



Z-7200

LIQUID CRYSTAL GRAPH

INSTALLATION AND OPERATION MANUAL

EAGLE
THE ALL AMERICAN SONAR

LITHO IN U.S.A.

988-0106-09

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cal energy from the transmitter into ultrasonic sound waves. When a return echo strikes the transducer, it converts the sound waves into electrical energy which is received and displayed by the sonar unit.

TRANSOM MOUNT - A method of mounting transducers or other sensors on the transom of the boat.

UPPER/LOWER LIMIT - These are the range limits displayed on the sonar screen or paper. The upper limit is shown at the top of the display, while the lower limit is at the bottom. For example, a 20 to 30 foot range has 20 feet as the upper limit and 30 feet as the lower limit.

VIDEO GRAPH - A sonar unit that uses a CRT or television type display.

WINDOW - A segment of the depth range. For example, an upper limit of 20 feet and a lower limit of 50 feet creates a 30 foot window.

ZOOM - A feature that enlarges targets on the display.

REMOTE - An intelligent "repeater" unit that receives depth information from another sonar unit. A remote doesn't have a transmitter or receiver. However, it does have its own features that are adjustable and operate separately from the master.

RESOLUTION - The ability of a sonar unit to separate targets from each other or the bottom.

RMS - A standard rating of transmitter power output.

SCALE - The markings on a sonar unit's display. To determine the depth of a target, simply compare the target's location to the location of the scale markers on the display.

SECOND ECHO - Another echo that registers at roughly twice the depth of a target echo. This is caused by the sound waves reflecting off the bottom, striking the surface of the water, travelling to the bottom again, and returning to the surface.

SECOND FUNCTION KEY - A button that converts the functions of the primary keys on the keyboard. Sonar units with a second function key have other keys with two functions. You can switch functions with the second function key.

SENSITIVITY - The ability of a sonar unit's receiver to display targets. Increasing the sensitivity allows weaker targets to be displayed. Also called "gain".

SCROLL SPEED - See CHART SPEED.

SHOOT-THROUGH-HULL - A transducer installation which allows the sonar signals to pass through a fiberglass hull without cutting a hole in the hull.

SUPPRESSION - A method used in some sonar units to eliminate interference or noise.

SURFACE CLARITY CONTROL - Reduces or eliminates undesirable signals displayed near the water's surface. Also called "SCC".

THERMOCLINE - A layer of water caused by the meeting of warm and cool layers of water. The thermocline provides the temperature most fish prefer.

TRANSDUCER - The element of a sonar system that converts the electri-

INTRODUCTION

When the Z-7200 Liquid Crystal Graph (LCG) is turned on, it will automatically find and display the bottom signal and other targets. As the bottom depth changes, the Z-7200 will automatically change the range and sensitivity to keep the bottom signal on the display. If desired, the only key that needs to be touched is the ON key. However, disabling the automatic mode allows manual adjustment of the Z-7200.

The Z-7200 is nitrogen filled and sealed for complete waterproof protection. The liquid crystal display and keyboard are backlit for easy use at night. Plus, it's covered by a full one year warranty. This includes all parts and labor for one year from the date of purchase.

To get started with your Z-7200, first read the installation section. This is where it all begins, and improper installation can cause problems down the road. After you've read these instructions and installed your Z-7200, read the rest of this manual in detail. The more you know when you get to the water, the more your Z-7200 will do for you.

INSTALLATION

Mounting

Install the Z-7200 in any convenient location, provided there is clearance when tilted for the best viewing angle. Holes in the bracket base allow wood screw or through bolt mounting. Attach the bracket to aluminum panels with sheet metal screws. Place a piece of plywood on the back of thin fiberglass panels to secure the mounting hardware. Make certain there is enough room behind the unit to attach the power and transducer cables.

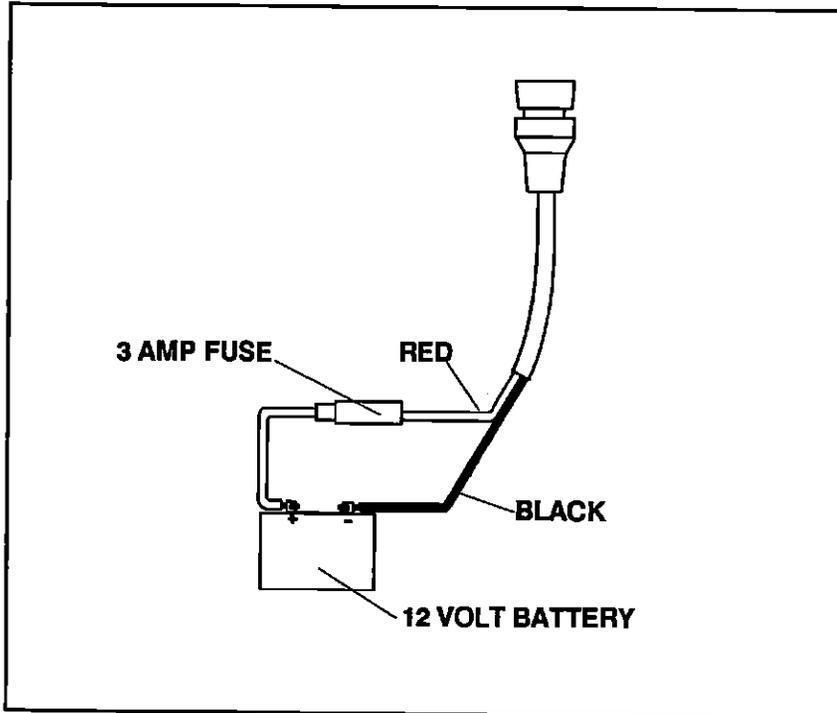
You can route the power and transducer cables through the 7/8" hole in the base of the gimbal bracket. Then pass them through a hole in the mounting surface. The smallest hole that will pass one connector through is 3/4". Pass the transducer connector and cable up through the hole and gimbal bracket. Then push the power cable wire down through the bracket and dash. After routing the cables, fill the hole with silicone rubber adhesive (RTV). Offset the bracket to cover the majority of the hole.

Power Connections

The Z-7200 operates from a 12 volt battery system. Attach the power cable to an accessory or power buss. If you have problems with electrical interference, then attach the cable directly to the battery. Electrical interference shows as random dots on the display whenever the boat's engine or an accessory is on.

The power cable has two wires, red is the positive lead and black is negative or ground. Attach the in-line fuse holder to the red wire on the power cable with the crimp connector. The other end of the fuse holder attaches to the battery or accessory buss. If the cable is not long enough, splice ordinary #18 gauge wire onto it. Be certain that the fuse holder is as close to the power source (battery or accessory buss) as possible. This protects the power cable and your Z-7200 in the event of a short. Use a 3-amp fuse.

The Z-7200 has reverse polarity protection. No damage will occur if the wires are reversed. (However, the unit will not work until the wires are attached correctly.)



of the bottom. In other words, you can tell if the bottom is soft or hard. A hard bottom returns a strong signal causing a wide gray line. A soft, muddy or weedy bottom returns a weaker signal which is emphasized with a narrow gray line.

IN-DASH - A sonar unit installed through a hole in the boat's dash. Usually, the face of the sonar is flush or nearly so with the dash.

KHz - Kilohertz. A measurement of frequency. Your Eagle sonar operates at 192 Kilohertz. (192,000 cycles per second).

LCD - Liquid crystal display. The screen or display of a Liquid Crystal Graph sonar instrument.

LCG - Liquid Crystal Graph.

NOISE - Any undesired signal. Electrical noise is caused by engine ignitions systems, radios, etc. Acoustic noise is caused by the vibration of the engine or other mechanical sources. It appears on the display as random dots or lines.

OPERATING FREQUENCY - Frequency that the sonar unit's transmitter and receiver are tuned to.

OUTPUT POWER - The amplitude of electrical energy transmitted from the sonar unit to the transducer. Measured in watts, the higher the output power, the deeper a sonar unit can read, and more detail can be displayed.

PEAK-TO-PEAK - A measurement of the transmitter's power output.

PIXEL - The small dots or squares on a liquid crystal display or CRT.

PIXEL DENSITY - The number of pixels per square inch on a liquid crystal display. The best resolution is obtained when a high number of pixels are in the vertical.

PULSE LENGTH - The amount of time that the sonar transmits. This is measured in micro-seconds. The shorter the pulse length, the better the resolution. For example, a 30 micro-second pulse length is equal to a one inch resolution.

RANGE - The section of water shown on the sonar display. For example, a 60 foot range has zero for the upper limit and 60 for the lower limit.

GLOSSARY

ANCHOR WATCH - A setting of the sonar unit's alarm. The alarm activates when the boat drifts into shallower or deeper water than the alarm set points.

BACK-LIGHTED - A display or keyboard illuminated from behind by a light. Back-lighted displays and keyboards are essential when night fishing or navigating.

CAVITATION - Air bubbles created by the high speed movement of a boat or transducer through water.

CHART SPEED -(1) The speed of the chart paper on a paper graph recorder. (2) The speed of an image across the screen of a liquid crystal graph. (Also called "scroll speed").

CONE ANGLE - Width of the transducer's cone of sound. Eagle has transducers with cone angles from 8 to 45 degrees to suit the varying needs of fishermen.

CRT - Abbreviation for Cathode Ray Tube. See Video Graph.

DEFINITION - The ability of a sonar unit's display to show detail. A high resolution display can show more detail than a low resolution one.

DISCRIMINATION - A feature that allows the sonar to eliminate noise and display only true target information. Discrimination on Eagle products cuts out false signals from other sonar, noise, thermoclines, and more.

FISH ALARM - An alarm that activates when a fish is detected.

