![SI-TEX logo]

GPS-95CP

OPERATIONS MANUAL

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Important Notice

Manual Handling	Keep this manual in a safe place where you can access it quickly. This Manual must be passed to a new owner of the GPS-95CP(i) when it is transferred.

The Global Positioning System (GPS) consists of a total 24 GPS satellites that orbit the earth, enabling you to determine your position anywhere in the world, 24 hours a day, if you can receive satellite signals. During actual navigation, carefully compare the position data with all available navigation sources such as Loran C, Decca, other navigators, charts, visual navigation, depth, water temperature and others. It is your responsibility to make navigation judgments.

DGPS Operation Note:

Your position can be improved by DGPS correction. However, when you are communicating with other ships, you may use a DGPS corrected position but they may not. Make your position source known during communication.

The Electronic Chart:

Only official authorized charts and notices to mariners contain all the information needed for the safety of navigation and, as always remember, the user is responsible for their prudent use.

Pictorials

This manual uses the following symbols for easy understanding safety instructions. Always follow these instructions carefully.

⚠	WARNING	Always follow this safety instruction to prevent death or injury.
⚠	CAUTION	Follow this safety instruction to avoid possible injury or damage to your property. This symbol is a CAUTION or WARNING label indicating the safety instruction.
⚡	WARNING	This symbol is an Electrical Shock WARNING label.
🚫		This symbol is an instruction that you must not violate. (This symbol instructs NOT to disassemble the system components)
		This symbol is an operation instruction that you must follow. (This symbol shows the main power OFF instruction.)

⚠ **WARNING <For System Operators>**

Always follow this instruction to prevent death or personal injury.

	Turn power off During abnormality.	If smoke or a smell of burning occurs, a fire or an electrical short circuit may result. Turn the power switch OFF and shut down the power supply immediately. Never try to repair the system yourself. Call for service.
	Do not open Case.	High voltage exists in the instrument. Contact with voltage may cause possible injury or death.
🚫	**Do not touch back side of the equipment.**	Harmful line voltage is present on back side of the equipment. Never try to touch back side while power is turned on.
🚫	**Avoid excessive shock to display unit.**	The LCD display module contains a liquid. Do not apply any mechanical shock to the display. If the display broken, liquid may leak and injure your skin and eyes.
🚫	**Do not use with poor ventilation.**	If you cover this unit or use in an enclosed place, it may malfunction or become damaged as a result of overheating. Use only where there is sufficient ventilation.

Installation Cautions <For service Personnel>
Follow installation instructions to avoid personal injury and system malfunction.

Installation in rigid location.	Mount your GPS-95CP(i) on a rigid frame or base to prevent your unit from working loose.
Use correct Installation materials.	Use the installation materials provided in the standard accessory pack only. If you use hardware of insufficient strength, your system may loosen causing damage.
Keep away from direct sunlight.	Keep your system out of direct sunlight as it may become damaged by overheating.
Keep away from water.	Take care not to get water on or in your unit as it may be damaged and/or cause an electrical shock.
Keep away from heat source.	Keep your system away from other heat source as it may malfunction, be damaged, or burn.
Use correct power source.	Operate your system within the specified power voltage. An incorrect power supply may cause damage.

Maintenance Cautions<For Maintenance Personnel>
Use the following safety precaution internal inspection.

Discharge capacitors.	High voltage may be retained in the capacitors in the high-tension circuit several minutes after you have turned the power switch off.
Check that power is OFF	To prevent an electrical injury due to erroneous power switching, make sure that the main power supply and the system power switch are both in the off position. Additionally, attach a safety label showing that service is in progress.
Avoid EMI.	Take care not to damage the ESDs (Electrostatic Sensitive Devices) by static electricity from carpet and cloths.
Avoid dust.	Wear a safety mask so as not to breath in dust during inspection or cleaning inside your system instruments.

Operation Notes <For operators>

Observe the following operation notes, otherwise the system failure or deterioration can result. And periodical inspection and maintenance are required for keeping the system in an optimum condition.

Backup important data.	The waypoint and other registered data may become unreadable by unexpected failure. We recommend recording this data separately on optional user or SD-picture card.

⚠️ WARNING	This product is designed to assist a navigation. When you are sailing, use the certified chart from the Government or IMO.

GPS-95CP(i) Color LCD Charting System

Welcome

The GPS-95CP(i) Color LCD Charting System opens a new chapter of performance and integration in vessel navigation system display and management. Whether you are a Cruiser or Sport fisherman or both, GPS-95CP gives you the information you need.

⚠ CAUTION

The GPS-95CP(i) is a Color LCD Charting Systems that employs the latest in proven technology to provide accurate navigation information. The Plotter functions of the GPS-95CP are totally dependent upon the capability of the navigation source to provide accurate position information. This device is only an aid to navigation. It should be used in conjunction with all other navigation accuracy. For safety, always resolve any uncertainty before continuing navigation.

⚠ CAUTION

Electronic charts are derived from geographical data – including official government charts – which we believe to be accurate. They are neither verified nor approved by Hydrographic Authorities. Electronic charts in GPS-95CP(i) are designed only to ease and speed navigation calculations and so must not be relied upon as a primary source of navigation information, but rather a backup to the use of official government charts and prudent navigation habits.
There is no direct relationship between the color of water areas and their depth. The navigator shall always query the area for depth information and use the official paper chart.

⚠ CAUTION

The performance of LCD displays are degraded by continuous direct exposure to ultraviolet rays. Locate your GPS-95CP(i) Display away from direct sunlight. When not in use, keep the display covered.

⚠ DISPLAY BREAKAGE WARNING

The LCD display module contains a liquid. If the display is broken and the liquid contacts your skin, wash it off immediately in running water for 15 minutes. If the liquid contacts your eyes, immediately flush your eyes with running water for 15 minutes. Contact a physician if any abnormal symptom is experienced.

GPS-95CP(i) Color LCD Charting System

Introduction

The GPS-95CP(i) Color LCD Charting System is a premium multifunction command and control center. It combines in one unit, display of worldwide cartography, and GPS navigation. GPS-95CP(i) front panel keyboard and its large screen with wide viewing area make placement easy. Although GPS-95CP(i) offers many advanced features, operation is simplified through the use of popup menus similar to those found on personal computers. Also, the front panel keyboard has specific keys for direct access to the most used functions and settings.

Equipment Supplied
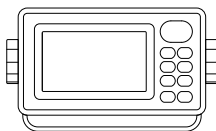
GPS-95CP(i) Display
unit
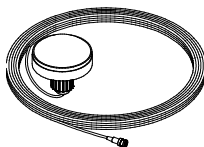
GPS ANT.
(except 95CPi)

Manual

Protector
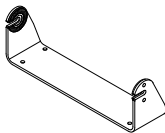
Mounting Bracket

Knobs
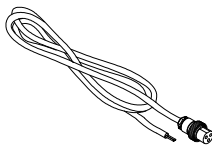
Power cable

GPS-95CP(i) Color LCD Charting System

GETTING STARTED

This getting Started section will help you become acquainted with the displays and the front panel keyboard functions of your GPS-95CP Color LCD Charting System. This section is intended to demonstrate the main functions and basic operation of your GPS-95CP System. More detailed procedures may be found in the Operation section.

GPS-95CP(i) has built-in simulators that present realistic displays of cartography and GPS.

Note: Simulators are interactive so the front panel keyboard can be used to browse through menus and change setting in the same manner as actual operation. The internal simulators allow GPS-95CP(i) to operate without having antennas or remote sensors connected. However, it is necessary to connect the power cable to 12 to 36 Vdc power source. Please refer to *Power Connection* in the installation section.

If GPS-95CP is already installed on your vessel, simulators are still useful for familiarity with displays and practice with operating procedures.

GPS-95CP(i) Color LCD Charting System

Display Unit

The heart of the GPS-95CP(i) Color LCD Charting System is the display unit. Within the display unit are the powerful central processor and integrated display system, built-in cartography. The bright 4.3 inch active matrix color LCD, is easily viewed over a wide area on the bridge or nav center.

Knobs

Keyboard

Mounting Bracket
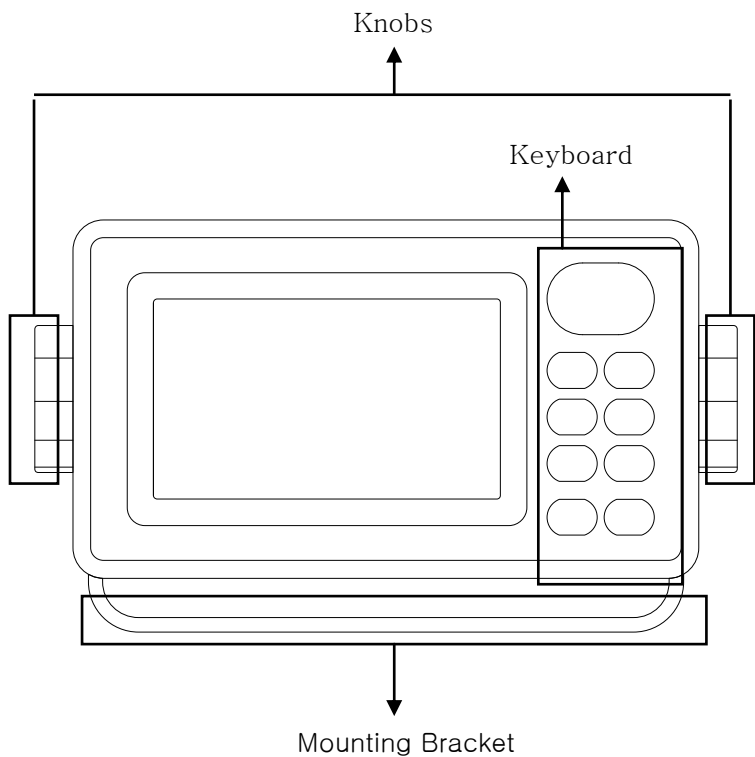
GPS-95CP(i) Color LCD Charting System

