LCD ECHO SOUNDER

LCS-180

OPERATION MANUAL

SI-TEX®

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1. IMPORTANT NOTICE

Congratulations on your purchase of the SI-TEX LCS-180 Supertwist LCD Echo Sounder. It is recommended that you read through the operation manual prior to installing and operating the unit.

The LCS-180 has a built-in simulator to help you understand its operations better. To display the simulator mode on the screen, press and hold REVIEW 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.

WARNINGS:

A. **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.**

B. **It is recommended to install the LCS-180 as far as possible from any radio antennas (Loran, VHF, etc) to prevent noise interference.**

C. **The LCS-180 is not waterproof but splashproof. When installing the unit, take it into your consideration.**

D. **Excessive heat to the unit should be avoided. Otherwise the display LCD might be damaged permanently.**

E. **Usage of the transducer other than the one supplied by SI-TEX may cause degradation of performance.**

2. INTRODUCTION

The LCS-180 has auto mode for Gain and Range controls as well as manual mode. It is initially set for auto modes at the factory, and automatically selects the proper range and gain level at the first turn-on. The settings changed during the operation will be preserved until the next turn-on. You can return to the initial auto settings just by holding down MENU key while touching ON key.
The LCS-180 has the zoom and bottom lock displays in addition to the standard display, that tell you the more detailed profile of echoes and bottom in the water. The fish symbol supplied shows the echo levels from fish school in 3 different sizes of fish marks.
If the standard transducer is connected, the LCS-180 will display depth, boat speed, log and surface water temperature.

3. TRANSDUCER INSTALLATION AND MAINTENANCE CAUTION

Mounting your transducer requires drilling holes into boat structure which can affect its water integrity and, therefore, should be attempted only by competent persons. If you are not sure where and how to attempt this installation, we recommend you take your boat to a marine dealer or a 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. TRANSOM MOUNT

Your LCS-180 is provided with a transom mount transducer as standard. It contains three sensors of depth, boat speed and water temperature.
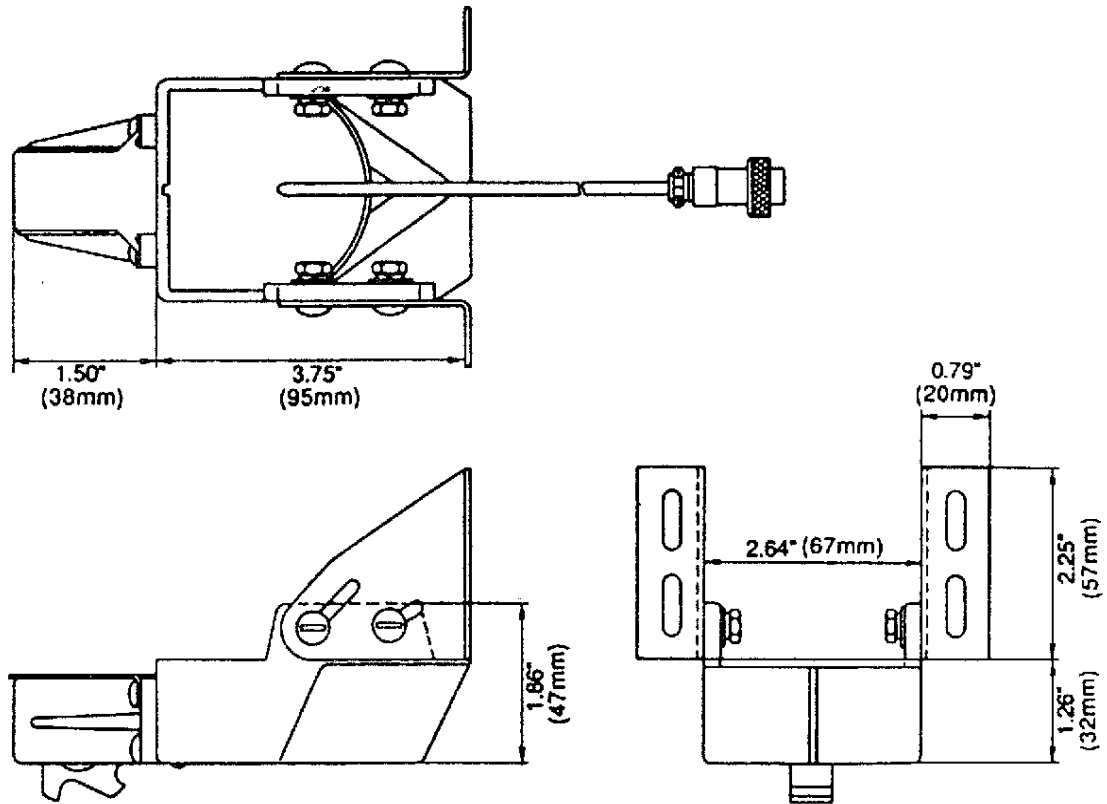

Figure 1 Transom Mount Transducer

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.
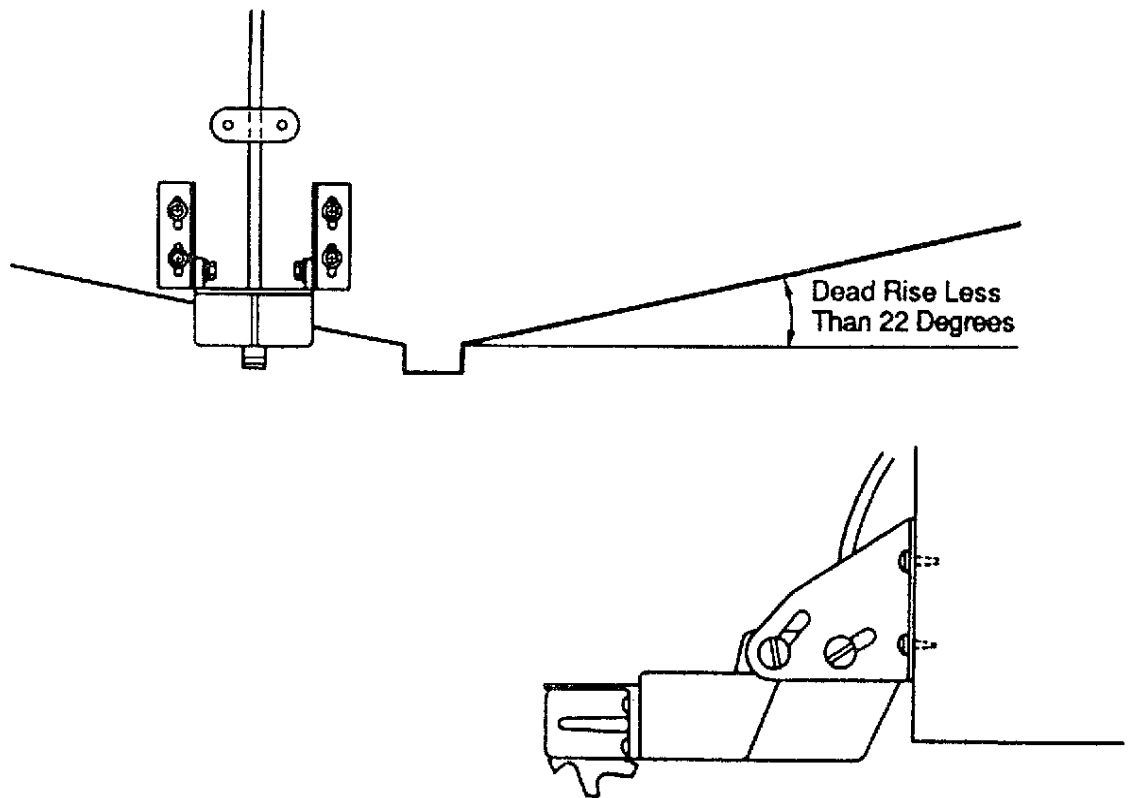
Figure 2 Transom Mounting

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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:
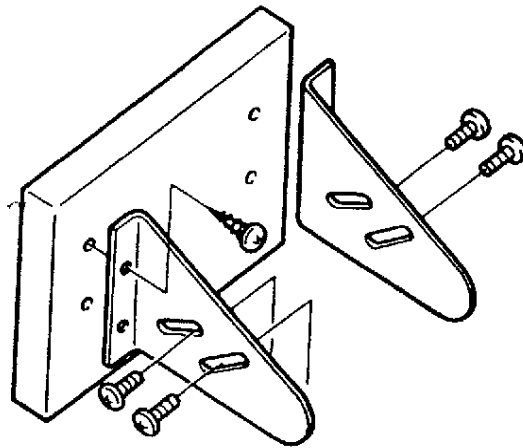

Figure 3 Transom Bracket

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.
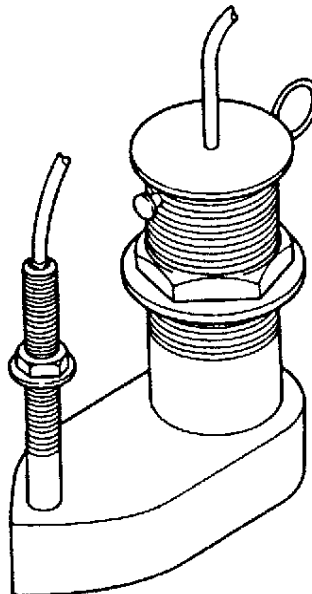

Figure 4 Thru-Hull Mount Transducer

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.


