navtiX

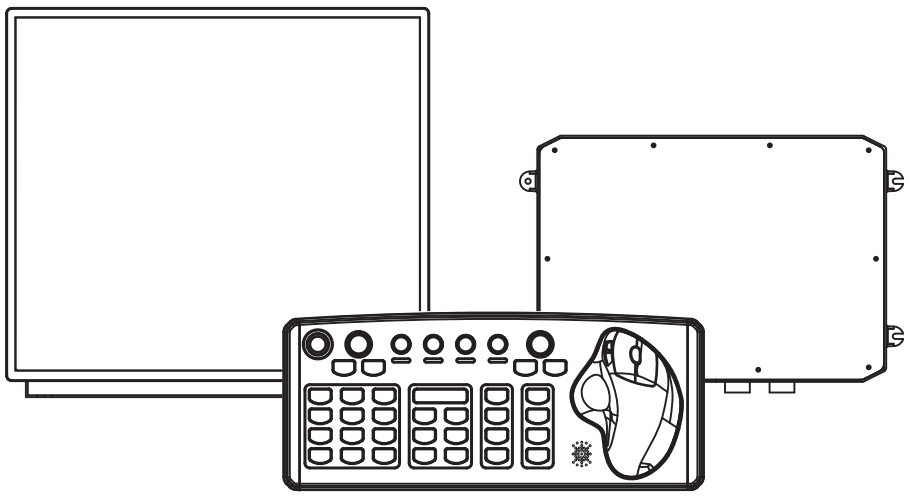
Black Box Marine Radar

Operator's Manual

TFT LCD COLOR MARINE RADAR

Model: KSR-1938
KSR-2659
KSR-2669

Complies with IMO MSC.192(79)



FC CE

⚠SAFETY INSTRUCTIONS

"DANGER","WARNING" and "CAUTION" notices throughout this manual. It is the responsibility of the operator and the installer of the equipment to read, understand and follows these notices. If you have any questions regarding these safety instructions, please contact an agent or dealer.

⚠ WARNING



Do not open the equipment.
Hazardous voltage which can cause electrical shock, burn or serious injury exists inside the equipment. Only qualified personnel should work inside the equipment.



Wear a safety belt and hard hat when working on the antenna unit.
Serious injury or death can result if someone falls from the radar antenna mast.



Stay away from transmitting antenna.
The radar antenna emits microwave radiation which can be harmful to the human body, particularly the eyes. Never look directly into the antenna radiator from a distance of less than 1 m when the radar is in operation.



Turn off the radar power switch before servicing the antenna unit. Post a warning sign near the switch indicating it should not be turned on while the antenna unit is being serviced.
Prevent the potential risk of someone being struck by the rotating antenna and exposure to the RF radiation hazard.

Do not disassemble or modify the equipment.
Fire, electrical shock or serious injury can result.

Turn off the power immediately if water leaks into the equipment or the equipment is emitting smoke or fire.
Continued use of the equipment can cause fire or electrical shock.

Do not place liquid-filled containers on top of the equipment.
Fire or electrical shock can result if liquid spills into the equipment.

⚠ CAUTION

Use the proper fuse.
Use of a wrong fuse can result in fire or permanent equipment damage.

Do not use the equipment for other than its intended purpose.
Personal injury can result if the equipment is used as a chair or stepping stool, for example.

Do not place objects on top of the equipment.
The equipment can overheat or personal injury can result if the object falls.

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FOREWORD

A Word to the Owner of Navtix KSR-1938/26x9 series radar :
Congratulations on your choice of KSR-1938/26x9 series radar and TT equipment.
For over 20 years, We has been in the field of Marine navigation equipment deepening and won the reputation.
Your radar is design and manufacture to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless installed, operated and maintained properly. Please carefully read and follow the recommended procedures for operation and maintenance.
We would appreciate hearing from you, the end-user, about whether we are achieving our purposes.
Thank you for considering and purchasing ours equipment!

Features

- 1280*1024&1920*1200 high resolution radar display 19/26 inches;
- This series of radar and TT (target tracking) are the standard;
- Using fully functional control unit with trackball: KRK- 1121, use very convenient;
- Through the main interface small window and quick operation;
- Applicable to the HSC (high speed);
- TT, AIS and radar graph plotter are standard configuration;
- Conform IEC62388 (Maritime navigation and radio communications equipment and systems - the shipboard radar - performance requirements, test methods and test results required by the) the requirements;
- Conform with IMO MSC. 192 (79);
- Conform IEC62288 (Marine navigation and radio communications equipment and systems - navigation information on shipboard navigation display shows the general requirements, test methods and requirements of the test result);
- Target alarm monitoring to in or out the alarm area target;
- CPA/TCPA limit alarm;
- Electronic parallel index (PI);
- 48 RPM antenna speed used in HSC.

Signal Processing Functions

This radar has the signal processing functions described in the table below. All signal processing functions are set with the Picture feature.

Signal processing function	Description
Interference rejector	Suppress interference transmitted by other radars. Interference received simultaneously from many radars can be difficult to reduce.
Echo stretch	Enlarge target echoes, especially small echoes. Suppress interference, sea clutter and rain clutter before using echo stretch, to prevent the enlargement of unwanted echoes.
Noise rejector	Suppress white noise and increase the S/N ratio to improve picture clarity.

KSR-1938/2659/2669 TECHNICAL PARAMETER

ANTENNA UNIT

ITEM		KSR-1938	KSR-2659	KSR-2669
Type		KRA-2021		
Radiator Type		Slotted waveguide array		
Radiator length		200cm(6.5ft)		
Horizontal beamwidth		1.2º		
Vertical beamwidth		22º		
Sidelobe Attenuation	Within ± 10º off mainlobe	less than -25dB		
	Outside ± 10º off mainlobe	less than -32dB		
Polarization		Horizontal		
Antenna rotation		48 ± 3 rpm		
Compass Safe Distance	Standard	75cm		
	Steering	50cm		

TRANSCEIVER UNIT

ITEM		KSR-1938/KSR-2659	KSR-2669
Type		KRT-1232	KRT-2532
Magnetron		MSF1425	MSF1458A
Frequency		9410 ± 30MHz(X band)	
Peak output power		12.5KW	25KW
Pulselength & Pulse Repetition Rate		0.08μs,approx. 2100 Hz (S1 : 0.125 nm to 1.5 nm)	
		0.17 μs, approx. 2100 Hz (S2 : 0. 5 nm to 3 nm)	
		0.3 μs, approx. 1200 Hz (M1 : 0.75 nm to 6 nm)	
		0.3 μs, approx. 1200 Hz (M1 : 0.75 nm to 6 nm)	
		0.8 μs, approx. 600 Hz (L1 : 3 nm to 24 nm)	
		1.2 μs, approx. 500 Hz (L2 : 6nm to 96 nm)	1.2 μs, approx. 500 Hz (L2 : 6nm to 120 nm)
Modulator		FET Switching	
Duplexer		Circulator with diode limiter	
Tuning		Automatic or Manual	
Intermediate Frequency		60 MHz	
Bandwidth		25 MHz (0.08μs, 0.17μs, 0.3μs,0.5μs,), 3 MHz (0.8μs, 1.2μs)	
Compass Safe Distance	Standard	195cm	140cm
	Steering	60cm	100cm

DISPLAY, MAIN, CONTROL & PERFORMANCE UNIT

ITEM	KSR-1938				KSR-2659				KSR-2669						
Type	KRD-1910, KRD-2601, KRM-1001, KRK-1121, KRP-1001														
Indication	LCD digital display														
Display	19/26 inch ,daylight,1280 x 1024/1920 x 1200 pixel,32-bit TFT color display														
Range Scale (nm)	0.125	0.25	0.5	0.75	1.5	3	6	12	24	36	48	64	72	96	120
Range Ring Interval	0.0625	0.125	0.125	0.25	0.25	0.5	1	2	4	6	8	16	12	16	20
Number of Rings	2	2	4	3	6	6	6	6	6	6	6	4	6	6	6
Bearing Resolution	1.2º(KRA-2021)														
Range Discrimination	Better than 30 m or 1 % of range , whichever is the greater														
Bearing Accuracy	±1º														
Minimum Range	Meets 35 m HSC requiments														
Range Ring Accuracy	1 % of range or 30 m, whichever is the greater														
VRM Accuracy															
I/O Ports	IEC-61162-1port(three input) RS-232C ports(three input/output) RD-422 ports(two input/output): For TT(ARPA) data output & other USB ports(six,input/output):For keyboard & other Net port: For radar transceiver														
NAV Data Input	IEC-61162-1/NMEA 0183 Own ship's position : GGA>RMC>RMA>GLL Speed : RMC>RMA>VTG>VHW Heading (True) : VHW>HDT Heading (Magnetic) : VHW>HDM>HDG Course (Trne) : RMC>RMA>VTG Course (Magnetic) : VTG>RMC>RMA Waypoint (Range/Bearing) : RMB>BWC>BWR Time : ZDA Loran time difference : RMA>GLC>GTD Water depth : DPT>DBT>DBK>DBS Water temperature : MTW>MDA AIS:VDO>VDM>ACA>ACS>ALR>ACK														
TT data Output	OSD>RSD>TLB>TLL>TTD>TTM														
Compass safe Distance	Standard	120cm(KRM-1001), 70cm(KRD-2610), 55cm(KRK-1121), 20cm(KRP-1001)													
	Steering	50cm(KRM-1001), 45cm(KRD-2610), 25cm(KRK-1121), 10cm(KRP-1001)													

ENVIRONMENTAL CONDITIONS

ITEM		KSR-1938	KSR-2659	KSR-2669
Ambient Temperature	Scanner Unit	−25 deg. to +70 deg.		
	Display Unit	−15 deg. to +55 deg.		
Humidity		Relative humidity 95% or less at +40 deg.		
Vibration		IEC 60945, Edition 3		

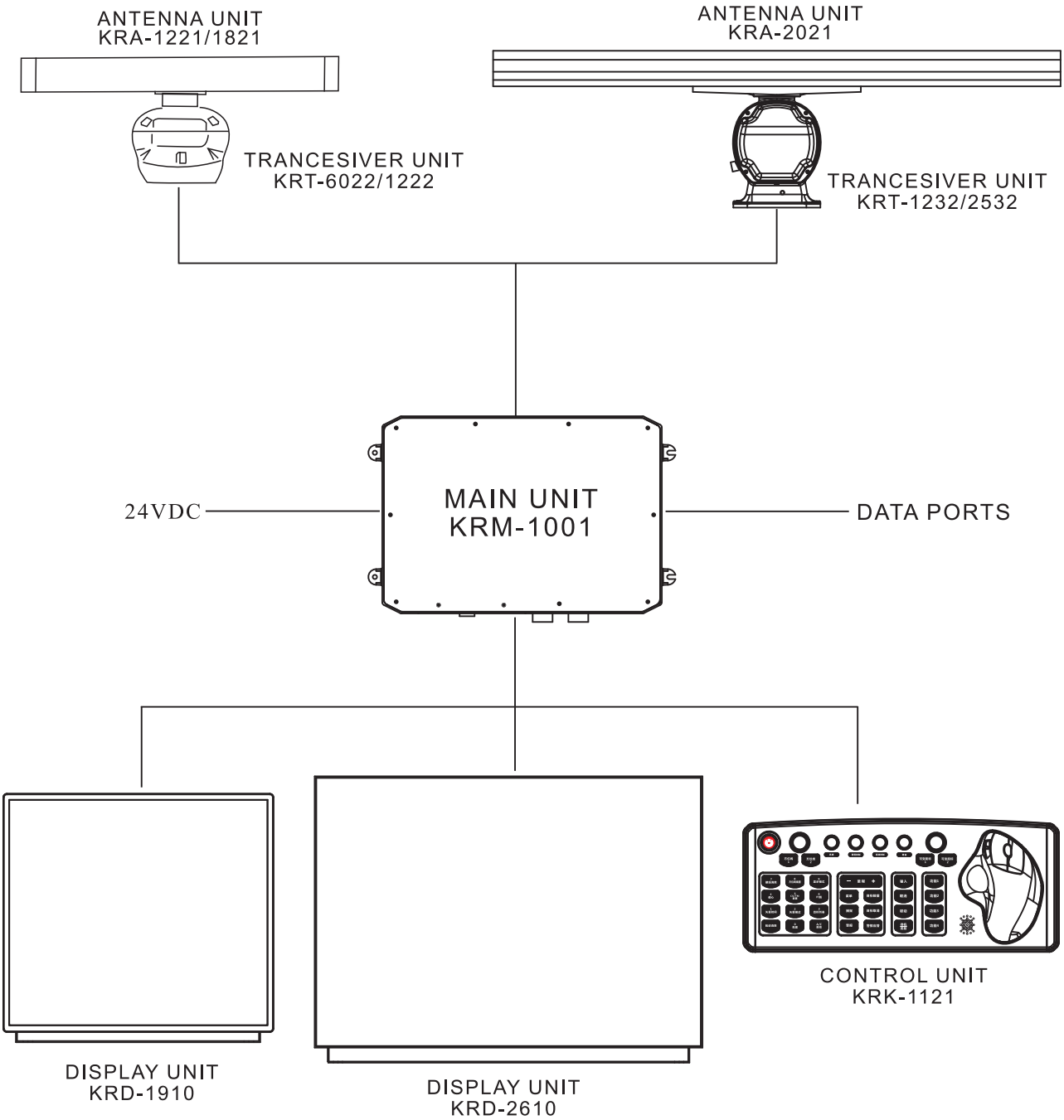
POWER SUPPLY & POWER CONSUMPTION

ITEM	KSR-1938	KSR-2659	KSR-2669
Power Supply	24VDC:18 to 32V		
Power Consumption	180W(no wind)/300W(100kn)	210W(no wind)/330W(100kn)	

RADIO FREQUENCY RADIATION

Radar model	Transceiver	Magnetron	Antenna	100W/m^2	50W/m^2	10W/m^2
KSR-1938	KRT-1232	MSF1425	KRA-2021	<10cm	<10cm	<10cm
KSR-2659	KRT-1232	MSF1425	KRA-2021	<10cm	<10cm	<10cm
KSR-2669	KRT-2532	MSF1458A	KRA-2021	<10cm	<10cm	<10cm

KSR-1938/2659/2669 SYSTEM CONFIGURATION



1. PRINCIPLE OF OPERATION

1.1 What is Radar?

The word radar is an acronym derived from Radio Detection And Ranging. Applies to electronic equipment designed for detecting and tracking objects (targets) at considerable distances.The main purpose of a marine radar is to provide bearing and distance of ships and land targets in vicinity from own ship for collision avoidance and navigation at sea.

1.2 How Ships Determine Position Before Radar

Before the invention of radar, when running in fog near a rugged shoreline, ships would sound a short blast on their whistles, fire a shot, or strike a bell. The time between the origination of the sound and the returning of the echo indicated how far the ship was from the cliffs or the shore. The direction from which the echo was heard indicated the relative bearing of the shore.

1.3 How Radar Determines Range

Radar determines the distance to the target by calculating the time difference between the transmission of a radar signal and the reception of the reflected echo. It is a known fact that radar waves travel at a nearly constant speed of 162,000 nautical miles per second. Therefore the time required for a transmitted signal to travel to the target and return as an echo to the source is a measure of the distance to the target. Note that the echo makes a complete round trip, but only half the time of travel is needed to determine the one-way distance to the target. The radar automatically takes this into account when making the range calculation.

1.4 How Radar Determines Bearing

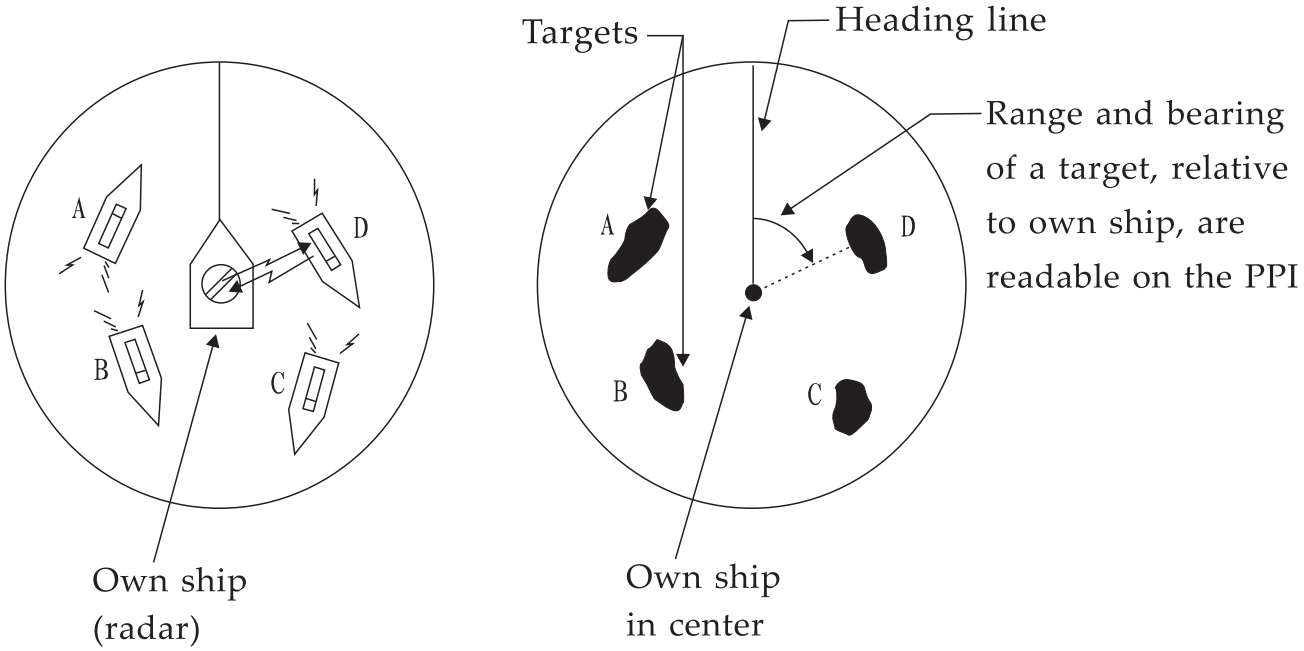
The bearing to a target found by the radar is determined by the direction in which the radar scanner antenna is pointing when it emits an electronic pulse and then receives a returning echo. Each time the scanner rotates pulses are transmitted in the full 360 degree circle, each pulse at a slightly different bearing from the previous one. Therefore, if one knows the direction in which the signal is sent out, one knows the direction from which the echo must return.

1.5 Radar Wave Speed and Antenna Rotation Speed

Note that the speed of the radar waves out to the target and back again as echoes is extremely fast compared to the speed of rotation of the antenna. By the time radar echoes have returned to the scanner, the amount of scanner rotation after initial transmitting of the radar pulse is extremely small.

1.6 The Radar Display

The range and bearing of a target is displayed on what is called a Plan Position Indicator (PPI). This display is essentially a polar diagram, with the transmitting ship's position at the center. Images of target echoes are received and displayed at their relative bearings, and at their distance from the PPI center. With a continuous display of the images of targets, the motion of the transmitting ship is also displayed.

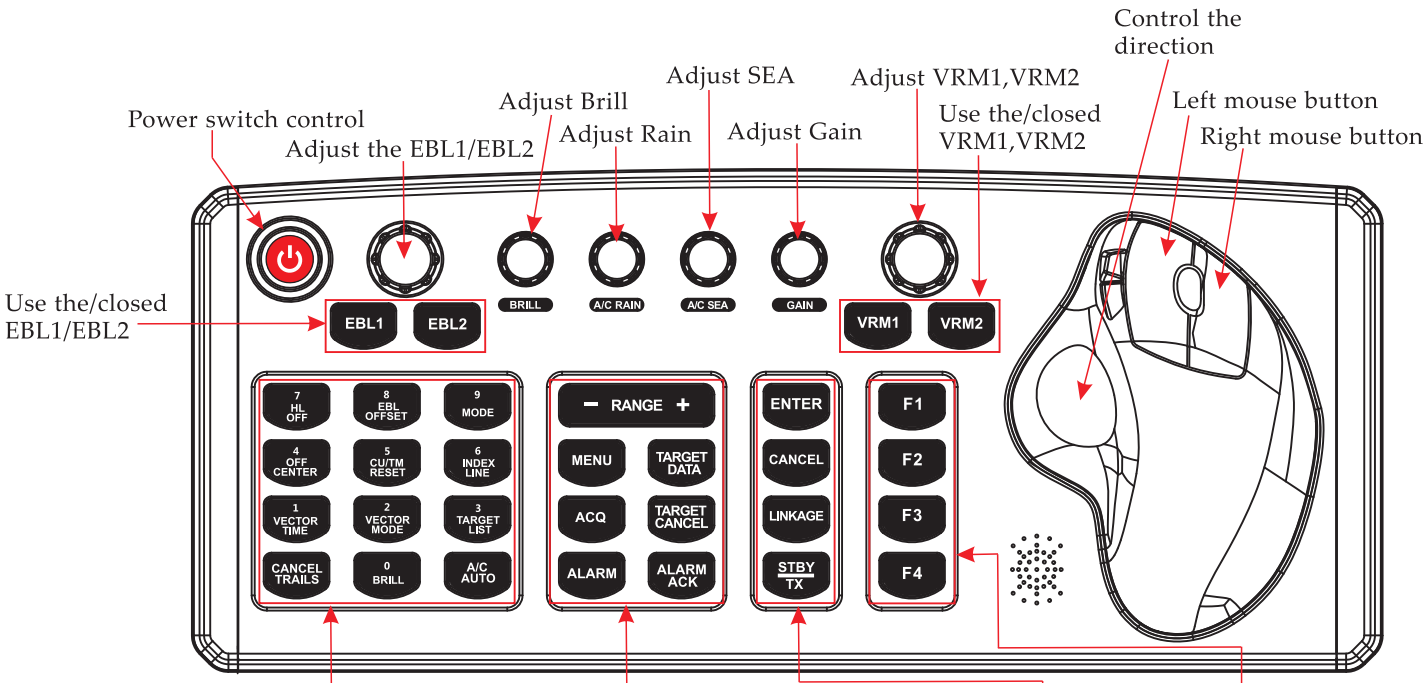


(A) Bird's eye view of situation **(B) Radar picture of (A)**

Figure 1-1 How radar works

2. MAIN MENU

2.1 Control PANEL



Cancel Trails: Echo tracking wake and wake time clearing
A/C Auto: Long press automatic turning, short press control wave suppression automatic/manual
0: Controlled brightness
1: Vector time control
2: Vector mode control
3: Display target list
4: Center control
5: Course up and true motion foreline reset to zero
6: Control display PI line
7: Bow line display control, hold down disappear, release display
8: Control EBL1, VRM1 offset
9: Switch display mode

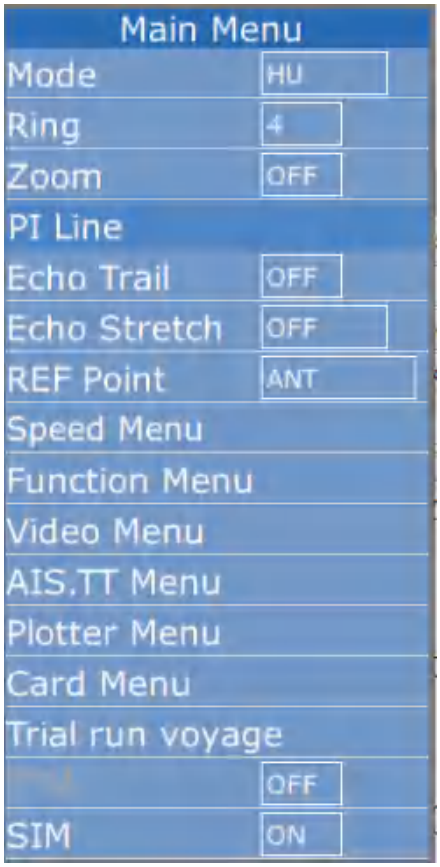
Range +/-: Control range +/-
Menu: Control menu off or on
ACQ: Capture the target
ALARM: Select the alert area of the painting
Target Data: Display AIS.TT target display data in the specified area
Target cancel: Cancels tracking of targets that capture AIS.TT
Alarm ACK: Display the alarm list for alarm silencing

Enter: Confirm option
Cancel: Cancel option
LINKAGE: The radar is linked to the camera
STBY/TX: Switch the standby launch state

Customize function keys 1: The default setting is background color
Customize function keys 2: Default setting is echo color
Customize function keys 3: The default setting is anti-jamming
Customize function keys 4: The default setting is zoom

2.2 MAIN MENU INTERFACE

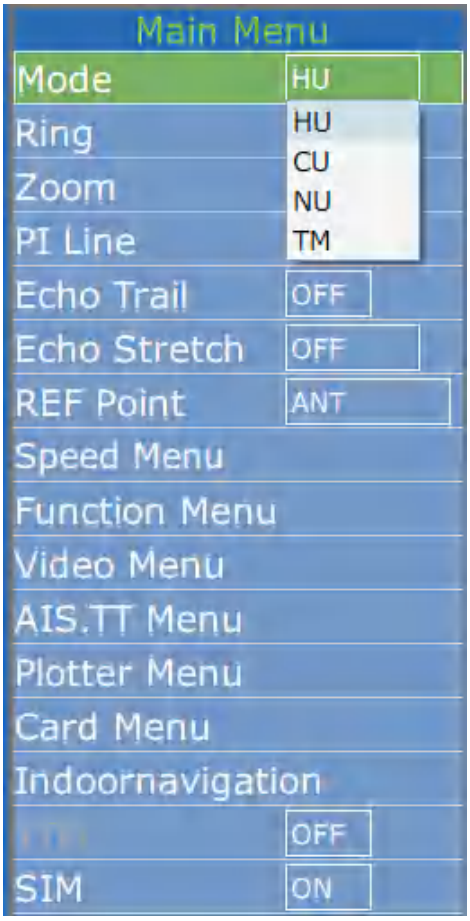
Press the [MENU] key to display the main menu interface.



2.3 DISPLAY MODE(including 5 options: HU UNSTB,HU STB, CU, NU, TM)

Operation steps:

- Move the mouse on the main menu to select the display mode
- Move the mouse to the heading up position
- Click the left mouse button or press [ENT] directly pop-up drop-down box
- Choose need display mode press left key or [ENT] to determine a menu item
- Then press [Menu] key or [Cancel] button from the menu display.
- In addition, you can directly press the quick [Jetty 9] key to switch modes.



Bow up(HU):

The image on the screen keeps the bow line at the top and center of the screen, a pattern often used for navigating crowded waterways.

Course up(CU):

First turn the ship to the heading direction, then press "CU" mode, then the bow is the same as the heading direction, but when the ship is yawing, the course is still displayed in the center of the display. The bow line will swing on both sides of the course following the yaw Angle to show yaw.

North up(NU):

The North marker is displayed in the top center of the screen while the bow line moves to the actual direction relative to the north. This pattern is mostly used as a navigation monitor on the chart when the ship's position is determined.

This image is more stable, which can better restore the target echo.

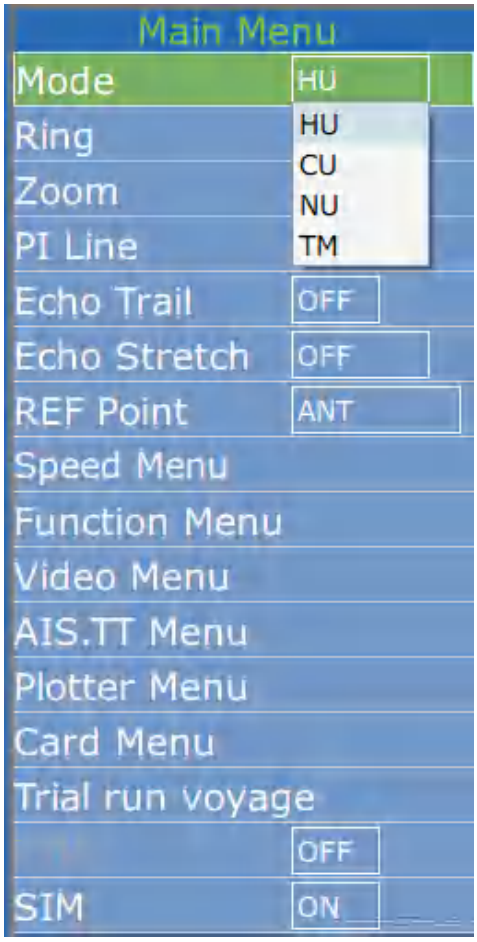
True motion(TM):

This mode shows the true direction of motion of the ship and the moving target.

2.4 Range Ring(Contains five options:OFF,1,2,3,4)

Operation steps:

- It's on the main menu
- Move the mouse to choose the Ring
- Move the mouse over menu item 4
- Press the left mouse button or directly press the [ENT]button to pop up the drop-down box
- Select the desired gear and press the left or [ENT] button to determine the menu item
- Then press menu button or cancel to exit the menu display.



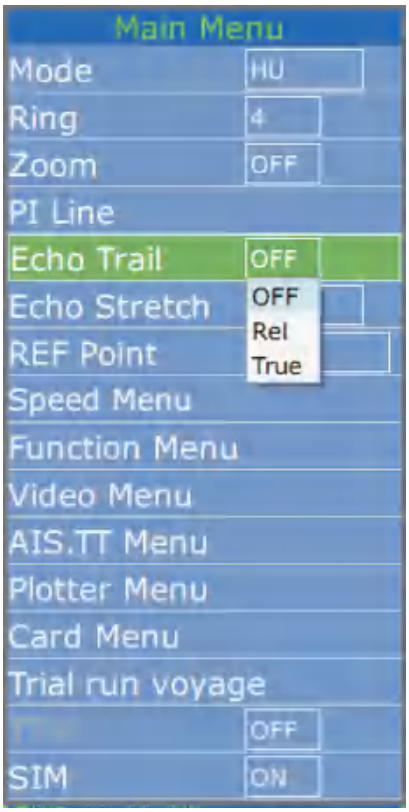
2.5 Echo Trail(Contains three options: OFF, Rel, True)

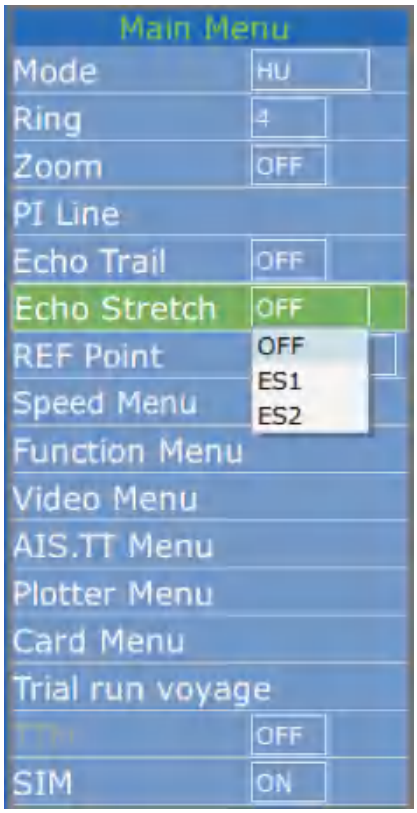
Operation steps:

- Move your mouse over the main menu to select Echo Trail
- Move the mouse to the real position, press the left mouse button or press the [ENT] button directly to pop up the drop-down box.
- Select need mode press the left mouse button or [sure] to determine menu items
- Then press the [Menu] key or [Cancel] key to exit the menu display

OFF:Close the echo trail display
Rel:The historical wake of the movement of the target relative to the native ship is shown
True:Historical wake displays only occur when the object is in motion

Note: The control of wake display time is controlled in the menu item of wake display time in the video menu, and the control of wake display color level is also controlled in the menu item of wake color level in the video menu.





