

KC OPERATOR'S MANUAL

GPS CHART PLOTTER WITH FISHFINDER



SAFETY INSTRUCTIONS

Safety Instructions for the Operator

WARNING

Do not open the equipment.

Only qualified personnel should work inside the equipment.

Do not disassemble or modify the equipment.

Fire,electrical shock or serious injury can result.

Immediately turn off the power at the switchboard if the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock.Contact a **ONWA** agent for service.

Use the proper fuse.

Use of a wrong fuse can damage the equipment or cause fire.

Be sure the power supply is compatible with the equipment.

Incorrect power supply may cause the equipment to overheat.

The useable temperature range -15° to 55° for the display unit.

Use of the equipment out of those ranges may damage the equipment.

Safety Instructions for the Installer

WARNING

Do not open the cover unless totally familiar with electrical circuits and service manual.

Improper handling can result in electrical shock.

Turn off the power at the switchboard before beginning the installation.

Fire or electrical shock can result if the power is left on.

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or equipment damage.

Use the proper fuse.

Use of a wrong fuse can damage the equipment or cause fire.

CONTENTS

| FOREWORD | 1 |
|---|---------|
| MAIN PERFORMANCE AND SPECIFICATIONS | 2 |
| CONFIGERATION ····· | 6 |
| 1 OPERATION OVERVIEW | 7 |
| 1.1 Keypad instruction | |
| 1.2 Turning ON and OFF Power | |
| 1.3 Adjusting Brilliance and DIM | |
| 1.4 Display Modes ····· | 9 |
| 2 PLOTTER DISPLAY OVERVIEW | |
| 2.1 Choosing the Display Range | |
| 2.2 Moving the Cursor | |
| 2.3 Panning the PLOTTER Display | •••••11 |
| 2.4 Centering Own Ship's Position | |
| 2.5 Coordinates | |
| 2.6 Map | 12 |
| 2.7 Perspective View | |
| 2.8 Heading Line | |
| 2.9 Cursor | •••••14 |
| 2.10 Ship shape/color······ | |
| 2.11 Range Circle····· | |
| 2.12 Drawing | |
| 2.13 Palette····· | |
| 2.14 Map Direction | |
| 3 TRACK | |
| 3.1 Changing Track Plotting Interval, Stopping Plotting | •••••19 |
| 3.2 Displaying the Track | |
| 3.3 Creating Track Data | 20 |
| 3.4 Erasing Track | |
| 3.5 Erasing All Backup Data | 21 |

| | VAYPOINT/MOB22 |
|-----|--|
| | Entering Waypoints |
| | Entering the MOB Mark24 |
| | Displaying Waypoint Name24 |
| | Operation on the Waypoint Editing25 |
| 4.5 | Erasing Waypoints26 |
| 5 R | OUTES |
| | Creating Routes 27 |
| | Editing Routes 227 |
| | Erasing Routes···································· |
| 5.5 | Erasing Koules |
| | ESTINATION |
| 6.1 | Setting Destination by Cursor |
| 6.2 | Setting Destination by Waypoint (WPT) |
| 6.3 | Setting Route as Destination |
| 6.4 | Setting Track Data as Destination35 |
| | Canceling Destination |
| 6.6 | Distance 37 |
| | |
| | LARM |
| | Anchor Drag Alarm |
| | Arrival Alarm·····40 |
| 7.3 | XTE (Cross-Track Error) Alarm41 |
| | Speed Alarm |
| | Voltage Alarm |
| | Time Alarm·····42 |
| 7.7 | Buzzer Type Selection43 |
| | |
| | PRAWING |
| | Drawing Marks44 |
| | Drawing Lines45 |
| 8.3 | Drawing Place name·····45 |

| 8.4 | Editing Drawing Marks |
|------|--|
| | Editing Drawing Lines47 |
| | Editing Drawing Place Name48 |
| | Erasing Drawing Marks |
| | Erasing Drawing Lines50 |
| 8.9 | Erasing Drawing Place Name51 |
| | THER SETTING |
| | |
| | Map Scale |
| | Unit of Measurement52 |
| | Bearing Reference53 |
| | Magnetic Variation |
| | Deviation55 |
| 9.6 | Time55 |
| 9.7 | TTG/ETA speed56 |
| 9.8 | Key beep56 |
| 9.9 | Wind screen56 |
| 9.10 |) GPS setting |
| 9.11 | NMEA data display59 |
| 10 - | THE AIS FUNTION |
| | Vessels list |
| | |
| | The collision alarm60 |
| | Own ship's information61 |
| | Chart Screen61 |
| 10.5 | 5 View AIS vessels' information on chart screen |
| 10.6 | Check all AIS ships within the scope of Radar (AIS screen)62 |
| | Emergency alarm |
| 10.8 | Entry/Departure setting63 |
| 10.9 | AIS Vessel······64 |

| 11 ECHO SOUNDER OVERVIEW ······ | 65 |
|---------------------------------|----------|
| 11.1 Sonar mode | ······65 |
| 11.2 Gain | 67 |
| 11.3 Range | 67 |
| 11.4 TVG | |
| 11.5 Pic. Advance | |
| 11.6 Split ratio | |
| 11.7 Sonar Menu | |
| 11.8 Alarm | |
| 11.9 System Menu | |
| 11.10 Data Field | |
| 12 INSTALLATION | |
| 13 INTERCONNECTION DIAGRAW····· | 79 |
| 14 DISPLAY SIZE····· | 80 |
| 15 SHORTCUTS······ | 81 |
| 16 DATA IN/OUT DESCRIPTION | 82 |
| 17 MENU TREE······ | 83 |
| 18 ABBREVIATIONS······ | 89 |
| 19 GLOSSARY····· | 90 |

FOREWORD

The KCOMBO ONWA GPS PLOTTER aid are specially designed for the vessel traffic management, ONWA is a professional brand of the domestic and foreign navigation products.

The products are designed to be all-sealed and waterproof, can be rapid position-fixing and resistant to poor environment. The software is powerful by using the advanced ARM9 processors, can be capable to display faster, and the design for operation is professional and reasonable, can be easy to use. The built-in Large-capacity map storage space provides intuitive and accurate indication to navigation. It's applicable to the navigation and position-fixing of various vessels at sea and rivers, as well as the hydrographic information collection, river management, etc. For the application for different types of the products please refer to the following:

FEATURES

- Easy to operate
- Ultra high brightness LCD, viewable under strong sunlight
- . Compatiable with dual mapping system, C-MAP NT MAX and ONWA K-Chart
- Built-in GPS antenna, external antenna can be used as an option
- Digital HD fishfinder technology
- Built-in commercial fishfinder module which is widely using in worldwide commercial fishing bost
- IPX7 waterproof panel

MAIN PERFORMANCE AND SPECIFICATIONS

Plotter Char

| Waypoints/icons | 12000 user waypoints with name, symbol. 3 system waypoints: MOB, Start , Cursor 10 proximity waypoints |
|-------------------|--|
| Routes | Max 30 routes. And up to 170 points for each one |
| Tracks | 8000 points automatic track log; |
| | 10 saved tracks (up to 8000 track points each). |
| | Let you retrace your path in both directions |
| Alarms | XTE, Anchor drag, arrival, speed, voltage, |
| | proximity waypoint and time, AIS alarm. |
| Palette | Normal |
| | Daylight exposed to sunlight |
| | Night in dark environment |
| | NOAA paperchart colors |
| Tides | Tide data |
| Projection | Mercator projection |
| Position format | Degree of minutes and UTM |
| Basemap | Built-in Onwa K-Chart |
| External Map | SD Cards slot for C-Map MAX and ONWA K-Chart |
| User data storage | Internal backup of user settings, |
| | or external SD-card |
| Plot Interval | 5s to 60min 0.01nm to 10nm Automatic way |
| Plotting scales | 0.001nm to 1000nm |
| Nav Data | Inputs: |
| | \$GGA, \$GLL,\$GSA, \$GSV, \$RMC, |
| | \$VTG, \$ZDA, \$VWR,\$VWT,\$MWD, \$VPW |
| | Outputs: |
| | "GGA", "GLL", "RMC", "AAM", "APA", |
| | "APB", "BOD", "BWC", "BWR", "DBT" |
| | "DPT", "HDT", "MTW", "RMB", "TLL", |
| | "VTG", "WPL", "XTE", "ZDA", "ZTG", |
| | "ZDL", "MWD", "VPW", "VWR", "VWT", |
| | Outputs for autopilot: |
| | \$APB,\$BOD,\$XTE,\$APA |
| Perspective View | On/off |
| Celestial | Sunrise/Sunset Moonrise/Moonset |

Power Supply

10.5 to 35VDC, current drain<1.0A at 12V

Physical

| Size: | 243mm(H)X155mm(W)X82mm(D) |
|----------------------|--|
| Weight: | 0.6kg |
| Display: | 7-inches ColorTFT day-view LCD 800×600 pixels |
| Input & Output Port: | one opto-isolated input Port |
| | one RS232 Output Port |
| Waterproofing: | Display unit: IPX5 |
| Temperature range: | Display unit: -15°C to +55C |
| | Antenna unit: -25℃ to +7℃ |

GPS Receiver Ch

| Receiver: | 50 parallel channel GPS receiver continuously tracks and |
|-------------------|--|
| | uses up to 50 satellites to compute and update your position |
| Acquisition time: | Cold start: 60 seconds average |
| | Hot start: 45 second average |
| Update rate: | 1/second,continuous |
| | Position: 2.5 meters(95%) without S/A |
| | Velocity: 0.1 meter/sec without S/A |
| | Time: 100ns synchronized to GPS time |
| Dynamics: | Altitude: 50,000m Max |
| | Velocity: 500 m/s |
| | Acceleration: 4g Max |
| Datum: | WGS 84 and user define |

Equipment List

Standard

- 1. Display unit
- 2. Operator manual
- 3. Installation materials and standard spare parts

AIS interface

Data input:NMEA 0183, RS232Baud rate:38,400

Option Accessories

- 1) GPS antenna KA-07
- 2) Transducers

Dual Frequency Thru-Hull Transducer

- 600W Bronze NMM40-50/200
- 600W Plastic NBM40-50/200
- 600W Airmar Bronze Transducer w/Temp seosor B45

Dual Frequency Transom Mount Transducer

- 600W Onwa Transducer w/Temp seosor KTD-520_TM
- 600W Airmar transducer w/Temp seosor P58

3) Temperature seosor

Onwa Thru-Hull temperature seosor KTS-10K_TH

Onwa Transom Mount Temperature seosor KTS-10K_TM

HD Fishfinder Ch

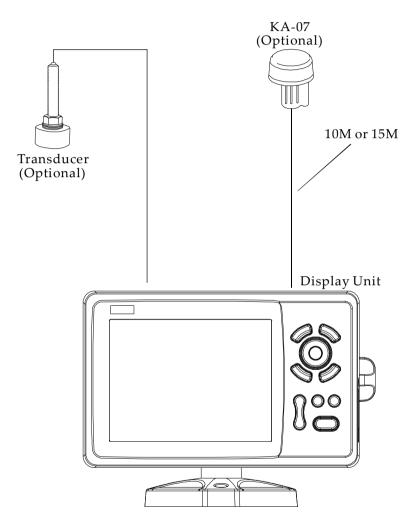
| Echo Color | 16 colors (including background color) according to echo |
|-----------------------|--|
| | intensity. The background color is selectable from blue, |
| | light blue, white and black. |
| Basic Range | Meters 5/10/20/40/80/150/200/300/600/1000 |
| | Feet 15/30/60/120/200/400/600/1000/2000/3000 |
| | Fathoms 3/5/10/20/40/80/100/150/300/600 |
| Range Shift | 80 meters, 200 feet, 100fathoms |
| Zoom Range | Times 2,3,4,6 |
| Bottom Lock Expansion | 5/10meters,10/20feet, 2/5fathoms |
| Auto Mode | Automatic adjustment of range and gain |
| Display Mode | High Frequency (200KHz),Low Frequency (50KHz), Dual |
| | (200K and 50K 1/2display on each), Zoom (200KHz and |
| | 50KHz zoom) and A-scope Display |
| Zoom Display | Marker Zoom, Bottom Zoom and Bottom-lock Expansion |
| Display Advance Speed | Lines/TX:Freeze,1/8,1/4,1/2,1/1,2/1 |
| TX Frequency | 50 and 200kHz (alternately transmitted) |
| Power Output | 600W |
| Pulse-length/TX rate | |

| Display End Depth (m) | 5 | 10 | 20 | 40 | 80 | 150 | 200 | 300 | 600 | 1000 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| Pulse-Length (ms) 200K | 0.12 | 0.22 | 0.32 | 0.52 | 0.92 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 |
| Pulse-Length (ms) 50K | 0.17 | 0.27 | 0.37 | 0.57 | 0.97 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| TX Rate (Pulse/min) | 2400 | 1500 | 857 | 444 | 231 | 125 | 95 | 63 | 38 | 30 |

Interference Rejecter Rejects unwanted signals by comparing last and present echoes in strength. Alarm Fish and Bottom alarms, Temperature alarm (sensor

required)

CONFIGERATION



1. OPERATION OVERVIEW

1.1 Keypad instruction

| Plotter function: Moving the cursor upward or to change the setting. Sounder function: Moving the VRM upward. |
|--|
| Plotter function: Moving the cursor to the right. Sounder function: |
| Long Press - Activates feeding rate selection for picture advancement Short Press - Setting the depth range (setting upper range limit). |
| MENU Pressing it once displays the menu of the current page, pressing it twice enters the main menu. |
| Plotter + Sounder Function: |
| Long press - Activates split ratio selection. |
| Short Press - Displays the menu of the screen that has $(\bigcirc \bigcirc \bigcirc$ |
| >50% screen coverage. MODE Display the seven main screens circularly, turn over the listed interfaces. |
| Plotter Function: Press and hold to change track color. Sounder Function: Press and hold to activate sonar mode selection. |
| ESC Withdraw from an optional operation, or display the previous |
| page in reverse-cycle order. |
| Plotter function: Press and hold to switch track ON/OFF. |
| (ENT/ Confirms the input or data. |
| Plotter function: Long Press - Activates Drawing Mark option. |
| Short Press - Activates waypoint attribute edit |
| window. |
| Sounder function: Long Press - To switch from manual gain to |
| automatic gain and vice versa. |
| Short Press - To adjust gain level. |
| Plotter and AIS Function: Enlarges the scale of the maps and charts. |
| Sounder Function: Decreases the depth range for shallow waters. |
| Plotter and AIS Function: Reduces the scale of the maps and charts. Sounder Function: Increases the depth range for deeper water. |
| F D Plotter function: Display other function (GOTO, tide table, search, etc.) menu. Sounder function: Provides signal level selection. Eliminates low |
| intensity echoes (up to light-blue echoes) each level. |
| MOB The MOB mark denotes man overboard position. |
| (小文) Long Press - Turn the power ON/OFF. |
| Short Press - Adjust the screen brightness and control panel dim |

1.2 Turning ON and OFF Power

Turning on the power

Press the $[\bigcirc/\mit{?}]$ key. The unit beeps and displays the "**ONWA**" logo. After a few seconds, it starts up with the last used display mode.