Water line stopped

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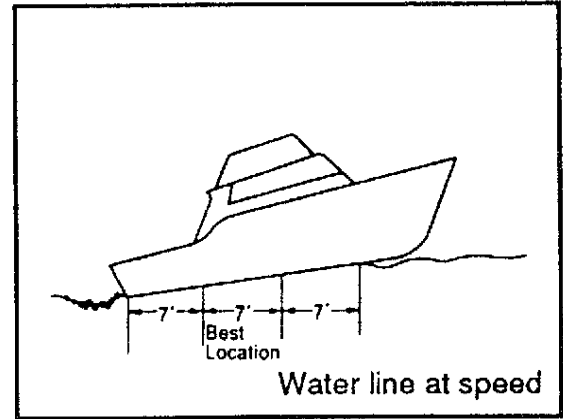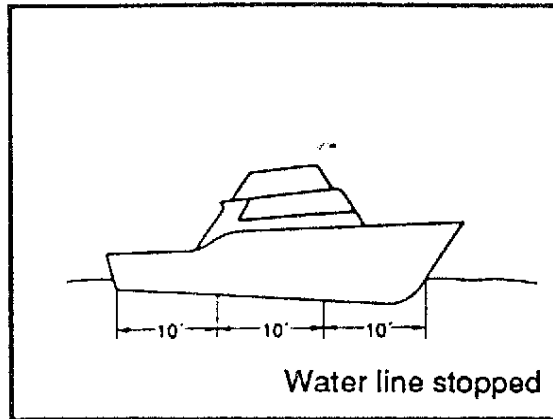
3) The transducer should be installed so as to maintain the acoustic face in parallel to the water surface. Therefore, some boat hulls may require fairing blocks for this alignment.

DEAD RISE ANGLE LESS THAN 5°
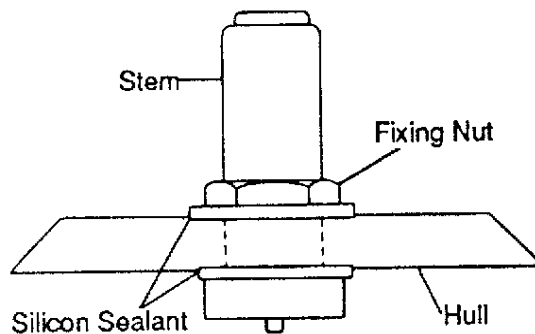
In this case, no fairing blocks are necessary. To prevent water intrusion, any gaps between the stem threads and the holes should be filled with silicon sealant.

DEAD RISE ANGLE MORE THAN 5°
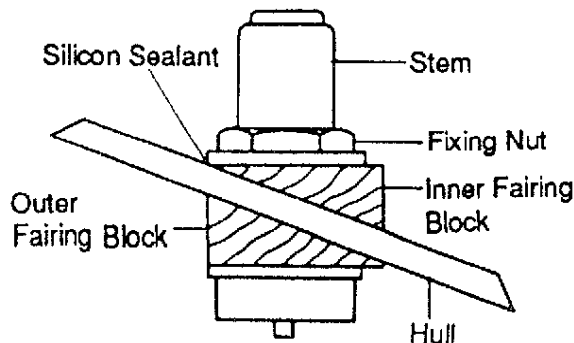
Apply fairing blocks inside and outside of the hull, and install the transducer with its face to be parallel to the water surface.
To prevent water intrusion, any gaps between the stem threads and the block should be filled with silicon sealant.

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4. LCS-180 MOUNTING PROCEDURE

The LCS-180 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.

4.8"(122mm)   1.8"(45.5mm)   11"(280mm)

5.4"(138mm)

6.1"(156mm)

6.1"(156mm)

2"(50mm)

2.9"(73.5 mm)

Weight:
1.2lbs(540g)
including trunnion
& knobs

1.5" (38mm)
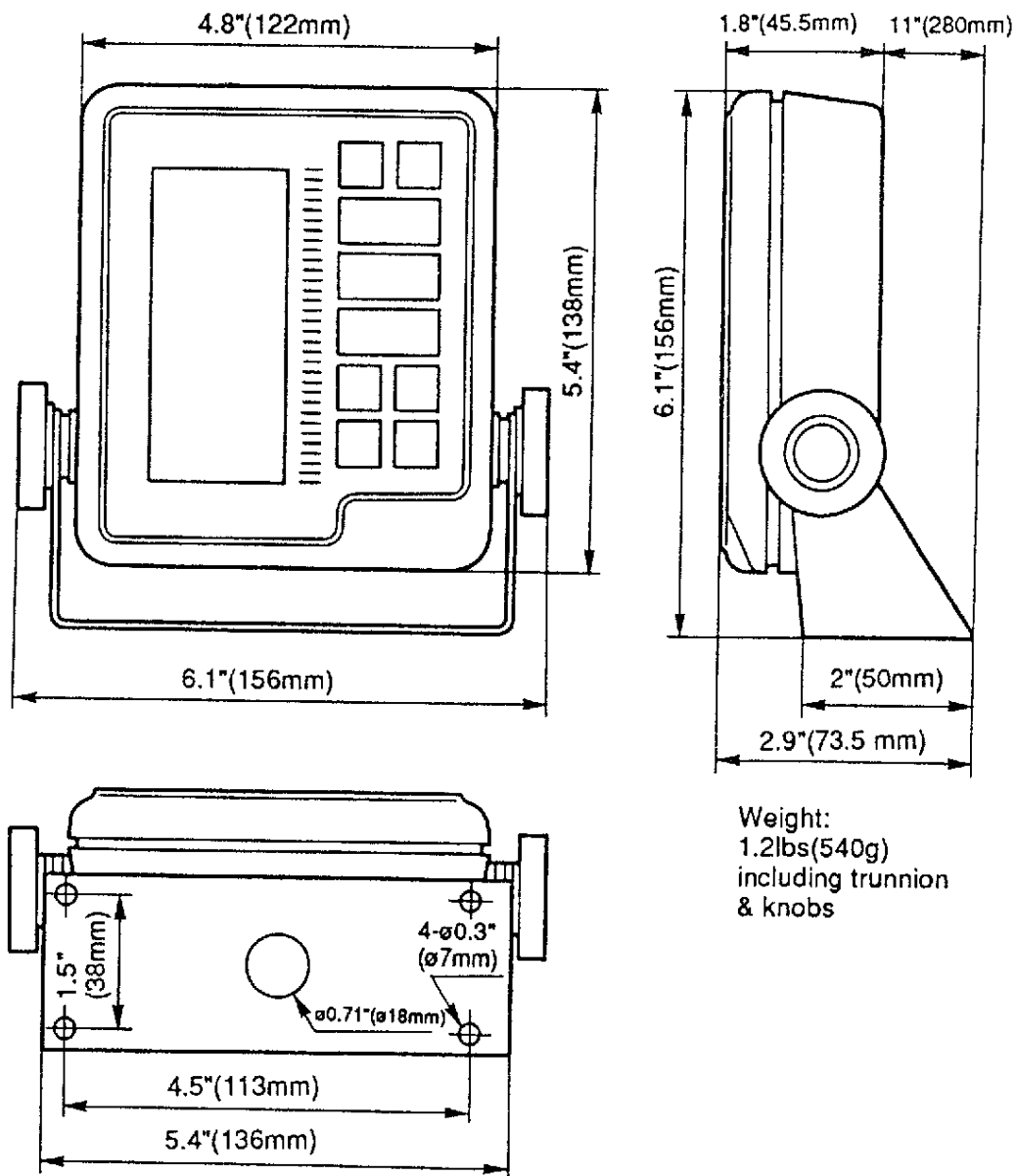
4-ø0.3"
(ø7mm)

