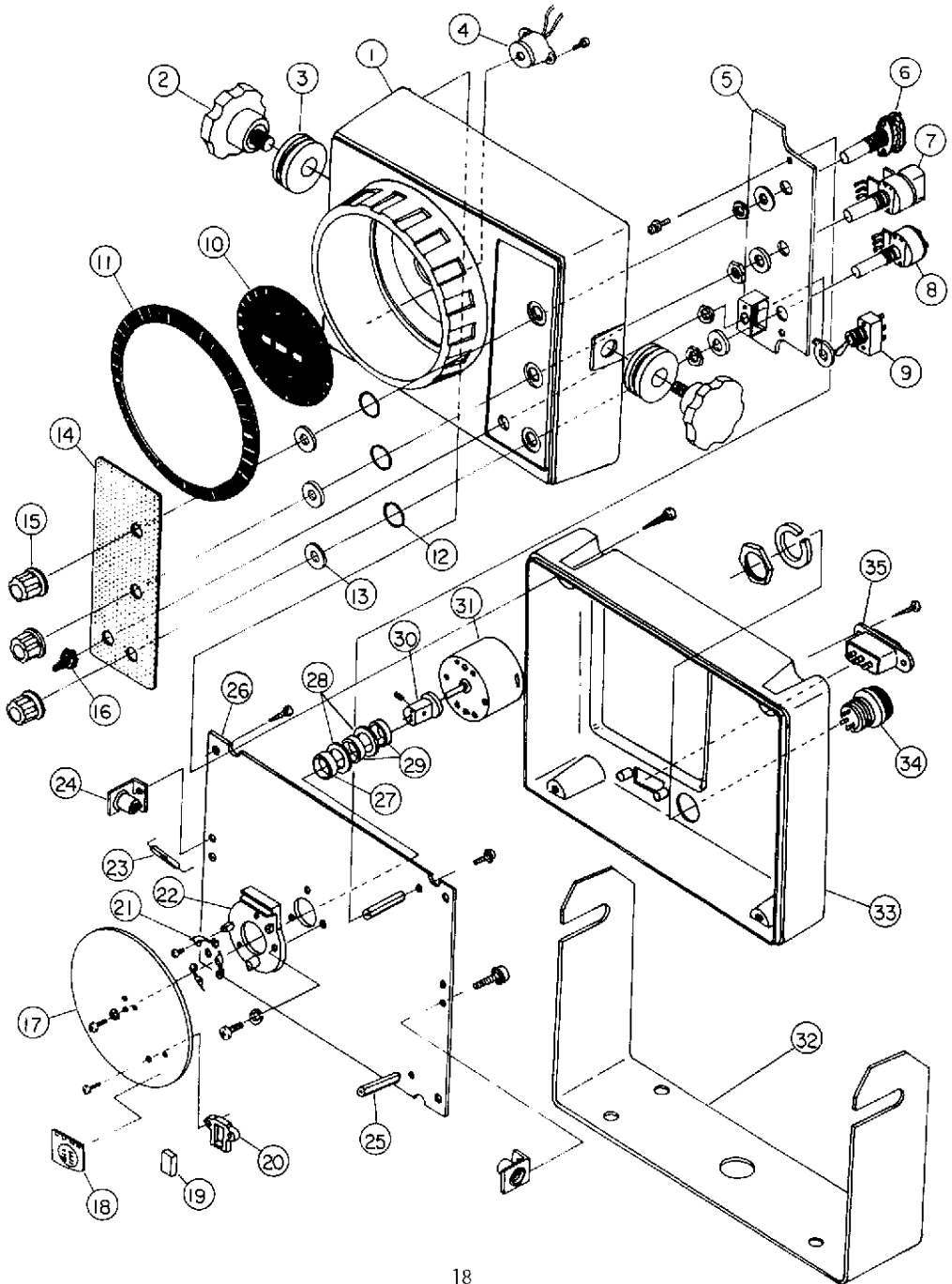


MECHANICAL DRAWING



TROUBLESHOOTING CHART

<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
Unit turned on, no display, and motor does not run.	<p>Check for power at 12 VDC connector at rear of unit</p> <p>If power is O.K., check the fuse. The fuse holder is located on the rear of the unit. Rotating counterclockwise the cap of the fuse holder, take off the cap. Replace fuse using 1 amp value only.</p>
Unit turned on, no display, and motor is running.	LED display board or other problem that will require shop service.
Unit turned on, displays zero light and bottom O.K., but only red display can be obtained.	Green LED bad or other problems that will require shop service.
Unit works fine when boat is sitting still or running at slow speed, but no bottom return is seen at higher speed.	<p>Transducer is not in contact with water or too much white water is under the transducer face. Check or change transducer location. The pulse of sound emitted by the transducer travels at a speed of 4800 feet per second, so if the unit operates satisfactorily sitting still, it will work satisfactorily at any boat speed providing the transducer is properly located.</p>
Unit works fine when boat's engine is off but has multiple strobes around the dial when engine is running.	Unit is picking up electrical interference from the boat's engine. Refer to section on engine interference.
Unit works fine but bottom light disappears when boat is in reverse or when passing over another boat's wake.	Unit cannot read through white water because most of the pulse is reflected.
Operation of unit is generally normal but occasionally zero light gets wider.	This is generally caused by heavy seas or wave action pushing tiny air bubbles down, as deep as 10-15 feet, and the unit is picking up these air bubbles and displaying them as target echoes.
Operation normal but weak echo appears red instead of green or orange.	Gain control is set too high.
Unit turned on and has zero mark, but no bottom return is displayed at any gain setting.	<p>Transducer is not in contact with water.</p> <p>Transducer connector is not in place.</p> <p>Bad transducer or broken wire at connector.</p>
Unit operation is normal but alarm does not work.	<p>Check manual for alarm operation instructions.</p> <p>Alarm buzzer is bad.</p>