Interconnecting diagram

SD Card Slot

USB
Connect to PC
(by USB)

MINI JACK
Connect to PC
(by Serial Port)

C-MAP Slot

GPS Antenna
(Except 95CPi)

Power (12V ~ 36V)
Data In/Out (RX/TX)

Speaker

The Keyboard

Cursor pad

Zoom in & Zoom out

Select display mode & cancel
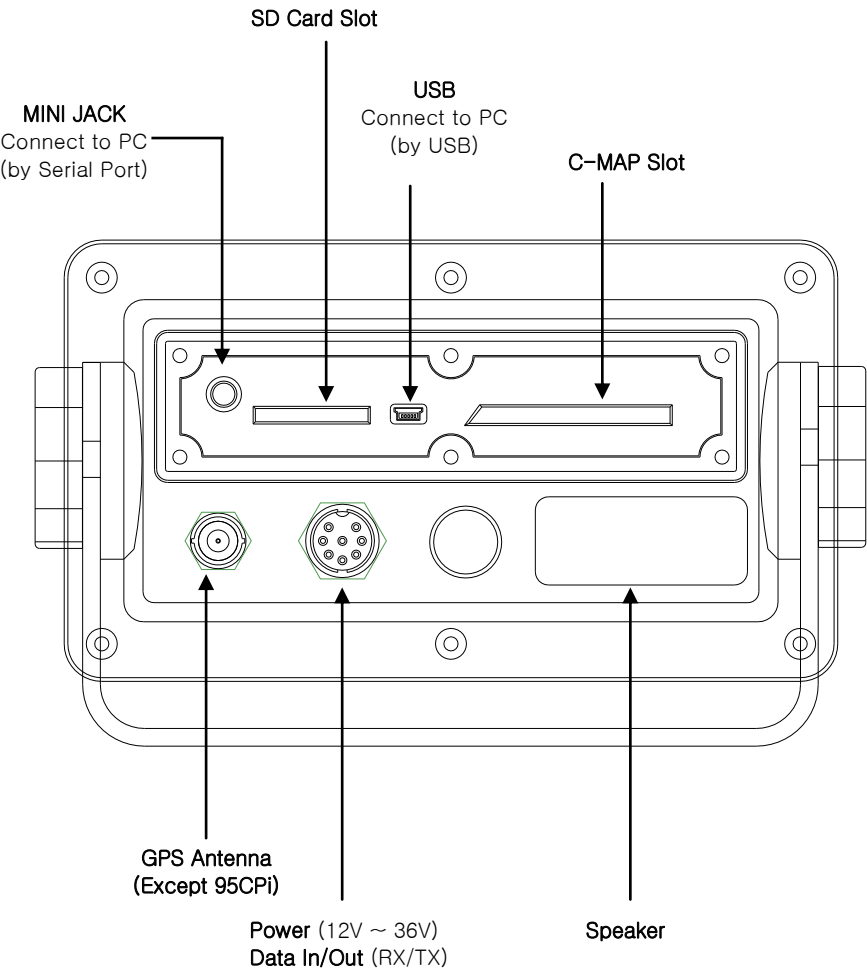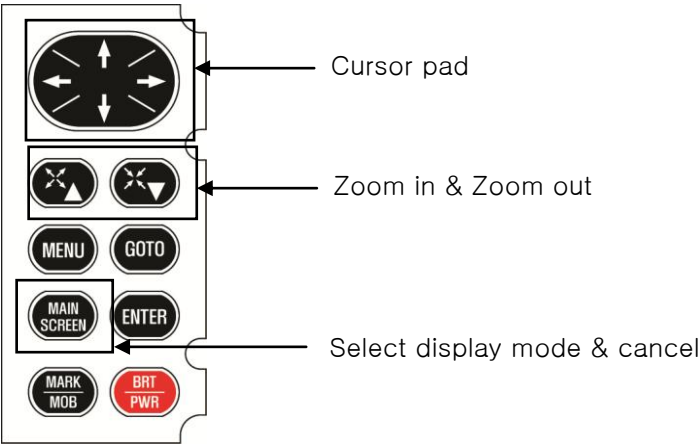
[ZOOM-IN]	Change the chart of scale bigger in plotter
[ZOOM-OUT]	Change the chart of scale smaller in plotter
[MENU]	Menu opens menu to select options
[GOTO]	Cursor display: Place the cursor and press "GOTO' to set WPT No cursor/Pointed WPT: Save WPT and set free the pointed WPT No cursor/No pointed WPT: List for WPT, route
[MAIN SCREEN]	Selects function to display on Full Chart Display, Plotter Display, LAT/LOT Display, Highway Display, Steering Display, Nav data Display. (∗ When the menu or the cursor appears, it's used for ESC.)
[ENTER]	Completes pending selection or operation
[MARK/MOB]	Mark: Places a mark on the plotter main screen. MOB: Is a special navigation function that immediately stores your present position as a waypoint and activates navigation to the stored coordinates.
[BRT/PWR]	BRT: Brightness adjust the brightness in day mode or night. PWR: Turns On/Off
[CURSOR PAD]	Cursor On and use to move the cursor, select menu items, scroll lists, select options, change settings in plotter (∗To make the cursor deleted, press [MAIN SCREEN].

How to use [BRT/PWR]

Use PWR:
To turn off the power, keep pressing the [BRT/PWR] until the end of count down.
Use BRT:
Press [BRT/PWR] quickly and the brightness can be controlled. Use the arrow keys of the cursor to control the brightness and the contrast.

Display Modes

Your unit has six-display modes. Press the [MAIN SCREEN] key to choose a display mode. Each time the key is pressed, the display mode changes in the sequence shown below.
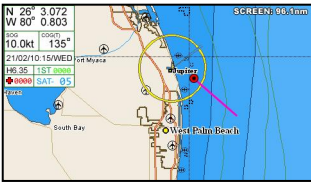
[Full Chart Display]
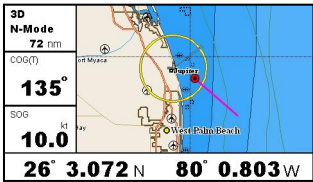
[Plotter Display]
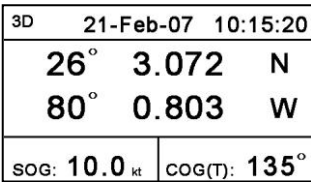
[Nav Data Display]
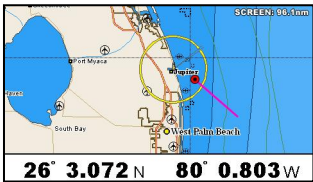
[Lat/Lot Display]
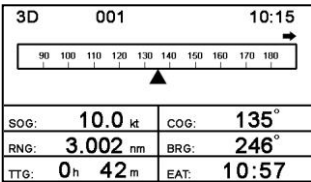
[Steering Display]
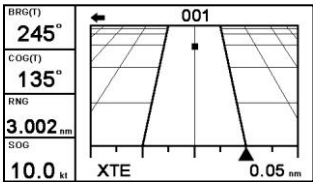
[Highway Display]

Display Modes

1. Full Chart Display

This mode provides GPS information and the chart.

Scale

Present Position

i) GPS Information

Speed over Ground

Present position in latitude and longitude

Course over Ground
T: True
M: Magnetic

Receiver status

Date

Track Information

Satellites Information
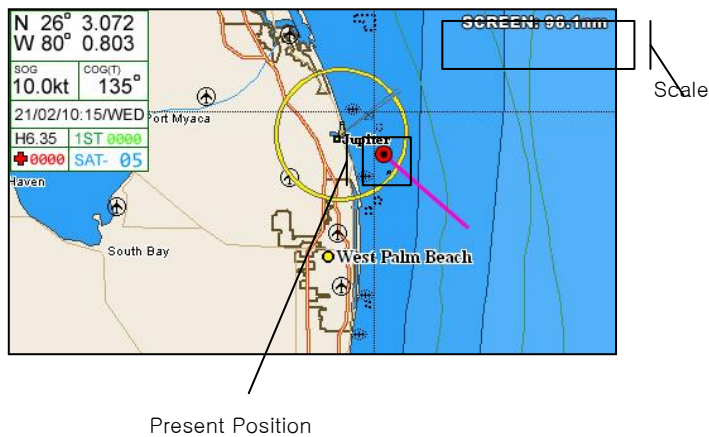
[GPS Information]
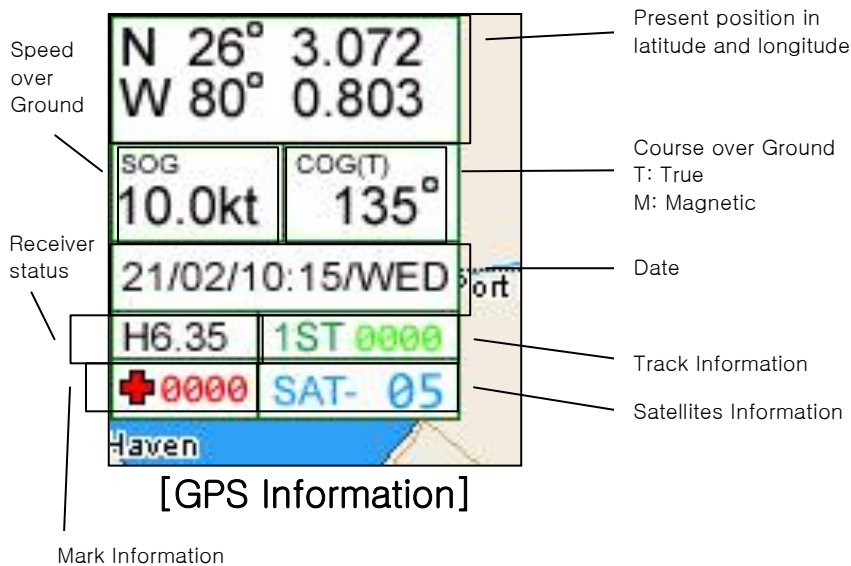
Mark Information