ø0.71"(ø18mm)

4.5"(113mm)

5.4"(136mm)

Figure 5 Dimensions/Weight

4.1. TABLE TOP MOUNT

A trunnion mounting bracket is supplied for the table top mount.
Position the trunnion, mark and drill four 1/4" holes. Secure it with
screws. The slots on the trunnion should face forward.
After mounting the trunnion, place the display unit in it and secure it
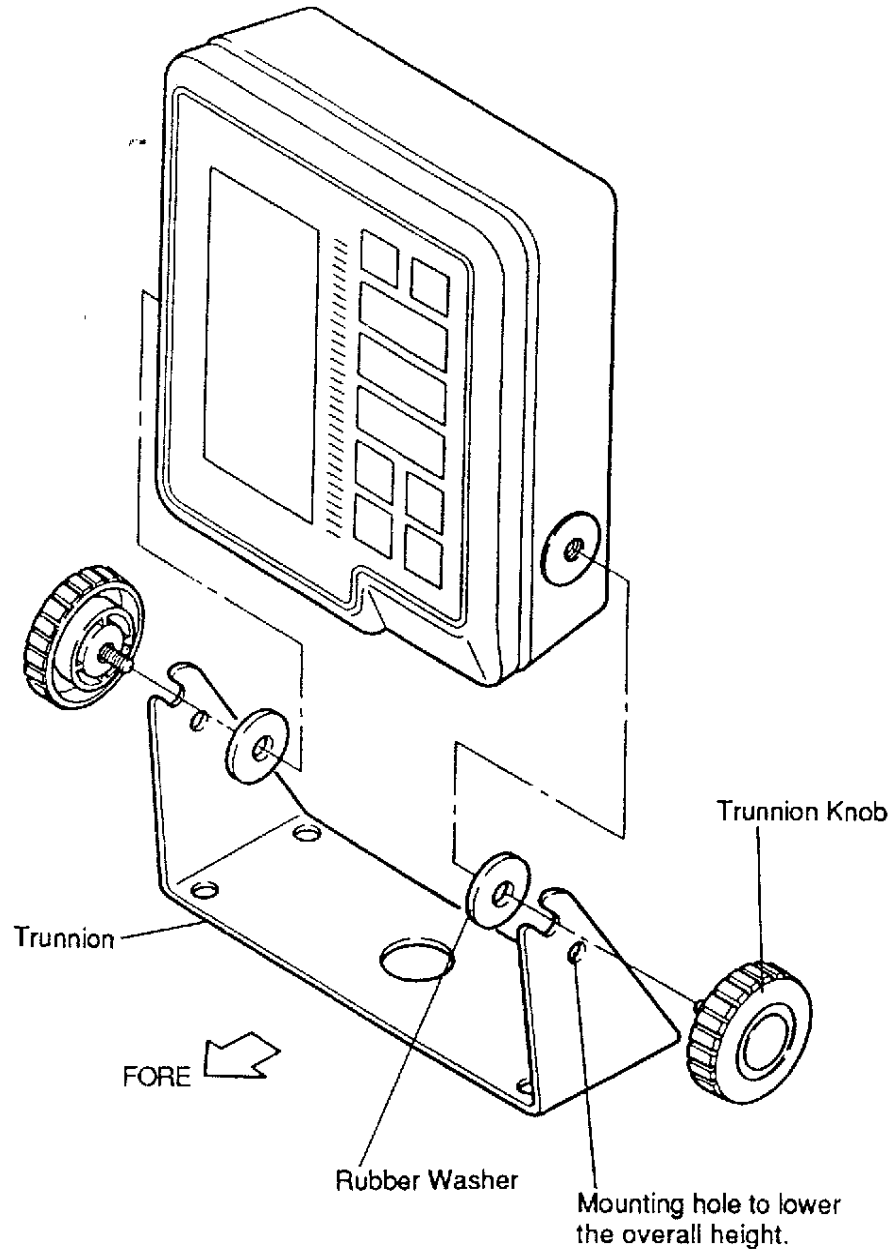with two knobs and rubber washers as shown in Figure 6.

Figure 6 Table Top Mount

If the place where you want to install the LCS-180 does not have
enough room in height, use the holes at the sides of the bracket and
place the display unit in it.

4.2. FLUSH MOUNT

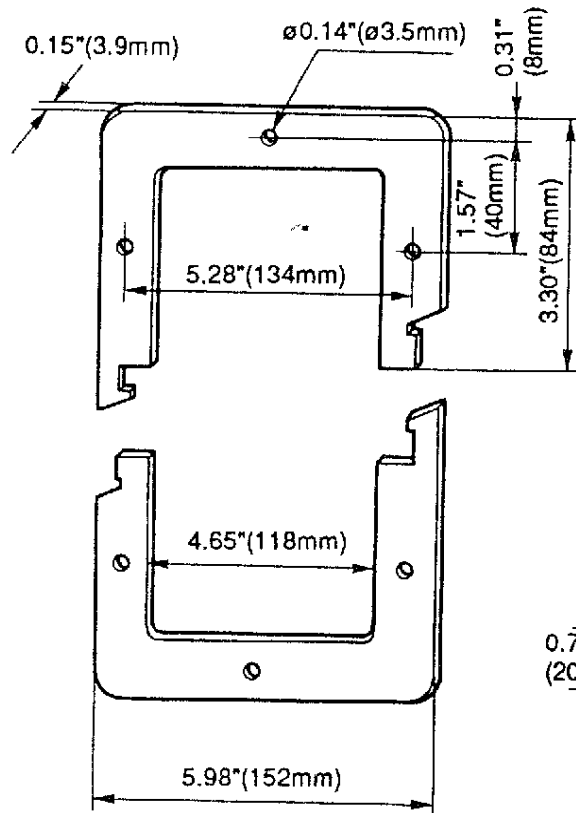The flush mount kit is also contained in the box. It is a two-piece flange.

Figure 7
Flush Mount Bracket
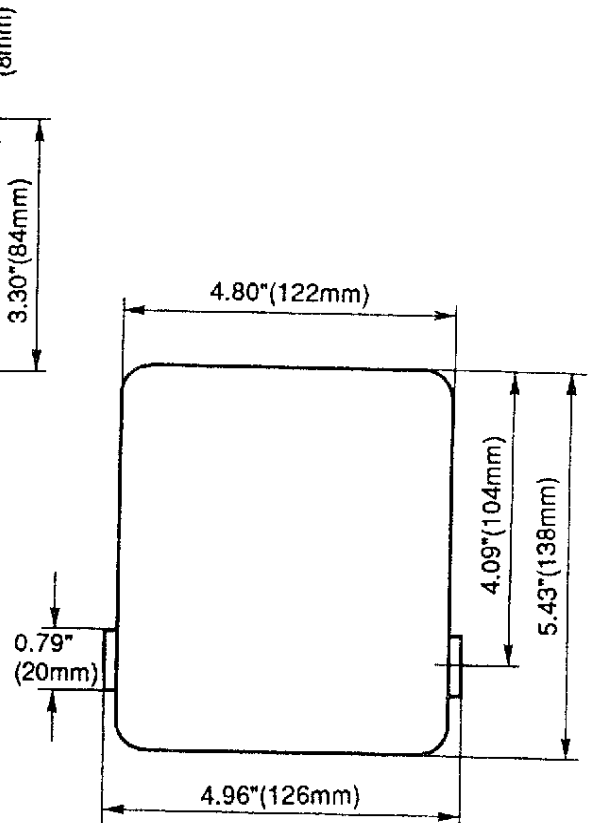
Figure 8
Clearance Diagram

After selecting a mounting position, mark the place to be cut out on the dash panel according to the drawing of clearance diagram. Then, cut the hole as marked. Make sure there is nothing behind the selected place that can be damaged by the hardware of clearance procedure. Next slide the two halves of the flange into the groove between the front case and the rear case from the top and bottom of the unit. Then slide the assembly into the hole just cut. Mark and drill screw holes provided in the flange. Secure the flange with 0.12" (3-millimeter) screws.