Turning off the power

Press and hold down the $[\bigcirc/ \dot{\times}]$ key until the screen goes blank (about four seconds).

1.3 Adjusting Brilliance and DIM

You can adjust display brilliance as shown below.

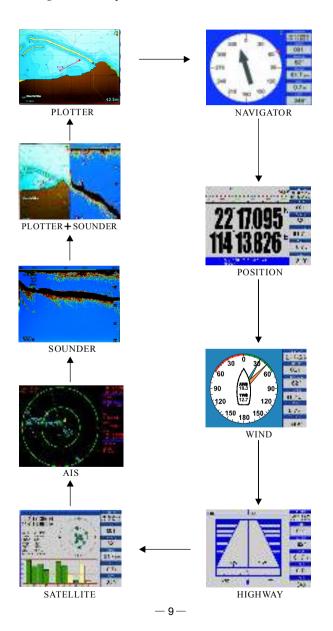
1. Press the [0/x] key. The adjusting window appears.



- 2. Press [▲] or [▼] to adjust LCD display brightness.
- 3. Press [▶] or [◀] to adjust keypad backlight.
- 4. Press the [ESC] key to confirm and exit.

1.4 Display Modes

Your unit has eleven display modes: PLOTTER SCREEN, NAVIGATOR SCREEN, WIND SCREEN, POSITION SCREEN, SATELLITE SCREEN, HIGHWAY SCREEN, AIS SCREEN, SOUNDER SCREEN and PLOTTER + SOUNDER SCREEN. Press the [MODE] key to choose a display mode. Each time the key is pressed, the display mode changes in the sequence shown below.



2. PLOTTER DISPLAY OVERVIEW

2.1 Choosing the Zoom Display Range

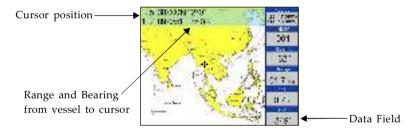
You may press (R) to Zoom In and (R) to Zoom Out as desired on the PLOTTER display.

2.2 Moving the Cursor

Press the cursor pad to move the cursor. The cursor moves in the direction of the pressed arrow. Whether up $[\blacktriangle]$, down $[\lor]$, left $[\triangleleft]$, right $[\triangleright]$ or diagonal [B].

Cursor Position Turned On

Cursor position is displayed in latitude and longitude at the top left corner of the **PLOTTER** display when the cursor is on. The range and bearing from own ship to the cursor appears at the top left corner of the display too.



Cursor Position Turned Off

Press the **[ESC]** key to clear the cursor. Cursor position data will disappear when the cursor is off.



2.3 Panning the PLOTT

Using the cursor, pan left, right, up or down on your desired area. Place the cursor at the edge of the screen to start panning. The display shifts in the direction opposite to cursor pad operation.

2.4 Centering Own Ship's Position

Press the [ESC] key for centering own ship's position.

2.5 Coordinates

Coordinate Systems are ways of splitting up the world in order to form transferable units (numbers) that relate to points on a map.

1. Press [MENU] key in PLOTTER screen.

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|---------------|-------------------|
| Indisk | |
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| sange vinde | |
| 200m Sheo | 200 |
| Directing | 1.1 |
| Palette | N2 (00) |
| Nap direction | NUME |
| Nepsince | L CHAPT |
| Napianguage | (hep-sh) |
| Tala Beld | |
| E Marchak | VIERING |

2. Choose Coordinates and then press [ENT] key to select.

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|---|-------------------|
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| accordments | 200 |
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| Maspa nr | ALL Large |
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| Shis nto displa | C full |
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| Zoom Shac | |
| Difference C | |
| Paratte | Name of Lot |
| Nap sinedion | Nexed |
| Nupersee | K CLEAR |
| Nap Language | bank (|
| Date De d | SACON N |

3. Choose "N/E" or "UTM" as desired then press [ENT] key to finish.

2.6 Map

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose **Map** and then press [▶] key to select.
- 3. Choose the layer "ON" or "OFF" as desired and then press [ENT] key to finish.

| MAC | | | | |
|------------------|------|----------------|-------|--|
| Deep point | Off | Water line | CH | |
| Obstructions | OB | Help info. | C (CH | |
| Danger | OB | Limit zone | CH | |
| Place names | OIL | Depth line 20m | .CH | |
| Port names | OB | Depth line 10m | C.H | |
| Light | 1.41 | Route line | EH | |
| Communication | 1.41 | Depth area 2m | C.H | |
| Reference points | Off | Depth area Sm | CH | |
| Dock | UH | LAT / LON grid | CH | |
| Light line | CH. | ALL | C.H | |

(K-Chart)

| | Nt | NP . | |
|-------------------|---------|------------------|--------|
| Place names | - DEF | Roads | 128.8 |
| Name tags | DEF | POI | 118.8 |
| Nav aids & Light | OFF | Lat/Lon grid | OFF |
| Attention area | OFF | Chart boundaries | OFF |
| Tides & Currents | EXP.P. | Value-added data | OFF |
| Seabed type | OFF | Chart lock | 011 |
| Forts & Services | OFF | Underwater obj. | 000010 |
| Track & Roubes | OFF | Rocks 041 | 6 |
| Depth range Hin | 0000 (8 | Obstructions OH | |
| Depth range Max | 0000 0 | Diffusers on | Π. |
| Land elevations | OFF | Wrecks 011 | P |
| Land elev. Values | OFF | ALL | OFF |

(C-MAP)

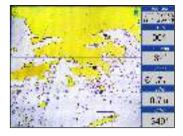
2.7 Perspective View

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose Perspective and then press [ENT] key to select.

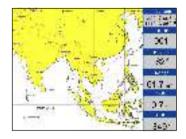
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3. Choose "ON" or "OFF" as desired and then press [ENT] key to finish.

4. Choose the layer "ON" as desired and then press [ENT] key to finish.



5. Choose the layer "OFF" as desired and then press [ENT] key to finish.



2.8 Heading Line

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose Heading Line and then press [ENT] key to select.

| 10116 | - 13 - s - 13 |
|--------------------|--|
| HPC) | |
| Cimensblock | classication and |
| Coordinate | 94. |
| Na: | 10527 . |
| AN ADMITTAN | 10-P |
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| Pap / Pice | Recent |
| Pap Englage | Par No. |
| Data I eld | 19695150 UK |
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3. Choose "Off", "Variable", "Max" or "Timeline" as desired and then press [ENT] key to finish.

4. Heading Line option: "COG Time Line" selection

The length of heading line will vary according to the SOG to show the estimated point of destination after the set period. Example, if you set the COG Time Line to 10 minutes then the length of the heading line will point to the position that your boat will reach after 10 minutes.

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2.9 Cursor

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose Cursor and then press [ENT] key to select.

| | R CONFIG |
|-----------------------|----------------|
| Track | |
| Current track | diaplayon nock |
| Coordinate | N/E |
| Мар | |
| Perspective | OFF |
| Waypoint | ALL Large |
| Heading line | Man |
| KAUSOF. | Mandard |
| Icon Ship shape/co | di tapra |
| Ship info.displ | ay Auto |
| Range circle | OFF |
| Zoom Step | 1895 |
| Drawing | |
| Palette | Normal |
| Map direction | Normal |
| Hap choice | IC CHART |
| Flap Language | English. |
| Data field | |
| States in the | AN INCOMENT. |

3. Choose "Standard" or "Full Screen" as desired and then press [ENT] key to finish.

2.10 Ship shape/color

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose Ship shape/color and then press [ENT] key to select.



Press [▶] key and then press [ENT] key.

| Tiack | |
|-----------------|-------------------------------------|
| Ourse track | ciaplayore muce |
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| Parspective | 916 |
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| Heading line | HIS |
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| Sim alapeoal | |
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| Range circle | John n |
| Zoom Step | tez. |
| Distang | |
| Palette | Aprimal |
| Map direction | NOOD |
| Matta frome | K CHART |
| Mao Languaçe | DigiNic |
| Data liek | within P |
| NE1135 N | OT N NUMBER |

2.11 Rang

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose Range Circle and then press [ENT] key to select.

| Task. | 40.005-00 | |
|-----------------|----------------|------|
| | | |
| an monach- | d aplay or 1 m | 0.04 |
| Courtinate | 1000 | |
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| Zootr West | 900 - C | |
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| Hat direction | Normal | - 5 |
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| Terra field | | |
| Trans Is N | ALC: NAME: | |

3. Choose "ON" (if you choose "ON", you need to input the radius of the circle manually), or "OFF" as desired and then press [ENT] key to finish.

2.12 Drawing

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose Drawing and then press [ENT] key to select.



- 3. Choose "Mark", "Line" or "Place name" as desired and then press [ENT] key to finish.
- 4. User can change the size of User Marks.

| 10.11 | 11111-04 | 11 | | 1 | | |
|------------------------|--|------|-----|----------|-------|-------|
| Teck | | | | 1 | | |
| Current treck | d actus | N IN | юж | 1 | | |
| Coordinate Rep | | | | | | |
| Anspective Weepoint | | Ante | - | | | |
| Heading line | | | | | | |
| ou ter | No als | a – | | | | |
| icar Ship trape/ep | | | | | | ~ |
| Ship nito dapi | ev date | | | | DEAmT | NG . |
| Sunger Ling le | | | | Neile | 19. | Large |
| Soom Step | Litte | | - | and the | 28. | 1162 |
| 3 Million | | | | PARATA | me vo | 100 |
| Po etce | E HORNINI | - | - | | | |
| hisp cirection. | · Ware d | 0.7 | | | | |
| Map 11000 | Per-Al | nr. | | | | |
| Map Language | Lingfer | ÷. | 124 | | | |
| Data lie d | and a large | | 61 | | | |
| HINKS | CONTRACTOR OF CONT | | | | | |

5. User can change the size of Drawing Lines.

| ACT IS | INCONFOG | | 1 | | |
|-----------------|---------------------|----|------------------|-----|-------|
| Tack | | | | | |
| Current buck | duple you in the | ж | | | |
| Geordinate | 47 | | | | |
| Pap- | | 1 | | | |
| Fatboot vo | a+ | | | | |
| W87.00 NT | | | | | |
| Heading Inc. | He | | | | |
| C INSIG | Werdard | | | | |
| 1000 | - seal | 3 | | | |
| Ship ships/col | | | | | |
| Ship infoldisok | WID2 | | | 662 | |
| Range chole | 977 | | Fark. | 10 | Lings |
| Zoom Step | Lev- | | 1.04 | 35 | 146 |
| Enaming | S1.41 | | Flace name | 26 | The |
| Welle | isa mal | 1 | 1 - 000000-00 V. | 100 | |
| Nap clirect or | Scend | | | | |
| Nap choice | K CHERT | | | | |
| Nep Language | 103 81 | | | | |
| Cata field | | E. | | | |
| March 19 | ALC: NOT THE OWNER. | | - | | |

2.13 Palette

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose Palette and then press [ENT] key to select.

| POOL E | ar converte |
|-------------------|---------------------|
| Tate | |
| Current Install | displaying terrory. |
| Overdinate Rep | мт. • |
| Terrapett ve | V1 |
| daspy it. | ALC: Large |
| And no line | MAX. |
| Gurber | Sva bari |
| lact | and then |
| Ship anape, co | lon ship 📕 |
| STL: MOUCKP | 87 10.00 |
| Same of the li | 0+ |
| 200 th 5000 | 0.00 |
| Dretaing | 100 |
| A REPORT | Sector 1 |
| Nop direction. | 12276 |
| Nap choice | 07.441. |
| Nap Language | KDAR . |
| Jobs Held | |
| Res. DE | CORP. NO |

3. Choose "Normal", "Daylight", "Night" or "NOAA" as desired and then press [ENT] key to finish.

2.14 Map Direction

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose Map Direction and then press [ENT] key to select.



3. Choose "Normal", "North Up", "WPT Up" or "COURSE Up" as desired and then press [ENT] key to finish.

3.1 Changing Track Pl

When the track memory becomes full, the oldest track is erased to make room for the latest.

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose **Track record** and then press **[▶]** key to select.

| TRACK | |
|------------------------|----|
| Track record mode Time | 55 |
| Saved track | |
| Save current track | |

3. Choose Track record mode and then press [▶] key select.

| TR/ | ACK | |
|-----------------------------------|------|----|
| Track record mode | Time | 58 |
| Saved track Save current track | Time | |

4. Choose "Time", "Distance", "Auto" or "Off".

Time: Track is recorded and plotted at the time interval set. Distance: Track is recorded and plotted at the distance interval set. Auto: Plotting and recording interval changes with display range selected. Off: Track is neither recorded nor plotted.

- 5. For Time and Distance, enter the recording interval as follows:
 - a) Press the [▶] key to choose "5s", "10s", "30s", "1min", "5min", "10min", "30min" or "60min".
 - b) Use $[\blacktriangle]$ or $[\blacktriangledown]$ to select value.
- 6. Press [ENT] key to finish.

3.2 Displaying the Tr

- 1. Press [MENU] key in PLOTTER screen.
- 2. Choose **Track** and then press **[**▶] key to select.

| TRACK | | |
|-------|-----------|--|
| | ON | |
| | UN | |
| | ON | |
| | ON | |
| | ON | |
| | DN | |
| | ON | |
| | ON | |

- 3. Choose the color and if you want to turn it "ON" or "OFF".
- 4. Press [MENU] key to finish.

