A60 and RS12 Display & GPS

Installation Manual

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Contents

Important Information

Intended Use

The A60 is a GPS Chartplotter display unit that can be upgraded to include optional Fishfinder functionality.

This handbook contains important information on the installation of your A60 display and RS12 GPS Antenna. To get the best results in operation and performance, please take the time to thoroughly read the accompanying Owner's Handbook.

Safety Notices

WARNING: Navigation Aid

This product is intended to be used as an aid to navigation. Its accuracy can be affected by many factors, including equipment failure or defect, environmental conditions and incorrect handling or use. It is the user's responsibility to exercise common prudence and navigational judgement. This device should not be relied upon as a substitute for such prudence and judgement.

WARNING: Product Installation

This equipment must be installed in accordance with the instructions in this manual. Failure to do so could result in poor product performance, personal injury and/or damage to the vessel.

WARNING: Electrical Safety

Make sure the power supply is switched off before making any electrical connections.

CAUTION: Global Positioning System Antenna
Do not connect or disconnect the GPS antenna from the display unit while power is switched on as this may result in irreparable damage.

CAUTION: Water Ingress
To prevent the ingress of water and consequent damage to the display, ensure that the chart card door is firmly closed. This can be confirmed by an audible click.

CAUTION: CompactFlash Card Installation
When installing CompactFlash cards ensure that the card is
inserted in the correct orientation. DO NOT try to force the card
into position as this may result in irreparable damage to the card.

CAUTION: CompactFlash Card Damage
DO NOT use a metallic instrument such as a screwdriver or pliers
to help you remove a card, as this can cause irreparable damage.

TFT LCD Displays

The colors of the display may seem to vary when viewed against a colored background or in colored light. This is a perfectly normal effect that will be seen with all color LCD displays.

In common with all Thin Film Transistor (TFT) LCD displays, the screen may exhibit a few (less than 5) wrongly illuminated pixels. These may appear as black pixels in a light portion of the screen or as colored pixels in black areas.

CAUTION: To provide protection against the damaging effects of
UV light, Raymarine advises that you replace the sun cover
provided when the color LCD display is not in use.

Protective Dust Covers

Protective covers have been attached on the SONAR, AUX and NMEA connectors on the rear of the A60. If you are not using one or more of these ports, please keep the cover attached to the connector to protect it from the elements.

Dust Cover
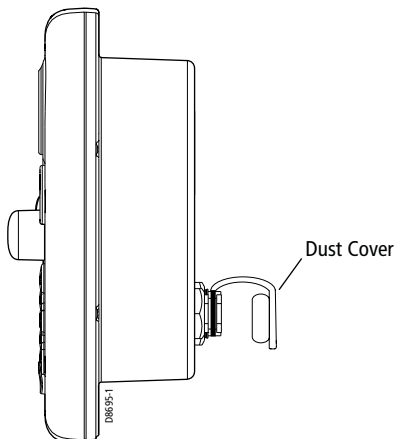
EMC Conformance

All Raymarine equipment and accessories are designed to the best industry standards for use in the recreational marine environment.

Their design and manufacture conforms to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised. Although every effort has been taken to ensure that they will perform under all conditions, it is important to understand what factors could affect the operation of the product.

The guidelines given here describe the conditions for optimum EMC performance, but it is recognized that it may not be possible to meet all of these conditions in all situations. To ensure the best possible conditions for EMC performance within the constraints imposed by any location, always ensure the maximum separation possible between different items of electrical equipment.

For optimum EMC performance, it is recommended that wherever possible Raymarine equipment and cables connected to it are:

> At least 3 ft. (1 m) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 7 ft. (2 m).

> More than 7 ft. (2 m) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.

Ensure that the equipment is supplied from a separate battery from that used for engine start. Voltage drops below 10 V, and starter motor transients, can cause the equipment to reset. This will not damage the equipment, but may cause the loss of some information and may change the operating mode.

Ensure that Raymarine specified cables are used. Cutting and rejoining these cables can compromise EMC performance and must be avoided unless doing so is detailed in the installation manual.

Suppression Ferrites

If a suppression ferrite is attached to a cable, this ferrite should not be removed. If the ferrite needs to be removed during installation it must be reassembled in the same position. If a ferrite is packed separately in the carton, it must be installed as soon as the cables are run.

The following illustration shows typical cable suppression ferrites sometimes used with Raymarine equipment. To ensure EMC compliance, always use these ferrites, if supplied by Raymarine for use with this equipment. If not supplied by Raymarine, a ferrite is not required for use with this equipment.
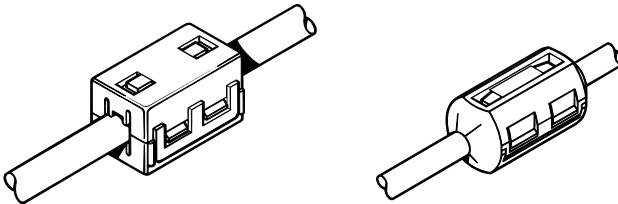
D3548-3

Connections to Other Equipment

If your Raymarine equipment is to be connected to other equipment using a cable not supplied by Raymarine, the suppression ferrite (if supplied) MUST always be attached to the cable nearest the Raymarine unit.

Declaration of Conformity

Raymarine plc declare that the A60 Dual Function Displays are in compliance with the essential requirements of EMC directive 2004/108/EC. The original Declaration of Conformity certificate can be viewed on the relevant product page at www.raymarine.com.

Product Disposal

Waste Electrical and Electronic Equipment (WEEE) Directive

The WEEE Directive requires the recycling of waste electrical and electronic equipment. While the WEEE Directive does not apply to some of Raymarine's products, we support its requirements as part of our environmental policy and we ask you to be aware of how you should dispose of this product.

The wheelie bin symbol found on our products signifies that it should not be disposed of in general waste or landfill. Please contact your local dealer, national distributor or Raymarine Technical Services for information on product disposal.

Chapter 1: Introduction

This manual provides information and instructions for installing your A60 display and RS12 GPS sensor.

1.1 Selecting the Display Unit Location

Your A60 can be mounted using the mounting bracket supplied, or console mounted using the optional flush mount kit.

Before you install the display, plan its installation, considering:

- **Convenience**. The mounting location should be easily accessible to allow operation of the front panel controls.
- **Access**. There must be sufficient space behind the display to allow cable connections to the rear panel connectors, avoiding tight bends in the cable.
- **Interference**. The selected location should be far enough away from devices that may cause interference, such as motors, generators and radio transmitters/receivers (see EMC Guidelines).
- **Magnetic compass**. Mount the display at least 3ft (1m) away from a magnetic compass.
- **Cable runs**. The display should be mounted as close as possible to the DC power source.
- **Environmental**. The display should be protected from physical damage and excessive vibration. Although the display unit is waterproof, it is good practice to mount it in a protected area away from prolonged and direct exposure to rain and salt spray.

1.2   What Comes in the Box

Unpack the display carefully, to prevent damage. Save the carton and packing, in case the unit has to be returned for service.

