

FURUNO

OPERATOR'S MANUAL

MARINE RADAR

MODEL MODEL-1722/1722C/1732/1732C/1742/1742C/1762/1762C



FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN

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•Your Local Agent/Dealer

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MODEL1722/C SERIES



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SAFETY INSTRUCTIONS

WARNING



ELECTRICAL SHOCK HAZARD
Do not open the equipment.

Only qualified personnel should work inside the equipment.



Turn off the radar power switch before servicing the antenna unit. Post a warning sign near the switch indicating it should not be turned on while the antenna unit is being serviced.

Prevent the potential risk of being struck by the rotating antenna and exposure to RF radiation hazard.

Immediately turn off the power at the switchboard if water leaks into the equipment or something is dropped in the equipment.

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Do not place liquid-filled containers on the top of the equipment.

Fire or electrical shock can result if a liquid spills into the equipment.

Immediately turn off the power at the switchboard if the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

WARNING

Keep heater away from equipment.

A heater can melt the equipment's power cord, which can cause fire or electrical shock.

Use the proper fuse.

Fuse rating is shown on the equipment. Use of a wrong fuse can result in equipment damage.

Make sure no rain or water splash leaks into the equipment.

Fire or electrical shock can result if water leaks in the equipment.

CAUTION

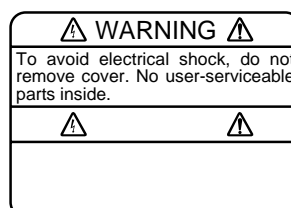
Do not use the equipment for other than its intended purpose.

Use of the equipment as a stepping stool, for example, can result in personal injury or equipment damage.

No one navigation device should ever be solely relied upon for the navigation of a vessel.

Always confirm position against all available aids to navigation, for safety of vessel and crew.

A warning label is attached to the equipment. Do not remove the label. If the label is missing or damaged, contact a FURUNO agent or dealer.



Name: Warning Label (1)
Type: 86-003-1011-0
Code No.: 100-236-230

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FOREWORD

A Word to the Owner of the MODEL-1700C/1700 series

FURUNO Electric Company thanks you for purchasing the MODEL-1722C/1732C/1752C/1762C Color LCD Radar/Plotter, MODEL-1722/1732/1752/1762 Monochrome LCD Radar/Plotter. We are confident you will discover why the FURUNO name has become synonymous with quality and reliability.

For over 50 years FURUNO Electric Company has enjoyed an enviable reputation for quality and reliability throughout the world. This dedication to excellence is furthered by our extensive global network of agents and dealers.

Your radar is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless properly installed and maintained. Please carefully read and follow the operation and maintenance procedures set forth in this manual.

We would appreciate feedback from you, the end-user, about whether we are achieving our purposes.

Thank you for considering and purchasing FURUNO.

Features

The MODEL-1700C series, MODEL-1700 series works within our new product-network system called the "NavNet." Each product has an IP address to communicate with NavNet compatible products within the network, using TCP/IP protocol through an Ethernet 10-Base-T.

The main features are

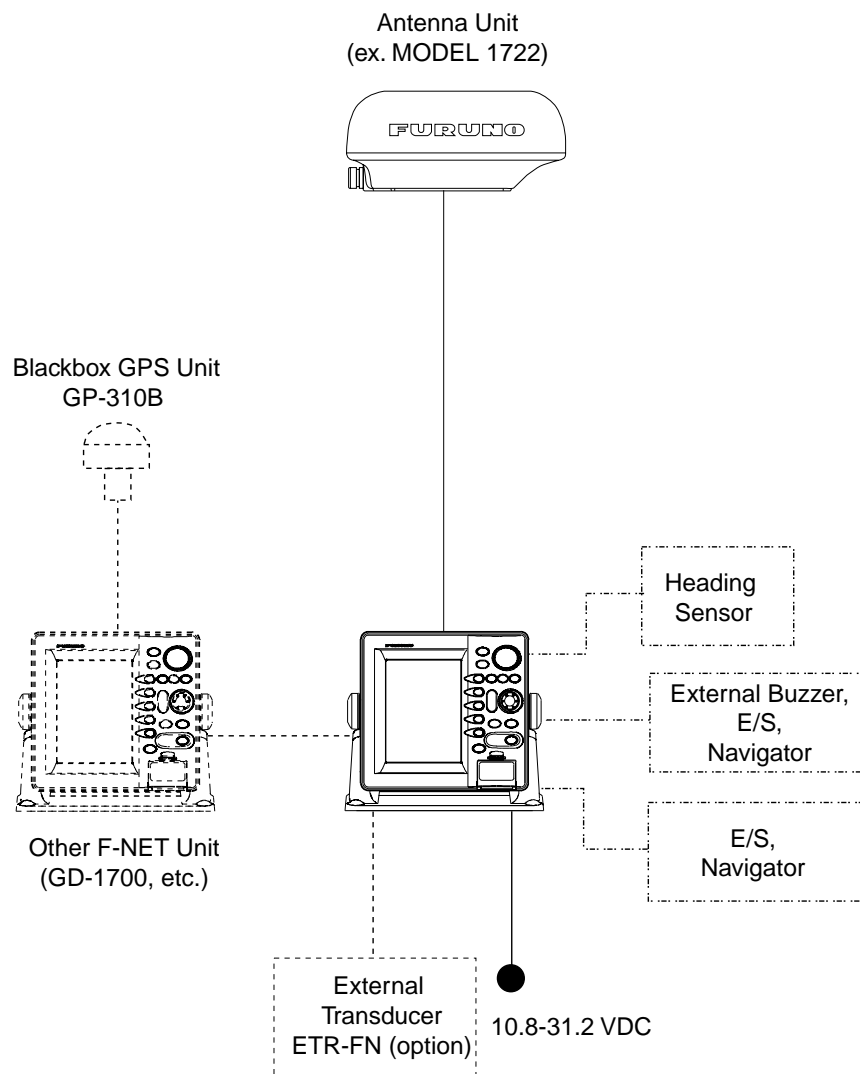
- Bright 7" screen visible even under direct sunlight.
- User friendly operation with combination of discrete keys, soft keys and Omnipad.
- Radar picture available with connection to NavNet compatible radars.
- Accepts C-MAP, Nav-charts™ (NAVIONICS) and FURUNO charts.
- Fast chart redraw.
- Built-in NavNet interface circuit board.
- 12-channel black box GPS unit with highly accurate position fixing optionally available.
- Video sounder picture available with connection to NavNet compatible black box echo sounder.

