)	Display	Symbols: Predicted point and target number
		Vector : Predicted motion of a target as a result of own ship's direction and speed input.
		Display modes: Relative (REL)/True (TRUE)
(7)	Tracking range	0.5 to 40 NM
(8)	PRF	2,000 Hz maximum
(9)	Bearing signal	1,080 or 2,048 pulses / rev (Switched automatically) See Note.

Note: The ATA board does not accept bearing signals other than specified above. In case the ATA board is used in the monitor mode display, make sure an incoming bearing pulse rate agrees with that specified in this specification.

5.6.2 Operating Instructions

5.6.2.1 Outline
The ATA detects a target from radar image signals and measures the distance from the target and its bearing automatically. By calculating changes in the measurement results to predict the target movement, the ATA tracks the target automatically.
The ATA calculates the CPA (closest point of approach) and the TCPA (time required for the ship to reach the CPA) from the movement of the target toward the ship. Then comparing them to those preset, it generates a collision alarm if both values are smaller than the preset ones.
The target bearings are calculated by (1) bearing of the target toward the ship and (2) bearing of the ship's heading marker. Therefore, the accuracy of the data on the heading marker's bearing affects tracking performance. Tracking may become impossible if the compass is inaccurate and especially when the ship is yawing or changing the course. These cases, however, are not caused by a malfunction of ATA.

5.6.2.2 Setting
Before using the ATA function, the settings described below are necessary.
Note: Use the ATA function in either the PPI or ALL PPI mode. Even if other modes are used, the ATA still continues tracking though the symbols and data are not displayed on the radar.
(1) Switching the ATA function ON/OFF
Select the ATA PRESET items from the SET UP/CUSTOM menu.
The menu contents are as follows.

```
-------------------------------------------------------
CPA SET        0.0 NM
TCPA SET       0 MIN
VECT SET       6 MIN
VECT MODE      REL      TRUE
ATA                     ON       OFF
-------------------------------------------------------
```

Check that ON in the ATA items is highlighted. If OFF is highlighted (selected), the ATA does not function.
* Unless the ATA board is installed properly, the ATA PRESET items are not displayed on the above SET UP/CUSTOM menu.

5.6.2.3 Operation

(1)   Acquisition of a target

Firstly, select the target to track. Place the cursor on the target image and acquire it by using the ACQ (ac-quisition) function.

Press the ACQ key. When operating from the MENU, place the cursor on NAVI/ACQ and press the ENT key.

Select the target when it is displayed clearly and no other targets are displayed around it. If other targets are displayed around it, the ATA may track a different one.

All targets acquired by ATA are identified by the numbers, from 0 to 9. These figures will be shown in the upper right window on the screen. A vacant column shown like "-" indicates no target being acquired.

Before starting selection, use the TGT NUM (target number) function so that "-" is highlighted.

The TGT NUM function is used to change the target numbers. The target number will not change auto-matically unless this function is used.

Press the TGT NUM key. When operating from the MENU, place the cursor on NAV/TGT NUM and press the ENT key.

When ATA starts acquisition, a symbol appears at the cursor position on the screen, and the target number is shown on the lower right side of the symbol.

(2)   Tracking the target

When the operator acquired the target by the procedure (1), ATA automatically detects the target to start automatic tracking. As soon as stable tracking is established, a vector will be developed on the screen.

The target tracking is not relevant to the range scale in use, i.e. the tracking continues even if the range scale is changed beyond the viewable ranges for the target.

Note: A tracked small target may be lost when the range scale is changed to shorter pulse ranges, causing the target signal level to be decreased. This may lead to a tracking failure on the target that will become a lost target.

(3)   Canceling target tracking

To cancel tracking, use the DEL (delete) function. The number highlighted on the upper right of the screen will disappear. If ALL DEL (delete all) is selected, the ATA will cancel tracking of all targets.

Press the soft key if the DEL function has been set.

When operating from the MENU, place the cursor on NAVI/DEL or NAVI/ALL DEL and press the ENT key. When the radar is set to the SY'BY mode, the ATA will cancel tracking of all targets.