NOTE:The sizes shown in the clearance diagram indicate the actual case sizes. You may need to add 0.04" or so to each size when you cut a hole.

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5. CONNECTOR CONNECTION METHODS

1) 2 Pin Power

2) 8 Pin Transducer
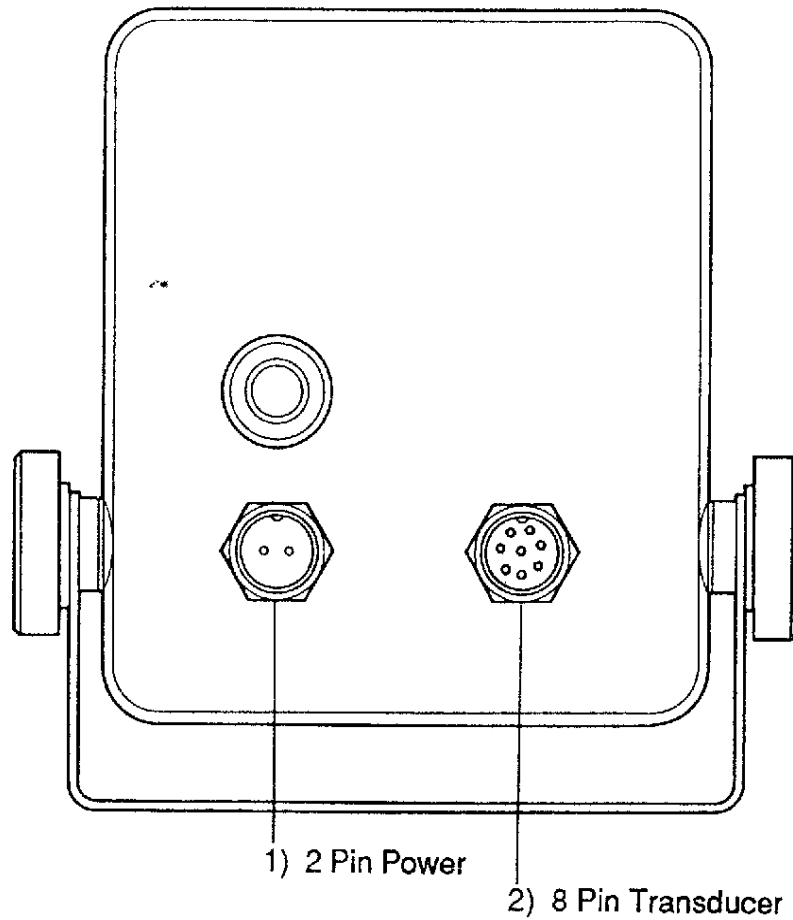
Figure 9 Rear View

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

1) Power
1	(+)	Black with White Line
2	(−)	Solid Black

2) 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

6. OPERATION
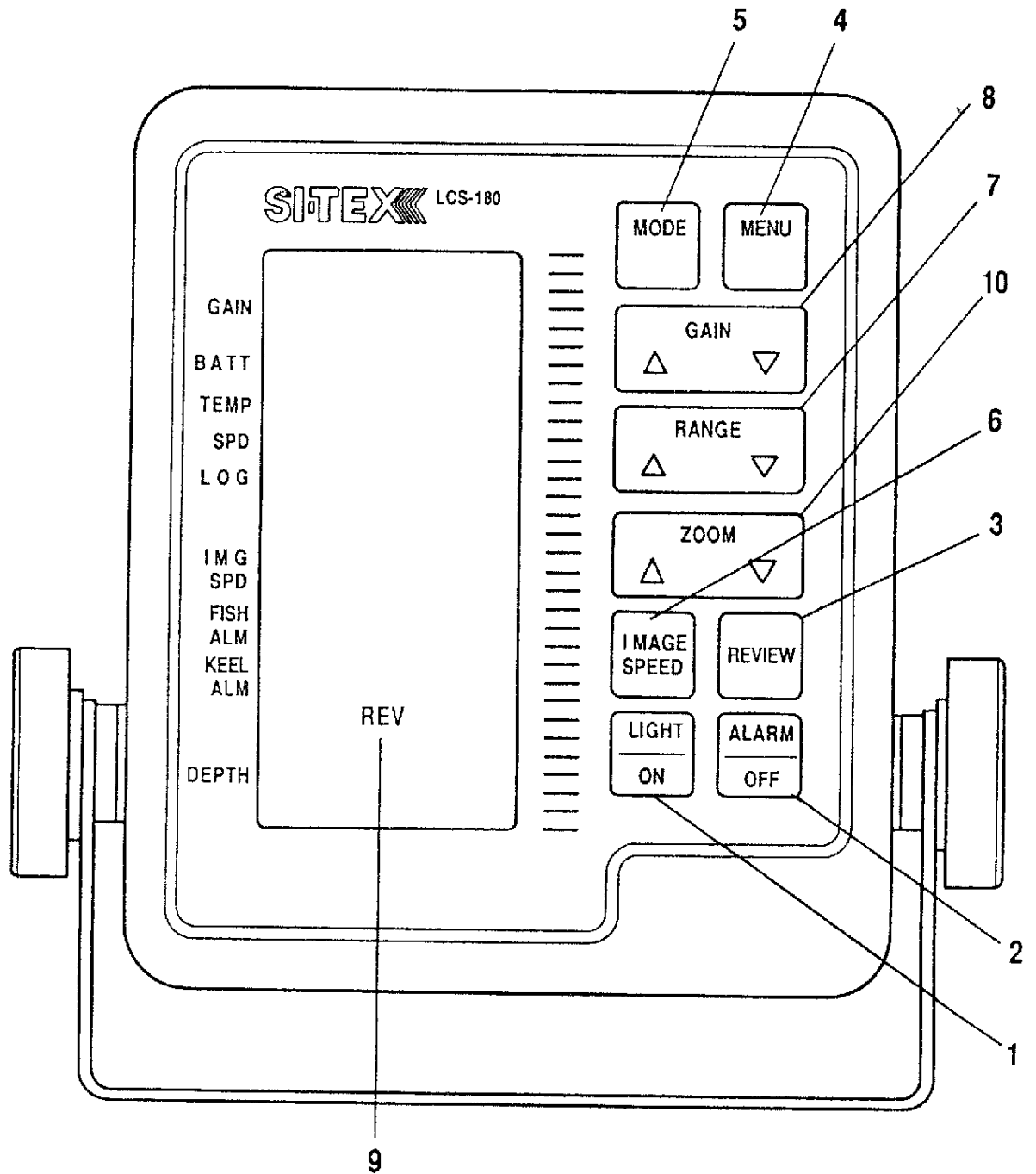
Figure 10 Front View

6.1. GENERAL
1) To turn the unit ON, press "LIGHT/ON" Key (Fig. 10-1).

2) To turn the unit OFF, press and hold the "ALARM/OFF" Key (Fig. 10-2).

6.2. SIMULATOR
1) The LCS-180 has an internal simulator. The use of this simulator is useful in learning the operation of the unit. Only a 12 VDC source is required for the operation of the unit.

2) To turn the unit ON, press and hold the "REVIEW" Key (Fig. 10-3) while pressing the "LIGHT/ON" Key (Fig. 10-1).

6.3. MEMORY
1) The LCS-180 has an internal battery. The battery enables the unit to remember how you were using it when it was turned OFF, so it will operate the same when the unit is turned on again. However, this memory could be lost if the unit is turned OFF by disconnecting the power cable or by turning the unit OFF by a remote source.

2) When the LCS-180 is OFF, to return the MENU to original factory settings, press and hold "MENU" Key (Fig. 10-4) while pressing the "LIGHT/ON" Key (Fig. 10-1).

