IMPULSE

FISH FINDER FUNCTIONS

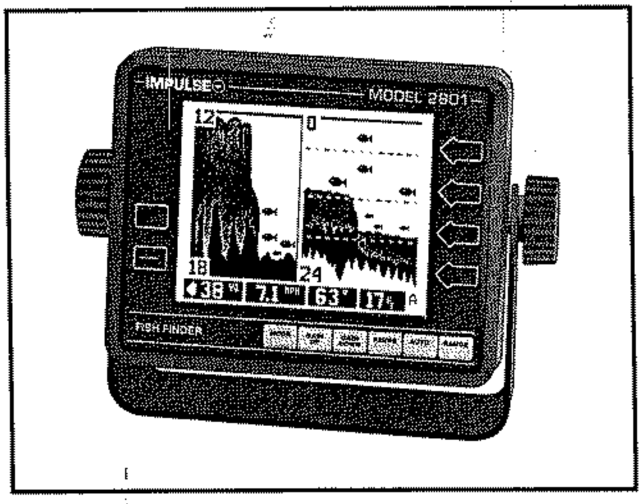
Model 2801 Fish Finder

Model 2831 Fish Finder/Loran C

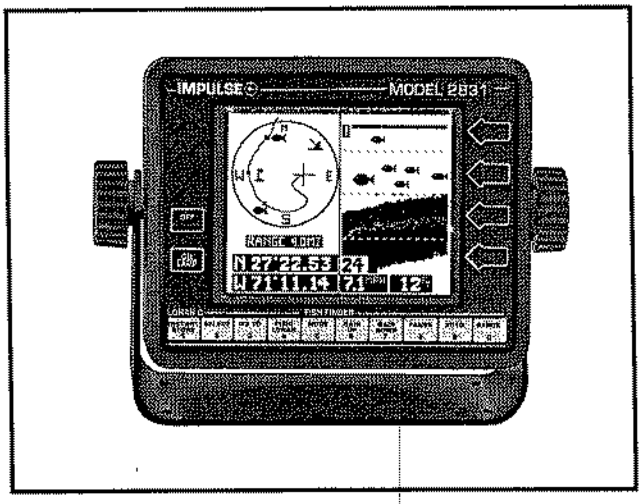
Owner's Manual

Installation and Operation Guide

Model 2801 Fish Finder



Model 2831 Fish Finder/Loran C



IMPULSE

FISH FINDER FUNCTIDNS

MODEL 2801 Fish Finder
MDDEL 2831 Fish Finder/Loran C

TO OUR CUSTOMER:

This manual addresses the Fish Finding functions only of the above IMPULSE products. The Loran functions of the 2831 are detailed in a separate Owner's Manual and Installation Guideline.

We would like to extend our thanks to you for purchasing the IMPULSE MODEL 2801 or the IMPULSE MODEL 2831 Combination Fish Finder and Loran C. These products are highly sophisticated instruments which were designed using the criteria of "simplicity of operation". You can axpect that we will be making on-going software enhancements to some features of this instrument which will allow you to upgrade your unit throughout the manufacturing cycle.

Each Instrument contains a built-in simulator. We suggest that you use this simulator to thoroughly familiarize yourself with this product prior to actual usage. You will find this simulator helpful in teaching you how the Fish Finder functions operate. Details of proper installation are also included in this manual and should be referenced prior to actual installation.

It is very important that you review this manual carefully and thoroughly prior to using your impulse inatrument. Successful instrument operation can be achieved with proper installation, background education, and a thorough understanding of how the equipment operates.

Your IMPULSE MODEL 2801 and the IMPULSE 2831 are aids to navigation and do not reduce the need for caution or judgment. No electronic navigation system is absolutely reliable; outputs may occasionally be incorrect. The careful navigator should never rely solely on one device, to the extent of endangering life or property. Please remember: any time that a display reading flashes on and off, the outputs may be in error and should not be used for navigation. We recommend that you use this system in combination with marine charts, and knowledge of the area where you are boating.

Again, we want to thank you for purchasing an Impulsa product and are confident of your satisfaction.

Sincerely,
IMPULSE TECHNOLOGY

IMPULSE TECHNOLOGY, 329 Railroad Avenue, Pittsburg CA 94565 USA PHONE: 510-439-2072

GENERAL OVERVIEW:

This Owner's Manual addresses only the Fish Finding functions of the Impulse 2801 and the Impulse 2831 Fish Finder/Loran C. Loran C functions are detailed in a separate Owner's Manual and Installation Guideline.

It has been arranged in the sequence outlined below. The overview below will provide you with a correct sequence of events required to successfully install and operate your instrument.

FISH FINDER FEATURES OF THE IMPULSE MODEL 2801 AND IMPULSE 2831

- **Split Screen Fish Finder** function enabling a full range to be displayed on half of the screen and a zoom section of this range on the other half of the screen.
- **Fish Alarm Zone** can be set up so that as fish enter a section of the fish alarm zone, the alarm will sound.
- Super Twist LCD, High-Resolution, High-Contrast, Wide-Temperature Range
- Seven primary depth ranges in feet or fathoms
- FISH ID displays fish in six different fish shapes or traditional arch/block format.
- One touch zoom enlarging as small as 6 feet over entire screen.
- Bottom track window follows bottom at whatever range or zoom selected.
- Auto Range selects range according to depth.
- Two echo levels for discrimination between weak and strong echoes - presented as black and gray on screen.
- Fineline for on-the-bottom fish enhancement (similar to gray or white line)
- Distance behind the vessel shows how much history is currently being shown on the screen. (Automatically changes when speed of the boat changes.)
- Full daylight viewing.
- Full night viewing with Electro luminescent (EL) backlighting
- Digital screen showing digital depth, alarm setting, boat speed, distance travelled log, surface water temperature, and a graph of surface temperature over time.
- Adjustable Sensitivity Control accessed on the rear panel
- Low Power consumption because of the LCD and the type of components used.
- Shallow water depth alarm.
- Depth, boat speed and water temperature shown in all screens and modes.
- Built-In Simulator.
- Flat Rate Fee for repairs with new rate established at beginning of each year.
- **Made in the United States.**

UNDERSTANDING SONAR:

All depth sounders emit Ultra Sonic Sound signels from the transducer into the water located under your boat. These sound signals travel through the water at a rate of approximately 4,800 feet per second (1500 meters per second). The depth sounder transmits a signal and receives a returning echo. The unit calculates the amount of time in microseconds that elapsed while the signal traveled down to the bottom and returned back to the transducer. This time is then converted to depth and displayed on the screen.

It may help to understand these sound signals traveling between the transducer and the bottom by imagining a ping pong bell bouncing up and down from the floor. The closer the ball is to the floor, the less time it takes for it to return. The higher the ball is bounced, the longer it takes to return. Bouncing the ball off of a hard surface, such as cement, is the same as bouncing a signal off of a sandy or hard bottom. Bouncing this same ball off of carpeting creates a totally different effect because the ball returns with less force. The same applies to an echo bouncing off of e muddy or grassy bottom which causes the echoes to be weaker.

AIR ECHOES:

Air echoes can be caused by excessive turbulence under the face of the transducer. Ultra sonio signals from a transducer will not penetrate air. They react to air in the same manner as they react to a hard bottom described above. Therefore, if your transducer is not mounted properly and you are getting turbulence (air bubbles) under your transducer you may get false readings simply because signals are being returned by the turbulence and never reaching the bottom.

Modifying the Shallow Water (TVG) setting can reduce this problem. Adjusting the transducer location can also help solve these false readings.

TRANSDUCER REPLACEMENT/IDENTIFICATION TAG:

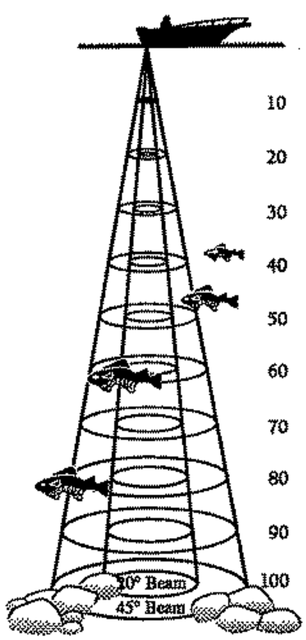
On most transducers menufactured after 1987, the operating frequency and parf number is attached to the cable or is printed on a mylar tag near the connector end. Do not remove this tag since it identifies the transducer and will help you identify the operating frequency of the transducer. (Incorrect frequency will cause your instrument to operate improperly.)

TRANSDUCER WETTING:

Immediately before launching your vessel, thoroughly wipe the face of the transducer with a detergent type liquid soap. This reduces the amount of time required for the transducer to establish good contact with the water. If this procedure is not followed it may take several days for the complete "wetting" to occur, resulting in reduced performance of the instrument.

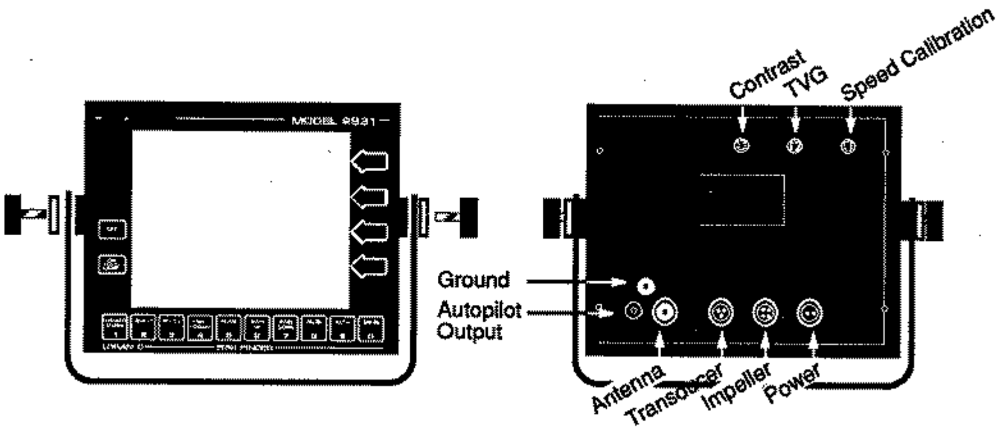
TRANSDUCER PAINTING:
If a vessel is kept in saltwater, especially southern U.S.A., marine growth can accumulate repldly on the transducer face and seriously reduce performance. If fouling does occur, use a stiff brush or putty knife to remove this growth. Wet sanding of the fouled transducer face is permissible with #220 or finer grade of wet or dry emery peper. (Use plenty of water.) Coating transducers with anti fouling paint is often necessary to achieve consistent performance. All anti fouling paints have a solvent base. However, some solvent bases will damage encapsulation materials and plastics to varying degrees. If you need anti fouling protection **use only paints with a mineral spirits base; do not use acetone vinyl based paints.** Glochester (RULE) Durapoxy is a hard, mineral spirits based paint that has been found to be virtually transparent to acoustic energy. Never apply paint to the transducer by spraying; use a brush or roller. A sprayed surtace "wets" very slowly and there are often microscopic air pockets under the surface which attenuate the sound energy.

