

**LCD ECHO SOUNDER
LCS-200
OPERATION MANUAL**

SITEX[®]

DOC NO. LCS-200 12-89

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1. IMPORTANT NOTICE

Congratulations on your purchase of the SI-TEX LCS-200 LCD Echo Sounder. It is recommended that you read through the operation manual prior to installing and operating the unit.

As the LCS-200 has a built-in simulator, reading the operational portion by looking at the simulator display would make you understand the operations more deeply. Bringing the simulator mode up on the screen is easy; press and hold RECALL key and turn the power on.

After reading the operation manual, if you still do not understand about the operations and installations of your unit, we recommend you contact your dealer or SI-TEX Marine Electronics Customer Service Department.

WARNING

- A. The temperature guarantee range of the supertwist LCD is not so wide. Exposing the LCS-200 to direct sunlight or a heat source will make the screen black and invisible. It even may damage the unit.
- B. Make sure to connect the power cable to the battery to match polarity. Black with white line lead is for positive and solid black lead is for negative.
- C. The LCS-200 is not waterproof but splashproof. When installing the unit, take it into your consideration.

2. INTRODUCTION

The LCD-200 is a 4" supertwist LCD echo sounder. Since it has auto mode for Gain and Range control as well as manual mode, it automatically selects the proper range and gain just by hitting the power switch. It also has the zoom and bottom lock displays in addition to the standard display, that tell you the conditions in the sea in more details.

The 200 watts RMS output power is provided for precise fish detection and greater depth capability. The fish symbol supplied shows the echo levels from fish school in 4 different size fish marks.

If the standard transducer is connected, the LCS-200 will display depth, boat speed, log and surface water temperature as well as echo sounder's information.

The data input/output function based on NMEA0183 format makes it possible to interface with other equipment. The unit displays the present position input from the external Ioran C, while it sends out those kinds of information like depth, water temperature, boat speed and log.

Manual controls such as clean echo and anti clutter are also provided to allow you tailor the display for your particular fishing/cruising situation.

3. TRANSDUCER INSTALLATION AND MAINTENANCE

CAUTION

Mounting your transducer requires drilling holes into transom which can affect its water integrity and, therefore, should be attempted only by competent persons. If you are in doubt as to your competence to attempt this installation, we recommend you take your boat to a marine dealer and/or marina that has people qualified and experienced in transducer installations.

Saltwater Maintenance

Antifouling paint - If the vessel is kept in saltwater, sea growth can accumulate rapidly on the transducer face and seriously reduce performance in a matter of weeks. It is recommended that at least the acoustic face of the transducer be coated with a special transducer antifouling paint. Alternatively, the entire transducer can be painted and then generally is easier to keep clean. All copper base paints are unsatisfactory.

If fouling does occur, use a stiff brush or putty knife to remove growth. Wet sanding of fouled surfaces is permissible with #220 or finer grade wet or dry paper.

3.1. TRANSMOUNT MOUNT

Your LCS-200 is provided with a transom mount transducer as standard. It contains three sensors of depth, boat speed and water temperature.

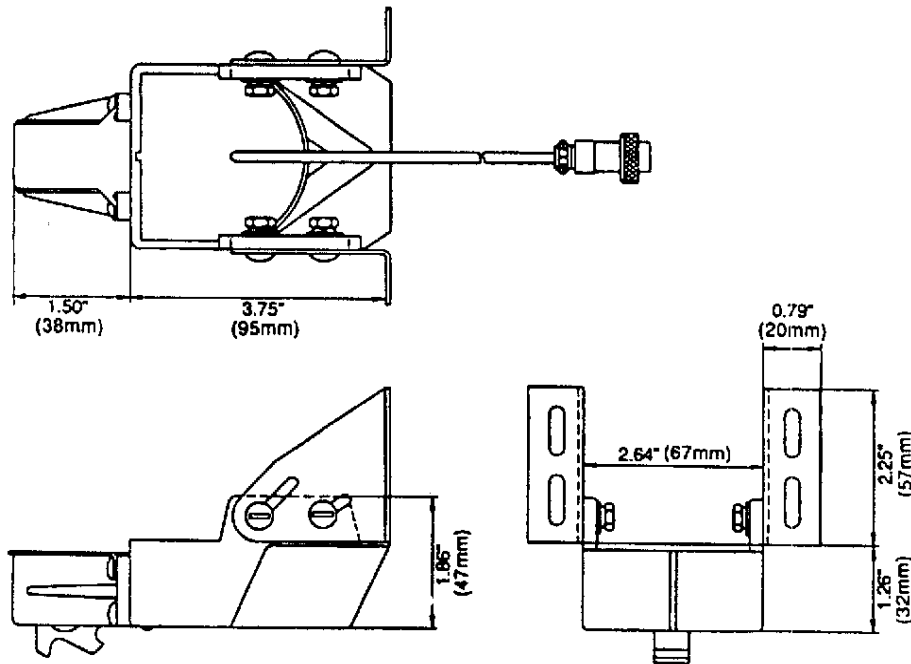


Figure 1 Transom Mount Transducer

Since your LCD echo sounder's performance depends on how well the transducer has been installed, please carefully read through the following mounting procedures:

- 1) For proper performance, the transducer's mounting location must be chosen carefully. The transducer should be mounted in a location that is free from turbulence and air bubbles created by movement of the boat as it travels through water. Air bubbles greatly reduce the efficiency of the transducer. It is also strongly recommended that the transducer be mounted on the port side and not in front of the propeller. To determine the best mounting location, operate the boat at several different speeds and observe the water as it passes under the transom. Study the turbulence created by the hull structure, the keel, and the lifting strakes. Keep the transducer and its cables as far as possible from the boat's power cable, tachometer and other electrical cables.
- 2) This transducer has been designed to give you excellent readings by being installed on the transom of almost all boat types, however, the transom transducer should not be mounted on boats with in-board engines or trim tabs. In these instances, the thru-hull transducer should be used.
- 3) Determine the transducer mounting place by referring to the above-mentioned procedures 1 and 2. For best results, the face of the wedge housing should be parallel to the water's surface. Also the wedge should be mounted from 1/8" to 1/4" below the surface of the hull. The trailing edge of the housing should be about 1/8" below the leading edge.