SYSTEM CONFIGURATIONS

All NavNet products incorporate a “network circuit board” to integrate each NavNet product on board through an optional LAN cable (Ethernet 10 Base T). Each NavNet product is assigned an IP address to enable transfer of images between NavNet products. For example, video plotter pictures can be transferred to a radar and vice versa. Pictures received via the NavNet may be adjusted at the receiving end.

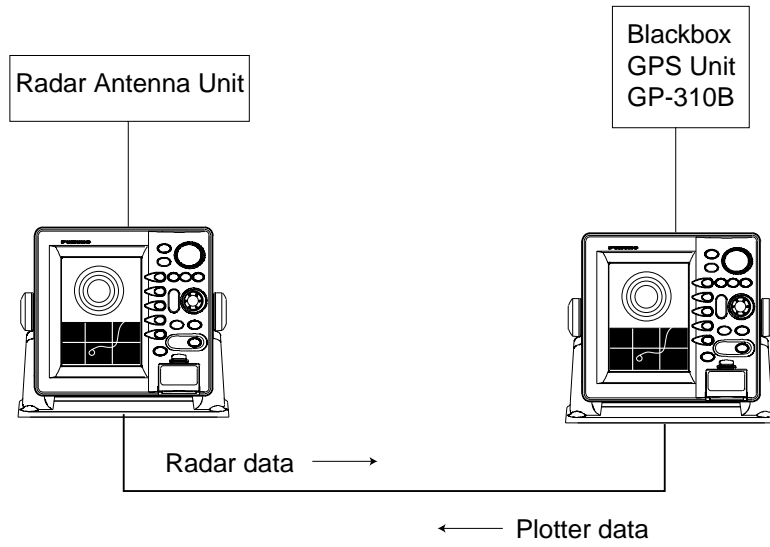
An NavNet system may consist of a single, dual, or three and more NavNet products. For a system incorporating three or more products a “hub” is required to process data.