3.3 Creating Track Data

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose Track Record and then press [▶] key to select.
- 3. Choose Save Current Track and then press [ENT] key. The following window will appear.

| Name : | No.: | OFF |
|----------------------------------|----------------------|-----|
| Start 5'36,000'N 102'45.200'E | End: 5"38 102.45. | |
| Distance : 0.0nm | Points : 1 | 62 |
| Date : | | |
| Save 7 Ex | t? (| |

Track Data can be used for navigation.

3.4 Erasing Track

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Erase and then press [] key to select.

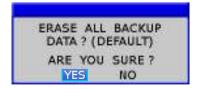
| FRASE | |
|----------------------|---|
| All waypoint/HOB | |
| All roubes | |
| Current track | |
| Saved track | + |
| All drawing marks | |
| All drawing lines | |
| All drawing name | |
| Load default setting | |
| All backup data | |

- 3. Choose Current track or Saved track.
- 4. If Saved track is chosen, press [▶] key to choose the color that you want to erase or choose ALL if you want to erase all tracks and then press [ENT] key. The following window will appear:

| ERASE ALL SAVED TRACK ? |
|-------------------------|
| ARE YOU SURE ? |
| YES NO |

3.5 Erasing All Backup Data

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Erase and then press [>] key to select.
- 3. Choose **All backup data** and then press **[ENT]** key. The following window will appear.



4. WAYPOINT/MOB

4.1 Entering Waypoints

Waypoints can be entered on the **PLOTTER** display in three ways: by cursor position, at own ship's position, and from the waypoint edit.

Entering a waypoint with the cursor

1. Use the cursor pad to place the cursor on the location desired for a waypoint.

2. Press the **[ENT]** key. The following window appears.

| CURSOR POS -> V | VPT. |
|------------------------|-------|
| NAME: 006MARK | < |
| 24'39.936'N 📑 🔳 | |
| 05-AUC-10 | 00:00 |
| TTG: OUHDOM ETA; UU:00 | |
| SAVE QUIT | |

- 3. This window is where you can rename, edit LON and LAT, choose mark shape and color, and enter a comment.
- 4. Choose "SAVE" to finish.

Entering a waypoint at own ship's position

1. Momentarily press [ENT] key when no cursor is seen. The following window appears.

| GPS POS → WPT | |
|------------------------|-------|
| NAME: 006 MARK | n n |
| 24°39.936'N | |
| 124°39,936'E 💻 - | 00000 |
| 05-AUC-10 | 00:00 |
| TTG; muonsi ETA; on:on | |
| SAVE QUIT | |

2. If you do not need to change anything, choose "SAVE" to finish.

Entering a waypoint from the waypoint list

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose **Edit** and then press **[>]** key to select.

| EDIT |
|-------------------|
| Waypoint |
| Route |
| Drawing marks |
| Drawing lines |
| Drawing placename |
| Proximity |

3. Choose **Waypoint** and then press [**ENT**] key. The following window will appear

| | | | | | - | 68 A.L. | | | | | | | |
|------|------|------|------|------|----|---------|-----|-----|-----|------|-------|------|-------|
| 1.00 | - | | | | | | | | | | | | |
| 100 | 1400 | | - | - | 10 | - C.A. | 1.0 | | 7.4 | 1.00 | 10.00 | 1.1 | 10.00 |
| - 8 | 14 | 141 | 1.44 | | 32 | 14 | | 34 | | 1.5 | - | | 1.4 |
| | 1.0 | 114 | - | | 10 | 26 | | - | | 0.0 | inin' | | 1.00 |
| 16.1 | 12 | 1.60 | 1001 | 1.2 | 42 | 10.7 | 28 | 21 | | 63. | 30.00 | 64 | 100 |
| 280 | .12 | 1.84 | DH. | 1.2 | 13 | tre a | 100 | 24 | | 6.2 | 200 | < 4) | Cat |
| 41 | 1.0 | *** | in | 1.0 | 27 | 267 | | - | ۰. | 1.84 | | 12 | 1.4. |
| 1911 | 1.0 | 44.1 | 5.11 | 1000 | 10 | - 14 | 10. | 38 | 8 | 114 | 10.0 | 12 | 1.15. |
| - | 100 | | - | - | 2 | 000 | 100 | 1.0 | - | _ | | 18 | - |
| | 199 | | | 0.00 | | | | 1. | | 10.0 | 1.11 | ÷. | 0.33 |
| - | 0.63 | 222 | 1 | - | 22 | - | | 10 | 5 | - | 20. | 2 | 1 |
| | | | | 14 | | 1.2 | | 54 | 2 | - | 10 | 2 | 44 |
| | - 68 | 1 | 8 | - 0 | | 199 | | 24 | 9 | | 14 | 82 | |
| | - 95 | 10 | 34. | | | - 22 | | 24 | ę. | | - 11 | 14 | - 22 |
| | - 14 | - | 22 | - 14 | | 24 | | 1 | 2 | 100 | - 14 | 94 | 100 |
| | + | - | 1 | | | | | 22 | | | | - | - 12 |

4. Choose NEW then press [ENT] key.

The following window appears.

| GPS POS → WPT | |
|--|-------|
| NAME: 006 MARK 24"39.936'N | |
| 124*39,936'E • • • • • • • • • • • • • • • • • • • | 00:00 |
| SAVE QUIT | |

5. If you do not need to change anything, choose "SAVE" to finish.

4.2 Entering the MOB Mark

Only one MOB mark may be entered.

Each time the MOB mark is entered, the previous MOB mark and its position data are over-written.

1. Long press the [MOB] key on any display mode.

The following display appears.

| SAVE TO MOB GO TO MOB ? |
|----------------------------|
| ARE YOU SURE? |

 To set MOB position as destination, press [▶] to choose "YES" and then press [ENT] key. Choosing "NO" saves the position as a waypoint called "MOB".

4.3 Displaying Waypoint Name

You may display waypoint name as follows:

- 1. Press the [MENU] key on the PLOTTER screen.
- 2. Choose **Waypoint** and then press the **[ENT]** key. The following window will appear.

| 1880110 | E COOP IS |
|--|---|
| truck. | Contraction at the set |
| Carrient trail. | Repairing the line of a |
| Coordinate | ANT COLLECT |
| Map. | 1. |
| Perspective | URL SAME |
| Weppeerd | A Daries |
| Needing-Ime | Contra Contra |
| Cartar | A LA DE |
| stars shape look | Line 1 |
| Mary Way down | ALCONG 1 |
| Rande COLLER | And |
| doore 1840 | 100 |
| Dratema | |
| Paletta | Conned U. 197 |
| The direction | - normal |
| thep photoe | A CAMPT. |
| Hep Language | (Truba |
| Cata Seid | colat. |
| Suma in the local division of the local divi | ACCURATE AND ADDRESS OF |

3. Choose "All", "Goto", "Route", "Icon" or "OFF" as desired and then press the [ENT] key. All: Displays all waypoint names.

Goto: Displays only the GOTO waypoint name.

Route: Displays all waypoint names when a route is set as destination.

OFF: Do not display any waypoint name.

4. User can change the size of Waypoint Marks

| ESCIET. | ECCOPTS . |
|--------------------------|---------------------------|
| Track. | COLOR DATA |
| Carriert trailli | Repairing the line of the |
| Coordinate | - |
| Perspettive Vie joker | No. Contraction |
| The pool of | |
| Needing-Ime | that wanty |
| | If and not |
| | 1000 |
| state shippin/col | |
| Wap Selecidepte | NALANCE IN |
| Rance circle | OFF. |
| 200 PP 1840 | 1.055 |
| Drateing | |
| Paletta | contract (197 |
| The direction | |
| thep photoe | |
| fleg Langedge | |
| | and the second |
| Cata field | |
| Manual No. 12 | |

4.4 Operation on the Waypoint Editing

Waypoint position, waypoint name, mark shape, mark color and comment can be edited from the Waypoint Edit.

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose Edit and then press [] key to select.
- 3. Choose Waypoint and then press the [ENT] key. The following window will appear.

| 1.788.998 | | | | 1.000.000 | 1 at 10 100 | | | - |
|-----------|------|----------|-----|-----------|-------------|------|-----------|----------|
| 10000 | | | | | | | | |
| - | 100 | 46,0125 | THE | Tridere. | 00004488 | | minore l | - |
| teres : | 100 | 11.0001- | 110 | ABBATE. | 104.0-00 | 1.84 | Designed. | - Davies |
| - | 140 | 96.04Ph | ne | 10.0400 | 10000-000 | | mented | - |
| - | 40 | 46.34456 | 118 | 10-104 | 0000 | 100 | second. | - |
| 1 | 127 | 44,007% | 11F | TENPE | 000.0144 | 84 | INCOME. | - |
| | - | 44,22276 | 110 | 11.1444 | 1001-0-00 | *** | dimental. | - |
| | | | | | | | -8.M | 1 |
| | 40 | | | - | - | | 1.14 | 1.6 |
| | | | | | | | 100.04 | |
| | | 1.74 | | | - | | 1.14 | |
| | | - | | | - | | 1.14 | |
| | 100 | | | | | | 1.00 | 1.5 |
| | 10.0 | - | | | - | | 1222 | |
| | iic. | | | - | 1000 | | La la | |

4. Choose waypoint to edit and then press the [ENT] key. The following window will appear.

| | WAYPOI | NT |
|-----------|---------------------------------------|-------|
| NAME | 1 | MARK |
| 100000000 | 9.936'N | - |
| | 9.936'E | |
| 05-AU | | 4679 |
| TTG: | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | TA: |
| SAVE | QUIT | ERASE |

- 5. Choose the object you want to edit and then press the [ENT] key to select.
- 6. Change name, position, mark shape, mark color, comment as desired.
- 7. Choose "SAVE" and then press [ENT] key to finish.

4.5 Erasing Waypoints

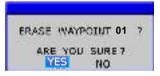
- 1. Press the [MENU] key twice to main menu.
- 2. Choose Edit and then press [▶] key to select.
- Choose Waypoint and then press the [ENT] key. The following window will appear.

| | е. | | | | | | | |
|---------|------|------------|------|----------|------------------------|-----|--------------|--------------|
| 10000 | | | | | | | | |
| - | 100 | 46,0175 | TTE | Tribber. | 000.0+88 | 100 | minore. | (make |
| lore ! | 100 | \$2.000 hr | 338 | ALBERT. | 1061.0+00 | 144 | Desired. | - Desire |
| 1.0 | 140 | 96.060% | ne | 10.167 | interior in the second | *** | distant. | - mark |
| | 140 | 46.3445 | 11.0 | 10-1992 | 0000 | *** | SHOON. | (maintained |
| 146 - C | 100 | 4,005 | 11F | TANK | -000.0144 | 844 | interest. | (mark) |
| | - | 96,73276 | 110 | 11.1448 | 10011-01 | *** | BRIER | - |
| | -1-2 | | | | - | | -1. M. | 1.00 |
| | 140 | | | | - | | 1.14 | 0.63 |
| | | | - | | | | 100.04 | |
| | | 1.74 | | - | | | 1.84.14 | |
| | | | | | - | | 10.00 | |
| | 16.0 | | | | - | | 100.00 | 1.5 |
| | 10.0 | | - | - | | | 100.00 | |
| | | 100 | | - | | | LP. 4 | 1 |

- 4. Select a waypoint and press [ENT] key.
- 5. The confirm window will appear. Choose "ERASE" and then press [ENT] key.

| V | VAYPDI | NT |
|--------|------------|-------|
| NAME : | lenn ensen | MARK |
| | 9.935'N | |
| 124-39 | 9,936'E | |
| 05-AU | G-10 | |
| TTG: | E | TA: |
| SAVE | QUIT | ERASE |

6. Choose "YES" and then press [ENT] key to finish.



Erase All Waypoints

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose Erase and then press [>] key to select.
- 3. Choose All waypoint/MOB and then press [ENT] key. The confirming window will appear.

| ERASE ALL WAYPOINT ? | |
|----------------------|--|
| ARE YOU SURE? | |
| YES NO | |

4. Choose "YES" and then press [ENT] key to erase all waypoints.

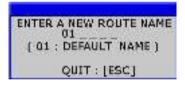
5. ROUTES

5.1 Creating Routes

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Edit and then press [>] key to select.
- 3. Choose **Route** and then press **[ENT]** key. The following window will appear.

| 1 × 41 | MAU L | |
|------------|-------|--|
| (CONCRETE) | 2.1 | |
| ** | 14.~ | |
| | | |
| 1 | | |
| | ÷ | |

4. Choose "NEW" and then press [ENT] key. The following window will appear.



5. Use [▲] or [▼] to enter the route name and then press [ENT] key to finish. The following will appear.

| | NAME. | |
|----------|-----------|-------|
| 10.00 MJ | | DESCR |
| mana | | |
| =:== | ==== | |
| | 22.2 | |
| | 27.7 | |
| 5 | 1 - E - F | |
| = | === | |
| 1.15 | | |

6. Choose the location (e.g. 01) and then press [ENT] key.

A new window will open which will let you choose a waypoint.

| | _ | | | 100.001 | 1 | | |
|--------|------------|----------|--------|---------|-----------|-------------|-------|
| 100 | 1 1 | | _ | | - | | |
| 1.00 | 10 | | 1.1.1 | 100.000 | | 00000000000 | 222 |
| 111 | 4: | # 20 P. | deal a | 1001 | 000 m. | HC CHON | 26.25 |
| ana - | 4: | 2.361. | 40.0 | 3 1017 | 49.20 | 201 214:04 | 15.3 |
| Ares . | | 4 | | | | | |
| | 2.0 | | 2.75 | 1.4 | 10.00 | 10.1.1.19 | N 14 |
| A 1 | 4: | 4C 7371. | 1.10 | 1001 | 204 C .m. | 541 K04C04 | 24.05 |
| 10 | 41 | 40 mit. | 1.0 . | 1000 | (24 C m) | HI CHON | 3435 |
| | 100 | 1.00 | 1000 | | 100 | | |
| | - 198 | 1.1 | - | | - N.M. | 1.4 | |
| | = 7 | | | | - 10 | | |
| | 1.0 | 2. 2.1 | - | 12 | | 1.4 | 1.1 |
| | - 34 | 9 - 16 I | - | - 92 | - A. | | |
| | - 74 | - 24 | - | - 2 | - 12 | | |
| | 14 | - 22 | | 1.1 | - 22 | | |
| | - 32 | 1.1 | - | | - 25 | | 1.20 |
| | | 0.3 | | 2.0 | | | - 50 |

- 7. Choose the waypoint name that you want to include in the route and then press **[ENT]** key (e.g., 001). You can also create a new waypoint if needed.
- 8. Repeat step 6 and 7 until the route is complete.

