

# Chapter 9 MAINTENANCE AND CHECK

## 9-1 ROUTINE MAINTENANCE

### DANGER



Never carry out internal inspection or repair work of the equipment by users.  
Inspection or repair work by unauthorized personnel may result in fire hazard or electric shock.  
For inspection and repair work of equipment components, consult with our branch office, branch shop, sales office, or our distributor in your district.



When conducting maintenance, make sure to turn the main power off.  
Failure to comply may result in electrocution.



Turn off the main power before cleaning the equipment. Especially when a rectifier is used, make sure to turn it off since voltage is still outputted from the rectifier even after the indicator and the radar are turned off. Failure to comply may result in equipment failure, or death or serious injury due to electric shock.

For operating the radar equipment in the good conditions, it is necessary to make the maintenance work as described below. If maintenance is made properly, troubles will reduce.

It is recommended to make regular maintenance work.

Common points of maintenance for each unit are as follow:

Clean the equipment.

Remove the dust, dirt, and sea water rest on the equipment cabinet with a piece of dry cloth.

Especially, clean the air vents with a brush for good ventilation.

## 9-2 MAINTENANCE OF EACH UNIT

### 9-2-1 SCANNER NKE-1066



**DANGER**



**When conducting maintenance work on the antenna, make sure to turn its main power off.**

**Failure to comply may result in electrocution or injuries.**

### **Note:**

- If the radiator front face (radiation plane) is soiled with smoke, salt, dust, paint or birds' droppings, wipe it with a piece of soft cloth wetted with alcohol or water and try to keep it clean at all times. Otherwise, radar beam radiation may attenuate or reflect on it, resulting in deterioration of radar performance.
- Never use solvents of gasoline, benzine, trichloroethylene and ketone for cleaning.  
Otherwise, the radiation plane may deteriorate.

**9-2-2 SCANNER NKE-2044**



## DANGER



**When conducting maintenance work on the antenna, make sure to turn its main power off.**

**Failure to comply may result in electrocution or injuries.**

## Note:

- If the radiator front face (radiation plane) is soiled with smoke, salt, dust, paint or birds' droppings, wipe it with a piece of soft cloth wetted with alcohol or water and try to keep it clean at all times. Otherwise, radar beam radiation may attenuate or reflect on it, resulting in deterioration of radar performance.
- Never use solvents of gasoline, benzine, trichloroethylene and ketone for cleaning.

Otherwise, the radiation plane may deteriorate.

## 9-2-3 DISPLAY NCD-2256

**DANGER**

**When cleaning the display screen, do not wipe it too strongly with a dry cloth. Also, do not use gasoline or thinner to clean the screen. Failure to comply will result in damage to the screen surface.**

Dust accumulated on the screen will reduce clarity and darken the video.

For cleaning it, wipe it with a piece of soft cloth (flannel or cotton).

Do not wipe it strongly with a piece of dry cloth nor use gasoline or thinner.

### 9-3 PERFORMANCE CHECK

Make operational check on the radar equipment regularly and if any problem is found, investigate it immediately.

Pay special attention to the high voltage sections in checking and take full care that no trouble is caused by any error or carelessness in measurement. Take note of the results of checking, which can be used effectively in the next check work.

Operational check shall be made in accordance with Table 4.3-1 Function Check List in the order as specified in it.

**Table 9-3-1 Performance Check List**

Equipment	Item to be checked	Criteria	Remarks
Transmitter-receiver Unit	Tuning LED of Receiver	The LED is lighting during operation	48NM range
Display Unit	Video and echoes on the screen Sensitivity LCD brilliance can be controlled correctly Various markers Various numerical indications Lighting	Can be correctly controlled	
	Safety Switch Various Currents and Voltages	See "■ Sensor Test" in "4.3.8 SELF TEST".	
	Communication Lines	See "■ Line Test" in "4.3.8 SELF TEST".	
	Memory	See "■ Memory Test" in "4.3.8 SELF TEST".	
	Panel	See "■ Key Test" in "4.3.8 SELF TEST".	
	Checking the Monitor	See "■ Monitor Display Test" in "4.3.8 SELF TEST".	
	Magnetron Current	See "4.3.4 SCANNER INFORMATION".	
	Error Logging Display	See 4.3.6 ERROR LOG.	
	System Information Display	See 4.3.2 SYSTEM INFORMATION and 4.3.3 SYSTEM TIME.	