Single unit



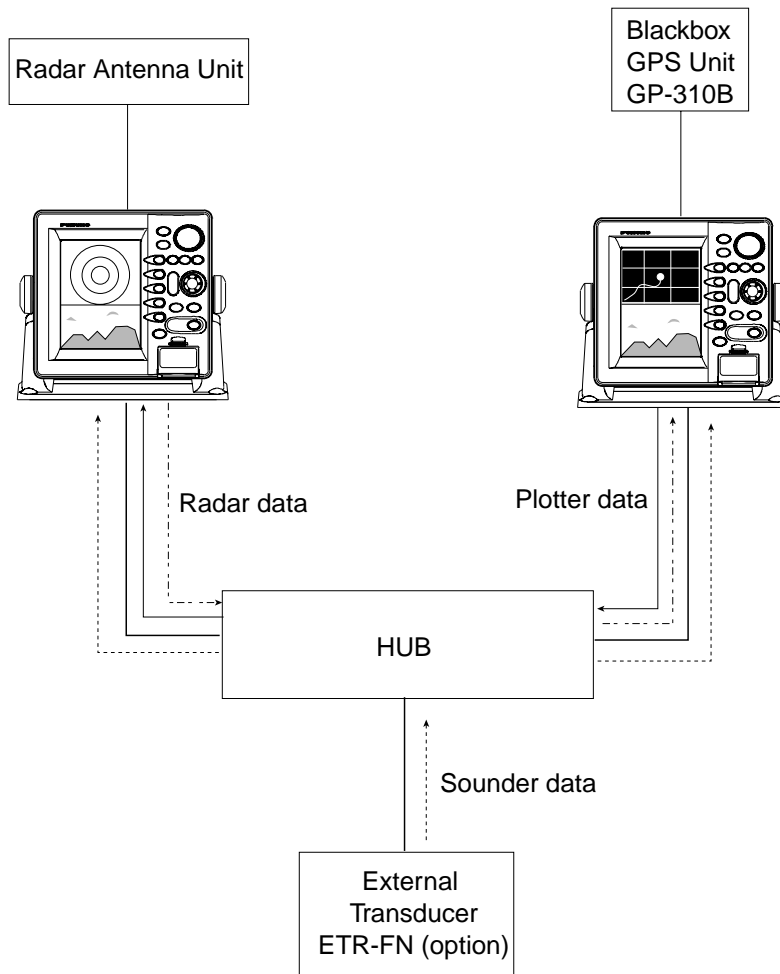
Single-unit NavNet system

Two-unit system



Two-unit NavNet system

Three-or more unit system



Three-or more unit NavNet system

1. OPERATIONAL OVERVIEW

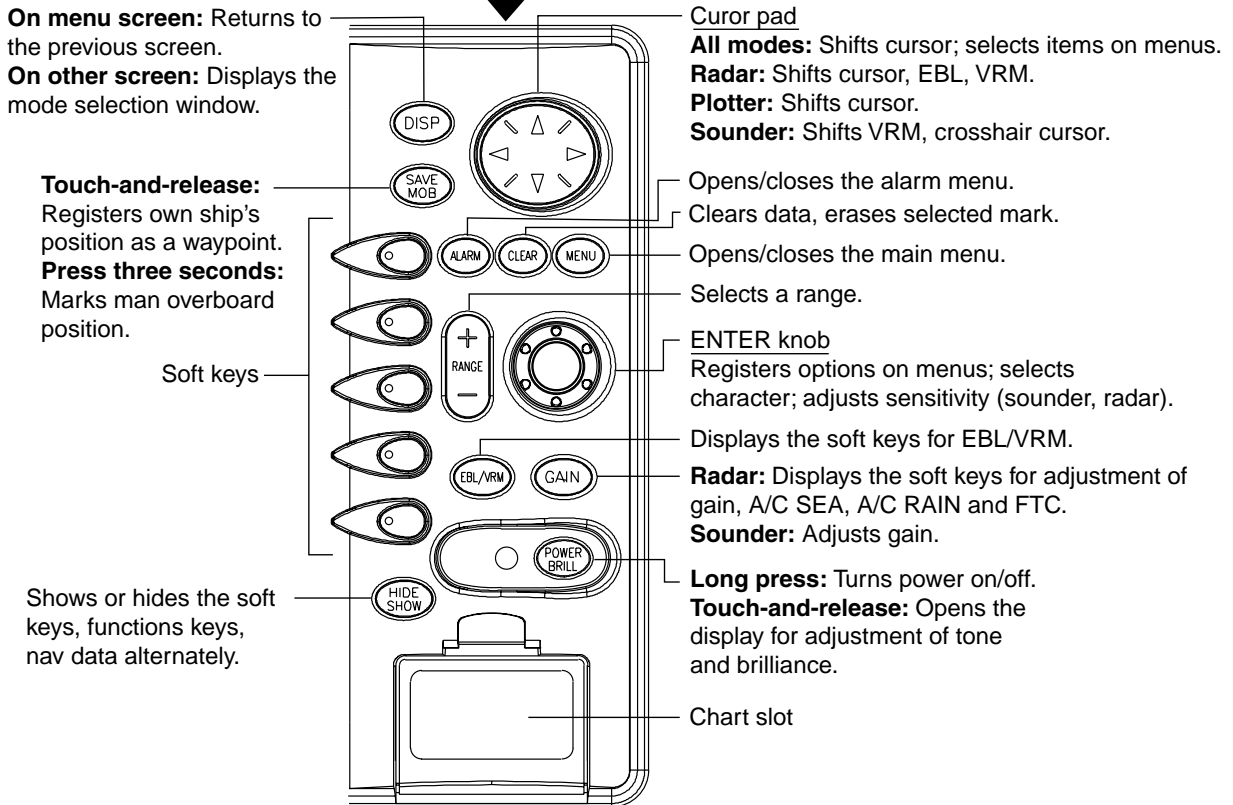
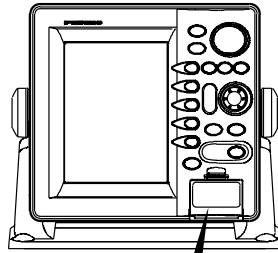
This chapter provides basic information to get you started using your radar/plotter. Instruction includes

- Control overview
- Chart card insertion
- Power on/off
- Contrast, brilliance and hue (MODEL-1700C series only) adjustments
- Display selection
- MOB (Man OverBoard) mark entry
- Data boxes
- Function keys
- Demonstration display

1.1 Operating Controls

1.1.1 Control overview

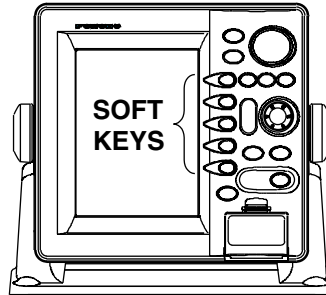
The radar functions are operated with 17 controls. Ten controls are labeled and they provide the function shown on their labels. The five soft keys provide various functions according to current operating mode. The [ENTER] knob mainly functions to register selections on the menu. The cursor pad's main function is to move the cursor across the screen. Whenever you operate a key a single beep confirms control operation. Invalid operation emits three beeps.



Control panel

1.1.2 Soft keys

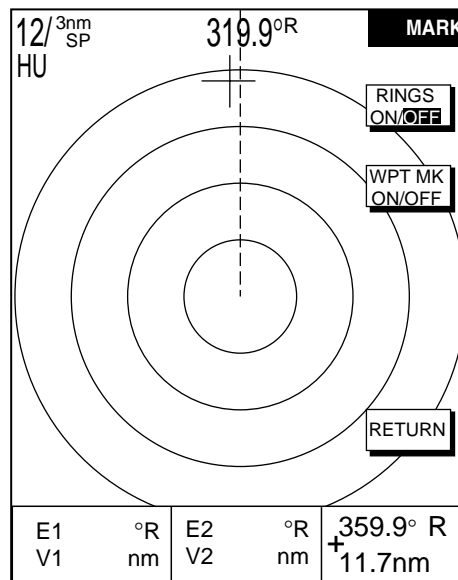
The five soft keys' function changes according to the operation. Their labels for their current functions are shown on the screen to the left of the keys. To hide or show the soft keys press the [SHOW/HIDE] keys.



Display unit

When you press a soft key one of three operations is executed: the selected operation is executed, a sub-set of soft keys appears or a menu is displayed.

Some soft keys show their currently selected soft key option in reverse video as below.

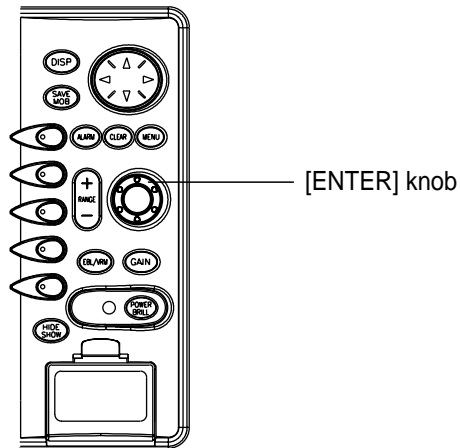


Radar display

1. OPERATIONAL OVERVIEW

1.1.3 [ENTER] knob

The [ENTER] knob functions to register input and enter alphanumeric data such as waypoint name. Clockwise rotation of the knob selects an alphabet, symbol or numeric, in one of the sequences shown below. After you have selected desired character push the [ENTER] knob to register your selection.



