

INSTALLATION AND OPERATION MANUAL

FOR

**LOWRANCE FLASHER  
SONAR UNITS**

LITHO IN U.S.A.

988-0115-48

**LOWRANCE ELECTRONICS, INC.**  
12000 E. SKELLY DR., TULSA, OK 74128

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## NOTES

Dear Customer,

We regret the manual for your depth sounder is no longer available. However, we have printed this manual that covers all Lowrance flasher-type sonar units. Please note that this manual does not cover the transducer installation for the permanent mount units. If you need a transducer installation manual, please contact us.

Lowrance designed these sonar units to give the best possible performance and the most information. We use only the finest parts in the construction. Even though your unit may be many years old, we hope it will continue to serve you well for many more.

This manual covers the installation and operation of the following products:

ALL "RED BOX"	LFG-660
ALL "GREEN BOX"	LFG-660A
LFG/P-110	LFG-1220
LFG/P-120	LFG-1225
LFG/P-150	LFG-1230
LFG/P-160	2060B/C
LFG-175	2100/A/B/C
LFG/P-200	2160/A/B/C
LFG-205	2260/A/B/C
LFG-225	2330/A/B/C
LFG/P-235	2360
LFG/P-250	2460/A/B/C
LFW-250	(PLUS ALL PORTABLE
LFG-275	SYSTEM 2000 UNITS)
LFG/P-300	
LFG/P-300D	
LFP-300E	
LFP-300 COMMEMORATIVE	
LFG-305	
LFG-306	
LFG-310	
LFG-312	
LFG-320	
LFG-325	
LFG-330	
LFG-360	

## Power Connections (Permanent Mount Units Only)

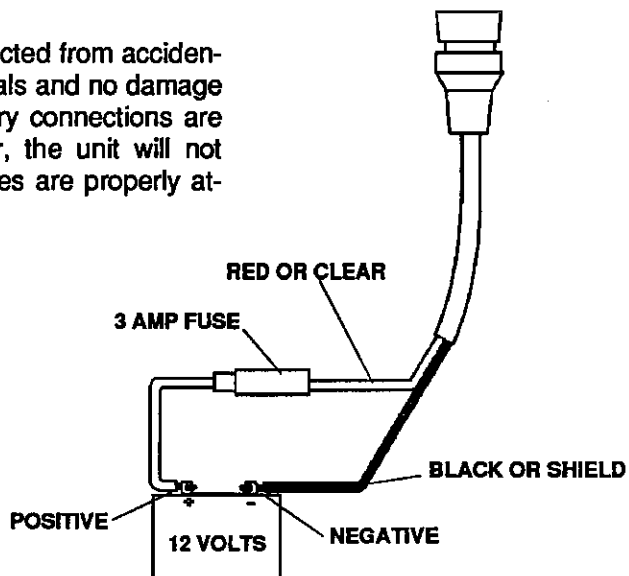
Supply power for the depth sounder with the boat's 12-volt DC electrical system. Power may be picked up at an accessory or power buss. However, you may have problems with electrical interference, which is indicated by extraneous flashes on the dial. If so, connect the power cable directly to the battery.

If a longer power cable is required, use ordinary #18 lamp cable available at any hardware or electrical supply store. Solder all splices. If this can't be done, use crimp-type splices. Simple twisting of splices may result in intermittent power connections which can cause interference. Tape all splices with electrical tape.

### IMPORTANT

Make certain that a in-line, 3 amp fuse (supplied with some units) is attached to the positive conductor of the power cable. Install it as close to the power source (battery, power buss) as possible. This will protect both the unit and the power cable in case either is ever shorted. Some flashers have a fuse located inside the unit. This will only protect the unit, not the power cable.

All units are protected from accidental polarity reversals and no damage will result if battery connections are wrong. However, the unit will not work until the wires are properly attached.



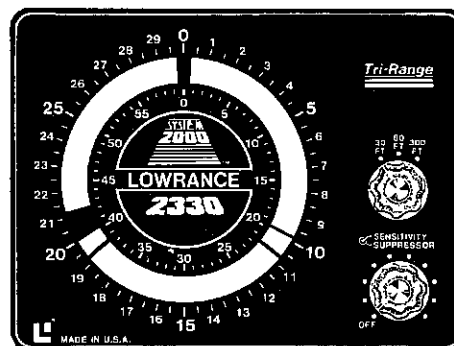
## FISH SIGNALS

Here are some things that will help you understand the signals that are displayed on your Lowrance sonar unit: A big fish returns a wide signal while a small fish returns a narrow one. A school of bait fish or minnows, nearly always near the surface, returns a great many thin, rapid signals. Wide signals beneath indicate the game fish which are often present under the school of little fellows to feed on them.

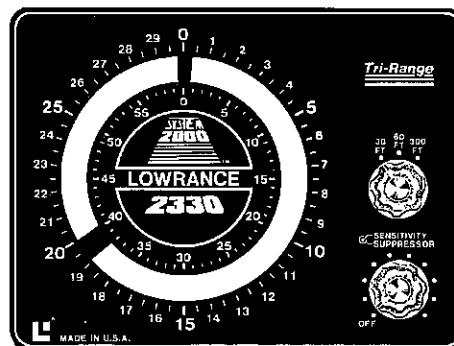
Remember, many kinds of game fish like sharp drop-offs, rocky ledges, and underwater cliffs. But, as your boat moves across these spots, the sonar unit will not be able to show the fish because the sloping bottom sends back such a wide signal.

Many kinds of fish remain suspended between the water surface and bottom during hot weather. Crappies will usually lie at a uniform depth similar to a horizontal blanket in the water.

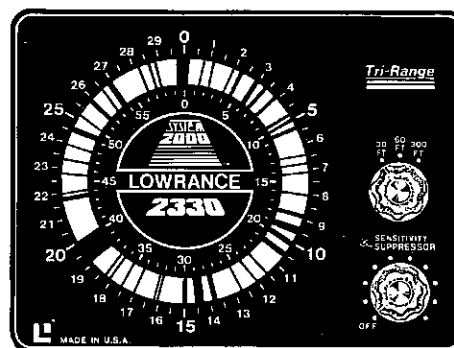
A big school may extend 100 feet in each direction and as you pass over it you will get an almost constant signal, plus other flashing a few inches above and below. A school of white bass isn't likely to cover such a big area as a school of crappie sometimes does, especially in the summer and fall. The signals will show these fish occupying a greater spread vertically (8 to 10 feet). The larger game fish such as bass and walleye aren't likely to be so tightly grouped as white bass, crappie, or other panfish, and the individual members, being larger, return stronger signals.