BEAM ANGLES:
There are two different 120 KHz beam angles available: 20° and 45°. You can generally expect that the 45° beam angle transducer will go to a maximum depth of 480 feet (150 Meters) when the bottom is hard and reflects echoes strongly. The 20° beam angle should be used for deeper water applications. With a strong reflective bottom, it should be able to read to a maximum depth of 960 feet (300 Meters). A graphic description of the conical shape of the beam angle is given below. Note that the diameter of the cone becomes larger as the depth becomes greater. As the depth of water increases, the GAIN (Sensitivity) of the instrument should also be Increased.

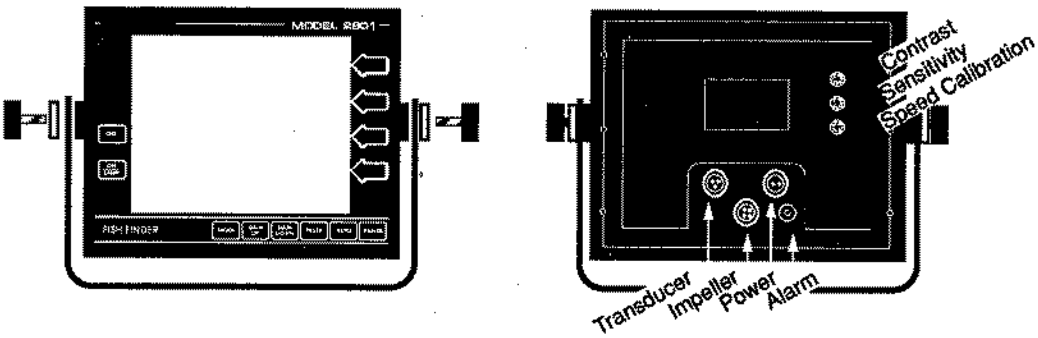


	DIAMETER OF CONE	
DEPTH	20° BEAM ANGLE	45° BEAM ANGLE
10 Feet	3.5 Feet	8.3 Feet
20 Feet	7.0 Feet	16.6 Feet
30 Feet	10.6 Feet	24.9 Feet
40 Feet	14.1 Feet	33.1 Feet
50 Feet	17.6 Feet	41.4 Feet
60 Feet	21.2 Feet	49.7 Feet
70 Feet	24.7 Feet	58.0 Feet
80 Feet	28.2 Feet	66.3 Feet
90 Feet	31.7 Feet	74.6 Feet
100 Feet	35.3 Feet	82.8 Feet
110 Feet	38.8 Feet	91.1 Feet
120 Feet	42.3 Feet	99.4 Feet
130 Feet	45.9 Feet	107.7 Feet
140 Feet	49.4 Feet	116.0 Feet
150 Feet	52.9 Feet	124.3 Feet
200 Feet	70.5 Feet	165.6 Feet
250 Feet	88.2 Feet	207.1 Feet
300 Feet	105.8 Feet	248.5 Feet
350 Feet	123.4 Feet	289.5 Feet
400 Feet	141.1 Feet	331.4 Feet
500 Feet	176.3 Feet	414.2 Feet

Model 2831



Model 2801



Mount your MODEL 2801 or 2831 in a location where you can easily monitor and operate the unit. It should also be sheltered from the elements as much as possible to ensure ease of operation and protect it under adverse conditions.

Here are some points to consider before you mount the main instrument housing:

1. Install it where it will capture as much light as possible.
2. Keep at LEAST 3" at the rear of the unit for the connectors.
3. Keep the unit as far as possible from any compass or radio(s) to reduce interference.
4. Always disconnect the cables from the unit before you remove it from its mount.
5. Route all associated cables away from other electrical cables and equipment which may radiate electronic interference.

COMPASS SAFE DISTANCE

The presence of ferrous metal, electrical equipment or wiring in the vicinity of a magnetic compass tends to distort the magnetic field influencing the compass. As a rule of thumb, mount the unit no closer than necessary from any compass and check for compass accuracy. Before finalizing the installation of the unit, turn it on and observe any interference or interaction which may occur when the vessel is running and when other equipment is operated. If necessary, change the location or re-route cables to minimize interference.

GIMBAL MOUNTING BRACKET

To mount the main unit, remove the bracket that is attached to the main unit by loosening the two large knobs. Then mount the bracket at the desired location using the appropriate hardware. You may want to place a small piece of neoprene (gasket material) between the bracket and the dash panel to reduce any possible vibrations. Reinstall the main unit in its mounting bracket and connect the transducer, impeller, and power cables to the unit's rear plugs.

SWIVEL MOUNTING BRACKET

The optional 360° swivel mount makes removal of the instrument easy without having to remove the side thumbscrew knobs and washers each time the instrument is removed from the boat.

CORRECT PLACEMENT AND VIEWING ANGLE

The unit should be mounted so that it can be tilted towards the sun so that it reflects as much available light as possibie. Direct sunlight causes the Liquid Crystal Display to appear brighter and the picture becomes clearer. The 2801 is backlit with a EL (Electro Luminescent) lighting panel which helps in low ambient light conditions and at night to provide a clear, crisp picture.

Adjustments can be made by moving the unit within the gimbal mounting bracket in combination with the contrast adjustment on the back of the instrument. When the sun is at the back of the instrument and it cannot reflect the sunlight, tilt the instrument down slightly so it can use the light reflecting off the dash (if it is white fiberglass as you might find on a flying bridge). Turn on the back light by using the ON/LAMP key.

CONTRAST CONTROL

There is a contrast control knob **on the back** of the 2801 housing. You will need to provide access to this control so that the contrast can be adjusted as various light conditions change. When the 2801 is FLUSH MOUNTED, special care should be made for accessing this knob.

TVG (TIME VARIED GAIN) - SENSITIVITY

The TVG adjustment is performed by rotating the screw located on the back of the instrument housing. Performing this adjustment will affect the first 10 feet of water below the surface. In general, this should be a ONE TIME ONLY ADJUSTMENT. Do not perform the TVG adjustment unless you are repeatedly picking up too much surface clutter in the first ten feet. It is in this area thet the greatest amount of air bubbles and clutter occur from either the installation of the transducer or from wakes of other vessels. Too much surface clutter should cause you to adjust this setting up slightly. Be sure and watch the fish finder screen section at the right to see the effect of your TVG adjustment. See TROUBLE SHOOTING -FISH FINDER Section #4 and #5 for proper Alignment Procedure. The TVG Adjustment also affects the DIGITAL depth reading.

CALIBRATION

Your unit is shipped from Impulse with the speed and distance calibration statute miles. If you wish to verify calibration on your installation, or to change to knots, you must:

1. Run a known distence in both directions at a constant RPM (speed).
2. Keep accurate track of time for both runs with a stopwatch.
3. Use the following formulas to determine the boat speed.

LAP 1

$$\frac{\text{60 X DISTANCE}}{\text{TIME}} = \text{LAP 1 SPEED}$$

LAP 2

$$\frac{\text{60 X DISTANCE}}{\text{TIME}} = \text{LAP 2 SPEED}$$

$$\frac{\text{LAP 1 + LAP 2}}{2}$$

Time is time in minutes and tenths.

4. Once you have calculated your boat's speed accurately, you can change the Speed/Distance by rotating the Calibration Control to match your computed speed.

EXAMPLE: A boat runs a measured mile in one direction, it takes 12 minutes and the reverse run takes 4 minutes.

$$\frac{\text{60 X DISTANCE}}{\text{TIME}} = \text{SPEED}$$

LAP 1

$$\frac{\text{60 X 1 MI}}{\text{12 MIN}} = 5$$

LAP 2

$$\frac{\text{60 X 1 MI}}{\text{4 MIN}} = 15$$

$$\frac{\text{SPEED LAP 1 + SPEED LAP 2}}{2} = \text{SPEED} \qquad \frac{5 + 15}{2} = 10 = \text{SPEED}$$

NOTE: IF THE MEASURED DISTANCE IS IN STATUTE MILES (5,280 feet) THE SPEED IS IN MPH. IF THE MEASURED DISTANCE IS IN NAUTICAL MILES (6,076 feet) THE SPEED IS IN KNOTS.

INSTALLATION:	POWER SOURCE

SELECTION OF POWER SOURCE

Do not use a power source shared by a high current load or radio, since power disturbances and transmissions may feed back into tha power circuit and create interference. Ensure that regulation of the power source remains within +11.5 volts to +16 volts under loaded conditions. **You should never have any electronic device turned on when starting an engine as the voltage drop and surge can damage the sensitive electronic components in the set.**

BATTERY CONNECTION/POWER REQUIREMENT

1. Route the power cable away from other possibla sources of electrical interference such as engine wiring, VHF radios, bilge pumps, refrigerators, etc.

2. Connect the main unit to a 12 volt battery using the power cable supplied with your unit. You may extend this cable as necessary, but you must observe proper polarity (i.e., red is positive, black is negative)

3. Connect the BLACK wire to the negative (-) battery terminal.

4. Connect the RED wire to the positive (+) battery terminal.

5. Make sure the connections are clean and tight so they do not vibrate loose during the boat's operation. Occasionally clean any accumulated corrosion from the battery terminals.

6. If for some reason the fuse is blown, replace with a **1 amp fuse, normal blow.**

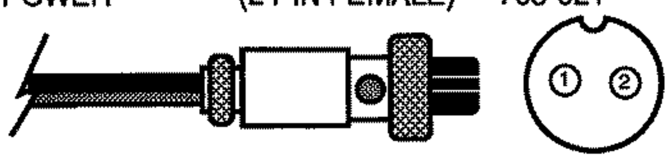
DO NOT OVER FUSE! Because the 2801/2831 consumes .30 amps of current when it is on, you will want to keep your battery fully chargad.

INSTALLATION:	CONNECTOR WIRING

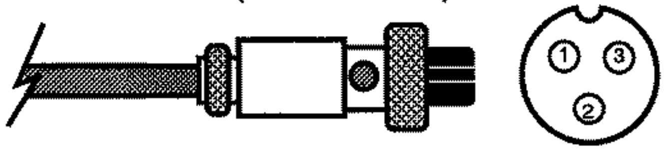
If for some reason you have occasion to check the internal wiring and/or soldering, all connectors' wiring diagrams, part descriptions, and part numbers are outlined below.

PIN NUMBERS REFER TO SOLDER VIEW AND ARE IN COUNTER CLOCKWISE DIRECTION WITH PIN 1 = UPPER LEFT.