A60 Dual Function Display,
E33025 (US), E33026 (CE)

Frame Screws,
M3 (x4)
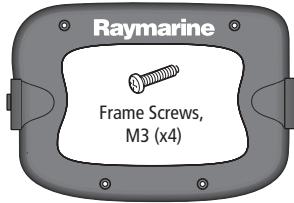
Mount Frame,
part no. R38109
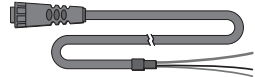
Power/Data Cable, 3 pin, 1.5m
part no. R08003
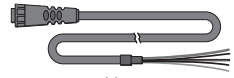
NMEA Cable, 5 pin, 1.5m
part no. R08004

Sun Cover,
part no. R38108

Bracket Screws,
No.10 x 3/4 (x3)
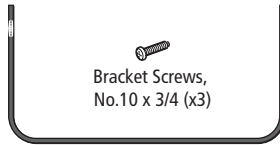
Mounting Bracket,
part no. R38110

Bracket Knobs,
part no. R38107
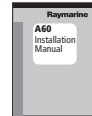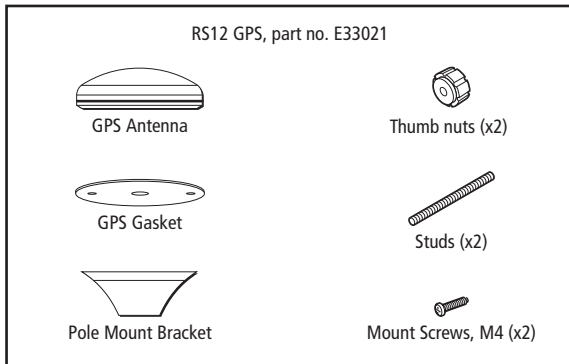
Installation Manual,
part no. 87081

RS12 GPS, part no. E33021

GPS Antenna

GPS Gasket

Pole Mount Bracket

Thumb nuts (x2)

Studs (x2)

Mount Screws, M4 (x2)

Owner's Handbook,
part no. 81295

1.3   Optional Equipment

The following optional items are also available to complete your system:

Part No.	Description
E63070	DSM25, Digital Sounder Module, 200/50KHz, 500W
E36017	Flush Mount Kit, A60
R69086	Network Cable, A60, 3.5m
E36015	Network Cable, A60, 8.5m
E36016	Network Cable, A60, 15m
E66066	Transducer Adapter, Pathfinder (DSM250) to A Series
E66070	Transducer Adapter, Legacy Transducer (L365/L470) to A Series

1.4   Unit Size

The dimensions for your A60 display are as follows:
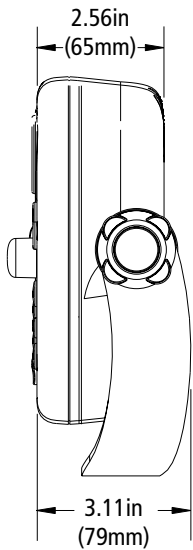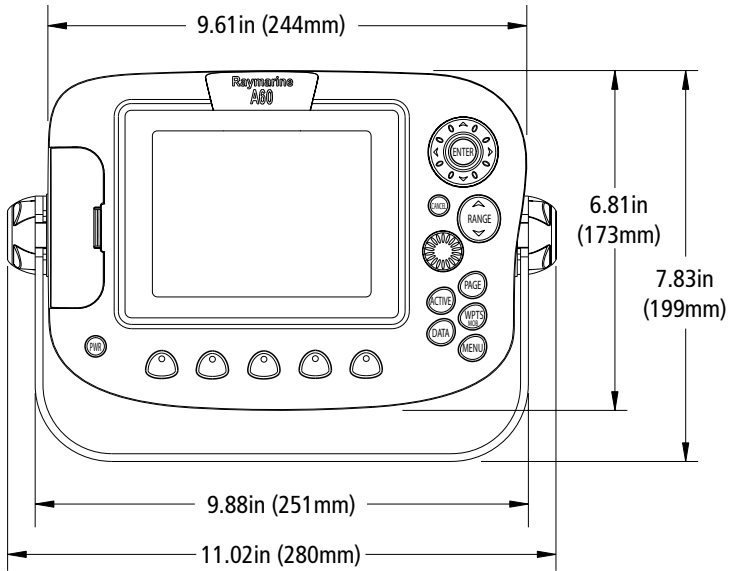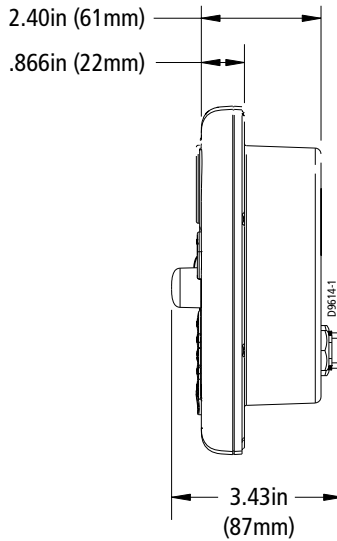
Bracket Mount   Flush Mount

Chapter 2: Installing the Display Unit

The A60 display unit is waterproof to IPX-7 and can be installed either above or below deck using either the mounting bracket or by flush mounting into the console.

2.1 Mounting

Note: *The mounting bracket and the mount frame to which the bracket attaches must be removed prior to flush mounting.*

Mounting Bracket Method

The mounting bracket can be used to secure the display unit to a dash, chart table, bulkhead or deckhead.
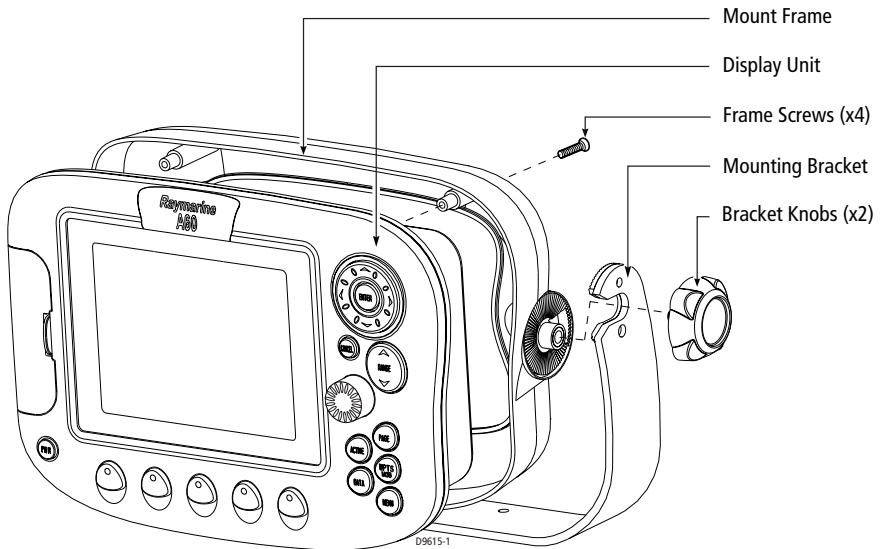
You should install the mount bracket as follows:

1. Loosen the knobs and remove the bracket from the unit.
2. Mark the locations of the bracket screw holes on the mounting surface.
3. Drill 9/64" (3mm) pilot holes at the marked locations, taking care that there are no cables or anything that may be damaged behind the surface.
4. Align the bracket holes with the holes on the mounting surface.

5. Use the screws and nuts supplied to securely attach the bracket to the mounting surface.
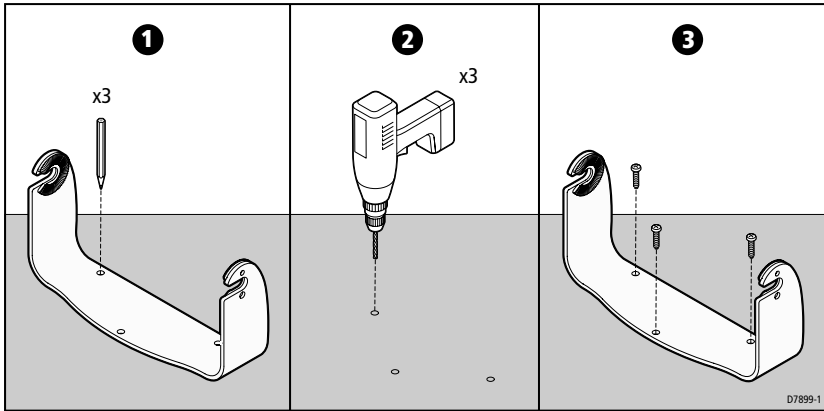
6. Attach the display unit to the bracket.
7. Adjust the unit angle for clear vision and tighten the knobs.

