West Marine®

SeaVolt

West Marine®
500 Westridge Dr.
Watsonville, CA 95076
Made in China
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West Marine®

SeaVolt

Mobile Power Inverter

175W
400W
700W

Owner's Manual

West Marine®

SeaVolt Power Inverter
175W, 400W, 700W

Owner's Manual

Disclaimer

See warranty information on page 41.

Date and Revision

January 2003, Revision 1

Contact Information

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500 Westridge Dr.
Watsonville, CA 95076
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Part number

445-0221-01-01

1 Introduction

Connected to the 12 volt outlet in your vehicle, boat, RV, or directly from a dedicated 12 volt battery (400 and 700 watt only), the SeaVolt Power Inverter efficiently and reliably powers a wide variety of household AC products such as portable stereos, laptop computers, TVs, VCRs, and other similar products.

The SeaVolt Power Inverter employs reliable solid state power electronics for years of safe, trouble-free operation, and includes the following automatic features to ensure safe and trouble-free operation:

- Low battery alarm
- Low voltage shutdown
- High voltage shutdown
- Overload shutdown
- Over temperature shutdown
- Short circuit protection

About This Guide

To get the best performance from your SeaVolt Power Inverter, we recommend that you read this guide before connecting and using the inverter, and then save it for future reference.

This guide contains:

- Important safety information
- Instructions for connecting the inverter
- Operating guidelines
- Troubleshooting guidelines
- Warranty and service information

2 Important Safety Information

Misusing or incorrectly connecting the SeaVolt Power Inverter may damage the equipment or create hazardous conditions for users. Read the following safety instructions and pay special attention to all **Caution** and **Warning** statements in the guide.

Warnings identify conditions that may result in personal injury or loss of life.

Cautions identify conditions or practices that may damage the SeaVolt Power Inverter or other equipment.

Warnings and Cautions

Warning! Shock Hazard

Keep children away from the SeaVolt Power Inverter. The inverter generates the same potentially lethal AC power as a normal household wall outlet.

Warning! Heated Surface

The SeaVolt Power Inverter housing may become uncomfortably warm, reaching 140° F (60° C) under extended high power operation. Ensure that at least 2 inches (5 cm) of air surround the inverter. During operation, keep it away from materials that may be affected by high temperatures.

Warning! Explosion Hazard.

Do not use the SeaVolt Power Inverter in the presence of flammable fumes or gases, such as in the bilge of a gasoline powered boat, or near propane tanks. Do not use the SeaVolt Power Inverter in an enclosure containing automotive-type, lead-acid batteries. These batteries, unlike sealed batteries, vent explosive hydrogen gas, which can be ignited by sparks from electrical connections.

Caution!

Some chargers for small nickel-cadmium batteries can be damaged if connected to the SeaVolt Power Inverter. Do not use the inverter with the following appliances:

- **Small battery-operated appliances like rechargeable flashlights, some rechargeable shavers, and night lights that are plugged directly into an AC receptacle to recharge.**
- **Battery chargers used in hand power tools. These chargers display a warning label stating that dangerous voltages are present at the charger battery terminals.**

Caution!

Do not connect live AC power to the SeaVolt Power Inverter's AC outlets. The inverter will be damaged even if it is switched OFF.

Do not connect any AC load, which has its neutral conductor connected to ground, to the SeaVolt Power Inverter.

Additional Safety Guidelines

- **Do not insert foreign objects into the SeaVolt Power Inverter outlets.**
- **Never connect the inverter to power utility AC distribution wiring.**
- **Do not use the SeaVolt Power Inverter in temperatures over 104° F (40° C).**
- **Do not expose the SeaVolt Power Inverter to water, rain, snow, or spray.**

Failure to follow these safety guidelines may cause personal injury and/or damage to the SeaVolt Power Inverter. It may also void your product warranty.

3 SeaVolt Power Inverter Features

This section describes the main features of the SeaVolt Power Inverter.

AC (Front) Panel

Figure 1 shows the AC panel of the SeaVolt Power Inverter 175W.