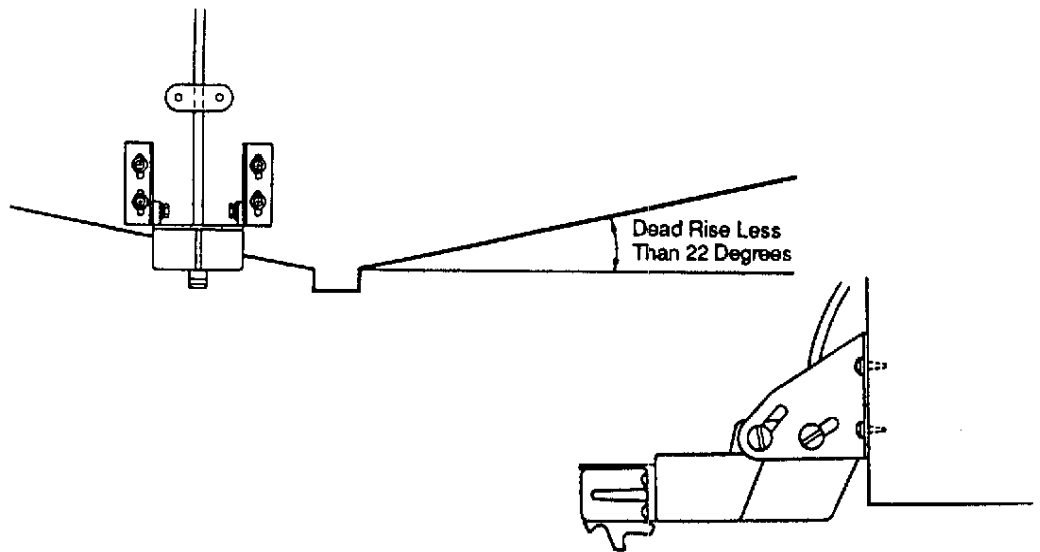


Figure 2 Transom Mounting

- 4) Tentatively fix the two bracket plates to the transducer using 4 sets of screws, nuts and washers in the set as shown in the figure below:

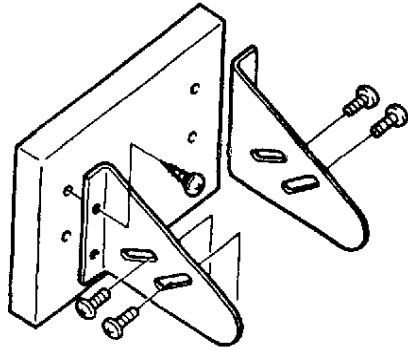


Figure 3 Transom Bracket

3.2. THRU-HULL MOUNT

For the users who want a thru-hull transducer, a bronze thru-hull transducer containing three sensors of depth, boat speed and water temperature is available.

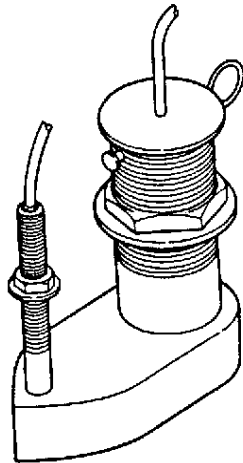
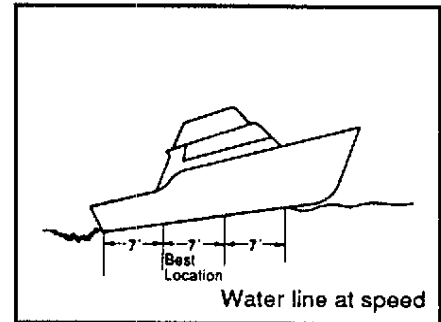
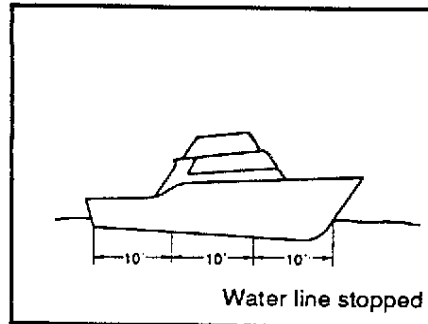


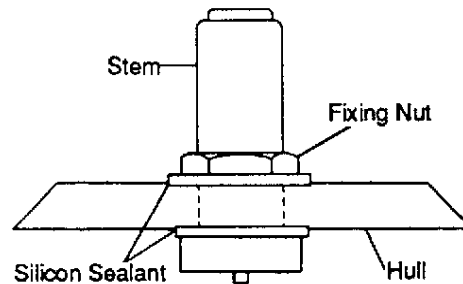
Figure 4 Thru-Hull Mount Transducer

- 1) The transducer should be installed at a place where no bubbles and no water spiral are not generated around it.
- 2) The transducer should be installed as far from the engine as possible, but not too close to the bow. Normally it should be installed in the middle 1/3 of the hull, at speed as shown below.



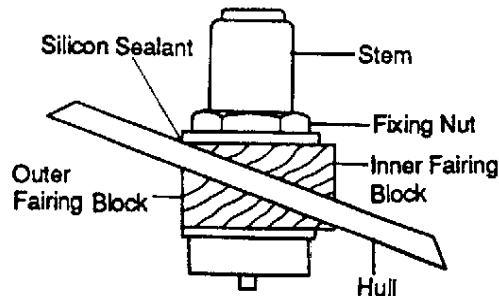
- 3) The transducer should be installed so as to maintain the acoustic face in parallel to the water surface. Therefore, some boat hulls may require fairing blocks for this alignment.

DEAD RISE ANGLE LESS THAN 5°



In this case, no fairing blocks are necessary. To prevent water intrusion, any gaps between the stem threads and the holes should be filled with silicon sealant.