2.6 Echo Stretch(Contains three options:OFF,ES1,ES2)

Operation steps:

- Move your mouse over the main menu to select Echo Stretch
- Move the mouse to the real position, press the left mouse button or press the [ENT] button directly to pop up the drop-down box
- Choose need Stretch press the left mouse button or [ENT] to determine the menu items
- Then press the [Menu] key or [Cancel] key to exit the menu display

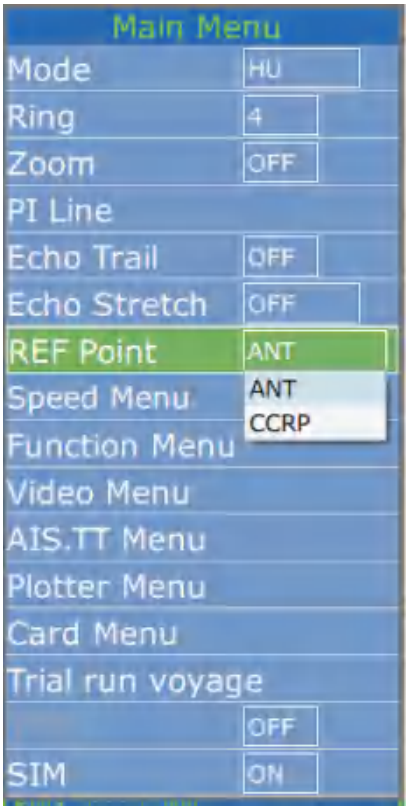
2.7 REF Point(Contains two options: ANT,CCRP)

Operation steps:

- Move your mouse over the main menu to select a reference location
- Move the mouse to the position of antenna press the left mouse button or press [ENT] directly pop-up drop-down box

- Select the required reference point press the left mouse button or [ENT] key to determine the menu item
- Then press the [Menu] key or [Cancel] key to exit the menu display

Note: The reference position for measurements (range, bearing, etc.) and symbols (bow line, stern line, etc.) can be set to the antenna position or the ship's common reference point (CCRP). This position is relevant to all horizontal measurements of the ship, e.g. Range, bearing, relative course, relative speed, nearest approach point (CPA) or time to nearest approach point (TCPA) are all calculated on this basis.



2.8 SIM(Contains two options: OFF,ON)

Operation steps:

- Move the mouse on the main menu to select simulation
- Move the mouse to the open position and press the left button of the mouse or press the [ENT] button directly to pop up the drop-down box
- Select the required reference point press the left mouse button or [ENT] key to determine the menu item
- Then press the [Menu] key or [Cancel] key to exit the menu display

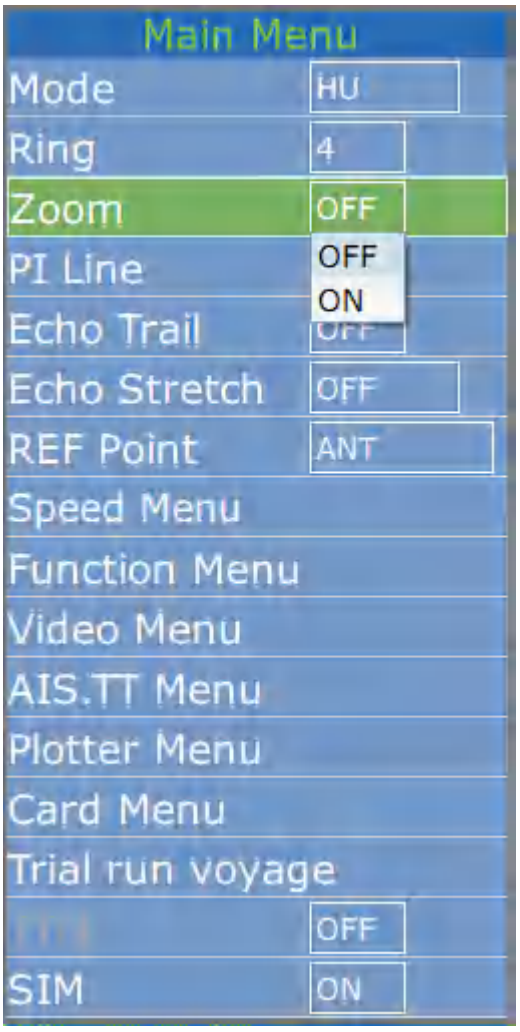
OFF: Disables the analog echo display to display the real echo

ON: Displays analog echo

2.9 ZOOM(Contains two options: OFF,ON)

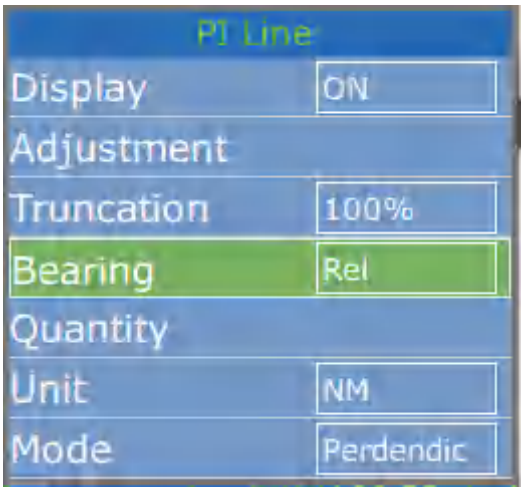
Operation steps:

- Move your mouse over the main menu and select Zoom in
- Move the mouse to the off position
- Click the left mouse button or press [sure] directly pop-up drop-down box
- Choose menu items needed to press left key or [sure] to determine a menu item
- Then move the mouse to any position on the launch interface and click the left button to enlarge, and press the [Cancel] button to exit the operation



3. PI LINE

Press [Menu] to select the parallel index line. Press [ENT] to enter the menu interface of the parallel index line.



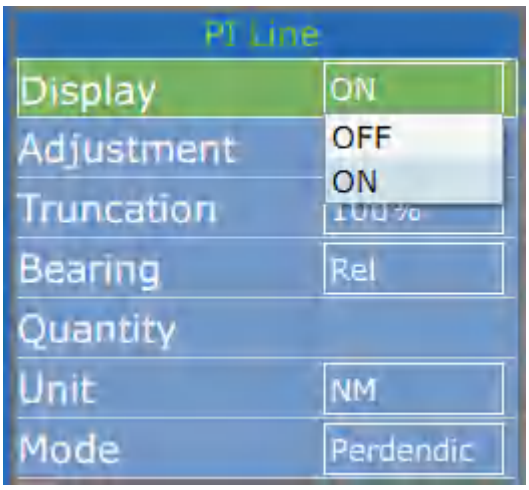
3.1 Display (contains two options: OFF, ON)

Operation steps:

- Move the mouse on the parallel index line interface to select the display
- Then move the mouse to close the position of press the left mouse button or press [sure] directly pop-up drop-down box
- Choose menu items needed to press the left mouse button or [sure] to determine menu items
- Then press [menu] key or [cancel] button from the menu display.
- Or directly press [key 6] to switch the display switch of parallel index line

OFF: Disables parallel index line display

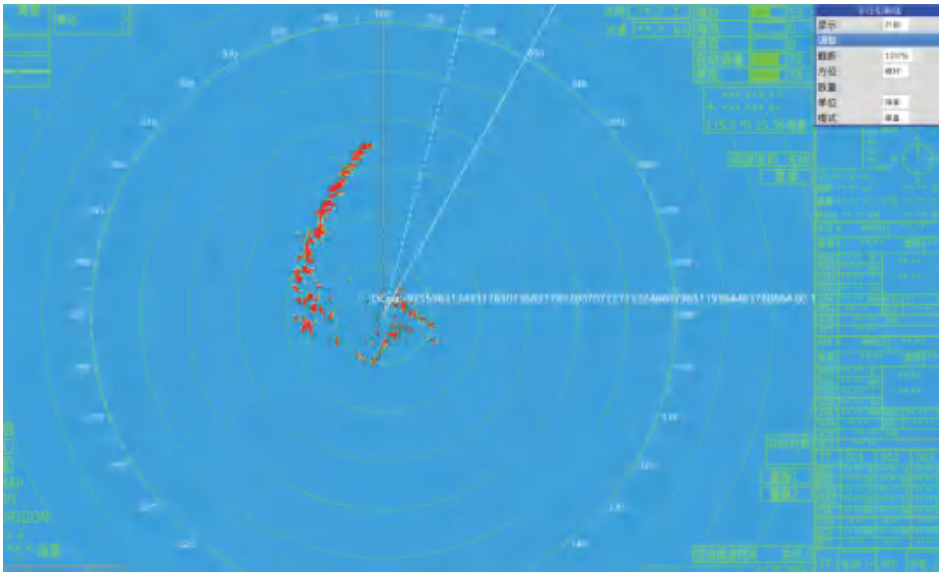
ON: Displays parallel index lines

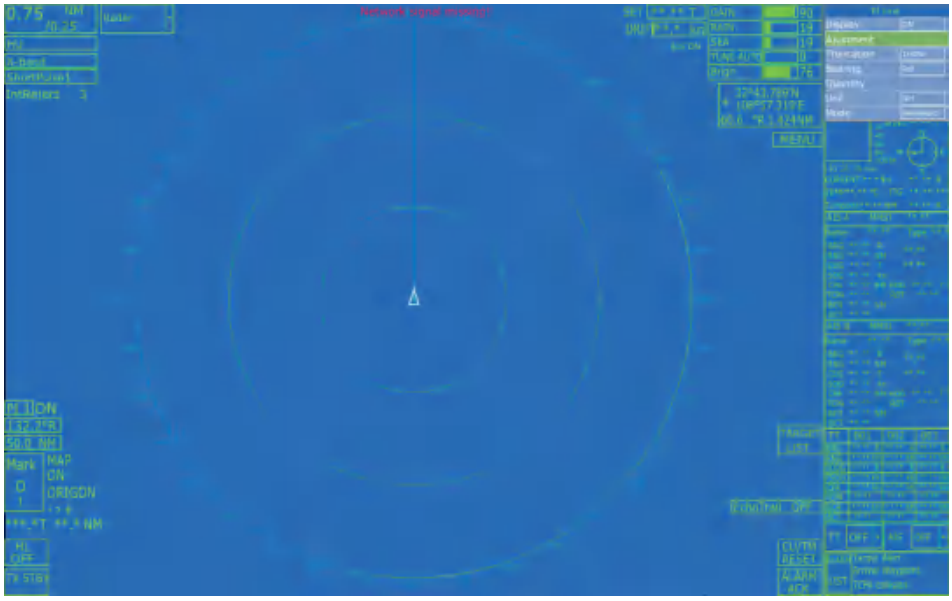


3.2 Ajustment

Operation steps:

- Move the mouse on the parallel index line interface to select adjustments
- Press [ENT] to adjust the parallel index line
- Press the [ENT] key for the first time to adjust the direction of the parallel index line. Press the [ENT] key and then move the mouse to adjust the direction
- Press the second [ENT] key to adjust the spacing of the parallel index line, and also adjust the spacing by moving the mouse.
- Press the third [ENT] button to end the adjustment
- Then press [Menu] to return to the upper menu or [Cancel] to exit the menu directly



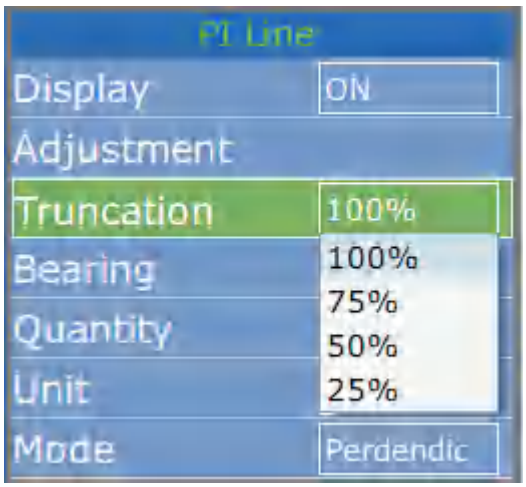


3.3 Truncation (Contains four options: 25,50,75,100)

This function is used to select the display length of parallel index lines.

Operation steps:

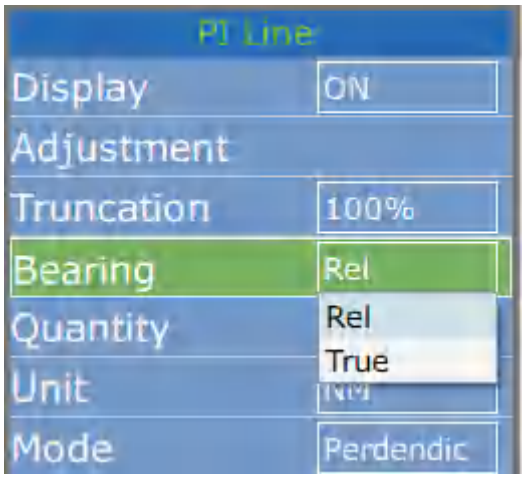
- Move the mouse over the parallel index line screen to select truncation
- Click the left mouse button move the mouse to 100% of the location or press [sure] pop-up drop-down box
- Select the desired option and press the left or [ENT] key to determine the menu item
- Then press [Menu] to return to the upper menu or [Cancel] to exit the menu directly



3.4 Bearing(Contains two options: Rel.True)

Operation steps:

- Move the mouse to select orientation on the parallel index line interface
- Move the mouse to the relative position and click the left mouse button or press [ENT] to pop up the drop-down box
- Select the desired option and press the left or [ENT] key to determine the menu item
- Then press [Menu] to return to the upper menu or [Cancel] to exit the menu directly



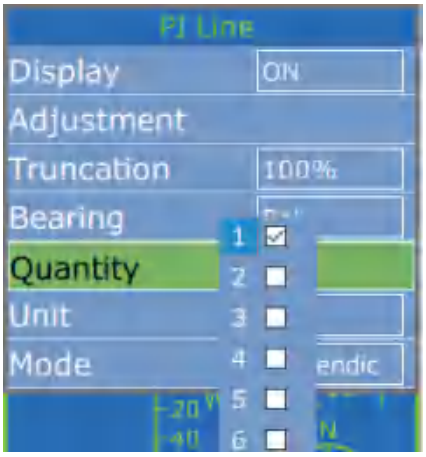
3.5 Quantity(Contains 6 options: 1,2,3,4,5,6)

This feature is multi-selected

Operation steps:

- Move the mouse on the interface of parallel index line to select the number and press [ENT] to pop up the window
- Select the desired number by moving the mouse button and press the left mouse button or the [ENT] button
- Then press [cancel] button to exit the operation and return to the higher level menu.

Note: The first step is checked, and the second step is unchecked

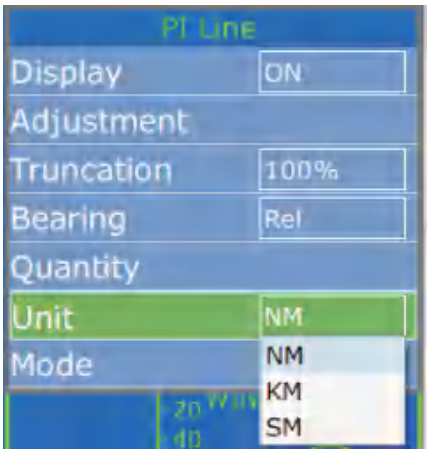


3.6 Unit (Contains three options: NM, KM, SM)

This function is to modify the spacing unit of parallel index lines

Operation steps:

- Move the mouse to choose the unit
- Move the mouse to the position of the sea click the left mouse button or press the [ENT] button to pop up the drop-down box
- Select the required unit and press the left button or [ENT] button to determine the option
- Then press [Menu] to return to the upper menu or [Cancel] to exit the menu directly

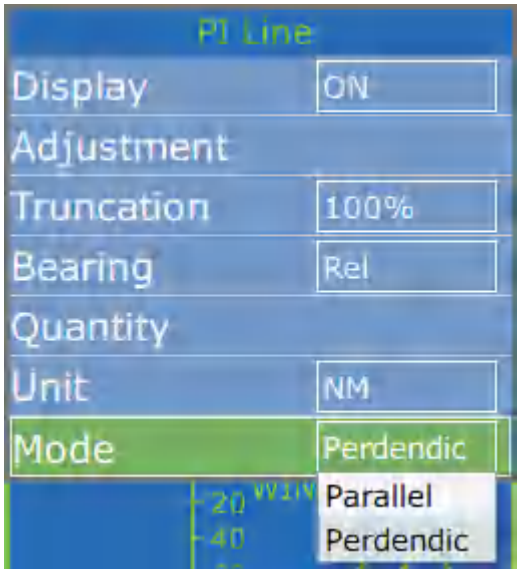


3.7 Mode (contains 2 options; Parallel, Perdendic)

This function resets the display position of parallel index lines.

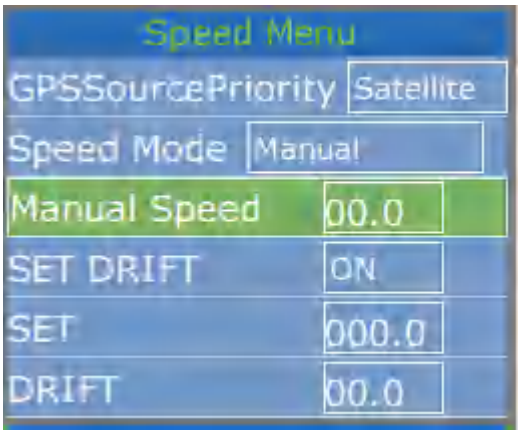
Operation steps:

- Move the mouse over the parallel index line interface to select a mode
- Move the mouse to the parallel position and click the left mouse button or press the [ENT] button to pop up the drop-down box
- Select the required unit and press the left button or [ENT] button to determine the option
- Then press [Menu] to return to the upper menu or [Cancel] to exit the menu directly



4. SPEED MENU

Press the menu key to select the speed menu. Press [ENT] to enter the speed menu interface.

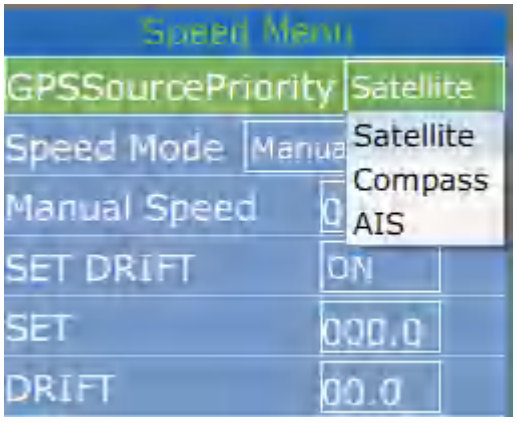


4.1 GPS Source Priority (includes three options: satellite, Compass, AIS)

This function is used to switch GPS priorities

Operation steps:

- Move the mouse on the speed menu interface to select the GPS source priority
- Move the mouse to the position of the satellite, click the left mouse button or press the [ENT] button to pop up the drop-down box
- Choose need AIS press left key or [ENT] to determine options
- Then press [Menu] to return to the upper menu or [Cancel] to exit the menu directly

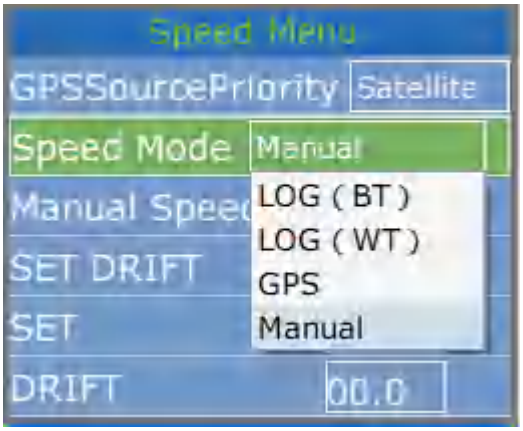


4.2 Speed Mode(Contains four options: LOG(BT),LOG(WT), GPS, Manual)

Operation steps:

- Move the mouse to select the ship speed on the speed menu interface
- Move the mouse to the GPS position and click the left mouse button or press the [ENT] button to pop up the drop-down box

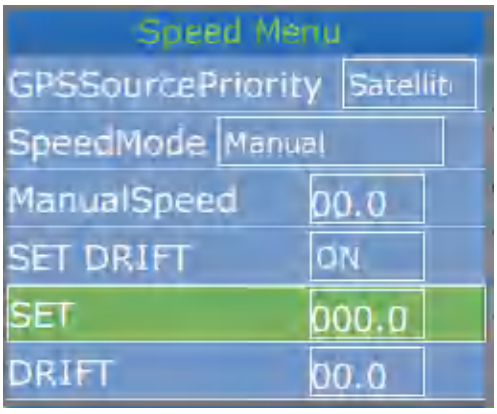
- Select the desired option and press the left button or the "OK" button to determine the option
- Then press [Menu] to return to the upper menu or [Cancel] to exit the menu directly



4.3 Manual Speed (these three functions are for editing window types)

Operation steps:

- Move the mouse over edit box 00.0 on the Speed menu interface
- Click the left mouse button will pop up a keyboard interface software
- Then set the desired value by moving the mouse click
- Click ok to complete the setup.
- Then press [Menu] to return to the upper menu or [Cancel] to exit the menu directly

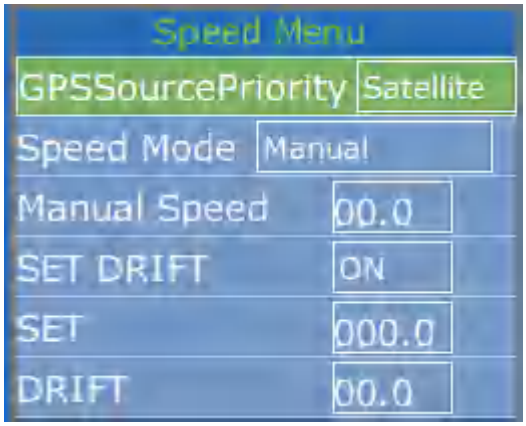




4.4 Set & Drift (includes two options: OFF, ON)

This function controls whether the underlying fixed and drift values take effect.
This function does not take effect in the Off state. It takes effect only in the On state
Operation steps:

- Move the mouse on the Speed menu screen to select Set and Drift
- Move the mouse to the closed position, click the left mouse button or press the [ENT] button to pop up the drop-down box
- Select the desired option and press the left button or the "OK" button to determine the option
- Then press [Menu] to return to the upper menu or [Cancel] to exit the menu directly



5. VIDEO MENU

Press the menu key to select the video menu. Press [ENT] to enter the video menu screen.



5.1 Basic Function Menu

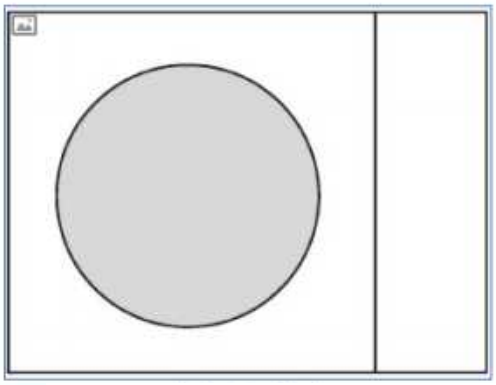
Operation steps:

- Move the mouse over the menu subitem to the left of the menu item
- Click the left mouse button or the [ENY] key to pop up the drop-down box
- Select the required menu item function, press the [ENT] button or the left mouse button to determine the options

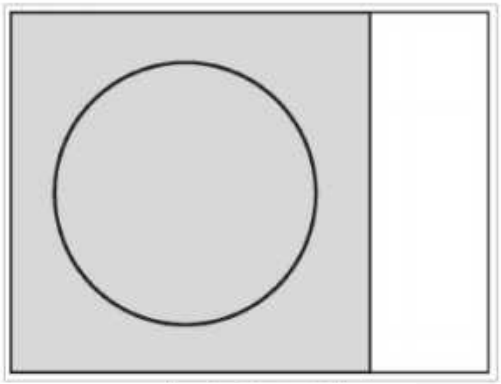
Trail Tone	Contains two options：Single,Multi
Int Reject	Contains four options：OFF，1，2，3
Noise Reject	Contains two options：OFF.ON
Pluse Length	This function displays the corresponding pulse width options according to the range
Trail Time	Contains eight options：15S,30S,1M,3M,6M,15M,30M, ALL
Tune	Contains two options：Auto，Manual
D.Range	Contains three options：Nar,Mid,Wide
Dead Sector	Contains two options：OFF，ON
Echo Area	Contains two options：Round，Wide

5.2 Echo Area

Echo display range can be set to circle or square as required, which can be set through the “Echo Area” item in the video menu.



Round

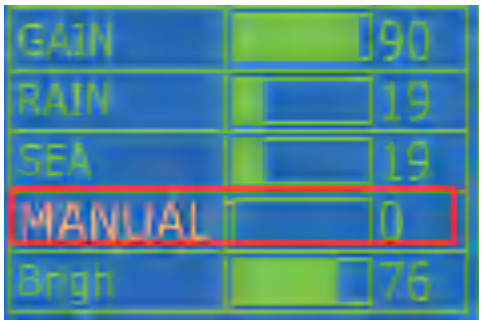


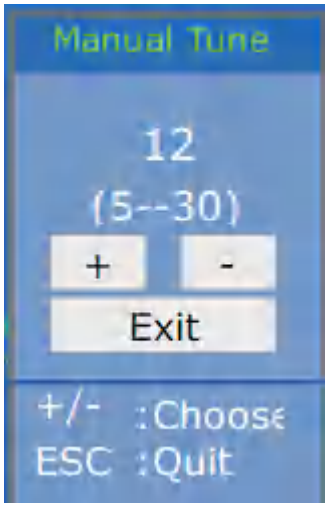
Wide

5.3 Tuning Mode

- After selecting Manual, click Manual tuning on the main interface with the mouse and a display interface of manual tuning voltage will pop up
- Adjust the voltage by clicking the plus or minus on the manual tuning interface
- Press [Cancel] to exit the Settings window

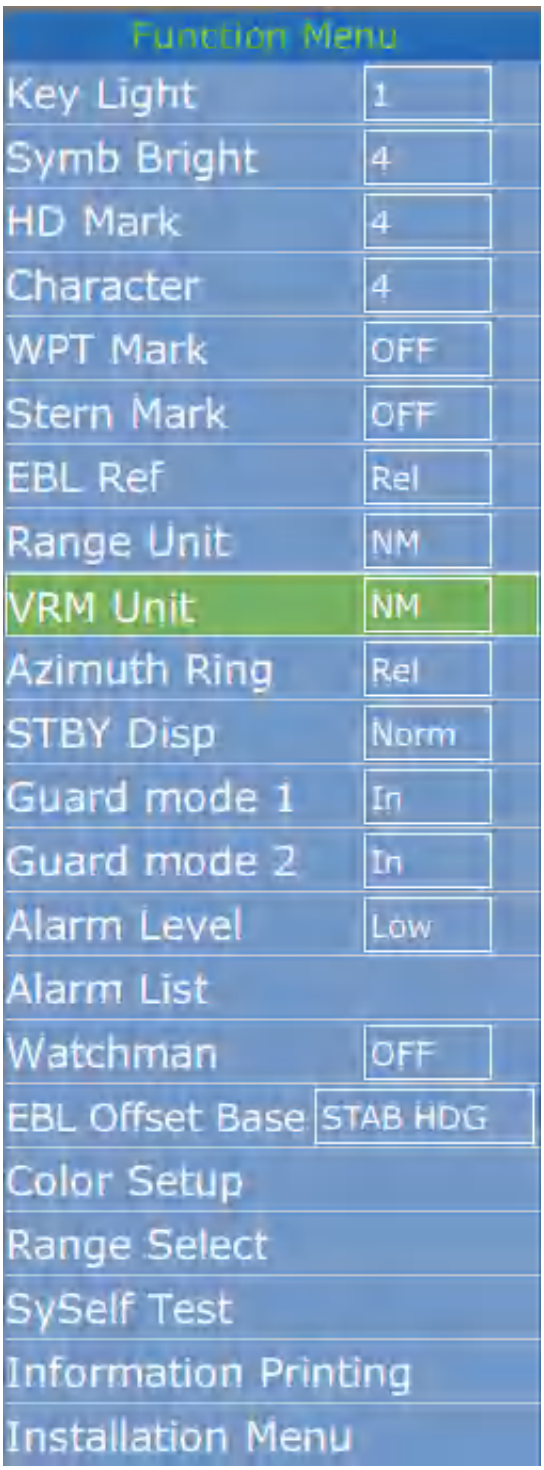
As follows:





6. FUNCTION MENU

Press the menu key to select the function menu. Press [ENT] to enter the function menu interface.



6.1 Function Menu Basic Operation

- Move the mouse over the menu subitem to the left of the menu item
- Click the left mouse button or the [ENT] key to pop up the drop-down box
- Select the required menu item function, press the [ENT] button or the left mouse button to determine the options

Keyb Linght	The brightness display for controlling the keyboard consists of four gears
Symbol bright	Select variable range markers, electronic bearing line, vernier, alert area and light point markers, including four gear positions
HD Mark	Four gears control the brightness of the bow line
Character	There are four gears to control the brightness of the character display
WPT Mark	Control waypoint marking switch
Stern Mark	Display switch that controls the stern line
EBL Ref	Switch azimuth line display unit
Range Unit	Switch range display unit
VRM Unit	Toggle variable distance label display unit
Azimuth Ring	Change the display mode of azimuth circle
STVBY Disp	Switch the standby screen display mode
Guard mode 1	Select the trigger mode of the alarm, enter or leave
Guard mode 12	Select the trigger mode of the alarm, enter or leave
Alarm Level	Set the minimum echo intensity that triggers the alarm
Watchman	Enable the Sentinel function to set sleep time or disable the watch function
EBL Offset Base	Used to set the calculation base when the electronic azimuth line is offset.

6.2 Alert List

Operation procedure

- On the Functions menu, move your mouse over the Alert List menu item
- press [ENT] alarm list into the interface
- Click the mouse to switch between the upper and lower pages
- press [cancel] to build from the interface
- Or press the shortcut key [Alarm ACK] key to display the alarm list interface



6.3 Range selection

Operation steps:

- Move the mouse to select the range on the function menu interface
- Press [ENT] to pop up the window
- Select the desired number of ranges by moving the mouse
- Press the left mouse button or [ENT] button to check
- Then press the [Cancel] key to exit the operation and return to the superior menu

Note: The first step is checked, and the second step is unchecked.

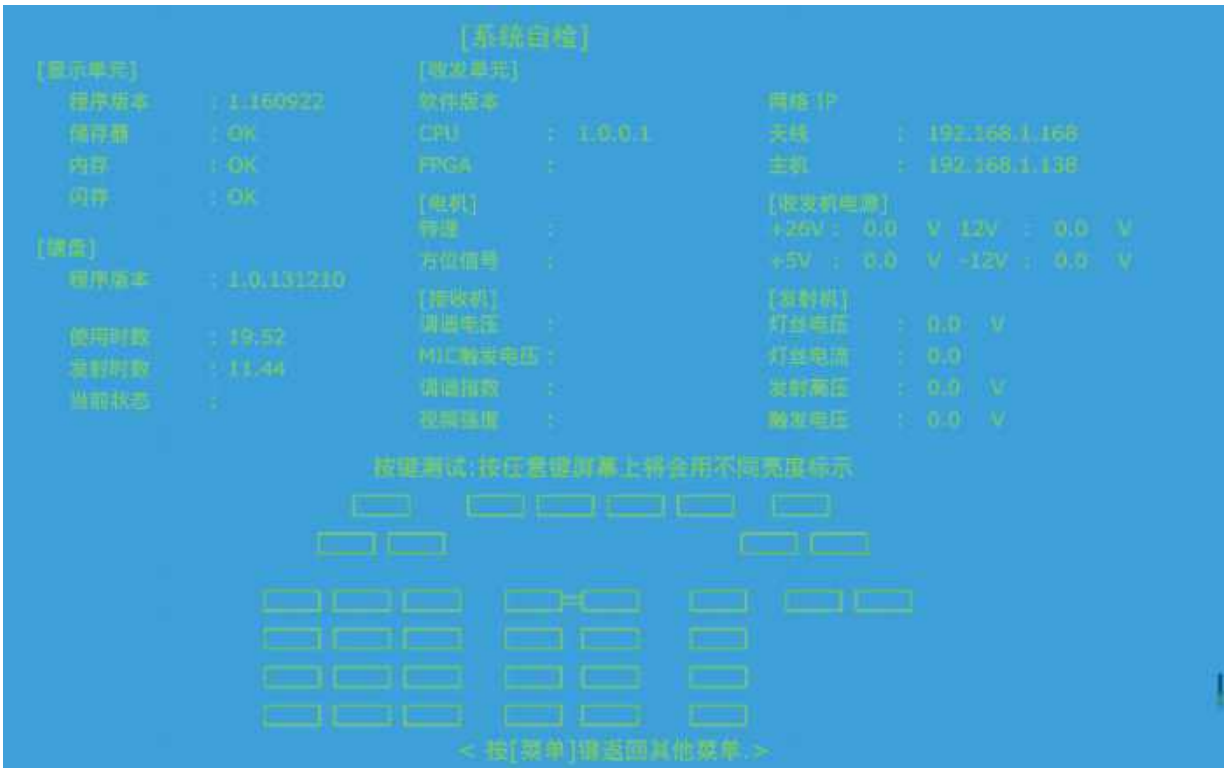
Note: The options in the range selection list are displayed along with the maximum range value in the Factory menu



6.4 Self Test

Used to test keys, program memory and memory, check antenna speed and display Operation steps:

- Move the mouse on the feature menu interface
- Select the system self-check menu item
- Press [ENT] to enter the system self-test interface


[系统自检]
[显示单元]
程序版本 : 1.160922
储存器 : OK
内存 : OK
闪存 : OK
[键盘]
程序版本 : 1.0.131210
使用时数 : 19.52
发射时数 : 11.44
当前状态 :
[收发单元]
软件版本
CPU : 1.0.0.1
FPGA :
[电机]
转速 :
方位信号 :
[接收机]
调谐电压 :
MIC触发电压 :
调谐指数 :
视频强度 :
网络 IP
天线 : 192.168.1.168
主机 : 192.168.1.138
[收发机电源]
+26V : 0.0 V 12V : 0.0 V
+5V : 0.0 V -12V : 0.0 V
[发射机]
灯丝电压 : 0.0 V
灯丝电流 : 0.0
发射高压 : 0.0 V
触发电压 : 0.0 V
按键测试:按任意键屏幕上将会用不同亮度标示
< 按[菜单]键返回其他菜单 >


[Self Test]
[Display unit]
S/W Ver : 1.160922
ROM : OK
RAM : OK
FLASH : OK
[Keyboard]
S/W Ver : 1.0.131210
HoursUse : 80.8
TxHours : 8.5
Current State:
[RX/TX Unit]
S/W Ver
CPU : 1.0.0.1
FPGA :
[Motor]
Speed :
Azimuth :
[RX Unit]
Tune :
MIC Trig.V :
Tune IND :
Video Leve :
LAN IP
Antenna : 192.168.1.100
Main unit : 192.168.50.160
[TransceiverPower]
+26V : 0.0 V 12V : 0.0 V
+5V : 0.0 V -12V : 0.0 V
[TX Unit]
MAG.Curren : 0.0 V
MAG.Heater : 0.0
TX HV : 0.0 V
V Trig : 0.0 V
Key test:Press each key and check on-screen indication lights.
< Press MENU for OTHERS menu.>

7. COLOR SETTING

On the function menu interface, select the color setting menu item and press [ENT] to enter the color setting interface.