Flush Mounting

Flush mounting your display on the console requires the optional E36017 Flush Mount Kit.
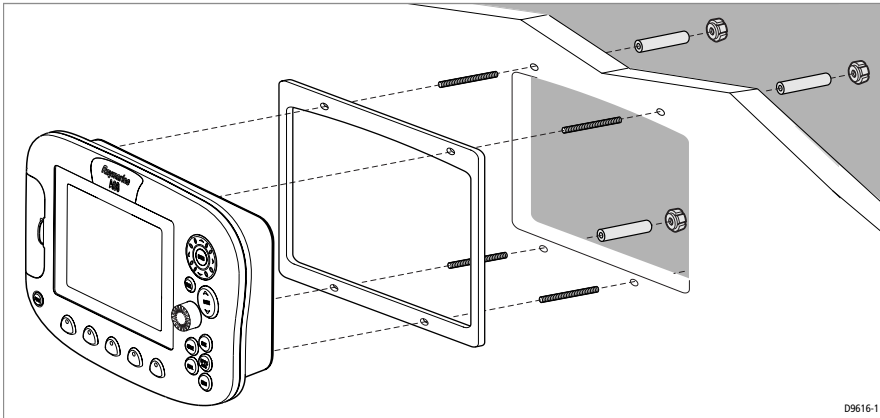
⚠️ **CAUTION: Installation**
Make sure there are no hidden electrical wires or other items behind the selected location before proceeding.

Make sure there is sufficient rear access for mounting and cabling.

1. Check the selected location for the unit. A clear, flat area with suitable clearance behind the panel, is required.
2. Attach the template included with the flush mount kit to the selected location, using masking or self-adhesive tape, taking care that it is level.
3. Use a hole saw to make a pilot hole in each corner of the cut-out area.
4. Using a suitable saw, cut along the inside edge of the cut-out line.
5. Detach the mount frame from the unit by removing the four mounting screws. Make sure that the unit fits in the area that has been cut out.
6. Drill four 3/16 in (4.5 mm) holes as indicated on the template to accept the retaining bolts.
7. Place the gasket onto the display unit.
8. Connect the cables to the display, avoiding tight bends.
9. Screw the 4 supplied studs into the rear of the unit.
10. Slide the unit into the console.
11. From the rear, attach the supplied nuts onto the studs and tighten until secure.

2.2 Cable Runs

When installing system cables consider the following:

- All cables should be adequately secured, protected from physical damage and exposure to heat. Avoid running cables through bilges or doorways, or close to moving or hot objects.
- Avoid acute bends.
- Where a cable passes through an exposed bulkhead or deckhead, a watertight feed-through should be used.
- Secure cables in place using tie-wraps or lacing twine. Coil any extra cable and tie it out of the way.
- Do not pull cables through a bulkhead or deckhead using a cord attached to the connector. This could damage the connections.

RS12

12V Power Supply

Display Unit

DSM25 Sounder

Fluxgate Compass

GPS

Power   Power

Fishfinder   NMEA

D7722-3

Transducer
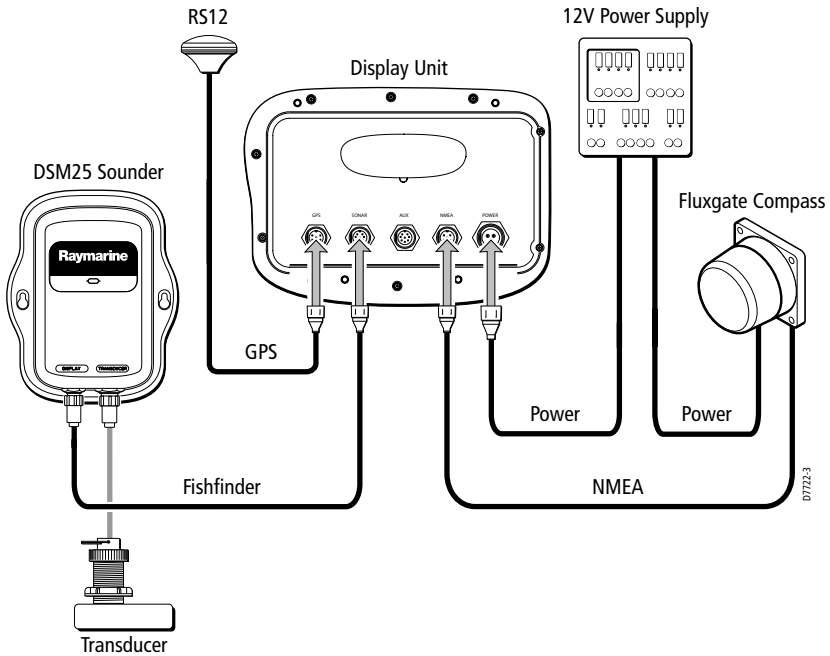
Making the Cable Connections

The cable connections are located on the back of the display unit as shown below:

| GPS | SONAR | AUX | NMEA | POWER |

D7719-1
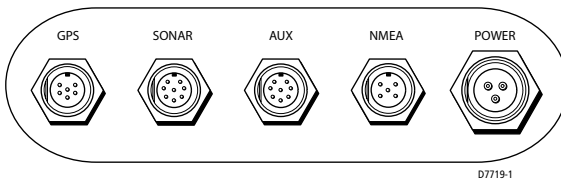
Power Input Cable (R08003)

This 1.5m (5 ft) cable is supplied for connecting to your boat's DC power supply.

DC power is connected at the 3-pin POWER connector on the unit's connector panel. The connector (viewed from the outside) and pin functions are shown in the following diagram and table.
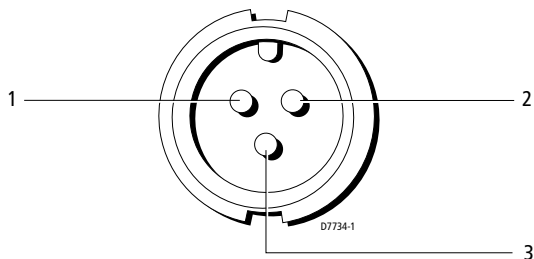
Power Connector

Pin No.	Function	Color
1	Battery positive (12 VDC systems)	Red
2	Battery negative	Black
3	Shield (drain wire)	No insulation

Power Supply

The A60 is intended for use on boat's DC power systems rated from 10.7 to 18 VDC. The power connection to the unit should be made at either the output of the battery isolator switch or at a DC power distribution panel. Power should be fed directly to the A60 via its own dedicated cable system and protected by a thermal circuit breaker or fuse on the red (positive) wire that is installed close to the power connection.

CAUTION: Dedicated Power Connection
The A60 also supplies power for the GPS and sounder units (if so equipped). To minimize succeptibility to display flickering due to power fluctuations, provide the display unit with its own dedicated connection to boat's power.

The RED wire must be connected to the feed from the positive (+) battery terminal and the BLACK wire to the feed from the negative (–) battery terminal. The shield wire (drain) should be connected to the boat's RF ground.

CAUTION: Fuse Protection
Install a fast blow 4 amp fuse on the red (positive) wire.

If a longer power cable run is required, use the supplied power cable to connect to the display unit. Then use a suitable connector block to connect the free end to the extension cable, taking particular care to ensure the correct polarity.

Use commonly practiced methods to determine proper wire gauge based on wire length, current, and wire tables. You may also trim the power cable supplied with the A60 to reduce overall wire length. Only use enough wire to connect the unit to the power source, including a service loop.

Note: *When the A60 has been powered off using the PWR key but is still electrically connected to the power supply, the GPS continues to draw current.*

The supplied power cable has a cross section of 10 mm.

CAUTION: Correct Polarity
If the power connections are accidentally reversed the system will not work. Use a multimeter to ensure that the input power leads are connected for correct polarity.

NMEA Cable (R08004)

The 5-pin, 1.5m (5 ft) NMEA input cable is supplied with exposed wire connecting tails. These should be connected to your existing NMEA instruments using suitable connector blocks as follows:

Function	Color	Pin no.
NMEA Input (-ve) common	Green	1
NMEA Input (+ve)	White	2
NMEA Output (+ve)	Yellow	3
NMEA Output (-ve) common	Brown	4
Not connected	Screen	5
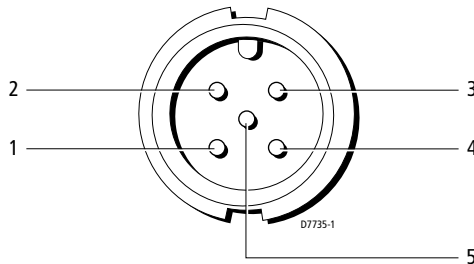
GPS Cable

Connect the 6-pin RS12 cable to the left-most connector, labeled GPS.

