

SITEX

MODEL HE-708

COLOR VIDEO SOUNDER

**INSTALLATION · OPERATION
MANUAL**

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GENERAL INFORMATION

The color sounder (Figure 1) is a compact video unit that uses microprocessor-based electronics to measure the depth of underwater objects. The sounder will determine water depth, bottom conditions and the location of intervening objects, such as fish, and will display this information on a 6-inch, color CRT (Cathode Ray Tube). Five sets of color configurations are available for operator selection. Each configuration contains seven color levels. Strong echoes from the bottom will produce red (level one) recorded images; intermediate echoes will produce varying colored images (red, yellow, green, purple, white or light blue) depending on the strength of the returning signal and the choice of color configuration. The background color can be either blue or black (level seven). The sounder also contains a clean echo function that reduces electrical interference from other depth recorders operating in the same general area, and an alarm that can be preset to sound when approaching shallow water.

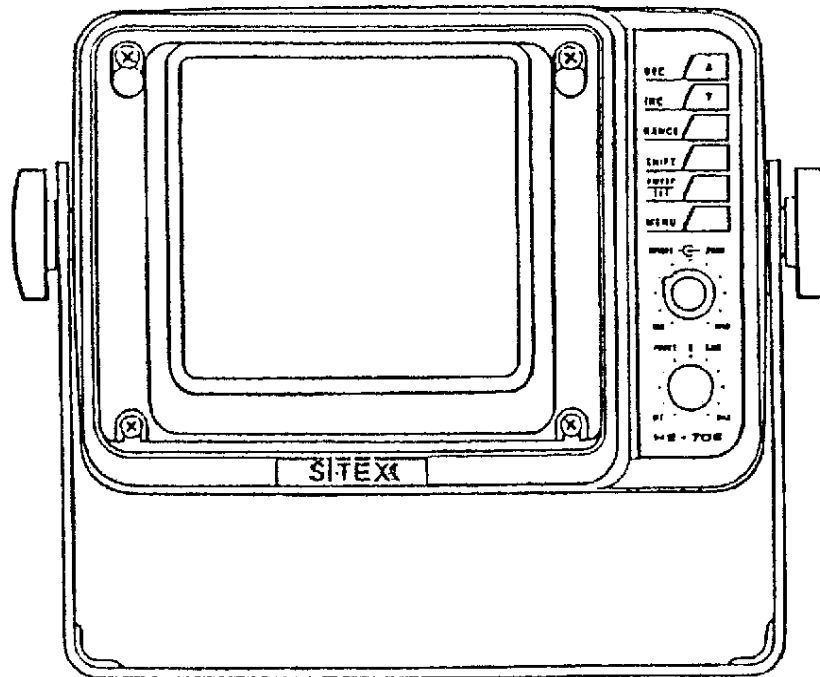


Figure 1. HE708 Sounder

FUNCTIONAL DESCRIPTION OF THE SOUNDER

The basic functions of the color sounder are illustrated in Figure 2.

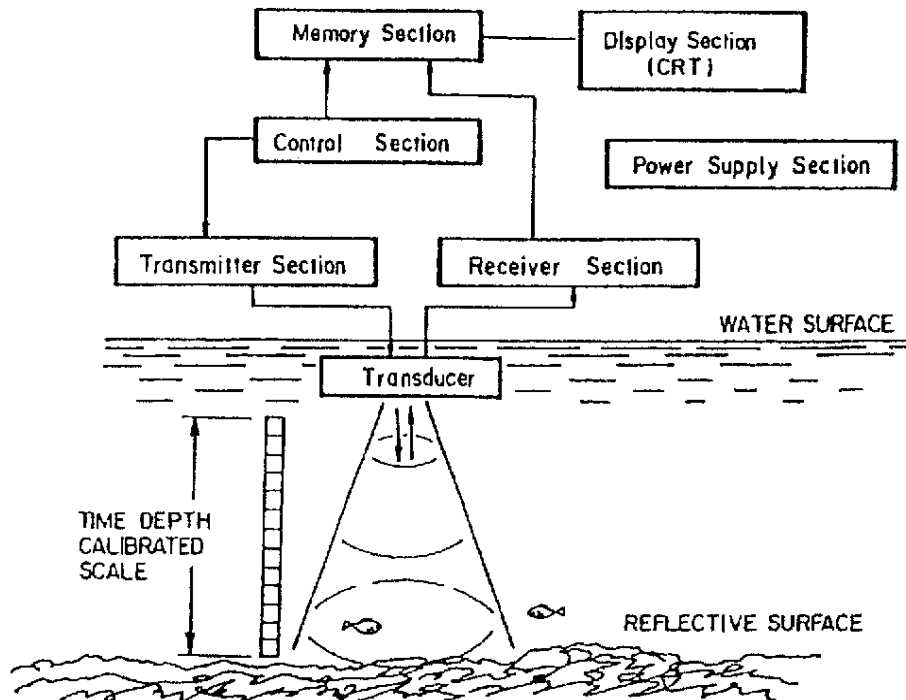


Figure 2. Functions of the Sounder

The control section initiates function commands for both the transmitter and memory sections. Ultrasonic sound waves generated by the transmitter section are converted from electrical energy to mechanical energy by the transducer. This mechanical energy, in the form of ultrasonic vibrations, is radiated into the water in a cone-shaped pattern. At the instant of transmission, the receiver section marks a transmission line at the top of the screen. At the same time the control section begins to measure the time interval between transmission and the return of each echo. Echoes from the bottom are reflected back to the transducer and are converted from mechanical energy back to electrical energy. Each echo returned to the transducer is amplified in the receiver section, then transferred to the memory section where its depth location is marked on the screen. Echoes from close objects arrive in the transducer in a shorter period of time than do echoes from deeper objects. A calibrated scale is provided to reference depth of recorded marks.

EXAMPLE: The speed at which sound waves travel through water is approximately 4800 feet per second; therefore, a time interval measurement of one second (from time of transmission until return of an echo) will be recorded on the video screen as 2400 feet in depth. This is equivalent to a round-trip distance of 4800 feet; that is, 2400 feet down to the object (fish or bottom) and 2400 feet back from the object.

NOTE: This is an example. This unit is not designed to record depths of 2400 feet.

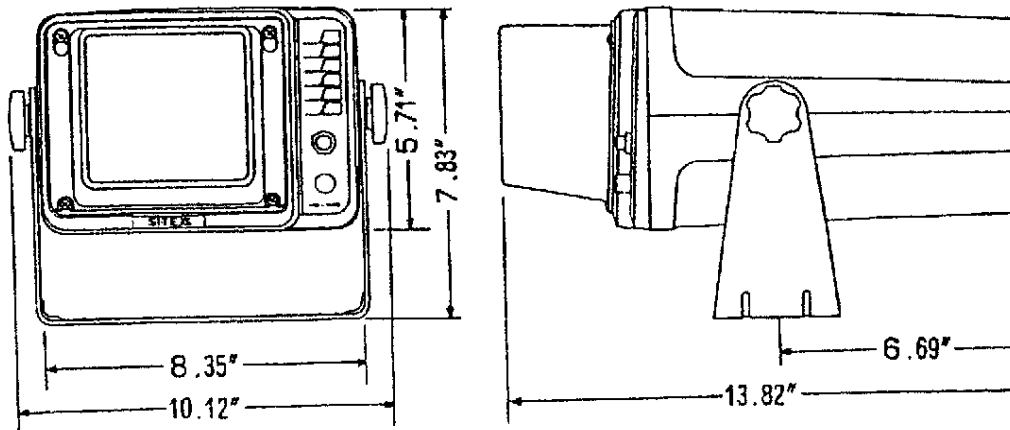
Ultrasonic pulses are transmitted from the transducer into the water. (The speed at which sound travels through water is approximately 4800 feet per second.) These pulses are recorded on the video screen as the transmission line and establish the zero depth (which is actually the location of the transducer under the boat).