(4)   Data display

When necessary, numerical data of the current tracking target can be displayed in the data display window.

Use the DATA function to display the numerical data of the number highlighted on the upper right corner of the screen. Press the soft key if the DATA function has been set.

When operating from the MENU, place the cursor on NAVI/DATA and press the ENT key.
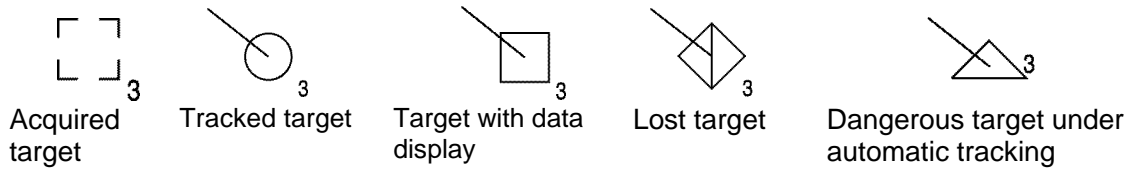
Items to be displayed are as follows.

Target number:	TGT NO.x	The number of the target currently displayed.
Vector time:	TIME xx MIN.	Setting time to display vector length. (Speed x Time=vector length)
Vector mode:	TRUE or REL	Display mode of vector and data. TRUE and REL represent true and relative speeds, respectively.
Target data:		BRG (bearing), DIST (distance), CRS (course), SPD (speed), CPA (closest point of approach) and TCPA (time required for the ship to reach the CPA)
State:		A collision or lost alarm will appear according to the state of the target.

Example:

```
--------------------------------------------------------------------------
|       TGT No.x                 ALM   LOST   TIME xxMIN    TRUE          |
--------------------------------------------------------------------------
|       BRG   123.4DEG       CRS   234.5DEG      CPA   12.3NM             |
|       DIST  12.3NM         SPD   10.0KT        TCPA  12.3MIN            |
--------------------------------------------------------------------------
```

(5)   ATA indications
In the PPI and ALL PPI modes, symbols and data are displayed. In other modes, target tracking is still
continued though the ATA display and operation are disabled. The symbols are as follows:

Acquired target	Tracked target	Target with data display	Lost target	Dangerous target under automatic tracking

 (6)   Ship's speed setting
The ship's speed can be set in the SPD SET item in the SET UP/CUSTOM/PRESET2 menu. Other than the
standard NMEA interface, manual setting and log pulse input can also be selected. In the case of manual
setting, input the ship's actual speed. Menu indication is as follows:

```
---------------------------------------------------------------------------------------
SPD SET          NMEA  MANU 0.0 KT    LOG 200P
---------------------------------------------------------------------------------------
```

5.6.2.4 Interface
(1)   Data output
The ATA data output is ready at the optional connector terminal on the rear of the display unit. Pin No.32 is
the NMEA_OUT signal terminal which outputs signals conforming to the NMEA0183. This output terminal
is used for the TARGET function (to output L/L of the cursor position), the MOB function (to output L/L of
the ship's position) and the ATA data output function.
The data format is as follows:
        $RATTM,01,0.42,292.1,T,4.99,0.0,T,0.4,0.0,N,,T,,,M*2A
Description
$RA   Unit identification code (radar)
TTM   Formatter
01   Target number
0.42   Distance to the target
292.1   Bearing of the target (∘)
T   Indicates the true bearing.
4.99   Speed (knots)
0.0   Course (∘)
T   Indicates the true speed and course, while R indicates relative movement.
0.4   Indicates the CPA (closest point of approach)
0.0   Time required for the ship to reach the CPA (min.)
N   Indicates the unit of distance used: NM
T   Indicates tracking condition: Q: unstable, T: tracking, L: lost
M   Indicates that acquisition is carried out manually.
*2A   Sum checking

(2)   Log signal input
The log signal can be used for ship speed input by inputting it to the optional connector terminal on the rear of
the display unit. Pin No.32 is the log signal terminal and it is driven between itself and pin No.14 (GND)
using contact signals such as a relay.
400, 200, 150 or 100 pulses/NM signal can be selected.