6.4. MODE

Figure 11 Standard Display

Figure 12 Zoom Display
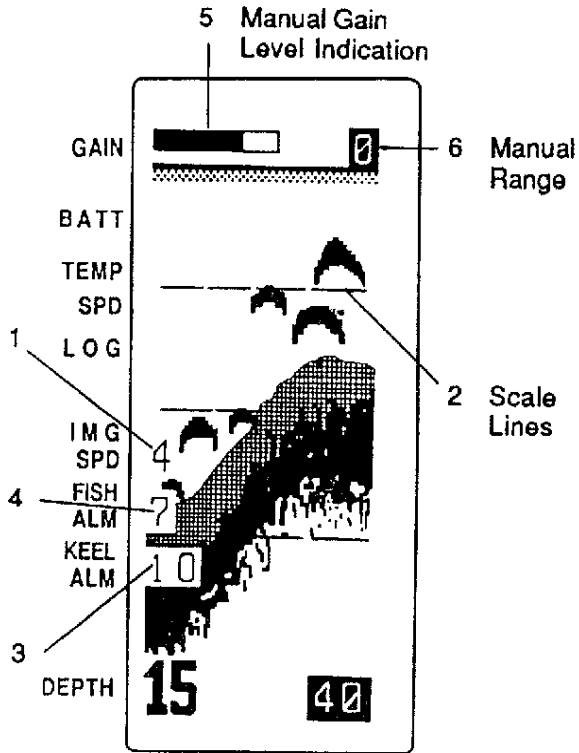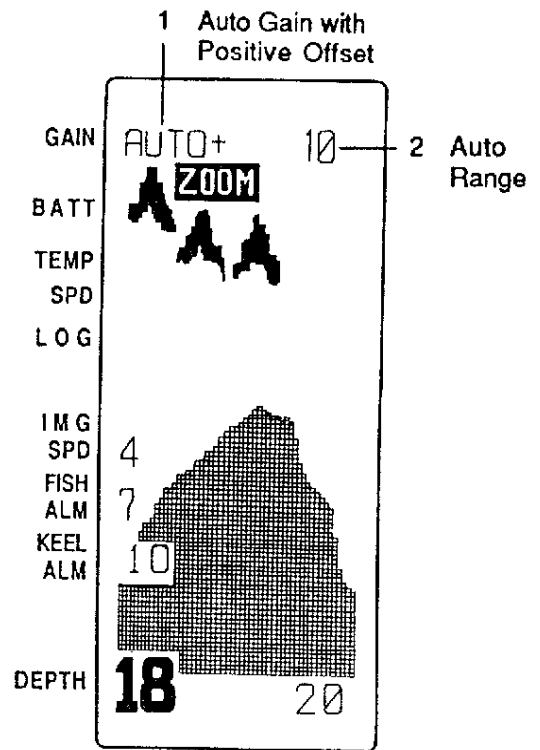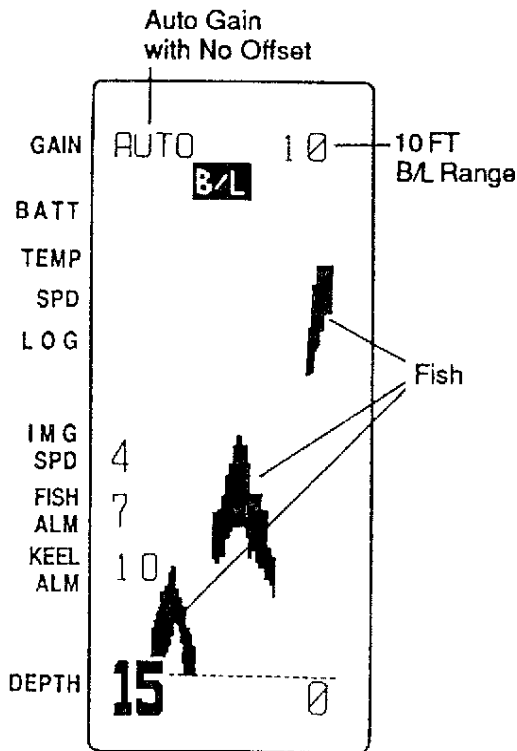**NOTE:** Zoom range set for 10FT.
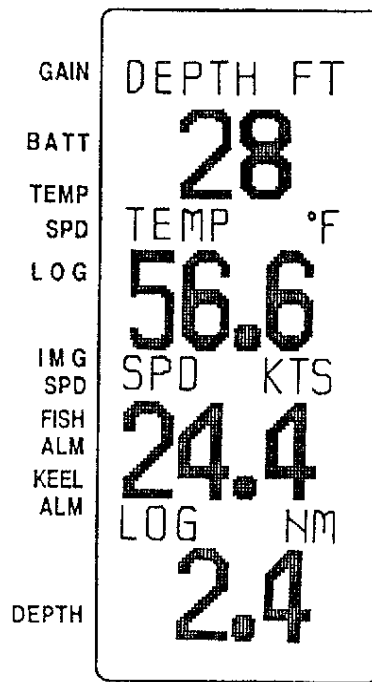

Figure 13 B/L Display

Figure 14 Big Number Display

There are four display modes on the LCS-180: Standard (Fig. 11), Zoom (Fig. 12), Bottom Lock (Fig. 13), and Big Numbers (Fig. 14). They are scrolled through by pressing the "MODE" Key (Fig. 10-5).

6.5. MENU

1) There are four "MENU" pages: MENU 1 through MENU 4. Pressing the "MENU" Key (Fig. 10-4) will scroll through them.

2) Pressing the "MODE" Key (Fig. 10-5) while in the "MENU" pages, will return the unit to the same display mode you were using.

6.6. REVIEW

1) By pressing the "REVIEW" Key (Fig. 10-3), you can scroll back two screens of memory. You can scroll back in Standard, Zoom or Bottom Lock Displays. When the "REVIEW" Key (Fig. 10-3) is pressed, the letters "REV" will appear in lower part of screen (Fig. 10-9).

2) To return to normal operation, press the "MODE" Key (Fig. 10-5).

6.7. IMAGE SPEED

There are four image speeds plus freeze. You can scroll through them by pressing the "IMAGE SPEED" Key (Fig. 10-6). If you want to stop the image advance you would select "0". If you are traveling slow, use a lower image speed. If you speed up, use a higher image speed. This will allow you to observe the same resolution of the bottom. The Image Speed selected is displayed on the screen. Refer to Fig. 11-1.

6.8. BACKLIGHT

When the unit is ON, by pressing the "LIGHT/ON" Key (Fig. 10-1), the LCS-180 screen is backlighted. Next press of the key turns off the backlight.

6.9. ALARM RESET

When a pre-selected alarm, either Fish Alarm or Keel Alarm would sound, by momentary pressing the "ALARM/OFF" Key (Fig. 10-2), the alarm is deactivated.

MENU 1

1	CONT. 6	GAIN △ ▽
2	ZOOM R. 1/4	RANGE △ ▽
3	B/L R. 10 FT	ZOOM △ ▽
4	ADD. INF NORMAL+ DIGITAL	IMAGE SPEED

Figure 15 Menu 1

MENU 2

1	SCALE OFF	GAIN △ ▽
2	K. ALM. 10FT	RANGE △ ▽
3	F. ALM. OFF	ZOOM △ ▽
4	FISH SYMBOL OFF	IMAGE SPEED

Figure 16 Menu 2

MENU 3

1	TMP+DEP °F FT	GAIN △ ▽
2	SPD+LOG KTS NM	RANGE △ ▽
3	SPD.ADJ 100	ZOOM △ ▽
4	LOG RESET	IMAGE SPEED

Figure 17 Menu 3

MENU 4

1	GAIN MANUAL	GAIN △ ▽
2	RANGE AUTO	RANGE △ ▽
3	A. CLT. OFF	ZOOM △ ▽
4	C. ECHO OFF	IMAGE SPEED
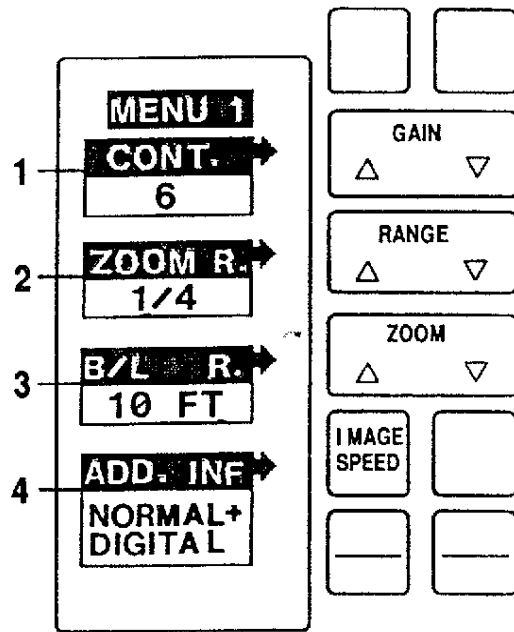
Figure 18 Menu 4

NOTE: You will now see the various MENU pages and see how they affect the four mode displays.