7.1 COLOR SETUP BASIC OPERATION

- Move the mouse over the menu subitem to the left of the menu item
- Click the left mouse button or the [ENT] key to pop up the drop-down box
- Select the required menu item function, press the [ENT] button or the left mouse button to determine the options

Theme	Contains three options: Daytime,Dusk,Night
Daytime-BackColor	Contains three options: green, yellow, Multi
Daytime-EchoColor	Contains five options: black/green, dark blue/green, blue/green, blue/white, and black/red
Dusk-BackColor	Contains three options: green, yellow,Multi
Dusk-EchoColor	Contains five options: black/green, dark blue/green, blue/green, blue/white, and black/red
Night-BackColor	Contains three options: green, yellow, Multi
Night-EchoColor	Contains five options: black/green, dark blue/green, blue/green, blue/white, and black/red

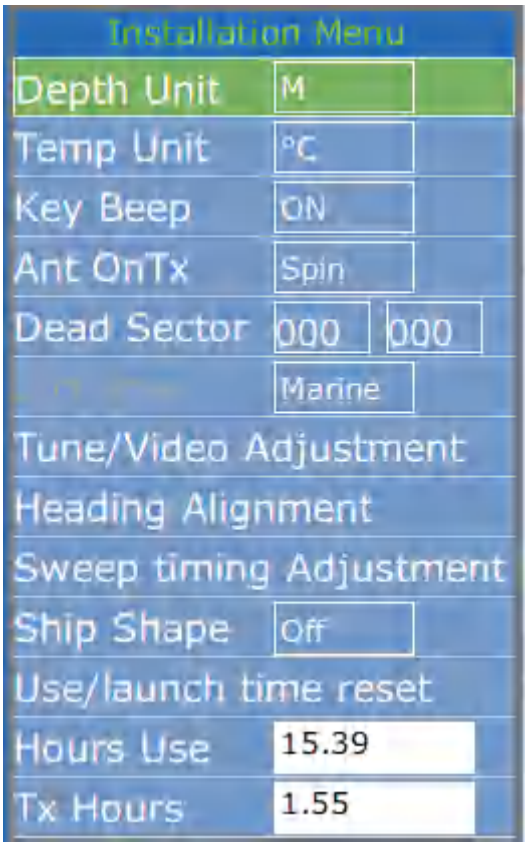
7.2 Restore Default Setting

Select "Restore default Settings" on the color setting interface and press [ENT] to restore the default Settings for the background color and echo color of theme - Day - dusk - night in the color setting interface.



8. INSTALLATION MENU

Selecting the Installation Menu on the Function Menu Screen Press OK to enter the Installation menu screen.



8.1 Basic Function

Operation steps:

- Move the mouse over the menu subitem to the left of the menu item
- Click the left mouse button or the [ENT] key to pop up the drop-down box
- Select the required menu item function, press the [ENT] button or the left mouse button to determine the options

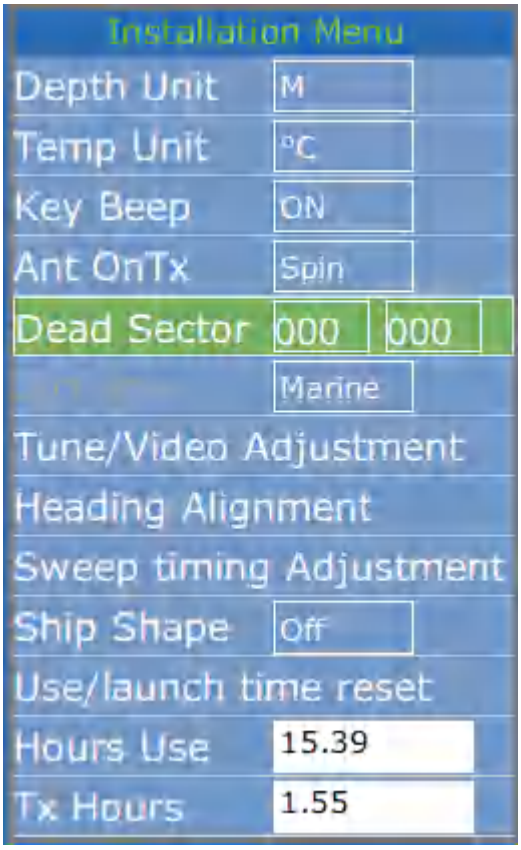
Depth Unit	Contains three options: meters, fathoms, feet
Temp Unit	Contains two options: ° C, ° F
Ant On TX	Contains two options: rotate, stop
Key Beep	Contains two options: OFF,ON

8.2 Scan Prohibition

Operation steps:

- On the Installation menu screen
- Move the mouse to the edit box and click the left button to pop up the software disk
- Then move the cursor to the desired value and click ok to complete the setting

Note: After the setting is complete, enable or disable the forbidden scanning area in the video menu to control whether the setting takes effect.

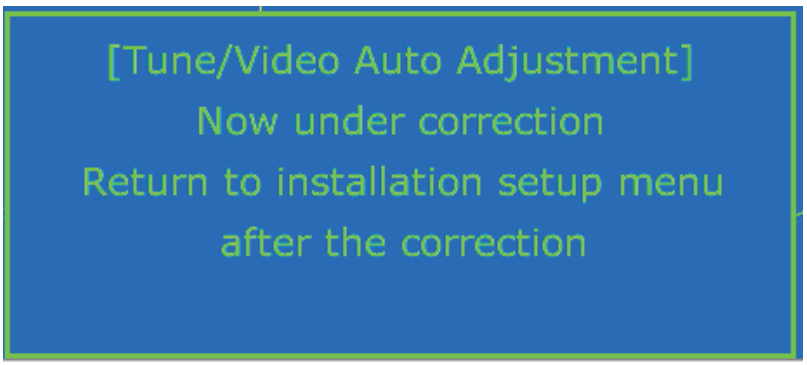




8.3 Tune/Video Adjustment

Operation steps:

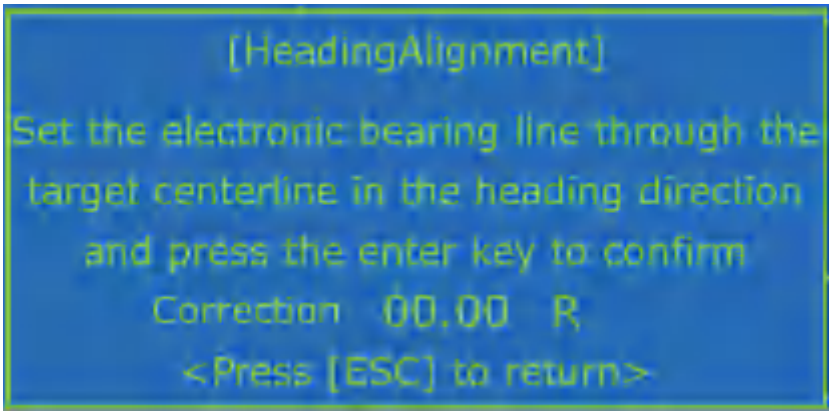
- Move the mouse on the setup menu to select the Tune/Video Auto Adjusment option
- Press [ENT] button to pop up automatic tuning/display automatic adjustment interface
- Perform automatic tuning in the end of the tuning interface will automatically exit



8.4 Heading Alignmennt

Operation steps:

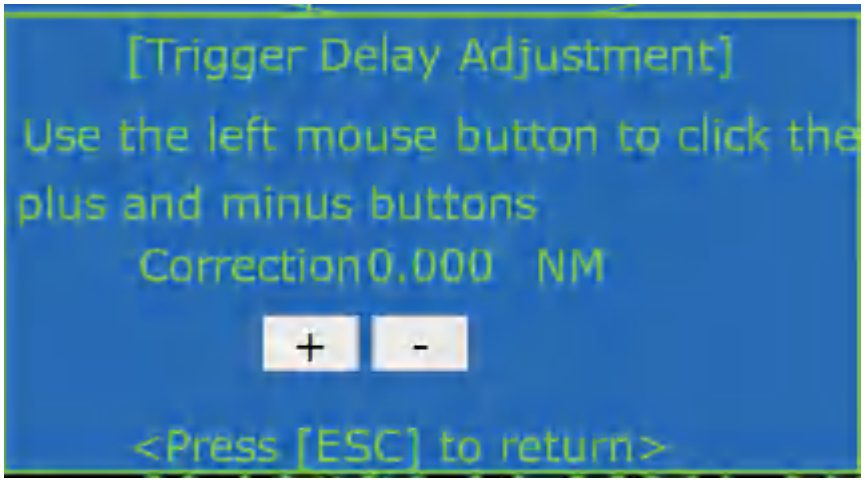
- Move your mouse over the Setup menu to select the bow alignment option
- Press [ENT] to pop up the bow line correction interface
- Move the mouse to the target position that needs to be corrected to the bow and press [ENT] to correct
- press [cancel] key operation



8.5 Trigger Delay Adjustment

Operation steps:

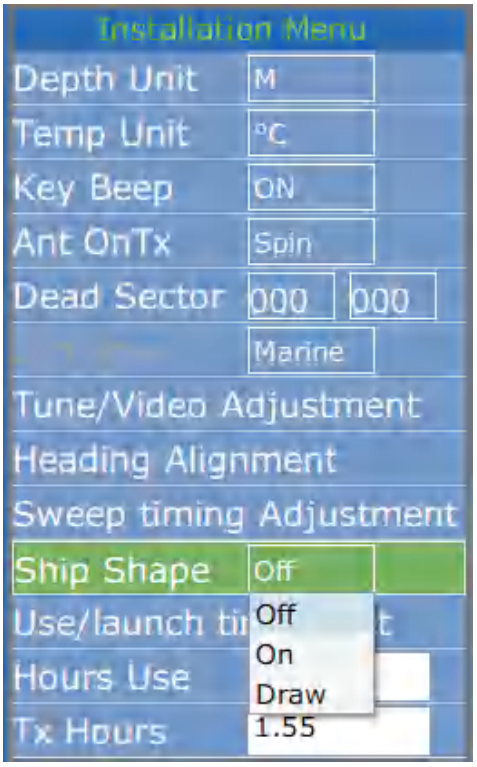
- Move your mouse over the Install menu to select the Trigger delay adjustment option
- Press [ENT] to enter the trigger delay adjustment screen
- Adjust the trigger delay by moving the mouse and clicking the plus or minus key
- press [cancel] key operation



8.6 Own Ship Shape

Operation steps:

- Move the mouse to select the ship outline on the installation menu
- Move the mouse to the closed position and click the left mouse button or press the [ENT] button to pop up the drop-down box
- Select the corresponding option and press the left button or the [ENT] button to determine the option



Drawing the outline of the ship

Operation steps:

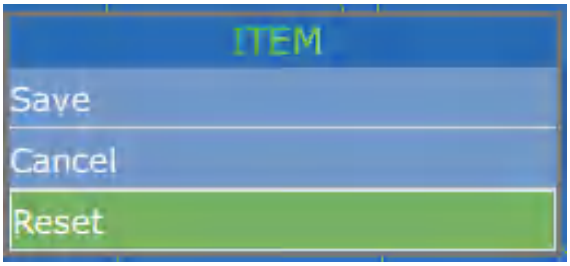
- In the ship Outline menu item of the installation menu
- Choose drawing
- Press [ENT] key to enter the ship outline painting interface

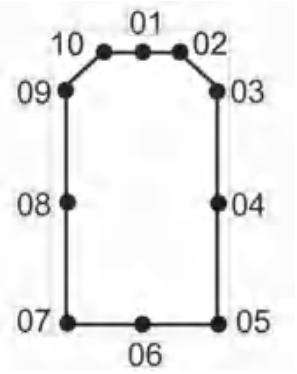
The true scale outline of the ship can be displayed on the screen as follows

Painting steps:

- By moving the mouse position to click the left mouse button to draw the position of the point
- The first starting point shows the * sign for the antenna position
- After drawing another ten points, it will automatically close into a region shape
- A menu option window appears as shown below:

Save painting by selecting Save or cancel painting and repaint





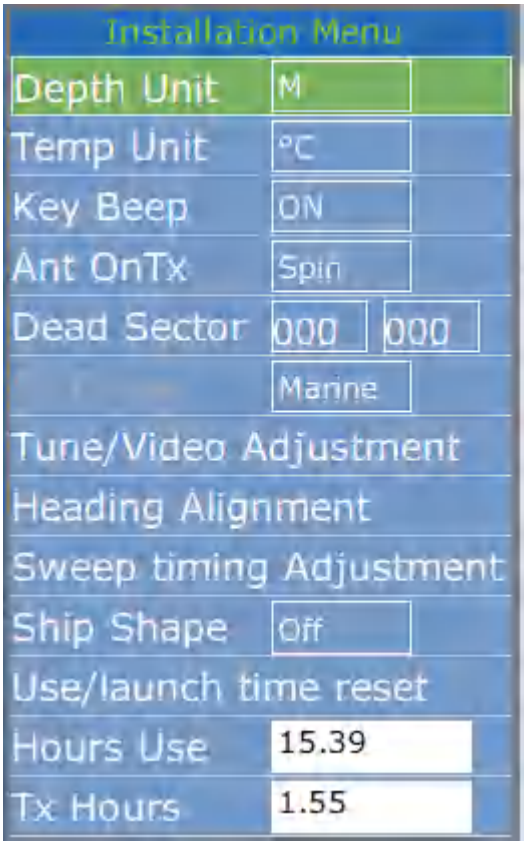
8.7 Use/TX Time Reset

Operation steps:

- Move your mouse over the Use/Launch Time Reset menu item on the Install menu screen
- Press [OK] to reset zero

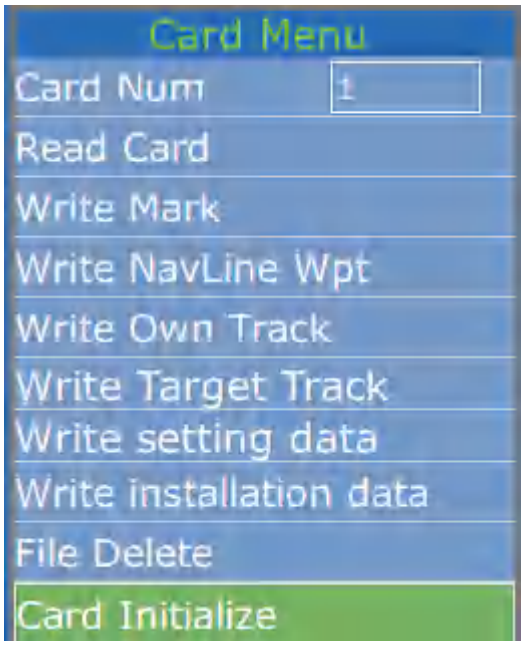
Usage time: Records the usage time of the antenna

Transmitting time: Records the time when the antenna is transmitting



9. CARD MENU

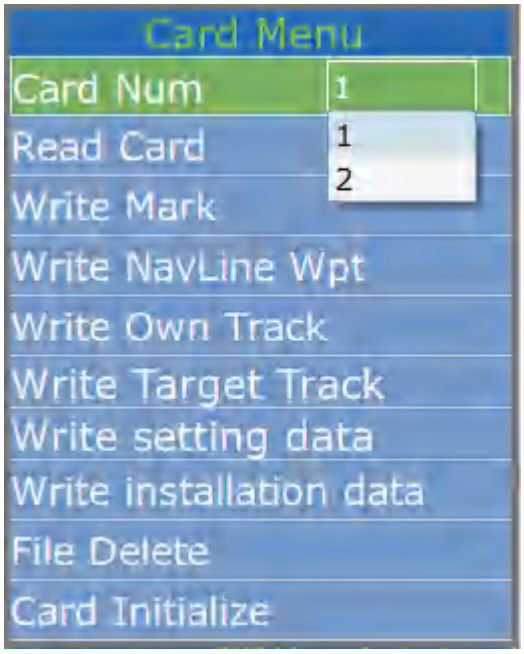
Select the Memory card option on the main menu interface and press [ENT] to enter the memory card interface.



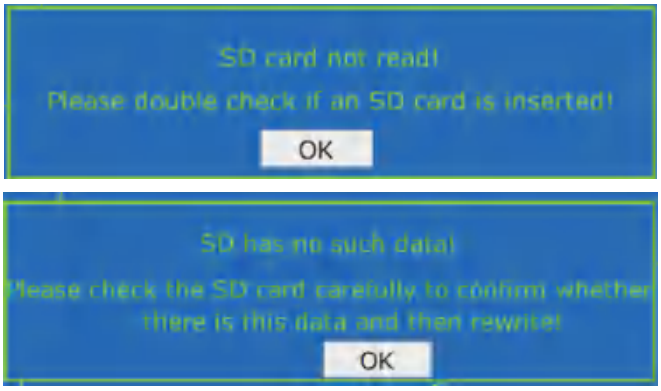
9.1 Select SD Card

Operation steps:

- On the memory card interface, move the mouse to 1 to select the corresponding SD card
- Press the [ENT] key or left mouse button to determine the SD card slot



Note: If you select all menu items except the menu item of SD card when no SD card is inserted, the prompt window shown below will be displayed. Move the mouse and click OK to exit the window prompt.



9.2 Read Card

Operation steps:

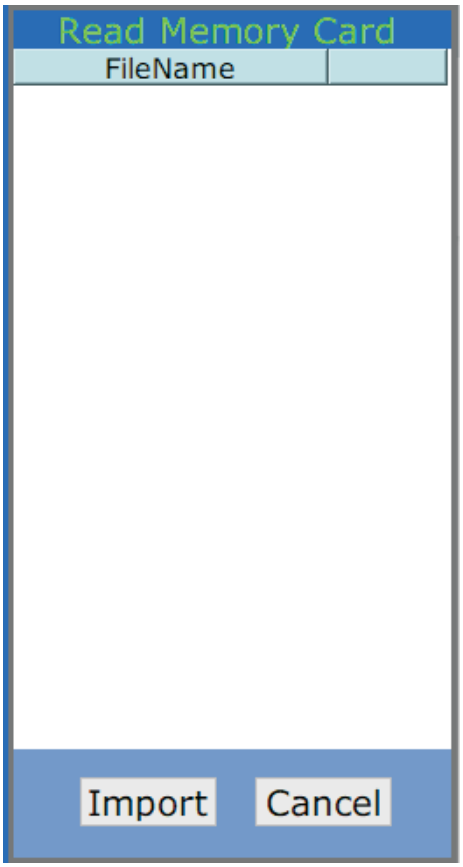
- The memory card menu is displayed
- choose read memory card press [ENT] into the memory card interface
- After selecting the data item to be imported by moving the mouse
- Click the import data import
- Click cancel choose cancel import action out of the current window

Note: Setting data refers to the menu Settings

Map data: refers to all the painted navigation points, marks, routes, regions, place names, flight tracks, etc., in the plotter

Installation data: refers to the menu Settings in the installation menu

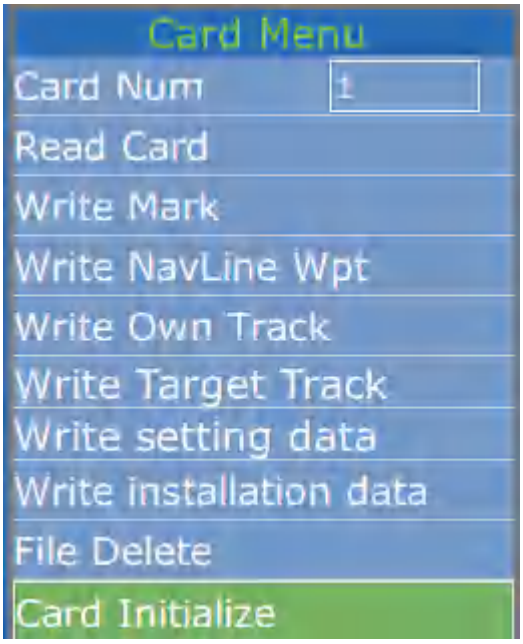
Note: The import of reading memory card refers to the import of external data into the ship



9.3 Write Data

(Contains six write operations:Wr Mark,Wr NavLine.Wpt,Wr OwnTrack,Wr TargetTrack, Wr SettingData,Wr InstallData)

In the memory card involves writing the ship's data to the SD card, and then the data into another machine operation.



Operation steps:

- First, you need to confirm whether to insert the SD card
- After confirming that the SD card is inserted and the SD card slot is selected
- Choose need to write to the menu item of data in SD card
- Press the [ENT] key and a prompt window will pop up as shown in Figure 1
- move the mouse to click yes or no for the next step of operation
- Click the Yes button to write data to the SD card
- The prompt window that will prompt the completion of writing after the completion of writing is shown in Figure 2
- Then click OK button to exit the window and complete the writing operation
- Click the No button to cancel the write operation to exit the window

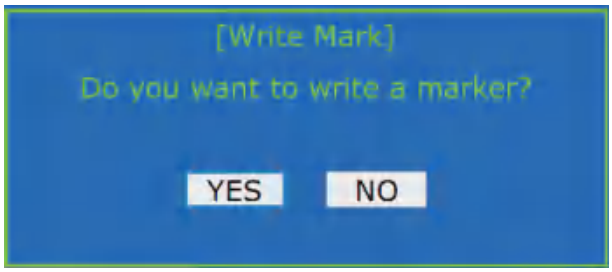


Figure_1

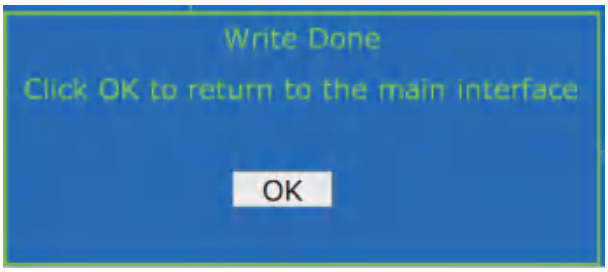


Figure_2

9.4 File Delete

This function is to delete files in the SD card operation

Operation steps:

- In the memory card interface
- choose file deletion
- Press [ENT] to enter the file deletion interface as shown in Figure 1
- Move the mouse to select the file you want to delete
- click delete as shown in figure 2 shows a tooltip window will appear
- Then move the mouse to click delete or cancel button for the next action
- After click the delete button to delete the selected file (temporarily did not increase the click delete delete prompt dialog box and progress after the deletion hint, look at whether to need to increase the next)
- Click Cancel to exit the current delete operation

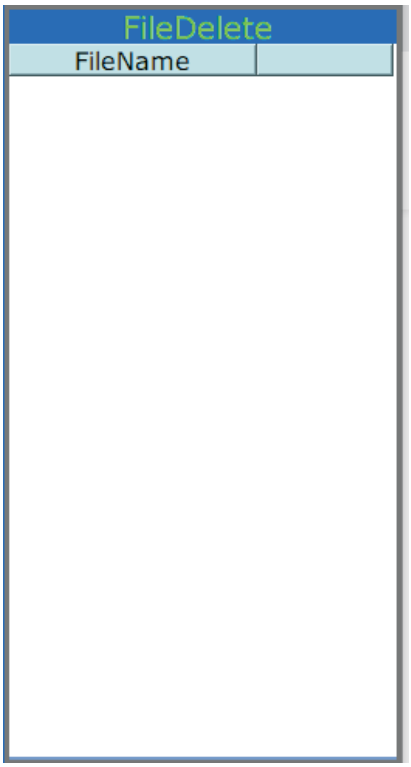


Figure 1

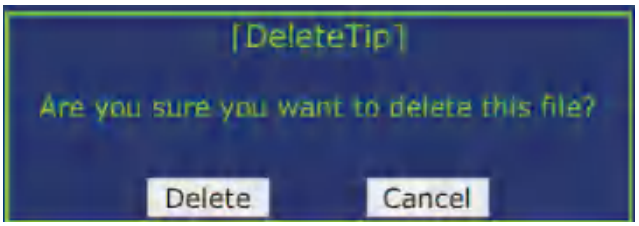


Figure 2

9.5 Format Card

This function is for formatting an SD card

Operation steps:

- In the case of ensuring that the SD card is inserted
- storage card interface
- Select the CardInitialize item

- Press [ENT] to pop up the prompt window as shown in Figure 1
- Move the mouse to click the button for the next action
- click button is for formatting to format the SD card is completed you will be prompted as shown in figure 2 shows the prompt window click OK to complete the operation
- click no button to exit the current formatting

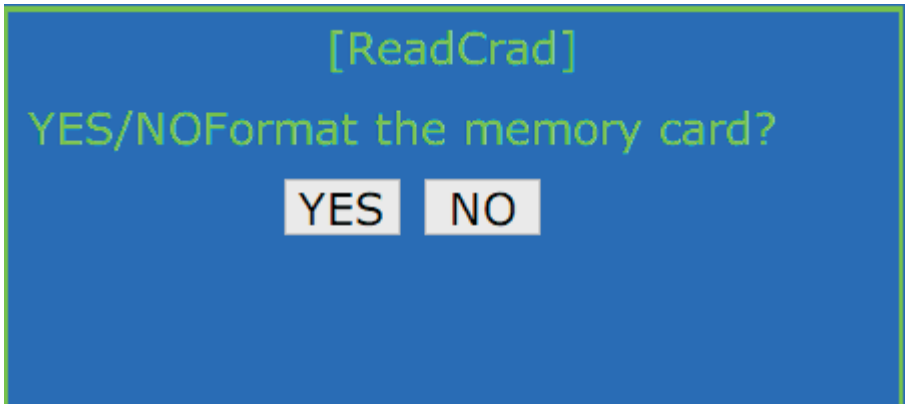
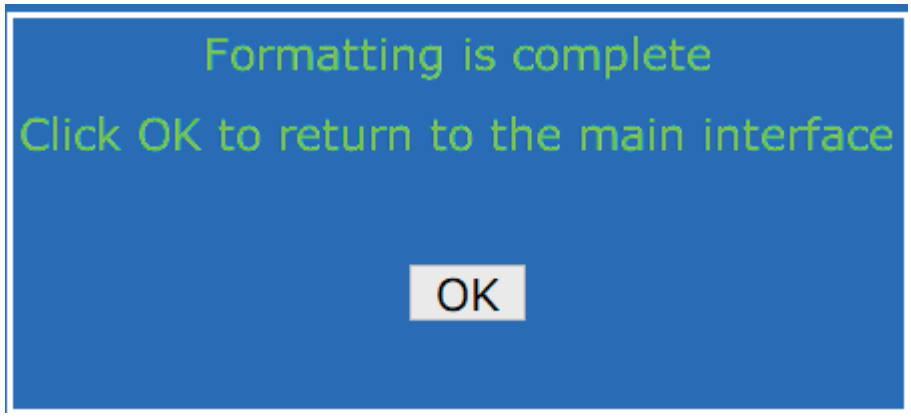


Figure 1



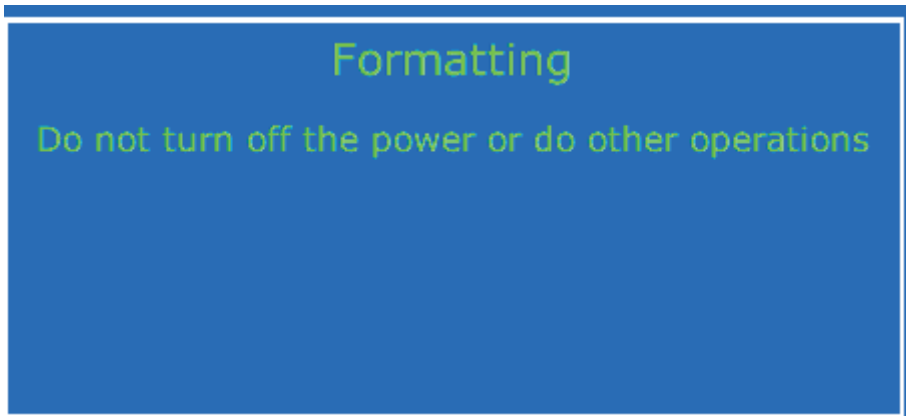


Figure 2

10. TRIAL MANOEUVRE

This function is used to simulate whether ships will collide and avoid collisions.
Operation steps:

- Select test flight in the main menu interface
- Click the [ENT] button to enter the test operation interface as shown in Figure 1
- After setting the corresponding parameters by moving the mouse
- choose began to run option
- Press [ENT] to simulate the scene as shown in Figure 2
- According to the parameters currently set to simulate the position of ten points to see whether there will be a collision between this ship and the target ship, so as to judge whether to avoid
- If you want to end the simulation in advance during the simulation process, move the mouse to select the option to end the operation and press [ENT] to end the scene simulation in advance. (Note: Operation of the edit box: Click the left mouse button on the edit box and a software keyboard interface will pop up. Then move the mouse to set the required value and click ok to complete the setting.)