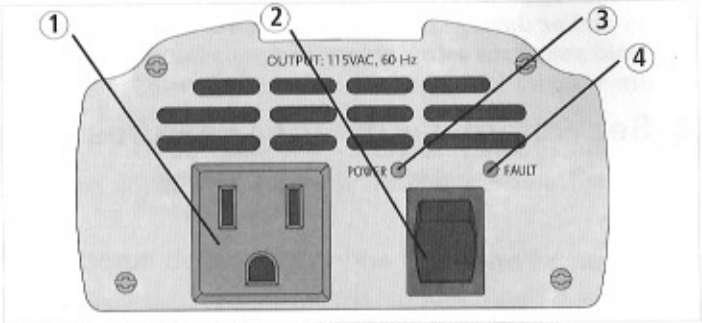

Figure 1 AC Panel of SeaVolt Power Inverter 175W

Figure 2 shows the AC panel of the SeaVolt Power Inverter 400W and SeaVolt Power Inverter 700W.

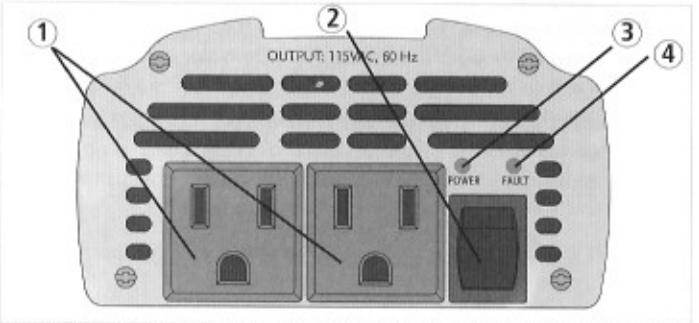

Figure 2 AC Panel of SeaVolt Power Inverter 400W and SeaVolt Power Inverter 700W

(1) AC Outlets

SeaVolt Power Inverter 175W An AC receptacle is located on one end of the inverter. You can plug in any 120-volt appliances with a combined total power consumption of 150 watts or less when the inverter is turned on.

SeaVolt Power Inverter 400W Two AC receptacles are located on one end of the inverter. You can plug in any 120-volt appliances with a combined total power consumption of 320 watts or less when the inverter is turned on.

SeaVolt Power Inverter 700W Two AC receptacles are located on one end of the inverter. You can plug in any 120-volt appliances with a combined total power consumption of 560 watts or less when the inverter is turned on.

(2) **On/Off Switch** When the On/Off switch is on, AC power is available at the outlet.

(3) **POWER Light** The green **POWER** light indicates that AC power is present at the outlet and that the SeaVolt Power Inverter is operating normally.

(4) **FAULT Light** The red **FAULT** light indicates that the inverter has shut down. Shutdown is caused by low or high battery voltage, overload, or excessively high temperatures.

Audible Alarm An audible alarm warns of an impending low voltage shutdown.

Ventilation Openings To prevent overheating, ensure that the ventilation openings on the front and back panels are kept clear.

DC (Back) Panel

Figure 3 shows the DC panel of the SeaVolt Power Inverter 175W.

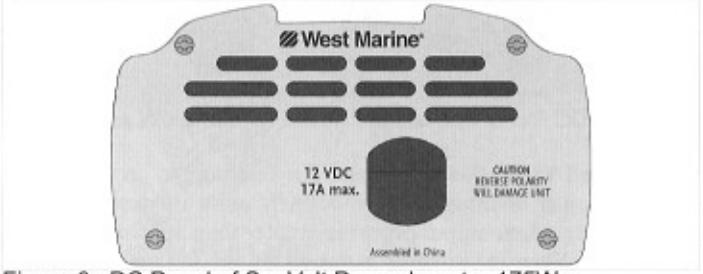

Figure 3 DC Panel of SeaVolt Power Inverter 175W

Figure 4 shows the DC panel of the SeaVolt Power Inverter 400W and SeaVolt Power Inverter 700W.