Display Modes

ii) WPT Information

| WPT Info | POINT01 |

WPT: WPT's name
Route: Point's No of WPT

N 26 3.072
W 80 0.803

WPT in latitude and longitude

DIST 6.436nm

Distance between the present position and the WPT

BRG 129°

Bearing between the present position and the WPT

ETA
21 02 AM 12:59

Estimated time to arrive

iii) Cursor Information

Cursor Info

Cursor in latitude and longitude

N 26 3.072
W 80 0.803

Distance from the present position to the cursor

DIST 6.436nm

Bearing between the present position and the cursor

BRG 129°

Display Modes

2. Plotter Display

The plotter display traces own ship's track, and shows position, bearing to cursor, range to cursor, horizontal display range setting and receiver status.
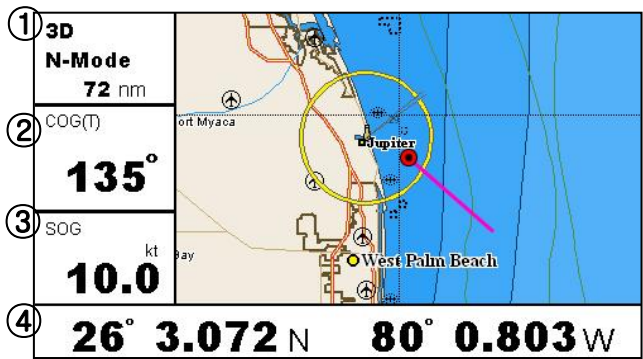
① Receiver status, Mode, Horizontal display range setting.

Receiver status indications

Indication	Meaning
2D	2D GPS POSITION FIX
3D	3D GPS POSITION FIX
D2D	D2D GPS POSITION FIX
D3D	D3D GPS POSITION FIX
W2D	W2D GPS POSITION FIX
W3D	W3D GPS POSITION FIX
DOP*	2D: hdop LARGER THAN 4 3D: pdop LARGER THAN 6
SIM	SIMULATION MODE

② COG & BRG(+)
     Cursor isn't displayed: COG (Course Over Ground): T (True), M (Magnetic)
     Cursor is displayed: BRG (+): Bearing to cursor

③ SOG & RNG(+)
     Cursor isn't displayed: SOG (Speed Over Ground)
     Cursor is displayed: RNG (+): Range to cursor

④ Lat/Lon
     Cursor isn't displayed: Present position in latitude and longitude
     Cursor is displayed: Cursor position in latitude and longitude

Display Modes

3. Lat/Lon Display

Only Lat/Lon displayed on the bottom of the screen. This mode is useful to expand the chart.
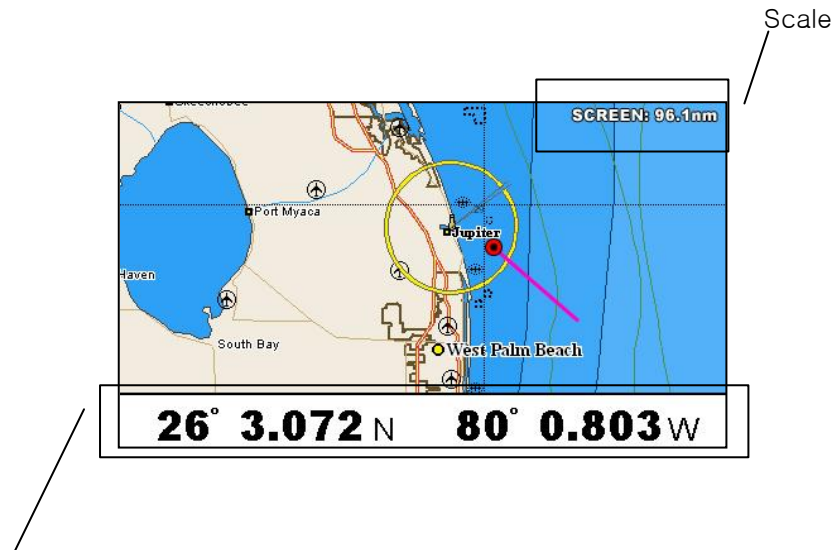
Scale

Cursor isn't displayed:
> Present position in latitude and longitude.

Cursor is displayed:
> Cursor position in latitude and longitude.

Display Modes

4. Highway Display

The highway display provides a 3D view of own ship's progress toward destination (waypoint).

Destination waypoint name

Bearing from own ship to destination

BRG(M)
5°

Course Over Ground

COG(M)
7°

Range from own ship to destination waypoint

DST
2.38 nm

Speed Over Ground

SOG
10.0 kt

WPT0001

Destination waypoint

0.05nm   0.01nm   0.05nm

XTE Alarm Radius

XTE Alarm Radius

XTE of Vessel
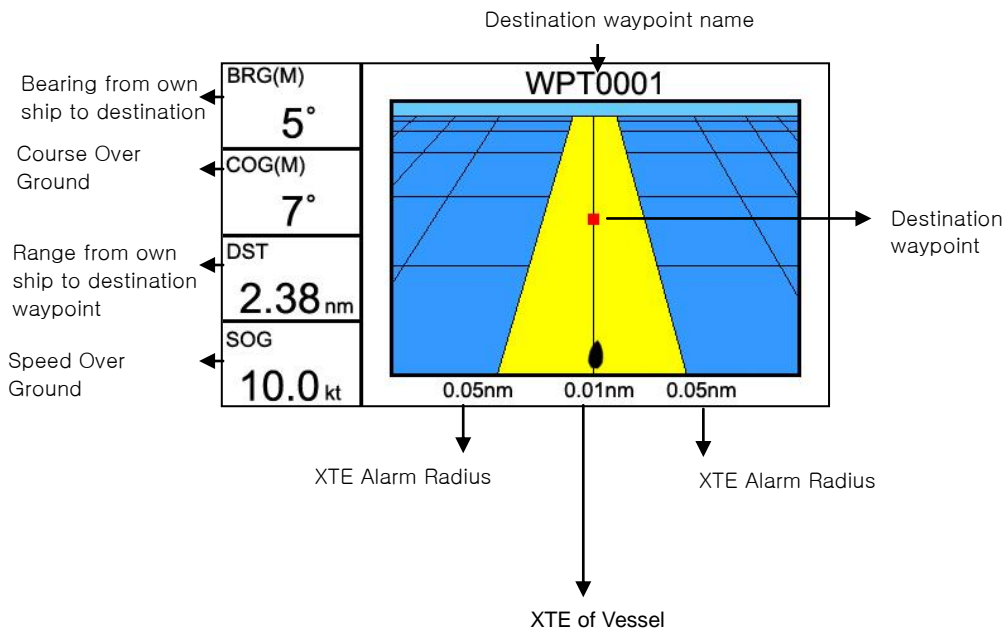
Display Modes

5. Steering Display

The steering display provides steering information such as ship's speed, course, range, bearing, EAT and TTG.

Bearing from own ship to destination

Course Over Ground

Rang from own ship to destination

COG(M):	7°
BRG(M):	5°
DST:	2.38nm
SOG:	10.0kt
TTG:	00h19m
XTE:	L 0.01nm

Bearing from own ship to destination

0
330
300
270
240
210
180
30
60
90
120
150

WPT0001

USB

Cross-Track-Error
Time-To-Go to destination
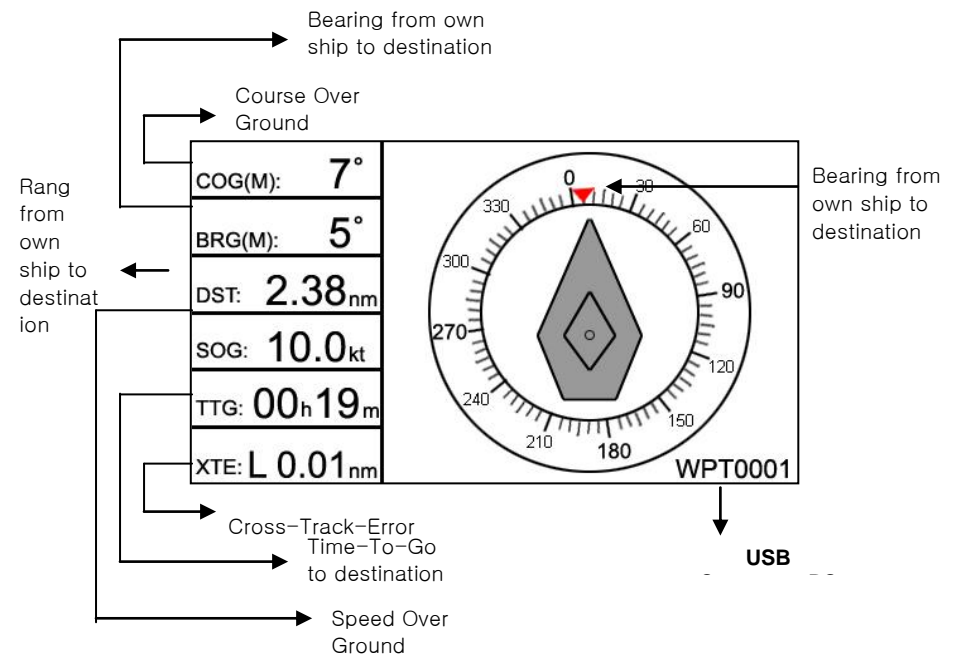
Speed Over Ground

Display Modes

6. Nav data display

The nav data display shows receiver status, position in latitude and longitude, course over ground, speed over ground, date and time.