[ENTER] knob

Alphabet, symbol, numeric

A→B→C→D→E→F→G→H→I→J→K→L→M→N→O→P→Q→R→S→T→U→V
→W→X→Y→Z→_→'→#→0→1→2→3→4→5→6→7→8→9→A→B...

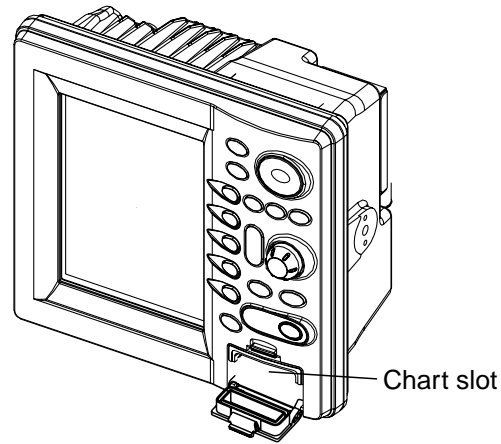
Numerics

0→1→2→3→4→5→6→7→8→9→0→1...

1.2 Inserting a Chart Card

This unit accepts FURUNO, Nav-Charts™ (NAVIONICS) and C-MAP chart cards. You may insert the chart card of your choice as follows:

1. Open the chart card slot lid.



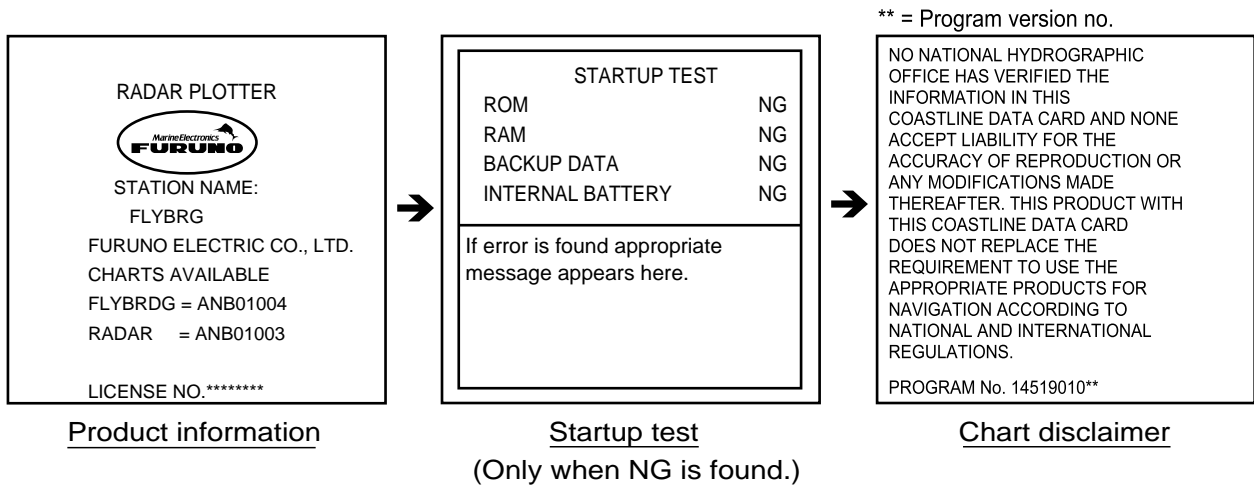
Display unit

2. Insert desired chart card groove side up.
3. Close the lid to prevent water from entering the chart drive.

Note 1: For C-MAP card, do not eject it while the chart is being drawn. This may cause the equipment to freeze.

1.3 Turning the Unit On/Off

Press and hold down the [POWER/BRILL] key to turn the unit on. A beep sounds and the equipment proceeds in the sequence shown below, displaying the startup screen, startup test results and the chart usage disclaimer in that order. The startup test checks the ROM, RAM, internal battery and backup data for proper operation, displaying the results for each if there is NG (No Good). If error is found an appropriate message appears on the screen. For any NG, try to press any key to go to the chart disclaimer screen.



You may press any key at the chart disclaimer screen to show the last-used radar display, or wait several seconds to let the equipment do it for you.

To turn the unit off, press and hold down the [POWER/BRILL] key. Release the key when you see the timer which counts down the time remaining until the unit is shut off. To protect the LCD attach the hard cover.

Note: The very first time the system is powered the display shows the message displayed below which asks you if you want to start the demonstration mode. Press the [ENTER] knob to start the demo mode, or press the [CLEAR] key to start normal operation. For further details about the demonstration mode, see paragraph 1.9.

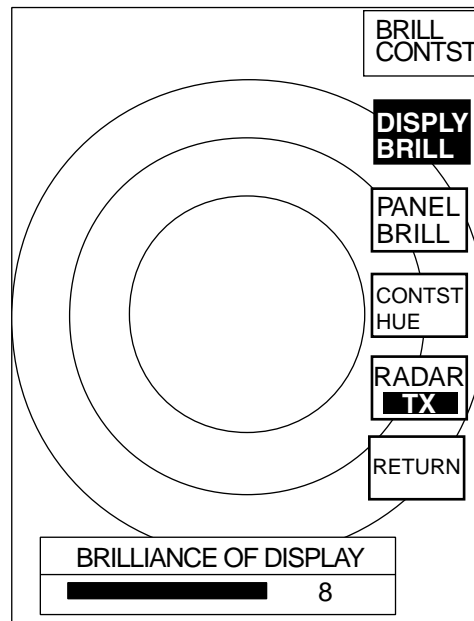
START DEMO MODE?
 YES ... PUSH 'ENTER' KNOB
 NO ... PUSH 'CLEAR' KEY
 (CLEAR KEY TO SKIP DEMO.)

