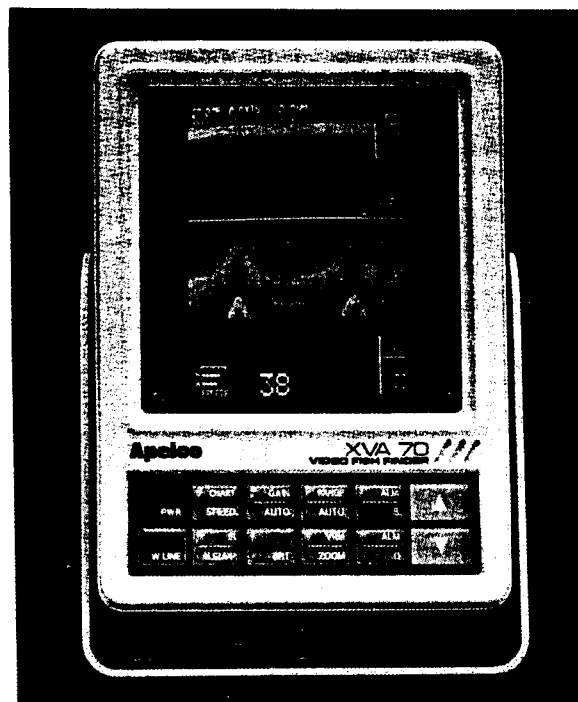


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Apelco

XVA 70 AMBER VIDEO FISHFINDER INSTRUCTION MANUAL



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SECTION I

GENERAL DESCRIPTION

1.1 Introduction

Congratulations on your purchase of one of the most versatile amber video fish finders. The XVA70 with its large 6" amber display gives you a graph type display of the bottom and underwater activity, plus displays boat speed, water temperature, trip log and digital bottom depth all at the same time. Also incorporated is a unique variable depth marker with quick zoom which makes zooming in on underwater targets simple.

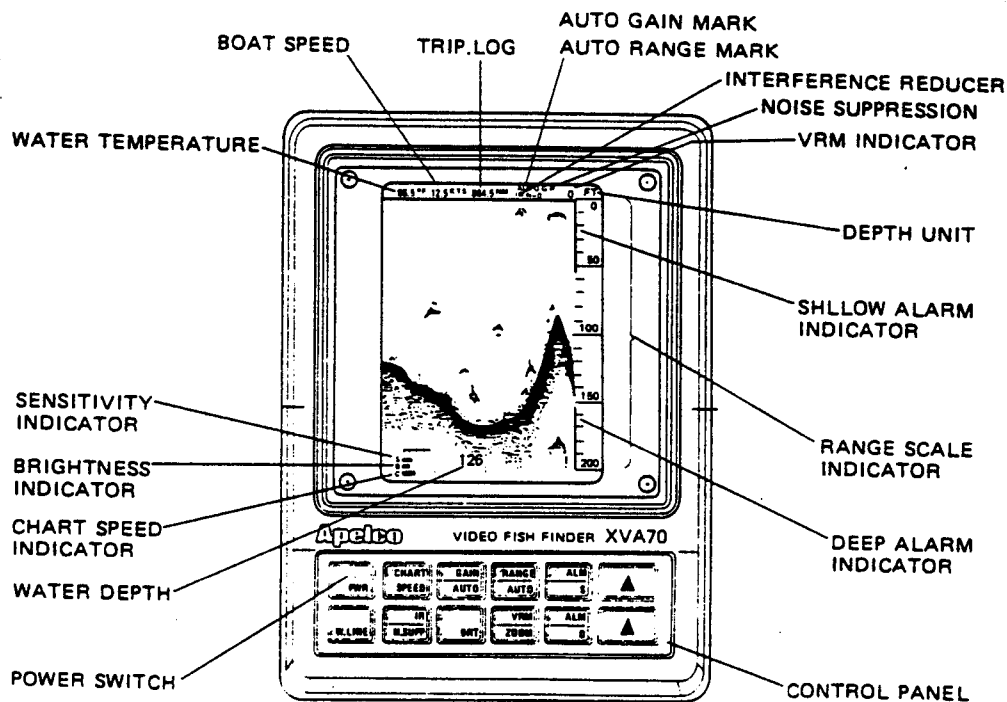
We are sure you will be happy with your selection of the XVA70 and that the unit will provide you with many years of trouble free operation.

1.2 Display and Keypad

The following section is intended to familiarize you with the display and keyboard of the XVA70.

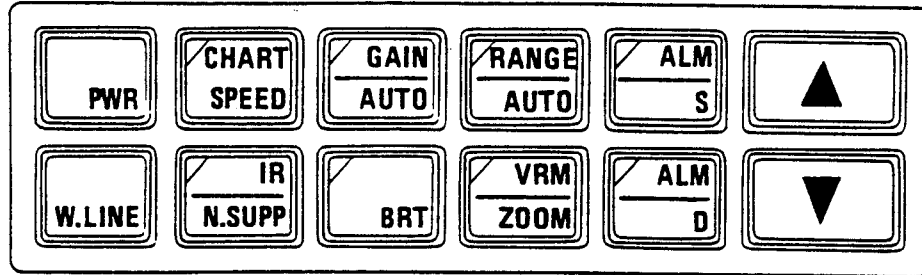
1.2.1 Display Diagram













The figure below of the XVA70 display identifies the location and description of the numeric readouts and symbols.





1.2.2 Keypad Layout

The diagram below identifies the location of the front panel keys followed by a description of the keys operation.





-  - POWER Key turns unit on and off.
-  - WHITE LINE Key selects white line, gray line, or normal display of bottom return.
-  - Controls speed at which chart display moves across screen.
-  - Turns interference reducer on or off, also selects noise suppression setting.
-  - Selects automatic or manual setting of gain control.
-  - Controls brightness of display.
-  - Selects automatic or manual setting of ranges.
-  - Selects variable range marker function or zoom function.
-  - Sets alarm shallow setting.
-  - Sets alarm deep setting.
-  - Increases setting of selected function.
-  - Decreases setting of selected function.

The keys on the keypad with the blue diamonds select the function you wish to set. Then press the up  or down  to adjust the setting.

SECTION II OPERATION

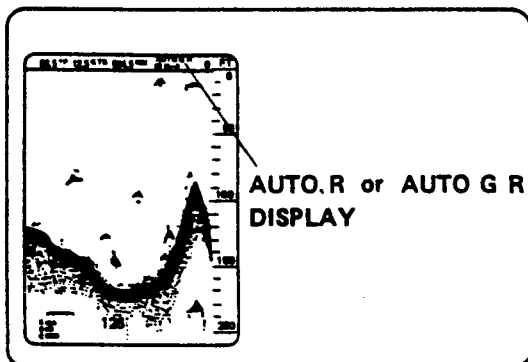
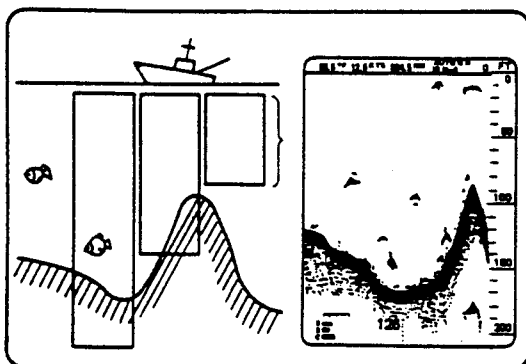
ASSUMING THE INSTALLATION HAS BEEN PROPERLY COMPLETED, LETS PUT THE XVA70 INTO OPERATION.

2.1 Turning the Power "ON" and "OFF".

Press the  key in a couple of seconds. The display should light up. Press the  a second time to turn the unit off.


2.2 Panel Operation


ALM.D	:	Increase/Decrease the deep alarm range.
ALM.S	:	Increase/Decrease the shallow alarm range.
RANGE	:	Increase/Decrease the range (5 to 995).
VRM	:	Up/Down the variable range marker.
GAIN	:	Increase/Decrease the sensitivity (0 to 15).
BRT	:	Increase/Decrease the video contrast (0-9)
CHART SPEED	:	Increase/Decrease the rate of the chart speed
N.SUPP	:	Increase/Decrease the noise suppression level.



 and  UP/DOWN Keys




The up and down keys are used to increase or decrease levels or settings of the XVA70. The chart to the left shows the keys that are used in conjunction with the up or down keys. Notice that these keys all have a blue diamond in the upper left hand corner.

 Range/Auto


The  Key sets the area of water you want to look at on the screen in 5-unit step (5 to 995).

The range setting appears in the bottom right of the screen.

