COLOR VIDEO SOUNDER

CVS - 209

OPERATION
MANUAL

SI-TEX®

TABLE OF CONTENTS

1. IMPORTANT NOTICE

Congratulations on your purchase of the SI-TEX CVS-209, 8" Color Video Sounder with Plotter.

IT IS RECOMMENDED THAT YOU READ THROUGH THE OPERATION MANUAL PRIOR TO INSTALLING AND OPERATING THE UNIT.

After reading the operation manual, if you still do not understand about the operation and installation of your unit, we recommend you contact your dealer or SI-TEX Marine Electronics Customer Service Department at 813-576-5734.

SIMULATOR

This unit contains a built-in simulator for practice, that you can access as below.

1. SIMULATION

2. TEST MODE

3. TX. DATA

4. RX. DATA

5. ALL CLEAR

6. MENU CLEAR
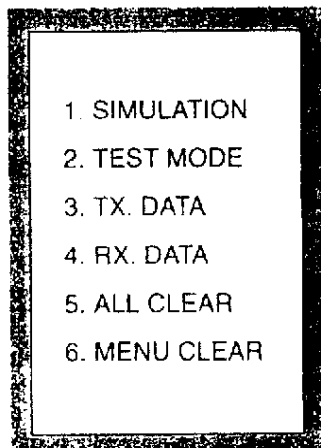
1   To get this display [WPT/MENU] + [ON]

Press and hold the **WPT/MENU** key and touch the **ON** key.

Do not release the **WPT/MENU** key until the display comes up.

2   To select the simulator [X/1]

As the display indicates, press the 1 key.

Reading this manual and practicing in the simulator mode will enhance your skill operating this unit.

Other items are used in the following situations.

2. TEST MODE	Please refer to 11. ADJUSTMENT OF SCREEN.
3. TX DATA	These are used only by the factory. Please do not touch them.
4. RX. DATA	All contents will return to the initial conditions.
5. ALL CLEAR	Press the [SYMBOL/S] key to do it.
6. MENU CLEAR	All menus will return to the initial conditions.Press the [GAIN/6] key to do it.

WARNINGS!

A. Be sure to observe proper polarity when connecting the power cable to the battery. Black with white line wire is positive and solid black wire is negative.

B. 7A and 3A fuses are provided for different power supply voltage. 7A should be used for power of 11 -20V. 3A for power of 20V - 40V.

7A

11 - 20V

3A

20 - 40V
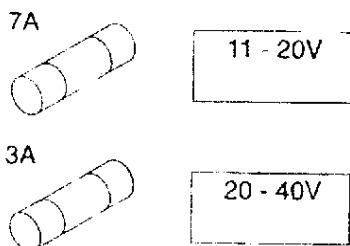
7A fuse is installed on the unit at the factory.

C The CVS-209 is not waterproof. When installing the unit, take this into consideration. Protect the unit from the elements whenever you can.
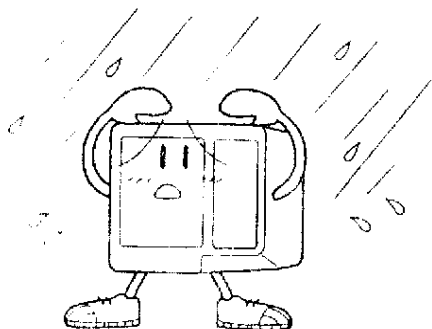
D. Long periods of direct sunlight on the display should be avoided, as the unit can be damaged.
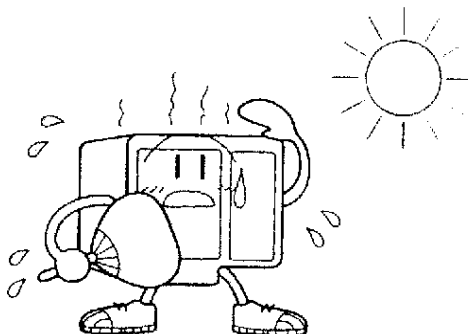
E. We recommend you install the CVS-209 as far as possible from any antennas (Loran, VHF, etc.). This will help prevent noise interference.

F. Use of a transducer other than the one supplied by SI-TEX can degrade the performance of this unit.

G. Do not install the unit near magnetic material as it will cause color distortions.

2
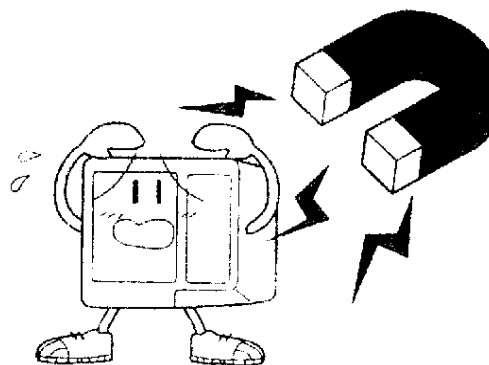
2. TRANSDUCER INSTALLATION AND MAINTENANCE

CAUTION

Mounting your transducer requires drilling holes into your boat hull, which can affect its water integrity and, therefore, should be attempted only by qualified personnel. If you are in doubt as to your ability to attempt this installation, we recommend you take your boat to a marine dealer and/or service center that has people qualified and experienced in transducer installations.

Saltwater Maintenance

Antifouling paint - If the vessel is kept in saltwater, sea growth can quickly accumulate on the transducer face and greatly reduce this unit's performance in a matter of weeks. It is recommended that at least the acoustic face of the transducer be coated with a special transducer antifouling paint. Alternatively, the entire transducer can be painted, and is easier to keep clean. All copper base paints are unsatisfactory and will not allow this unit to detect bottom or fish. If fouling does occur, use a stiff brush or putty knife to remove growth. Wet sanding of the transducer surfaces is O.K. with a #220 or finer grade wet or dry paper.

2-1. TRANSOM MOUNT

This is an example of transom mount transducer (#239-50-200ST).
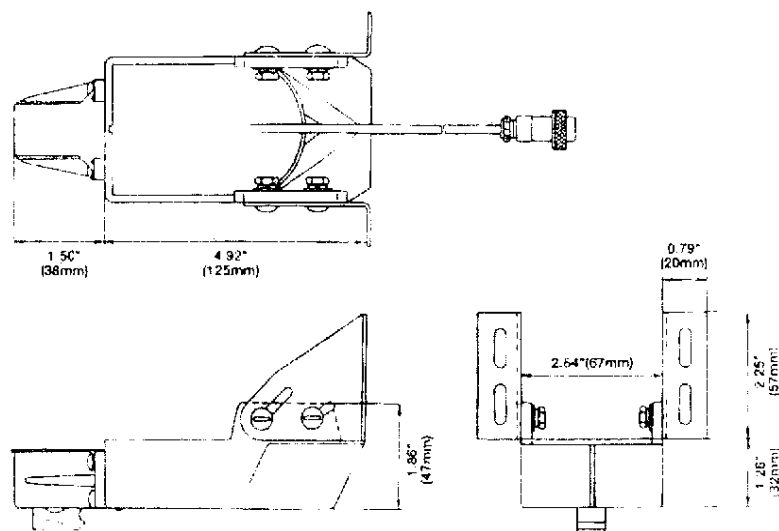

Figure 1 Transom Mount Transducer

As your echo sounder's performance depends on how well the transducer has been installed, please carefully read through the following mounting procedures:

1) For proper performance, the transducer's mounting location must be chosen carefully. The transducer should be mounted in a location that is free from turbulence and air bubbles created by movement of the boat as it travels through water. Air bubbles greatly reduce the efficiency of the transducer. It is also strongly recommended that the transducer be mounted in an area with the least amount of disturbed water coming off the transom. To determine the best mounting location, operate the boat at several different speeds and observe the water as it passes under the transom. Look for turbulence caused by the trim tabs, motor mounting, the keel and lifting strakes. Keep the transducer cable as far as possible from the boat's power cable, tachometer and other electrical cables.

2) This transducer has been designed to give you good performance installed on the transom of most boat types, however, the transom transducer should not be mounted on boats with in-board engines. For boats with poor water flow on the transom or in-boards, consider epoxying the transducer to the inside of the hull or select a thru-hull transducer. SI-TEX offers many styles of transducers for all applications.

3) Determine the transducer mounting place by referring to the above mentioned steps, 1 and 2. For best results, the transducer face should be level. Also the transducer face should be mounted from 1/8" to 1/4" below the surface of the hull. The trailing edge of the housing should be about 1/8" below the leading edge. The adjustable stainless steel bracket is designed to allow for "fine tuning" once the installation is completed.
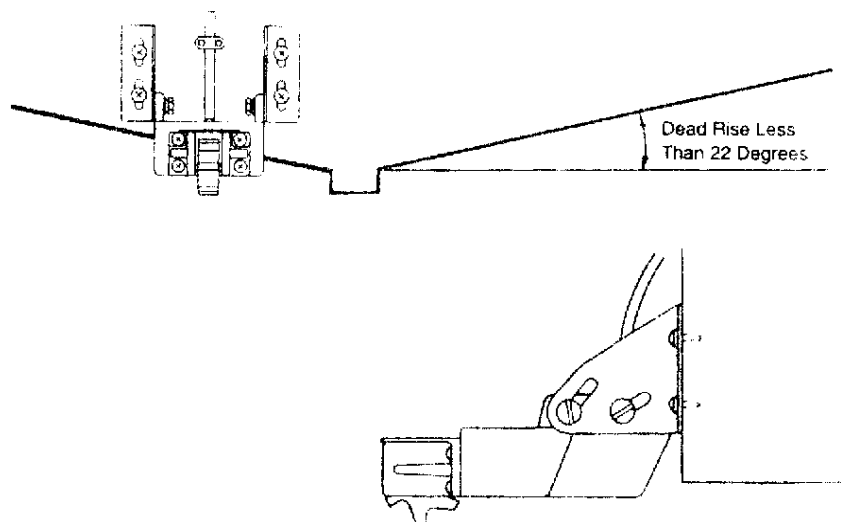

Dead Rise Less Than 22 Degrees

Figure 2 Transom Mounting

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1) Install the two bracket plates to the transducer using 4 sets of screws, nuts and washers in the set as shown in the figure below:
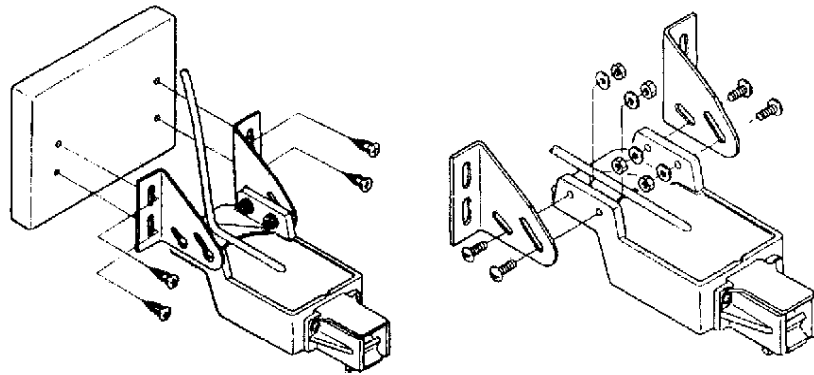
Figure 3 Transom Bracket

2-2. THRU-HULL MOUNT

This is an example of thru-hull mount transducer (#403-50-200ST).
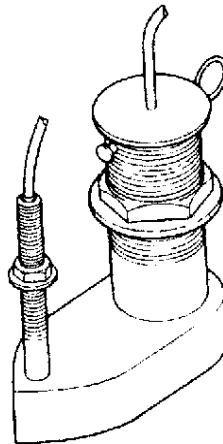
Figure 4 Thru-Hull Mount Transducer

1) The transducer should be installed in a place where no bubbles or disturbed water flows around it. Do not mount behind other thru-hulls such as water intakes or anything else that can cause a disturbed water flow.

2) The transducer should be installed well in front of the engine,but not too close to the bow. Ideally, it should be installed in the middle 1/3 of the hull at speed as shown below.

Water Line stopped

Best Location

Water Line at speed
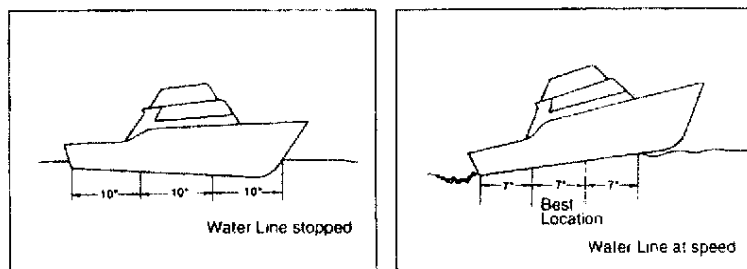
3) The transducer should be installed so as to maintain the transducer face pointed straight down. Therefore, some boat hulls may require fairing blocks for this alignment.

DEAD RISE ANGLE LESS THAN 5°

In this case, no fairing block is necessary. To prevent leakage, any gaps between the stem threads and the holes should be filled with marine sealant.

Stem

Fixing Nut

Marine Sealant
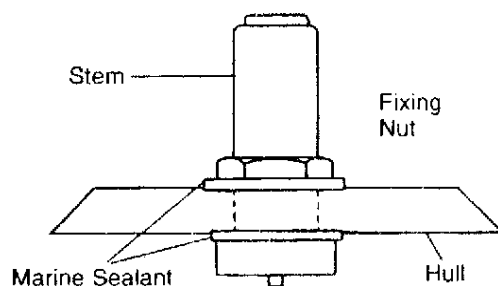
Hull

DEAD RISE ANGLE MORE THAN 5°

Apply fairing blocks inside and outside of the hull, and install the transducer with its face pointed straight down.
To prevent leakage, any gaps between the stem threads and the fairing block should be filled with marine sealant.

Marine Sealant

Stem

Fixing Nut

Outer Fairing Block

Inner Fairing Block

Hull
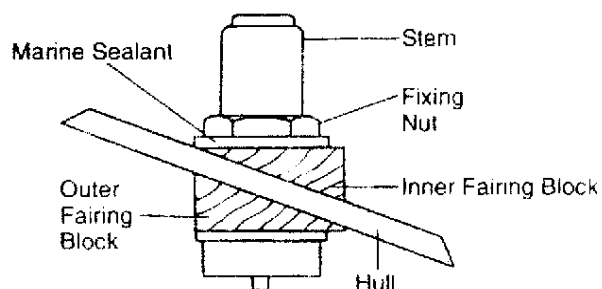
3. CVS-209 MOUNTING PROCEDURE

9.29" (236mm)

8.94" (227mm)

11.42" (290mm)

10.87" (276mm)

10.04" (255mm)

6—⌀0.28"
(⌀7mm)

2.76" (70mm)

3.94" (100mm)

7.09" (180mm)

9.37" (238mm)

0.12"
(3mm)

0.12"
(3mm)

Weight : 12.5lbs (5.6kg)
including trunnion
& Knobs

Figure 5 Dimensions/Weight

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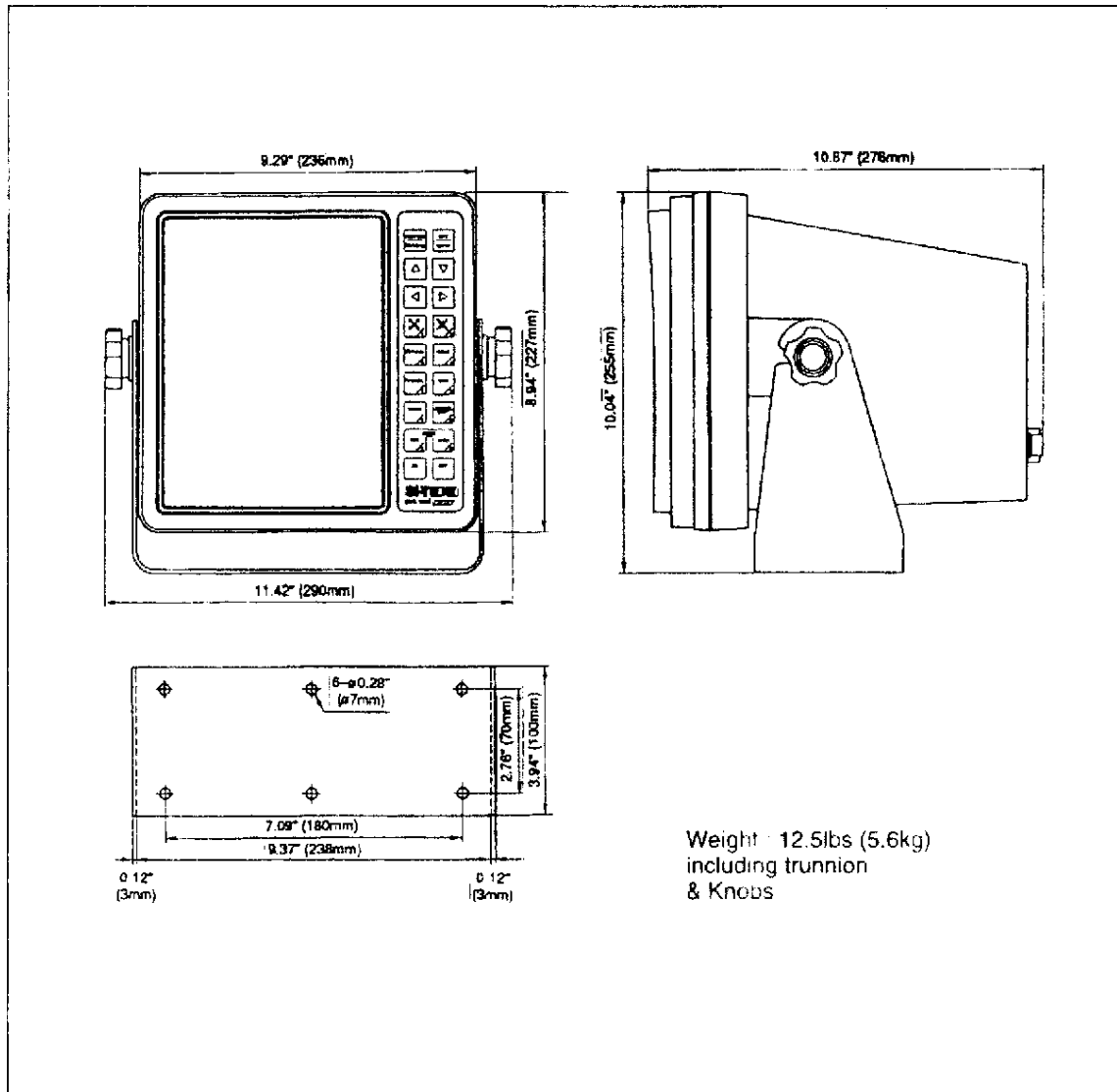1) The CVS-209 should be installed on a flat, solid surface for maximum stability.
As interference among other marine electronics equipment on board is a serious problem, consider this when selecting your location and before you decide on a permanent mounting place.

2) Position the trunnion mount, mark and drill six 1/4" holes.
Secure it using stainless steel screws or through bolts with backup washer and lock washers.
Mount the trunnion with the slots facing forward.