### 9-3-1 TEST MENU

The performance status of this radar equipment can be checked on the Test Menu.



### 9-3-2 SYSTEM INFORMATION

Displays the current system information. (software version information).

### 9-3-3 SYSTEM TIME

Displays the following system time information.

- Indicator Running Time
- Scanner Transmit Time
- Scanner Motor Time
- Scanner Running Time

### **9-3-4 SCANNER INFORMATION**

Displays the following scanner information.

- Transmitted output power
- Motor Type
- Magnetron Current

### **9-3-5 HARDWARE INFORMATION**

Displays the following hardware information.

- Serial Number
- MAC Address
- Temperature

### **9-3-6 ERROR LOG**

The error log displays previously occurred system alarms with the dates and times when they occurred.

### **9-3-7 LINE MONITOR**

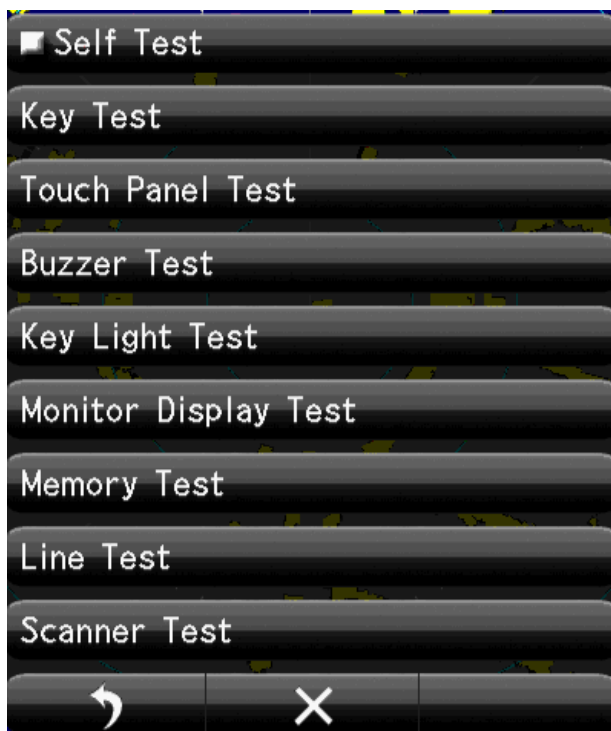
Serial communication data can be seen on the built-in Line monitor.

Line monitor can be used to make sure that the serial data are received properly

### 9-3-8 SELF TEST

The following tests can be performed.

- Key Test
- Buzzer Test
- Key Light Test
- Monitor Display Test
- Memory Test
- Line Test
- Sensor Test







## 9-4 REPLACEMENT OF MAJOR PARTS

The system includes parts that need periodic replacement. The parts should be replaced as scheduled. Use of parts over their service life can cause a system failure.

### WARNING



Direct exposure to electromagnetic waves at close range will have adverse effects on the human body. When it is necessary to get close to the antenna for maintenance or inspection purposes, make sure to turn the indicator power switch to "OFF" or "STBY." Direct exposure to electromagnetic waves at close range will have adverse effects on the human body.



When conducting maintenance work, make sure to turn off the power and unplug the power connector J1 of the display unit so that the power supply to the equipment is completely cut off. Some equipment components can carry electrical current even after the power switch is turned off, and conducting maintenance work without unplugging the power connector may result in electrocution, equipment failure, or accidents.

### CAUTION



Make sure to shut off the main power before replacing parts. Failure to comply may result in electrocution or equipment failure.



When replacing magnetrons, make sure to shut off the main power and let the equipment stand for more than 5 minutes to discharge the high-voltage circuit. Failure to comply may result in electrocution.



Make sure to take off your watch when your hand must get close to the magnetron. Failure to comply may result in damage to the watch since the magnetron is a strong magnet.



Do not directly touch the inverter circuit of the LCD display with a bare hand since high voltage temporarily remains in the circuit even after the main power is shut off. Failure to comply may result in electrocution.

### 9-4-1 PARTS REQUIRED FOR PERIODIC REPLACEMENT

Here are parts required for periodic replacement.