Manual Setting of Range

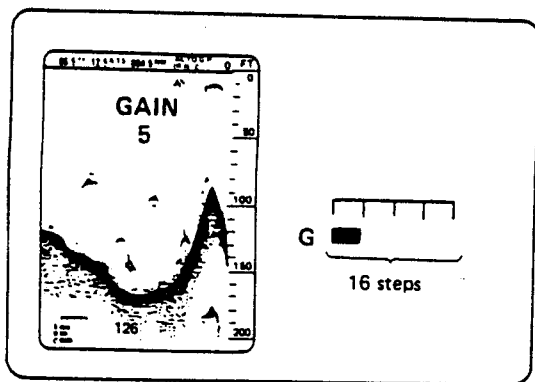
By pressing  Key, "RANGE" will appear on-screen. The up  Key decreases range or down  Key increases range.

Automatic Setting of Range

By pressing  Key twice, Auto Range operation is enabled.

Auto Range will maintain the bottom on the screen at all times by changing the range to the next scale if the bottom goes off the screen.

"AUTO R" appears at top of screen in Auto Range mode.



GAIN Gain/Auto

The sensitivity of the fish finder is controlled by pressing **GAIN** Key and up **▲** or down **▼** Key. An on-screen level indicator appears on the display. The gain changes in 16 steps.

Manual Setting of Gain

By pressing **GAIN** Key, "GAIN/X" will appear on-screen. The up **▲** Key increases gain or down **▼** Key decreases gain. (X = 0 ~ 15)

Automatic Setting of Gain

Auto Gain can be activated by pressing **GAIN** Key twice. "AUTO G" appears at top of screen and the optimum gain level is set automatically.

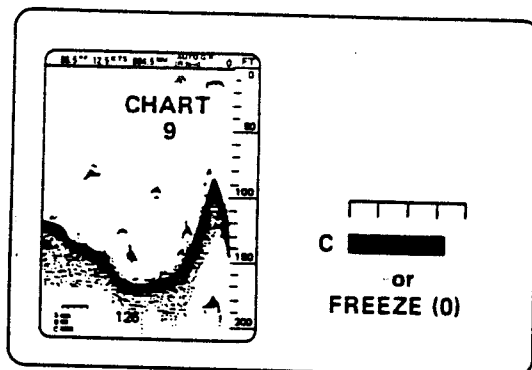
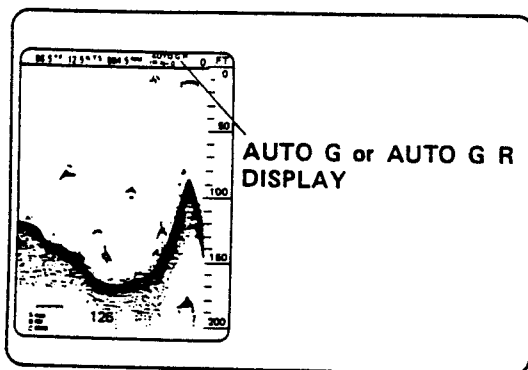
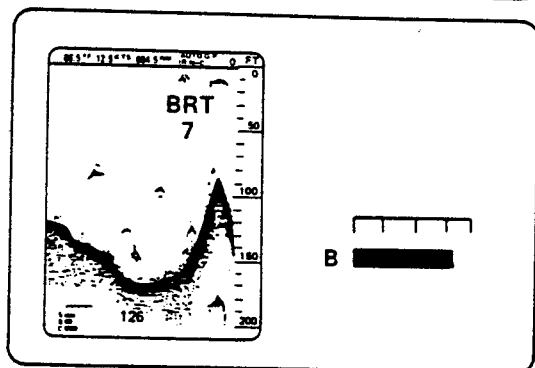


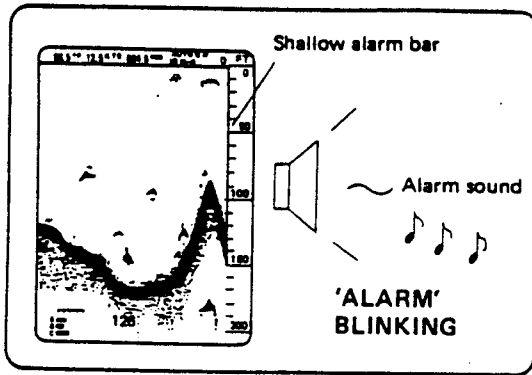
CHART Chart Speed

The chart speed can be increased or decreased in 10 steps. By pressing **CHART** Key, "CHART/X" will appear on-screen, then up **▲** Key or down **▼** Key increases or decreases the rate of the chart speed. (X = 0 ~ 9)



BRT Brightness

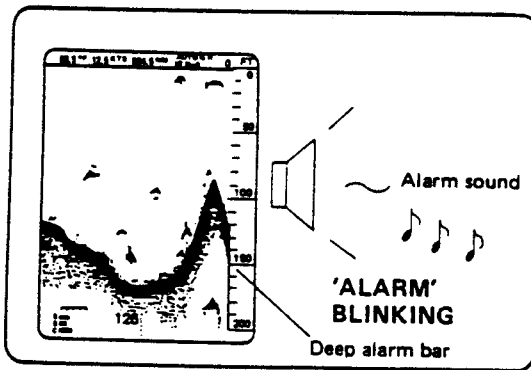
The display Brightness can be varied in 10 levels from 0 to 9. By pressing **BRT** Key, "BRT/X" will appear on-screen, the up **▲** Key or down **▼** Key increases or decreases the brightness. (X = 0 ~ 9)



..... Shallow Alarm

If your boat enters a shallower area than a preset water depth, an audible alarm is produced. Shallow alarm area is displayed by the shallow alarm bar on right side of the display.

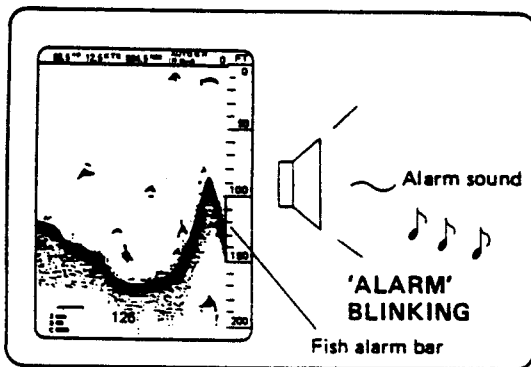
By pressing Key, "ALM.S" will appear on-screen, the up Key or down Key decreases or increases the shallow alarm setting.



..... Deep Alarm

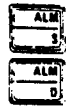
Deep Alarm area is also displayed at the right of display with the same vertical line as shallow alarm bar.

By pressing Key, "ALM.D" will appear on-screen. The up Key or down Key decreases or increases deep alarm range.





..... Fish Alarm

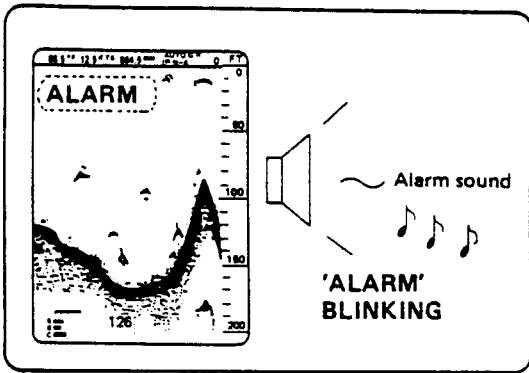
When the shallow alarm and deep alarm bar overlaps on the display, this creates a fish alarm. Anything passing through this area sets off an alarm.



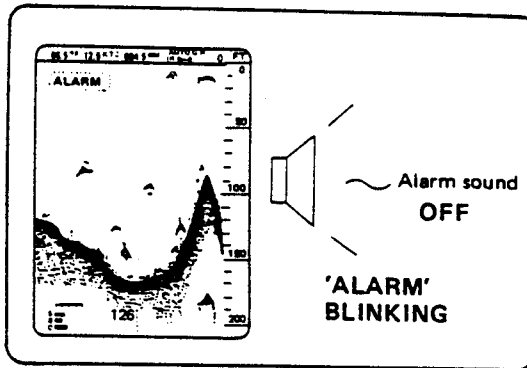
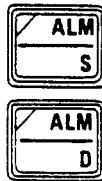
..... Alarm off

To silence the alarm press  and  together.

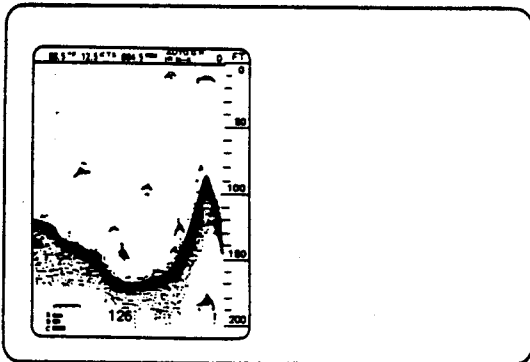
This will silence the audible alarm, however the visual display will continue to flash.