DEAD RISE ANGLE MORE THAN 5°



Apply fairing blocks inside and outside of the hull, and install the transducer with its face to be parallel to the water surface. To prevent water intrusion, any gaps between the stem threads and the block should be filled with silicon sealant.

4. LCS-200 MOUNTING PROCEDURE

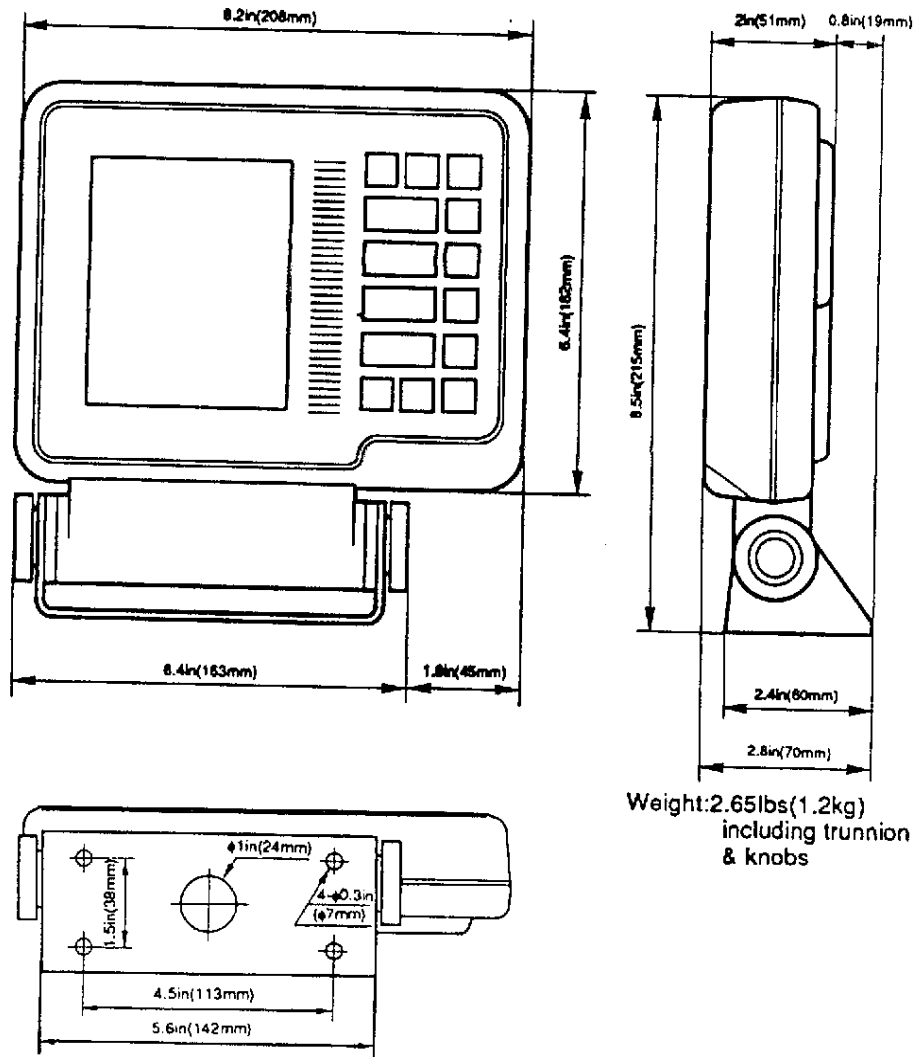


Figure 5 Dimensions/Weight

- 1) The LCS-200 should be installed on a flat, solid surface for maximum stability. The interference among the marine electronics machines on board is a serious problem recently. Consider this matter when selecting a location and decide the permanent mounting place. You can mount the trunnion on a swivel mount which has the same mounting holes as your trunnion.

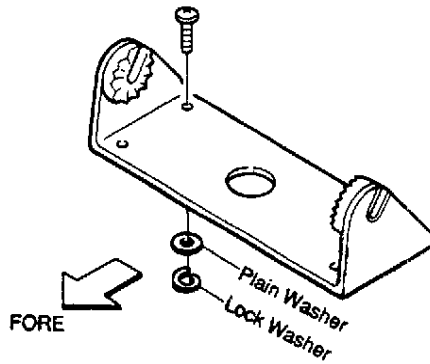


Figure 6 Trunnion Bracket

Position the trunnion, mark and drill four 1/4" holes. Secure it using stainless steel through bolts with backup washers and lockwashers. Mount the trunnion with the slots to face backward.

- 2) Place the display unit in its trunnion and secure it to the trunnion using two trunnion knobs as shown in Figure 7.