Receiver status

Date and time

W3D   16 - 07 - 2008 16:05:11

37° 31. 1203 N

126° 45. 7352 E

SOG: 10.0 Kt   COG(M):   349°

Speed Over Ground

Course Over Ground

Present position in latitude and longitude
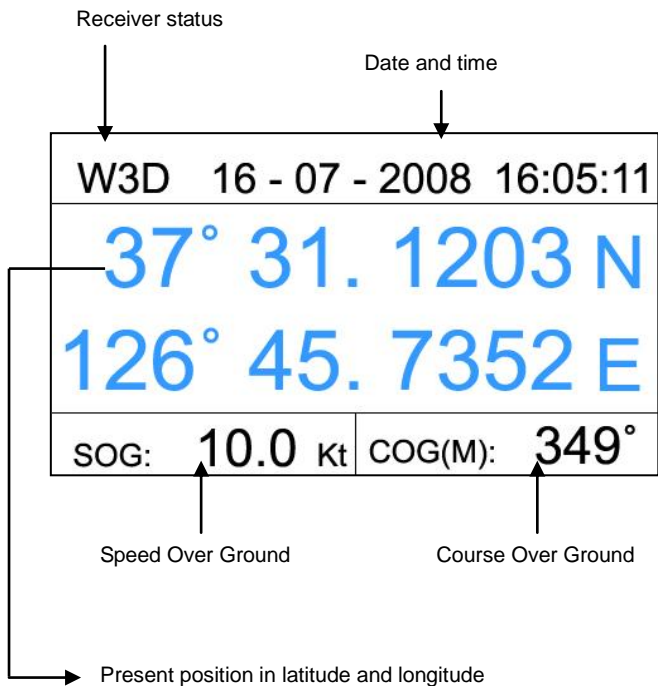
Operations

Edit

Edit numbers, symbols, and colors of Mark, WPT, and Route.

1. Editing Character

[←],[→]:
move the position

[↑],[↓]:
move the bar

[▲][▼]:
input letters

[ENTER]:
choice and input

2. Editing Number

[←],[→]:
move the position

[↑],[↓]:
change the number

[ENTER]:
choice and input

Operations

Edit

3. Editing Symbol

[↑],[↓]:
move the bar

[ENTER]:
choice and input

4. Editing Color

[↑],[↓]:
move the bar

[ENTER]:
choice and input

Operations

※MOB/Mark key

- without the cursor : MOB or inputting a mark at the present position
  MOB :
  ▶ [MOB/MARK] -> [ENTER]
  Mark :
  ▶ [MOB/MARK] -> all keys except [ENTER]

- with cursor : only mark is available at the cursor
  ▶ [MOB/MARK]

MOB is a special navigation function that immediately stores your present position as a waypoint and activates navigation to the stored coordinates. MOB waypoints are stored in the waypoint library at the next available position in the WPT mark list. MOB waypoints appear in the list and on the Plotter Min Screen in the same manner as normal waypoints.
(※MOB available only without the cursor)

▶ [MARK/MOB]->[ENTER]

Operations

MARK

Mark means that a user indicates an important position or a point such as a fish heaven or a danger area for sailing. This is one of the most important functions in the plotter.

1. Creating Mark
- Cursor isn't displayed :
> ▸ [MARK/MOB]->press any keys except [ENTER].

(※inputting a mark at the present position)
- Cursor is displayed :
> ▸ move the position to where you want and press [MARK/MOB].

- addition in the edit of mark:
(※PLS, refer the edit list)

2. Changing Mark symbol
Ten symbols are for Mark.
 i) Cursor isn't displayed :
> ▸ [MENU] -> [8.User data Edit] -> [4. Mark Symbol]->[←][→]

 ii) Cursor is displayed :
> ▸ [ENTER]->[1.Mark]-[2. Mark Symbol]->[←],[→]

3. Changing Mark color
Ten colors are for Mark.
i) Cursor isn't displayed :
> ▸ [MENU] -> [8.User data Edit] -> [5. Mark Color]->[←][→]

 ii) Cursor is displayed :
> ▸ [ENTER]->[1.Mark]-[3. Mark Color]->[←],[→]

4. Deleting Mark
 i) Delete the mark with the cursor.
Press the key, [Cursor pad] and move it to the mark position. Get to the mark position on the center of the cursor and press the key, [MARK/MOB]. It will be deleted on the screen.
ii) Delete the mark in the list
(※PLS, refer the edit list)

5. Editing Mark
▸ [MENU]->[1.Edit]->[3.Mark Edit]
 i) Creating Mark
> ▸ [↑][↓]->[ENTER]

 ii) Editing Mark
> ▸ [↑][↓]->[ENTER]

 iii) Deleting Mark
> ▸ [↑][↓]->[MENU]->[ENTER]

 iv) All deleting Mark
> ▸ [MENU]->[MENU]

Operations

Waypoint(WPT)

Waypoints may be entered and stored in the waypoint library by any of two different methods. You may use the cursor to select locations from a chart, or store vessel present position as a waypoint

1. Creating destination point
You can place the destination point and immediately start navigating to it.
▶ [GOTO]->[ENTER]
- Saving destination: when saving the present instant route
      ▶ [GOTO]->[ENTER]
- Deleting Destination: when deleting the present instant route
      ▶ [GOTO]->[MENU]

2. Creating WPT
i) Cursor isn't displayed :
      ▶ [ENTER]->[2.Waypoint]->[ENTER]
ii) Cursor is displayed :
      ▶ [ENTER]->[3.Waypoint]->[ENTER]

3. Selecting WPT
▶ [GOTO]->[1.WPT List/Edit]->[↑][↓]->[GOTO]

4. Editing WPT
▶ [MENU] → [1.Edit] → [1.WPT.Edit]
i) Creating WPT
      ▶ [↑][↓]->[ENTER]
ii) Editing WPT
      ▶ [↑][↓]->[ENTER]
iii) Deleting WPT
      ▶ [↑][↓]->[MENU]->[ENTER]
iv) All deleting WPT
      ▶ [MENU]->[MENU]

Operations

Route

1. Instant Route
Use waypoints to create a instant route for your sailing. The capacity of waypoints are 20 point.
Every time you put waypoints on the screen, the temporary route is drawn on the screen.
▸ [CURSOR PAD]->[GOTO]->[CURSOR PAD]->[GOTO]->........->[ENTER]
- Saving Instant Route: when saving the present instant route
    ▸ [GOTO]->[ENTER]
- Deleting Destination: when deleting the present instant route
    ▸ [GOTO]->[MENU]

2. Creating Route
▸ [MENU] -> [1. Edit] -> [2. Route Edit] -> [BRT/PWR]

3. Selecting Route
▸ [MENU]->[1.Edit]->[2.Route List & Edit]->[↑][↓]->[GOTO]

4. Deleting Route
▸ [MENU]->[1.EDIT]->[2.Route List/Edit]->[↑][↓]->[MENU]->[ENTER]

5. Reversing Route
[MENU]->[8.User Data Edit]->[0.Route Forward/Reverse]->[←][→]

6. Setting Point
Move the point step by step.
▸ [MENU]->[8.User Data Edit]->[9.Skip Routes]->[ENTER]

7. Edit the existing route
Choose the route you want to eidt and press [MARK/MOB]
- Adding saved WPT
Move the cursor where you want -> Press the [MARK/MOB] -> Choose the WPT on the [Insert WPT] -> press the [ENTER]
- Adding new WPT
Move the cursor where you want -> Press the [BRT/PWR] -> Add your WPT -> press the [ENTER] -> Edit the WPT

8. Editing Route
▸ [MENU]->[1.Edit]->[2.Route List & Edit]
i) Creating Route
    ▸ Press [BRT/PWR]
ii) Route seeing & edit
    ▸ [↑][↓]->[MARK/MOB]
(※PLS, refer Editing for the WPTs in the route)
iii) Route deleting
    ▸ [↑][↓]->[MENU]->[ENTER]

Operations

Track

The Track function provides a record of the path over which your vessel has traveled. A track is a series of lines connecting points of vessel present position which are plotted at wither time or distance intervals. Tracks are recorded and stored one at a time. AQUA supports five different tracks, each has up to ten thousand (20,000) points of track history. Tracks are displayed on the Main Plotter Screen in any user selectable combination from none to five. Current track status is displayed on the lower line of the GPS area of the information display. Track number, on/off condition, and number of track points used are presented.

1. Track ON/OFF
▸ [ENTER]->[1.Track]->[←][→]. For displaying on/off, use the arrow keys, right and left.

2. Changing Track Color
▸ [MENU]->[8.User Data Edit]->[2. Track Color]. For choosing the color you want, use the arrow keys, right and left.

