Congratulations in choosing a high performance marine instrument and welcome to the growing family of SR Mariner product owners. Since our establishment in 1973, we have engineered our products to give you quality at a reasonable price.

To familiarize yourself with all the features and installation procedures please read the following instructions carefully.

If you still have any questions or comments please call your nearest dealer or call the factory at (716)693-5977 or write:

SR Instruments
600 Young Street
Tonawanda, NY 14150
Attn: Service Department

Before proceeding, please check for all necessary parts:

1. NAV-5st - main station
2. NAV-5cd - cockpit display or remote
3. CM - combination mast unit
4. DT-5 - depth transducer
5. TR-1E5 - knot/log transmitter
6. CAHN-5 - cable harness
7. C6504 - 65 foot cable with connector
8. C0204 - 2 foot cable with connector
9. DCB-5 - 30 foot coaxial cable with 2 BNC connectors
10. TH-1 - thru hull fitting
11. DP-1 - dummy plug
12. ICW-5 - instrument cover for cockpit display

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It is recommended that you temporarily hook up your SR MARINER equipment before installation so that you become familiar with its connections and system performance. DO NOT CUT ANY CABLES, but connect according to wiring diagram (fig.1). As you go through the steps, verify functions and readings at both the station and cockpit. Also change the sea state switches to test each mode:

1. Switch station display to read KNOTS. Spin the paddle wheel and a (+) sign will appear on the cockpit knots display only. The station will give the speed reading without the trim indicator.

2. Continue spinning the paddle wheel until the log registers on station and cockpit.

3. Switch station display to read DEPTH. Put the transducer over the side of the boat or in a pool of water (min.3-4 feet). If both the station and cockpit DEPTH displays read the same and is accurate, then adjust the alarm settings to set off the buzzer in the station and cockpit (details to operate alarms are found in OPERATIONS under DEPTH).

4. Switch station display to read WIND SPEED. Spin the cups of the mast unit and verify readings on both the station and cockpit WIND display.

5. Switch the AW-CH to AW and turn the wind vane through the full range scale. If that is good, then switch to CH and slowly turn to 50 degrees (port then starboard) and the green indicator should turn on and the pointer will go to the blue inside scale and read 50 degrees. Rotate to 10 degrees and then check the other side.

If all functions perform satisfactorily, proceed with installation. If the system fails to perform, check all connections. If system still fails to perform check with your dealer for advice and/or replacement if needed.

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I. CHARACTERISTICS OF THE NAV-5 SYSTEM

A. STATION - 11.0" x 7.0" x 3.0"

1. FUNCTIONS:
   a. A digital display that can be switched to monitor water speed, Wind speed, or depth.
   b. A pointer display for Apparent Wind or Closed Haul.
   c. Audible and visual alarm for shallow water
   d. Audible depth alarm for deep water
   e. Two log counters:
      1. Resettable - 0 to 999.99 miles
      2. Total - 0 to 9999.99 miles

2. CONTROLS:
   a. Power on-off and lighting on-off
   b. Light dimmer
   c. Averaging controls for water speed, depth, Wind speed, and apparent wind
   d. Depth alarm set for shallow and deep
   e. Depth audible alarm on-off switch
   f. Apparent Wind - Closed Haul automatic switch
   g. Log reset buttons for the station and for the cockpit

3. ADJUSTMENTS:
   a. Knots calibration
   b. Log calibration
   c. Apparent Wind calibration for full scale
   d. Wind speed calibration
   e. Depth shallow gain adjustment
   f. Depth keel offset adjustment

B. COCKPIT DISPLAY - 12.0" x 5.5" x 1.0"

1. FUNCTIONS:
   a. Water speed from 0 to 19.99 kph (or mph) with a + or - trim indicator
   b. Log from 0 to 99.99 miles
   c. Wind speed from 0 to 75 kph (or mph)
   d. Depth from 2 to 300 feet with visual and audible alarms
   e. Apparent Wind (pointer display) with Closed Hauled scale
   f. Closed Haul indicator

C. TECHNICAL DATA

1. CURRENT DRAW
   a. .75 amps with lights on
   b. .15 amps with lights off

2. DEPTH FREQUENCY
   a. 160 kilohertz (KHZ)

3. SPEED SENSOR
   a. 14400 pulses per nautical mile
D. MAST UNIT:
Mount the base for the mast unit assembly with four screws so that the mast pipe will point straight toward the bow. Run the free end of the 65 foot cable down or through the mast and splice it to the 2 foot length cable. It is preferred to solder the connections and use heat shrinkable sleeving, but if not convenient, use the crimp connectors provided. This will connect to the 4 pin plug of the cable harness also allowing a quick disconnect so you can unstep the mast.

