

Chapter 4 MEASURE THE SURROUND SHIPS

4-1 MEASURE DIRECTION AND RANGE USING VRM/EBL

4-1-1 ICON DISPLAY

VRM(Variable Range Marker) (ST-BY)



When activated functions.(TX)



EBL(Electric Bearing Line) (ST-BY)



When activated functions.(TX)



4-1-2 OPERATION OF VRM, EBL ICON

* VRM Tap ring, and Flick: VRM ring size will moving, meet to the target to ring together. That target Range is displayed on screen as VRM. .
Ob course, it is possible to use Rotary knob, turn and press.

Erase VRM: Select VRM icon by Rotary knob and double tap the icon, or double push the Rotary knob.

*EBL Tap line, and Flick: EBL line direction will rotate, meet line to the target together. The target Bearing is displayed on screen as EBL. .
Ob course, it is possible to use Rotary knob, turn and press.

Erase EBL: Select EBL icon by Rotary knob and double tap the icon, or double push the Rotary knob.

8-1-1 MAIN BANG SUPPRESSION

(Usually, doesn't need set up. adjust if necessary)

This adjustment is decrease the transmitted signal which appears as a circular echo around the center.

Adjustment is done so as to main bang is observe slightly seen.

Excess adjusting is danger for nearest small target observation.

If the main bang is not so big, use as factory setting.

WARNING



Do not change Suppression Level/DIST unless absolutely necessary.
Incorrect adjustment will result in deletion of nearby target images and thus collisions may occur resulting in accidents.

8-1-2 TARGET EXPANSION

Level setting.

The level which can be set up is level 1, the level 2, the level 3, and the level 4.

Expansion and the magnifying the observation target size..

Tap the "Level1, Level2, Level3, Level4" icon.



8-1-3 GAIN LEVEL

(Important adjustment. Since adjusted in factory, adjustment is not necessary in the field.)



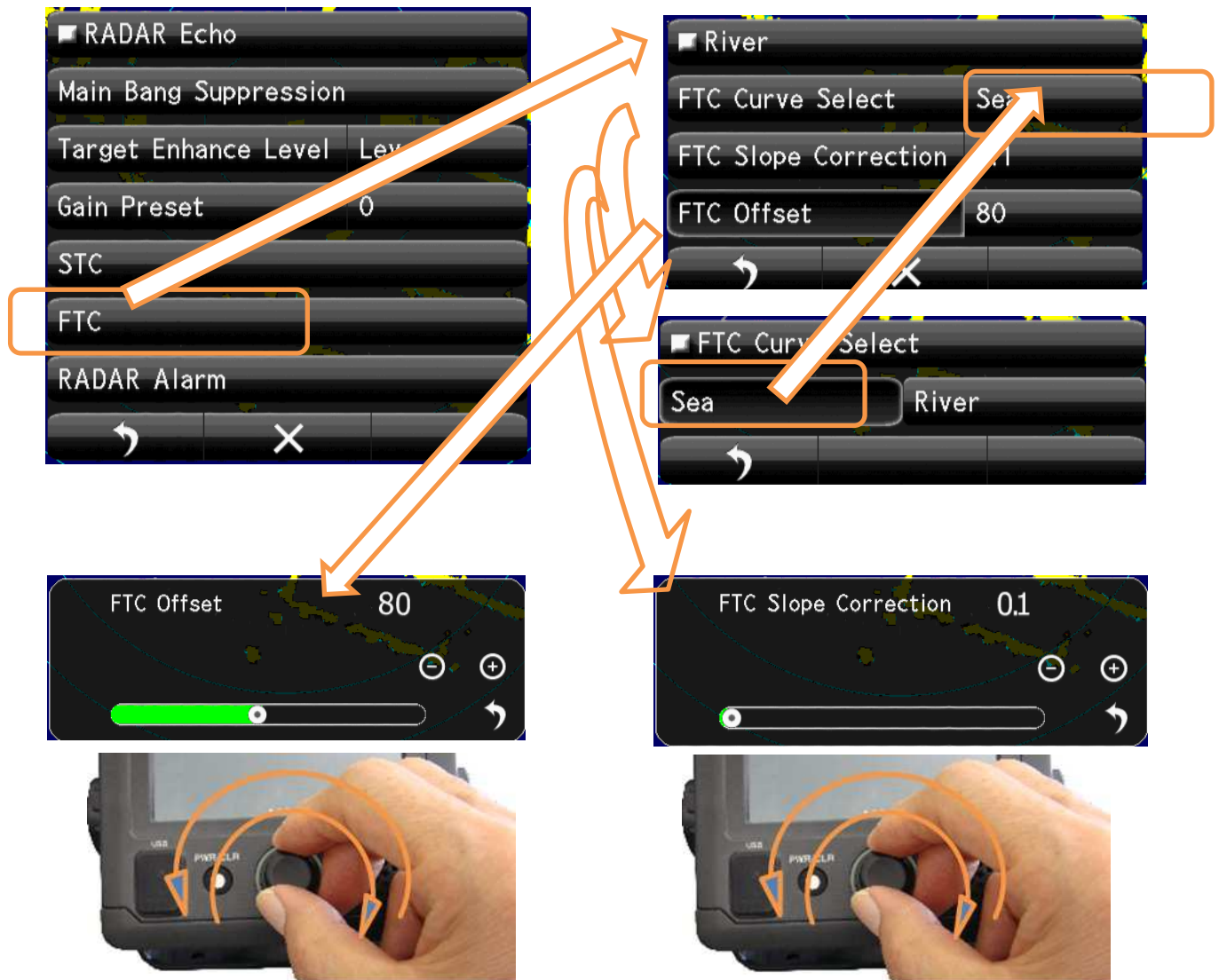
8-1-4 SEA CLUTTER LEVEL

(Important adjustment. Since adjusted in factory, adjustment is not necessary in the field.)



8-1-5 RAIN AND SNOW CLUTTER LEVEL

(Important adjustment. Since adjusted in factory, adjustment is not necessary in the field.)



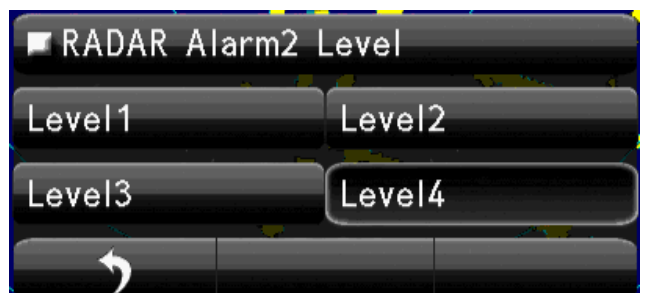
8-1-6 RADAR Alarm LEVEL



Set up Alarm 1 Level

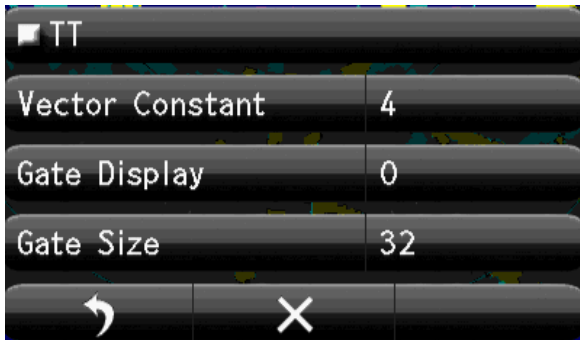


Set up Alarm 2 Level



8-2 TT(TARGET TRACKING) FUNCTION

(Important adjustment. Since adjusted in factory, adjustment is not necessary in the field.)



Vector shows the movement of the target.

Vector Constant large. Vector is stable, but the response is slow.

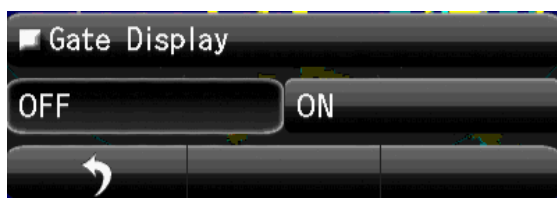
Vector Constant small. Vector is unstable, but the response is quick..



Tap Vector Constant, setting Bar appears lower part of screen.

Set up by flick or tap + -.

Rotary knob adjusting is possible. Click and set.

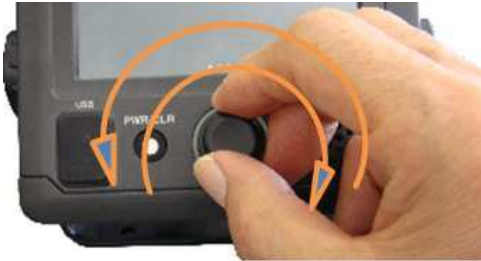


Gate Display: The region automatically search target moving area.

ON: Confirmation is possible under green searching area.

OFF: Doesn't display automatically searching area.

Gate Size: Set up the region size which can search the moving target automatically.



- Wide region: Possible to track fast moving target, but many clutters are include.
Sometime do miss tracking because of much noise.
- Narrow region Possible to track stable, but fast moving target are tend to lost.
Because of first target soon goes outside of the region.

8-3 SCANNER FUNCTION



8-3-1 PULSE REPETITION FREQUENCY FINE TUNING (PRF ADJUST)

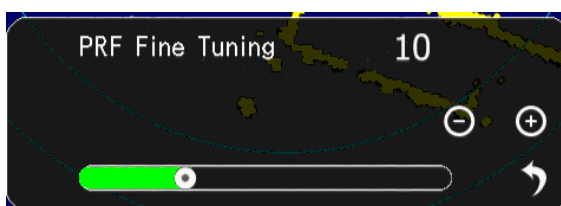
When existing the same frequency radar, in the same area, they interfere each other.

If p.r.f.(pulse reputation frequency)is the same, Interference can't reject on the screen.

In that case shift the p.r.f. a little may decrease the radar interference.

PRF Fine Tuning:

If radar interference cannot reject completely, it is effective way to shift the PRF.



Watching the screen echo, rotate the Rotary knob and stop when radar interference are fade out from screen.

8-3-2 STAGGER TRIGGER

When existing the same frequency radar, in the same area, they interfere each other.
If p.r.f.(pulse reputation frequency)is the same, Interference can't reject on the screen.
Another way to decease interference is shift the transmitting time randomly.
Not synchronize signal which transmit randomly is eliminate.
So decrease the other radar interference echo on screen.

ON Stagger: Stagger trigger is generated

OFF Stagger: Stagger trigger stop. (Normal trigger timing)

Select and Tap



Watching the screen echo, select off or on when heavy radar interference on screen.



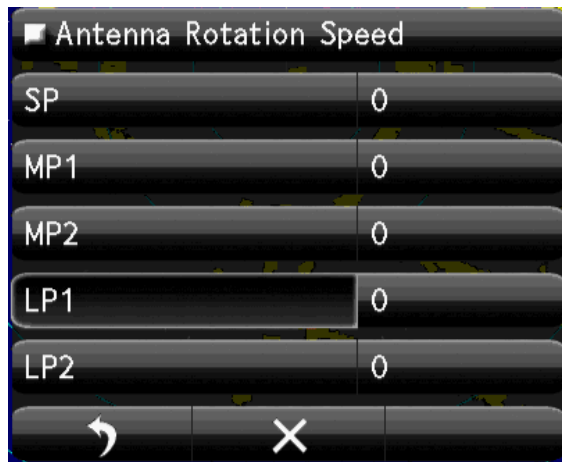
return to the menu

8-3-3 SCANNER ROTATIONAL SPEED

The rotational speed of inside microwave radiator is possible to change.

The sensitivity of radar are low speed is more higher.

So scanner rotation speed is possible to change according observing range.



Every pulse length can select the Antenna rotation speed.

Short range uses short pulse (SP).

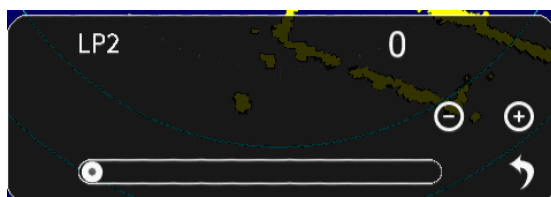
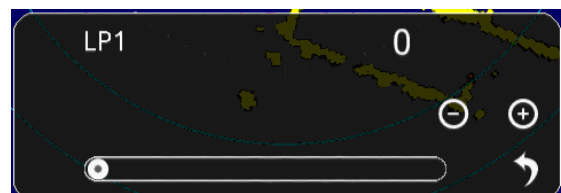
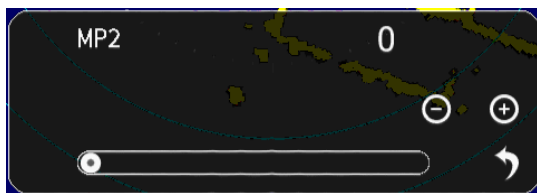
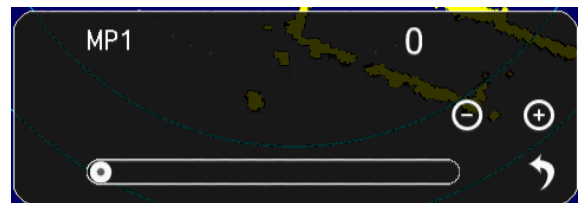
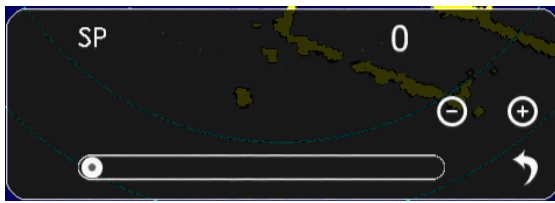
Medium range uses medium pulse (MP)

Long range uses Long pulse (LP)

Shorter range requires the High speed refresh screen.

Longer range requires the Low speed for High sensitivity.

User can select rotational speed according to his request.



8-3-4 ECONOMY MAGNETRON SETUP (PRF , PULSE LENGTH)

The life of magnetron proportion to the total transmitting pulse power.

Low power transmission makes magnetron life more longer.

Selection

Normal: It is the usual factory setup. Usually, this is chosen.

Economy: Selected the shorter pulse, repeat frequency is also selected lowest 650 Hz.

The life of a magnetron keeps more longer time.

Sensitivity is decrease somewhat from Normal.

High Power: High sensitivity high performance.



Select and Tap

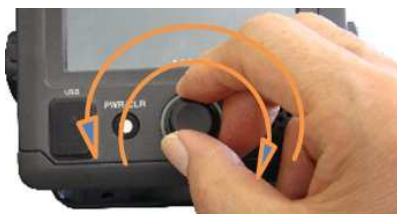
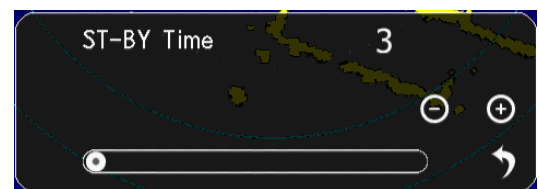
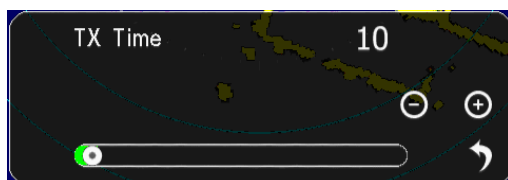
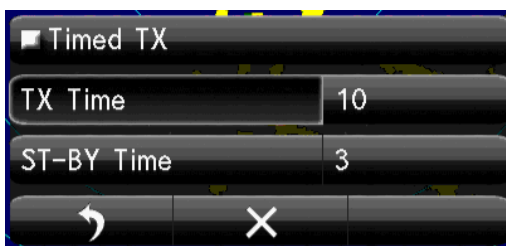


return to the menu

8-3-5 TIMED TX

The life of magnetron proportion to the total transmitting pulse power.

Timed TX can save magnetron life longer.



8-3-6 TUNE PEAK LEVEL

Normally, adjustment is not necessary.

(In case of adjustment the tuning peak point is shifted from maximum echo point.)

This adjustment must be done with (8-3-7 Tuning indicator) alternately.

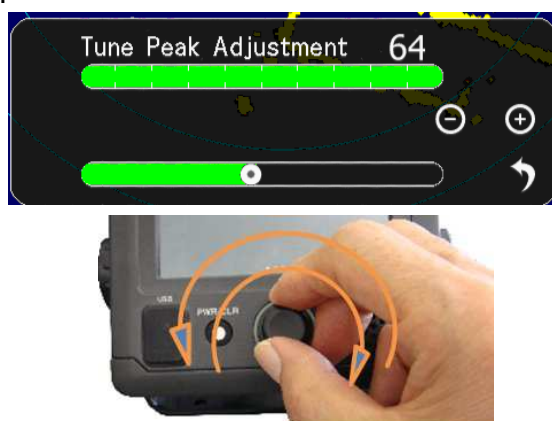
Set RANGE at 24NM

Display tuning level indicator menu.

Tune maximum echo point.

At this point adjust tuning level, so as to seen within the green bar.

Adjusting data is 0 to 127



8-3-7 TUNE INDICATOR LEVEL

Normally, adjustment is not necessary.

(Adjust ,in case of tuning level is too low.)

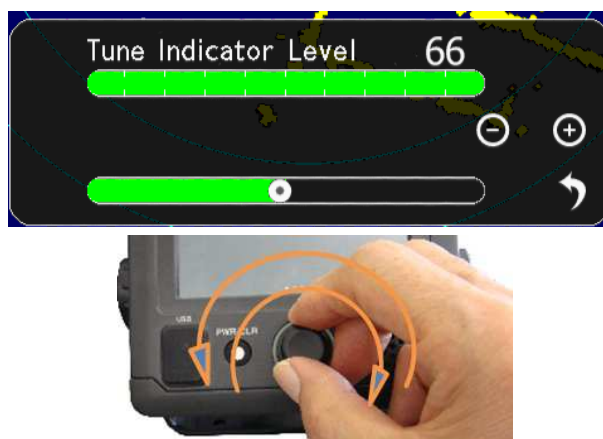
Set RANGE at 24NM

Display the Tune Indicator menu.

Tuning region is 0 to 127

NOTE! If tuning level is too excess setting, can't work automatic tuning function.

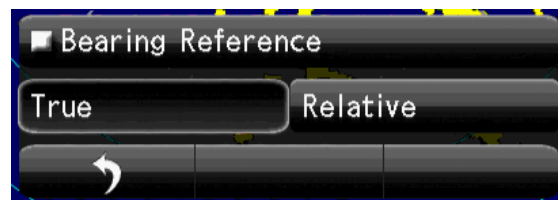
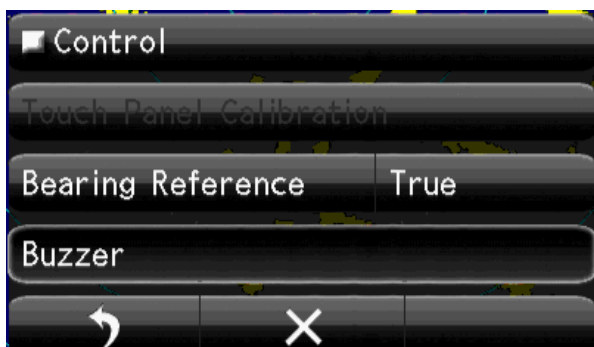
Adjust the tuning level bar moves within 80 to 90%.



8-4 CONTROL



8-4-1 BEARING REFERENCE

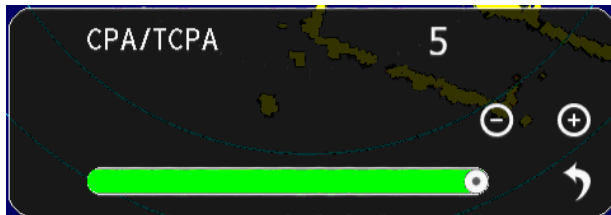
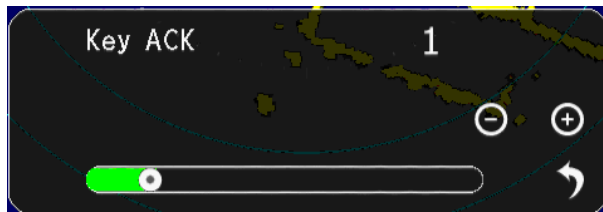


Select Bearing Mode
True or Relative

8-4-2 BUZZER

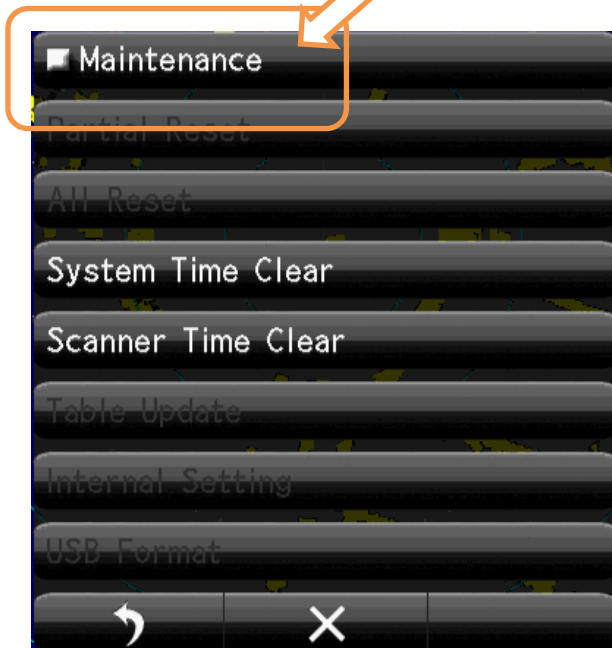


Set up the Buzzer sound Level.



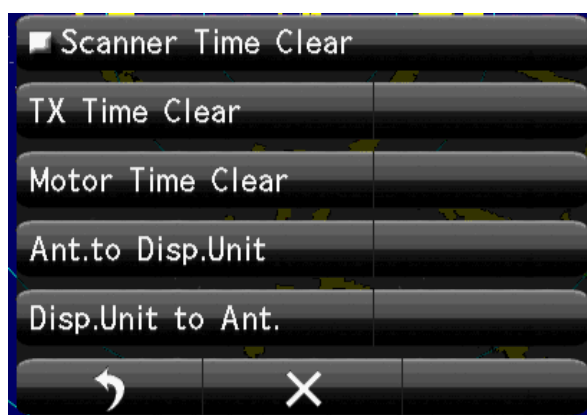
Set up the Every sound Level.