TOGETHER






VARIABLE RANGE MARKER



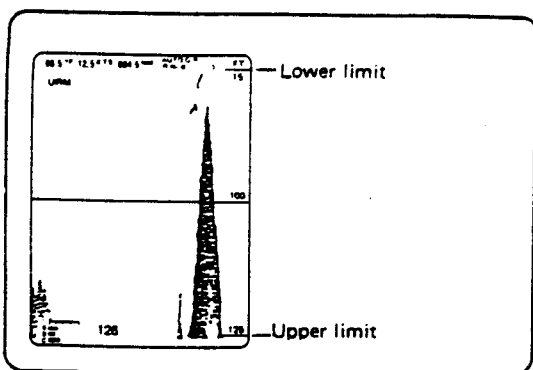
..... Variable Range Marker

The  Key controls the position of the depth measuring line on the video display.




By pressing  Key, "VRM" will appear on-screen, the up  Key or down  Key to decrease or increase the VRM position.

The depth of the VRM is indicated immediately adjacent to the VRM line. The position of the VRM also determines the area displayed in "Quick ZOOM" Mode.

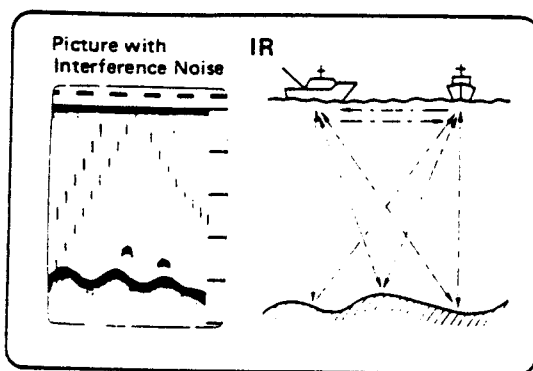
Quick Zoom



..... Quick Zoom


Press the  Key twice and the XVA70 will magnify the area around the VRM by four. The upper limit and lower limit scale will be displayed by the scale markers. The up  or down  Key will allow you to move the scale up or down to change the area being zoomed.

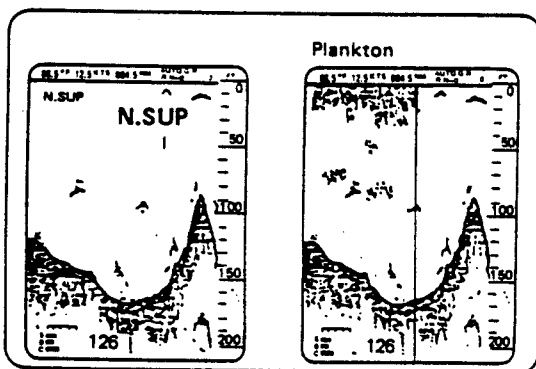
Press the  Key a third time to resume normal display.



..... Interference Reducer and Noise Suppression




Interference Reducer Setting

Press the  Key to eliminate interference from other fish finders "IR" will appear at top of display to indicate the IR is in use.




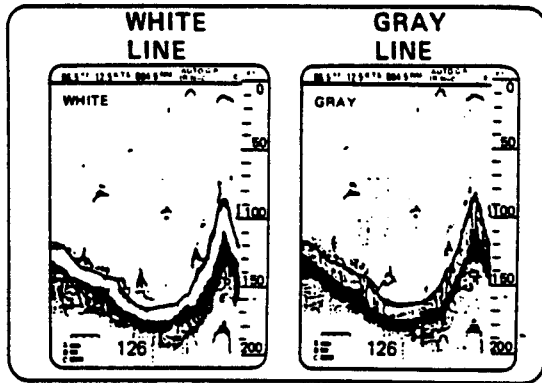
Noise Suppression Setting

To help eliminate surface clutter such as plankton the XVA70 has noise suppression which can be adjusted from 0 to 5.

Press  Key twice, "N-X" will appear on-screen, then up  Key or down  Key to increase or decrease the noise suppression level. (X = 0 ~ 5)

IR and N.SUPP cancellation


Press  Key three times, to cancel the Interference Reducer and Noise Suppression.




..... White/Gray Line

White line or Gray line is used to provide better separation of bottom and fish schools near the bottom.


White Line Set

Press  Key, "WHITE" will appear on-screen.

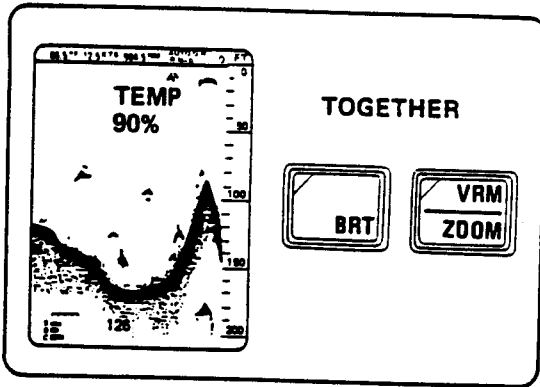
Gray Line Set

Press  Key twice, "GRAY" will appear on-screen.





Normal (white line and gray line cancel)

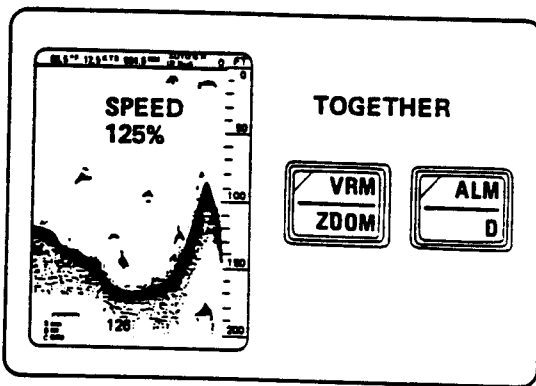
Press  Key three times, "NOR" will appear on-screen.

2.3 Adjustment Temperature and Boat Speed







Temperature Adjustment (75 to 125%)

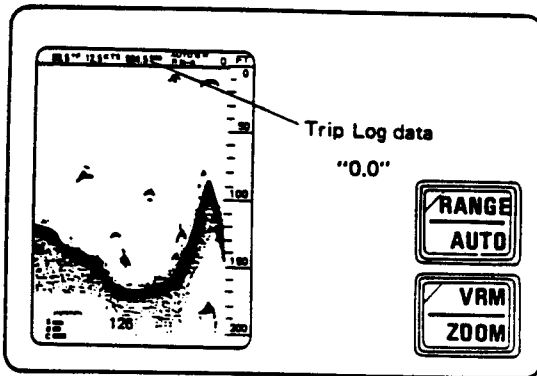
By pressing  and  Key together, "TEMP/100%" will appear on-screen. Then up  Key or down  Key will increase or decrease the temperature readings.





Boat Speed Adjustment (50 to 150%)

By pressing  and  Key together, "SPEED/100%" will appear on-screen.

Then up  Key or down  Key will increase or decrease the boat speed readings. (100% = 22000 pulse/n.m at paddle sensor)



Trip Log Reset



By pressing  and  Key together, "0.0" will appear at top of screen. Trip Log data is reset.

2.4 Change Units of Measurement



The XVA70 is capable of measuring depth in feet, fathoms, or meters. Boat speed can be measured in knots, km/h, or MPH (mile/h), and temperature can be measured in farenheit or celsius.

UNIT (Deep/temperature/speed unit)



DEEP : M (Meter), FM (Fathom) or FT (Feet)

  **TOGETHER**



SPEED : KT (Knot), MH (Mile/H) or KM (Kirometer/H)

  **TOGETHER**



TEMP : °F or °C

  **TOGETHER**



Deep Unit

To select feet (FT), fathoms (FM), or meters (M), press the  and  Keys together. "FT", "FM" or "M" appear at top of scale graph.

Boat speed Unit

To select knots, km/h, or M/H, press the  and  Keys together. "KTS", "KM/H" appear next to speed readout.

Temperature Unit

To select farenheit or celsius, press the  and  Keys together. "F" or "C" appear next to temperature reading.