<b>PARTS NAME</b>	<b>INTERVAL</b>
<b>1. MAGNETRON</b>	<b>4,000 HOURS</b>
<b>2. MOTOR</b>	<b>10,000 HOURS</b>

**9-5 FAULT FINDING****9-5-1 ALARMS AND OTHER DISPLAY LISTS****9-5-2 FUSE****9-6 TROUBLE SHOOTING****9-6-1 INCLUDED ACCESSORIES****9-6-2 SPECIAL PARTS**

Location	Parts No.	Name	Type	Code	Manufacture
NKE-1066	V101	Magnetron	M1624		New JRC
NKE-2044	V101	Magnetron	MSF1421B	5VMAA00092	New JRC
NKE-2044	A101	Circulator	FCX68R	5AJIX00027	Orient Microwave
NKE-2044	A102	Diode Limiter	NJS6930	5ATBT00006	New JRC

**9-6-3 CIRCUIT BLOCK TO BE REPAIRED**

**JMA-1032**

Location	Circuit Block	Type	Remarks
Scanner	Motor unit	H-7BDRD0053	
Scanner	Modulation circuit	CME-396	Include IF Amplifier
Scanner	Micro wave unit Transmitter/ receiver	CMN-924/NZT-1066	Include Receiver frontend
Display Unit	Power Supply circuit	CBD-1928	
Display Unit	Process Circuit	CDC-1433	
Display Unit	LCD Panel	NZP-2256	

**JMA-1034**

Location	Circuit Block	Type	Remarks
Scanner	Motor unit	H7BDRD0052A	
Scanner	Modulation circuit	CME-397 NZT-2044	
Scanner	Receiver	NRG-242	
Display Unit	Power Supply circuit	CBD-1928	
Display Unit	Process Circuit	CDC-1433	
Display Unit	LCD Panel	NZP-2256	



# Chapter 10 AFTER-SALE SERVICE

## 10-1 KEEPING PERIOD OF MAINTENANCE PARTS

Keeping period of maintenance parts is ten years from the production is discontinued.

## 10-2 WHEN YOU REQUEST FOR REPAIR

If you suppose the product may be out of order, read the description in "9-2-5 FAULT FINDING" and "9-2-6 TROUBLE SHOOTING", and check the suspected point again. If it is still out of order, you are recommended to stop operation of the equipment and consult with the dealer from whom you purchased the product, or our branch office in your country or district, the sales department in our main office in Tokyo.

- Repair within the Warranty Period

If any failure occurs in the product during its normal operation in accordance with the instruction manual, the dealer or JRC will repair free of charge.

In case that any failure is caused due to misuse, faulty operation, negligence or force major such as natural disaster and fire, the product will be repaired with charges.

- Repair after the Warranty Period.

If any defective function of the product is recoverable by repair, the repair of it will be made at your own charge upon your request.

- Necessary Information for Repair

Product name, model, manufacturing date and serial number

Trouble conditions (as detailed as possible. Refer to page "10-4 Radar failure check list".)

Name of company/organization, address and telephone number

## 10-3 RECOMMENDED MAINTENANCE

The performance of the product may deteriorate due to the secular change of the parts used in it, though such deterioration depends upon the conditions of operation.

So checkup and maintenance is recommendable for the product in addition to your daily care.

For maintenance, consult with the near-by dealer or our sales department.

Such maintenance will be made with charges.

For further details of after-sale service, contact the JRC Offices.

## 10-4 RADAR FAILURE CHECK LIST

### Radar Failure Check List

When placing an order for repair of the product, it is requested that you could confirm the check items and fill the results and sent the sheet to our contact.

If there is any unclear items, contact the ship on which the product is installed, and give the correct information on the product.

Ship name: \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Radar general model name: JMA- \_\_\_\_\_ Serial No. : \_\_\_\_\_

(Write the full model name correctly)

(1) Check the following items in the order of the number, and circle the applicable answer between YES or NO. If the item cannot be determined as YES or NO, explain in detail in the item (17), others.

(2) If any of the items (1) to (5) is marked as NO, check the fuse of the product (refer to Section 9.1.2 and 9.2).

(3) Check the items (4) to (16) while the transmission (TX) is ON.

\*Functions mentioned in the items (14), (15) and (16) may be optional, answer is not necessary.

