

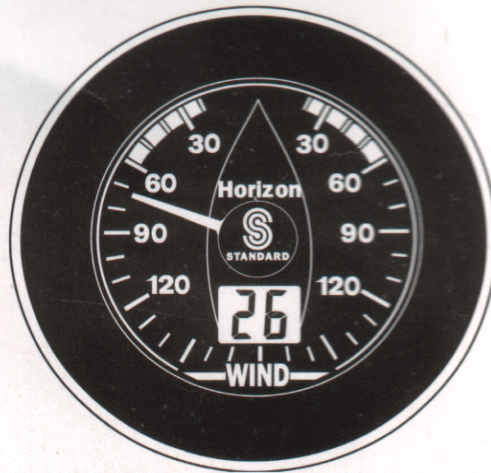
# Horizon WS45 Wind/Speed Point

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## Owner's Manual

### Contains:

- ☐ General Information
- ☐ Accessories
- ☐ Installation
- ☐ Operation
- ☐ Maintenance
- ☐ Specifications
- ☐ Troubleshooting
- ☐ Schematic



**Standard**  
Communications

## **1. GENERAL INFORMATION**

### **1.1 INTRODUCTION**

The WS45 Wind/Speed Point is a high-quality instrument. The WS45 provides accurate information needed to set the proper sail trim. The instrument's advanced microprocessor computes and displays apparent wind speed and direction. When the WS45 is coupled with the optional SL45 Speed/Log, velocity made good (VMG) is calculated by and displayed on the SL45 instrument allowing sailing to its full potential, both on and off the wind.

### **1.2 FRONT PANEL**

The front panel includes an analog wind direction indicator and a 2-digit numeric wind speed display. The front panel is designed to withstand direct water spray without damage.

### **1.3 REAR PANEL**

The instrument rear panel contains two 5-pin connectors, a power cable, and two control keys. One 5-pin connector is used for connection to the SL45 Speed/Log instrument when it is installed. The red molded 5-pin connector is used for connection to the Masthead Cable. The third cable connects the instrument to a DC voltage source.

The two keys on the rear panel are used for calibration and linearization of the instrument to the Masthead Assembly.

### **1.4 MASTHEAD ASSEMBLY**

The WS45 wind instrumentation includes a Masthead Assembly made up of an extremely low-drag precision anemometer (wind speed cup/wind direction vane), supported by a masthead boom which connects to and is supported by the Mounting Block at one end of the Masthead Cable. A 5-pin connector which connects to the Wind Instrument is at the opposite end of the Masthead Cable. The Masthead Cable length may be adjusted by cutting out an unused portion during installation. The Masthead Cable Junction Box is provided to re-connect the cut ends of the cable.