NO SUPPRESSION

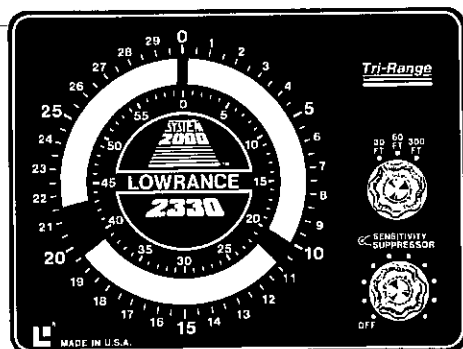


PROPER SUPPRESSION  
(HIGH SPEED RUN)



NO SUPPRESSION  
(HIGH SPEED RUN)

## SUPPRESSOR ADJUSTMENT

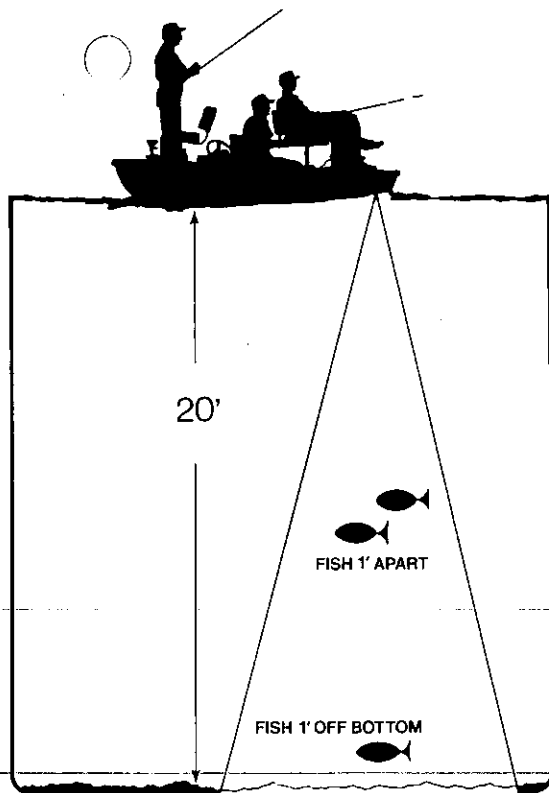


TOO MUCH SUPPRESSION 60'  
RANGE

The Suppressor control knob can be used to cut down or eliminate false flashes on the dial. These false flashes can be caused by ignition interference from the boat's motor or by air bubbles passing over the face of the transducer.

Turning the knob clockwise increases the amount of suppression. Always use as little Suppression as possible, because an increase in it cuts down on the ability of the unit to show separate fish close together or close to the bottom.

Increasing Suppression does not decrease the **Sensitivity** of the unit.



## Mounting

The depth sounder can be installed in any convenient location which has a flat surface. The adjustable mounting bracket permits mounting on either a bottom or overhead supporting surface. If the unit is to be located in the vicinity of a compass, run it in position temporarily to make sure it does not affect compass readings. If compass heading changes, choose an alternate location. (Note: The unit must be running when you make this test.) Holes in the base of the bracket allow wood screw or bolt mounting.

## Inserting the Batteries (Portable units only)

Open the battery compartment. Sonar units with a plastic housing store the batteries in the base. Remove the screws that retain the cover for access to the battery compartment. Metal housing units store the batteries under the transducer clip. A nut holds the cover closed on older units; newer ones use a simple catch. Once you have opened the battery compartment, slide two six volt spring terminal batteries into it. Make certain the spring terminals make contact with the copper or silver colored strips on the battery board. The battery board is specially designed to assure proper polarity, no matter how the batteries are placed. Close the battery compartment and turn the unit on. You should hear the motor run and a light should shine at the zero mark. If the light doesn't come on, plug the transducer in. If the light still doesn't turn on, the batteries could be weak. Another cause is poor contact against the battery board. If the batteries and their connections are good, the sonar unit is defective.

## Transducer

(Note: Due to the many different transducers produced with the sonar units over the years, permanent installation instructions are not included in this manual. If you need permanent transducer installation instructions, please contact the Lowrance factory.)

## Mounting the Transducer (Portable Units Only)

Assemble the transducer and bracket. Next, clean a spot on the transom that's at least a foot away from the motor. Wet the suction cup(s) and press it firmly against the transom. The transducer's face

should be slightly below the bottom of the hull for best results. Tie one end of the nylon cord to the transducer bracket and the other end to a convenient location on the boat. This will prevent the loss of the transducer if the suction cup loses its grip. The transducer should be vertical. Some transducers can withstand higher speeds than others, but keep in mind this mounting is not meant for high speeds. If you wish to travel at high speed, it's a good idea to remove the transducer from the transom until you're ready to use it again.



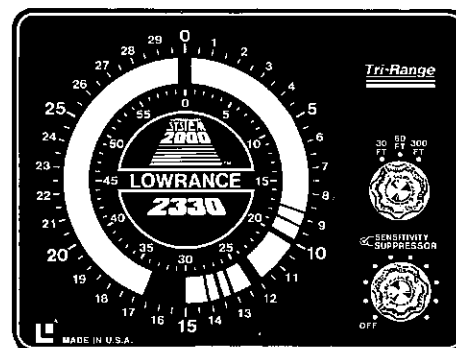
### Sensitivity and "ON-"OFF" Knob

This knob operates in a manner similar to the volume control on a radio. After mounting the transducer, turn the unit on by turning the sensitivity knob clockwise. (LFG-660 and 660A units - turn the range switch to feet or fathoms.) You will see the constant surface signal at zero. Turn the knob in a continued clockwise manner to increase the receiver sensitivity. Weaker echoes from deeper water can and will be observed on the dial. Before long, you will see another signal - at ten feet if the water is ten feet deep. This signal indicates the bottom. It, too, should always show.