No.	Check Item	Result	
		YES	NO
(1)	Power can be turned on. (The lamp on the Operation unit is lit)	YES	NO
(2)	A few minutes after powering-on, it will become standby status .	YES	NO
(3)	When powering-on (or TX ON), LCD monitor something is lit.	YES	NO
(4)	The antenna rotates at the transmission (TX) ON. (Check the following items while transmission is ON)	YES	NO
(5)	Current is supplied to the magnetron. (Refer to the instruction manual)	YES	NO
(6)	Turning is enabled. (Check with the range of 6 NM or more)	YES	NO
(7)	Fixed marker is displayed.	YES	NO
(8)	VRM is displayed.	YES	NO
(9)	While noise is displayed while set at SEA and RAIN minimum, GAIN maximum, IR-OFF and range 48 NM.	YES	NO
(10)	Target reflection echo is displayed.	YES	NO
(11)	Sensitivity of reflection echo is normal.	YES	NO
(12)	EBL is displayed.	YES	NO
(13)	Cursor mark moves.	YES	NO
*(14)	GYRO course can be set and normally displayed.	YES	NO
*(15)	LOG speed can be normally displayed.	YES	NO
*(16)	Target tracking function works normally.	YES	NO

(17) Others (Error message, etc.) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# Chapter 11 DISPOSAL

## 11-1 DISPOSAL OF THE UNIT

When disposing of this unit, be sure to follow the local laws and regulations for the place of disposal.

## 11-2 DISPOSAL OF USED MAGNETRON

A magnetron is used for the scanner (NKE-1066) (NKE-2044).

☆ When the magnetron is replaced with a new one, return the used magnetron to our dealer or business office.

For detail, consult with our dealer or business office.

## 11-3 CHINA ROHS

有毒有害物质或元素的名称及含量  
(Names & Content of toxic and hazardous substances or elements)

形式名(Type): JMA

名称(Name): RADAR

部件名称 (Part name)	有毒有害物质或元素 (Toxic and Hazardous Substances and Elements)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
雷达天线单元 (Scanner Unit)	×	×	○	×	×	×
收发信单元 (Transmitter-receiver Unit)	×	×	×	×	×	×
主船内装置 (Inboard Unit) · 显示装置 (Display Unit) · 键盘装置 (Operation Unit) · 信号处理装置 (RADAR Process Unit)	×	×	×	×	×	×
外部设备 (Peripherals) · 选择 (Options) · 电线类 (Cables) · 手册 (Documents)	×	×	×	×	×	×
<p>○: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11306-2006 标准规定的限量要求以下。 (Indicates that this toxic, or hazardous substance contained in all of the homogeneous materials for this part is below the requirement in SJ/T 11363-2006.)</p> <p>×: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。 (Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T 11363-2006.)</p>						