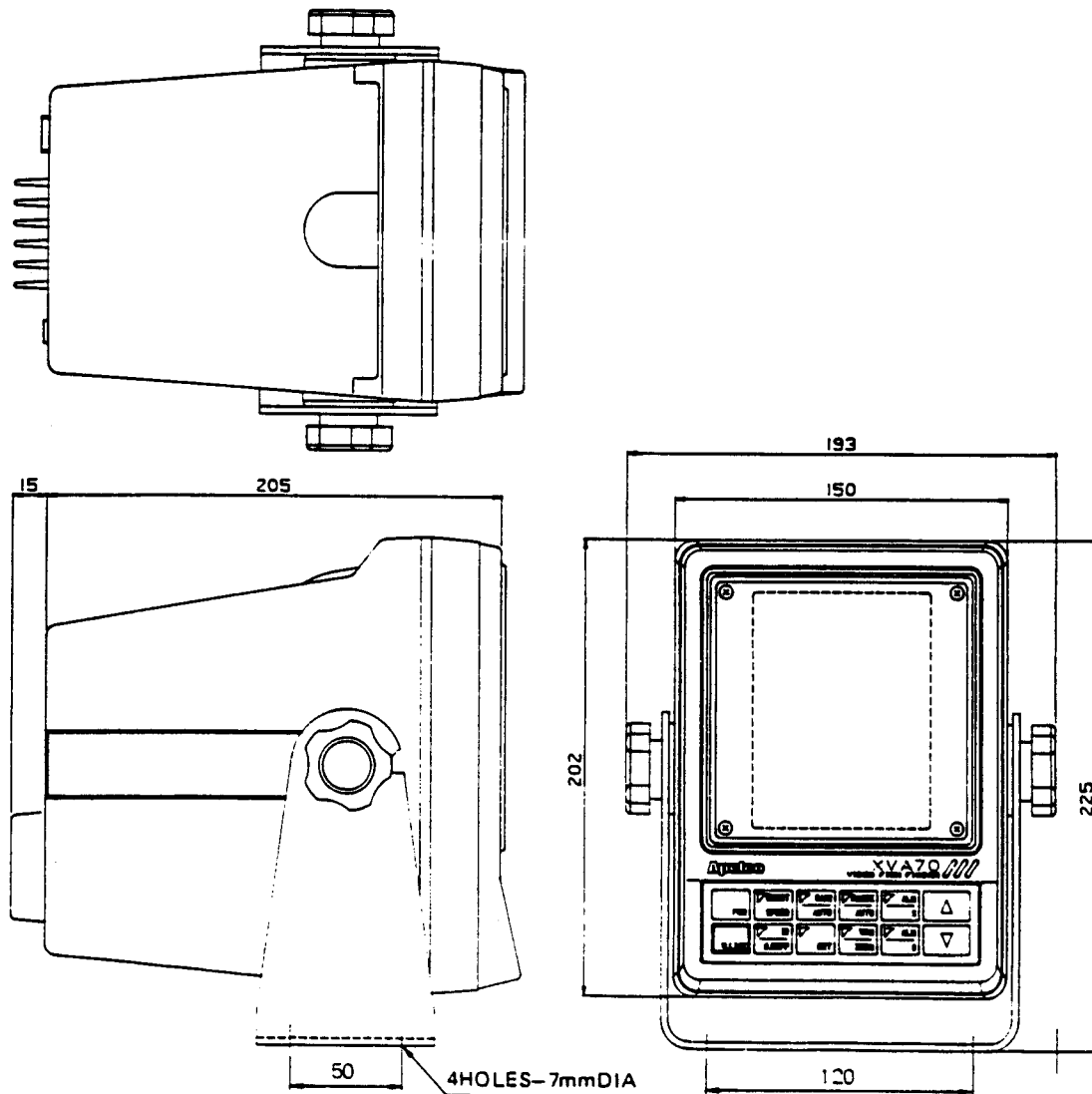
SECTION III

INSTALLATION

3.1 Main Unit

The XVA70 Main Unit may be mounted on a table, shelf or overhead using the mounting bracket furnished. Select a convenient location suitable for easy viewing in a sheltered area and out of direct sun rays if possible.



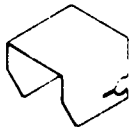

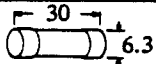
To mount the unit, remove the mounting yoke from the unit by loosening the yoke knobs on each side of the XVA70. Attach the bracket to the desired mounting surface with proper screws. Slide the unit back into its yoke. At the desired position, secure the unit with the yoke knobs.



3.2 Composition

XVA70 Amber Video fish finder product code: M78815

Consisting: See table

	COMPONENT	MODEL NO.	Q'TY	DESCRIPTION	SHAPE
1	Main frame	XVA70	1		
2	200 kHz Transducer assembly	M78649	1	Triducer 13° (Transom)	
		M78682	Option	Triducer 20° (Transom)	
		M78811	Option	All in one Thru-Hull Bronze	
3	Hood	MTT021118	1		
4	Dust cover	MPXP01998	1		
5	Power cable	CFQ-2889	1	2 m	
6	Instruction manual	6ZPBSO2524	1		
7	Spare parts kit consists of: (6ZXBS00142)				
7-1	Fuse		1	2A	
7-2	Lamp		1	5 V 30 mA	

3.3 Electrical Connections

The XVA70 will work with any ship's DC voltage within the 11.5 – 15.7 volts range, since a power regulator circuit is built-in. Connect the power cable furnished to a DC source capable of supplying at least 1.5 ampere of current. (The power leads normally should be routed to the ship's DC power distribution panel on larger boats or directly to the battery main breaker on smaller vessels.) Observe proper polarity. The red wire of the power cable should be connected to the positive source terminal and the black lead to the negative source terminal.

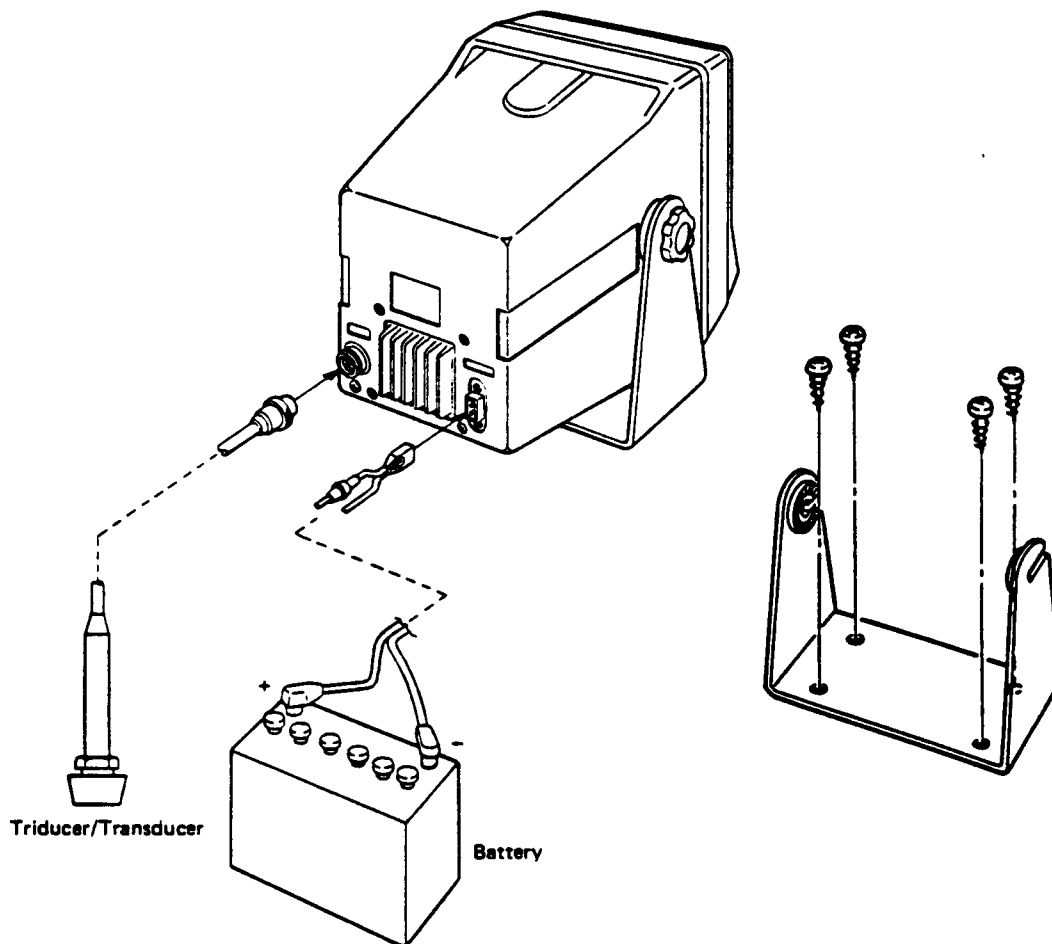


Fig. 3.1 Simple Installation System Block

3.4 Transducer Installation

The XVA70 is designed to work with either a transom mount type "Triducer" which has the 200 kHz transducer element, boat speed sensor (paddle wheel type) and surface water temperature sensor in a single housing, or when thru-hull mounting is required, a thru-hull mount type 200 kHz all in one sensor with speed/temp. is available.

Your Apelco dealer can best advise you concerning any special mounting circumstances and selection of the transducers and sensor listed below:

TABLE: XVA70 TRANSDUCERS/SENSORS

DESCRIPTION	MOUNTING	CODE
"Triducer" 13°	Transom	M78649
"Triducer" 20°	Transom	M78482
All in One T/H	Thru-Hull	M78811

General:

The transducer element is that portion of a sounder system that converts the electrical pulse from the sounder into a sound wave which is transmitted downward to the bottom and returned as an echo. This echo is picked up by the transducer and sent to the sounder which, through time comparison converts the difference for display on your XVA70.

The transducer, the heart of the depth sounder, is a delicate instrument and should be handled accordingly. The thru-hull transducer element is housed accordingly. The thru-hull transducer element is housed in a valox casting with an epoxy surface. The epoxy surface is the "window" through which ultrasonic pulses travel. It must be as smooth as possible. Extreme caution is advised when handling the transducer to prevent damage to the transducer face.