## 2 CONTROLS AND CONNECTORS

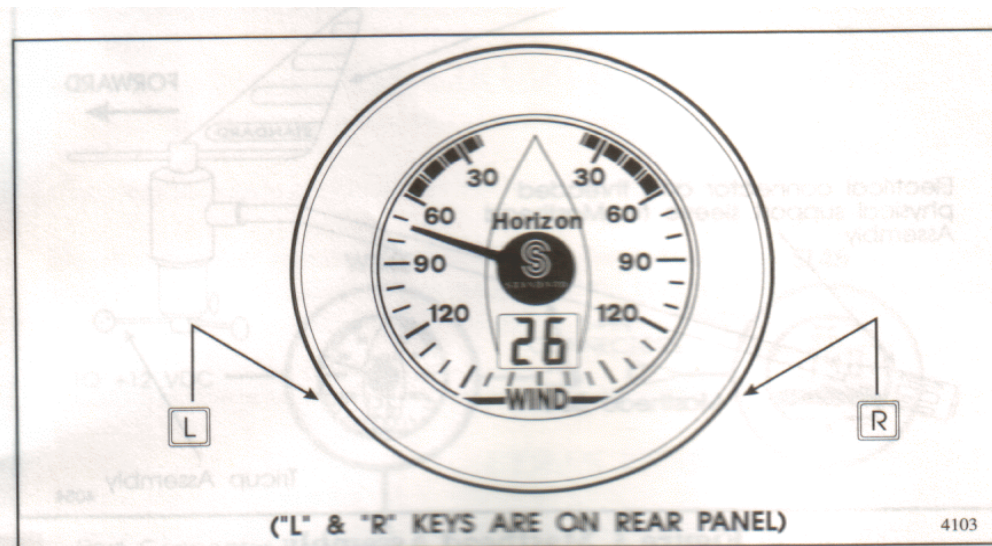


Figure 1. Front Panel

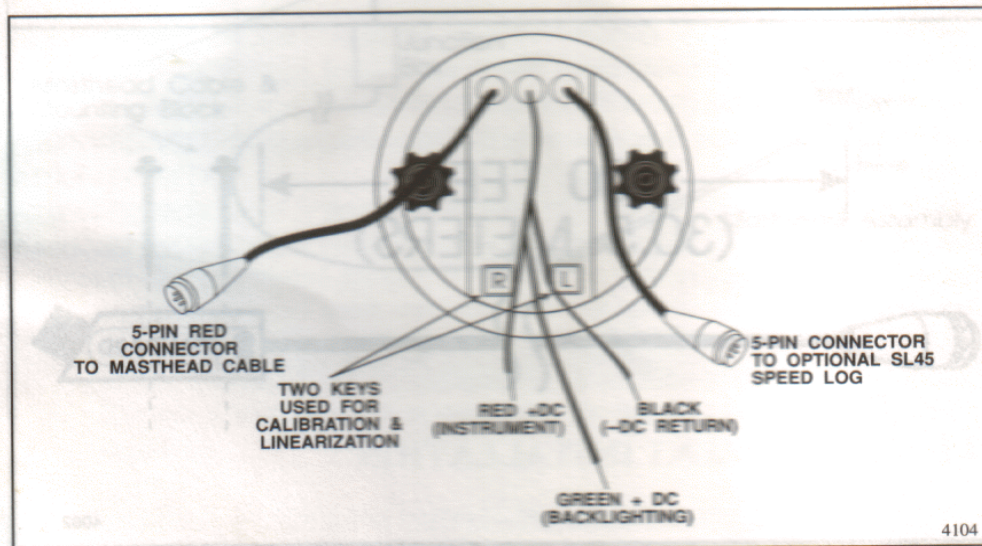
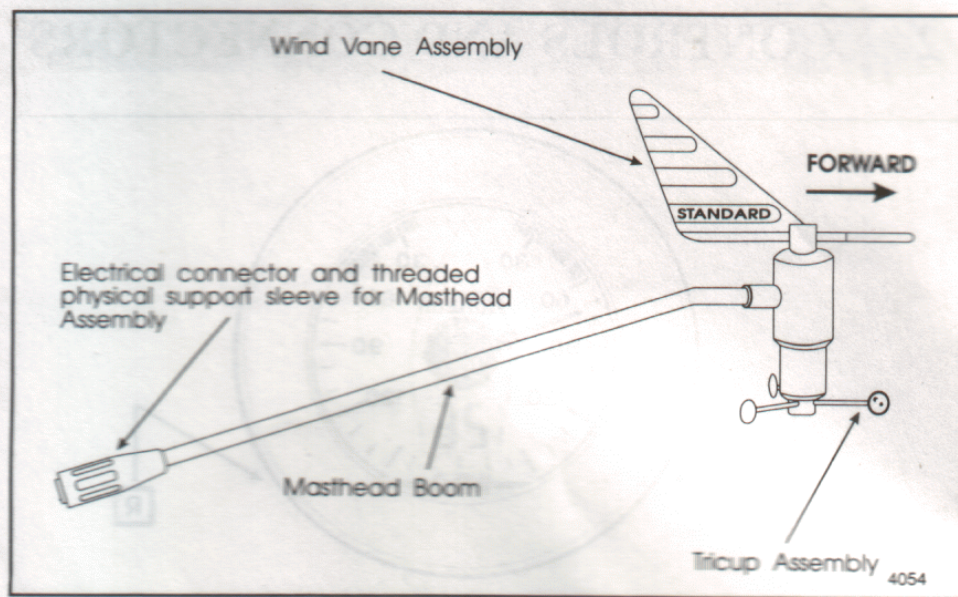
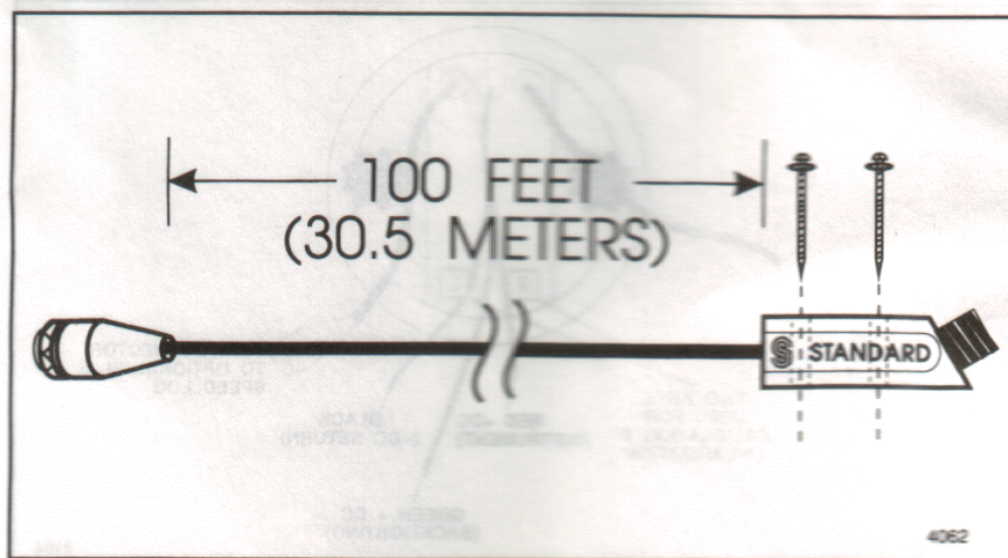