NOTE: When the mast unit can not be mounted with pipe pointed forward, then the vane can be readjusted for other angles as follows - set the position of mast unit and then loosen the two set screws in the wind vane and remove vane. Turn the potentiometer shaft until the display reads 180 degrees. Carefully install vane pointing straight aft and tighten set screws. Check display for 10 and 90 degrees on port on starboard. If satisfactory, put Loctite or equivalent on set screws.

E. CABLES:
1. Cable Harness- Plugs into navigation station with cables to:
   a. 25 foot 20 conductor cable with connector that plugs into the cockpit display. This connector will pass through a 7/8" diameter hole or inner diameter of a pipe.
   b. 25 foot 4 conductor cable with connector to bottom of mast.
   c. 25 foot 3 conductor cable with connector to knot/log transmitter.
   d. 20 foot 2 conductor cable to power panel or battery.

2. Depth Cable- 30 foot coaxial cable with 2 BNC connectors.

NOTE: THE CABLES MAY BE ALTERED TO ACCOMODATE INDIVIDUAL NEEDS EXCEPT FOR THE DEPTH CABLE.

FIGURE 1
II. INSTALLATION

A. NAVIGATIONAL STATION
The navigational station may be mounted on any convenient vertical bulkhead. Although this unit is well sealed, it is intended for internal mounting. It should be placed so that its connectors, switches, and calibration adjustments are accessible. Mount with four #8 screws using the dimensions or the template provided.

B. COCKPIT DISPLAY
1. Bulkhead Mounting:
   Drill a 3" diameter hole and two 5/16" holes according measurements or the template drawing. Bolt the display with the 1/4" nuts and flat washers provided. Caulking should not be necessary unless the surface is curved or uneven.

2. Pedestal Mounting:
The factory stocks pods for the cockpit display if you choose to mount on a pedestal. The cable harness connector will pass through the inner diameter of the 1" OD tubing used with these pods.

C. SPEED AND DEPTH TRANSDUCERS:
The preferred position is where water is diverging around the hull and is free from turbulence and eddies. This is generally in the forward one-third of the hull in front of the keel and approximately one foot off the centerline. Generally the knotmeter transmitter can be mounted on one side of the keel with depth transducer in a similar position on the opposite side of the keel. If due to access considerations, it is necessary to locate the depth transducer and knotmeter transmitter on the same side on a fore and aft line, be sure to locate the depth transducer in front so that the turbulence created by the paddlewheel does not interfere with the depth sensor.

The depth transducer should be installed in a fairly flat area where degree of angle does not exceed 20 degrees. An alternate location is along side the keel two feet off the keel, ahead of amidships.

The thru hull fittings require a 2 1/8" hole with a 30 degree flange. SR Mariner provides a tool (THT) that drills and flares this hole in one operation. If this tool is not available locally contact the factory and arrangements can be made to rent one.

NOTE: MAXIMUM HULL THICKNESS FOR THRU HULL FITTING IS 1-1/4"

1. Thru the Hull:
   Choose the location of the sensors and cut your holes for the thru-hull fittings. File a notch FACING FORWARD to seat the key way. The key way ensures proper orientation of the sensors for use and/or maintenance. After proper fit is secured, place bedding compound around the lip and body of the fitting where it will be in contact with the hull. Insert the thru-hull fitting and tighten the fitting nut by using a spanner wrench or a tap with a small wooden block against the nut to provide a snug fit. DO NOT OVER TIGHTEN!