INTERFERENCE SUPPRESSION

Interference in sufficient magnitude will cause erratic performance of the depth finder and possibly cause multiple strobes around the dial.

Check installation for interference by stopping the engine in medium depth water and observing the depth finder. Then start the engine with the propeller disengaged; increase engine RPM and observe the indicator for interference.

If interference is present, one or more of the following remedies may affect a cure:

1. Operate the unit at minimum required GAIN setting for satisfactory performance.
2. Install a suppressor on the center lead of the distributor. Install a coaxial condenser between the ignition coil and the ignition switch.
3. Install coaxial condensers on the electrical power line and the control leads which leave the engine compartment.
4. Bond engine, electrical accessories, propeller shaft, and rudder to each other and to the ground plate, if installed, with heavy copper grounding straps.
5. Resistor type spark plugs and/or copper screening on the inside of the engine compartment may be required in extreme cases.

On some engines, Champion "U" type spark plugs (such as UJ6) are specified. It is virtually impossible to eliminate noise caused by these plugs as they have an extra spark gap near the top of the plug which causes the leads to radiate noise. Replace these plugs with a resistor type plug such as the Champion XJ6, XJB, etc. Check all high tension wires for continuity.

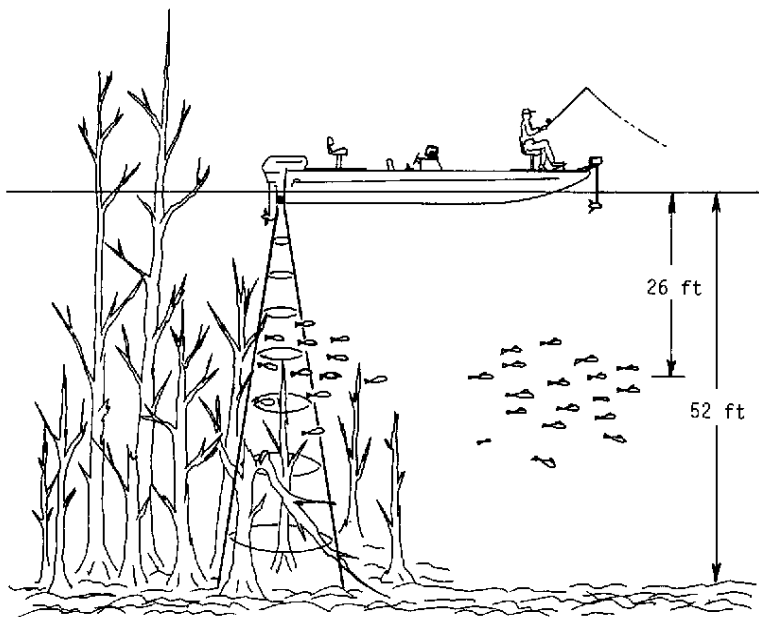
Ignition coil should be mounted on the engine. Clean away paint to ensure a good ground. Plastic-encased coil radiate excessive noise and should be replaced with a standard metalcased unit.

Older types of voltage regulators contain a vibrating set of contacts to control voltage. If the usual capacitors eliminate the noise, replace with a solid-state regulator which has no moving parts.

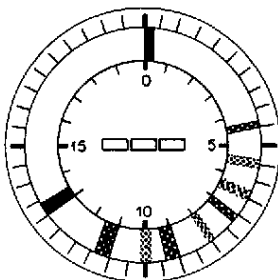
Some electrical tachometers cause considerable radiation of spark noise. This type of tach connects to the points of the distributor. Disconnect the tach wire at the distributor, and note the noise reduction. This lead could be shielded or a special tach filter installed. If SUN tachs are used, all wires must be shielded and the plastic-cased sender unit, which contains a vibrating set of contacts, should be completely shielded in a metal enclosure.

Your authorized marine electronic dealer will be familiar with the methods of reducing electrical interference and is qualified to assist you should a problem exist.