6.10. MENU 1 (Fig.15)

NOTE: The keys corresponding to the arrow on the screen are used to change each function.

1) CONT(Contrast) (Fig. 15-1)
The screen contrast is adjusted in 10 steps. Pressing the up or down arrows of the "GAIN" Key (Fig. 10-8) will increase or decrease the contrast on the screen.

2) ZOOM R(Zoom Range) (Fig. 15-2)
   (a) By pressing the up or down arrows of the "RANGE" Key (Fig. 10-7), you can select a zoom range of 1/4, 2/4 or 3/4 of your range scale.

   (b) When you are in the Zoom Display Mode (Fig. 12), the selected zoom range within your range scale will be displayed on the screen by pressing the up and down arrows of the "ZOOM" Key (Fig. 10-10). Zoom Range is not applicable when on the 0-10 feet or 0-5 meters range scale. For the second range of 0-20 feet or 0-10 meters, the usable Zoom range is 10 feet or 5 meters.
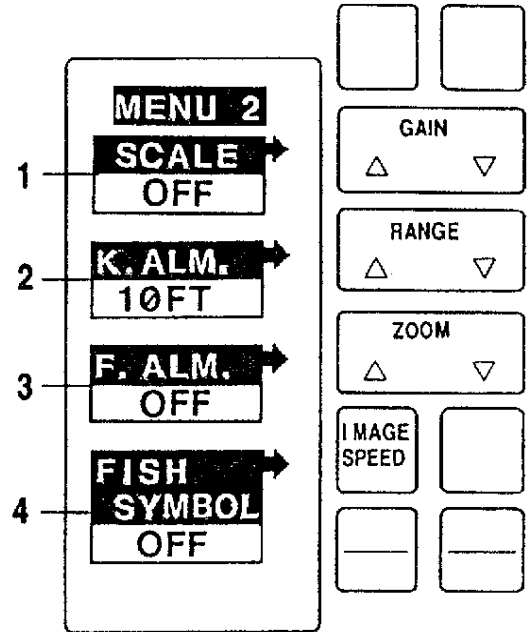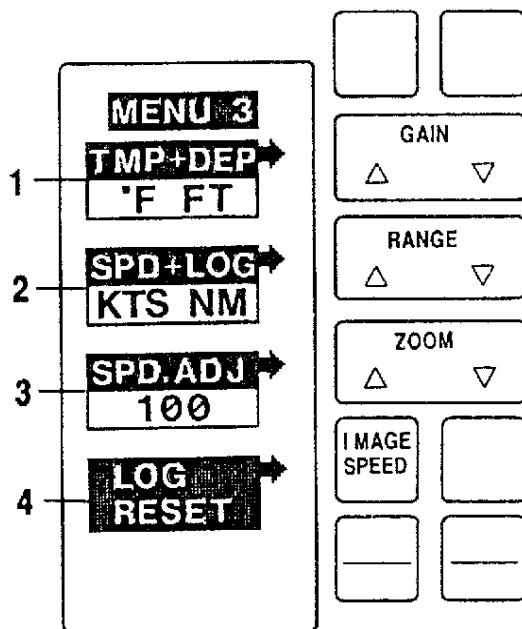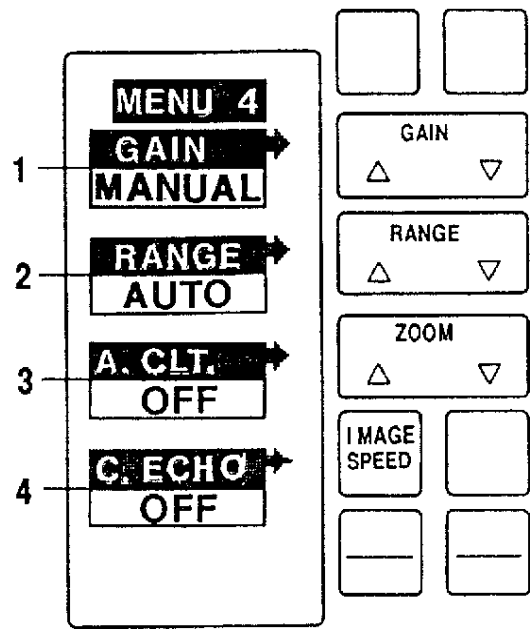
3) B/L R(Bottom Lock Range) (Fig. 15-3)
   (a) The Bottom Lock Ranges are 10 ft., 20 ft., or 30 ft. (If you have selected meters, Ref. Para 6-12, the ranges would be 5 mt., 10 mt., or 15 mt.). Select the range by the up or down arrows of the "ZOOM" Key (Fig. 10-10).

   (b) When you are in the Bottom Lock Display (Fig. 13), the bottom will appear as a straight line regardless of bottom contour. Fish within the bottom lock range will be shown on the screen.

4) ADD. INF(Added Information) (Fig. 15-4)

(a) There are four functions to "ADD INF" which can be scrolled through by pressing the "IMAGE SPEED" Key (Fig. 10-6).

(b) ADD.INF/NORMAL is the normal display we see when the unit is first turned "ON".

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NOTE: All four functions of the "ADD. INF" will affect the Standard, Zoom and Bottom Lock Displays (Fig. 11, Fig. 12, Fig. 13).

(c) ADD. INF/NORMAL + DIGITAL will add information as shown in Fig. 19-1.
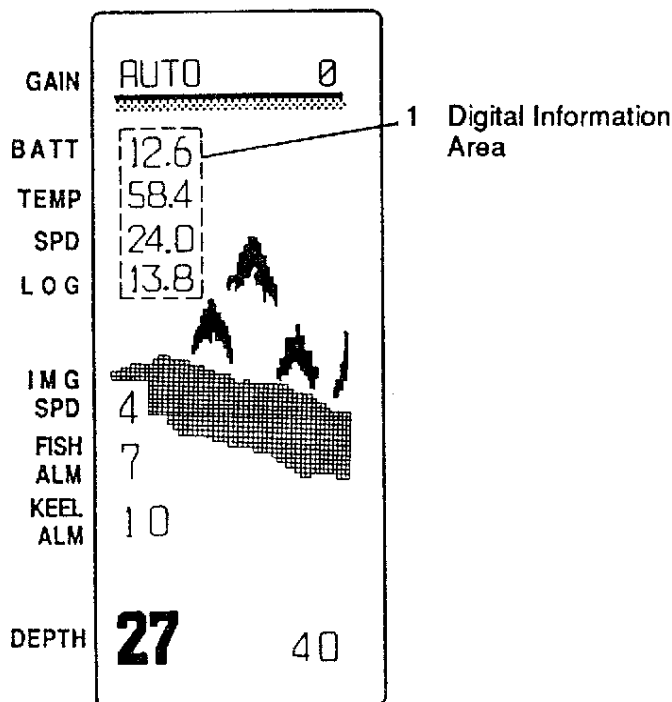
Figure 19   Digital Info (Example over Standard)

BATT 12.6   This is the battery voltage supplied to the LCS-180.

The LCS-180 is designed to operate with a supplied voltage of 11 - 17 VDC. When the voltage drops to about 11 VDC, a beeping sound is made to warn you that the voltage is close to the operational limit. If the voltage is outside the limits, such as 10 VDC, the voltage is turned off automatically, and the "LIGHT/ON" Key (Fig. 10-1) is inoperative.