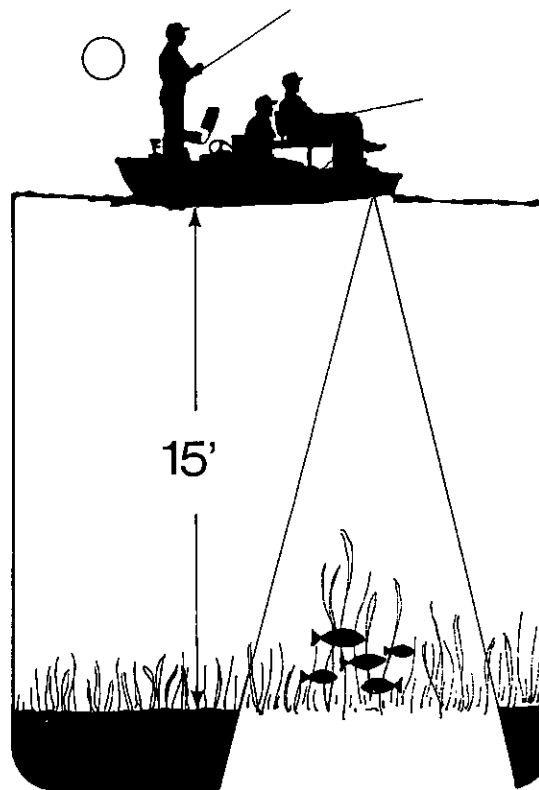
Continue turning the sensitivity control toward the right and you will see a second bottom signal at double the depth of the first. With a water depth of 10 feet, the second echo appears at 20 feet. The sound waves have hit bottom, bounced back, hit the surface of the water, then bounced down and up again. Over a firm bottom you can increase the sensitivity until the dial shows three or four bottom signals at multiples of the true depth. Remember, the shallowest bottom signal is the true bottom depth.

Since the sensitivity is adjustable, always set it to return a steady bottom signal nearly as bright as the zero signal regardless of depth. Turn the knob counterclockwise when you begin to get the double bottom signal; clockwise when the bottom signal begins to fade. To show fish set the sensitivity control to show a strong, bright bottom signal. Many fishermen prefer to run the sensitivity control very high with the second bottom signal showing. This will insure they see all the underwater detail as well as fish.

### WEEDS RETURN PALE, THIN SIGNALS



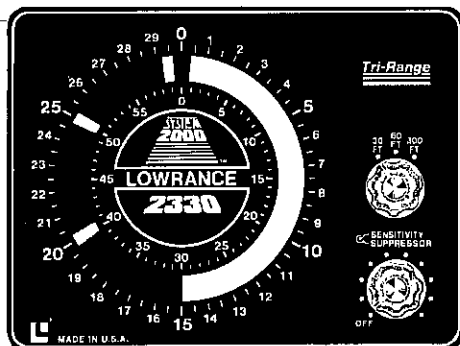
30' RANGE



Weeds return pale, thin signals that tie in with the bottom signal. These signals are weaker than those returned by brush or trees on the bottom.

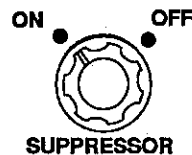
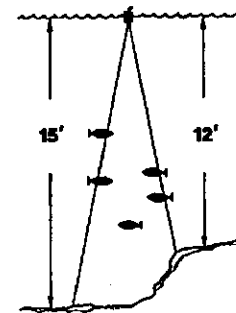
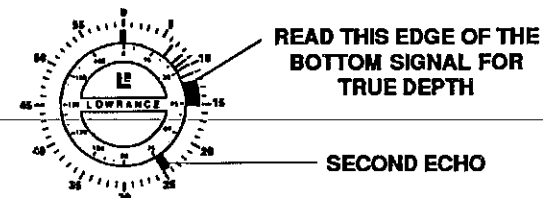
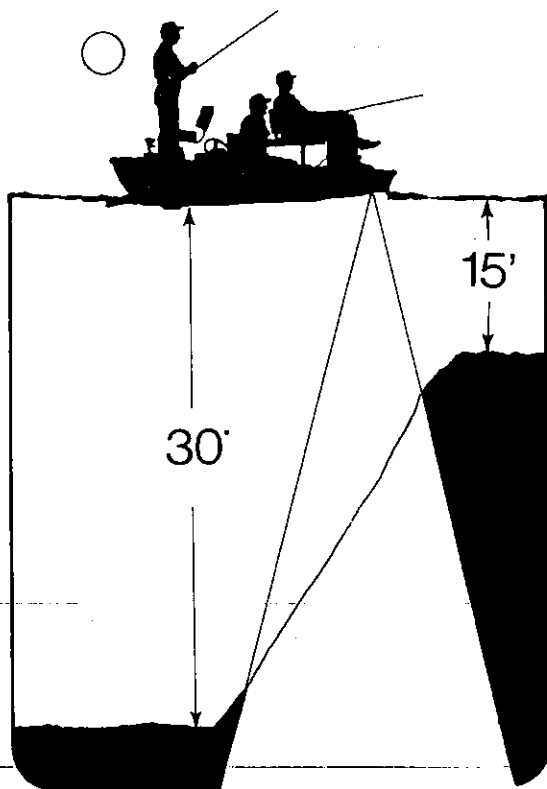
In most lakes, weeds don't grow in water more than 12 or 15 feet deep because of the lack of sunlight. As your boat approaches a patch of underwater weeds, their signal will climb up toward the zero signal; as you leave them, the weak signals will climb back down.

## SLOPING BOTTOMS



30' RANGE

A smooth sloping bottom will be similar to a rock ledge. However, the sloping bottom can be distinguished by the nearly solid signal. A steep slope returns a wide signal, the steeper the wider, with the signal returned from a high underwater cliff being the widest of all. The sure proof of a drop-off is the sudden change of the regular depth signal to a wide one, then back to the usual width, but either more shallow or deeper as the boat moves past.



## SUPPRESSOR CONTROL

Use the suppressor control knob to cut down or eliminate false flashes on the dial. These false flashes can be caused by ignition interference from the boat's motor or by air bubbles near the transducer.

Turning the knob clockwise increases the suppression. Always use as little suppression as possible, because an increase in suppression cuts down resolution. Resolution is the ability of the unit to show separate signals or objects (such as fish) close together.