FISH ARCH - A sonar with good resolution displays fish signals with an upside down "V" or arch. This distinguishes fish signals from other targets.

FLUSH MOUNT - A transom mount transducer that is installed with the bottom of the transducer flush with the bottom of the hull.

GIMBAL BRACKET - A bracket used to install a sonar unit permanently. The sonar unit can rotate in the bracket for the best viewing angle.

GRAYLINE - This function shows the relative strength of signals displayed on the screen. Signals weaker than the GRAYLINE setting are displayed in black, stronger targets are gray. It also gives clues to the composition

NOISE

Minimize electrical noise by routing the power cable away from other possible sources of electrical interference. One of the largest noise generators is the engine's wiring harness that runs from the engine to the instrument panel. This harness usually contains a wire for the tachometer which radiates RF (radio frequency) energy. For best results, keep the power and transducer cables away from the engine wiring. Also, bilge pump wiring can sometimes radiate noise so try to keep the Z-7200's cables away from those wires.

VHF radio antenna cables radiate RF energy at higher power levels than even the engine's wiring harness. It is important to keep the Z-7200's power and transducer cables as far away as possible from VHF radio cables.

If interference begins at slow boat speeds, worsening as the boat speed increases, then a probable cause is acoustic noise, or cavitation. This noise is not electrical, but rather mechanically induced noise from the transducer. Stop the boat, put the engine in neutral, and increase the Rpm. If the noise does not increase on the display, then it is cavitation. Usually, air bubbles passing over the face of the transducer create acoustic noise. The faster a boat travels, the more air bubbles increase and generate noise on the display. To eliminate this problem, read the transducer owner's manual for proper mounting techniques.

TRANSDUCER

Installation instructions for the transducer are with the transducer in a separate package. Please read the instructions carefully before you install the transducer.



KEYBOARD BASICS

This section gives a brief explanation of the keyboard. Read the Operation section for a detailed description of each key's operation.

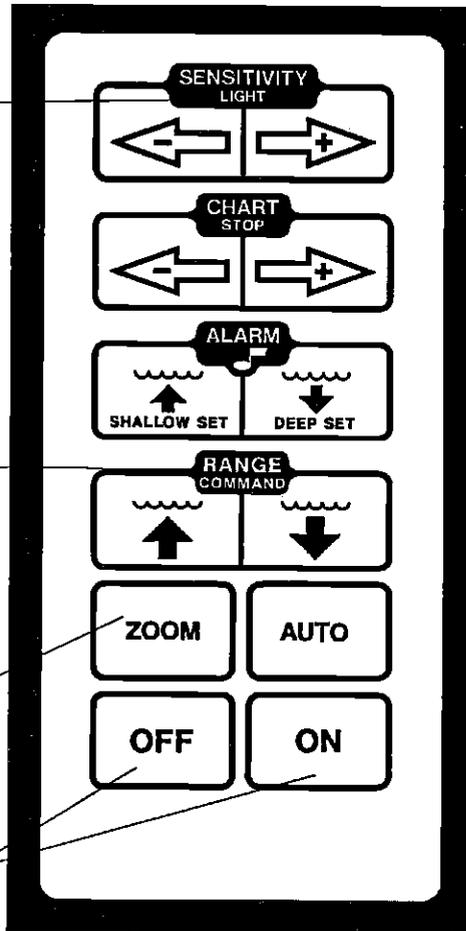
SENSITIVITY These keys control the graph's sensitivity. (The digital automatically adjusts its sensitivity.) The receiver sensitivity has 32 steps, allowing adjustment over a wide range of conditions. The left arrow key decreases the sensitivity, the right arrow key increases it.

RANGE The arrow keys allow the selection of depth ranges. Press the up arrow to decrease the range depth. Press the down arrow to increase the range.

ZOOM Targets on the display are enlarged to twice normal size or "zoomed" with this key.

ON OFF These keys turn the Z-7200 on and off. To turn it on, simply press the ON key. To turn it off, press the OFF key.

Pressing any key generates a tone or "beep." This is the Z-7200's way of telling you that it has accepted a command.



SPARE PARTS

The following is a list of the most commonly needed parts. To order, simply write the list of parts required on a slip of paper and mail it to the above address.

(Note: Price subject to change without notice.)

Part Number	Description	Price
151-0071-00	Power Cable	6.75
003-2250-00	Gimbal Knobs (w/washers, 2 ea.)	3.95
003-2223-00	Gimbal Bracket	7.75
003-2181-00	Fuse Holder (w/3 amp fuse)	3.95
988-0106-09	Owner's Manual	2.50

SPECIFICATIONS

Dimensions	5 3/4"H x 8 3/16"W x 2 5/8"D
Weight	1 3/4 pounds
Transmitter	
Frequency	192 kHz
Output Power	500 watts peak to peak typical 63.5 watts RMS
Receiver Sensitivity	> 85 db temperature stabilized
Operating Current	200 ma (lights off) 500 ma (lights on)
Operating Voltage	9-15 vdc
Number of pixels	192 x 64 (vertical x horizontal) 12,288 Total
Depth Capability	300'-500' typical (with 20 degree transducer) 500'-700' typical with 8 degree transducer)

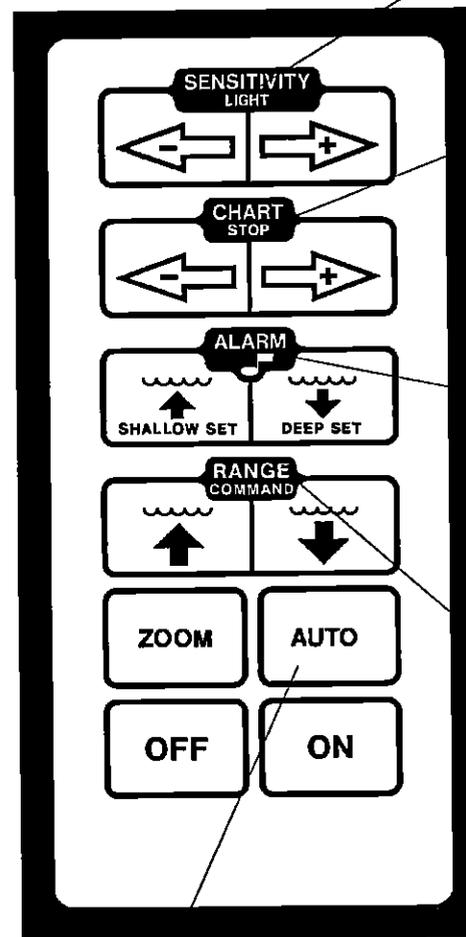
BAIT FISH

The importance of bait fish to successful fishing can't be over-emphasized. They are the principle food of all game fish in most waters.

Bait fish are the plankton feeding forage fish, such as minnows and shad. Bait fish can also be the young of game fish, such as crappies, bluegill, and bass.

Most bait fish concentrate within five feet of the surface where sunlight promotes the growth of the plankton on which they feed. One method of fishing is to use the Z-7200 to find the bait fish first. A school of bait fish will look like a "cloud" on the Z-7200's display. Usually, game fish will be nearby, often directly beneath the school of bait fish.

KEYBOARD BASICS



LIGHT Press both sensitivity keys at the same time to turn the lights on or off.

CHART The CHART group of keys controls the chart speed. The Z-7200 has 10 chart speeds, ranging from very slow to FAST. Pressing the right arrow key speeds up the chart speed. The left arrow key reduces it. Press both keys at the same time to stop and restart the chart display.

ZONE ALARM KEYS This group of keys controls the Z-7200's zone alarm. It's commonly used as a "fish alarm." Any target (such as a fish or school of fish) will set off the alarm if it enters the alarm zone.

COMMAND FUNCTION The Z-7200 has "menus" of features that are accessed by pressing both range keys at the same time.

AUTO The AUTO key switches the Z-7200 in or out of the automatic mode. The Z-7200 automatically adjusts the sensitivity and range selection at power on. Pressing the AUTO key allows you to take control of the Z-7200, making manual adjustments as desired. When the Z-7200 is in the automatic mode, the word "AUTO" displays immediately below the sensitivity bar.

Note: The Z-7200 has many more features than the ones just discussed. For a detailed look at the Z-7200's features and operation instructions, read the Operation section of this manual.

DISPLAY INTERPRETATION

Now let's look at the display. First, we'll turn on the Z-7200 by pressing the ON key. The lights will flash for six seconds. The chart is now scrolling the return echoes across the screen and the digital is searching for the bottom depth. It's flashing 0 because it hasn't found the bottom yet. Once it finds the bottom, the depth is displayed.

Here the Z-7200 has found the bottom at 49 feet. The range is zero to 60 feet. It automatically chooses a lower limit that places the bottom signal near the bottom of the display.

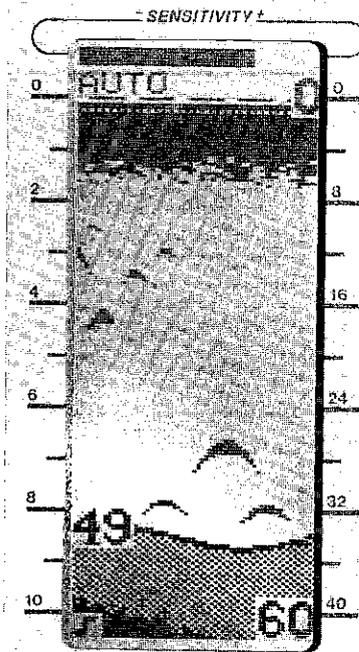
The bar at the top of the display is the sensitivity bar. It shows the sensitivity in use. The bar extends from left to right. A very short bar indicates minimum sensitivity. Setting the sensitivity to maximum causes the bar to run completely across the top of the display.