Also when handling the transducer or sensor units, avoid lifting or pulling on the cables. The cables could become damaged and malfunction at the most inopportune time.

Since the mounting locations of the transducer will vary with the type of vessel and its particular hull construction, the following mounting rules generally apply: Install the transducer;

1. Where it will be continuously immersed in water when the vessel is under way.
2. Where turbulent water will not pass over the transducer face.
3. As far from the engine as practicable.

3.4.1 Transom Mounts

Transom mounting of the "Triducer" using the mounting bracket supplied is illustrated in Fig. 3.2 Ideally, the "Triducer" should be perpendicularly mounted with the sea bottom and flush with the hull line. On boats with one motor, the mounting location should be at least 15 inches either side of the centerline to minimize the effects of turbulence. The tilt angle of the

transducer should be maintained from being greater than 10° for maximum depth accuracy, once the ideal mounting location has been selected, proceed as follows:

Note: The "Triducer" should be installed flush with the bottom of the boat. Fore and aft and athwartship angle of the Triducer face should be less than 10 degrees from the horizontal.

1. Check the "Triducer" and bracket for configuration as shown in Fig. 3.2
2. Mark and install the Triducer/bracket assembly to the transom with screws. .
3. Verify that the leading edge of the Triducer is against the transom. The Triducer may be installed with a slight forward tilt. (Rear end lowered about $1/8"$ for better water flow situation).

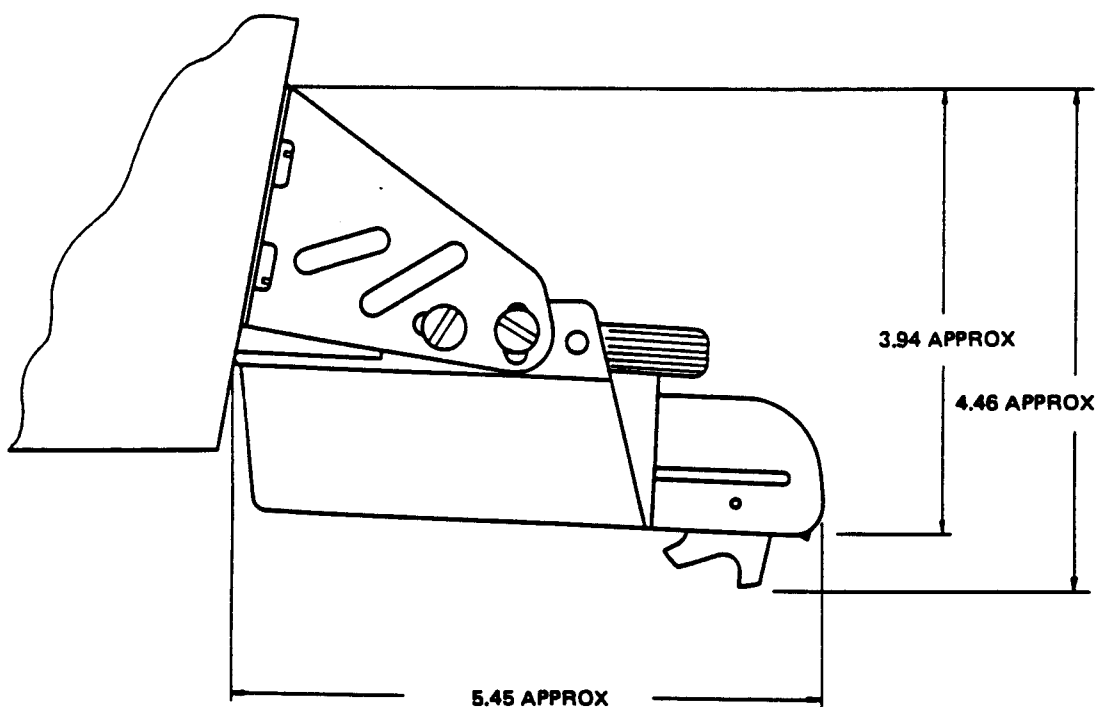
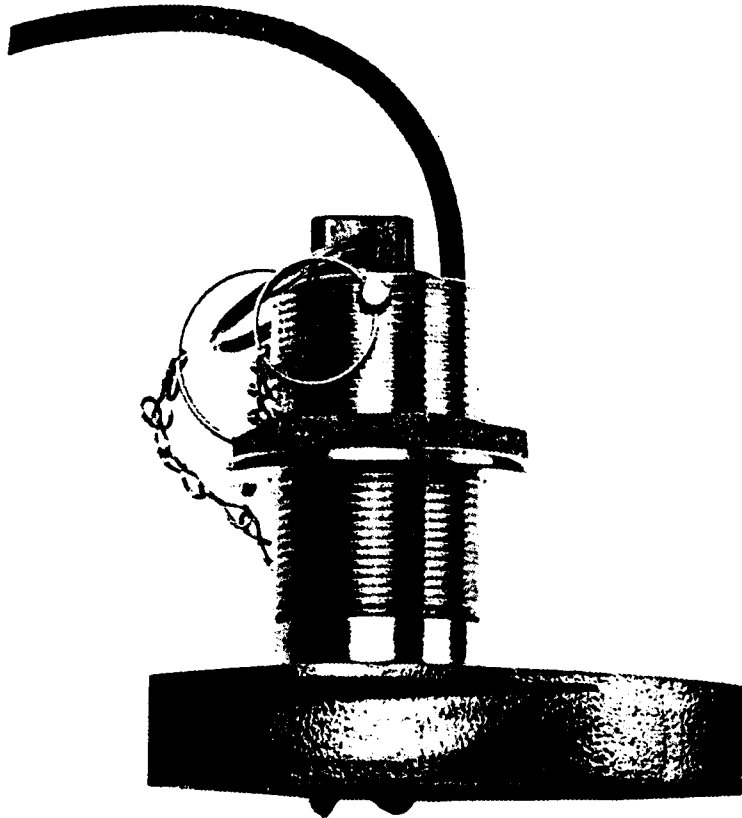


Fig. 3.2 Installing the Triducer M78649



3.4.2 Installation Instructions for the All in One Bronze Thru-Hull

The following contains important information. Please read these directions completely before proceeding with installation.

Cautions:

- Do not install a bronze transducer housing directly in a metal hull because electrolytic corrosion will occur.
- If you have a cored hull structure, appropriate transducer core hull instructions should be followed. If there is some doubt on how to proceed with the installation please contact Apelco for advice before proceeding.

A. Selecting the Location:

1. Non-aerated (bubble free) water must flow across the multisensor at all speeds if good depth and speed sensing performance is to be achieved. The multisensor should be located where the following conditions can be met.
 - A. On sailboats it should be mounted where the acoustic beam will not be shaded by the keel. A spot forward of a fin keel is usually best. Try to find an accessible spot with a minimum deadrise angle.

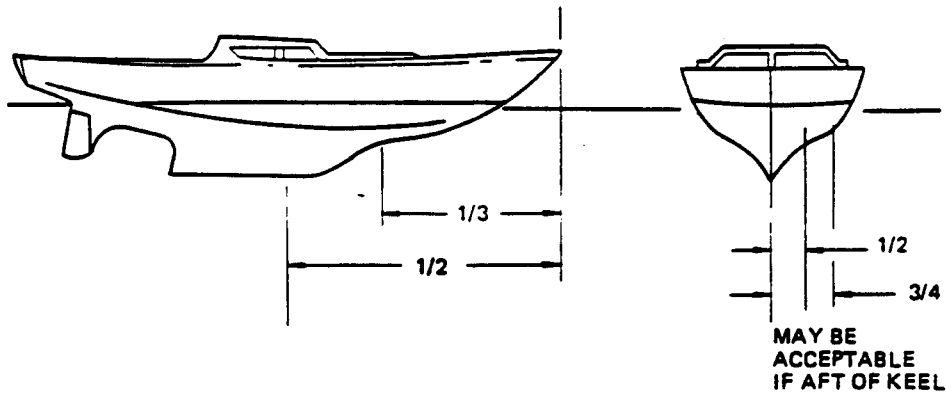


Fig. 3.3 Sailboat Installation

- B. On displacement hull power boats (e.g., trawlers), the transducer should be mounted amidships, relatively close to the keel (centerline of the hull).
- C. Generally, the higher the top speed capability of the vessel, the more critical the installation location. On planing powerboat hulls, the triducer™ multisensor should be mounted well aft and close to the keel to insure that the multisensor is in contact with the water at higher boat speeds. If the vessel is capable of speeds greater than 20knots, you should review installation location and operational results on similar boats before proceeding.