Figure 2. Rear Panel

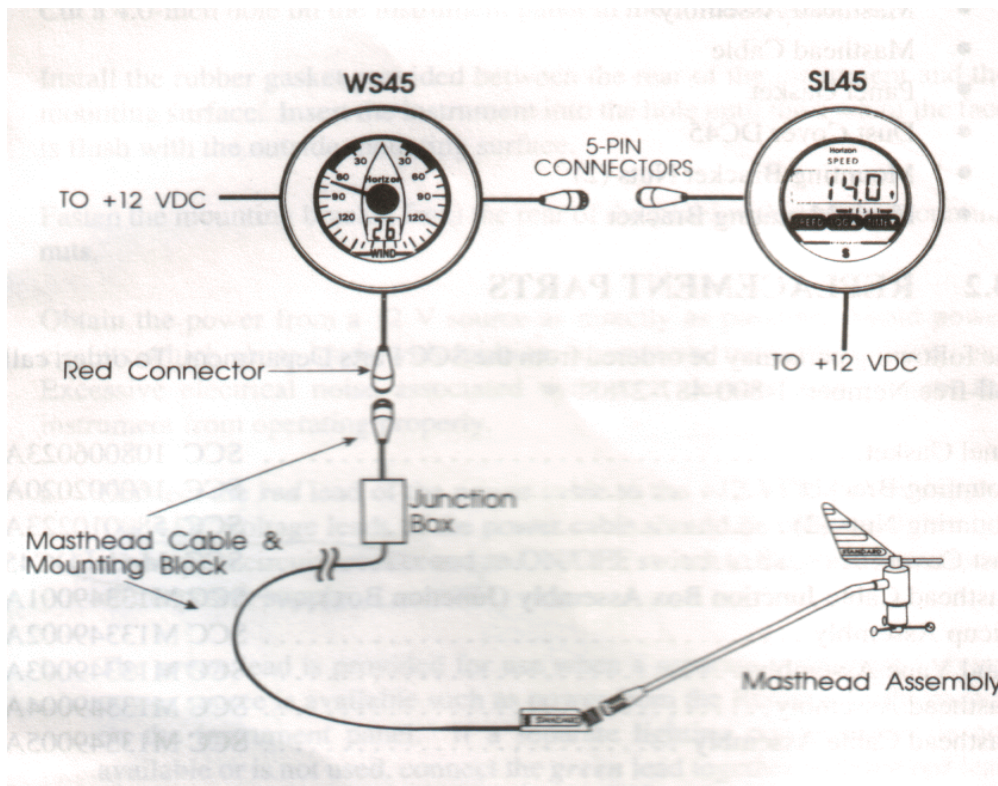




**Figure 3. Masthead Assembly**



**Figure 4. Masthead Cable & Mounting Block**



**Figure 5. Connection to SL45 Speed/Log Instruments**

## **ACCESSORIES**

### **3.1 PROVIDED WITH INSTRUMENT**

Junction Box  
 Masthead Assembly  
 Masthead Cable  
 Panel Gasket  
 Dust Cover DC45  
 Mounting Bracket -Nuts (2)  
 Flush Mounting Bracket

### **3.2 REPLACEMENT PARTS**

The following parts may be ordered from the SCC Parts Department. To order, call Toll-free Number: 1-800-487-2788.

Panel Gasket	SCC 108006023A
Mounting Bracket	SCC 160002020A
Mounting Nuts (2)	SCC 580010223A
Dust Cover	SCC Model DC45

Masthead Cable Junction Box Assembly (Junction Box)    SCC M13349001A  
Tricup Assembly    SCC MI 3349002A  
Wind Vane Assembly    SCC M13349003A  
Masthead Assembly    SCC MI 3349004A  
Masthead Cable Assembly    SCC MI 3349005A

## 4    **INSTALLATION**

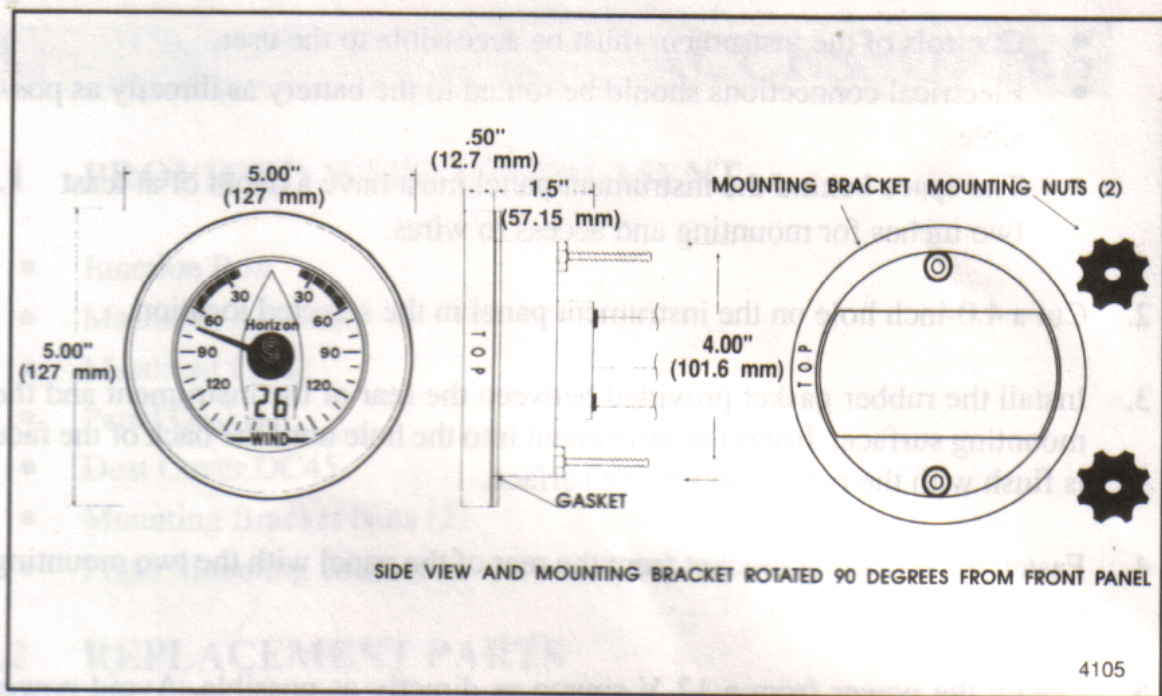
### 4.1    **INSTRUMENT INSTALLATION**

The WS45 can be easily installed in different types of instrument panels. To install, perform the following steps:

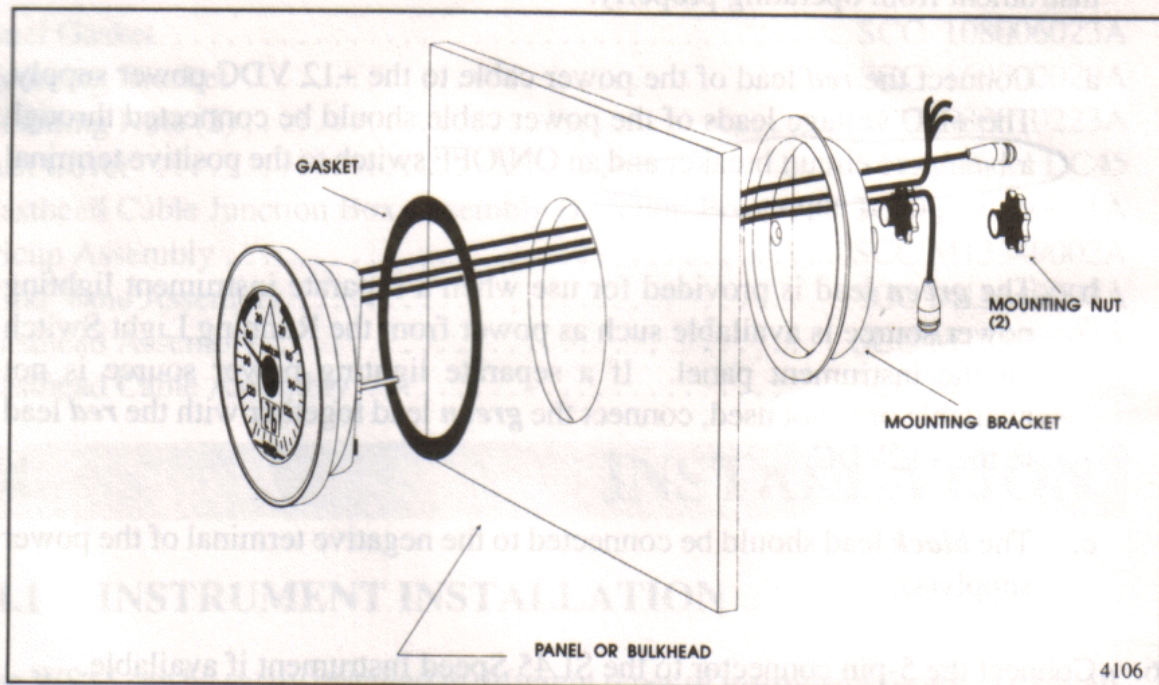
1.    Select a suitable location for the instrument. When selecting the location for mounting, the following are recommended:
  - Controls of the instrument must be accessible to the user.
  - Electrical connections should be routed to the battery as directly as possible.
  - The space behind the instrument panel must have a depth of at least two inches for mounting and access to wires.
2.    Cut a 4.0-inch hole on the instrument panel in the selected location.
3.    Install the rubber gasket provided between the rear of the instrument and the mounting surface. Insert the instrument into the hole until the back of the face is flush with the outside mounting surface.
4.    Fasten the mounting bracket from the rear of the panel with the two mounting nuts.
5.    Obtain the power from a 12 V source as directly as possible. Avoid power circuits which share loads with ignition, alternators, radio transmitters, etc. Excessive electrical noise such devices may prevent the instrument from operating properly.
  - a.    .Connect the **red** lead of the power cable to the +12 VDC power supply. The +DC voltage leads of the power cable should be connected through a 1 -ampere circuit breaker and an ON/Off switch to the positive terminal of the power supply.
  - b.    The **green** lead is provided for use when a separate instrument lighting power source is available such as power from the Running Light Switch on the instrument panel. If a separate lighting power source is not available or is not used, connect the **green** lead together with the **red** lead to the +12 VDC.
  - c.    The **black** lead should be connected to the negative terminal of the power supplies.
6.    Connect the 5-pin connector to the SL45 Speed Instrument if available.



7. Do not connect the red 5-pin connector to the Masthead Cable at this time.  
See Masthead Installation in the next paragraph.