3. Deleting Track
▸ [MENU]->[8.User Data Edit]->[3. Track Deletion]->Choose the color you want to delete
->[ENTER]
(* If you want to delete all tracks, choose "All Delete")

4. Changing Track page
 Saving 10,000 points are available in each page.
▸ [MENU]->[4.Setup 1/2]->[0.Track Pages]->[←][→]

5. Loading Track
 Saving 10,000 points are available in each .
▸ [MENU]->[4.Setup 1/2]->[enter]->[9.Load track]->[ENTER]

User Data

Save User Data(Back-up)
▸ Insert the SD card -> [MENU] -> [1. Edit] -> [6. Save User Data] -> [ENTER]
*SD card must be a normal type. (mini SD and Mirco SD are not available) Please, kindly note that the maximum is 2GB.

Load User Data
▸ Insert the SD card -> [Menu] -> [1. Edit] -> [7. Load User Data] -> [ENTER]
*SD card must be a normal type. (mini SD and Mirco SD are not available) Please, kindly note that the maximum is 2GB.

Operations

Display ON/OFF

The menu selects icons or symbols and lines displayed ON/OFF.

▶ [MENU]->[2.Display ON/OFF]->[←][→]

(* If you want to go to next page of the menu, press [MENU])
(* In C-MAP, it could be different from HY-chart.)

Map Orientation

There are four display modes for Main Screen that involve the Plotter or Radar screen. Both Plotter and Radar mode change together regardless ok which one is active when a mode change is made. The display modes are: Normal mode, North up, Course up, Head up

▶ [MENU]->[9.Mode]

1. True motion:
The True Motion display is oriented North up or South up depending upon the North/South setting found on the PLOTTER MENU. The difference between True Motion and North/South Up display is in the way the vessel position is presented. In True Motion mode, the vessel position
symbol moves over the map while the map remains stationary.

2. North up:
The North Up/South Up display is oriented North up or South up depending upon the North/South setting found on the PLOTTER MENU. For this mode setting the vessel present position remains fixed in the center of the Main Screen while the map moves under it.

3. Course up:
The Course Up mode screen orientation is determined by whether or not navigation is in progress. During navigation vessel present position is in the center of the Main Screen and the course line to the destination waypoint is straight up. As your present position changes, the map moves under the stationary vessel symbol. If navigation is stopped, the Main Screen appears as North/South Up.

4. Head up
For Head Up mode, vessel present position is fixed in the center of the Main Screen and vessel heading is upward. As your present position changes, the map moves under the vessel symbol.

Operations

GPS Setup

It is available to control and confirm information in GPS receiver.

▸ [MENU]->[3.GPS Setup]

GPS Setup 1/2

1. Datum:
It shows GPS Datum. WGS-84, which is the worldwide standard is only available.

2. Satellite Information:
It shows the receiving condition of the signal from satellites.

3. Latitude Modification:
There could be a receiving signal error from satellites. If it is on the latitude, modify in the latitude modification.

4. Longitude Modification:
There could be a receiving signal error from satellites. If it is on the longitude, modify in the longitude modification.

5. Smoothing set:
How to set the calculation of Smoothng.
OFF : No use.
Mode 1: Calcalation in short time.
Mode 2: Calcalation in long time.
(☞ The default setting is Mode 1.)

6. Average COG:
It sets time by second for average bearing. It is a special function for a fishing boat.
(※ Although you set a time to the menu, it is unavailable if the menu, No. 5(Smoothing ser is off.)
(☞ The default setting is incorrect every the country.)

7. Average SOG:
It sets time by second for average speed. It is a special function for a fishing boat.
(※ Although you set a time to the menu, it is unavailable if the menu, No. 5(Smoothing ser is off.)
(☞ The default setting is incorrect every the country.)

8. Lat/Lon Unit:
It is to select the number of the unit for Lat/Lon.
(☞ The default setting is 4 unit.)

9. GPS Receiving Port:
It is to select Inter receiver Interior or Exterior.
The default setting is Interior.

0. Coordinate System:
It sets coordinate system of GPS or Loran.
(☞The default setting is GPS.)

Operations

Setup

It is available to set the menu or units for user's visual confidence.
(* For next page, press [MENU])

▸ [MENU]->[4.Setup]

Setup 1/2

1. Distance/Speed Unit:
Select desired unit of measure for distance and speed. Choose from: nautical mile/knots (nm/kt), kilometer/kilometers per hour(km/kmh), yard/knot(yd/kt).
cf) 1nm = 1.852km, 1kt /h= 1.852km/h, less than 1nm display in yard and over 1nm display in mile

2. Present Position Size:
The size of the present position is adjustable from 0 to 9. The biggest size is '0'.

3. Track Size:
The size of a track is selectable between thin and pan.

4. Track Display Interval:
Track display interval is adjustable by distance or time.

5. Time Interval:
If track interval is set in time, a track displays by track time interval. The track time interval and the maximum capacity is 10,000 points.

6. Distance Interval:
If track interval is set in distance, a track displays by track distance interval.

7. Heading Line Length:
The length of the heading line is adjustable from 50 until 300. The bigger number, the longer line. The heading line is used in modes of the true motion and the north/south up.

8. True/Magnetic:
There is a difference degree where you are in the earth. This function is to modify the error from true and Magnetic.

9. Compass Modification:
There could be a difference between the magnetic compass and the GPS compass. An error depends upon your area. It is necessary to use AUTO PILOT together with GPS Plotter.

0. TD setup
It sets Chain, Pair, ASF.

Operations

Setup

It is available to set the menu or units for user's visual confidence.
(* For previous page, press [MENU])

▸ [MENU]->[4.Setup]

Setup 2/2

1. Displaying Time Setup:
 Provides for local time offset (-12:00 to +13 hours in 1/2 hour steps) from UTC.

2. Data Output:
AQUA can be connected with a radar and an autopilot, which needs to get a signal from the radar and the autopilot. These data are necessary to communicate with NMEA 0183.

DESCRIPTIONS	CONTENTS OF DATA FIELD
$GPGGA	Global Positioning System Fix Data
$GPGLL	Geographic Position, Latitude/Longitude
$GPGSA	GPS DOP and active satellites
$GPGSV	GPS Satellites in View
$GPVTG	Course and Ground Speed
$GPZDA	Time & Date
$GPRMC	Recommended Minimum Specific GPS/TRANSIT DATA
$GPAPB	Satellites information
$GPXTE	Cross-track error, measured
$GPBOD	Bearing, origin to destination
$GPRMB	Recommended minimum navigation information

3. Land Color Select:
Choose the color of the land.
(*This function is only available in HY-chart)

4. Chart Change:
Choose the chart system. (HY-MAP/External MAP/C-MAP)

5. Reset
All systems returns to the initial system.
> ▸ [ENTER] : reset without deleting user data.
> ▸ [GOTO]->[ENTER]: returning to the initial system from the releasing of factory.
> (All user data will be deleted)

6. WPT Name Font Size
Choose the font size of the WPT.

7. SOG Setup
Control the abnormal speed an anchoring.
8. Save Track
Current Track save to Track data.
9. Load Track
Saved Track load to display

Operations

0. Depth unit
Select the depth unit.
- M: Meter unit
- Ft: Feet unit
- FM: Femten unit

Operations

Maintenance

It is necessary to check the system or the version for maintenance and demonstrate AQUA with the simulators

▸ [MENU]->[5.Maintance]

1. System Information
It contains ID and the program version, and it has important information for maintenance and upgrade.

2. Chart Information:
It contains the version of the chart, the datum and the number, which is necessary for maintenance and upgrade

3. Keyboard Test:
It tests the keyboard if it's working properly.

4. GPS Simulator:
It is necessary for an indoor demonstration. The simulations of GPS plotter are two in the memory.

5. Language:
AQUA supports three different kinds of languages, English, Chinese, Arabic, Thai etc.
Pressing the [ENTER], AUQA turns off and reboot the system for the new language.
(☞ When the language does not come out, inquiry to purchase place.)

Operations

Alarm

Special notices are necessary on sailing. AQUA has four kinds of alarm, arrival, out of the course, anchor and time.

▸ [MENU]->[7.Alarm]

1. Arrival Alarm:
When you approach into the waypoint range, it gives you a notice with alarm.

2. Arrival Radius:
It is to adjust the range of arrival from your waypoint. If you have a route, it changes to the next waypoint automatically.

3. XTE Alarm:
If you are out of the course, it gives you a notice with alarm.

4. XTE Radius:
It is to adjust the range of the off course.

5. Anchor Alarm:
It is necessary when your vessel anchors.

6. Anchor Radius:
If you vessel is out of the range of the anchor, it gives you notice with alarm.

7. Interval Alarm:
It alarms every time you set.

8. Interval Time
The time is available from one minute until sixty minutes.

9. Course Alarm:
It alarms if it breaks into the setting area.

0. Course Alarm Range:
It sets the range of the course alarm.

Operations

User Data Edit

It is possible to set the menu of user data.
(Track, Mark, WPT, Route)

▶ [MENU]->[8. User Data Edit]->[Enter]

1. Track On/Off
It is available to set start and stop the track.

2. Track Color
It is available to set the track color. Use curser to change the color.

3. Track Deletion
Press [ENTER]. "Track deletion" and the window is showed. Use the curser and select color then press [ENTER] key. All tracks which are selected by color will be deleted.