5.2 Editing Routes

Replacing waypoints in a route

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose Edit and then press [>] key to select.
- 3. Choose Route and then press [ENT] key to select.
- 4. Choose the route to edit and then press [ENT] key.
- 5. Place the cursor on the waypoint to replace, press the **[ENT]** key to show the route options.

| Change ? | |
|----------|---------------------|
| Remove ? | - |
| Insert ? | |
| Skip ? | |
| Quit ? | A REAL PROPERTY AND |

6. Choose "Change" and then press [ENT] key. The waypoint select window will appear.

| | _ | | | | 0.51 | 114 | м. | | | | | |
|---------|--------|------|------|-----|------|------|------|-------|------|------|------|--------|
| | | | | | | | | | | | | |
| 12,755 | 100 | 2010 | | | | | 14.1 | - | | | - | |
| 640 | 20 | | 九田 | 112 | 145 | n | 386 | 24 | 40 | 82 | 314 | 25.0 |
| Sec. 4. | - 29 | 10. | 8.0 | | 150 | 12 | 34.1 | 84 | 10.3 | 3.2 | . 24 | 32.4 |
| | 100 | | 1011 | IIN | 144 | | | 100 | 1.5 | 1.6 | CH. | 1.10 |
| 1 C 1 | - 22 | 100 | 10.0 | 117 | 157 | - 14 | - | 210 | 1.0 | 14.4 | - | 100 |
| 10 C | - 25.3 | 4. | 1.01 | 0.8 | 30.5 | - | - | 100 | 44. | 3.6 | - 14 | 1.41.1 |
| 160 | * | 4. | 8.13 | HV. | 12.5 | 30. | | 100 | | 1.1 | 1.11 | 196. |
| | 1.1 | 1. | 380 | | | | | 100 | 0.00 | 1 | 29 | |
| | 22 | | - | - | - | 20 | - | 1.17 | 100 | - | - 14 | - |
| | 1.3 | 14 | | | 1.40 | 234 | | - 5 1 | 162 | 10.0 | - 4 | 0.4 |
| | 1.1 | - 1 | 1.4 | - 3 | 14 | 28 | | | 612 | 904 | 0.04 | 2.1 |
| | a * | 2. | | | 82 | | | 12.5 | 6.77 | 200 | 1.0 | |
| | 32 | 22 | 1. | _ | 1.2 | 14 | 1 | 10 | 020 | 65 | 24 | 10 |
| | | | | | | | | - 5 | | 1.0 | 100 | 1.4 |
| | 10.1 | 1.4 | | | 1.14 | 24 | | | ENV: | 0.14 | 2.44 | |
| | ÷ | ÷. | 1 | • | ÷. | 3 | | | ŧ. | | 4 | |

- 7. Choose the waypoint name that you want to include in the route and then press **[ENT]** key.
- 8. Repeat step 5 to 8 until finish edit.

Permanently deleting a waypoint from a route

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose Edit and then press the $[\blacktriangleright]$ key to select.
- 3. Choose Route and then press [ENT] key to select.
- 4. Choose the route desired and then press [ENT] key to select.
- 5. Choose the waypoint you want to delete and then press **[ENT]** key to show the route edit options.

| Change ? | |
|----------|--|
| Remove ? | |
| Insert ? | |
| Skip ? | |
| Quit ? | |

6. Choose "Remove" and then press [ENT] key to finish.

5.3 Erasing Routes

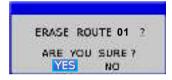
- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose **Edit** and then press **[>]** key to select.
- 3. Choose Route and then press the [ENT] key. The following window will appear.



- 4. Select a route then press [ENT] key.
- 5. The confirm window will appear. Choose "ERASE" and then press [ENT] key.

| | ROUTL | |
|------------|-------|----------|
| N.88 1.2 | | Barsess. |
| training a | 300 | |
| | | |
| | | |
| | | |
| 1 | | |
| | 2.1 | |
| = = | | |
| 1.00 | | |
| •77 | | |

6. Choose "YES" and then press [ENT] key to finish.



Erase All Routes

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose **Erase** and then press **[>]** key to select.
- 3. Choose **All routes** and then press **[ENT]** key. The confirming window will appear.

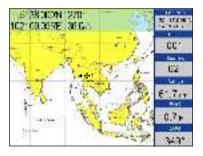
| ERASE ALL | ROUTES ? |
|-----------|----------|
| ARE YOU | SURE 7 |
| YES | NO |

4. Choose "YES" and then press [ENT] key to erase all routes.

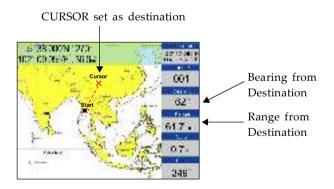
6. DESTINATION

6.1 Setting Destination by Cursor

- 1. Press [F] key to display the FUNCTION window.
- 2. Choose Goto cursor and then press [ENT] key to select.
- 3. The cursor appears with "?".



- 4. Use the cursor pad to place the cursor on the location desired for destination.
- 5. Press the $\left[ENT\right]$ key to mark destination.



6.2 Setting Destination by Waypoint (WPT)

1. Press the [F] key to display the FUNCTION window.



- 2. Choose Goto WPT and then press [ENT] key to select.
- 3. The **WAYPOINT** list appears.



4. Choose a waypoint and then press [ENT] key to finish.

6.3 Setting R

- 1. Press the [F] key to display the FUNCTION window.
- 2. Select Goto route and then press [ENT] key to select.

| FUNCTION |
|----------------------|
| Goto cursor |
| Goto WPT |
| Goto route |
| Goto track |
| Stop goto |
| Drawing • |
| Tide table Search |
| Calendar |
| Celestial |
| Distance |

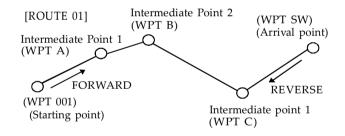
3. The **ROUTE** list appears.

| | -500.0 | |
|---|----------|------|
| | 12.0 | EXE |
| - | <u>.</u> | =, 1 |
| | | |
| | | = |

4. Choose a route and then press [ENT] key. The following window appears.



5. Choose "Forward" or "Reverse" in order to traverse the waypoints in the route, and then press [ENT] key to finish.



Meaning of forward and reverse

6.4 Setting Track Data as Destination

Track Data can be used for navigation.

- 1. Press the [F] key to display the FUNCTION window.
- 2. Choose Goto track and then press the [ENT] key to select.

| FUNCTION |
|-------------|
| Gaba curson |
| Gobs WPT |
| Gala route |
| Gobo track |
| Stop goto |
| Drawing + |
| Tide table |
| Search + |
| Calendar |
| Celestial |
| Distance |

3. The SAVED TRACK window will appear.

| 0101010 | 5.85 | IL COMPANY | |
|---------|------|---------------------------|-------|
| N. # F4 | 1494 | 10.01 | 51.40 |
| | | | |
| | | | |
| | | Contraction of the second | |
| | | 1 | |
| | | | |
| | | | 344 |
| | | | |
| | | | 344 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

4. Choose the track that you want to set as destination, and then press [ENT] key.



5. Choose Forward or Reverese to start Goto track navigation.

Once a Goto track has been activated, the track will divide it into segments. Up to 200 temporary waypoints are created (named T1,T2, T3, etc. and END) to mark the most significant features of the track, duplicating your exact path as closely as possible. To get the most out of the Goto track feature, remember the following tips:

- Always clear the track log at the point that you want to go back to.
- There must be at least two track log points stored in memory to create a track route.
- If the receiver is turned off or satellite coverage is lost during your trip, it will draw a straight line between any point where coverage was lost and where it resumed.
- If your track's changes in distance and direction are too complex, 200 waypoints may not mark your path accurately.

The receiver then assigns the 200 waypoints to the most significant points of your track, and simplifies segments with fewer changes in direction.

6.5 Canceling Destination

You can cancel a destination as follows.

1. Press the [F] key to display the FUNCTION window.



2. Choose Stop goto and press [ENT] key to finish.

6.6 Distance

Measure the distance of several points and save it as a route.

1. Press [F] key in PLOTTER screen to display FUNCTION window.



2. Select "**Distance**" and press **[ENT]** key to activate the distance measurement function.

16 20102E 191... Es co-

A@

В

Fig.3

Note:

- a) LON/LAT is the position of the cursor (point C)
- b) BRG is the bearing of cursor to the last point (point B)
- c) LEG is the distance of cursor to the last point (point B)
- d) DST is the total distance from the cursor to the starting point (AB + BC)
- e) M is Magnetic North, T is True North



- 3. Move the cursor to the starting point (A) and press **[ENT]** to set up starting point. Now all BRG, LEG and DST are display 0.
- 4. Move the cursor to the next point (B). Now the BRG and LEG display the Bearing and Distance from point A to point B, DST=0.



5. Press [ENT] key, now DST= distance from point A to point B is shown, while BRG and LEG turns to 0.

6. Move the cursor to the next point (C). Now the BRG and LEG displays the Bearing and Distance from point B to point C. DIST displays the total distance from point A to point B.



7. Press [ENT] key, now DIST = distance of point AB + distance of point BC is shown, while BRG and LEG turns to 0.

| 24 06049N | 209 6 Leo 000 a Dat 105 a | 8 |
|-----------|---------------------------------|---|
|-----------|---------------------------------|---|

- 8. Repeat steps 3, 4 and 5 to measure the distance of several points.
- 9. Press [ESC] key during the step 3, 4 or 5, the following menu will pop out.

| SAVE AS A ROUTE | | |
|-----------------|-----------------------------|--------|
| Route : | 03 | A |
| Start : | 24'39.936'¥ 124'39.936'E | |
| End : | 18'42.307'N 119'02.655'E | |
| SAVE | QUIT | CANCEL |

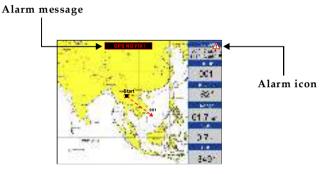
10. You can select :

- A) "SAVE" to save the measurement as a route.
- B) "QUIT" to quit the distance measurement function without saving.
- C) "CANCEL" to continue the distance measurement.

There are six alarm conditions which generates both audio and visual alarms: Arrival alarm, Anchor drag alarm, XTE (Cross-Track Error) alarm, Speed alarm, Voltage alarm and Timer alarm.

When the alarm setting is violated, the buzzer sounds and the name of the offending alarm and the alarm icon appears on the display.

You can silence the buzzer and remove the alarm name indication by pressing any key. The alarm icon remains on the screen until the reason for the alarm is cleared.



7.1 Anchor Drag Alarm

Anchor Drag Alarm informs you that own ship is moving when it should be at rest and when the ship moves out a certain set range.

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Alarm and then press [>] key to display ALARM menu.

| ALARM | | | | |
|---------|-------|--------|-------|--|
| Anchor | OTT | 100.00 | FT9 - | |
| Arrival | OFF | 00,00 | nr | |
| XTE | OFF | 00.00 | nr. | |
| Speed | OFF | 0.00 | kl | |
| Volbage | OFF | 0.00 | Ψ. | |
| Timer | OFF | 000 | mn | |
| Buzzer | Short | - 10 | | |
| Warning | , mez | age | | |

3. Choose Anchor and then press [ENT] key. The alarm options appear.

| ALARM | | | | |
|---------|-------|-------|-------|--|
| Anchol | OFF | 08.00 | DEL | |
| Arrival | UFF | 00.00 | nm | |
| XTE | ON | 00.00 | F# 15 | |
| Speed | OFF | 00.0 | kt | |
| Voltage | OFF | 09.0 | 8 | |
| Timer | DET. | OTH | 111 | |
| Guzzer | Short | - 15 | 1.5 | |
| Warning | mes | sage | | |

4. Press [▶] key to select the alarm value and then press [ENT] key to setup the value.

5. Choose "ON" and then press [ENT] key to enable the alarm.

7.2 Arrival Alarm

Arrival Alarm informs you that own ship is approaching your set destination.

- 1. Press [MENU] key to enter main menu.
- 2. Choose Alarm and then press [▶] key to display ALARM menu.
- 3. Choose Arrival and then press [ENT] key. The alarm options appear.

| ALARM | | | | |
|-----------------|-------|--------|------|--|
| Anchor | 011 | 00.00 | inn | |
| Arrival | UFF | 00.00 | n m | |
| XTE | OFF | 00.00 | TELL | |
| Speed | UPP | 00.00 | kt. | |
| Voltage | TIFF | 0.001 | ¥. | |
| Timer | OFF | 000 | mi- | |
| Buzzer | short | 22.24C | 100 | |
| Warning message | | | | |

4. Press [▶] key to select the alarm value and then press [ENT] key to setup the value.
5. Choose "ON" and then press [ENT] key to enable the alarm.

7.3 XTE (Cross-Track Error) Alarm

XTE (Cross-Track Error) Alarm warns you when own ship is off its intended course.

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Alarm and then press [▶] key to display ALARM menu.
- 3. Choose XTE and then press [ENT] key. The alarm options appear.

| ALARM | | | | |
|---------|-------|--------|-----------|--|
| Anchor | (IFF | 011.00 | 111 | |
| Amival | GFF | 00.00 | 111 | |
| XTE | OFF | 00.00 | m | |
| Speed | GFF | 00.0 | 0 | |
| Voltage | ON | on.u | g_{\pm} | |
| Timer | OFF | .000 | min | |
| Guzzer | Short | | | |
| Warning | mees | age | - | |

- 4. Press [▶] key to select the alarm value and then press [ENT] key to setup the value.
- 5. Choose "ON" and then press [ENT] key to enable the alarm.

7.4 Speed Alarm

Speed Alarm provides visual and aural alerts when the ship's speed is higher or lower than the alarm range set.

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Alarm and then press [>] key to display ALARM menu.
- 3. Choose Speed and then press [ENT] key. The alarm options appear.

| ALARM | | M |
|---------|-------|-----------|
| Anchor | OFF | 00.00 11 |
| Antval | OPE | 00.00 11 |
| XTE | OPF- | 00.00 204 |
| Speed | OFF | 00.0 |
| Voltage | 1011 | 00.0 |
| Timer | LOW | 000 mm |
| Buzzer | Short | |
| Wanning | mez | age |

- 4. Press [▶] key to select the alarm value and then press [ENT] key to setup the value.
- 5. Choose "ON" and then press [ENT] key to enable the alarm.