The recorded image is a product of many echoes returned from the bottom or from intermediate objects. A single echo will not produce a completely recorded image, of fish or any other object; a single echo will produce only a single mark on the screen. Accumulated echoes for the same object will be recorded in a variety of shapes, depending on the strength of the echo, the depth of the object, and the angle of the transducer's beam. The movement of the boat through water and the movement of swimming fish will also have varying effects on recorded images. Soft-textures (a muddy bottom, seaweed, surface noise, air bubbles) will absorb some of the ultrasonic sound and will cause the reflected echo to be displayed in a variety of colors (levels three through six), depending on the strength of the returning signal and the choice of color configuration. Hard objects, however, (rock or gravel bottom) will be displayed in either red or yellow (levels one and two). Fish and schools of fish will produce color images ranging from level two through level six.

HE-708 SPECIFICATIONS CONT'D

Depth Indicator: ON
Surface Temperature Indicator/Graph: ON/OFF
Alarm: ON/OFF
Weight: 6.6 lbs. approx.
Dimensions: 5.71 inches (H) by 8.35 inches (W) by 13.82 inches (D)
Fuse: 2 AMP (3AG Type)

Specifications subject to change without notice.



INSTALLATION

SOUNDER INSTALLATION

Sounder Mounting For proper performance, the sounder's mounting location must be chosen carefully. The recommendations listed below are important and should be followed to obtain the best results.

1. Select a location that allows convenience in operating the unit and observing the CRT display. Provide adequate clearance for connecting and disconnecting the power and transducer cables.
2. Install sounder in a location that will provide protection from weather conditions (for example: direct spray or rain).

NOTE

Water damage voids warranty.

3. If unit is installed in an open boat, protect with some type of transparent plastic cover.
4. Route the transducer cable a minimum of 12 inches from all other electrical cables and equipment.
5. Route the power cable away from the transducer cable and, if possible, away from other electrical equipment that may radiate electrical interference (noise).
6. Provide a separation of at least two feet between the sounder and the boat's compass. Magnetic fields and other radiated interference may adversely affect compass readings.
7. Operate the sounder for a brief period before finalizing mounting location. Observe any interference interaction that may occur between the sounder and all other equipment.

After suitable location has been selected, mount the sounder using the following instructions:

1. Remove sounder unit from mounting bracket by unscrewing the two clamping knobs. (See Figure 3.)
2. Position bracket in mounting area and mark location of mounting holes.

3. Install the universal mounting bracket using the mounting screws provided. Tighten all screws securely.
4. Install the sounder back onto the mounting bracket using the two clamping knobs. Tighten clamping knobs securely.

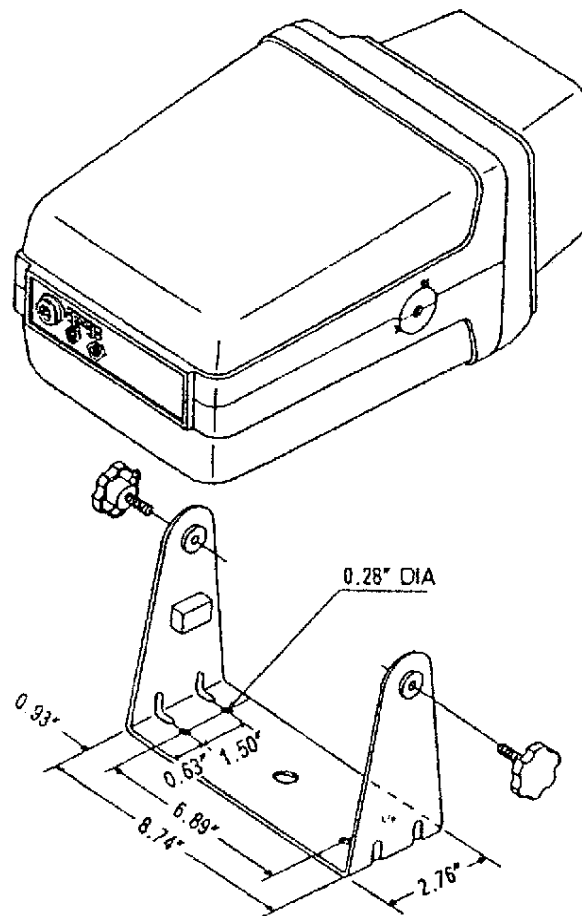


Figure 3. Sounder Mounting Bracket Installation

POWER CONNECTION

Check the voltage and polarity of the battery before connecting the sounder. Set the sounder's power switch to OFF by rotating the GAIN control counterclockwise. Connect the black wire to the negative (-) terminal; connect the red wire to the positive (+) terminal. Connect the plug of the power supply cable to the power supply socket located at the rear of the unit (see Figure 4).

To minimize extraneous electrical interference, the power cable should be connected directly to the battery's terminals. It should not be routed in parallel with, or within 12 inches of, the transducer cable.

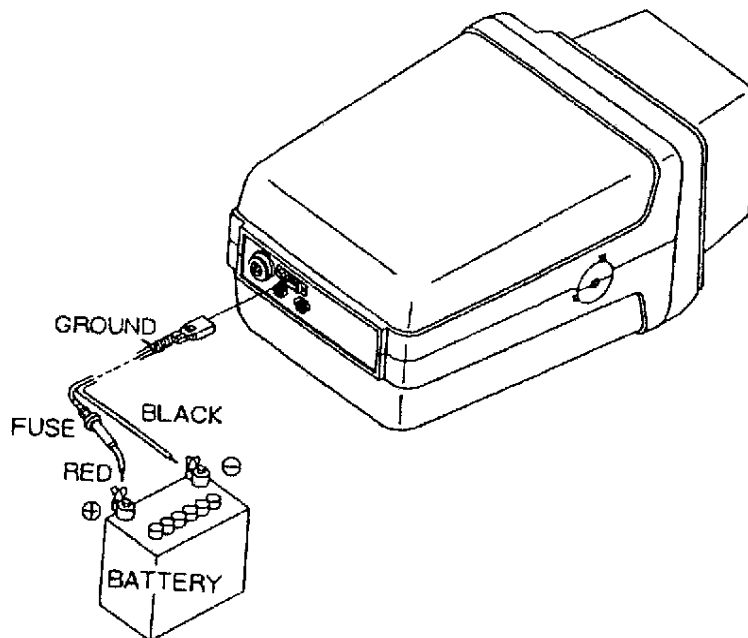


Figure 4. Power Connection/External Cabling

TEMPERATURE SENSOR CONNECTION

Set the sounder's power switch to OFF by rotating the GAIN control counterclockwise. Connect the plug of the temperature sensor cable to the temperature sensor jack located on the rear of the unit (see Figure 5).

To minimize electrical interference, the temperature sensor cable should not be routed in parallel with, or within 12 inches of, the transducer cable.