1.4 Adjusting Display Brilliance, Panel Brilliance, Contrast, Hue

You can adjust display brilliance, panel brilliance, contrast (MODEL-1700 series only) and hue (MODEL-1700C series only) as shown below.

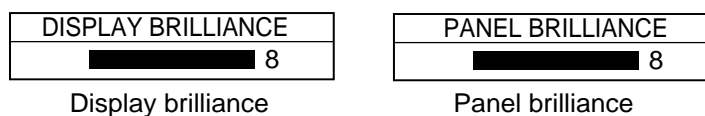
1.4.1 Display brilliance, panel brilliance

1. Press the [POWER/BRILL] key with a touch-and-release action. A set of soft keys for adjustment of brilliance and contrast or hue appear.



Brilliance adjustment soft keys

2. Press the DISPLY BRILL or PANEL BRILL soft key as appropriate. An adjustment window appears at the bottom of the screen. This window shows the name of the item selected for adjustment plus current level, by bar graph.



Display brilliance and panel brilliance windows

3. Adjust the [ENTER] knob, clockwise to raise the setting or counterclockwise to decrease it. You may also use the soft key pressed at step 2, in which case the item selected is adjusted cyclically, from low to high. Eight levels of display brilliance and panel brilliance are available.
4. Hit the RETURN soft key to finish.

1.4.2 Contrast

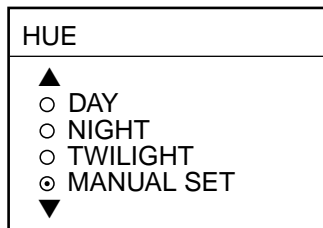
1. Press the [POWER/BRILL] key with a touch-and-release action.
2. Press the CONTST (MODEL-1700 series) or CONTST/HUE (MODEL-1700C series) soft key.
3. **For the MODEL-1700C series**, two soft keys appear at the pressing of the CONTST/HUE soft key: CONTST and HUE. Press the CONTST soft key to adjust the contrast.
4. Adjust the [ENTER] knob, clockwise to raise the setting or counterclockwise to decrease it. You may also use the soft key pressed at step 2 (3 for the MODEL-1700C series), in which case the item selected is adjusted cyclically, from low to high. 16 levels (MODEL-1700 series) and 10 levels (MODEL-1700C series) of contrast are available.



Contrast window

1.4.3 Hue (MODEL-1700C series only)

1. Press the [POWER/BRILL] key with a touch-and-release action.
2. Press the CONTST/HUE soft key.
3. Press the HUE soft key to show the hue setting window.



Hue window

4. Operate the cursor pad to select hue desired, referring to the table below. MANUAL SET restores default hue setting.

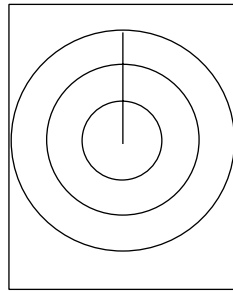
	Night	Day	Twilight	Applicable mode
Characters	Red	Black	Green	Plotter, radar, sounder
Radar ring	Red	Green	Green	Radar
Radar echo	Green	Yellow	Green	Radar
Background	Black	White	Blue	Plotter, radar, sounder
Landmass	Light Yellow	Yellow	Green	Radar

5. Hit the RETURN soft key to finish.

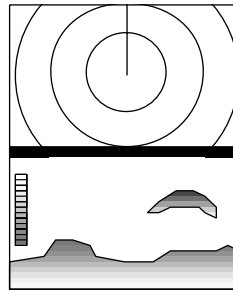
1.5 Selecting a Display

1.5.1 Display modes

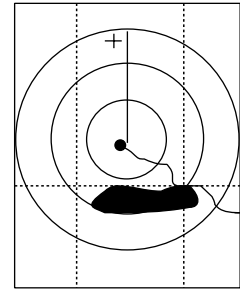
If you have a radar, navigator and video sounder connected, four full-screen displays are available: plotter, radar, video sounder and navigation data. In addition to the full-screen display, you can divide the screen into half-screen displays to show two sets of images (data), and combine the plotter and radar displays on the overlay screen.



Full screen
(radar)



Combination screen
(radar + sounder)



Overlay screen
(radar + plotter only)

Display screens

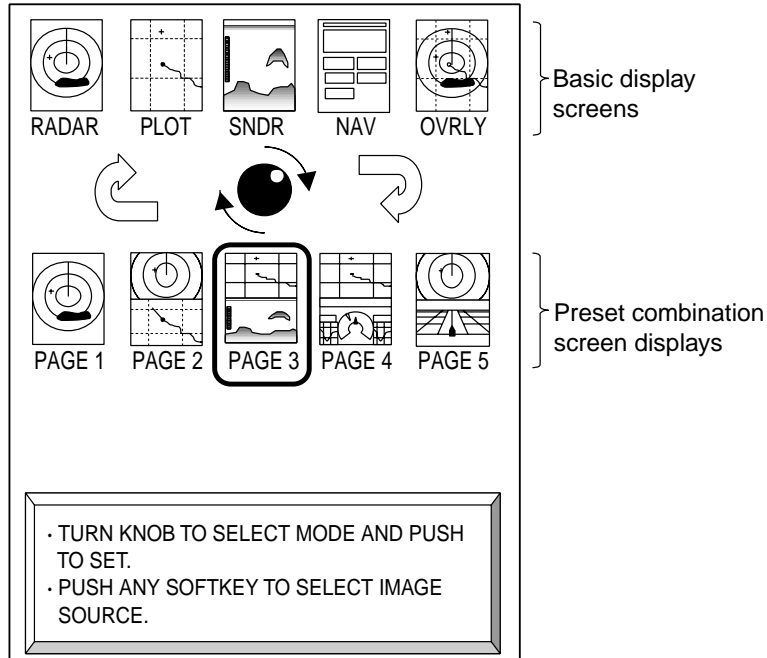
The table below shows the displays available with each screen type.

