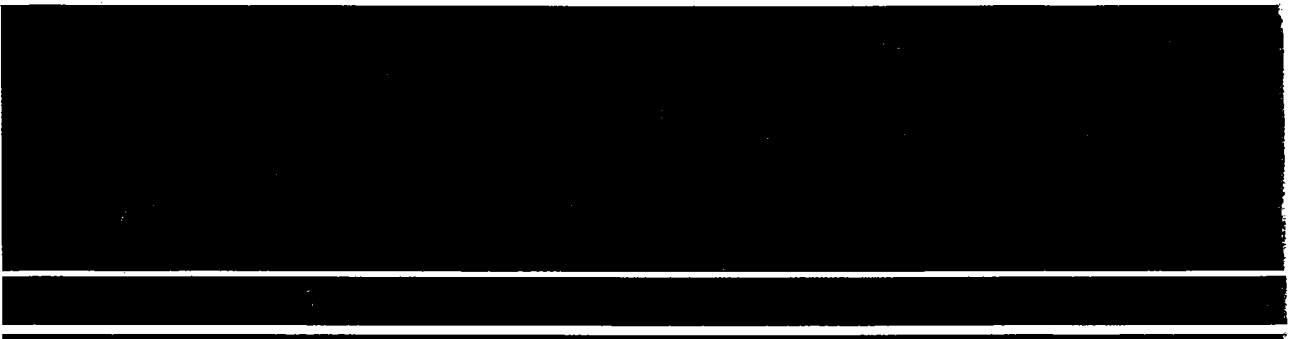
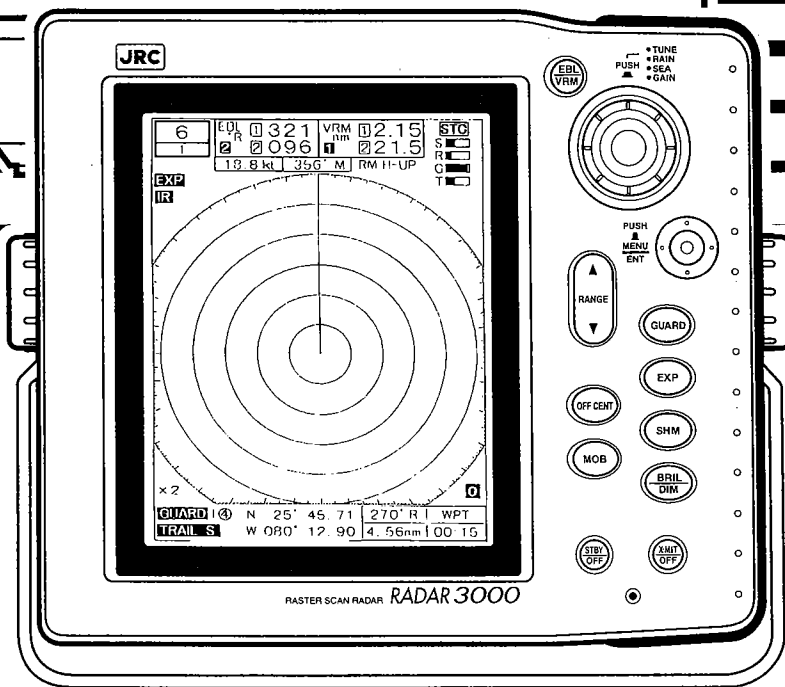




# INSTRUCTION MANUAL



# JRC



# RASTER SCAN RADAR **RADAR 3000**

**Thank you for purchasing the RADAR 3000 radar.**  
**It will provide many years of trouble free use when operated properly.**

To use your RADAR 3000 properly, please observe the following precautions:

- Read this manual thoroughly to gain a good understanding of the capabilities and requirements of this equipment.
- Store the manual in a safe location so that it does not become lost or damaged.
- Observe standard storage and handling procedures for electronic equipment.
- If after proper installation RADAR 3000 appears to be defective, please contact your JRC sales or service representative for assistance.

### **Symbols Used In This Manual**

The following symbols are used in this instruction manual and on the product itself to ensure correct handling of the product and to protect your safety. Their meanings are explained below. Please take note of these symbols as you read the manual.



#### **WARNING**

A safety warning to alert you of possible physical harm to you or the equipment.



#### **CAUTION**

Equipment damage precaution to alert you of possible harm and/or failure of equipment.



Electric shocks

This symbol is intended to alert the user to the presence of dangerous items to be handled with every possible caution. For safe operation, read the instructions carefully.



Prohibition

These symbols are intended to alert the user to the presence of prohibited items that must never be performed. Read the instructions carefully and do not attempt things prohibited.



Prohibits disassembly




Instruction


This symbol is intended to alert the user to the presence of instructions whose performance is absolutely necessary. Read the instructions carefully and be sure they are executed.

## Operating Precautions


### **Warning**


-  To avoid electrical shock, never touch the inside of the scanner or display unit. Leave protective cover on.

High voltage present inside of these units could cause personal injury. Refer equipment servicing to authorized JRC personnel.


-  Avoid routinely entering the nearby vicinity of the scanner unit.

The scanner unit rotates quickly and could cause personal injury. The scanner should be installed in a high place such as the cabin roof, flying bridge, radar mast, or the top base frame of your ship. If the scanner cannot be located out of normal human reach, it should be surrounded with a fence. Prolonged human exposure to radar signals at close range is not recommended.


-  Before approaching or removing the scanner unit, turn off the STBY/OFF and X-MIT/OFF keys on the display unit. Cable connector P1 on the display unit should be disconnected before removing the scanner unit from its installed position.

-  Never sit on the scanner unit.  
The radome and/or the parts in the scanner unit may be damaged.

### **Caution**

-  Use your RADAR 3000 system properly by following the instructions in this manual.

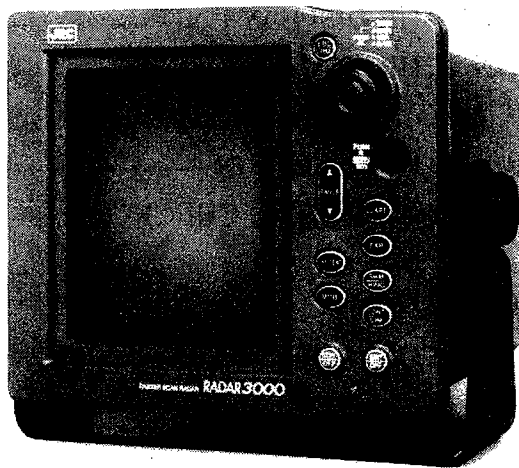
Incorrect operation can detract from optimum system performance.

-  This radar unit is only an aid to navigation. Its accuracy can be affected by many factors including equipment failure or defects, environmental conditions, and improper handling or use. It is the user's responsibility to exercise common prudence and navigational judgment. This radar unit should not be relied upon as a substitute for such prudence and judgment.

*Equipment Photograph*



*SCANNER UNIT NKE-1046*



*DISPLAY UNIT NCD-3744*

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## ***RADAR GLOSSARY OF TERMS***

The following is a list of abbreviations and acronyms which maybe used in the text of the manual.

A/D	Analog to Digital Conversion
ALM	Alarm In, also known as the approach alarm. For targets set zone. approaching a preset zone.
CPU	Central Processing Unit
EBL	Electronic Bearing Line
EXP	Expansion
FTC	Fast Time Constant also known as Rain Clutter
GPS	Global Positioning System
IR	Interference Rejection
KM	Kilometer
LL	Latitude/Longitude
MH	Modulator High voltage
NM	Nautical Mile
PCB	Printed Circuit Board
PPI	Plan Position Indicator
PW	Pulse Width
RR	Range Rings ( Fixed)
SHM	Ship's Heading Marker
STBY	Standby
STC	Sensitivity Time Constant, also known as Anti-Clutter Sea
TD	Time Difference
TI	Trigger
VD	Video
VOM	Volt-ohm Meter
VRM	Variable Range Marker
WPT	Waypoint
X-MIT	Transmit

---

# *SECTION 1*

---

## **INTRODUCTION**

### **1.1 FUNCTION**

The JRC RADAR 3000 Radar is compact raster scan radar with a 4 KW transmitter and a 7-inch cathode ray tube. Except for special tubes, they are all made up of solid state device for improved reliability.