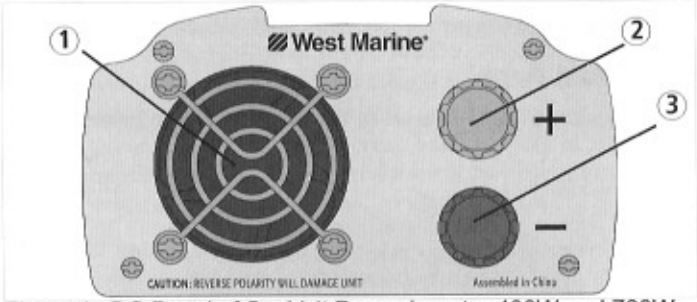

Figure 4 DC Panel of SeaVolt Power Inverter 400W and 700W

① **Fan and Ventilation Openings:** The cooling fan on the SeaVolt Power Inverter 400W and 700W units are designed to operate only when output power is greater than approximately 100 watts. When the inverter is turned on, the fan may operate momentarily. The ventilation openings should not be covered at any time the inverter is operating.

② **Positive and** ③ **Negative Cabling Terminals:** For the SeaVolt Power Inverter 400W and 700W, you connect the ring terminals on the power cables to these terminals. To ensure correct polarity, red must be connected to red and black must be connected to black.

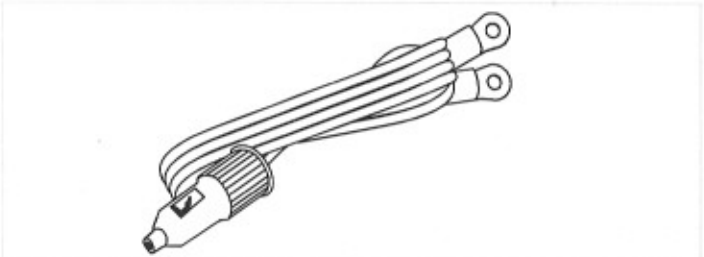
Figure 5 Lighter Plug Cable

Figure 6 Cable for Direct Connection to 12 Volt Battery

Caution!

The SeaVolt Power Inverter 175W can not power loads over 150 watts, so it is not equipped with cabling terminals and can not be run directly from a 12 volt battery.

Types of Connections

Table 1 Types of Connections

Product	Lighter Plug Connection	Cable Clamps/Battery Connection
SeaVolt Power Inverter 175W	Available - A cable is permanently attached to the inverter. Figure 5.	Not Available
SeaVolt Power Inverter 400W	Available - You must connect a separate lighter plug cable (included). Figure 5.	Available - You must connect a separate cable clamp cable (included). Figure 6.
SeaVolt Power Inverter 700W	Not Available	Available - You must connect a separate cable clamp cable (included). Figure 6.

4 Connecting the SeaVolt Power Inverters

Caution!

The SeaVolt Power Inverter must only be connected to a battery that has a nominal output of 12 volts. It will not operate if connected to a 6 volt battery and may be damaged if connected to a battery with 16 volts or more.

Note:

The SeaVolt Power Inverter 700W can not be powered from the lighter socket of a vehicle. It's capacity is greater than the output of a lighter socket.

Choosing a Location

For the best performance, place the inverter on a flat surface in a location that is:

Dry	Do not allow water or other liquids to splash on the inverter.
Cool	Ambient temperatures should be between 32° F and 104° F (0° C and 40° C) - the cooler the better within this range. Keep the inverter away from heating vents.
Well ventilated	Allow at least 2 inches (5 cm) of clearance all around the inverter, and keep the ventilation openings clear.
Safe	Do not install any inverter in a compartment with batteries or flammable liquids, such as gasoline, or explosive vapors.

Clean and free of dust/dirt This is especially important if the SeaVolt Power Inverter is used in a work environment.