# Chapter 12 SPECIFICATIONS

**NKE-1066 scanner**



**NCD-2256 display**



**1.5ft scanner 4kw  
Radome diameter  $\phi$ 450mm**

**NKE-2044 scanner**

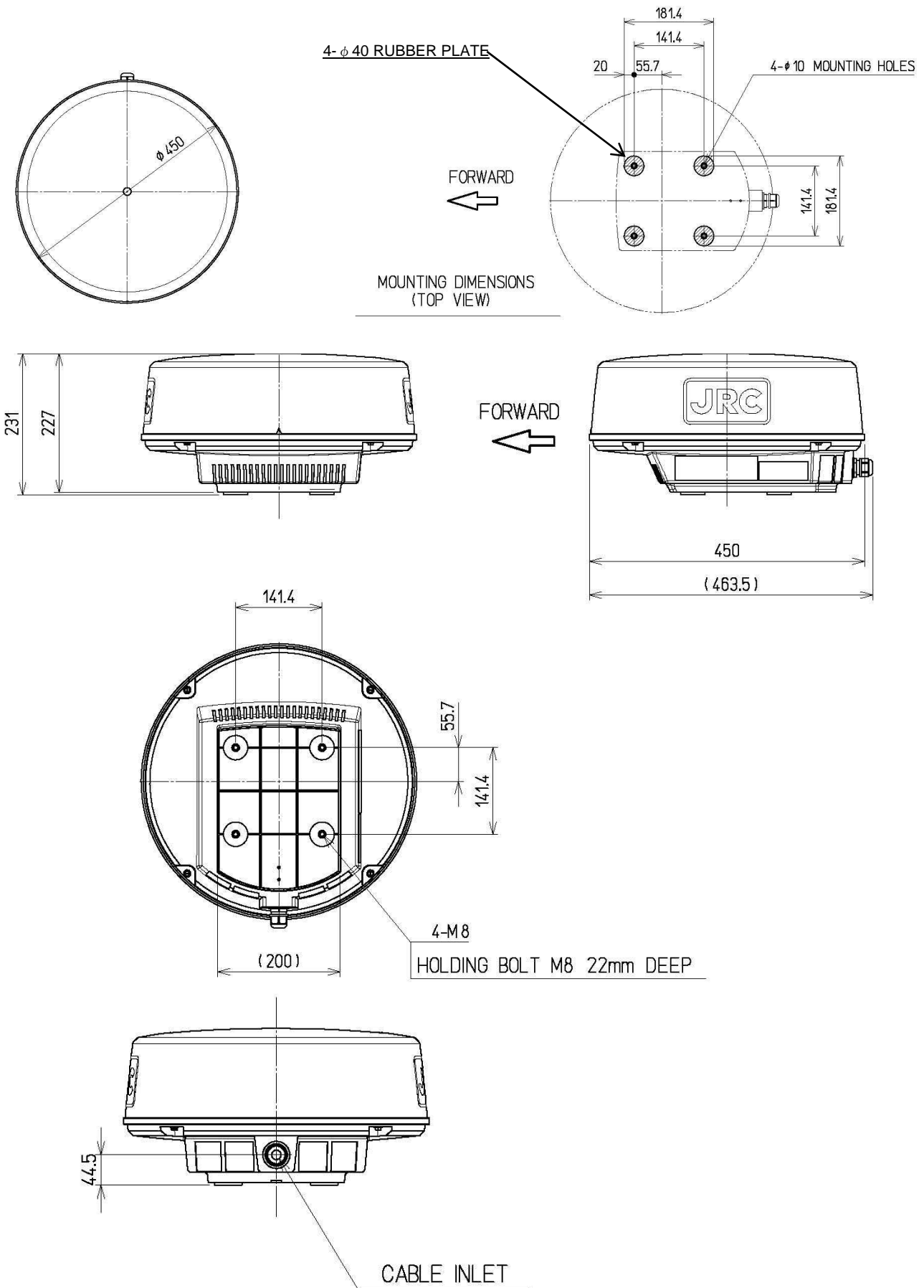


**Display 7inches wide LCD**

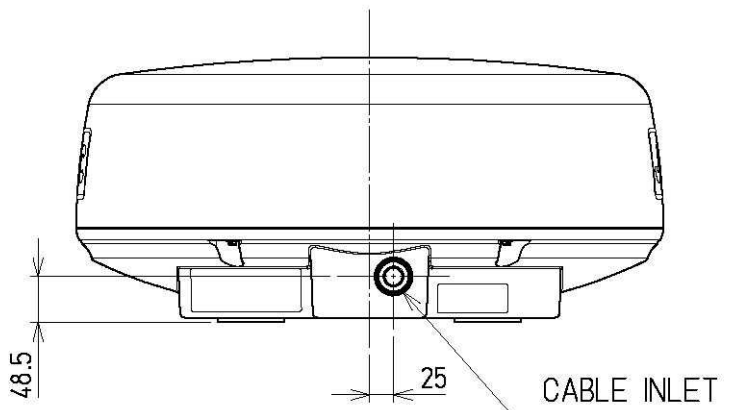