The word AUTO indicates the Z-7200 is in the automatic mode.

The top line of the display is always a dashed line. It moves from right to left, showing the chart is moving. As the chart speed increases or decreases, the dashed line changes speed accordingly. The word "STOP" appears when the chart is stopped.

The range is both an upper limit and a lower limit at the top and bottom of the display, respectively. In this example, the range is 0 - 60 feet. Scale markers printed on both sides of the display help determine the actual depth.

For best results, read the Operation section of this manual. It explains in detail all of the functions that are in this section, plus other features not discussed here.



The temperature of water in the lake is seldom constant from top to bottom. Layers of different temperatures form, and the junction of a warm and cool layer of water is a thermocline. The depth and thickness of the thermocline can vary with the season or time of day. In deep lakes there may be two or more at different depths. Thermoclines are important to fishermen because they are areas where fish are active. Many times bait fish will be above the thermocline while larger game fish will suspend in or just below it.

The Z-7200 can detect this invisible layer in the water, but the sensitivity will probably have to be turned up to see it.

A knowledge of the water temperatures various fish prefer, and in which they usually remain, helps you get the most from your Z-7200.

SURVEYING A LAKE

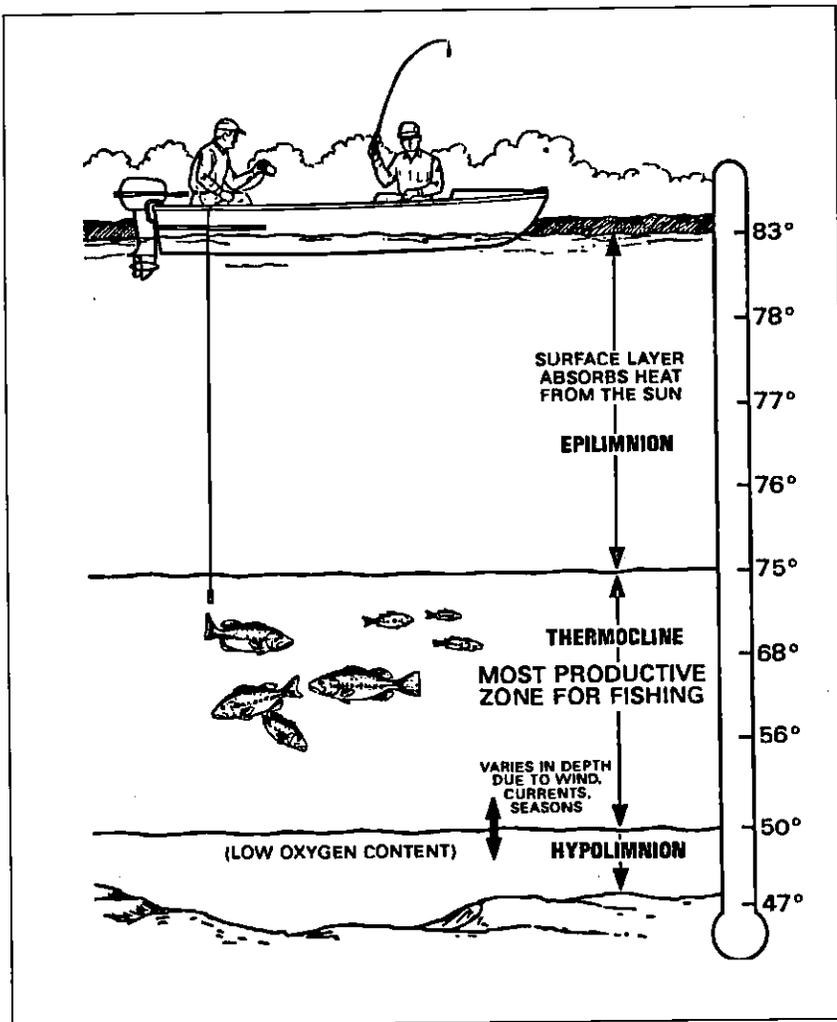
The most successful anglers on any body of water are those who fish it day after day and year after year. Eventually, they learn the hot spots that produce fish consistently. They discover through experience where, and at what depth, they can expect to find the fish they want at any season. And they realize that these productive areas change throughout the year depending on water level, temperature, food, and other factors.

With the Z-7200, anyone can eliminate guesswork and concentrate on the areas where fish are likely to be. Even if it's the first time on the lake!

The most efficient way to become acquainted with a body of water is to survey it with your Z-7200. Start with a map of the lake, if possible, and indicate the promising spots in relation to landmarks on shore.

As you go about your survey, your Z-7200 will tell you the depth and type of bottom. It will also reveal suspended fish. Multiple signals on the dial usually indicate a good school of fish and it's worth it to stop and fish for them. You may not get any further.

Keep a few marker buoys in the boat, ready to toss overboard. When the Z-7200 indicates a school of fish, throw the buoy out. The string will unwind until the sinker hits bottom. Then, because of the marker's flat shape, it won't unwind any further. With the school thus marked, you can make your turn and come back to fish in exactly the right spot. This is essential when you're far from shore on a big lake. Unless you mark the school of fish when you're over it, you may not be able to find it again.



Most fish don't spawn unless the water temperature is within rather narrow limits. To find the different temperatures, a surface temperature meter, such as the EDT-20 is a valuable aid to your boat. This unit provides an extremely quick response to identifying the desired surface water spawning temperatures for various species. Trout can't survive in streams that get too warm. Bass and other fish eventually die out when stocked in lakes that remain too cold during the summer. While some fish have a wider temperature tolerance than others, each has a certain range within which it tries to stay. Schooling fish suspended over deep water lie at the level that provides this temperature. We assume they are the most comfortable here.

OPERATION

When the Z-7200 is first turned on, it automatically finds and displays the bottom depth, and adjusts the sensitivity to the proper level. It also sets the scales to a range that will keep the bottom signal on the display, plus much more. Using the Z-7200 in this mode is simple and allows you to concentrate on fishing. However, virtually every function of the unit is manually adjustable so it can be "fine tuned" to the surrounding conditions. At first, take this manual with you as a reference guide.

ON 

The ON key is located in the lower right corner of the keyboard. It's easily found in this location - even at night. To turn the Z-7200 on, press the ON key. An audible beep reflects the key press. The chart lights will begin flashing, then stop after six seconds. The chart will begin scrolling across the display and the number "0" will flash. This number is the digital bottom depth display. After the unit finds the bottom, it displays the digital depth.

OFF 

To turn the Z-7200 off, press the OFF key.

AUTO 

The automatic mode is enabled when the Z-7200 is turned on. To switch to the manual mode, press the AUTO key located above the ON key. Pressing the AUTO key erases the word AUTO at the top of the display. This cancels auto sensitivity and ranging, giving you complete manual control of the unit. Return the Z-7200 to automatic at any time by pressing the AUTO key again.





SENSITIVITY

When first turned on, the Z-7200 is in the AUTO SEARCH mode. The micro-computer automatically adjusts the sensitivity and range to find and lock onto the bottom. You can leave the sensitivity in the automatic mode or manually adjust it to suit conditions.

A horizontal bar at the top of the screen displays the sensitivity level. When the sensitivity is at minimum, the bar is very short. Increasing the sensitivity causes the bar to travel to the right, increasing in length correspondingly. Setting the sensitivity to maximum will cause the bar to extend across the top of the display. (There are 32 steps of sensitivity available.)

To place the Z-7200 in manual mode, press the AUTO key once. This turns auto sensitivity off. The word AUTO at the top of the display will disappear, signifying that the Z-7200 is in the manual mode. To increase the sensitivity, press and hold the right arrow key until the sensitivity is at the desired level. The left arrow decreases sensitivity in the same manner. Notice how the sensitivity bar moves as you change settings. When you press the right arrow key, the bar moves to the right, indicating an increase in sensitivity. Pressing the left arrow key moves the bar to the left, showing the sensitivity has decreased accordingly. You'll also see the change on the display.

On the next page, the photo on the left shows a graph with too little sensitivity. On the right, the graph has a proper sensitivity setting. A fish along with higher surface clutter are now visible, and the bottom signal has widened.

When the horizontal bar reaches the far right hand side of the screen, the sensitivity level is at maximum. With high sensitivity settings, a second bottom echo (second echo) may appear. This is normal. It's caused by the returning signal reflecting off the surface of the water. Then it makes a second trip to the bottom and back again.

To turn Auto Sensitivity back on, press the AUTO key. Remember, pressing the AUTO key turns both automatic sensitivity and auto ranging functions on and off at the same time.

If a partial arch occurs most of the time on your unit (the mark curves up, but not back down, or vice-versa) it could be the transducer is not pointing straight down. Adjust a transom mounted transducer until the fish show the distinctive arch. This may take some trial and error until you achieve the correct mounting.

Remember, there must be some movement between the boat and the fish to develop the arch. Usually, this means trolling at very slow speeds with the main engine in gear at a minimum throttle setting.

The depth of the water will affect the size and shape of the fish arch due to the cone angle diameter. For example, if the cone passes over a fish in shallow water, the signal displayed on the Z-7200 may not arch at all. This is due to the narrow cone diameter and the resolution limitations of the display. Even the 20 degree transducer has only a 3 foot diameter at this depth.

Compared to a paper graph, a Z-7200 cannot show as fine of detail. The reason for this is the pixels (dots on the screen) are much larger than a paper graph's markings. Therefore, the Z-7200 cannot show fish arches as well as a graph. Plus, it requires a bit more work initially to read and interpret the screen than a paper graph.