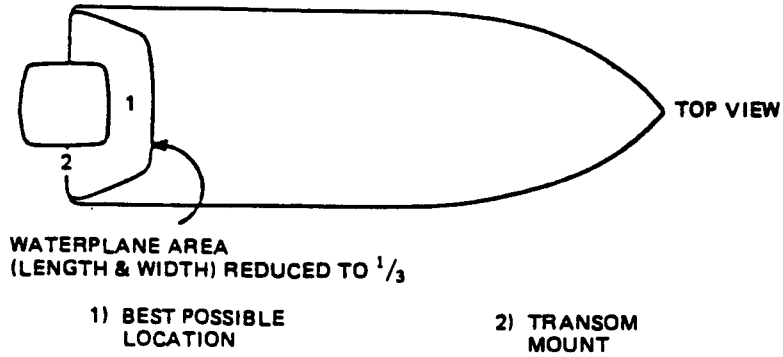


Fig. 3.4 Planing Hull Installation

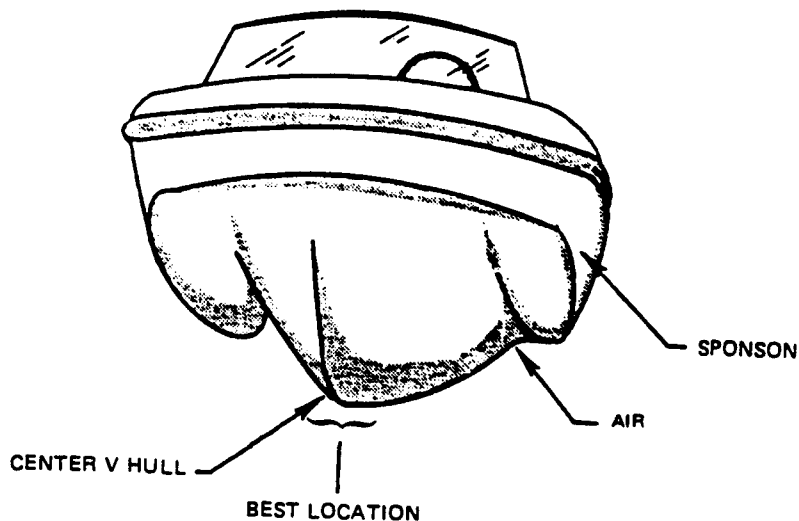


Fig. 3.5 Tri-Hull Installation

- D. Never position the multisensor directly behind shaft struts, fittings and other paddlewheel speed transducers, since the turbulence generated by these structures can adversely affect depth transducer performance especially at higher boat speeds.
- E. On I/O's, transducer mounting close to the engine(s) usually yields good results. On inboards always mount the transducer well ahead of the propeller(s). Turbulence from props seriously degrades transducer performance. Make sure acoustic beam is not shaded by the prop shaft(s).
- F. If the boat has bottom paint applied and has been used, inspect for areas where paint erosion has taken place. Erosion is frequently caused by turbulent water and these areas are unsuitable transducer mounting locations.
- G. It is very important that the mounting location have reasonable access from inside the vessel since the transducer will require tightening from inside the hull and the paddlewheel assembly will require periodic inspection to check for marine growth. To allow for inspection of the paddlewheel, there should be a minimum of 6" of headroom above the transducer mounting position.

B. Installation Procedure

1. The following tools and materials will be useful during the installation.
 - A. Variable speed electric drill – $\frac{3}{8}$ " or larger chuck capacity.
 - B. $\frac{1}{8}$ " drill ($\frac{3}{16}$ or $\frac{1}{4}$ " can also be used).
 - C. 2" hole saw.
 - D. Marine Bedding/Sealing Compound (Boatlife's Lifeseal™ is a good choice).
 - E. Files, rasp, or disc sander.

Now that a location for the transducer has been determined, it will be necessary to assure that

the transducer will maintain a perpendicular relationship to the sea bottom. A fairing block is useful to achieve the desired angular relationship.

C. Fairing Block

Nearly all vessels have some deadrise angle at the transducer mounting location. If the thru-hull Triducer™ multisensor, is mounted directly to the hull, the sound beam will be tilted off the vertical at the same angle as the deadrise. Generally, if the deadrise angle at the mounting point exceeds 10 degrees, a fairing block is strongly recommended. Fairing blocks are usually constructed of wood (such as mahogany) and shaped to both reduce drag and minimize aeration on the transducer face. Best results are obtained with sharp vertical leading edge fairings because this wedge shape helps to divert aerated water off to the sides of the transducer and not over the acoustic face.

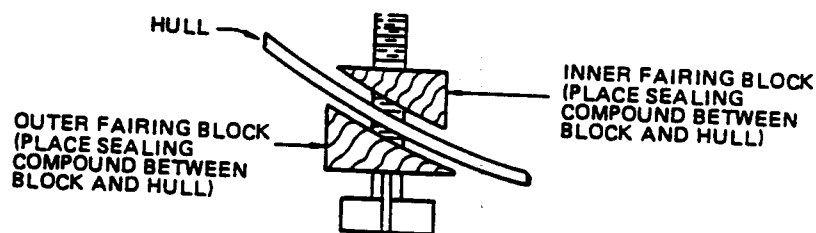


Fig. 3.6

D. Hole Drilling:

1. Usual installation practice is to drill a $1/8$ " pilot hole from inside the hull to assure access to tighten the housing nut and clearance for the cable.
2. However, if there is a strake or other hull irregularity near the selected mounting location, it may be desirable to drill from the outside. (If the pilot hole is drilled in a wrong location, drill a second hole in a better location. Apply masking tape to the outside of the hull over the incorrect hole(s), and fill with epoxy).
3. Using a 2" hole saw, drill the hole from the outside of the hull. (For personal safety, use safety goggles and dust mask).
4. Sand or clean the area around the hole, inside and outside, to assure that the sealing compound will adhere properly to the hull. If there is any petroleum residue inside the hull, remove with a weak solvent such as alcohol, before sanding. During the cleaning process do not allow any plastic parts of the transducer or any plastic thru-hull fittings to come in contact with cleaning solvents such as acetone since some plastics are seriously weakened by such solvents.

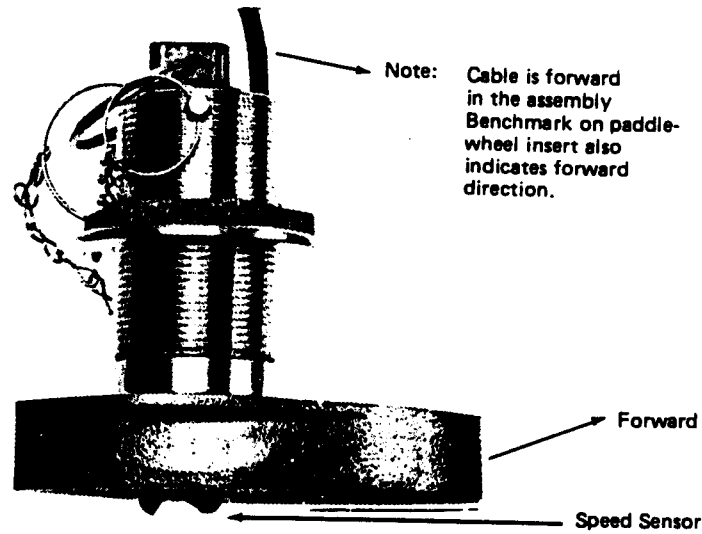


Fig. 3.7

E. Bedding Procedure and Installation:

1. Select a marine grade polysulfide, urethane or RTV bedding/caulking compound.
2. Next, remove the hex nut from the housing and cable.
3. Uncoil the transducer cable and thread the transducer cable through to the inside of the hull.

NEVER PULL OR CARRY THE SENSOR WITH THE TRANSDUCER CABLE, SINCE THIS MAY SEVER INTERNAL CONNECTION. NEVER HOLD THE TRANSDUCER IN PLACE BY APPLYING TENSION TO THE TRANSDUCER CABLE.

4. Following the manufacturers directions for application, apply a $\frac{1}{8}$ " thick layer of sealant on the upper flat surface of the bronze housing and fairing block if used (Figure 3.6). A thin layer should also be applied up the sidewalls to a height of $\frac{1}{4}$ " greater than the hull and shim thickness. This will ensure there is sealant material in the threads to seal them and hold the housing nut securely in place.
5. From the outside of the hull, push the sensor housing (with sealant applied) into the 2" hole. Apply a twisting motion to the housing to squeeze out excess sealants. Confirm that the transducer is orientated so that the paddlewheel is AFT and the axis of the transducer parallels the fore and aft axis of the vessel centerline.
6. Tighten the hex nut with a wrench or large slip-joint pliers (allow for swelling in wooden hulls).
7. From the outside, remove excess sealant to assure smooth water flow over the transducer.
8. Route the cable to the instrument, being very careful not to tear the cable jacket when passing the cable through bulkheads, etc. To reduce electrical interference, keep the transducer cable separated from ignition, tachometer, alternator or other electrical wiring. Secure the transducer cable in place, to prevent damage, using tywraps or lacing twine.