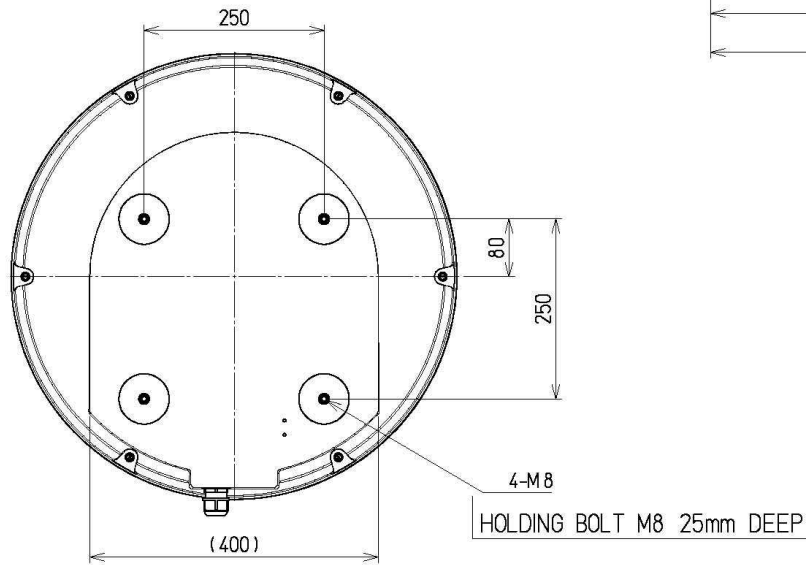
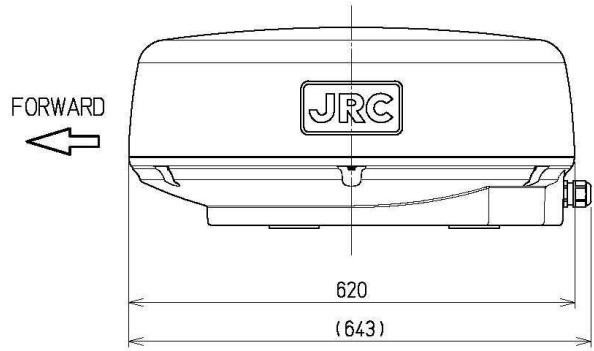
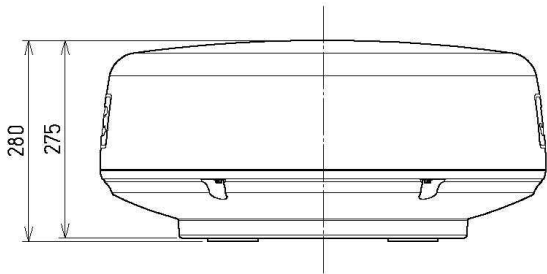
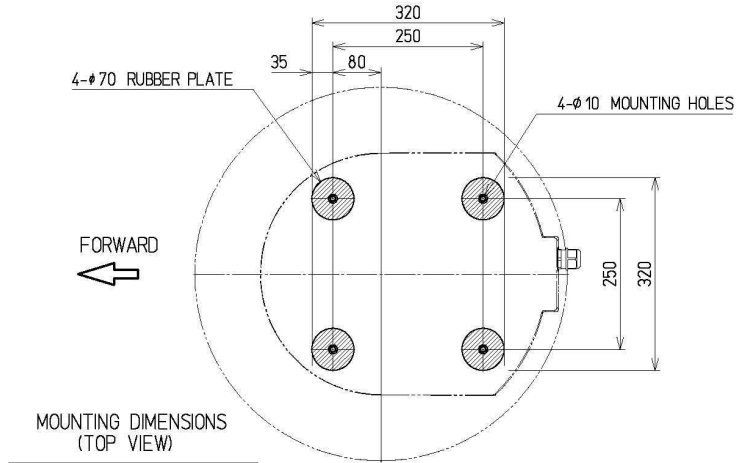
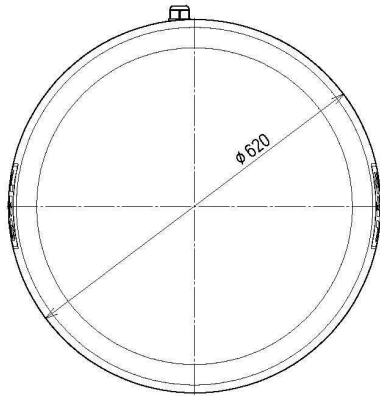
**2ft Scanner 4kw  
Radome diameter  $\phi$ 620mm**