TYPICAL INDICATIONS



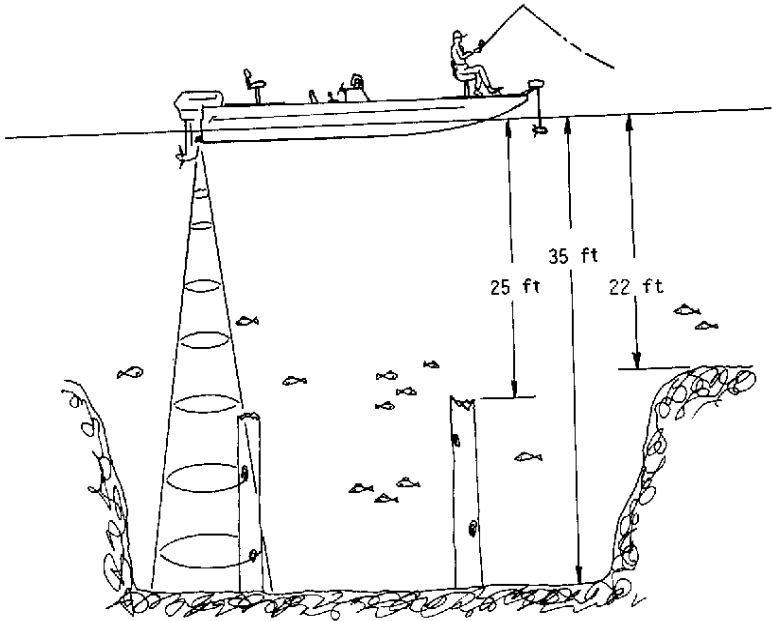
RANGE
FEET X4



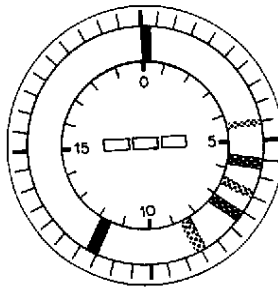
Depth of water is shown in red at 52 feet. Standing timber can be confused for fish, which are hard to distinguish but usually found in this type of cover.

Figure 13. Controls and Indicators - (5)

TYPICAL INDICATIONS



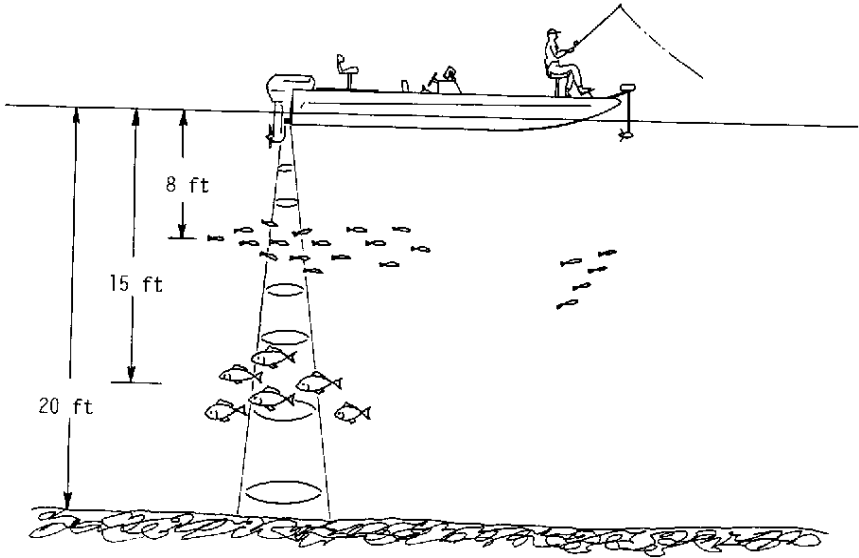
RANGE
FEET X3



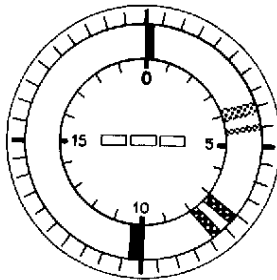
Red strobe indicates depth of 35 feet. Broken telephone pole at 25 feet is shown in red or orange, which could be mistaken for fish. However, the 22 and 28 foot echoes do not move, indicating stationary objects.

Figure 12. Controls and Indicators - (4)

TYPICAL INDICATIONS



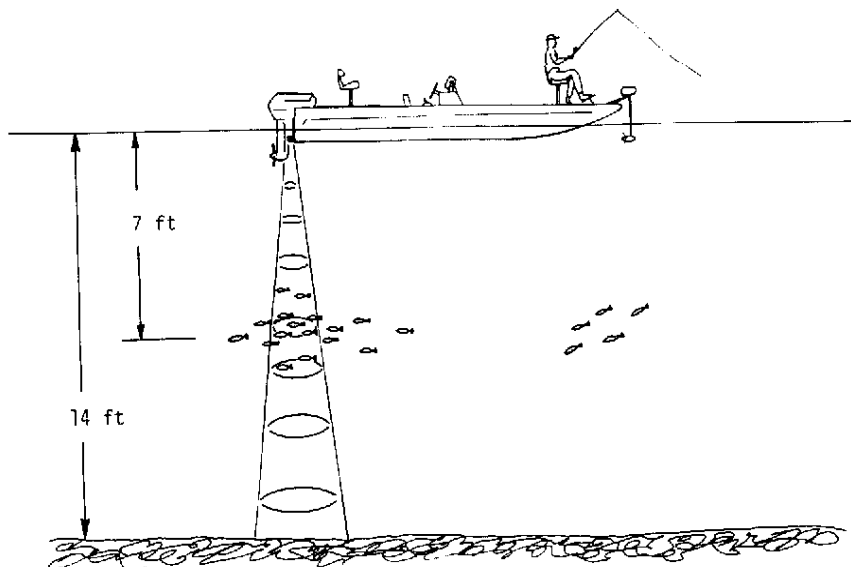
RANGE
FEET X2



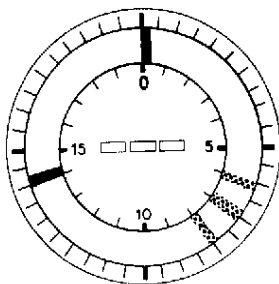
Depth is 20 feet and is displayed in red. Small bait fish are indicated at 7 to 9 feet and are shown as green. Larger fish are indicated at 14 to 16 feet and probably will be shown as orange.