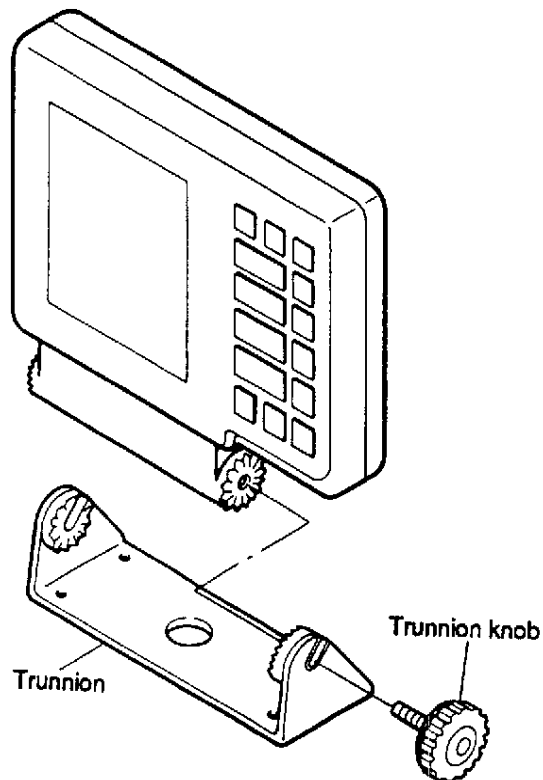


Figure 7 Mounting LCS-200

5. CONNECTOR CONNECTION METHODS

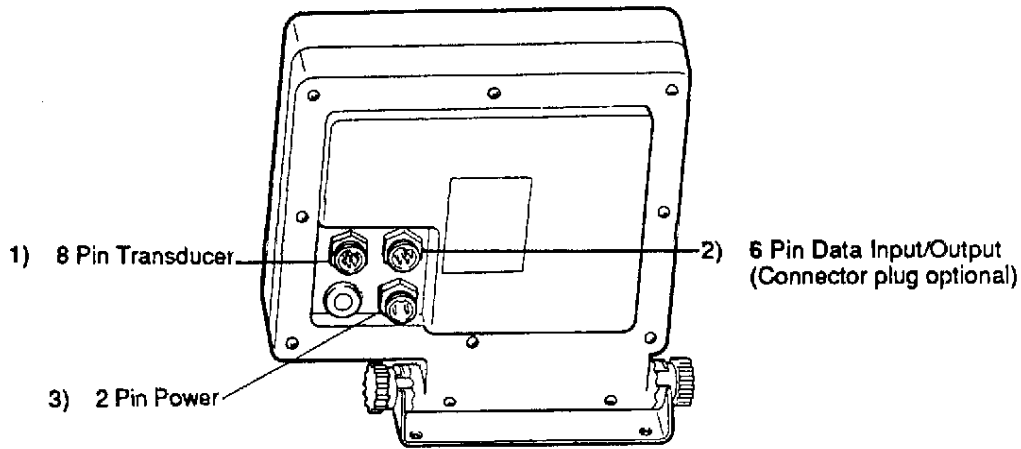


Figure 8 Rear View

Three connectors are mounted on the rear panel. The functions and pin arrangements are as specified below:

1) Transducer

1	Speed sensor	Brown
2	Speed sensor	Red
3	Transducer	Black
4	Transducer	Shield
5	Transducer	Blue
6	Temperature sensor	White
7	Temperature sensor	Green
8	Ground	Shield

2) Data Input/Output NMEA0183

1	Shield	
2	Signal	Data Out
3	Return	
4	Signal	Data In
5	Return	
6	+12V	

3) Power

1	(+)	Black with White Line
2	(-)	Solid Black

6. OPERATION

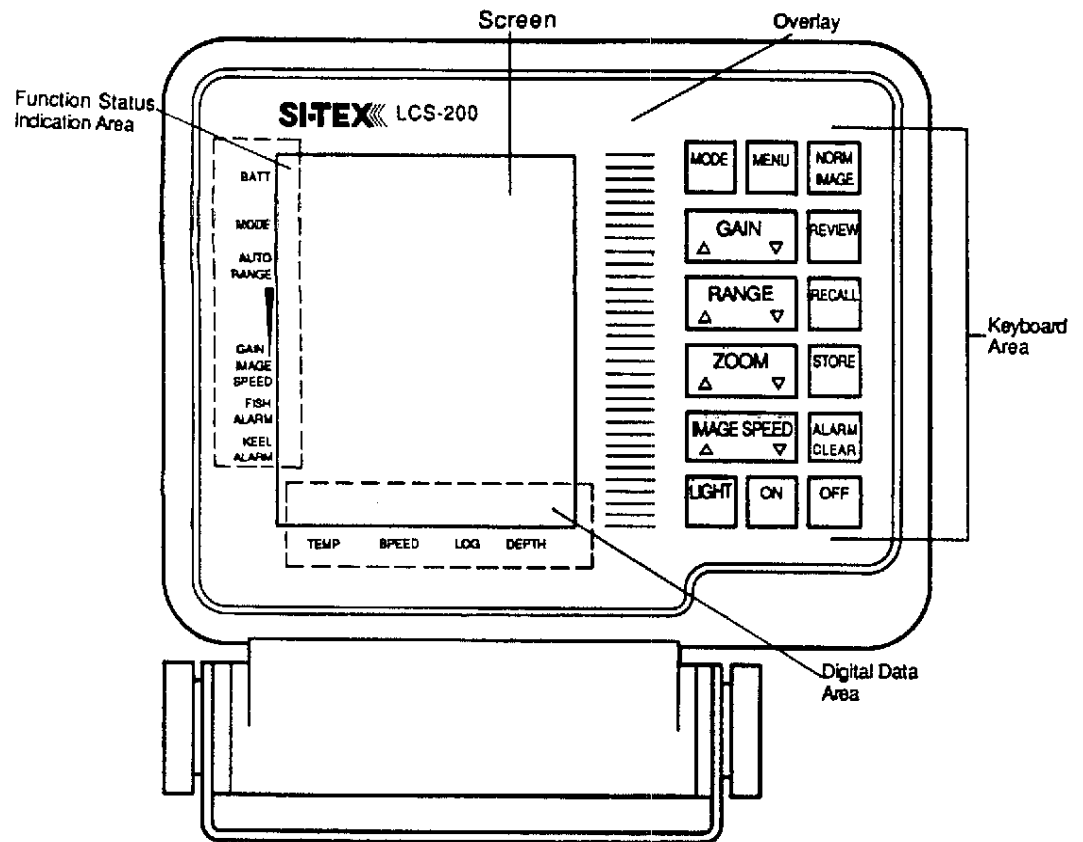


Figure 9 Front View

6.1. DISPLAY CONSTRUCTIONS AND KEY OPERATION

The LCS-200 consists of some displays.

1) Normal Displays

There are four display modes for normal displays. Standard, Standard + Zoom, Zoom and Standard + Bottom Lock. They are scrolled through by pressing MODE key.

2) Menu Displays

There are three displays. Menu 1, Menu 2 and Big Number. Pressing MENU key scrolls through them.