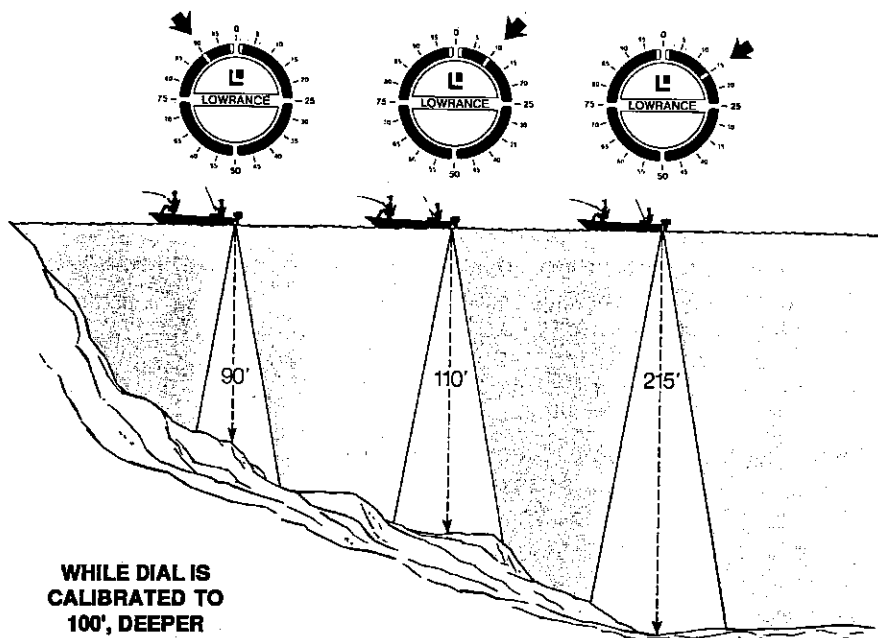
Because of the type of suppression circuitry used by Lowrance, only unwanted signals are eliminated. It does not affect the sensitivity of the unit. (Sensitivity in this instance is the ability to show detail or depth.) Some resolution is lost when suppression is used. This means that fish close to the bottom may blend in with the bottom with high suppression settings. Only use enough suppression to eliminate noise.

## RANGE

(All units without a range switch)

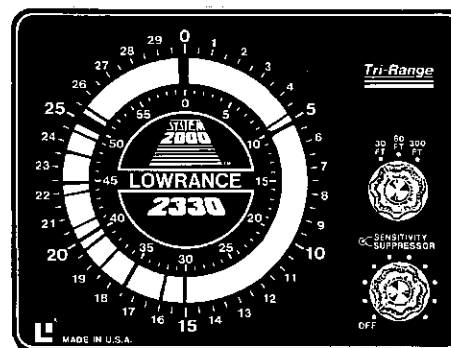
Even though there is only a single scale on your sonar, depths greater than the scale's maximum can also be measured on your unit. For example, a sonar has a 0 to 100' scale. As the water depth goes from 90 feet to 110 feet, the bottom signal on the dial moves past the "zero" signal to the 10-foot mark on the outer scale. Simply add 100 feet to the reading on the dial to get the correct depth.

If in doubt as to depth, turn the unit off until the scan disc stops. Turn it back on and watch to see if the bottom signal completes one revolution before stopping. If it does, you are at the depth shown, plus the maximum range on the scale. For example, if the bottom signal travels past the "0" mark and stops at the 20 foot mark, then you're in 120 feet of water, if the sonar has a 0-100' scale. On the same scale, if the bottom signal moves past the zero mark twice and stopped at the 20 foot mark, the water depth is 220 feet. Some Lowrance units have a scale printed on the inside of the dial to make this easier.

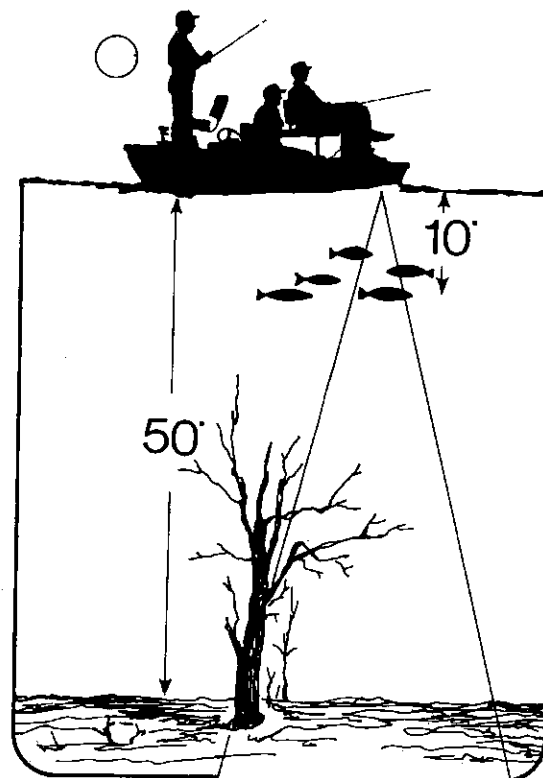


WHILE DIAL IS  
CALIBRATED TO  
100', DEEPER  
DEPTHS CAN ALSO  
BE READ

## TREES IN THE WATER



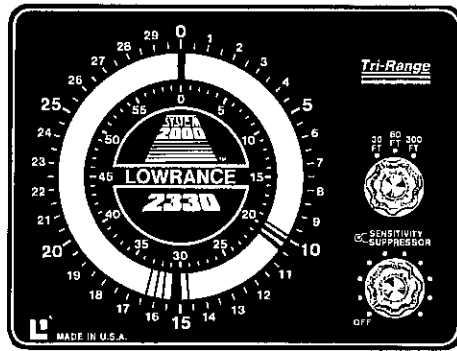
60' RANGE



The signals on the dial shown here indicate an underwater tree with a few fish above it. The water is 50 feet deep, the tree 21 feet tall, and the fish are at 9 and 10 feet deep. Limbs at various depths return individual signals and account for the wide band of signals on the dial. Brush appears similar, though not so tall.

Bass and panfish often hang around submerged vegetation, not only near the surface but down to depths of 25 or 30 feet, depending on the thermocline. To detect them, anchor bow and stern so your boat can't move. Constant signals indicate tree limbs. Signals that come and go or shift up and down are fish — limbs don't move.