Very small fish probably will not arch at all. Medium sized fish will show a partial arch, or a shape similar to an arch if they're in deep water. Large fish will arch, but turn the sensitivity up in deeper water to see the arch. Because of water conditions, such as heavy surface clutter, thermoclines, etc., the sensitivity sometimes cannot be increased enough to get fish arches.

One of the best ways to get fish arches is to expand or "zoom" a segment of the water. For example, 40 to 60 feet. The smaller the segment, the better the screen resolution will be. Then, turn up the sensitivity as high as possible without getting too much noise on the screen. In medium to deep water, this method should work to display fish arches.

WATER TEMPERATURE AND THERMOCLINES

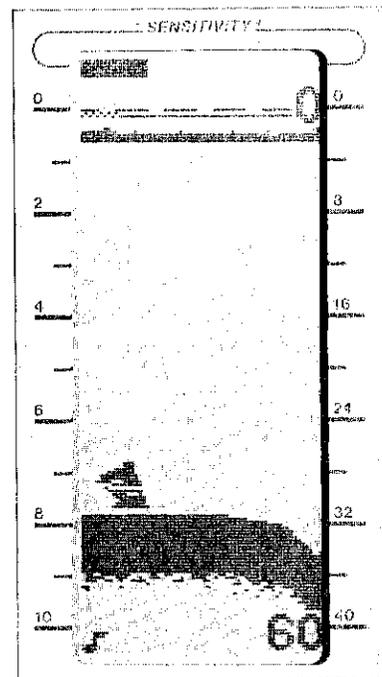
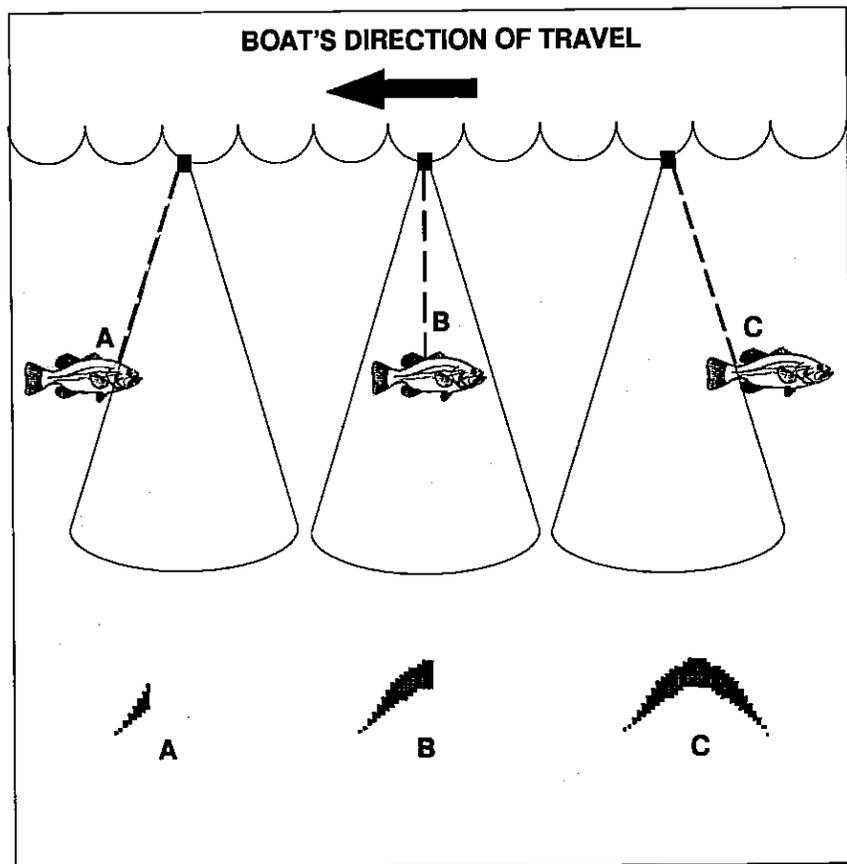
Water temperature has an important-if not controlling-influence upon the activities of all fish. Fish are cold blooded and their bodies are always the temperature of the surrounding water. During the winter, colder water slows down their metabolism. At this time, they need about a fourth as much food as they consume in the summer.

Brush usually lies on the bottom and shows up as clumps rising above the bottom signal. Brush signals look similar to large rocks, however their signal is not as strong as rock.

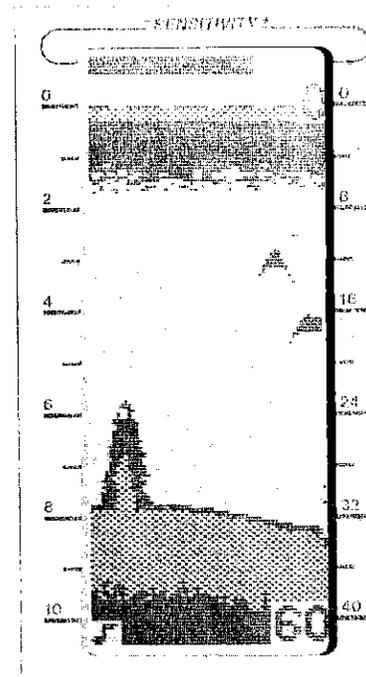
FISH SIGNALS

The signals displayed on the Z-7200 by fish are identified by various shaped markings in certain patterns, as opposed to random marks created by noise. Or the solid, continuous markings made by the bottom.

Typically, fish are identified by a characteristic arch that separates them from their stationary surroundings. The reason for this is shown below. The distance to a fish when it moves into the sonar's cone of sound is shown as "A" below. When the fish has moved into the center of the cone, the distance to it will be shorter, "B". As it moves out of the cone, the distance will increase again as shown in "C".



SENSITIVITY: TOO LITTLE



SENSITIVITY: ADJUSTED PROPERLY

AUTO SENSITIVITY OPERATION

When the Z-7200 is in the automatic mode, the receiver's sensitivity automatically adjusts to the surrounding conditions. The micro-computer places it at a level slightly above the minimum required to pick up the bottom signal.

Changing the sensitivity level while the Z-7200 is in the automatic mode is possible. This may be desirable if the sensitivity level is not enough to show fish or other small detail. The Z-7200 will increase the sensitivity to pick up the bottom signal, then add in the level you programmed. If desired, you can add sensitivity up to the maximum.

To adjust the sensitivity while the Z-7200 is in the automatic mode, simply press either the right arrow key > to increase it. Press the left arrow key < to decrease the sensitivity. If the value goes below the minimum required to keep the bottom signal, the Z-7200's audible tone will sound an alert. The same is true if you try to go above the maximum level. As you press the arrow key, the sensitivity bar will move right or left, according to the sensitivity level chosen.



CHART SPEED

At power on, the chart speed scrolls at a pre-determined speed. For a higher speed, press and hold the FAST key in the CHART section of the keyboard. When the scroll speed reaches the desired speed, release the FAST key. To slow the display, press and hold the SLOW key. Pressing either of these keys causes the sensitivity bar at the top of the display to change to a dashed line. The letters "CHT" will also appear in a window near the top of the display. The bar represents the chart speed. If you press and hold the FAST key for example, the bar will start moving to the right. This signifies that the chart speed is increasing. There are 10 steps of chart speed. By holding either the FAST or SLOW keys, the display can be speeded up or slowed down. When the horizontal bar reaches the far right side of the screen, the chart speed is at its maximum value. The Z-7200 will sound a tone indicating maximum chart speed.

At times it is desirable to stop or "freeze" the display to examine an echo before it scrolls off the screen. Pressing both arrow keys in the CHART section at the same time will freeze the display. Now the top line on the display will flash on and off to signify that the unit is in the freeze mode. Pressing both keys at the same time again will start the display moving at the last chart speed setting. If the digital sonar is on, the bottom depth will continue to be displayed. The digital does not stop when the chart is in the "freeze" mode.

SCALE

There are ten scale markers printed on both sides of the display. This helps to determine the depth of a target. For example, if the range is 0 to 60 feet, then each mark is equal to six feet. If a target (such as a fish) is next to the 5th line, then it is 30 feet deep. (5 lines times 6 feet = 30 feet.)



RANGE

When the Z-7200 is in automatic, the ranges change to keep the bottom signal on the display as the bottom depth varies. At times, however, it may be desirable to expand the range or zoom in on a target. Pressing the ZOOM key doubles the size of targets on the screen.

The 20 degree transducer is almost always the best to use in fresh water, the 8 degree mostly in salt water. In a deep water environment, (300 feet - fresh water, 100 feet - salt water) the narrow cone angle is more desirable. Since the sound energy is concentrated in a smaller area, it can penetrate to much deeper depths.

Both 8 degree and 20 degree transducers give accurate bottom readings, even though the bottom signal is much wider on the 20 degree model. This is because you are seeing more of the bottom. Remember, the shallow edge of the signal shows you the true depth. The rest of the signal tells you whether you are over rocks, mud, etc.

Paint transducers on salt water boats with a thin coat of anti-foulant paint to prevent organisms from growing. If unchecked, barnacles and other marine growth will cause a decrease in the transducer's sensitivity. Do not use a metal based anti-foulant paint as it will decrease the transducer's sensitivity. There are special anti-foulant paints specifically designed for transducers. They're readily available at most marine dealers.

SIGNAL INTERPRETATION

Since your Z-7200 is both extremely sensitive and powerful, it gives an accurate picture of the bottom that your boat is passing. A bottom of firm sand, gravel, shell, or hard clay returns a fairly wide signal. If the automatic sensitivity is off and the signal narrows down, then it means that you have moved over a mud bottom. Mud absorbs the sound wave and returns a weak signal. Turn up the sensitivity. If you have the automatic sensitivity turned on, watch the sensitivity bar. As the boat passes over the mud bottom, the Z-7200 will automatically increase the sensitivity to maintain a good bottom signal. The sensitivity bar will help you in determining if the bottom is soft or hard. If it increases while in the same depth of water, then the boat has moved over a soft bottom. If it decreases, then it is over a hard bottom. Of course, as the water depth increases or decreases, the sensitivity will also change.