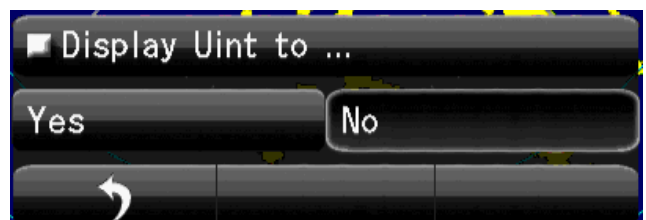
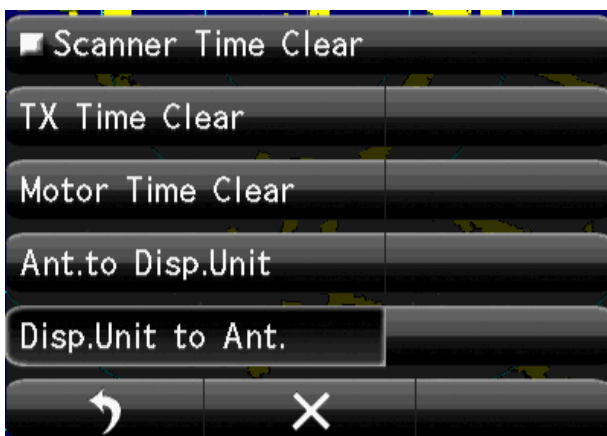
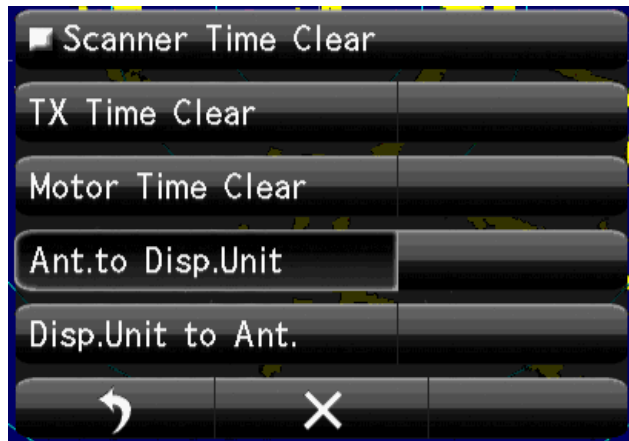
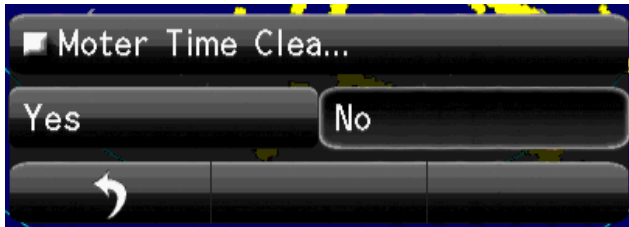
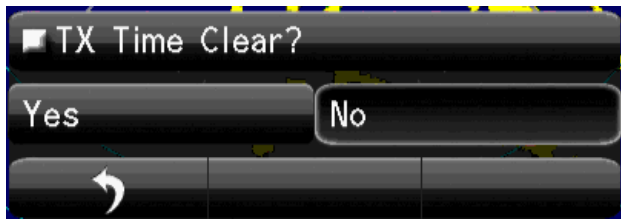
8-5 MAINTENANCE SETTING



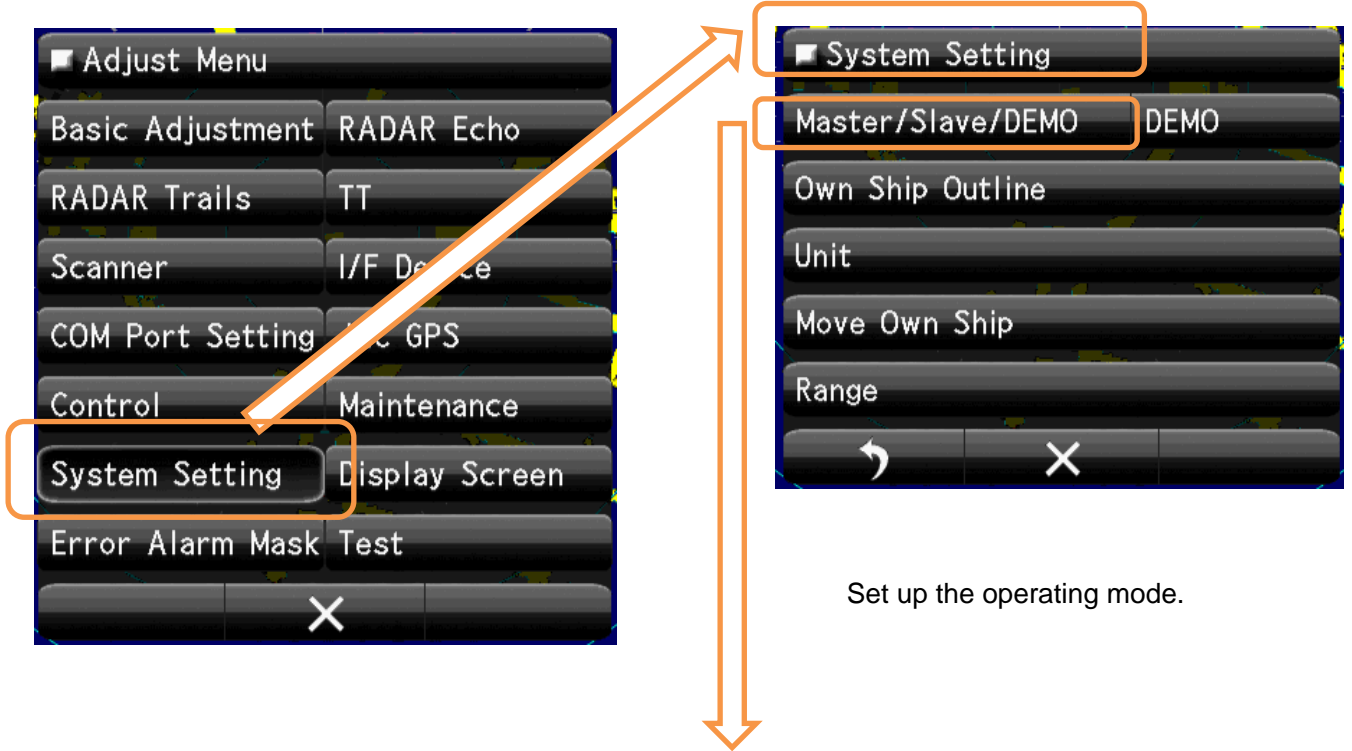
Clear System time

Clear Scanner time.





8-6 SYSTEM SETTING



8-6-1 MASTER/SLAVE/DEMO



Mode selection of display.

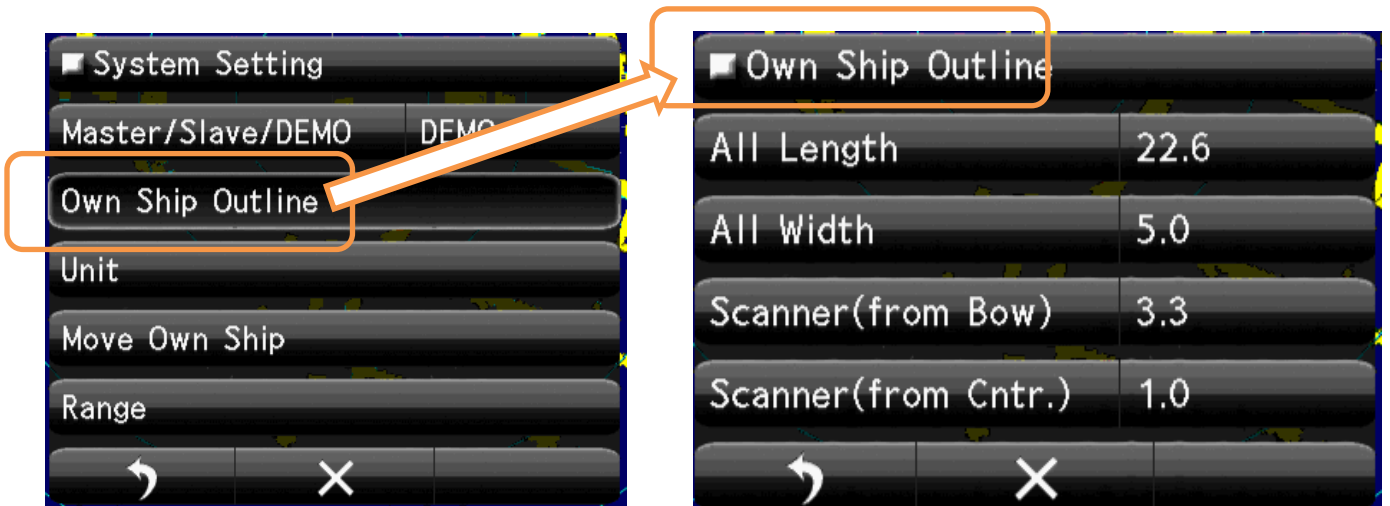
Master: control scanner.(Stand alone).

Slave: Receive another radar signal and display. can't control scanner.

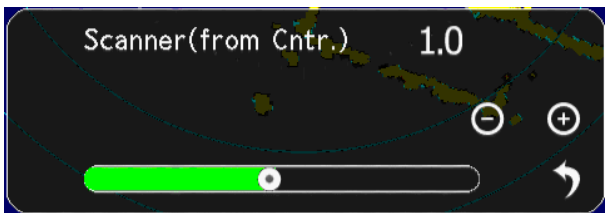
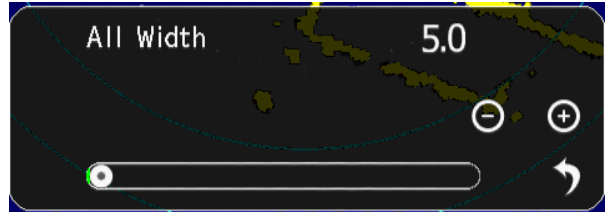
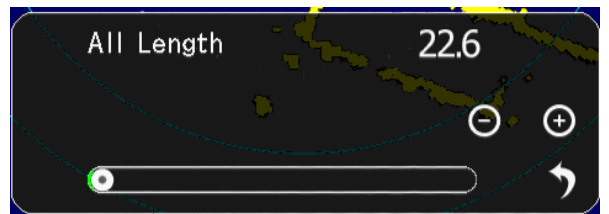
Demo: When use as carrying out the demonstration

Select Master

8-6-2 Own Ship Outline

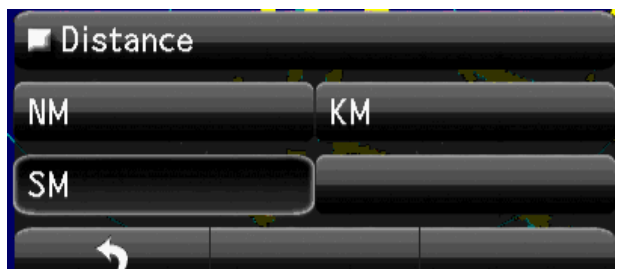
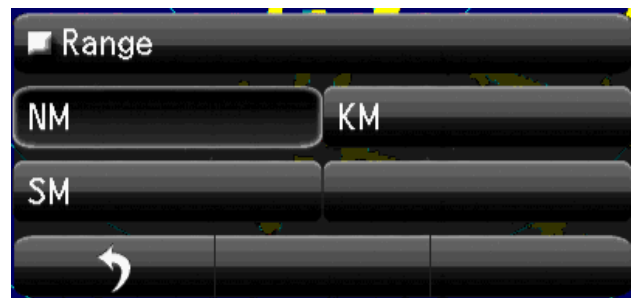


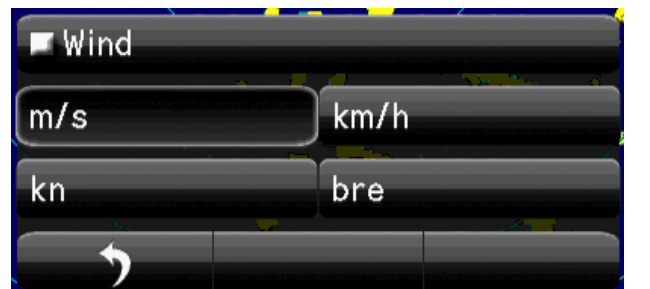
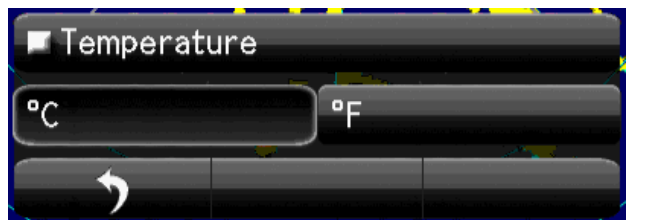
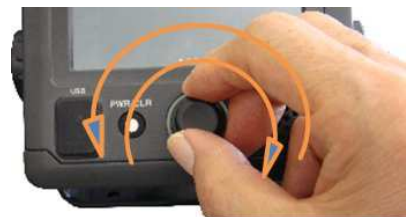
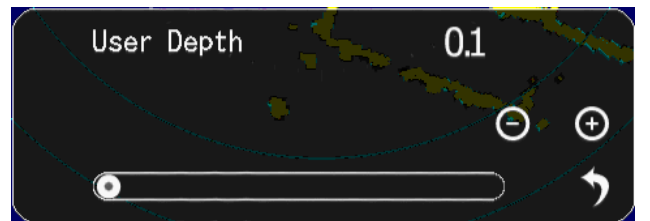
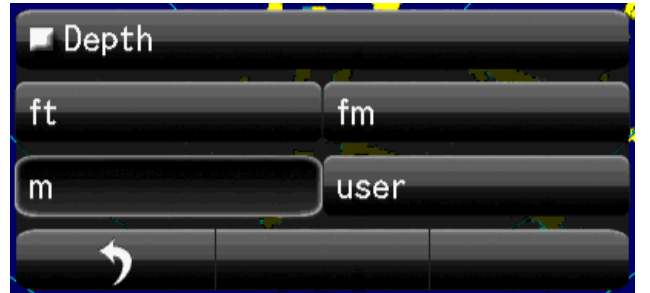
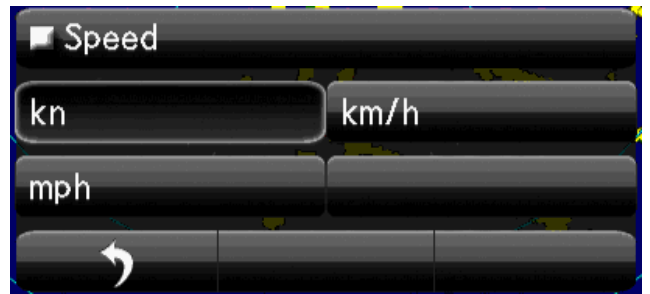
Set up the Own ship's Outline, length and scanner position.



8-6-3 UNIT

Display units, such as distance, speed, depth of water, water temperature, and wind velocity. "NM", "km", "ktn", etc. are possible to set up.



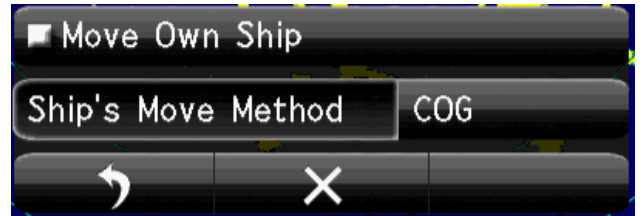


8-6-4 MOVE OWN SHIP

Means of Moving own ship.

Select

GPS, LOG, Dead Reckoning (dead-reckoning navigation), etc.



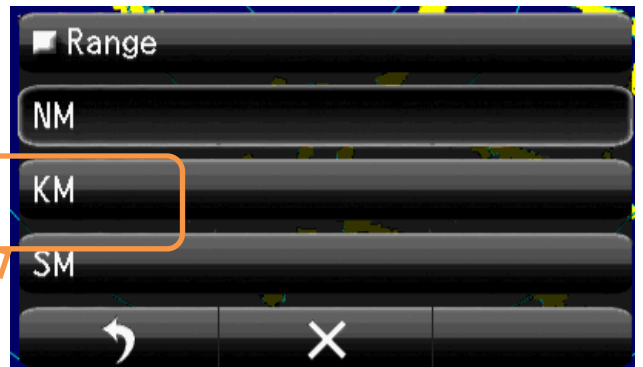
8-6-5 USE RANGE SELECT



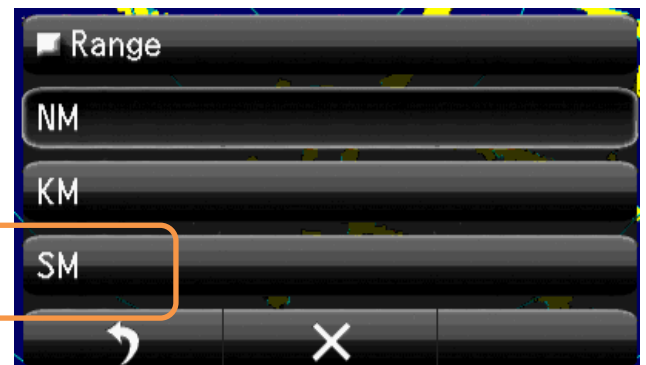
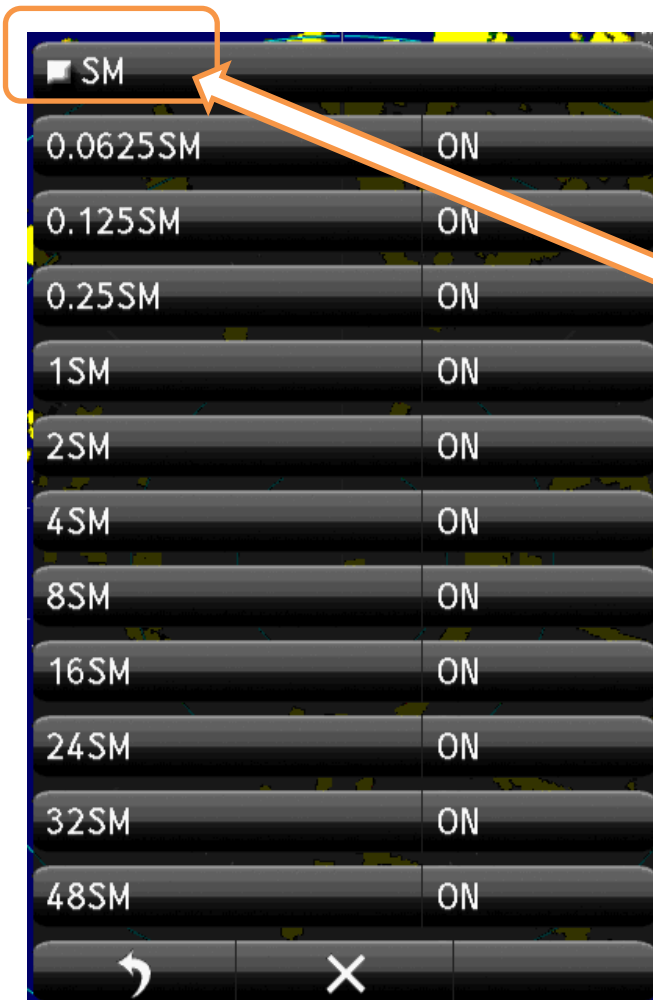
Select the using unit. "NM", "KM", "SM".



Select the using NM range "ON".
Not using range, set up "OFF".



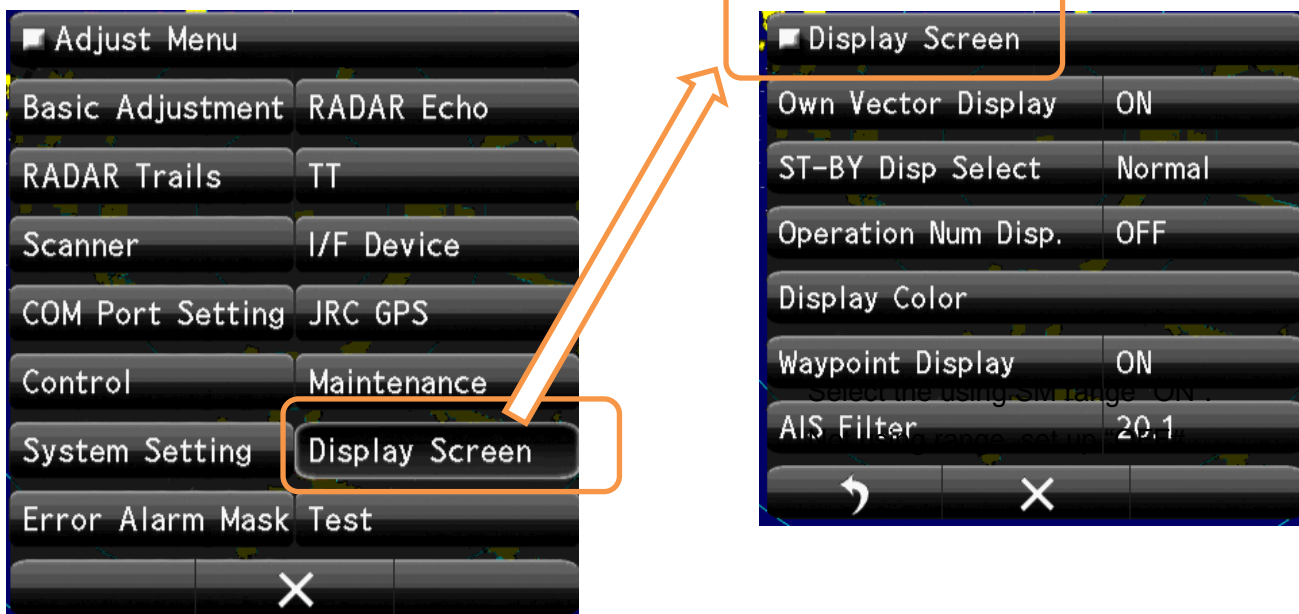
Select the using KM range "ON".
Not using range, set up "OFF".



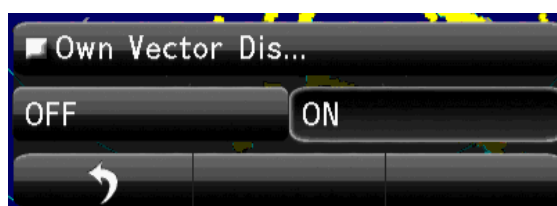
Select the using SM range "ON".
Not using range, set up "OFF".

8-7 DISPLAY SCREEN

Various display setting..



8-7-1 OWN VECTOR DISPLAY



Select the Own Vector display ON or OFF.

8-7-2 ST-BY DISP SELECT

Selections whether at stand by state, display the numeric data on screen or not.



Select the ST-BY Display. "Normal" "Graphical" "Numeric".



“Normal”

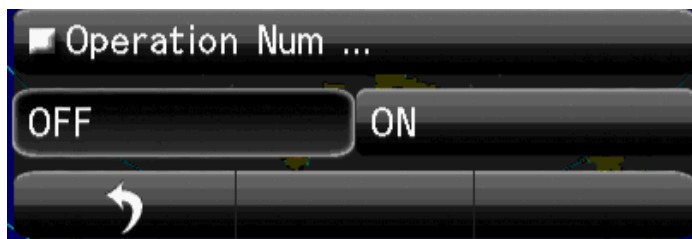


“Graphical”



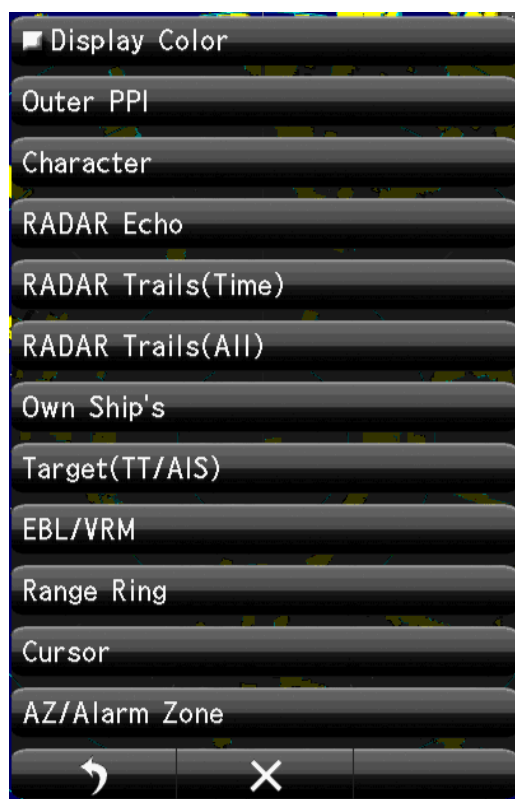
“Numeric”.

8-7-3 OPERATION NUMERICAL DISPLAY

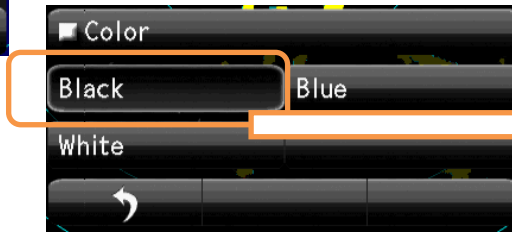
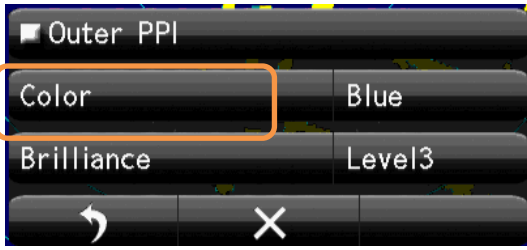


Select the Display. OFF or ON

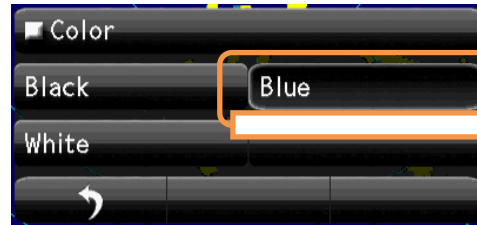
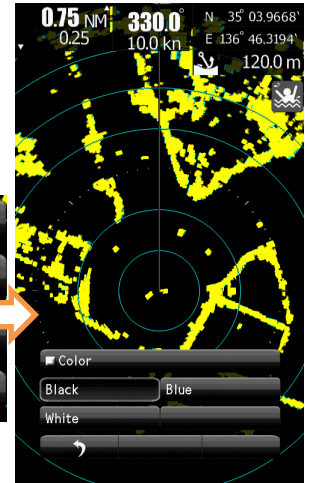
8-7-4 DISPLAY COLOR



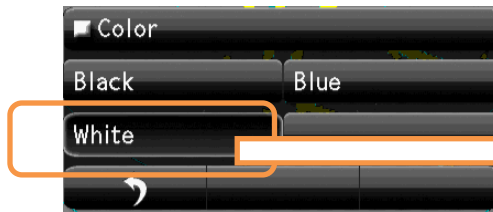
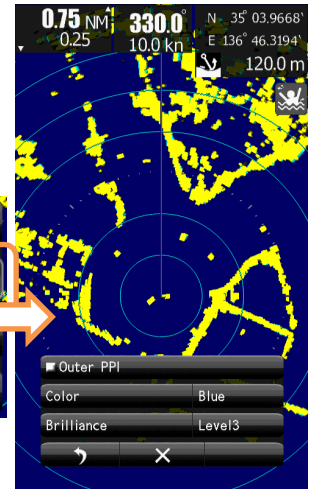
Setting of screen color.