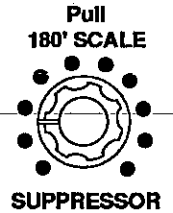
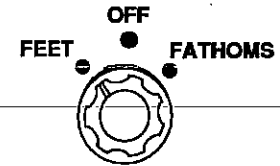
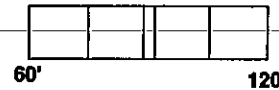
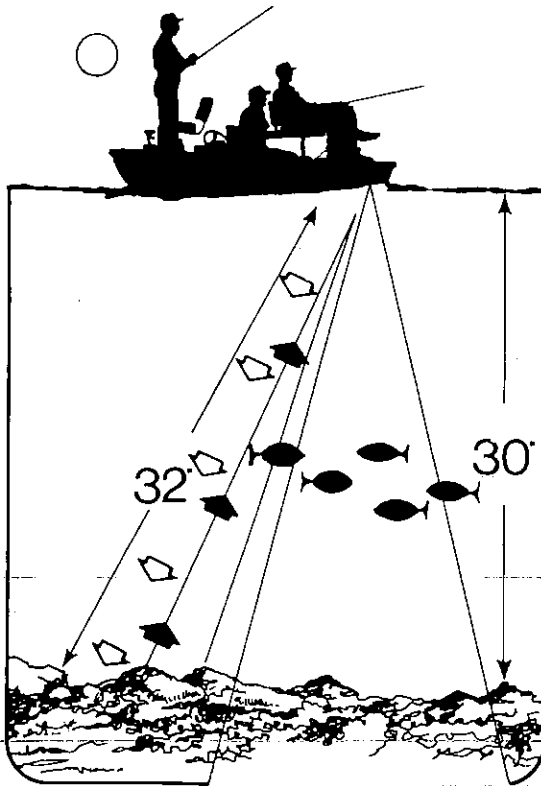
## SIGNALS RETURNED BY A ROCKY BOTTOM



60' RANGE

The signals returned from a rocky bottom are quite confusing when you first see them. The dial will indicate the level of the bottom at the correct depth, but it will also show clear, thin signals, above and below the wider main bottom signal. This is explained by the fact that the rocks near the outer edge of the cone of sound waves are farther from the transducer than those in the center, while the tops of the latter are closer than the bottom.

Figure 15 also shows the typical signals indicating a school of white bass or bluegills at a depth of twenty feet.



## RANGE (All units with a range switch)

On all dual-range sonar units, the shallow scale is printed on the faceplate's outside circle of numbers. The deep scale is printed on the inside circle. For example if the sonar unit has 0-60' and 0-120' depth ranges, read the depth on the outside scale when the range switch is in the 60' position and the inside scale when it's in the 120' position.

If your unit has a 60'/60 fathom range, each mark on the 0-60 scale is equal to one foot when the range switch is in the feet position. When the range is switched to the fathoms position, each mark is equal to one fathom. (Note: One fathom is equal to 6 feet.)

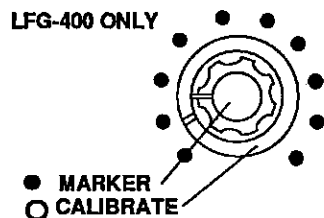
If your unit has three ranges, the shallow range is read on the outside scale. The middle range is read on the inside scale. Read the deep range from the same scale as the shallow range and multiply to get the correct depth, or it may have a set of blue numbers next to the outside scale. These blue numbers are the correct depth markings for the deepest scale. Therefore, you don't have to multiply to get the correct depth.

**NOTE:** The speed of the motor determines the depth range. So it's normal for the motor to slow down when switching to deeper ranges, or speed up when switching from a deep range to a shallow one.

## ALARM

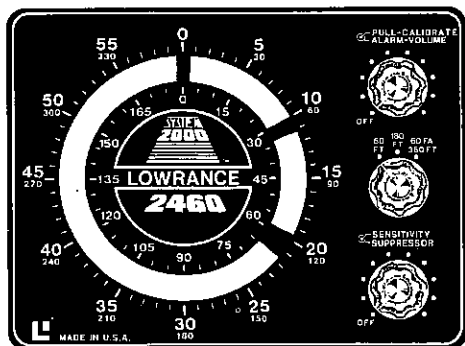
The depth alarm will sound whenever the bottom or targets such as fish are at a depth shallower than the alarm calibration point. This can be used to alert you to fish or schools of fish, or to shallow water. The shallowest alarm setting is approximately six feet on most units.

Two different methods are used to adjust the alarm setting. The LFG-400 uses the small outer knob as an on/off switch to turn the alarm marker light on or off. The large, inner knob is used to set the alarm depth. There is no alarm volume control. All other units use the small, outer knob both as a marker light on/off switch and to set the alarm depth. The large, inner knob is the alarm volume control.



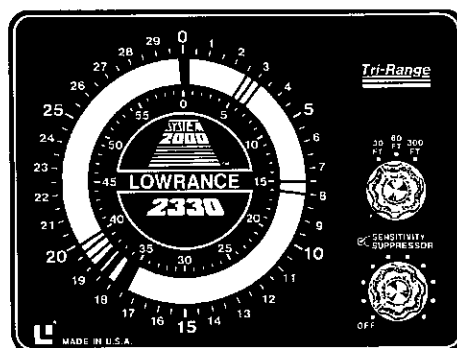
### LFG-400 Alarm Set

Turn the small, outer knob to the right to turn the marker light on. Rotate the large, inner knob until the marker light is at the desired depth. If any echo appears between approximately six feet and the marker setting, the alarm will sound. If desired, the marker light can be turned off by switching the small knob to the "OFF" position. This does not turn the alarm off, it simply turns the marker light off. Rotate the large, inner knob all the counter-clockwise to turn the alarm off.