### **1.2 FEATURES**

- Improved anti-sea clutter and anti-rain clutter suppression
- Easy control for VRM, EBL, GAIN, anti-sea, and anti-rain, using J-DIAL
- Approach and departure guard zone with audible alarm
- Use of robust material, aluminum die cast
- Easy to understanding other target information for range, bearing and Lat/Long by using cursor
- Destination mark can be displayed
- 2/3 radius off-centering for any direction
- Trail indication
- Man overboard indication
- Intermittent transmission



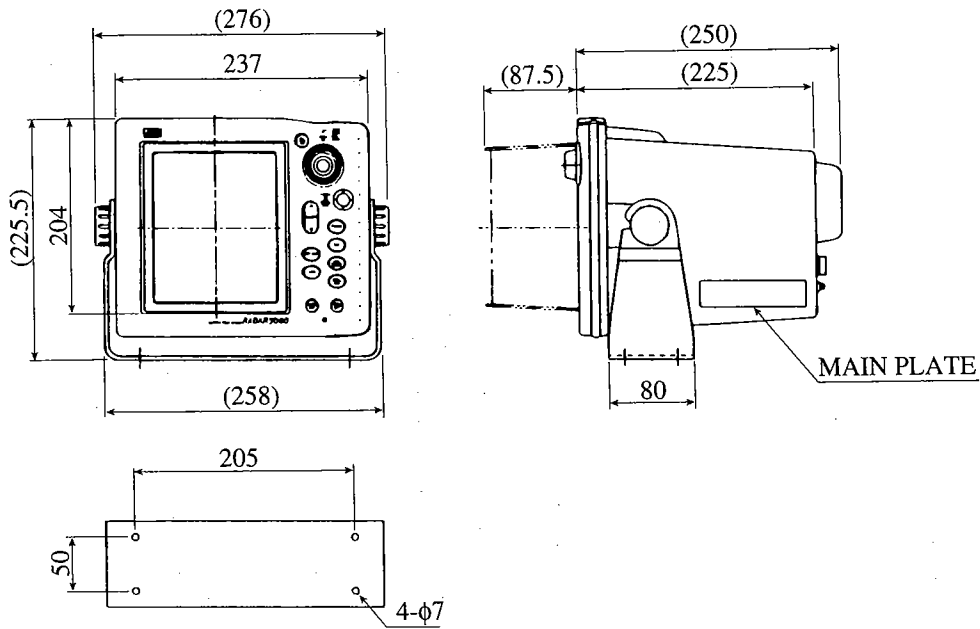
### 1.3 COMPONENTS

Table 1-1 indicates a listing of items that are included with your new radar system.

<b>Description</b>	<b>Model No. or Code No.</b>
Radar 3000 system	JMA-1541
Scanner Unit	NKE-1046
Display Unit	NCD-3744
Sun Shield	MTV301854
Inter-unit Cable (10m)	CFQ8026-10
Power Cable (2m)	CFQ2646
Instruction Manual	7ZPRD0414
Standard Spares	6ZXRD00192
Sun Cover	MTV301855
Scanner Mounting Hardware	
Display Mounting Hardware	MPTG02024

*Table 1-1 EQUIPMENT SUPPLIED*

# 1.4 CONSTRUCTION



MOUNTING DIMENSIONS

FIG. 1-1 DISPLAY MOUNTING DIMENSIONS

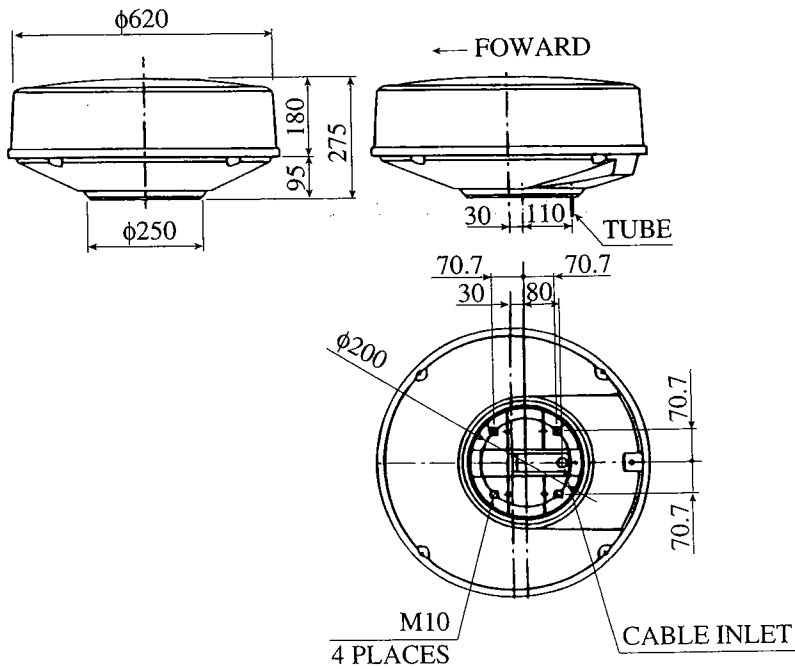


FIG. 1-2 SCANNER MOUNTING DIMENSION

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# SECTION 2

---

## OPERATING CONTROLS AND FUNCTIONS

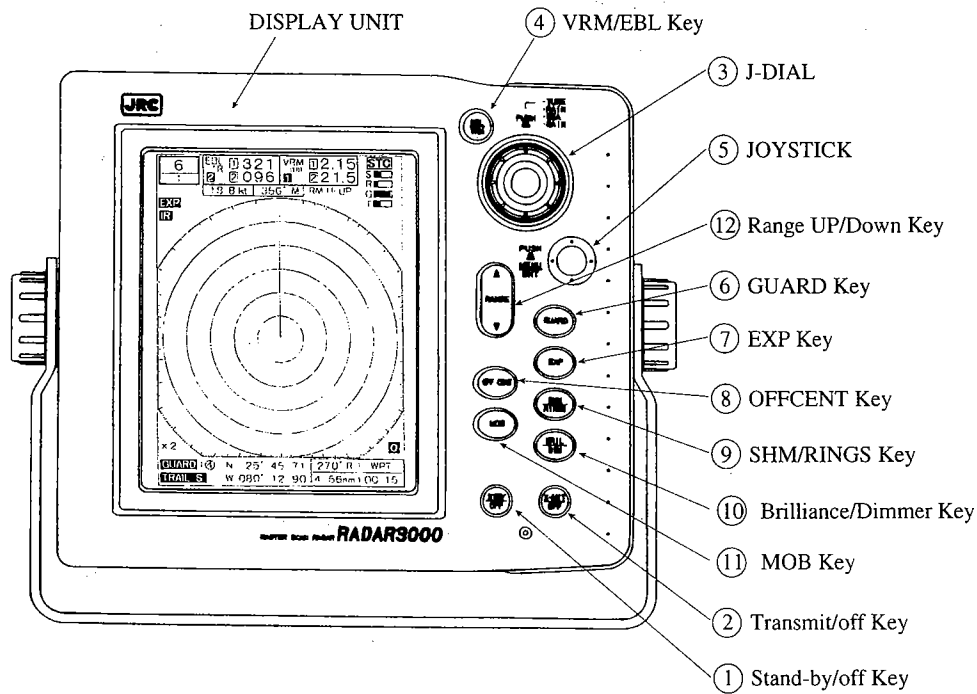


FIG. 2-1 OPERATING CONTROLS

## 2.1 CONTROL PANEL

### ① Stand-by/off Key

- Turn ON power to Display and Scanner and activates 90 second countdown timer.
- Press ST-BY/OFF key to Stand-by mode while in the Transmitting mode.
- Press STBY/OFF and X-MIT/OFF keys simultaneously to shut off.

### ② Transmit/off Key

- Turn ON transmitter which activates Radome.
- Press STBY/OFF and X-MIT/OFF keys simultaneously to shut off.