# 12-1 SCANNER DIMENSION

## 12-1-1 NKE-1066

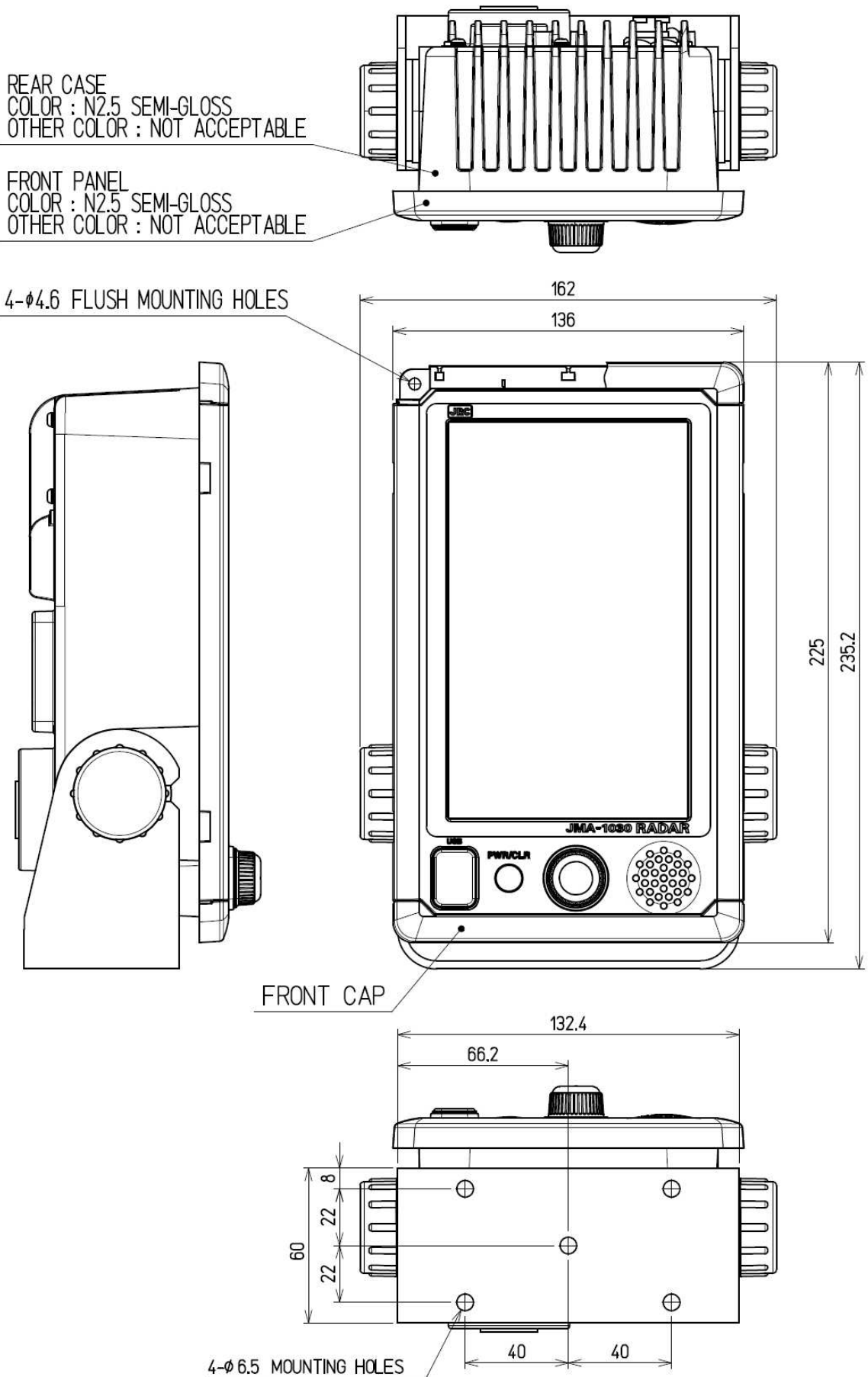


**12-1-2 NKE-2044**



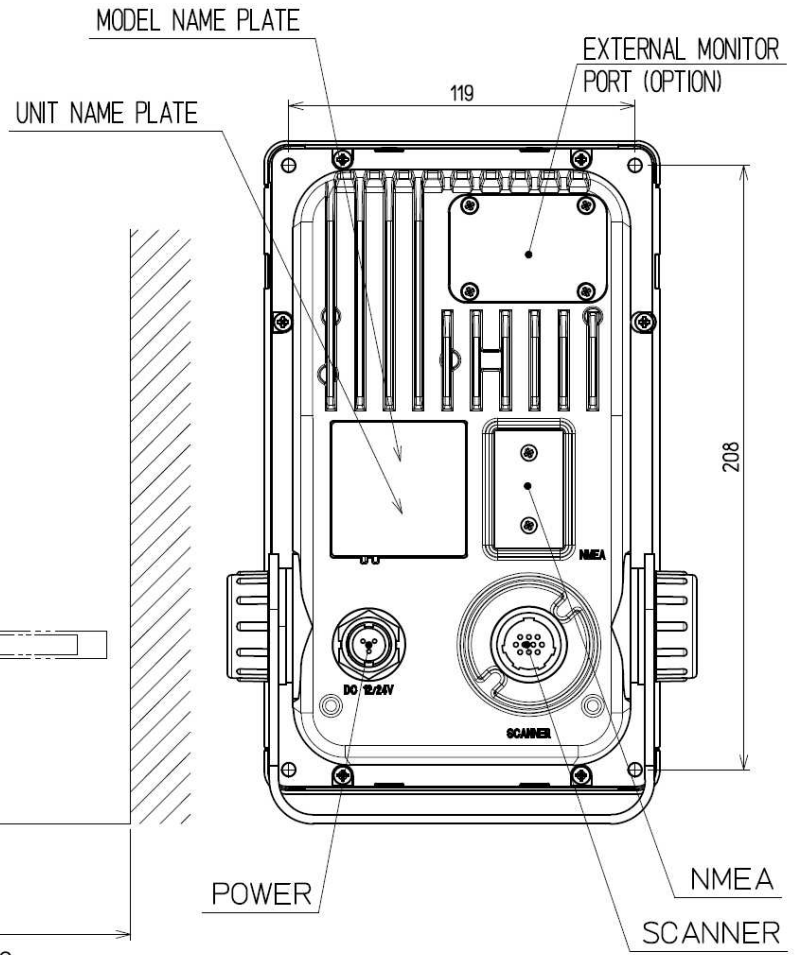