Disp On Off	The options include "off" and "On".
Stable Base	Contains two reference options for sea and ground
Display Color	Contains seven color options: red, green, blue, yellow, cyan, magenta and white

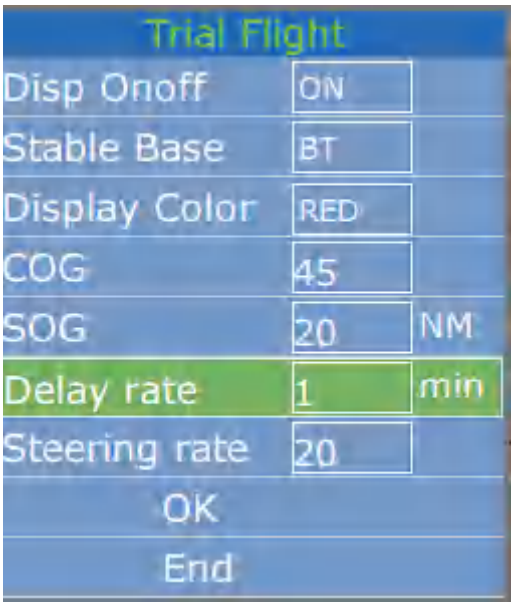


Figure 1



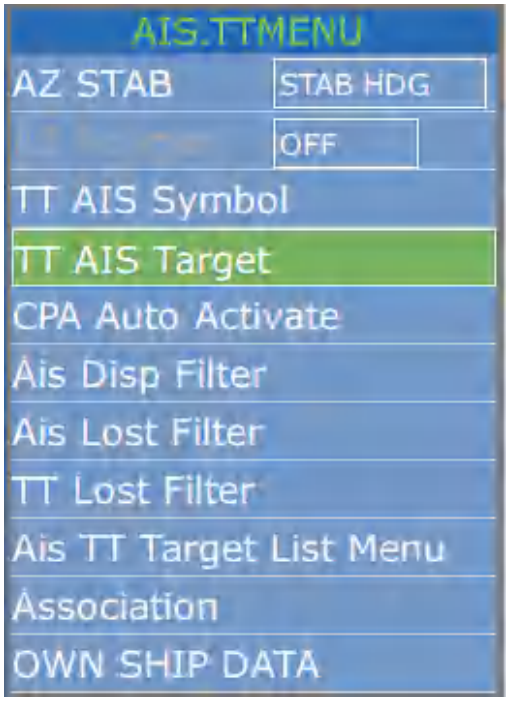
Figure 2

11.1 Acquisition Zone Stabilization

Operation steps:

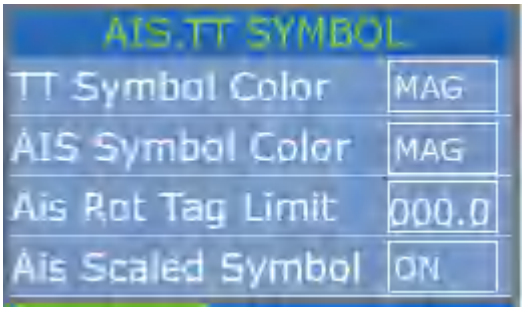
- Select the AIS.TT menu in the main menu interface
- press [ENT] to AIS. TT menu interface
- Select the AZ STAB options
- Move the mouse to the north of the stable click the left mouse button or press the [ENT] button to pop up the drop-down box
- select the desired stable benchmark press the left mouse button or [ENT] to determine options

Note: The switch of the capture area contour display is controlled in the Automatic Capture menu item in the TT.AIS object menu



11.2 AIS.TT Symbol

Select the tt. AIS symbol from the AIS.TT menu and click OK to enter the TT.AIS symbol menu interface



11.2.1 AIS.TT Symbol Color

TT symbol color and AIS symbol color menu items are used to control the display colors of TT target and AIS target on the main interface. The submenu drop-down box contains seven color Settings: red, green, blue, yellow, cyan, magenta and white. Users can choose the desired display color according to their needs.

Operation steps:

- By moving the mouse over the desired menu item
- click the left mouse button or press [ENT] popup menu drop-down box
- choose menu items after press the left mouse button or [sure] to determine options

11.2.2 Ais Rot Tag Limit

This function is used to set the lower limit of the target steering mark display. The range is 0.1° to 720°/min, that is, the steering mark will be displayed only when the steering rate exceeds the set value. As shown in the figure below:

Operation steps:

- In the TT.AIS symbol menu interface
- Move the left mouse button to click on the edit box will pop up a software keyboard interface
- Then by moving the mouse click to set the required value and click ok to complete the setting



11.2.3 Ais Scaled Symbol

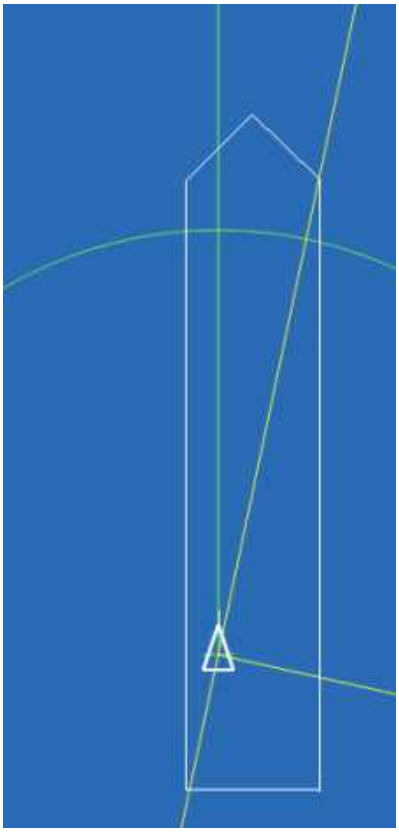
This function is to control the AIS display symbol according to the captain of the scale display.

Operation steps:

- in AIS. TT symbol menu
- move the mouse to choose true ratio symbols
- mouse movement to close or open the sub menu item
- click the left mouse button or pop-up drop-down box [ENT] key
- choose menu items after press the left mouse button or [sure] to determine options

Off: True scale symbol is not enabled

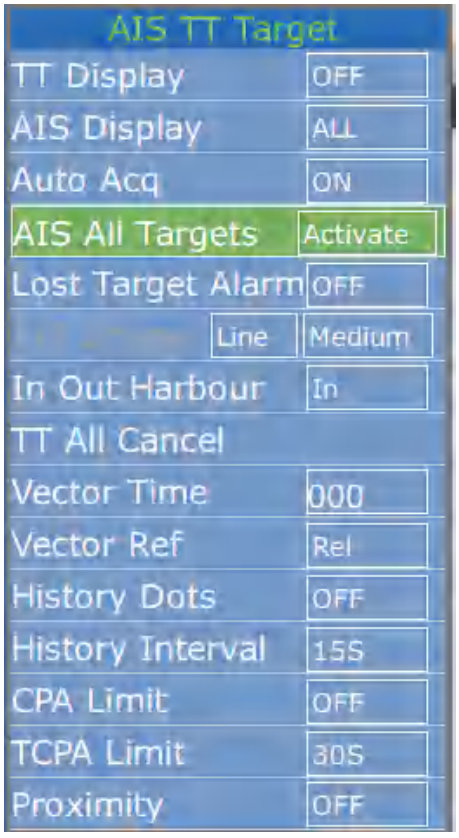
On: Turn on the true proportion symbol, as shown in the figure below:



11.3 AIS.TT Target

Operation steps:

- in AIS. TT menu to select AIS. TT target
- Press [ENT] to enter the AIS.TT target menu screen



11.3.1 TT Display

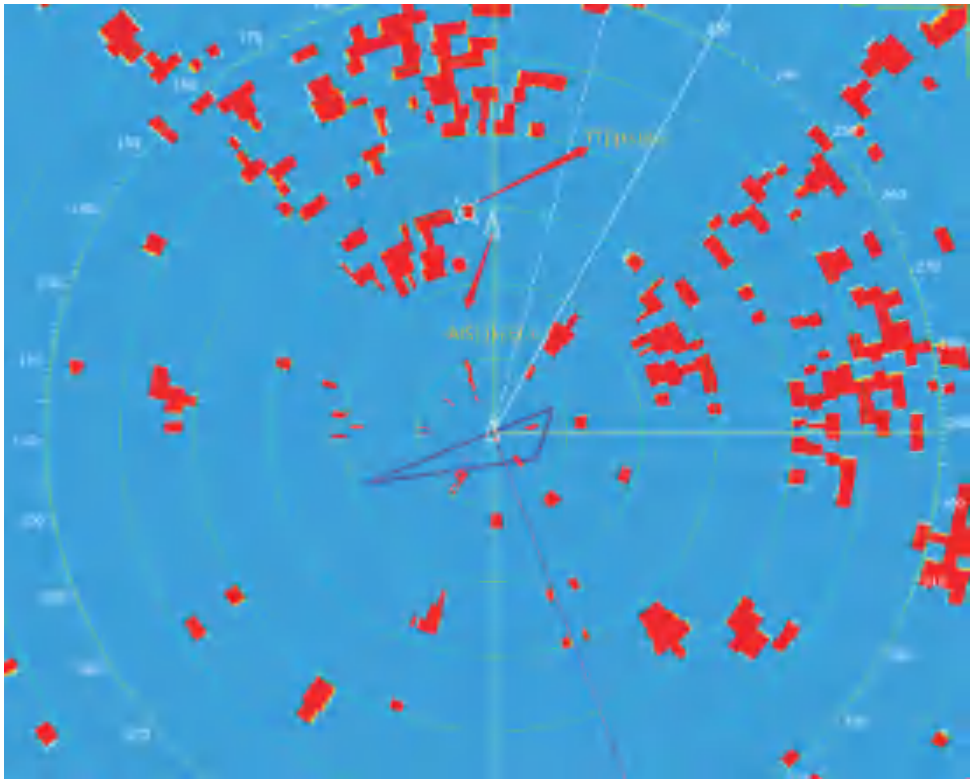
Display switch used to control the TT target. Targets captured manually or automatically with the TT target on will display the painted mark, position record and target data.
Operation steps:

- in AIS. TT target menu
- Select TT display
- move the mouse to the closed position
- Click the left mouse button or press the [ENT] button to pop up the drop-down box
- Choose off or on, press the left mouse button or certain [Ent] key

11.3.2 AIS Display

It is used to control the display switch of AIS vessels. When the AIS display switch is on, the AIS target will display the painting mark, position record and target data.
Note: AIS function is always working. If the AIS signal is received, the tracking of the signal is continued even when it is not displayed, so as to ensure that the corresponding target will be displayed immediately as long as the AIS display is opened when necessary.
Operation steps:

- In AIS. TT target menu
- choose AIS display
- move the mouse to the OFF position
- Click the left mouse button or press the [ENT] button to pop up the drop-down box
- Choose off or on, press the left mouse button or certain [Ent] key

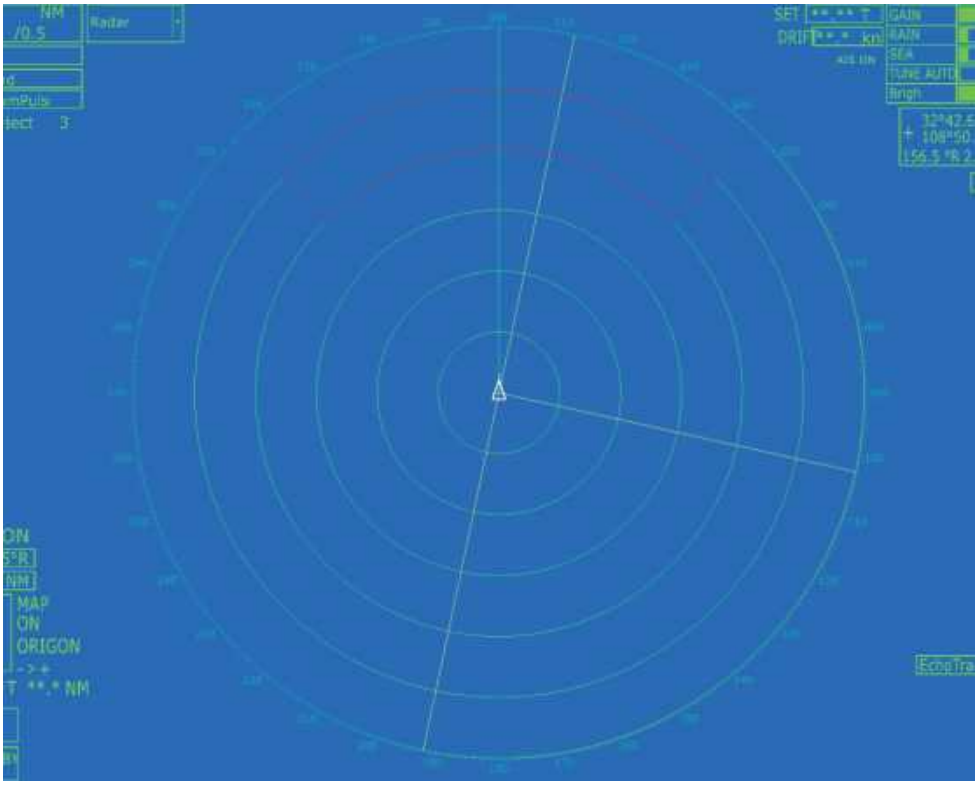


11.3.3 Auto ACQ

A maximum of 10 targets can be captured by setting the automatic capture area. If there are more than 10 manually captured targets when automatic capture is selected, automatic capture can only capture the remaining number. For example: If 35 targets have been manually captured, the automatic capture can only capture a maximum of 5 targets. When 10 targets have been automatically captured, the message "automatic target full" will appear in the upper left corner of the display.

Set automatic capture area:

The automatic capture zone is defined as a fan zone between 2.0 and 2.5 nautical miles with 45° angles on each side of the bow line. If a target enters this zone, it will be automatically captured.



Automatic capture area display:

Operation capture:

- ASI. TT target interface
- Choose Auto Acq
- move the mouse to the OFF position
- Click the left mouse button or press the [ENT] button to pop up the drop-down box
- Choose off or on, press the left mouse button or certain [Ent] key

Note: The display position of automatic capture is controlled in the capture area reference in the AIS.TT menu whether it is stable to the bow or stable to the north.

Manual capture: With automatic capture turned off, manual capture can be used to capture the target and display the target data

Operation steps:

- in the case of TT according to open
- Move the mouse to the target position
- Press the [ACQ] button to capture the target

Note: The manual capture operation is as follows. A maximum of 40 targets can be captured manually. After capturing more than 40 targets, a prompt window will pop up as shown in Figure 1 below. If you want to capture more targets after 40, you have to remove some targets.

Target cancellation procedure:

- Cancel a single target operation if the target is full
- move the mouse to have capture target need to cancel
- Press the [TARGET CANCEL] button to cancel the target

Target Data:

- want to see the captured target capture target of displaying data in detail
- move the mouse to capture the location of the object
- Press the [Target Data] key, and the information about changing the target will be displayed in the data on the left, as shown in Figure 2

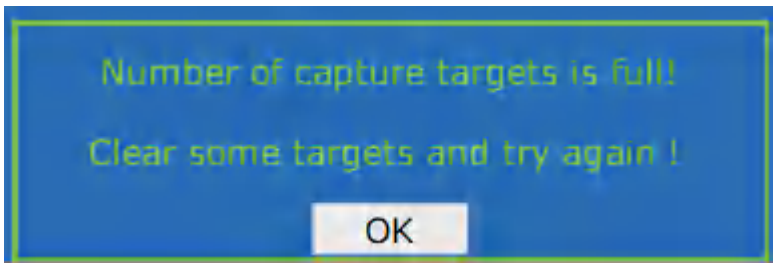


Figure 1

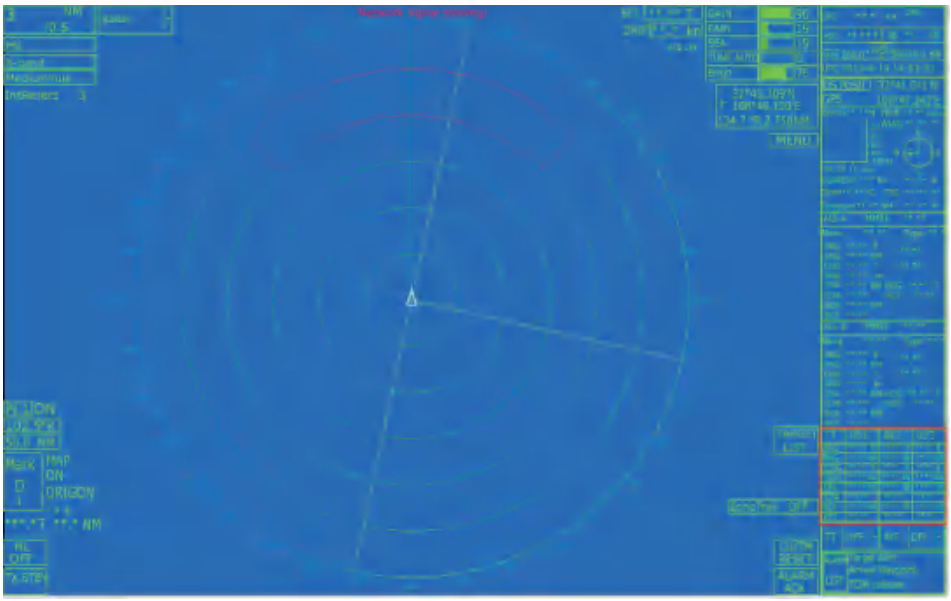


Figure 2

Display mode of TT target in different states:
Plotter drawing markers change shape according to state, as listed below, vector markers are selected. Appear within 1 minute of setting the target and indicate the direction of movement of the selected target, if within 3 minutes. Being able to trace all the way to the target plot marker will become a solid line formation, if the capture fails the marker will flicker and then disappear.


CIRCLE(Dotted line)
Initial capture -Drawing marks are made up of dotted lines.


Dotted lines and vector marks appear
Capture l minutes -The vector is still unreliable.


(Solid lines are formed and marked with vectors)
Capture 3 minutes -The drawing mark changes to a solid circle, indicating that the trace has entered a steady state.


When the target is selected to read data, the drawing mark changes to a circle with a discontinuous outer frame.


When the target is lost, the drawing mark becomes a diamond icon
Note 1: To capture the target, you must be within 0.2 to 16 nautical miles of the ship and not in the shadow of waves or rain or snow interference.
Note 2: If you want to capture the 41st target, drop at least 1 of the captured targets.

11.3.4 All AIS Target Activation And Sleep

This function is used to change the display status of the AIS target.
Operation steps:

- In AIS.TT target menu
- choose all AIS target activation and sleep
- move the mouse to sleep or activation options
- click the left mouse button or press [ENT] to choose

	Goals of sleep	An acute isosceles triangle whose distance from the center represents the target reference position of the target's sleep. The acute Angle of the triangle indicates the heading of the ship with thousands or, in the absence of a heading, the COG
	Objective of the activity	The dashed line represents COG and the solid line represents HDG
	Steering target	Show the turning ship
	Select the target	Marked with a square discontinuous box line
	Missing target	Use crossed thick solid lines across the mark, solid lines The direction of the vertical thousand is the last direction of the target.

11.4 Lost Target Warning

If the information of an AIS target or TT tracking target within the current range is not received after its maximum update interval, the lost target alarm function will be triggered. In this case, the symbol of the target will be changed into the lost target symbol as shown below, the color of the symbol is red and shiny, and the radar will send out an audible alarm to alert the ship operator. To manually stop the audible alarm, hold down the alarm answer key.

Operation steps: In AIS.TT target menu

- choose missing target alarm
- move the mouse to the menu item in the closed position
- Click the left mouse button or press the [ENT] to select Close or Filter, all
- press the left mouse button or [ENT] to determine the choice

AIS  TT 

Lost target alert-filter: AIS lost filter and TT lost filter in the AIS.TT menu. When the lost target alarm filter is selected, the targets in the parameters set in the menu of AIS lost filter and TT lost filter are filtered.

Lost target Alert -All; Missing targets within the current range trigger an alarm

11.5 AIS Vessel

This function is to control the display size and style of the AIS target

Operation steps: In AIS.TT target menu

- Choose AIS vessel
- mobile mouse choose need to modify the menu item
- press the left mouse button or [ENT], pop-up drop-down box
- press the left mouse button or [ENT] to determine the choice

11.6 Inbound And Outbound Settings

Inbound and outbound Settings

This function is designed to avoid the constant alarm caused by too many AIS vessels when entering port. You can set this to inbound when the ship is entering port, and both CPA and TCPA alarms will be disabled.

Operation steps:

- In AIS. TT target interface
- Select inbound and outbound Settings
- mobile mouse choose need to modify the menu item
- press the left mouse button or [ENT], pop-up drop-down box
- press the left mouse button or [ENT] to determine the choice

11.7 All TT Targets Are Cleared

This function is to clear all captured TT targets with one key. When the number of captured targets is full or multiple targets are lost, you do not want to gradually clear a single target by selecting the menu item of all TT targets from the AIS.TT target menu and press [ENT] to clear with one key.

11.8 Vector Time

This setting uses thousands to set the vector display time of the ship and the target ship. What the vector mark indicates is the position that the ship should arrive after the set sailing time according to the current sailing mode. This is an estimate value, which will change with the movement of the ship, so that the radar operator can make a more simple and intuitive judgment of the current sailing state.

Operation steps:

- In AIS. TT target interface
- choose vector time
- moving the mouse on the edit box on the left
- Click the left mouse button to pop up the software disk
- by moving the mouse to click the number in the soft keyboard set numerical click "OK" button to complete the Settings

11.9 Vector Reference

It is the calculation basis of the lines estimated by the target ship after setting the vector time.

Operation steps:

- In AIS. TT target interface
- Select the vector reference
- move the mouse to the left of the option on
- click the left mouse button or press [ENT] pop-up drop-down box
- move the mouse to choose the menu item, click the left mouse button or press [ENT] to determine the choice

11.10 History Dots & Interval

It is used to record the time interval of the sailing position of the ship and the target ship. This function can record the sailing position of the ship according to a certain time interval, and record the number of points at most 5 or 10 points for each target. The time interval of each point is set here, such as: If 6 minutes is selected, the position will be recorded every 6 minutes and displayed on the screen. When a new point is recorded, the earliest point will disappear. In other words, the position passed within 30 minutes can be recorded at most in this case.

For example, if the historical track is set to 5, a maximum of 5 track points are recorded.

Operation steps:

- In AIS. TT target interface
- selecting history or historical time interval
- click the left mouse button or press [ENT] pop-up drop-down box
- move the mouse to choose the menu item, click the left mouse button or press [ENT] to determine the choice

11.11 CPA & TCPA Limit

CPA: refers to the nearest possible point between the target ship and the ship, which is used to warn ships of collision.

TCPA: refers to the time to reach the nearest approach point calculated by the speed of the ship and the target ship. CPA and TCPA are calculated automatically. When the target ship has clearly passed the ship's route, CPA and TCPA are shown as "* *. * * ". In this case, the TCPA is because the calculated value has exceeded 99.9 minutes, and the display at this time indicates that the TCPA is greater than 99.9 points.

CPA/TCPA Alert:

When the CPA and TCPA values calculated to any target are within the preset alarm limits, an audio-visual alarm is triggered and an audible alarm lasts for 10 seconds. The automatic plotting system automatically predicts the closest approach point (CPA) and time to closest approach point (TCPA) of each tracked target to the ship.

The ARPA system will issue an audible alert when the predicted CPA value of any target is less than the set alarm limit and its predicted TCPA value is less than the preset TCPA limit in thousands. At the same time, the mark of the object changes to a triangle and its vector mark lights up.

Operation steps:

- In AIS. TT target interface
- by moving the mouse to the need to set up a menu item
- click the left mouse button or press [ENT] pop-up drop-down box
- in the drop-down box moving the mouse choose good options according to [sure] key or the left mouse button

11.12 CPA Auto Activate

Used to activate AIS target ships that match the parameters set in the CPA Activation menu.

Note: The CPA activation parameter only works for the AIS target of sleep.

Operation steps:

- In the AIS.TT menu
- choose CPA to activate, press [ENT] to enter CPA to activate the menu as shown in figure show
- in CPA to activate the parameters need to set up the good in your menu
- move the mouse into the sub menu items
- by clicking the left mouse button or press [ENT] to choose or Settings

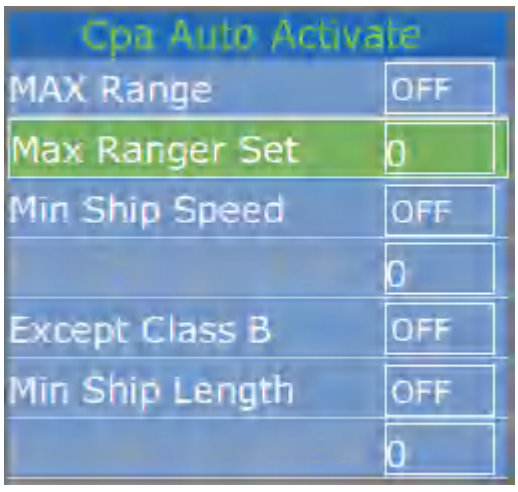


Figure 1



Figure 2

MAX Range	AIS targets beyond this setting will not be activated
Min ship speed	AIS targets beyond this setting will not be activated
Except class B	Class B ships will not be activated
Min ship length	AIS targets beyond this setting will not be activated

11.13 AIS Display Filter

Used to filter the AIS target ship display that conforms to the parameters set in the AIS display filtering menu.

Note: The AIS target of the current display data is not subject to filter Settings.

Operation steps:

- In the AIS.TT menu
- Select AIS display filtering and press [ENT] to enter the AIS display filtering menu as shown in Figure 1
- in AIS according to filter the parameters need to set up the set
- move the mouse into the sub menu items
- by clicking the left mouse button or press [ENT] to choose or Settings

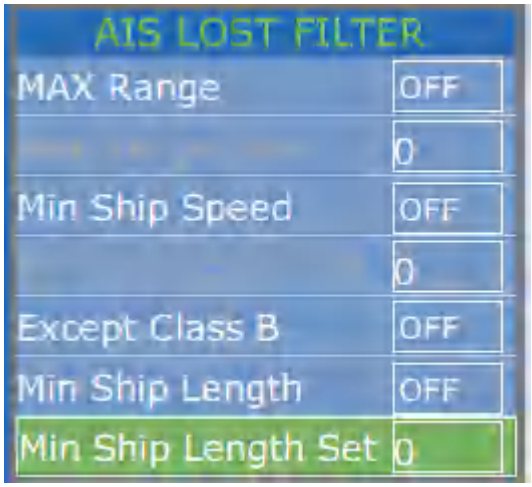


MAX Range	AIS sleep targets beyond this setting are displayed by filtering
Min ship speed	AIS sleep targets beyond this setting are displayed by filtering
Except class B	Class B ships will not show
Min ship length	AIS targets beyond this setting are not displayed

11.14 AIS Lost Filter

AIS lost targets that meet the AIS lost filtering parameters are filtered and displayed.
Note: This function is only triggered when filtering option in Lost Target Alert in the AIS.TT target menu.
Operation steps:

- In the AIS.TT menu
- choose AIS lost filtering, press [ENT] to AIS lost filter menu as shown in figure show
- Set the desired parameters in the AIS loss filter
- move the mouse into the sub menu items
- by clicking the left mouse button or press [ENT] to choose or Settings



MAX Range	None of the AIS loss targets beyond this setting will trigger a loss target alert.
Min ship speed	Any AIS lost target slower than this setting will not trigger a lost target alert.
Except class B	Select Open to prevent trigger loss AIS B type ships from losing target.
Min ship length	Any AIS lost target setting with a length less than this does not trigger the lost target

11.15 TT Lost Filter

The TT loss targets that match the TT loss filtering parameters are displayed.
Note: This function is only triggered when filtering option in Lost Target Alert in the AIS.TT target menu.
Operation steps:

- In the AIS.TT menu
- lost in AIS filtering in the parameters need to set up the set
- move the mouse into the sub menu items
- by clicking the left mouse button or press [ENT] to choose or Settings



MAX Range	No TT lost target beyond this setting will trigger a lost target alert.
Min Ship Speed	Any TT lost target slower than this setting will not trigger a lost target alert.

11.16 AIS TT Target List

On the AIS.TT menu screen, select the target list menu and press [OK] to enter the target list menu screen.



11.16.1 Refresh Time Setting

Used to control the data refresh rate of the target list

Operation steps:

- in the target list menu interface
- choose break open
- move the mouse to refresh the time set in the edit box
- Click the left mouse button to pop up the software disk
- set up the data refresh time

Note: Refresh time is in minutes

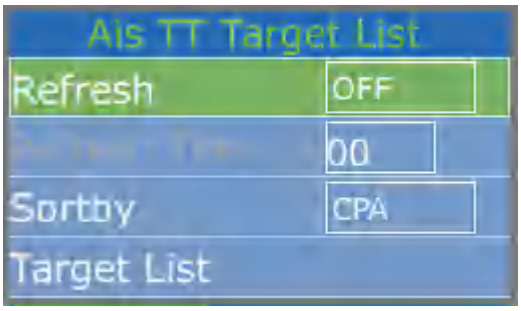
11.16.2 Sorting Basis

Used to sort the display contents of the target list by options

Operation steps:

- in the target list menu interface
- selection basis

- click the left mouse button or pop-up drop-down box [ENT] key
- choose target list the basis of a sort
- click the left mouse button or [ENT] key to determine a good option



CPA	Sort by CPA order from nearest to furthest
TCPA	Sort by shortest to longest TCPA order
BCR	Sort by BCRS from near to far
BCT	Sort by BCT order of shortest to longest time
Range	Sort by distance order from near to far
Speed	Sort by fastest to slowest speed

11.16.3 Target List

Displays the content and quantity of the received TT.AIS targets

Operation steps:

- in the target list menu interface
- choose target list
- press [ENT] into the target list interface As shown in figure one shows
- by moving the mouse to the AIS target
- click the left mouse button will display the detailed information of the AIS target as shown in figure 2 shows
- click target list page up and down buttons to page display
- press [cancel] button to exit interface display
- by pressing the shortcuts [3] and click on the main screen target list can quickly
- open the list interface

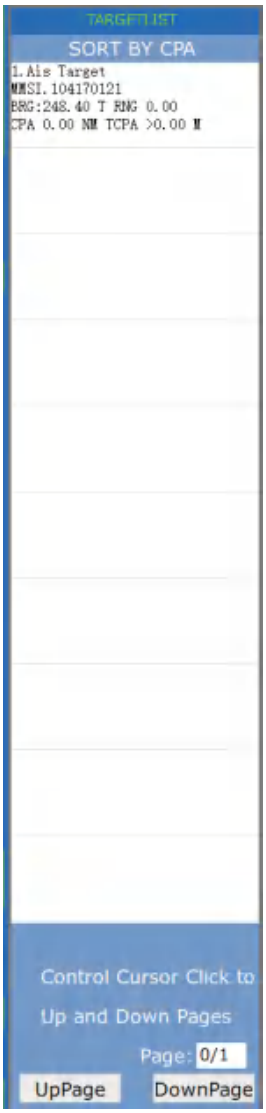


Figure 1

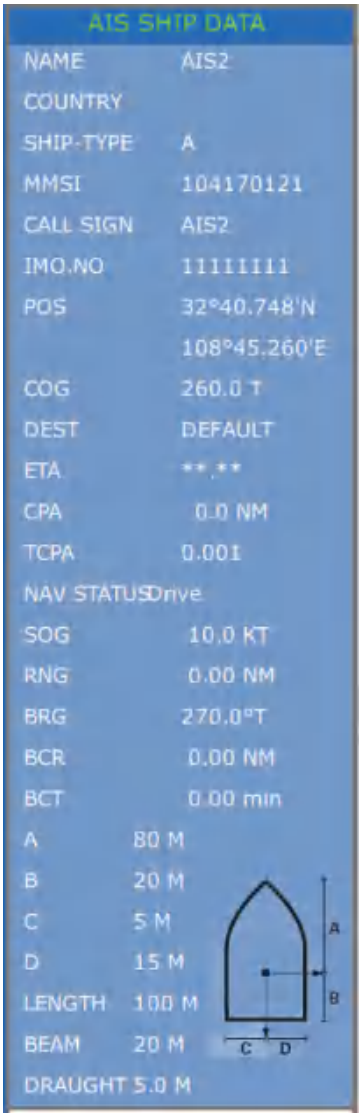


Figure 2

11.17 Target Association

In the radar ship equipped with AIS, an AIS target and TT target will be displayed. In order to avoid using two symbols to display the same physical target, targets that conform to the parameters set in the target association menu will be integrated display.

Note: Fusion is not performed if associated AIS targets sleep or are lost.

Operation steps:

- in AIS. TT on the menu
- choose target associated menu items
- Associated Press [ENT] into the target menu interface
- by moving the mouse to click the left mouse button or press [ENT] to set parameters and the associated display



Association Target	The switch and display basis used to control the object association: Off - The object association function is not enabled AIS -- Use the AIS coincidence and AIS data as the display basis TT-- Uses the TT match and TT data as the display basis
GAP	Target distance is used to set the maximum distance between associated targets
RANGE	The target distance is used to set the maximum distance difference from the ship to the AIS target and tracking target
BEARING	The target bearing is used to set the maximum bearing difference from the ship to the AIS target and tracking target
SPEED	Speed difference is used to set the maximum speed difference between the AIS target and the tracking target
COURSE	Course difference is used to set the maximum course difference between the AIS target and the tracking target

12. PLOTTER

12.1 Plotter Menu

A radar map is a combination of map lines and symbols in which the user can define and enter navigation data, route planning and monitoring data. This radar map may contain 20,000 data points. Map data can be saved for reuse in regular navigation areas. Users can create radar maps in real time while using radar for navigation or at their leisure anchors or radar is not being used. A map location can be used for any waterway in addition to the actual location of your own ship.