Figure 11. Controls and Indicators - (3)

TYPICAL INDICATIONS



RANGE
FEET X1



Depth is 14 feet with bottom color in red. Fish are shown from 6 to 8 feet and their color may vary from green to orange, depending on their size.

Figure 10. Controls and Indicators - (2)

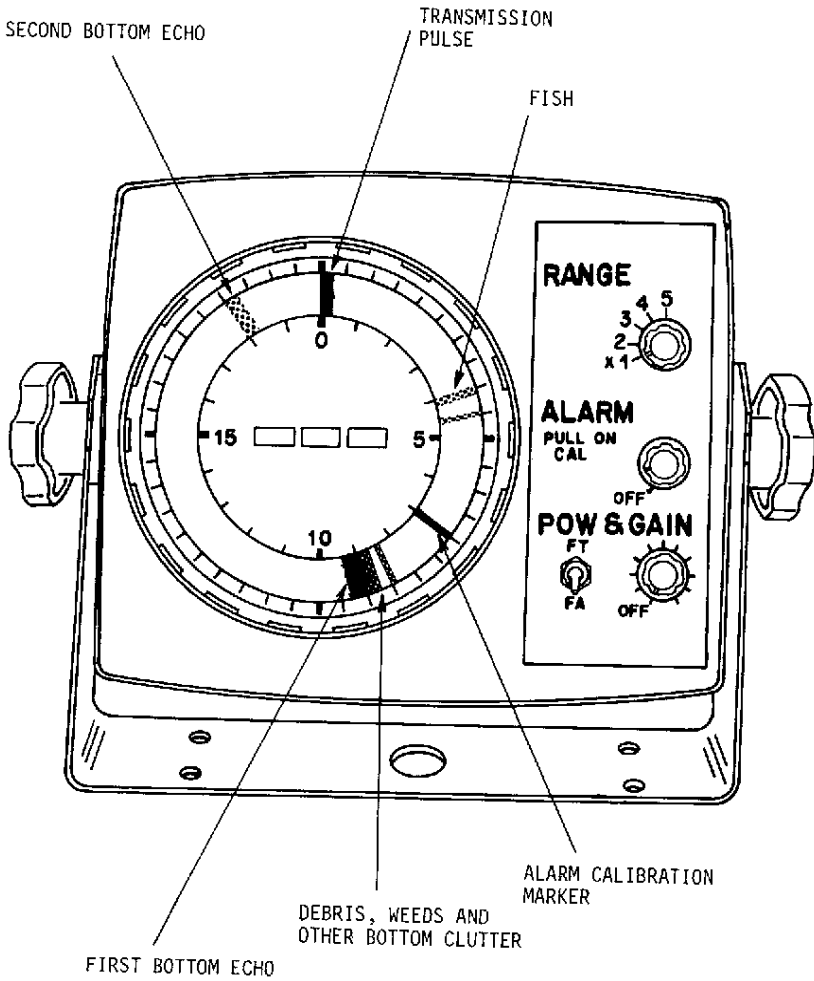


Figure 9. Controls and Indicators

CONTROLS AND INDICATORS

SCALE SELECTOR

FEET or FATHOMS display is selected by the front panel control. In the up position, all depth ranges are displayed in FEET, in the down position, all depth ranges are displayed in FATHOMS.

GAIN CONTROL

This is combination on/off and sensitivity (gain) switch. When the control is rotated clockwise, Figure 9, the unit is switched on, and further rotation of the control in a clockwise direction will increase the sensitivity of the unit proportionately; counterclockwise rotation will decrease the sensitivity proportionately; complete counterclockwise rotation will switch off the unit.

Gain setting is very important on this unit because the point at which it is set will be a reference point for all color indications being displayed. For the best operation, increase the gain control so that the depth light is red for a strong echo, such as the bottom.

Weaker echoes, like those from small fish, will appear green; stronger echoes from intermediate returns may appear orange, indicating large fish.

Echo from a hard bottom, free of debris and weeds, will be indicated as a solid red light. Debris, weeds, and other bottom clutter will be indicated by a orange light adjacent to the red bottom light, Figure 9. This results from weaker echoes from tops of weeds or other soft materials near the bottom.

When the bottom strobe lights change from red to orange or green, it indicates that bottom consistency is softer than that used as reference to set the gain. As an example, if fish appear as green or orange echoes, an increase in gain may cause the fish echoes to appear as red strobes, because by increasing the gain the reference level for the color display is changed.

DEPTH RANGE CONTROL

This control enables you to select electrically one of five depth ranges in FEET (and five depth ranges in FATHOMS). FEET or FATHOMS display is selected by front panel switch. For the fresh water angler, depth range selection is from zero to 20 feet on the first range, down to 100 feet on the last range of the feet scale. For deep water fishing, selection is from zero to 20 fathoms on the first range, down to 100 fathoms on the last range of the fathom scale.