Chapter 3: Installing the GPS Antenna

The RS12 package contains the following items:

1. Low profile GPS Receiver, with 10 m (33 ft) cable
2. Flush mount gasket
3. Mounting studs (x2) and thumb nuts (x2)
4. Pole mount kit *

Note: *If you intend to mount the receiver on a pole, you will need to obtain a suitable pole with 1 inch 14 TPI thread.*

3.1 Selecting the Mounting Location

The RS12 can be mounted on a pole or flush mounted on a suitable horizontal surface.

Receiver Location

The RS12 receiver is designed to receive the signals emitted from satellites in a direct path. It should be mounted:

• On a horizontal surface.
• In a location that is open and clear of any obstructions (such as masts, search lights, or other structures) that could block line-of-sight reception of signals.
• As low as possible: the height of the receiver is not as important as it having a clear view horizon to horizon for optimum signal reception. In fact, the lower the unit can be mounted and have a clear view to satellites, the better. The more stable the unit, the more effectively it will track satellites low to the horizon.

Note: *Do NOT mount the receiver up a mast, as the receiver will swing with the boat, leading to significant COG/SOG errors.*

• As far as possible from any sources of interference: the receiver should be separated by at least 1 m (3 ft) from other antennas and electronic equipment. It should not be mounted in the direct path of a radar's beam.

When mounting the receiver flush to a surface:

• select an area that allows access to the underside of the mounting surface
• avoid areas where the receiver might be stepped on or tripped over

Cabling Route

When planning the location for the unit, consider the best route for running the cable between the receiver and GPS display unit or to the rest of an integrated system. Ideally, you should try to route the cable so it is:

• hidden from view

• separated as far as possible from other cables (to prevent interference)

When running cable, always observe the following guidelines:

• if a cable has to be fed through the deck, use a good quality deck grommet

• where cables are fed through holes, use grommets to prevent chafing

• secure long cable runs so they do not present a hazard

• wherever possible, route cables away from fluorescent lights, engines and radio transmitting equipment, as these may cause interference

3.2   Mounting the Receiver

When you have selected a suitable location, follow the installation instructions for *Pole Mounting* or *Surface Mounting*.

Pole Mounting

Note: *You will need to obtain a suitable pole with 1 inch 14 TPI thread.*

1. Securely attach the pole mount base to a suitable pole or rail mount bracket.

2. Pass the cable through either:

    A: the center hole of the pole mount base, or

    B: the side exit channel

Note: *If you intend to use the side exit channel, remove the two plastic tabs obstructing the channel. If you do not remove these tabs before using the cable channel, you could damage the cable.*

3. Check the cable is positioned correctly, then secure the receiver to the pole mount base using the two M4 screws provided.

D8689-1
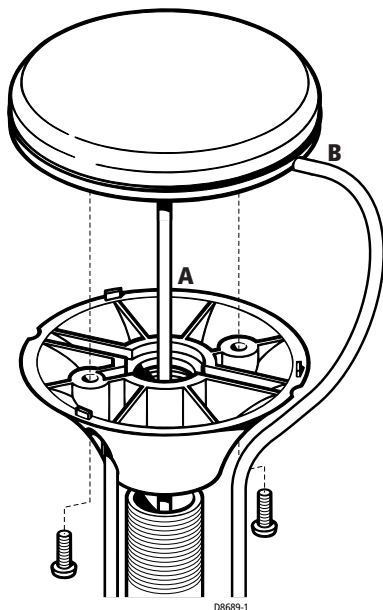
Surface Mounting

1. Use the template supplied in this handbook to mark the two 6 mm (0.25 in) mounting holes.

2. OPTION A:
    If the cable is going to pass through the mounting surface drill a 19 mm (0.75 in) center hole.
    OPTION B:
    If the cable is to exit from the side of the receiver above the mounting surface, remove the two plastic tabs (1) obstructing the cable channel. If you do not remove these tabs before using the cable channel, you could damage the cable.

3. Screw the two mounting studs (2) into the underside of the receiver.

4. Stick the supplied gasket (3) to the mounting surface, ensuring that the holes on the gasket correspond with the drilled holes.

5. Pass the cable down through the center hole (Option A) or route it through the cable exit channel (Option B).

6. Carefully position the receiver so the mounting studs pass through the holes in the mounting surface.

7. Secure the receiver to the surface using the two thumb nuts (4).
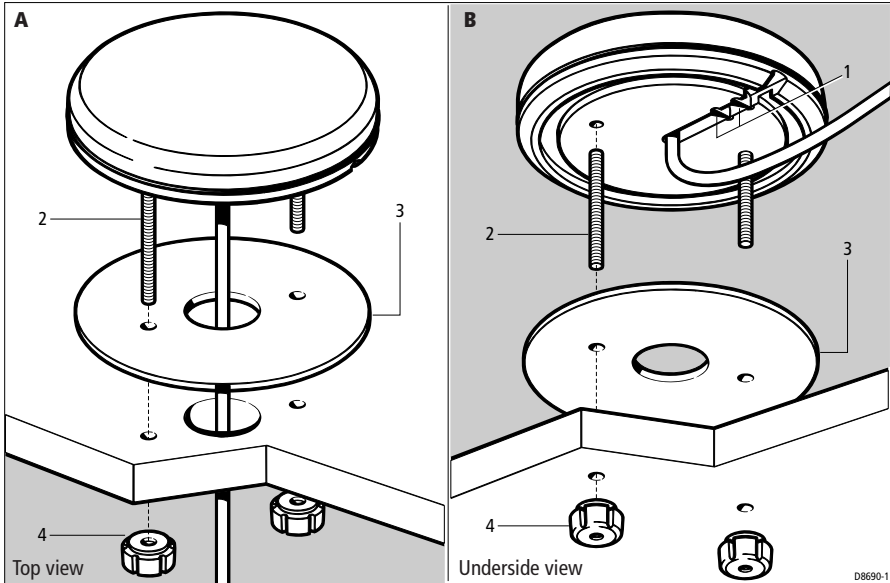
Making the Cable Connections

Connect the cable to the connector Labeled GPS on the back of the display unit as shown below:
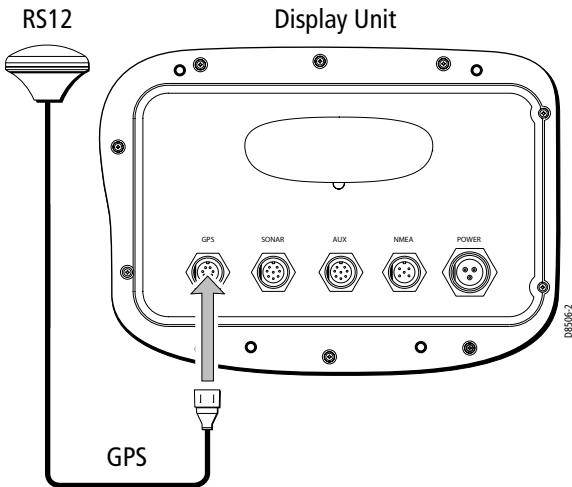
Chapter 4: Maintenance

4.1 Introduction

This chapter provides information on maintaining and troubleshooting your A60 GPS Chartplotter and on how to get assistance from Raymarine.

At regular intervals, carry out the following servicing procedures:
• Routine checks.
• Cleaning the Display.

Do not attempt any other servicing procedures.

Servicing and Safety

• Raymarine equipment should be serviced only by authorized Raymarine service technicians. They will ensure that service procedures and any replacement parts used will not affect performance. There are no user serviceable parts in any Raymarine product.

• Some products generate high voltages, so never handle the cables or connectors when power is being supplied to the equipment.