FORE

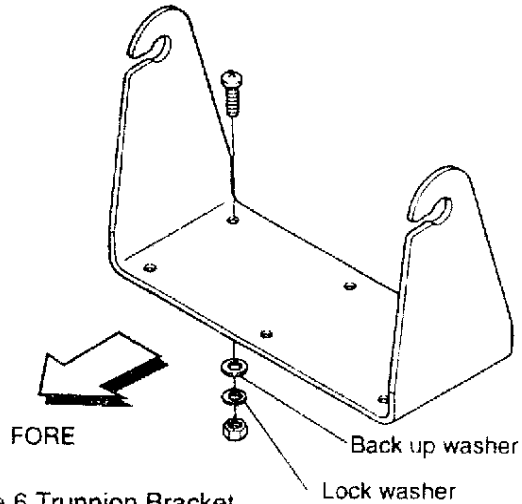Figure 6 Trunnion Bracket

Back up washer

Lock washer

3) Place the display unit in its mount and secure it to the trunnion using trunnion knobs and washers as shown in Figure 7.

Trunnion

Rubber Washer
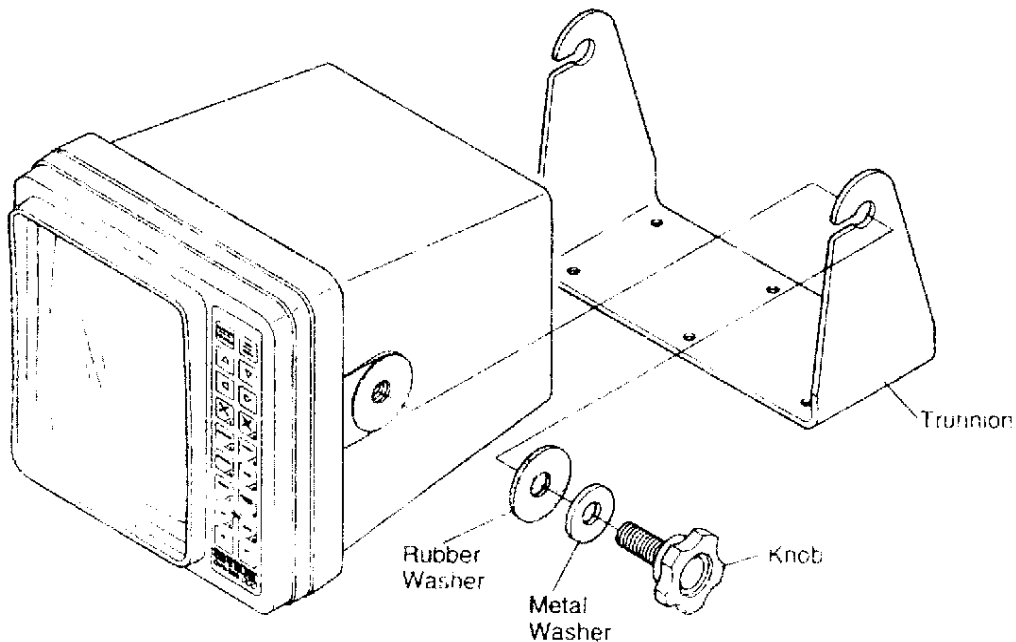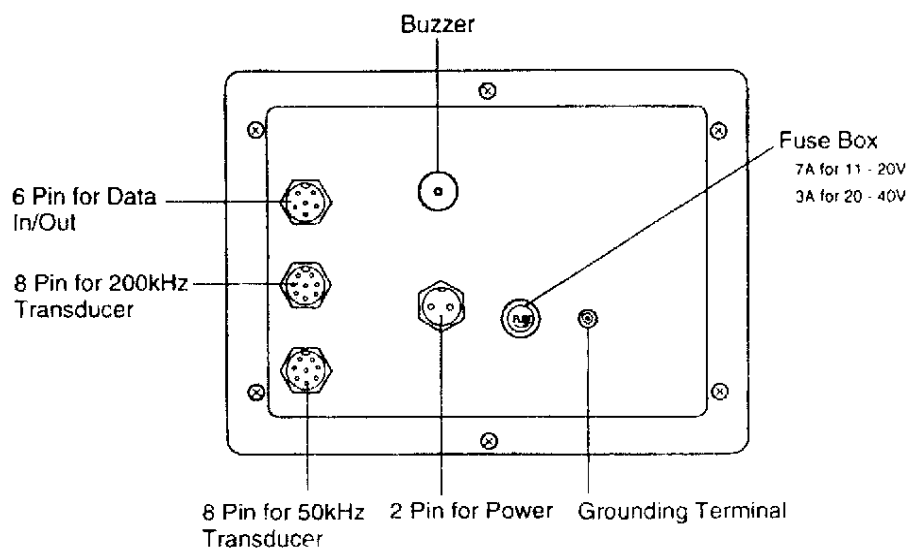
Metal Washer

Knob

Figure 7 Mounting CVS-209

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4. CONNECTOR CONNECTIONS

Buzzer

6 Pin for Data In/Out

8 Pin for 200kHz Transducer

Fuse Box
7A for 11 - 20V
3A for 20 - 40V

8 Pin for 50kHz Transducer   2 Pin for Power   Grounding Terminal

1) Transducer

The CVS-209 is a dual frequency unit of 50kHz and 200kHz, for which two 8 pin sockets are provided.

Four transducers are available.

Please select one depending on your application.

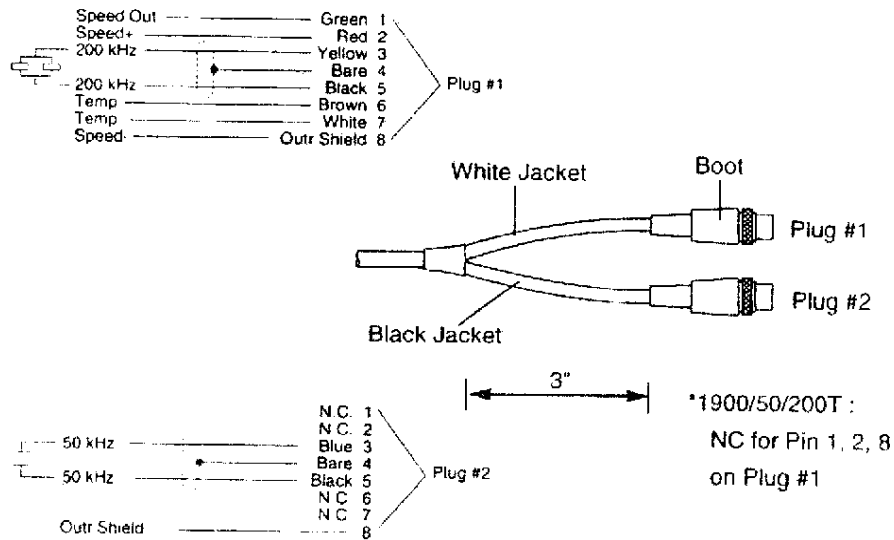| STANDARD	APPLICATION
239/50/200ST (Transom w/Temp and Speed) 403/50/200ST (Bronze Thru-Hull w/Temp and Speed)	Shallow Water

* Both are dual frequency single transducers.

OPTIONAL	APPLICATION
1900/50/200T (Bronze Thru-Hull w/Temp Only) 1900T & 705/200T (Bronze Thru-Hull w/Temp Only)	Deep Water

* 1900/50/200T: Dual Frequency Single Transducer
* 1900T & 705/200T: Two Separate Transducers

Cable of Dual Frequency Single Transducers

```
Speed Out  ───────── Green   1 ⟍
Speed+     ───────── Red     2
200 kHz    ───────── Yellow  3
           ───────── Bare    4        ⟩ Plug #1
200 kHz    ───────── Black   5
Temp       ───────── Brown   6
Temp       ───────── White   7
Speed-     ───────── Outr Shield 8 ⟋
```

White Jacket   Boot
                                    Plug #1

                                    Plug #2

Black Jacket

```
            N.C.  1 ⟍
            N.C.  2
50 kHz  ─── Blue  3
        ─── Bare  4   ⟩ Plug #2
50 kHz  ─── Black 5
            N.C.  6
            N.C.  7
Outr Shield ────  8 ⟋
```

|← 3" →|

*1900/50/200T :
NC for Pin 1, 2, 8
on Plug #1

As the figure shows, the temperature and speed sensors are provided to the 200kHz side.When you use these transducers, you are advised to set for HF for them in menu 2.

```
┌─────────────────────────────────┐
│  SPEED  TEMP ┊ HF   HF           │
└─────────────────────────────────┘
```

2) Data Input/Output NMEA0183

```
┌──────────────────────────────────────┐
│   1   Shield                          │
│                                       │
│   2   Signal ─────┐                   │
│                   ├── Data Out        │
│   3   Return ─────┘                   │
│                                       │
│   4   Signal ─────┐                   │
│                   ├── Data In         │
│   5   Return ─────┘                   │
│                                       │
│   6   + 12V                           │
└──────────────────────────────────────┘
```

3) Power

```
┌──────────────────────────────────────┐
│   1 (+)   Black with White Line       │
│   2 (-)   Solid Black                 │
└──────────────────────────────────────┘
```

4) Fuse

We supply two kinds of fuse.One is 7A and the other is 3A.Please use them properly depending on the power supply voltage.

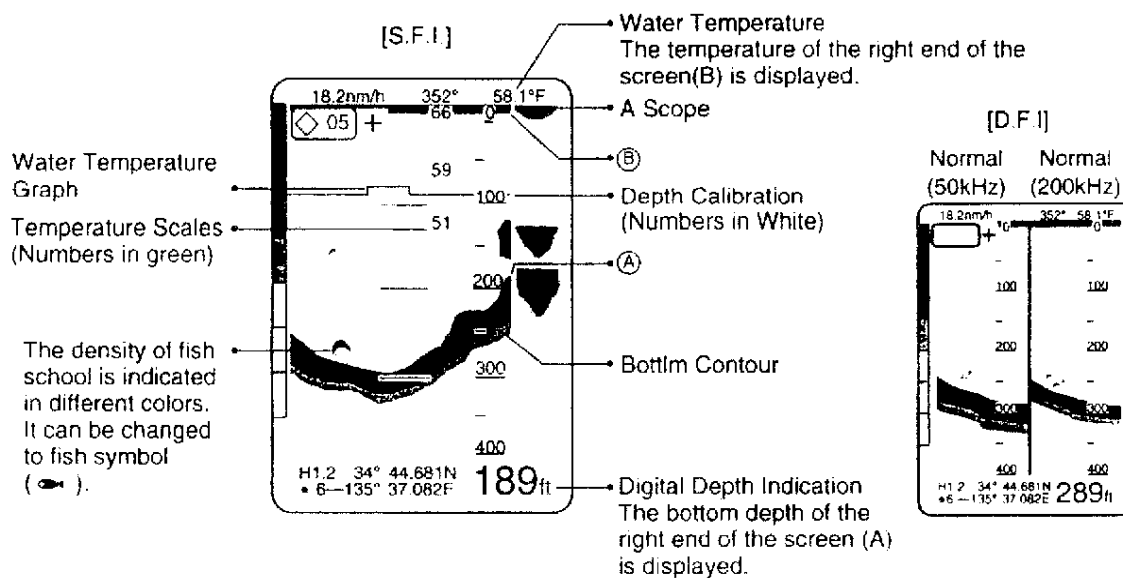| Power Voltage	Fuse to Use
11 - 20V	7 amp
20 - 40V	3 amp

When you get the product, 7A fuse is installed. If you use the power supply of 20   40V please change it to 3A fuse, which is included in the accessory box

10
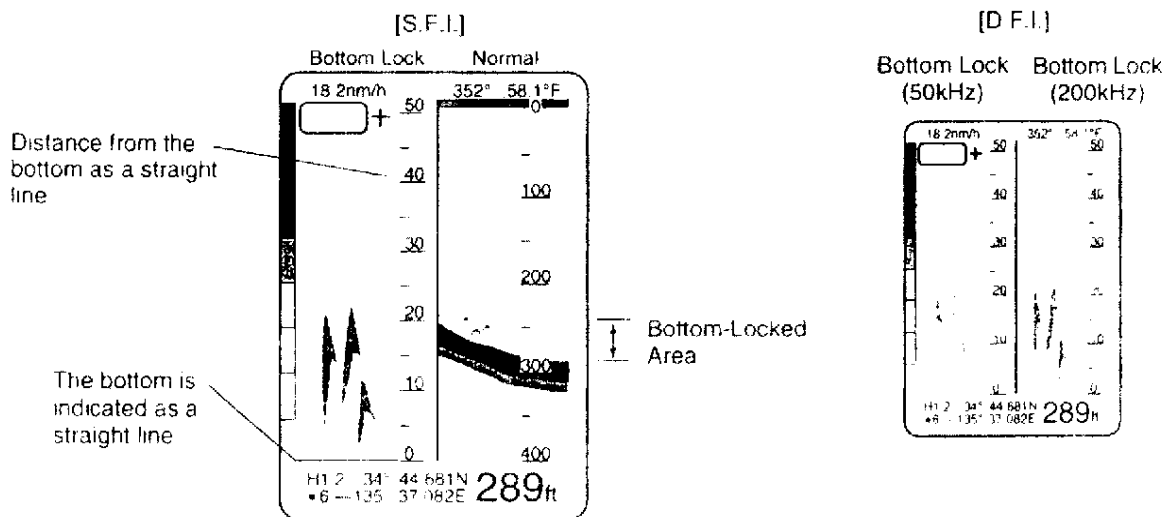
5. DISPLAYS AND OPERATION KEYS

5-1. SOUNDER DISPLAY

S.F.I. = Single Frequency Image
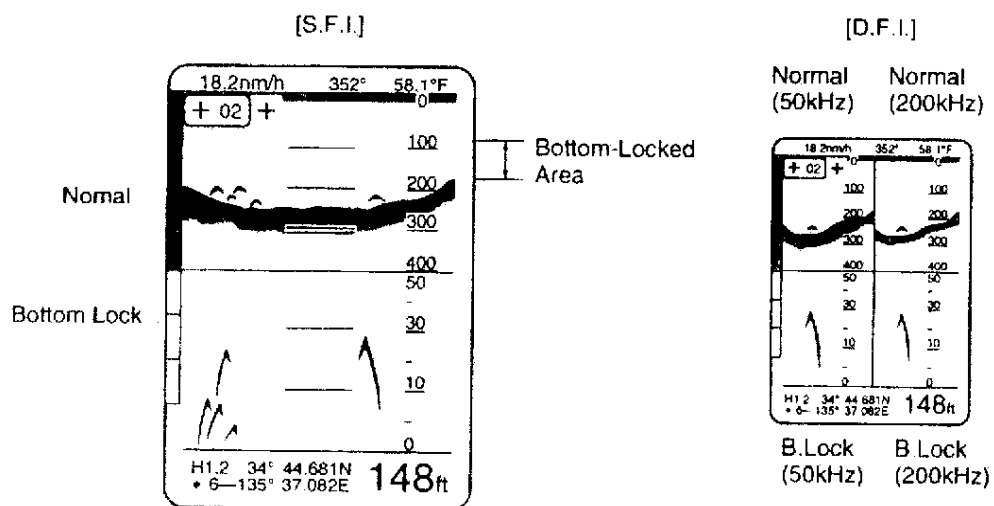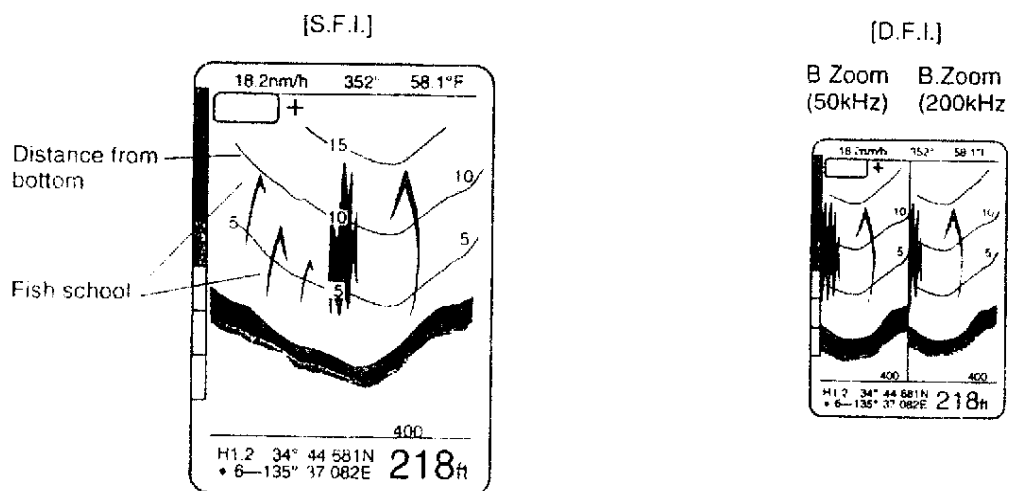D.F.I. = Dual Frequency Image

Normal Display

[S.F.I.]

Water Temperature
The temperature of the right end of the screen(B) is displayed.

A Scope

Water Temperature Graph

ⓑ

Depth Calibration (Numbers in White)

Temperature Scales (Numbers in green)

ⓐ

The density of fish school is indicated in different colors. It can be changed to fish symbol (⌖).

Bottlm Contour

Digital Depth Indication
The bottom depth of the right end of the screen (A) is displayed.

[D.F.I]

Normal (50kHz)   Normal (200kHz)

Normal + Bottom Lock Display

Vertical display split

[S.F.I.]

Bottom Lock   Normal

Distance from the bottom as a straight line

Bottom-Locked Area

The bottom is indicated as a straight line

[D.F.I.]

Bottom Lock (50kHz)   Bottom Lock (200kHz)

11

Horizontal display split

[S.F.I.]

Normal

Bottom Lock

Bottom-Locked Area

[D.F.I.]

Normal (50kHz)   Normal (200kHz)

B.Lock (50kHz)   B.Lock (200kHz)

Bottom Zoom Display

[S.F.I.]

Distance from bottom

Fish school

[D.F.I.]