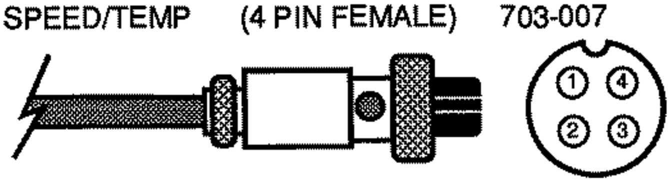
CONNECTOR	DESCRIPTION	PART #	COLOR		Solder View
POWER	(2 PIN FEMALE)	703-021	**Black**	=	**Pin 1**
			Red	=	**Pin 2**



CONNECTOR	DESCRIPTION	PART #	COLOR		Solder View
TRANSDUCER	(3 PIN FEMALE)	703-002	**Black/Green**	=	**Pin 1**
			Shield	=	**Pin 2**
			Red	=	**Pin 3**



CONNECTOR	DESCRIPTION	PART #	COLOR		Solder View
SPEED/TEMP	(4 PIN FEMALE)	703-007	**Black/Shield**	=	**Pin 1**
			Green	=	**Pin 2**
			Red	=	**Pin 3**
			White	=	**Pin 4**



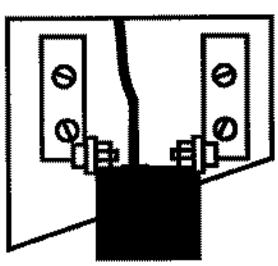
There are a variety of transducers available for use on the many styles of boats available and the preference of the boat owner. The three most popular styles are:

- **TRANSOM MOUNT:** Ideal on boats with outboard engine or on I/O driven boats installed on the stern of the boat)
- **THROUGH-THE-HULL:** Installation (ideal for boats with Inboard engine(s)
- **INSIDE-THE-HULL:** Often called Shoot Through Transducer; can be used effectively if procedures for installation are followed carefully

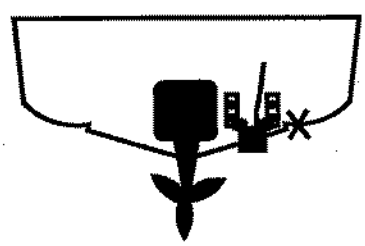
TRANSOM MOUNT TRANSDUCERS

WARNING: DO NOT INSTALL YOUR TRANSDUCER UNDERNEATH A GASOLINE OVERFLOW AS THIS WILL DESTROY THE PLASTIC MATERIAL OF THE TRANSDUCER AND THE BRACKET. THIS DAMAGE IS NOT COVERED UNDER WARRANTY. ALSO, DO NOT USE LOCKTITE OR ANY OTHER ADHESIVES ON THE MOUNTING HARDWARE AS THESE MATERIALS ALSO DESTROY THE TRANSDUCER.

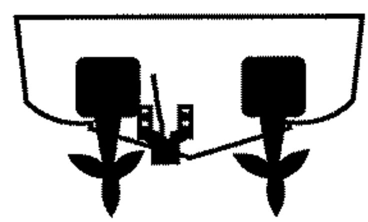
1. Attach the transducer to the bracket as shown.
2. WEDGE FORWARD: The styling of the transducer with the wedge installed pointing toward the bow is ideal for aluminum hulls, deep-vee hulls, and flat bottom boats. The wedge allows turbulence and water to flow around the face of the transducer and will give high speed performance.
3. Keep the face of the transducer clean and do not paint unless you use paint designed for transducers as described in the section on Transducer Painting. Before launching the boat, wash the face of the transducer with liquid soap.
4. Keep the transducer cable as far away as possible from engines, motors, and other wires.
5. If you leave your boat in the water, follow the instructions for transducer maintenance and/or painting the face of the transducer with transducer paint designed for this purpose.
6. Just before launching your trailerable boat, thoroughly wipe the face of the transducer with a detergent type liquid soap to clean the think layer of film coating the face of the transducer. This reduces the amount of time required for the transducer to establish good contact with the water.



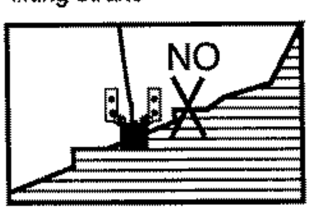
Do not mount on or behind lifting strake



18" to 24" outboard from the centerline before the first lifting strake



Best location for transducer within 8" of centerline



On single engine boats, the Starboard (right) side is preferred due to the potential of engine cavitation caused by the rotational pitch of the prop. (I.e. The turbulence caused by the transducer can cause your boat's engine to cavitate if the transducer is on the Port side and the rotation of the prop is clockwise.)
WARNING: DO NOT PUT UNDER FUEL OVERFLOW!!!

THROUGH-THE-HULL TRANSDUCERS

The two most popular styles of Through-the-Hull transducers produced are **Low Profile** types, which typically are 1-3/4" or 2" in diameter, or **Stam type** transducers, which typically have a 3/4" pipe thread and require a fairing block to level. The two most popular materials used are nylon and bronze.

- **WOODEN BOATS** require the use of a bronze transducer or bronze fittings due to the fact that when the boat is out of the water, the wood will dry out. When the fitting is installed and the boat returned to the water, the wood will swell and possibly crack a nylon type of transducer. Therefore, bronze is recommended for all wooden boat applications.
- **LARGER FIBERGLASS BOATS** often require bronze transducers and fittings due to the size of the boat and the total number of fittings used in the installation.

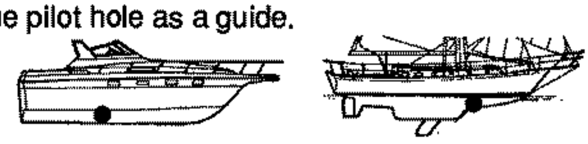
INSTALLATION GUIDELINES: THROUGH-THE-HULL:
In mounting a transducer Through-the-Hull (through-hull), it is important that it is done correctly because the location of the transducer on the hull will determine how well the entire unit will perform. **There ara several factors involved in choosing** a **good location for a Through-the-Hull transducer**. In general, powerboats should have the transducer mounted in the last 1/2 - 2/3 of the hull below the waterline, but always forward of the props and shafts. Sailboats should have the transducer mounted in the first third of the hull below the waterline, if possible, about two feet in front of the keel. Consider the following when mounting your Through-the-Hull transducer:

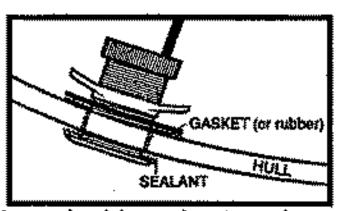
1. The transducer face must always have a smooth flow of water over the face of transmitting surface. Bubbles will cause the instrument to read improperly and cause erroneous readings.
2. Never mount a transducer in direct line or within 4 feet behind another through hull fitting, the keel or rudder, zinc anodes, or other projections that would cause turbulence around the transducer when the boat is under way.
3. Never mount a transducer in a recess or cutaway on the hull so that the face of the transducer is shielded from direct contact with the flow of water.

LOW PROFILE TRANSDUCERS
The Low Profile style of transducer is ideal for high speed sport boats and sailboats, this style of transducer is designed to be mounted flush against the hull without a fairing or leveling block. The hull deadrise angle must not exceed 20° in order to use this transducer fitting.

- SAILBOATS: Normally at maximum beam amidship or in front of the keel
- POWERBOATS: Off centerline, 6"-12" and before the first lifting strake (flat area). Do not install it on a lifting strake since this is the area where air bubbles travel from the bow to the stern in order to provide a smooth ride.

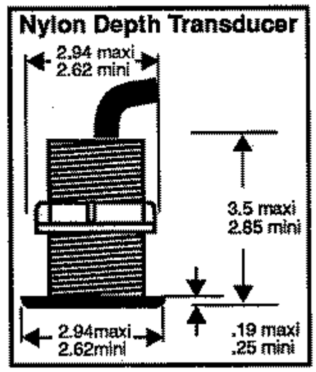
INSTALLATION: LOW PROFILE TRANSDUCER
Mount the transducer using the following steps:
1. Drill an 1/8" pilot hole in the preferred transducer location.
2. Drill a 1 3/4'" or 2" hole through the hull using the pilot hole as a guide.
3. Have some type of soft backing plate or thin piece of plywood (3-1/2" x 3-1/2" x 1/2" thick) available to strengthen the inside of the hull around where the hole was drilled. This serves the dual purpose of allowing the transducer to conform to the inside of the hull along while preventing the transducer locknut from unwinding.

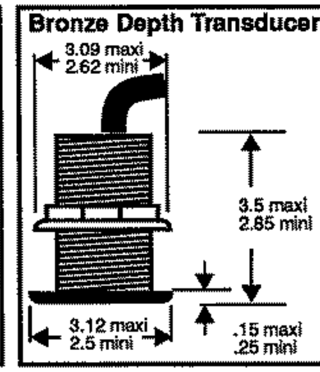




4. Route the transducer cable through the hole in the hull. Do not pull on the cable as this may cause internal damage to the transducer by causing an internal wiring short and require a new transducer be installed.

5. Apply a good grade of underwater marine sealant (polysulphide compound) to the flange of the transducer. Use enough sealant so that it beads out around the transducer as you tighten from inside of the hull.
6. Put the nut on the transducer from the inside of the hull. If nylon, hand tighten only. If bronze, tighten with a wrench. (NOTE: On speed/temperature impellers, use the stainless steel wire supplied with the unit to lock the nut and the wing nut together. This will help prevent pressure from building up and causing the Through-the-Hull assembly from leaking or breaking loose.)
7. Clean off any excess sealant from around the transducer.



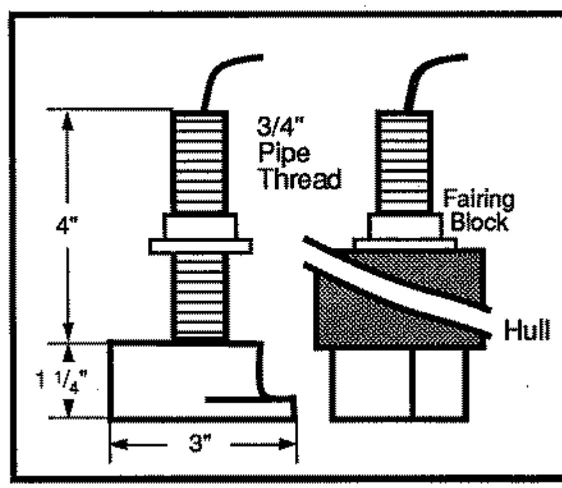


STEM TYPE OR POWERBOAT BRONZE TRANSDUCERS

The Stem type transducer is popular as a replacement transducer since it was the primary style used on older boats and the stem will fit the same size hole as the previous defective or obsolete transducer. In order to provide good, steady readings, it requires the use of a fairing block. Without a fairing block, a large portion of the transducer is unprotected and runs the risk of being hit off by objects in the water. Fairing blocks are best made out of hard wood such as oak. The shape of the block will be determined by the shape of your hull and the style of transducer you choose.