• When powered on, all electrical equipment produces electromagnetic fields. These can cause adjacent pieces of electrical equipment to interact with one another, with a consequent adverse effect on operation. In order to minimize these effects and enable you to get the best possible performance from your Raymarine equipment, guidelines are given in the installations manual, to enable you to ensure minimum interaction between different items of equipment, i.e. ensure optimum Electromagnetic Compatibility (EMC).

• Always report any EMC-related problem to your nearest Raymarine dealer. We use such information to improve our quality standards.

• In some installations, it may not be possible to prevent the equipment from being affected by external influences. In general this will not damage the equipment, but it can lead to spurious re-setting action, or momentarily may result in faulty operation.

Routine Checks

Carry out the following tasks on a regular basis:
• Examine all cables for signs of damage, such as chafing, cuts or nicks.
• Check that all cables are securely connected.

Cleaning the Display Window

A coating is applied to the plastic window of your display. This makes it water repellent and prevents glare. To avoid damaging this coating, the recommended cleaning procedure must be followed.

CAUTION:
Please read these instructions carefully. Failure to follow the correct cleaning procedure may damage your display window and invalidate your warranty.

Recommended Cleaning Procedure

1. Power off the display.
2. Rinse the window with fresh water, to remove all dirty particles and salt deposits.
   - **Do not** use any abrasive materials, including a dry cloth.
   - **Do not** use any cleaning solutions, polishes or sprays.
   - **Do not** use a jet wash.
3. Allow the window to dry naturally.
4. If any smears remain, very gently wipe the window with a clean microfiber cleaning cloth (not supplied).

4.2   Resetting the System

You can reset the A60 display in one of three ways:

- Power-on Reset
- Settings Reset
- Settings and Data Reset

Power-on Reset

When you reset the system, at power-on the last used values are retained for all the options, except for those listed in the following table which are reset to the factory default each time:

Item	Power-on setting
Relative Motion mode	Relative
Brightness	ON at 100%

Settings Reset

The factory reset will set all values back to their original factory settings. The Waypoint and Route List databases are not reset. There are two ways to carry out a Settings Reset: using hardware keys or via the System Setup Menu.

To carry out a Settings Reset using the hardware keys:

1. With the A60 powered OFF, press and hold the left hand soft key.
2. Press and release the **POWER** key to power ON the display, but continue to hold in the soft key. A countdown message appears. Continue to depress the soft key until the RESETTING DATABASE message appears.

The reset will take place during this operation.

To carry out a Settings Reset using the System Setup Menu:

1. With the A60 powered ON, press the **MENU** key.
2. Use the trackpad to navigate to the System Setup menu.
3. Select Settings Reset. A confirmation message appears.
4. Press **ENTER** to accept the reset or **CANCEL** to quit without resetting.

Settings and Data Reset

This option returns all settings to their original factory values and deletes all waypoints and route lists.

To carry out a Settings and Data Reset:

1. With the A60 powered ON, press the **MENU** key.
2. Use the trackpad to navigate to the System Setup menu.
3. Select Settings and Data Reset. A confirmation message appears.
4. Press **ENTER** to accept the reset or **CANCEL** to quit without resetting.

4.3 Troubleshooting

All Raymarine products are, prior to packing and shipping, subjected to comprehensive test and quality assurance programs. However, if your A60 should develop a fault, this section will help you to identify the most likely cause and show the corrective action required to restore normal operation.

If, after referring to this section, you are still having problems with your Display, contact your local dealer, national distributor or Raymarine Technical Services Department for further advice.

Always quote the product serial numbers, which are printed on the back of the unit.

Common Problems and How to Solve Them

Problem	Solution
Display is blank	1. Make sure that the power supply cable is sound and that all connections are tight and free from corrosion. 2. Check relevant fuses. 3. Make sure that Brightness level is not set too low.
"NO DATA SOURCE" message	The boat's power system must be capable of delivering at least 10.8 VDC at 4 amps. Check for: • Inadequate wire gauge or excessive wire length • Too many other electronics devices connected on the same circuit • Loose connections • Corroded fuse blocks and fuses • Low battery charge
"Invalid software: Version xx.x, Version xx.x required"	Incorrect software version installed. Contact your local Raymarine dealer or visit the Customer Support section of raymarine.com.

4.4 Upgrading the Display

Raymarine occasionally issues software updates for adding new features and improving product performance. The A60 includes a Software Upgrade Utility for installing these updates when they become available.

Product updates are generally available on the Raymarine website, under Customer Service/Software and Firmware upgrades. The update process requires:

• A CompactFlash (CF) memory card. Any card of 8 MB capacity or larger will usually work. Do not use the Navionics chart card for this procedure.

• A CompactFlash reader/writer, which allows you to move files between your CF card and personal computer.

• A personal computer, Windows or Mac compatible.

To upgrade your A60:

1. Connect the CompactFlash reader/writer to your computer and load the CompactFlash memory card into it.

2. Download the update files from the Raymarine web site to your computer, according to the instructions on the web site.

3. Copy the files from your computer to the root directory of your CompactFlash memory card. For example, if your CompactFlash card reader is identified by the computer as drive 'E:', open this drive and paste the files there.

4. Remove the CompactFlash card from the reader/writer.

5. Make sure the A60 and DSM25 (if one is installed) are fully connected but powered OFF. (The DSM25 must be connected for it to be updated.)

6. Insert the CF update card into the A60 chart card reader.

7. Power ON the A60. The following screen appears.
The Upgrade Package Available field displays the contents of the card. Local Unit Details displays the file versions currently installed in your A60.

```
              Raymarine Software Upgrade Utility
         Upgrade Packages Available        Upgrade Package Details
         A60_BTLD_UPD      2.02           Title:    A60_BTLD_UPD
         A60_APP_UPD       2.28           Version:  2.02
         DSM25_BTLD_UPD    2.02           Created:  27 Oct 2006 19:07
         DSM25_APP_UPD     2.02           Label:    Build
                                          Machine:  LOCAL
                                          Product:  D675 A60 Display
                                          File:     A60BTLD.PKG

                                              Local Unit Details
                                          NAME      A60 Display
                                          FAMILY    A Series
                                          PRODUCT:  D675
                                          SERIAL#   25525532767
                                          BOOT:     V1.28
                                          APP:      V1.44
                                          FPGA:     V01.00.018


               ┌─────────┐  Use Navigation Keys to Select Upgrade   ┌────────┐
               │ Upgrade │  Then Press Upgrade or Enter Key          │ Reboot │
               └─────────┘  After Upgrade Remove Card and Reboot     └────────┘
```

Contents of CF card — *(label pointing to Upgrade Packages Available)*

Details of the highlighted file — *(label pointing to Upgrade Package Details)*

Version status of your A60 — *(label pointing to Local Unit Details)*

8. Compare the upgrades that are available in the Upgrade Packages Available field with the version displayed in Local Unit Details. If a newer version is available under Upgrade Packages Available, use the trackpad to highlight that file.

Note: *If installing multiple files, upgrade one at a time and reboot only after all upgrades have been installed.*

9. Press the Upgrade soft key. An upgrade progress bar replaces the two soft keys. You are prompted to confirm the upgrade.

10. Press Continue to confirm. When complete, the following message appears: "Upgrade Completed. Press ANY KEY to Continue".

11. Press a key on the A60. The Upgrade and Reboot soft keys now replace the text.

12. Highlight and install any other updates as needed, one file at a time, by repeating steps 9–11.

13. When finished installing the updated files, remove the Compact Flash card from the A60 card reader and replace it with your Navionics chart card.

14. Press Reboot. The following message appears: "Press ENTER to Continue or ANY KEY to Abort".

15. Press ENTER. The unit restarts. The upgrade is complete.
    You can verify the version numbers by viewing Unit Information in the Diagnostics Menu.

4.5 Technical Support

Raymarine provides a comprehensive customer support service, on the world wide web, through our worldwide dealer network and by telephone help line. If you are unable to resolve a problem, please use any of these facilities to obtain additional help.

Worldwide Web

Please visit the Customer Support area of our website at: www.raymarine.com

As well as providing a comprehensive Frequently Asked Questions section and servicing information, the website also gives e-mail access to the Raymarine Technical Support Department and a details of the locations of Raymarine agents, worldwide.