NOTE: The battery alarm beeping may be stopped by pressing the "ALARM/OFF" Key (Fig. 10-2).

TEMP 58.4   This is the surface water temperature measured in tenths of a degree. The range is from 32.0 to 99.9 degrees Fahrenheit or 0.0 to 40.0 degrees Centigrade.

SPD 24.0   This is the speed of your vessel as measured by the paddlewheel transducer. Speed is displayed from 0.1 resolution to 99.9 in KTS, MPH, or KM.

LOG 13.8   The log is the distance you have traveled. Reading less than 100 will be to the nearest tenth. Reading from 100 to 999 will be in whole numbers. Again, log is measured by the paddlewheel and displayed in nautical miles, statute miles and kilometers.

(d)   ADD. INF/NORMAL + T. GRAPH will add a temperature graph on the screen (Fig. 20). The Temperature Range (Fig. 20-1) is automatically selected by the LCS-180 based on your present temperature (Fig. 20-3). The Temperature Graph (Fig. 20-2) will reflect the past history of changes in temperature.
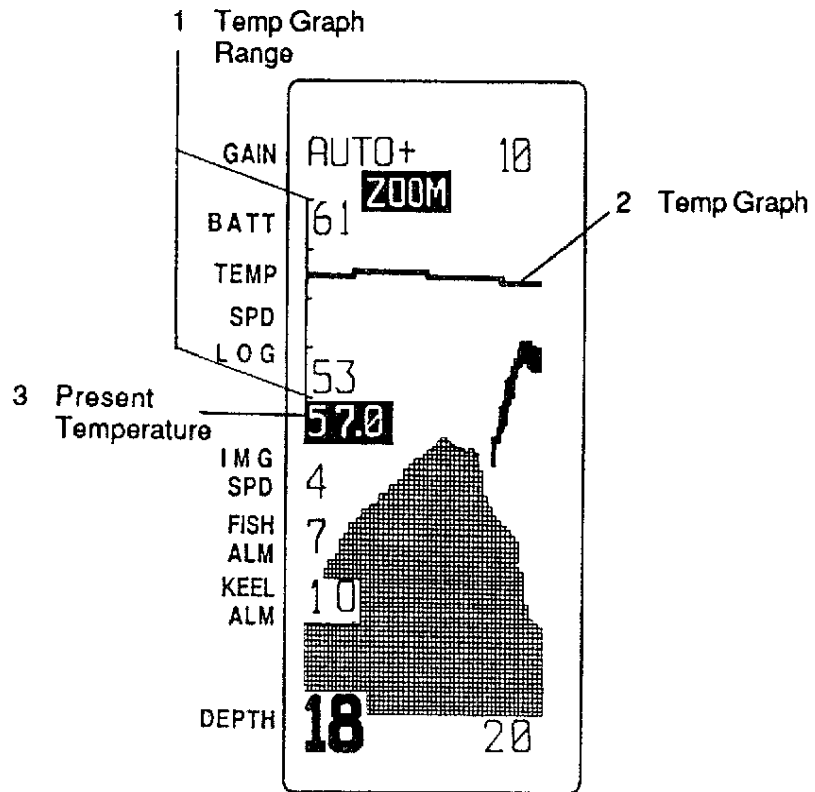
Figure 20   Temp. Graph (Example over Zoom)

(e) ADD. INF / NORMAL + A SCOPE – An "A" scope is used to determine the strength of returned echo directly under your vessel of that instant. The wider the bar (Fig. 21-1), the stronger the echo or the larger the fish. The LCS-180 displays seven (7) levels of echo strength, from the smallest to the largest fish.
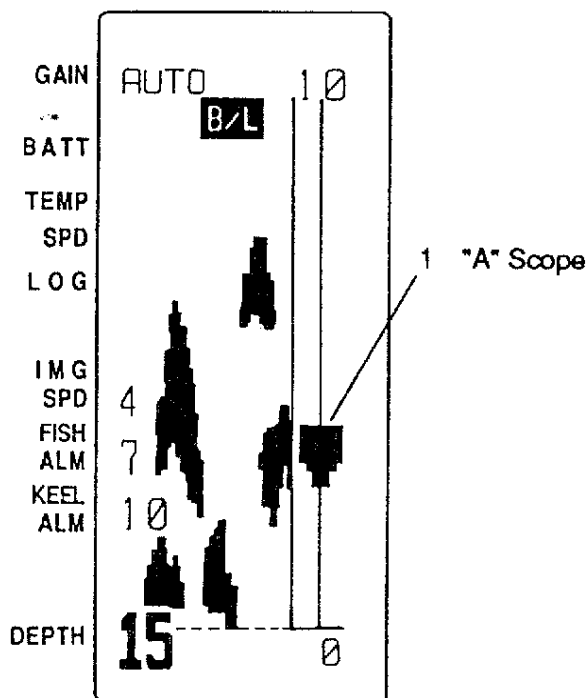
Figure 21   "A" Scope (Example over B/L)

6.11. MENU 2 (Fig.16)

1) SCALE/OFF or ON (Fig. 16-1)
By pressing the "GAIN" (Fig. 10-8) arrows, the scale line will be ON or OFF the screen (Fig. 11-2).

2) K. ALM./OFF or ON (Keel Alarm) (Fig. 16-2)
By pressing the down arrow of the "RANGE" key (Fig. 10-7), the depth alarm is turned ON and depth setting is increased. Depth can be set up to 99. If you hold the up or down arrow, the depth will change in increments of 5. If you had set the depth at 10 (Fig. 11-3), and you went less than 10, a beeping alarm would sound. OFF prohibits the alarm.

NOTE: The depth alarm beeping may be stopped by pressing the "ALARM/OFF" Key (Fig. 10-2).

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3) F. ALM/OFF or ON (Fish Alarm) (Fig. 16-3)
By pressing the up arrow of the "ZOOM" Key (Fig.10-10), the Fish Alarm is turned ON. Each press of the up arrow key will set an alarm from 1 to 7. The LCS-180 will determine the size of the fish returns in seven (7) levels. Number "1" is the smallest fish show and number "7" is the largest. Therefore, if you set the Fish Alarm at "7" as shown in Fig. 11-4, only the largest fish would cause the alarm to sound. By pressing the down arrow of the "ZOOM" Key.(Fig. 10-10), we can lower the Fish Alarm or turn it OFF.

4) FISH SYMBOL/OFF or ON (Fig. 16-4)
By pressing the "IMAGE SPEED" Key (Fig. 10-6), the Fish Symbols (Fig. 22-1) will be turned ON or OFF. When the Fish Symbols are ON, the LCS-180 will display three (3) sizes of fish. The sizes will be determined by the strength of the return echo. The size of the fish image does not necessarily indicate the actual fish size. School of small fish are displayed by a large fish image if the echo is strong enough.

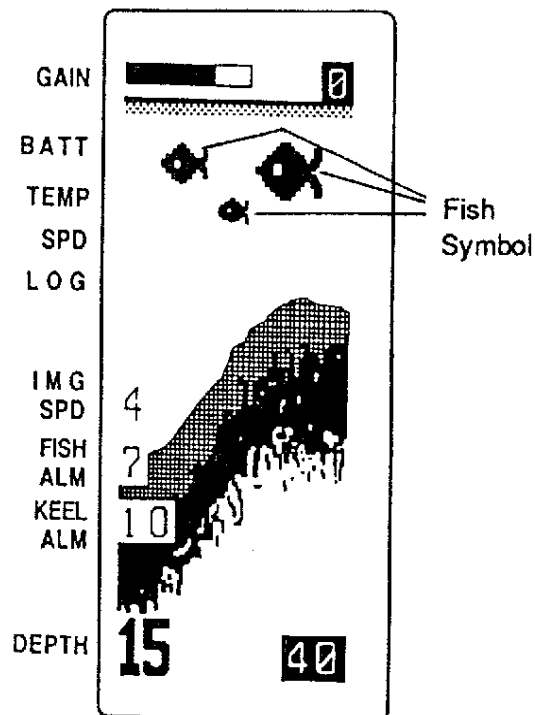NOTE: Fish Symbols are displayed only in the Standard Display Screen.