B Zoom (50kHz)   B.Zoom (200kHz

The bottom zoom shows the same bottom as in normal display, but the area close to the bottom is zoomed up. It is effective to locate the fish close to the bottom or at the bottom.
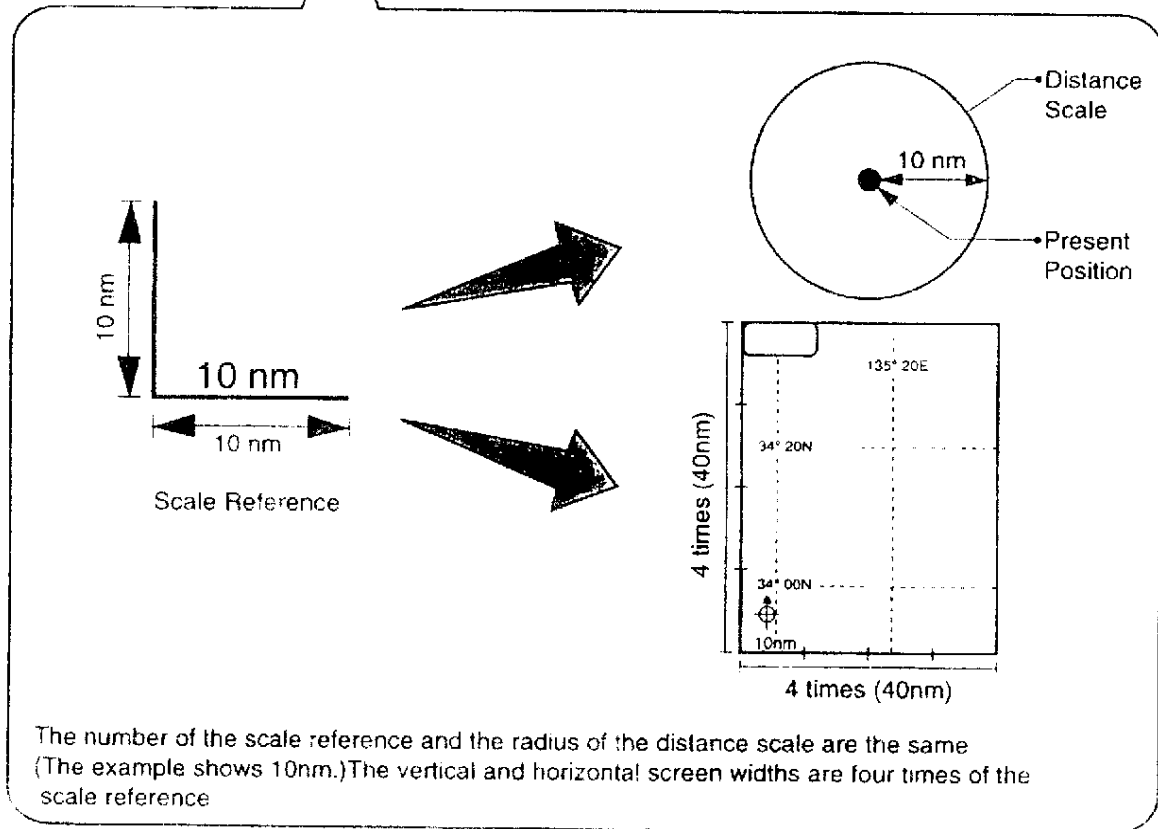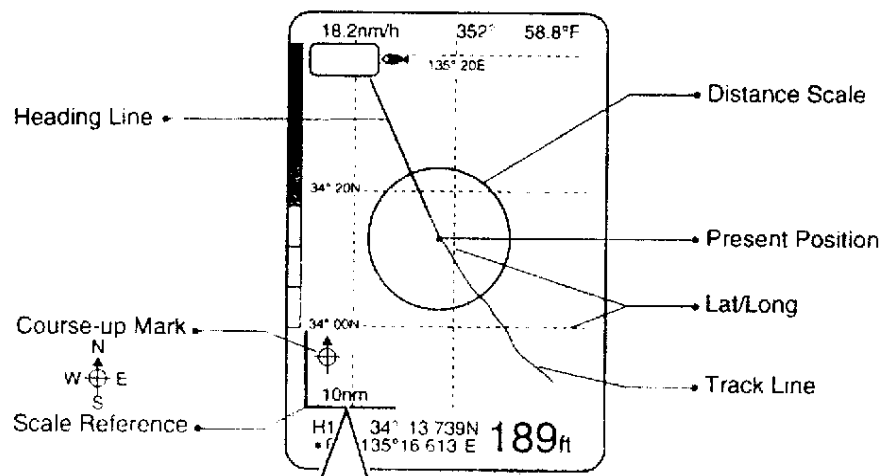
Normal + Zoom Display
Vertical display split

[S.F.I.]

Zoom   Normal

18.2nm/h   352°   58.1°F

+195
215
235
255
275
295

0
100
200
300
400

Zoomed Area

Zoom Bar

H1.2   34° 44.681N
6—135° 37.082E   278ft

[D.F.I.]

Zoom   Zoom
(50kHz) (200kHz)

18.2nm/h   352°   58.1°F
+195
215
235
255
275
295

195
215
235
255
275
255

H1.2   34° 44.681N
6—135° 37.082E   278ft

Horizontal display split

[S.F.I.]

18.2nm/h   352°   58.1°F

+

Normal

Zoom

0
100
200
300
400
199
239
279
299

Zoomed Area

Zoom Bar

H1.2   34° 44.681N
6—135° 37.082E   224ft

[D.F.I.]

Normal   Normal
(50kHz) (200kHz)

18.2nm/h   352°   58.1°F

+   0   0
100   100
200   200
300   300
400   400
199   199
239   239
279   279
299   299

H1.2   34° 44.681N
6—135° 37.082E   224ft

Zoom   Zoom
(50kHz) (200kHz)

5-2. PLOTTER DISPLAY

To use the plotter, you have to connect a GPS or a Loran C to the CVS-209.

The number of the scale reference and the radius of the distance scale are the same (The example shows 10nm.)The vertical and horizontal screen widths are four times of the scale reference

Information When Cross Hair Cursor On

Distance and bearing ← from the present position to the cross hair cursor that are displayed in yellow.

Present Position

The present position and the cross hair cursor are connected with a dotted line in white.

Cross Hair Cursor

Lat/Long of the cross hair cursor position that are displayed in yellow

Display shows:
18.2nm/h   352°   58.8°F
135° 20E
12.9nm
231°
34° 20N
34° 00N
10nm
H1.2   34° 13.739N
•6 —135° 16.613E   189ft

Inset diagram:
Present Position
12.9nm
231°
Cross Hair Cursor

Information When Marks On

● Indications when the cross hair cursor position is marked or the cursor is placed over a mark.

• Waypoint Mark   [⚓ 01]
   Mark ⌐   ⌐ Waypoint Number
                 in Yellow

• Event Mark   [🐟]
   Mark ⌐

• "DRAW" Mark   [•—]
   Mark ⌐

● Indications when navigating to a waypoint or a route waypoint.

• Waypoint Mark   [⚓ 01]
                 ⌐ Navigating Waypoint Mark
                    and Number in Blue

The used mark with the selected color is displayed here

Display shows:
.2nm/h   352°   58.8°F
135° 20E
11.1nm
256°
34° 20N
⚓01
POINT A
34° 00N
10nm
H1.2   34° 13.739N
•6 — 135° 16.613E   189ft

Present Position

Cross Hair Cursor

Waypoint Mark
   ⚓ POINT A
   Mark   Waypoint Name

Waypoint Mark
   ⚓ 01
   Mark ⌐   ⌐ Waypoint Number
                 in White
The mark can be selected among 11 symbols x 7 colors

"DRAW" Mark
The mark can be selected among 3 symbols x 7 colors.

Event Mark
The mark can be selected among 11 symbols x 7 colors

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Information When Navigating

Waypoint Mark
The mark and number of the waypoint that you are navigating to are displayed.

Distance, Bearing & Time to Go (ETA) from the present position to the waypoint are displayed in blue.

Heading Line
This indicates the line in the direction that boat is heading.

HDOP Value of Receiving Satellites
Smaller number shows better acquisition. When exceeding 20, the position calculation is stopped.

Number of Receiving Satellites

Track Color
Single color appointed
All 7 colors appointed

Boat Speed

Boat Course (Magnetic Bearing)

Water Temperature at Present Position

Distance Scale

Track Line
It is possible to change the colors by the change of the water temperature and depths.

Present Position

Shortest Route (Dotted line)

Waypoint Mark

Bottom Depth

Lat/Long of Present Position
Displayed in white when the position is acquired
Displayed in red when the position is not acquired.

(display readings: 18.2nm/h 352° 58.8°F 01 135° 20E 12.9nm 231° 00:58 34° 20N 34° 00N 10nm H1.2 34° 13.739N *6 135° 16.613E 189ft)

5-3. PLOTTER + SOUNDER DISPLAY

Plotter + Normal Display
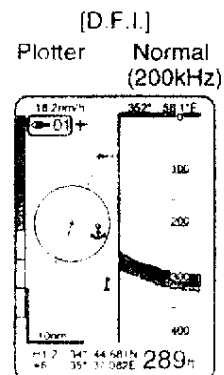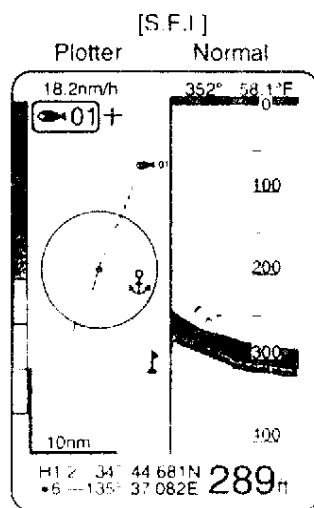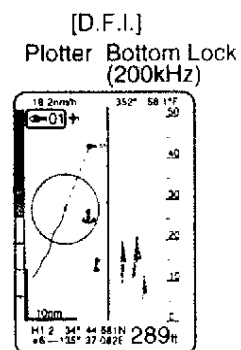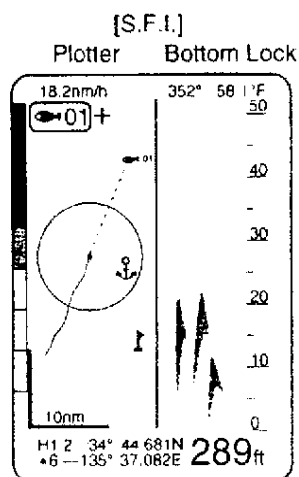
[S.F.I]
Plotter   Normal

[D.F.I]
Plotter   Normal
(200kHz)

Plotter + Bottom Lock Display
Vertical sounder display split

[S.F.I.]
Plotter   Bottom Lock

[D.F.I.]
Plotter Bottom Lock
(200kHz)

Horizontal sounder display split

[S.F.I.]
Plotter   Normal

Bottom Lock

[D.F.I.]
Plotter   Normal
(200kHz)

Bottom Lock
(200kHz)

Plotter + Bottom Zoom Display

[S.F.I.]
Plotter   Bottom Zoom

[D.F.I.]
Plotter Bottom Zoom
(200kHz)

17
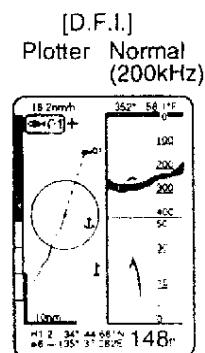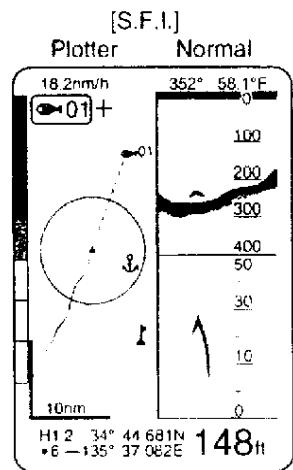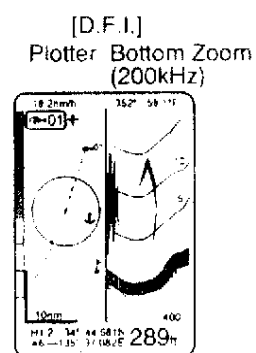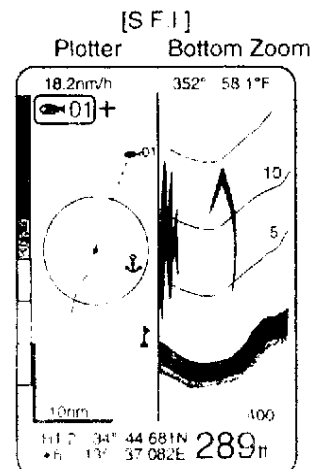
Plotter+ Zoom Display
Vertical sounder display split

[S.F.I.]
Plotter   Zoom

18.2nm/h   352° 58.1°F
01 +
195
215
235
255
275
10nm
295
H1 2   34° 44.681N
•6 — 135° 37.082E 289ft

[D.F.I.]
Plotter Zoom
(200kHz)

18.2nm/h   352° 58.1°F
01 +
195
215
235
255
275
10nm
295
H1 2   34° 44.681N
•6 — 135° 37.082E 289ft

Horizontal sounder display split

[S.F.I.]
Plotter   Normal

18.2nm/h   352° 58.1°F
01 +
0
100
200
300
400
199
239
279
299
10nm
H1 2   34° 44.681N
•6 — 135° 37.082E 289ft

Zoom

[D.F.I.]
Plotter   Normal
(200kHz)

18.2nm/h   352° 58.1°F
01 +
0
100
200
300
400
199
239
279
299
10nm
H1 2   34° 44.681N
•6 — 135° 37.082E 289ft

Zoom
(200kHz)
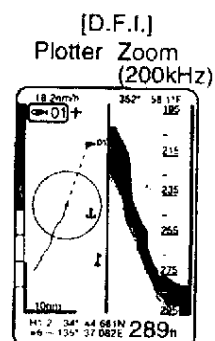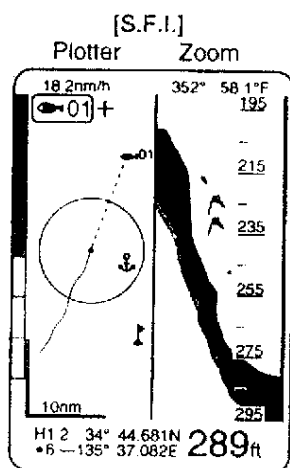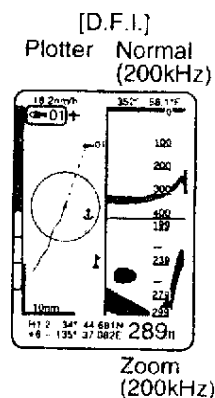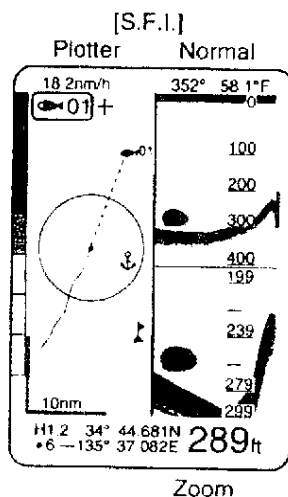
5-4. WAYPOINT DISPLAY

Waypoint Number
Waypoint Name
Waypoint's Lat/Long
Date & Time
Waypoint Mark
Depth & Water Temperature
at waypoint

Mark for Unoccupied Numbers

Mark for Occupied Numbers

Mark for waypoints not
displayed on screen
(Waypoints information is
stored here but not
displayed on Plotter
screen)

△ ▽ ◁ ▷ WPT SELECTION

01
POINT A   ]
33° 57   939N
135° 08   613E
06 - 20- 95
11   20 AM
184ft   59.2°f

0 1 2 3 4 5 6 7 8 9
0 0 0 0 0
1
2 0 0
3
4
5
6
7
8
9

COPY
fr ??   1
to ??   2

ROUTE
OFF   3

EDIT   4

DISP   6

INSTANT
MEMORY 8
00

Menu to Edit Waypoints

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5-5. MENU DISPLAY

1. PLOTTER MENU

1 [▲][▼]MOVE [◄][▶]SELECT

COURSE UP	OFF ON AT
AUTO SCALE	OFF ON
DRAW MARK	OFF ON
DIST SCALE	OFF ON
HDG LINE	OFF ON AT
L/L LINES	OFF ON
WPT NAMES	OFF ON
SEA COLOR	BL BK
NAV TIME	TTG ETA

2. TRK. COLORS/UNITS MENU

2 [▲][▼]MOVE [◄][▶]SELECT

TRK COLOR [□□□□□]

DEPTH ⋀   TEMP ⋀
10 ....59.6
20 ....59.4
30 ....59.2
40 ....59.0
50 ....58.8
60 ....58.6

DIST UNIT	nm sm km
DEPTH UNIT	ft m fm / thr HR
TEMP UNIT	°f °c

3. TRK. ERASE & MEMO MENU

3 [▲][▼]MOVE [◄][▶]SELECT

TRK DISP	OFF ON
TRK ERASE	[■□□] EXECUTE
PLOT INTERVAL	TIME DIST / 10 SEC

OVERALL   5hrs 30min

REST OF TRACK   1999

PRIMARY MENU

[▲][▼]MOVE [◄][▶]SELECT

BRIGHT   DK ▬ BT

1 PLOTTER
2 TRK COLORS/UNITS
3 TRK ERASE & MEMO
4 CORR./MARK CLEAR
5 ALARMS
6 SOUNDERS
7 SOUNDERS/OTHERS

7. SOUNDERS/OTHERS MENU

7 [▲][▼]MOVE [◄][▶]SELECT

GAIN	MAN AT
RANGE	MAN AT
A-SCOPE	OFF ON
ZOOM DISP	[∐] [⊟]
T GRAPH	OFF ON
BEARING	MAG TRU
SPEED TEMP	HF HF
SPEED DATA	INT EXT
FORMAT	NMEA-0183

4. CORR./MARK CLEAR

4 [▲][▼]MOVE [◄][▶]SELECT

POSITION CORRECT	EXECUTE / CANCEL
TIME CORR	+00 hour
SPEED ADJ	100
SPEED AVE	001 sec
MARK CLEAR	. / EXECUTE
WPT CLEAR	EXECUTE

REST OF MARKS   1000

5. ALARMS MENU

5 [▲][▼]MOVE [◄][▶]SELECT

ARRIVAL ALARM	OFF ON / 0.1 nm
ANCHOR ALM	OFF ON
XTE ALARM	OFF ON / 0.1 nm
KEEL ALARM	OFF ON / 1 ft
FISH ALARM	OFF ON / [■□□]
ALARM TONE	A B C D

6. SOUNDERS MENU

6 [▲][▼]MOVE [◄][▶]SELECT

IMAGE SPD	3/2
A. CLUTTER	[■□□]
C ECHO	OFF 1 2
DEP SCALE	OFF ON
F SYMBOL	OFF ON
S.T.C. HF	OFF 1 2 3
S.T.C. LF	OFF 1 2 3
PULSE	S M L
POWER	L M H

5-6. KEYBOARD

PLOTTER/SOUNDER KEY
This selects one of three displays of "Plotter", "Sounder" and "Plotter + Sounder".

When in menu displays, these four keys ([△][▽][◁][▷]) are used to move the square cursor or to change the settings.

EXPANSION KEY
This expands an area and displays it.

CURSOR KEY
Plotter Mode:This turns the cross hair cursor on or off.
Sounder Mode:This turns the depth scale on or off.

SYMBOL KEY
This selects a waypoint/event mark.

CLEAR KEY
This clears waypoint mark or event mark.
This also cancels the waypoint navigation.

WAYPOINT MEMORY KEY
The present position or the cross hair cursor position is memorized as a waypoint.

ON KEY
The power is turned on.

WPT/MENU DISPLAY KEY
The waypoint display or the menu display appears on the screen.

ARROW KEYS
Plotter Mode: These keys move the plotter disply or the cross hair cursor.
Sounder Mode: [△][▽] keys move the depth scale up or down.
Plotter + Sounder Mode: [◁] [▷] keys change the display width of them

REDUCTION KEY
This key reduces an area and displays it.

MODE KEY
In sounder display, this key displays the mode selecting window.

GAIN KEY
In sounder display, this key displays the gain adjusting window.

RANGE/SHIFT KEY
In sounder display, this key displays the range/shift selecting window.

MARK MEMORY KEY
The present position or the cross hair cursor position is memorized as an event mark

OFF KEY
Pressing down the key turns the power off

The keys with numbers at the bottom right corner are also used for editing waypoints and selecting a menu page.

6. SOUNDER

6-1. SELECTION OF SOUNDER MODE
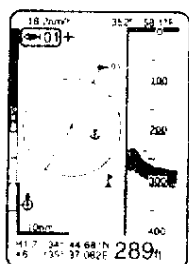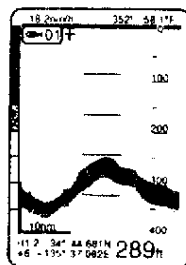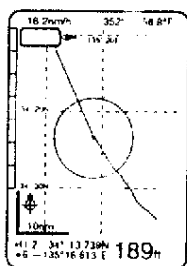
Every time the [PLOTTER / SOUNDER] key is pressed, the screen changes among "Plotter","Sounder" and "Plotter + Sounder" displays in rotation.