Navigate to the Customer Support page for links to:

• Finding Factory Service locations and Authorized Dealers near you
• Registering your Raymarine products
• Accessing handbooks in Adobe Acrobat format
• Downloading RayTech software updates
• Accessing the Raymarine solution database

Clicking the Find Answers link routes you to our solution database. Search questions and answers by product, category, keywords, or phrases. If the answer you are seeking is not available, click the Ask Raymarine tab to submit your own question to our technical support staff, who will reply to you by e-mail.

If you don't have access to the world wide web, contact Technical Support where specialists are available to answer questions about installing, operating and trouble-shooting all Raymarine products.

Help us to help you

When requesting service, please quote the following product information:
• Equipment type
• Model number
• Serial number
• Software issue number

Contacting Raymarine in the US

You can contact Raymarine in the US either using the Raymarine world wide web as detailed above or by calling one of the telephone numbers below.

Accessories and Parts

You can obtain many Raymarine accessories and parts directly from your authorized Raymarine dealer. However, if your dealer does not have the item you want, contact Raymarine Technical Services at:

603-881-5200 extension 2333.

You can use these numbers Monday to Friday 8:00 AM to 6:00 PM Eastern Standard Time or Eastern Daylight Savings Time.

If you are not sure which item is appropriate for your unit, you should first contact the Technical Support Department at:

603-881-5200 extension 2444.

to verify your requirements.

Product Repair and Service

In the unlikely event that your Raymarine unit should develop a problem, contact your authorized Raymarine dealer for assistance. The dealer is best equipped to handle your service requirements and can offer timesaving help in getting your equipment back into normal operation.

If repairs cannot be obtained conveniently, obtain product service by returning the unit to:

Raymarine Product Repair Center
21 Manchester Street
Merrimack, NH 03054

The Product Repair Center is open Monday to Friday 8:15 AM to 5:00 PM Eastern Standard Time or Eastern Daylight Savings Time.

All products returned to the Repair Center are registered upon receipt and a confirmation letter is sent to acknowledge the repair status and the reference number of the product.

We will make every effort to carry out the repair and return your unit as quickly as possible.

If you wish to enquire about the repair status of your unit, contact the Repair Center at:

603-881-5200 extension 2118.

Contacting Raymarine in Europe

You can obtain Technical Support, service and accessories from your authorized Raymarine dealer, or by contacting:

Raymarine plc
Robinson Way
Anchorage Park
Portsmouth PO3 5TD
United Kingdom
Tel +44 (0)23 9271 4713
Fax +44 (0)23 9269 4642

Appendix: Specifications

A60 LCD Color Display

General

Approvals CE - conforms to	2004/108/EC (EMC), EN60945:2002
Mounting	Bracket with dash (flush) mount option
Size (H x W x D)	7.8 x 11.0 x 3.1 in (199 x 280x 79 mm), bracket mounted 6.8 x 9.6 x 2.4 in (173 x 244 x 61 mm), dash mounted
Weight	3.09 lbs (1.40 kg), bracket mounted 2.25 lbs (1.02 kg), dash mounted
Power	External 10.7–18.0 VDC required, 13.8 VDC nominal Floating earth/ fully isolated Consumption with full brightness: 9 W
Environmental: Op/Storage Temp. Range Humidity limit	Waterproof to IPX7; suitable for external mounting 14° F to 122° F (–10° C to + 50° C) up to 95% at 35° C non-condensing
Controls	9 defined keys, 5 soft keys, trackpad and rotary control
Display type	Color TFT LCD
Resolution	320 x 240 pixels (¼ VGA)
Display size	5.7 in
Display Windows	Chart, Fishfinder and Data
Brightness	Screen and keypad illumination: 0 to 100% in 20 steps
Languages	UK English, US English, Danish, Dutch, Finnish, French, German, Icelandic, Italian, Norwegian, Portuguese, Spanish, Swedish
Alarms	Anchor, Arrival, Battery, Deep Depth, MOB, Off Track, Fish, Shallow Depth, Temperature
Connectors	3 pin POWER 5 pin NMEA 8 pin AUX 8 pin SONAR 6 pin GPS

General

Interfaces	RS12 GPS Antenna DSM25 Sounder NMEA0183, receive and transmit CompactFlash card slot
Man Overboard (MOB Mode)	Mark placed with course line; readout shows range, bearing, and lat/long of MOB
Screen functions	Full and half screens available dependent on function.

Chartplotter Features

Cartography	Navionics Charts on CompactFlash cards Chart of the world built in
Chart scaling	1/32nm minimum range
Presentation Modes	Head up, Course up or North up (selectable True or Magnetic, Relative or True Motion)
Waypoints	1000 waypoints entered via cursor, lat/lon or at boat's position. 16 character name can be assigned. 6 different waypoint symbols available Additional storage available on CompactFlash cards
Waypoint Transfer	Waypoints database via NMEA or CompactFlash card
Routes	Up to 495 routes can be stored in the unit's internal memory. A route plan may contain up to 50 waypoints. Same waypoint can be used in multiple routes. Additional storage available on CompactFlash cards. Feature to create a route from track history; up to 50 waypoints created to form new route.
Navigation information	Status Bar at top of screen displays chart range, orientation, relative motion mode, and position data.
Track History	16 tracks with up to 1000 points in each can be stored in the units internal memory. Track optimization reduces number of points used. Additional storage available on CompactFlash cards

Interfacing

DSM connection	For communication with DSM25	
NMEA Input - NMEA 0183	APB	Auto Pilot sentence "B"
	BWC	Bearing & distance to waypoint, great circle
	BWR	Bearing & distance to waypoint, rhumb line
	DBT	Depth Below Transducer
	DPT	Depth of water
	GLL	Geographic position, Latitude/Longitude
	GGA	Global positioning system fix data
	HDG	Heading, deviation & variation
	HDM	Heading, magnetic
	HDT	Heading, true
	RMA	Recommended minimum data for LORAN-C
	RMB	Recommended minimum navigation data
	RMC	Recommended minimum data for GPS
	RTE	Routes
	VHW	Water speed & heading
	VLW	Distance traveled through the water
	VTG	Vector Track and Ground speed
	WPL	Waypoint location
	XTE	Cross Track Error, measured
	ZDA	Time & date
NMEA Output - User selectable	APB	Auto Pilot sentence "B"
	BWC	Bearing & distance to waypoint, great circle
	BWR	Bearing & distance to waypoint, rhumb line
	DBT	Depth Below Transducer
	DPT	Depth of water
	GLL	Geographic position, Latitude/Longitude
	MTW	Water Temperature
	RMB	Recommended minimum navigation data
	RMC	Recommended minimum data for GPS
	RTE	Routes
	VHW	Water speed and heading
	VLW	Distance traveled through the water
	VTG	Vector Track & Ground speed
	ZDA	Time & date

RS12 GPS Antenna

Approvals CE - conforms to	2004/108/EC (EMC)
Dimensions:	diameter: 3.7 in (95 mm) height: 1.2 in (30 mm); 2.4 in (62 mm) with pole mount kit
Weight:	15.3 oz (0.435 kg)
Cable length:	33 ft (10 m)
Receiver type:	SD-GPS, WAAS/EGNOS/MSAS ready, 12 parallel channels
Operating conditions:	temperature range: 14°F to 158°F (–10°C to 70°C) water protection: waterproof to CFR46
Storage conditions	temperature range: 14°F to 158°F (–10°C to 70°C)
Frequency	1575.42 MHz ±1 MHz (C/A code), L1
Sensitivity	Tracking: –152 dBm Acquisition: –139 dBm
Signal acquisition:	Automatic
Time to first fix (TTTF):	Hot start < 6 seconds (typical); Warm start < 40 seconds (typical); Cold start < 60 seconds (typical)
Position accuracy:	2 DRMS ~ 2 m 95%
Speed accuracy:	0.1 kts RMS
Geodetic datum:	WGS-84

Index

36mm (1.4in)

18mm (0.7in)

19mm (0.75") dia. for cable and plug

18mm (0.7in)

36mm (1.4in)

6mm (0.25") dia. pilot hole

Cable Exit Channel

6mm (0.25") dia. 2 positions

D4194-2

GPS Antenna Mounting Template

Note: *Be sure to leave sufficient spacing beneath the mounting surface for the mounting nuts.*

Raymarine World Wide Warranty

Raymarine Inc.