**Figure 6. Mounting Dimensions**



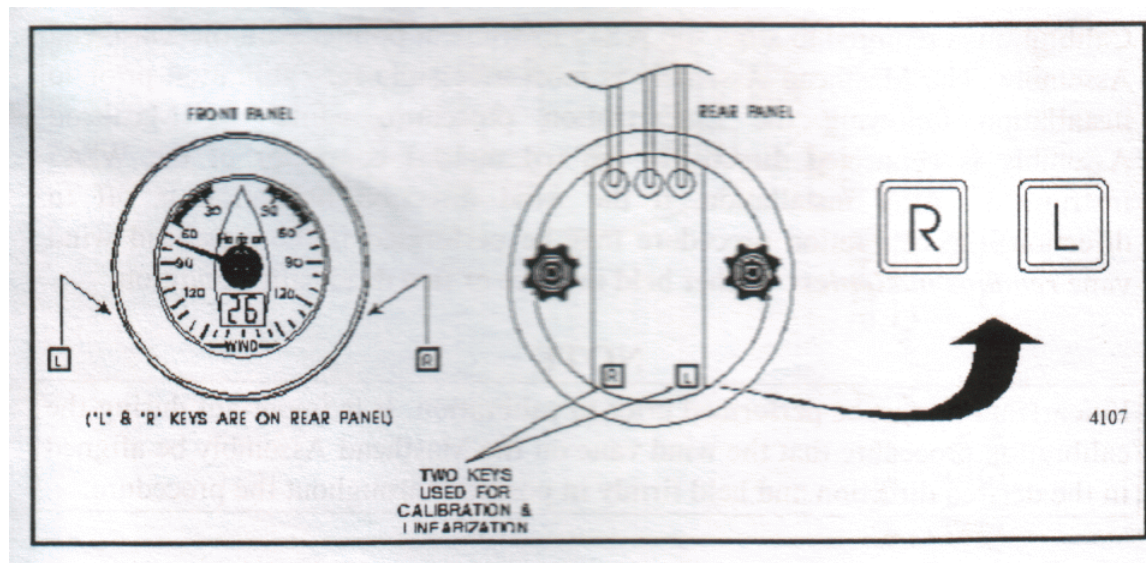
**Figure 7. Installation**

### 4.1.1 Operation

1. Prior to installation of the Masthead Cable, Masthead Assembly, and Junction Box the instrument should be checked for proper operation.
2. Connect the Masthead Cable to the Masthead Assembly and the instrument.
3. Connect 12 VDC to the instrument.
4. Spin the tricups on the masthead assembly. The instrument should show a speed reading in the display.
5. Turn the wind vane and the instrument pointer should follow; calibration for accuracy will be performed in paragraph 4.1.2.2.

### 4.1.2 Linearization and Calibration

Linearization and Calibration procedures can be performed before or after installation. The procedures are easier accomplished before installation because the masthead wind vane must be held motionless while performing the Calibration procedure. If for some reason in the future a new or repaired Masthead Assembly is to be used in the WS54 system. the linearization and calibration procedures are performed again for proper WS45 performance. The orientation of the two keys used to perform linearization and calibration are shown below.