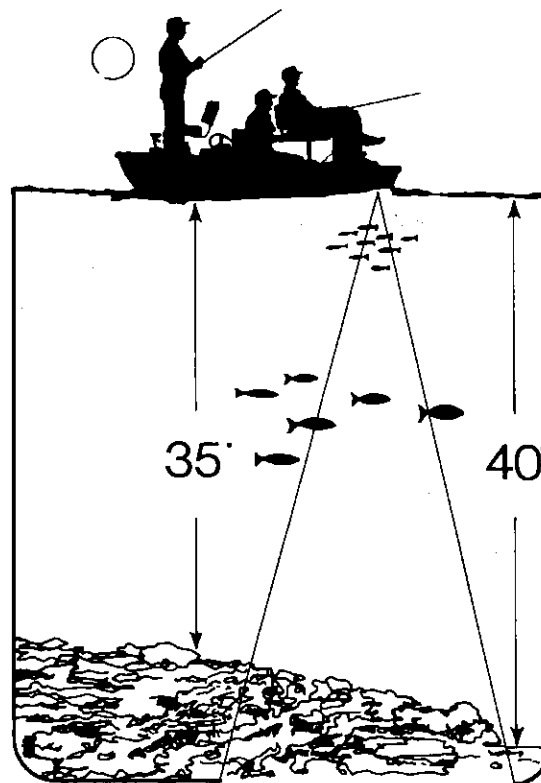


BOTTOM AT 19 1/2 FEET  
ALARM MARKER AT 10 FEET

## WIDTH OF SIGNAL INDICATES SIZE OF FISH



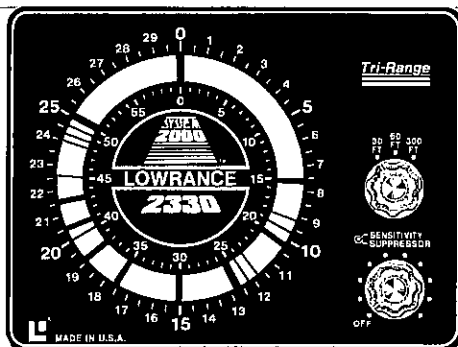
60' RANGE



Small minnows or bait fish appear on the dial as thin, pale lines. If they are tightly schooled they may cover a depth of from five to ten feet on the dial with a few pale lines for individual minnows at the bottom of the school. Your Lowrance sonar will indicate even a single minnow 30 feet beneath the surface of the water.

Obviously, the back of a big fish offers a larger surface to reflect the signal than the back of a small one. Consequently, you get a wider and brighter signal on the dial and, even though you can't tell the exact size of the fish from the signal, it does give you a good clue so that you can instantly tell big ones from little ones.

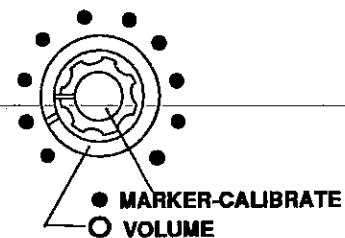
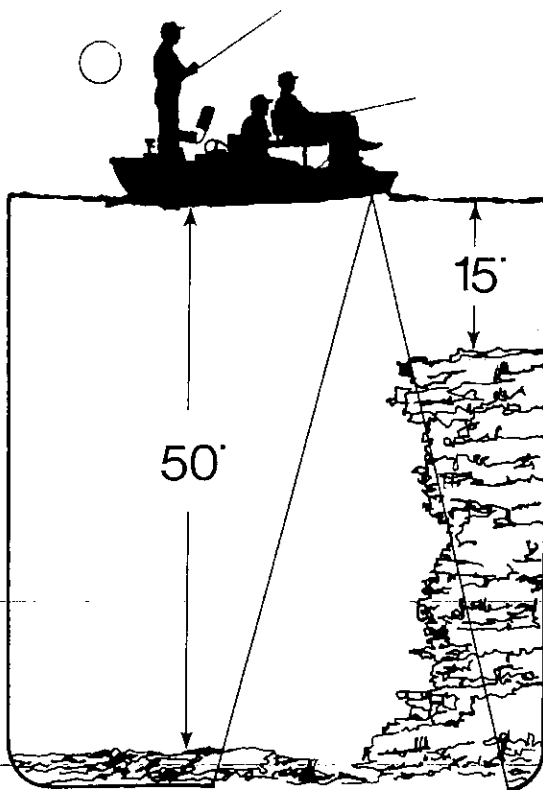
## SIGNALS FROM STEEP, ROCKY LEDGES



60' RANGE

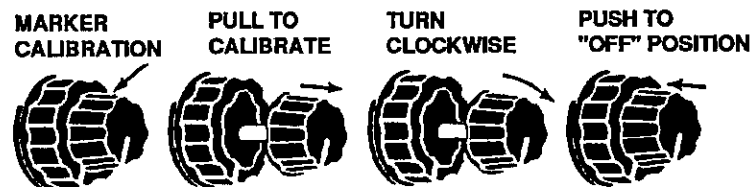
Your Lowrance sonar unit translates time into distance — the farther the sound waves travel, the longer it takes them to return to the transducer and the greater the depth shown on the dial. Nowhere is this shown more clearly than when your boat passes over a steep, rocky underwater ledge or cliff, either vertical or inclined at a steep angle.

Assume the top of the cliff is 15 feet beneath the surface of the water, and the bottom is 50 feet deep. Sound waves will hit rough spots on the cliff all the way down. As the result, the signals on the dial will cover an area extending from 15 to 50 feet — a condition that could easily lead to confusion until you understand it.



### Alarm Set - All Others

To set the alarm on these units, PULL the small knob OUT. This will turn the marker light on. Rotate the small knob until the marker light is at the desired depth setting. If desired, the knob can be pushed in to turn the marker light off. This does not turn the alarm off, just the marker light. If any echoes appear between the marker light setting and approximately six feet, the alarm will sound. Adjust the large, inner knob for the desired alarm volume.



To turn the alarm off, rotate the small, outer knob all the way counter-clockwise.

### All Alarms

Remember, once the depth alarm has been set, any fish or suspended material located between the alarm set point and approximately six feet will trigger the alarm.

In order to operate properly, the marker setting must be made between the zero position and the bottom signal. If the marker is set deeper than the bottom, the audible alarm will sound continuously.

The alarm sensitivity is preset and is not intended to sound on false targets such as small bubbles. However, large quantities of surface clutter may trigger the alarm.

## How to use your Lowrance Depth Sounder

The word "Sonar" is an abbreviation of Sound, Navigation, and Ranging. It was developed during World War II as a means of tracking enemy submarines. Sound travels at approximately 4,800 feet per second through water compared to 1,100 feet per second through air.

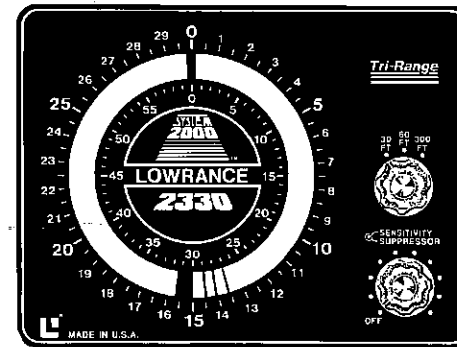
The way a sonar works is an electrical pulse is converted into a sound wave and transmitted into the water. When this wave strikes an object, it rebounds. Since the speed of sound through water is known, the time lapse between the transmitted signal and the received echo can be measured. From this, the distance to the object is determined.