APPLICABLE TO PRODUCTS SOLD THROUGH OFFICIAL RAYMARINE INC. DEALERS, DISTRIBUTORS AND BOAT BUILDERS WITHIN THE AMERICAS AND CARIBBEAN.

Limited warranty

Subject to the terms, conditions and limitations set forth in this U.S. Limited Warranty (hereinafter the 'Warranty'), Raymarine warrants that its products, when properly installed and used, will be free from defects in material and workmanship for a period of twenty-four (24) months (with respect to VHF radios, a period of thirty-six (36) months), from the date of first purchase (the 'Warranty Period').

For the purposes of this warranty, 'date of first purchase' means the date that the product was purchased by the first retail customer; or in the case of a product installed on a new vessel by a certified Raymarine original equipment manufacturer (a 'Raymarine OEM'), the date that such vessel was purchased by the first retail customer.

Raymarine will, at its sole option, repair or replace any defective products or components returned during the Warranty Period in accordance with the terms, conditions and limitations set forth below. **Such repairs or replacement will be the sole remedy of the customer under this Warranty.**

Obtaining Warranty Service

Standard Warranty Service

To qualify for standard warranty service the product must be returned to a Raymarine-certified service agent, or directly to Raymarine in person, or by mail (i) within the Warranty Period, and (ii) within thirty (30) days of the alleged product failure.Any products returned by mail must be securely packaged and sent pre-paid and insured to Raymarine or to a Raymarine-certified service agent. All products, whether returned in person or by mail, must be accompanied by a copy of the original sales receipt, to be eligible for standard warranty service.

A list of Raymarine-certified service agents is available from Raymarine Technical Support or at **www.raymarine.com**

'On Board' Warranty Service

For any Raymarine product or system that (i) has been installed on your vessel by a Raymarine-certified service agent or by a Raymarine OEM, and (ii) has a MSRP equal to or greater than USD $2,500, you are eligible to receive warranty service by a Raymarine certified service agent on-board your vessel ('On Board Warranty Service') for a period of 12 months from the date of first purchase of such product or system, or the date of first purchase of the vessel on which such product or system has been installed (the 'On Board Warranty Period'). In order to obtain On Board Warranty Service eligible customers **MUST**:

- (i) within the On Board Warranty Period, and (ii) within thirty (30) days from the date of the alleged failure giving rise to the warranty claim for which you are requesting On Board Warranty Service, contact a local Raymarine-certified service agent and request On Board Warranty Service.
- Present to the Raymarine-certified service agent a copy of the original sales receipt for the product, together with proof of the date of installation of the product by a Raymarine-certified service agent. The service agent may at its sole option, accept or deny such proof of purchase and proof of installation as sufficient to qualify you for On Board Warranty Service.

Costs associated with travel, mileage, taxi fares, launch or docking fees, aircraft or vehicle rental, meals, customs, shipping, communication charges, and service agent travel costs are specifically excluded from coverage under this

Warranty and are your responsibility. **In addition**, this Warranty does not cover fees associated with hauling, shipping or towing your vessel to a Raymarine-certified agent.

Upon the expiration of the On Board Warranty Period, you are still eligible to receive standard warranty service for the remaining term of the Warranty Period, but will not be eligible for continued On Board Warranty Service.

Limitations and Exclusions

In addition to any other limitations and exclusions set forth herein, Raymarine is not responsible for, and this Warranty does not cover:

- failures due to abuse, misuse, accident, unauthorized alteration or repair, improper installation (whether or not by a Raymarine-certified service agent), shipping damage or corrosion;
- Costs associated with routine system checkouts, alignment/calibration, seatrials or commissioning;
- repair or replacement of consumable items, including, without limitation, fuses, batteries, drive belts, radar mixer diodes, snap-in impeller carriers, impellers, impeller bearings and impeller shafts;
- costs associated with overtime or premium labor costs;
- differences in material, coloring or size that may exist between actual products and the pictures or descriptions of such products in our advertising, advertising literature or on the Internet;
- products purchased by a customer from a United States dealer via the Internet if such products were not delivered and installed within the United States; or
- the replacement of missing components from the package of any product purchased through an online auction site.

Other conditions

This Warranty is fully transferable provided that you furnish the original proof of purchase to Raymarine or, in the case of On Board Warranty Service, to a Raymarine-certified service agent. This Warranty is void if the label bearing the serial number has been removed or defaced.

TO THE EXTENT CONSISTENT WITH STATE AND FEDERAL LAW, THE FOREGOING WARRANTY IS RAYMARINE'S SOLE WARRANTY AND IS APPLICABLE ONLY TO NEW PRODUCTS PURCHASED IN THE UNITED STATES OF AMERICA. THE PROVISIONS OF THIS WARRANTY ARE IN LIEU OF ANY OTHER WRITTEN WARRANTY, WHETHER EXPRESSED OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

THE LIABILITY OF RAYMARINE TO A CUSTOMER UNDER THIS WARRANTY, WHETHER FOR BREACH OF CONTRACT, TORT, BREACH OF STATUTORY DUTY OR OTHERWISE SHALL IN NO EVENT EXCEED AN AMOUNT EQUAL TO TEN (10) TIMES THE MANUFACTURER'S SUGGESTED RETAIL PRICE OF THE PRODUCT GIVING RISE TO SUCH LIABILITY AND IN NO EVENT SHALL RAYMARINE BE LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES.

SOME JURISDICTIONS DO NOT ALLOW EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY FROM JURISDICTION TO JURISDICTION.

This Warranty supersedes and replaces all previous Warranties.

January 2005

Raymarine UK Ltd.

APPLICABLE TO PRODUCT SOLD THROUGH OFFICIAL RAYMARINE UK LTD. DEALERS, DISTRIBUTORS AND BOAT BUILDERS WITHIN EUROPE, THE MIDDLE AND FAR EAST, AFRICA AND AUSTRALASIA.

Limited Warranty

The Raymarine warranty terms and conditions as described below do not affect the customers legal rights and complies with EU Directive 1999/44/EC.

In order to ensure that the product continues to operate efficiently and reliably, we recommend that, before using the product, the customer carefully reads the Owner's Handbook and follows the advice on the safe and correct operation and use of the product. We recommend that the Raymarine product is installed by a Raymarine certified installer. Installation by persons other than a Raymarine certified installer may invalidate the warranty.

1. Product warranty

1.1 Raymarine warrants each new product to be of good materials and workmanship. Raymarine, or its approved agents, will repair or exchange under warranty any parts or product proven to be defective in material or workmanship under normal use, for a period of 2 years (24 months) from date of sale to end user, subject to the limits contained in this warranty document.

1.2 The Raymarine warranty covers the parts and labour associated with any warranty repair as described above, provided that the product is returned to Raymarine or one of its approved agents.

1.3 Raymarine reserve the right to replace under warranty, not repair, certain Raymarine products subject to the limitations below, provided that they are returned to the nearest Raymarine National Distributor. For details of such products refer to the internet at *www.raymarine.com* or contact your nearest Raymarine National Distributor.

2. Onboard warranty

2.1 In addition to the Product warranty cover as described above, Raymarine will, authorize onboard warranty service by the nearest Raymarine approved service agent, subject to the maximum mileage and other limits referred to in paragraph 4.12 below, on products, where proof of installation, or commission by Raymarine certified installers, can be shown.

2.2 The warranty provides for onboard repair or exchange of the product, by Raymarine or its approved service agents, for a period of 2 years (24 months), subject to the limits contained in this warranty document. In the case of a product installed, by a Raymarine certified OEM installer, on a new boat prior to the sale of the boat to a customer, the 2-year period will begin on the date of the sale of the boat to the customer. In the case of a product installed, by a Raymarine certified installer, on a boat already in the possession of the customer, the 2-year period will begin on the date of the commissioning of the installed product.