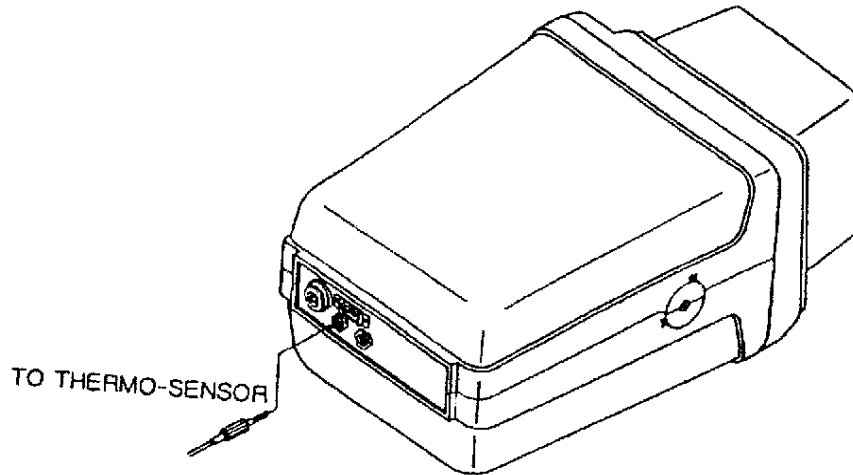


Figure 5. Temperature Sensor Connection

TRANSDUCER INSTALLATION

Transom Transducer Mounting For proper performance, the transducer's mounting location must be chosen carefully. The transducer should be mounted in a location that is free of white water; that is, free of turbulence and air bubbles created by movement of the boat as it travels through water. Air bubbles greatly reduce the efficiency of the transducer. To determine the best mounting location, operate the boat at several different speeds and observe the water as it passes under the transom. Study the turbulence created by the hull structure, the keel and the lifting strakes. Keep the transducer and its cable as far as possible from the boat's power cables, tachometer and other electrical cables.

After a suitable location has been found, mount the transducer using the following instructions:

1. Assemble the transducer in temporary form as shown in Figure 6.
 - a. If the dead rise angle is 10 degrees or less and the transducer is to be mounted flush with transom's bottom, locate the transducer as illustrated in Figure 7.
 - b. If the transducer is to be mounted parallel with the waterline, locate the transducer as illustrated in Figure 8.
2. Use a straightedge to align transducer with the bottom of the hull. Mark the location of mounting holes on the transom.
3. Drill four, 1/8" holes. Mount the brackets with the screws provided. Coat the screws with bedding compound to prevent leakage.
4. Position transducer as shown in Figure 9 and tighten nuts and screws.

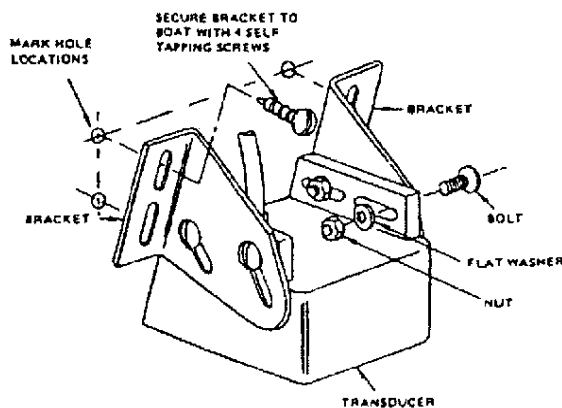


Figure 6. Transducer Installation

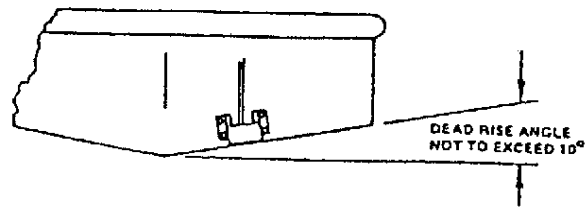


Figure 7. Transducer Mounting Flush with Transom Bottom

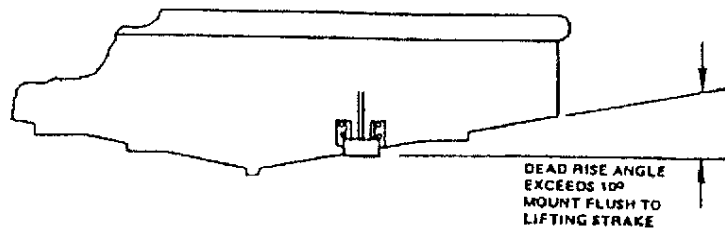


Figure 8. Transducer Mounting on Transom Parallel with Waterline

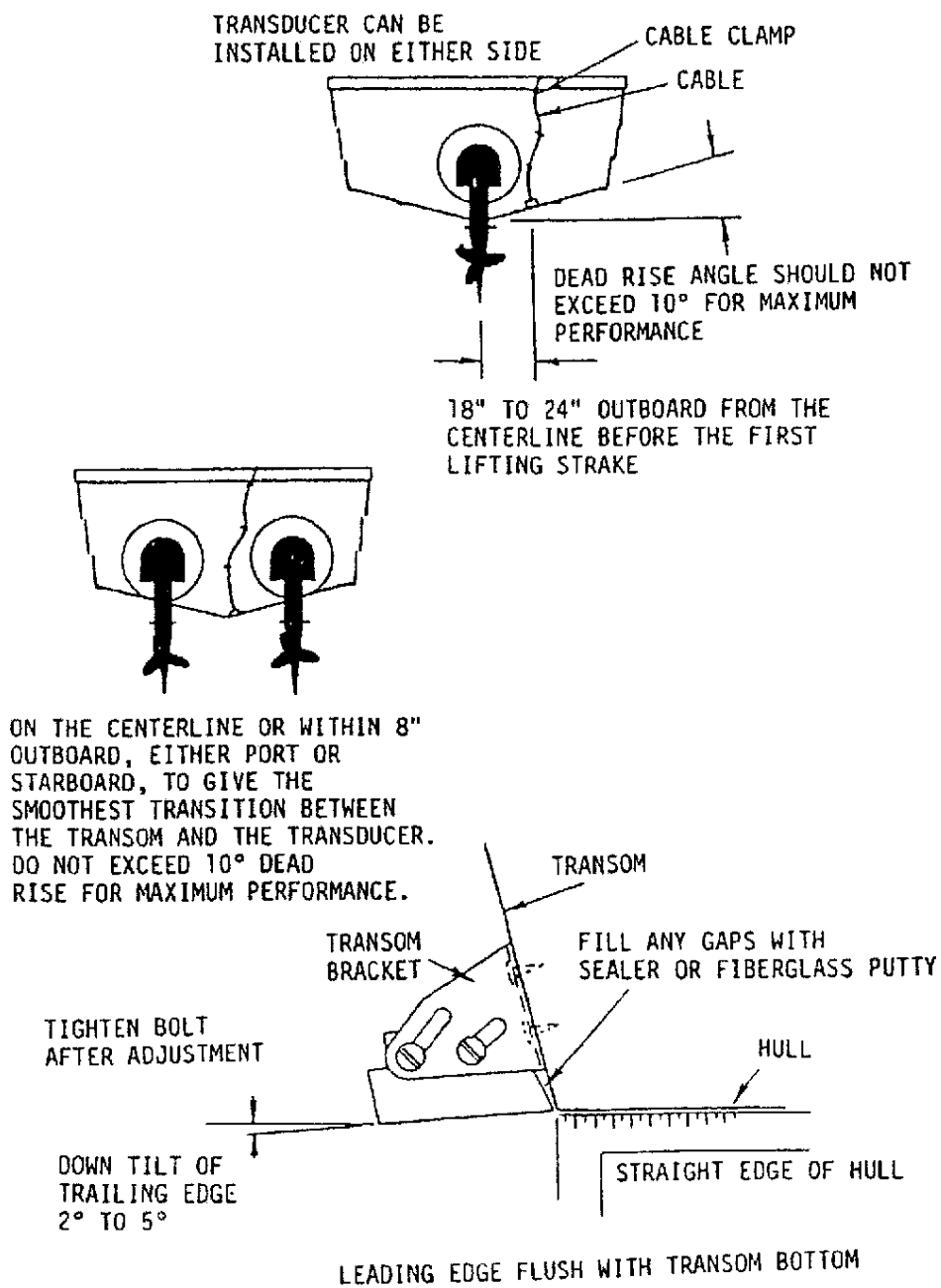


Figure 9. Transducer Mounting Locations

Inside-Hull Transducer Mounting The power and sensitivity of the unit will be reduced when using this method. However, good results can be obtained when mounting the transducer inside the hull. It is important to ensure that the transducer is placed in an area that has a single-hull thickness. This type of mounting works best on fiberglass and aluminum boats. 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, first wash the transducer's face with a mild detergent. Next, put some water in the bilge and position the transducer so that the face is flush and coupled with the hull. Run the boat at various speeds, moving the transducer to different areas 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's face with a mild detergent. Allow the hull and transducer to dry completely. Use a good fiberglass resin to bond the transducer's face to the hull (coat the transducer's face and hull with resin). Press the transducer firmly to the hull and gently twist back and forth to remove any air which may be trapped in the resin. Allow to dry per resin instructions.