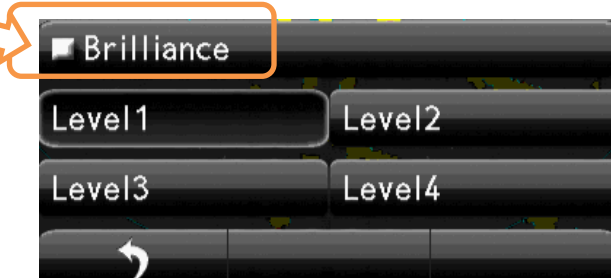
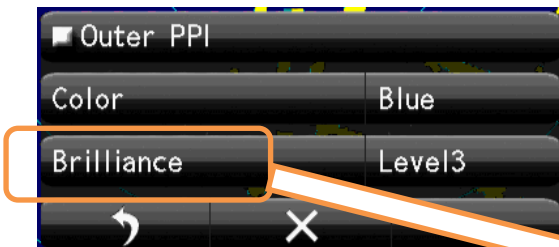
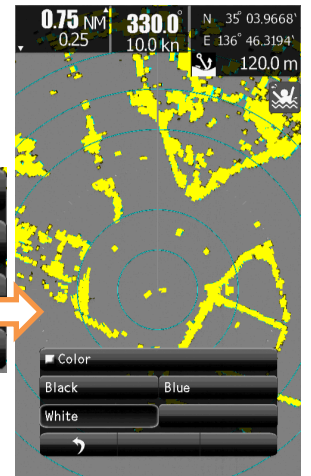
Black screen color.



Blue screen color.



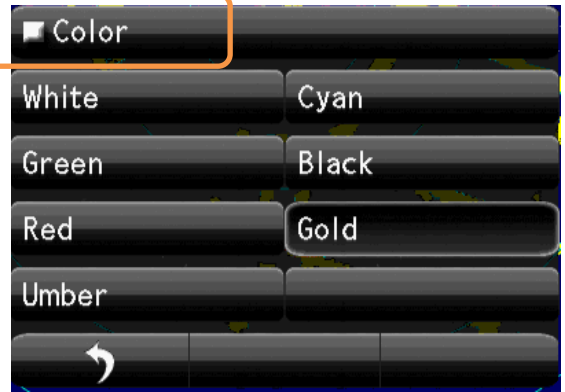
White screen color.



Select Brilliance Level



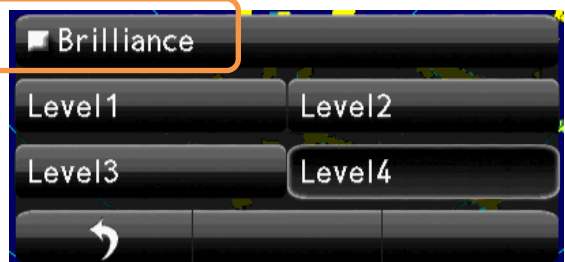
Select Character Color



Select Color



Select Brilliance.



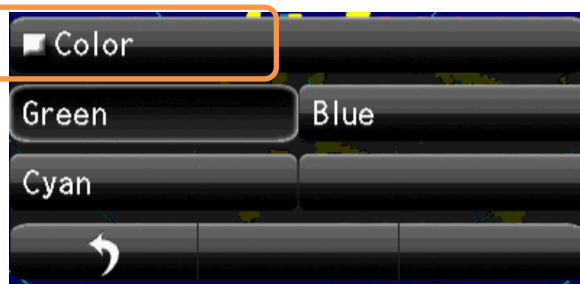
Select Brilliance. Level.



Select Echo Color



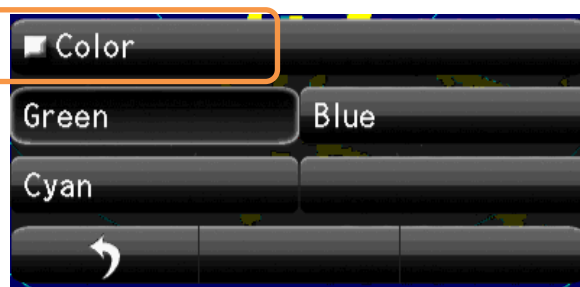
Select Brilliance. Level.



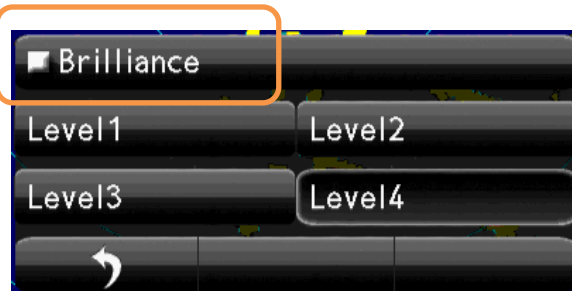
Select Trails(Time) Color



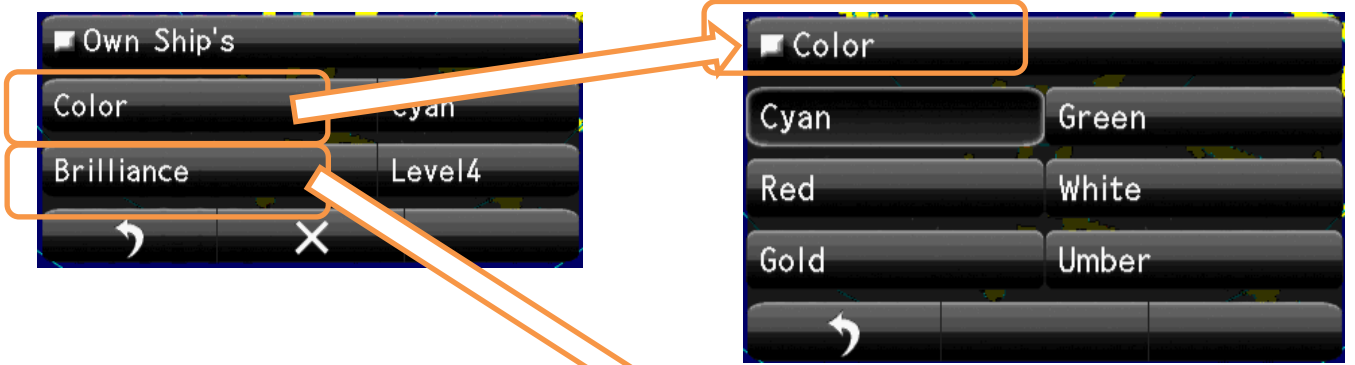
Select Brilliance. Level.



Select Trails(All) Color



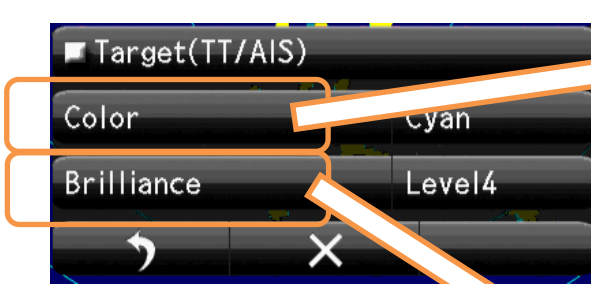
Select Brilliance. Level.



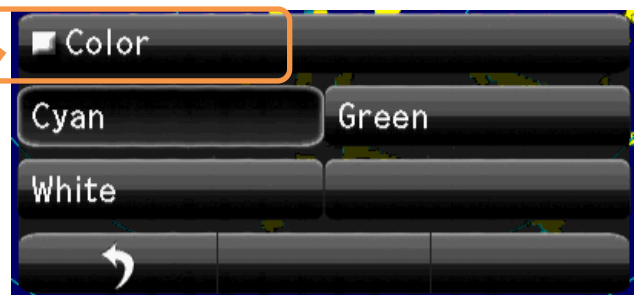
Select Own Ships Color



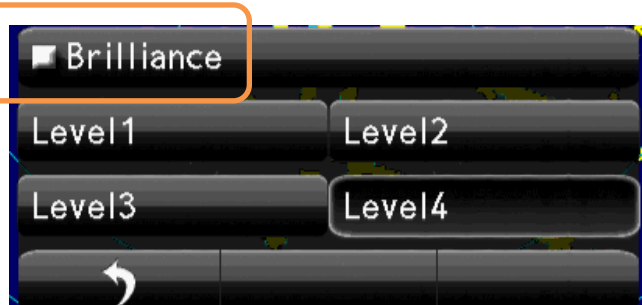
Select Brilliance. Level.

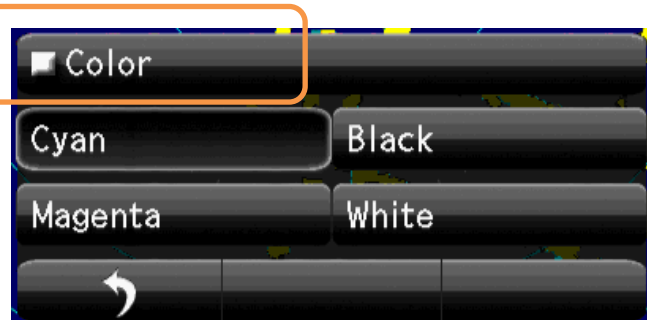
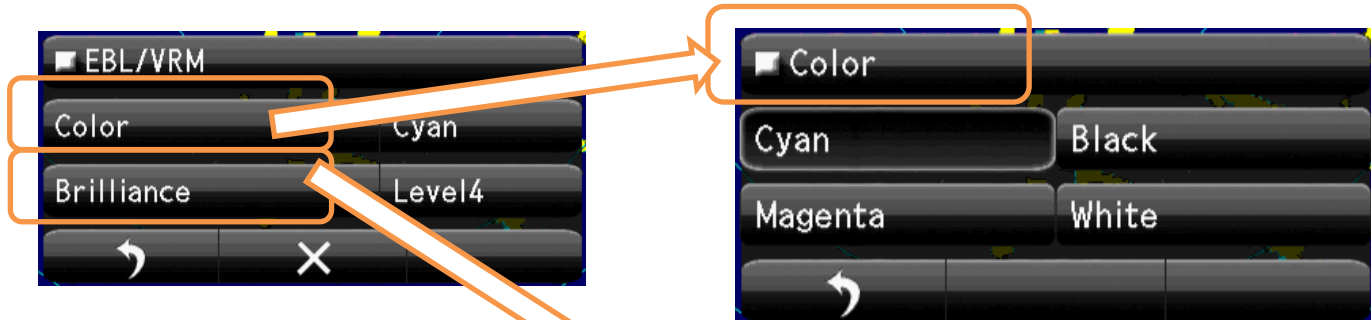


Select Target (TT/AIS) Color

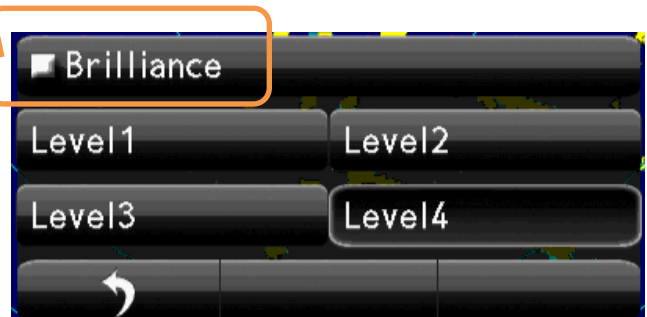


Select Brilliance. Level.

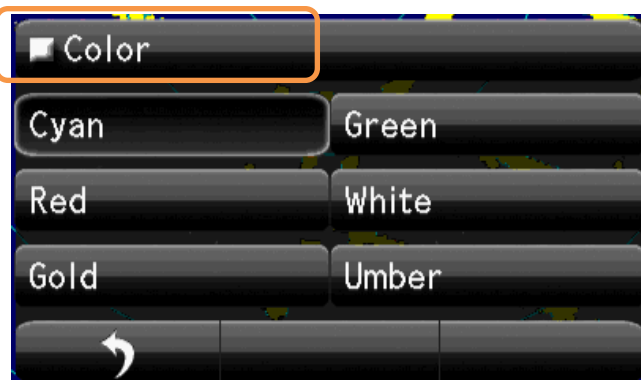
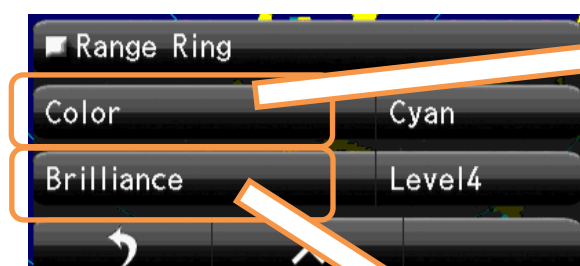




Select EBL/VRM Color



Select Brilliance. Level.



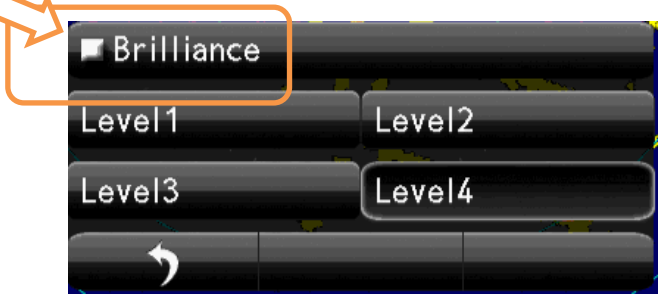
Select Range Ring Color



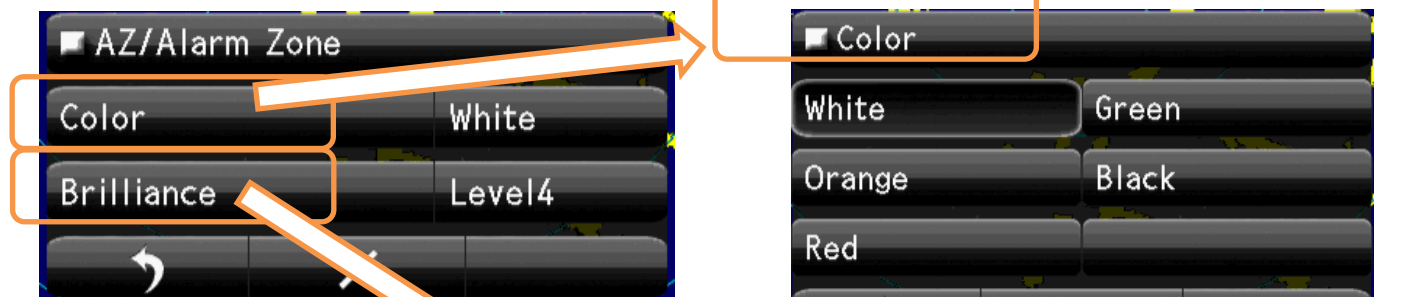
Select Brilliance. Level.



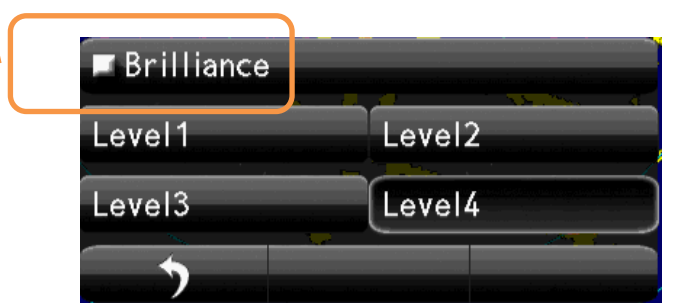
Select Cursor Color



Select Brilliance. Level.

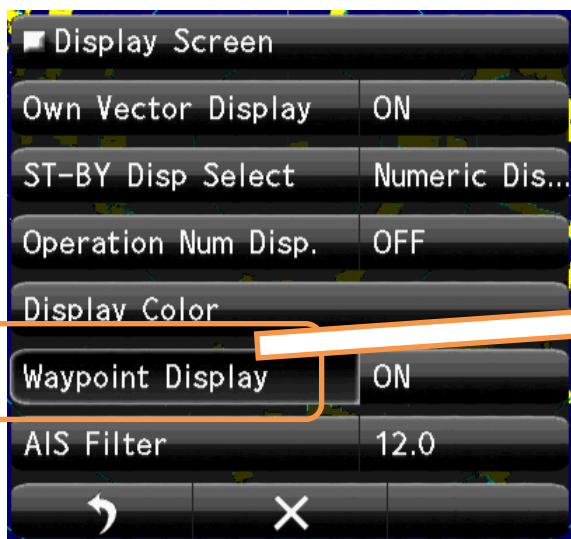


Select AZ/Alarm Color



Select Brilliance. Level.

8-7-5WAYPOINT DISPLAY

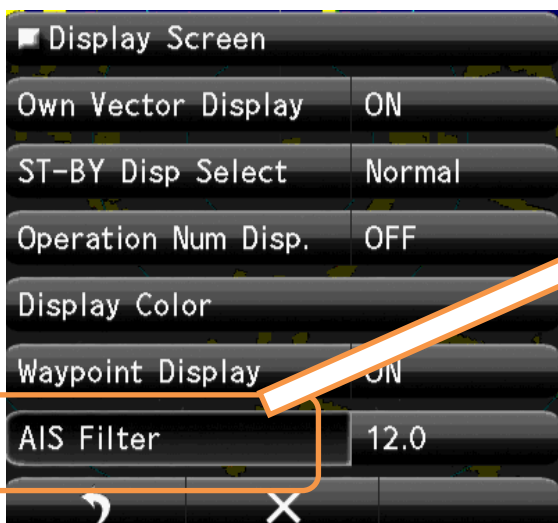


Select Waypoint Display.



Select Waypoint Display "ON" or "OFF".

8-7-6AIS FILTER



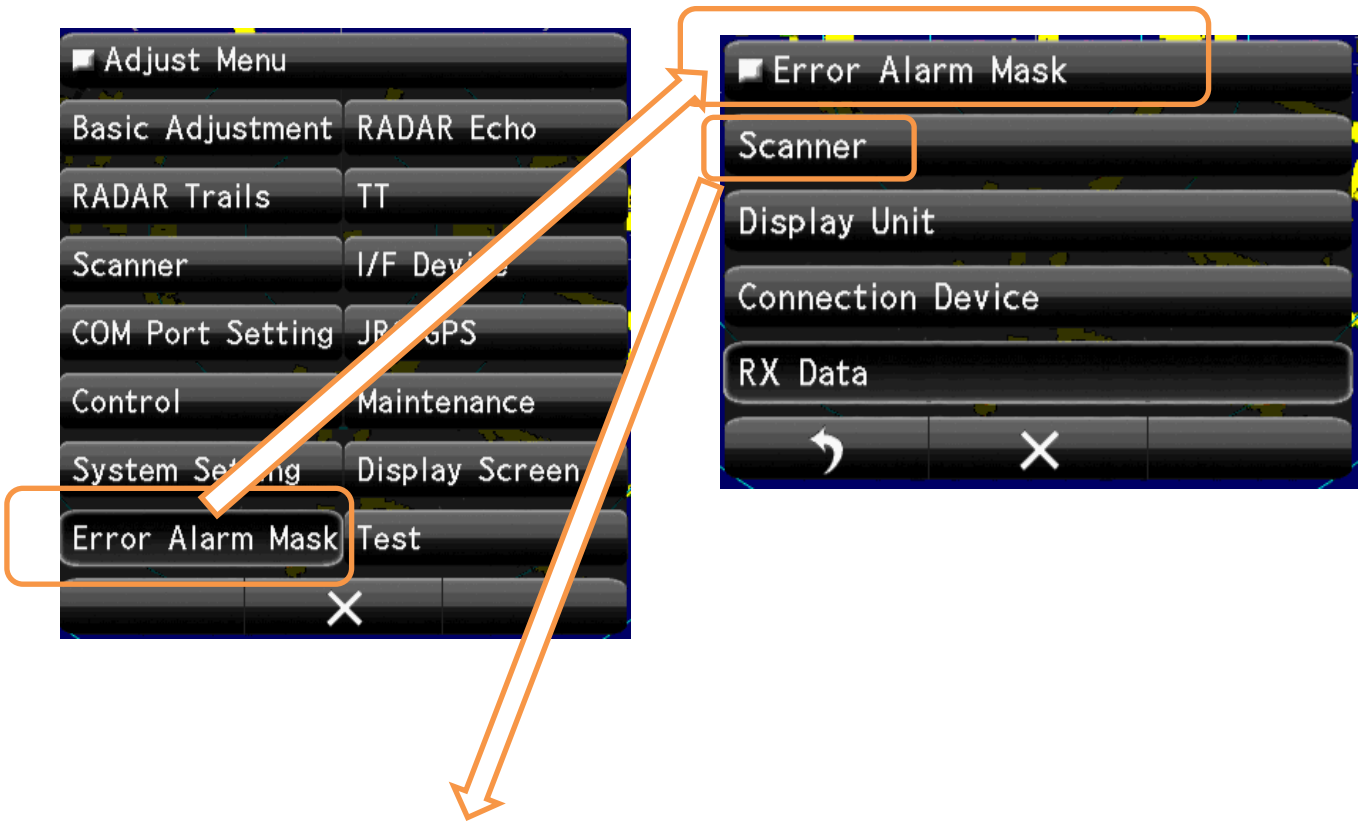
Select AIS Filter



Set up AIS Filter Range.

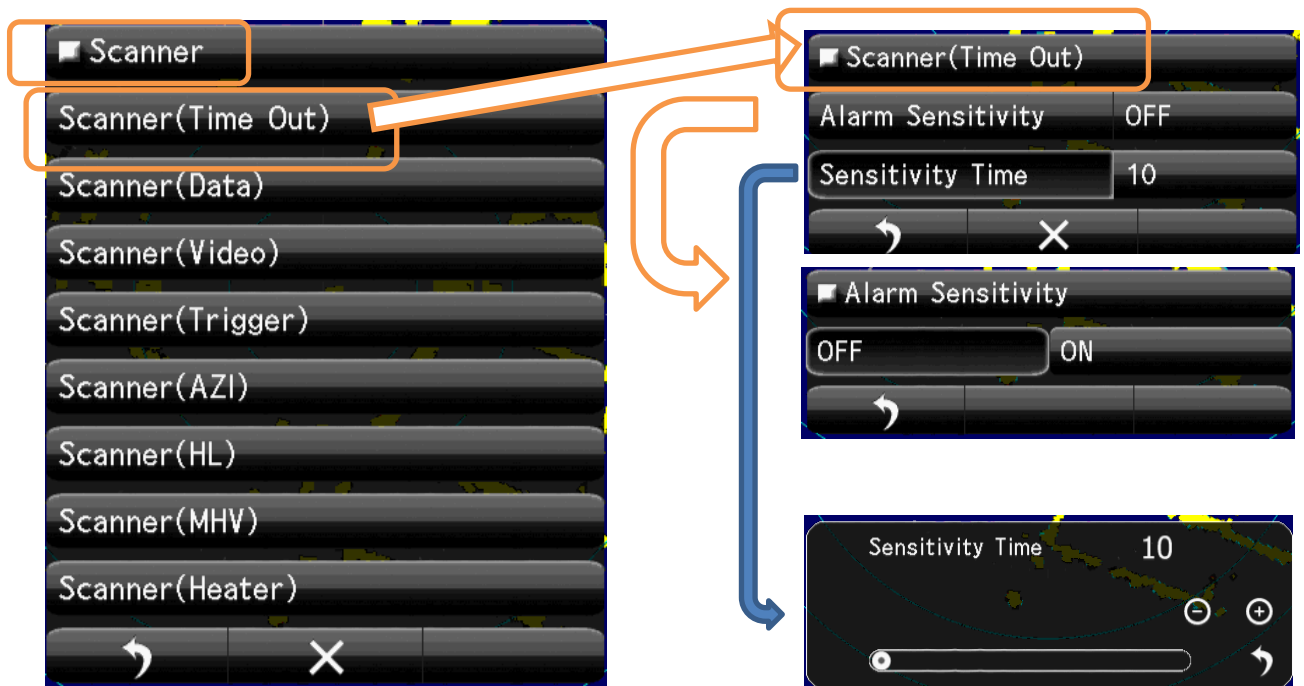
8-8 ERROR ALARM MASK

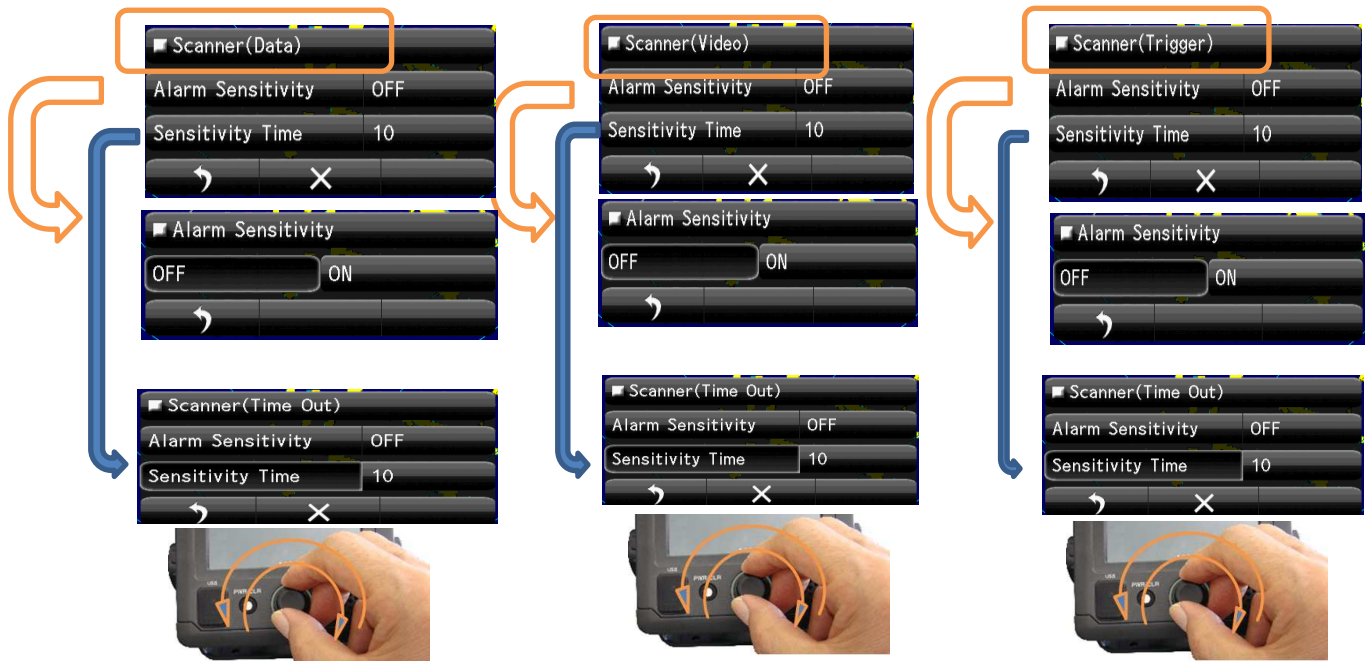
Ignore the unnecessary error signal's alarm.