2.3 Certain Raymarine products are not covered by onboard warranty unless the products are pre-registered and on board warranty is purchased from the Raymarine certified installer. For details of such products refer to the internet at *www.raymarine.com* or contact your nearest Raymarine National Distributor.

2.4 The Purchaseable onboard warranty is subject to the limitations below.

3.Obtaining warranty service

3.1 In the event of warranty service being required, the customer should contact Raymarine Technical Support or the nearest Raymarine approved service agent - the contact details of Raymarine Technical Support and a full list of the names and details of worldwide service agents are available on the internet at *www.raymarine.com* and in the Owner's Handbook.

3.2 In cases where the customer is requesting a warranty service and a Raymarine certified installer has not installed the product; i.e. Product warranty, the affected product must be returned to the customer's local Raymarine approved service agent or direct to Raymarine with:

> 3.2.1 proof of purchase showing the date of purchase and the name of the supplier of the product; and
>
> 3.2.2 the serial number of the affected product; or
>
> 3.2.3 a warranty card completed by the product supplier (which will contain the information required by paragraphs 3.2.1 and 3.2.2).

Subject to the limitations below, the product will be repaired or replaced (at the discretion of Raymarine or a Raymarine Service Agent) at no further cost and promptly returned to the customer.

3.3 In cases where the customer is making a warranty claim and the product has been installed by a Raymarine certified installer, (boat builder, installer, dealer etc.) i.e. Onboard warranty, the nearest Raymarine approved service agent should be contacted and onboard service requested (which will be subject to the limits referred to in paragraph 4.12 below). Before the onboard warranty service is performed, the customer must have available:

> 3.3.1 proof of purchase showing the date of purchase and the name of the supplier of the product; and
>
> 3.3.2 the serial number of the affected product; or
>
> 3.3.3 proof of installation of the product by a Raymarine certified installer; or
>
> 3.3.4 a warranty card completed by the product supplier (which will contain the information required by paragraphs 3.3.1 and 3.3.3).

3.4 In cases where onboard warranty has been purchased - as described in 2.3; the nearest Raymarine approved service agent should be contacted and onboard service requested, information detailed in 3.3.1 and 3.3.2 is required. Onboard warranty service will only be performed if the product serial number confirms that the onboard warranty service has been purchased and is valid.

4. Warranty limitations

4.1 Raymarine warranty policy does not apply to any product that has been subjected to accident, abuse or misuse, shipping damage, alterations, corrosion, incorrect and/or non-authorized service, or products on which the serial number has been altered, mutilated or removed.

4.2 Certain products do not carry the onboard warranty, as described in section 2 above, unless the onboard warranty cover is purchased at the time of installation. The purchaseable onboard warranty is only available on products purchased in specific territories, for further details refer to the internet at *www.raymarine.com* or contact your nearest Raymarine National Distributor.

4.3 Products purchased outside the country of installation will not be covered by onboard warranty.

4.4 Raymarine assumes no responsibility for damage incurred during installation or as a result of improper installation.

4.5 This warranty does not cover routine system checkouts, alignment/calibration, seatrials or commissioning, unless required by replacement of part(s) in the area being aligned.

4.6 Raymarine assumes no responsibility for damage caused by or to other equipment, systems or components occasioned by improper or unauthorized connection, or use, of the product.

4.7 Consumable items, including, but not limited to: fuses, batteries, drive belts, radar mixer diodes, snap-in impeller carriers, impellers, impeller bearings, and impeller shafts are specifically excluded from this warranty. A complete list of the consumable items relating to each product can be found in the Owner's Handbook and/or on the internet at *www.raymarine.com*.

4.8 All costs associated with transducer replacement, other than the cost of the transducer itself, are specifically excluded from this warranty.

4.9 Overtime/premium labour portion of services outside of normal working hours is not covered by this warranty.

4.10 If repairs are necessary under the warranty, the affected product must be forwarded to a Raymarine facility or a Raymarine approved service agent, at the owner's expense.

4.11 The Raymarine warranty does not cover any differences in material, coloring or size between those alluded to in corporate advertising, literature or published on the internet, which are not specifically objected to at the time of delivery.

4.12 Travel costs other than auto mileage, tolls and two (2) hours travel time, are specifically excluded from the warranty on all products. Costs, which are excluded from the coverage of this warranty, include but are not limited to; taxi fares, launch fees, aircraft rental, subsistence, customs, shipping, and communications charges etc.

4.13 Neither Raymarine nor a Raymarine service agent shall be liable for any incidental, indirect, consequential or special (including punitive or multiple) damages, nor shall Raymarine or a Raymarine service agent be liable for any loss of profit, business, contracts, opportunity, goodwill or other similar loss. The liability of Raymarine or a Raymarine service agent to a customer under this warranty, whether for breach of contract, tort, breach of statutory duty or otherwise, shall not exceed US$1,000,000. Nothing in this paragraph 4.13 shall limit the liability of Raymarine or a Raymarine service agent in respect of death or personal injury caused by its negligence, fraud or any other liability which by law, cannot be excluded or limited.

4.14 All Raymarine products sold or provided hereunder are merely aids to navigation. It is the responsibility of the user to exercise discretion and proper navigational skill independent of any Raymarine product.

Raymarine Service Centers....

www.raymarine.com

United States

Raymarine Technical Support
1-800-539-5539 extension 2444, or
(603) -881-5200

Product Repair and Service
Raymarine Product Repair Center
21 Manchester Street,
Merrimack, NH 03054 - 4801
1-800-539-5539

Opening hours:
Monday through Friday 0815 - 1700
Eastern Standard or Eastern Daylight
Savings Time.

Europe, Middle and Far East, Africa and Australasia

Technical Support
Services
Accessories

Raymarine plc
Anchorage Park
Portsmouth
PO3 5TD
England

Tel:
+44(0)23 9271 4713

Fax:
+44(0)23 9266 1228

D7477_1a

Help us to help you

When requesting service, please quote the following product information:
Equipment type ● Model number ● Serial number

Stick barcode label here

Purchased from   Purchase date

Dealer address

Installed by   Installation date

Commissioned by   Commissioning date
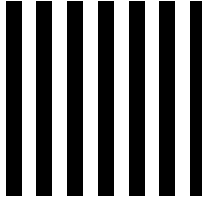
Owners name

Mailing address

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO.2460 NASHUA, NH

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN WARRANTY DEPARTMENT
RAYMARINE INC
21 MANCHESTER ST
MERRIMACK NH 03054-4801

Document number 84065_8
June 2005

North and South America

Detach and mail this portion within **48 hours.**

To validate the warranty, the customer or dealer must fill in the requested information below and mail to address shown on front.

☐ Do not distribute my name or information to third parties.

Stick barcode label here

Purchased from _____ Purchase date _____

Dealer address _____

Installed by _____ Installation date _____

Commissioned by _____ Commissioning date _____

Owner's name _____ Boat's name / Boat type / Location _____

Mailing address _____

_____ Owner's occupation _____

2 1

2

Note: This information is held by Raymarine only and shall not be made available to any other companies. Raymarine may send you mailshots/details of any new products.

Please tick this box ☐ if you do not wish to receive any further information from Raymarine.

Raymarine Limited
Freepost PT 1127
Portsmouth
PO3 5BR
England

Document number 84065_8
June 2005

UK, Europe, Middle East and Far East

Detach and mail this portion within **48 hours.**

To validate the warranty, the customer or dealer must fill in
the requested information below and mail to address shown
on front.

Stick barcode label here

Purchased from

Purchase date

Dealer address

Installed by

Installation date

Commissioned by

Commissioning date

Owner's name

Boat's name / Boat type / Location

Mailing address

Owner's occupation

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http://www.404manual.com

http://www.luxmanual.com

http://aubethermostatmanual.com

Golf course search by state

http://golfingnear.com

Email search by domain

http://emailbydomain.com

Auto manuals search

http://auto.somanuals.com

TV manuals search

http://tv.somanuals.com