- WOODEN BOATS require the use of a bronze transducer or bronze fittings due to the fact that when the boat is out of the water, the wood dries. When the fitting is installed and the boat returned to the water, the wood will swell and possibly crack a nylon type of transducer. Therefore, **bronze is required for all wooden** boat installations.

INSTALLATION: STEM TYPE (POWERBOAT BRONZE) TRANSDUCERS



1. Drill a 1/8" pilot hole in the preferred transducer location. Reference previous section on determining the best location for your type of boat.
2. Drill a hole "slightly" larger than the stem of the transducer. Be carefully not to make it too large as you will run the risk of water leaking into the hull.
3. Cut the fairing block to the shape of your hull and insert the cable and stem of the transducer through 1/2 of the fairing block.
4. Apply a good grade of underwater marine sealant (polysulphide compound) to the flange on the transducer and to the surface of the leveling block where the block touches the outside of the hull. Apply enough sealant so that it beads out around the transducer as you tighten the transducer nut.
5. Put the remaining 1/2 of the fairing block on the inside of the transducer along with sealant next to the hull. Tighten lightly with a wrench.
6. Clean off the excess sealant from around the transducer.

IMPORTANT: AFTER LAUNCHING THE BOAT, BE CERTAIN TO CHECK THE TRANSDUCER LOCATION FOR LEAKS.

INSIDE-THE-HULL TRANSDUCERS

This type of transducer is very popular since it does not require the drilling of a hole such as the Through-the-Hull transducer. However, you should consider the disadvantage due to the possible loss of sensitivity which could cause a measurable depth loss in terms of maximum depth capability. The success of Inside-the-Hull installation is also greatly dependent upon the purity of the hull directly below the transducer and the type of hull.

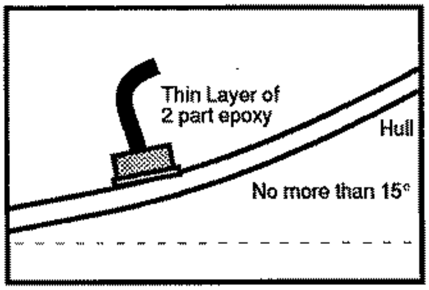
When performing an Inside-the-Hull installation, you must use the special INSIDE-THE-HULL TRANSDUCER since internal to the housing is a transducer crystal which is wider in inside diameter than other styles of transducers and is designed to transmit the pulse Through-the-Hull. Do not attempt to use a transom mount transducer as the crystal is too small to insure optimum instrument results.

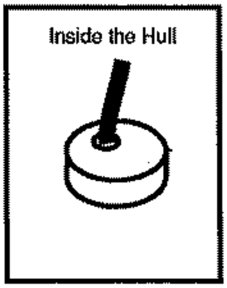
Make sure that the transducer mounting location is at a point where a minimum of air bubbles occur beneath the installation location. For example, do not choose an area above a lifting strake because this is an area where air travels underneath the hull and could cause erroneous readings or not allow the pulse to transmit and/or be received back to the unit.

DO NOT USE INSIDE-THE-HULL MOUNTING ON ALUMINUM HULLS, BALSA CORE HULLS, WOODEN HULLS, OR HULLS WHERE THE DEADRISE ANGLE IS MORE THAN 15°.

INSTALLATION: INSIDE-THE-HULL TRANSDUCERS

1. Select a relatively "thin" area of the hull. Avoid any built up areas that have been added to strengthen the hull.
2. The transducer must be below the waterline and in an area where it will always have water underneath its surface.
3. Mount in an area as flat and horizontal as possible. The greater the angle (deadrise) of the hull, the greater the loss in sensitivity and maximum depth.
4. We recommend that you perform a test to determine the accuracy of readings before permanently installing the transducer. Do this by either placing the transducer in a plastic bag of water or putting axle grease on the face of the transducer. Then try the unit in this location to ascertain the readings in shallow water and deep water.
5. After finding the optimum location, sand and clean the installation surface until it is smooth.
6. MIX THE TWO PART EPOXY SUPPLIED WITH THE TRANSDUCER FOR AT LEAST 3 MINUTES. If this is not done, proper bonding of the transducer to the hull will not occur and false readings can be caused.
7. Apply the mixture to the clean location on the hull and to the face of the transducer in a small amount.
8. Press the face of the transducer into the spot of epoxy and slowly rotate it in one direction only to remove any air bubbles and until the transducer is physically against the hull or within 1/4" of the hull.





When the epoxy has cured, it should be permanently bonded to the hull and hard to the touch. Test the epoxy which extends out of the underside of transducer with a screwdriver to insure that it can't be dented and is completely hard. Epoxy which is not hardened will eventually come up and cause improper readings.

IMPULSE provides only two kinds of speed/temperature impellers - Transom Mount or Through-the-Hull. The materials are generally either nylon or bronze and the type you install is dependent upon the style of boat, and personal preferences.

- **TRANSOM MOUNT** Speed/Temperature Impellers are ideal for boats with I/O or outboard engine(s) and are installed on the stern of the boat . They can be installed as follows:
- Clipped on to a wedge shaped Transom Mount transducer
- Use a separate mounting bracket installed "in line" with the deadrise angle of the hull so that only the impeller blades extend below the hull
- **THROUGH-THE-HULL** Speed/Temperature Impellers are ideal for boats with Inboard engine(s). They can be removed and a "dummy plug" inserted for ease of cleaning.

TRANSOM MOUNT IMPELLERS

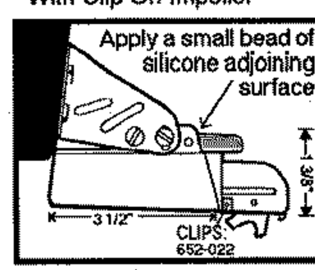
The following guidelines should be considered when installing a transom mount impeller:

- The impeller should be mounted in a location on the hull where it will always remain under water and where the flow of water is not turbulent.
- Do NOT locate this fitting immediately behind any protrusions or other fittings which could cause turbulence.
- Do NOT install your impeller near a close-by through hull fitting that discharges water, as this will cause inaccurate readings of the surface water temperature.

There are two types of transom mount speed/temperature impellers available:

CLIP-ON STYLE IMPELLERS

Transom Mount Wedge Transducer With Clip On Impeller

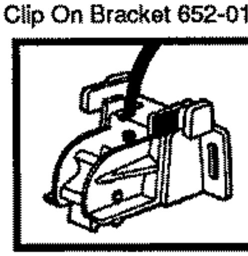


The Clip-On style impeller is used with the wedge transom mount transducer. There are two methods for installing this style impeller:

- Clip the impeller to the rear of the transducer. Follow these steps:

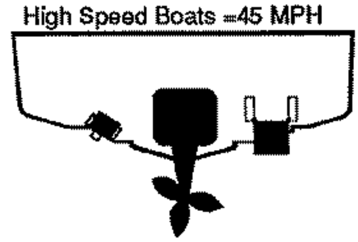
1. Simply slide the bottom of the impeller into the slides of the rear of the transducer and snap securely in place.
2. Apply a small bead of silicone to the adjoining surfaces.
3. Make sure that the Clip On impeller is at least 3° to 5° lower than the front of the wedge of the transducer. Adjust this level by using the slides in the mounting brackets.

Clip On Bracket 652-015



- Use a separate mounting bracket. For some applications, including flat bottom hulls, it is successful to turn the Transom Mount wedge transducer so it is pointing backwards, installing it as a smooth extension of the hull. This "backwards mount" makes a direct clipping on of the impeller impossible, and requires the use of a separate Impeller Clip-On Bracket. Using this bracket, the impeller should be installed on the opposite side of the hull "in line" with the deadrise angle of the hull so that just the blades are below the hull.

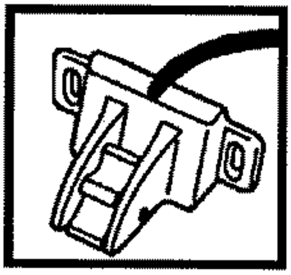
High Speed Boats =45 MPH



BRONZE HIGH SPEED IMPELLERS

This bronze style impeller is generally used for boats which have speed applications in excess of 45 MPH. (The Clip-On impeller is not recommended for these conditions due to the excessive stress placed on the transducer at high speeds, which could damage both the transducer and the Clip-On impeller). It is suggested that the optional Bronze Impeller housing (P/N: 653-0904) be installed on the opposite side of the hull from the depth sounder transducer.

Follow these steps to install your Bronze High Speed Impeller:

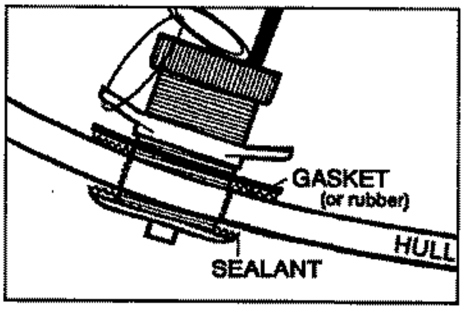


1. Install the impeller in a location of the transom with the deadrise angle of the hull. Be sure it is not on a lifting strake. Only the impeller blades should be extended below the underbody of the hull.
2. Secure the impeller to the hull using high quality screws and then seal with silicone to insure that water does not enter in these locations.

THROUGH-THE-HULL IMPELLERS

This type of fitting is low in profile and only has a small flange extending out of the hull. The paddle wheel assembly is designed so it can easily be removed from the fitting housing for easy cleaning. It is important, therefore, to choose an area which permits convenient access from inside the boat.

HOW TO INSTALL THROUGH-THE-HULL SPEED/TEMPERATURE IMPELLER:



1. Mark the desired location on the boat's hull and check inside and outside the hull for clearance.
2. Drill a pilot hole and then a 2" hole for the through hull fitting. Locate the arrow imprinted into the flange of the unit and point it towards the bow. This will notch aligns with an arrow on the top of the impeller assembly and will help you locate the correct alignment when you are cleaning the blades.
3. Apply a marine sealant (polysulphide compound) around the hole and to the flange of the fitting. Mount the fitting in the hole and hand tighten the nut to the inside of the hull.
4. Gently insert the impeller assembly and carefully pull up on the cable so as not to cause internal damage to the wiring internal to the assembly.
5. Line up the notch and the arrow of the impeller assembly and then tighten the nut securely so that water cannot enter the bilge.
6. Secure the Stainless Steel Ring to the Wing Nut by using either the stainless steel wire to link the two together or passing the locking pin (new style) through the assembly.

THROUGH-HULL ASSEMBLY CLEANING PROCEDURE:

1. First locate the DUMMY PLUG which should have been provided with your unit. Without this, do not perform the cleaning procedure.
2. With the dummy plug in hand, locate the notch of the through hull fitting to make sure that it lines up with the notch of the dummy plug. This will insure that the plug can be tighten correctly so as to stop the flow of water into the hull.
3. Loosen the nut of the through hull fitting. Quickly pull up on the ring at the top of the impeller assembly. Immediately pull it out of the fitting and PUSH THE DUMMY PLUG IN PLACE aligning it with the notch. Tighten the nut in place. Typically you can expect between 1 to 2 pints of water to flow into the bilge before the dummy plug is tightly in place.