The Lowrance depth sounder transmits a high frequency sound wave (which is inaudible to fish as well as humans) through the water. At the same time, a high intensity neon bulb whirls at a constant speed behind the dial on a disc driven by an accurately governed motor. The bulb is lighted every time the transmitter fires. This provides a visual reference point on the dial which is used as a starting point to measure depth, and as an indicator that the depth sounder is on. Even though the neon bulb flashes, it happens so often that the human eye sees it as a nearly constant light.

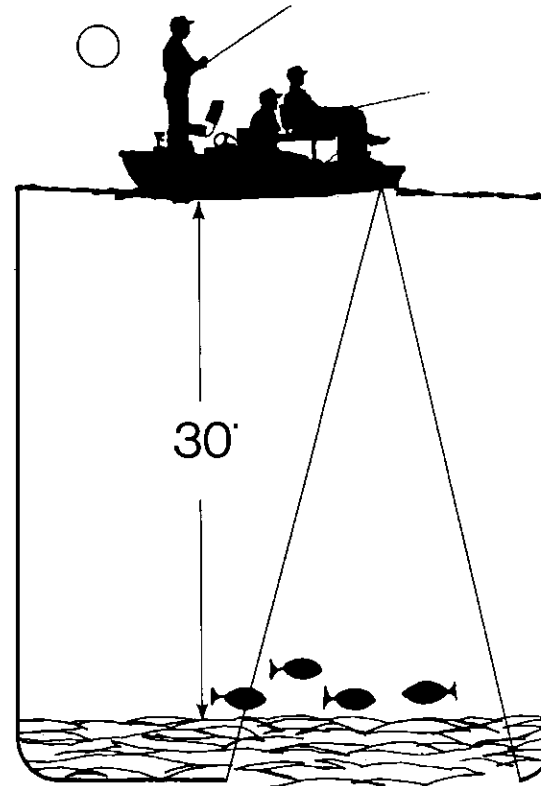
The bulb also flashes at the point on the dial that indicates the depth. The point is indicated by the length of time it takes the sound waves to reach the bottom and return. In addition, echoes returned from any object in the water between the surface and bottom fire the bulb, too. Since these echoes are also timed, they show the exact depth of any fish or any number of fish in the water. And because the sound waves from the transducer go down into the water at an angle, they tell, within a matter of a few feet, the fish's location as well as the depth.

At a depth of 10 feet, the cone covers a circle that is approximately one foot in diameter. At 15 feet it is two feet wide, at 20 feet, it's three feet wide. Regardless of depth, the cone of sound ends at the bottom. But an echo is also returned from any object between the transducer and the bottom.

## MUD BOTTOMS CAUSE THE SIGNAL TO FADE



60' RANGE

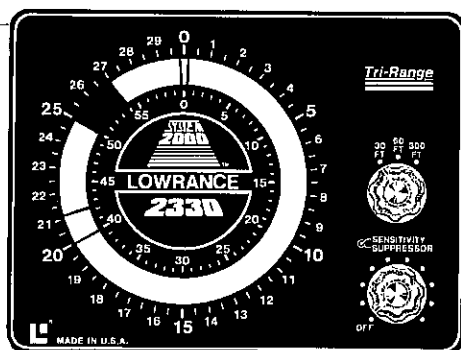


Mud and decayed vegetation

When you are hunting fish, with the sensitivity adjusted properly to return a clear, bright signal from a hard bottom, you will sometimes see the signal disappear. This doesn't necessarily mean that you have suddenly come to extremely deep water — the dial would have shown the drop-off with a wide band of signals in that case.

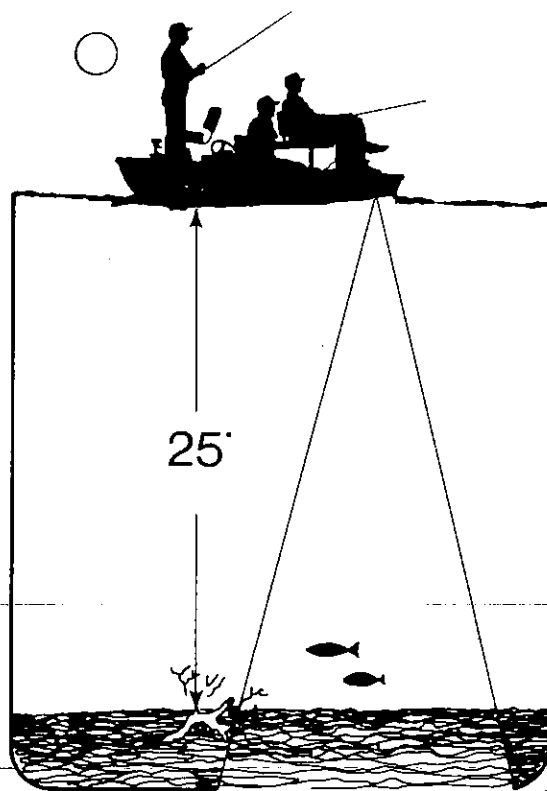
Instead, your boat is now above a mud bottom. Mud absorbs the sound waves. Turn up the sensitivity control. The bottom signal may be faint from a bottom of decaying vegetation under deep water. Fish will still show on the dial, however. Back over a hard bottom you'll get multiple signals.

## HARD CLAY, GRAVEL, SHELL BOTTOMS



30' RANGE

Some fish, including bass, catfish, walleyes, and crappies, occasionally lie right on the bottom. Even here your Lowrance will show them as you pass over, provided the bottom is smooth shell, gravel, or clay. This illustration shows a hard bottom with the sensitivity control adjusted so that a strong bottom signal is displayed.



Sand bottom

## Signal Interpretation

Because your Lowrance sonar is both extremely sensitive and powerful, it can give you an accurate picture of the type of bottom your boat is passing. A bottom of firm sand, gravel, shell, or hard clay returns a bright, fairly wide signal. If you are traveling over such a bottom and the signal weakens, it means that you have moved over a mud bottom. Mud absorbs the sound waves and returns a weak signal. In this case, simply turn up the sensitivity to get a good bottom reading.

A level bottom with scattered rocks returns the usual bottom signal plus secondary signals both above and below it. This is caused by the different distances the sound waves travel. Those that go straight down, hit a rock, and come back indicate, correctly, that the top of the rock is above the level of the bottom. However, sound waves that hit a rock toward the outer edge of the cone of sound waves and are reflected to the transducer travel further. Consequently, their signals appear below the bottom signal.