ALARM CONTROL

As the ALARM control knob is pulled, an alarm calibration marker (red) appears on the dial. As the knob is rotated clockwise, a calibration marker signal will begin to circle the dial in a clockwise direction. By continuing to rotate the marker knob, the signal alarm can be set at any depth down to a minimum of 1.5 feet (or fathoms) on the first range to a minimum of 5 feet (fathoms) on the fifth range.

NOTE

Once the unit has been calibrated, the ALARM knob can be depressed so that the calibration signal will not interfere with other signals such as bottom, brush, fish, etc.

Once the depth alarm has been set, target echoes (orange or red signal) between the surface and the predetermined depth setting will sound the alarm.

Transducer Maintenance

If boating in salt water, paint the transducer with thin coat of antifouling. Allow time for the face of the transducer to become wet (coupled intimately to the water) after installation or after returning to the water from storage.

Clean the face of the transducer with a mild detergent or soap pad if the transducer's "vision" becomes obstructed, which may happen through constant exposure to the oily waters of a marina. Oil will act as an insulator and cause the face to become decoupled from the water or unwetted. Cleaning will restore the signal transmitting and receiving.

If the instrument fails to function, check all transducer electrical connections before calling a serviceman.

Do not coat the face of the transducer with heavily-pigmented antifouling paints, especially those filled with cuprous oxide, because they reduce the sensitivity or "vision" of the transducer.

Transducer Connector

The Transducer cable is a two-wire (black and white) shielded cable. Using a proper stripping tool, prepare the end of the cable as shown in Figure 8.

Unscrew the cable clamping screws and plug-body securing screw of the connector and slide the shell and coupling ring on the cable. Solder the black lead to terminal No. 1, the white lead to terminal No. 3 and the shield to terminal No. 2. The terminal identification numbers are indicated on the plug-body face.

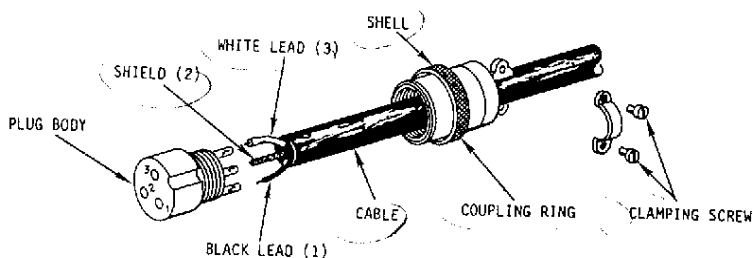


Figure 8. Transducer Connector Assembly

Through-Hull Type Transducer Mounting (Recommended for Optimum Performance)
Install the transducer so that its working face will be parallel to the water line when the vessel is in its normal upright position and will remain submerged when the vessel is heeled and under way. The pointed end of the transducer must point forward. Since air bubbles will greatly decrease the efficiency of the transducer and sensitivity of the receiver, the mounting site should be as far from air bubble streams as possible.

In through-hull installation, Figure 7, use leveling blocks, as required, to ensure that the transducer face is parallel to the water line.

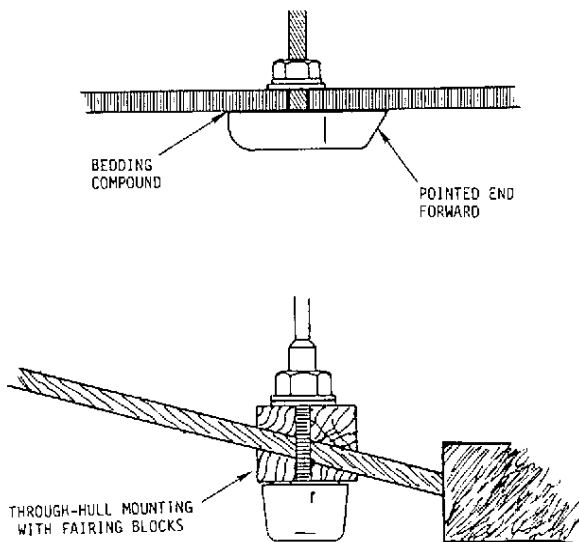


Figure 7. Through-Hull Type Transducer Mounting

Inside Hull Transducer Mounting In many cases, good results can be attained by mounting the transducer inside the hull, generally in the bilge area. It is important to ensure that the transducer is placed in an area that has a single-hull thickness. There must not be any air or flotation material, other than solid fiberglass, between the transducer's face and the water. Also, the transducer should not be placed over hull struts or ribs which generally run under the hull.

To determine the best position for the transducer, put some water in the bilge, wash the transducer face with a mild detergent and place the transducer in the bilge so that the transducer face is flush with the hull. Run the boat at various speeds and move the transducer to different locations to determine the best location for permanent installation.

To ensure a good transducer installation, drain all the water from the bilge, thoroughly clean the inside hull where the transducer is to be mounted, and clean the transducer face with the recommended detergent. Allow both to dry completely, then use a good two-part epoxy or fiberglass resin to bond the transducer face to the hull (coat the transducer face and hull with epoxy). Press the transducer firmly to the hull and gently twist back and forth to remove any air which may be trapped in the epoxy. Allow to dry per epoxy instructions.