Menu 1 and Menu 2 are the displays where the settings for each function on the display are performed. Big number display shows the information such as depth, water temperature, boat speed and log in numbers. It is also used to change their calibration units.

If pressing NORM IMAGE key while a menu page is displayed, the unit returns to the normal image display that had been used prior to moving to the menu page.

3) Memory Displays

Memory displays are used to store the normal displays, and to review them later. There are 4 memory displays that are recalled in turn by pressing RECALL key.

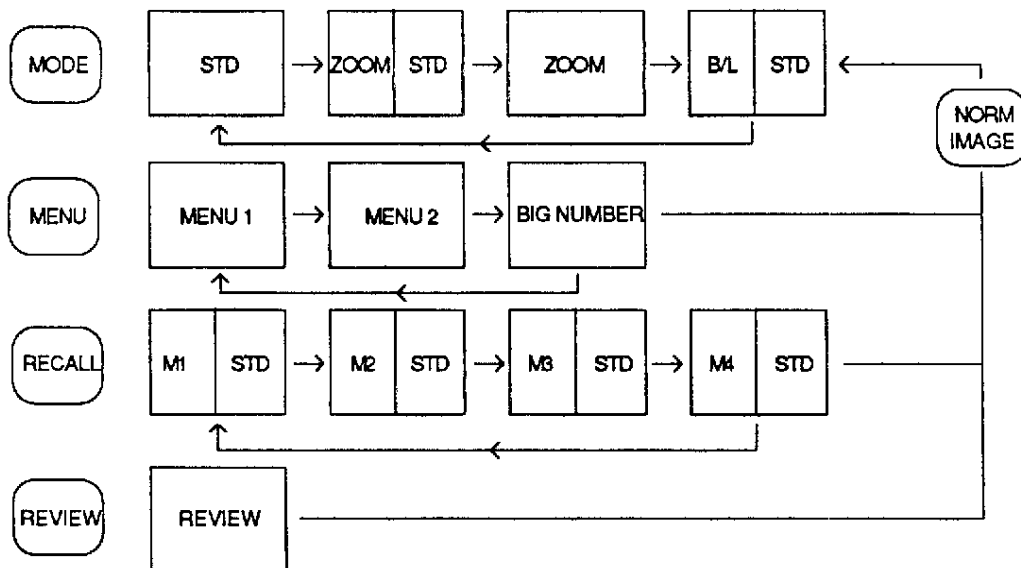
If you press STORE key after displaying a memory page on the screen, the normal image currently displayed on the screen is stored in that memory page. If a display has been stored there, it is erased by overwriting.

Though a full screen image is stored by the storing procedure, only the left half of the screen is memory display area. So, only half of the stored image is displayed there. The right half keeps to display the normal image. To review the remaining half of the stored image, press and hold REVIEW key. The remaining half will be recalled back on the left half of the screen until the key is released.

Pressing NORM IMAGE key returns to the normal image display that had been used prior to moving to the memory display.

4) Review Display

If you press REVIEW key while a normal image is displayed, the unit is changed to the review mode. Holding down the key will bring one full screen back on the screen by shifting the image. Pressing "NORMAL IMAGE" key will return the unit to normal image.



5) Simulator

Your LCS-200 has an internal simulator to enable you to become familiar with its operation. To activate the simulator, press and hold the "RECALL" while pressing the "ON" key.

6.2. MENU DISPLAYS AND KEY OPERATION

Pressing MENU key during a normal display brings a menu page on the screen. While the menu pages are displayed, the keys corresponding to the arrows on the screen next to each preset information are used to change their settings.

1) Menu 1 Display

Menu 1 display is used to set the functions shown in Figure 10. All the functions except for Fish Alarm are set with both the up and down arrows of the key corresponding to each function. The two arrow marks next to "MENU 1" on the screen indicate that.

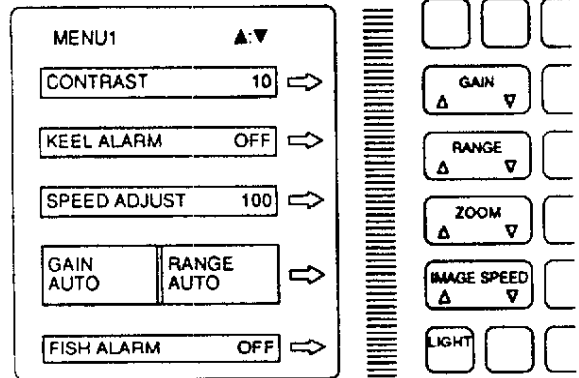


Figure 10 Menu 1

CONTRAST 10

Adjusts the screen contrast. Pressing the up arrow of GAIN key increases the level number and the down arrow decreases it. The level is arranged in 20 steps.

KEEL ALARM OFF

Sets the depth to activate the beeper when the bottom becomes shallower than that depth. The arrow keys of RANGE are used for this setting. The alarm depth can be set between 1 and 99 in 1 unit increments. The down arrow selects the deeper range. Holding down the key changes it in 5 increment steps. The set-up value is displayed at the lower left side of the screen.

SPEED ADJUST 100

Sets the adjustment value of boat speed. Normally it is not necessary to touch it. When necessary, the value can be set between 50% and 150% by pressing the arrow keys of ZOOM.

GAIN AUTO | RANGE AUTO

Selects the mode of Gain and Range between Automatic and Manual. Pressing the up arrow of IMAGE SPEED changes the mode of Gain and pressing the down arrow changes the mode of Range.

FISH ALARM OFF

Sets the echo level reflected by fish school where the fish alarm starts beeping. The levels are divided into 7. Pressing LIGHT key scrolls through the level number. If the level number is increased, the fish alarm reacts only upon the stronger echoes.

The set-up level is displayed at the lower left side of the screen.

2) Menu 2 Display

Press MENU key.

Menu 2 display is used to set the functions shown in Figure 11.

They are also set with the up and down arrows of each

corresponding key except for Fish Symbol. The both arrow marks next to "MENU 2" on the screen indicate that.