### ③ J-DIAL

- Push to select SEA, RAIN, GAIN and TUNE for control.
  - SEA      Reduces sea returns.
  - RAIN     Reduces rain or snow returns.
  - GAIN     Controls strength of target returns.
  - TUNE     Manually fine tunes receiver by peaking tuning bar (No tuning bar in AUTO tune).
- Control the SEA, RAIN, GAIN, TUNE, VRM, EBL, Contrast for desire setting.

### ④ VRM/EBL key

- Enable a VRM or EBL for display. A short press to turn on or off selected VRM or EBL. Press and hold, selects VRM or EBL for control by using J-DIAL.

### ⑤ JOYSTICK

- Position cursor setting.
- Enables MENU for setups and selection.

### ⑥ GUARD Key

- Enables or disables Guard Zone alarm as set with the JOYSTICK and I or O operation

I = In mode alarm    O = Out mode alarm    Blank = OFF

- ⑦ EXP Key
  - Target Expander ON/OFF.
- ⑧ OFFSET Key
  - Places origin at any point on screen up to 2/3 radius. Inop on 24 nm range.
- ⑨ SHM/RINGS Key
  - Enables or disables the fixed range rings alternately.
  - Momentarily disables the Heading Flash while key is held depressed.
- ⑩ Brilliance/Dimmer Key
  - Brilliance level for video, characters, rings, and EBL.
  - Setting panel illumination.
- ⑪ MOB Key
  - Marks the point where the incident occurred.
- ⑫ Range UP/Down key
  - Increases or de decreases the range scale in use.

---

# *SECTION 3*

---

## **INSTALLATION**

This section provides practical guidelines to assist in the planning and installation of the RADAR 3000 aboard your vessel.

### **3.1 UNPACKING AND INSPECTION**

Use care when unpacking the RADAR 3000 radar from the shipping carton to prevent damage to the contents. It is also good practice to save the carton and the interior packing material until the radar has been satisfactorily installed on the vessel. The original packing material should be used in the unlikely event that it is necessary to return the unit for service.

### **3.2 PLANNING THE INSTALLATION**

The layout for installing the RADAR 3000 should be planned to give the best operation and service aboard your particular vessel. In general, the scanner unit should be mounted as high as possible above the waterline. The display unit should be installed in a convenient viewing position near the helm. Keep in mind the optimum viewing angle when installing the display. You may want to apply power in advance of installing the unit as that you can determine a satisfactory viewing angle.

A 10 meter length of inter-unit cable is furnished for interconnecting the two main units (scanner and display). This length of inter-unit cable should be sufficient to complete the cable run required on most small vessels. It is recommended that the maximum length of inter-unit cable not exceed 20 meters.

A general system diagram for the RADAR 3000 is shown on the following page.

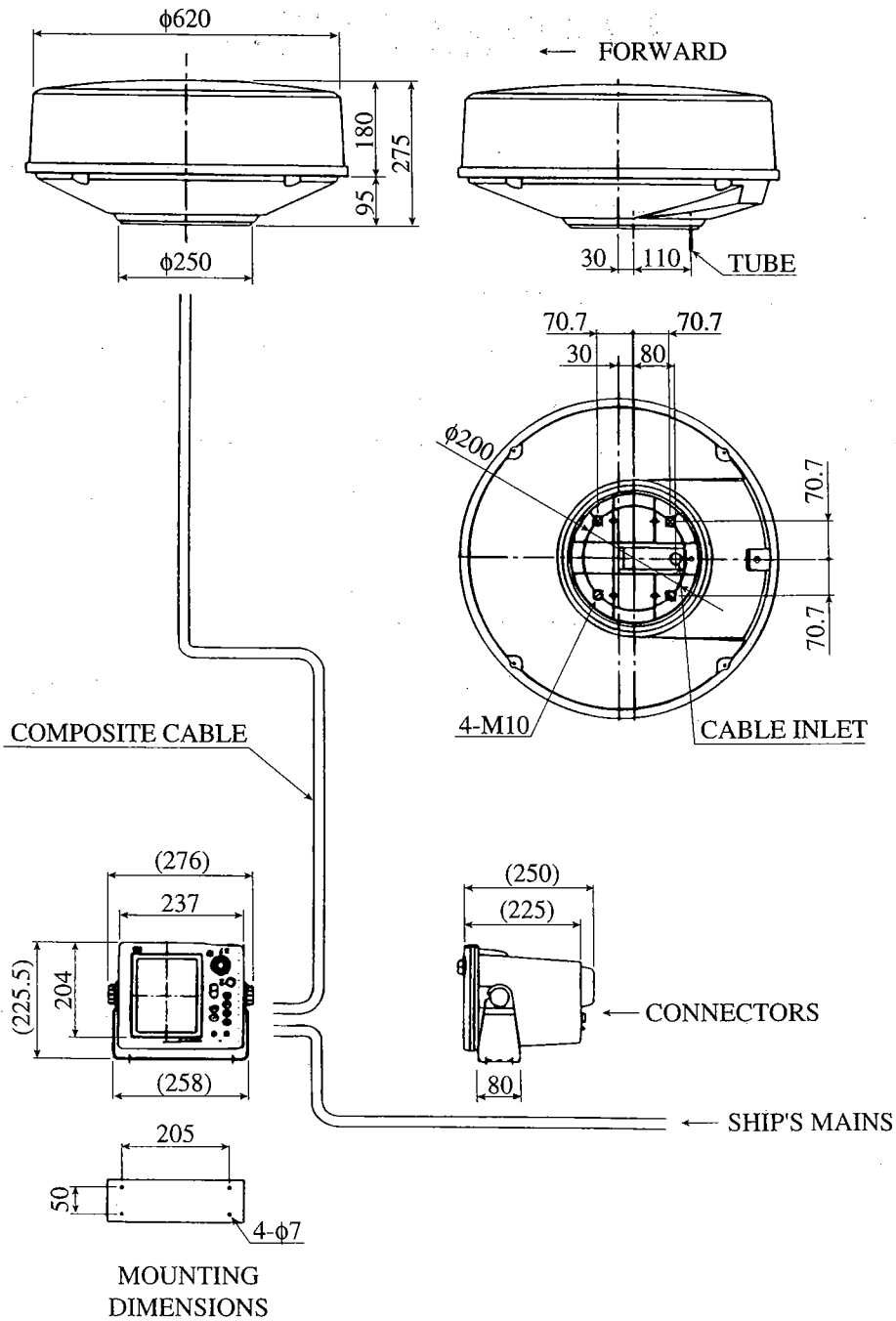


FIG. 3-1 GENERAL SYSTEM DIAGRAM

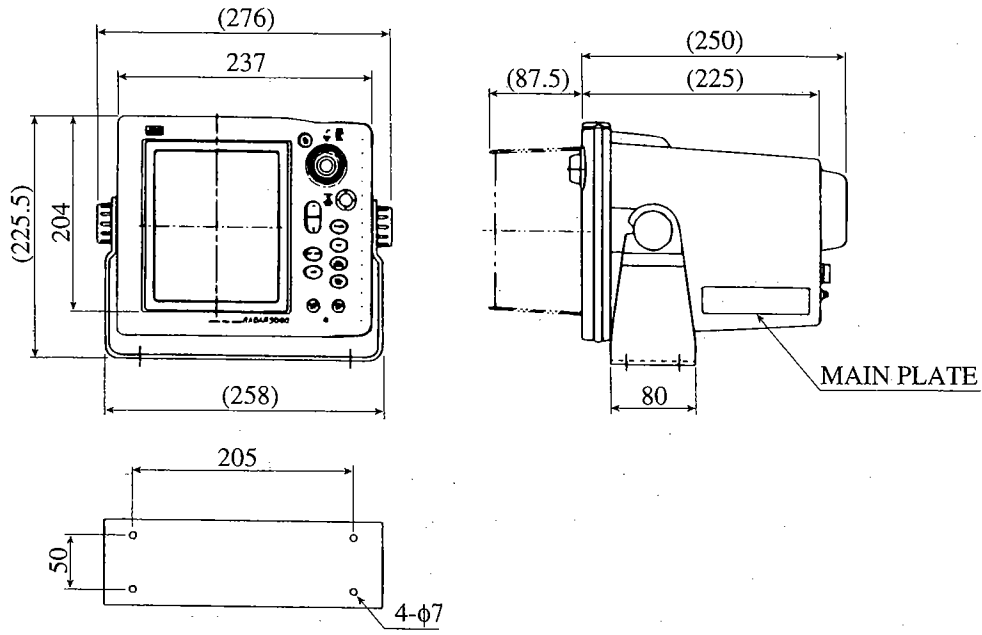
### **3.3 MOUNTING THE DISPLAY UNIT**

When planning the installation for your display unit , the following conditions should be considered to ensure dependable and trouble free operation.