Connecting the SeaVolt Power Inverter 175W and SeaVolt Power Inverter 400W for Loads Under 150 Watts

Follow these steps to connect the SeaVolt Power Inverter 175W or 400W inverter:

1. Place the inverter on a flat surface like the floor of your vehicle.
2. Make sure the On/Off switch on the front panel is off.
3. The SeaVolt Power Inverter 175W has a power cord with lighter plug hard-wired into it, so you do not need to complete this step.
   If you have a SeaVolt Power Inverter 400W, take the power cord equipped with the lighter plug (Figure 5) and place the ring terminals over the two cabling terminals on the back of the inverter. (The cabling terminals are shown in Figure 4.)

Caution!

Make sure you connect red to red and black to black, and make sure you screw the nuts on tightly.

4. Place the inverter's lighter plug in the vehicle's cigarette lighter socket or a 12 volt outlet.
5. Turn on the front panel On/Off switch.
   The green **POWER** light indicates that the SeaVolt Power Inverter is operating normally and that AC power is available at the outlet.
6. Plug in the AC appliance you want to operate.
7. If you disconnect the battery, turn the inverter off first.

Connecting the SeaVolt Power Inverter 400W and SeaVolt Power Inverter 700W for Loads Over 150 Watts

You must connect the SeaVolt Power Inverter 400W or 700W directly to a 12-volt battery if you are going to operate loads greater than 150 watts continuously. When the inverter is connected this way, you can operate loads of any size up to 320 watts continuously with a SeaVolt Power Inverter 400W and 560 watts continuously with a SeaVolt Power Inverter 700W.

Warning!

Batteries contain corrosive materials and present an electrical shock hazard. To prevent irritation and burns, wear protective eyewear and clothing when you install the inverter or work with the batteries. Take special care to ensure that metal tools and personal metal objects like rings and bracelets do not contact the battery terminals.

Follow these steps to make a direct battery connection:

1. Place the inverter on a flat surface.
2. Make sure the On/Off switch on the front panel is off.

Caution! Reverse Polarity

Power connections of the 12 volts DC battery to the SeaVolt Power Inverter must be positive to positive and negative to negative.

A reverse polarity connection (positive to negative) will blow a fuse in the inverter and may permanently damage the unit. Damage caused by a reverse polarity connection is not covered by your warranty.

3. Take the cables equipped with battery clips on one end (Figure 6) and place the ring terminals over the two cabling terminals on the back of the inverter. (The cabling terminals are shown in Figure 4.)

Caution!

Make sure you connect red to red and black to black, and make sure you screw the nuts on tightly.

4. Fasten the positive (red) clip to the positive battery post, and then fasten the negative (black) clip to the negative battery post.
5. Turn on the front panel On/Off switch.
   The green **POWER** light indicates that AC power is available at the outlets and that the inverter is operating normally.
6. Plug in the AC loads you want to operate.
7. If you disconnect the battery, turn the inverter off first.

5 Operating the SeaVolt Power Inverter

This section explains how to operate the SeaVolt Power Inverter 175W, SeaVolt Power Inverter 400W and SeaVolt Power Inverter 700W most efficiently.

Operating Conditions and Guidelines

This section describes normal operation as well as conditions that trigger an alarm or automatically shut down the SeaVolt Power Inverter.

Normal Operation When you connect the inverter to the vehicle's cigarette lighter or directly to the 12 volt outlet and turn on the On/Off switch, the green **POWER** light illuminates and AC power is available at the outlets. You can now plug in your AC products and switch them on one at a time.

Low Battery Alarm and Shutdown As the battery discharges, its voltage decreases. When the SeaVolt Power Inverter senses that the voltage at its DC input has dropped to 10.7 volts, it sounds an

alarm. If you ignore the alarm, and the DC input voltage drops below 10.0 volts, the inverter shuts down all loads to save the battery from further discharge. The red **FAULT** light comes on.

Overload Shutdown If you connect an AC load that is rated too high (see Table 2 on page 25) or a load that draws excessive surge power, the SeaVolt Power Inverter shuts down. The red **FAULT** light comes on.

Over Temperature Shutdown The SeaVolt Power Inverter shuts down automatically if it exceeds its safe operating temperature. The red **FAULT** light comes on.