The radar map does not affect any radar functions.

Operation steps:

- in the main menu interface
- choose plotter menu
- press [ENT] into the plotter menu interface
- by moving the mouse to select you need to set up a menu item
- press the left mouse button or [ENT] to set up.

Plotter Display	Control radar map display switch, on the latitude and longitude grid display
Origin Mark Stab	Refers to the position of the painting mark painting reference, including stability to the ground, stability to the sea.
Own Track Interval	Control the ship's track display record interval, including OFF,Show or,10s,30s,1M,2M,3M,6M,15M nine options
Own Track Color	Control the ship's track display color, including red, green, blue, yellow, cyan, magenta, white and other seven color Settings
Target Track Interval	Control the target ship's track display record interval, including OFF,Show or,10s,30s,1M,2M,3M,6M,15M nine options
Target Track Color	Control the target track display color, including red, green, blue, yellow, cyan, magenta, white and other seven color Settings



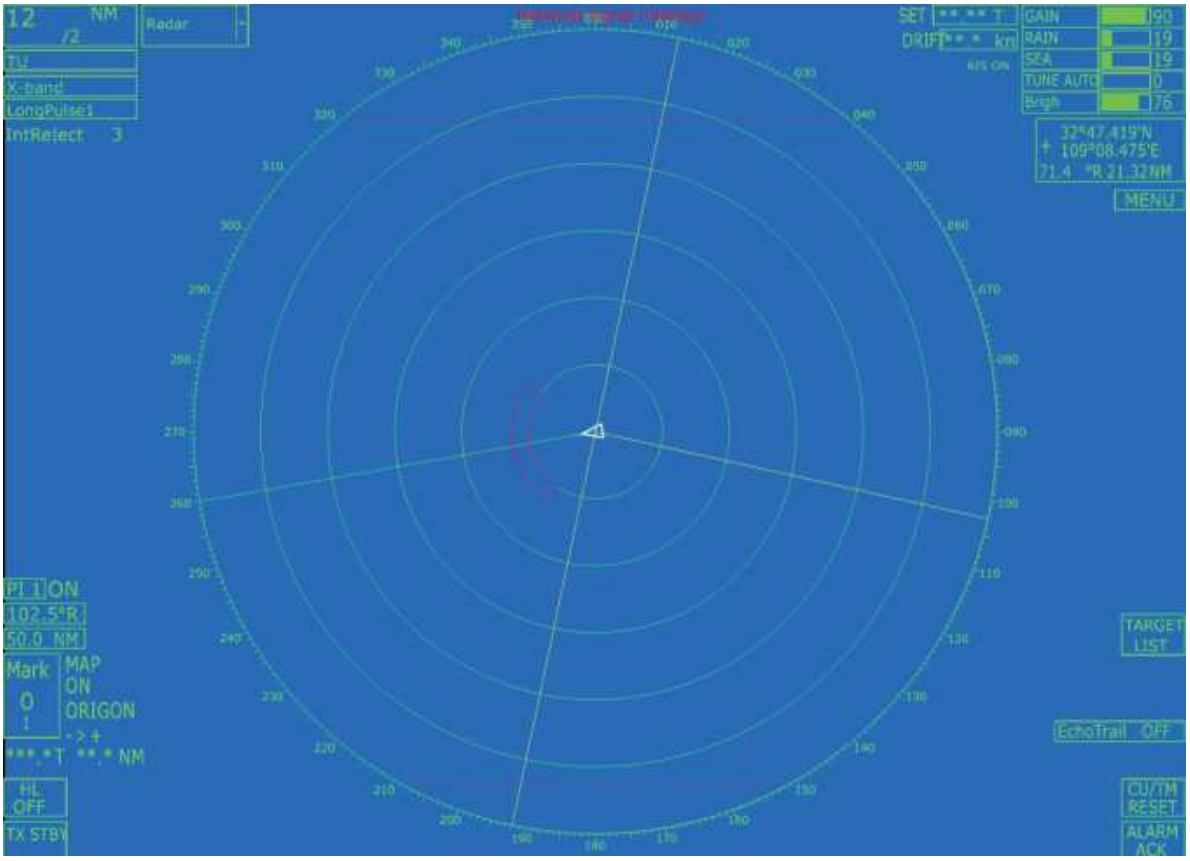
12.2 Cursor Correction

Used to correct the wrong position of radar map marked lines.

Operation steps:

plotter menu

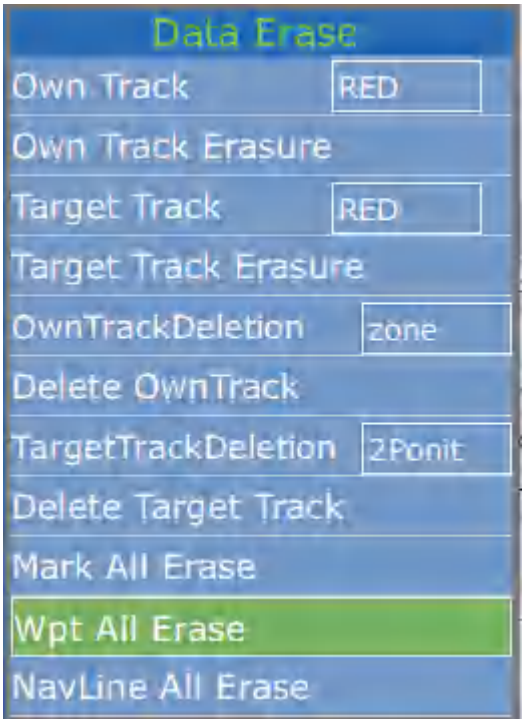
- choose Cursor Align on the menu items
- move the left mouse button or press [sure] to choose closed or open
- choose open after moving the mouse to choose the cursor longitude and latitude correction
- Press [ENT] button to correct
- on the radar screen by clicking the left mouse button
- correction after press [cancel] button to exit the correction



12.3 Data Erase

Operation steps:

- plotter menu interface
- Select Data Erase menu item
- Press [ENT] to enter Data Erase



12.3.1 Delete Own Ships Track

This function is to delete the local track record display

Operation steps:

- In the Data Erase interface
- Select Delete own ship select menu item
- Select the display Settings for the ship's track to be deleted (including all, red, green, blue, yellow, cyan, magenta, white, 30%, 50%, 80%).
- choose good you need to remove the vessel after the track is set
- Select delete own ship track menu item
- press [ENT] to track is erased, this vessel will pop-up prompt window shown in the figure
- move the mouse to click the delete button to delete this vessel track
- click cancel, cancel the ship track is deleted

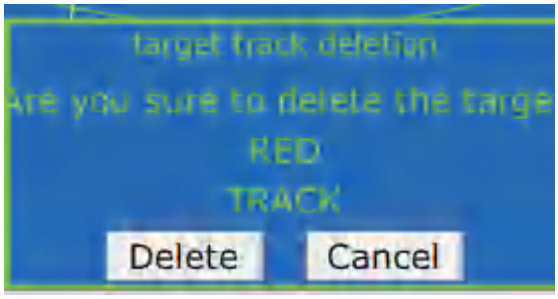


12.3.2 Target Track Deletion

This function is to delete the target's track record display

Operation steps:

- In the Data Erase interface
- Select Delete Target track select menu item
- Select the display Settings for the target track to be deleted (including all, red, green, blue, yellow, cyan, magenta, white, 30%, 50%, 80%).
- choose after good need to delete the target track is set up
- choose target track is erasing a menu item
- press [ENT] to target track is erased, prompt window as shown in figure display will appear
- move the mouse to click the delete button of target track is deleted
- click cancel, cancel the target track is deleted

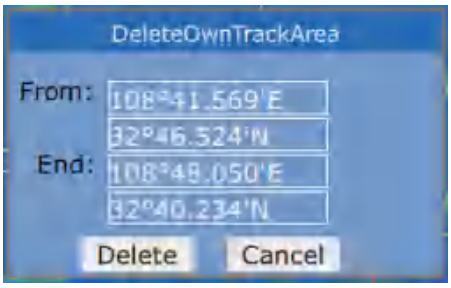


12.3.3 The Ship's Track Two Points Or Area Type Deleted

This function is to carry out two point deletion or custom area deletion action on the ship's track.

Operation steps:

- In the Data Erase interface
- choose this ship track is deleted type, choose two points or areas
- choose this ship track is deleted
- press [ENT] to the next steps
- select two points on the main interface moving the mouse to click the track record of this vessel to remove any two points
- When selecting the region, move the mouse on the main interface and click any two diagonal points on the ship's track record to delete the region



12.3.4 Target Track Two Points Or Area Type Deleted

This function is to carry out two point deletion or custom region deletion action on the target track

Operation steps:

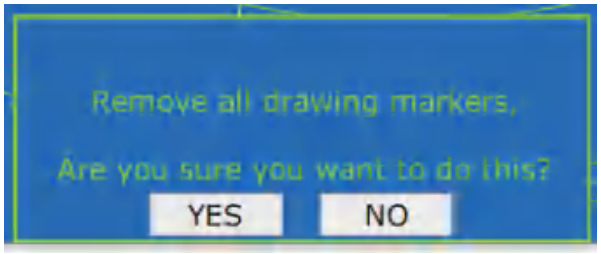
- In the Data Erase interface
- choose target track is deleted type, choose two points or areas
- choose target track is deleted
- press [ENT] to the next steps
- select two points on the main interface moving the mouse to click target track record of any two points are deleted
- selection area on the main interface when moving the mouse click on the target track record delete any two diagonal point to area

12.3.5 Mark All Clear

This function removes all of the painting markers displayed

Operation steps:

- In the Data Erase interface
- Select the mark to clear all
- press [ENT] to tag all cleared, pop-up prompt window
- move the mouse to click [YES] or [no] button for the next operation
- Click the [Yes] button to remove all painting markers
- click [no], cancel the delete action

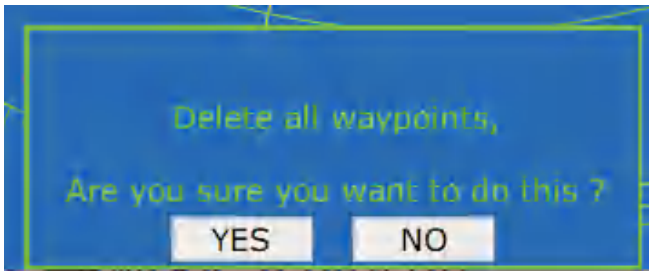


12.3.6 All Navigation Points Cleared

This function removes all the navigation points of the paintings displayed

Operation steps:

- In the Data Erase interface
- Select all waypoints to clear
- Press the [ENT] key to clear all waypoints, and a prompt window will pop up
- move the mouse to click [YES] or [no] button for the next operation
- click the [Yes] button to delete all painting waypoints
- click [no], cancel the delete action

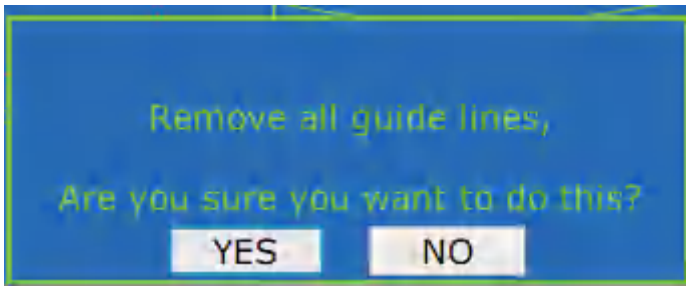


12.3.7 All Navigation Cables Are Cleared

This function removes all the paintings displayed by the navigation line

Operation steps:

- In the Data Erase interface
- Select the navigation line to clear all
- Press the [ENT] key to clear all navigation lines and pop up a prompt window
- move the mouse to click [YES] or [no] button for the next operation
- click the [Yes] button to remove all drawing navigation lines
- click [no], cancel the delete action



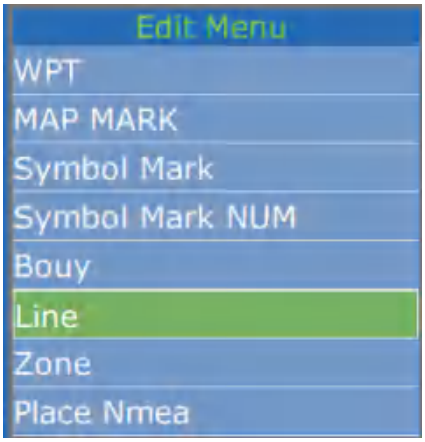
12.4 Edit Menu

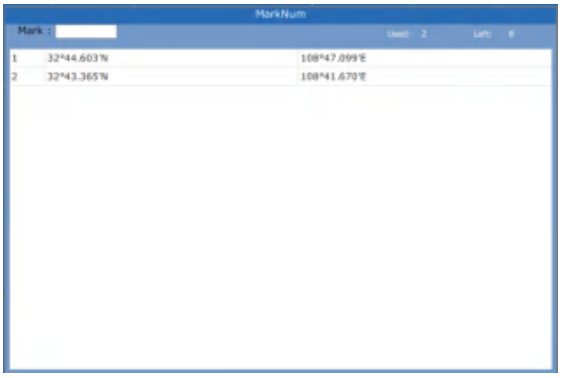
Edit and modify painted marks and lines

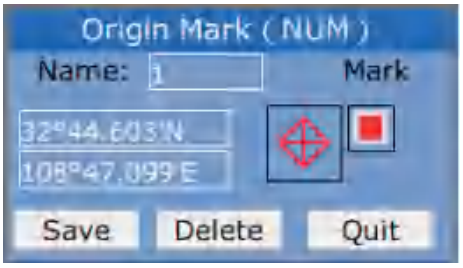
Operation procedure:

- in the plotter menu
- select edit menu items
- press [ENT] to enter the edit menu
- choose need to edit the options, such as navigation point
- press [ENT] play staring point list, as shown in figure show
- move the mouse to position on the need to modify the navigation point
- double click the left mouse button pop-up editor window, as shown in figure 2 shows
- moving the mouse click on the edit box in the prompt window popup of the navigation software
- by clicking on the software modifications, press the OK button to exit the editor changes
- again hint window by clicking on the navigation point save, delete and cancel button on the next steps

- click save is a cache the modification operations
- click exit is out of the edit action does not cache the modify the content
- click delete is to remove the navigation point









12.5 Data Display

This function is to control the plotter content display switch

Operation steps:

- in the plotter menu interface
- select data display a menu item
- Press [ENT] key to enter the data display menu
- by moving the mouse to select a menu item to modify
- click the left mouse button or modified operation [sure] key

Grid	Control the display of latitude and longitude grid, closed does not display, latitude and longitude is the display grid
Own Track	Controls the ship's track display to be turned off or on
Target Track	Control the turn off or on of target track display
Mark	Controls whether the marker display is turned off or on
Land Density	Control the land density display to turn off or on
Place Name	Controls the turn off or on display of place names
Coast Line	Controls the coastline display to be turned off or on
Contour Line	Control the turn off or on of the contour display
Nav Line Map	Controls whether navigation lines (maps) are displayed on or off
Danger Highlight	Control hazard highlighting off or on
Prohibited Area	Controls whether the forbidden zone display is turned off or on
Buoy	Controls the buoy display to be turned off or on

12.6 Mark Menu

This menu is used for painting, marking lines, etc

Operation steps:

- Plotter menu
- Select Mark Menu
- Press [ENT] to enter the mark menu interface



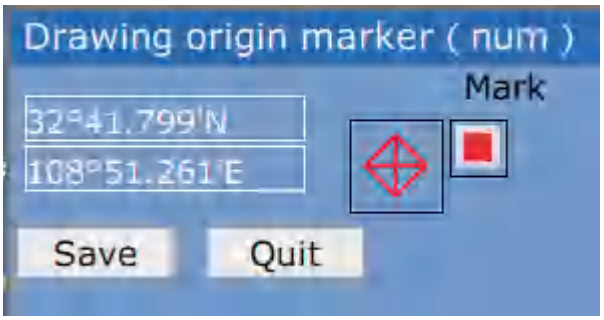
B, C and W types (seven colors available)	Item on DISPLAY menu*	IMO and A types	Item on DISPLAY menu*
	Mark	Red	Buoy
	Danger Highlight	Green	Buoy
	Buoy	Red	Buoy
	Buoy	Green	Buoy
	Buoy	Red	Buoy
	Buoy	Green	Buoy
	Buoy	Red	Buoy
	Danger Highlight	Green	Buoy
	Mark	Purple	Danger Highlight
	Mark	Purple	Danger Highlight
	Mark	Orange	Mark
	Mark	Orange	Mark
	Mark	Orange	Mark
	Mark	Purple	Navline (map)
	Mark	White	Coastline
	Nav Line (map)	Gray	Contour Line
	Coastline	Purple	Danger Highlight
	Contour	Purple (cable)	Danger Highlight
	Prohibited Area	Orange	Mark
(cable)	Danger Highlight	Orange	Mark

12.6.1 Mark Painting

In the process of marking painting, the type of marking to be painted should be selected first, and then the painting marking should be selected.

Operation steps:

- In the markup menu interface
- Select the type of marker
- Click the left mouse button or the [ENT] button to pop up the drop-down box
- choose need painting tag type press the left mouse button or [ENT] to determine options
- then move the mouse to choose tag painting
- press [ENT] to the next steps
- on the main interface moving the mouse to click the left mouse button at any position in painting tag action, a display as shown in figure drawing mark prompt window.
- if need to modify the tag color or icon is displayed, move the mouse to the position of figure a red box click the left mouse button pop-up icon choose choose need to click the left mouse button icon, a yellow tag box is modified and the display of the color



Origin Mark NUM	Refers to numbered origin mark (maximum of 10 paintings)
Origin Mark	Refers to the origin mark without number (up to 10 paintings)
MAP Mark	Map Marker display (up to 100 paintings)
WPT 1-50	Can draw 1-50 waypoints (maximum 50)
WPT 51-100	Can draw 51-100 waypoints (maximum 50)
WPT 101-150	Can draw 101-150 waypoints (maximum 50)
WPT 151-200	Can draw 151-200 waypoints (maximum 50)
Buoy	Buoy Marker display (Max. 10 paintings)

Note: There is a limit on the number of marks for each kind of painting. When painting is performed after the number of paintings is full, there will be a window prompt indicating that painting is full. At this time, you need to delete some marks before painting.

12.6.2 Mark Position

Refers to the drawing reference action of the drawing mark

Operation steps:

- In the markup menu interface
- Select the Mark position
- Click the left mouse button or the [ENT] button to pop up the drop-down box
- choose the cursor or the vessel, arbitrary three latitude and longitude of a tag benchmark as a painting
- choose tag location according to the operation steps of 12.5.1 marked drawing

Note: The latitude and longitude should be set before painting, as shown in Figure 2. Move the mouse to the longitude, latitude menu item position click the left mouse button to pop up the software disk for latitude and longitude Settings.

Cursor	Any mouse position can be painted marks
Own ship	Draw marks on the position of the ship
Lon/Lat	Mark drawing according to latitude and longitude Settings



Figure 1



Figure 2

12.6.3 Map Marking Color

This function is used to control the color display of radar map drawing markers
Operation steps:

- In the markup menu interface
- Select the map marker color
- move the mouse to the sub menu items
- Click the left mouse button or the [ENT] button to pop up the drop-down box
- choose color according to [ENT] key or the left mouse button options

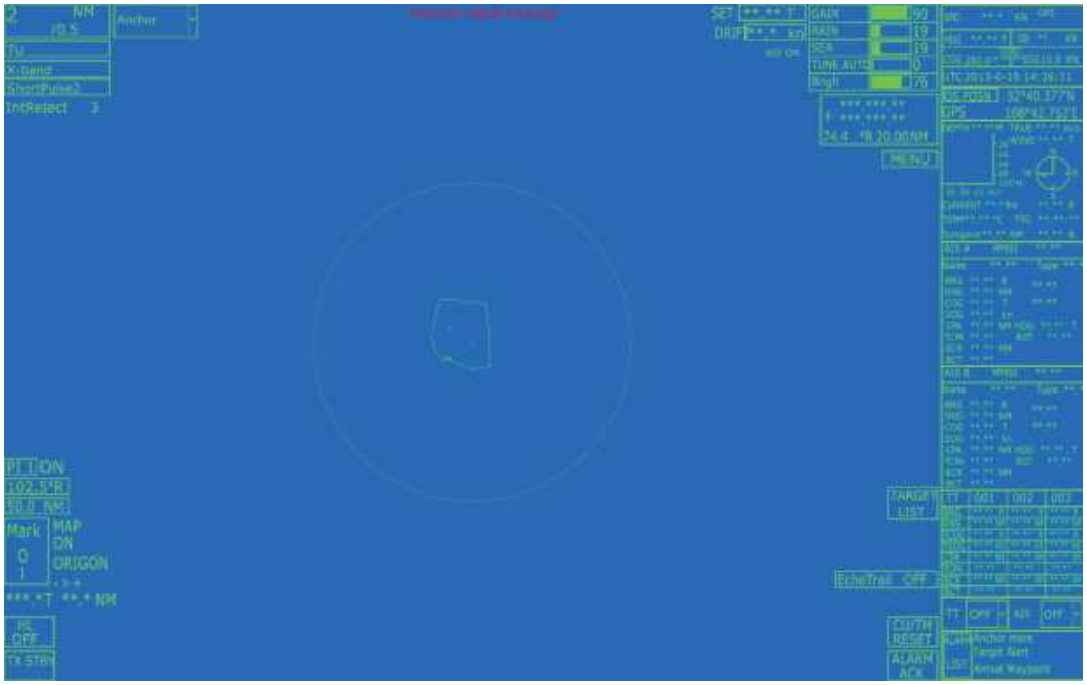


12.6.4 Anchor

This function refers to the wider circle setting of the anchor when the ship is stopped, and the alarm warning warning will be triggered when the ship is pushed out of the warning range set by the running water.
Operation steps:

- In the markup menu interface
- Select the anchor menu item
- Move the left mouse button or the [ENT] button to select off or on
- When selecting On
- Move the mouse to anchor a warning range Settings menu items
- Click the edit box to pop up the software disk

- Move the mouse to set the alert range
- In the main interface switch to anchor a school official cites use the mouse to click on the radar, the following figure
- In standby launch key, in standby mode display anchor more alert circle



12.6.5 Drawing Line

When painting lines, we should first choose the line style that needs to be painted, and then choose the line of painting.

Operation steps:

In the markup menu interface

- Select the Line Style menu item
- Click the left mouse button or press the [ENT] key sub-menu item
- choose style of painting lines, press the left mouse button or [ENT] to determine options
- Then select the Drawing Lines menu item
- Press the [ENT] button to proceed to the next drawing action
- Move the mouse to click anywhere on the main interface for line drawing
- Press [Cancel] button or right mouse button to pop up a prompt window, as shown in Figure 1
- Click save to cache the current drawing action, to cache the drawn line
- Click Cancel to cancel the current drawing action without caching the line being drawn
- If you want to edit the drawn lines, select the line menu item in the Edit menu of the plotter menu and press the [ENT] key to pop up the line list, as shown in Figure 2

- Move the mouse in the line list to select the line position that needs to be modified. Double-click the left mouse button to enter the list of line drawing points, as shown in Figure 3.
- Click the Delete button at the top left of the list of line drawing points to delete the line
- Move the mouse to the waypoint in the list of Figure 3 and double-click the left button to edit and modify, as shown in Figure 4
- Click the left mouse button in the edit box in Figure 4 to pop up the software disk
- Click the software disk to modify, press the OK button to quit editing and modify
- Then click the line prompt window save, delete, cancel button for the next step
- Click Save to cache the change
- Click exit to exit this edit modification action without caching the modified content
- Click delete to delete the waypoint.

Note: At least 2 navigation points need to be drawn for drawing lines, and at most 30 lines can be drawn.

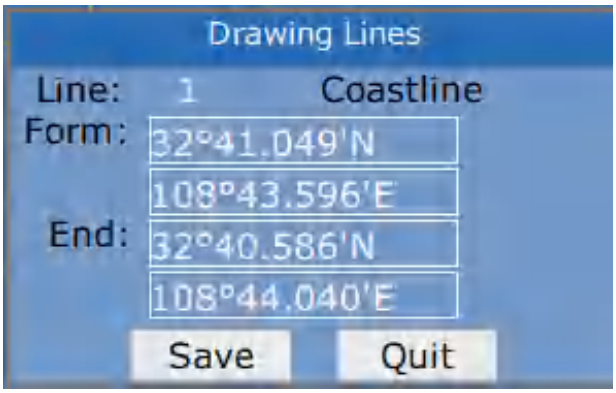


Figure 1

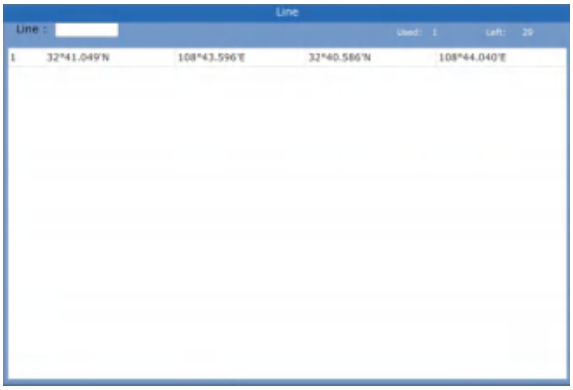


Figure 2

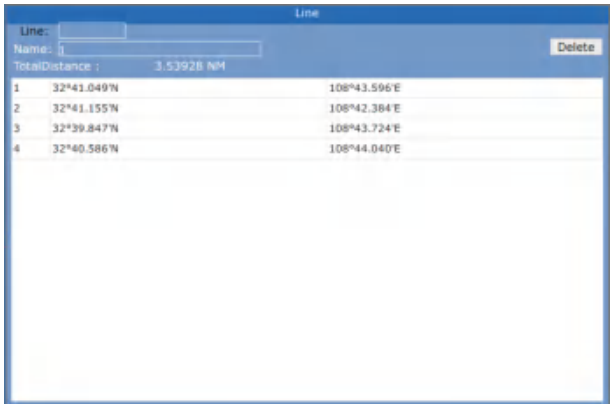


Figure 3

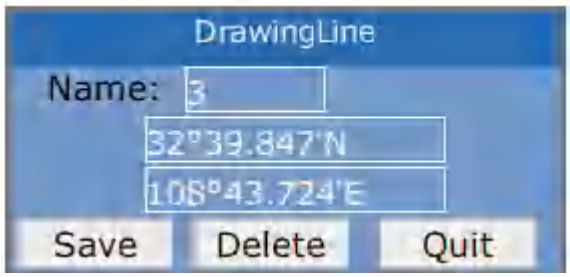




Figure 4

12.6.6 Painted Place Names

Operation steps:

- In the markup menu interface
- Choose the famous menu of painting places
- Press the [ENT] button to proceed to the next drawing action
- Move the mouse on the main interface and click the left button of the mouse at any position to draw the place name, as shown in Figure 1
- In the prompt window of Figure 1, move the mouse to click the name of the edit box to pop up the soft keyboard, as shown in Figure 2
- Input on the keyboard in Figure 2 by moving the mouse click
- Click OK to complete the location name input
- Click the "Save" button or "Cancel" button in the window of Figure 1 to complete the operation of the place name
- If you want to edit or modify the place name of the painting, you need to select the place name in the edit menu and press [ENT] to enter the place name list, as shown in Figure 3
- Select the location of the place name to be modified in the list of place names and double-click the left mouse button to edit and modify, as shown in Figure 4
- Click the left mouse button in the edit box in Figure 4 to pop up the software disk
- Click the software disk to modify, press the OK button to quit editing and modify
- Then click the save, delete, Cancel button of the location name prompt window for the next step
- Click save to cache this modification operation
- Click exit to exit this edit modification action without caching the modified content
- Click delete to delete the place name

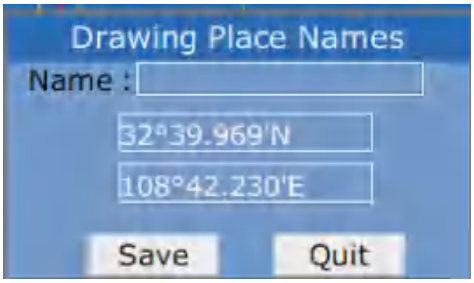


Figure 1



Figure 2

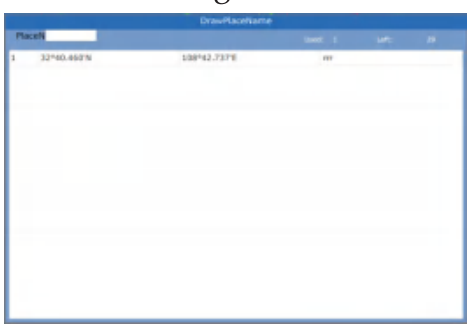


Figure 3

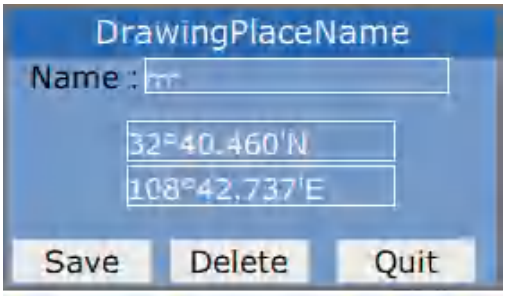
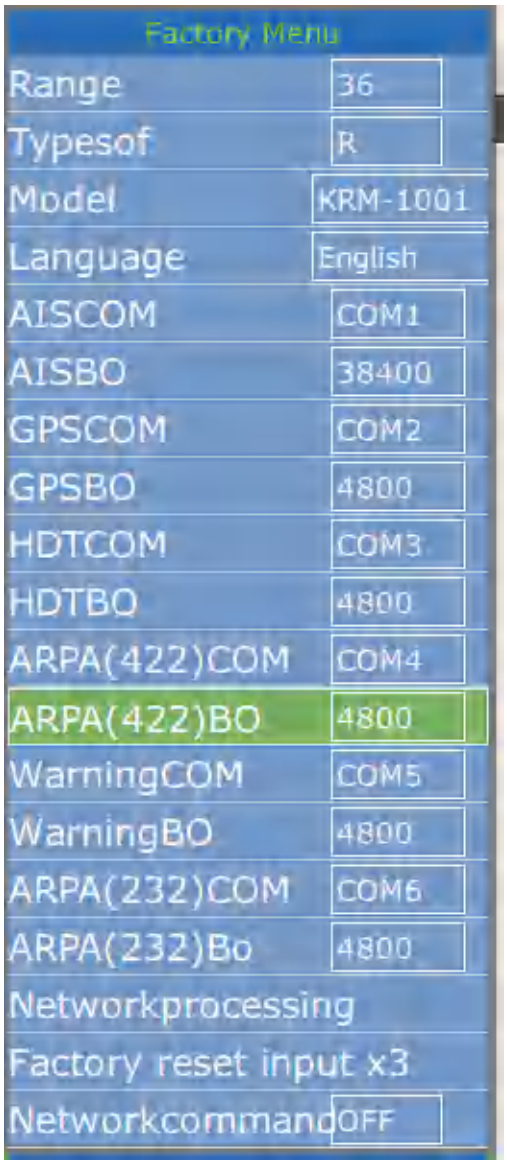


Figure 4

13. FACTORY MENU

Operation procedure: In the standby interface, long press [No.7] key on the keyboard + press 5 [Menu] key to bring up the factory menu interface.