7.5 Voltag

Voltage Alarm warns you when the input voltage in the unit is higher than the set value.

- 1. Press [MENU] key to enter main menu.
- 2. Choose Alarm and then press [▶] key to display ALARM menu.
- 3. Choose Voltage and then press [ENT] key. The alarm options appear.

| ALARM. | | | |
|---------|-------|--------|-----|
| Anchor | OFF | 100.00 | HL |
| Arrival | OFF | 00.00 | DT. |
| XTE | OFF | 00.00 | nne |
| Speed | OFF | 0.011 | kt |
| Voltage | OFF | 0.00 | 10 |
| Timer | THEF | 000 | mn |
| Buzzer | Sibre | 1000 | |
| Warning | mess | age | |

- 4. Press [▶] key to select the alarm value and then press [ENT] key to setup the value.
- 5. Choose "ON" and then press [ENT] key to enable the alarm.

7.6 Timer Alarm

Timer Alarm provides audio and visual alarms when the time set has expired.

- 1. Press [MENU] key to enter main menu.
- 2. Choose Alarm and then press [▶] key to display ALARM menu.
- 3. Choose Timer and then press [ENT] key. The alarm options appear.

| ALARM. | | | |
|---------|------|-------|------|
| Anchor | UFF | 00.00 | 111 |
| Amival | nrr | 00.00 | iri. |
| XTE | OFF | 00.30 | пт |
| Speed | OFF | 00.0 | E. |
| Voltage | OFF | 00.9 | V. |
| Timar | UFF | 009 | еù |
| Buzzer | OFF | | |
| Warning | THES | sage | |

- 4. Press [▶] key to select the alarm value and then press [ENT] key to setup the value.
- 5. Choose "ON" and then press [ENT] key to enable the alarm.

7.7 Buzzer Type Selection

The buzzer sounds whenever an alarm setting is violated.

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose Alarm and then press [>] key to select.
- 3. Choose **Buzzer** and then press **[▶]** key to select.
- 4. Choose buzzer type desired and then press [ENT] key to finish.

| | ALAR! | А |
|---------------|--------|-----------|
| Anchor | OTT | 00.00 |
| Arrival | OFF | 00.00 * m |
| XTE | OPE | 00.00 001 |
| Speed | OFT | 00.0 0 |
| Voltage | OFF | 00.0 9 |
| Timer | OFF | 000 mi |
| Buzzer | Short | 10.000 |
| Warning | Short | 1 |
| CONTRACTOR OF | Consta | ant |

Short: Two short beeps Long: Three long beeps Constant: Continuous beeps

Disabling the alarm

- 1. Press any key to disable the buzzer of any alarm.
- 2. The Alarm Icon will not disappear until the reason for the alarm is cleared.

8.1 Drawing Marks

- 1. Press [F] key to display the FUNCTION window.
- 2. Choose Drawing and then press [▶] key to select.
- 3. Choose Mark and then press [ENT] key.

The cursor appears with "+?" on the PLOTTER screen.



4. Use the cursor pad to place the cursor on the location desired, add a mark and then press [ENT] key. The following window appears.

| DRAWING | MARK |
|-----------------------------|------|
| | MARK |
| 24°39.936'N 124°39.936'E | - |
| SAVE QUIT | |

5. Edit Lat/Lon or mark, and then choose "SAVE" to finish.

Changing the Symbol and Color

- 1. Move the cursor to the mark and press [ENT] key to select.
- 2. Use $[\blacktriangle]$ or $[\lor]$ to select color or symbol then press [ENT] key.
- 3. Select "SAVE" to finish.

8.2 Drawing Lines

- 1. Press [F] key to display the FUNCTION window.
- 2. Choose Drawing and then press [▶] key to select.
- 3. Choose Line and then press [ENT] key. The cursor appears with "+?" on the **PLOTTER** screen.
- 4. Use the cursor pad to place the cursor on the location desired, add a point of the line and then press [ENT] key.
- 5. Repeat step 4 to complete the line.
- 6. Press [ESC] key to finish, and then the save confirmation window will appear.

| DF | AWING LINE |
|----------------|--------------|
| LINE | : 001 |
| Start : | 24°39.936'N |
| and the second | 124 39.936'E |
| End : | 24"39.936'N |
| | 124'39.936'E |
| SAVE | QUIT |

7. Move the cursor to the color and press [ENT] key to modify the color, if required.8. Choose "SAVE" and then press [ENT] key to save the line.

8.3 Drawing Place name

- 1. Press [F] key to display the FUNCTION window.
- 2. Choose **Drawing** and then press [▶] key to select.
- 3. Choose Place name and then press [ENT] key.
- 4. The cursor appears with a "+?" on the PLOTTER screen.
- 5. Use the cursor pad to place the cursor on the location desired, add a name and then press [ENT] key. The save confirmation window will appear.

| DRAWIN | IG PLACE NAME |
|--------|---------------|
| NAME : | ABC |
| 24°39 | .936'N |
| 124°39 | 9.936'E |
| SAVE | QUIT |

6. Enter the name and then choose "SAVE" to finish.

8.4 Editing Drawing Marks

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Edit and then press [>] key to select.
- 3. Choose **Drawing marks** and then press **[ENT]** key. The following window appears.

| | _ | | 186477 | |
|----|-------|---|--|--|
| | | 2.266.26 | NUMBER OF STREET | |
| 2 | | 97.795.538 | Developments and the second seco | |
| 21 | 14 | 2 3000 725 | CB | |
| 4 | 14 | <1.0044121H | 0.6 ×0.4 | |
| 1 | ×. | - 1 Ats (6) | Call Contract | |
| | 10 | Hannell | and an one | |
| | | 14 | that many and | |
| | ۰. | | and an owned | |
| | | Contraction M. | | |
| | 6 | 1 6 M | 1 4 1 1 | |
| | 1.8.2 | H | | |
| | 083 | | and an and | |
| | 10 | السب م | | |
| | 1 | Hannah | | |
| | | - · · · · · · · · · · · · · · · · · · · | | |
| | | | | |

- 4. Select a mark then press [ENT] key to edit.
- 5. After editing, choose "SAVE" and then press [ENT] key to finish.

8.5 Editing Drawing Lines

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Edit and then press [>] key to select.
- 3. Choose Drawing lines and then press [ENT] key. The following window appears.



4. Choose the line that you want to edit and then press [ENT] key. The following window appears.

| 454 | |
|--|---------------|
| an an Crist Trai Without - Juan - A County Internet | Barren |
| r sext fills | |
| - 100 100 | |
| : :=::::: | |
| | |

- 5. Choose the point that you want to edit and then press [ENT] key.
- 6. After editing, choose "SAVE" and then press [ENT] key to finish.

8.6 Editing Drawing Place Name

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Edit and then press [▶] key to select.
- 3. Choose Drawing placename and then press [ENT] key. The following window appears.



4. Choose the place name that you want to edit and then press [ENT] key. The following window appears.

| DRAWI | ING PLACE NAME | |
|-------|----------------|---|
| NAME | ABC | 1 |
| 24°3 | 19.936'N | |
| 124°3 | 39.936'E | |
| SAVE | QUIT | |

5. After editing, choose "SAVE" and then press [ENT] key to finish.

8.7 Erasing Drawing Marks

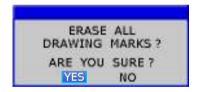
- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Edit and then press [▶] key to select.
- 3. Choose Drawing marks and the press [ENT] Key.
- 4. Choose the mark that you want to clear, and then press **[ENT]** key. The confirmation window will appears.



- 5. Choose "ERASE" and then press [ENT] key.
- 6. The confirmation window will appear then choose "YES" to finish.

Erasing All Drawing Marks

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Erase** and then press [▶] key to select.
- 3. Choose All drawing marks and then press [ENT] key. The confirmation window will appears.



4. Choose "YES" to erase all drawing marks.

8.8 Erasing Drawing Lines

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose Edit and then press [>] key to select.
- 3. Choose Drawing lines and the press [ENT] key to select.
- 4. Choose the line that you want to erase, and then press [ENT] key.

The confirmation window appears.

| 1.55 | |
|---|------|
| 947 57 17727 (4) 9 8 1918 AC9011 2 2018 CC9011 2 2018 CC9011 8 2018 CC195 9 19 2 87 105 | rse: |
| | |
| | |

- 5. Choose "ERASE" and then press [ENT] key to select.
- 6. The confirmation window will appear then choose "YES" to finish.

Erasing All Drawing Line

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Erase** and then press [▶] key to select.
- 3. Choose All drawing lines and then press [ENT] key. The confirmation window will appear.

| ERASE ALL DRAWING LINES ? |
|---------------------------|
| ARE YOU SURE? |
| YES NO |

4. Choose "YES" to erase all drawing lines.

8.9 Erasing Drawing Place Name

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Edit** and then press **[>]** key to select.
- 3. Choose Drawing placename and then press [ENT] key to select.
- Choose the place name that you want to erase, and then press [ENT] key. The confirmation window appears.

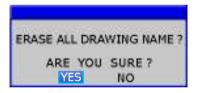


5. Choose "ERASE" and then press [ENT] key.

6. The confirmation window will appear then choose "YES" to finish.

Erasing All Drawing Place Name

- 1. Press [MENU] key twice to main menu.
- 2. Choose Erase and then press [>] key to select.
- 3. Choose **All drawing name** and then press **[ENT]** key. The confirmation window will appears.



4. Choose "YES" to erase all place names.

9. OTHER SETTING

9.1 Map Scale

You can change the map scale display format.

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press **[>]** key to select.

| SF . | TUP |
|----------------------|---------------------------|
| Magiscala Mies | Simulation |
| Speed unit min,kt | Calibrate |
| Depth unit meter | Map source SD Car |
| Wind unit kt | Languages English |
| BRG, REF Irue | key beep CN |
| MAG, VAR, Auto | Wind screen OFF |
| Deviation Lat+00.000 | Ais screen OFF |
| Deviation Lon+00,000 | Sonar screen UN |
| Tima 248 (10000) | NMEA data dispaly |
| TTG/ETA speed Auto | an contract of the factor |

- 3. Choose Map scale and then press [ENT] key to select.
- 4. Choose "Miles" or "Ratio" as desired and then press [ENT] key to finish.

9.2 Unit of Measurement

Speed Unit

Distance/speed can be displayed in nautical miles/knots, kilometers/kilometers per hour, or statute miles/kilometers per hour.

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press **[>]** key to select.
- 3. Choose Speed unit and then press [ENT] key to select.

| S | TUP |
|-----------------------|--------------------------------------|
| Mapiscale Nm | Simulation |
| Speed unit inwy kt | Calibrate |
| Depth unit um kt | Map source SD Card |
| Wind unit km, kmt | Languages English |
| BRG. REF | key beep ON |
| MAG. VAR. Auto | Wind screen OFF |
| Deviation Lat +00,000 | Als screen Off |
| Deviation Lon (00.000 | Sonar sereen ON |
| Time 246 100:00 | NHEA data dispaly |
| TTG/ETA speed Auto | a second second second second second |

4. Choose "nm, kt", "km, kmh" or "sm, kph" as desired and then press [ENT] key to finish.

Depth Unit

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press **[**▶] key to select.
- 3. Choose Depth unit and then press [ENT] key to select.

| Map scale | NIT | Simulation | |
|--------------|-------------|----------------|---------|
| Speed unit | nm,kt | Calibrate | |
| Depch unit | feet | Nap source | SD Card |
| Wind unit | feet | Languages | English |
| BRG, REF | mortist | key beep | 00 |
| MAG. VAR. | hus | Wind screen | OFF |
| Deviation La | £+00.000 | Ais screen | OFF |
| Deviation Lt | 000.000 m | Sonar sereen | 04 |
| Time | 2411 +00:00 | NMEA date di | spaly |
| TTG/ETA spee | d Auto | 2009-2003/2009 | 0.530/6 |

4. Choose "feet", "fathom" or "meter" as desired and then press [ENT] key to finish.

9.3 Bearing Reference

Ship's course and bearing to a waypoint may be displayed in true or magnetic bearing. Magnetic bearing is true bearing plus (or minus) earth's magnetic deviation. Use the bearing reference in accordance with the compass interfaced: magnetic for magnetic compass, true for gyrocompass.

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press [**>**] key to select.
- 3. Choose BRG. REF. and then press [ENT] key to select.

| and the second se | SE | TUP | |
|---|-------------|-----------------|----------|
| Map scale | NOT | Simulation | |
| Speed unit | nm,kt | Calibrate | |
| Depth unit | meter | Hap source | SD Card |
| Wind unit | kt | Languages | English |
| BRG, REF | True | key beep | CN |
| MAG, VAR. | 1rin: | Wind screen | OFF |
| Deviation La | Magnetic | Ais screen | OFF |
| Deviation La | | Sonar sereen | ON |
| Time | 2411 +00:00 | NMEA data di | spaly |
| TTG/ETA spee | d Auto | XORGANGER MODER | (1893) - |

4. Choose "True" or "Magnetic" as desired and then press [ENT] key to finish.

9.4 Magnetic Variation

The location of the magnetic North Pole is different from the geographical North Pole. This causes a difference between the true and magnetic north direction. This difference is called magnetic variation, and varies with respect to the observation point on earth.

Your unit is pre-programmed with all the earth's magnetic variation. However, you may want to enter variation manually to refine accuracy. Set **BRG. REF** on the **PLOTTER** screen to "Magnetic" to use magnetic variation.

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press [**>**] key to select.
- 3. Choose MAG. VAR. and then press [ENT] key to select.

| | SE | THP | |
|--------------|------------|--------------|---------|
| Map scale | Not | Simulation | |
| Speed unit | nrn,kt | Calibrate | |
| Depth unit | meter: | Nap source | SD Card |
| Wind unit | kt | Languages | English |
| GRG REF | True | key beep | ON |
| MAG. VAR | ALLO | Wind screen | OH |
| Deviation La | Auta | Als screen | OFF |
| Deviation Lt | Marinal | Sonar sereen | ON |
| Time | 24H +00.00 | NMEA data di | spaly |
| TTG/ETA spee | d Auto | | 0861250 |

4. Choose "Auto" or "Manual" (if you choose "Manual", you need to input the value manually) as desired and then press [ENT] key to finish.