Screen type and available display screen

Full screen	Combination screen options	Overlay screen options (MODEL-1700C series only)
Radar, plotter, sounder, nav data	Plotter radar, video sounder, compass, highway, compass/highway, nav data, overlay	Radar + plotter

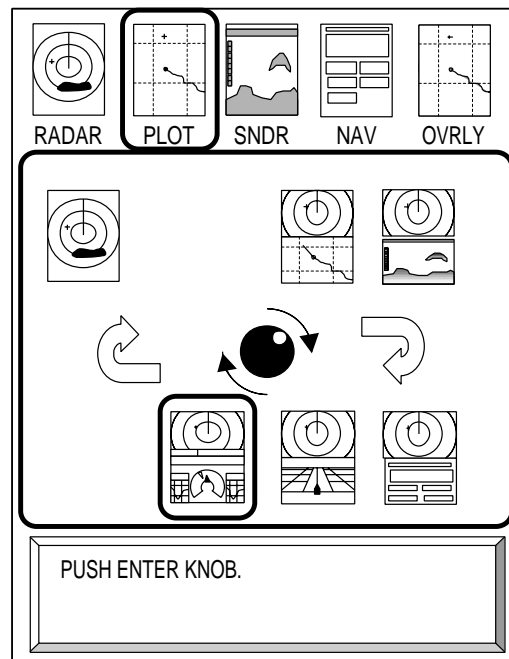
1.5.2 Selecting a display

1. Press the [DISP] key to show the full-screen selection window. The icons of modes not available are shaded in grey. PAGE 1-PAGE 5 are “hot page” combination screen displays which you may configure as you like. For further details see paragraph 5.5 Hot Page Setup.



Full-screen selection window

2. Rotate the [ENTER] knob to select a basic display screen or a “hot page” screen. If you selected a “hot page” press the [ENTER] knob to finish.
3. **If you selected a basic display screen at step 2**, push the [ENTER] knob. The corresponding combination screen selection window appears.

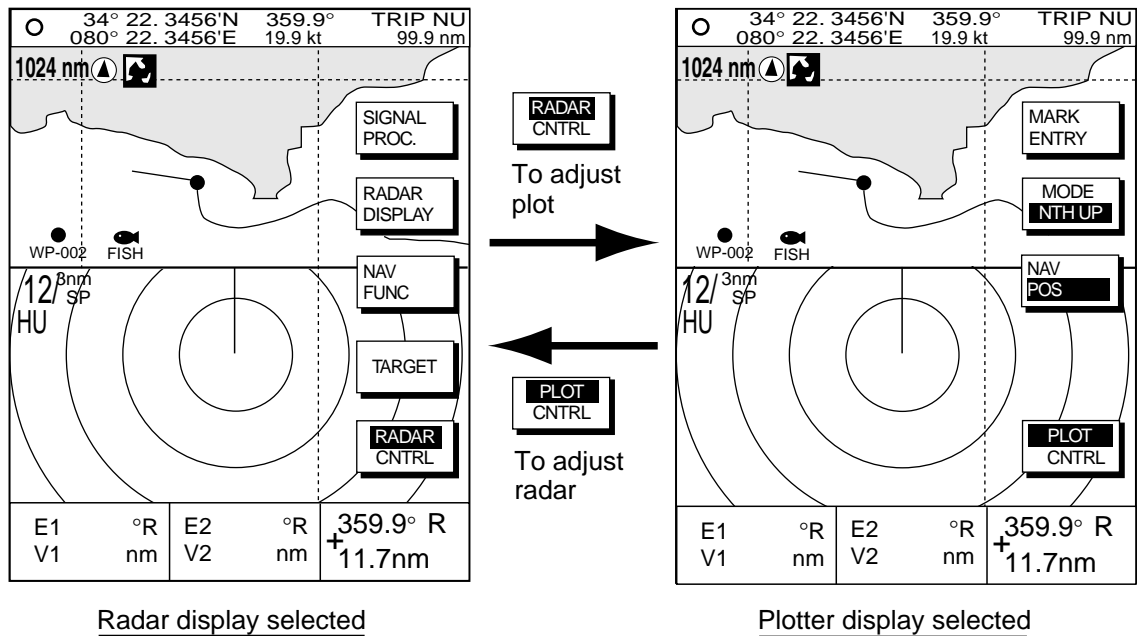


Combination screen selection window

4. Operate the [ENTER] knob to select a combination display and push it to set.

1.5.3 Switching control in combination and overlay screens

A soft key is provided in relevant combination and overlay screens (MODEL-1700C series only) to switch control between displays. In the example below the RADAR CNTL and PLOT CNTL soft keys enable switching control between the radar and plotter screens in the plotter/radar combination display.

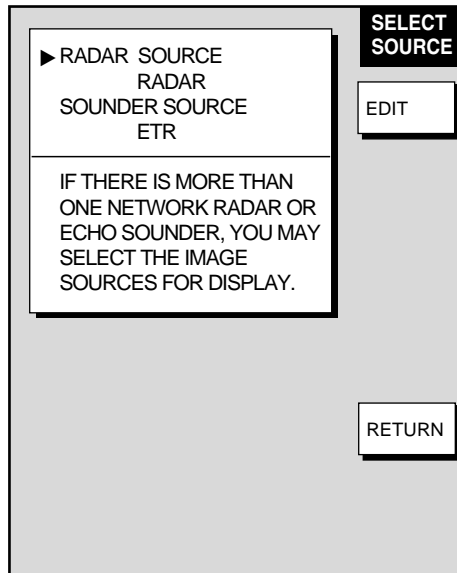


How to switch control between modes in the plotter/radar combination display

1.5.4 Selecting image source

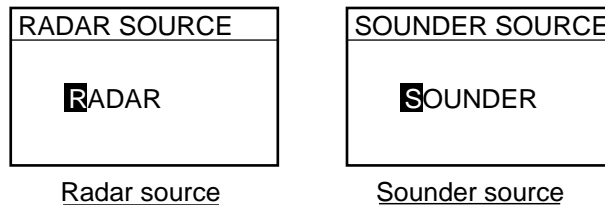
When more than one network radar or a blackbox echo sounder is connected to the equipment you may select image source for each as shown below. This is not necessary when only one network radar or echo sounder is connected.