- 1) The mounting location should be easily accessible to allow operation of the front panel controls.
- 2) There should be adequate ventilation.
- 3) There should be sufficient space behind the display unit to allow cable connections to the rear panel connectors.
- 4) The display unit should be located near a DC power source.
- 5) The selected location should be far enough away from device that may cause interference, such as motors and generators.
- 6) Generally, the display unit should be located in a protected area away from prolonged direct exposure to rain and salt spray. It is good practice to protect your valuable electronic equipment as much as possible.

The display unit can be conveniently mounted on a chart table, or bulkhead mounted in a desired location. Using the outline of FIG 3-1 and 3-3 as a guide, install the display unit and secure to the mounting surface.





MOUNTING DIMENSIONS

FIG. 3-3 DISPLAY MOUNTING DIMENSIONS

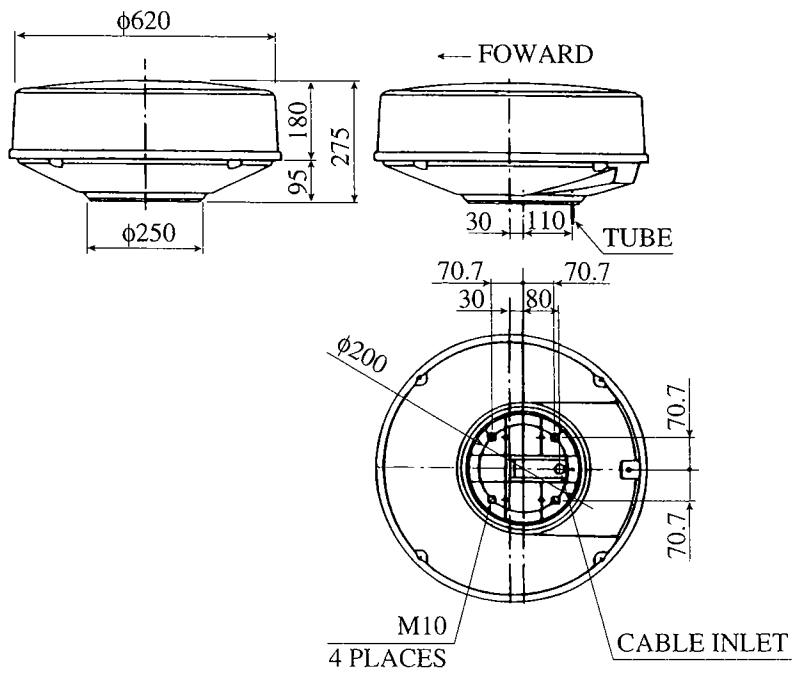


FIG. 3-4 SCANNER MOUNTING DIMENSION

### **3.4 MOUNTING THE SCANNER UNIT**

Selecting an adequate location for the scanner unit requires careful consideration. On many small vessels, the unit can be installed on a mast platform, on an arch, or on a bridge structure near the ship's centerline.

The radiator beam should not be obstructed by nearby large objects. Locate the unit where large structures such as superstructures, searchlight, horns, or masts are not in the same horizontal plane, otherwise, blind areas and false targets can appear on the radar screen.

Using the outline drawing of FIG 3-4 or template in the front of the manual as a guide, install the scanner unit and secure it to a solid mounting surface.

Usually the mounting surface for the scanner unit should be parallel with the ship's waterline. Some vessels, however, may adopt a higher bow angle when the vessel is at its cruising speed. This substantially alters and raises the radar's radiation plain. In this case nearby target detection might be poor. It may be helpful to lower the radar beam towards the parallel by shimming the radar pedestal so as to tilt the beam angle slightly downward with respect to the waterline.

### **3.5 CONNECTING THE SCANNER UNIT CABLE**

- ① Route the scanner unit cable from bottom of the mounting base and connect them to connectors J1 and J2 of the CME-229 modulator printed circuit board.
- ② Tighten the ground terminal and securing the clamping plate with the rubber grommet.

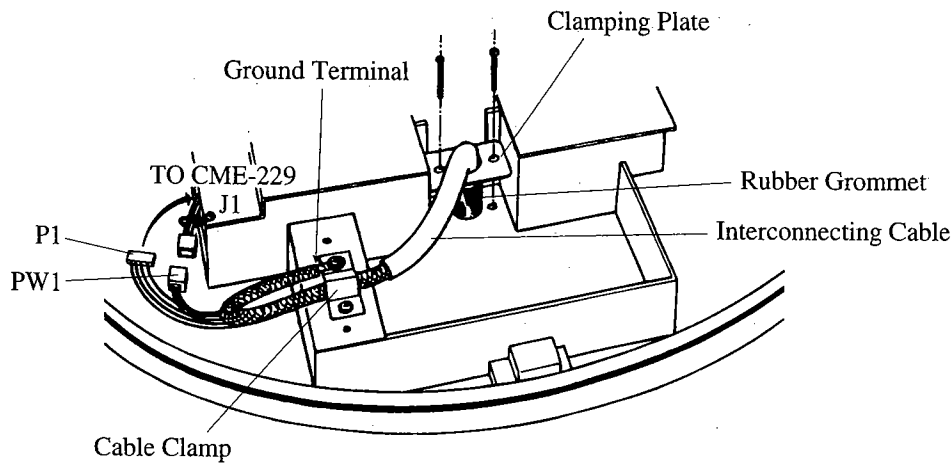


FIG. 3-5 SCANNER UNIT CABLE CONNECTION PROCEDURE

### 3.6 ELECTRICAL CONNECTION

#### 3.6.1 DC POWER CABLE

The RADAR 3000 will work with any ship's mains within the 10.2 to 42 volt range, since it contains a power regulator circuit. Connect the power cable to a DC source. The power cable normally should be wired through the circuit breaker. The white lead wire of the power cable should be connected to the positive source terminal and the black lead to negative source terminal. The shielded wire should be connected to the ship's RF ground. Should the power connections be inadvertently reversed, a protective fuse will blow. Recheck the input power leads for correct polarity with a VOM and reconnect the leads observing correct polarity. Replace the fuse.

#### 3.6.2 EXTERNAL SYSTEM INTERFACE

### CAUTION



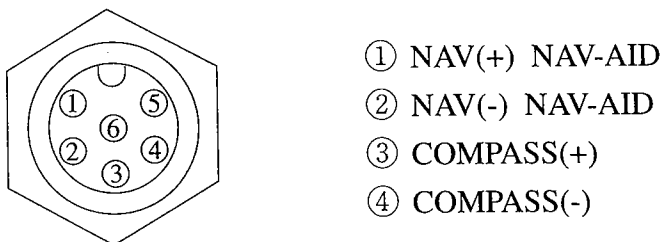
To connect with NAV-AID and/or compass, make sure pin assignment, if used same connector.

In case of different pin assignment, the RADAR 3000 or connected NAV-AID will be damaged.