OPERATION: SIMULATOR

The simulator is designed to help dealers demonstrate the unit and for the user to become familiar with the functions of the product before putting it into ectuel usage.

In the 2831, it is important to know that eny of the entries, changes, or set up operations made while you are in the Simulator Mode are not held in permanent memory and will be erased when you turn the unit OFF. Although the simulator allows you to operate the majority of features on your unit, it cannot possibly cover eech function in its entirety.

IMMEDIATELY AFTER TURNING THE UNIT ON WITH THE ON/LAMP KEY, TOUCH THE MODE KEY TO ENTER THE SIMULATOR.

WARNING: MAKE SURE YOU DO NOT USE THE SIMULATOR IN "REAL WORLD CONDITIONS" AND RELY UPON ITS INFORMATION. IT IS FOR DEMONSTRATION AND EDUCATIONAL PURPOSES ONLY.

OPERATION: TURNING ON THE 2801/2831

On the 2801, there are twelve (12) keypads which control the operations and functions of the 2801. The 2831 has sixteen (16) keys. When pressure is applied to a keypad switch, a beep will sound to acknowledge your command. Keypads are sealed to prevent moisture intrusion. Do not use sharp point instruments such as pens, pencils, or fingernails to operate these keys.

There are two front panel keys located on the left of the front side. These keys are labelled OFF and ON/LAMP.

- **ON**/LAMP
  Press ON key to turn your unit on. It will quickly sound with a long "BEEP". After 5 seconds, it will sound with two beeps "BEEP BEEP," to acknowledge that it is receiving power and is ON in the fish finding world. The first menu selection screen will appeer. Press the MODE key to fish.
  Note: The 2831 will eutomaticelly enter the fishing mode.

- *ON/***LAMP**
  Pressing the *ON/***LAMP** key once will turn the backlighting panel on so that in marginal lighting conditions and at night, the LCD screen is viewable.

- **OFF**
  PRESS AND HOLD this key for 5 full seconds to turn the unit OFF.

USING THE FISH FINDER MODE:
After powering your unit ON, you may choose to use your unit in several different manners. The first screen that appears is the Menu Selection Screen which offers you the option of changing the FISH ID to ON or OFF, using the Digital Screen, setting the Fish Alarm, or selecting more options. After making your menu selection choices, to enter the fish finder function simply press the key marked MODE. To access the Menu Selection Screen, while viewing the Fishing Screen, press MODE on the 2801, or SELECT on the 2831.

MENU SCREEN 1

MENU SCREEN 2

Each of the four functions shown on the MENU SCREENS has a heading. Directly to the right of the heading is an arrow key on the keypad area of the front panel. To select one of these functions, press the center of the arrow of the function you desire. Notice the word in the the box you have selected will become dark and is highlighted to remind you that you have chosen this function. For example, in the FISH ID box, one of the words OFF or ON will be darker. Also to confirm that it has accepted your selection, you will hear a short "BEEP" sound.

FIRST MENU SELECTION SCREEN:
When you first turn your unit on and are not in the Simulator Test mode, this is the first screen that will be displayed. It is one of two Menu Selection Screens and is displayed first so that you are given an immediate opportunity to program choices such as whether you want FISH ID On or Off, to use the Digital Screen, or to enter Fish Alarm zones.

- On the 2801, to select the Menu Screens, press the MODE Key.
- On the 2831, to select the Menu Screens, press the SELECT Key.

To enter a menu instruction, use one of the four arrow keys located to the right of the Liquid Crystal Display. Press the key next to the function you wish to perform.

If you have a 2831, this same Menu 1 Screen will appear. You have the option at this time to choose one of the arrow functions or press MODE to FISH.

Refer to the Loran C Owner'a Manual and Installation Guideline for operating details of the Loran portion of your instrument.

FISH ID OFF/ON: The 2801/2831 automatically comes on in the FISH ID OFF mode. If you want to program the instrument to display targets in the shape of fish, simply press the top arrow key and notice that the word ON becomes highlighted. Press MODE to fish.

By selecting the FISH ID ON function, you program the instrument to display fish in the shape of FISH. There are six different sizes that the unit will use to display different sizes of targets. By pressing the arrow key again, the OFF function will program the instrument to display fish in the traditional shape(s) such as arches, blocks, marks on the screen.

DIGITAL SCREEN: When you want to display the digital screen, press the second arrow key from the top. This will result in changing from the Menu Selection Screen to a full screen with digital depth, elarm, speed, trip log, surfece tempereture, and a graph which displays temperature over a ten minute period of time.

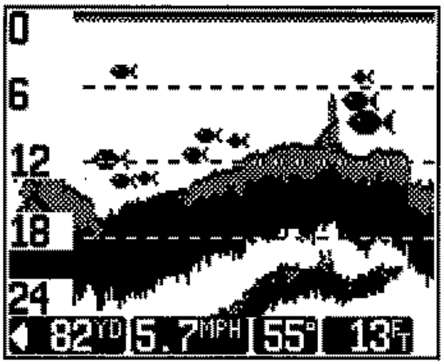
FISH ALARM: In order to program e Fish Alarm Zone and select the size of fish that you want to trigger the elarm, press the third arrow key from the top. This will result in changing from the Menu Selection Screen to a full screen displeying the upper limit end lower limit elarm options along with the five sizes of fish which set off the alarm. When the alarm is set, there will be a vertical open bar shown on the fishing screen to show the depths the alarm is set for. Press MODE to fish.

MENU OPTION 2 OPTIONS: Press the bottom arrow key to enter the Second Menu Selection Screen.

SECOND MENU SELECTION SCREEN

FEET/FATHOMS: The 2801/2831 automatically is programmed to display depth in Feet. Notice that the word FEET is highlighted. To change the instrument so that it will read depth in FATHOMS and be programmed so that the elarms are also in fathoms, press the top arrow key. Notice that the word fathoms becomes highlighted and is darker. To fish, press MODE.
FISHING HELP: The 2801 has two help screens. They are simply examples of typical bottom conditions and are not reel life depth reedings. To enter the help screens, press the third arrow key. Press MODE to fish.

- **The 2831 does not have FISHING HELPS screens due to the loran memory requirements.**



READING A FISH FINDER SCREEN

Notice that the screen starts updating from the right hand side end moves to the left until it has fish finder and bottom contour information displayed across the entire screen. In traditional fish finding display format, the instrument displays the most current reeding on the right and then this data moves to the left of the display. If your boat is moving and you see a fish on the right edge of the screen, it is directly below the transducer. As the boat continues to travel, the fish is behind the boat and the information moves to the left of the screen. The oldest information is at the far left of the screen and the distance is shown in the lower left corner of the screen. The fester your boat is travelling, the more distance you will be covering and the higher the number in the DISTANCE BEHIND THE BOAT reference will be. This reference enables you to geuge the amount of distance behind the boat displayed on the screen. When you are trolling, you will be going less distance and therefore the number will be smaller. When the boat stops, the screen will continue to move; however, the distance behind the boat measurement will not be updated due to non movement of your boat.

INTERPRETING THE SCREEN

The Liquid Crystal Display used in the Model 2801 contains thousands of tiny dots (20,480 pixels) which are used to display the bottom contour and information below the transducer. The pixels are arranged in different graphic formats which indicate types of bottom conditions, fish (targets), and matter growing off the bottom. The different shades and colors assist the user in quickly interpreting the screen.

- **Muddy bottoms** are displayed in dark shades.
- **Hard bottoms** are displayed in a crisscross cross pattern of light and dark pixels.
- **Fish** are identified as suspended matter off of the contour of the bottom and often appear in the shape of arches. This is greatly dependent upon the speed of the boat when travelling over the fish, the beam angle of the transducer, and where the fish appears in the beam angle. Wider angle transducers are more likely to display fish in the arch shaped format. Narrow angle transducer display fish in more vertical or blocked format. Refer to the sections of this manual entitled Understanding Sonar and Beam Angles for background material.
- **Second Echoes** generally occur when the bottom is very hard and reflective in nature. An analogy which helps understand second echoes is ringing a bell. When the bell is first struck (transducer transmits the pulse and hits the bottom), it continues to reverberate. A second echo is simply the second time the pulse travels back and forth and is not a problem.
- **Bait Fish/Schools of Fish** are displayed in tightly packed groups on the screen and are often described as "clouds going across the screen".
- **Grass/kelp** growing on the bottom displays on the screen as a dark images
- **Rip Tide and thermoclines** may display as a very faint bottom.

RANGE LINES

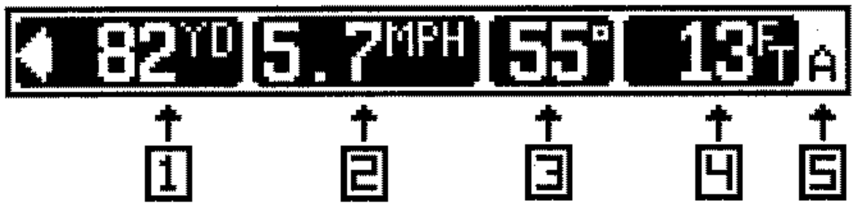
The area dedicated to displaying fish finder information is divided up into four equal sections. Each section is separated by horizontal, dotted lines which are helpful as reference in determining the depth of water and the depth where the fish are located.

DIGITAL DEPTH

Since it can be difficult to interpret the Range Lines in terms of an accurate depth reading, a digital depth is provided in the lower right corner. It is important to know that this instrument is designed primarily as a fish finder and this read out is a supplemental feature. Make reference to TVG Adjustment in the following section if the two reedings vary.

OPERATION: DATA AT THE BOTTOM OF THE FISH FINDER SCREEN

The line of data located at the bottom of the screen displays pertinent NAVIGATION INFORMATION. It is displayed on all screens at all times except on the Digital Screen. When any of the information is blinking on and off, it cannot be relied upon as correct data and the reason for this condition may need to be determined.



1. DISTANCE BEHIND THE BOAT "YD": "YARDS":
The Information displayed in this box relates to the measurement of DISTANCE BEHIND THE BOAT from the right hand side of the FISH FINDER SCREEN to the left hand side of the screen in yards or statute miles.

This function is very helpful when locating fish and determining how far behind the boat the targets (fish) are located. In this example, the screen shows a total distance of 82 yards. The distance will be proportional to the speed of the boat. The slower your boat is travelling, the less distance you will be showing and this number will be smaller. The faster the speed of your boat, the higher the number. There are several things that will affect this figure. Depressing the MODE key and thereby going into other screen functions will stop the counting process and return the number to zero. Notice that as you start recounting, this number gets bigger in value as the new distance travelled is updated across the screen until it has an entire screen of information.