Big rocks or stumps on a smooth bottom send back signals above the bottom level signal. The height of the signal depends on the target's height. As you pass over a post, it will be clearly visible as a short line extending above the bottom signal.

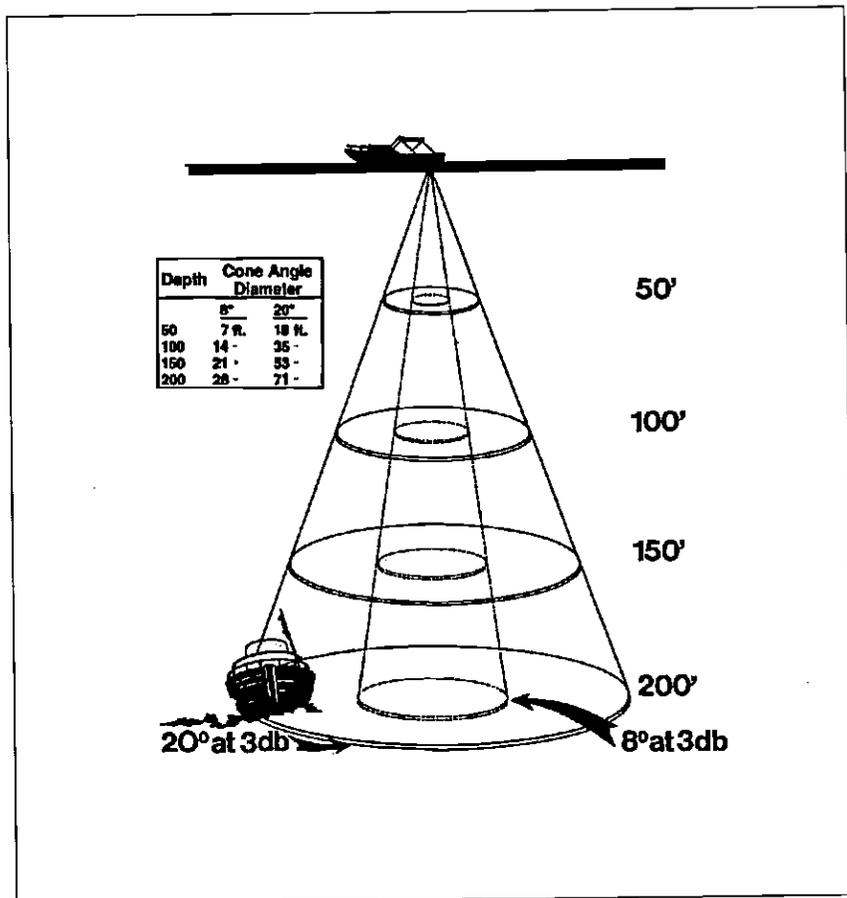
A steep slope returns a wide signal, the steeper the wider. Signals returned from a high underwater cliff are usually the widest of all.

TRANSDUCERS AND CONE ANGLES

The sound waves from the transducer spread out into the water in a cone shaped beam. This looks much like the beam from a flashlight. The angle between the outside edges of the cone is the cone angle.

Eagle offers a choice of transducers with either an 8 or 20 degree cone angle. These will interchange with any of the 192 kHz sonar products. In other words, use any Eagle sonar instrument with any Eagle transducer of the same frequency with no loss of performance. However, the use of any other manufacturers' transducer will result in a loss of performance.

Typically, wide cone angle transducers (20 degrees) are ideal for operating in shallow to medium water depths. The 20 degree cone angle allows you to see more of the underwater world. In 15 feet of water the 20 degree cone covers an area about six feet across. The 8 degree transducer covers only about a two foot circle.



LOWER LIMIT

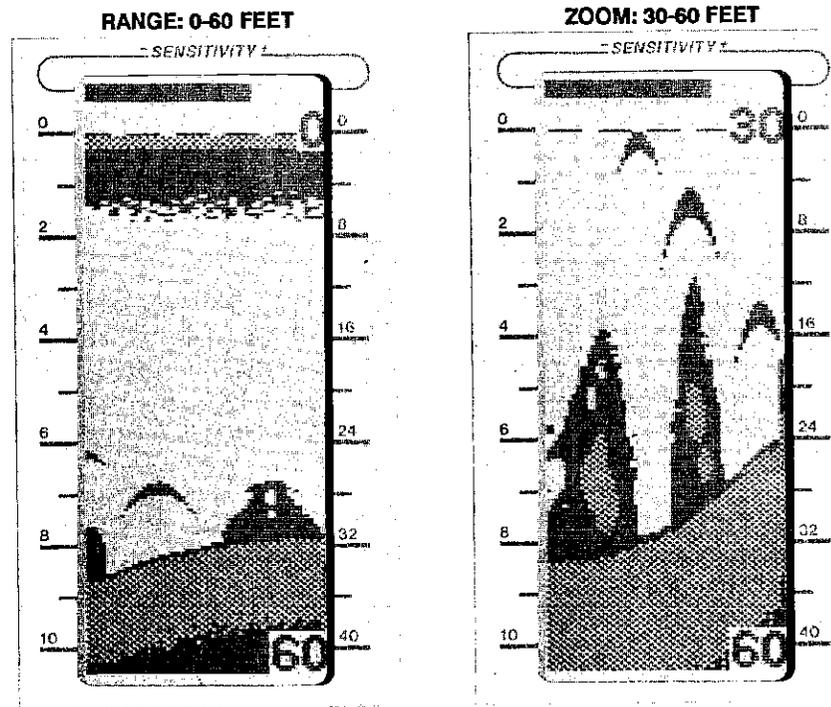
To change the lower limit, first make certain the word "AUTO" is off at the top of the screen. This indicates that the automatic mode is off. (Note: This also disables the automatic sensitivity function.) If the automatic mode is on, press the AUTO key once to disable it. Next, press one of the arrow keys in the RANGE section, until the desired lower limit appears. The display will immediately change to the new depth range and display the new lower limit at the bottom of the screen.

NOTE: The maximum lower limit the Z-7200 can display is 1000 feet. However, the actual depth that it can reach is dependent on water and bottom conditions, plus the quality of the transducer installation.

ZOOM

ZOOM

Often it's desirable to expand or "ZOOM" a section of the display to show more detail. You can do this on the Z-7200 by using the ZOOM key to double the size of the targets. For example, if the range is 0-60 feet, pressing the ZOOM key changes the range to 30-60 feet. This 30-60 range is called a "window". To change the window size, press the up or down arrows in the



RANGE section. For example, if you have a 30 foot window, pressing the up arrow in the RANGE section will change the window to 20 feet. Press the up arrow again and the zoom window will change to 10 feet. This is the smallest zoom window. The largest zoom window is 300 feet.

AUTOMATIC BOTTOM TRACKING

The lower limit will change as the bottom depth changes, if the Z-7200 is in the automatic mode. To zoom in on the bottom and track it as its depth changes, follow the steps below.

To use this feature, first make certain the Z-7200 is in the automatic mode. If it isn't, press the AUTO key. Next, choose a zoom window. For example, let's use a 20 foot zoom window. This means that the Z-7200 will keep the upper limit 20 feet above the lower limit. Automatically placing the bottom signal in this window, the Z-7200 tracks it as it moves shallower or deeper. Press the ZOOM key. The zoom window size appears on the upper center portion of the display for a few seconds. If you don't have a 20 foot window, press either the up or down arrows in the RANGE section until the upper limit is 20 feet shallower than the lower limit. The Z-7200 will choose an upper and lower limit that will place the bottom signal in the 20 foot window. The bottom will always be inside this window. If the segment size is 40 feet or greater, the window limits will end in zero (10,20,30, etc.). Otherwise the limits are in one foot increments.

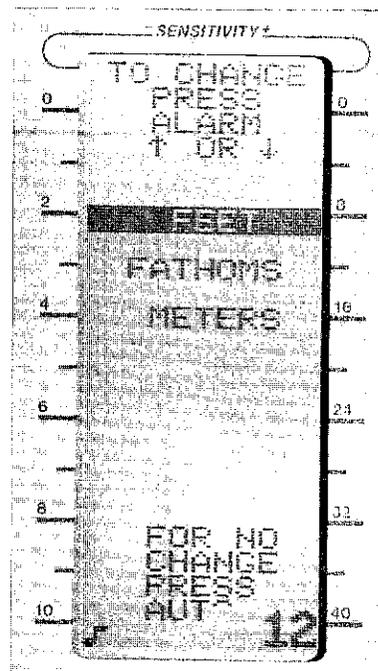
To exit from this function, press the ZOOM key.

GRAYLINE

The GRAYLINE function tells the relative strength of signals displayed on the screen. It also gives clues to the composition of the bottom. In other words, you can tell if the bottom is soft or hard. A hard bottom returns a strong signal causing a wide gray line. A soft, muddy or weedy bottom returns a weaker signal which is emphasized with a narrow gray line.