9. If your transducer comes with a connector, do not remove it or cut and splice the cable to ease cable routing problems. Either cut holes that will pass the connector, or choose a different route to the instrument. **Connector removal or cable splicing voids transducer warranty.** Never cut and shorten the cable; coil any excess cable and secure in place.
10. Extension cables are available to complete installation requirements from your Apelco Dealer. When adding extension cables, assure that the connections are tight and protected from water entry. Dow Corning DC-4 or other H.) electric compound may be used to protect the connector assemblies.

F. Check for Leaks:

When the boat is placed in the water, **IMMEDIATELY** check around the thru-hull for leaks. Note that very small leaks may not be readily observed. It is best not to leave the boat in the water for more than 3 - 24 hours before checking it again. If there is a small leak, there may be considerable water accumulation after 8 - 24 hours (probably not enough to cause water damage). If a leak is observed, the installation bedding procedure should be repeated to seal the leak. **IT IS NOT PRUDENT TO INSTALL A THRU-HULL AND LEAVE A BOAT IN THE WATER UNCHECKED FOR SEVERAL DAYS.**

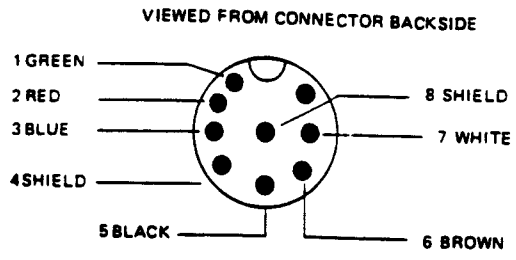
3.5 Transducer Cabling

A 25' length of interconnecting cable with connector is supplied with each transducer and sensor assembly, and normally should not be shortened or lengthened. If only a short distance is required for the cable run, it is recommended that any extra cable be coiled and stored out of the way.

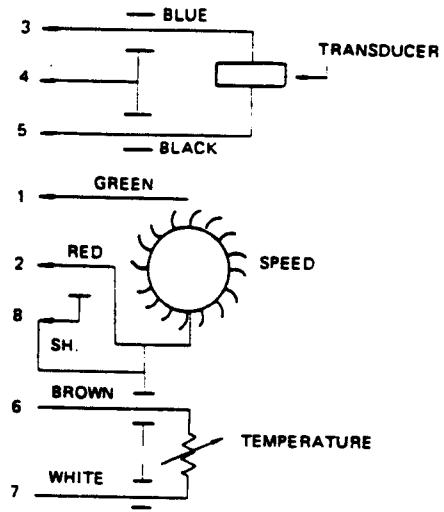
The transducer cable should run independently in the boat to the XVA70 unit. It should not be run close to other wiring (including the unit's own power leads) for any appreciable distance, and should be kept away from the engine and from other electrical system wiring as much as possible.

If the connectors must be removed to facilitate making the cable runs through tight places, the following drawings illustrate the proper connections for the 8 pin and 3 pin transducer connectors. They can guide you in remarking the connections.

8 Pin Connector



Triducer Wiring



3.6 Specification of XVA70

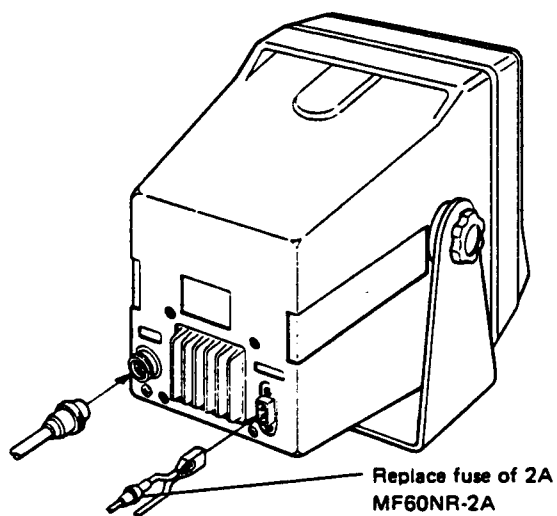
ITEM	SPECIFICATION
Display structure	6-inch Amber CRT
Display resolution	256 x 256 dots
Presentation	8 levels of Amber
Picture display Range	5 to 995 units, 5 unit-step (Manual/Auto) Setting from Keyboard, by UP and Down pushbuttons.
Display Modes	Standard mode STD Quick Zoom mode ZOOM
Depth marker	Marker line with alph numeric indication
Sea bottom depth indication	Numerical indication on display
Alarm	Shallow alarm Deep alarm Fish alarm
Interference Reducer and Noise suppression	Setting by Keypad For elimination of white noise on display in 5 steps
White line and Gray line	Setting by Keypad
VRM	Variable Range Marker
Panel Lighting	Always ON
Chart speed	1/1 to 1/9 selectable Keypad 0 : freeze
Frequency	200 kHz
TX Power	800 W (P-P), 100 W (rms)
Depth Units	Meters, Fathoms, Feet
Temperature Units	fahrenheit (F), celsius (C)
Boat speed Units	knots, mile/h, km/h
Boat speed indication	0 to 50 (knots, mile/h, km/h) in 0.1 steps Trip Log. is included (0 to 999.9)
Surface Water Temperature indication	32 to 95°F in 0.1 steps (0 to 35°C in 0.1 steps)
Picture Brightness	0 to 9, 10 steps
Sensitivity	0 to 15, 16 steps
STC	Fixed
Internal Adjustments	a) For speed range (through water) from sensor 11000 - 33000 p/nm b) For temperature
Pulse width	0.2 to 1 msec linked with depth range
Sounding rate	600 Pulse/min (max)

ITEM**SPECIFICATION****Battery Back-Up****Built-in Battery protection for vital memory****Power source****12 V DC (11 to 16 V DC)****Power consumption****12 VA (approx)****Dimension****225(H) x 193(W) x 220(D) mm****Weight****6.6 lbs (3 Kg) (approx)**