Permanent installation is preferred because oily bilge water tends to make sounding through the hull more difficult. Also, the transducer could move around if it were not secured in place.

On fiberglass flotation hulls, Figure 10, the inner hull can be removed and a reservoir made for transducer placement. After the reservoir is made, check fish finder operation before securing the transducer.

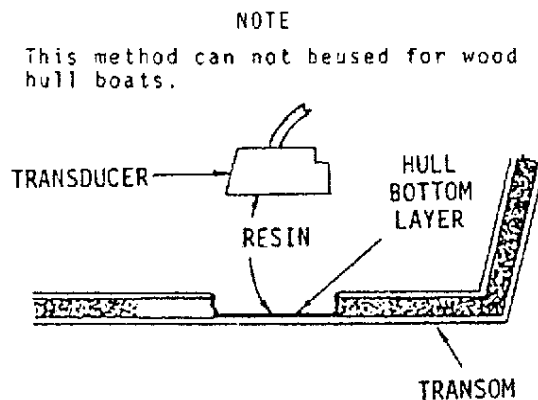


Figure 10. Inside-Hull Transducer Mounting

Through-Hull Transducer Mounting (Recommended for optimum performance.)

Install the transducer so that its working face will be parallel with the waterline when the vessel is in its normal upright position, and so that it will remain submerged when the vessel is heeled and underway. The pointed end of the transducer must point forward. Since air bubbles will greatly decrease the efficiency of the transducer and the sensitivity of the receiver, the mounting site should be located as far from air bubble streams as possible.

With through-hull installation (Figure 11), use fairing blocks, as required, to ensure that the transducer's face is parallel with the waterline.

Installation is accomplished using the following instructions:

1. Select a location in the aft section of the boat, approximately 1/3 to 1/2 the distance from the stern to the midsection. Allow 12 inches lateral offset from the keel.
2. Mount the transducer, as illustrated in Figure 11, with the pointed end forward.
3. If the hull is not level within 10 degrees in any direction, use fairing blocks (both inside and outside) between the transducer and the hull to ensure that the transducer's face is parallel with the waterline. (Refer to Figure 11.)
4. Measure mounting stem's diameter prior to drilling any holes in the hull or fairing blocks. Drill the hole properly sized so that excessive force is not required to install the stem. Oversized holes are not recommended.
5. After the drilling operation is completed, loosely assemble the transducer (and fairing blocks if used) against the hull. Check that the transducer's working face is level. Observe the relative position of each part for location during final installation.
6. During the final installation, clean each mounting surface, then apply sealing or bedding compound to the inside and outside mounting surfaces of the hull, the fairing block mounting surfaces and the top surface of the transducer. This procedure will maintain the watertight integrity of the hull.

NOTE

Follow the manufacturer's recommendations for use of sealing and bedding compounds.

7. Assemble the transducer and the fairing blocks to the hull. Tighten the mounting nut securely to prevent loosening from vibration and other outside forces. On boats with wooden hulls, allow normal wetting and swelling time before the mounting nut is tightened completely.

CAUTION

Do not overstress the threaded stem and mounting nut by excessive tightening.

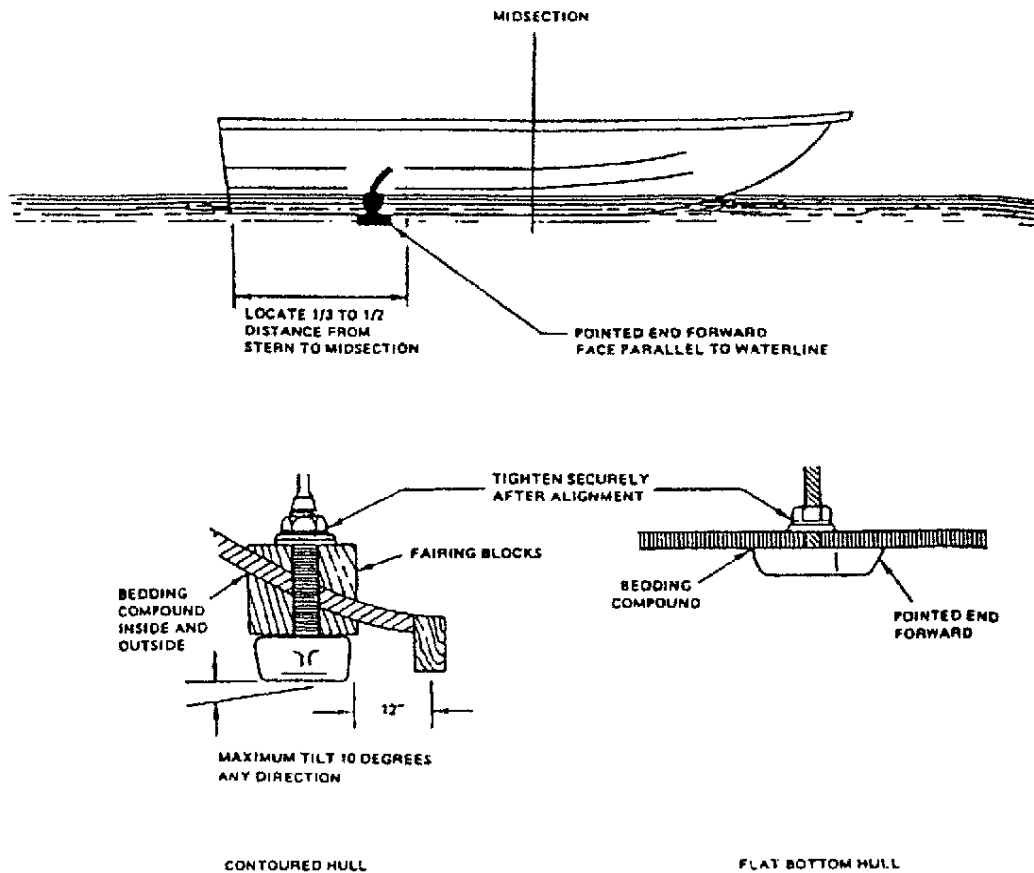


Figure 11. Through-Hull Transducer Mounting

TRANSDUCER CONNECTOR

The transducer's cable is a two-wire (Red and white), shielded cable. To replace or reconnect the transducer connector, first loosen the cable clamp screws and the plug-body securing screw of the connector. Slide the shell and lock washer, if applicable, onto the cable. Using a proper stripping tool, prepare the end of the cable as shown in Figure 12. Solder the Red lead of the cable to terminal No. 1. Solder the white lead to terminal No. 3 and the shield to terminal No. 2. The terminal identification numbers are indicated on the plug-body's face. Slide the shell back onto the plug body and secure, being careful not to twist the cable. Finally, tighten cable clamp screws.