The RADAR 3000 will interface with any NAV-AID (GPS or LORAN) and compass that has the standard NMEA0182 or NMEA0183 output. The inputs from NAV-AID will be digital data conforming to the NMEA0183 formats to drive various radar features such as waypoint mode. If more than one data type is present at the radar inputs (for example; compass and NAV-AID) , a system priority has been established in the radar's software to respond to the inputs in driving the features. The assigned priorities are set in this manner:

- |           |   |
|-----------|---|
| HEADING:  | 1. Compass (NMEA0183 "HDM,HDT,HSC")     |
|           | 2. NAV-AID (NMEA0183 "RMC,RMA,VTG")     |
| POSITION: | 1. NAV-AID (NMEA0183 "RMC,RMA,GLL,GTG") |
| SPEED     | 1. NAV-AID (NMEA0183 "RMC,RMA,VTG,VHW") |
| WAYPOINT  | 1. NAV-AID (NMEA0183 "RMB,RMC)          |

Using the outline of FIG 3-6 as a guide, connect the RADAR 3000 to your NAV-AID and compass.



**FIG. 3-6 EXTERNAL INTERFACE**

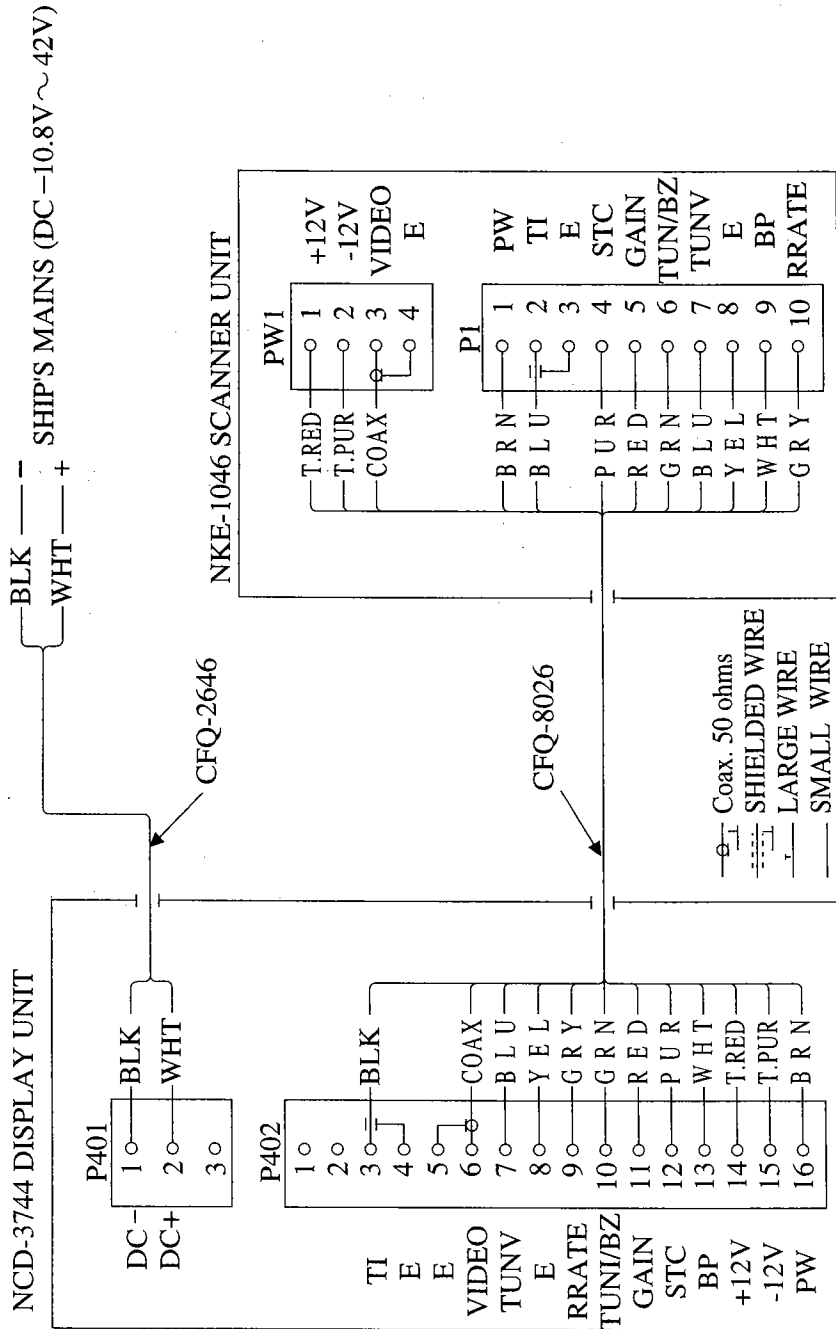


FIG. 3-7 INTERCONNECTION DIAGRAM

## **3.7 INITIAL OPERATION AND CHECKOUT**

### **3.7.1 INSPECTION AFTER THE INSTALLATION**

After completing the installation and prior to energizing the equipment, it is necessary to assure that all the steps of the installation were accomplished in accordance with the instructions.

- (1) The cables are not crimped or damaged.
- (2) The input voltage connected accurately.
- (3) The securing bolts of all equipment is tightened.
- (4) The connection of the power cable shield is made properly to RF ground.

### **3.7.2 OPERATING INITIAL SETTING MENU**

Press the JOYSTICK, and the initial setting menu will be appear on the screen. The JOYSTICK is used to select a particular menu. The particular menu will be highlighted character, then press the JOYSTICK.

### **3.7.3 RELATIVE BEARING ALIGNMENT**

This alignment should be made when the radar unit is installed. Failure to perform this procedure can result in incorrect target bearing readings.

Proceed as follows:

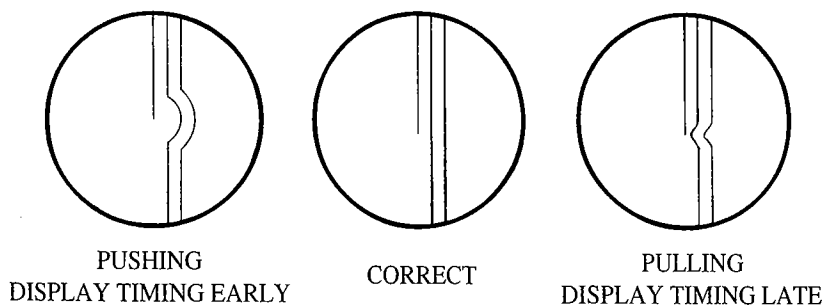
- ① Identify a suitable targets (e., buoy, etc.) preferably between 0.5 and 1 NM in range on the screen.
- ② Visually locate the target and line the bow of the vessel up with the target.
- ③ Put the EBL marker on the target.
- ④ Press and hold the JOYSTICK for the initial setting menu.
- ⑤ Select BEARING by using the JOYSTICK, press the JOYSTICK for the bearing adjustment mode.

- ⑥ Put the EBL over the desired target using the J-DIAL, and press the JOYSTICK.
- ⑦ Move the EBL so that the target will be displayed on the SHM.
- ⑧ Press the JOYSTICK to end the bearing adjustment mode.

### 3.7.4 DISPLAY TIMING (ZERO NM ADJUSTMENT)

This alignment must be made when the radar unit is installed. Failure to perform this procedure can result in incorrect target distance readings. Set the range at 0.25 NM and observe a target at a known (nearest) distance.

- ① Locate a straight dock, sea wall or bridge.  
Press and hold the JOYSTICK for the initial setting menu.
- ② Select DISPLAY TIMING by using the JOYSTICK, and press the JOYSTICK.
- ③ Adjust distance so that the object appears to be straight on the display by using the J-DIAL.
- ④ Press the JOYSTICK to end the display timing adjustment mode.



### 3.7.5 TUNE PRESET

The tune preset is pre adjusted at the factory for proper operation. Normally further adjustment is not required. If after about 10 minutes of transmit, the tune bar is oriented towards one end or its range for video peak, perform the following steps:

- ① Set the range scale to 3 NM.
- ② Set the gain control to desired level.
- ③ Set the SEA, RAIN and IR to Off.
- ④ Press and hold the JOYSTICK for the initial setting menu.
- ⑤ Select TUNE PRESET by using the JOYSTICK, and press the JOYSTICK.
- ⑥ Adjust using the J-DIAL to maximum targets on the screen.
- ⑦ Press the JOYSTICK when maximum targets are set.

### **3.7.6 STC PRESET**

The STC preset is adjusted at the factory for proper operation. Normally further adjustment is not required.