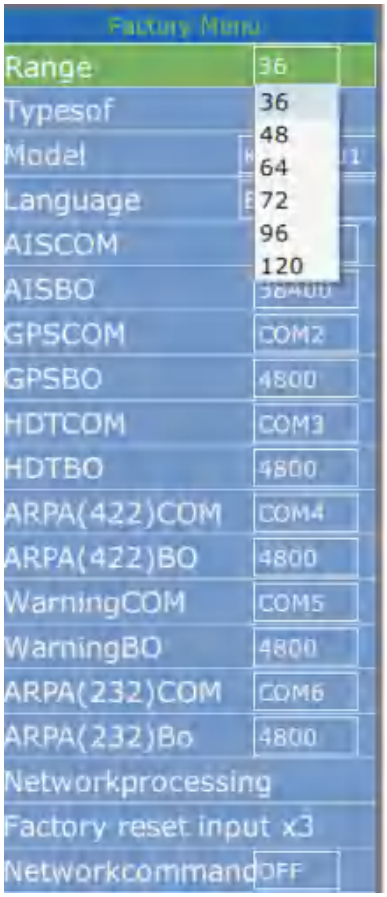
13.1 Maximum range

Control the maximum zoomable range of the radar range

Operation steps:

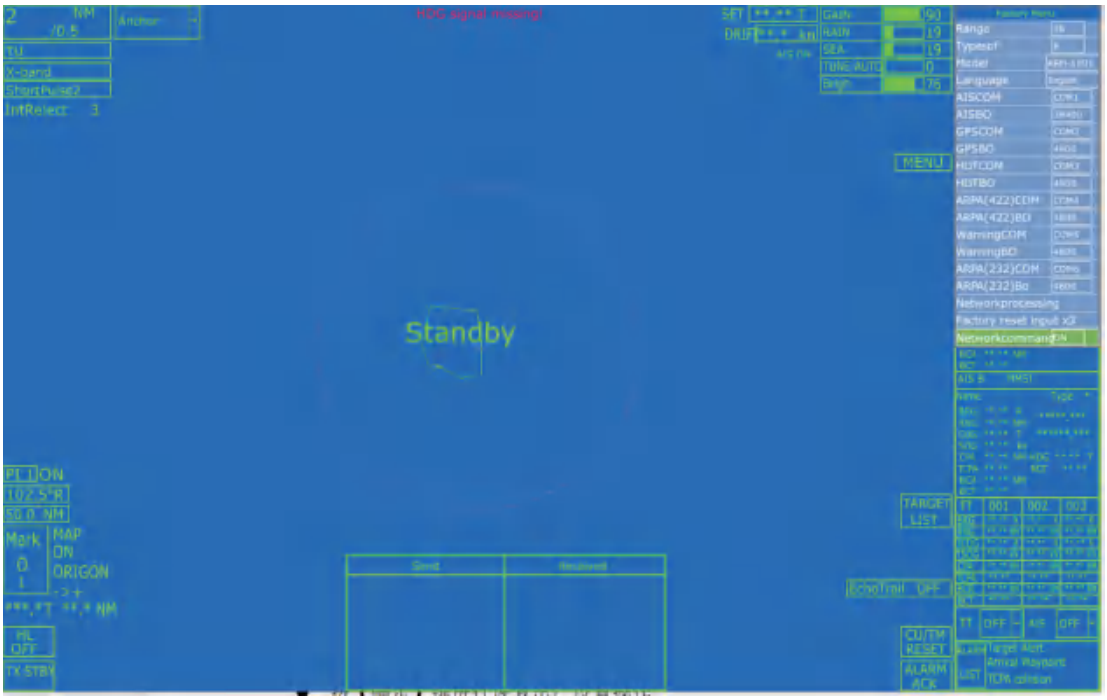
- In the standby interface, long press the keyboard [No.7] key + press the [Menu] key 5 times to bring up the factory menu interface
- Select the maximum range menu item
- Click the left button of the mouse or [ENT] key to select the maximum range can be scaled by selecting the maximum range can be scaled by the keyboard range plus or minus keys

Note: Optional range is (36,48,64,72,96,120) when measuring range is in nautical miles. The km hour range can be (72,96,120,160,214,268).



13.2 List Of Basic Menu Item

Type	Select Radar class
Class	Select radar type
AIS COM	Serial port Select. By default, serial port 1 is fixed
AIS BO	Default fixed baud rate 38400, other baud rates (4800,9600,38400,115200) can be selected.
GPS BO	Serial port Select. By default, serial port2 is fixed
GPS COM	Default fixed baud rate 4800, other baud rates (4800,9600,38400,115200) can be selected.
HDT BO	Serial port Select. By default, serial port 3 is fixed
HDT COM	Default fixed baud rate 4800, other baud rates (4800,9600,38400,115200) can be selected.
ARPA 422 BO	Serial port Select. By default, serial port 4 is fixed
ARPA 422 COM	Default fixed baud rate 4800, other baud rates (4800,9600,38400,115200) can be selected.
Warning BO	Serial port Select. By default, serial port 5 is fixed
Warning COM	Default fixed baud rate 4800, other baud rates (4800,9600,38400,115200) can be selected.
ARPA 232 CO	Serial port Select. By default, serial port 6 is fixed
ARPA 232 COM	Default fixed baud rate 4800, other baud rates (4800,9600,38400,115200) can be selected.
Language	Switch languages, only simplified Chinese, Traditional Chinese, and English for the time being
Network command display	Open the switch of network command display. When you select Open, there will be a refresh display of network command on the main interface, as shown in the figure below



13.3 Restore Factory Setting

This function resets the configuration of all menu functions

Operation steps:

- In the factory menu
- choose to restore factory Settings function
- Press [ENT] key to resume the factory Settings operation

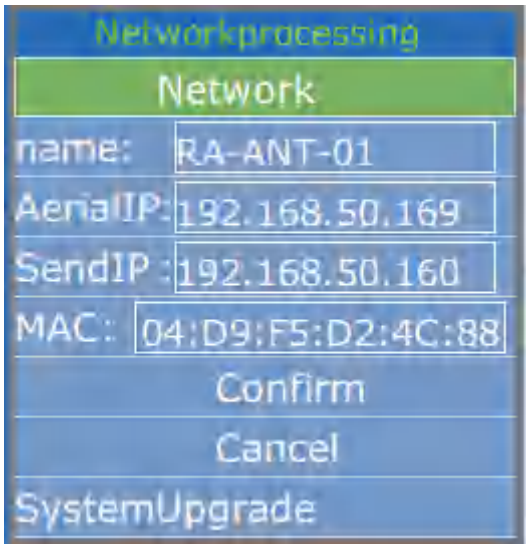
13.4 Signal Processing Unit Setup

Used to configure the network address

Operation steps:

- In the factory menu
- Select network signal processing unit Settings
- Press [ENT] to enter
- Move the mouse to select the ip menu item to configure
- Use the left mouse button to click the edit box to pop up the soft keyboard
- In the software disk by clicking IP configuration, click OK to complete the configuration
- On moving the mouse to determine a menu item
- Press [ENT] to complete the IP configuration operation
- Select the Cancel menu item to disable this IP configuration operation

Note: After the IP address is configured, restart the machine for the configuration to take effect. The MAC address cannot be modified.

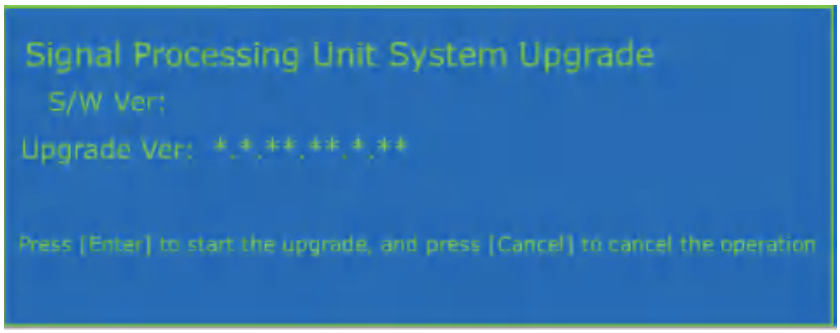


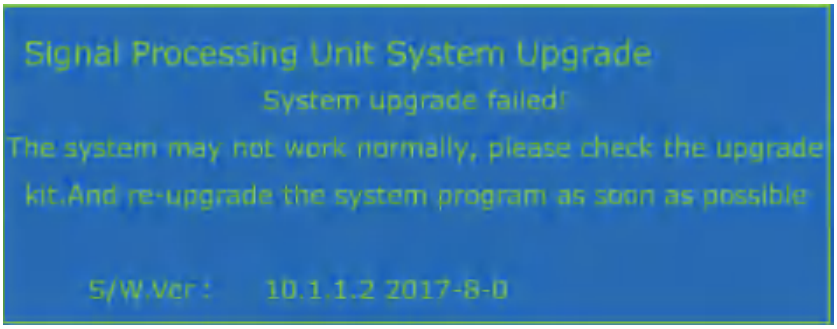
13.5 System Update

Before upgrading the system, insert an SD card or USB flash drive and place the upgrade program in the root directory.

Operation steps:

- Set the interface in the network signal processing unit
- choose system upgrade
- Press [ENT] to pop up the update prompt window
- Perform system upgrade operation according to the prompt window operation
- Press the [ENT] key to upgrade, and the [Cancel] key to exit the upgrade operation





14. INSTALL KSR-1938/26X9

This chapter provides the procedures necessary for installation.

Installation mainly consists of the following:

- sitting and mounting the display unit and antenna unit
- connection of the signal cable and the power cable
- establishing the ground
- checking the installation, and
- adjustments.

14.1 Antenna Unit Installation Sitting, handling considerations

- The antenna unit is generally installed either on top of the wheelhouse or on the radar mast on a suitable platform. Locate the antenna unit where there is a good all-round view rigging intercepting the scanning beam. Any obstruction will cause shadow and blind sectors. A mast for instance, with a diameter considerably less than the width of the radiator, will cause only a small blind sector, but a horizontal spreader or crosstrees in the same horizontal plane as the antenna unit would be a much more serious obstruction; you would need to place the antenna unit well above or below it.
- It is rarely possible to place the antenna unit where a completely clear view in all direction is available. Thus, you should determine the angular width and relative bearing of any shadow sectors for their influence on the radar at the first opportunity after fitting. (The method of determining blind and shadow sectors appears later in this chapter.)
- If you have a radio direction finder on your boat, local its antenna clear of the antenna unit, to prevent interference to the direction finder. A separation of more than two meters is recommended.
- To lessen the chance of picking up electrical interference, avoid where possible routing the signal cable near other onboard electrical equipment Also avoid running the cable in parallel with power cables.
- The compass safe distance should be observed to prevent deviation of the magnetic compass.

Model	Standard compass	Steering compass
KSR-2659		
KSR-2669		

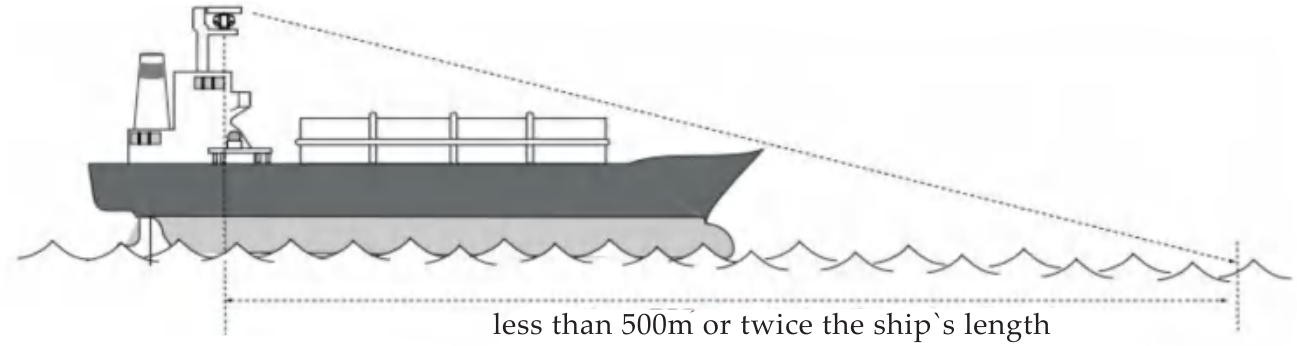


Figure 14-1 Typical antenna unit location

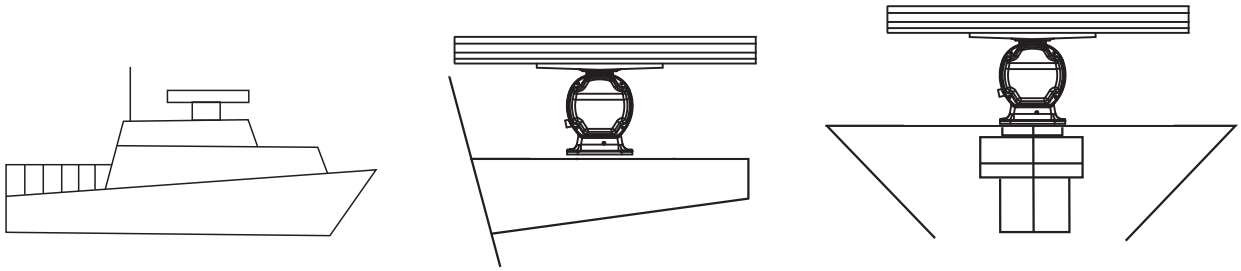


Figure 14-2 Typical antenna unit mounting locations

1. Drill four fixing bolt holes (16 millimeters dia.), In the mounting platform. See the outline drawing.
2. Detach the antenna housing cover from the antenna housing by loosening four fixing blots. The antenna housing cover fitted with the transceiver module can be stored in a convenient place until the wiring to the antenna unit is done.
3. Place the antenna housing on the mounting platform and orient it as shown in Figure 14-3

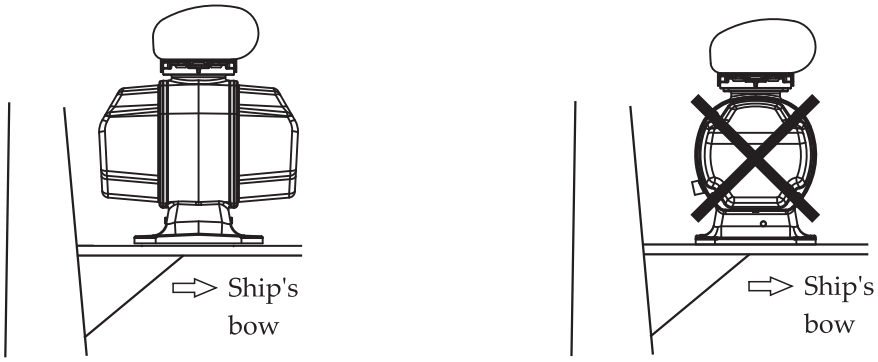


Figure 14-3 How to orient the antenna unit

4. Use the supporting four M14X60 hex head bolts to install them to the 4 fixing holes. Pay attention to the correct installation of flat washers and elastic washers during installation. Please see the picture below for details:

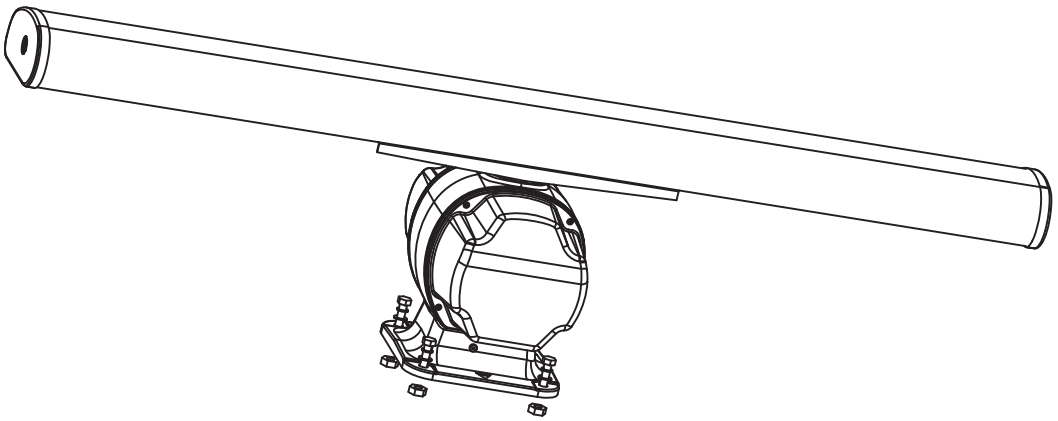


Figure 14-4 How to mount the antenna housing

Connections

Only one signal cable runs from the display unit to the antenna unit. Make the hole for passing the cable through the bulkhead or deck at least 20 millimeters diameter. In order to minimize the chance of picking up electrical interference, avoid routing the signal cable near other onboard electrical equipment. Also, avoid running the cable in parallel with power cables. Pass the cable through the hole and apply sealing compound around the hole for waterproofing.

The procedure for connecting the signal cable to the antenna unit is as follows:

1. Through a pipe or waterproof cable gland fitted on the wheelhouse top or bulkhead
2. Unfasten fastening bolts at rear of the scanner tail to remove the cable gland assembly.
3. Pass the signal cable sequentially through the fastening bolt, the washer, waterproof apron, under the washer, and then through the mounting hole into the base of the antenna inside(removed in step2)

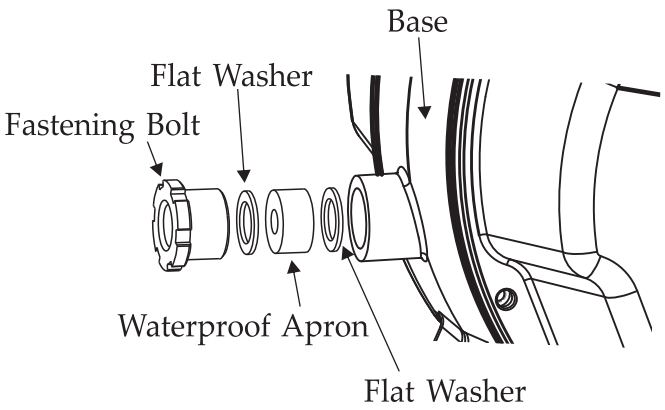


Figure 14-5 Passing the signal cable through the antenna housing

5. Tighten the screws
6. Plug in the Rj45 network of the signal cable to the corresponding Rj45 socket
7. Connect the 5 core plug of the signal cable to the corresponding 5 core socket as shown in figure 14-6

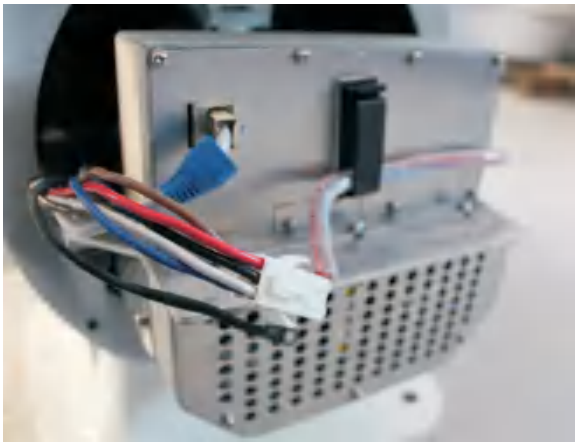
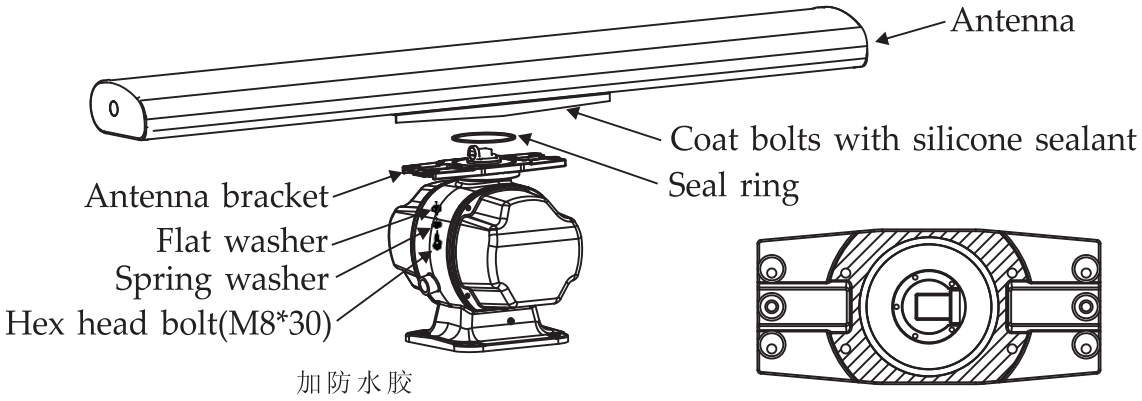


Figure 14-6

8. Cover the antenna cover, check the waterproof apron.

Installation of Waveguide:

9. The antenna is placed in the arm, and the packing of the antenna is opened;
10. Take out the antenna base waveguide filler;
11. Install the waterproof rubber ring.
12. To check the position of the antenna base guide, and to load the antenna waveguide port with the alignment. as shown below:



Note: Apply anticorrosive sealant to hached areas. antenna bracket for KRA-2021 type radiator.

Figure 14-7 Fastening the radiator to the radiator bracket

13. Open antenna cover;
14. Check the internal connection of signal cable is correct;
15. The grounding of the earth wire in the signal cable to the chassis;
16. Loosely fasten the cover screws. You will tighten them after confirming the unit is working normally.

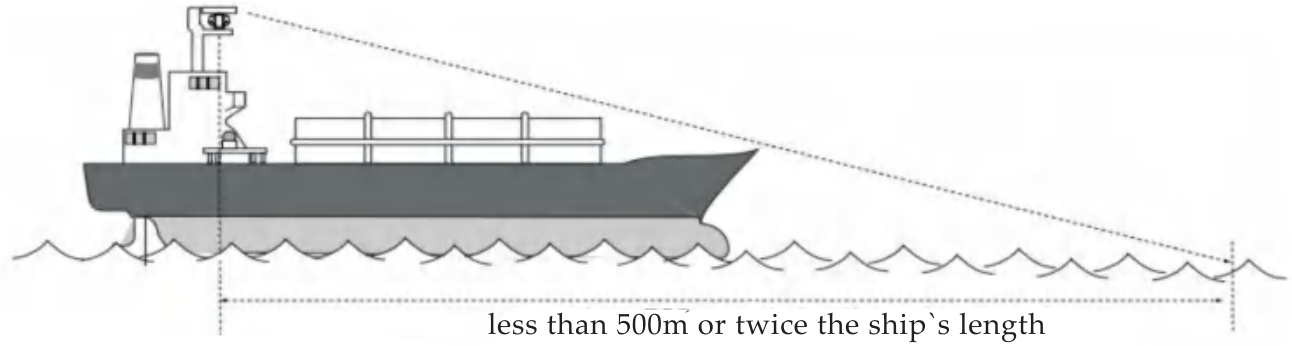


Figure 14-8 Typical antenna unit location

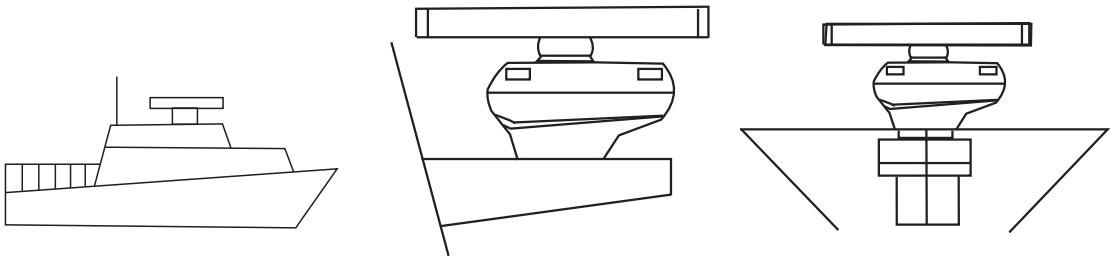


Figure 14-9 Typical antenna unit mounting locations

1. Drill four fixing bolt holes (13 millimeters dia.), In the mounting platform. See the outline drawing.
2. Detach the antenna housing cover from the antenna housing by loosening four fixing blots. The antenna housing cover fitted with the transceiver module can be stored in a convenient place until the wiring to the antenna unit is done.
3. Place the antenna housing on the mounting platform and orient it as shown in Figure 14-10

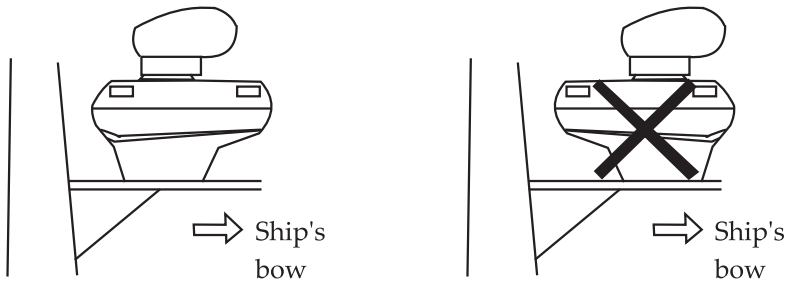


Figure 14-10 How to orient the antenna unit

4. Insert four M12× 60 hex head bolts with the seal washers from inside the antenna housing, to prevent the bolts from contacting the transceiver module. Install the seal washer with the larger diameter next to the head of the bolt. Coat flat and spring washers and nuts and then use them to fasten the antenna housing to the mounting platform. Finally, coat exposed parts of nuts, bolts and Flat and spring washers as shown in Figure 8 - 4

Note: Tighten the bolts by their nuts to prevent damage to the seal washer. Do not turn the bolts to secure the antenna housing.

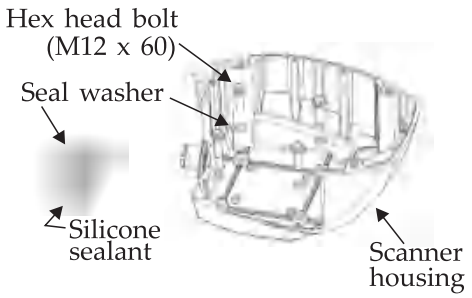


Figure 14-11 How to mount the antenna housing

Connections

Only one signal cable runs from the display unit to the antenna unit. Make the hole for passing the cable through the bulkhead or deck at least 20 millimeters diameter. In order to minimize the chance of picking up electrical interference, avoid routing the signal cable near other onboard electrical equipment. Also, avoid running the cable in parallel with power cables. Pass the cable through the hole and apply sealing compound around the hole for waterproofing.

The procedure for connecting the signal cable to the antenna unit is as follows:

1. Through a pipe or waterproof cable gland fitted on the wheelhouse top or bulkhead
2. Unfasten fastening bolts at rear of the scanner tail to remove the cable gland assembly.
3. Pass the signal cable sequentially through the fastening bolt, the washer, waterproof apron, under the washer, and then through the mounting hole into the base of the antenna inside(removed in step2)

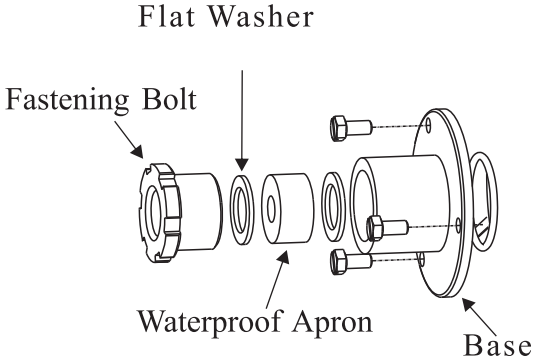


Figure 14-12 Passing the signal cable through the antenna housing

4. Tighten the screws

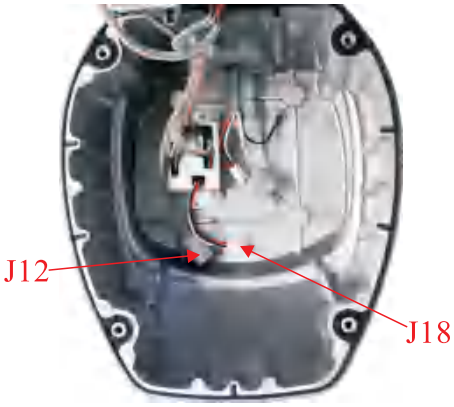


Figure 14-13 Antenna Cable Wiring

5. Plug in the RJ45 network of the signal cable to the corresponding RJ45 socket J12;
6. Connect the 4 core plug of the signal cable to the corresponding 4 core socket J18, as shown in figure 8-7;



Figure 14-14 Connection in the antenna housing

7. Cover the antenna cover, check the waterproof apron.

Installation of Waveguide:

8. The antenna is placed in the arm, and the packing of the antenna is opened;
9. Take out the antenna base waveguide filler;
10. Install the waterproof rubber ring.
11. To check the position of the antenna base guide, and to load the antenna waveguide port with the alignment.As shown below:

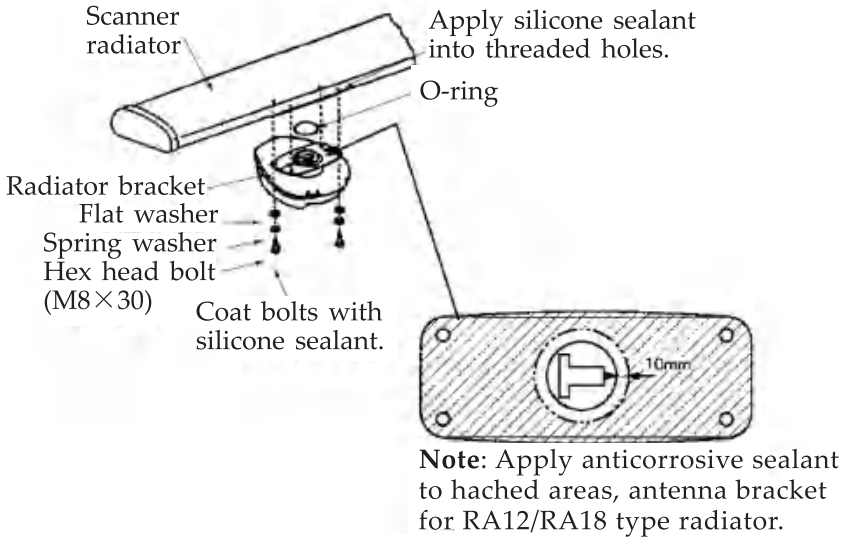


Figure 14-15 Fastening the radiator to the radiator bracket

12. Open antenna cover;
13. Check the internal connection of signal cable is correct;
14. The grounding of the earth wire in the signal cable to the chassis;
15. Loosely fasten the cover screws.You will tighten them after confirming the unit is working normally.

14.2 Display Unit And Control Unit Installation Mounting Considerations

When selecting a mounting location for the display unit keep in mind the following points.

- Even though the display unit is waterproof, it is recommended that the display unit must be mounted inside an enchosed cabinet.
- Provide adequate space behind and around the unit to permit circulation of air and to provide convenient access to the rear connectors.
- Even though the picture is quite legible even in bright sunlight, keep the display unit out of direct sunlight or at least shaded because of heat that can build up inside the cabinet.
- Locate the display unit in a position where you can view and operate it conveniently but where there is no danger of salt or fresh water spray or immersion.
- The orientation of the display unit should be so the radar screen is viewed while the operator is facing in the direction of the bow. This makes determination of your position much easier.
- Make sure you allow enough clearance both to get to the connectors behind the unit and to allow you to get your hands in on both sides to loosen or tighten the mounting knobs. Make sure you leave at least a foot or so of "service loop" of cables behind the unit so it can be pulled forward for servicing or easy removal of the connectors.
- The compass safe distance of meters (standard compass) and meters (steering compass) should be observed to prevent deviation of the magnetic compass.

Mounting

The display control unit is designed for desktop or embedded installation.

- Display Unit

Desktop Mounting

1. Using the hanger as a template, mark screw locations in the mounting location.
2. Fix the hanger to the mounting location with seven M5 tapping screws(supplied).
3. Fit the knob bolts to the display unit. Install the display unit in the hanger. Tighten the knob bolts securely.

Flush Mounting

1. Make cutout in mounting location refeerring to the outline drawing.
2. Insert the display unit to the hole, remove the rubber plugs, fix it with four tapping screws(M6x50).
3. Attach four rubber plugs to the fixing holes.

● Control Unit

Desktop Mounting

1. Using the hanger as a template, mark screw locations in the mounting location.
2. Fix the hanger to the mounting location with four M5 tapping screws(supplied).
3. Insert the display unit to the hole, remove the rubber plugs, fix it with four tapping screws(M4*30) .
4. Attach four rubber plugs to the fixing holes.

Flush Mounting

1.Make cutout in mounting location referring to the outline drawing.
2.Insert the display unit to the hole, remove the rubber plugs, fix it with four tapping screws(M4*30).
3.Attach four rubber plugs to the fixing holes.

14.3 Checking the Installation

After completing the installation, it is a good idea to recheck it to be sure all steps were correctly done. Use the table 6-1 to check the installation.

Tick box (Table 6-1)

- The signal cable is securely retained against the mast or mounting platform and is free of interference from running rigging
- The cable gland or entry on the deck, if provided, is waterproofed
- The power connections to the battery are of correct polarity
- The plugs at the rear of the display unit are tightly fastened
- The fuse in the power cable is 10A (24V DC)

14.4 Adjustments

This section covers adjustment of the radar after installation.