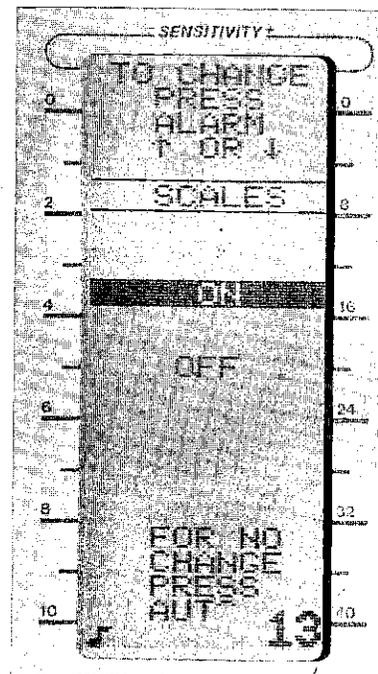
If you have two signals of equal size, one with gray and the other without, then the target with gray is the stronger signal. This helps distinguish weeds from trees on the bottom, or fish from structure.

When the Z-7200 is first turned on, the GRAYLINE function is automatically on. Normally, it doesn't require adjustment. However, should you desire to change the GRAYLINE level, see menu #8 in the COMMAND section.



MENU #12 - FEET, FATHOMS, or METERS

The Z-7200 can display the depth in either feet, fathoms, or meters. At first, the display reads in feet. To change to fathoms or meters, press both arrow keys in the RANGE section at the same time. Using the same arrow keys, scroll through the menus until menu #12 appears. Use the arrow keys in the ALARM section to select feet, fathoms or meters. Press the AUTO key to activate the selection.

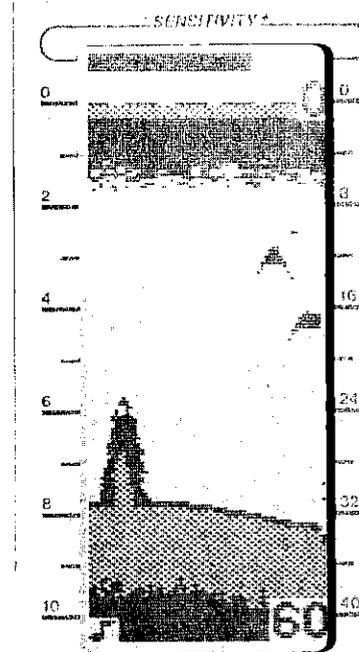
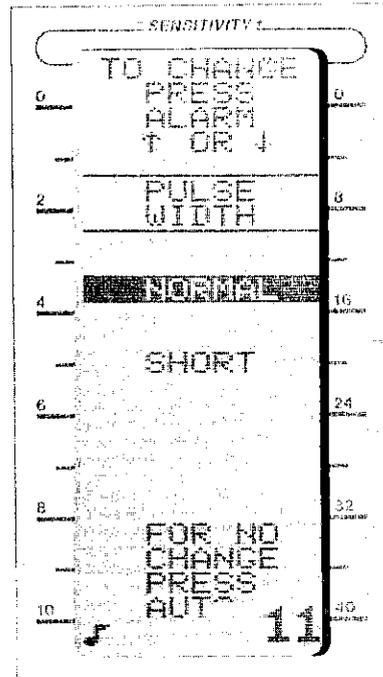


MENU #13 - SCALES

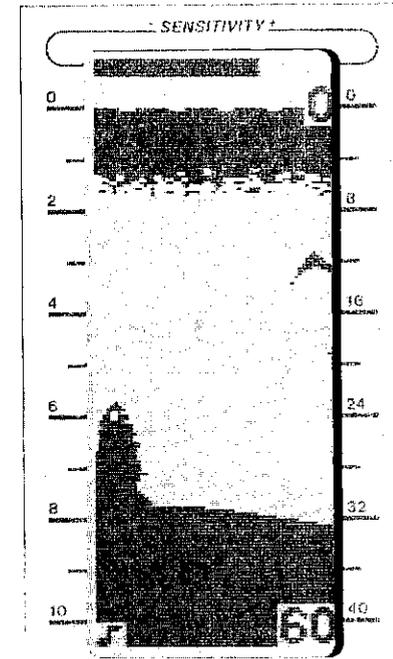
When the Z-7200 is turned on, the upper and lower range limits are automatically displayed on the right side of the display. To turn them off, press both arrow keys in the RANGE section at the same time. Using the same arrow keys, scroll through the menus until menu #13 appears. Use the arrow keys in the ALARM section to select ON or OFF. Press the AUTO key to activate the selection.

MENU #11 - PULSE WIDTH

There is a relationship between resolution and transmitter pulse width. Resolution, in this case, is the ability of a sonar to separate targets. The shorter the pulse width, the better the sonar's ability to separate targets. However, in deep water, the shorter the pulse width, the less likely a return echo will be received. In fact, the Z-7200 automatically increases the pulse width as the range increases. In shallow water, a narrow pulse width is beneficial, since the probability of echo detection is high. For even better target separation, the Z-7200 gives you the capability to narrow the pulse width. Combine that with a twenty foot zoom and the Z-7200 displays detail far better than other liquid crystal graphs. To change the pulse width, press both arrow keys in the RANGE section *at the same time*. Using the same arrow keys, scroll through the menus until menu #10 appears. Use the arrow keys in the ALARM section to change the pulse from normal to short or back again. Press the AUTO key to activate the selection.



GRAYLINE: ON



GRAYLINE: OFF

DIGITAL

Built inside the Z-7200 is a complete digital sonar. It automatically discriminates between the valid bottom echoes and false echoes from fish, thermoclines, or other signals. The digital display will show only the bottom depth. Use it any time, regardless of the mode the Z-7200 is in.

At power on, the digital will flash "0" until it has "locked on" to the bottom signal. Once it has acquired the bottom depth, it will display the depth in the lower left of the display.

The digital can display the bottom depth in tenths of a foot in water shallower than 100 feet. See the COMMAND section for details.

There are two different sizes of the digital depth display. They can be easily changed with a menu selection. See the COMMAND section for details.



To get the maximum performance out of your digital sonar, stop the chart by pressing both arrow keys at the same time in the keyboard's chart section. This turns the Z-7200 into a digital sonar only and allows it to better track the bottom signal. A good reason to use the digital is if you are going to travel at high speed and you just want to know the bottom depth. Stop the chart, then change to the large digital number size. This will give both the fastest possible depth updates plus an easy-to-read display.

If you wish to turn the digital display off, see the COMMAND section for details.



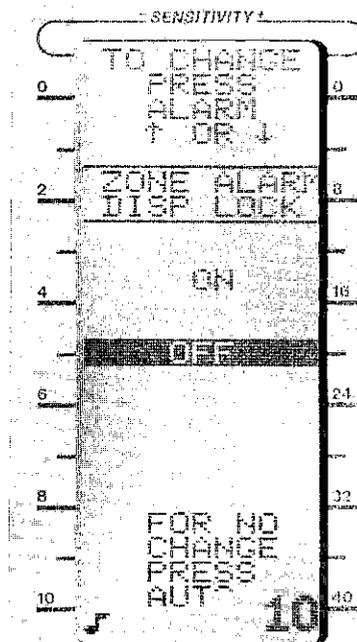
ZONE ALARM

To set the Zone Alarm, press the SHALLOW SET key in the ZONE ALARM section of the keyboard. The letters "ZA" appear in the lower left corner of the screen. A vertical bar also displays on the left side of the screen for six seconds. This is the Zone Alarm's "window." Any echo that appears between the top and bottom of this bar will sound the alarm. Adjust both the shallow and deep ends of this bar to make a smaller or larger alarm "window."

To adjust the shallow (top) alarm, press the SHALLOW SET key. The alarm bar displays with a small arrow pointing to the top of the bar. This signifies that the top or shallow portion of the bar is ready for adjustment. Then press the up arrow key to move the top of the alarm window up. Press the down arrow key to move the top of the zone deeper. Six seconds after the adjustments are made, the alarm bar disappears.

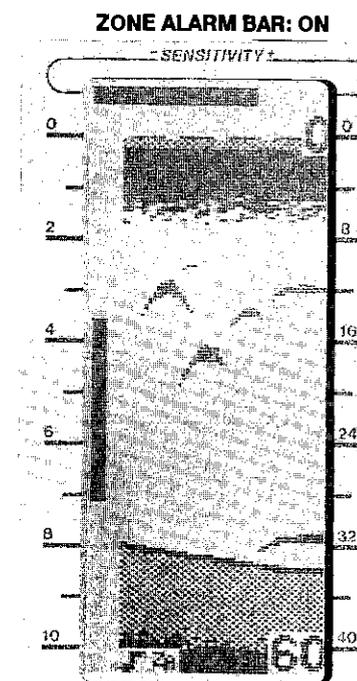
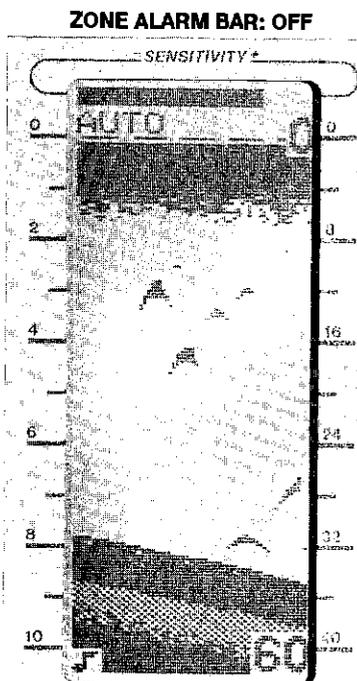
Set the bottom of the zone in the same manner using the DEEP SET key. Press the DEEP SET key. The alarm bar displays with the small arrow pointing to the bottom of the bar. Then press the up arrow key to make the bottom part of the window move shallower. Or you can press the down arrow key to move the bottom of the window deeper. Release the keys and the bar will remain on the screen for six seconds, then disappear.