When the ARROW is shown in this same block, it indicates that the distance is showing the entire screen measurement of distance travelled.

2. SPEED OF THE BOAT: "MPH"
The information displayed in this area refers to the speed you are currently travelling. It is displayed in Statute Miles Per Hour and is derived from the speed impeller installed.

3. TEMPERATURE: "FAHRENHEIT"
The information displayed in this area refers to the temperature of the water "at the surface". It is displayed in Fahrenheit

4. DIGITAL DEPTH: "FEET"
The information displayed in this area of the screen provides a digital reference to the depth of the water.

5. AUTO:
Indicates that you are in the AUTO RANGE and AUTO BOTTOM LOCK mode and it will track to the bottom. When you are in this mode, the "A" symbol will appear in the lower right hand corner.

GAIN UP/DOWN

In general terms, GAIN relates to the amount of sensitivity which is required in order to display fish finder data clearly on the display. Typically, you require less GAIN when the water is shallow and clear and more GAIN when the water is deeper and the pulse has be projected further. Sometimes after a heavy rain, you will find that the screen is full of tiny dots (air bubbles caused by the rain) and that by reducing the gain setting of the instrument the screen becomes clearer and easier to interpret.

Pressing the Gain key pointing Down brings the GAIN of the instrument down as it relates to the fish finder display screen. Pressing the Gain Up key brings the GAIN of the instrument higher. Notice that as you touch one of these arrows, the number in the lower left comer becomes higher or lower respectively. There are 32 gain settings possible.

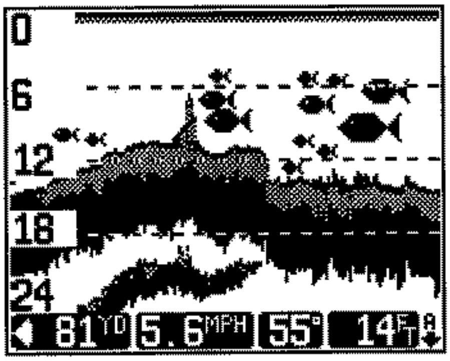
Immediately after you press one of these Gain keys, notice that the gain setting will display in the lower left-hand corner of the display. For good fish finding, run the gain at the higher settings so that you are picking up the fish, but not so high as to copy interference or clutter on the screen. The GAIN control affects the DIGITAL DEPTH reading which displays in the bottom right corner but not on the DIGITAL screen.

PAUSE

Selecting this will allow you to stop the screen from moving and updating. During the time that the instrument is in the PAUSE mode, it is not providing you with updated information from the transducer. Notice that after you release from the PAUSE mode a line is drawn vertically on the screen. This is to remind you that the data at the left of the screen is old information which cannot be relied upon. The new data is displayed to the right of the vertical line. This also resets the Distance Behind the Boat.

MANUAL RANGE ADJUSTMENT

When you press the MANUAL range selection, your fish finder will change ranges according to the range scales. The 2801/2831 has the following pre-programmed range scales: 0-24', 0-48', 0-96', 0-192', 0-384', 0-480', 0-960'.



The Auto Range feature programs your unit to automatically select the most appropriate depth range for displaying the bottom contour. As the depth increases or decreases, the range changes. The 2801/2831 will automatically follow the bottom contour and change the scale to closely fit the new depth.

In the AUTO mode, the instrument will choose the most appropriate depth range that best matches the actual depth of the water. For example, the auto range displayed may select ranges like 0-32' or 0-64', thus, the depth ranges selected may not be one of the seven Primary depth ranges which occur when the instrument is not in the Auto mode.

When you are in the Auto mode and a range is selected that you prefer to use, i.e. 0-64', you may retain it on the screen by pressing the Auto key to turn this function off. Note that the letter "A" in the lower right corner will be removed.

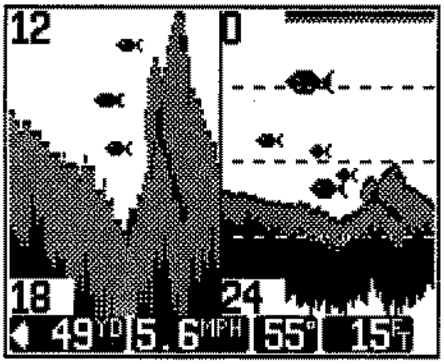
The primary advantage of Auto Range is the elimination of manual range changes. It also ensures that the full range scale is kept on the screen at all times so that the user can monitor all targets within this range.

1. To enter the Auto Screen Mode:
   Press the Auto key located at the bottom of the instrument keypad next to the Range key. To confirm that your selection has been accepted by the unit, notice the letter "A" for automatic has been displayed in the bottom line of data directly above the key.

2. To leave the Auto Screen Mode:
   Press the Auto key again. Verify that the letter "A" has been removed.

NOTE: When the user has selacted the SPLIT SCREEN ZOOM Moda and AUTO RANGE mode, the left zoom aide of the LCD will track the bottom and adjust its range as the depth increases or decreases. The right side of tha screen will also be in the AUTO RANGE Mode.

The Zoom Scale will alwaya be 1/4 of the Range selected.



Your unit has the ability to visually split the screen to display two different depth functions simultaneously. The full range scale will be displayed on the right half of the LCD and a zoom magnification of the range selected on the left half of the LCD. This feature is particularly valuable when it is important to monitor the depth from the top of the water's surface to the bottom range selected; while also monitoring a smaller portion of this same range.

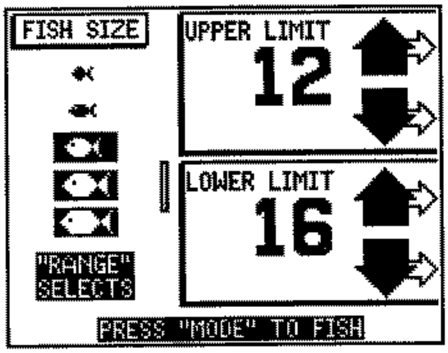
To enable the SPLIT SCREEN mode, Press one of the four zoom keys. Each range is divided into four sections which is identified by dotted, horizontal lines across the screen.

1. To enter the Split Screen Mode:
   Press one of the four ZOOM keys located to the right of the screen. The section (1/4) of the full range you zoomed will be displayed to the left of the range scale.

2. To leave the Split Screen Mode, press the RANGE key located in the bottom right corner of the keypad.

To subsequentially view a different section (1/4) of the range, press the adjacent zoom key located to the right of the screen.

If the AUTO function has been enabled, Note that if the bottom gets shallower or deeper and causes the unit to AUTO RANGE, the lett side of the display will adjust correspondingly to give 1/4 of the right side of display.



The Fish Alarm zone feature on the 2801 monitors fish in a selected depth range or portion of a range. You can select from one, two, three, four, or five, or all fish sizes to trigger the audible alarm when fish enter this zone. The fish sizes are selected by using the RANGE Key located in the bottom right hand comer of the keypad. There is an Upper Limit and a Lower Limit fish alarm zone which can be entered by using the ARROW keys on the right of the display.

To set the Fish Zone Alarm, locate the First Menu Selection and the line with the words "FISH ALARM". Press the adjacent arrow key and the Fish Zone screen appears. When the 2801 is first tumed on, the fish alarm zone will be OFF. To enter a Fish Alarm press any arrow key which will automatically select a full range alarm zone. Specific alarm zones can be selected by using the four arrow keys as follows:

To set the UPPER LIMIT Fish Alarm depth:

1. Press the **second arrow** key and notice that the number increases by increments of one foot (fathom) each time this key is pressed. This number gets larger by a factor of one each time this key is pressed. Note that at deeper depth ranges, the increments are proportionally greater.

2. To bring the Upper Limit to a shallower depth, touch the **first arrow** key and notice that the number gets smaller by a factor of one each time the key is pressed. Notice that the Alarm Zone is represented by a vertical "open bar graph" which changes as the limits are changed.

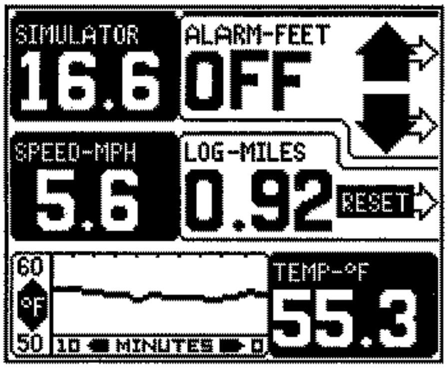
To set the LOWER LIMIT Flah Alarm depth:

1. Press the **third arrow** key from the top and notice that the number decreases by increments of one foot (fathom) each time the key is pressed.

2. To increase the Lower Limit to a deeper depth, touch the **bottom (fourth) arrow** key to make the bottom limit of the alarm zone deeper. Each time you press this key, the number will increase in depth. The depth is limited to the depth range selected

To set the FISH SIZE for the Fish Alerm Zone:

1. **Press the Range key and notice that each time this key is depressed one, two, three, four, five, or none of the fish shapes become highlighted. Determine the size of fish which you want to trigger the alarm and then press MODE to return to the fish finder screen. If no fish are selected, the Fish Alarm la turned off.**



Press the arrow key next to the word DIGITAL on the Menu Selection Screen.

DIGITAL DEPTH: In the left hand corner, the digital depth displays depth from 2.5 feet to 15.0 feet in tenths. It then reads in whole numbers down to a maximum depth of 480 feet with the 120 KHz wide angle transducer (dependent upon the reflective nature of the bottom). The narrow beam transducer will read to 960 feet with a good bottom.

DEPTH ALARM: Can be set from 3.0 feet to 60 feet. There is an audible sound to alert the user when the depth of water becomes SHALLOWER THAN the preset alarm. When this alarm is enacted, it will remain in memory in all other functions of the instrument, i.e. when using fish finder screens. It can also be set to OFF so that no alarm is programmed.

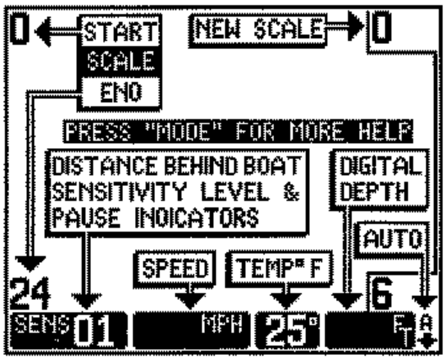
SPEED OF THE BOAT: Digital speed of the vessel is displayed on the Digital Screen. It receives its pulses from the rotation of the impeller blades. Speeds are greatly dependent upon the installation of the impeller. Minimum speed is rated at 1.0 MPH and maximum speed is rated to approximately 50 MPH. However, it is important to know that the instrument can read higher than 50 MPH, but it is unlikely since at high speeds the impeller blades can cavitate and stop rotating.