2. Cemented to the Hull (for DEPTH ONLY):
   If your primary importance is for shallow water monitoring, the transducer may be cemented to the hull, thereby eliminating a hole through the hull. The position selected must not have air voids, balsa fillers, etc. It is best to choose a location and make a small putty dam and fill it with water and put your transducer in it to see if a stable depth is indicated. At this point back off on the gain until reading becomes unstable to see how much reserve gain is available. Compare this gain setting with the transducer hung overboard: this will give an approximation of attenuation at the chosen location. If operation is suitable, clean the surface of the transducer with lacquer thinner to remove the anti-fouling paint. Clean the hull to remove grease and mold release. The transducer may be cemented with epoxy or fiberglass resin (stir the epoxy slowly). THERE SHOULD BE NO AIR BUBBLES IN THE ADHESIVE BOND.
III. OPERATION - Operation of the navigational station is as follows:

A. POWER: Power for the system is controlled by the POWER switch.

B. LIGHTS: The cockpit lights may be turned on or off with the switch labeled REMOTE. The station lights are controlled with the switch labeled NAV STA. The brightness of the lights is set with the DIM control.

C. DISPLAY: The three position toggle switch selects WINDSPEED, KNOTS, or DEPTH data to be displayed. The bar on the left is used to identify the data being selected. The (+) or (-) acceleration symbols are not displayed on this unit.

D. SEA STATE: The averaging switches are provided to smooth or average the data for APPARENT WIND, WINDSPEED, DEPTH, and KNOTS DISPLAY. For calm seas, a faster response is desired therefore use the CALM position. If waters are rough then switch to the ROUGH position to slow the response. MED position is used for normal conditions.

E. DEPTH: Two depth alarm set points are provided - shallow and deep. The shallow alarm is used to warn you of shallow waters. The deep alarm is used as an anchor watch so you do not drift without warning. Either may be set from 0 to 50 feet, HOWEVER, THE DEEP ALARM MUST BE SET DEEPER THAN THE SHALLOW ALARM.

1. Alarm Set: Set the display switch to DEPTH. Hold the SHALLOW-DEEP switch in the up or SHALLOW position and adjust the SHALLOW knob until the desired reading is obtained. Hold the switch in the down position and adjust the DEEP knob for setting the deep alarm.

2. Alarms: If only the shallow alarm is desired, turn the ALARM switch in the up position. If both or either alarm is desired, then turn the switch to the down position. The center position is the OFF position. NOTE: The red L.E.D. will come on whether the audible alarms are turned on or off.

F. APPARENT WIND/CLOSE HAUL: When the AW-CH is in the up position, the apparent wind needle will indicate the angle on the outer white scale. If the switch is in the down CH position, then the needle will indicate the blue scale while in the 10 to 50 degree range on either port or starboard.

G. LOG: Three log readouts are provided:

1. A LCD display of 0 to 99.99 miles on the cockpit. This display can be reset by turning off the power or by pressing the RESET-REMOTE DISPLAY button on the station.

2. A resetting mechanical counter display of 0 to 999.99 miles in the station.

3. A non-resettable mechanical counter display of 0 to 9999.99 miles in the station. The mechanical counters retain their readings when power is turned off.
IV ADJUSTMENTS AND CALIBRATION

The system is calibrated in KNOTS at the factory, however individual hull design, sensor placement, etc. may require slight readjustments for best accuracy. These adjustments are accessible behind the plastic plugs along the side of the navigational station by using a small blade type screwdriver.

A. KNOTS AND LOG: After making an initial determination of distance by using a chart, markers, etc. adjust the LOG CAL to correct the accuracy. If there is a current, then travel both ways and take the average of the two. Once the log has been calibrated then you can adjust the knots by timing the clicks from the log and adjusting the KNOTS CAL. Use the following table to help you:

<table>
<thead>
<tr>
<th>KNOTMETER-SECONDS PER CLICK - .01 MILE (KNOTS)</th>
<th>NAUT. MILE (6080 FT)</th>
<th>STATUTE MILE (5280 FT)</th>
<th>KNOTMETER-SECONDS PER CLICK - .01 MILE (MPH)</th>
<th>NAUT. MILE (6080 FT)</th>
<th>STATUTE MILE (5280 FT)</th>
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B. DEPTH:

1. Shallow Gain: When the transducer sends out its signal, it can receive a reflection from the keel, pilings, and other nearby objects before the reflection from the bottom. To eliminate the returns from these unwanted signals, the SHALLOW GAIN must be adjusted. For best results, start in 10-15 feet of water and turn the SHALLOW GAIN clockwise until the readings are substantially less than the actual depth. Now turn back counter clockwise until the readings return to the actual depth. Repeat this procedure while under way.