High Input Voltage Shutdown If a defective battery charging system causes the battery voltage to rise to dangerously high levels, the SeaVolt Power Inverter shuts down automatically. The red **FAULT** light comes on.

Shutting the Inverter Off

- If you are going to disconnect the battery, turn the inverter off first.
- Turn the inverter off using the front panel On/Off switch.

Operating Normal Loads

The SeaVolt Power Inverter is capable of continuously powering most 120-volt AC products with the following power rating maximums:

Table 2 Power and Surge Ratings

Inverter	5 minute Max. Power Rating	Continuous Power Rating	Surge Rating Maximum
SeaVolt Power Inverter 175W	175 watts	150 watts	300 watts
SeaVolt Power Inverter 400W	400 watts	320 watts	600 watts
SeaVolt Power Inverter 700W	700 watts	560 watts	1000 watts

The inverter's AC ("modified-sine wave") output waveform, is designed to function similarly to the sine wave shape of utility power. Most AC products correctly rated for the power rating maximums listed above or less will operate normally with the SeaVolt Power Inverter.

Operating Loads With High Surge Requirements

The power, or wattage, rating of AC loads is the average amount of power they use. Some appliances consume more power than their power rating when they are first turned on. TVs, monitors, and electric motors are some products that have high surge requirements at start up. The SeaVolt Power Inverter can supply momentary surge power that is higher than its maximum power rating. Some products rated less than power rating maximum for your inverter may exceed its surge capability and trigger an overload shutdown. If this problem occurs when attempting to operate several AC products at the same time, try first switching on the inverter with all AC products switched off, then one by one switch each on, starting with the high surge product first.

6 Maintaining Battery Condition

The battery operating time of the SeaVolt Power Inverter depends on the charge level of the battery, battery capacity, and the amount of power drawn by the AC loads you are operating. With a typical vehicle battery, you can expect the following:

Table 3 Battery Operating Times

Inverter	Load	Sample Appliance	Operating Time
SeaVolt Power Inverter 175W	50 watts	CD player	6-8 hours
SeaVolt Power Inverter 400W	100 watts	small TV	3-4 hours
SeaVolt Power Inverter 700W	100 watts	small TV	3-4 hours

Here are some guidelines that will help to preserve your battery:

- Vehicle batteries are not designed for repeated deep-discharge cycles, and constantly recharging a vehicle's battery will shorten its life. Therefore, when you are using a vehicle battery as a power source, start the vehicle every hour or two to recharge the battery.
- The SeaVolt Power Inverter will operate while the engine is running, but the voltage drop that occurs when the engine starts may trigger a low voltage shutdown.
- Vehicle batteries are designed to provide brief periods of very high current needed for engine starting. They are not intended for constant deep discharge. Regularly operating the inverter from a vehicle battery until the low voltage alarm sounds will shorten the life of the battery. Consider connecting the inverter to a separate deep discharge type battery if you will be frequently running electrical products for extended periods of time.
- If you are not going to use the SeaVolt Power Inverter for more than a week, turn off the On/Off switch. The inverter draws less than 0.25 amps when the On/Off switch is on and no load is connected, but it will eventually discharge the battery.

7 Troubleshooting

This section will help you identify the source of most problems that can occur with the SeaVolt Power Inverter.

If you have a problem with the inverter, please review this section before contacting Technical Support. If you are unable to solve a problem and need to contact Technical Support, please prepare for the call by writing down the following details:

- Inverter's serial number
- How long the inverter has been in use
- Where it is installed
- Appliances operating when the problem occurred
- A brief description of the problem

Technical Support (toll free in North America) 1-800-670-0707

Common Problems

Warning! Electrical Shock and Burn Hazard

Do not dismantle the SeaVolt Power Inverter. It does not contain any user-serviceable parts. Attempting to service the inverter yourself could result in an electrical shock or burn.

Buzz in Audio Systems

Some inexpensive stereo systems have inadequate internal power supply filtering and buzz slightly when powered by the SeaVolt Power Inverter. The best solution is to use an audio system with a good quality filter.