The depth sounder will now operate with no water in the bilge. This type of mounting is preferred, as oily bilge water will tend to make sounding through the hull more difficult, and the transducer could move around if it were not secured in place.

This type of transducer mounting works best on fiberglass and aluminum boat, and in many cases, good-to-fair results can be obtained in wood boats providing the hull is not too thick and it is void of air.

On fiberglass flotation hulls, Figure 6, the inner hull can be removed and a reservoir made for transducer placement. After the reservoir is made, check depth-sounder operation before securing the transducer down.

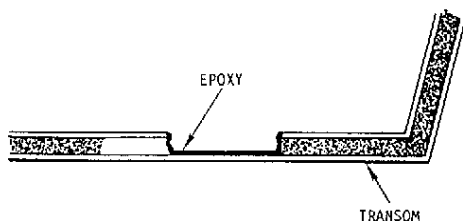
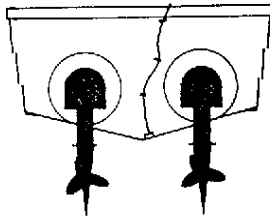
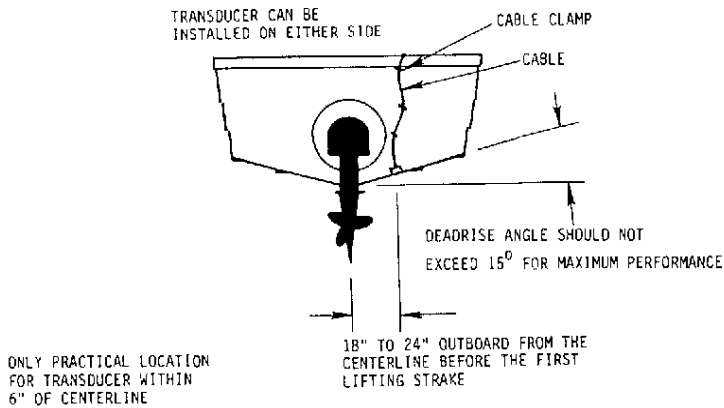


Figure 6. Inside Hull Transducer Mounting



ON THE CENTERLINE OR WITHIN 8" OUTBOARD EITHER PORT OR STARBOARD TO GIVE THE SMOOTHEST TRANSITION BETWEEN THE TRANSON AND THE TRANSDUCER DO NOT EXCEED 15° DEADRISE FOR MAXIMUM PERFORMANCE

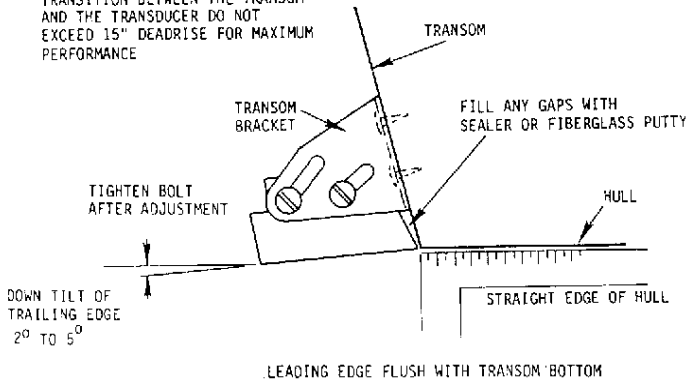


Figure 5. Transducer and Cable Mounting

TRANSDUCER INSTALLATION

For proper performance, the transducer mounting location must be chosen carefully. The transducer should be located in an area that is relatively free of white water. To determine the best location, run the boat at varying speeds and observe the water as it passes under the transom. Keep the transducer and its cable as far as possible from the boat's power cables, tachometer and other electrical cables.

After a suitable location is found, assemble the transducer, figure 4, temporarily as outlined below:

1. Use a straight edge to align transducer with the bottom of the hull and mark the mounting hole location on the transom.
2. Drill four 1/8" holes and mount the brackets with the screws provided. Coat the screws with bedding compound to prevent leakage.
3. Position transducer per Figure 5 and tighten nuts and screws.

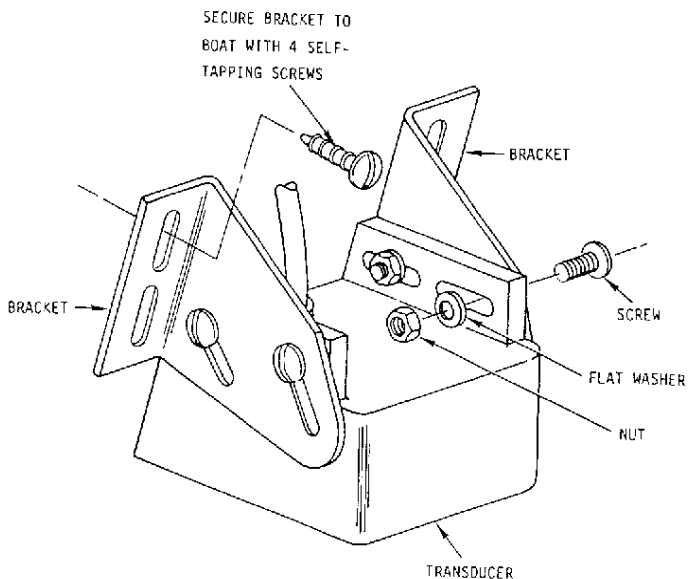


Figure 4. Transducer Installation

POWER CONNECTION

Connect the plug of the power supply cord to the power supply socket located in the rear of the cabinet, Figure 3. Connect the red wire to the positive terminal and the black wire to the negative terminal of the external battery.