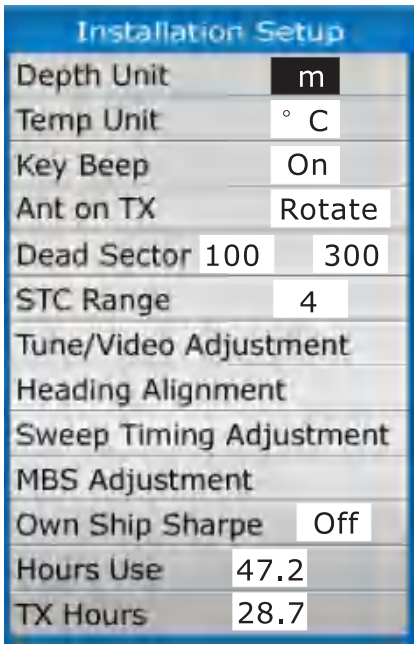
You will need to

- adjust tune/video amplifier level input
- enter antenna height
- adjust tuning level
- adjust sweep timing
- adjust main bang suppression
- setting a blanking area

These adjustment are done through the radar install menus.

Preparation

1. Turn off the radar. While pressing and holding down the **[7 HL OFF]** key press the [**POWER**] key.
2. Release the **[7 HL OFF]** key, when you see logo and wait for finish standby (finish count down).
3. Press the [**MENU**] key, and select "FUNCTION MENU" by using the omnipad, and pressing [**ENTER**] key.
4. Select "INSTALLATION SETUP".
   Press the [**ENTER**] key to open the installation setup menu.



Adjusting tune/video

Do the following to adjust tune and video amplifier level input.

1. Press the [**ST BY/TX**] key to transmit.

⚠ WARNING

Before transmitting the radar make sure no one is near the antenna unit, to prevent the potential risk of being struck by the rotation antenna and exposure to radiation hazard.

2. On the Installation setup menu, select "TUNE/VIDEO ADJUSTMENT" and press the [**ENTER**] key.
3. The unit automatically adjusts, displaying the following message.

[Tune/Video Auto Adjustment]

Now under correction.

Return to installation setup menu after the correction.

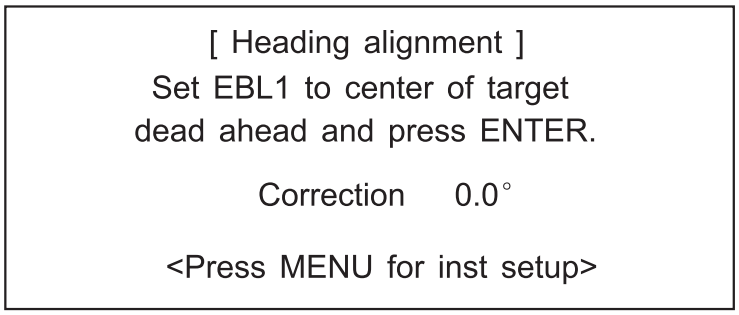
4. When adjustment is completed, the messages disappears.

Aligning heading (Adjustment sector:0~359.90)

You have mounted the antenna unit facing straight ahead in the direction of the how. Therefore, a small but conspicuous target dead ahead visually should appear on the heading line (zero degrees).

In practice, you will probably observe some small error on the display because of the difficulty in achieving accurate initial positioning of the antenna unit. The following adjustment will compensate for this error.

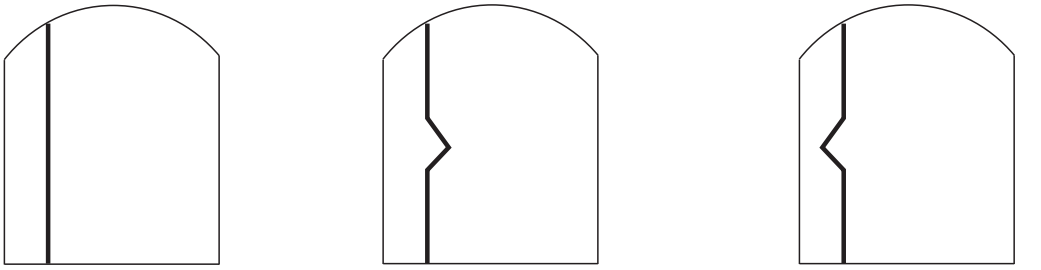
1. Identify a suitable target (for example, ship or buoy) at a range between 0.125 to 0.25 nautical miles, preferably near the heading mark. To lessen error, keep echoes in the outer half of the picture by changing the range. Also, be sure the zoom and off center functions are off.
2. Select "HEADING ALIGNMENT" on the installation setup menu and press the [**ENTER**] key. The following message appears on the display.



3. Operate the trackball to bisect target selected at step 1 with the heading line.
4. Press the [**ENTER**] key.
5. As a final test, move the boat towards a small buoy and confirm that the buoy shows up dead ahead on the radar when it is visually dead ahead.

Adjusting sweep timing(Adjustment range:0.000~4.266nm)

This adjustment ensures proper radar performance, especially on short ranges. The radar measures the time required for a transmitted echo appears on the display based on this time. Thus, at the instant the transmitter is fired, the sweep should start from the center of the display (sometimes called sweep origin.) A trigger pulse generated in the display unit goes to the antenna unit through the signal cable to trigger the transmitter (magnetron). The time taken by the signal to travel up to the antenna unit varies, depending largely on the length of signal cable. During this period the display unit should wait before starting the sweep. When the display unit is not adjusted correctly, the echoes from a straight local object (for example, a harbor wall or straight pier) will not appear with straight edges - namely, they will be seen as "pushed out" or "pulled in" near the picture center. The range of objects will also be incorrectly shown.



Examples of improper and correct sweep timing

1. Transmit on the shortest range and confirm that the [**GAIN**] and [**STC**] controls are properly adjusted.
2. Visually select a target which forms straight line (harbor wall, straight pier).
3. Select "SWEEP TIMING ADJUSTMENT" on the installation setup menu and press the [**ENTER**] key. The message appears.

[Sweep Timing Adjustment]
Use omnipad to staighten
Target and press ENTER key.

Correction 0.000 nm

<Press MENU for inst setup>

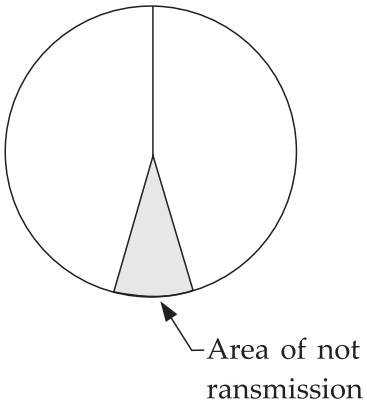
Sweep timing adjustment message

4. Operate the trackball to straighten the target selected at step 2, and then press the [**ENTER**] key.

Setting a blanking area

When the antenna is installed at a close distance in front of the wheelhouse, the radar should be set not to transmit within that area. No echoes appear in the blanking areas.

1. Select "DEAD SECTOR".
2. Press the [**ENTER**] key.
3. Operate the trackball to enter staring point of area (in figures).
4. Press the [**ENTER**] key.
5. Operate the trackball to enter ending point of area (in figures).
6. Press the [**ENTER**] key.

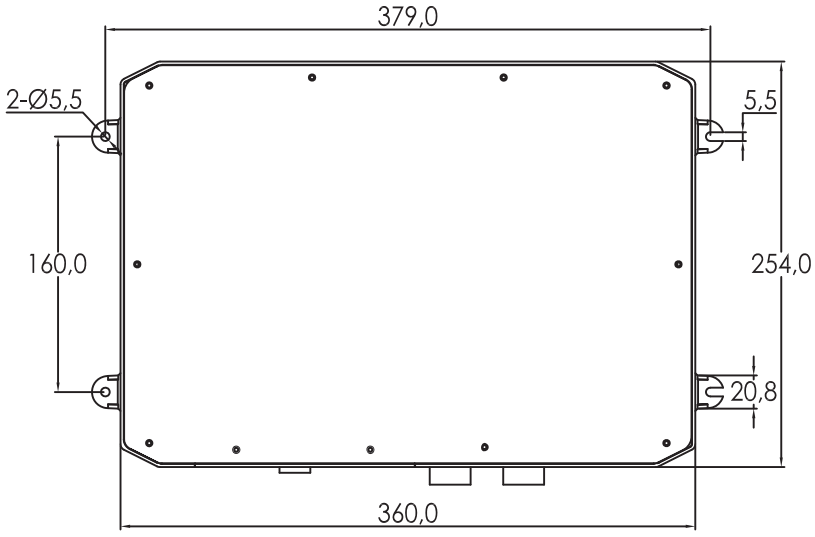


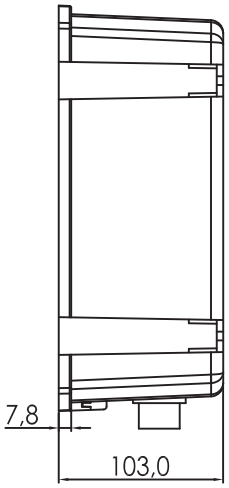
Blank areas where transmission is suspended

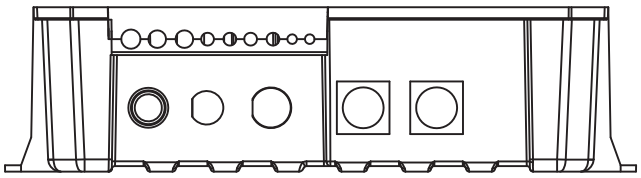
This area can be turned on/off on the VIDEO MENU.

Note: This setting should be done after other adjustment are finished.