- ① Set Range to 6 NM.
- ② Set the Gain to maximum (Refer to Section 3.5).
- ③ Press and hold the JOYSTICK for the initial setting menu.
- ④ Select STC PRESET by using the JOYSTICK, and press the JOYSTICK.
- ⑤ Adjust distance so that no background noise appears in range of 0 to 2 NM by using the J-DIAL.
- ⑥ Press the joystick to end the STC PRESET mode.

### **3.7.7 BUZZER VOLUME**

At the time of shipment, the Buzzer sound has been set to maximum position. When it is necessary to lower the volume.

- ① Select the initial setting menu → BUZZER.
- ② Adjust the suitable buzzer sound level using the J-DIAL.
- ③ Press the JOYSTICK to end the buzzer setting mode.



---

# SECTION 4

---

## OPERATION

Generally the operation of the RADAR 3000 is easy straight forward. However the navigator who knows the layout and understands the functions of various controls will obtain the best performance from his equipment.

### 4.1 LAYOUT OF CONTROLS

Layout of the control are shown in Figure 4-1.

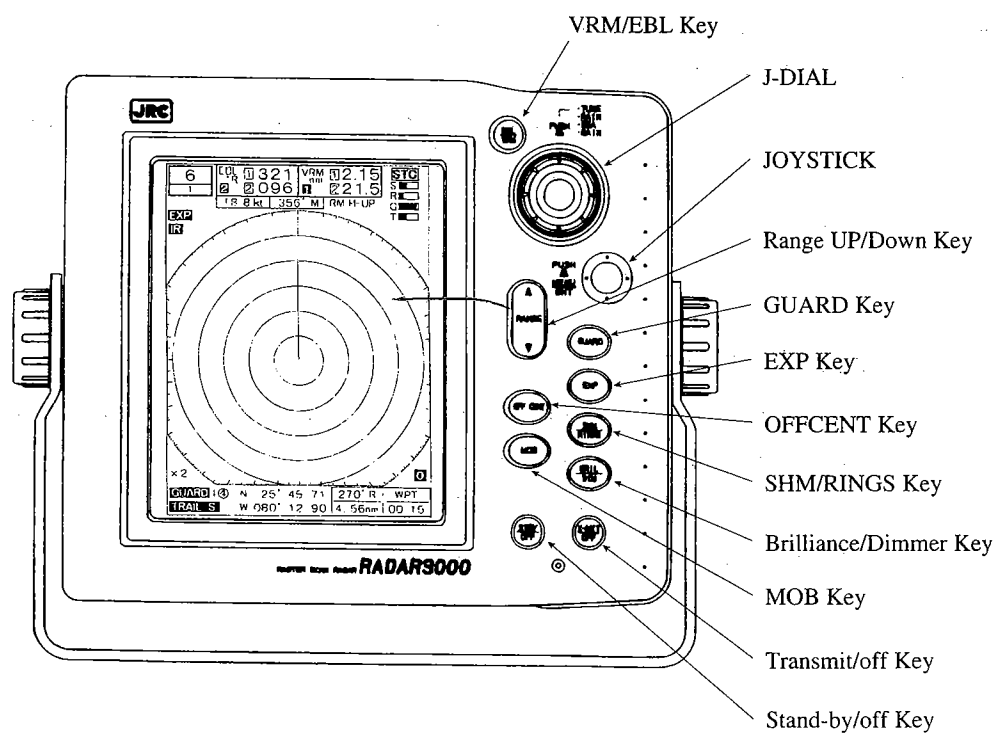


FIG. 4-1 OPERATING CONTROLS

## 4.2 TURNING THE RADAR ON AND OFF

- TO TURN ON:** Press the STBY/OFF key  
**TO TRANSMIT** Press the X-MIT/OFF key  
**TO STANDBY** Press the STBY/OFF key  
**TO TURN OFF:** Press the STBY/OFF and X-MIT/OFF key simultaneously

After pressing the STBY/OFF key, the countdown timer is displayed on the screen. Approximately 90 seconds after, wards the displayed prompt “ ST-BY” appear.

Pressing the X-MIT/OFF key puts the radar in to transmitting mode.

Pressing the STBY/OFF key while in the transmitting mode, will cause the radar to return to standby condition. This reduces the drain from the ship’s battery. To resume transmitting simply, press the X-MIT/OFF key.