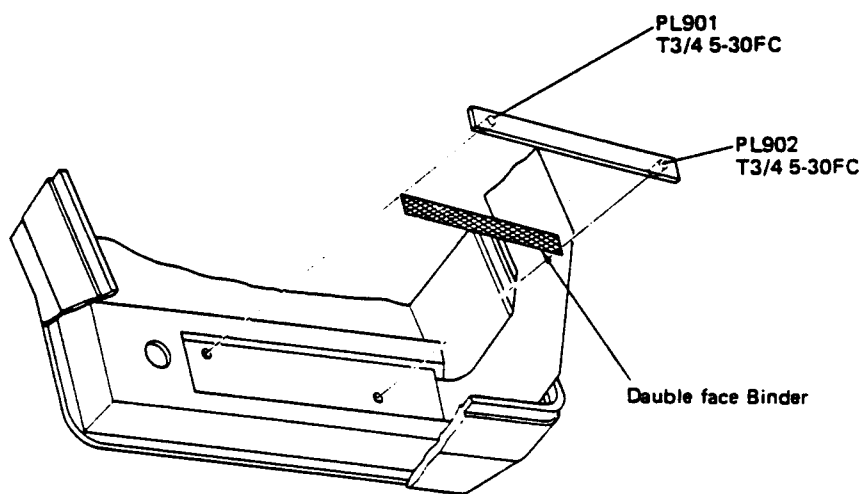
SECTION IV

MAINTENANCE

4.1 Fuse Replacement

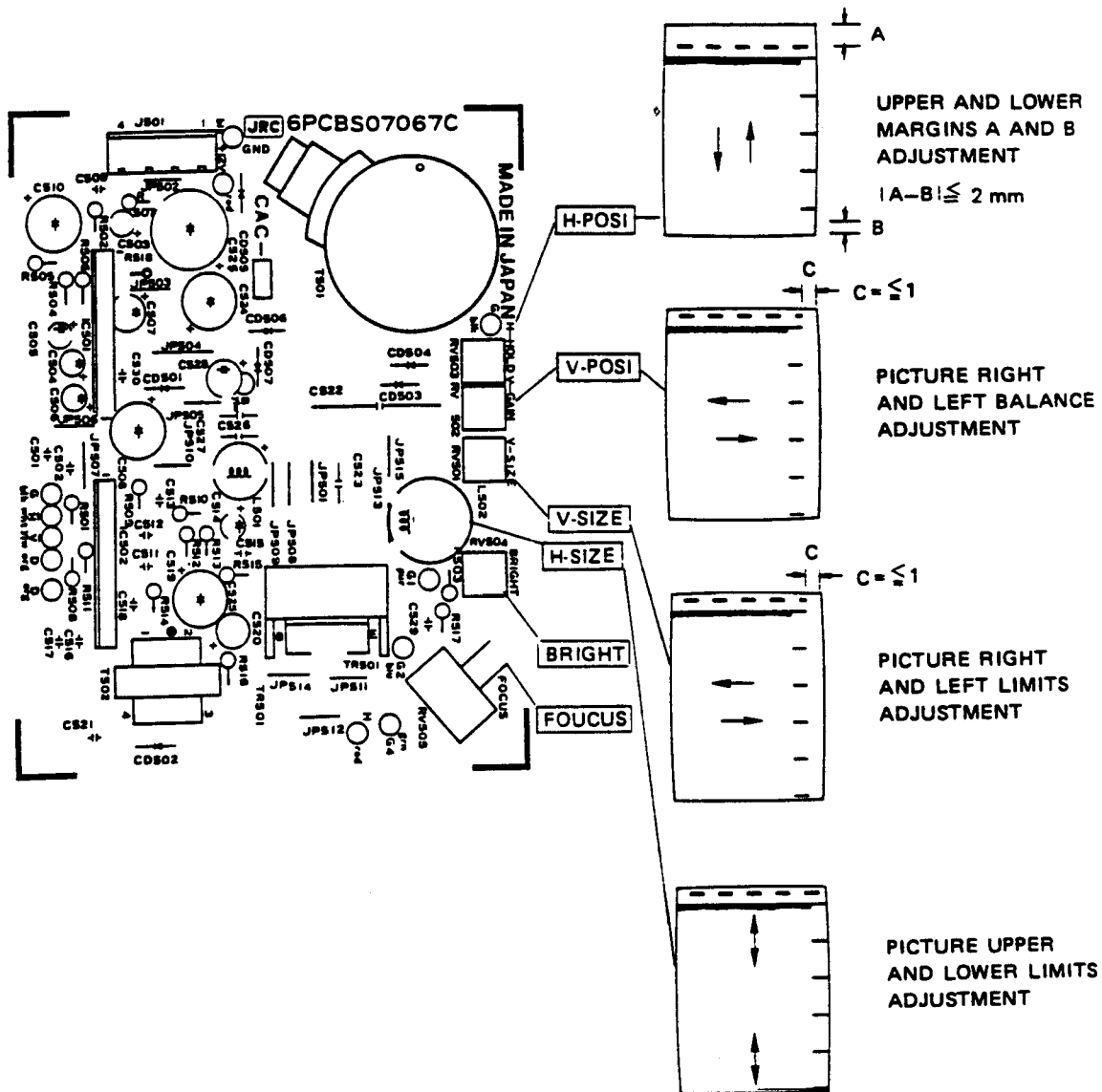


4.2 Illumination Lamp Replacement

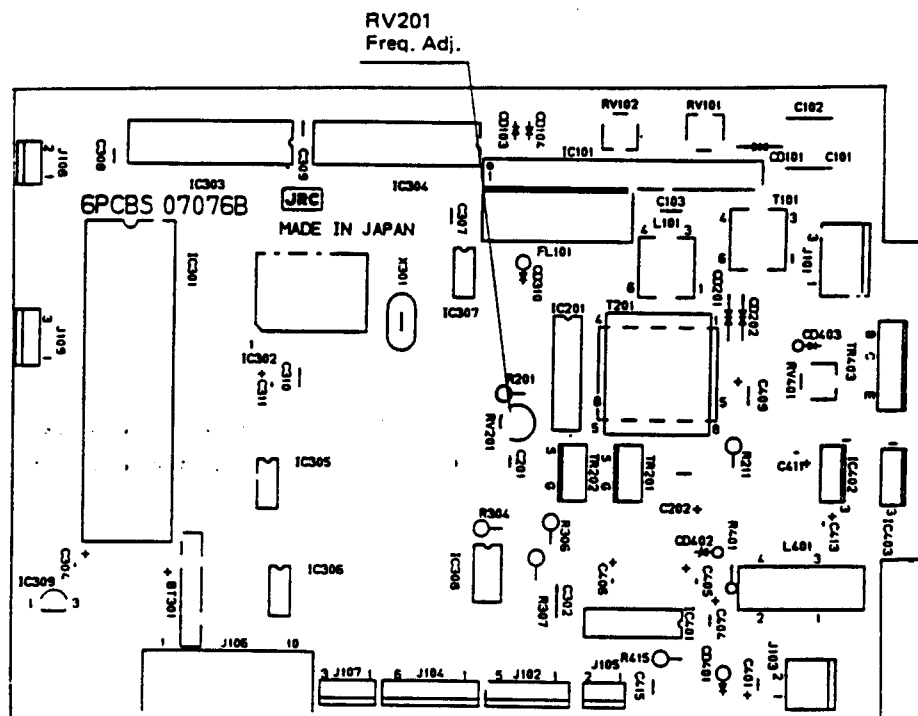


4.3 Picture Adjustment

In case the picture position is not aligned on CRT properly field.

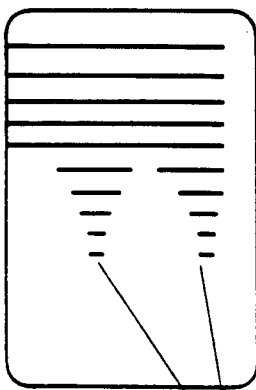


4.4 Transmit Frequency Adjustment







With the transducer in water to see the sea bottom echo, adjust the frequency control for a maximum echo returns.

GAIN : 1/4
N. SUPP : 0



Set the control RV201 to a position for a maximum number of echo signals.

4.5 Symptom Trouble Shooting Chart

ITEM SYMPTOM	CHECK POINT
1. No operation with power switch on; dead.	1. Polarity of ship power line. 2. Fuse blown (2A); refer to para. 4.1.
2. Poor echoes; Zero line satisfactory	1. Transducer Connected? 2. GAIN ON, N.SUPP Zero position Adjust transmit frequency; refer to para. 4.4
3. Picture not advancing across screen	 being set to 0? Try to press  and  or  keys operation.
4. Picture varying in dark and bright.	Battery voltage ralling below 12V?
5. Picture swinging	Transformer of AC-DC convertor intracing?
6. Entire display area shifted low or high.	Effect of earth magnetism possible. Take measures according to para. 4.3.

4.6 Units for Maintenance

	UNIT	MODEL/TYPE	REMARKS
1	Amber CRT	R55DPDB E2765PDB	6VBBS00009 6VBBS00008
2	Transmitter receiver	CMN-182	200 kHz
3	Power cable	CFQ-2889	1.8 m
4	Panel switch	6SWBS00024	6SWBS00024
5	Stand	MTB141334	
6	Knob	BRHD00382	
7	Front Cabinet	MTV002492	
8	Rear Cabinet	MTV002493	
9	Connector (Power)	CV-2	2 pin
10	Connector (Triducer)	NS-1508	8 pin

4.7 Mechanical Parts List

ITEM	NAME	QTY	PART NUMBER	REMARKS
1.	Front Panel Ass'y			
-1	Front Panel	1	MTV002492	
-2	Rubber Packing	1	MTT021087	
-3	Sponge Rubber	1	MPPK01322	
-4	Sheet	1	MTZ003002	
2.	Shield Filter	1	MPOL00936	
3.	Cabinet Ass'y			
-1	Cover	1	MTV002493	
-2	Sponge Rubber	1	MPPK01321	
-3	Shielding Rubber	2	MTV002429	
-4	Nut	2	BSLN06000B	LN6Bs
4.	Shield Plate	1	MTB163370	
5.	Radiator	1	MTC002784	
6.	Plate	1	MTB163553	
7.	Radiate Sheet	1	MTT024067	
8.	Panel Switch	1	MDYW02838	
9.	Main Unit	1	CMN-182	
10.	CRT Control Unit	1	CAC-66	
11.	Video Unit	1	CAD-181	
12.	Back Light Unit Ass'y			
-1	Back Light Unit	1	CCN-167	
-2	Tape	1	MTZ003003	Duble fuce Binder
13.	Shield Case	1	MTB167356	
14.	Bracket Ass'y			
-1	Bracket	1	MTB141334	
-2	Notched Washer	2	MTV002834	

ITEM		QTY	PART NUMBER	REMARKS
15.	Knob	2	BRHD00382	
16.	_____	—	_____	
17.	Label	1	MPNN21029	
18.	Rubber Packing	1	MTT019163	
19.	Tapping Screw	4	BRTG03635	φ4 x 20 Fe FNM P Type
20.	Tapping Screw	4	BRTG03848	φ4 x 16 Fe ZMC P Type
21.	Tapping Screw	11	BRTG03095	φ3 x 8 Fe ZMC B Type
22.	Screw	4	BRTG02594	M3 x 0.5 x 6 Bs BLACK
23.	Screw	2	BSNA03008S	M3 x 0.5 x 8 Fe ZMC
24.	Screw	4	BSNC03010B	M3 x 0.5 x 10 Bs BNM
25.	Screw	1	BSNB04016B	M4 x 0.7 x 16 Bs BNM
26.	Washer	4	BSFW04000B	W4Bs
27.	Screw	2	BSNK02610B	M2.6 x 10Bs
28.	Spring Washer	2	BSSW02600S	SW2.6
29.	Washer	2	BSLW02600B	LW2.6 Bs
30.	Tapping Screw	1	MPTG02024	For Setting
31.	Hood	1	MTT021118	
32.	Dust Cover	1	MPXP01998	