To minimize extraneous electrical interference, the power cord should be connected directly to the battery terminals, and it should not be routed in parallel with the transducer cable.

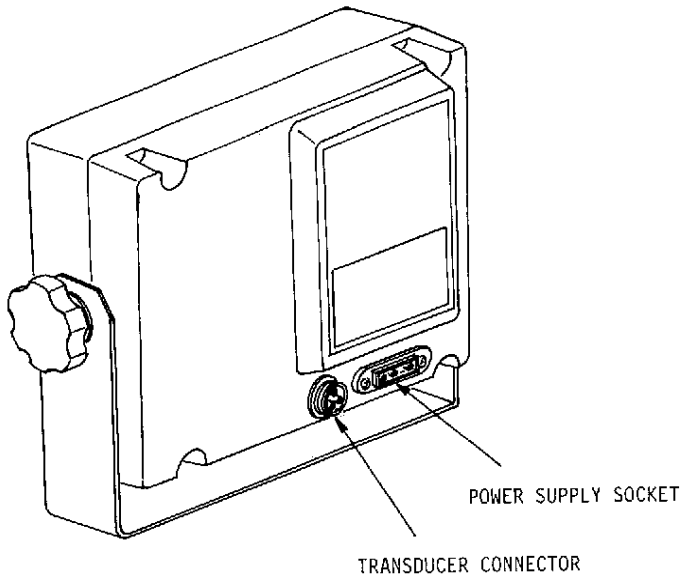


Figure 3. Power and Transducer Connections

INSTALLATION

INDICATOR MOUNTING

The indicator can be mounted in any convenient location that has a flat surface. The adjustable bracket, Figure 2, permits mounting on either a bottom or an overhead supporting surface or a bulkhead.

If the indicator is mounted near a magnetic compass, check that it does not affect the compass readings. If compass readings are affected, select an alternate mounting site.

Mount indicator where it can be easily viewed. However, it should be mounted out of direct sun light; otherwise, the sun shield may have to be used.

Although the unit is splash proof, it should be sheltered from the weather. (Warranty does not cover water or salt damage.)

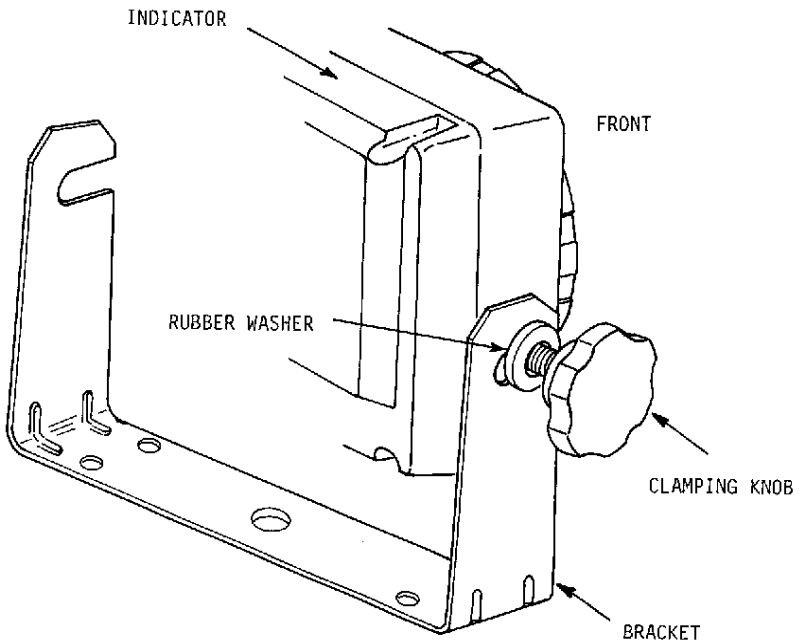
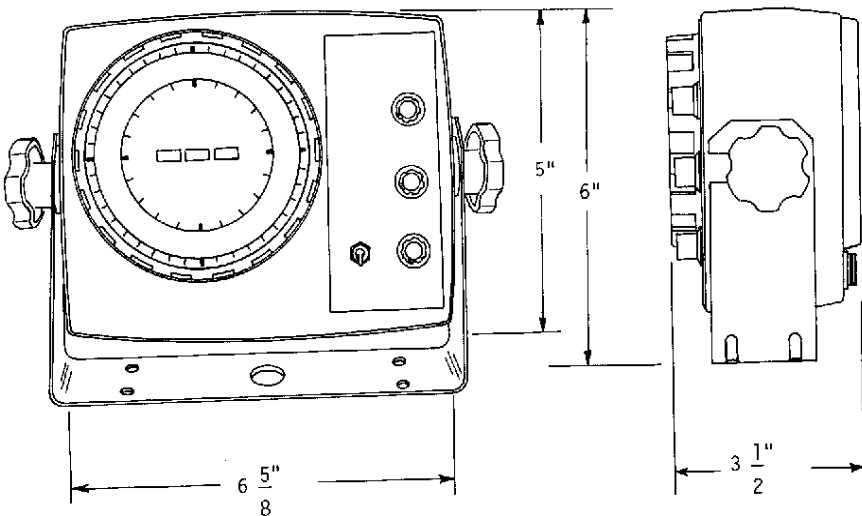