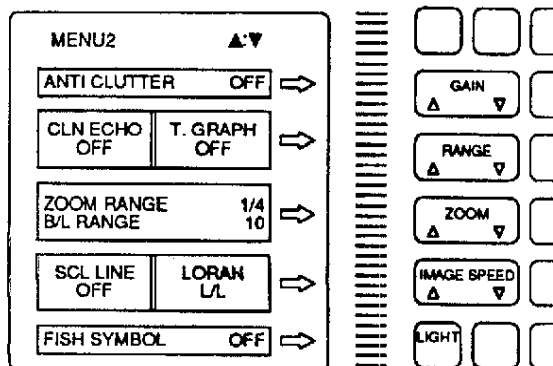


Figure 11 Menu 2

ANTI CLUTTER OFF

Sets the level between 1 and 6. Pressing the up arrow of GAIN key increases the level number and the down arrow decreases it until "OFF" is displayed.

Anti clutter is a function to prevent echoes lower than some level from being displayed. It is used to remove unwanted echoes like those from the plankton or small debris near the surface. When the level number is increased, more echo levels are deleted on the display.

Use this function with care because it may reduce the unit's sensitivity.

CLN ECHO OFF **T. GRAPH OFF**

Pressing the up arrow of RANGE turns clean echo on/off. It is effective to eliminate the interference by the echo sounders from near-by boats.

As in Anti clutter this should be used with care because it may also reduce the unit's sensitivity. Pressing the down arrow turns temp. graph on/off. If it is turned on, the temperature graph is displayed over the standard displays.

ZOOM RANGE 1/4
B/L RANGE 10

By pressing the up arrow of ZOOM, the both ranges change at the same time as below;

ZOOM RANGE **1/4** **2/4** **3/4**
B/L RANGE **10** **20** **30**

Since the both ranges are linked as above, when the zoom range is 1/4, the B/L range is 10 ft.

SCL LINE OFF **LORAN L/L**

Pressing the up arrow of IMAGE SPEED turns scale lines on/off. Pressing the down arrow rotates through the indication of Loran among L/L, TD and OFF. If a loran C is connected, the present position from the loran is displayed on the big number page and the normal displays in L/L or TD, or you can turn the indication off even if a loran C is connected according to this selection. The interfacing format is NMEA0183.

FISH SYMBOL OFF

Switches on/off by pressing LIGHT key. If the function is turned on, the fish are changed to actual fish image. The fish image has four sizes depending on the strength of the echoes. The size of the fish image does not necessarily indicate the actual fish size. School of small fish are displayed with a big size fish image if the echoes are strong enough. Fish Symbols are displayed only on the standard screens.

Fish symbols react also on noises. So, some noise may be reverted to fish symbols. We suggest you use this function by activating anticlutter and/or clean echo when much noise is present.

3) Big Number Display

Press MENU key.

This display shows depth, water temperature, boat speed and log in numbers. However, this is also the display where you can change their calibration units.

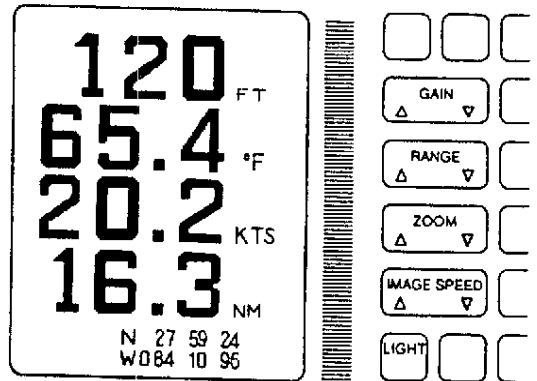


Figure 12 Big Number

120 FT

Meter can be selected by pressing the up arrow of GAIN. Next press returns to Feet.

65.4 °F

Pressing the up arrow of RANGE alternates Fahrenheit and Celsius.

20.2 KTS

MPH and KPH are also available as boat speed units. The unit changes by pressing the up arrow of ZOOM key. The log unit also changes in conjunction with this unit.

SPEED
LOG

KTS
NM

MPH
SM

KPH
KM

1 6.3 NM

The setting of the log unit is performed as explained as above. If you press the up arrow of IMAGE SPEED, the log counter is reset.

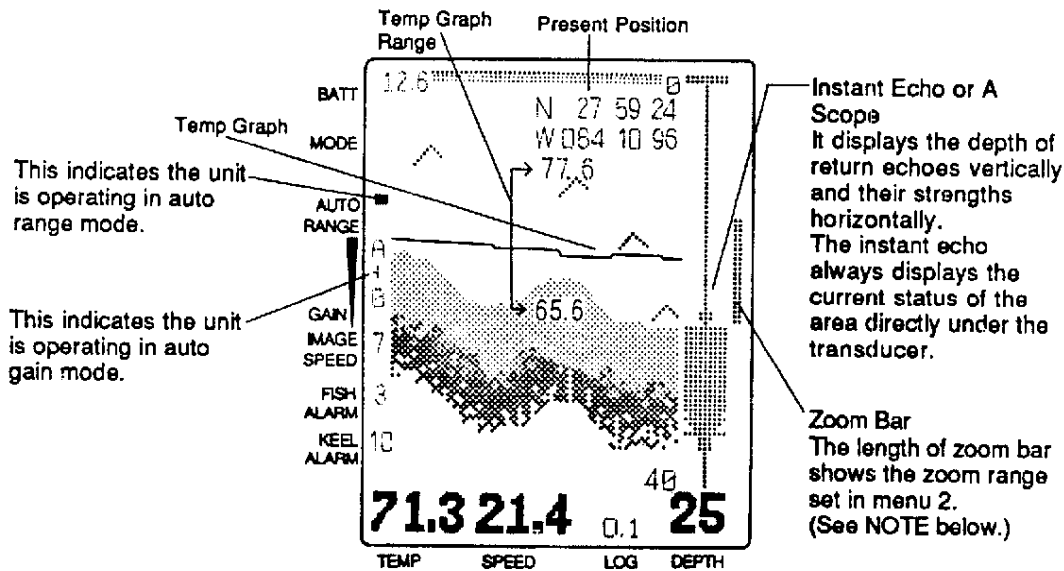
Present Position

If a Ioran C is connected, the present position information from the Ioran is displayed here.