NOTE:
When in "Plotter + Sounder" display, the display width can be changed with the [◁] [▷] keys.
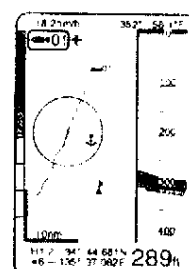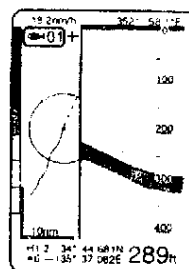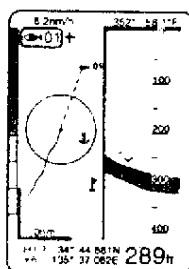
6-2. SELECTION OF OTHER SOUNDER DISPLAYS
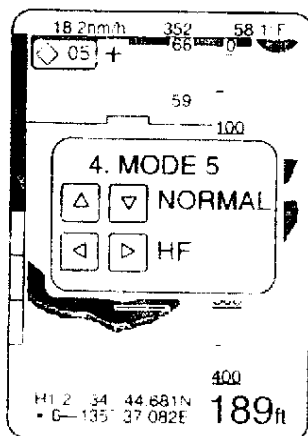
When you touch the [MODE] key, you will get this window.

1) [△] [▽] for selection of NORMAL, BOTTOM LOCK, BOTTOM ZOOM or ZOOM.

2) [◁] [▷] for selection of HF, LF or LF + HF.

HF. High Frequency = 200kHz
LF: Low Frequency = 50kHz

```
4. MODE 5
[△] [▽] NORMAL
[◁] [▷] LF + HF
```
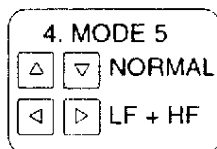
When selecting
NORMAL and LF + HF

Normal Display of Low
Frequency on left side
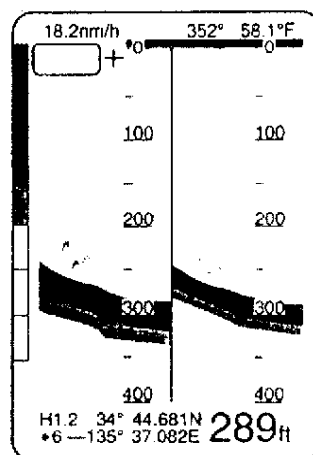
Normal Display of High
Frequency on right side

6-3. ADJUSTMENT OF GAIN AND DYNAMIC RANGE

[1] GAIN

The gain should be adjusted so that the bottom is displayed in red. The gain level changes depending on bottom depth, nature of soil, kinds of fish and way of transducer mount.Referring to the following drawings, please adjust it.
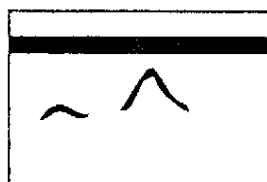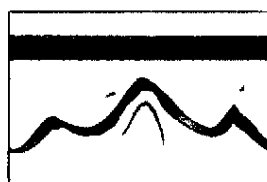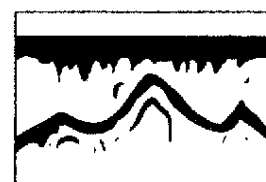
Poor   Good   High

NOTE:
The gain is set to Manual at the factory. Please adjust it to the proper level, or change to Auto mode in menu 7.

MANUAL GAIN ADJUSTMENT
(While in Manual Gain Mode)
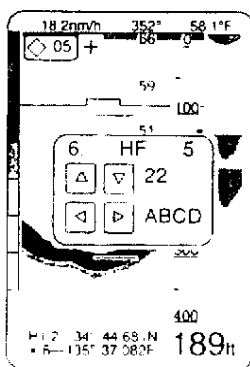
When you press the [GAIN] key, you will get this window.

The frequency here indicates the one you selected in 6-2.

If you selected LF + HF, pressing the [GAIN] key shows LF and HF alternately.

1) [△] [▽] for selection of manual gain level between 0 and 50

2) [◁] [▷] for selection of dynamic range among A, B, C and D

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AUTO GAIN ADJUSTMENT

(While in Auto Gain Mode)
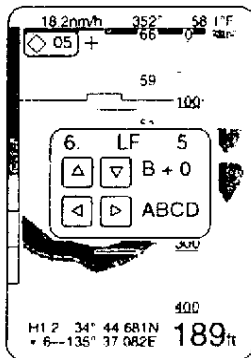
When you press the [GAIN] key, you will get this window. The frequency here indicates the one you selected in 6-2.

1) [△] [▽] for selection of offset value between +5 and -5.

Offset Value

This is for the fine adjustment of auto gain, which may be necessary to compensate for the change of gain due to the way and place of transducer mount, and the nature of bottom soil.

2) [◁] [▷] for selection of dynamic range among A, B, C and D.

[2] DYNAMIC RANGE

When the bottom of the sea is soft like mud, the gain is usually increased to get the clear bottom image.
However, it also causes noise on the screen.
This function is provided to show the bottom clearly without the clutter on the screen.
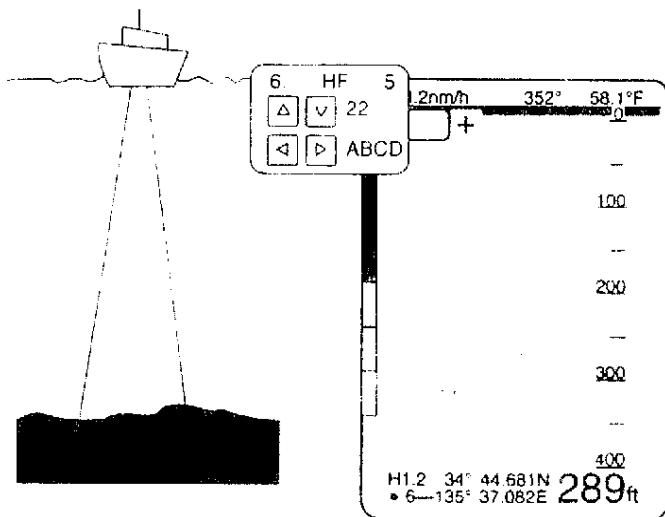
Muddy Bottom

Bottom is not clear

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```
6.    HF    5
[△][▽] 22
[◁][▷] ABCD
      [△][▽] 47
      [◁][▷] ABCD
```
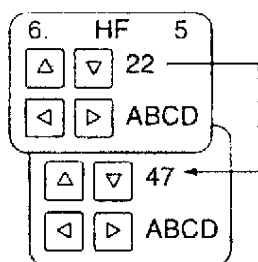
Gain was increased.
Dynamic range is unchanged.
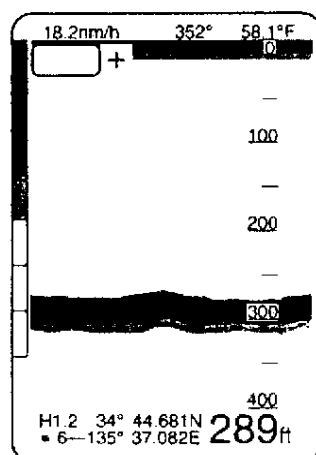
Bottom became clearer but the unwanted noise also appeared and it is difficult to see the screen.

```
6.    HF    5
[△][▽] 22
[◁][▷] ABCD
      [△][▽] 22
      [◁][▷] ABCD
```
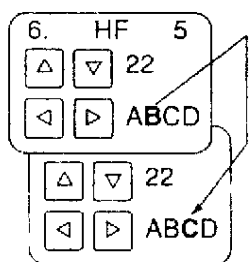
Gain is unchanged.
Higher level of dynamic range was selected (B →C).
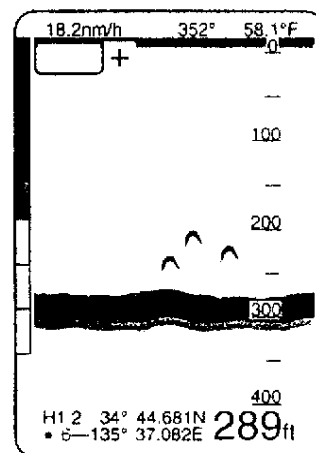
Bottom became clearer.
No unwanted noise is displayed.

6-4. CHANGE OF DEPTH RANGE AND RANGE SHIFT

[1] DEPTH RANGE

You can select auto or manual range mode in Menu 7. It is set to Manual at the factory.

Manual Range

· As the depth range is fixed, you can see the change of the bottom contour at a glance.

Auto Range

· Depending on the bottom depths, the depth range is selected automatically. This keeps displaying the bottom image on the screen without any manual intervention.

NOTE:

The following conditions may fluctuate the digital depth indication or select an improper depth range.
. Boat is running too fast.
.Gain is low
.Depth is very shallow so that the transducer and the bottom are extremely close each other

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MANUAL RANGE SELECTION
(While in Manual Range Mode)
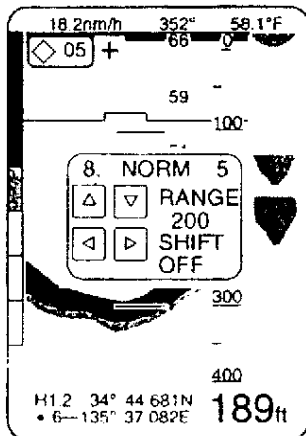
When you press the [RANGE SHIFT / B] key, you will get this window. As the depth range is adjustable only in normal display, "NORM" is indicated.

1) [△] [▽] for selection of depth range manually.

Maximum Depth Range
The maximum depth range is 3,000 feet.
Available ranges
10, 20, 30, 40, 50, 60, 80, 100, 120, 140, 160, 200, 240, 300, 400, 500, 600, 800, 1000, 1500, 2000, 3000

[2] RANGE SHIFT

Range shift function can be set for both auto depth range mode and manual depth range mode.

RANGE SHIFT IN MANUAL RANGE MODE
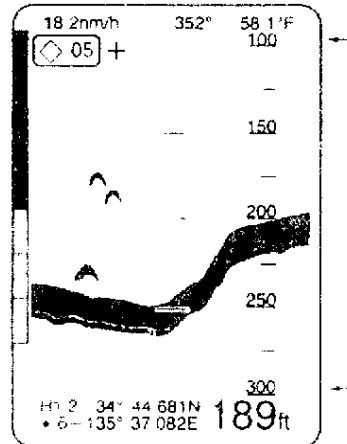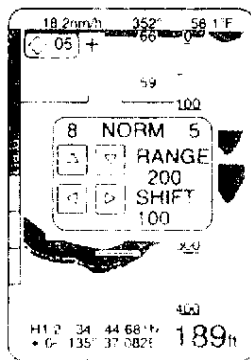
The CVS-209 is operating in 100 - 300 feet depth range

How to Use Shift Function

1 Select a depth range to use with [△] or [▽] keys.

2 Select a shift range with [◁] or [▷] keys

- Selected depth range
  - 200 feet
- Selected shift range
  - 100 feet

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RANGE SHIFT IN AUTO RANGE MORE

How to Use Shift Function

1) Select a depth range to use with

[△] or [∨] keys.
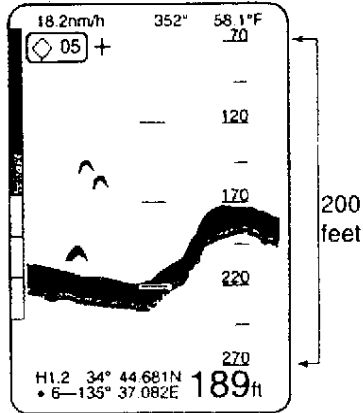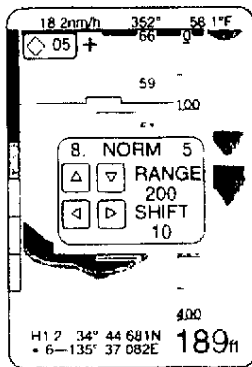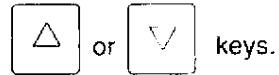
2) Turn the shift function on by selecting any number other than "OFF" with

[◁] or [▷] keys.

In Auto range mode, please select any number because it is just necessary for turning the shift function on.

The CVS-209 selects the best upper and lower limits with 200 feet range width.