Figure 2. Indicator Mounting

SPECIFICATIONS

FL-5																					
Range	<table border="0"> <tr> <td>Feet</td> <td>1. 0- 20 feet</td> <td>Fathoms</td> <td>1. 0- 20 fathoms</td> </tr> <tr> <td></td> <td>2. 0- 40</td> <td></td> <td>2. 0- 40</td> </tr> <tr> <td></td> <td>3. 0- 60</td> <td></td> <td>3. 0- 60</td> </tr> <tr> <td></td> <td>4. 0- 80</td> <td></td> <td>4. 0- 80</td> </tr> <tr> <td></td> <td>5. 0- 100</td> <td></td> <td>5. 0- 100</td> </tr> </table>	Feet	1. 0- 20 feet	Fathoms	1. 0- 20 fathoms		2. 0- 40		2. 0- 40		3. 0- 60		3. 0- 60		4. 0- 80		4. 0- 80		5. 0- 100		5. 0- 100
Feet	1. 0- 20 feet	Fathoms	1. 0- 20 fathoms																		
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	4. 0- 80		4. 0- 80																		
	5. 0- 100		5. 0- 100																		
Sounding Rate	<table border="0"> <tr> <td>1. 1476 pulses/minute</td> <td>1. 738 pulses/minute</td> </tr> <tr> <td>2. "</td> <td>2. 492</td> </tr> <tr> <td>3. "</td> <td>3. 369</td> </tr> <tr> <td>4. "</td> <td>4. 295</td> </tr> <tr> <td>5. 738</td> <td>5. 246</td> </tr> </table>	1. 1476 pulses/minute	1. 738 pulses/minute	2. "	2. 492	3. "	3. 369	4. "	4. 295	5. 738	5. 246										
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2. "	2. 492																				
3. "	3. 369																				
4. "	4. 295																				
5. 738	5. 246																				
Frequency	200 KHz																				
Pulse Length	64 usec - 0.32 msec, 0.38 - 1.92 msec																				
Output Power	50 Watts effective (400 Watts peak)																				
Voltage & Current	12 VDC @ 0.4 amps																				
Display Color	Red, Orange and Green (7 dB step)																				
Scale Diameter	3.14 inches																				
Alarm Range	2 feet at 0-20 and 0-40 feet or fathoms (Minimum) 3 feet at 0-60 feet or fathoms (Minimum) 4 feet at 0-80 feet or fathoms (Minimum) 5 feet at 0-100 feet or fathoms (Minimum) Full scale (Maximum)																				
Weight	2.5 lbs.																				

DIMENSIONS:



GENERAL INFORMATION

The FL-5 Colormatic Depth Sounder, Figure 1, is small light-weight unit that is rugged and versatile enough for any size boat. The FL-5 will indicate water depth, bottom conditions, and intervening objects, such as fish, in three distinct colors. Strong echoes from the bottom are displayed in red while intermediate echoes are displayed in orange or green depending on the strength of the returning signal. Typically, an orange LED flash would indicate large fish or school of fish. Green would indicate smaller fish, thermoclines or plankton. FL-5 also contains an alarm that can be pre-set to sound when approaching shallow water or when suspected fish returns are present.

The depth sounder transmits bursts of high frequency pulse (200 KHz) which are converted from electrical to mechanical energy by the transducer. These pulses radiate from the transducer to the bottom and are reflected back to the transducer. The transducer converts them from mechanical vibrations to electrical pulses which are displayed on the unit's face. These pulses travel at approximately 4800 feet per second to provide a constant update of water depth and location of intervening objects, such as fish.

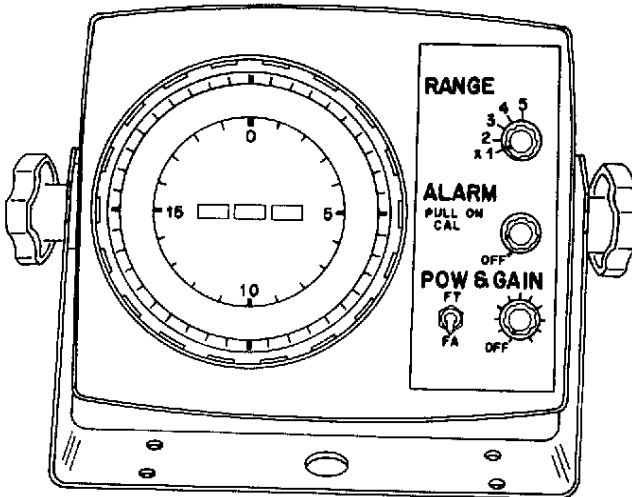


Figure 1. FL-5 Depth Sounder

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