4. Mark Symbol
It is available to change the Mark symbol. Use the curser to change symbol.

5. Mark Color
It is available to change the Mark color. Use the curser to change color.

6. Skip Routes
It is available to set up a next WPT in the Present preferred route. Press [ENTER].

7. Route Forward/Reverse
It is available to set up the route forward and reverse in the Present preferred route.

Operations

AIS System

AIS is an Automatic Identification System. It has been introduced to improve the safety of navigation by assisting in the efficient operation of ship to ship, ship reporting and VTS applications. The system should enable operators to obtain information from the ship automatically, requiring a minimum of involvement of ship's personnel, and should have a high level of availability.
Connecting to the chart plotter an AIS receiver, vessels with AIS transponder within VHF range are displayed on screen giving he skipper or navigator a visual interpretation of the data of nearby vessels. This improves safety, and specifically for collision avoidance reasons.

1.AIS system definitions

CPA	Closest Point of Approach is the closest distance that will be achieved between your vessel and the tracked target, based on your vessel's speed and direction and the target's speed and direction.
CPA Alarm	Occurs if CPA is less or equal to CPA Radius. This test is done for active targets only.
CPA Limit	This is the distance from your vessel that a target may reach before a target is deemed a threat.
TCPA	Time to Closest Point of Approach is the time remaining until the CPA will occur.
TCPA Alarm	Occurs if TCPA is less or equal to TCPA Radius. This test is done for active targets only and if CPA value is less or equal to CPA Radius.
TCPA Limit	This is the time remaining before the CPA is reached.
Name	Name of ship, 20 characters.
MMSI	Maritime Mobile Service Identity.
MMSI number	A unique 9 digit number that is assigned to DSC radio station. It primarily registers the boat information in the U.S. Coast Guard's national distress database for use in emergency situations.
Target	It is a vessel equipped with AIS. Information about the targets is being received by AIS Receiver and displayed on the screen.
Active Target	Target located within the Activation Range. Active target is represented by oriented triangle with COG and Heading vectors. Rate of turn may also be displayed.
Dangerous Target	Target detected by CPA or TCPA Alarm. Dangerous target is Active Target by definition. For better visibility Dangerous Target symbol is charged from basic color to red color.
Sleeping Target	Target located outside the Activation Range. Sleeping target is represented by a small oriented triangle.

Lost Target	When the AIS info is not received from that vessel for 3.5minutes. The presentation will be marked X on the target.

2. AIS Setup
It sets AIS on/off, AIS Scale, CPA Alarm, CPA Limit, TCPA Alarm, TCPA Limit.

▶ [MENU]->[3.GPS Setup]->[MENU]->[1.AIS Setup]

2-1. AIS on/off
Turns the display of AIS targets overlay on the cartography ON or OFF.
The default setting is OFF.

2-2. AIS Scale
It is possible to setup AIS Targets with Scale, The default setting is 2nm.

2-3. CPA Alarm
Turns ON/OFF the alarm. The default setting is OFF.

2-4. CPA Limit
The values allowed are from 0.1nm to 10nm. The default setting is 0.1nm.

2-5. TCPA Alarm
Turns ON/OFF the alarm. The default setting is OFF.

2-6. TCPA Limit
The values allowed are from 1 to 50 min. The default setting is 1 min.
It is a vessel equipped with AIS. Information about the targets is being received by AIS Receiver and displayed on the screen.
(☞ Refer to AIS Setup for GPS Setup 2/2 of AIS setup.)

3. Quick info on AIS target
Press [ENTER] key on Target which wants to see. It shows Information of "AIS INFO" window.

AIS INFO window
1. Name
2. MMSI number
3. Nationality
4. Navigation Status
5. Heading
6. COG
7. SOG
8. Longitude
9. Latitude
10. CPA
11. TCPA

 (* The baud of TX/RX is set up 38400 bps automatically when AIS is ON.)

Operations

Plotter Menu

Press [ENTER] key without cursor, it shows Plotter Menu.

1. Track
It is possible to setup start and stop of Track.

2. Navigating
It is possible to setup start and stop of Navigating.

3. Mark
Mark is input on the Vessel Position.

4. Object Information
It is possible to use Find function and to see map information at the Vessel Position.
☞ Information is Port Services, Tides, Lights, Wrecks, Rocks, Buoys, Beacon, Obstructions, Land markers, etc.
☞ Find function works when press [Zoom in] key. Refer to description of find how use

Cursor Menu

Press [ENTER] with cursor, Cursor Menu will be showed up.

1. WPT
WPT is input at position of cursor.

2. Mark
WPT is input at position of Mark.

3. Range/Bearing
Press [ENTER] to place where you want to make start point then move the cursor to place where you want. You can know Range and Bearing between start point and position of cursor on cursor info.

4. Object Information
It is possible to use Find function and to see map information at the Vessel Position.
☞ Information is Port Services, Tides, Lights, Wrecks, Rocks, Buoys, Beacon, Obstructions, Land markers, etc.
☞ Find function works when press [Zoom in] key. Refer to description of find how use

Operations

Find

The charplotter allows finding Nearest Services, Port By name, Port by distance, Tide Stations, Wrecks, Obstructions.

1. Port Services
To locate and display the nearest available facilities of a particular type.

▶ [ENTER]->[4.Object Information]->[ENTER]->[Zoom in]->PORT SERVICES->[ENTER]

The icons of the available services are shown. Use the cursor key to select any facility and press [ENTER]. The list of the ports containing the facility will be sown on the screen. Then choose the port you want and press [ENTER]

2. Port by names
To select the Ports by name function following the procedure.

▶ [ENTER]->[4.Object Information]->[ENTER]->[Zoom in]->PORT BY NAME->[ENTER]

Shows the list of all ports stored on the C-CARD in alphabetical order and allows to search ports by name to locate the ports on the map.

3. Port by distance
To select the ports by distance function following the procedure.

▶ [ENTER]->[4.Object Information]->[ENTER]->[Zoom in]->PORT BY DISTANCE->[ENTER]

Shows the list of all ports stored on the C-CARD in closest distance order and allows to locate the ports on the map

4. Tide stations
Finds the nearest Tide stations on the map, from the boat position -if a valid fix is received- or from the cursor position-if the received fix position is not good.

▶ [ENTER]->[4.Object Information]->[ENTER]->[Zoom in]->TIDE STATIONS->[ENTER]

A new window will appear in few seconds. Choose the tide stations you want and press [ENTER] to display the tide graph page.

5. Wrecks
Searches for nearest Wrecks.

▶ [ENTER]->[4.Object Information]->[ENTER]->[Zoom in]->WRECKS->[ENTER]

Use the cursor key to select the port. Press [ENTER] to locate the selected Wreck on the map.

Operations

Find

The charplotter allows finding Nearest Services, Port By name, Port by distance, Tide Stations, Wrecks, Obstructions.

6. Obstructions
Searches for nearest Obstructions.

▶ [ENTER]->[4.Object Information]->[ENTER]->[Zoom in]->OBSTRUCTIONS->[ENTER]

Use the cursor key to select the port. Press [ENTER] to locate the selected Obstrutions.

Installation

GPS-95CP(i) brings expandable display technology to your bridge or navigation station. A careful installation will assure maximum benefit from GPS-95CP(i) integrated features.

Display Unit Location

Select a location for your GPS-95CP(i) display unit that provides easy viewing from all likely operator's positions. The display unit is designed to be mounted on either a console or from an overhead surface. The GPS-95CP(i) display is also designed for flush mounting using six threaded holes on the rear panel. Locate the display in an area that is protected from the elements and avoid direct sunlight on the viewing window. Also, consider access to the rear panel of the unit for connecting power and cables to the various remote sensors. The mounting surface must be flat and solid to support the unit and prevent vibration. There should be access to the inside of the surface to permit through bolt fastening for the mounting bracket.

Display Unit Installation

Temporarily install the mounting bracket on the GPS-95CP(i) display unit and place the unit at the selected location.

⚠ CAUTION

The GPS-95CP display unit is unstable when the mounting bracket is not secured. Hold the unit in place at all times.

Check the suitability of the location and make any adjustments. When all is satisfactory, use the holes in the mounting bracket as a guide and mark the holes locations on the mounting surface.

Installation

Drill a 1/4 in. diameter hole at each marked location. Mount the GPS-95CP(i) display bracket using bolts through the mounting surface. Place large flat washers on the opposite side of the mounting surface from the bracket and then install lock washers and nuts. Tighten securely.

Install the display unit into the mounting bracket. Check alignment and operation of the pivots and security of the mounting. Make any adjustments necessary to prevent binding and assure even meshing of the pivot locking washers. It is advised to remove the display unit and store it in a safe place to prevent damage during the rest of the installation process.

- Power Connection

Power is supplied to the GPS-95CP(i) Charting System through a connector on the rear panel of the display unit.
Route the power cable from the GPS-95CP(i) location to the ship's power distribution panel.
Connect the black wire to a battery negative (-) terminal of the power panel.
Connect the red wire to a fused battery positive (+) terminal of the power panel (12 to 36 Vdc nominal). If a fused terminal is not available, install an in-line fuse holder. (1 amp)

Reference

- Care and Cleaning

Your GPS-95CP(i) is made to withstand marine elements but a little care ensures a trouble free life. Accumulations of salt and sand, if not removed, will eventually mar the finish. No solvents or harsh cleaners should be used. The display unit may be wiped down with a damp cloth while avoiding the display window. Be careful not to scratch the display window surface. Gently remove any sand or other grit particles before cleaning the display window. The display window should be cleaned only with water and a clean soft cloth using very light pressure.

- NMEA

A standard developed by the National Marine Electronics Association and used by most marine equipment manufacturers for data communication is known as NMEA 0183 version 1.5 and version 2.0. NMEA0183 specifications offer many recognized sentences for exchanging data between many types of marine equipment.
The following technical information is provided for reference and is accurate to the best of our knowledge at the time of printing. Please refer to the appropriate NMEA specifications for details and the latest information.
The data sentences used by the GPS-95CP(i) are as follows.