```
· Selected depth range
  - 200 feet
· Shift function on
  - "OFF" → "10"
```

When the bottom goes out of the screen, the new range is automatically selected to keep it on the screen.
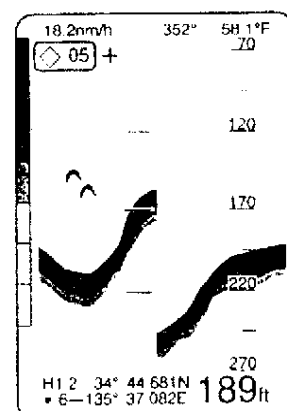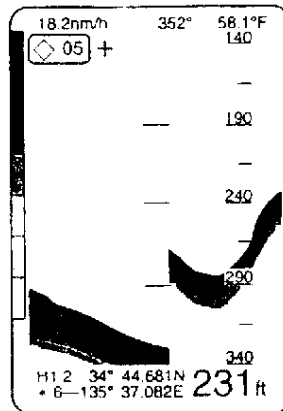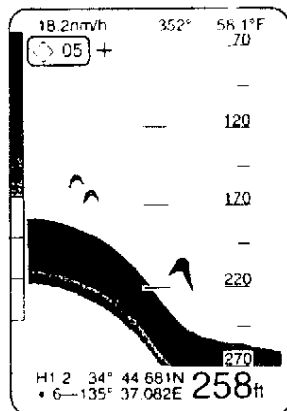
The range width (200feet) is unchanged.

6-5. CHANGE OF ZOOM RANGE

When you select zoom mode, the zoomed image of a certain area is displayed together with the normal image on the screen. The area can be selected anywhere within the normal range.

When you change the zoom range, you have to display the zoom mode.
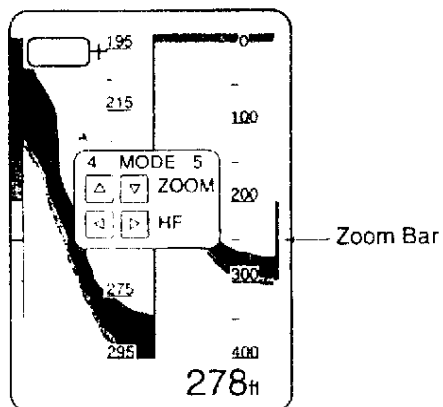
1) [MODE] key for displaying mode selection window.

2) [△] or [▽] for selection of "ZOOM".

Zoom Bar

The area indicated with the zoom bar is zoomed and displayed on the left side.

CHANGE OF ZOOM RANGE

Zoom Bar
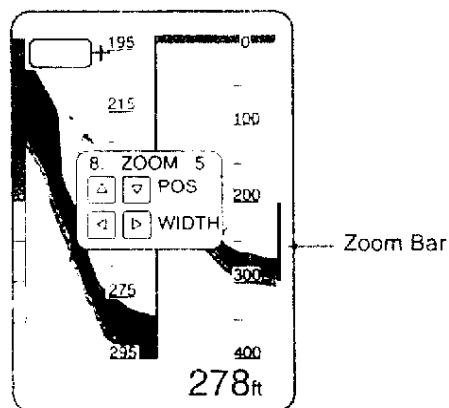
When you press the [RANGE SHIFT] key, you will get this window.

If the range/shift change window appears,press it again
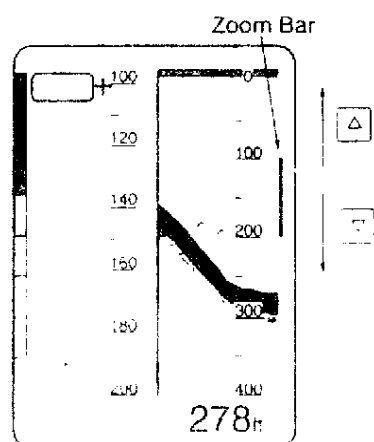
Zoom Bar

1) [△] [▽] for selection of zoom position

(The bar moves up and down)

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2) ◁ ▷ for changing the zoomed area.

(The length of the zoom bar changes.)
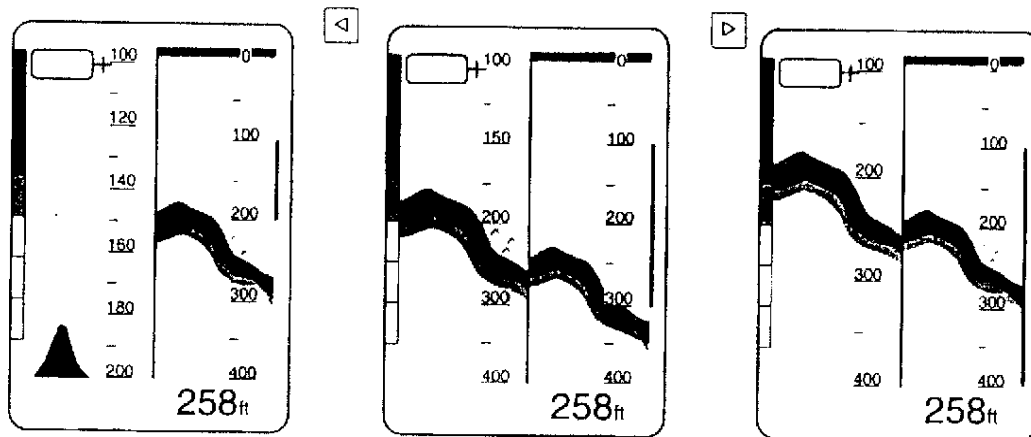
6-6. DEPTH SCALE

Depth Indication of Scale Position
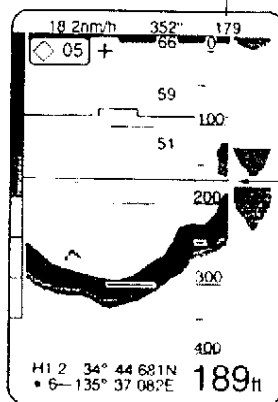
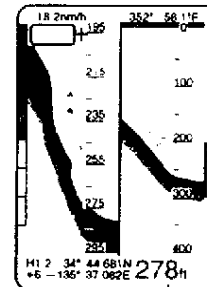You can see the exact depth of a point, fish school, etc., using this scale.
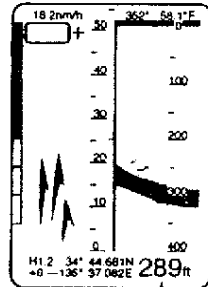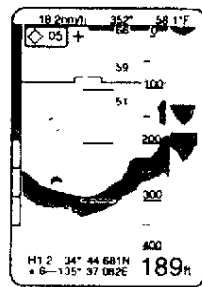
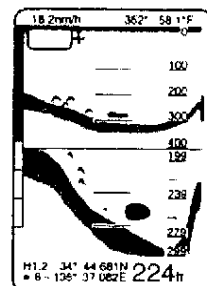Press CURSOR /₃ key. The depth scale is
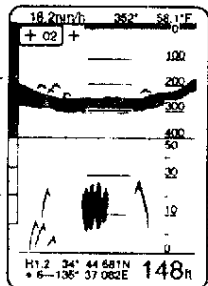
displayed

1) ∧ ▽ for moving the depth scale up

and down.

Displayes where the depth scale is available.

[S.F.I.]

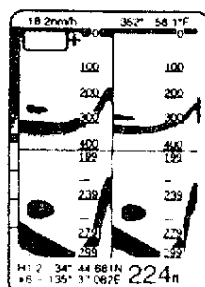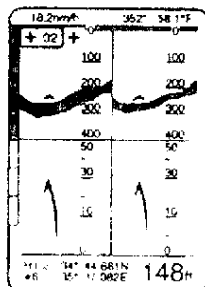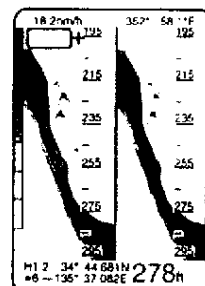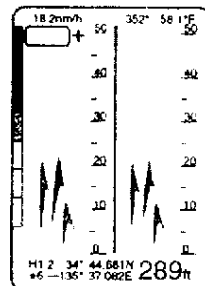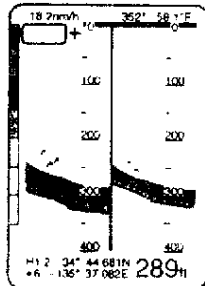· Depth scale is active for normal displays.

· Depth scale is active for both displays.

· · Depth scale is not available for Bottom Zoom displays.

[D.F.I.]

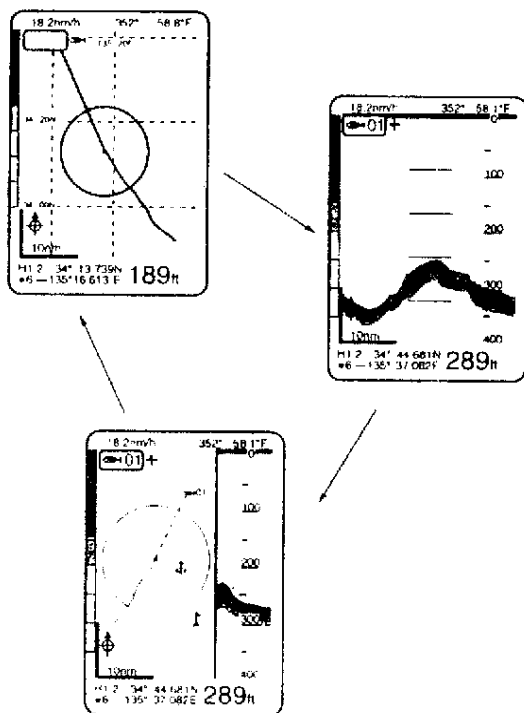Depth scale is not available for Bottom Zoom displays.

7. PLOTTER

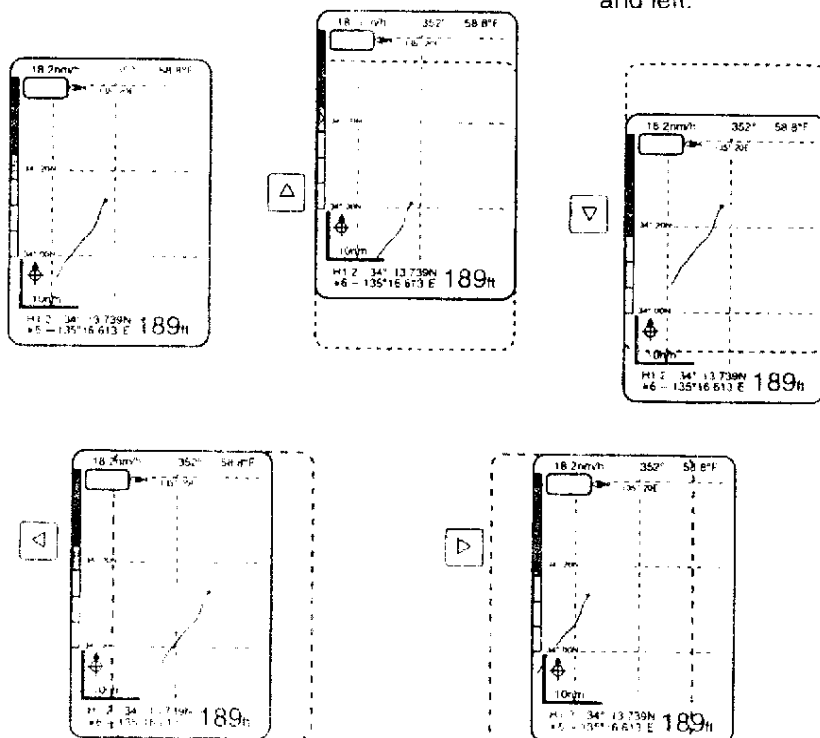To use the plotter, you have to connect a GPS or a Loran C to the CVS-209.

7-1. SELECTION OF PLOTTER MODE

Every time the [PLOTTER/SOUNDER] key is pressed, the

screen changes among "Plotter", "Sounder" and "Plotter + Sounder" displays in rotation.
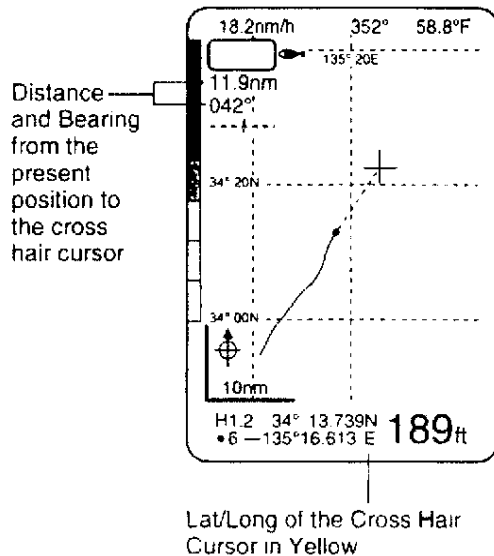
7-2. MOVING THE DISPLAY

You can move the display up and down, or right and left.

When the cross hair cursor is on, these keystrokes move it.

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7-3. CROSS HAIR CURSOR

DISPLAY OF CROSS HAIR CURSOR

Distance
and Bearing
from the
present
position to
the cross
hair cursor

Lat/Long of the Cross Hair
Cursor in Yellow

When you press the [CURSOR] key, the cross

hair cursor is displayed at the center of the screen.

When you press it again, it is turned off.

The navigational calculation from the present position to the cross hair cursor position is automatically started.

Lat/Long at the bottom changes to the cross hair cursor position.

MOVING THE CROSS HAIR CURSOR
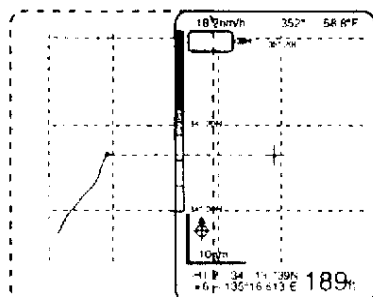
You can move the cross hair cursor with

[△] [▽] [◁] [▷] keys
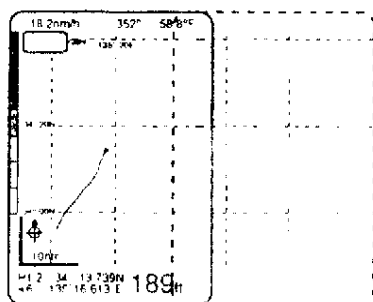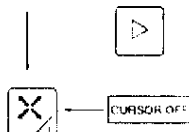
When the present position goes out of the screen by moving the cross hair cursor, it will not be displayed if the cross hair cursor is turned off.

To display the present position on the screen, press

the [✕] or [✕] key.

7-4. DISPLAY EXPANSION AND REDUCTION

EXPANSION
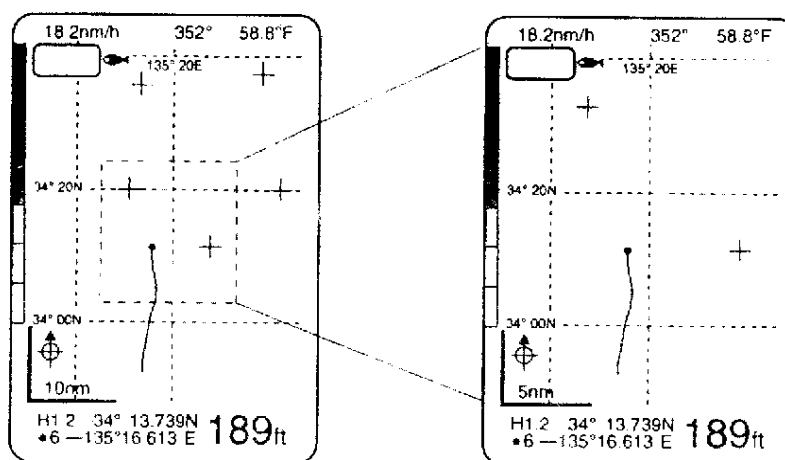
When you press the [X] key, the area enclosed with [ ] is

expanded to the size of screen.
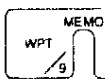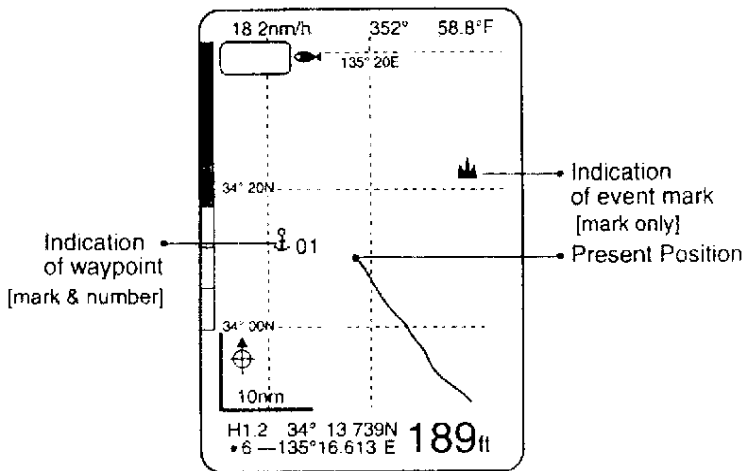
REDUCTION
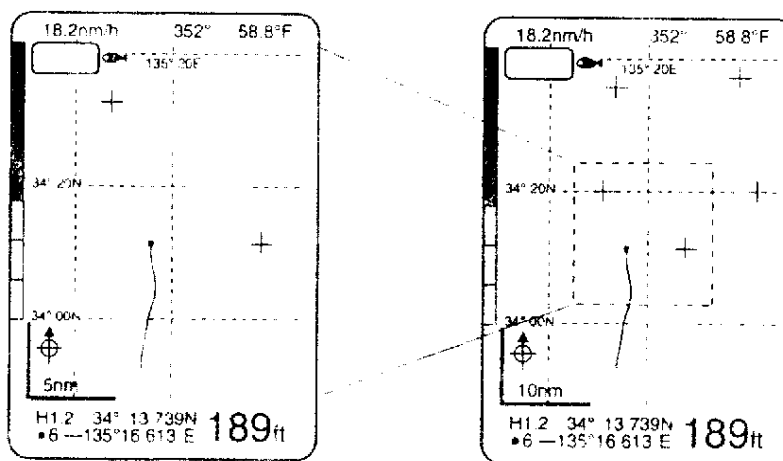
When you press the [X] key, the display of the full screen is reduced to

the size enclosed with [ ]

7-5. EVENT MARK AND WAYPOINT

DIFFERENCES BETWEEN EVENT MARK AND WAYPOINT

	WAYPOINT	EVENT MARK
Keys to Use		
Points of Memory	200 points (100 for temporary storage)	1000 points
Indication on Plotter Display		
Information	· The indication of waypoint can be turned on or off on the plotter screen. · In the waypoint display, you can see the information such as point name, day & time, lat/long, mark, depth and water temperature.	· If the point is erased out of the screen, it can not be displayed again. · The event mark is only indicated on the plotter display. No information can be stored.
Application	You can do the waypoint navigation by using the stored waypoint.	When you come across an incident, or find a good fishing spot, you can use this point as a landmark

You can not navigate to an event mark point

SELECTION OF MARK AND ITS COLOR
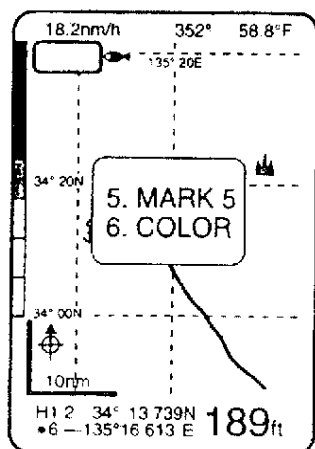
When you press the [SYMBOL] key, you will get this window.

You can select a mark and its color used for event mark or waypoint.

Available marks

+ + ○ ◇ □ × ▲ ➤ ⚓ ✈ ⌐

Abailable Colors
Blue, White, Cyan, Green, Yellow, Orange, Red

This mark changes by pressing the key
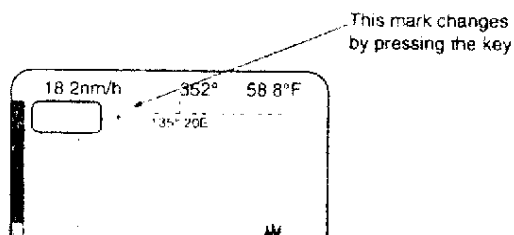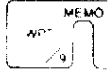
1) [SYMBOL] for the selection of mark, as the first line of the window indicates.

2) [GAIN] for the color selection for the selected mark.

EVENT MARK OR WAYPOINT MARK ENTRY

When you want to mark the present position as a waypoint or an event mark,

press [MEMO / WPT] or [MEMO / MARK] key.

This is possible for both Plotter and Sounder modes.

" ➤ " mark was selected

[MEMO / WPT] key was pressed

36

Selected Mark

18.2nm/h   352°   58.8°F

00 135°20E

34°20N

34°30N

10nm

H1.2   34° 13.739N
• 6 —135°16.613 E   **189**ft
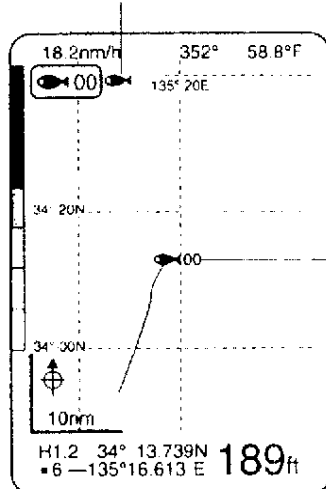
• Present position was
  marked as a waypoint.

△ ▽ ◁ ▷ WPT SELECTI

00

34°   33.   286N
135°   15.   070E
+06 - 23-' 95
   03 : 15 AM
   219ft 58.1°f

  0 1 2 3 4 5 6 7 8 9
0 O · · · · · · · ·
1 · · · · · · · · ·
2 · · · · · · · · ·

COPY
fr ??
to ??

ROUTE
OFF

EDIT

The data is stored
in the waypoint #00
in Waypoint display.

Waypoint is also marked on Sounder display.

18.2nm/h   352°   58.1°F

00

0

100

200

300

400

H1.2   34° 44.681N
• 6—135° 37.082E   **289**ft
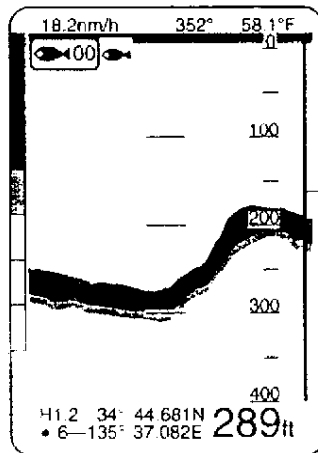
• It is marked
  with any ellow
  vertical line.

Look!

**This line will be lost when it   goes out of
the screen.**

To mark the cross hair cursor position as a waypoint

18.2nm/h   352°   58.8°F

00 135°20E

34°20N

00

34°30N

10nm

H1.2   34° 13.739N
• 6 — 135° 16.613 E   **189**ft
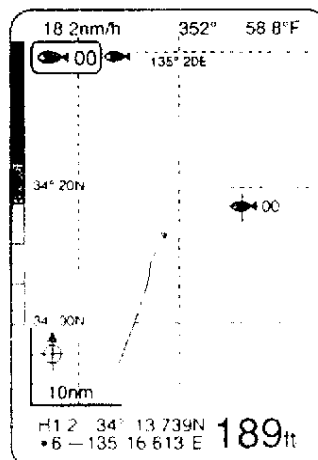
1) Turn the cross hair cursor on with the [CURSOR] key

2) Place the cursor at the place to mark with

   △   ▽   ◁   ▷   keys.

3) Press the [MEMO/WPT/9] key
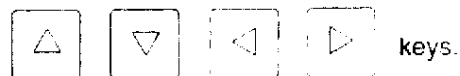
! → ⬤ for waypoint 10

When you place the cross hair cursor over 10, it is indicated here.
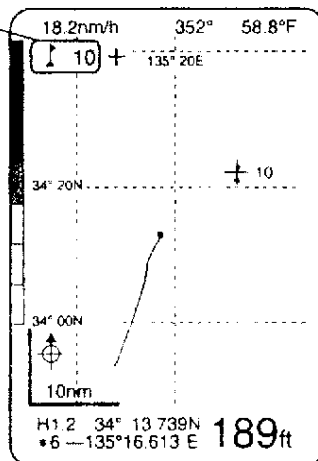
1) Turn the cross hair cursor on with [CURSOR /3] key

2) Move it with [△] [▽] [◁] [▷] keys

and place it over waypoint 10.

3) Press the [SYMBOL /5] key. You will get this window.

Then, press it again until the mark " ⬤ " appears at the column.

5. MARK 5
6. COLOR
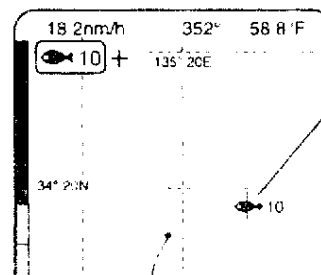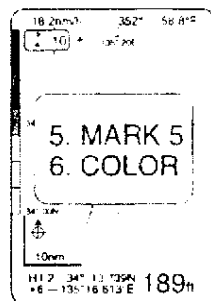
This mark is also changed.

ERASING WAYPOINT OR EVENT MARKS
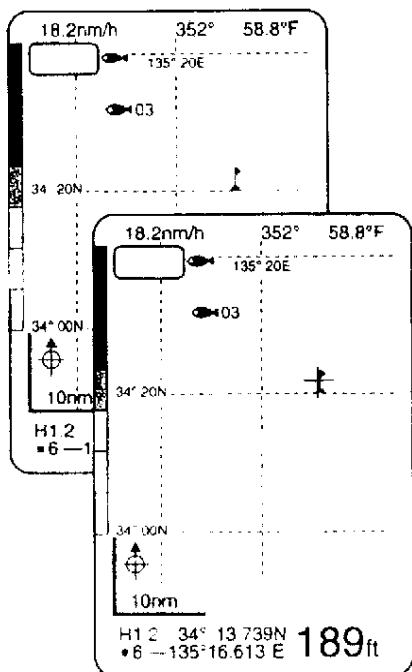
1) Turn the cross hair cursor on with the [CURSOR] key.
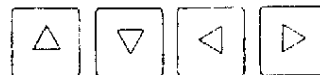
2) Move the cursor with [△] [▽] [◁] [▷] keys, and place it over the waypoint or event mark to erase.

3) Press the [CLEAR] key.

Event Mark: Once erased, it will not be displayed again.
Waypoint: It can be displayed again as its data is kept in Waypoint display.

7-6. WAYPOINT DISPLAY

TWO WAYPOINT DISPLAY PAGES
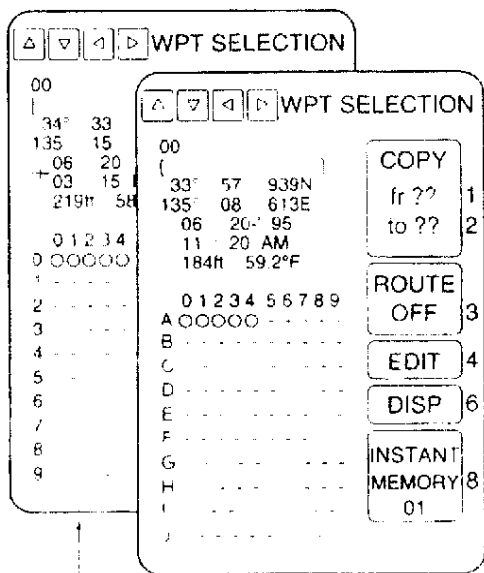
[Page for Temporary Memory - lines in numbers]

[Page for Permanent Memory - lines in alphabets]

To change the display page, press

[△] or [▽] key until the square cursor goes over to the next page.

COPYING A WAYPOINT TO OTHER WAYPOINT NUMBER

To copy 00 to 35

SELECTION

```
COPY
fr ??    1
to ??    2
```

```
   0 1 2 3 4 5 6 7 8 9
0  0 0 0 0 0 0 0 0 0 0
1  - - - - - - - - - -
2  - - - - - - - - - -
3  - - - - - - - - - -
4  - - - - - - - - - -
5  - - - - - - - - - -
6  - - - - - - - - - -
7  - - - - - - - - - -
8  - - - - - - - - - -
9  - - - - - - - - - -
```

Keys for Copying

1) Place the square cursor over 00 with
△ ▽ ◁ ▷ keys.

2) Press the key.