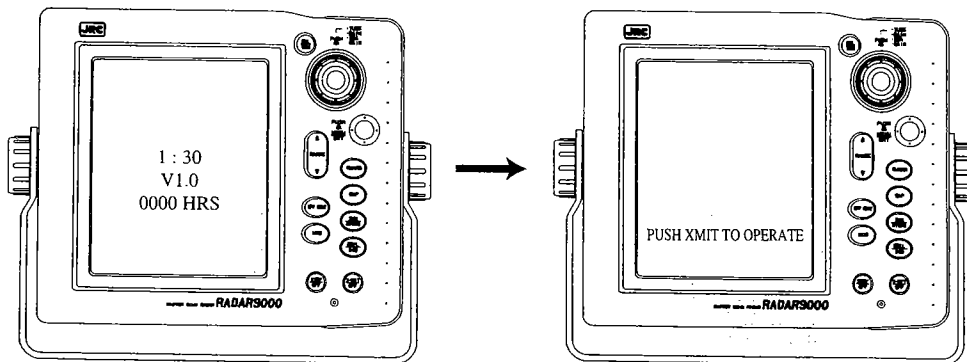


FIG. 4-2 TURN ON/OFF THE RADAR

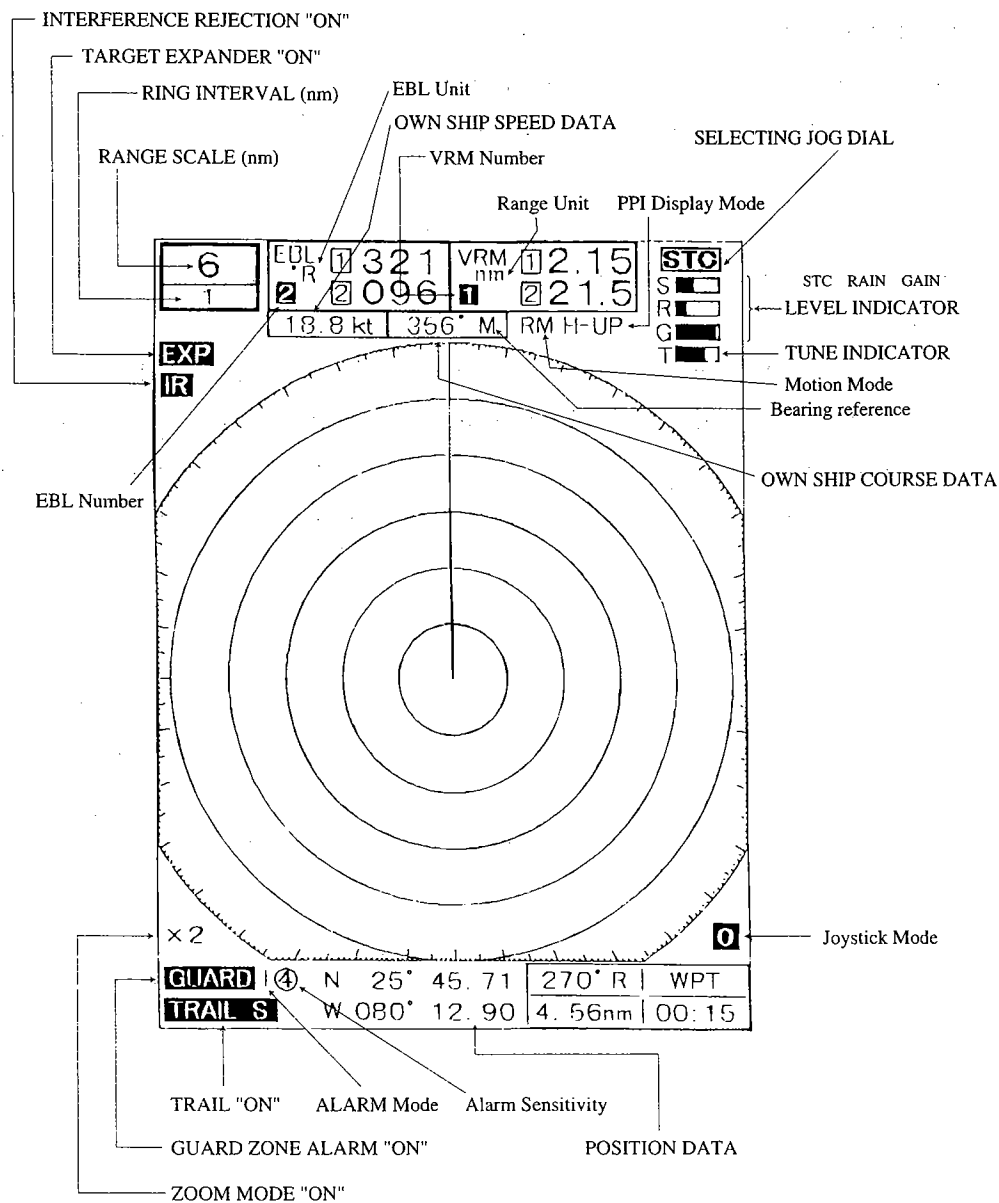


FIG. 4-3 LAYOUT OF THE SCREEN

### **4.3 SELECTING A RANGE**

The actual range scale and range rings interval is shown in the upper left corner of the display. Press the RANGE ▲ key for an increased range scale, or ▼ key for a decreases range scale. The selected range automatically determines the proper number and distance between the range rings.

### **4.4 ADJUSTING RECEIVER SENSITIVITY**

Press the J-DIAL until GAIN appears highlighted on the upper right corner of the display. Rotate the J-DIAL clockwise or counterclockwise, to vary the gain and thus control the strength of echo returns on the radar screen. An on-screen bar indicates the gain level selected for display. The proper setting is when the background noise is just visible on the screen.

### **4.5 ADJUSTING TUNING**

The RADAR 3000 is setting Auto Tune mode at the power ON. If wish to manual tuning, required to select Manual Tune mode by using menu (Refer to 4.23).

Press the J-DIAL until the TUNE appears highlighted on the upper right corner of the display. Rotate the J-DIAL clockwise or counterclockwise, to maximize the target echo. If land targets are not within the radar's range, adjust the control for maximum sea clutter. The on-screen tuning indicator will shown the strength of tuning peak conditions is turned for maximum deflection. Normally, tuning is performed on the 3 NM range scale or higher. Minor readjustment may be necessary after the radar has warmed up 10 minutes.

## 4.6 REDUCING SEA CLUTTER

### CAUTION



**On short range scales, the setting of the sea clutter control should never be advanced so high as to completely obliterate all clutter, since this setting could prevent the detection of close-in target echoes.**

The sea clutter control is normally used on the shorter ranges to suppress the effect of sea clutter close to own's ship.

Press the J-DIAL until the SEA appears highlighted on the upper right corner of the display. Rotate the J-DIAL clockwise or counterclockwise to vary the sea clutter control and thus control the strength of echo returns from sea surface clutter. There is an on-screen bar indication of the sea clutter control level in use.

## 4.7 ADJUSTNG RAIN CLUTTER

Press the J-DIAL until the RAIN appears highlight on the upper right corner of the display. Rotate the J-DIAL clockwise or counterclockwise, to vary the rain clutter control and thus control the strength of echo returns from rain or snow. As you rotate clockwise, the return echoes will become narrow and the returns from rain or snow will be reduced. An on-screen bar indicates the selected rain clutter level.

## 4.8 SETTING CRT BRILLIANCE

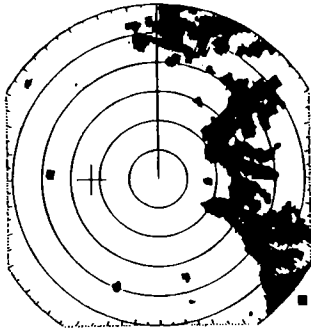
Press the BRIL/DIM key, and then rotate the J-DIAL clockwise or counterclockwise to change the display brilliance.

## 4.9 SETTING DIMMER

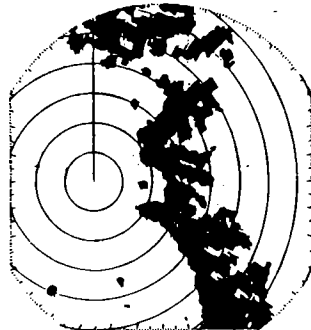
By pressing the BRIL/DIM key, the back light for the panel illumination can be varied in intensity. Dimmer level is reached at maximum brightness, and the next level returns the dimmer level to the lowest level (OFF).

#### 4.10 SETTING OFFCENT

By pressing the OFFCENT key, the display is into off-center mode by 2/3 radius, expanding the display area in the direction instructed by JOYSTICK. Press the key a second time to return the display to normal.



Off-center mode off



Off-center mode on

#### 4.11 RANGE MEASUREMENT

- (1) Consider the range scale in use and count the number of rings between the center of the screen and the target. Add to this a visually estimate of the distance between the inner edge of the target and the nearest ring.
- (2) Using #1 VRM
  - Press the EBL/VRM key
  - If EBL is highlighted, Press and hold the EBL/VRM key to change to VRM mode.
  - Rotate the J-DIAL clockwise for outer direction or counterclockwise for inner direction to move the variable range marker. The actual target distance appears on the center top of the screen in selecting unit.
  - To turn off the VRM, press the EBL/VRM key while VRM is highlighted.
- (3) Using #2 VRM
  - ① Press the JOYSTICK.
  - ② Selects FUNCTION menu, then press the JOYSTICK.
  - ③ Selects #2 VRM-SET, then press the JOYSTICK. The VRM2 appears highlight on the upper right corner of the display.

- ④ Rotate the J-DIAL clockwise for outer direction or counterclockwise for inner direction to move the #2 variable range marker. The actual target distance appears on the center top of the screen in selecting unit.

To turn off the #2 VRM, select the FUNCTION-#2 VRM-OFF on the menu sheet.

- (4) Using cursor

Touch the JOYSTICK, cross cursor appears on the screen. The cross mark will be move any direction by using the JOYSTICK and the range and bearing Time-To-Go data and Lat/Long of the cursor position will be displayed on the lower right corner on the display.

The cross cursor and cursor data will disappear in approximately 15 seconds.

## 4.12 BEARING MEASUREMENT

- (1) Using the bearing scale

Using the bearing scale on the screen, visually estimate the bearing where the radial line of the bearing scale would pass through the center of the target. The bearing you obtain will be the target's relative bearing in degrees.

- (2) Using #1 EBL

Press the EBL/VRM key

If VRM is highlighted, press and hold the EBL/VRM key to change to EBL mode.

Rotate the J-DIAL clockwise or counterclockwise to move the electronic bearing line to the center of the target. Target bearing appears on the center top of the screen in degrees. Bearing may be displayed in relative "R", true "T", or magnetic "M" depending on the menu selection.

To turn off the EBL, Press the EBL/VRM key while EBL is highlighted.

- (3) Using #2 EBL

- ① Press the JOYSTICK.
- ② Selects FUNCTION menu, then press the JOYSTICK.
- ③ Selects #2 EBL-SET, then press the JOYSTICK. The EBL2 appears high-light on the upper right corner of the display.

- ④ Rotate the J-DIAL clockwise or counterclockwise to move the #2 EBL on the center of the target. The actual target bearing appears on the center top of the screen in selecting unit.

To turn off the #2 EBL, selects the FUNCTION-#2 EBL-OFF on the menu sheet.