Output sentences:

Output A:
   GPAAM, GPAPB, GPBOD, GPBWR, GPGGA

Output B:
   GPRMB, GPRMC, GPVTG, GPWNC, GPXTE

Output C:
   GPZDA, SDDBT, SDMTW

GPS

For centuries, sailors have been searching for a reliable and precise method of travelling the world's waterways. From celestial navigating to the modern navigation techniques as Loran, Decca navigator, Omega or Transit Satnav, each system has had its problems with weather, range and reliability. Without doubt, the "Global Positioning System", or GPS for short, is the most significant advance in navigation: it provides the navigator a position 24 hours a day, 365 days a year in any weather condition.

GPS is a satellite based navigation system which provides suitably equipped users with accurate position, velocity and time data. Originally the GPS, developed by the U.S. Department of Defense, was conceived for military purposes, but now it is used in a host of civilian applications. GPS navigation uses satellite signals to determine your position in relation to a set of satellites orbiting the earth. The GPS constellation of satellites continuously sends radio signals, containing the precise position for each satellite back to earth. By knowing the position of 3 or 4 satellites and calculating various time differences between transmitted signals, the GPS receiver can determine its present position anywhere on earth, and thanks to continuous updates, calculate speed and course information.

HOW GPS WORKS

Currently, the GPS constellation consists of 26 orbiting satellites (including 3 spares), but this number will increase in the future.

The GPS receiver computes an accurate position by calculating the distance to the GPS satellites that orbit the earth. Signals are required from 3 satellites for two dimensional (2D) position calculation whilst 4 satellites are required for three dimensional (3D) position calculation.

As mentioned earlier, GPS satellites are not geostationary, but they are orbiting the earth as illustrated on the following figure:
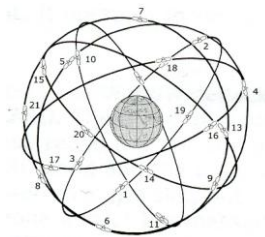

[The GPS constellation]

Note that position is repeatedly fixed through the following three steps while any 3 satellites are in line of sight.

The position calculation procedure is indicated in the following three steps:
1. GPS satellites continuously transmit their own precise orbital data and the GPS receiver comp utes their locations by receiving this data.
2. In this receiving process, the GPS receiver measures very accurate distances to the satellites, using the "Spread Spectrum Modulation" method. Excellence in GPS's position-fixing accuracy is mainly due to this technology.
3. When the satellite locations and their distances are known, the GPS receiver fixes its own pos ition by triangulation:
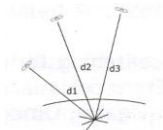

[The GPS position calculation]

As illustrated in the previous figure, the position is calculated as the meeting point of three spheres, which are drawn around the three satellites with diameters d1, d2 and d3.

Position Fixing Accuracy: HDOP
The GPS fix accuracy is due to the locations of 3 satellites in the sky. High accuracy is obtainabl e when the satellites are widely scattered in the sky; on the
contrary, accuracy is reduced when the satellites have gathered in a narrow space. In the followi ng figure, in both cases it is possible to obtain the GPS fix, but in the left case the accuracy will be higher than the right:
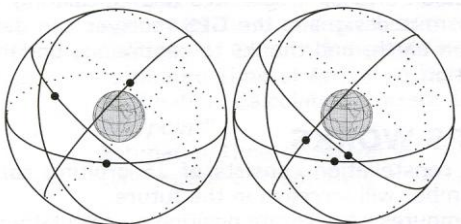

[HDOP]

The index for position-fixing accuracy is called HDOP (*"Horizontal Dilution Of Precision"*). The s maller the HDOP value, the more accurately the position can be fixed.

GPS

## The installation of the GPS ANTENNA. (Except 95CPi)

The GPS ANT must be installed at the highest area of the boat and the easiest place to receive the signal from the satellites. If there are obstacles around the GPS ANT, it isn't able to receive all signals. The receiving time could be longer or the receiving power would be weaker. Please, follow the instruction for your installation.

1. Keep from a metal.
2. Over 4m away from a MF/HF ANT, VHF or HF whip ANT.
3. Over 1.5m higher than MF/HF ANT.
4. Over 1m away from a receiving ANT.
5. Don't put the GPS ANT into the range of radar's beam. (Range: 30° ~ 40°)
6. Over 1m away from the scanner of the radar.
7. Over 5m away from the ANT of the Inmarsat.
8. Over 3m away form the ANT of the roof.
9. Over 2m away from the engine.
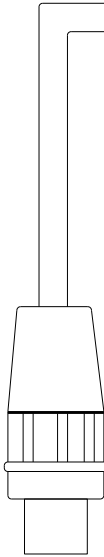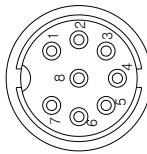10. Over 0.5m away from the metal surface.
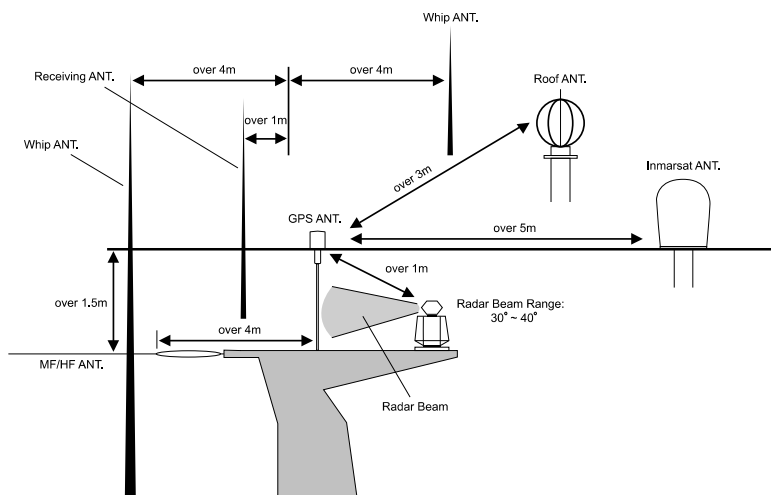
※Warning: Not less than 0.5m away from the metal surface.

If the environment can't be satisfied from 1 to 10, have NO. 10 satisfied and consider the others.
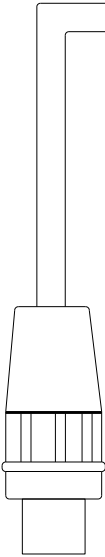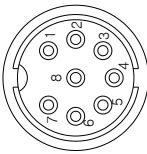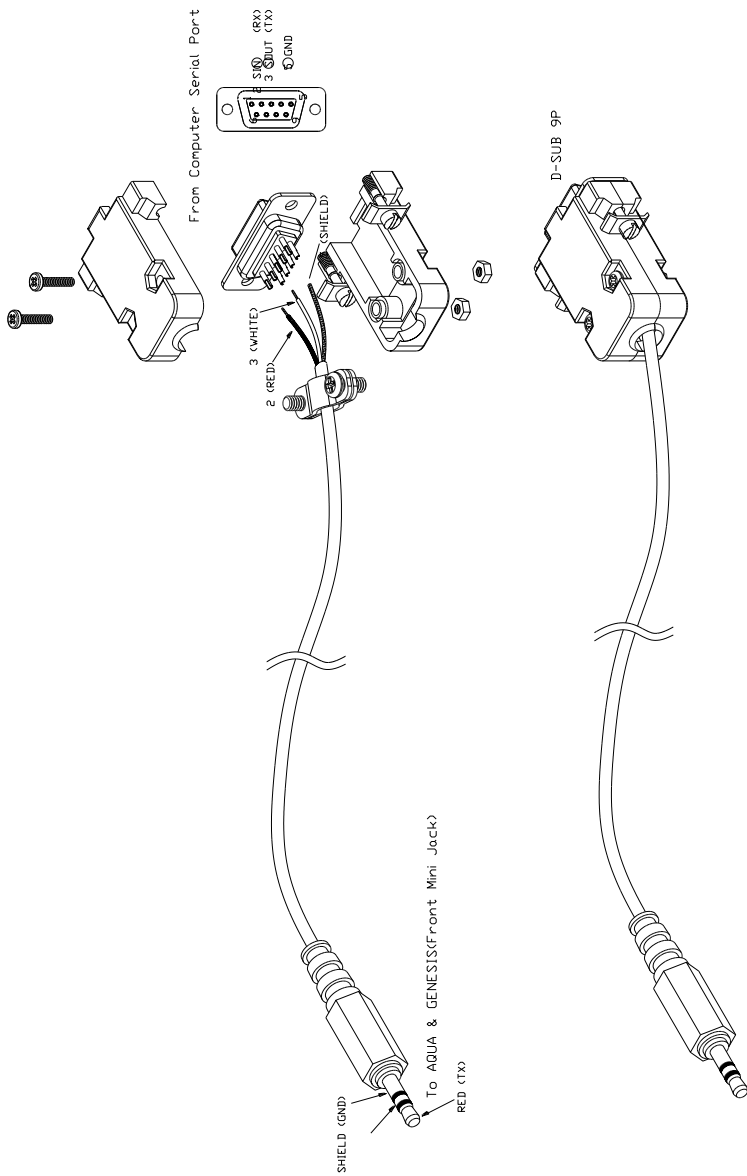
Power Cable

PIN #	WIRE COLOR	FUNCTION
1	BLACK	GND/COMMON
2	RED	PWR+(12~36V)