DISTANCE: This portion of the Digital Screen displays the distance travelled since power was applied to the instrument. It will read up to 999 miles, but zeroes out when power is turned off.press the arrow key labelled "Reset" to manually reset the distance log.

TEMPERATURE: Surface temperature gets a reading from a thermistor sensor located in the speed/temperature impeller. It is a good idea to clean this sensor in case any growth has occurred which could inhibit sensing the correct temperature. (It is approximately 1/4" round, metal). There is a temperature range bar which tracks temperature within a ten degree (10°) range over a ten minute period of time. This feature is helpful when looking for changes in surface temperature of the water.

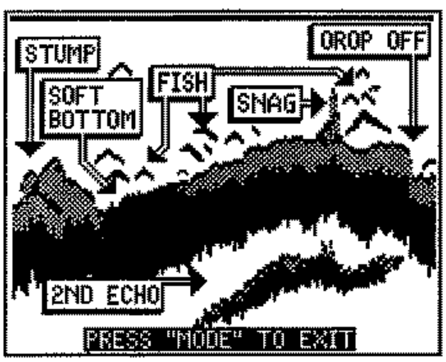
TEMPERATURE OVER TIME: This area is devoted to displaying the surface temperature over a ten minute period of time.

On occasion when the instrument is new and you want to familiarize yourself with some of the functions of the 2801, you may find it helpful to access the Fishing Help Screens. (The 2831 does not have these Fishing Help Screens due to limited memory space.) These screens are simply copies from the pages of this owner's manual and are meant to give reference to the functions of the instrument and not to actual real world conditions.



1. To access these screens, enter the Menu 1 screen and depress the bottom selection arrow labeled Menu 2 Options. Then press the third selection arrow key with the words Fishing Help screen.

2. The first screen displayed gives reference to the Fishing Screen and details the features of the screen. There is a flashing message that appears every second which instructs the user to 'PRESS MODE FOR MORE HELP.



The second screen that appears is an "example" of a typical fishing situation and the bottom contour. The words point to the type of bottom conditions, fish targets and how they may appear in the real fishing world, and types of topography.

Press MODE to exit this screen and you will notice that the instrument returns to the Fishing Screen.

A partial list of terms used in fish finding is presented herein.

BEAM ANGLE A transducer beam angle is shaped in an inverted cone (narrow at the top and larger at the bottom). Most of the energy from the instrument is reflected back to the transducer when it hits bottom. There are different beam angles for different purposes. Generally, narrow beam angles are used on digital depth sounders, medium beam angles for deeper depth, and wide angles tor tish finding applications where there is a need to look at a larger area below the boat.

EL LIGHT Electro Luminescent panel that backlights the display

GAIN (SENSITIVITY) Gain is another name tor sensitivity control.. The deeper the water, the more gain you will require.

PIXELS The individual dots on the LCD screen. The more dots, the better picture quality and resolution of targets.

RANGE The total depth capability, depending on bottom conditions. Maximum depth tends to decrease as the bottom becomes sotter.

SUPERTWIST LCD Liquid Crystal Display. An liquid organic compound between two layers ot glass with polarizing abilities. The display screen ot the 2801 is a LCD with Supertwist crystals. The molecules internal to the display are twisted so that they provide you with a high contrast levels and better viewing angles.

TARGET An object shown on the screen. When this term is used, it generally is reterring to a tish or a school of tish.

THROUGH HULL FITTINGS Plastic through hull speed impellers (or depth transducers) should be mounted in tiberglass and metal hulls only. Plastic should never be used in wooden hulls as the swelling ot wood may over-stress the plastic housing. Do not use bronze housings in aluminum hulls since electrolytic corrosion will occur.

TRANSDUCER All depth sounders emit ultrasonic sound signals that travel through water looking for a strong return echo (impulse). Inside the transducer is a crystal element that transmits as well as receives these pulses. The unit calculates the emount of time for the signal to travel to the bottom and return back to the transducer. It then converts this time into depth and displays it on the screen.

TRANSDUCER FREQUENCY The rate at which the sonar vibrates. It is critical to installation that the frequency of the transducer and the trequency of the instrument be the same. Sonar instruments are designed to operate on a trequency which can provide different results such as shallow or deep water performance, etc. It is best not to have two ot the same trequency transducers on the same vessel, unless you plan in advance tor this type ot installation with a Switch Box so that you can switch trom one beam angle to the other.

ZOOM The ability of the 2801 to expand a section ot the screen to enhance and enlarge target definition.

TROUBLE SHOOTING: GENERAL OPERATION

1. **SYMPTOM:** Unit does not turn on at all. No beep, no display.
   CHECK: Make sure the unit is actually receiving power. Check the In-line fuse, and the circuit breaker panel on the boat. Make certain the unit is receiving 11 to 16 volts of CLEAN DC. Make sure the DC polarity has not been reversed. Check for corrosion on the power connector, and clean if necessary. Sometimes gently spreading the two pins on the male power connector with a small knife will help make a better contact.
2. **SYMPTOM:** Unit Beeps, but no display
   CHECK: Check the contrast control on the back of the unit; or disconnect the 4 Pin speed/temperature connector from the back of the instrument. If the display returns, replace the speed/temperature impeller.
3. **SYMPTOM:** Unit always operates in Simulator Mode, fishing image repeats over and over again regardless of the boat's movement.
   CHECK: After turning the unit on, do not press the Mode control until after hearing the "Beep Beep".

TROUBLE SHOOTING: FISH FINDER

1. **SYMPTOM:** Fish finder screen not showing the bottom, fish, due to a blank screen.
   CHECK: With the engine(s) shut down, locate the boat in water between 10 feet and 30 feet deep. Check the contrast level of the LCD display to make sure it is not turned down too low. Check the GAIN and TVG settings by using the Gain keys and noting the setting which appears in the lower left-hand corner of the display. Make sure the Gain is not turned too low. We recommend a gain setting of 15-18 for this test. Rev the engine(s) to cruising RPM to see if the screen continues to operate properly. Look for "black snow" on the screen. This would indicate that noise from the engine(s) is getting into the system.

2. **SYMPTOM:** Under way at high speeds, fish finder screen does not show bottom or fish.
   CHECK: Stop the boat to see if the screen picture quality appears and the bottom reading shows clearly on the screen.

   Suggested solution is to relocate the transducer to achieve a clean smooth flow of water over face of transducer. Please see Pages 10-14 for depth sounder installation guidelines.

3. **SYMPTOM:** Fish finder screen quality is very poor and does not always show the bottom.
   CHECK: Check the frequency of the transducer to make sure that it matches the frequency of your Instrument. The 2801 is 120 KHz. Check the mylar tag located approximately 12" from the connector end of the transducer cable to make sure that it is 120 KHz as well. IMPULSE transducer part numbers begin with the prefix "650"-XXXX and IMPULSE speed/temperature impellers begin with the prefix "653"-XXXX. In the back of this manual is a listing of spare and replacement parts.

4. **SYMPTOM**: Surface Clutter appears at the top of the screen when using the fish finder.

CHECK: If there is not enough sensitivity, using the TVG adjustment on the back of the unit perform the following procedure.

- Take the boat to a shallow area of water. (We suggest 4-6 feet deep.)
- Set the gain by using the front panel control to a gain setting of 15 and the Range to 0-6 feet. Set Fish ID to OFF
- Turn the control on the back of the unit COUNTER CLOCKWISE in slight increments until you get a solid bottom reading on the DIGITAL readout located in the lower right-hand corner of the graphic display, without any black bands between the transmission pulse and the bottom.
- Double check the DIGITAL screen to ensure that this reading is steady and consistent at the correct depth

It should not be necessary to use the TVG adjustment again unless your boating location changes or unusual circumstances occur.

NOTE: Do not try to adjust out the straight band located at the top of the display. This band is the transmitter pulse and you can expect that it will represent an area equal to approximately 3 feet.

5. **SYMPTOM**: Digital depth in lower right corner jumps around but fish finder update informetion looks OK.

CHECK: Refer to the above solution and resolve problem in same manner.

6. **SYMPTOM**: Screen turns black above a given speed or gives lots of false fish echos..

CHECK:
A. Take boat into 10 to 30 feet of water
B. Set Front Gain Control to 16
C. Turn Fish ID off
D. Set range appropriately (0-24 or 0-48)
E. In neutral, Rev engine(s) to cruising RPM to see if the black speckle or "snow" occurs
F. Suppress the source of noise (see Alternator Interference.)

7. **SYMPTOM:** 98 Reading on Temperature.

CHECK: Unplug the 4 pin Conncector from the back of the unit. If the temperature drops to 25 then the set is ok and the Speed/Temp Sensor Assembly needs to be replaceed.

ISOLATING ON-BOARD INTERFERENCE

On-board interference is caused by other electrical devices located on your boat. To reduce the effects of these other sources of RFI, you will first need to isolate the source.

- First, turn off all possible sources of interference (see list of INTERFERENCE SOURCES, below), including your boet's engine.
- Then, turn on your IMPULSE. Allow the unit a few minutes to settle. Observe the behavior of the unit.
- Turn the unit off again, and then start your boat's engine. Tum the IMPULSE back on, again wait a few minutes for the unit to settle. Next, tum on each suspect piece of equipment, one at a time, and watch for any clutter on the screen. If you have a noticeable amount, repeat a few times with each piece of equipment to meke sure it's actually caused by the equipment you just tumed on. If the clutter appears again, you will probably need to teke corrective steps of action with the equipment in question. Sometimes this will involve shielding or properly grounding an instrument, or by consulting the manufacturer of the offending equipment.

TYPES OF INTERFERENCE:

ALTERNATORS

The most likely source of interference and perhaps the most common on-board source of RFI is the altemator used for charging the battery. This interference is readily controlled by installing en appropriete filter at the output of each alternetor. A proper filter in the POSITIVE LEAD between the BATTERY and the ALTERNATOR will usually solve this interference. **NOTE**: NEVER FILTER THE FIELD LEAD AS THIS WILL PROBABLY DAMAGE THE ALTERNATOR.

- Suggested solution is to order Altemator Filter from MAR LINE.
  Phone (213) 595-6521 in U.S.A.

FLUORESCENT LIGHTS

Small 12 volt DC fluorescent lights produce both conducted end radiated RFI. If you need these lights while operating your unit, install a filter in the powerline to each unit. If interference is radiated, you may need to RF shield each lamp.

TV SETS

All TV-type devices, i.e., TV's, computer and video displays, produce a great amount of RFI. This is conducted out of the set's power wiring and is radiated by the magnetic components of the set's beam deflection and high voltage circuits. A prectical means of controlling this radiation - without a totally shielded enclosure - is not evailable. Separate the two instruments as far as possible from each other. We suggest that the offending device be tumed OFF.

LESS COMMON SOURCES OF RFI

This group of possible interfering sources may or may not cause a problem. Every boat is different. A DC power filter installed at the source will usually take care of the problem. Select a powerline filter with a current rating capable of handling each device for each offending accessory.