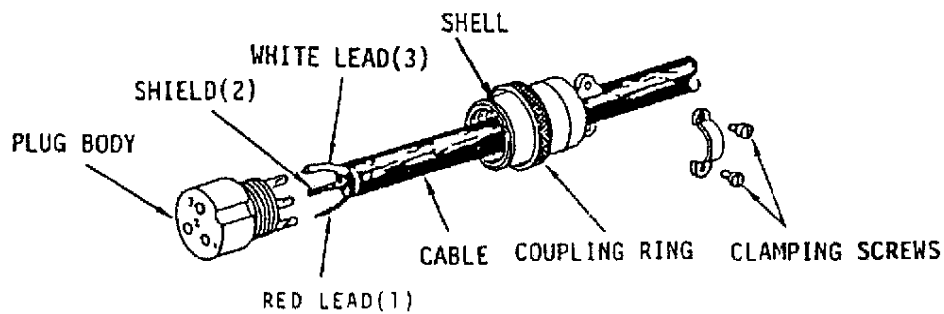


Figure 12. Transducer Connector Assembly

OPERATION

CONTROLS AND CRT DISPLAY

Controls for normal operation of the sounder are located on the right side of the unit's front panel. (See Figure 13.) These controls are:

- | | |
|-------------------|-------------|
| * POWER/GAIN | * SWEEP/SET |
| * BRIGHTNESS/ZOOM | * DEC |
| * RANGE | * INC |
| * SHIFT | * MENU |

The INC (Δ) and DEC (∇) keys are interconnected with a time delay of approximately 1 second. Either of these two keys must be pressed within 3 seconds after pressing the RANGE or SHIFT key in order to change to a new setting. Otherwise, the function is locked out. This is done to prevent accidental change of any preset operation. The INC (Δ) and DEC (∇) keys are also applicable as a variable range marker when pressing them individually.

NOTES

This product has a memory that will retain all control settings when power is turned off, except shift mode.

CAUTION

This unit has been factory calibrated for optimum performance. Internal adjustments should not be attempted by the operator.

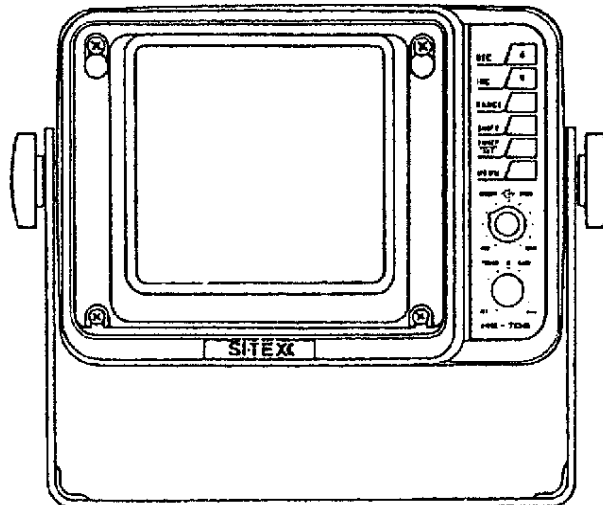


Figure 13. Front Panel Controls

Power/Gain Control This knob is both an on/off switch and gain control. Clockwise rotation turns the power ON and applies 12 volts to the unit.

NOTE

While the sounder is in operation, an excessive decrease of power supply voltage may cause erratic performance. In such a case, turn the power of the unit off, then, turn it on again.

The gain control adjusts the sensitivity of the unit. Clockwise rotation increases the sensitivity; counterclockwise rotation decreases the sensitivity.

Optimum setting for the gain control will vary, depending on such factors as water depth, local conditions and experience. To properly adjust the gain, set the range deep enough to allow room for display of a second bottom echo. Increase the gain setting until second bottom echo is visible. The range may now be reduced to display only the main bottom echo.

Fixed STC (Sensitivity Time Control) is internal to the receiver for eliminating surface noise. It requires no operator adjustment. STC is effective to about 60 feet. Weak echoes, small fish and other small objects may not be seen if the gain is not set properly. Also, intermediate color tones may appear as weaker echoes when the gain is set too low.

Brightness/Zoom These controls allow continuously variable settings (from minimum to maximum) for both the brightness and the zoom functions of the unit. The small center knob (see Figure 13) controls the zoom and provides for expansion (up to 50%) of the screen. The outer ring behind the zoom knob controls the brightness.

Range Depth range is selected by pressing the RANGE key (located on the upper right side of the sounder), then immediately pressing either the INC or DEC key.

NOTE

If more than a few seconds elapse between pressing either the RANGE key or the INC or DEC keys, the RANGE key must be pressed again to change depth.

Depth, in feet, is displayed in light blue numbers in the right of the CRT. Seven possible depth ranges are available:

0-10
0-20
0-40
0-80
0-150
0-300
0-600

Zero is the white transmission line (zero depth is actually the location of the transducer under the boat). Maximum range is 600 feet. Scale ranges are for presentation only. The actual depth capability of echo sounders depends on the transducer, the quality of the installation, type of bottom, salinity of water and other considerations.

Actual bottom depth is displayed (-999FT) in white numbers in the lower right hand corner of the CRT.

A white E will appear in place of a number when the sounder is not receiving a bottom echo signal.

A white 0 will appear when the bottom depth is over than 999FT.

Shift The shift provides a means to expand any selected depth scale. By shifting a shallow depth scale to a deeper depth, the depth images are enlarged. Shift can be either an automatic or a manual function. Choice of shift type is provided by the MENU. When the sounder is set for automatic shift, an A will be present on the screen. In this setting the depth for the selected range will shift continuously until a bottom reading is attained. The unit will then automatically track the bottom (except for depths less than 10 feet) thereby providing expansion the selected range.

Manual shift allows increase of a selected range for closer inspection of markings. To use, first press the SHIFT key, then the INC key (DEC is not possible when the top reading on the screen is zero).

NOTE

If more than a few seconds elapse between pressing either the SHIFT key or the INC or DEC keys, the SHIFT key must be pressed again to change depth.

With each press of the INC key, both the top and bottom readings on the display will shift by an equal amount. For example: with an initial setting of 0-20 feet, pressing the SHIFT key and then INC will increase the range limits by 5 feet; that is, from 0-5-10-15-20 to 5-10-15-20-25. With a 0-150 setting, however, pressing SHIFT and then INC will increase the top and bottom readouts by 50 feet (from 0-50-100-150 to 50-100-150-200). Each additional INC press will change the readouts by another 50 ft.

It is also possible to expand a portion of a depth range. For example:

Range setting is 0-80 feet, but a closer inspection of the 40-60 foot portion is desired. To expand, first decrease range to 0-20 feet. Next, press shift, then press and hold the INC key until the bottom readout of 60 ft. is attained.

When the AUTO-SHIFT operation is activated the unit automatically searches to find the bottom echoes. Once the bottom is detected, the bottom echoes are always shown in the lower half of the CRT screen.

Whenever the depth changes, the unit will automatically SHIFT to keep the bottom echoes in the lower half of the screen. AUTO-SHIFT may not always be effective when the bottom depth contour changes quickly. In this case, the unit may lose the bottom depth detection and begin to SHIFT again searching for the bottom echoes. Excessive surface noise may also interrupt the AUTO-SHIFT operation and in extreme cases it may not be usable. Return the setting to manual operation.

NOTE

It is most important to have a good clean transducer installation which is free of white water turbulence and surface noise caused by the hull of the boat, otherwise the AUTO-SHIFT operation will not perform properly.