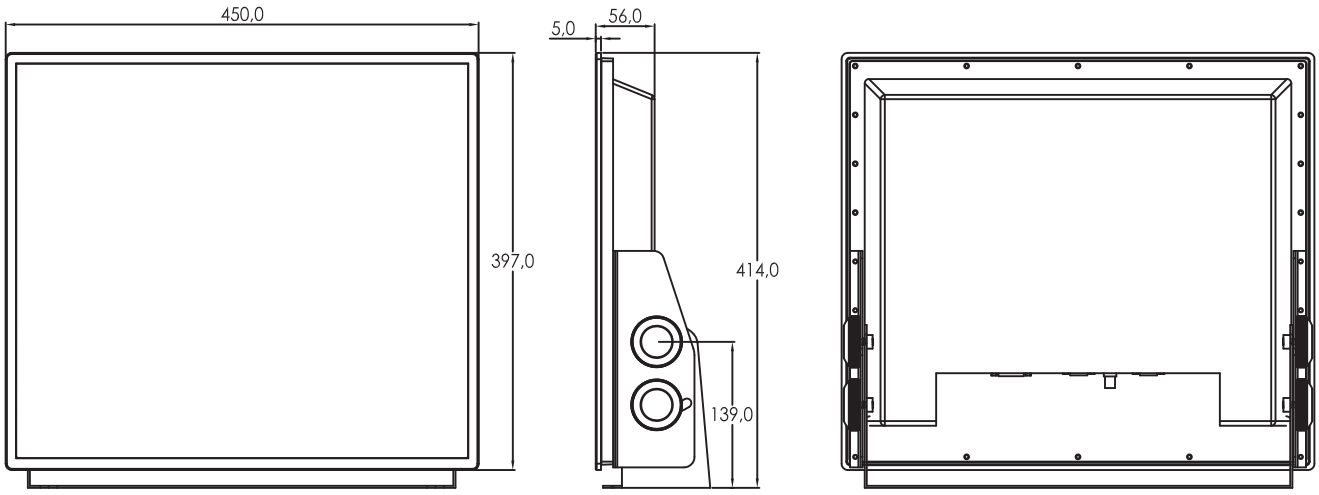
15. OUTSIDE DRAWING

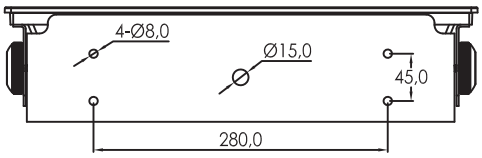




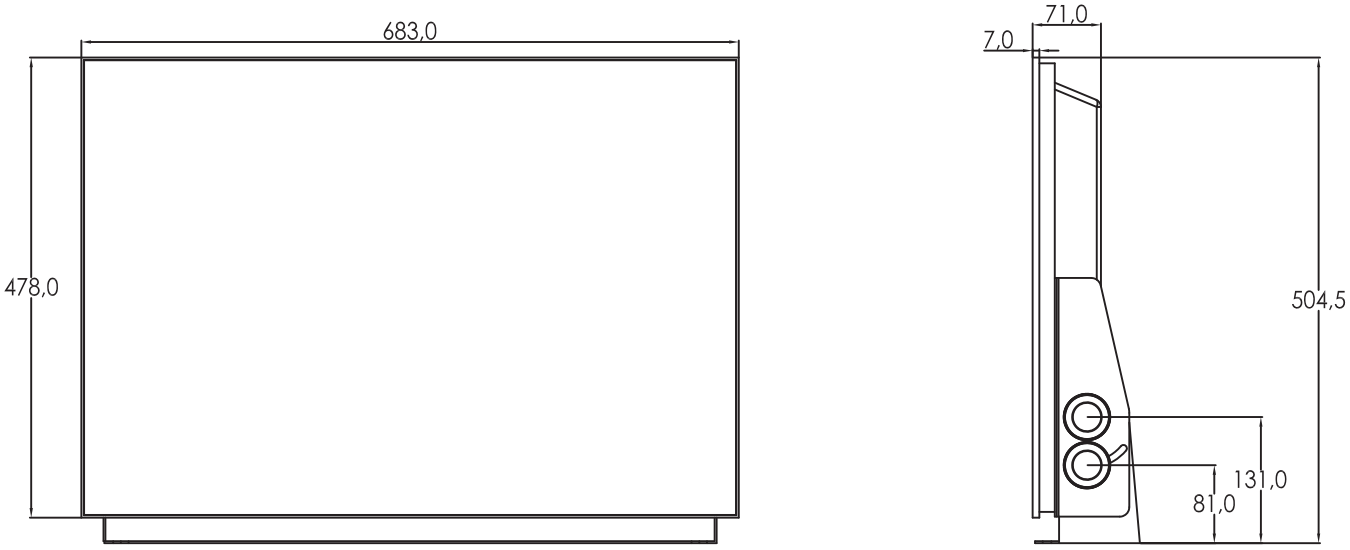


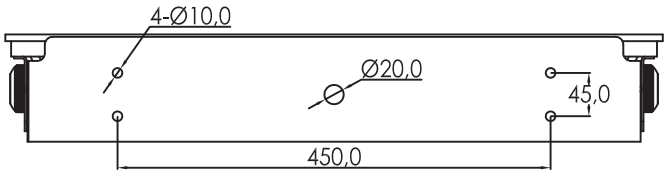
Type	KRM-1001
Name	Main unit



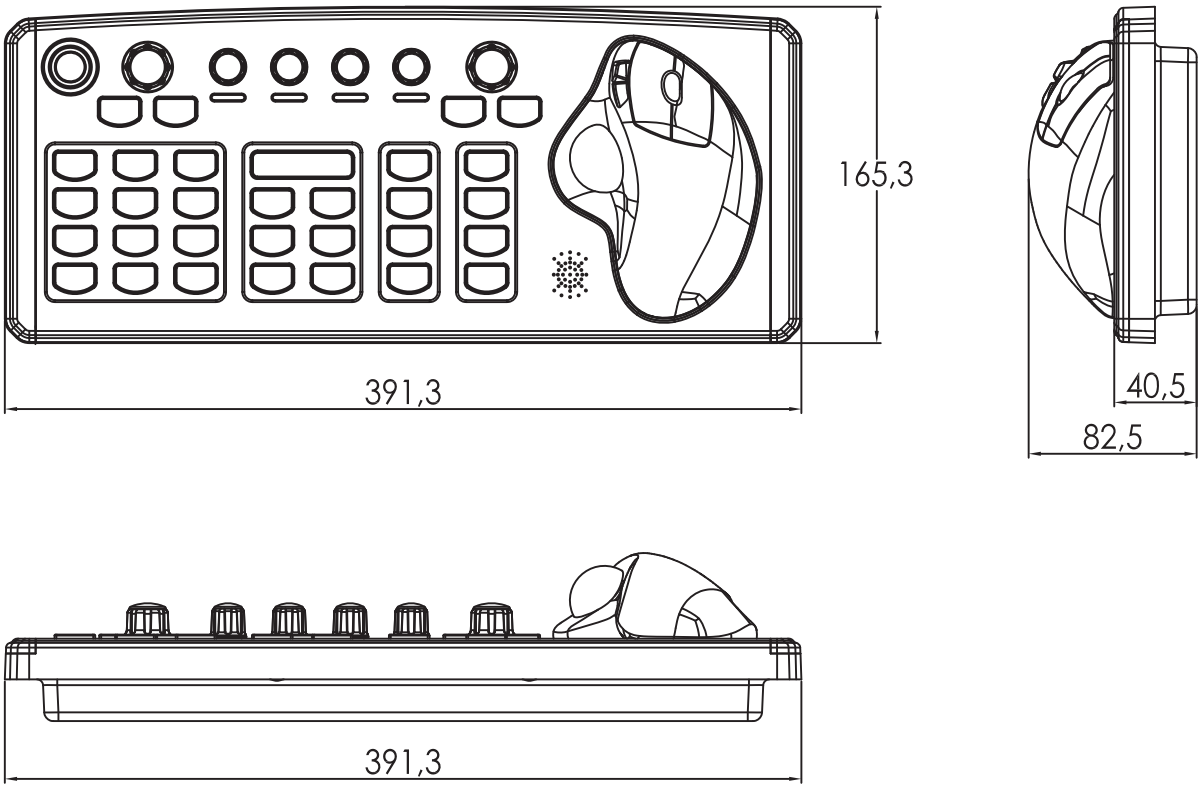


Type	KRD-1910
Name	Display unit

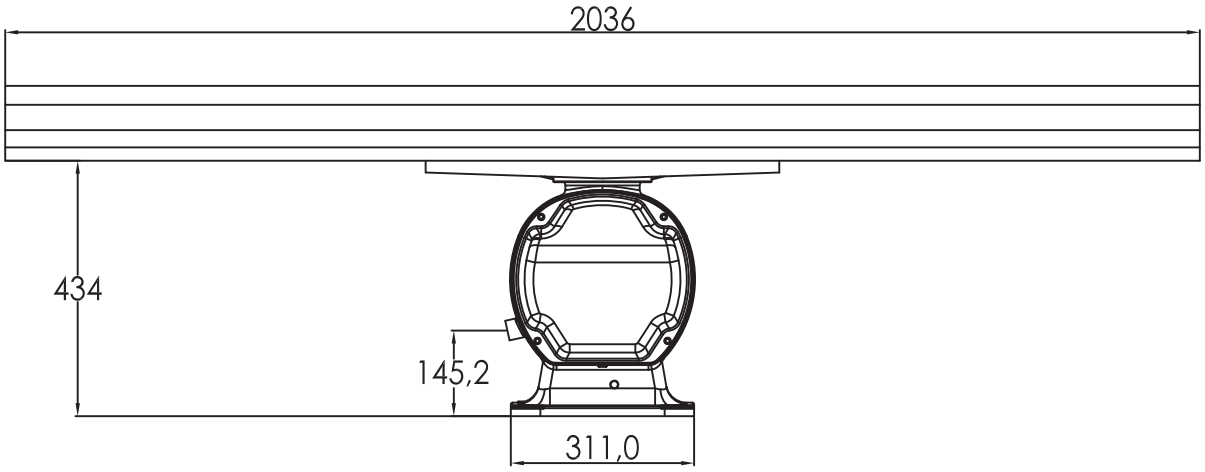


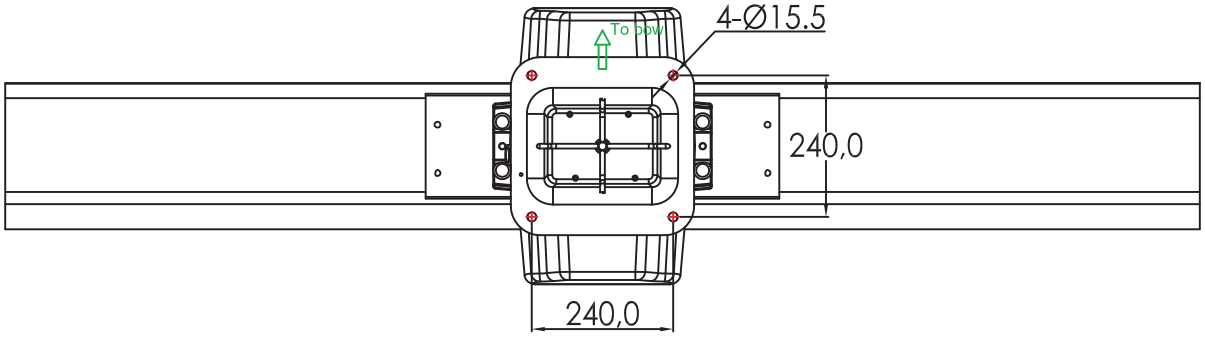


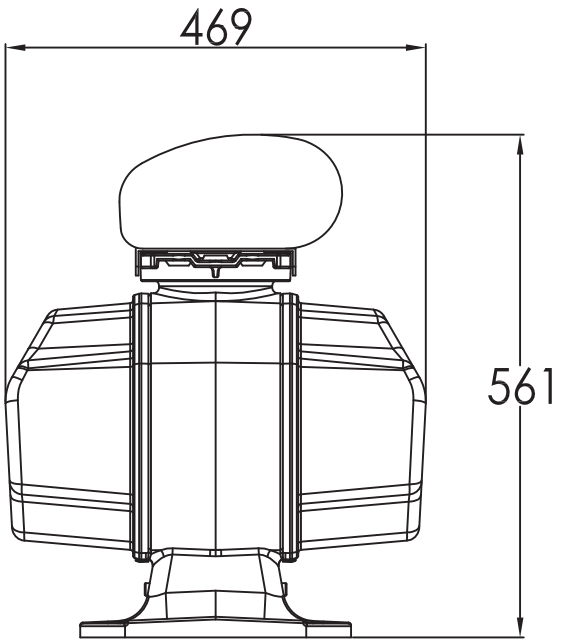
Type	KRD-2601
Name	Display unit



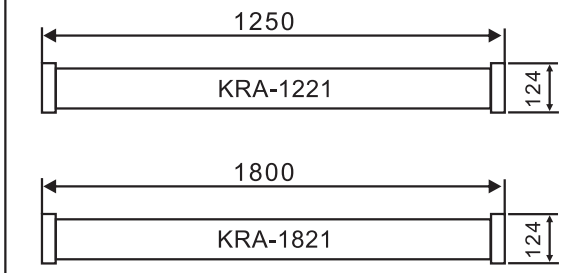
Type	KRK−1121
Name	Control unit



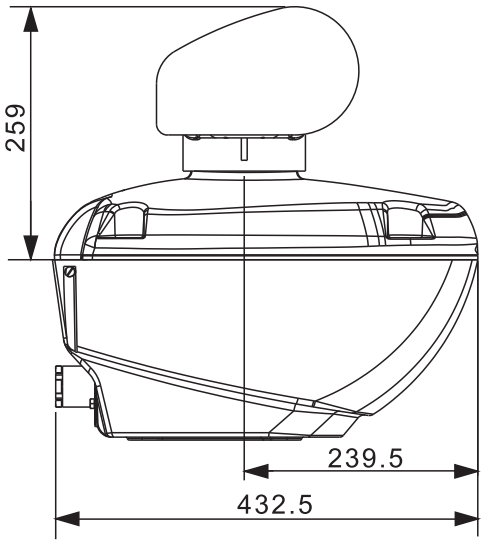


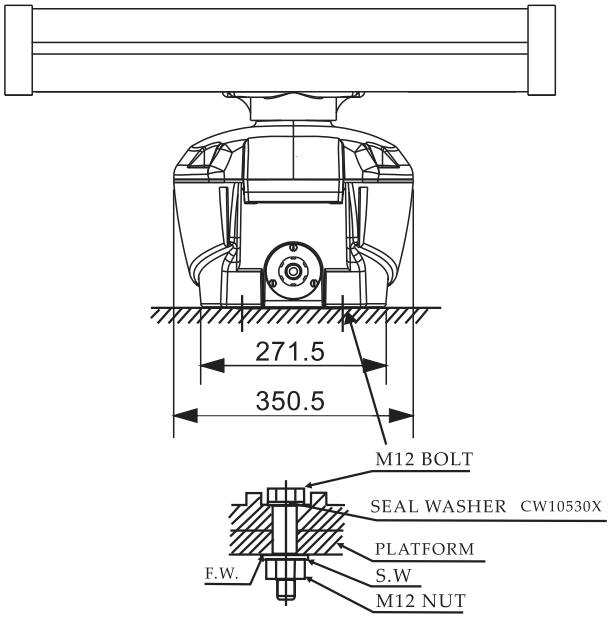


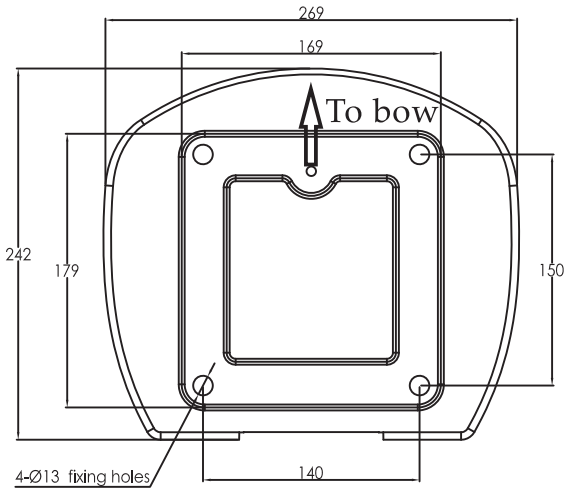
Type	KRA-5001
Name	Transceiver unit



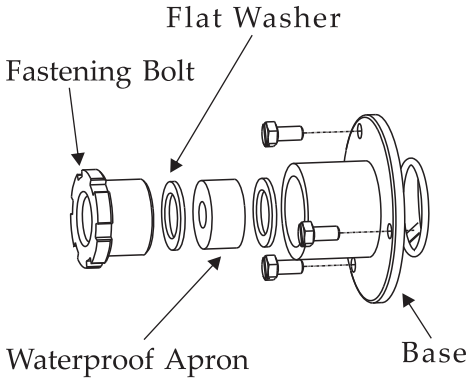
RADIATOR（S=1/25）





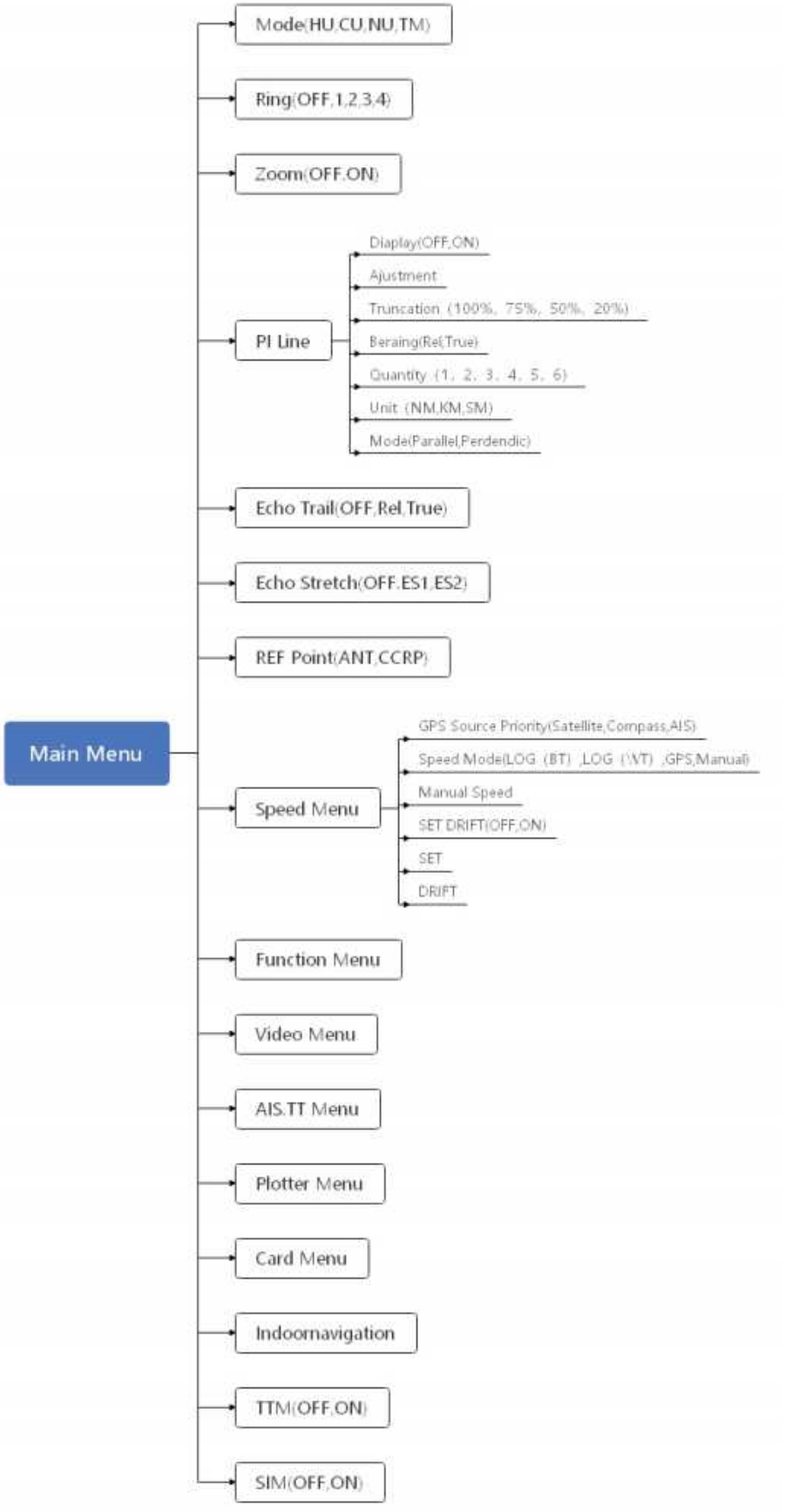


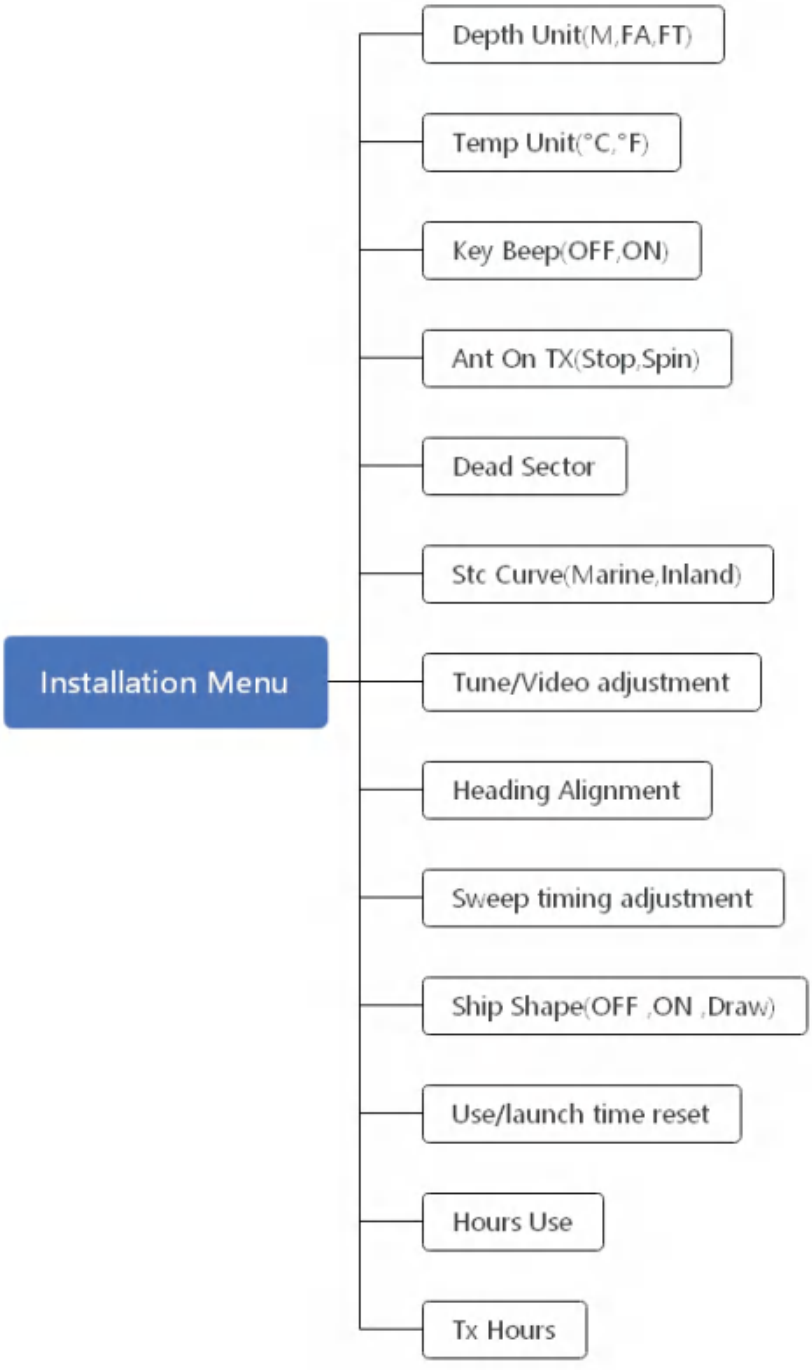
MOUNTING DIMEENSIONS

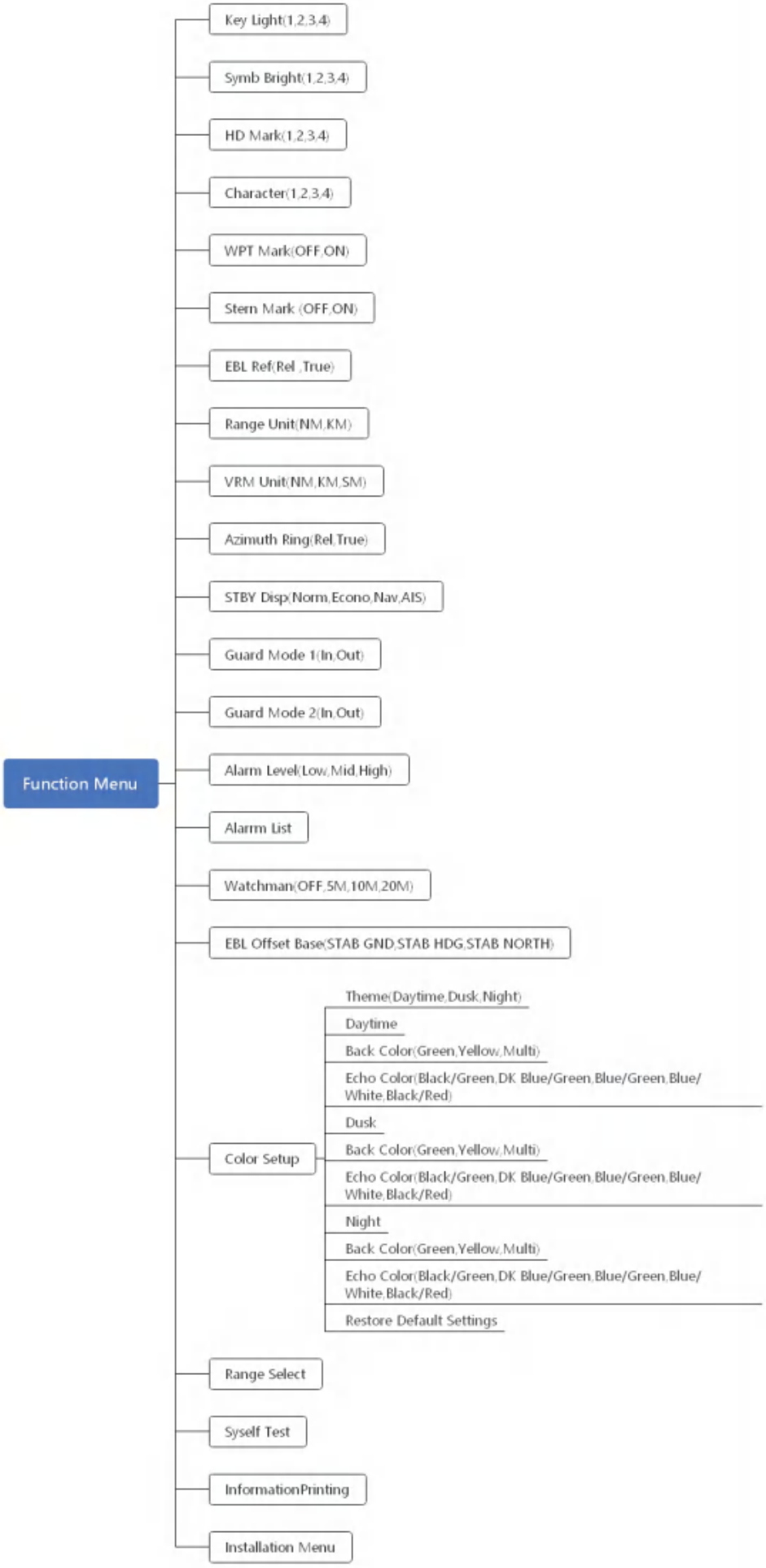


MODEL: KRT-6022/KRT-1222
NAME: SCANNER UNIT

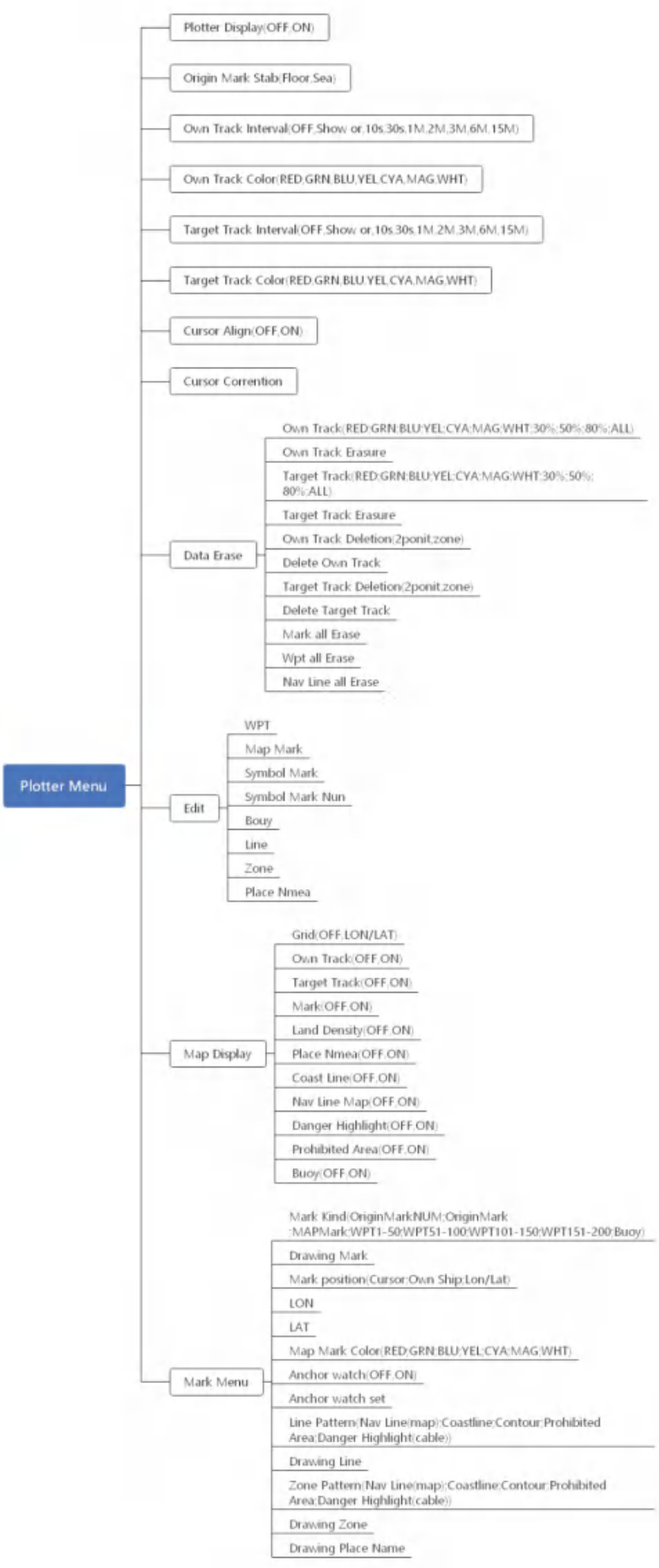
16. MENU TREE

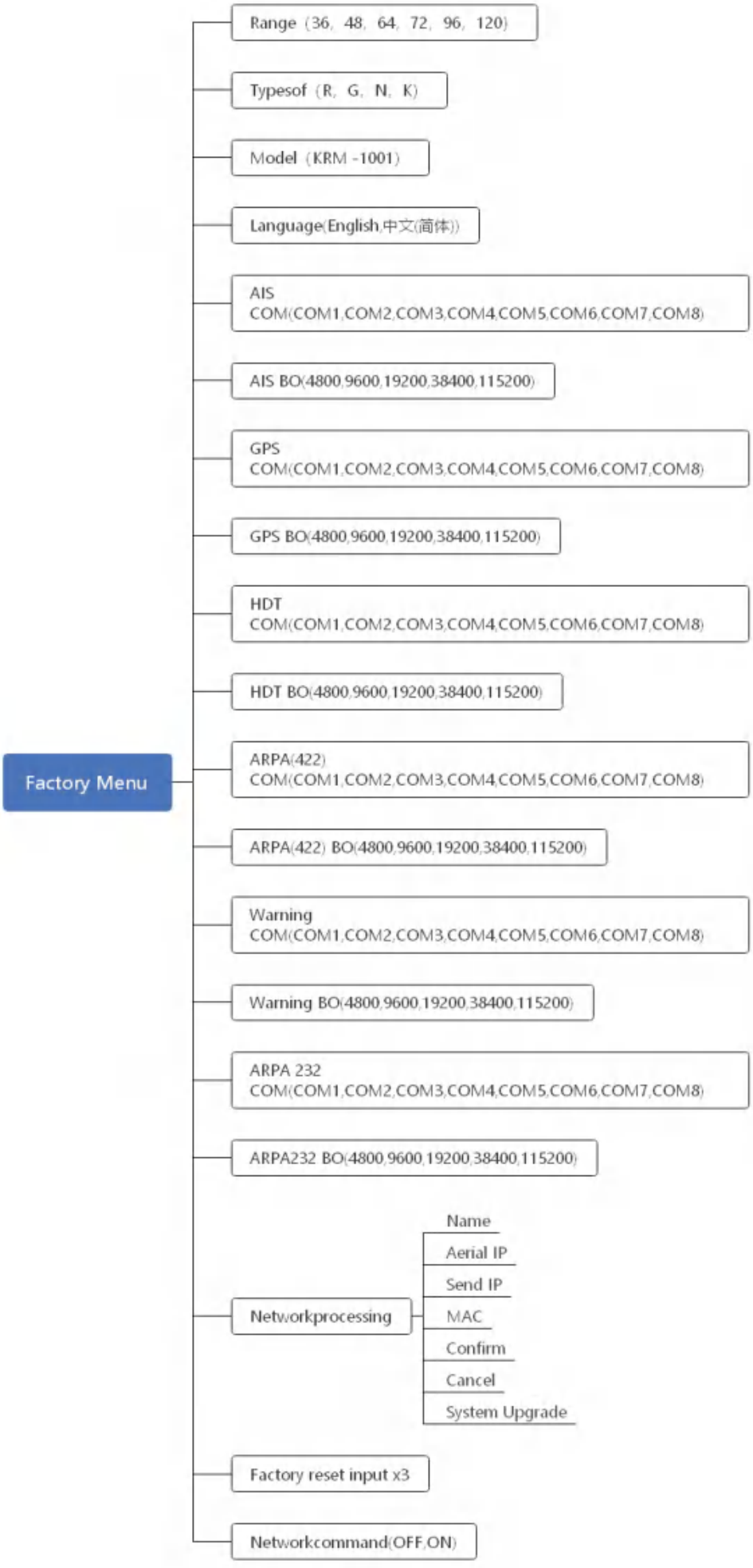

Main Menu
Mode(HU,CU,NU,TM)
Ring(OFF,1,2,3,4)
Zoom(OFF,ON)
PI Line
Diaplay(OFF,ON)
Ajustment
Truncation (100%, 75%, 50%, 20%)
Bearing(Rel,True)
Quantity (1, 2, 3, 4, 5, 6)
Unit (NM,KM,SM)
Mode(Parallel,Perdendic)
Echo Trail(OFF,Rel,True)
Echo Stretch(OFF,ES1,ES2)
REF Point(ANT,CCRP)
Speed Menu
GPS Source Priority(Satellite,Compass,AIS)
Speed Mode(LOG (BT) ,LOG (VT) ,GPS,Manual)
Manual Speed
SET DRIFT(OFF,ON)
SET
DRIFT
Function Menu
Video Menu
AIS.TT Menu
Plotter Menu
Card Menu
Indoornavigation
TTM(OFF,ON)
SIM(OFF,ON)

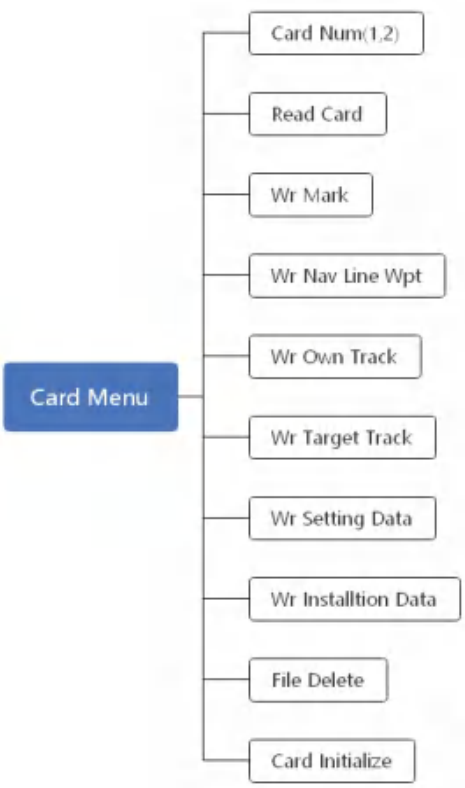

Installation Menu
Depth Unit(M,FA,FT)
Temp Unit(°C,°F)
Key Beep(OFF,ON)
Ant On TX(Stop,Spin)
Dead Sector
Stc Curve(Marine,Inland)
Tune/Video adjustment
Heading Alignment
Sweep timing adjustment
Ship Shape(OFF ,ON ,Draw)
Use/launch time reset
Hours Use
Tx Hours

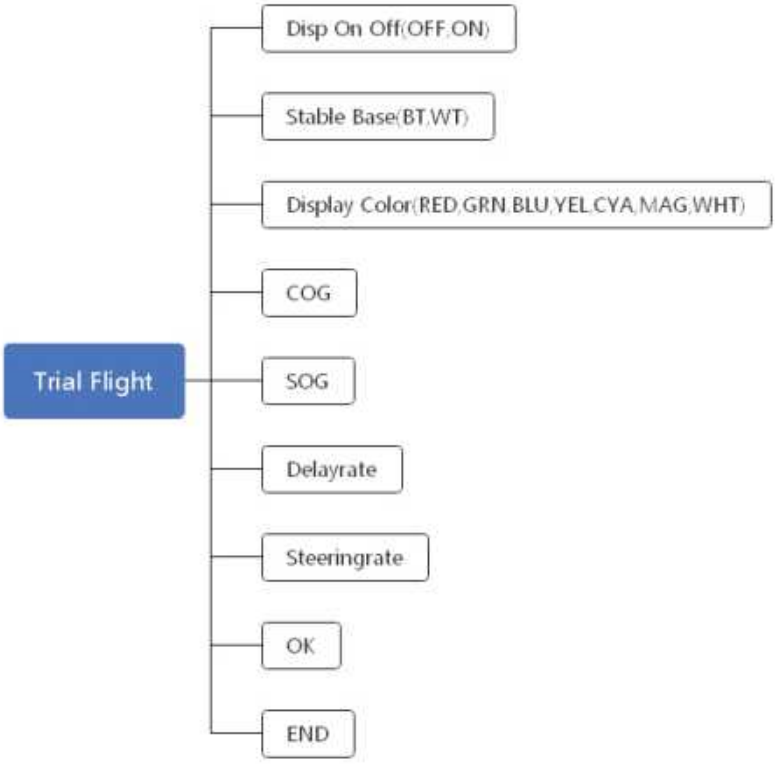

Function Menu
Key Light(1,2,3,4)
Symb Bright(1,2,3,4)
HD Mark(1,2,3,4)
Character(1,2,3,4)
WPT Mark(OFF,ON)
Stern Mark (OFF,ON)
EBL Ref(Rel ,True)
Range Unit(NM,KM)
VRM Unit(NM,KM,SM)
Azimuth Ring(Rel,True)
STBY Disp(Norm,Econo,Nav,AIS)
Guard Mode 1(In,Out)
Guard Mode 2(In,Out)
Alarm Level(Low,Mid,High)
Alarm List
Watchman(OFF,5M,10M,20M)
EBL Offset Base(STAB GND,STAB HDG,STAB NORTH)
Color Setup
Theme(Daytime,Dusk,Night)
Daytime
Back Color(Green,Yellow,Multi)
Echo Color(Black/Green,DK Blue/Green,Blue/Green,Blue/White,Black/Red)
Dusk
Back Color(Green,Yellow,Multi)
Echo Color(Black/Green,DK Blue/Green,Blue/Green,Blue/White,Black/Red)
Night
Back Color(Green,Yellow,Multi)
Echo Color(Black/Green,DK Blue/Green,Blue/Green,Blue/White,Black/Red)
Restore Default Settings
Range Select
Syself Test
InformationPrinting
Installation Menu

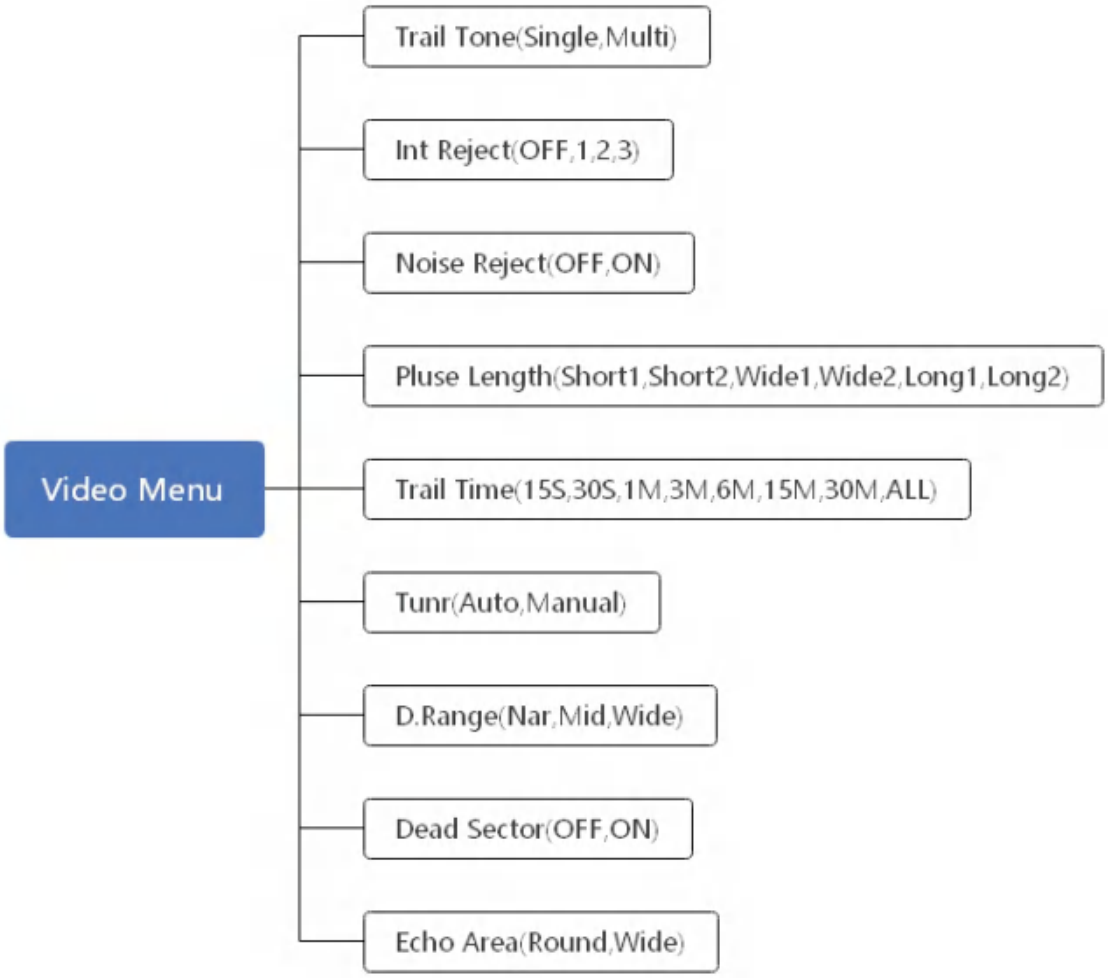

AIS.TT Menu
AZ STAB（STAB HDG,STAB NORTH)
TT.AIS Symbol
TT Symbol Color（RED,GRN,BLU,YEL,CYA,MAG,WHT)
AIS Symbol Color（RED,GRN,BLU,YEL,CYA,MAG,WHT)
Ais Rot Tag Limit
Ais Scaled Symbol(OFF,ON)
TT.AIS Target
TT Display（OF,ON)
AIS Display（OFF,Filter,ALL)
Auto Acq(OFF,ON)
AIS ALL Targets(Sleep,Activate)
Lost Target Alarm(OFF,ALL,Filter)
In out Harbour(In,Out)
TT ALL Cancel
Vector Time
Vector Ref(Rel,True)
History Dots(OFF,5,10)
History Interval(15S,30S,1M,2M,3M,6M,12M)
CPA Limit(OFF,0.5nm,1nm,2nm,3nm,5nm,6nm)
TCPA Limit(30S,1M,2M,3M,4M,5M,6M,12M,15M)
Proximity(OFF,0.5nm,1nm,2nm,3nm,5nm,6nm,12nm,24nm)
Cpa Auto Activate
MAX Range(OFF,ON)
Max Ranger Set
Min Ship Speed(OFF,ON)
MinShip Speed Set
Exceot Class b
Min Ship Length(OFF,ON)
Min Ship Length set
AIS Disp Filter
MAX Range(OFF,ON)
Max Ranger Set
Min Ship Speed(OFF,ON)
MinShip Speed Set
Exceot Class b
Min Ship Length(OFF,ON)
Min Ship Length set
AIS Lost Filter
MAX Range(OFF,ON)
Max Ranger Set
Min Ship Speed(OFF,ON)
MinShip Speed Set
Exceot Class b
Min Ship Length(OFF,ON)
Min Ship Length set
TT Lost Filter
Max Range(OFF,ON)
Max Range set
Min Ship Speed(OFF,ON)
Min Ship Speed set
AIS TT Target List
Refresh(OFF,ON)
Refresh time
Sortby（CPA,TCPA,BCR,BCT,range,speed)
Target List
ASSOCIATION
Association Target（OFF，AIS,TT)
Gap
Range
Bearing
Speed
Course

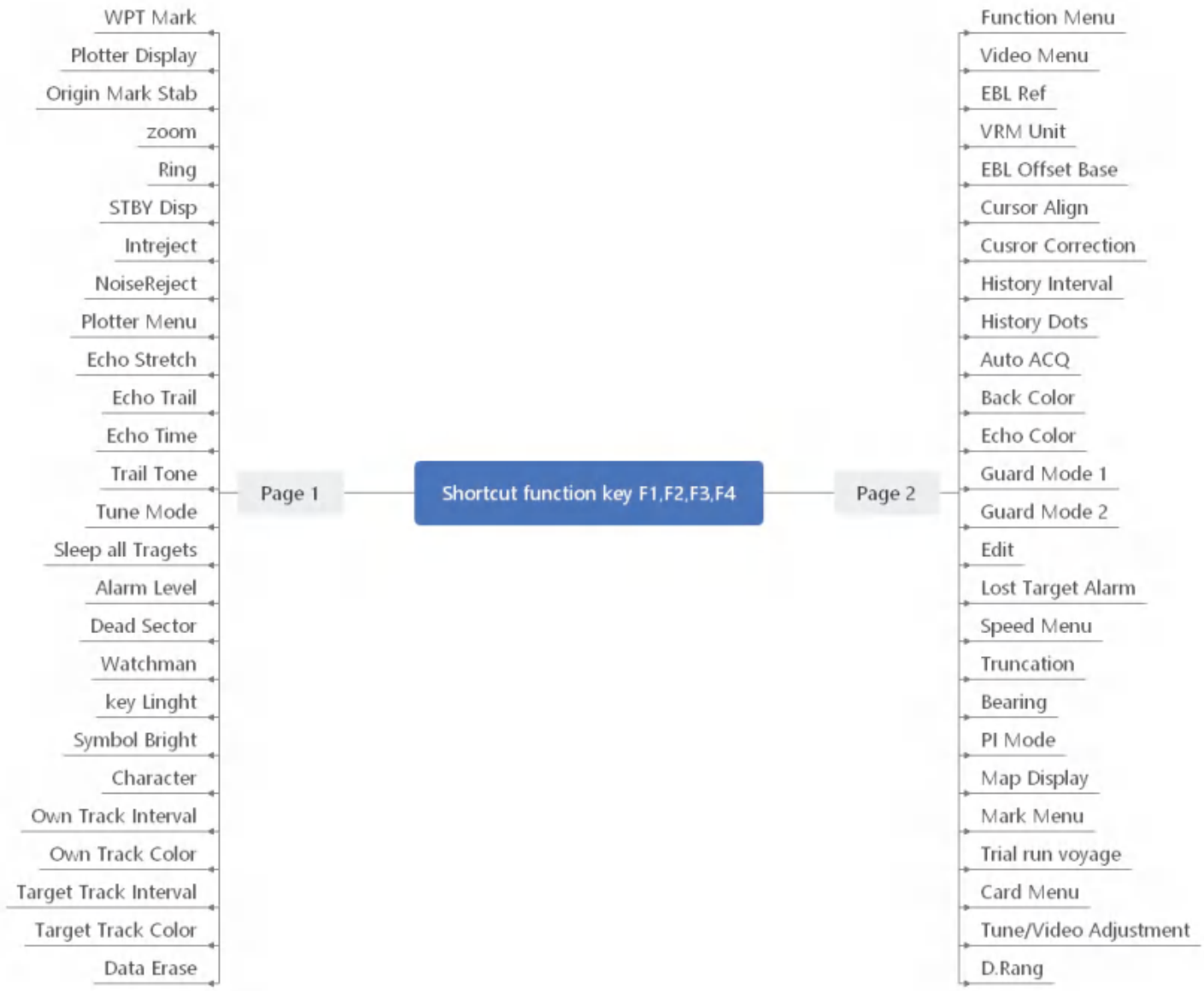

Plotter Menu
Plotter Display(OFF,ON)
Origin Mark Stalb(Floor,Sea)
Own Track Interval(OFF,Show or,10s,30s,1M,2M,3M,6M,15M)
Own Track Color(RED,GRN,BLU,YEL,CYA,MAG,WHT)
Target Track Interval(OFF,Show or,10s,30s,1M,2M,3M,6M,15M)
Target Track Color(RED,GRN,BLU,YEL,CYA,MAG,WHT)
Cursor Align(OFF,ON)
Cursor Corrention
Data Erase
Own Track(RED:GRN:BLU:YEL:CYA:MAG:WHT:30%:50%:80%:ALL)
Own Track Erasure
Target Track(RED:GRN:BLU:YEL:CYA:MAG:WHT:30%:50%:80%:ALL)
Target Track Erasure
Own Track Deletion(2ponit,zone)
Delete Own Track
Target Track Deletion(2ponit,zone)
Delete Target Track
Mark all Erase
Wpt all Erase
Nav Line all Erase
Edit
WPT
Map Mark
Symbol Mark
Symbol Mark Nun
Bouy
Line
Zone
Place Nmea
Map Display
Grid(OFF,LON/LAT)
Own Track(OFF,ON)
Target Track(OFF,ON)
Mark(OFF,ON)
Land Density(OFF,ON)
Place Nmea(OFF,ON)
Coast Line(OFF,ON)
Nav Line Map(OFF,ON)
Danger Highlight(OFF,ON)
Prohibited Area(OFF,ON)
Buoy(OFF,ON)
Mark Menu
Mark Kind(OriginMark:NUM:OriginMark
:MAPMark:WPT1-50:WPT51-100:WPT101-150:WPT151-200:Buoy)
Drawing Mark
Mark position(Cursor:Own Ship:Lon/Lat)
LON
LAT
Map Mark Color(RED:GRN:BLU:YEL:CYA:MAG:WHT)
Anchor watch(OFF,ON)
Anchor watch set
Line Pattern(Nav Line(map):Coastline:Contour:Prohibited Area:Danger Highlight(cable))
Drawing Line
Zone Pattern(Nav Line(map):Coastline:Contour:Prohibited Area:Danger Highlight(cable))
Drawing Zone
Drawing Place Name


Factory Menu
Range（36，48，64，72，96，120）
Typesof（R，G，N，K）
Model（KRM -1001）
Language(English,中文(简体))
AIS
COM(COM1,COM2,COM3,COM4,COM5,COM6,COM7,COM8)
AIS BO(4800,9600,19200,38400,115200)
GPS
COM(COM1,COM2,COM3,COM4,COM5,COM6,COM7,COM8)
GPS BO(4800,9600,19200,38400,115200)
HDT
COM(COM1,COM2,COM3,COM4,COM5,COM6,COM7,COM8)
HDT BO(4800,9600,19200,38400,115200)
ARPA(422)
COM(COM1,COM2,COM3,COM4,COM5,COM6,COM7,COM8)
ARPA(422) BO(4800,9600,19200,38400,115200)
Warning
COM(COM1,COM2,COM3,COM4,COM5,COM6,COM7,COM8)
Warning BO(4800,9600,19200,38400,115200)
ARPA 232
COM(COM1,COM2,COM3,COM4,COM5,COM6,COM7,COM8)
ARPA232 BO(4800,9600,19200,38400,115200)
Networkprocessing
Name
Aerial IP
Send IP
MAC
Confirm
Cancel
System Upgrade
Factory reset input x3
Networkcommand(OFF,ON)


Card Menu
Card Num(1,2)
Read Card
Wr Mark
Wr Nav Line Wpt
Wr Own Track
Wr Target Track
Wr Setting Data
Wr Installtion Data
File Delete
Card Initialize


Trial Flight
Disp On Off(OFF,ON)
Stable Base(BT,WT)
Display Color(RED,GRN,BLU,YEL,CYA,MAG,WHT)
COG
SOG
Delayrate
Steeringrate
OK
END


Video Menu
Trail Tone(Single,Multi)
Int Reject(OFF,1,2,3)
Noise Reject(OFF,ON)
Pluse Length(Short1,Short2,Wide1,Wide2,Long1,Long2)
Trail Time(15S,30S,1M,3M,6M,15M,30M,ALL)
Tunr(Auto,Manual)
D.Range(Nar,Mid,Wide)
Dead Sector(OFF,ON)
Echo Area(Round,Wide)


Shortcut function key F1,F2,F3,F4
Page 1
WPT Mark
Plotter Display
Origin Mark Stab
zoom
Ring
STBY Disp
Intreject
NoiseReject
Plotter Menu
Echo Stretch
Echo Trail
Echo Time
Trail Tone
Tune Mode
Sleep all Tragets
Alarm Level
Dead Sector
Watchman
key Linght
Symbol Bright
Character
Own Track Interval
Own Track Color
Target Track Interval
Target Track Color
Data Erase
Page 2
Function Menu
Video Menu
EBL Ref
VRM Unit
EBL Offset Base
Cursor Align
Cusror Correction
History Interval
History Dots
Auto ACQ
Back Color
Echo Color
Guard Mode 1
Guard Mode 2
Edit
Lost Target Alarm
Speed Menu
Truncation
Bearing
PI Mode
Map Display
Mark Menu
Trial run voyage
Card Menu
Tune/Video Adjustment
D.Rang

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