9.5 Deviation

You can input the deviation of the ship or map manually to correct the position error from GPS error or map error.

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press [▶] key to select.
- 3. Choose Deviation and then press [ENT] key to select.

| | ŚF | THP | |
|--------------|------------|--|----------|
| Map scale | Nin | Simulation | |
| Speed unit | ara,kt | Celibrate | |
| Depth unit | meter | Map source | SD Card |
| wind unit | kt | Languages | Emplish: |
| BRG. REF | True | key beeg | UN |
| MAG. VAR | ALTO | Wind screen | ULL |
| Deviation La | 1 100.000 | Ats screen | OFF |
| Ceviation Lr | Sn 100.000 | Sonar sercen | UN |
| Time | 24H 100:00 | NINEA data di | spaly |
| TTG/ETA spec | d Auto | and the second s | 1.0110 |

4. Input the value as desired and then press [ENT] to finish. To disable deviation, input "0" into the value.

9.6 Time

GPS uses UTC time. If you would rather use local time, enter the Time difference (range: -13:30 to +13:30) between it and UTC time.

You may display the time in 12 or 24 hour format.

1. Press [MENU] key twice to enter main menu.

- 2. Choose **Setup** and then press [▶] key to select.
- 3. Choose **Time** and then press [▶] key to select.

| | 8 | FTLAP | |
|---------------|------------|-----------------|---------|
| Map scale | Nrs | Simulation | |
| Spead unit | nm,kt | Calibrate | |
| Depth unit | meter | Map source | SD Card |
| Wind unit | kl | Languages | English |
| ERG. REF | True | key beep | 01 |
| MAG. VAR | AUDO | Wind screen | 01 |
| Deviation Lat | E 1.00.000 | Als screen | 01 |
| Deviation Los | 1100.000 | Sonar sereen | 603 |
| Tima | 24H 107 | NMEA data di | spaly |
| TTG/ETA speed | 2411 | MENTERSON AND A | 1000 |
| | 12H | | |

4. Input the time difference as desired. Choose "24H" or "12H" as desired and then press [ENT] key to finish.

9.7 TTG/ET

To calculate time-to-go and estimated time of arrival, enter your speed as below.

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press **[▶]** key to select.
- 3. Choose TTG/ETA speed and then press [ENT] key select.

| Wind unit iki Ushguages That BRG, REF Time Kay baab Of HAG, VAR, Auto Wind screen OFF Deviation Lat -00.000 Aus screen OFF Deviation Lan-00.000 Sonar screen Off | tap scale Hur | Simulation | |
|---|-----------------------|--|----------|
| Wind unit iki Ushguages That BRG, REF Time Kay baab Of HAG, VAR, Auto Wind screen OFF Deviation Lat -00.000 Aus screen OFF Deviation Lan-00.000 Sonar screen Off | peed unit mm,kt | Calibrace | |
| BRG, REF Time Kay beas 04 HAG, VAR, Auto Wind screen OFF Deviation Lat =00.000 Avs screen OFF Deviation Lon=0.000 Screen 34 | apth unit insider | Nap source | SII Care |
| HAG, VAR, Auto Wind screen OFF Deviation Lat +02.000 As screen OFF Deviation Lon-0.000 Screecen 04 | Vind unit ki | Languages | Ingish |
| Deviation Lat =02.002 Ais screen Oct Deviation Lon=0.0000 Sonar screen OA | RG. REF line | kay beep | 204 |
| Deviation Lon-00.000 Schargereen 04 | AG. VAR. Auto | Wind screen | OFF |
| Contraction of the second se | leviation Lat -00.000 | Aissoneen | OFF |
| | eviation Lon-obloob | Sonar sereen | 004 |
| Time 248 Puctor MMEA data dispaly | me 248 300:00 | MinEA cata di | spaly |
| Lite/Et/Asseed Anha | 10-/h 1/h speed Auto | State and the state of the stat | |

 Choose "Auto" for automatic speed input (GPS calculated speed), or "Manual" for manual input.

9.8 Key beep

you can set the key sound

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press **[▶]** key to select.
- 3. Choose Key beep and then press [ENT] key select.

| | 51. | TUR | |
|---------------------|------------|--|---------|
| Hep scale | - Kritt | S-mulation | |
| Speed unit | nm,kt | Calibrate | |
| Depth unit | 20606 | Map source | SD Dard |
| Wind unit | - al. | Languages | English |
| BRC. REF | hae | Key bdsp | CHE |
| MAG. VAR. | Auto | Wind screen | CON STR |
| Deviation La | t+00200 | Als screen | GAG 1 |
| Deviation La | 000,001 1 | Sonar sereen | I GN |
| Tme | 241 100:00 | R MEA data di | spary |
| ETG/FTA spee | di Autor | A STATE OF THE STA | 09905 |

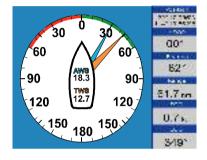
4. Choose "OFF" or "ON" and then press [ENT] key to finish.

9.9 Wind screen

- 1. Press the [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press **[**▶] key to select.
- 3. Choose Wind screen and then press [ENT] key select.

| | | TUP | |
|--------------|-------------|--------------|---------|
| Map scale | Nm | Simulation | |
| Speed unit | nm,kt | Calibrate | |
| Depth unit | meter | Map source | SD Card |
| Wind unit | kt | Languages | English |
| BRG. REF | True | key beep | ON |
| MAG. VAR. | Auto | Wind screen | DN |
| Deviation La | t + 00.000 | Ais screen | ODEE |
| Deviation Lo | 000.00+1 | Sonar sereen | dow |
| Time | 2411 +00:00 | NMEA data di | spaly |
| TTG/ETA spee | d Auto | | |

4. Choose ON and then press [ENT] key to finish. The following message appears



9.10 GPS setting 9.10.1 Choosing GPS output data

The unit's default is using an internal GPS module for position fixing. On the other hand, you can use external GPS data for position fixing.

- 1. Press [MENU] key on the SATELLITE screen.
- 2. Choose Output and then press [ENT] key to select.



- 3. Choose "ON" or "OFF" as desired and then press [ENT] key.
- 4. Press [▶] key to select your desired output data, press [ENT] key to finish.

9.10.2 Datum setting

You can choose 6 types of data output at the same time.

- 1. Press [MENU] on the SATELLITE screen.
- 2. Choose Datum and press [ENT] key to select.

| M | NU-SI | AT | |
|-----------|--------|---------|-----------------|
| Input | 15 | TERNAL | |
| Cutput | OF | Ŧ | |
| GGA | GLL | RMC | |
| AAM | AAH | AAM | |
| JAAN. | AAM | MAAM | |
| AAM | AAH | MAA | WIGG: EN72 |
| Baud rat | | 4800 | WG5 1984 |
| Cetam | | 1000 | ADINDAN |
| SBAS | | OFF | AFGOOVE |
| POS smo | oth | 010 | ADMIR, AND 70 |
| SOG sm | sath | 006 | AM SAMCA 19 |
| COG sm | ooth | 010 | AV444.1 AS. 65 |
| AWS smi | ooth | 005 | ANTIGUA AS. |
| AWA smi | ooth | 800 | ARC 1950 |
| TWS sm | docth | 000 | ARC 1950 |
| TWA smi | ridoe | 000 | COLOR PROPERTY. |
| TWD sm | ooth | 010 | |
| VMG smi | ooth | 000 | |
| Data fiel | d setu | p | |
| Manual | HATV | apari - | |

3. Choose your desired datum and press [ENT] key to confirm.

9.10.3 Smoothing

You can setup position smoothing, speed smoothing and course smoothing. 1. Press [MENU] key on the SATELLITE screen.

| ME | NU-SI | AT . | |
|------------------|----------|--------|---|
| Input | INTERNAL | | |
| Cutput | OF | P | |
| GGA | GLL | RMC | |
| AAM | AAM | AAM | 3 |
| AAN . | AAM | AAM | |
| AAM | AAH | MAA | |
| Baud rati | | 4200 | |
| Datum | | 13.20 | • |
| SBAS | | OFF | 4 |
| POS smo | | 010 | |
| SOG amo | | 005 | |
| COG sint | | 010 | |
| AWS smo | soth | 005 | |
| AWA smo | ooth | 000 | |
| TWS smo | xoth | 000 | |
| TWA sma | sobh | 909 | 4 |
| TWD sm | path | 010 | |
| VMG smo | | 001 | |
| Data fiek | 1 setu | p | |
| A DESCRIPTION OF | HARDS | episti | |

- 2. Choose POS smooth to enter position smoothing data.
- 3. Choose SOG smooth to enter speed smoothing data.
- 4. Choose COG smooth to enter course smoothing data.

9.11 NMEA data display

- 1. Press [MENU] key twice to enter main menu.
- 2. Choose **Setup** and then press [▶] key to select.
- 3. Choose NMEA data display and then press [ENT] key.

| | SE | TUP | |
|---------------|-----------------|--------------|---------|
| Map scale | Nm | Simulation | |
| Speed unit | nm,kt | Calibrate | |
| Depth unit | meter | Map source | SD Card |
| Wind unit | kt | Languages | English |
| BRG. REF | True | key beep | 08 |
| MAG. VAR. | Auto | Wind screen | OFF |
| Deviation La | st +00,000 | Ais screen | OFT |
| Deviation i.c | 000.000 http:// | Sonar sereen | ON |
| Time | 24H 400:00 | NMEA data de | spla y |
| TTG/ETA spec | ad Auto | | |

4. NMEA data display is used during the installation to check whether the NMEA input and output data to and from other equipment onboard is normal. Press [**] key to switch between the input and output ports. Press [ENT] key to stop scrolling of NMEA data and press [ENT] key again to restart NMEA data scrolling. Press [ESC] key to quit the NMEA data display.

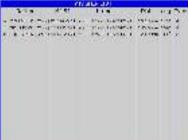


10.1 Vessels list

1. Press [MENU] on the AIS screen.

| MENU - AIS | | |
|-----------------|----------|--|
| Activation Ring | 03.00 m | |
| CPA Limit | 05.00 nm | |
| TCPA Limit | 10 10 | |
| CPA/TCPA Alarm | OFF | |
| Status | IN port | |
| AIS detail list | | |
| AIS TX | OFF | |
| AIS Vessel | Line | |
| Neura to NATA M | ILNU . | |

2. Choose AIS detail list and then press [ENT] key. The AIS SHIP LIST window will appear.



10.2 The collision alarm

1. Press [MENU] on the AIS screen.

| MENU - AD | S | |
|-----------------|----------|--|
| Activation Ring | 05.00 mm | |
| CPA Limit | 05.00 nm | |
| TCPA Limit | 10 (0) | |
| CPA/TCPA Alarm | OFF | |
| Status | IN port | |
| AIS detail list | 2000000 | |
| AIS TX | OFF | |
| AIS Vessel | Line | |
| New to NATA M | ICNU . | |

- 2. Select CPA Limit or TCPA Limit then press [ENT] key to enter a value.
- 3. Select CPA Alarm or TCPA Alarm then press [ENT] key to choose "ON" or "OFF".

10.3 Own ship's information

There are two ways to display "Own Ship Info"

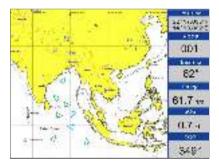
- 1. Enter the "Vessels list", and press the [MENU] key, and then select the "Own Ship Info" to check all the information of your own ship.
- 2. Move the cursor to select your AIS Vessel on the chart screen and press the **[ENT]** key.

| | a second |
|--------------------------|-------------------------|
| NAME : HAROLONGYPE | |
| VM51:123450785 | Calls on t BOBF |
| IHC : | Position sensor: 1 CPC |
| 90% : 15.3 d | from a staff |
| Prehind : 27:35.58219 | 1.0108.01 |
| | |
| Ship type : Cargo ality- | |
| Destination (SHANGHA | |
| Nexigehon status : Mat | |
| Draft of ship 1, 4.5m | Dut on view notice |
| Sine an | and the states wind the |
| Estimated en var time : | 13/05 20:00 |
| | d 015m in ster Oten |
| | 005m Ct date 009m |
| | |
| CRACK SEDIM | 0171111.154 |
| Dentilemente | (ESC) : stol |

10.4 Chart Screen

Users can check all AIS vessels being received in real-time on the chart screen, as well as the specific position and track of your own ship on the charts.

The track length of AIS vessels depends on the equipment memory space, generally not less than 20 track points.



10.5 View AIS vessels' information on chart screen

There are two ways to view AIS vessels' information: one is to move the cursor to select AIS vessel on the charts screen, and press the [ENT] key. The other is to select the AIS vessel from the AIS vessels list, and press the [ENT] key.



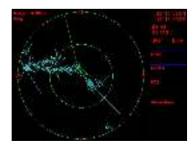


10.6 Check all AIS ships within the scope of Radar (AIS screen)

Displays all AIS ships within the current scope of the Radar. The current location of the own ship is at the center of the map, appearing as a white hollow triangle, and the vertex angle of the triangle stands for the current direction of your own ship. The blue hollow triangle stands for the vessels of CLASS B. The green hollow triangle stands for CLASS A vessels. The green hollow square stands for BASE STATION. Circle stands for no direction.

The collision alarm setting and the current scope of radar can be displayed on the upper left corner of the Radar, and the scope can be adjusted by pressing the [X] key and [X] key.

The message display frame on the upper right corner of the Radar displays the following information: the own ship's position, the current time, the current speed/direction of the own ship.



10.7 Emergency alarm

The information of the emergency alarm received is displayed on the bottom right corner. The emergency alarm is always available and can not be deleted, if the emergency alarm information is not read, after exiting the alarm menu, the "emergency alarm" window will pop up a little later. The warning ship displayed on the Radar will be yellow and flashing.



The relevant data (including the time, place, the relevant ship's information, etc.) will also be saved by the display terminals. It can be the basis of analysis in the event of any accident.

10.8 Entry/Departure setting

The Entry/Departure setting is for the temporary shut down or restart of the collision alarm. When entering the port, the collision alarm will be temporarily closed. When leaving the port, the collision alarm will be opened.