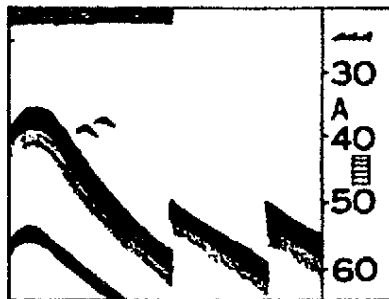


Figure 14. Example of AUTO-SHIFT Mode

Sweep/Set Sweep speed is indicated by little red arrows. The slowest speed is represented by one arrow; the fastest speed is represented by four arrows. Eliminating all arrows will "freeze" the display. To change the sweep speed, press the SWEEP/SET key and then either the DEC or INC button.

Decrease The DEC key decreases depth range, shift and the sweep setting. It also moves the flashing green marker on the MENU in the upward direction (as depicted by the arrow located above DEC on the key).

Increase The INC key increases depth range, shift and the sweep setting. It also moves the flashing green marker on the MENU in the downward direction (as depicted by the arrow located below INC on the key).

Menu Operation of the MENU key will freeze the picture on the CRT and will stop all other operations except menu selection. The MENU key provides a list of functions for operator selection. The list will replace the depth range readout and will be displayed just to the right of the CRT. Current settings will be marked by red asterisks. To make changes in the menu setting, press either the DEC or INC key to move the green cursor up or down. Place the cursor next to the item to be activated or changed. Press the SWEEP/SET key to enter the selected item. The appearance of a red asterisk indicates activation of the selection.

The functions available on the menu are described in Figure 14. To return the depth range readout, press the MENU key again.

A.S.	(Automatic Shift)
*M.S.	(Manual Shift)
*C.E.	(Clean Echo ON)
OFF	(Clean Echo OFF)
	Color Configurations See note below
1	(Red-Yellow-Green-White-Purple-light Blue-Blue)
2	(Red-Red-Yellow-Green-Purple-Light Blue-Blue)
3	(Red-Red-Yellow-Green-Light Blue-Blue-Blue)
4	(Red-Red-Yellow-Green-Purple-Light Blue - Black)
5	(Red-Red-Yellow-Green-Light Blue-Blue-Black)
C	(Surface Temperature & Graph in Degrees Centigrade)
F	(Surface Temperature & Graph in Degrees Fahrenheit)
*OFF	(Surface Temperature & Graph OFF)
S.L.	(Scale Line ON)
*OFF	(Scale Line OFF)
AL	(Alarm ON)
*OFF	(Alarm OFF)

Figure 15. Typical MENU Settings Upon Power Up

Note

Color configuration No.3 and No.5 are used to reduce the amount of weaker echoes shown on the screen when the water contains a lot of debris and air bubbles. These settings may reduce detection of small fish and bait fish at deeper depths.

Description of MENU

- A.S. (Automatic Shift) Shifts automatically until the bottom is displayed in lower portion of the screen.
- M.S. (Manual Shift) Shifts the range when operator presses SHIFT key, then either the DEC or INC key.
- C.E. (Clean Echo) Eliminates noise and interference from other sounders in order to produce a clear display.
- OFF Turns the clean echo off.
- Color Five sets are available.

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
Set 1	Red	Yellow	Green	White	Purple	Light Blue	Blue
Set 2	Red	Red	Yellow	Green	Purple	Light Blue	Blue
Set 3	Red	Red	Yellow	Green	Light Blue	Blue	Blue
Set 4	Red	Red	Yellow	Green	Purple	Light Blue	Black
Set 5	Red	Red	Yellow	Green	Light Blue	Blue	Black

- C Provides a surface temperature readout in degrees centigrade, plus a temperature graph. Temperature is the yellow number directly above the yellow C located just to the right of the display.
- F Provides a surface temperature readout in degrees Fahrenheit, plus a temperature graph. Temperature is the yellow number directly above the yellow F located just to the right of the display.
- OFF Turns off the surface temperature readout and the temperature graph.
- S.L. (Scale Lins) Turns on the scale lines.
- OFF Turns off the scale lines.

- AL (Alarm) (A) Press MENU. Use INC/DEC key to set flashing green marker to AL-on. Press SET key to turn Alarm on.
- (B) Set the alarm depth range using the arrow ◀ and Δ/▽ keys.
- Activates the alarm function. To set depth for the alarm, first press MENU to return to the depth range readouts. Select a range by pressing the RANGE key. Next, press and hold the INC key. A purple number will appear directly; depth will increase with continued pressing of the INC key. A yellow alarm marker, located beside the scale lines, will indicate alarm depth on the display.
- OFF Turns off the alarm.
The alarm depth readout will be changed from purple to green.

ZONE COVERAGE

Set the variable marker then zone is indicated for that depth. An approximate coverage (diameter) of the cone beam at an certain depth is shown in yellow digit on the upper right corner of the screen, under the alarm depth (purple) or variable range mark (green) indicator.

OPERATION OF THE SOUNDER

1. Before turning on the sounder, make the following checks:
 - a. Check all external cables for proper connection.
 - b. Check the power supply voltage. Be sure that the voltage and polarity are correct.
2. Turn the power switch ON by rotating the gain control clockwise.
3. Press the MENU key. The menu will be displayed to the right of the CRT with power up settings marked by asterisks.
4. Adjust power up settings to preferred functions. (See MENU setting description on page 22.)
5. Press MENU key again to return the depth range readout.
6. Select depth by pressing the RANGE key and then either the DEC or INC key.
7. Adjust the gain to produce a recording of a first echo from the seabed (or bottom) and a second echo. Strong echoes from the bottom will produce either red (level one) colored images. The second echo will not be displayed on the screen when the first echo is deeper than 1/2 of the selected range.
8. Set sweep speed by pressing the SWEEP/SET key and then either the DEC or INC key.

MAINTENANCE

TRANSDUCER MAINTENANCE

Clean the face of the transducer with a mild detergent or soap pad after installation and when unit becomes dirty from oily waters in a marina or from road grime accumulated during trailering. Oil and road grime act as insulators and will cause the face to become decoupled from the water or unwetted.

If the boat is to be left in salt water for long periods of time, paint the transducer with a thin coat of anti-fouling paint. 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.

INTERFERENCE SUPPRESSION

Interference of sufficient magnitude can cause erratic performance of the sounder and will possibly cause multiple returns and scattered markings on the display.

Check installation for interference by stopping the engine in medium-depth water and observing the sounder. Turn the sounder off and restart the engine. Once the engine is running, turn the sounder on and check for interference while increasing engine RPM.

If interference is present, use one or more of the following remedies:

1. Install a suppressor on the center lead of the distributor. Install a coaxial condenser between the ignition coil and the ignition switch.
2. Install coaxial condensers in the power leads.
3. Bond engine, electrical accessories, propeller shaft, and the rudder to each other and to the ground plate, if installed, with heavy copper grounding straps.
4. Use resistor-type spark plugs and/or copper screening on the inside of the engine compartment 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, XJ8, 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 coils radiate excessive noise and should be replaced with a standard metal-encased unit.

Older types of voltage regulators contain a vibrating set of contacts to control voltage. If the usual capacitors do not eliminate the noise, replace with a solid-state regulator which has no moving parts.