When the "ZA" letters are on, the alarm is active. If you wish to view the zone alarm bar, simply press either the SHALLOW SET or DEEP SET



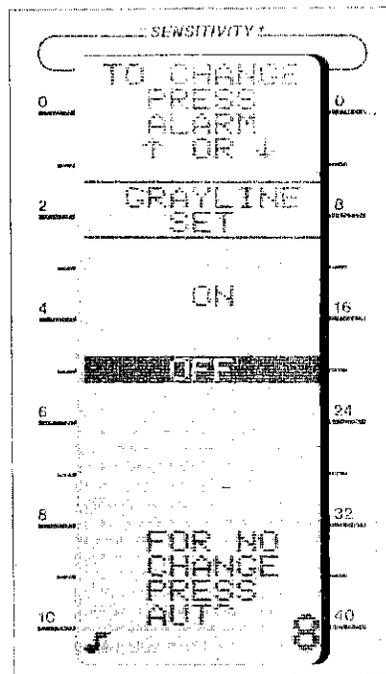
MENU #10 - ZONE ALARM DISPLAY LOCK

This menu allows you to turn the alarm bar on continuously. When the Z-7200 is turned on, the zone alarm bar is on only when the zone alarm is adjusted. To turn the bar on continuously, press both arrow keys in the RANGE section *at the same time*. Using the same arrow keys, scroll through the menus until menu #10 appears. Use the arrow keys in the ALARM section to turn the bar on or (if it's already on continuously) off. Press the AUTO key to activate the selection.



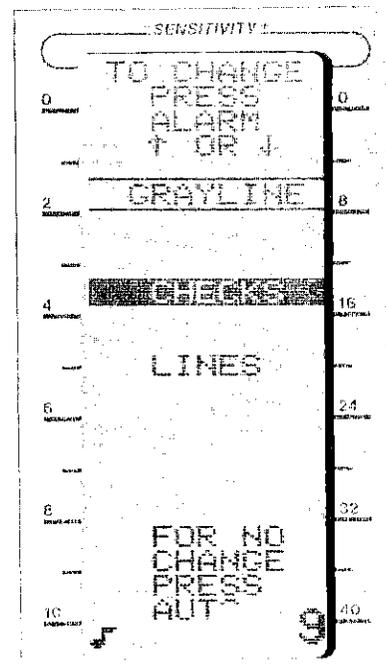
MENU #8 - GRAYLINE SET

To adjust the GRAYLINE level, press both arrow keys in the RANGE section at the same time. Use the same arrow keys until menu #8 appears. Press the up arrow key in the ALARM section to turn GRAYLINE SET on. The menu disappears and the Z-7200 returns you to the chart display. The word "GRAY" appears in the upper left corner of the screen. This signifies that the sensitivity bar now shows the amount of GRAYLINE in use. To increase or decrease the GRAYLINE level, press the right or left arrow keys in the SENSITIVITY section. After the desired level is attained, wait six seconds and GRAYLINE will turn itself off.



MENU #9 - GRAYLINE CHECKS OR LINES

GRAYLINE is normally displayed with a checkerboard pattern (checks). Using this menu, the pattern can be changed to horizontal lines. To change, press both arrow keys in the RANGE section at the same time. Using the same arrow keys, scroll through the menus until menu #9 appears. Use the arrow keys in the ALARM section to select checks or lines. Press the AUTO key to activate your selection.



keys. The bar will be displayed for six seconds. The zone alarm bar can be turned on permanently with a menu. See the COMMAND section for details.

When an echo appears on the right side of the screen in the area covered by the zone alarm bar, the words "ZONE ALARM" flash on the screen.

If the range is changed, the zone alarm may need to be changed also since it does not track range settings.

When the Z-7200 is turned on, the alarm's speaker is not activated. To turn the Zone Alarm's speaker on, press both the SHAL SET and DEEP SET keys at the same time. Pressing the SHAL SET and DEEP SET keys at the same time again will turn the alarm off and all settings will be erased.

LIGHT

A light allows operation of the Z-7200 at night. At first, turning the unit on causes the lights to flash for six seconds. Press both SENSITIVITY keys at the same time to turn the lights on. To turn the lights off, press both keys again. The lights will also go out when the Z-7200 is turned off.



COMMAND

The Z-7200 has "menus" of commands that allows you to customize the unit to your needs. There are 13 pages of menus available. These menus are accessed with the RANGE keys. Press both keys at the same time and the first menu appears for six seconds. As you can see in the photo on the next page, the first menu is SPEAKER VOLUME. The number "1" at the bottom of the screen indicates this is menu number one.

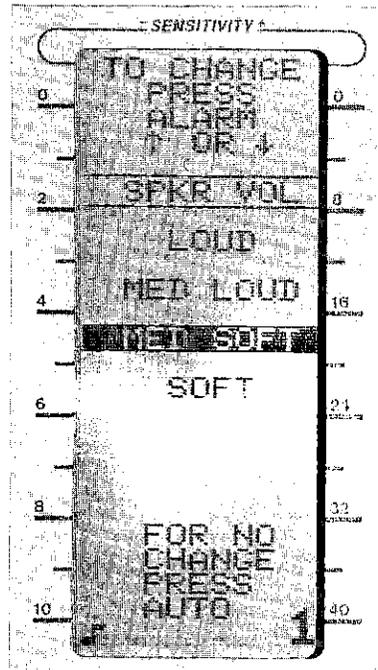


To change menus, use the arrow keys in the RANGE section on the keyboard. To select an item from the menu, use the arrow keys in the ALARM section. Once you make a selection, press the AUTO key to activate the selection. Or, switch to another menu to access another feature. Once all of the selections are made, press the AUTO key and all selections on all menus will be activated.

For a detailed description of the menus, see the following.

MENU #1 - SPEAKER VOLUME

This menu lets you adjust the speaker volume. The range is from soft (low) to loud. When the Z-7200 is turned on, the speaker volume is medium soft. To change it, press both arrow keys in the RANGE section of the keyboard at the same time. Since speaker volume is the first menu it appears immediately. Use the arrow keys in the ALARM section to change to the desired setting. Then press the AUTO key to execute the change. Or press one of the arrow keys in the RANGE section to change to another menu.



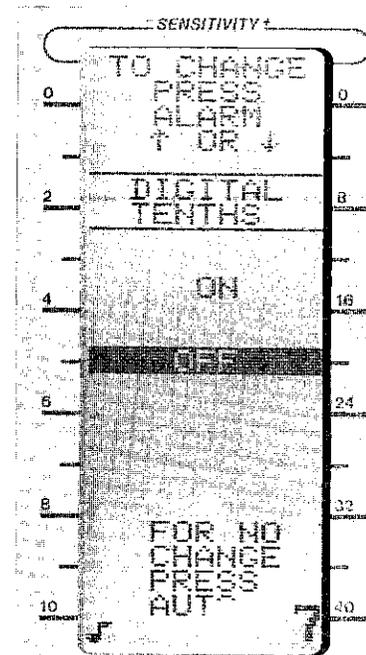
MENU #2 - DISCRIMINATION

High noise levels displayed on the screen can obstruct true target echoes and make it hard to interpret the display. Noise is defined as any undesired signal. It is caused by either electrical or mechanical source, or a combination of the two.

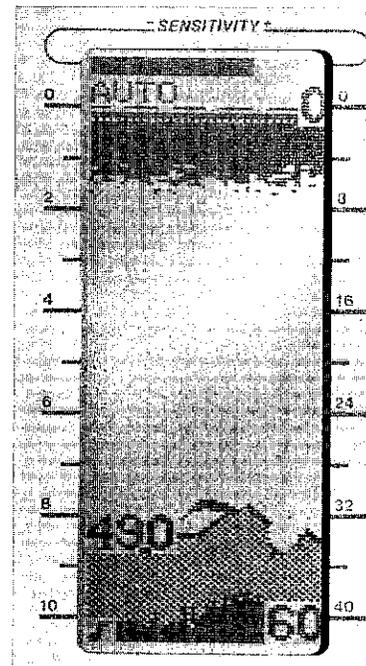
The Z-7200 has Discrimination which is effective in eliminating noise signals. It processes all incoming echoes, determines which ones are noise and eliminates them. Then it displays only the true target echoes.

MENU #7 - DIGITAL TENTHS

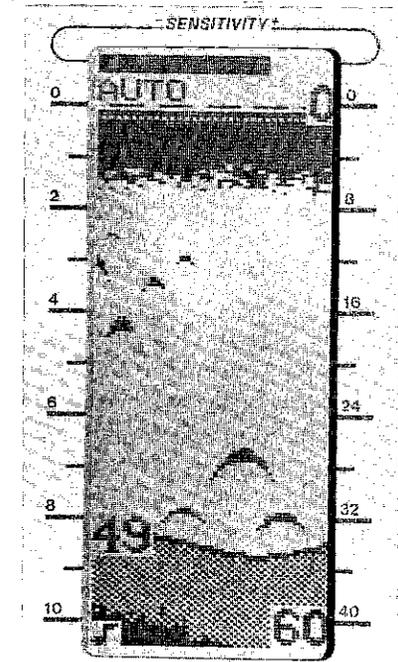
The digital sonar displays the bottom depth in whole numbers when the Z-7200 is first turned on. To display the depth in tenths of a foot, select the DIG TENTHS menu. The Z-7200 will display tenths of a foot down to 99.9 feet. Below this the depth display will automatically revert to whole numbers. To select the DIG TENTHS menu, press both arrow keys in the RANGE section at the same time. Then press the up or down arrow keys in the RANGE section until menu #7 displays. Next press the up or down arrows in the ALARM section of the keyboard to turn tenths on or off. Wait several seconds for the menu to disappear or press the AUTO key to activate.