- 1. Press the [MENU] key at the AIS screen.
- 2. Choose Status then press [ENT] key to select.
- 3. Select "In Port" or "Out Port" as desired and press [ENT] key to finish.

| MENU - AIS | | |
|-----------------|------------|--|
| Activation Ring | 05.00 | |
| CPA Limit | 05.00 111 | |
| TCPA Limit | 10 317 | |
| CPA/TCPA Alarm | OFF | |
| Status | INport | |
| AIS detail list | Sectored 1 | |
| AIS TX | OFF | |
| AIS Vessel | Line | |
| Menu to MALV M | ENU | |

10.9 AIS Vessel

1. User can define the AIS vessel display as either "Fill" or "Line".

| MENU -AIS | | |
|-----------------|----------|--|
| Activation Ring | 05.00 nm | |
| CPA Limit | 05.00 mm | |
| TCPA Limit | 10 111 | |
| CPA/TEPA Alarm | OFF | |
| Status | IN port | |
| AIS detail list | | |
| AIS TX | orr | |
| AIS Vessel | Line | |
| Neru te Main M | Eline | |
| - | Fill | |

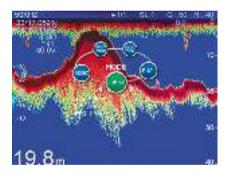


11. HD FISHFINDER OVERVIEW

11.1 Sonar mode

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose **Sonar mode** and then press **[ENT]** key or press and hold **[MODE]** key in the **SOUNDER** screen. The following window will appear.

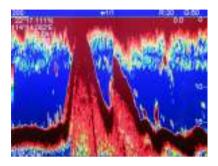
| DPT IDES | |
|--------------|---------|
| Soner mode | SOKH2 |
| COT | Manuale |
| Range | Manual |
| TVG. | TO |
| Pic. advance | 1/1 |
| Split ratio | 5047 |
| Sonar menu | |
| Alarm | |
| System menu | |
| Date field | |
| ▲/▼School | |
| LIVE Set | |
| ESC:Cancel | |
| Peno to PAI | N MENU |



| MODE | Function |
|----------------|---|
| 200KHz | Provides the high frequency (200KHz)normal picture on the full screen. |
| 50KHz | Displays the low frequency (50KHz)normal picture on the full screen. |
| DUAL | Displays the normal display for high frequency (200KHz) on the right half and low frequency (50KHz) on the left half. |
| 200KHz ZOOM | Shows the normal display of the high frequency (200KHz) on the right half and its zoom display on the left half. |
| 50KHz ZOOM | Provides the normal display of the low frequency (50KHz)on the right half and its zoom display on the left half. |

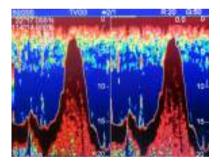
200KHz, 50KHz (high frequency, low frequency) mode

The sounder uses ultrasonic pulses to detect bottom conditions. The lower the frequency of the pulse the wider the detection area. Therefore, the 50KHz frequency is useful for general detection and judging bottom conditions, while the 200KHz frequency is useful for detailed observation of fish schools.



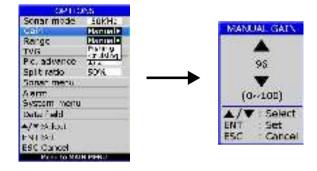
DUAL frequency mode

This mode provides the 50KHz picture on the left-half of the screen and the 200KHz on the right half, and is useful for detecting fish schools which have different reflection characteristics with frequency. For example, a school of tiny fish like minnow returns stronger echoes on a high frequency compared to a low frequency.



11.2 Gain

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose **Gain** and then press **[ENT]** key, or press **[ENT]** key in the **SOUNDER** screen to adjust gain manually. The following window will appear.



3. Choose Manual, Fishing or Cruising as desired and then press the [ENT] key, or press and hold [ENT] key in SOUNDER screen. AUTO 1 (fishing) mode is activated which is for ground fishing with automated gain adjustments. Press [ENT] key again to activate the AUTO 2 (cruising) mode with automatic gain adjustments for cruising. Press and hold [ENT] key to return to manual gain mode.

11.3 Range

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose Range and then press [ENT] key to select.
- Choose "Manual" or "Auto" and then press the [ENT] key or when in the SOUNDER screen, press and hold [] or [] to change to Manual or Auto.
- 4. If you choose Manual, press the **[ESC]** key to return to **SOUNDER** screen. Press **[**] or **[**] to increase or decrease in the depth range.

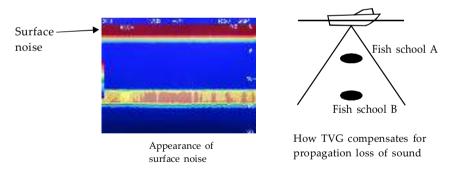
11.4 TVG

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose TVG and then press [ENT] key. The following window will appear.



3. Choose "Off" or "Manual" as desired then press [ENT] key.

The TVG compensates for propagation loss of sound, so that the echoes from the same fish school size are displayed in the same color. Normally, set it between "0" and "5". Avoid excessive TVG; weak echoes may not be displayed. The TVG is also useful for reducing surface noise.

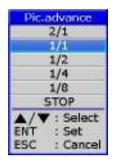


Note: Surface noise appearing in the range of 0 to 40 m can be reduced by the Clutter function.

11.5 Picture advance

The picture advance speed determines how quickly the vertical scan lines run across the screen.

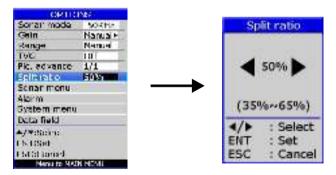
- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose **Pic. advance** and then press **[ENT]** key or press and hold **[▶]** key in **SOUNDER** screen. The following window will appear.



3. Press the [▲] or [▼] key to select speed: 2/1(FAST), 1/1, 1/2, 1/4, 1/8 (SLOW) or STOP advance.

11.6 Split ratio

- 1. When in **PLOTTER+SOUNDER** screen and the **SOUNDER** screen is ≥50%, press [MENU] key.
- 2. Choose **Split ratio** and then press **[ENT]** key to setup split ratio, or press and hold **[MODE]** key in the **PLOTTER+SOUNDER** screen. The following window will appear.



11.7 Sonar Menu

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose **Sonar menu** and then press **[ENT]** key. The following window will appear.

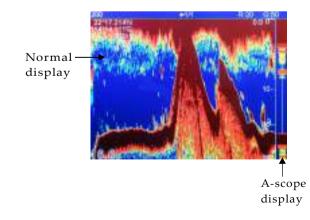
| A-Scope | CI-P |
|---------------|---------------|
| Zoom mode | eterker zoart |
| Lesse limiter | |
| Hue selection | 6 T. |
| Signal evel | 1 |
| Marker' | 0-97 |

11.7.1 A-Scope

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose Sonar menu and then press [ENT] key to select.
- 3. Choose A-Scope and then press [ENT] key. The following window will appear.
- 4. Press the $[\blacktriangle]$ or $[\lor]$ key to enable or disable the A-Scope.

| 9005788 | VENU. |
|------------------------------------|----------------|
| A-Scope | STATE OF STATE |
| Zoom mode Noise limiter | CN // |
| Hoeselection Signal level | 1. 5. |
| Markai | 0.091 |
| ▲/♥:Sele: ENT :Set ESC :Carc | :t |

This display shows echoes at each transmission with amplitudes and tone proportional to their intensities, on the right 1/4 of the screen. It is useful for estimating the kind of fish school and bottom composition.



11.7.2 Zoom modes

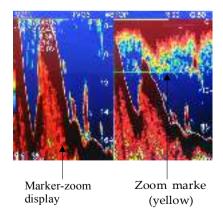
- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose Sonar menu and then press [ENT] key to select.
- 3. Choose **Zoom mode** and then press **[ENT]** key. The following window will appear.

| SONAR | MENU |
|--|--|
| A-Scope | OFF |
| Zoom mode | Marker zoom |
| Noise limiter Hue selection Signal level | Markerzoom Bottom lock Bottom zoom |
| Marker | VRM |
| ▲/▼: Select ENT : Set ESC : Cano | |

4. Choose "Marker Zoom", "Bottom lock" or "Bottom zoom" as desired then press [ENT] key to finish.

MARKER ZOOM

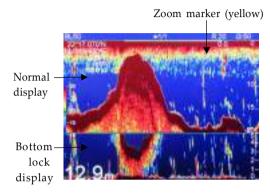
This mode expands selected area of the normal picture to full vertical size of the screen on the left-half window. You may specify the portion to expand with the VRM (Variable Range Marker), which you can shift with $[\blacktriangle]$ or $[\lor]$ key. The area between the VRM and the zoom range marker is expanded. The length of the segment is equal to one division of the depth scale.



BOTTOM LOCK

This display provides a compressed normal picture on the top 2/3 of the screen and a 5 or 10 meter (10 or 20 feet) wide layer in contact with the bottom is expanded onto the bottom 1/3 of the screen. This mode is useful for bottom discrimination. Note that the seabed should be steadily and distinctly plotted in red or reddish-brown. Adjust the gain if necessary.

Note: The zoom marker can be turned on/off on the system menu.

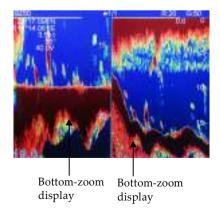


BOTTOM ZOOM

This mode expands bottom and bottom fish echoes two to five times to vertical size of the screen, and it is useful for determining bottom hardness. A bottom displayed with a short echo tail usually means it is a soft, sandy bottom. A long echo tail means a hard bottom.

The zone automatically moves so that the bottom echoes locate on the lower half of the screen.

Note: The zoom marker can be turned on/off on the system menu.



11.7.3 Noise limiter

Light-blue dots may appear over most of the screen. This is mainly due to unclean water or noise. This noise can be suppressed by adjusting Clutter on the menu.

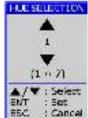
- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose Sonar menu and then press [ENT] key to select.
- 3. Choose **Noise limiter** and then press **[ENT]** key. The following window will appear.



4. Choose "Off", "Low", "Medium" or "High" as desired and then press [ENT] key to finish.

11.7.4 Hue Selection

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose Sonar menu and then press [ENT] key to select.
- 3. Choose **Hue Selection** and then press **[ENT]** key. The following window will appear.

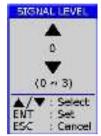


| Hue Ho. | Background color | Echo color |
|---------|------------------|----------------------------------|
| 1 | Blue | 7 colors, bottom reddish-brown |
| 2 | Blue | 6 colors, bottom red |
| 3 | Black | 7 colors, bottom reddish-brown |
| 4 | Black | 6 colors, bottom red |
| 5 | White | 7 colors, bottom reddish-brown |
| 6 | White | 6 colors, bottom red |
| 7 | Black | Monochrome yellow, 8 intensities |

Press the [▲] or [▼] key to select the background and press [ENT] key to finish.

11.7.5 Signal level

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose Sonar menu and then press [ENT] key to select.
- 3. Choose **Signal level** and then press **[ENT]** key. The following window will appear.



Press the [▲] or [▼] key to select the signal level and press [ENT] key to finish.

11.7.6 Marker

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose Sonar menu and then press [ENT] key to select.
- 3. Choose Marker and then press [ENT] key. The following window will appear.

| SONAR | MENU |
|---------------|-------------|
| A-Scope | OFF |
| Zoom mode | Marker zoom |
| Noise limiter | OFF |
| Hue selection | 1 |
| Signal level | 1 |
| Marker . | VRM |
| ▲/▼:Selec | |
| ENT : Set | (WHI |
| ESC : Cano | el |

4. Choose "VRM" or "WHT" as desired and then press [ENT] key to finish.

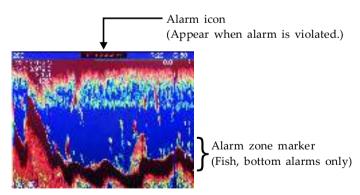
The white marker functions to display a particular echo color in white. For example, you may want to display the bottom echo (reddish-brown) in white to discriminate fish echoes near the bottom. Note that the bottom must be displayed in reddish-brown for the white marker to function.

11.8 Alarm

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose ALARM and then press [ENT] key. The following window will appear.

| ALARI | M |
|-------------|------|
| Bottom | OFT |
| From | 0 |
| Span | 0 |
| Fish | OFF |
| From | 0 |
| Span | 0. |
| Temperature | OFF |
| From | 0 |
| Span | 0 |
| ▲/▼:Seler | ct i |
| ENT : Set | |
| ESC : Cano | xel |

- 3. Press [Aor [Vkey to select an alarm.
- 4. Press [ENT] key to select "OFF", "ON", "IN" or "OUT". (For the water temperature alarm, select "IN" to get the alarm when the water temperature is within the alarm zone range, or "OUT" to get the alarm when the water temperature is higher than the alarm zone range.)
- 5. Choose From then press [ENT] key to adjust alarm starting depth. Press [▲] or [▼] to adjust value.
- 6. Choose Span then press [ENT] key to adjust alarm range. Press [▲] or [▼] to adjust value.



7. To deactivate an alarm, select "OFF" at step 4 in the above procedure.

11.9 System Menu

- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose **System menu** and then press **[ENT]** key. The following window will appear.

| SYSTEM M | ENU |
|--------------|----------------|
| Zoom marker | TIFF |
| F/A level | Weak. |
| Range 1 | 5 |
| Range 2 | 16 |
| Range 3 | 20 |
| Range 4 | 40 |
| Range 5 | 20 |
| Range 6 | 150 |
| Range 7 | 200 |
| Range 6 | 300 OUC |
| Range 9 | 600 |
| Range 10 | 1000 |
| Zoom range | *1 |
| B/L range | 5 m |
| Temp | ⁴ C |
| ▲/▼ : Select | |
| ENT : Set | |
| ESC : Cance | ł |

RANGE 1- 10: Activates or deactivates specific range scales. Default ranges are 5, 10, 20, 40, 80, 150, 200, 300, 600, and 1000 (meters). Setting area is 2m to 800m.

Note: Ranges must be set in numerical order. For example, if range 1 is 5 m and range 3 is 20m, range 2 should be between 6 and 19 m.