8-8-1 SCANNER

The error signal generated in the scanner.

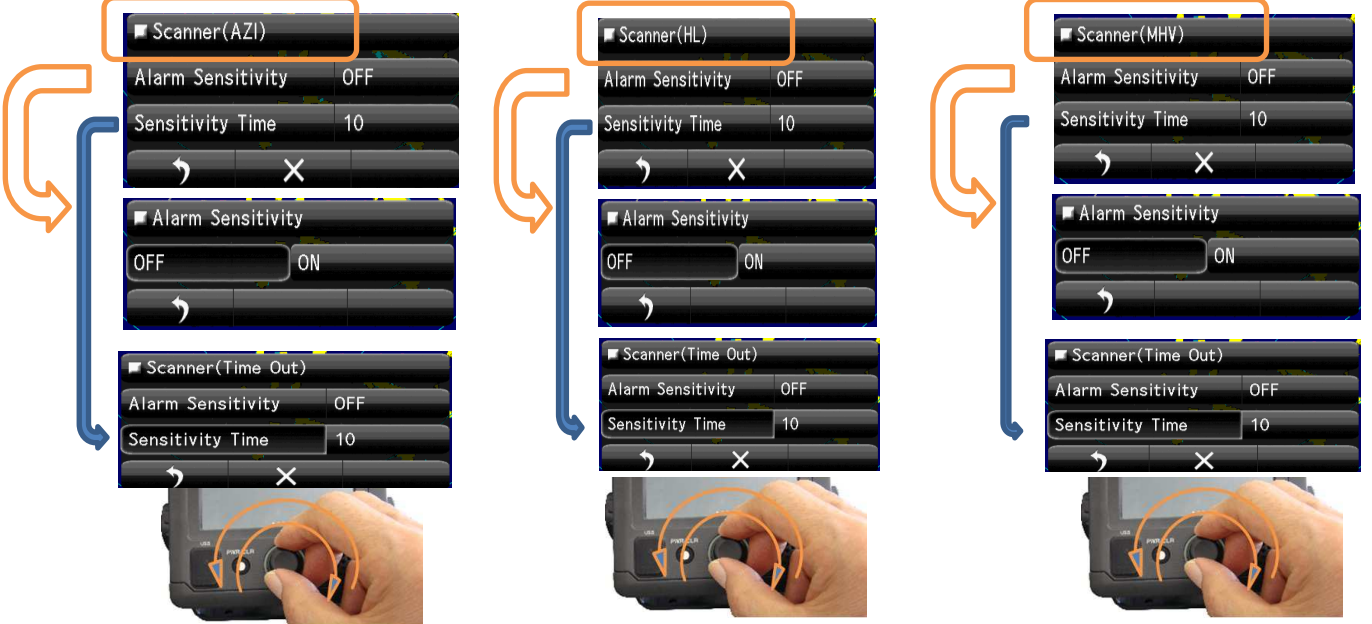




Scanner(Data)

Scanner(Video)

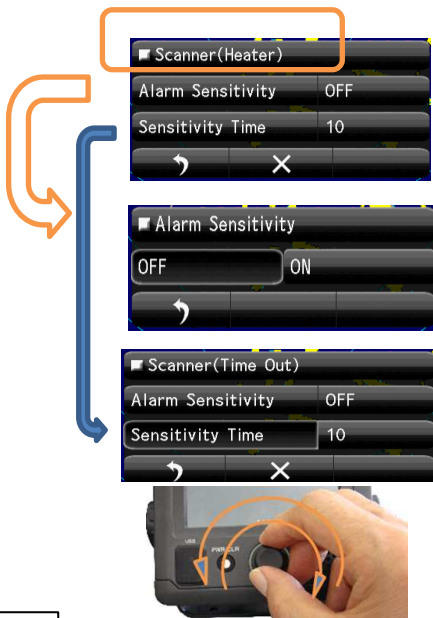
Scanner(Trigger)



Scanner(Azi)

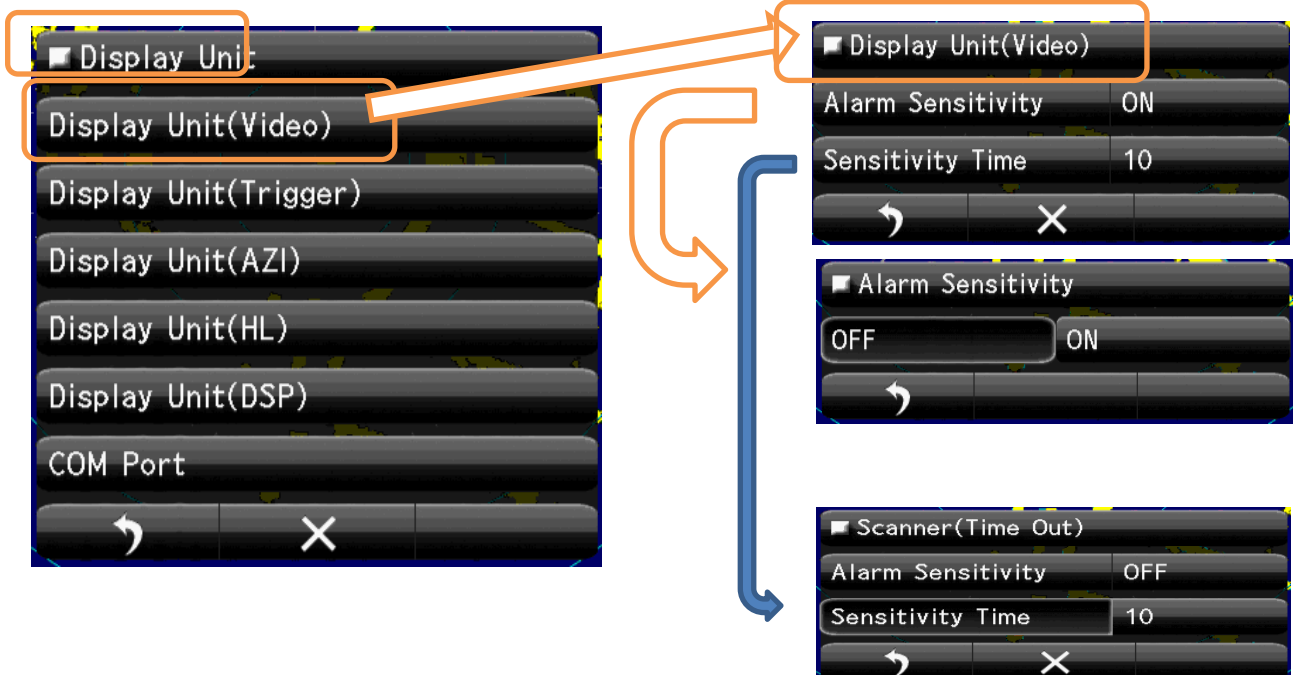
Scanner(HL)

Scanner(MHV)

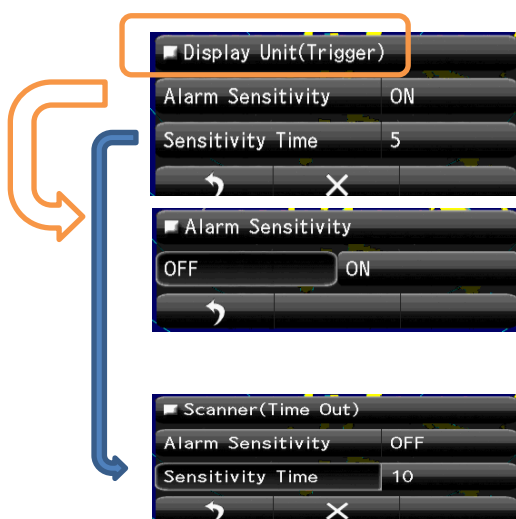


8-8-2 DISPLAY UNIT

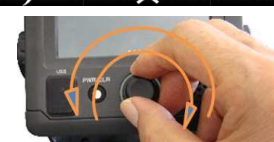
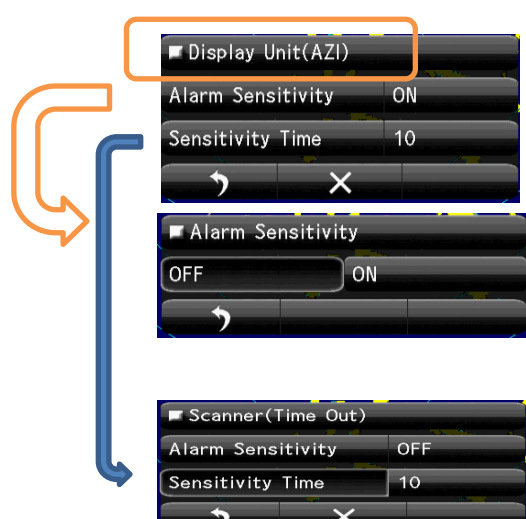
The error signal generated in the display unit.



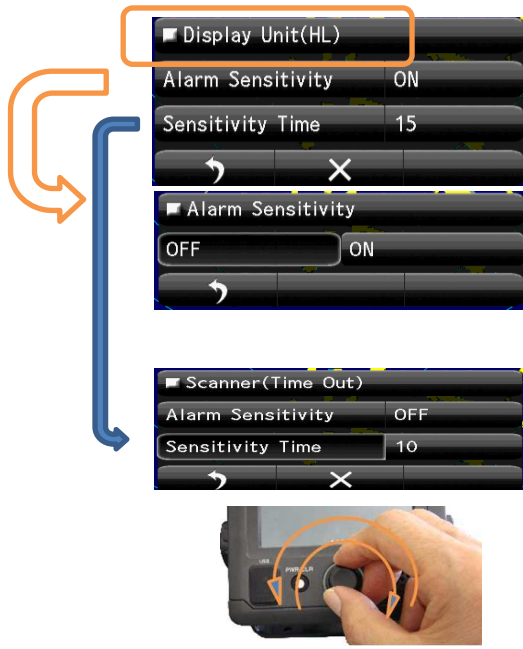
Display Unit(Video)



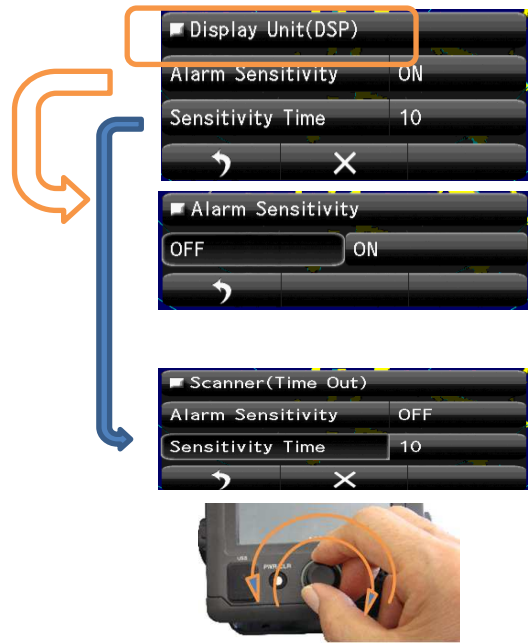
Display Unit(Trigger)



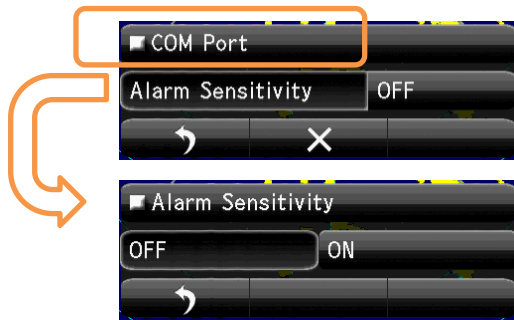
Display Unit(AZI)



Display Unit(HL)



Display Unit(DSP)

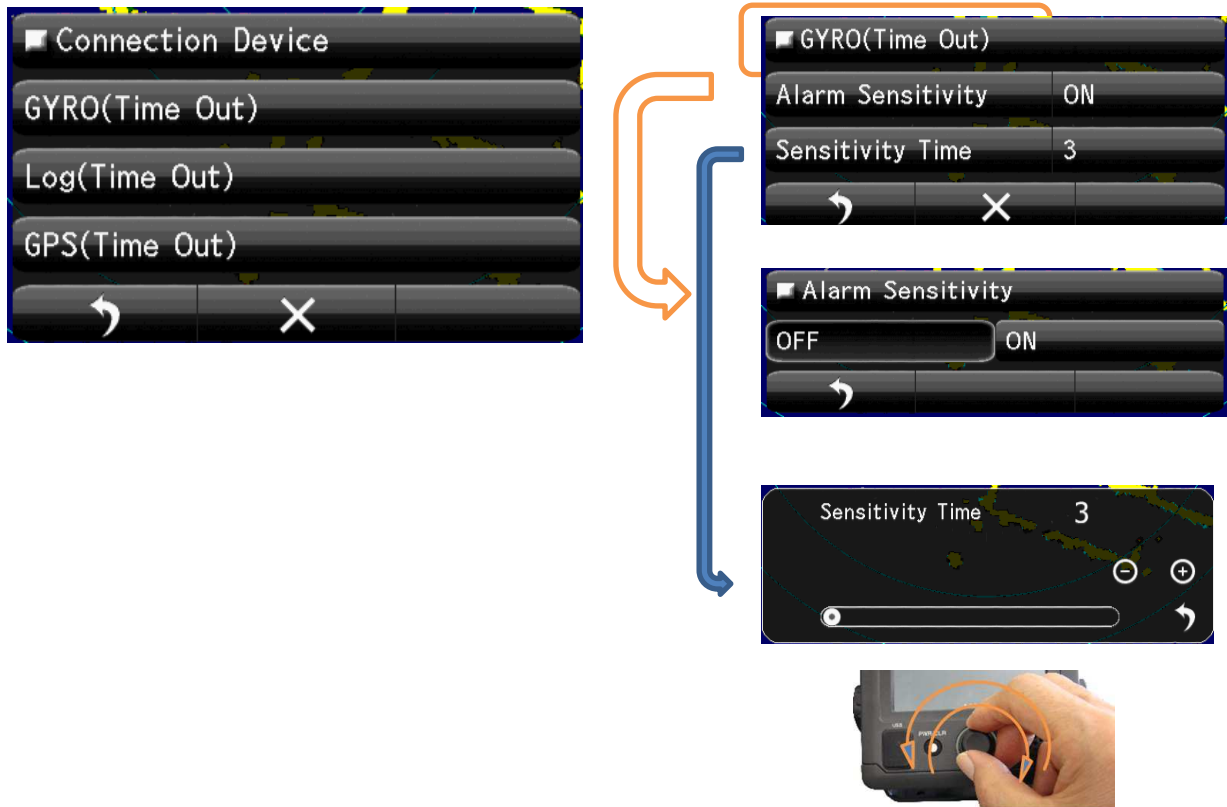


COM Port

]

8-8-3 CONNECTION DEVICE

The error signal generated about the connected device.



Gyro(Time Out)



Log (Time Out) GPS (Time Out) are the same method.

8-8-4 RX DATA

The error signal about receiving data from another equipment.

The main RX Data menu is shown with a grid of options: GYRO, Compass, Log, 2Axis Log, Course/Speed, Depth, Temperature, Wind, Rate of Turn, Rudder, WPT, LAT/LON, Datum, Status, HDOP, and AIS. An orange box highlights the GYRO option, with an arrow pointing to a detailed GYRO settings screen. This screen shows 'Alarm Sensitivity' set to ON and 'Sensitivity Time' set to 3. A blue arrow points to an 'Alarm Sensitivity' screen where 'OFF' and 'ON' are toggle buttons. Another blue arrow points to a 'Sensitivity Time' screen showing a slider set to 3. Below these screens is a small image of a hand adjusting a knob on the device.

The flowchart for 'Compass data Alarm' shows three screens: 1. 'Compass' settings with 'Alarm Sensitivity' ON and 'Sensitivity Time' 20. 2. 'Alarm Sensitivity' toggle screen with 'ON' selected. 3. 'Sensitivity Time' slider screen set to 20. A hand is shown adjusting the knob.

Compass data Alarm

The flowchart for 'Log data Alarm' shows three screens: 1. 'Log' settings with 'Alarm Sensitivity' ON and 'Sensitivity Time' 20. 2. 'Alarm Sensitivity' toggle screen with 'ON' selected. 3. 'Sensitivity Time' slider screen set to 20. A hand is shown adjusting the knob.

Log data Alarm

The flowchart for '2Axis Log data Alarm' shows three screens: 1. '2Axis Log' settings with 'Alarm Sensitivity' ON and 'Sensitivity Time' 20. 2. 'Alarm Sensitivity' toggle screen with 'ON' selected. 3. 'Sensitivity Time' slider screen set to 20. A hand is shown adjusting the knob.

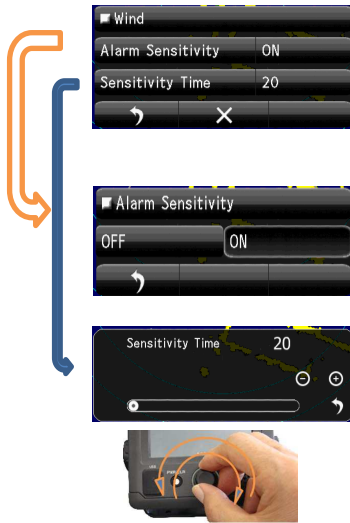
2Axis Log data Alarm

The flowchart for 'Course/Speed data Alarm' shows three screens: 1. 'Course/Speed' settings with 'Alarm Sensitivity' ON and 'Sensitivity Time' 20. 2. 'Alarm Sensitivity' toggle screen with 'ON' selected. 3. 'Sensitivity Time' slider screen set to 20. A hand is shown adjusting the knob.

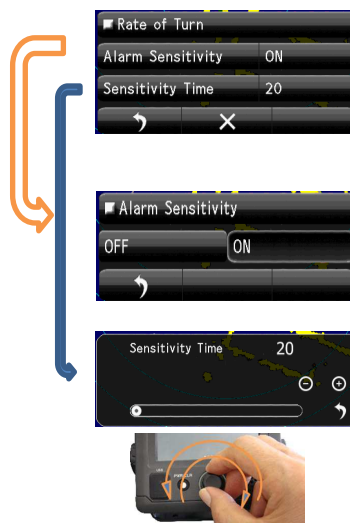
The flowchart for 'Depth data Alarm' shows three screens: 1. 'Depth' settings with 'Alarm Sensitivity' ON and 'Sensitivity Time' 20. 2. 'Alarm Sensitivity' toggle screen with 'ON' selected. 3. 'Sensitivity Time' slider screen set to 20. A hand is shown adjusting the knob.

The flowchart for 'Temperature data Alarm' shows three screens: 1. 'Temperature' settings with 'Alarm Sensitivity' ON and 'Sensitivity Time' 20. 2. 'Alarm Sensitivity' toggle screen with 'ON' selected. 3. 'Sensitivity Time' slider screen set to 20. A hand is shown adjusting the knob.

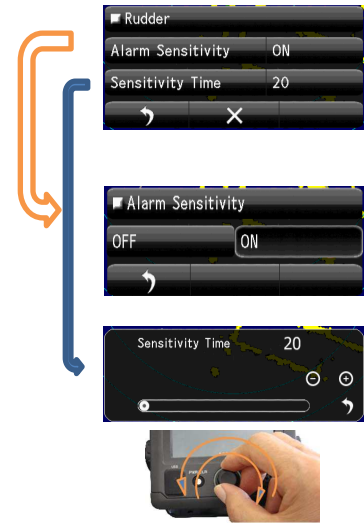
Course / Speed data Alarm



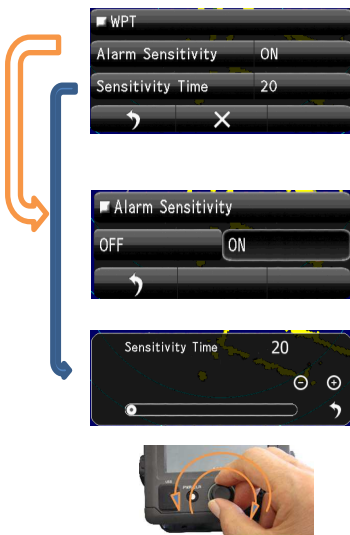
Depth data Alarm



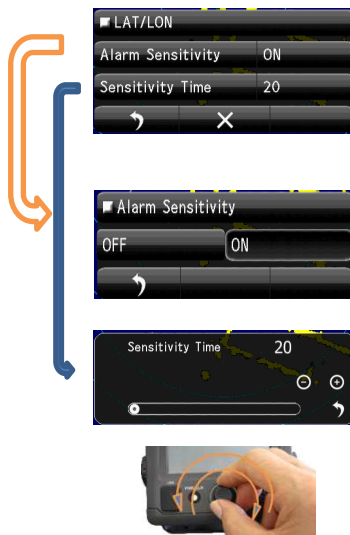
Temperature data Alarm



Wind data Alarm



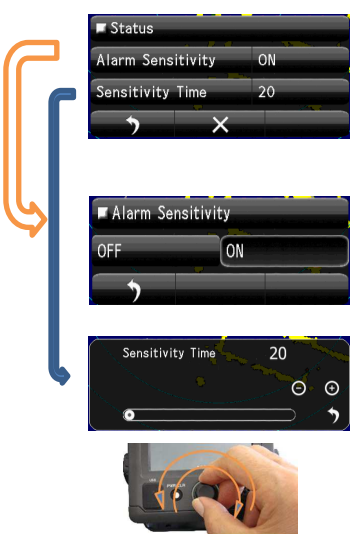
Rate of Turn data Alarm



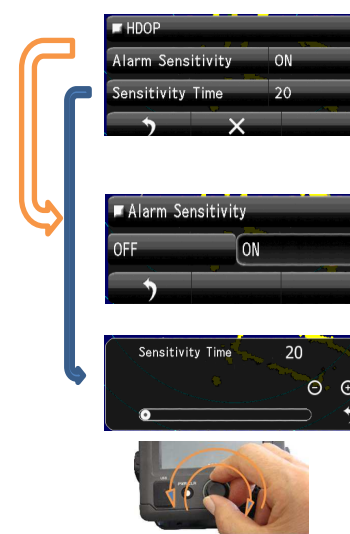
2Rudder data Alarm



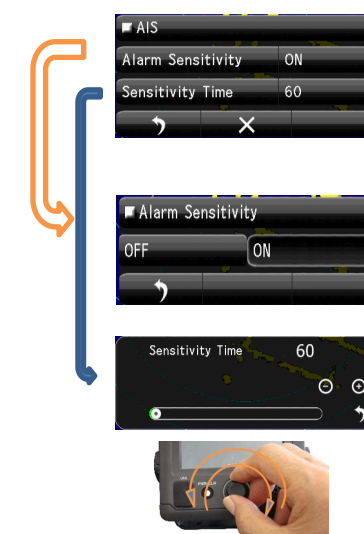
WPT data Alarm



LAT/LON data Alarm



Datum data Alarm



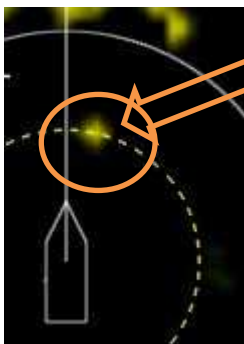
Status data Alarm

HDOP data Alarm

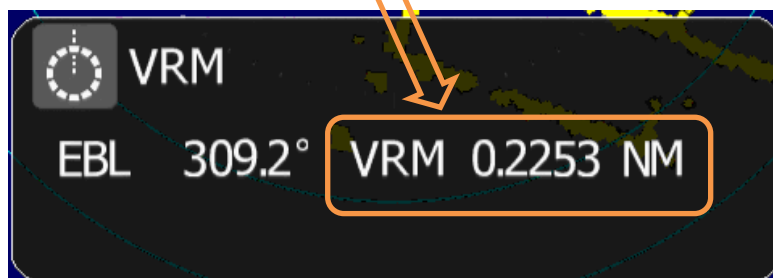
AIS data Alarm

4-1-3 EXAMPLE OF VRM FUNCTION

* The example of a display of VRM



Coincident target to VRM, Range of own ship to target is displayed.