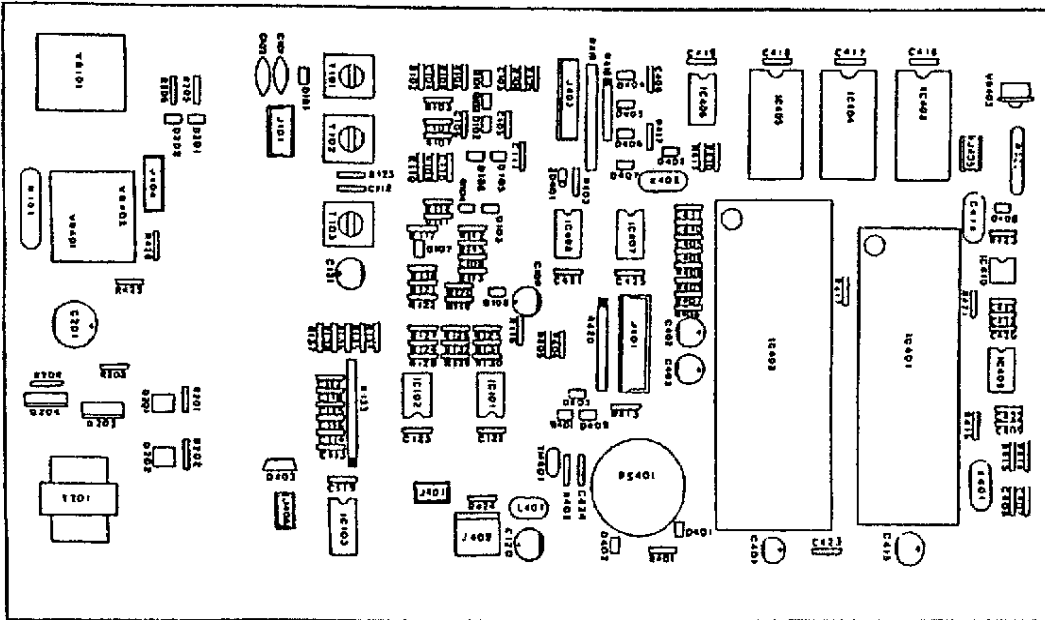
Some electrical tachometers cause considerable radiation of spark noise. This type of tach connects to the points of the distributor. Disconnect the tach wire at the distributor and note the noise reduction. This lead could be shielded, or a special tach filter installed. If SUN tachs are used, all wires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

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

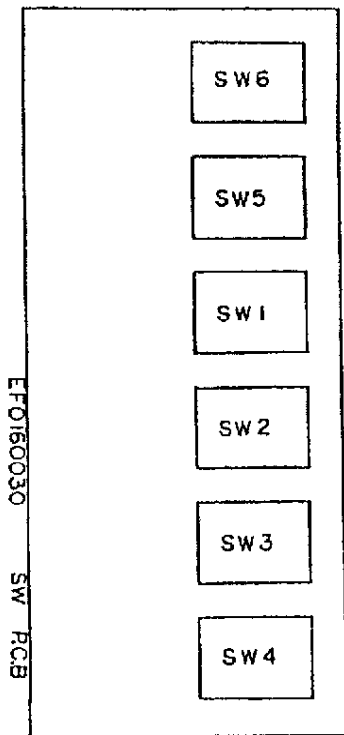
TROUBLESHOOTING CHART

<u>SYMPTOM</u>	<u>POSSIBLE CAUSE</u>
Unit turned on, but no display.	Check for power at 12 VDC connector at rear of unit. CRT (Cathode Ray Tube) or logic board problem 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 speeds. (An E will be displayed in lower right corner.)	Transducer is not in contact with water or too much white water is under the unit's face. Check or change transducer location. The signal emitted by the unit travels 4800 feet per second. If unit operates satisfactorily when boat is still, it will work satisfactorily at any speed provided the transducer is properly located. Gain control is set too low.
Unit works fine when boat's engine is off, but has scattered markings and other interference when engine is running.	Unit is picking up electrical interference from the boat's engine. Refer to section on engine interference.
E in lower right corner of the display.	Gain is set too low, or the transducer is not operating properly. Check transducer connector and cable. Bottom is not shown on the screen. Change the depth range or shift the depth until bottom is presented on the screen.
Unit turned on and has transmission mark, but no bottom return is displayed at any gain setting. (An E will be displayed in lower right corner.)	Transducer is not in contact with water. Transducer connector is not in place. Defective transducer or broken wire at connector. Gain is set too low.
Unit operation is normal, but alarm does not work.	Check manual for alarm operation instructions. Alarm buzzer defective.