1. Press the [DISP] key.
2. Press any soft key to show the following display.



Select source menu

3. Select RADAR SOURCE or SOUNDER SOURCE as appropriate and press the EDIT key.

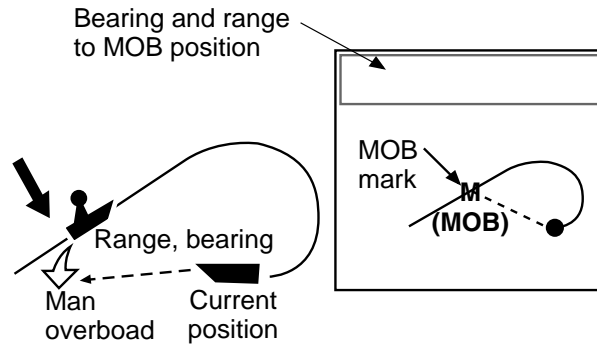


Radar source and sounder source windows

4. Enter host name with the [ENTER] knob.
5. Press the RETURN soft key to finish.
6. Press the [MENU] key to close the menu.

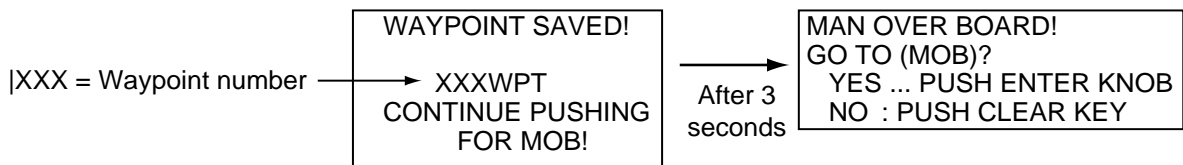
1.6 Entering the MOB Mark, Setting MOB as Destination

The MOB (Man Overboard) mark functions to mark man overboard position. You can inscribe this mark from any mode, except while playing back data or conducting a test. Note that this function requires position data.



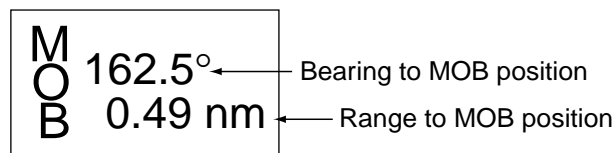
MOB concept

1. Press and hold down the [SAVE/MOB] key. The display shows the waypoint number being saved (youngest empty waypoint number, 001-999) followed by the MOB confirmation window.



MOB mark messages

2. Push the [ENTER] knob to select MOB position as destination, or press the [CLEAR] key to only mark position as a waypoint. If you select the MOB position as destination;
 - A full-screen radar, plotter or overlay (color model only) appears depending on the display in use.
 - The MOB mark "M" appears at the MOB position and a line runs between it and current position. This line shows the shortest course to the MOB position.
 - Range and bearing to the MOB position are shown in a data box.

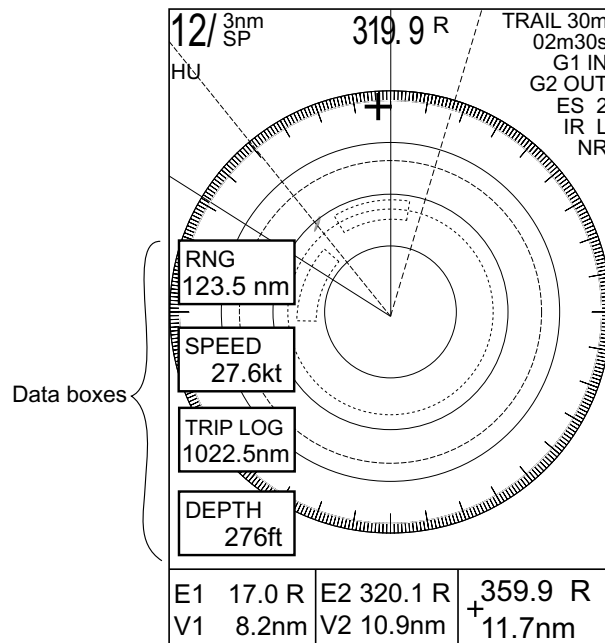


MOB data box

To erase an MOB mark, place the cursor on the MOB mark and press the [CLEAR] key followed by the [ENTER] knob to erase the waypoint.

1.7 Data Boxes

Data boxes, providing navigation data, may be shown at the bottom of any full-screen display. Up to six data boxes (two in case of large characters) may be shown. The user may choose which data to display, where to locate it, and show or hide it as desired. Further, data boxes may be set independently for each display mode (radar, plotter, sounder). For how to select data for the data boxes, see paragraph 5.4 Data Box Setup.



Radar display, showing data boxes

1.7.1 Showing, hiding data boxes with soft key

Radar: ZOOM/D.BOX → D. BOX ON, D.BOX OFF

Plotter: D.BOX ON, D.BOX OFF

Sounder: MODE/D.BOX → D.BOX ON, D.BOX OFF

1.7.2 Rearranging data boxes

You may select the location for data boxes as follows:

1. Use the cursor pad to place the cursor in the data box you want to move and press the [ENTER] knob.
2. Use the cursor pad to drag the data box to the location desired and press the [ENTER] knob.

1.7.3 Temporarily erasing a data box

If a data box is obscuring a desired object you may temporarily erase the box. Use the cursor pad to place the cursor inside the data box you wish to erase and press the [CLEAR] key. To redisplay the box, press the D.BOX soft key twice.