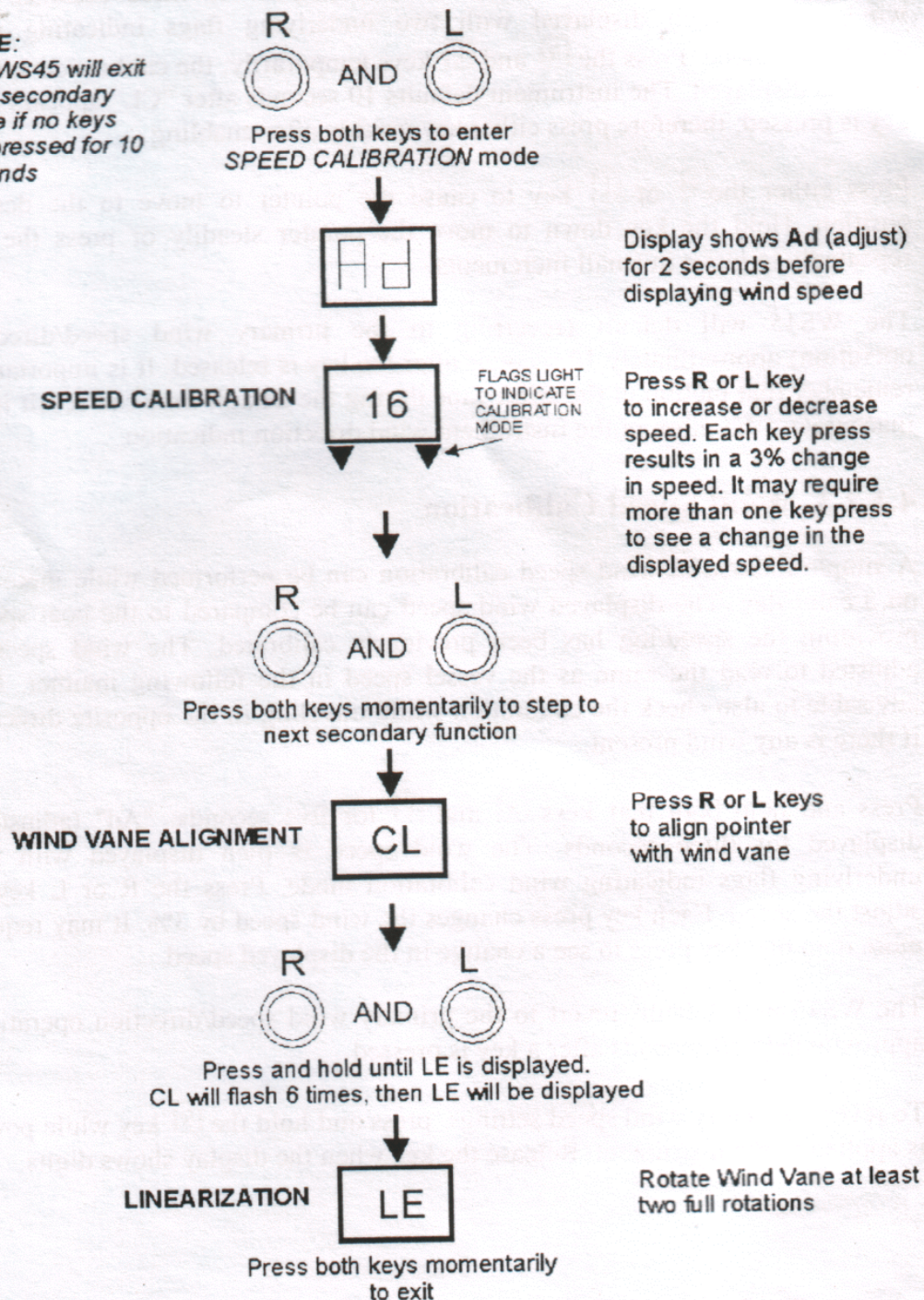




## WS45 SECONDARY FUNCTIONS

**NOTE:**

The WS45 will exit from secondary mode if no keys are pressed for 10 seconds



#### **4.1.2.1 Linearization**

Linearization is required to compensate for minor electrical irregularities that may be introduced between the Masthead Assembly and the WS45 instrument. The result is linear precision from 0 to 360degrees of wind vane rotation. The process can be performed before installation is accomplished. The Masthead Assembly is connected directly, to the red molded connector of the WS45 instrument allowing easy access to the wind vane.

Press and hold both rear keys “R” and “L” for five seconds; “AD” (adjust) is displayed for three seconds. The wind speed is then displayed with two underlying flags indicating wind calibratrion mode. Press both “R” and “L” keys momentarily; the calibration symbol “CL” is displayed. Press and hold both “R” and “L” keys; the display will blink - continue to hold both keys until the linearization symbol “LE” is displayed - release the keys. The “LE” mode is ready for the next step in the linearization process.

Slowly rotate the masthead wind vane through two or more turns. The total number of turns is not important as data is collected and stored into memory on each turn. The speed of the rotation is also not critical; it should be between 5 and 40 seconds for a revolution. Press both “R” and “L” keys for at least ½ second to exit the linearization mode.

#### **4.1.2.2 Wind Direction Calibration**

Calibration is required to alight the WS45 instrument pointer with the Masthead Assembly. The Masthead Assembly is most accessible for calibration prior to installation following the Linearization procedure while the Masthead Assembly is connected directly to the red molded connector the WS45 instrument. After installation, if the wind direction indication is off in direction, the calibration procedure may be performed if the masthead wind vane remains motionless - either held in place or in a dead calm condition.

**NOTE:** Linearization must be performed prior to calibration. It is important during the calibration procedure that the wind vane on the Masthead Assembly be aligned in the desired direction and held firmly in position throughout the procedure.

Position the wind vane in the desired direction. Press and hold both “R” and “L” keys for five seconds; “AD” (adjust) is displayed for three seconds. The windspeed is then displayed with two underlying flags indicating wind calibration mode. Press the “R” and “L” keys temporarily; the calibration symbol “CL” is displayed. The instrument defaults 10 seconds after “CL” appears if no key is pressed; therefore press either key quickly after enabling.

Press either the “R” or “L” key to cause the pointer to move to the desired position. Hold the key down to move the pointer steadily or press the key repeatedly to move in small increments.

The WS45 will default (reverting to the primary wind speed/direction operation) approximately 10 seconds after the key is released. It is important to remember that motion of the wind vane during the default time can result in an inaccurate calibration of the instrument wind direction indication.

#### **4.1.2.3 Wind Speed Calibration**

A simple method of wind speed calibration can be performed while motoring on a calm day. The displayed wind speed can be compared to the boat speed providing the speed/log has been previously calibrated. The wind speed is adjusted to read the same as the vessel speed in the following manner. It is advisable to also check the calibration while traveling in the opposite direction if there is any wind present.

Press and hold both rear keys “R” and “L” for five seconds; “AD” (adjust) is displayed for three seconds. The wind speed is then displayed with two underlying flags indicating wind calibration mode. Press the “R” or “L” key to adjust the speed. Each key press changes the wind speed by 3%. It may require more than one key press to see a change in the displayed speed.

The WS45 will default (revert to the primary wind speed/direction operation) approximately 10 seconds after a key is pressed.

To revert to factory wind speed settings, press and hold the “R” key while power is applied to the instrument. Release the key when the display shows digits.

1. Connect the Masthead Cable to the WS45 instrument and route the wire to the Junction Box. Cut the Masthead Cable at the Junction Box adding 6 to 12 inches for cable stripping.
2. Remove the Junction Box cover and connect the cut cable wires to the terminal strip. Replace the cover.