2. Gain: The gain control is a manual override on the automatic gain control and is used to set the maximum gain. This control is located internally of the station on the lower left hand corner of the depth board, 90 degrees from the SHALLOW GAIN control. It is usually set near maximum, however if electrical disturbances cause unstable readings, then turn counter clockwise to eliminate such noise.

3. Keel Offset: The depth can be adjusted to display depths from the surface of the water, or from the keel to bottom, or transducer to bottom. The unit is factory set for transducer to bottom. If you desire a different set up then measure the water depth with a lead line and adjust the KEEL OFFSET clockwise for a lower reading (keel bottom to bottom) or counter clockwise for a higher reading (surface to bottom). Each indicator represents an 1 foot increment.

C. APPARENT WIND: The apparent wind can be adjusted by the AW CAL on the left hand side of the station. Usually the best method is to switch on CH and turn the vane to 50 degrees port until the close haul is triggered then back off a little to bring it back to the normal scale. At this point adjust the pointer to 50 degrees then check starboard side. It may be necessary to attempt this a couple of times to balance the two sides.

D. WINDSPEED: The wind speed is factory set, but if a calibration is needed then adjust the WS CAL located next to AW CAL.
V. SERVICE - ALL SERVICE SHOULD BE DONE BY QUALIFIED PERSONNEL ONLY! If it becomes necessary to perform any immediate service work, please read the following carefully:

A. MODULES: Most of the circuitry and display components are contained on individual plug-in modules as listed below:

<table>
<thead>
<tr>
<th>NAVIGATIONAL DISPLAY</th>
<th>COCKPIT DISPLAY</th>
</tr>
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<tbody>
<tr>
<td>0730</td>
<td>Power supply module</td>
</tr>
<tr>
<td>0731</td>
<td>LCD display module</td>
</tr>
<tr>
<td>0732</td>
<td>Knots/log module</td>
</tr>
<tr>
<td>0734</td>
<td>Depth module</td>
</tr>
<tr>
<td>0735</td>
<td>AW/CH module</td>
</tr>
</tbody>
</table>

To remove a module, please follow the instructions to avoid any damage to the electronics or any harm to yourself:

1. Remove all power and other connections to the unit.
2. Remove the TEN perimeter screws from the back plate.
3. Locate the necessary module and remove the screws that hold it in place.
4. Carefully lift straight up.
5. To replace module, line up the pins, push down and replace the screws.

B. SENDING UNITS: All units can be removed while the boat is in the water.

1. DT-5: The face of the transducer must be kept clean and have ONE coat of anti-fouling paint if installed thru-hull. To remove old paint use a paint thinner instead of abrasives or sand blasting otherwise you can damage the transducer.

2. TR-1E5: The paddle wheel should be clean and free of any growth. If it is necessary, a thin coat of anti-fouling paint can be applied to the paddle wheel and inside housing. This should keep off growth while not deterring the performance of the unit. Also to maintain good operation, lubricate the paddle wheel should be lubricated at least once a year.

3. CM: It is recommended to remove the mast unit when the boat is put in for storage, however it is not always convenient to do so, therefore cover the unit to protect it from the harsh elements. The generator requires periodic lubrication, depending upon use and environment. We recommend a teflon based lubricant.

If any problems or inquiries, please contact the factory at:

SR Instruments
600 Young Street
Tonawanda, NY 14150
(716)693-5977

ACCESSORIES

<table>
<thead>
<tr>
<th>WV</th>
<th>WIND VANE</th>
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<tr>
<td>6637S</td>
<td>5K POT FOR MAST UNIT</td>
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<tr>
<td>ICW-5</td>
<td>INSTRUMENT COVER FOR COCKPIT DISPLAY</td>
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<td>AC</td>
<td>ANEMOMETER CUPS AND HARDWARE</td>
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