```
COPY
fr ??    ⟶    COPY
to ??         fr 00
              to 00
```

```
   0 1 2 3 4 5 6 7 8 9
0  0 0 0 0 0 0 0 0 0 0
1  - - - - - - - - - -
2  - - - - - - - - - -
3  - - - - 0 - - - -
4  - - - - - - - - - -
5  - - - - - - - - - -
6  - - - - - - - - - -
7  - - - - - - - - - -
8  - - - - - - - - - -
9  - - - - - - - - - -
```

3) Move the square cursor to 35 with
△ ▽ ◁ ▷ keys.

4) Press the key.

```
COPY
fr 00    ⟶    COPY
to 00         fr 00
              to 35
```

CLEARING THE DATA IN WAYPOINT

```
┌──────────────────┐
│  To clear 05     │
└──────────────────┘
```

```
    0 1 2 3 4 5 6 7 8 9
  0 0 0 0 0 0 0⧈0 0 0 0
  1 · · · · · · · · · ·
  2 · · · · · · · · · ·
  3 · · · · · · · · · ·
  4 · · · · · · · · · ·
  5 · · · · · · · · · ·
  6 · · · · · · · · · ·
  7 · · · · · · · · · ·
  8 · · · · · · · · · ·
  9 · · · · · · · · · ·
```

1) Place the square cursor over 05 with

△ ▽ ◁ ▷ keys.

2) Press the [CLEAR/?] key

```
  4  5  6  7   │        4  5  6  7  │
    [0]        │  ──→      [-]      │
```

> The mark changes from "0" to "-", and the data that was stored is lost.

> When you want to clear all waypoints, go to Menu 4, and select "WPT CLEAR".
> All waypoints are cleared at once.
>
> ┌──────────────┬──────────┐
> │ WPT CLEAR   │ EXECUTE │
> └──────────────┴──────────┘

SELECTING WAYPOINTS TO DISPLAY ON PLOTTER SCREEN

```
    0 1 2 3 4 5 6 7 8 9
  0 0 0 0 0 0 0 0 0 0 -
  1 · · · · · · · · · ·
  2 · · · · · · · · · ·
  3 0 0 0 0 0 ⧈ · · · ·
  4 0 0 0 · · · · · · ·
  5 · · · · 0 0 0 0 0 0
  6 · · · · · · · · · ·
  7 · · · · · · · · · ·
  8 · · · · · · · · · ·
  9 · · · · · · · · · ·
```
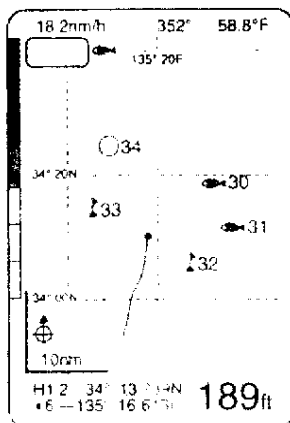
1) Select a line to display with △

or ▽ keys.

> The square cursor should be placed over an unoccupied waypoint number.
> Otherwise, the waypoint navigation will start to it.

2) Press the [PLOTTER/SOUNDER] key to show the

Plotter screen.

41

WAYPOINTS ON/OFF ON PLOTTER SCREEN

To turn off the waypoint 07

```
18.2nm/h      352°    58.8°F
          135° 20E

       ◯07

     ◄◄01
              ◇04


   34° 00N

10nm
H1.2  34° 13.739N
•6 —135° 16.613E  189ft
```
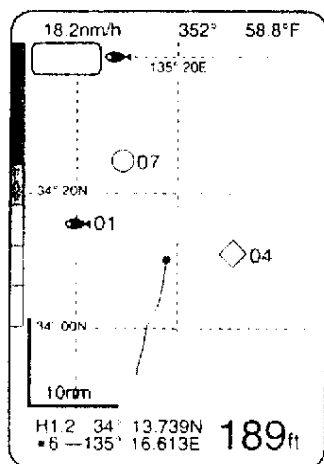
EDIT 4

DISP 6

INSTANT MEMORY 8
12

Key for this purpose

GAIN /6

```
    0 1 2 3 4 5 6 7 8 9
0 - 0 - - 0 - -[0]- -
1 - - - - - - - - - -
2 - - - - - - - - - -
3 - - - - - - - - - -
4 - - - - - - - - - -
5 - - - - - - - - - -
6 - - - - - - - - - -
```

1) Move the square cursor over 07 with

△ ▽ ◁ ▷ keys

2) Press the [GAIN /6] key. The mark of 07 changes

from "o" to "∗".

```
5  6  7  8           5  6  7  8
      [0]                   [∗]
```

```
18.2nm/h      352°    58.8°F
          135° 20E


   34° 20N

     ◄◄01
              ∠04


   34° 00N

10nm
H1.2  34° 13.739N
•6 —135° 16.613E  189ft
```

3)The display of 07 is turned off on the Plotter screen.
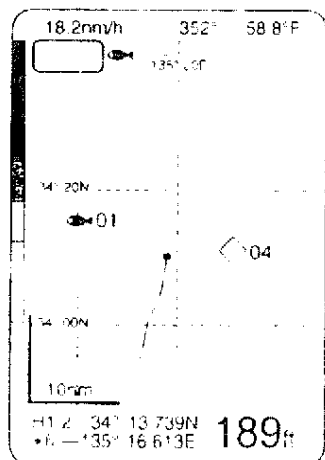
Press the [GAIN /6] **key again to return**

[∗] **to** [0] .

When you selected [0] **again,**

the display of 07 is restored.

SELECTING INSTANT MEMORY NUMBER

You can select the starting number to store the data.

INSTANT MEMORY 8
09
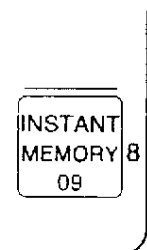
> **Usually the data will be stored from 00 to 99 in turn.**

> **Key for this purpose**
>
> RANGE SHIFT /8

To start from 30

```
  0 1 2 3 4 5 6 7 8 9
0 O O O O O O O O O O -
1 - - - - - - - - - -
2 - - - - - - - - - -
3 [·] - - - - - - - - -
4 - - - - - - - - - -
5 - - - - - - - - - -
6         - - - - - -
7 - - - - - - - - - -
8 - - - - - - - - - -
9   - - - - - - - -
```

ROUTE
OFF 3
EDIT 4
DISP 6
INSTANT MEMORY 8
09
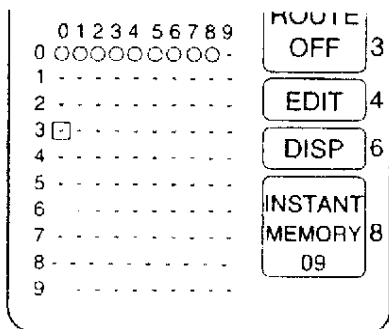
··Normally the next number to store the data is 09

1) Move the square cursor to 30 with

△ ▽ ◁ ▷ keys.

2) Press the RANGE SHIFT /8 key.

The indication 09 changes to 30.

☐ ▽ ◁ ▷ WPT SE
00
|
33° 57 939N
135° 08 613E
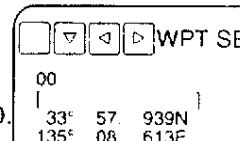
3) The nex waypoint memory will start from the number 30.

DIRECT ENTRY OF WAYPOINT DATA

To enter L/L: 34° 28.999N
135° 59.611E
Name: A POINT
Mark: !
at waypoint number 30.

> **Key for this purpose**
>
> MODE /4

OFF 3
EDIT 4
DISP 6
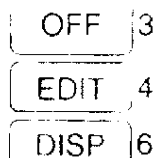
△ ▽ ◁ ▷ WPT SELECTION

```
30
[■               ]
  00°   00.  000N
000°   00.  000E
    00 - 00-' 00
    00 . 00 AM
       ft      °f

   0 1 2 3 4 5 6 7 8 9
0 0 0 0 0 - - -  - -
1 - - - - - - - - - -
2 - - - - - - - - - -
3 ▣ - - - - - - - -
4 - - - - - - - - - -
5 - - - - - - - - - -
6 - - - - - - - - - -
```

1) Place the square cursor over 30.

2) Press the [MODE] key. A square cursor also

appears at the head of name entry position.

3) When you press ◁ or ▷ key, the

cursor moves as below.

```
30
[■■               ]
 ..00°...00...000N
-000°...00...000E
 ┌ 00 - 00-' 00 ──┐  Direct entry
 ┼ 00 : 00 AM ────┤  for these data
      ft      °f   ┘  is impossible.
```

4) When you press the [MODE] key, the cursor
moves as below.

```
30
[■■               ]
  00°   00.  000N
000°   00.  000E
 ┌ 00 - 00-' 00
 ┼ 00 : 00 AM
      ft      °f
```

5) When you press △ or ▽ key,

alphabets, marks or numbers can be selected.

LOOK!

Available Symbols
A through Z.
., ', :, °, /, =, -, +,
1 through 9

6)   ┌┼┐ 00 - 00-' 00
     └─┘ 00 : 00 AM

When the cursor is placed over the mark position,

pressing △ key changes the mark, and

pressing ▽ key changes its color

44

The date and time when the inputs are completed are indicated here.

Number 30 is marked with "0".

```
△ ▽ ◁ ▷ WPT SELECTION
30
[ A POINT          ]
  34°  28.  999N
 135°  59.  611E
▶06 - 28 ' 95
▲02 : 51  PM
      ft      °f

    0 1 2 3 4 5 6 7 8 9
0  0 0 0 0 - - - - - -
1  - - - - - - - - - -
2  - - - - - - - - - -
3  0 - - - - - - - - -
4  - - - - - - - - - -
5  - - - - - - - - - -
6  - - - - - - - - - -
```

7) When all data were input, press [MODE] key to finalize it.

7-7. WAYPOINT NAVIGATION

WAYPOINT NAVIGATION

```
△ ▽ ◁ ▷ WPT SELECTION
01
[ POINT A      ]      COPY
  33°  57  939N
 135°  08  613E      fr ??  1
 ┌06 - 26  95
 └11  20  AM         to ??  2
 184ft  59 2°F
                     ROUTE
   0 1 2 3 4 5 6 7 8 9  OFF  3
0 0 0 0 0 - - -
1                     EDIT  4
2 0 0
3        - - - -      DISP  6
4
5                    INSTANT
6                    MEMORY 8
7                      00
8
9
```

→ [PLOTTER / SOUNDER] ↓

The selected waypoint is displayed here.

Distance, Bearing & Time-to-Go (or, ETA) from the present position to the waypoint are displayed in blue.

```
18.2nm/h     352°   58 9°F
[01]      135° 20E
12.9nm
231°
00 58

34° 20N

        01

34  00N
10nm
H 1 2' 34° 13 739N  189ft
•6 -135° 16 613E
```
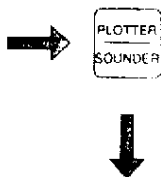
1) Select a waypoint to navigate in the Waypont display.

   To select it, move the square cursor over that waypoint.

   ┌──────────────────┐
   │ 01 was selected.│
   └──────────────────┘

2) When you move to the Plotter screen with the [PLOTTER / SOUNDER] key, the navigation to the selected waypoint is started.
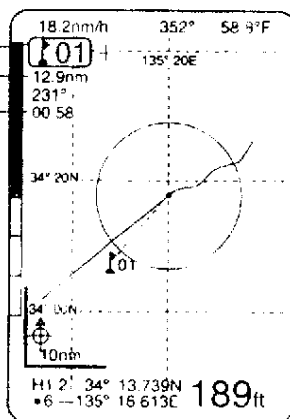
   ┌──────────────────────────────┐
   │ The course-up function is   │
   │ initially set to ON.   │
   │ Therefore, the waypoint to   │
   │ navigate to is placed upward. │
   └──────────────────────────────┘

3) When you cancel the waypoint navigation on the way, press the [CLEAR] key.

WAYPOINT NAVIGATION TO CROSS HAIR CURSOR POSITION

```
18.2nm/h      352°    58.8°F
┌───┐ ◆← 135° 20E
└───┘
12.9nm
231°
---┊---
34° 20N ------●------
|
|
— + —
|
34° 00N -----┊-----
|
10nm
H1.2  34° 13.739N  189ft
•6 -135° 16.613E
```
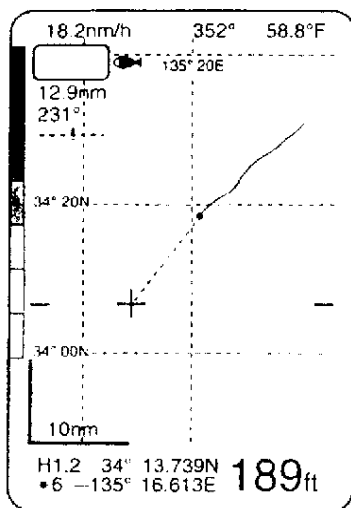
1) Turn the cross hair cursor on with the [CURSOR /₃] key.

2) Move the cursor with [△] [▽] [◁] [▷]
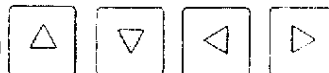
keys to the position to navigate.

> This is useful when you navigate to an event mark or a voluntarily selected point.

3) The navigation to the cursor position starts.

4) To stop the navigation, press the [CLEAN /₁] key.

> **When navigating to the cross hair cursor position, the functions like course- up and auto display shift do not work.**

ROUTE WAYPOINT NAVIGATION

```
┌─────────┐
│ COPY    │
│ fr ??  1│
│ to ??  2│
└─────────┘
┌─────────┐
│ ROUTE   │
│ OFF    3│
└─────────┘
┌─────────┐
│ EDIT   4│
└─────────┘
```

> Key for this purpose

➡ [CURSOR /₃] ➡

┌─────────┐ │ ROUTE │ │ OFF │ └─────────┘	Route navigation is off.
↓	
┌─────────┐ │ ROUTE │ │ GO │ └─────────┘	Route navigation is done from waypoint number 0 to 9 in order.
↓	
┌─────────┐ │ ROUTE │ │ RTRN │ └─────────┘	Route navigation is done from waypoint number 9 to 0 in order
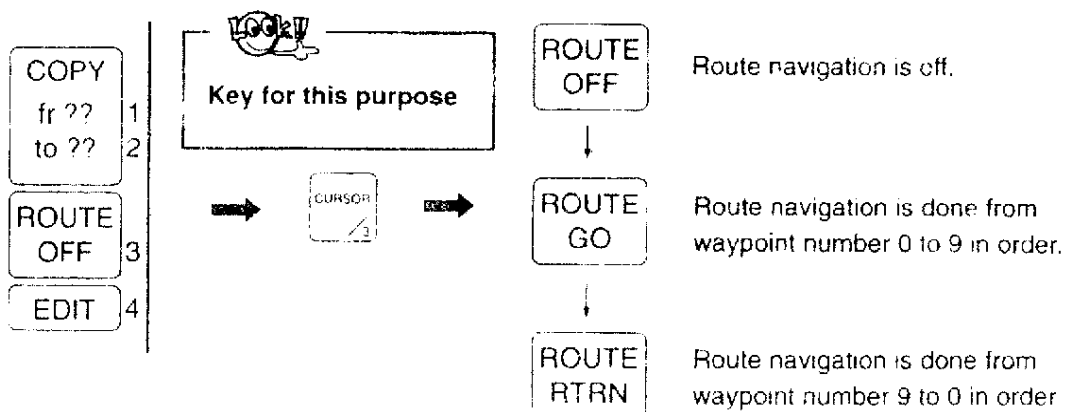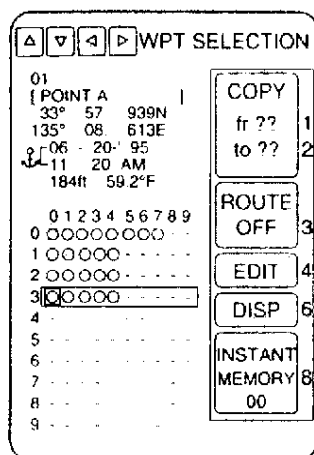
1) Select waypoints to make a route and put them in order to the numbers 30 to 34.

2) Place the square cursor over the starting waypoint number with $\boxed{\triangle}$ $\boxed{\triangledown}$ $\boxed{\triangleleft}$ $\boxed{\triangleright}$ keys.

Route from 30 to 34
Place the square cursor over 30.
Route from 34 to 30
Place the square cursor over 34

$30 \longrightarrow 34$
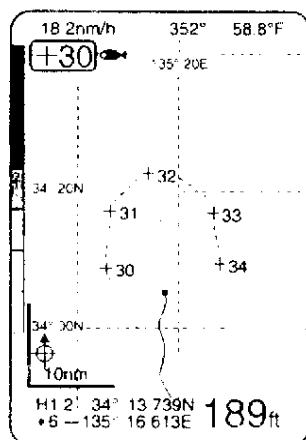
3) When you take the route from 30 toward 34, press the $\boxed{\text{CURSOR}}$ key and change the display to $\boxed{\text{ROUTE} \atop \text{GO}}$.

Then, press the $\boxed{\text{PLOTTER} \atop \text{SOUNDER}}$ key.

$34 \longrightarrow 30$
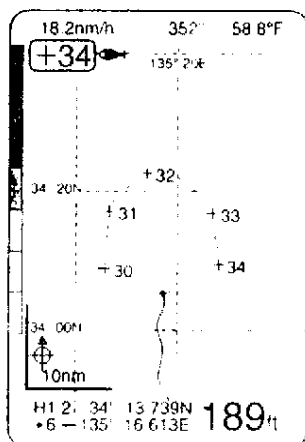
When you take the route from 34 toward 30, change the display to $\boxed{\text{ROUTE} \atop \text{RTRN}}$.

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8. MENU

8-1. PRIMARY MENU

SELECTION OF EACH MENU
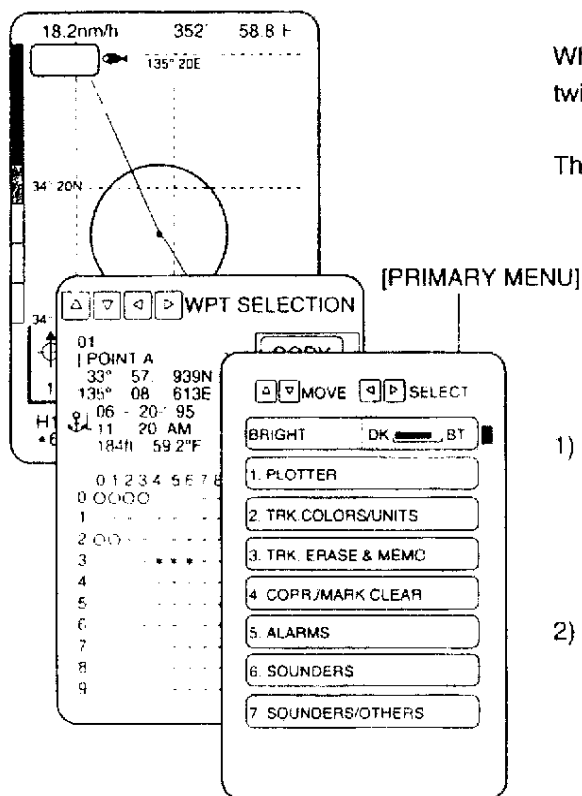
When in the Plotter mode, press the [WPT/MENU] key twice.

The primary menu appears.

[PRIMARY MENU]

1) [△] [▽] for moving the square cursor up or down.

2) [◁] [▷] for selecting a menu.

Menu items:
- 1. PLOTTER
- 2. TRK COLORS/UNITS
- 3. TRK. ERASE & MEMO
- 4. COPR./MARK CLEAR
- 5. ALARMS
- 6. SOUNDERS
- 7. SOUNDERS/OTHERS

BRIGHT   DK ▬▬ BT

△▽ MOVE ◁▷ SELECT

WPT SELECTION
01
| POINT A
  33° 57 939N
  135° 08 613E
  06 - 20 - 95
  11 20 AM
  184ft 59 2°F

CHANGE OF SCREEN BRIGHTNESS

BRIGHT   DK ▬▬▬ BT
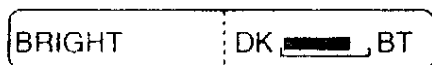
Press [◁] or [▷] keys.

The brightness can be adjusted in 16 steps.

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8-2. PLOTTER MENU