NOTE : If you were using the LCS-200 with manual gain and range, they will be reverted to automatic mode at Big Number display to keep tracking the bottom without reference to any change of the bottom depth. If you return to a normal display, the unit will operate with manual gain and range as previously set.

Pressing NORM IMAGE key in any of the above modes will revert the unit to normal image mode.

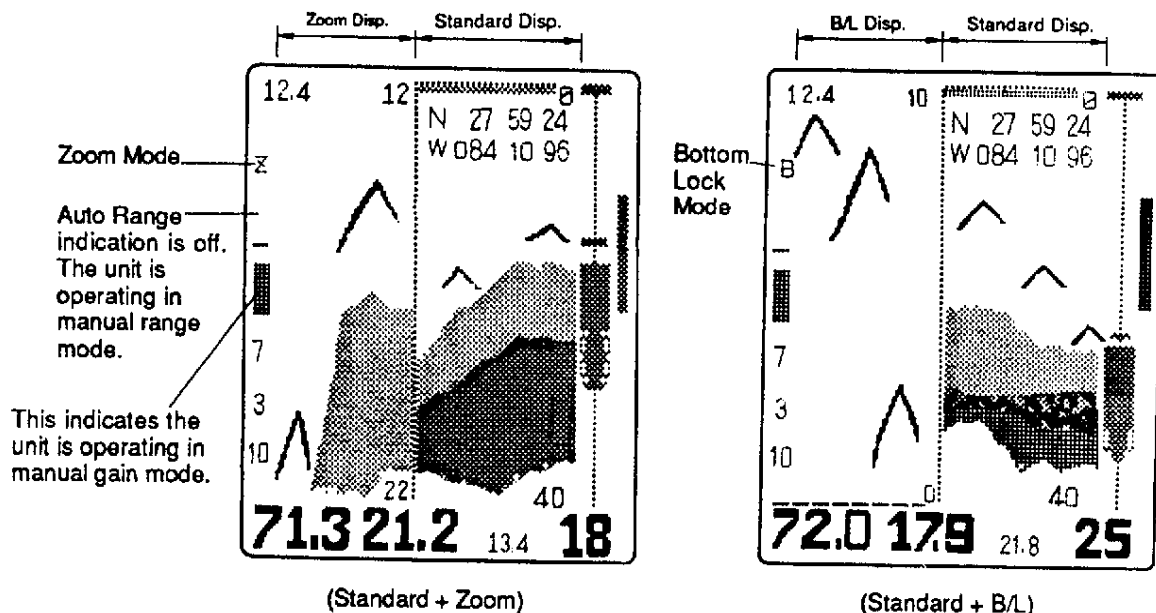
6.3. NORMAL DISPLAYS AND KEY OPERATION



(Example of Standard Display)

Figure 13 Display Examples

Normal displays include Standard + Zoom, Zoom and Standard + B/L in addition to Standard. The dual display splits the screen vertically, and displays the standard image on the right half and the zoom or bottom lock image on the left half. When the zoom image or the bottom lock image is displayed, it is indicated with "Z" or "B" on the screen next to "MODE" nomenclature on the overlay. The bottom lock function straightens the bottom and displays the set-up range up from the bottom. The bottom is always displayed with 0. The available bottom lock ranges are 10, 20 and 30 in feet, and 5, 10 and 15 in meters selected in MENU 2.



NOTE : Zoom range is not applicable to the minimum range of 0-10 feet or 0-5 meters. For the second range of 0-20 feet or 0-10 meters, the usable zoom range is only 2/4.

When interfaced with a loran or any other position fixing equipment, the sounding image may have slight irregularity due to data processing of incoming position data.

GAIN key

As explained earlier, the selection of automatic or manual mode of gain is performed in menu page.

In case of automatic mode, the indication as shown in Figure 13 is displayed.

The number below "A" indicates the offset value. The offset value changes between +1 and +3 by pressing the up arrow, and between -1 and -3 by pressing the down arrow. Set the offset value when you want to adjust the computer selected gain level curve upward or downward.

In case of manual mode, a bar is vertically displayed at that place. Pressing the up or down arrow increases or decreases the bar length and adjusts the gain. Manual gain is divided into 16 levels.

RANGE key

The selection of automatic mode or manual mode of range is also performed in the menu page.

In case of automatic mode, a bar is displayed on the screen as shown in Figure 13. While in manual mode, nothing is displayed there. You can change the range by pressing the up or down arrow.

ZOOM key

As explained earlier, the zoom range is decided in the Menu 2, and displayed with a bar. ZOOM key is used to set the zoom position by moving the bar on the right side of the screen. By pressing MODE key once, the zoom display will appear on left side of display while normal display will be on the right side. By pressing MODE key again, the range and position indicated by the bar is expanded on the full screen. The zoom position changes in two foot or one meter increments for the second and third standard ranges, and in ten foot or five meter increments for the other deeper ranges.

IMAGE SPEED key

It is used to change the image scrolling speed. The image speed can be changed in 7 steps. Pressing the up arrow selects a larger number and increases the speed.

The selected number is displayed at the left side of the screen, next to "IMAGE SPEED" indication.

ALARM CLEAR key

If the keel alarm set in the Menu 1 is reached, an alarm will sound. By pressing the ALARM CLEAR key, the alarm will stop. However, if we again go deeper than the Keel alarm is set and then return to the Keel alarm depth, the alarm will sound again. If the fish alarm set in Menu 1 is reached, an alarm will sound. By pressing the ALARM CLEAR key, the alarm will stop, however, if the Fish Alarm setting is reached again, the alarm will sound again.