TENTHS ON

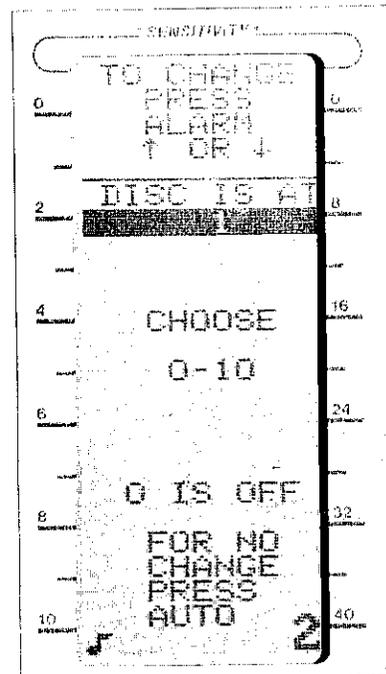
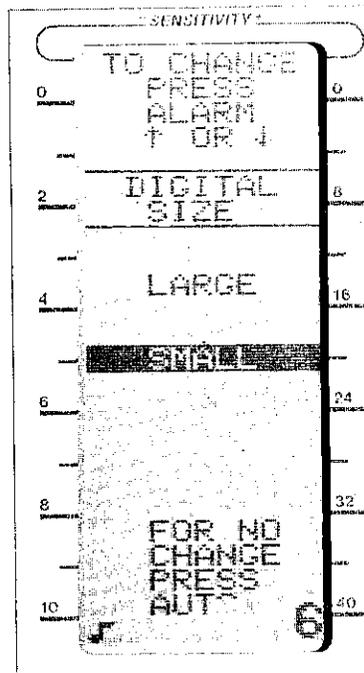


TENTHS OFF



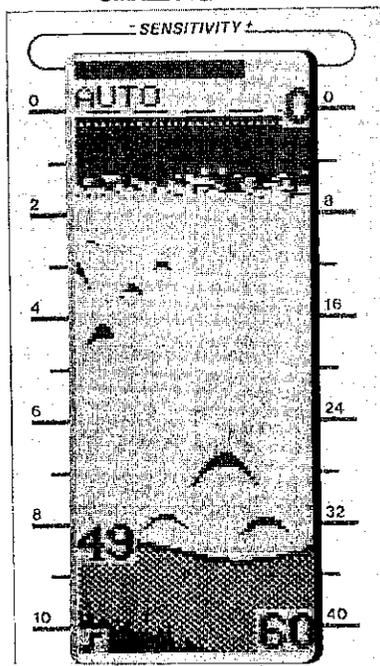
MENU #6 - DIGITAL SIZE

The digital depth display has two size selections: small and large. When the Z-7200 is first turned on, the depth is displayed with the small numbers. To change to a different size, press both arrow keys in the RANGE section *at the same time*. Then press the up or down arrow keys in the RANGE section until menu 6 displays. Next press the up or down arrows in the ALARM section of the keyboard to select the desired digital number size. Wait several seconds for the menu to disappear or press the AUTO key to activate.

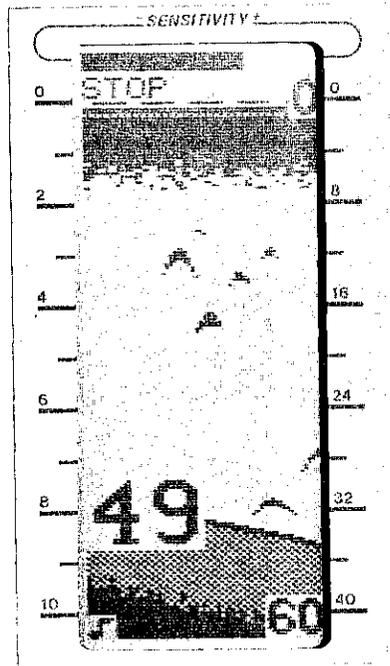


To change the Discrimination level, press both arrow keys in the RANGE section *at the same time* to display menu #1. Next, press the up arrow key until menu #2 appears. The current Discrimination level is displayed in the upper half of the screen. It can be adjusted from 0 (off) to 10 (high). When the Z-7200 is turned on, the Discrimination level is 1. Use the arrow keys in the ALARM section to change the level. Once the desired level is set, press the AUTO key to activate it.

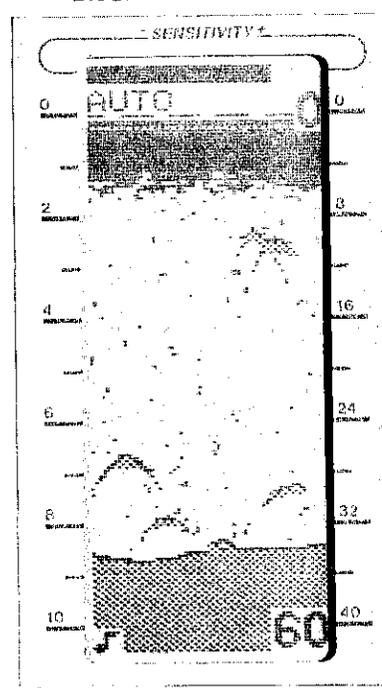
SMALL DIGITAL



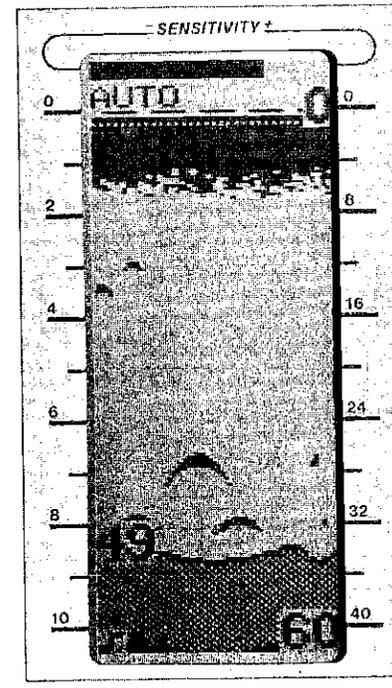
LARGE DIGITAL



DISCRIMINATION: OFF



DISCRIMINATION: PROPER SETTING

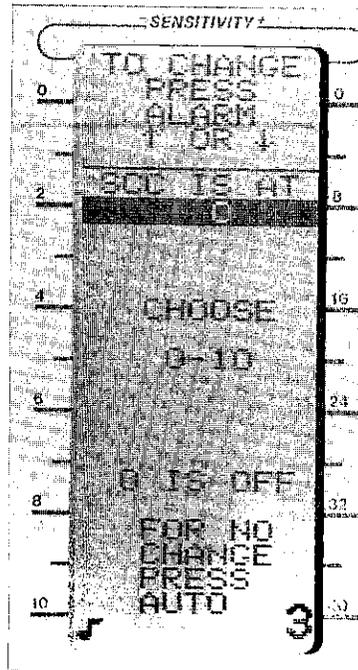
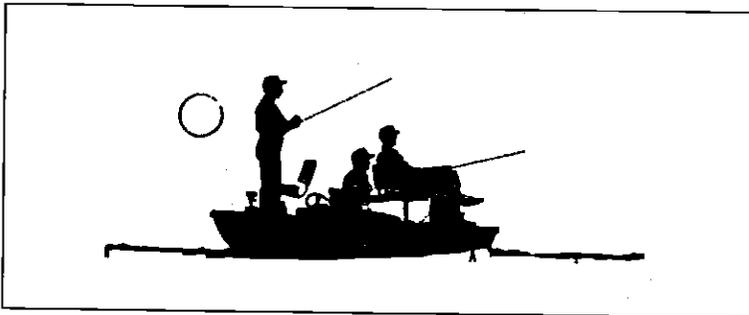


MENU #3 - SCC (SURFACE CLARITY CONTROL)

The markings—or noise—at the top of the display can extend many feet below the surface. This interferes with fish signals and other targets. These markings are Surface Clutter and are caused by wave action, boat wakes, bait fish, temperature inversions, and other reasons.

Use Surface Clarity Control (SCC) to reduce or eliminate surface clutter. SCC varies the gain of the receiver between each transmit pulse, while the receiver is "listening" for the return echoes. The gain is the lowest for echoes near the surface. It gradually increases as the depth increases. The maximum depth that SCC will affect is three quarters of the selected depth range. For example, with maximum SCC, on a 0 to 60 foot range, SCC would have an effect from the surface to 45 feet.

SCC has ten levels of adjustment. Turning the Z-7200 on automatically sets SCC to level 1. To change to a different level, press both arrow keys in the RANGE section at *the same time*, then press the up arrow key until the SCC menu appears. Then press the arrow keys in the ALARM section for the desired SCC level. Then press the AUTO key to activate the new SCC level.



MENU #4 - DIGITAL

This menu turns the digital depth display off and on. When the Z-7200 is turned on, the digital display is on. To turn it off, press both arrow keys in the RANGE section at *the same time*. Then press the up arrow key until menu #4 appears. Use the arrow keys in the ALARM section to turn the digital off or on. Press the AUTO key to activate your selection.

MENU #5 - DIGITAL AVERAGE

The digital sonar used in the Z-7200 is a highly sensitive device that gives rapid updates of the water's depth. Under most conditions, the bottom contour changes so quick that the display appears to "jitter". In other words, the display will change so quickly that it can be difficult to determine the actual bottom depth. To minimize this condition, the Z-7200 averages the bottom readings between narrow parameters and displays the result. When the Z-7200 is first turned on, averaging is enabled. To turn it off, select menu #8 by pressing both arrow keys in the RANGE section at *the same time*. Then press the up or down arrow keys in the RANGE section until menu 8 displays. Next press the up or down arrows in the ALARM section of the keyboard to turn averaging on or off. Wait several seconds for the menu to disappear or press the AUTO key to activate your selection.