```
1 [△][▽]MOVE [◁][▷]SELECT

COURSE-UP   OFF  ON  AT  ▮

AUTO SCALE   OFF   ON

DRAW MARK   OFF   ON

DIST SCALE   OFF   ON

HDG LINE    OFF  ON  AT

L/L LINES    OFF   ON

WPT NAMES   OFF   ON

SEA COLOR    BL   BK

NAV TIME    TTG   ETA
```

COURSE-UP FUNCTION

```
COURSE-UP : OFF  ON  AT
```

- Your boat is always heading upward
- While in waypoint navigation,
  the waypoint is always displayed upward
- Course-up function does not work.

[Course-up Off]

```
18 2nm/h      352°    58 8°F
◄►01◄►
13 6nm
069°
01 10

34 20N              ◄►01

34° 00N

10nm
H12  34° 13 739N  189ft
•6 —135° 16 613E
```
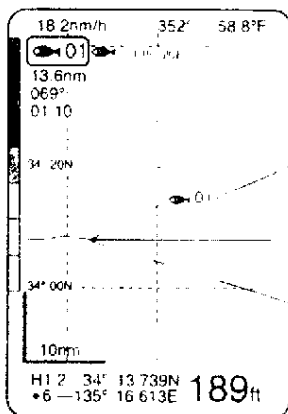
Waypoint Mark

Present Position

[Course-up On]

```
18 2nm/h      352°    58 8°F
◄►01◄►        34°00E
13 6nm
069°      ◄►01
01 10

135°00E

10nm    ⊕
H12  34° 13 739N  189ft
•6 —135° 16 613E
```
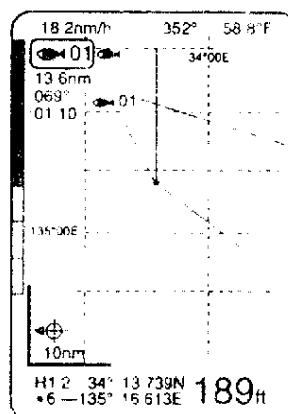
Waypoint Mark

Present Position

AUTO SCALING

```
AUTO SCALE : OFF   ON
```

Auto scale function
does not work

When getting close to the waypoint,
the display is expanded, and when going
away from it, it is reduced
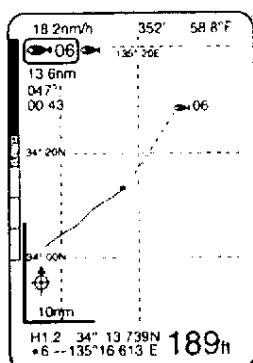
Expanded
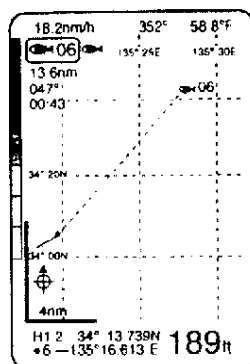
DRAW MARK

DRAW MARK ┆ OFF   ON

The function
is turned off.

Drawing a simple chart is possible
on the plotter display.

5. MARK 5
6. COLOR

E 189ft
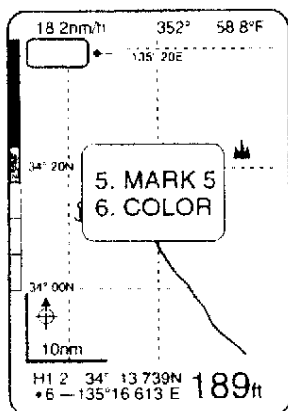
1) After selecting "ON", return to the Plotter display.

2) Press the [SYMBOL /s] key. The display on the left is

indicated.
Select a mark and its color.

LOOK!
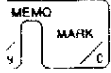
Available Marks

●——— Mark for starting point
——— Solid line
- - - - Dotted line

3) Turn the cross hair cursor on, and place it at the
starting point.

4) Press the [MEMO MARK /c] key The starting point is marked.

5) Move the cursor to the next point, and press the

[MEMO MARK /c] key again

A line is drawn from the starting point. Repeat this
operation.
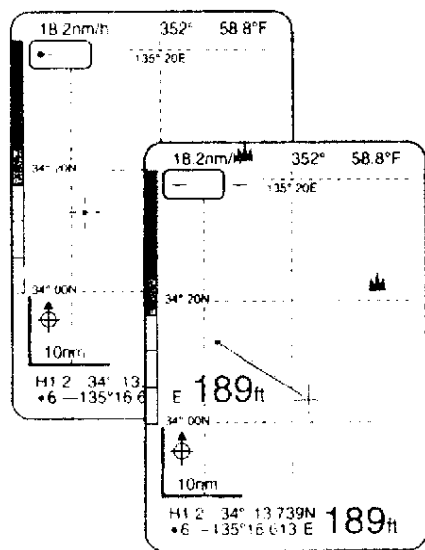
DISTANCE SCALE

| DIST SCALE | OFF   ON |

└── Circle line scale is displayed.
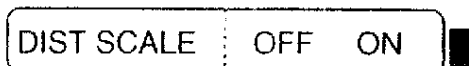
└── Circle line scale is not displayed.

Distance scale

HEADING LINE

| HDG LINE | OFF ON AT |
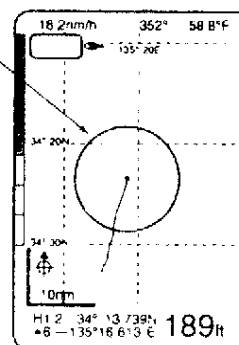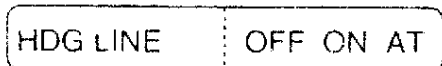
The line is not displayed

Without reference to the boat speed, the line is always displayed

When the boat speed is exceeds 2nm, the line is displayed.

Heading Line
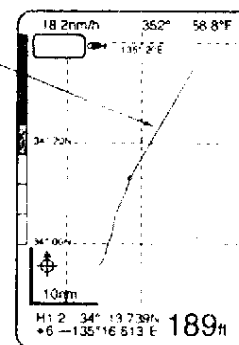
L/L LINES

| L/L LINES | OFF   ON |

└── Lat/Long lines are displayed.
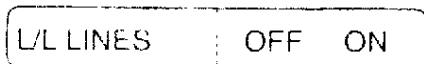
└── Lat/Long lines are not dispalyed

WAYPOINT NAMES

WPT NAMES	OFF	ON

Names of waypoints
are not displayed.

Names of waypoints
are displayed.
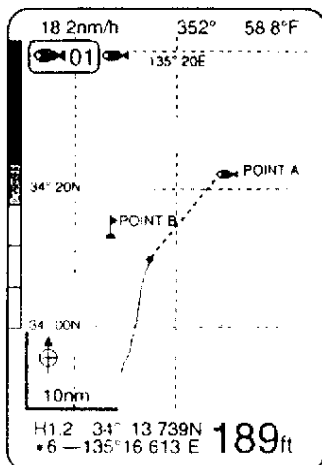
When the waypoint names are displayed, the
waypoint numbers are not displayed.

Waypoint names can be input in the Waypoint
display.

SEA COLOR SELECTION

SEA COLOR	BL	BK

Sea is displayed in black.

Sea is displayed in blue

TIME FOR NAVIGATION

NAV TIME	TTG	ETA

The time necessary
to go to the waypoint
is indicated

The estimated
time of arrival
at the waypoint
is indicated
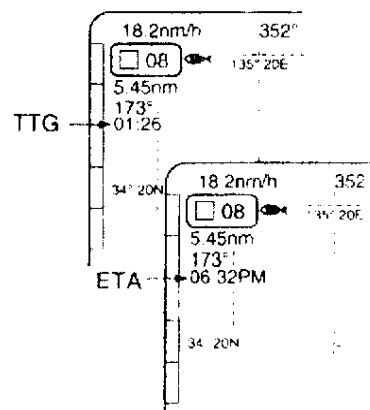
8-3. TRACK COLORS/UNITS MENU

```
2 △ ▽ MOVE ◁ ▷ SELECT

TRK COLOR    ☐ ■ ☐☐☐

  DEPTH        TEMP
    ft
    10          59.6
    20          59.4
    30          59.2
    40          59.0
    50          58.8
    60          58.6

DIST UNIT     nm  sm  km

DEPTH UNIT    ft   m   fm
              f   lm   HR

TEMP UNIT     °f   °c
```

TRACK COLORS

```
TRK. COLOR   ■■■☐☐☐
```

└──→ You can select one of 7 colors for track line, or all seven colors.
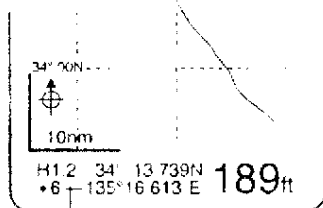
Track Color Indication

The selected track line color is indicated at the bottom left side of the screen.

When all colors are selected, you can set the depth or temperature ranges for each color.

1) Move the square cursor at the side of "DEPTH ft" "TEMP ° f", and select one of them.

2) Move down the cursor at the first color.

3) Set the depth or temperature range with

[◁] or [▷] keys.

```
DEPTH ft      TEMP °f

  10           59.6
  20           59.4
  30           59.2
  40           59.0
  50           58.8
  60           58.6
```
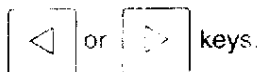
DISTANCE UNIT

```
DIST UNIT   nm  sm  km
```

└──→ • You can select one of them

DEPTH UNIT

| DEPTH UNIT | ft m fm |
| | I. fm HR |

└─→ You can select one of them.

I. fm = Italian fathoms
HR=Japanese Fathoms

TEMPERATURE UNIT

| TEMP UNIT | ° f ° c |

└─→ You can select one of them.

8-4. TRACK ERASE & MEMO MENU

```
S[▲][▼]MOVE [◄][►]SELECT

TRK DISP     OFF  ON  ■

TRK ERASE    ■■■■□□□
             EXECUTE

PLOT         TIME  DIST
INTERVAL
             10 SEC

OVERALL      5hrs 30min

REST OF TRACK     1999
```

DISPLAYING TRACK LINE

| TRK. DISP. | OFF ON |

└─→ The track line is displayed.
└─→ The track line is not displayed.

18.2nm/h   352°   58.8°F
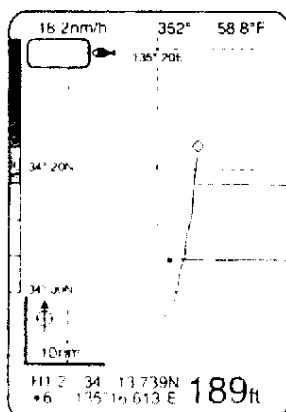
─── Old Track Line

─── Present Position

When tracing the old track line, it might be better to show the present position mark without the track line.

Maximum track points
12,000 points

ERASING TRACK LINE

The color of track line to erase is selected.

```
TRK. ERASE    [████ ▯ ▯]      ▮
              --------------
              EXECUTE         ▮
```

Erasing the track line of the selected color is executed.
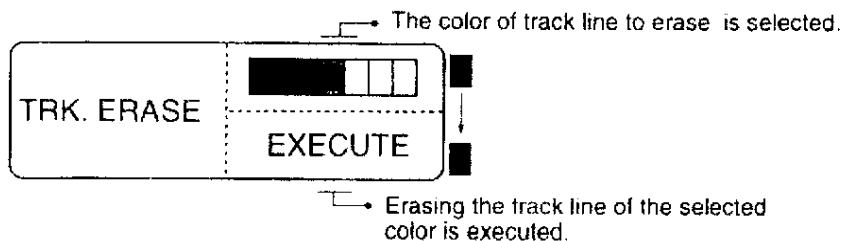
SELECTING PLOT INTERVAL
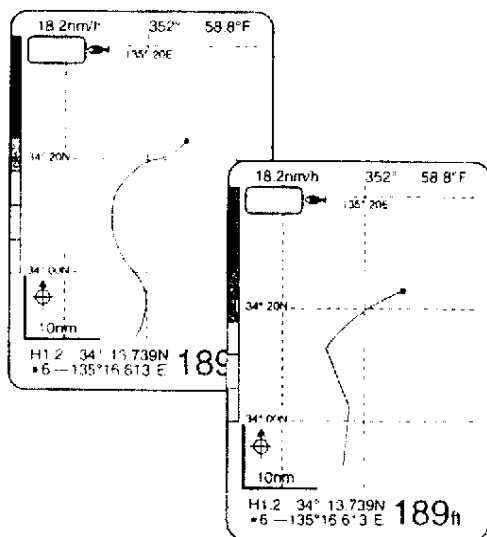
When you are traveling, the track line is marked with one second interval.
However, when the display scale is changed, the track line is memorized with the set interval of time or distance.

```
┌─────────────────────────────┐
│   PLOT INTERVAL: 10 sec      │
└─────────────────────────────┘
```

The points at every 10 seconds are connected with a line.

"Time" as unit of plotting   "Distance" as unit of plotting

```
PLOT        TIME   DIST      ▮
INTERVAL    ------------
            10 SEC.          ▮
```

The time or distance is set
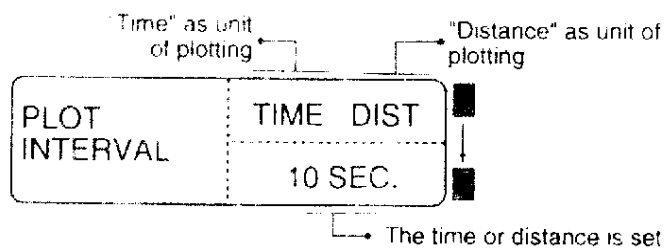
1) Select "TIME" or "DIST" as the unit of plotting.

2) Set the interval time or distance for plotting.

Time: 1, 2, 3, 5, 8, 10, 20, 30, 40 50 sec.,
      1, 2, 3, 5, 8, 10 min.

Dist.: 0.05, 0.1, 0.2, 0.3, 0.5, 0.8, 1, 2,
       3, 5, 8 nm/sm/km

8-5. CORRECTION/MARK CLEAR MENU

```
4 [△][▽] MOVE [◁][▷] SELECT

┌──────────────┬─────────────┐
│ POSITION     │  EXECUTE    │
│ CORRECT      │             │
│              │  CANCEL     │
├──────────────┼─────────────┤
│ TIME CORR    │  +00   hour │
├──────────────┼─────────────┤
│ SPEED ADJ.   │    100      │
├──────────────┼─────────────┤
│ SPEED AVE    │  001   sec  │
├──────────────┼─────────────┤
│ MARK CLEAR   │     +       │
│              │  EXECUTE    │
├──────────────┼─────────────┤
│ WPT CLEAR    │  EXECUTE    │
└──────────────┴─────────────┘
  REST OF MARKS    1000
```

POSITION CORRECTION

┌──────── Position correction
│   is executed.