Close menu automatically after 10seconds.

How to change the VRM

Flick of the VRM line; change the ring size, kept its data at tap off position.



Or

Rotate the rotary knob with monitoring VRM line.



Down side on screen, "RNG" display own ship to target RANGE(nm).

4-1-4 EXAMPLE OF EBL FUNCTION

* The example of a display of EBL Coincident target to EBL, BEARING of own ship to target is displayed.



Close menu automatically after 10seconds.

How to change the EBL

Flick of the EBL line; change the line bearing, kept its data at tap off position.



Or

Rotate the rotary knob with monitoring EBL line.



* * * * FOR REFERENCE * * * *

ABOUT THE DATA READ OUT WHEN MEASURE USING EBL /VRM

The RADAR can measure Target position as BEARING(degree°) and RANGE(nm).

BEARING is two way to measure.

①One is the RELATIV BEARING which is measured from Own ship heading line.

②Another is ABSOLUTE BEARING which is measured from the NORTH line

Of cause, ABSOLUTE BEARING is calculated by (RELATIV BEARING+GYRO BEARING).

So, ABSOLUTE BEARING is necessary the signal from GYRO or GPS compass.

☆In case of no external bearing signal, display only RELATIV BEARING mode.

☆(TT)Target Tracking function and display AIS symbol is necessary the GYRO or GPS compass signal.

When GYRO or GPS compass signal are received, normally Azimuth is measured based on from the NORTH(ABSOLUTE AZIMUTH).

This Radar's scanner microwave BEAM WIDTH is about 5degrees.

So every target echo has more than 5degrees width for bearing direction.

For above reason, In case of read out the target azimuth, set EBL line to the center of the target echo.

Target echo RANGE is measured by the distance from Own ship for any azimuth.

Target echo size is proportion to pulse length which own ship was transmit.

In case of MEASURE SHORT RANGE ECHO using VRM, set ring to the echo's nearest point from Own ship.

At that point is the correct RANGE for any pulse length.

Chapter 5 USEFUL FUNCTIONS

5-1 MOB (MAN OVER THE BOAT)

GPS signal and heading data (GYRO or GPS compass signal) are necessary.



Under navigation, if accident has happen (dropped person from the ship or anything). Tap the MOB icon, then Radar remain that point's longitude latitude in a moment. And any time keep displays the plot symbol on screen. For help the dropped person, anyway navigate the ship to MOB symbol position.

5-2 OFF-CENTER FUNCTION

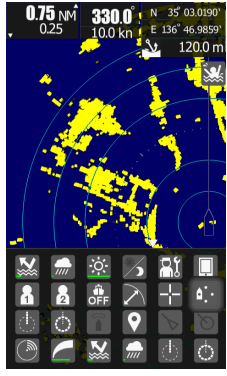
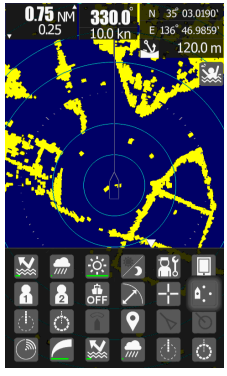
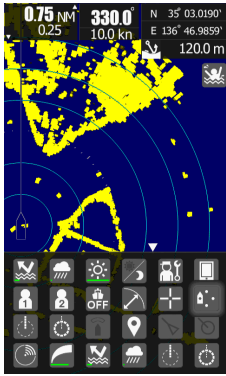
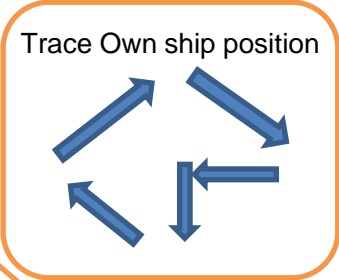
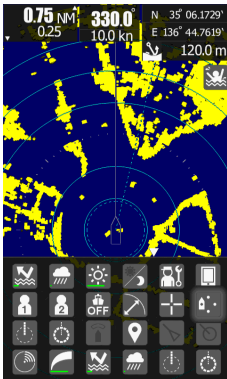


Shift the own ship center is possible to shift for more wider area observation.. Each tap of the icon, will shift the own ship center one step to the next.



Own ship position

Own ship's shifting trace is as follows.



downward

left

upward

right

5-3 CURSOR FUNCTION

CURSOR FUNCTION IS ONLY TOUCH SCREEN



Using the cursor function can read out correct target information.
 Tap cursor icon.
 Tap the screen in some place, the cursor icon will come out of screen.
 It's display that point's bearing and range on down side of screen.
 If GPS signal is alive, that's position's Longitude, Latitude is displayed.
 Numeric display is fade out from screen touch off after 5 seconds.

Tap screen will come out cursor onscreen.

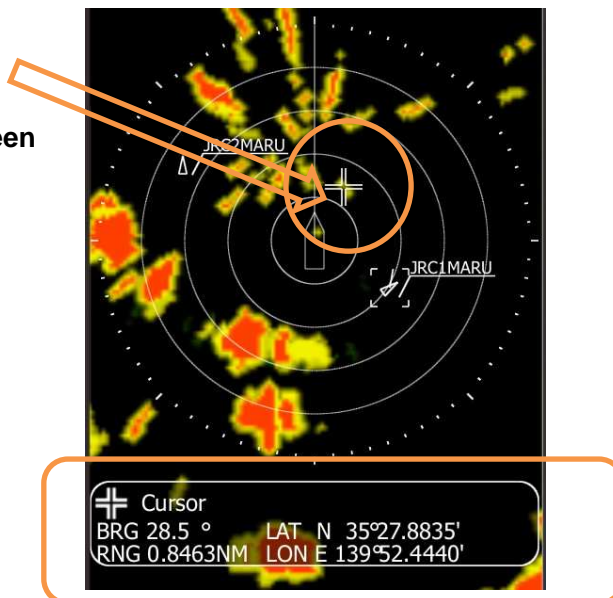
Down side of screen displayed as follows.

“BEARING” BRG 28.5°
 “RANGE” RNG 0.8463NM

In case GPS signal is connected.

“Latitude” “LAT N35° 27.8835’
 “Longitude” LON E 139° 52.4440’

Numeric display is faded out from screen touch off after 5 seconds.



5-4 SETUP THE GUARD ZONE

(WATCH THE TARGET IN ALARM AREA)



Guard zone function detects the echo's moving in warning area.

Alarm area can set in-alarm, or out-alarm both.

In alarm: Target echo is inside guard zone, generate the alarm sound.

Out alarm: Target echo go to outside of guard zone, generate the alarm sound.

Watching area is setting start point to end point of circle area.

Select alarm condition in-alarm or out-alarm.

FOR REFERENCE

Guard zone is move accordance with own ship's movement.

For example, set front side of the own ship, start keep watching, and if ship is crossing the setting area, automatically generate the alarm.

On the other hand, watch keeping sip is set inside the guard zone, if ship were go outside the guard zone, automatically generate the alarm.

Crew can realize which ship was moved.

So, it is effective to use as watch keeping the fishing net or buoy.

5-5 TRAIL (DISPLAY THE WAKE BEHIND THE SHIP)

(The heading signal and GPS signal is necessary.)

Under operating the radar and during cruise, adjust the wakes length behind the target.

5-5-1 Selection of trail length.

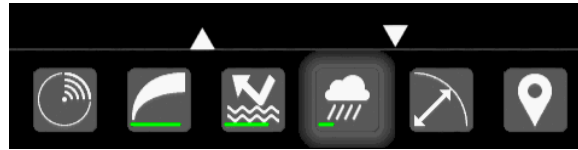



When the Radar power is not on,
Press PWR/CLR button and Power ON.

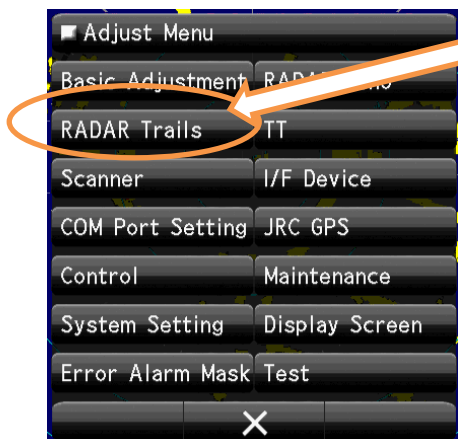
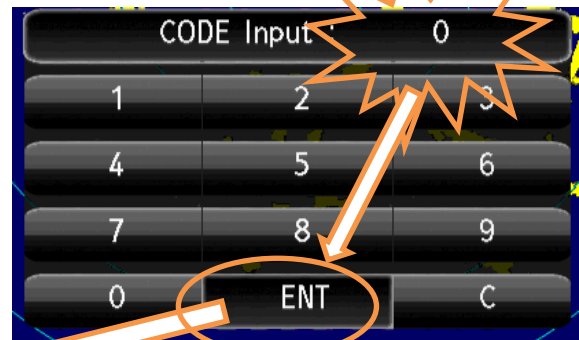
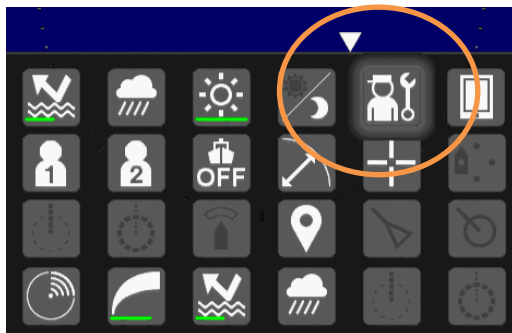
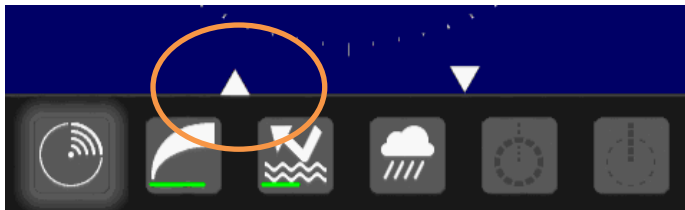
Turn the Rotary knob and a ribbon icon is found on the lower right screen.



Push Rotary knob

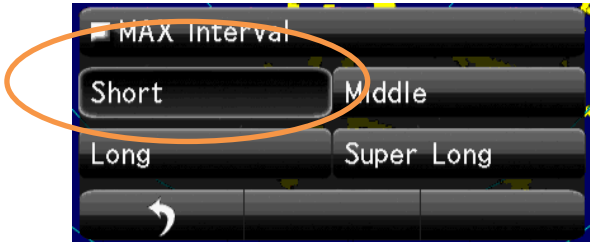


Tap “” or Flick screen towards upside.

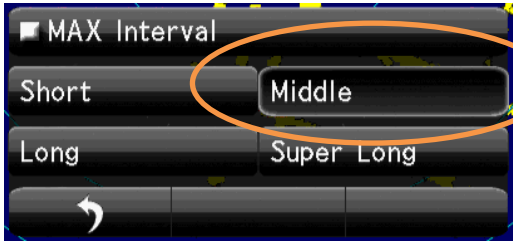


Select Trail length.

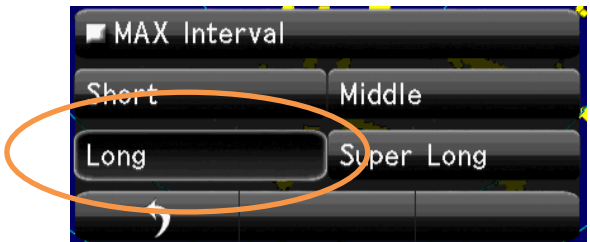
Trails: Short



Trails: Middle



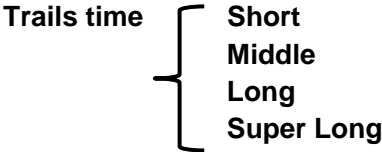
Trails: Long



Trails: Super Long



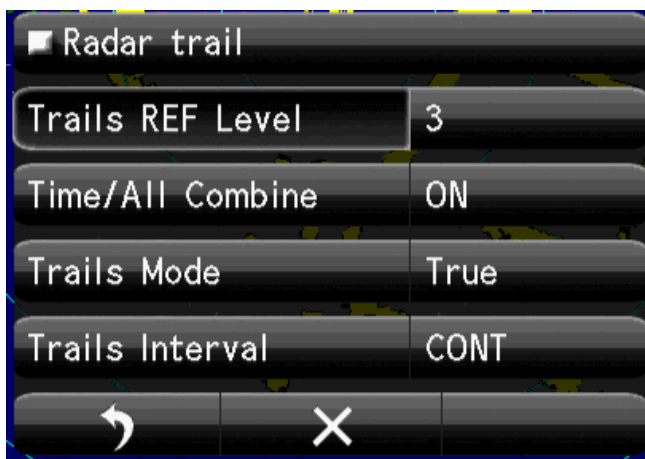
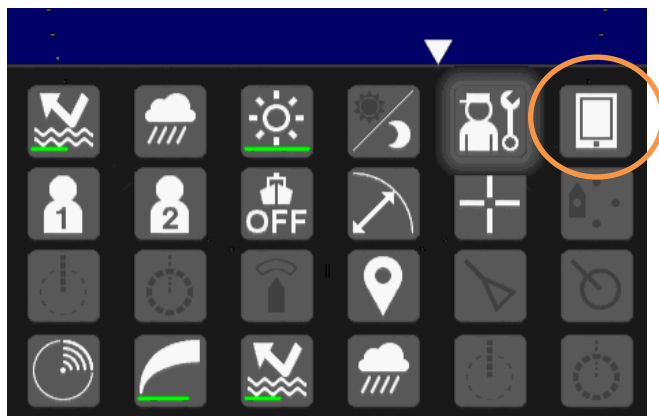
Return to Adjust Menu.



Quit Adjust Menu



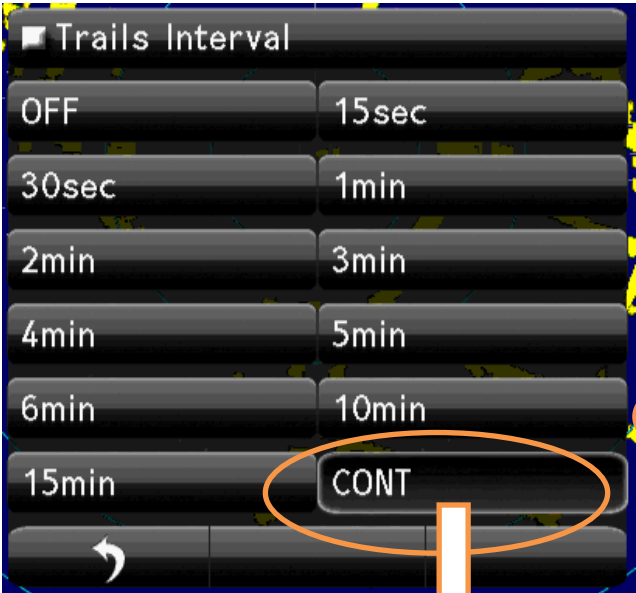
5-5-2 Select Radar Trail Mode



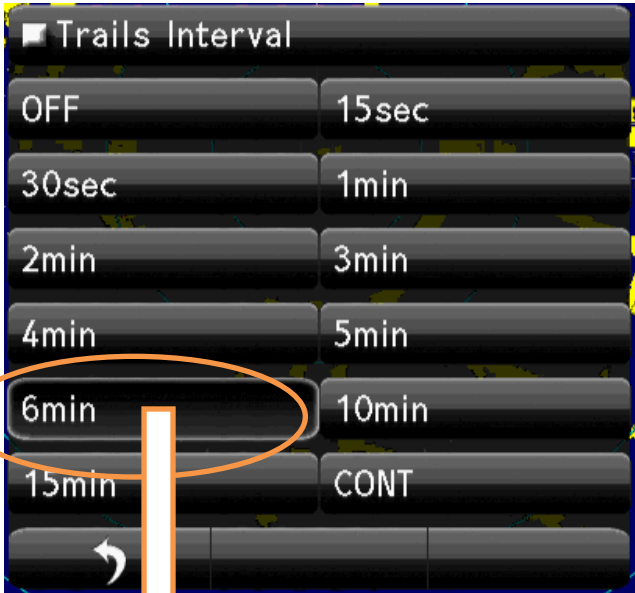
Trails Interval

Select Trails Interval.

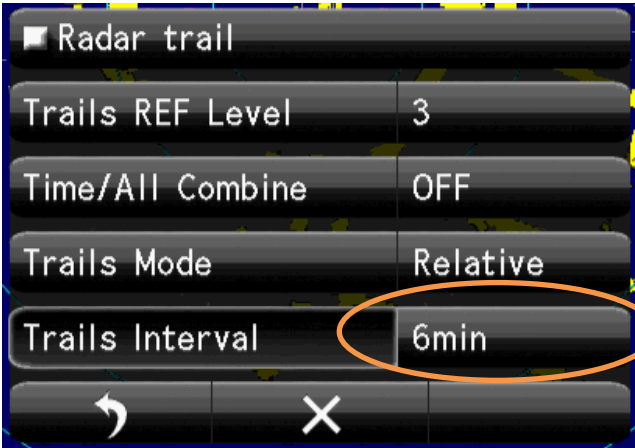
Example.



Continuous trail



6minutes trail



Quit menu.



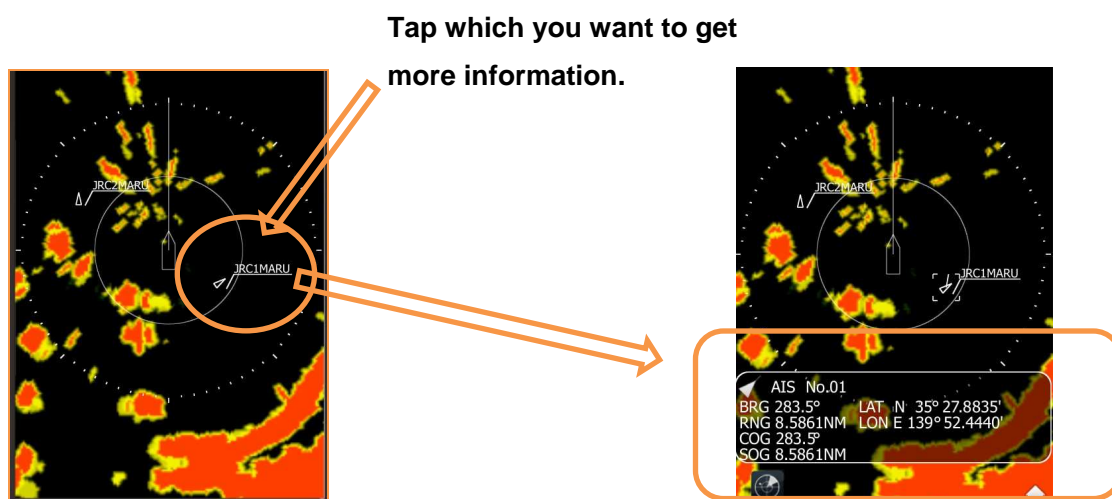
5-6 AIS (AUTOMATIC SHIP IDENTIFICATION SYSTEM)

ACQUIRE THE ANOTHER SHIP INFORMATIONS

NOTES : To display AIS information, it's necessary to connect AIS signal, GPS signal and GYRO signal.



AIS position signal which place is included in display area, displays automatically. Tap the AIS symbol, then display detail data information down side of screen.



The tapped AIS information is displayed.

Bearing and Range is the position which ship is observed from own ship.

Course and speed is the target speed and true course.

Position is measured by the ship's GPS data.

To release target detail data, use long tap.(keep press icon).

If Tap no AIS symbol surface place, Cursor icon will appear instead.

Again tap of icon on AIS symbol, display AIS again.

No action time more than 5Seconds, close information dialog automatically.

AIS Display example "JRC1MARU"



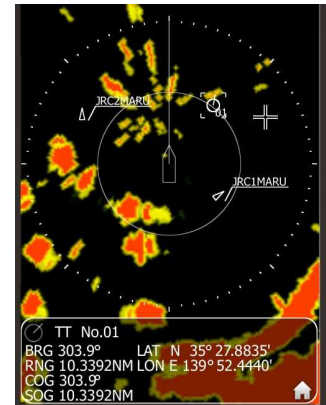
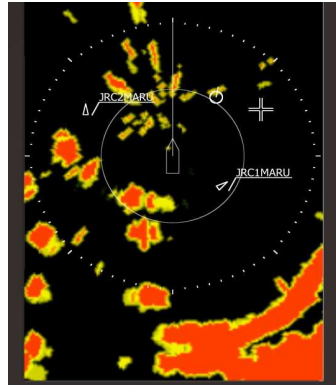
BRG : Target BEARING from own ship direction.	AIS No.01 's DIRECTION	238.5degree.
RNG : Target RANGE from own ship position.	AIS No.01 's RANGE	8.5861nm.
COG :The sip's Course of ground	AIS No.01 's COURSE(from north)	238.5degree.
SOG : The sip's Speed of ground	AIS No.01 's Speed(from ground)	8.5826kn.
LAT : The sip's POSITION Latitude	AIS No.01 's Latitude	35° 27.8835'.
N : Northern Hemisphere.	S : Southern Hemisphere.	
LON : The sip's POSITION Longitude	AIS No.01 's Longitude	139° 52.4440'.
E :EAST	W : WEST	
Unit: Degree, Minute.		

5-7 TT (TARGET TRACKING)

Notes : GPS (Speed) and the HEADING(Gyro) signal are also necessary.

Tracking the target function is effective to avoid collision accident.

The speed and direction of tracked target is automatically calculated, and if danger will be happen, generate danger alarm sound and signal..



Tap the target which you want to track.

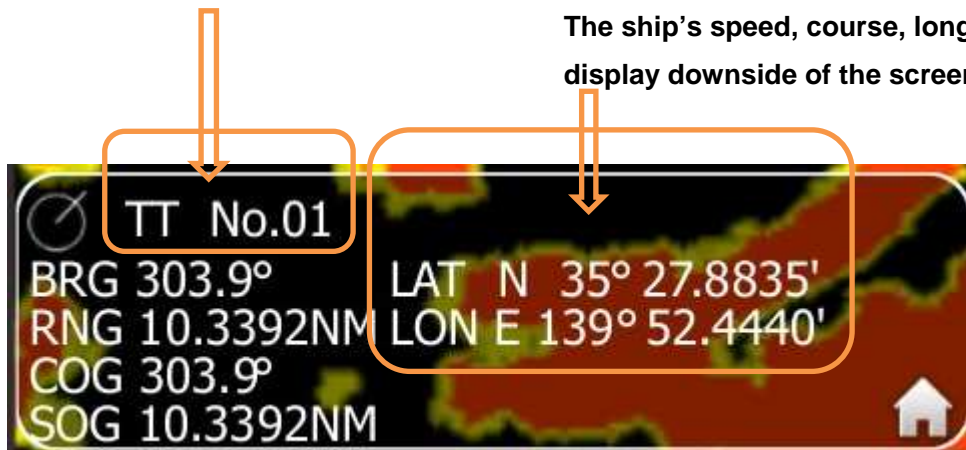
Up on the target, TT symbol will appear, and start tracking.

Tracked target is automatically note symbol and numbered.