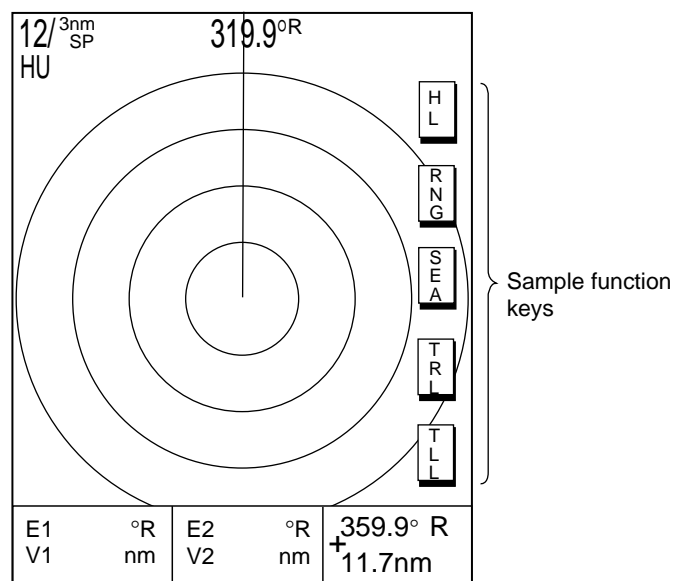
1.8 Soft Keys

The soft keys provide for one-touch call up of a desired function. The default soft key settings for the radar display are

- Soft key #1: Heading line on/off
- Soft key #2: Range ring on/off
- Soft key #3: Suppressing sea clutter
- Soft key #4: Echo trail on/off
- Soft key #5: Outputting TLL data

1.8.1 Executing a function

1. Press the [HIDE/SHOW] key to show the soft key labels for functions.



Plotter display, showing soft keys

2. Press soft key desired.
3. For or example, heading line on/off, press the soft key to erase the heading line.
4. Release the soft key to finish.

Note: Soft keys can be programmed for the radar, plotter and sounder displays. For further details see the following:

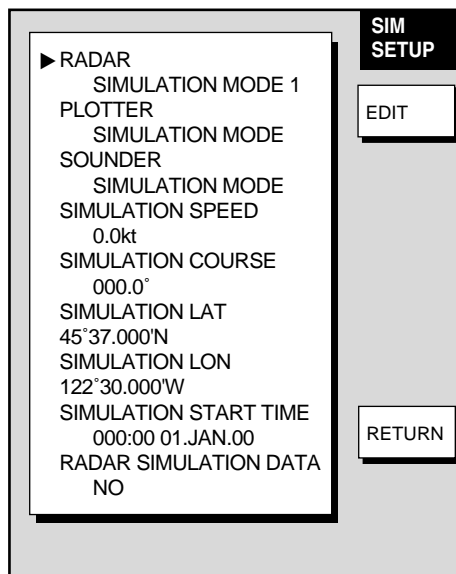
- Plotter: paragraph 5.2.2
- Radar: paragraph 5.8.3
- Sounder: paragraph 5.9.4

1.9 Demonstration Display

The demonstration display provides simulated operation of the equipment to help acquaint you with the many features it has to offer. It allows you to view and control a simulated radar, plotter and sounder picture, without GPS equipment, radar input or blackbox sounder. All controls are operative, thus you may practice setting guard zone, EBL/VRM, etc.

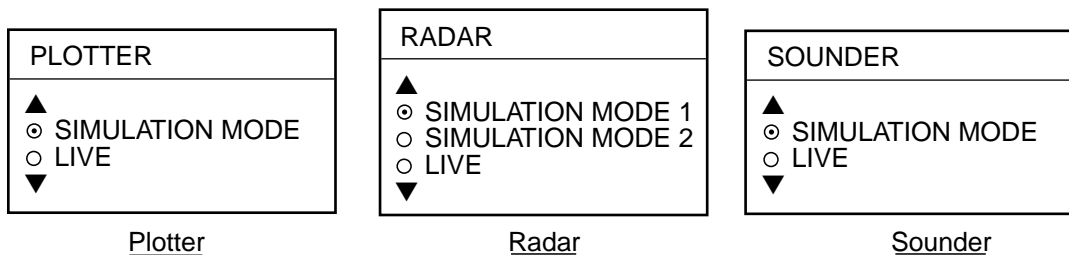
To start the demonstration display;

1. Press the [MENU] key.
2. Press the SYSTEM CONFIGURATION, SYSTEM SETUP and SIMULATION soft keys.



Simulation mode setup menu

3. Select RADAR, PLOTTER or SOUNDER as appropriate and press the EDIT soft key.



Plotter, radar, sounder simulation mode selection windows

4. Use the cursor pad to select simulation mode desired and press the RETURN soft key.

SIMULATION MODE (Plotter, sounder): Turns simulation mode on.

SIMULATION MODE 1 (Radar): Uses standard demonstration display.

SIMULATION MODE 2 (Radar): Uses data read into the unit from a network radar.

LIVE: Turns simulation mode off.

5. Select SIMULATION SPEED and press the EDIT soft key.
6. Enter speed (setting range, 0-99 kt, default speed, 10 kt) with the [ENTER] knob and press the RETURN soft key.
7. Select SIMULATED LAT and press the EDIT soft key.
8. Enter latitude (setting range, 85°N-85°S, default setting, 45°37'N) and press the RETURN soft key.
9. Select SIMULATED LON and press the EDIT soft key.
10. Enter longitude (setting range, 180°E-180°W, default setting, same as GPS default setting) and press the RETURN soft key.
11. Select SIMULATION START TIME and press the EDIT soft key.
12. Enter start date and time (default date and time: 2001/1/1, 0:0) and press the RETURN soft key.
13. If you selected SIMULATION MODE 2 at step 4, select YES and press the RETURN soft key. Press the [ENTER] knob to erase simulation data and get new data. The message "Now getting demo data. Do not cut off display unit." appears while the unit is receiving radar data.

If the network radar could not be found "Radar source is not found. Cannot get demo data." appears. And if the radar is not active, the message "Radar is not active. Cannot get demo data." is displayed.