DC MOTORS

Motors such as those used in pumps, windshield wipers, and refrigerators may also cause interference.

DIGITAL INSTRUMENTS

Instruments with microprocessors, such as depth sounders, speedometers, tachometers, etc., use switching circuits that may cause interference.

CONVENTIONAL GASOLINE ENGINES
Conventional gas engines can generate interference from the ignition wiring system, coils, plugs, electronic ignition (CD type). By following the manufacturer's suppression recommendations, these sources can usually be reduced and/or eliminated.

POWER INVERTERS
Power inverters used in radars, strobe lights, and various types of electronic equipment can cause RFI interference.

LORAN RECEIVER ISOLATION
Noise filters act to reduce noise from various sources, however, it sometimes cannot be totally eliminated. Reduce this residual noise by providing RF Isolation in both sides of the units DC powerline, install a powerline conditioner.

CARE AND MAINTENANCE

- Never spray directly with a hose or otherwise submerge your unit.
- Never use harsh cleaners or solvents (gasoline, window cleaner etc.) to clean your instrument or the transducer or paddle wheel.
- Do not use Locktite® on any plastic parts like the Speed Impeller or the transducer since it will disintegrate the material and destroy the plastic. This kind of damage is not covered under warranty.

SPECIFICATIONS: FISH FINDER FEATURES

Depth Ranges		Minimum Range	Maximum Range
Feet:	45° beam	0-6 feet	0-480 feet
	20° beam	0-6 feet	0-960 feet
Alarms:	Shallow Water, Fish		
Transducer Frequency:	120 KHz		
Transducer Beam Angle:	Standard beam is 45 degrees Optional beam is 20 degrees		
Transmit Power:	600 Watts Peak to Peak 70 Watts RMS		
Power Requirements:	11.5 - 16 volts DC, Draws .30 amps Max		
Speed:	Standard is Miles Per Hour		
Speed Range:	Instrument: 1.0 MPH to 80 MPH impeller: 1.0 MPH to 50 MPH *Manufacturer's specification rates impeller accuracy at +/-3%		
Trip Log:	0-999 Miles, resettable Resets to 0 when power turned off.		
Pixel Resolution:	160 X 128 pixels		
LCD Window Size:	4" Wide x 3-1/4" High		
Physical Dimensions of the 2801:	6-1/2 Wide x 5-1/8" High x 2-3/4" Deep (without mounting bracket/knobs - allow 2" for connectors)		
Physical Dimensions of the 2831:	6-1/2 Wide x 5-1/8" High x 3-7/8" Deep (without mounting bracket/knobs - allow 2" for connectors))		

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

SPARE PARTS LIST:

• Gimbal Mounting Bracket	950-028	
• Knobs - Side Thumbscrew type (each)	410-014	
Rubber Washer	208-006	
Nylon Washer	209-002	
• Power Cord with 1 amp fuse	719-044	
• 360° Swivel Mounting Bracket	950-012	(option)
• 2 Pin Female Connector (Power)	703-021	
• 3 Pin Female Connector (Transducer)	703-002	
• 4 Pin Female Connector (Speed/Temperature)	703-007	
• Stainless Steel Kick Up Bracket	652-013	(option)
• Clip On Bracket for Speed/Temperature	652-015	(option)
• Replacement Clips for Transom Impellers	652-022	
• Switch Box - 2 Units to 1 Transducer	652-024	(option)
• Switch Box - 1 Unit to 2 Transducers	652-023	(option)

REPLACEMENT TRANSDUCERS FOR FISH FINDER - 120 KHz

• Transom Mount 45° Beam Angle	650-3303
• Transom Mount 20° Beam Angle	650-3403
• Low Profile NYLON 45° Beam Angle	650-5003
• Low Profile NYLON 20° Beam Angle	650-5103
• Low Profile BRONZE 45° Beam Angle	650-5203
• Low Profile BRONZE 20° Beam Angle	650-5303
• Inside the Hull 20° Beam Angle	650-3703
• Tri-ducer, Bronze 20° Beam Angle	653-1008
• Power Boat Bronze 45° Beam Angle	650-3903
• Power Boat Bronze 20° Beam Angle	650-4003

REPLACEMENT SPEED/TEMPERATURE IMPELLERS

• Transom Mount, (Clips On to 650-3303, 650-3403)	653-0704
• Transom Mount, HIGH SPEED BRONZE	653-0904
• Low Profile NYLON	653-1104
• Low Profile BRONZE	653-1204

TRANSDUCER EXTENSIONS AND IMPELLER EXTENSIONS
(Transducer and Speed Impeller options are available at *additional charge*)

TRANSDUCER	SPEED/TEMPERATURE
10'.....P/N 720-001	10'.....P/N 720-005
20'.....P/N 720-002	20'.....P/N 720-006
30'.....P/N 720-003	30'.....P/N 720-007

Note: We do not recommend the cable be extended to more than a total of 50 feet. (accessories are supplied with approximately 20' cable purchasing and additional 30' extension equals 50' total cable length.)

WARRANTOR: Impulse Manufacturing, Inc. ("Impulse")

ELEMENTS OF WARRANTY: Impulse warrants, to the original retail purchaser, for a period of one (1) year from the date of purchase or within eighteen (18) months from the end of the month in which the product was shipped from Impulse, Impulse products (hereinafter referred to es the Product) to be free from defects in material and workmanship with only the limitations or exclusions set out below.

WARRANTY DURATION: This werranty shall terminate end be of no further effect one (1) year from the date of purchase or eighteen (18) months from the end of the month in which the product was shipped from Impulse, or at the time the product is (a) damaged or abused, (b) not maintained as reasonable or necessary, (c) modified by unauthorized personnel, (d) improperly programmed, (e) repaired by someone other than warrantor for a defect or malfunction covered by this warranty, or (f) used in e manner or environmental condition for which the product was not intended.

STATEMENT OF REMEDY: In the event that the Product does not conform to this warranty at any time while this warranty is in effect, warrantor will repair or recondition the defect and return it to you without charge for parts, service, or any other cost incurred by the warrantor in connection with the performance of this warranty. Any Costs Incurred with transducer or impeller replacement other than the cost of the transducer or impeller, itself, is specifically excluded from this warranty. THE ONE (1) YEAR LIMITED WARRANTY SET FORTH ABOVE IS SOLE AND EXCLUSIVE WARRANTY PERTAINING TO THE PRODUCT AND IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES OF ANY NATURE WHATSOEVER, WHETHER EXPRESS, IMPLIED OR ARISING BY OPERATION OF LAW, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY DOES NOT COVER OR PROVIDE FOR THE REIMBURSEMENT OR PAYMENT OF INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow this exclusion or limitation on incidental or consequential damages, so the above limitation or exclusion may not apply to you.

WARRANTY REGISTRATION CARD: In order to facilitate the servicing of this warranty by warrantor, the Warranty Registration Card should be returned by the Warrantor. However, return of the Warranty Registration Card is not a precondition of this Warranty, and this Warranty will be observed by the Warrantor whether or not the Warranty Registration Card is returned, provided thet other satisfactory evidence of the date of purchase is provided.

LEGAL REMEDIES: This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. This warranty is void outside of the United States of America.

IMPULSE CUSTOMER SERVICE CENTER: If you are certain that the Product is defective, pack the Product carefully (preferably in its original packaging) and include a note describing the specific defect that has caused you to return it. For your protection, it is advisable to insure the parcel against loss or damege. The Product (with evidence of original purchase) should be shipped or delivered (by UPS or insured parcel post), freight prepaid, to warrantor at:

IMPULSE MANUFACTURING, INC.
695 RAILROAD AVENUE
PITTSBURG CA 94565 U.S.A.
Telephone: (510) 439-2072
(8:00 a.m. to 5:00 p.m. PST - Monday through Friday)

IMPULSE, for a Flat Rate Fee, will repair and/or recondition the instrument to its original operational standards. Upon completion of repair, IMPULSE offers its original Limited Warranty to the instrument for a period of 90 days after the date of repair.

Services performed by IMPULSE for instruments Out of Warranty will be charged at a Fixed Rate established at the beginning of each calendar year.

- The Flat Rate Charge for 1992 for the Impulse 2801 is $69.00 which will be charged for each repair incident occurring in the year.
- The Flat Rate Charge for 1992 for the Impulse 2831/3001 is $89.00 which will be charged for each repair incident occurring in the year.

The Flat Rate Charges are subject to change without prior wriften notice.

The following items are specifically excluded from the Flat Rate Charge and the owner shall be responsible for any additional charges for the repair or replacement of the following items:

1. Replacement of the Liquid Crystal Display (LCD).

2. Cases, front panels, knobs, brackets, and hardware associated with the assembly of the instrument.

3. Transducers, impellers, couplers, and power cords.

This program does not cover defects or damages caused by unauthorized service, nor damages through accident, misuse, or abuse. The owner is responsible to provide reasonable and necessary maintenance in accordance with instructions provided in this Owner's Manual and to use common sense regarding storage in extreme weather conditions.

Software Updates for the Product may be available in the future at a nominal rate.

For your protection, it is advisable to insure the parcel against loss or damage.The product is returned "freight prepaid" to the following address:

IMPULSE TECHNOLOGY
695 Railroad Avenue
Pittsburg CA 94565 USA

PHONE: 510-439-2072, Main Number

FAX: 510-427-1920, Main Office

Checking on Status of Returns
Phone: 510-427-2570 or 510-427-2580

OWNER'S NOTES AND COMMENTS:

Date:	Location	Comments

PLEASE NOTE:

Do *NOT* send in the Warranty Card below if you have purchased a <u>Model 3001</u> or a <u>Model 2831</u>.

If you have purchased a <u>Model 3001</u> or a <u>Model 2831</u>, please return the orange Warranty Card enclosed in your Model 3001/2831 Owner's Manual to initiate your warranty.

Use the yellow Warranty Card below only if your have purchased a <u>Model 2801</u> Fish Finder.

WARRANTY REGISTRATION CARD

To validate warranty, fill out card and return to IMPULSE within 10 days of purchase.

Model ______________________ Date Purchased ________________
Serial No. ____
Name ____
Street ____
City ____________________ State ________ Zip ______________
Phone Number ______________________

Dealer's Name ____
Address ____
City ____________________ State ________ Zip ______________
Phone Number ______________________

The Post Office will not deliver mail without postage.

IMPULSE TECHNOLOGY
Impulse Factory Service Facility
695 Railroad Avenue
Pittsburg, CA 94565

Impulse Technology

Corporate Offices:
329 Railroad Avenue
Pittsburg CA 94565
Telephone: 510-439-2072
Facsimile: 510-427-1920

Service and Manufacturing Facility:
695 Railroad Avenue
Pittsburg CA 94565
Facsimile: 510-427-4459

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