Automatically assigned TT's ID number.

Tap symbol, you can get the information of that TT.

The ship's speed, course, longitude, latitude are display downside of the screen..



BRG : Target Bearing measured from own ship.(True mode, or Relative mode)

RNG : Target Range measured from own ship.

COG : Calculated target course. Calculated from own ship course and target ship course.

SOG : Calculated target speed. Calculated from own ship speed and target ship speed.

TT data display will be fadeout from the screen in 6 seconds after operation.

When tap the TT symbol place, changes in to TT function, another no symbol place change into cross cursor display instead.

Long tap can release TT function.

Up to 10 targets are possible to tracking using TT function.

Chapter 6 OPTIONAL FUNCTIONS

6-1 EXTERNAL MONITOR DISPLAY OUTPUT

Special interface: NQA-2447 (option)

Standard function can't use the external monitor.

Optional kit "NQA-2447" is line upped as this RADAR.

Additional Interface can possible to lead out the video signal to external monitor.

Additional external port is "D" sub 15pin connector output.

Display pixels are 800x480 dots (WVGA)

From external monitor, any control is impossible for operation.

External monitor's power supply must be supplied, and Brilliance control is stand alone.

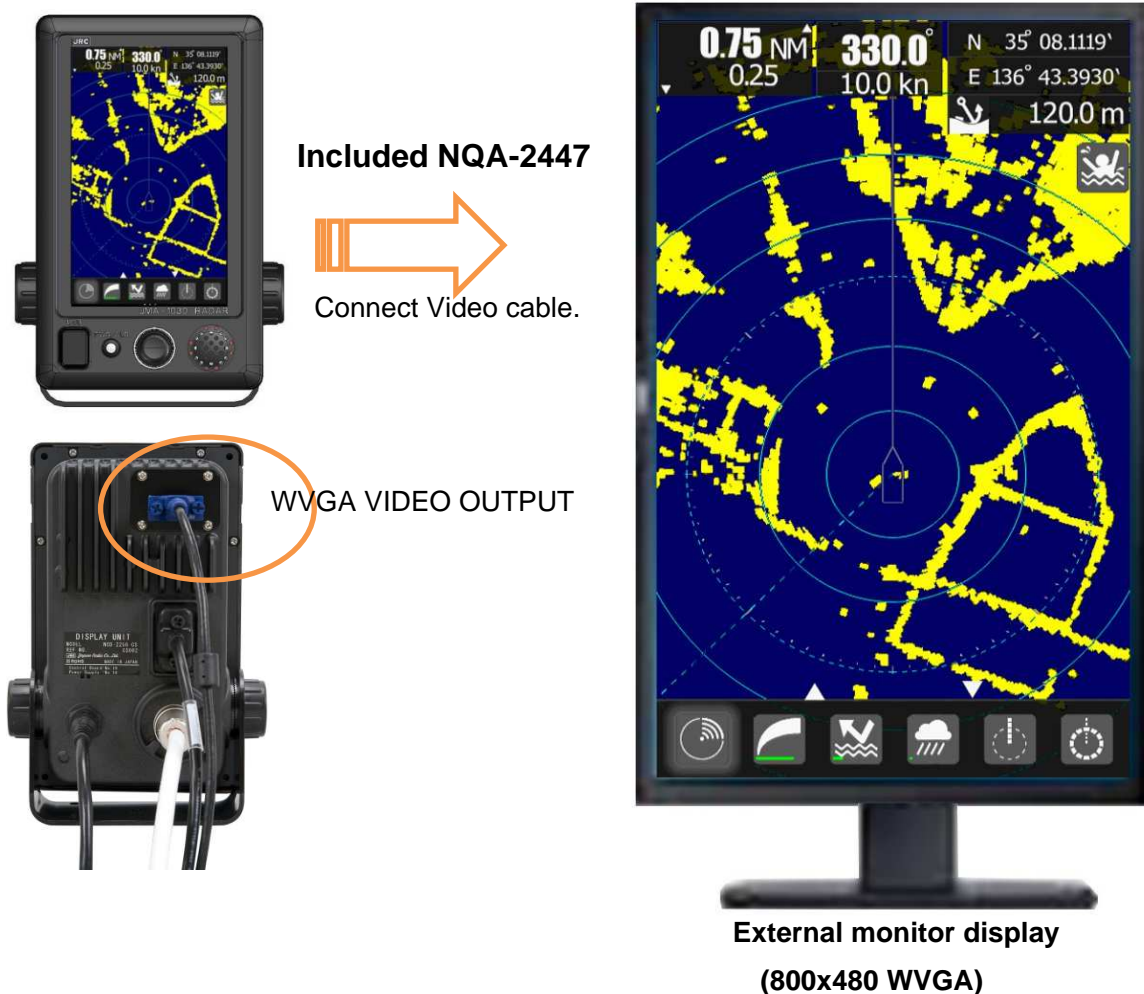
Cautions: Radar display is drawn in PPI.(PPI: Plan Position Indicator)

Original Range, Bearing signal are converted to X,Y memory plane.

Range is proportion to time (light speed)

Radar picture is required so correct circle.

In case of External monitor, sometime cannot describe so collect circle.



6-2 NMEA CABLE (OPTIONAL PURCHASE)

Option name: 7ZCRD1689

AIS, GPS, GYRO, LOG etc.: It is a cable which need for aid for navigation.

The data are received by IEC61162-1 / 2 (considerable).

The input signal (three-port GPS/HDG/AIS)

Navigation system interfaces, such as GPS

Telecommunications standard	NMEA0183 / 61162 to 1EC1 conformity
Communications protocol	4800 bps, start 1bit, data 8bit, stop 1bit, With no parity
Input sentence	NMEA0183:V1,5: GGA/ GLL/ RMC V2,0: GGA/G LL/ RMC/ZDA V2,3 : GGA/GLL/RMC/GNS/ZDA (Talker= "G P" etc.)
Information classification	about a ship -- the time entry; -- GGA/G NS/G LL/RMC Day entry: ZDA/RMC Time entry of equipment: ZDA/GGA/GNS/GLL/RMC

IEC61162-1 / 2 (considerable)

L/L:
SOG/COG:
Log speed:
HEADING:
DEPTH:
WATER TEMP:
ROT:
RUDDER:
AIS:
WIND:

Priority of data :

GGA>RMC>RMA>GNS>GLL
RMC>RMA>VTG
VBW>VHW
THS>HDT>HDG>HDM
DPT>DBT
MTW
ROT
RSA
VDM,VDO,ALR
MWV>VWT,VWR

Bearing signal

JRC-NSK format (JLR-10/20/30)

IEC61162-1/2(considerable)

4800bps/38400bps:THS>HDT>HDG>HDM

Speed signal

IEC61162 4800 bps :VBW, VHW

6-3 RECTIFIER UNIT

Input Power supply voltage allowance is between DC10.8 to 31.2V (DC12-24V-10%+30%).

Power dissipation power is about 50W.

When ship's DC battery power supply is not enough to this radar, use the rectifier unit.

AC /DC power converter unit name is NBD-865.

NBD-865:

Input voltage AC100/220V

Output DC24V

Chapter 7 INITIAL SETTING

7-1 INITIAL SETTING MENU

Before using the radar, try to do the most effective setup first.

Since almost all setting details are memorized inner memory, it is used as default data.

Various setup items as follows.

①The adjust items which must done first.

Language setting

②The adjust items which are possible to set later.

Tuning

Range

Scanner height

Communication port setting

GPS, AIS, GYORO, LOG

When unnecessary alarm is generated, set alarm mask setting and stop alarm.

Some item are not necessary to setup for start.(factory setting: default data are effective)

7-1-1 RECOMMEND SETTING BEFORE INITIAL SETTING

Language setup

7-1-2 NECESSARY SETTING BEFORE USE

Tuning control

Bearing adjustment

Range adjustment

Antenna height

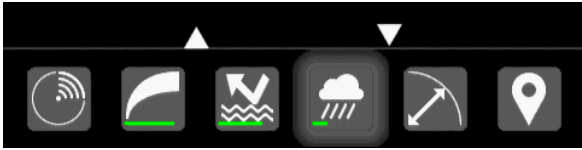
7-1-3 ALREADY SETTED-UP IN FACTORY

AND NOT NECESSARY TO SET-UP BEFORE USE


Alignment peak level adjustment

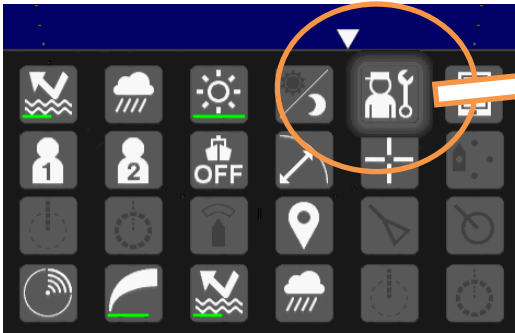
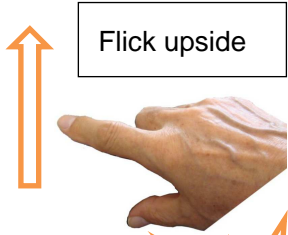
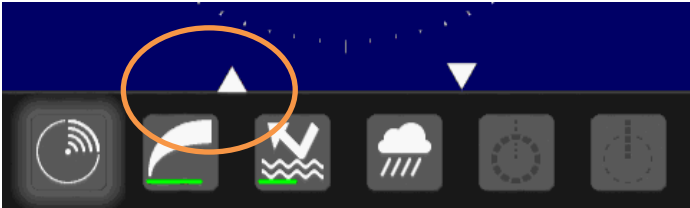
Push PWR/CLR button and power on.

Turn the Rotary knob, or tap downside icon, and appear the small menu.

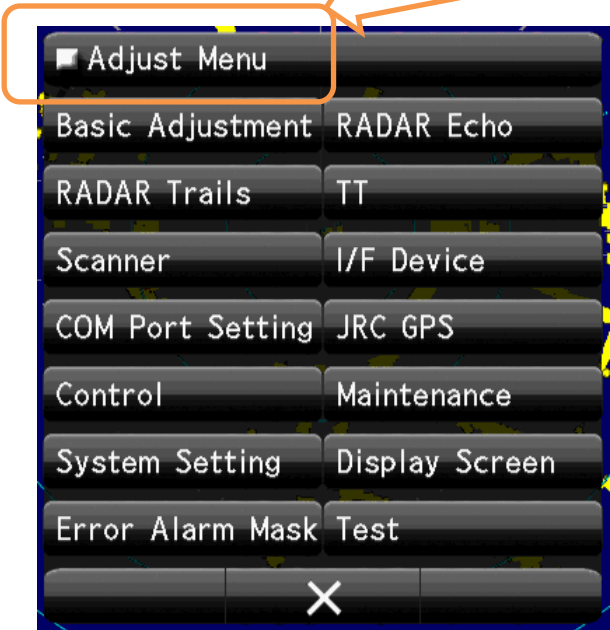


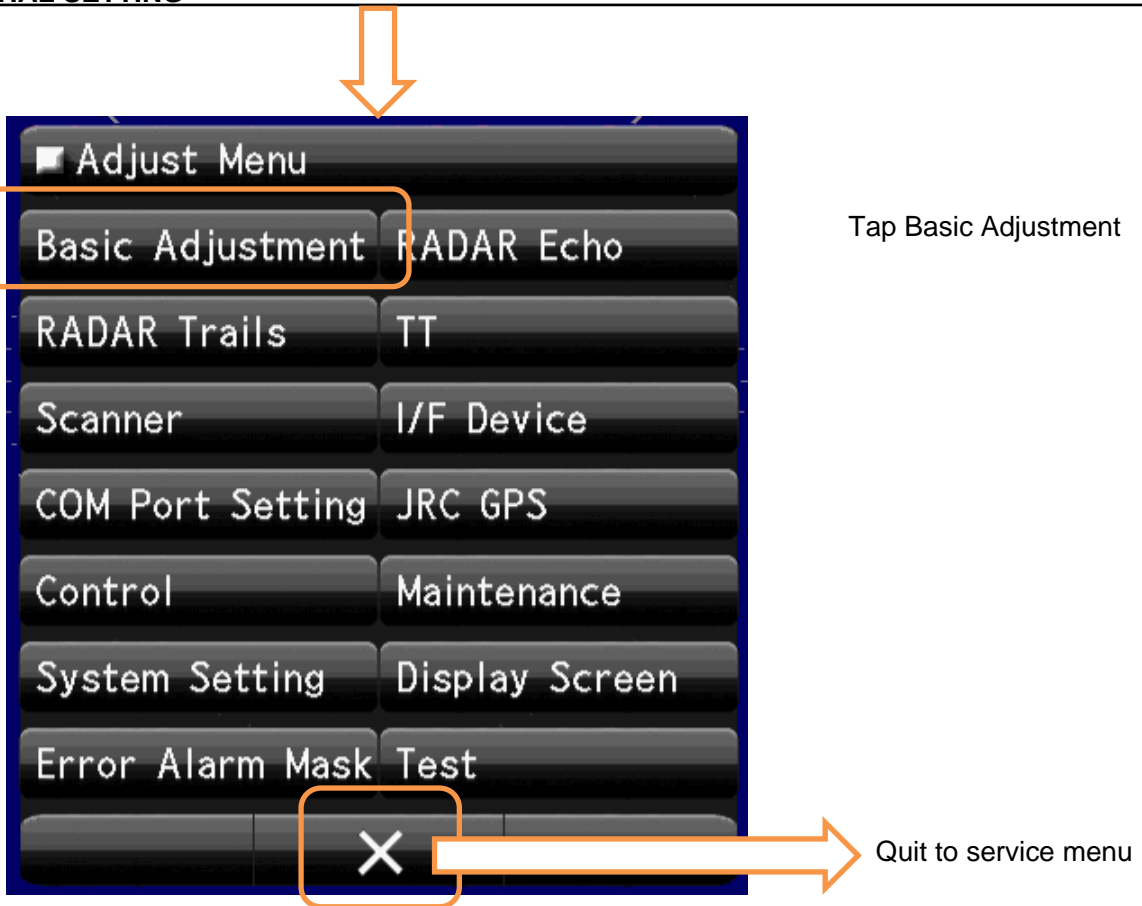
Push Rotary knob

Tap “” or Flick screen towards upside.

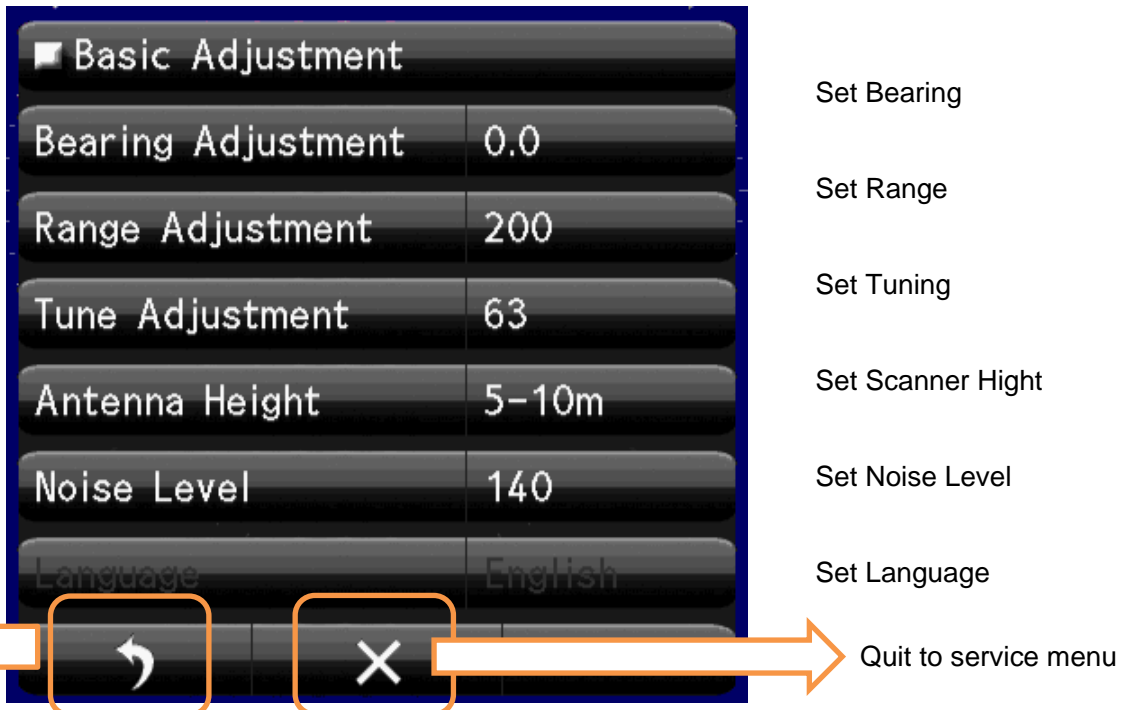


Confirm “0” input and tap ENT.





These Basic Adjustments are performed on TX.
Please adjust every item, observing the radar echo.



Select Basic adjustment.

In order to make it operate as a actual radar, minimum initial setting (basic adjustment) is necessary.

Any sequence of adjustment is possible.

Please carry out tuning control and appear the radar echo on screen.

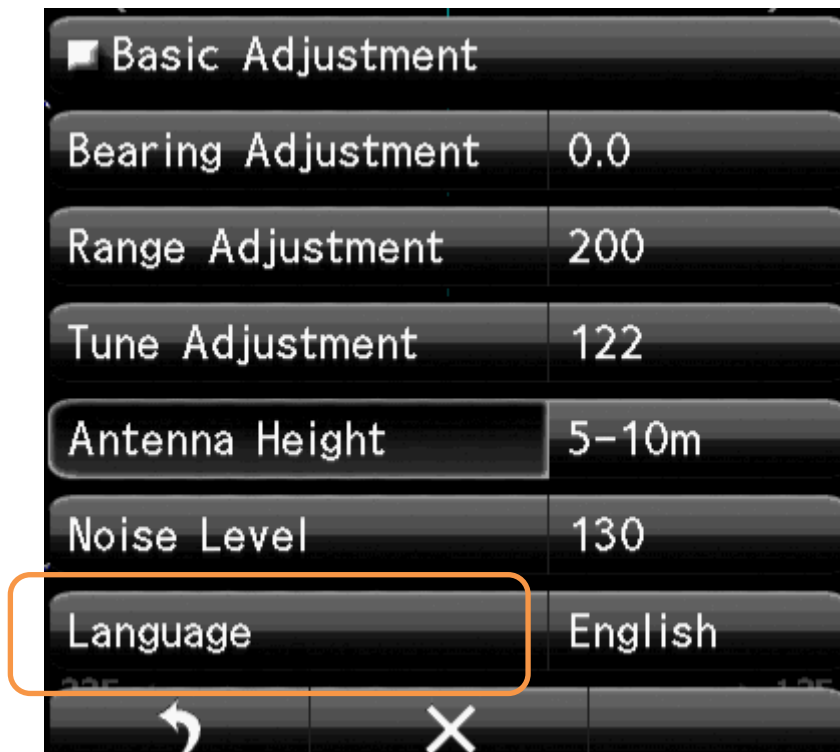
7-2 LANGUAGE SELECTION

The languages which can selectable are shown from menu.

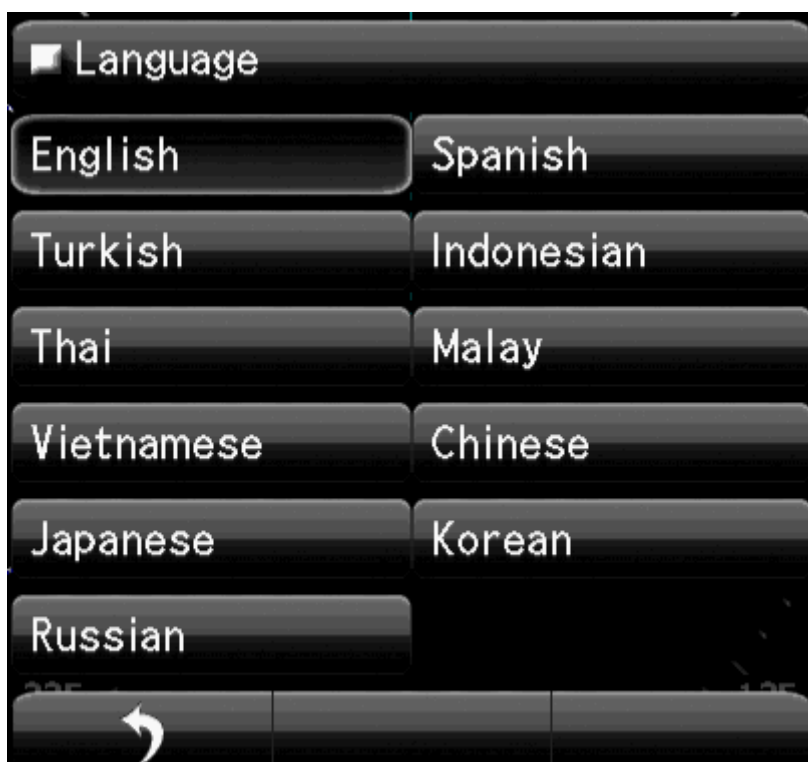
Procedure

(1) Set Basic Adjustment as previous page.

(2) Select. Language item.



And select your Language.



7-3 TUNING ADJUSTMENT

Tuning is necessary in order to keep high performance.

This function is adjustment of the Receiver to Magnetron frequency, and to get maximum radar sensitivity.

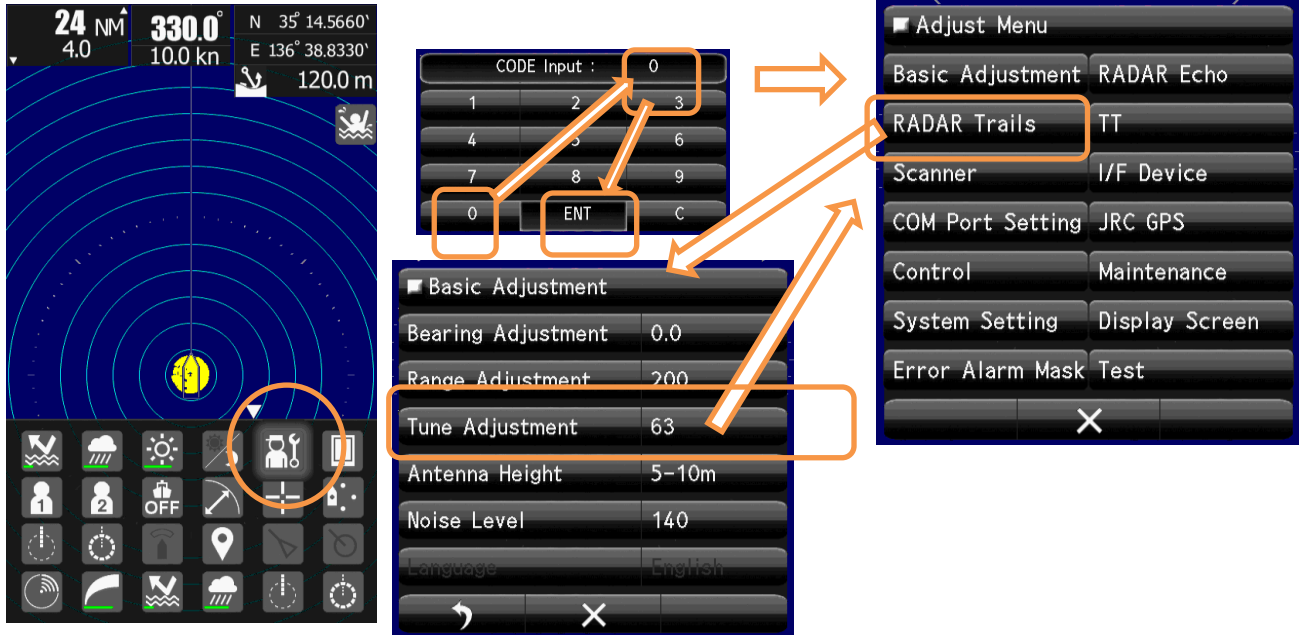
Procedure

(1) Set TX(radar transmission).

Select more longer range which can observe target.

For example, 12NM or 24NM.

Adjust GAIN, RAIN, and SEA so as to observe more long range target.



Turn Rotary knob or flick green belt or tap + -,checking radar



Return to Menu



Return to Main screen.

7-4 BEARING ADJUSTMENT

Adjust so that the heading marker (SHM) may align with the actual direction of a bow.
(Offset correction at the time of scanner installation)

Adjust the radar echo angle to the target angle which can observe by eye from bow.

Target viewing angle is view angle from scanner position, not display position.

So decrease error, select the more father target as long as possible.

This is the way of using EBL.