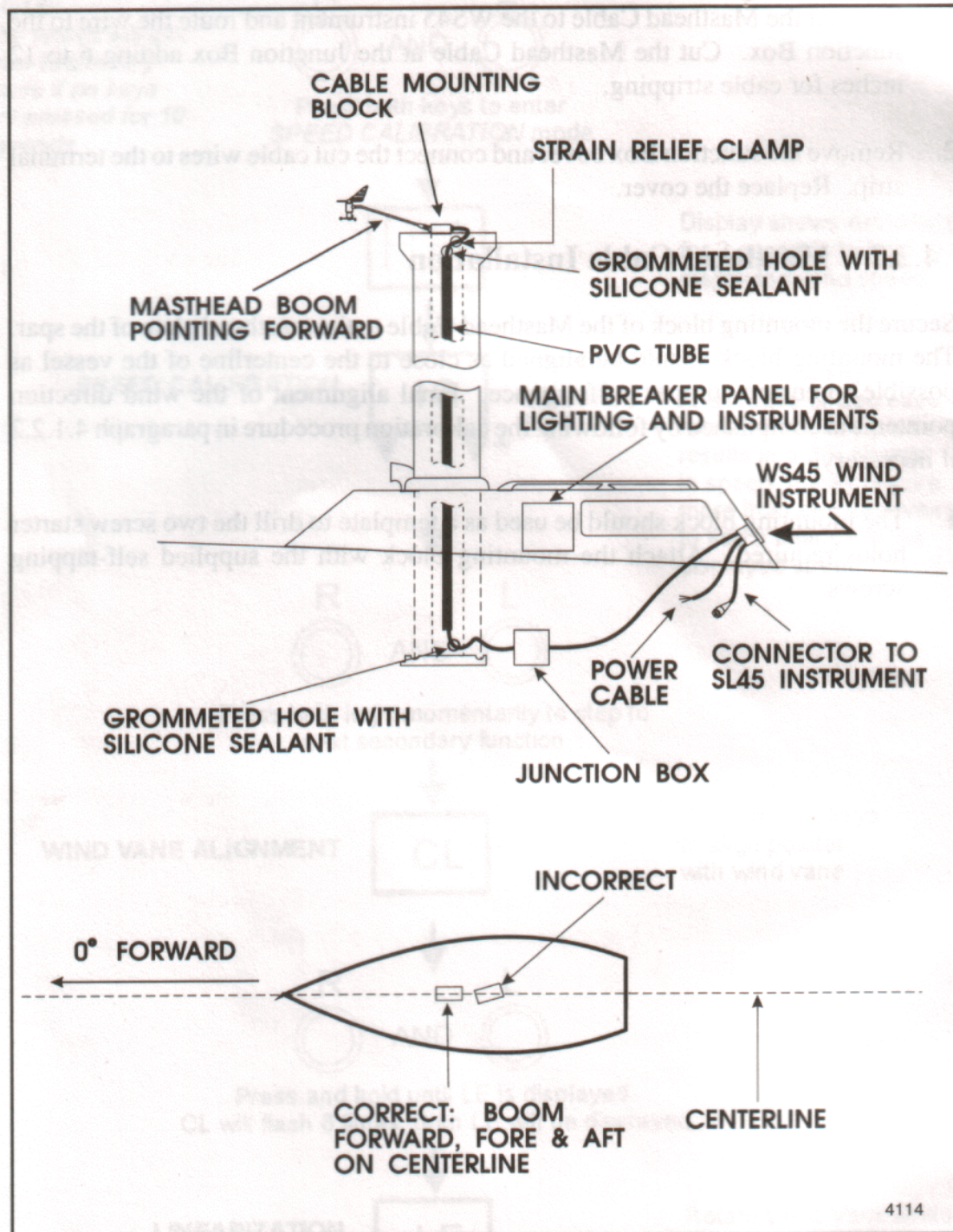
#### **4.2.2 Masthead Cable Installation**

Secure the mounting block of the Masthead Cable to the masthead plate of the spar. The mounting block should be aligned as close to the centerline of the vessel as possible to ensure proper performance. Final alignment of the wind direction pointer is accomplished by following the calibration procedure in paragraph 4.1.2.2 if necessary.

1. The mounting block should be used as a template to drill the two screw starter holes required. Attach the mounting block with the supplied self-tapping screws.
2. To accommodate the Masthead Cable, drill two 5/16" to 3/8" holes in the mast, one near the top and one near the base. See Figure 8. These holes will accommodate grommets with 1/4" inner diameters. Insert a grommet in each hole to prevent cable chafe.



3. Mount a strap or cable strain-relief clamp to the mast immediately above the grommeted cable entrance hole near the masthead. See Figure 8. The clamp is placed around the cable and secured to prevent strain on the cable connections at the Masthead Cable Mounting Block.