Figure 22   Standard Display with Fish Symbols

6.12. MENU 3 (Fig.17)

1) TMP + DEP/°F FT or °C MT (Temperature and Depth) (Fig. 17-1)
   By pressing either arrow of the "GAIN" Key (Fig. 10-8), the LCS-180 will display the temperature in Fahrenheit and depth in feet or temperature in Centigrade and depth in meters.

2) SPD + LOG/KTS NM or MPH SM or KPH KM (Speed and Log) (Fig. 17-2)
   By pressing either arrow of the "RANGE" Key (Fig. 10-7), the LCS-180 will display:
   (a) Speed in knots and log in nautical miles.
   (b) Speed in miles per hour and log in statute miles.
   (c) Speed in kilometers per hour and log in kilometers.

3) SPD. ADJ/100 (Speed Adjustment) (Fig. 17-3)
   If you run a known distance with your vessels and the log does not reflect that distance correctly, the speed adjustment can be used to calibrate your unit. If the log distance is less than your known distance, the up arrow of the "ZOOM" Key (Fig. 10-10) will increase the percentage up to 150 percent. The down arrow of the "ZOOM" Key (Fig. 10-10) will decrease the percentage to 50 percent.

4) LOG RESET (Fig. 17-4)
   By pressing the "IMAGE SPEED" Key (Fig. 10-6), the log distance displayed will be reset to zero. In other words, it is the same as resetting the trip mileage in your car.

6.13. MENU 4 (Fig.18)

1) GAIN/AUTO or MANUAL (Fig. 18-1)
   By pressing either "GAIN" Key (Fig. 10-8) arrows, the gain of the LCS-180 is automatically set (AUTO) or you have manual control of the Gain (MANUAL). The factory setting of the gain is AUTO.

   (a) In the "AUTO" position, AUTO will appear on top of the screen (Fig. 12-1). When in either of the Standard, Zoom or Bottom Lock Displays, by pressing the up arrow of the "GAIN" Key (Fig. 10-8), we can increase the gain slightly. The indication on the screen will be "AUTO +". By pressing the down arrow, we can decrease the gain slightly. The indication will be "AUTO –".

   (b) In the "MANUAL" position, a bar is displayed (Fig. 11-5) in the Standard, Zoom or Bottom Lock Displays. By pressing the up arrow of the "GAIN" Key (Fig. 10-8), the gain is increased and the black bar is longer. The down arrow will decrease the

gain. Manual gain has eight(8) levels. The gain adjusted properly is the least gain that will reflect a stable depth reading.

2)   RANGE/AUTO or MANUAL (Fig. 18-2)
     By pressing either "RANGE" Key (Fig. 10-7) arrows, the position of Auto Range or Manual Range is selected. The factory setting is the Auto Range position.
     (a)   In the "AUTO"position, the indication on the Standard, Zoom or Bottom Lock Displays will be like Fig. 12-2 without box around the numbers. The manual position will be like Fig. 11-6 with box around the numbers.

     (b)   When in the "AUTO RANGE" mode, the LCS-180 will select the ideal depth range automatically. The unit will shift ranges as the bottom increases or decreases in depth.

     (c)   When in the "MANUAL RANGE" mode, the up and down arrow of the "RANGE" Key (Fig. 10-7) will increase or decrease the pre-selected ranges.

3)   A. CLT. (Anti Clutter) (Fig. 18-3)
     By pressing the up arrow of the "ZOOM" Key (Fig. 10-10), the anti clutter is turned ON or increased from 1 to 6 positions. The down arrow will decrease the numbers or turn anti clutter OFF.

     NOTE: Normally anti clutter is not needed and is left in the OFF position. However, debris in the water or heavy concentration of plankton can cause the upper portion of screen to be cluttered with false showings. Anti Clutter is then turned on and set to the lowest number that will make the screen useable.

4)   C. ECHO/OFF or ON (Clean Echo) (Fig. 18-4)
     By pressing the "IMAGE SPEED" Key (Fig. 10-6), Clean Echo is turned "ON" or "OFF".

     NOTE: Normally Clean Echo is left in the "OFF" position. However, if your vessel is close to another vessel which has a sounder of the same frequency as the LCS-180, which is 200 KHz, the two sounders will listen to each other which will cause noise to appear on each others screen. If you turn Clean Echo "ON", the LCS-180 will no longer listen to the other sounder.

7. SPECIFICATIONS

Display:	Supertwist LCD
Resolution:	128 x 64 dots (8,192)
Output Power:	100 watts RMS(800 watts peak-to-peak)
Frequency:	200kHz
Display Mode:	Standard, Zoom, B/L, Big Number
Depth Ranges:	10, 20, 40, 80, 160, 320 feet
	5, 10, 20, 40, 80, 160 meters
Range Mode:	Automatic or Manual
Zoom Range:	1/4, 2/4, 3/4 of any range
B/L Range :	10, 20, 30 feet or 5, 10, 15 meters
Gain Mode :	Automatic or Manual
Alarm:	Keel alarm & Fish alarm
Image Speed:	4 steps plus FREEZE
Display Review:	Recall of 1 present plus 2 past images
Fish Symbol:	Provided in 3 sizes
Water Temp Display:	Selectable F or C
Vessel Speed/Log Display:	Provided
Ambient Temperature:	14°F to 122°F(-10°C to +50°C)
Dimensions:	6.1"W x 6.1 "H x 2.9"D
	(156 mmW x 156 mmH x 73.5 mmD)
	including trunnion & knobs
Weight:	1.2 lbs(540g) including trunnion & knobs
Power Requirement:	10 to 17 VDC 180mA with backlight off
	330mA with backlight on

*Specifications subject to change without notice.

8. STANDARD EQUIPMENT

LCD Display Unit	1	1.0 lbs
Trunnion	1	
Knobs	2	
Rubber Washers	2	
Flush Mount Kit	1	
Transducer	1	200kHz
		with built-in temperature and speed sensors
Power Cable	1	10 feet with a fuse holder
Operation Manual	1	
Fuse	1	1 A

9. TROUBLESHOOTING

When the LCS-180 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 the 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.

Certificate of Limited Warranty
All Products Except Radar

Providing you present a valid proof of purchase, SI-TEX Marine Electronics Inc. warrants all parts of each new product against defects in material and workmanship under normal use and will repair or exchange any parts proven to be defective at no charge for a period of one year from the date of purchase, except as provided below under Limited Warranty Exceptions.

Defects will be corrected during normal working hours by an authorized SI-TEX Marine Electronics Inc. dealer, service center, or at the SI-TEX office at Clearwater. There will be no charge for labor for a period of one year from the date of purchase, except as provided below under Limited Warranty Exceptions.

LIMITED WARRANTY EXCEPTIONS

SI-TEX Marine Electronics Inc. will not be responsible for equipment which has been subjected to water or salt water damage, accident, abuse, or misuse nor any equipment on which the serial number label has been removed, altered, or mutilated.

SI-TEX Marine Electronics Inc. assumes no responsibility for damage incurred during installation.

This Limited Warranty is effective only with respect to the original purchaser.

This Warranty and Proof of Purchase must be made available to the authorized SI-TEX Marine Electronics Inc. service location or dealer at the time of service.

Any cost associated with transducer replacement, other than the cost of the transducer itself, is specifically excluded from this Limited Warranty.

Travel costs incurred will not be accepted for SI-TEX Marine Electronics Inc. products.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF.

SPECIFIC EXCLUSIONS

Charges for overtime, stand-by, holiday, and per diem are specifically excluded from this Limited Warranty.

On Echo Sounders, chart paper, stylus, stylus belt, lamps, and fuses are consumable items and are not covered by this Limited Warranty.

Installation workmanship or materials except as provided directly by SI-TEX Marine Electronics Inc. are not covered by this Limited Warranty.

SI-TEX Marine Electronics Inc. equipment or parts thereof which have been repaired or altered except by an authorized SI-TEX Marine Electronics Inc. dealer or service center are not warranted in any respect.

SI-TEX Marine Electronics Inc. will not, at any time, assume any costs or labor charges for checkout or external line fuse replacement or problems not found to be at fault in the equipment itself.