Procedure

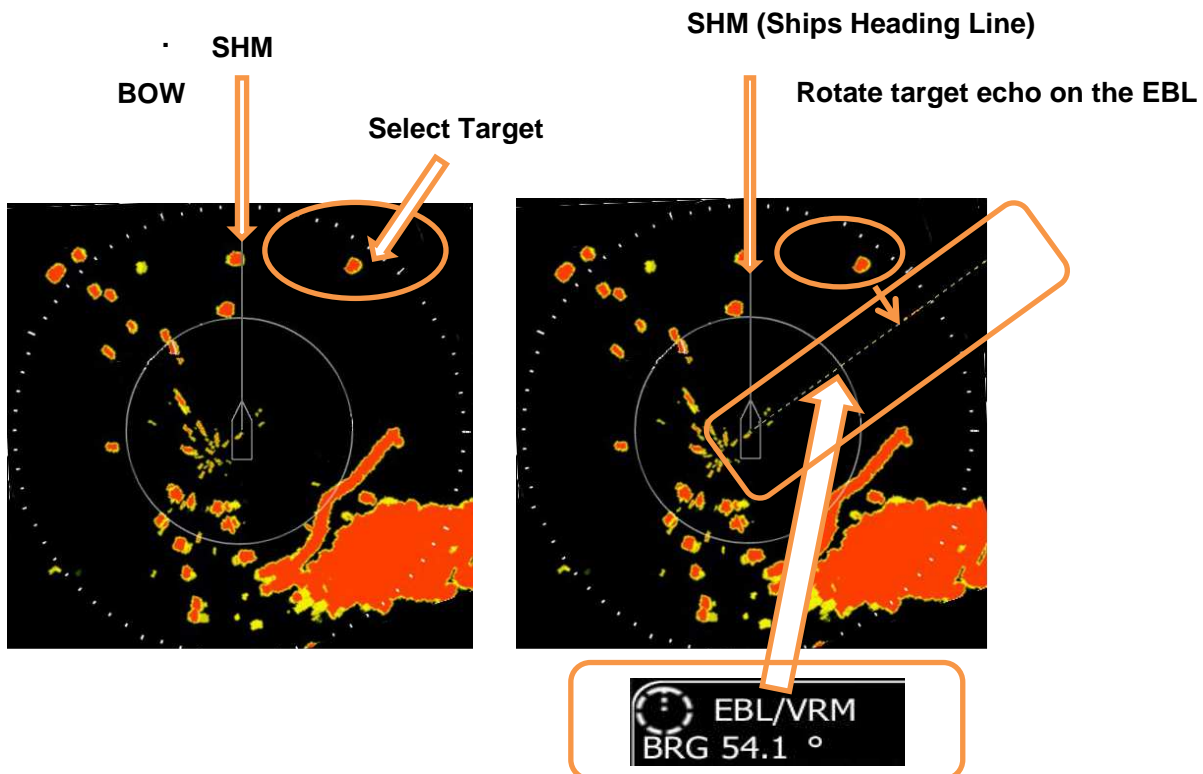
(1) Set radar TX.

(2) Adjust GAIN, RAIN, and SEA and find a known target on the screen.

In the case of the following figure, the target at the upper right of screen is a known target, and the direction from the bow(SHM).

In the case of the target which is 54 degrees as measured by viewing angle.

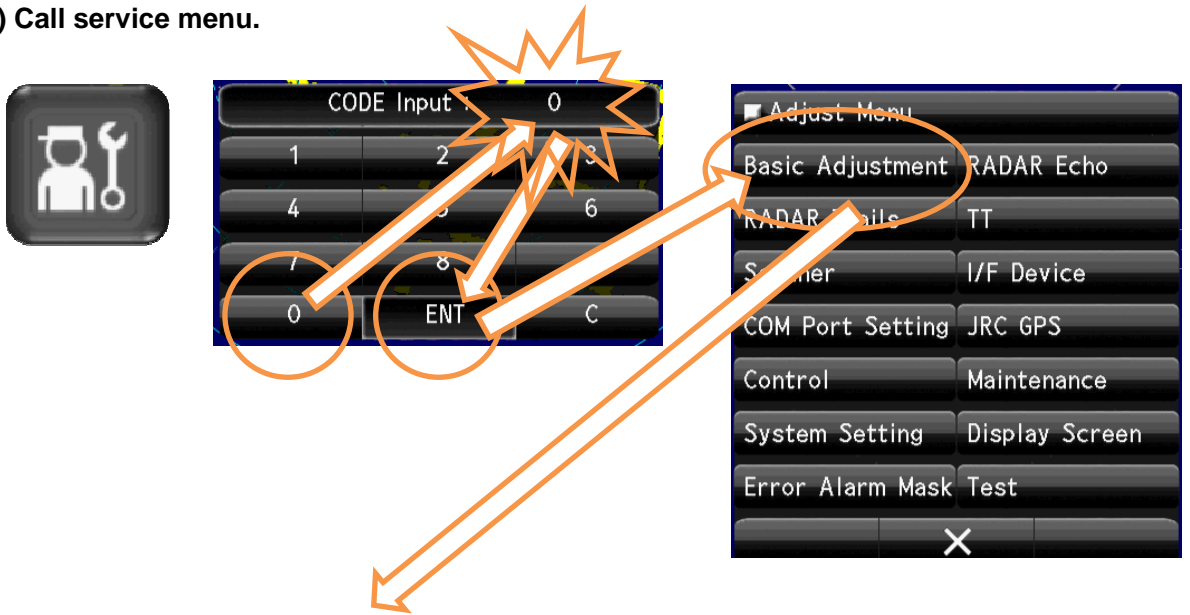
Set up EBL to 54 degrees and hold.



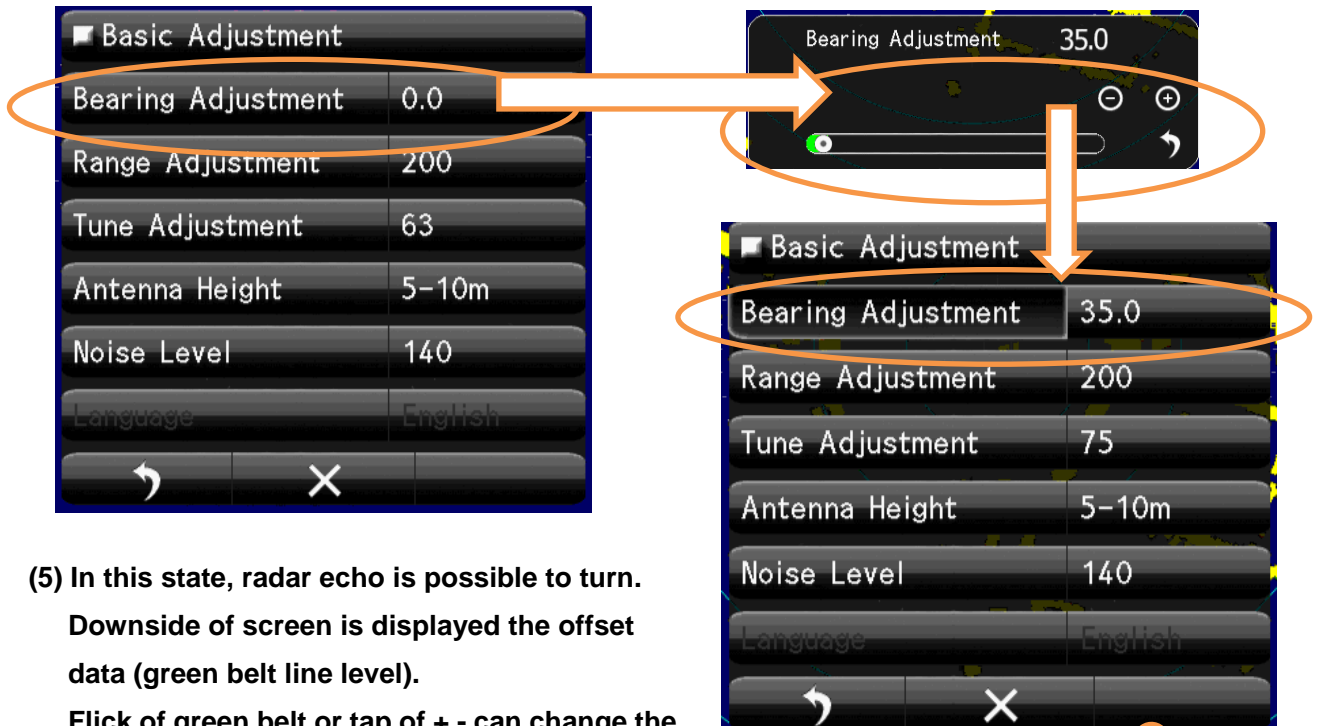
Next item must to do.

Turn the target echo until coincidence with EBL.
At that point is the off set point of Bearing Adjustment.
Press Rotary knob and fix data.

(3) Call service menu.

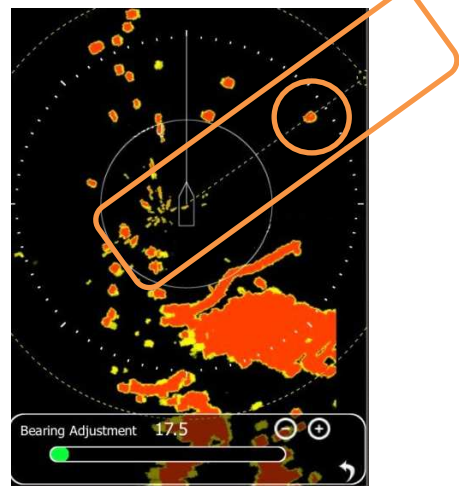


(4) Call Adjust Menu to Basic Adjustment and tap Bearing Adjust.



(5) In this state, radar echo is possible to turn. Downside of screen is displayed the offset data (green belt line level). Flick of green belt or tap of + - can change the offset position. Adjust the echo on the EBL.

Echo and EBL meet with on the line is correct offset angle. Click Rotary knob and fix offset data.



7-5 RANGE ADJUSTMENT

Read out the target range is used by VRM.

This set up is coincident the target RANGE with VRM readout data.

Select the target which is already known by map or another way.

The target height is the same as radar scanner is better condition.

The target echo's collect range is edge of radar side.(near centering on screen).

A distance unit is usually using " NM". (1nm= 1852m).

As an example Target which is distance of 300 m from own -ship,
 $300\text{m} \times (1/1852\text{m}) = 0.16198\text{NM}$.

Procedure

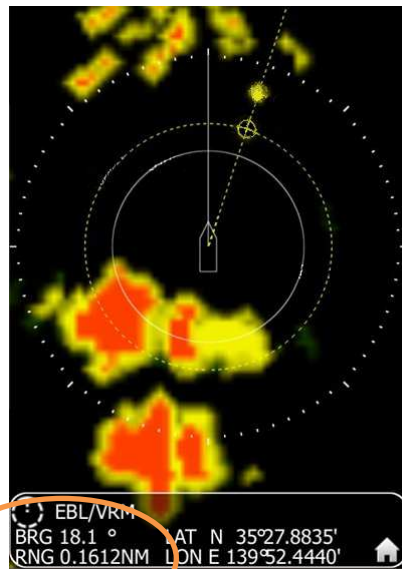
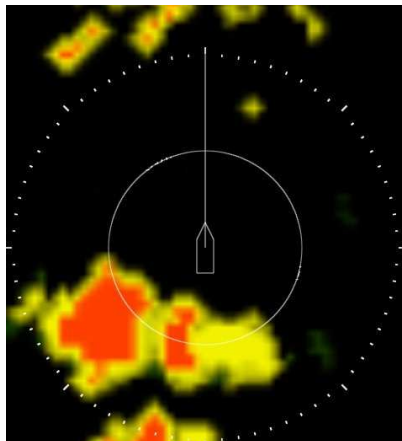
- (1) Set the radar transmit.
- (2) Adjust GAIN, RAIN, and SEA and find a known target from screen.

The smaller target is easy to adjust range.

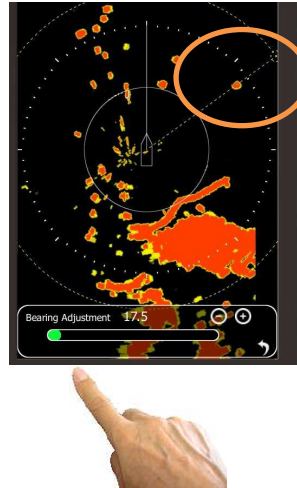
The nearest point of the target must be set as an actual distance.

Since the target length of radius direction proportion to the pulse length, set target's front side by VRM.

Reading of VRM is set as an actual distance.



(3) Adjust the RANGE.



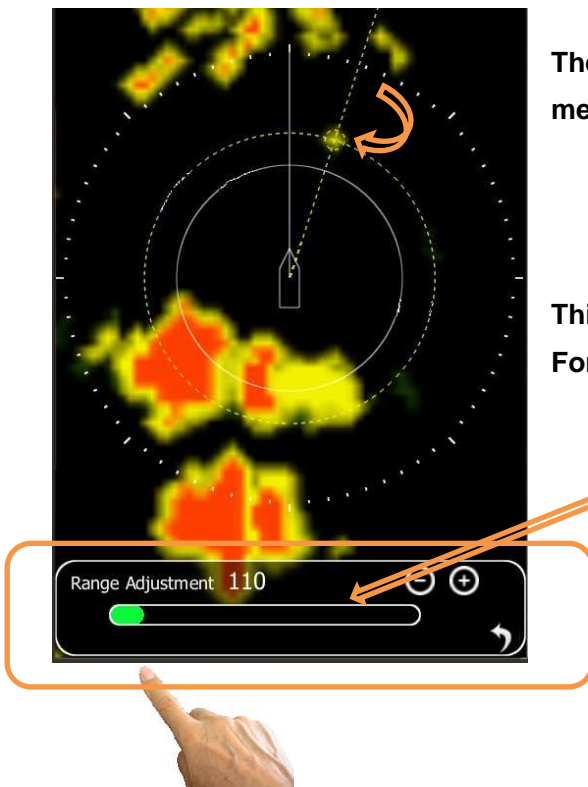
(4) Range adjust will be possible to adjust.

Down side of screen green bar's flick or + - tap can change the echo range.

Move the echo's front end come onto the VRM line.

At this point shows the collect offset range.

Click the Rotary knob and finish the range initialize adjustment.



The target which actual range of 300m(0.162nm) is measured by VRM as 0.162nm.

This offset data is memorized in nonvolatile memory. For the first time setting is necessary.

7-6 ANTENNA HEIGHT SET UP

Set up the antenna height.

This set up is related to sea clutter rejection control,

In near the range, Sea clutter level is proportion to the height of antenna position.

So optimum sea clutter rejection constant is selected according the height of antenna

Procedure

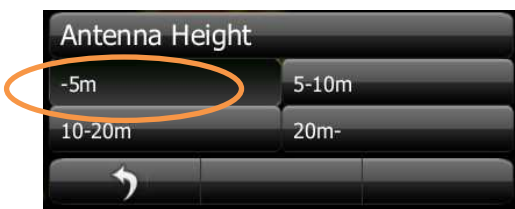
- (1) Turn a Rotary knob and tap the ribbon.
- (2) If an icon menu comes out, tap tool icon.

Select **Basic Adjustment** → **Antenna Height** .

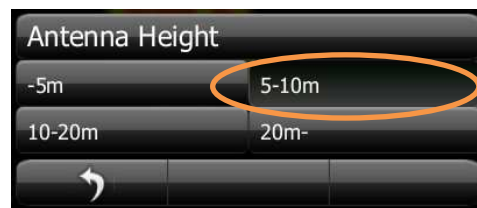
At selection menu, tap actual antenna height data.

Selected portion is reversed highlight.

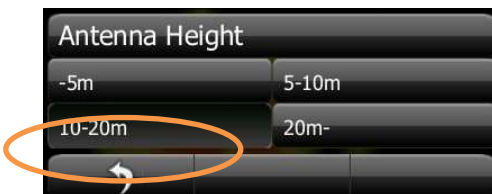
Antenna height 5-m or less



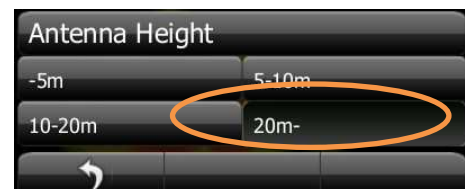
Antenna height From 5 m to 10 m



Antenna height 10 m to 20-m



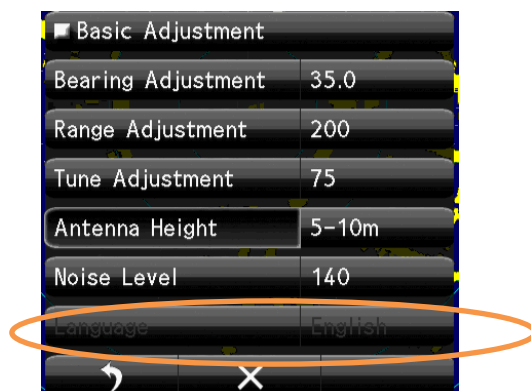
Antenna height More than 20 m



To fix the data is tap the right side return mark.



Confirm the menu if the selected value is set up.



Actual antenna height is set.

Expect the optimum control of sea clutter rejection.

7-7 ALREADY SETTED-UP ADJUSTMENT IN FACTORY

Please use on factory setting.

Adjustment is not always necessary.

Almost all adjustment is done in the factory, so necessary adjusting item is limited.

For example, it is not necessary items are follows.

7-8 Communication functions setup.

(Some case is necessary except can't automatically receivable.)

8-3-6 Tune peak adjustment

8-3-7 Tune indicator level adjustment.

From after next section is the guide to set up aid for better performance functions.


Set up any time while use.

7-8 COMMUNICATION PORT SETUP

Set up the communication port to communicate external device.
Push PWR/CLR button and power on.
Turn the Rotary knob, or tap downside icon, and appear the small menu.

Push PWR/CLR

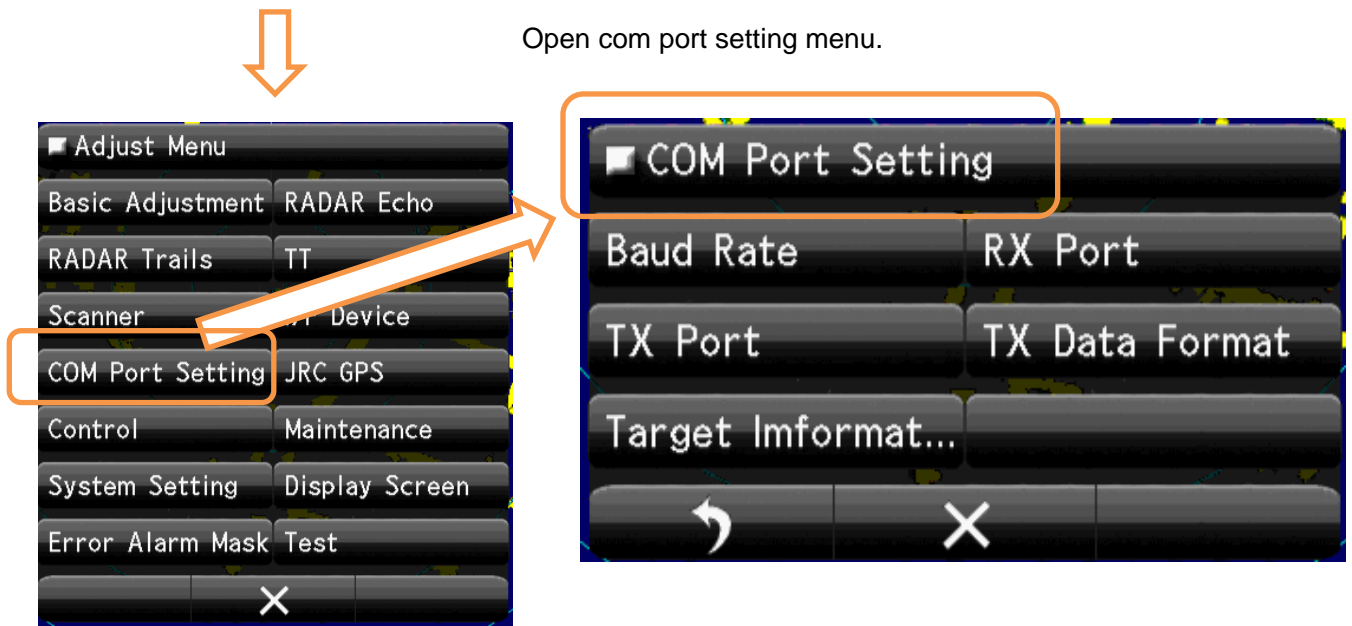
Push Rotary knob

Tap  icon
Or flick toward upside the screen.

Tap service icon.

CODE Input : 0

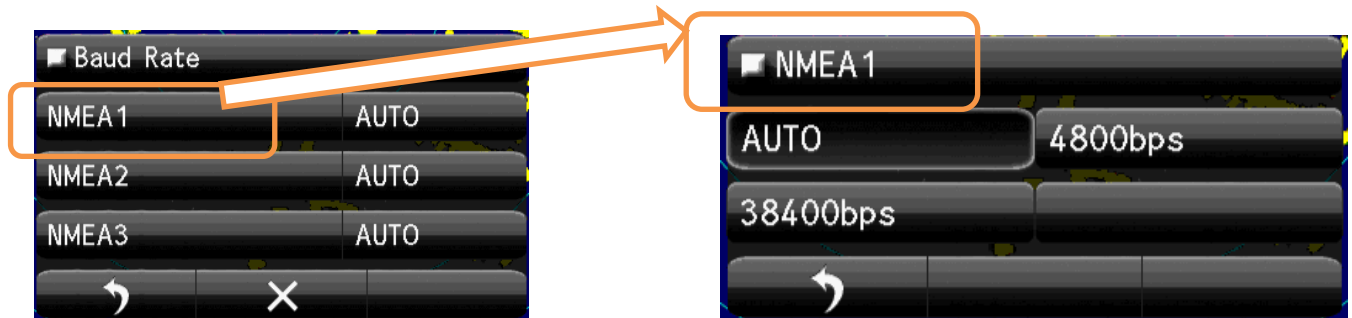
0 ENT C



7-8-1 BAUD RATE

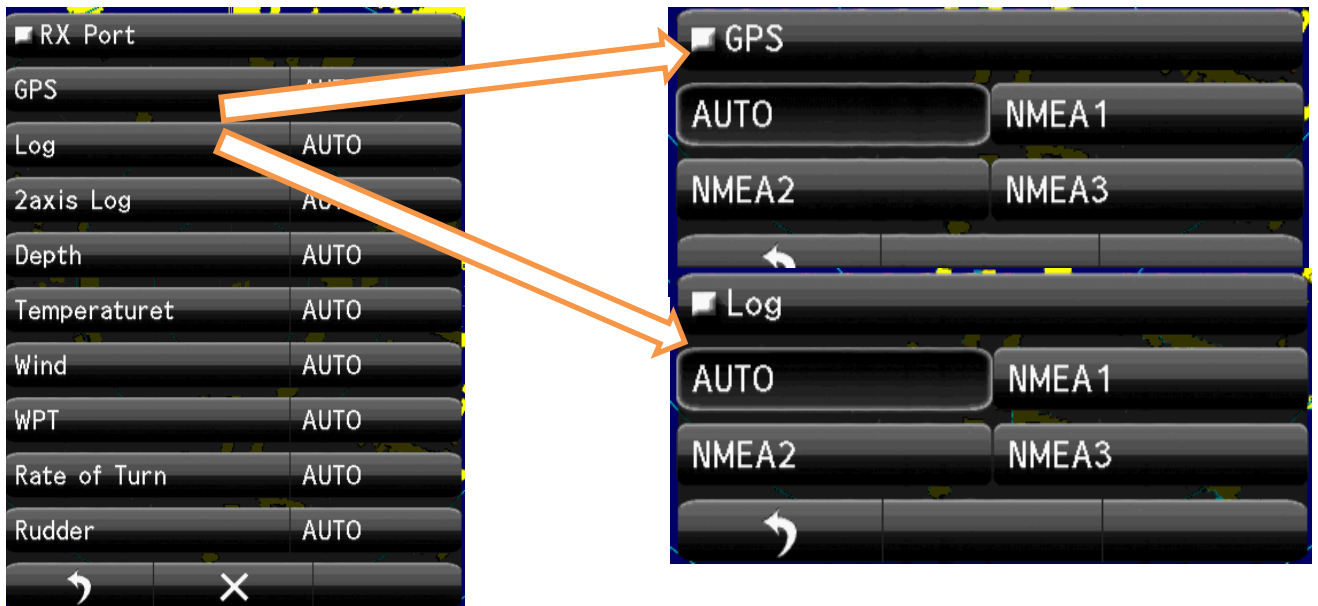
Data speed setting of communication.

Auto position: Selected automatically by receiving signal.



7-8-2 RX PORT

Receiving port selection, which kind of signal should receive from which terminal.