### 4.13 SETTING GUARD

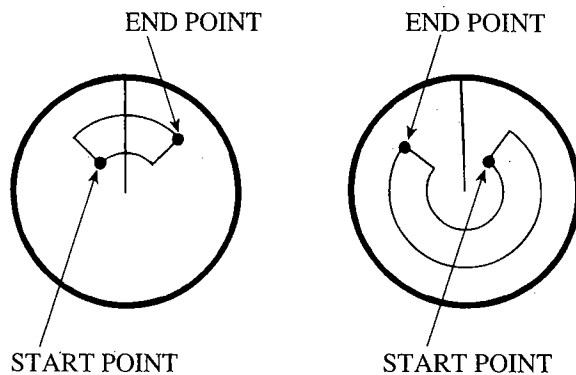
The GUARD Zone may be zone completely surrounding the vessel or a partial trapezoidal zone to monitor targets entering or departing the specified area. The guard zone will sound audible and visual alerts to the operator. In the IN mode, an alarm will sound if a target enters the area. The IN alarm is effective for alerting the operator to targets approaching his vessel. In the OUT mode, the alarm will sound if a target leaves the prescribed area. This type of alarm is useful for monitoring as an anchor watch, or pair trawling.

- ① Press the GUARD key.
- ② Sets the cross mark to the start point using the JOYSTICK and press the JOYSTICK.
- ③ Sets the cross mark to the end point using the JOYSTICK. Press the JOYSTICK and we now have a sector zone which alarm if any target enters the zone with the guard zone alarm indicator “GUARD I 4” which indicates IN alarm mode is in operation and the alarm target sensitivity is set at 4.
- ④ Press the GUARD key again and the symbol will change to “GUARD O 4” indicating that the OUT alarm will sound for targets leaving the guard zone.
- ⑤ Pressing the GUARD key again will turn off the Guard Zone.

To memorize an alarm zone, press and hold the GUARD key until the display beeps and the alarm character “GUARD I” turn into highlight at IN mode alarm. At this time the zone will have been memorized for use at any time.

To activate the memorized alarm zone, just press and hold the GUARD key until the display beeps. Your memorized zone will reappear. The zone will be displayed as an IN mode alarm. If you want to change to an OUT mode alarm, press the GUARD key.





#### 4.14 RINGS

Press the SHM/RINGS key to set rings on/off.

#### 4.15 SHM

Momentarily disables the Ship's Heading Flash while SHM/RINGS key is held depressed.

#### 4.16 POSITION

This allows selection of latitude/longitude (LL), time difference (TD) position or off displays. In addition you may display waypoint(WPT) as a LL position in place of your own position data.

#### 4.17 WAYPOINT

When the waypoint mode is turned on, and the radar is connected to a LORAN or GPS with the necessary data output, a waypoint symbol appears on the radar screen. Numeric data, showing the waypoint's bearing, range, and time-to-go appears at the bottom right corner on the screen.

#### 4.18 READ OUT DIMENSION OF BEARING

This selects the bearing for heading flush, EBL, cursor and waypoint to work in either magnetic or true bearings. When magnetic bearing is selected, displayed character "M" appears. When true bearing is selected, displayed character "T" appears. This bearing displays only numeric data. The ship's heading marker is displayed as 0° direction.

#### **4.19 TRAIL**

This feature allows the operator to see the past history of target movement as an after-glow or trail behind the moving targets. The selecting “short” enables trail, placing a short after-glow behind the moving targets. Selecting the “long” enables trail with a longer after-glow.

#### **4.20 TARGETS EXPANSION**

Target expand mode can be set to on or off. Target expand mode gives the operator the ability to make small targets appear larger on the display for better viewing. When active, “EXP” is highlighted in the upper left area of the screen.

#### **4.21 REDUCING INTERFERENCE REJECTION**

Interference Rejection (IR) mode can be set to on or off. The IR reduces noise on the display caused by other radars. When active, the “IR” is highlighted on the upper left of the screen. If you are navigating in a port area serviced by a RACON , you should turn off the IR mode to see the RACON signals.

#### **4.22 MOB(Man Over-Board)**

Pressing the MOB key, will locate a MOB mark over own ship’s present location and the range, bearing and TTG to MOB point be displayed in the lower position of the display..

#### **4.23 TIMED-TX MODE**

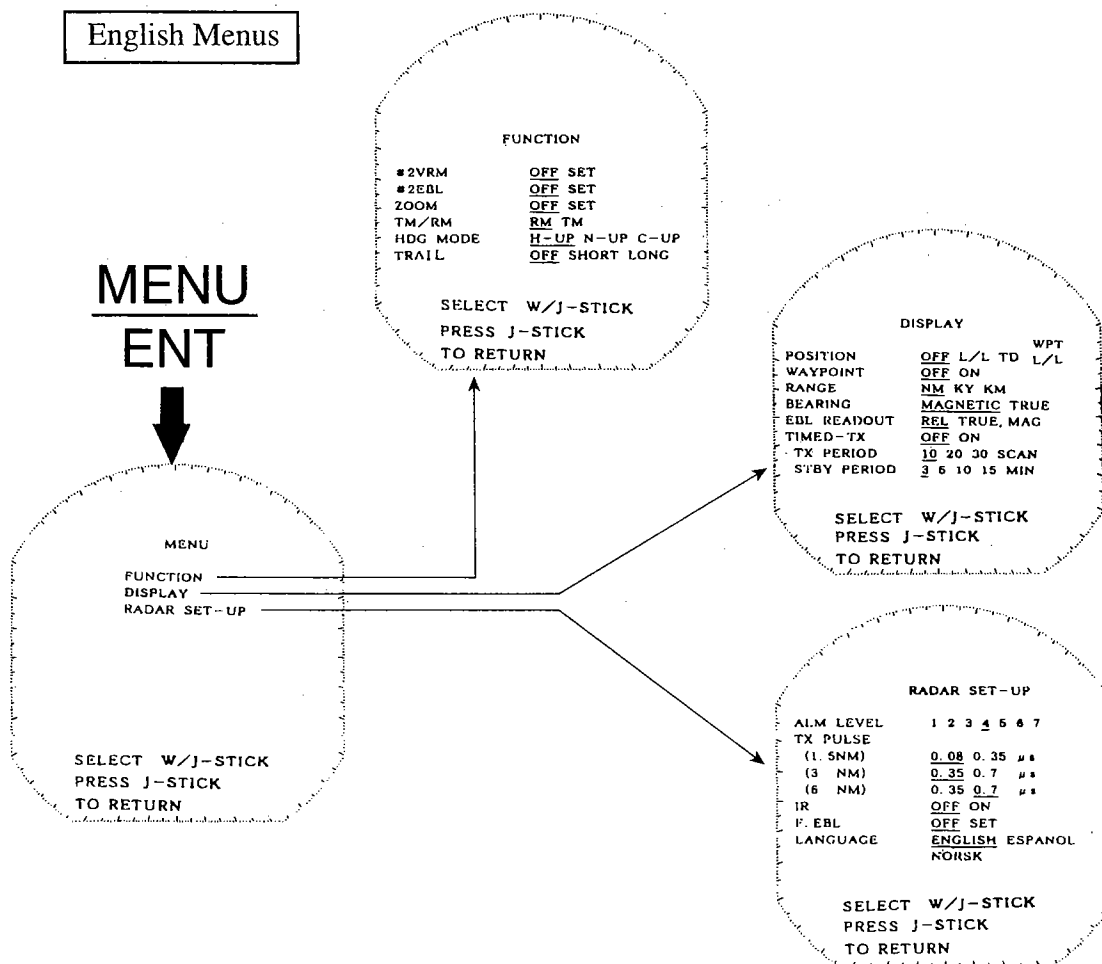
The TIMED-TX mode allows the operator to program the radar to automatically transmit for a programmed period followed by a standby period. This permits the user to maintain a radar watch while reducing the power consumption experienced during full transmit operation. In TIMED-TX mode press the STBY/OFF key and the radar will return to its normal operating mode.

## 4.24 SETTING AUTO/MANUAL TUNING

The tuning control can be selected either automatically or manually. If the manual tuning control is selected, the tuning bar indicator is present. The auto tune mode will automatically tune the radar for optimum reception whenever the radar is turned on, even if ranges changed.

## 4.25 OPERATING MENU

Press the JOYSTICK(MENU/ENT), and the first menu sheet will be appear. The JOYSTICK is used to select a particular menu. The particular menu will be highlighted character. Pressing the JOYSTICK(MENU/ENT) again will return the display to the normal video presentation.



Spanish Menus

MENU  
ENT