LIGHT key

It is used to turn on the backlighting for LCD and keyboard. It is useful at nighttime operation. Pressing the key repeats to turn the light on/off.

6.4. MEMORY DISPLAYS AND KEY OPERATION

Pressing RECALL key while in normal display brings the memory display up on the left half of the screen. At the right half, half of the normal display is left. The key operations explained in Normal Display section are effective for this right half screen.

The unit has 4 memory displays, that are scrolled through with RECALL key and identified with the indication "M1", "M2", "M3" or "M4" at the place of "MODE" on the overlay.

After a memory display was recalled, and you want to store the present normal image on the screen there, press STORE key. It looks like the half screen normal image is stored into the half screen memory page since they share the screen half and half. However, the full screen normal image is actually stored. If you want to see the other half, hold down REVIEW key. The other half image is scrolled back on the screen.

Since every press of STORE key overwrites a new normal image, the previously stored image is erased. By pressing NORM IMAGE key, the display will revert to normal image.

6.5. REVIEW DISPLAY AND KEY OPERATION

This display is used when you want to see the display that has gone off the screen during in normal display mode. The normal image freezes by pressing REVIEW key, and holding it down moves the display to the right and scrolls the image off the screen back on the screen. While in review display mode, "R" is indicated at the place of "MODE" on the overlay. By pressing NORM IMAGE key, the display will revert to normal image.

6.6. TEMP/SPEED/LOG INDICATION

These kinds of information are displayed if the temperature and speed sensors are connected to the unit.

The change of their calibration units and the log counter reset are performed in menu page as explained.

The temperature range is 32.0°F to 99.9°F or 0.0°C to 40.0°C. The paddlewheel speed is displayed with 0.1 resolution up to 99.9. The log number is in 0.1 resolution up to 100 and in 1 resolution over 100. The distance traveled is accumulated, and when it reaches to 999, the display will return to 0.

6.7. BATTERY ALARM

The present battery voltage is indicated at the upper left side of the screen. This unit is designed to operate with the voltage between 10V and 18V. When the voltage drops to about 11V, or goes up to about 18V, the beeps start sounding to warn you of the fact that the battery voltage is close to the marginal point. If the voltage goes up further and reaches 19V, the power turns off automatically, and the ON key is inoperative. It is operational again when the voltage comes back within the specification.

This battery alarm beeps can be also stopped by pressing ALARM CLEAR key.

6.8. INTERNAL MEMORY

The LCS-200 contains an internal memory, that will preserve the changes of the settings even if the power is removed for a long period of time. To return to factory settings, press and hold ALARM CLEAR key while pressing ON key.

When you do that, however, please note that it erases everything including the stored images and the compensated value of boat speed.

7. SPECIFICATIONS

Display:	4 "supertwist LCD
Resolution:	160x128 dots (20,480 pixels)
Output Power:	200 watts RMS(1,600 watts peak-to-peak)
Frequency:	120 kHz
Display Mode:	Standard, Standard + Zoom, Zoom, Standard + B/L, Big Number
Depth Ranges:	10, 20, 40, 80, 160, 320, 640 feet 5, 10, 20, 40, 80, 160, 320 meters
Range Mode:	Automatic or Manual
Zoom Range:	1/4, 2/4, 3/4 of any range
B/L Range:	10, 20, 30 feet 5, 10, 15 meters
Gain Mode:	Automatic or Manual
Alarm:	Keel alarm & Fish alarm
Image Speed:	7 steps plus FREEZE
Display Memory:	4 memory pages
Display Review:	1 present plus 1 past
Fish Symbol:	Provided in 4 sizes
Water Temp Display:	Selectable F or C
Vessel Speed/Log Display:	Provided
Serial Data Input/Output:	NMEA0183 Input LCGTD(Loran C TD's) or LCGLL(Loran C Lat/Lon) Output SDDBS(Sounder depth), SDVHW(Speed), SDVLW(Log) and SDMTW(Temperature)
Ambient Temperature:	14°F to 122°F (-10°C to +50°C)
Dimensions:	8.2"W x 8.5"H x 2.8"D (208mmW x 215mmH x 70mmD) including trunnion & knobs
Weight :	2.65lbs (1.2kg) including trunnion & knobs
Power Requirement :	10 to 18VDC 150mA with backlight off 300mA with backlight on

-Specifications subject to change without notice.

8. STANDARD EQUIPMENT

LCD Display Unit	1	2.2lbs
Trunnion	1	with fixing screws
Knobs	2	
Transducer	1	120kHz with built-in temperature and speed sensors
Power Cable	1	10 feet with a fuse holder
Operation Manual	1	
Fuse	1	1A

9. TROUBLESHOOTING

When the LCS-200 does not operate properly, please read this section carefully. If you are unable to correct the problem by performing these procedures, contact your SI-TEX authorized dealer.

PROBLEM	COUNTERMEASURES
No power.	Verify that power connector is securely inserted or if the polarity is reversed by mistake. (The unit is designed not to be damaged by reverse polarity.)
Power is on, but the sea bottom is not displayed.	Verify that the transducer connector is securely inserted or that the transducer cable is not broken. Check the display mode. Enable auto gain and auto range.
Screen display is weak, loss of sensitivity.	Check the connection of the transducer. Make sure the transducer is properly mounted and pointed correctly. Verify that no marine creatures stick on the transducer face. They are susceptible to accumulate on it. Take care not to damage the transducer face when you scrape them off. Disable anticlutter or clean echo.
Excessive noise is present on display.	Check for interference from other boats. Also, check if the other equipment is operating properly. Verify that the unit is not affected by the engine noise, and make sure that it is not picking up noise due to its proximity to noise source.
The display fades and then goes black under direct sunlight.	The unit is over-heated. Remove the unit and allow it to cool down. You may need to consider permanent relocation.
The display is difficult to see.	The LCD contrast may not be adjusted properly. Also, note that the contrast may change slightly with changes in ambient lighting.