11.10 Data field

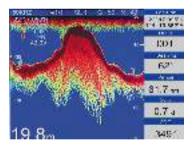
- 1. Press [MENU] key in SOUNDER screen.
- 2. Choose Data field and then press [ENT] key. The following window will appear.

| OPTIC | INS | |
|--------------------|------------------|----------------------|
| Sonar mode Gain | SOKH2 Nenual> | |
| Range | Manual | |
| TVG | Off. | |
| Pio, advance | 1/1 | |
| Split reto | 50% | |
| Goner menu | | |
| Alarm | | |
| System menu | | DAIA HELD |
| Cota field | | Data heid setup |
| ▲/▼:Select | | Show/hide data field |
| LNDSet | | |
| LSC:Cancel | | |
| Vienu ha VM | NNENU | |

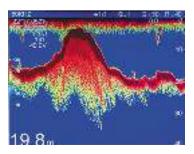
3. Data field setup

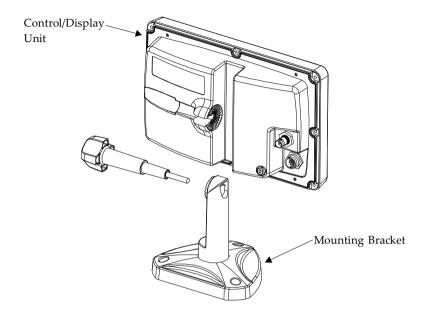
The Data Field will appear on the right-side of the screen. The black area is the data area of which may be changed.

- Press [ENT] key and a data table will appear.
- Press the [◀], [▶], [▼] or [▲] key to select the one you want to display on the data field, then press [ENT] to finish.



4. User can Show/hide data field as desired.

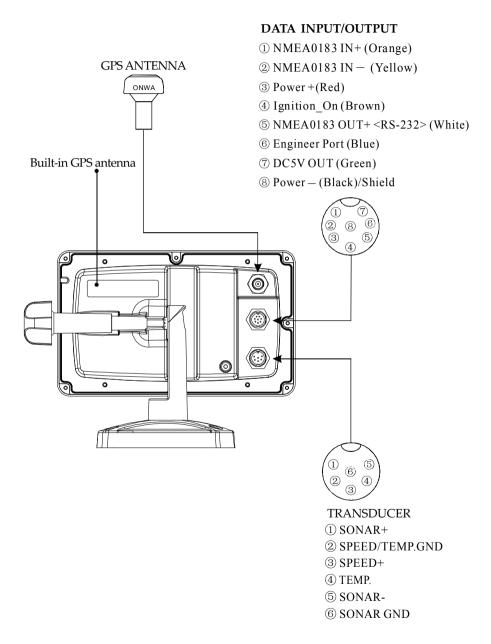




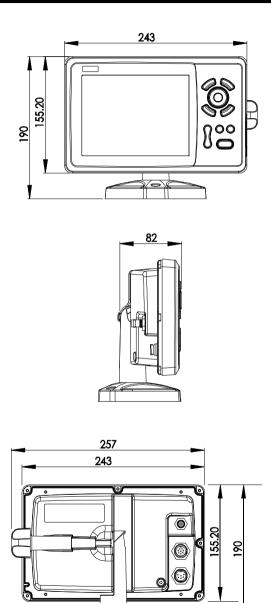
Notice: The unit should be mounted on a flat, solid surface for maximum stability. Be sure to fix the mounting bracket with screws. Otherwise, the display unit may fall down by the boat's pitching and rolling to the lead to the fire or the injury.

- (1) The mounting bracket should be fixed with 6mm screws.
 - Do not install the unit at the places that are affected by vibration or might be affected with spray or rain.
 - Avoid the places where there is sunlight because visibility might be limited and the unit will be exposed to heat too much.
 - Be sure that the space between the rear side of the unit and the wall is more than 10cm.
- (2) Fix the unit to the mounting bracket firmly with the knobs so as to prevent it to get out of the bracket while running.

13. INTERCONNECTION DIAGRAM



14. DISPLAY SIZE



Shortcuts in Plotter screen

- 1) Press and hold [MODE] to change the track color.
- 2) Press and hold [ESC] to turn track record on and off.
- 3) Press and hold [ENT] to activate the User Mark drawing function.

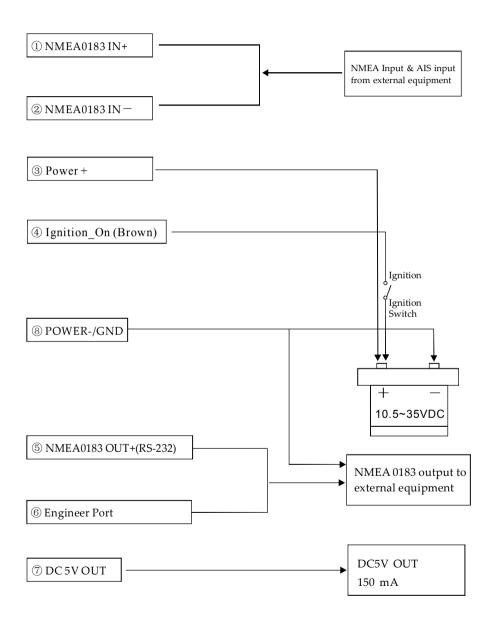
Shortcuts in Fishfinder (Sounder) screen

- 1) Press and hold [MODE] to change the Sonar mode, 50KHz, 200KHz, DUAL, 50KHz/ZOOM and 200KHz/ZOOM.
- 2) Press and hold [ENT] key to switch between Auto and Manual gain.
- 3) On manual gain slightly press [ENT] key to adjust manual gain.
- 4) On auto gain slightly press [ENT] key to switch between Auto-1 and Auto-2 mode.
- 5) Press and hold either [**X**] or [**X**] key to switch between Auto and Manual range.
- 6) Slightly press [F] key to change Signal Level.
- 7) Press and hold [▶] key to adjust picture advance speed.
- 8) Slightly press [◀] [▶] key to shift range.
- 9) Slight press $[\blacktriangle]$ $[\lor]$ key to move VRM.

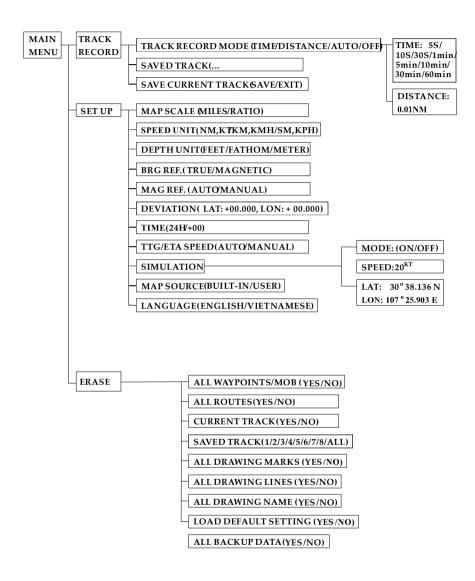
Shortcuts in Plotter/Sounder mode

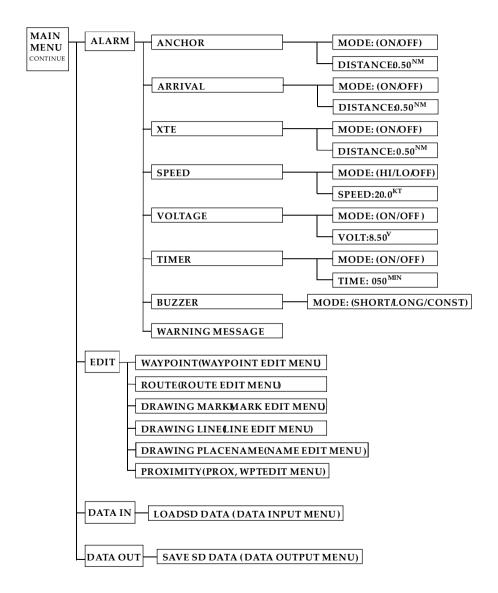
- 1) Press and hold [MENU] key to change the PLOTTER and SOUNDER screen split ratio.
- When SOUNDER screen is ≥50%, all key functionalities are the same as in SOUNDER screen only.
- 3) When **PLOTTER** screen is >50% all key functionalities are the same as in **PLOTTER** screen only.

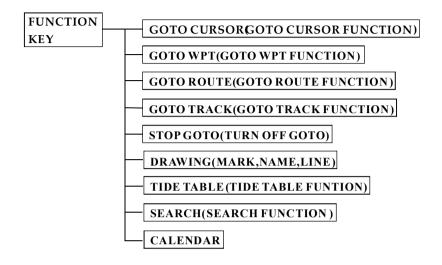
16. DATA IN/OUT DESCRIPTION

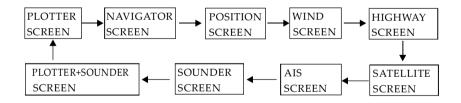


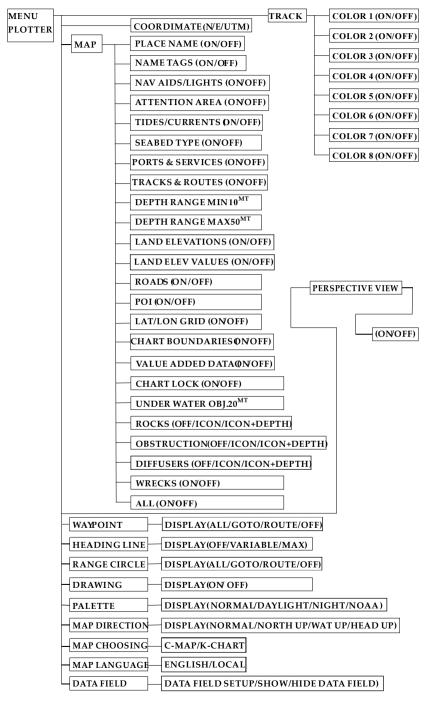
17. MENU TREE



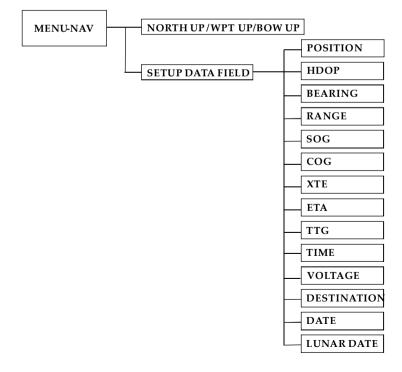


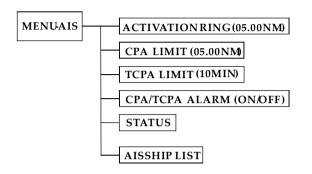


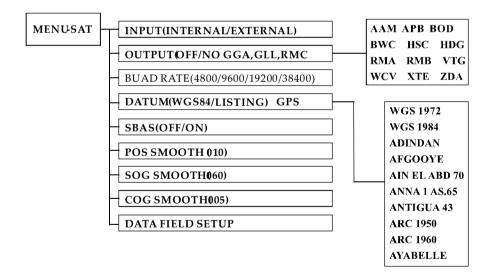




| MENU-POS DATA FI | POSITION |
|------------------|------------|
| DAIATI | HDOP |
| | BEARING |
| | RANGE |
| | SOG |
| | COG |
| | XTE |
| | ETA |
| | TTG |
| | TIME |
| | VOLTAGE |
| | DESTNATION |
| | DATE |
| | LUNAR DATE |







18. ABBREVIATIONS

| Abbreviations | Word |
|---------------|-------------------------------------|
| ESC | Escape |
| ENT | Enter |
| SBAS | Satellite-based augmentation system |
| POS | Position |
| SOG | Speed Over Ground |
| COG | Course Over Ground |
| AWS | Apparent Wind Speed |
| AWA | Apparent Wind Angle |
| TWS | True Wind Speed |
| TWA | True Wind Angle |
| TWD | True Wind Direction |
| VMG | Velocity Made Good |
| INFO | Information |
| LAT | Latitude |
| LON | Longtitude |
| TTG | Total Time to Go |
| ETA | Estimate Time of Arrival |
| XTE | Cross Track Error |
| HDOP | Horizontal Dilution of Precision |
| TVG | Time Variable Gain |
| PIC | Picture |
| B/L | Bottom Lock |
| F/A | Fish Alarm |
| MAG.VAR. | Magnetic Variation |

19. GLOSSARY

| ACA | (AIS) Regional Assignment Channel Assignment |
|---------|--|
| | Message |
| ACK | Acknowledgement |
| ACS | (AIS) Channel management information source messages |
| AFSK | Auto frequency-shift keying |
| ALR | (AIS) Alarm Message |
| A to N | Aid to Navigation |
| AIS | Automatic Identification System |
| BIIT | Built In Integrity Testing |
| BNC | Bayonet fitting type Therefore connector |
| COG | Course over Ground |
| CR | Carriage Return |
| CS | Carrier Sense |
| CSTDMA | Carrier Sense Time Division Multiple Access |
| DC | Direct Current |
| DGNSS | Differential Global Navigation Satellite System |
| DSC | Digital Selective Calling |
| GLONASS | Global Navigation Satellite System |
| GNSS | Global Navigation Satellite System |
| GMSK | Gaussian Minimum Shift Keying |
| GPS | Global Positioning Satellite / System |
| HF | High Frequency |
| IMO | International Maritime Organization |
| IEC | International Electro technical Commission |
| LED | Light Emitting Diode |
| LF | Line Feed |
| LNA | Low-noise Amplifier |
| MF | Medium Frequency |
| MKD | Minimum Keypad and Display |
| | |

| MMSI | Maritime Mobile Service Identity |
|------|--|
| MPE | Maximum Permissible Exposure |
| NMEA | National Marine Electronics Association |
| PC | Personal Computer |
| PI | Presentation Interface |
| RF | Radio Frequency |
| RTCM | Radio Technical Commission for Maritime Services Commission |
| RX | Receive or Receiver |
| RFI | Radio Frequency Interference |
| SAR | Specific Absorption Rate |
| SELV | Separated Extra Low Voltage |
| SMS | Short Message System |
| SOG | Speed over Ground |
| SRM | Safety Related Message |
| TDMA | Time-division Multiple Access |
| TNC | Threaded type RF connector |
| TX | Transmit or Transmitter |
| UTC | Universal Time Co-ordinated |
| VDM | (AIS) VHF Data Link Messages |
| VDO | (AIS) VHF data link own vessel messages |
| VHF | Very High Frequency |
| VSWR | Voltage Standing Wave Ratio |
| | |