2axis Log

2axis Log

AUTO NMEA1

NMEA2 NMEA3

↶

Depth

Depth

AUTO NMEA1

NMEA2 NMEA3

↶

Temperature

Temperature

AUTO NMEA1

NMEA2 NMEA3

↶

Wind

Wind

AUTO NMEA1

NMEA2 NMEA3

↶

WPT

WPT

AUTO NMEA1

NMEA2 NMEA3

↶

Rate of Turn

Rate of Turn

AUTO NMEA1

NMEA2 NMEA3

↶

Rudder

Rudder

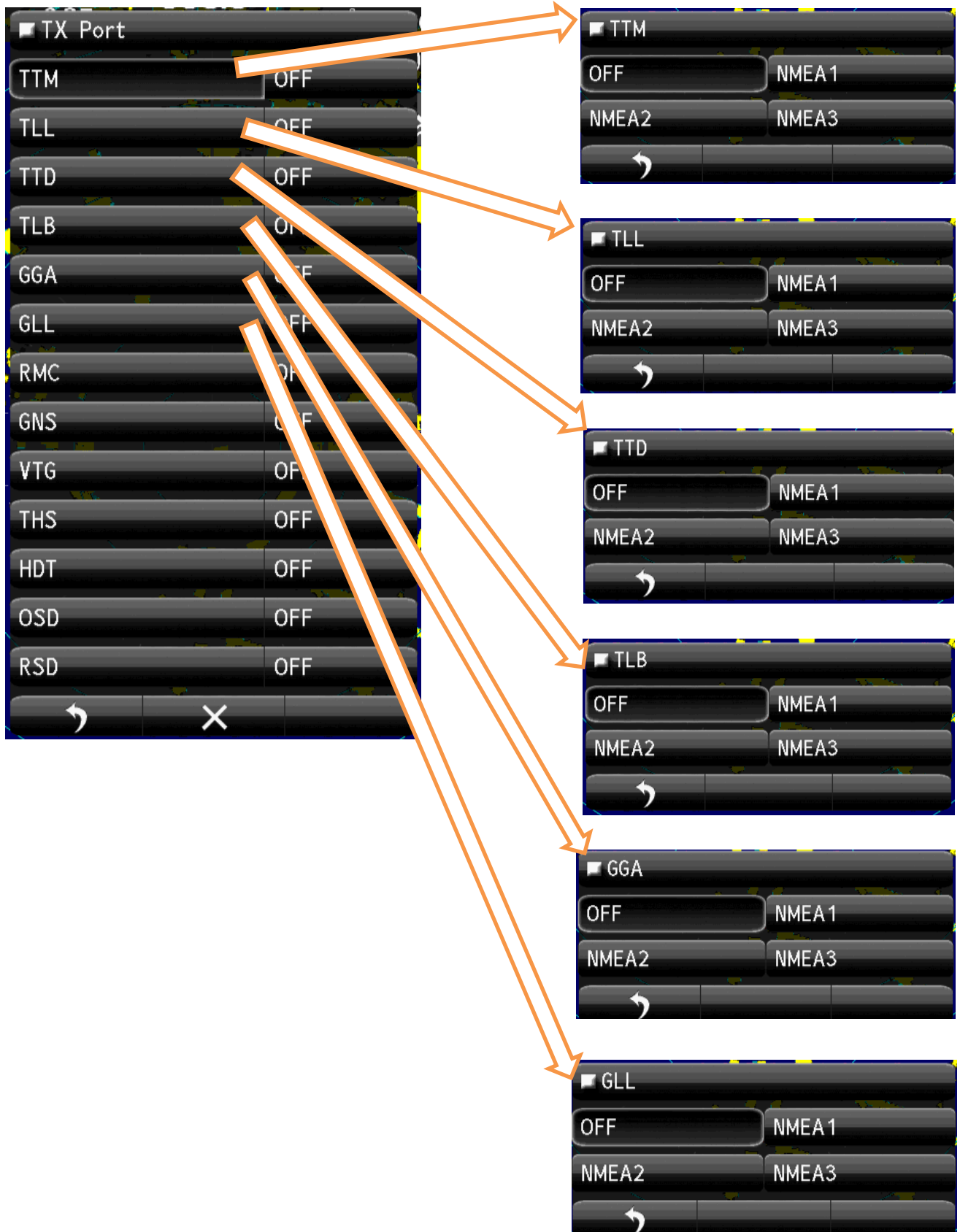
AUTO NMEA1

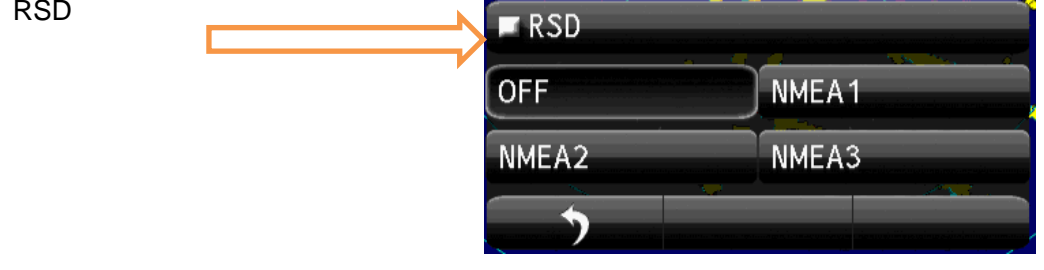
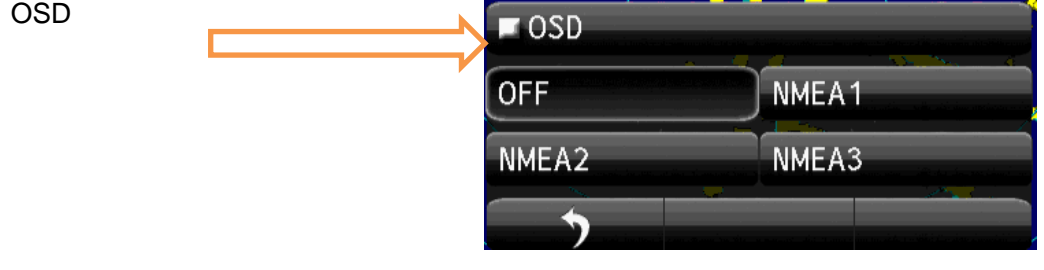
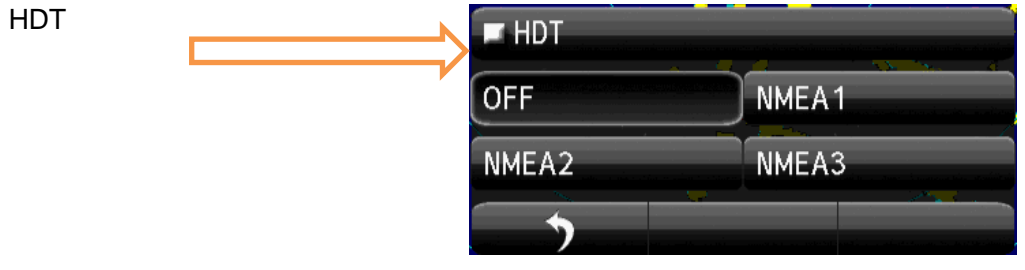
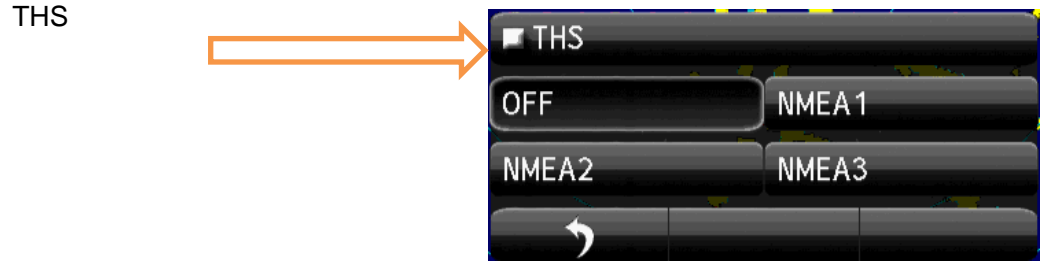
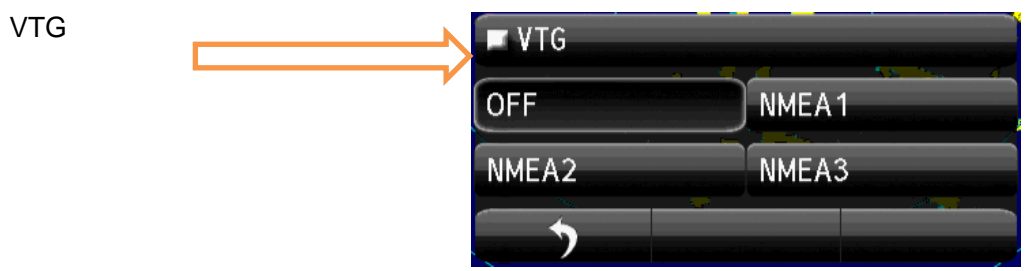
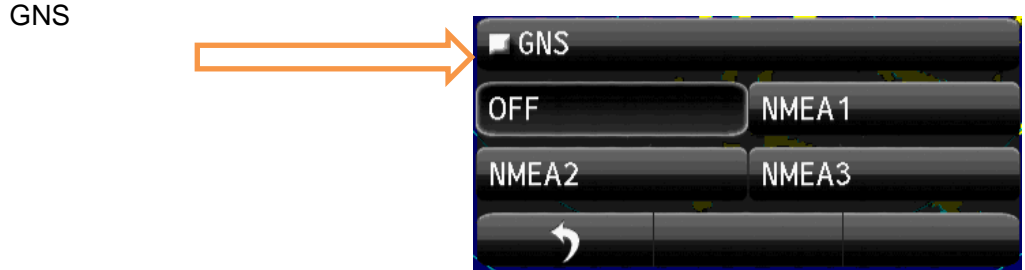
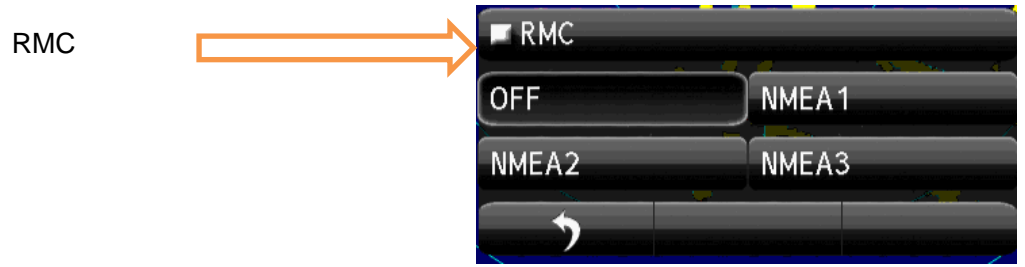
NMEA2 NMEA3

↶

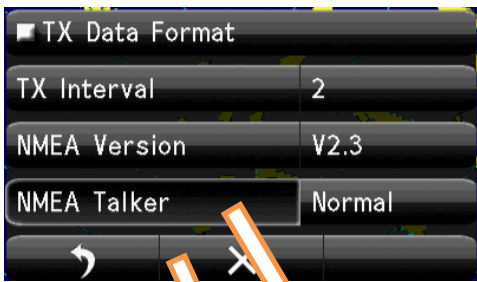
7-8-3 TX PORT

Transmitting port selection, which kind of signal should be send from which terminal.





7-8-4 TX DATA FORMAT



Standards selection of transmitting data format



Turn Rotary knob or flick green belt or tap + - ,checking radar echo.
Set up the TX Interval..



Select NMEA Version.



Select NMEA Talker



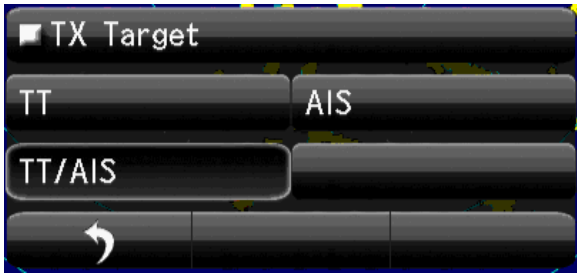
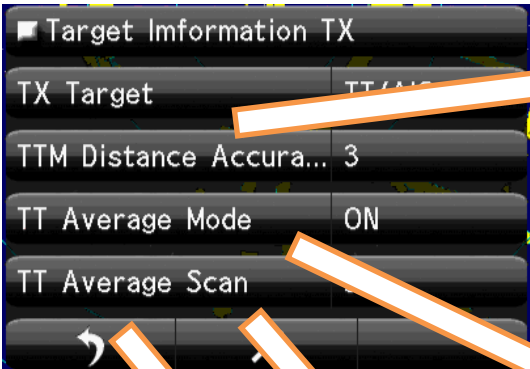
Return to COM Port Setting.



Quit to Service menu.

7-8-5 TARGET INFORMATION TX

When send target information, set up which information must be selected.



Turn Rotary knob

Flick



Turn Rotary knob or flick green belt or tap + -, checking radar echo.
Set up the TT Average Scan.

Tap



Return to COM Port Setting.



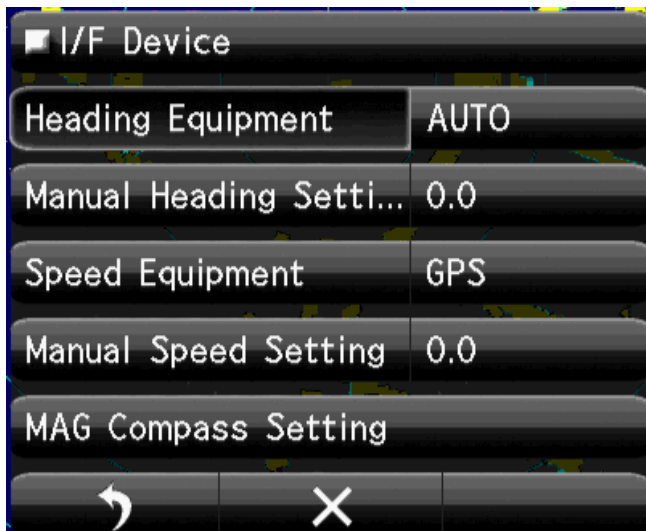
Quit to Service menu.

7-9 EXTERNAL INPUT SIGNAL SELECTION

For safe navigation, needs the correct navigational signals.

Own position, speed, course, gyro compass information etc. must be input and receive correctly..

Select the heading, speed, device.



7-9-1 HEADING SIGNAL DEVICE SELECT

(Heading direction measured from the north.)



AUTO: Select the available equipment data which priority is high.

GYRO: Select the gyrocompass data.

Normally use this data, because of stability.

Compass: Select magnet compass data.

Not so stable, normally not use.

For TT function, can't use.

GPS: Receive from GPS receiver, at slow speed, can't output stable data.

For TT function, can't use.

Manual: Manual setting only.

Not use for navigation.

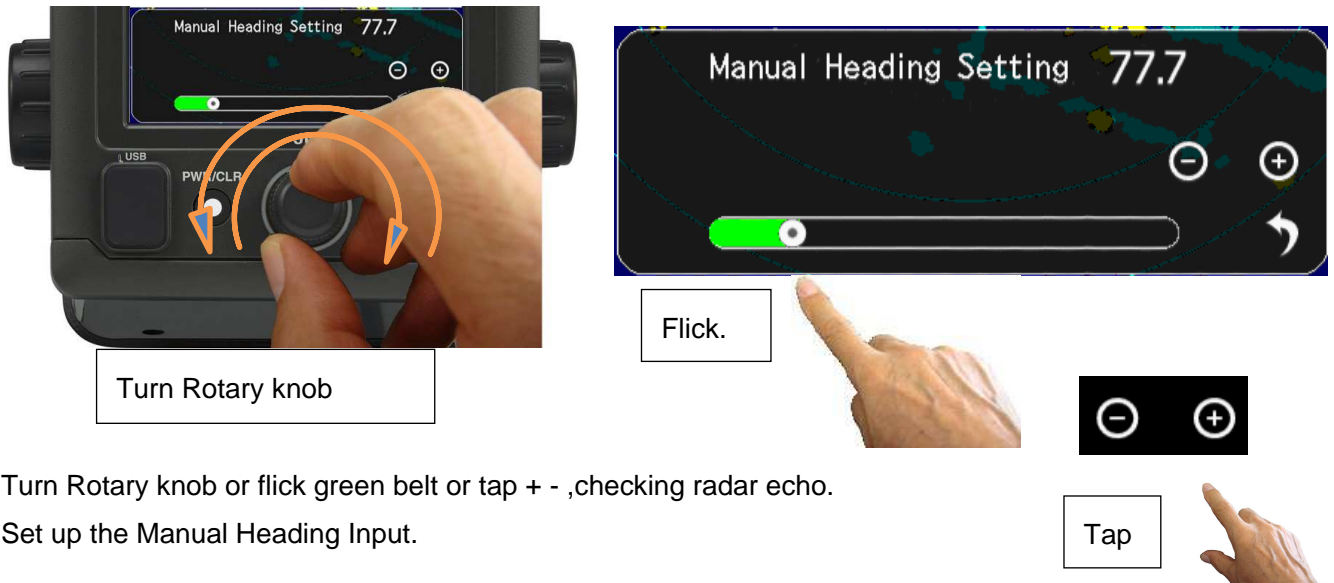
Select Input device and tap return icon.

Return to the I/F Device menu.



7-9-2 MANUAL HEADING INPUT

manual heading setup.



Turn Rotary knob or flick green belt or tap + - ,checking radar echo.
Set up the Manual Heading Input.

Manual Heading setting Bar appears in lower screen.

Flick the green bar and set.

Or tap +- is possible.

7-9-3 SPEED INPUT SELECTION

Hull speed information input selection.



GPS: Select GPS speed information.

Log: The LOG speed data.

2axis Log: The speed data of two axes (X-axis, Y-axis).

Manual: The manual input of the hull speed. (Usually, it does not use.)

When moving by simulator etc.

7-9-4 MANUAL SPEED INPUT

A speed input is possible by manual.



Turn Rotary knob

Flick



Tap



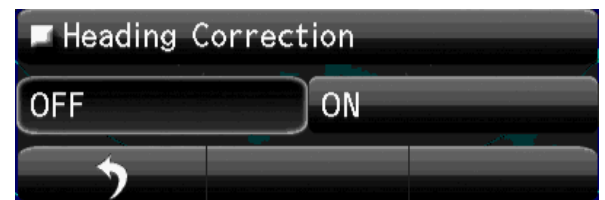
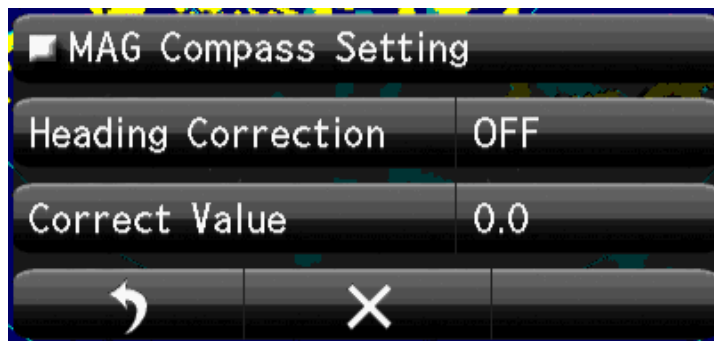
Turn Rotary knob or flick green belt or tap + - ,checking radar echo.
Set up the Manual Heading Input.

Manual Speed setting bar will appears in a screen.

Flick green bar, or it possible to set up by tap +- and click Rotary knob.

7-9-5 MAGNETIC COMPASS SETUP

Set magnet compass offset. (Data is not stable, usually it does not set up.)



Turn Rotary knob

Flick



Tap



Turn Rotary knob or flick green belt or tap + - ,checking radar echo.
Set up the Manual Heading Input.

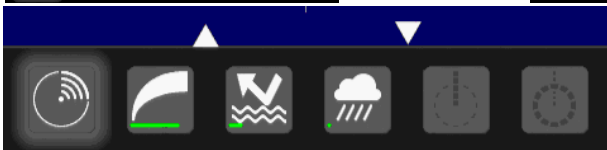
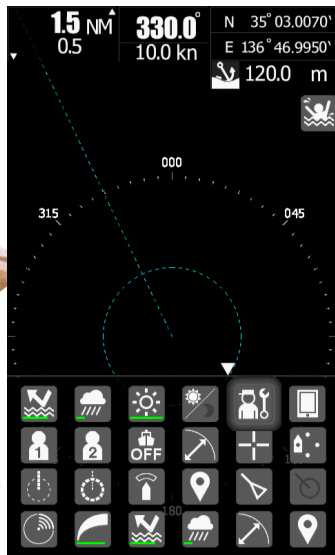
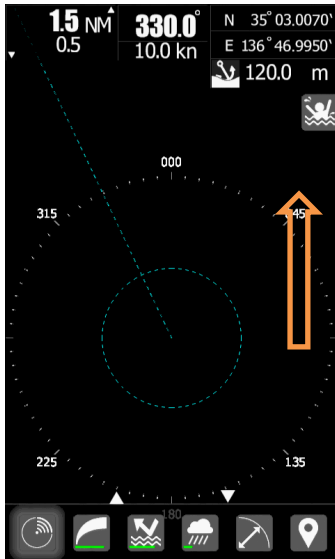


Push Rotary knob

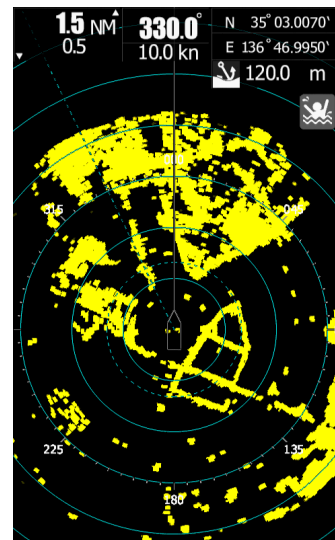
Push Rotary knob.



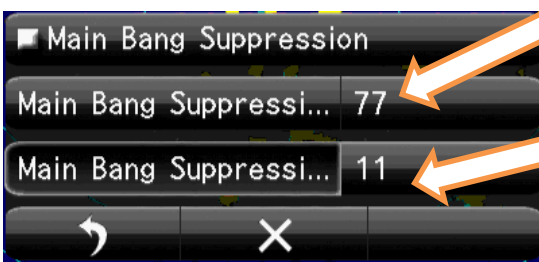
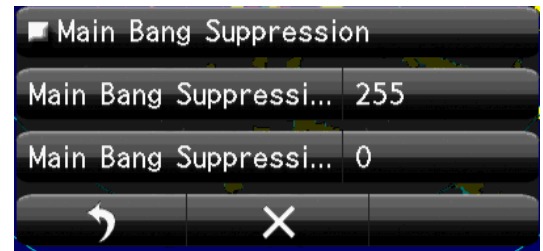
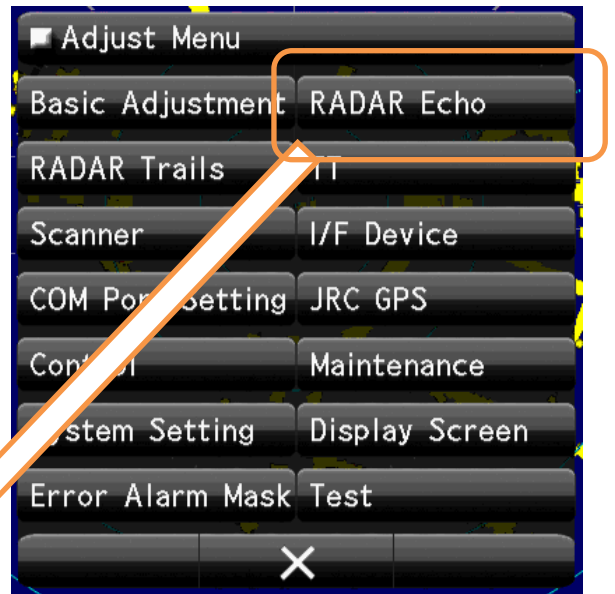
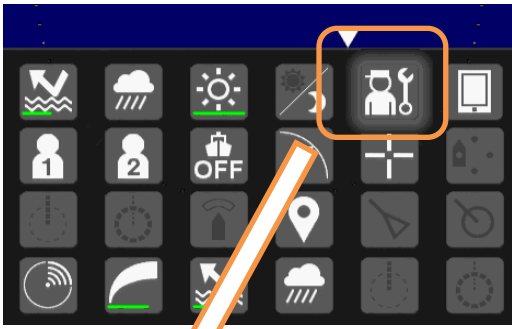
Tap “▲” or Flick screen towards upside.



Select TX-STBY icon, and push Rotary knob.



Push the Rotary knob, then Transmitting(TX) start



Flick green bar



Tap “-” “+”



Use Rotary knob.