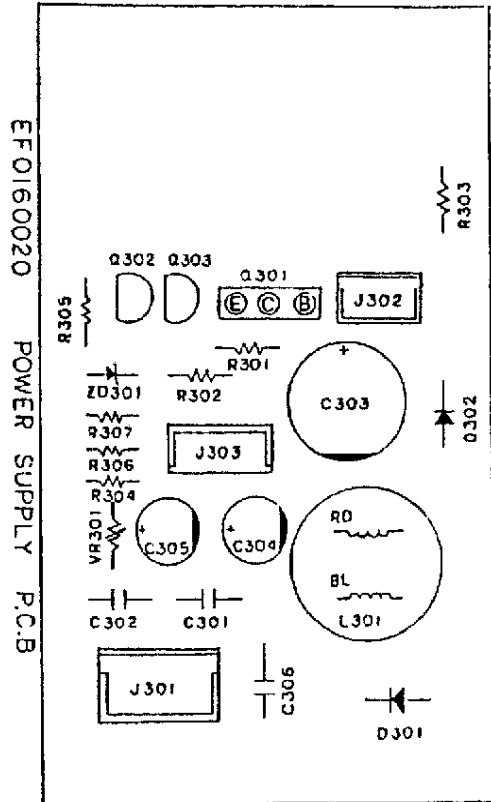
PCB LAYOUT



107 KHZ EFO160010 MAIN PCB

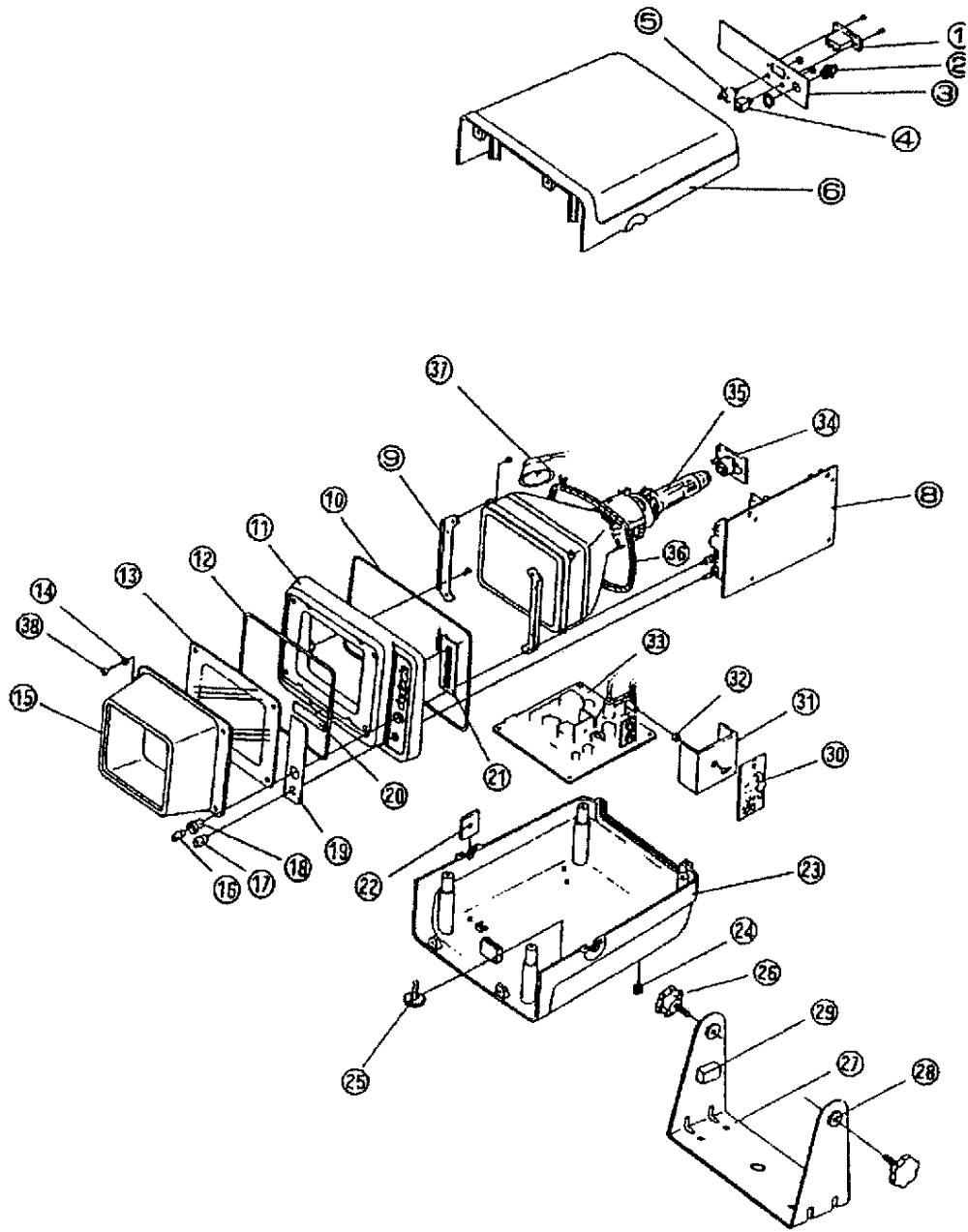


EFO160030 SW PCB



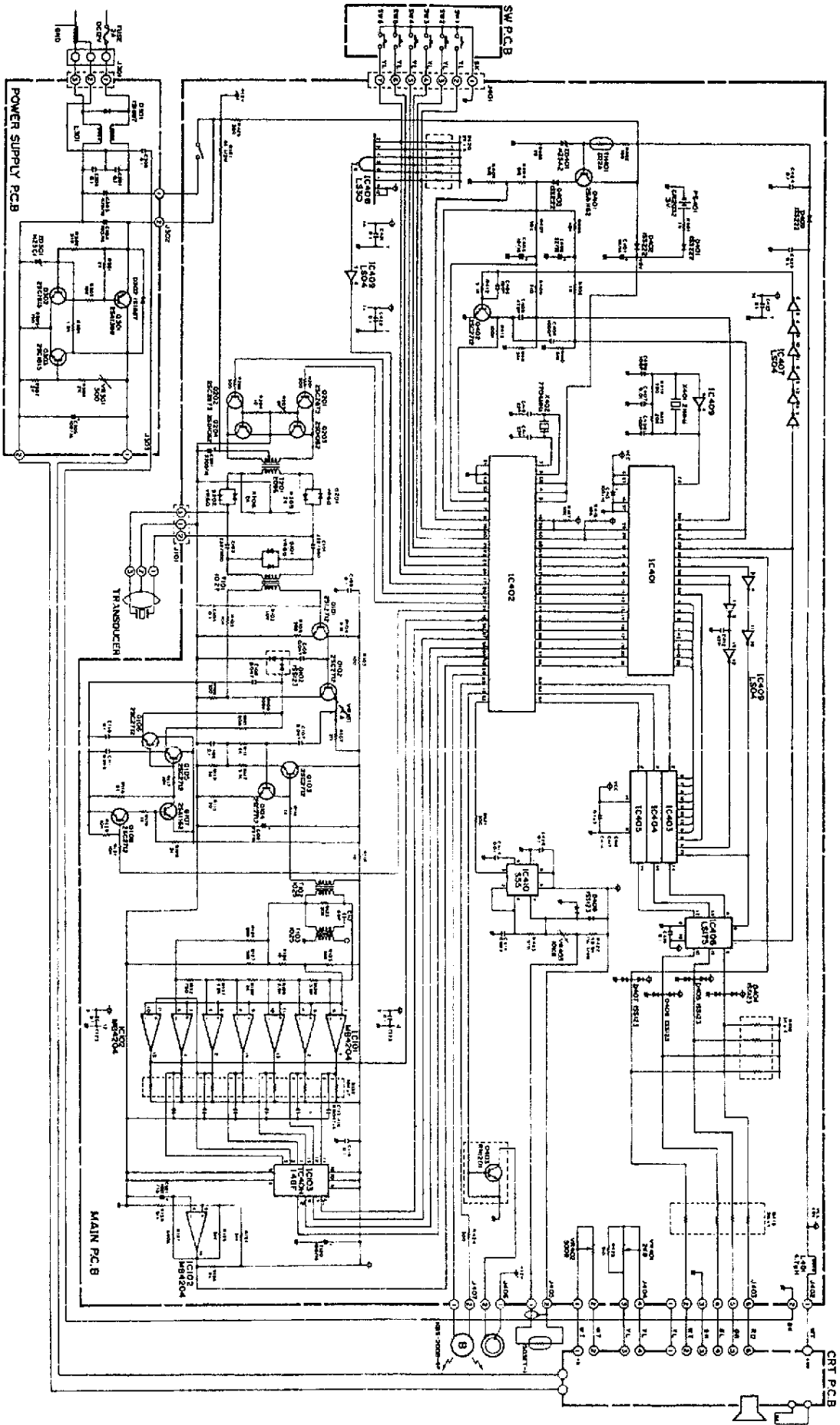
EFO160020 POWER SUPPLY PCB

HE-708 MECHANICAL DRAWING




HE-708 PARTS LIST (MECHANICAL)

N O.	CODE NO.	DESCRIPTION	DRAWING NO. SPECIFICATION
1	211065	Power Supply Connector (3P)	EF01D0300
2	211025	Transducer Connector (3P)	EF01D0310
3	176705	Rear Panel	EF0180050
4	211165	Thermo-Sensor Connector	EF01D0320
5	211145	Alarm-out Connector	EF01D0330
6	860395	Upper Case	EF01H0120
8	012001000	Main P.C.B (167KHZ)	A s s y
9	804545	CRT Bracket	EF0120180
10	807715	Sealing Rubber (1)	φ1.5*700
11	860375	Front Case	EF01H0100
12	807695	Sealing Rubber (2)	φ2*550
13	888225	Acrylic Filter	EF01F0170
14	880055	Sun hood Collar	EF01H0080
15	888215	Sun hood	EF01H0220
16	170575	Knob (1)	EF01H0160
17	170555	Knob (3)	EF01H0140
18	170565	Knob (2)	EF01H0150
19	290375	Control Panel	EF0180130
20	300505	SI-TEX Label	EF0180360
21	012002000	Switch P.C.B	A s s y
22	930085	Spacer	EF0120040
23	860385	Lower Case	EF01H0110
24	181085	Rubber Bush	EF-52A060
25	160035	Alarm	EF01D0340
26	930035	Knob Bolt	M6 * 15
27	900145	Mounting Bracket	EF0120091
28	802035	Rubber Washer	HFA8H0250
29	802205	Rubber Plate	EF01A0350
30	0120003000	Power Supply P.C.B	A s s y
31	320015	Heat Sink	EF0120200
32	880065	P.C.B. Support	EF01H0290
33~37	270255	CRT Ass'y	MC600BH
38	940585	Knurled Screw	M4 * 12 (Black)



NOTE: Unless otherwise specified, resistors
 values are in ohms, % and capacitors
 values are in picofarads.
 Type of resistor or capacitor is subject
 to customer's requirements.
 All dimensions are in millimeters.



HE-708 107 KHZ
 Model No. 107 KHZ
 OCT 1986 ET 1470020