Data Input/Out Cable

PIN #	WIRE COLOR	FUNCTION
3	WHITE	INPUT +
4	GREEN	INPUT −
5	GREY	NC
6	YELLOW	OUTPUT+
7	BROWN	NC
8	BLUE	NC

MATERIAL	---	DESCRIPTION	
		Power & I/O Cable	
MODEL	GPS−95CP	DWG. NO.	95cp−0001
CHK. BY	DES. BY	DRA. BY	DATE
Y.S.KIM	Y.S. KIM	Y.S. KIM	02.23.2007
SCALE NONE	PER'N G.T.RYU		SI−TEX MARINE ELECTRONICS

From Computer Serial Port

SHIELD

3 (WHITE)
2 (RED)

D-SUB 9P

To AQUA & GENESIS(Front Mini Jack)

RED (TX)

SHIELD (GND)

Mini Jack

SHIELD

SIN (RX)
3 OUT (TX)
GND

DESCRIPTION			
	Program Data Cable		
DWG. NO.		95GP 0002	
SITEX MARINE ELECTRONICS			

MATERIAL	---		
MODEL	GP-95CP & GP-95CPi		
SCALE NONE	CHK. BY	DES. BY	DRA. BY	DATE 07.15.2000
PER'N	H.S.KIM		IS.CHOI

- 53 -

To 95CP
REAR BNC CONNECTOR

					DESCRIPTION	GPS ANT
	MATERIAL		---			
	MODEL	GPS-95CP			DWG. NO.	95CP 0003
	CHK. BY	DES. BY	DRA. BY	DATE		
SCALE	H.S.KIM	IS.CHOI	IS.CHOI	08.15.2003		
NONE	PER'N					
	G.T.RYU				SITEX MARINE ELECTRONICS	

78

104.69

115

196.4

174.62

70
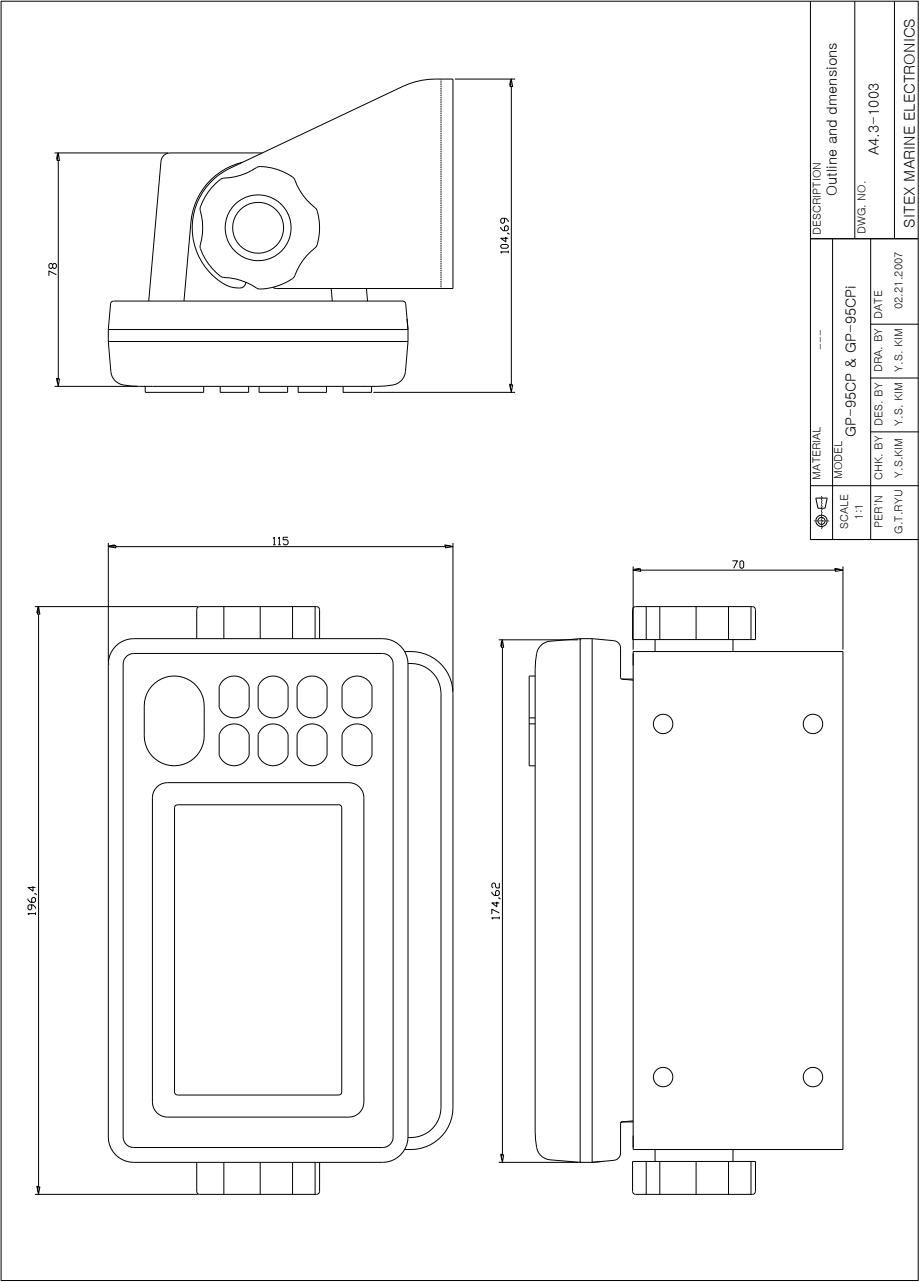
CERTIFICATE OF LIMITED WARRANTY

Providing you present a valid proof of purchase, SI-TEX Marine Electronics Inc. warrants all parts of each new product against defects in material and workmanship under normal use and will repair or exchange any parts proven to be defective at no charge for a period of two years for parts and one year for labor from the date of purchase, except as provided below under Limited Warranty Exceptions.

Defects will be corrected during normal working hours by an authorized SI-TEX Marine Electronics Inc. dealer, service center, or at the SI-TEX office in St. Petersburg, Florida. There will be no charge for labor for a period of one year from the date of purchase, except as provided below under Limited Warranty Exceptions.

This Warranty and Proof of Purchase must be made available to the authorized SI-TEX Marine Electronics Inc. service location or dealer at the time of service.

LIMITED WARRANTY EXCEPTIONS

SI-TEX Marine Electronics Inc. will not be responsible for equipment which has been subjected to water or lightning damage, accident, abuse, or misuse, nor any equipment on which the serial number label has been removed, altered or mutilated.
SI-TEX Marine Electronics Inc. assumes no responsibility for damage incurred during installation.
This Limited Warranty is effective only with respect to the original purchaser.
Any cost associated with transducer replacement, other than the cost of the transducer itself, is specifically excluded from this Limited Warranty.
Travel costs incurred will not be accepted for SI-TEX Marine Electronics Inc. products.
THERE ARE NO WARRANTIES, WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF.

SPECIFIC EXCLUSIONS

Charges for overtime, stand-by, holiday, and per diem are specifically excluded from the Limited Warranty.

Chart paper, stylus, stylus belt, lamps, and fuses are consumable items and are not covered by this Limited Warranty.

Installation workmanship or materials except as provided directly by SI-TEX Marine Electronics Inc. are not covered by this Limited Warranty. SI-TEX Marine Electronics Inc. equipment or parts thereof, which have been repaired or altered except by an authorized

SI-TEX Marine Electronics Inc. dealer or service center, are not warranted in any respect.

Transducer, software update, battery, microphone, magnetron, and microwave components and water damage on water resistant VHF radio are items excluded from the two-year warranty and are covered by warranty for a period of one year for both parts and labor.

SI-TEX Marine Electronics Inc. will not, at any time, assume any costs or labor charges for checkout or external line fuse replacement or problems not found to be at fault in equipment itself.

THERE ARE NO WARRANTIES OR GUARANTEES EXPRESSED OR IMPLIED WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. SI-TEX MARINE ELECTRONICS INC. HAS NO OTHER LIABILITY TO PURCHASE FOR DIRECT OR CONSEQUENTIAL DAMAGE OR ANY THEORY INCLUDING ABSOLUTE LIABILITY, TORT, OR CONTRACT. THIS LIMITED WARRANTY CANNOT BE ALTERED OR MODIFIED IN ANY WAY AND SHALL BE INTERPRETED IN ACCORDANCE WITH THE LAWS OF THE STATE OF FLORIDA. THIS WARRANTY IS LIMITED TO THE CONTINENTAL U.S.A., ALASKA, HAWAII, AND CANADA.

HOW TO OBTAIN SERVICE UNDER THIS WARRANTY

To provide better flexibility, SI-TEX Marine Electronics Inc. gives you the option of obtaining service under this warranty by either:

a) Contacting an authorized SI-TEX Marine Electronics Inc. service station (The closest service station may be found by contacting your dealer of purchase.)

Or

b) Shipping your equipment prepaid via UPS or truck with insurance prepaid to SI-TEX Marine Electronics Inc. at the address provided below. SI-TEX Marine Electronics Inc. will, whenever possible, make all repairs covered by Limited Warranty within two weeks of receiving the equipment in Florida and return same to you, freight prepaid.

c) You must present a copy of your Purchase Sales Slip at the time you request warranty service.

SI-TEX Marine Electronics Inc. offers a complete line of quality marine electronics including fishfinders, electronic charting systems, radars, autopilots, GPS/WAAS/Loran receivers, SSB receivers, direction finders, VHF/FM radiotelephones and integrated systems. For more information, contact your SI-TEX dealer or the main office, located in St. Petersburg, Florida.