Television Interference

The SeaVolt Power Inverter is shielded to minimize interference with TV signals. If TV signals are weak, you may see interference in the form of lines scrolling across the screen. Try one of these suggestions to minimize or eliminate the problem:

- Use an extension cord to increase the distance between the SeaVolt Power Inverter and the TV, antenna, and cables.
- Adjust the orientation of the SeaVolt Power Inverter, television, antenna, and cables.
- Maximize TV signal strength by using a better antenna, and use shielded antenna cable where possible.
- Try a different TV. Different models vary considerably in their susceptibility to interference.

Troubleshooting Reference

This section describes problems, their symptoms, possible causes, and specific remedies.

The AC load will not operate. No inverter lights are on.

Possible Cause	Suggested Remedy
Battery is defective.	Check battery and replace if required.
The inverter has been connected with reverse DC input polarity.	Check connection to battery. The inverter has likely been damaged and needs to be repaired. Have the unit repaired (not covered under warranty).
Loose cable connections.	Check cables and connections. Tighten as required.

Inverter will run some small loads, but not larger ones.

Possible Cause	Suggested Remedy
Voltage drop across DC cables.	Shorten cables or use heavier cables.

Measured inverter output is too low.

Possible Cause	Suggested Remedy
A standard "average-reading" AC voltmeter has been used to measure output voltage, resulting in an apparent reading 5-15 volts too low.	For accurate measurement, the modified sine wave output of the SeaVolt Power Inverter requires a "true RMS" voltmeter for accurate measurements.
The battery voltage is too low.	Recharge the battery.

Alarm is sounding.

Possible Cause	Suggested Remedy
Low voltage shutdown or thermal shutdown has occurred.	Shorten cables or use heavier cables. Recharge battery. Allow unit to cool. Improve air circulation around unit. Locate units in a cooler environment. Reduce load if continuous operation is required.

Battery run time is less than expected.

Possible Cause	Suggested Remedy
The AC product power consumption is higher than rated.	Use a larger battery to make up for the increased power requirement.

Possible Cause	Suggested Remedy
The battery is old or defective.	Replace the battery.
The battery is not being charged properly.	Some chargers are not able to fully recharge a battery. Make sure that you use a powerful charger.
Power dissipation in DC cables.	Use shorter/heavier DC cables.

The AC load will not operate. The FAULT light is on.

Possible Cause	Suggested Remedy
The AC product(s) connected are rated at more than the inverter's continuous power rating; overload shutdown has occurred.	Use a product with a power rating less than the inverter's continuous power rating (see Table 2 on page 25).

Possible Cause	Suggested Remedy
The AC product(s) connected are rated at less than the inverter's continuous power rating; high starting surge has caused overload shutdown.	The product exceeds the inverter's surge capability. Use a product with a starting surge power within the SeaVolt Power Inverter's capability.
Battery is discharged (alarm is sounding).	Recharge battery.
The inverter has overheated due to poor ventilation and has shutdown (alarm is sounding).	Switch inverter OFF and allow to cool for 15 minutes. Clear blocked fan or remove objects covering unit. Move the inverter to a cooler place. Reduce load if continuous operation is required.
Input voltage is greater than 15 volts.	Verify the charging system is properly regulated and the battery is 12 volts nominal.

8 Specifications

Specifications are subject to change without notice.

	SeaVolt Power Inverter 175W	SeaVolt Power Inverter 400W	SeaVolt Power Inverter 700W
AC output voltage (nominal)	120 volts AC	120 volts AC	120 volts AC
DC input voltage range	10–15 volts DC	10–15 volts DC	10–15 volts DC
Continuous AC output power	150 watts	320 watts	560 watts
5 minutes AC output power	175 watts	400 watts	700 watts