**Figure 8. Masthead Installation**

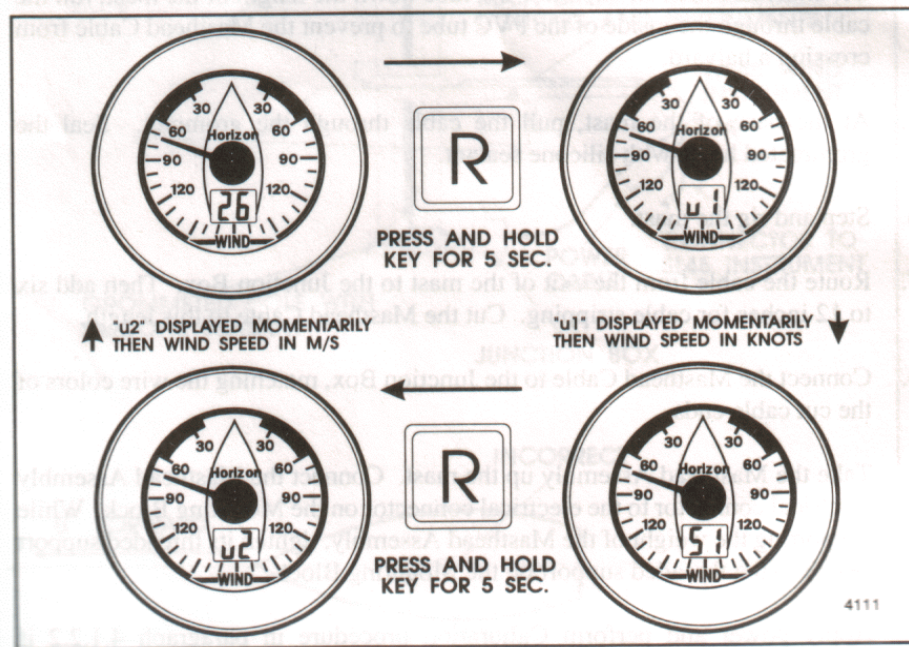
4. Starting at the masthead grommet, run the cable through the inside of the mast. Or, on a mast with an internal PVC tube down the length of the mast, run the cable through the inside of the PVC tube to prevent the Masthead Cable from crossing a halyard.
5. At the base of the mast, pull the cable through the grommet. Seal the grommets with silicone sealant.
6. Step and rig the mast.
7. Route the cable from the exit of the mast to the Junction Box. Then add six to 12 inches for cable stripping. Cut the masthead Cable to this length.
8. Connect the Masthead Cable to the Junction Box, matching the wire colors of the cut cable ends.
9. Take the Masthead Assembly up the mast. Connect the Masthead Assembly electrical connector to the electrical connector on the Mounting Block. While supporting the weight of the Masthead Assembly, tighten its support sleeve to the threaded support on the Mounting Block.
10. Apply power and perform Calibration procedure in paragraph 4.1.2.2 if necessary.

## **5 OPERATION**

WS45 operates when power is applied. The pointer indicates apparent wind direction and the 2-digit display indicates apparent wind speed.

### **5.1 WIND SPEED UNITS (KTS or M/S)**

Press and hold the "R" key for five seconds to switch between units; "u1" will be displayed momentarily to indicate the readings are in knots, or "u2" will be displayed momentarily to indicate the readings are in meters per second (M/S).



## 6 MAINTENANCE

Your instrument is designed for years of trouble-free operation assuming proper installation and care of the unit are provided. Following the installation and operation guidelines in this manual should ensure optimum performance of the instrument.

In the unlikely event that the instrument shall fail to perform or shall need servicing, please contact the following:

*Factory Repair Facility*  
*SCC- Standard Communications Corp.*  
*4876 W. North Temple St.*  
*Salt Lake City, Utah 84116*  
*Telephone No. 1-800-366-4566*  
*FAX No. 1-801-359-4122*

## 7 SPECIFICATIONS

### Size

Face Plate diameter ..... 5-inches (127mm)  
 Mount ..... 4-inch (101.6 mm) diameter hole  
 Depth behind panel. . ..... 2..25 inch (56.2 mm)  
 Display ..... 2 digit numeric (1-inch (25.4 mm)high)  
 Water Integrity ..... Front will withstand direct water spray  
 Operating Voltage ..... 13.8 VDC  $\pm$  20%



Operating Temperature ..... 32 to 122 F(0 to 50C)  
 Current Drain ..... 80 mA nominal  
 RF Interference .... < 6 dB Quieting on any marine radio channel  
 ..... (with 3 dB gain antenna) within 1 meter of the WS45.  
 Apparent wind Speed ..... 0-99 KTS or 0-50 M/S  $\pm 2\%$   
 Apparent wind Direction ..... 0 to 359 degrees  
 Power Cable ..... 6 ft (2m)  
 Mast Cable (incl. mounting block & connector) .. 100 ft (30.5m)  
 Wind Direction .....  $\pm 4$  degrees nominal  
 Maximum Wind Speed Log (resettable)  
 Wind speed ..... 0-99 KTS or 0-50 M/S  
 Calibration Range .....  $\pm 180$  degrees  
 Non-volatile memories:  
 ..... Linearization  
 . ..... Calibration  
 ..... Wind speed units (KTS or M/S)

## 8.1 TROUBLE SHOOTING CHART

PROBLEM	SOLUTION
Faulty wind speed or wind direction indication.	<ol style="list-style-type: none"><li>1. Possible defective Masthead Cable.</li><li>2. Possible defective Masthead Assembly.</li><li>3. Possible defective instrument.</li></ol> <p>Remove the Masthead Assembly from the masthead and connect it directly to the instrument red molded cable. If the indication is normal, the Masthead Cable is defective. If the problem persists, see Section 6 for service address.</p> <p>NOTE: The instrument and Masthead Assembly may be connected directly I for linearization of the repaired or new equipment prior to installation. See paragraph 4.1.2 .</p>
No wind speed or wind direction indication.	Check the DC power source applied to the WS45.