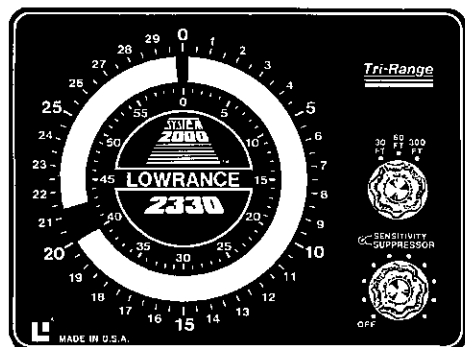
A smooth bottom of solid rock returns a wide, bright signal. Broken rock of various sizes sends back an even wider one, with occasional flashes above and below the level of the true bottom. However, these signals aren't as distinct as the ones returned by scattered rocks on a smooth bottom.

Big rocks or stumps on a smooth bottom send back signals above the level of a smooth bottom, the distance depending on their height. If you watch as you approach a post or a tree, however, you will often see the signal climb, then descend the other side as you continue.

A steep slope returns a wide signal, the steeper the wider, with the signal returned from a high underwater cliff being the widest of all. The sure proof of a drop-off is the sudden change of the regular depth signal to a wide one. Then it changes back to the usual width, but either shallower or deeper as the boat moves past.

Brush will return flashes of varying heights above the bottom signal. Weeds also tie in with the bottom, although they return weaker signals than brush or tree limbs. In most lakes, weeds don't grow in water more than 12 or 15 feet deep because of the lack of sunlight. Weeds make a great many thin, pale signals on the dial.

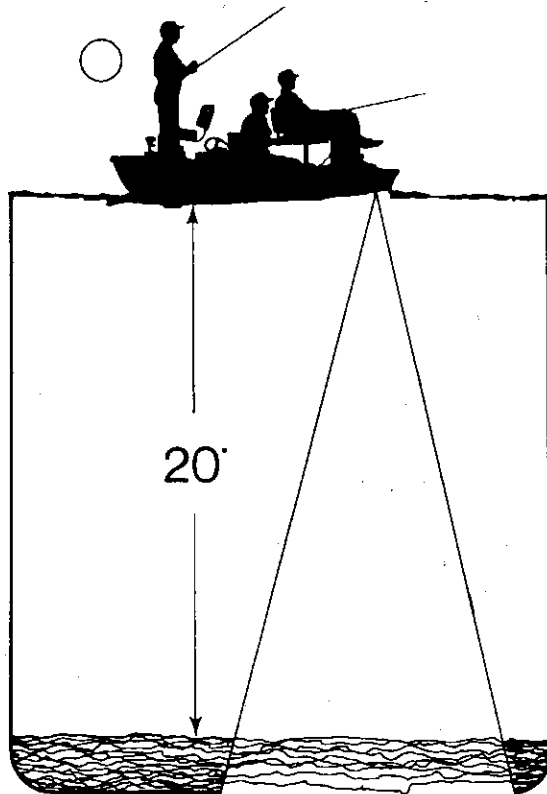
## DETECTING A SMOOTH, HARD BOTTOM



30' RANGE

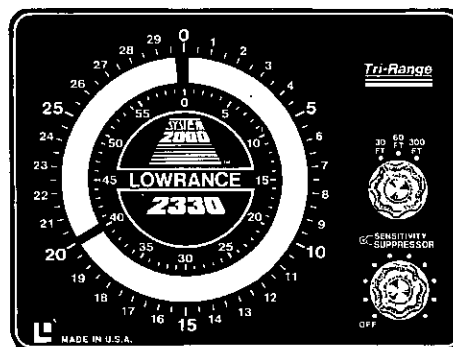
The nicest bottoms to survey with your Lowrance sonar unit are those that return a clear, bright signal, with no spikes either above or below it from scattered rocks. This is the easiest bottom signal of all to read and fish at any depth above it show up plainly on the dial. Nothing is more gratifying than to find a big school of large-mouth bass over clean gravel or walleyes over a smooth sandbar — places that these two popular fish like and that are easy to fish.

It is easy to get multiple signals on the dial from bottoms of this type. If you are over water 20 feet deep, for example, and turn up the gain you'll get signals at 20 and 40 feet.

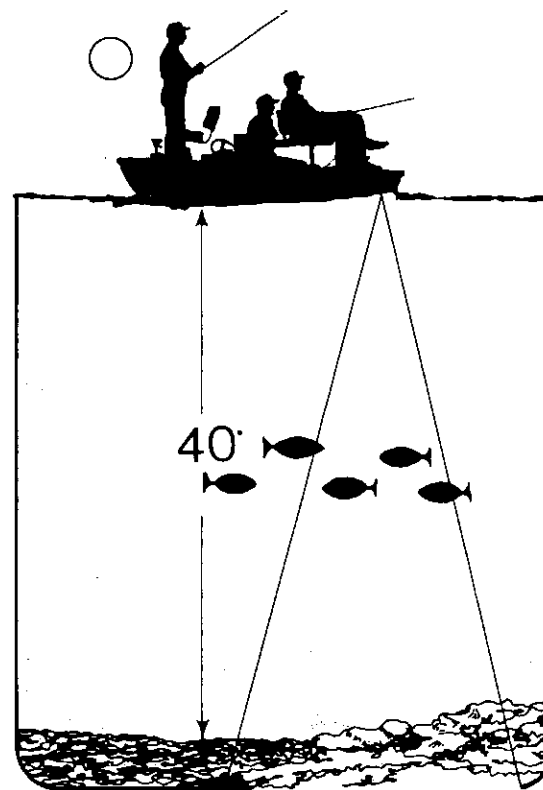


Gravel or Hard Clay

## WEAK SIGNAL INDICATES SENSITIVITY IS TOO LOW



60' RANGE



The sensitivity control on your Lowrance sonar unit might be compared to the volume on a radio. Turn the sensitivity knob to the right and you increase the receiver sensitivity; turn it to the left and you reduce it. This feature is provided so that you can use your Lowrance unit over both deep and shallow water. You should always adjust the sensitivity so that a bright bottom signal shows on the dial, regardless of depth. If you fail to do so and have only a faint bottom signal, the dial will fail to show fish in the water between the transducer and the bottom. This condition is shown in the drawing above — the fish are there but they aren't shown on the dial because the gain is set too low.