	SeaVolt Power Inverter 175W	SeaVolt Power Inverter 400W	SeaVolt Power Inverter 700W
Maximum AC output surge power	300 watts	600 watts	1000 watts
AC output frequency	60 ± 4 Hz	60 ± 4 Hz	60 ± 4 Hz
AC output waveform	Modified Sine Wave	Modified Sine Wave	Modified Sine Wave
Battery drain with no AC load (at 12 V input)	0.15 amps	0.20 amps	0.25 amps
Efficiency (maximum)	90%	90%	90%
Ambient operating temperature range	32° F – 104° F 0° C – 40° C	32° F – 104° F 0° C – 40° C	32° F – 104° F 0° C – 40° C

	SeaVolt Power Inverter 175W	SeaVolt Power Inverter 400W	SeaVolt Power Inverter 700W
Low battery alarm (nominal)	10.7 volts	10.7 volts	10.7 volts
Low battery shutdown (nominal)	10.0 volts	10.0 volts	10.0 volts
High battery shutdown point (nominal)	15.0 volts	15.0 volts	15.0 volts
Dimensions (L x W x H)	5 1/8 x 4 1/8 x 2 1/4 in 130 x 105 x 56 mm	5 7/8 x 4 1/8 x 2 1/4 in 149 x 105 x 56 mm	7 1/4 x 4 1/8 x 2 1/4 in 186 x 105 x 56 mm
Weight	1 lb 3 oz. 550 grams	1 lb 6 oz. 655 grams	1 lb 14 oz. 900 grams

9 Limited Warranty

Our Commitment to Quality:

This product was designed to provide many years of outstanding use. If it does not meet your expectation at any time, please do one of the following:

- Contact your local West Marine store
- Call 1-800-BOATING
- Log on to our website at www.westmarine.com to send an email

Important:

Evidence of original purchase, such as the original receipt, a cancelled check, or a credit card receipt is required for warranty service.

WARRANTOR:

WEST MARINE PRODUCTS, INC. ("WEST MARINE")

ELEMENTS OF WARRANTY:

WEST MARINE warrants for one year, to the original retail owner and user, this product to be free from defects in materials and craftsmanship with only the limitations or exclusions set out below.

WARRANTY DURATION:

This warranty to the original retail owner and user shall terminate and be of no further effect 12 months after the date of original retail sale. The warranty is invalid if the Product is (A) damaged or not maintained as reasonable or necessary, (B) modified, altered, or used as part of any conversion kits, subassemblies, or any configurations not sold by WEST MARINE, (C) improperly installed or programmed, (D) serviced or repaired by someone other than an authorized WEST MARINE service center, as provided below, for a defect or malfunction covered by this warranty, or (E) installed or programmed by anyone other than as detailed by the Owner's Manual for this product. THIS WARRANTY IS NON-TRANSFERRABLE.

STATEMENT OF REMEDY:

In the event that the product does not conform to this warranty at any time while this warranty is in effect, warrantor will either, at its option, repair or replace the defective unit and return it to you without charge for parts, service, or any other cost (except shipping and handling) incurred by warrantor or its representatives in connection with the performance of this warranty. Warrantor, at its option, may replace the unit with a new or refurbished unit. THE LIMITED WARRANTY SET FORTH ABOVE IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO THE PRODUCT AND IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES OF ANY NATURE WHATSOEVER, WHETHER EXPRESS, IMPLIED OR ARISING BY OPERATION OF LAW, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTIBILITY OR FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY DOES NOT COVER OR PROVIDE FOR THE REIMBURSEMENT OR PAYMENT OF INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow this exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you.

LEGAL REMEDIES:

This warranty gives you specific legal rights, and you may also have other rights, which vary form state to state. This warranty is void outside the United States of America.

PROCEDURE FOR OBTAINING PERFORMANCE OF WARRANTY:

If, after following the instructions in Owner's Manual you are certain that the Product is defective, pack the Product carefully (preferably in its original packaging). The product should include all parts and accessories originally packaged with the Product, include evidence of original purchase and a note describing the defect that has caused you to return it. The Product should be shipped freight prepaid, by traceable means, to WEST MARINE's Authorized Service Center at:

West Marine Authorized Service Center
2395 Bert Court
Hollister, CA 95023