```
┌────────────┬──────────────┐
│ POSITION   │  EXECUTE     │
│ CORRECT    │ ············ │
│            │  CANCEL      │
└────────────┴──────────────┘
```

└──────── Position correction
          is canceled.

To correct the position,

1) Turn on the cross hair cursor on the Plotter display.

2) Move it to the correct position.

3) Change the screen to this Menu.

4) Place the square cursor at the side of "EXECUTE", and activate it.

The present position was corrected to the cursor position.
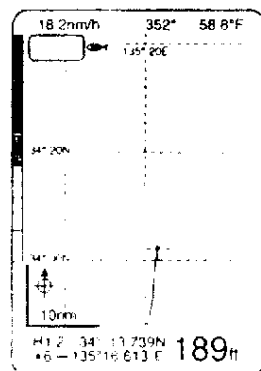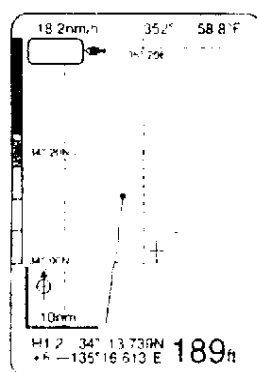
> **Position correction should not be done unless you know the present position precisely.**

The corrected value is kept in memory until it is canceled.

TIME CORRECTION

TIME CORR.	+00	hour

Time range for correction
-13 to +13%

↳ The time difference between the time transmitted by the satellites and the local time is set.

SPEED ADJUSTMENT

SPEED ADJ.	100

Range for adjustment
50% to 150%

↳ The indicated speed can be adjusted to the correct speed.

SPEED AVERAGE

SPEED AVE.	001	sec

Range for averaging
1 sec. to 100 sec.

↳ The speed data for the selected time span are

When you pull a net with other boat, averaging the speed to avoid the frequent change of speed indication is useful.

CLEARING EVENT MARKS

↳ The mark and color to clear is selected here.
If clearing all kinds of mark at one time, select "ALL".

MARK CLEAR	+
	EXECUTE

◁ for mark.   ▷ for color

When key is pressed, "OK?" appears. If yes, press the key again.

↳ Clearing the designated mark is executed.

CLEARING WAYPOINTS

WPT CLEAR	EXECUTE

└──➤ Clearing all waypoints is executed.

This clears all waypoints.
When clearing some waypoints, move to the
Waypoint display.

8-6. ALARMS MENU

```
5 [▲][▼] MOVE [◄][►] SELECT

ARRIVAL          OFF   ON
ALARM                0 1  nm

ANCHOR ALM   OFF   ON

XTE              OFF   ON
ALARM                0 1 nm

KEEL             OFF   ON
ALARM                1 ft

FISH             OFF   ON
ALARM

ALARM TONE   A  B  C  D
```

**To stop the alarm sound, press any key
other than ON and OFF.**

ARRIVAL ALARM

┌──➤ Arrival alarm function does not work.

   ┌──➤ When the boat arrives at the waypoint,
       the alarm sounds

ARRIVAL	OFF ON
ALARM	0 10 nm

└──➤ The range when the alram starts to sound is set.

**Alarm ranges
0.01 to 9.99 in 0.01 increments.**

When the boat enters
into this range, the
alarm sounds
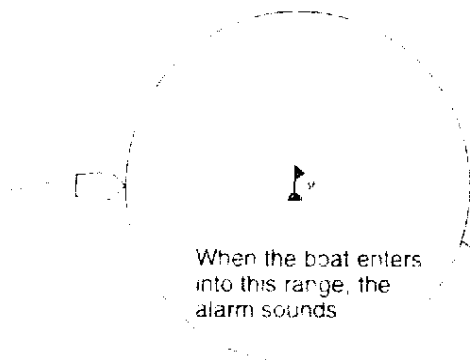
The range set with the
waypoint at the center.

ANCHOR WATCH ALARM

ANCHOR ALM | OFF | ON

> **LOOK!**
> The range set for arrival alarm is applied.

When the boat goes out of
the set range, the alarm sounds.

Anchor watch alarm function does not work.

When the boat goes out of
this range, the alarm sounds.

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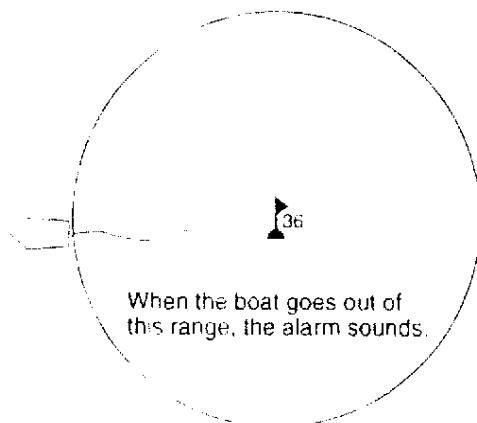
> **LOOK!**
> When the anchor watch alarm is ON, a red
> circle is displayed on the plotter screen.

CROSS TRACK ERROR ALARM

Cross track error
alarm function
does not work

→ When the course goes off the
set range, the alarm sounds.

XTE ALARM	OFF ON
	0.10 nm

• The range when the alarm starts to sound is set

> **LOOK!**
> Alarm ranges
> 0.01 to 9.99 in 0.01 increments.

Cross Track
Error Range

Track Line

Alarm sounds during this area

60

KEEL ALARM

Keel alarm function
does not work.

When the boat enters into
the shallower depth area than
the set range, the alarm sounds.

```
KEEL        | OFF  ON
ALARM       |
            |    1 ft
```

The range when the alarm starts to sound is set.

Keel alarm ranges
1 to 100 feet in 1 foot increments

When the digital depth indication is
unstable(in case of very shallow waters),
this alarm may not function properly.

FISH ALARM

Fish alarm
does not work.

The alarm sounds when the echo from the
fish is stronger than the set level.

```
FISH        | OFF  ON
ALARM       |
            |
```

Signals from fish

Strong ——— Weak

The color levels from the fish are set.

ALARM TONE

```
ALARM TONE | A  B  C  D
```

One of four tones can be selected.
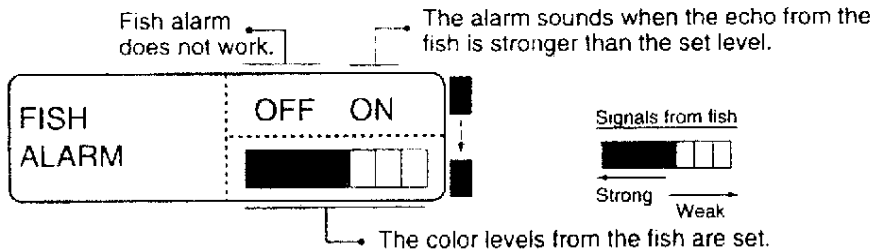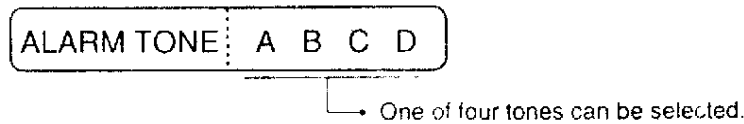
8-7. SOUNDERS MENU

```
6 [△][▽] MOVE [◁][▷] SELECT
IMAGE SPD        3 / 6
A CLUTTER   ████
F ECHO       OFF  1  2
DEP SCALE    OFF   ON
F SYMBOL     OFF   ON
S T C  HF    OFF  1  2  3
S T C  LF    OFF  1  2  3
PULSE         S   M   L
POWER         L   M   H
```

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IMAGE SPEED

IMAGE SPD : 3/6

└─• Image scrolling
speed is set.

STP -1/6 -2/6 -3/6 -4/6 -5/6 -6/6 -SPD

◄──────────────►

Slower   Faster
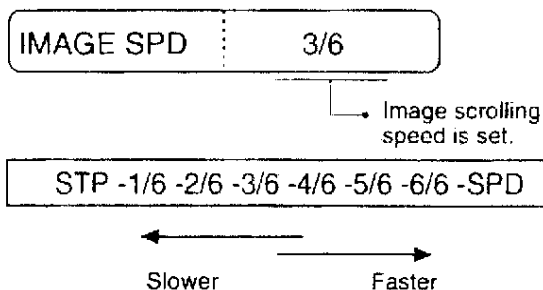
SPD
The image speed varies
according to the boat speed.

ANTI CLUTTER

A. CLUTTER :

└─• The colors you want
to delete can be selected.
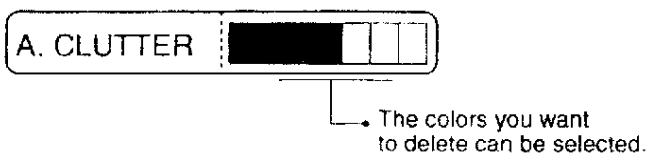
Colors that can be deleted.

(Green)(Cyan)(White)(Blue)
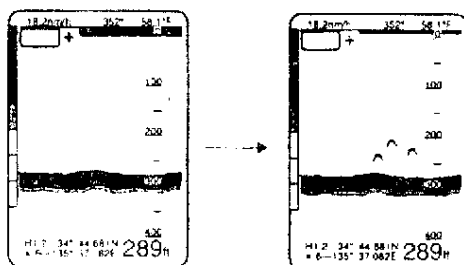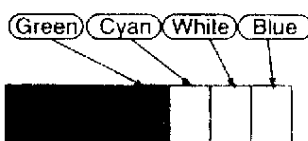
The anti clutter deletes unncecessary
noise, and makes the screen easy to see.

The fish of weak level may disappear with
the anti clutter functions.

CLEAN ECHO

C. ECHO : OFF 1 2

└─• When there are lots of noise, use this level.

└─• When there are some noise, use this level.

└─• Clean echo function does not work.

The clean echo deletes the noise from other
sounders or radios of nearby boats

DEPTH SCALES

DEP. SCALE : OFF ON
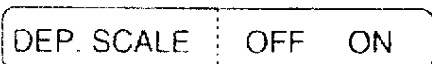
Scale lines are
not displayed

• Scale lines are displayed
on the screen.

Depth Scales

62
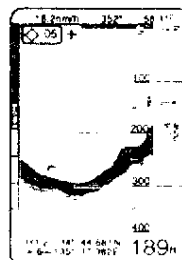
FISH SYMBOLS

F. SYMBOL	OFF ON

             └─► Fish are indicated with fish symbols.
        └─► Fish symbol function does not work.
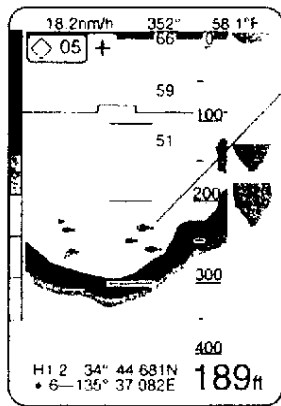
Fish Symbols

· Fish symbols are displayed only in the normal mode.

· The noises caused by running or the bubbles may be displayed with fish symbols.

	(Red)		(Blue)
Colors			
Echo Strength	Stronger		Weaker
Symbol Size	Larger		Smaller

S.T.C.

S.T.C. HF	OFF 1 2 3

For HF = high frequency (200kHz)

S.T.C. LF	OFF 1 2 3

For LF = low frequency (50kHz)

            └─► The higher the number, the stronger the level.
        └─► S.T.C. function does not work.

S.T.C. lowers the sensitivity near the water surface to prevent the clutter on the screen by the echoes from bubbles and planktons.

If selecting stronger level, the fish echoes may also be eliminated.

PULSE LENGTH SELECTION

PULSE	S M L

└─• They indicate short, medium or long pulses

Pulse Length	Long ◄─────── Medium ──────► Short	
Depth Resolution	Good ◄──────────────────► Bad	
Fish Detection	Bad ◄──────────────────► Good	
Purpose	Scarching deep sea	Discriminating fish distribution

Please do not use S for deep sea. Fish or bottom may be lost.

POWER SELECTION

POWER	L M H

└─• They indicate low, middle or high powers.

Lowering power is effective to avoid the interference from other sounder with the same frequency.
Low power for the deep depths may lose the fish and the bottom.

8-8. SOUNDERS/OTHERS MENU

```
7 [△][▽]MOVE [◁][▷]SELECT

GAIN          MAN  AT
RANGE         MAN  AT
A SCOPE       OFF  ON
ZOOM DISP.    [[   []
T GRAPH       OFF  ON
BEARING       MAG  TRU
SPEED TEMP    HF   IF
SPEED DATA    INT  EX
FORMAT        NMEA CIF
```

GAIN MODE SELECTION
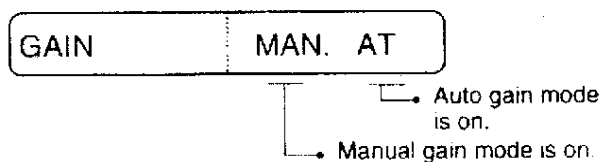
GAIN	MAN. AT

└─→ Auto gain mode
    is on.
└─→ Manual gain mode is on

RANGE MODE SELECTION

RANGE	MAN. AT

└─→ Auto range mode
    is on.
└─→ Manual range mode is on.

A-SCOPE

A-SCOPE	OFF ON

└─→ A-Scope is
    turned on.
└─→ A-Scope is turned off.

A-Scope

ZOOM DISPLAY SELECTION

ZOOM DISP	▯ ▯ ▭

└─→ The sounder display
    is split into two
    horizontally.
└─→ The sounder display is split
    into two vertically.

TEMPERATURE GRAPH

```
┌─────────────────────────────┐
│ T. GRAPH    │ OFF   ON       │
└─────────────────────────────┘
```
└─► Temperature graph is turned on.
└─► Temperature graph is turned off.

Please refer to "Normal Display" in 5-2. SOUNDER DISPLAY.

BEARING MODE

```
┌─────────────────────────────┐
│ BEARING     │ MAG   TRU      │
└─────────────────────────────┘
```
└─► True bearing mode is selected.
└─► Magnetic bearing mode is selected.

FREQUENCY TO SUPPLY SPEED/TEMPERATURE DATA

```
┌─────────────────────────────┐
│ SPEED TEMP │ HF    HF        │
└─────────────────────────────┘
```
└─► When you use speeed and temperature sensors,
you have to indicate the frequency here
from which their data are supplied.

SUPPLY OF SPEED DATA

```
┌─────────────────────────────┐
│ SPEED DATA │ INT   EXT       │
└─────────────────────────────┘
```
└─► The data from the connected equipment like
a GPS is used.
└─► The data from the paddlewheel speed sensor is used

FORMAT

```
┌─────────────────────────────┐
│ FORMAT      │ NMEA-0183      │
└─────────────────────────────┘
```
└─► NMEA format is selected between 0183 and 0182

9. SPECIFICATIONS

CRT	8" Color
TEMPERATURE RANGE	0-50° C
POWER REQUIREMENT	11-40V DC (Approx. 36 watts)

DEPTH SOUNDER

FREQUENCY	200kHz/50kHz
OUTPUT POWER	H - 600 Watts RMS
	M - 150 Watts RMS
	L - 25 Watts RMS
PULSE LENGTH	L - 0.06 - 2.5 msec
	M - 0.04 - 2.5 msec
	S - 0.02 - 1.1 msec
DEPTH RANGES	0-10, 20, 30, 40, 50, 60, 80, 100, 120, 140, 160, 200, 240, 300, 400, 500,600, 800, 1000, 1500, 2000, 3000 ft
	0-5, 10, 20, 30, 40, 50, 60, 80, 100, 120, 140, 160, 200, 240, 300, 400, 500, 600, 800 m/fm
ZOOM RANGES	1/5, 2/5 & 3/5 for depth ranges 50 ft/m/fm or less
	1/4, 2/4 & 3/4 for depth ranges 60 ft/m/fm or more
BOTTOM ZOOM(or LOCK) RANGES	Auto selection depending on depth ranges
DATA	7 Colors(Red, Orange, Yellow, Green, Cyan, White, Blue)
BACKGROUND	Blue or Black
BRIGHTNESS	Adjustable in 16 levels
DISPLAY MODE	Dual Frequency Mode:
	Normal + Normal, Bottom Lock + Bottom Lock, Bottom Zoom + Bottom Zoom,Zoom + Zoom
	Single Frequency Mode:
	Normal, Normal + Bottom Lock, Bottom Zoom, Normal + Zoom
A-SCOPE IMAGE	Selectable
ALARM	Keel Alarm - 100 ft/m/fm in one unit increments
	Fish Alarm - 7 levels
IMAGE SPEED	7 plus freeze including speed proportional to boat speed
TEMPERATURE GRAPH	Selectable
OTHER FUNCTIONS	Range Shift, Clean Echo, Anti Clutter, S.T.C.

PLOTTER

SCALE	0 2 - 1,000 nm/sm
	0.4 - 2,000 km
TRACK MEMORY	2,000 points
PLOT INTERVAL	Time: 1, 2, 3, 5, 8, 10, 20, 30, 40, 50 sec., 1, 2, 3, 5, 8, 10 min
	Dist: 0.05, 0.1, 0.2, 0.3, 0.5, 0.8, 1, 2, 3, 5, 8 nm/sm/km

DISPLAY MODE	Plotter, Plotter/Sounder
EVENT MARKS	1000 points
WAYPOINTS	2000 points
ARRIVAL ALARM	0.01 - 9.99 nm/sm/km
CROSS TRACK ERROR ALARM	0.01 - 9.99 nm/sm/km
OTHER FUNCTIONS	Course-Up, Auto Scaling, "Draw" function
SERIAL DATA INPUT	NMEA0183/0182
	xxGGA(GPS fix data)
	xxGLL(Lat/Long)
	xxVTG(Track made good & ground speed)
	xxRMC(GPS/Transit data)
	xxZDA(Time & date)
	xxHDM(Heading)
	PKODG(Koden proprietary: Date only)
SERIAL DATA OUTPUT	NMEA0183
	SDDBT(Depth)
	SDVLW(Log)
	SDMTW(Temp)
	GPGLL(Lat/Long)
	GPVTG(Track made good & ground speed)
	GPBWC(Bearing & dist. to waypoint)
	GPXTE(Cross track error)
	GPAPB(Autopilot sentence)
	GPBOD(Bearing - origin to dest.)
	GPGGA(GPS fix data)
	GPZDA(Time & date)

* Specifications subject to change without notice.

10. STANDARD EQUIPMENT

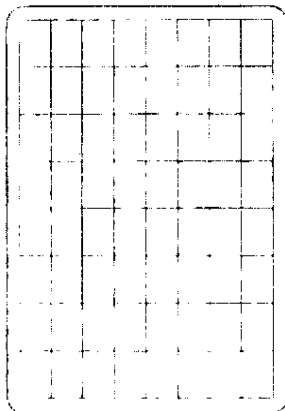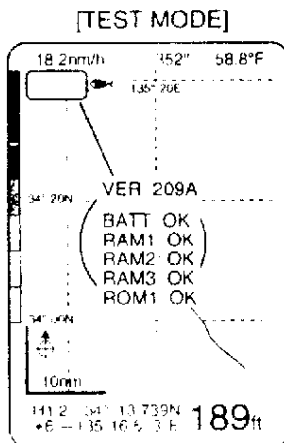| CVS-209 Control/Display Unit	1	11.5 lbs
Trunnion	1	
Knobs	2	
Metal and Rubber Washers	2	
Transducer	1	
Transducer Plug	2	8 pin
Data Interfacing Plug	1	6 pin
Power Cable	1	
Fuse	1	7A (for Power Source 11-20V)
	2	3A (for Power source 20-40V)
Sun Hood	1	
Operation Manual	1	

11. ADJUSTMENT OF SCREEN

The display position can be adjusted up and down, or to right and left.

1. SIMULATION
2. TEST MODE
3. TX. DATA
4. RX. DATA
5. ALL CLEAR
6. MENU CLEAR

1) For this adjustment, get the display as shown.

First, press and hold the [WPT / MENU] key and touch

the [ON] key.

2) Press the [✕ /2] key and get the TEST MODE

display.

[TEST MODE]

18.2nm/h   352"   58.8°F

VER 209A

BATT OK
RAM1 OK
RAM2 OK
RAM3 OK
ROM1 OK

10nm

189ft

3) Press the [WPT / MENU] key, and get the cross hatched

pattern on the screen.

4) Adjust the position of cross hatched pattern with

[△] [▽] [◁] [▷] keys

12. TROUBLESHOOTING

When the CVS-209 does not operate properly, please read this section carefully. If you are unable to correct the problem by performing these procedures, contact your authorized SI-TEX dealer.

PROBLEM	COUNTERMEASURES
No power.	Verify that the power connector is securely inserted, and check the fuse. If the polarity is reversed by mistake, the fuse will be blown. In this case, try to reverse the polarity and replace the fuse.
Power is on, but the sea bottom is not displayed.	Verify that the transducer connector is securely inserted or that the transducer cable is not broken. Enable auto gain and auto range.
Screen display is weak, loss of sensitivity.	Check the connection of the transducer. Make sure the transducer is properly mounted and pointed correctly. Verify that no marine creatures stick on the transducer face. They are susceptible to accumulate on it. Take care not to damage the transducer face when you scrape them off. Disable anti clutter or clean echo.
Excessive noise is present on display.	Check for interference from other boats. Also, check if the other equipment is operating properly. Verify that the unit is not affected by the engine noise, and make sure that it is not picking up noise due to its proximity to noise source.