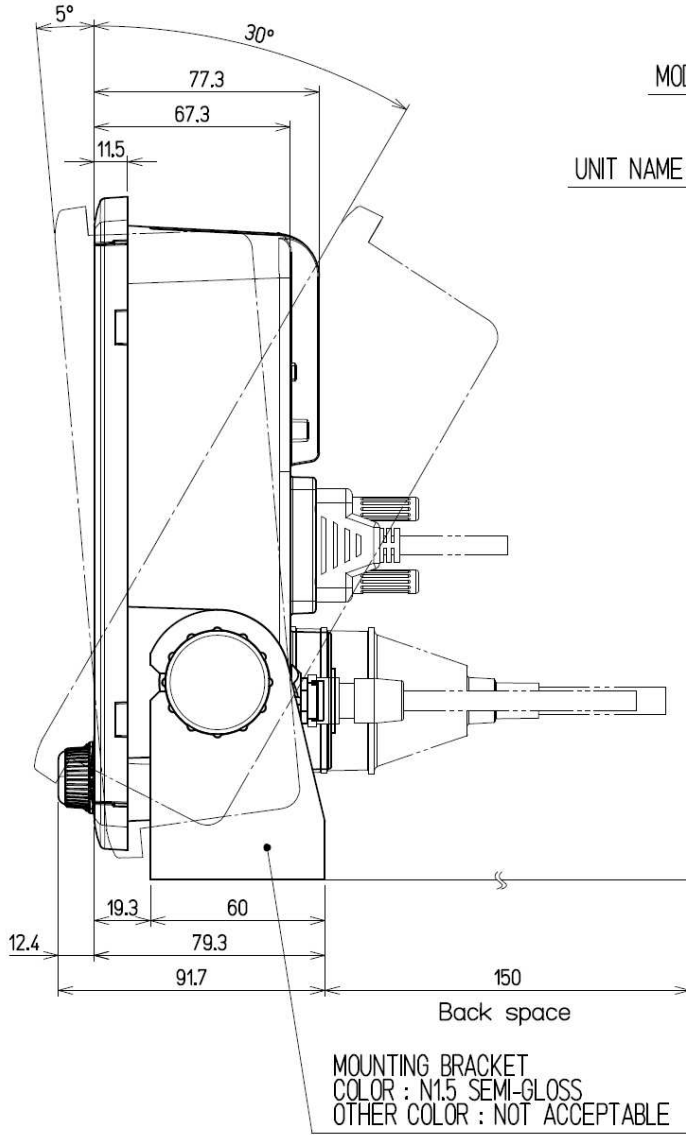
## 12-2 DISPLAY DIMENSION

### 12-2-1 NCD-2256





OUTLINE DIMENSIONS		PERMISSIBLE OUTLINE DIMENSIONAL DEVIATIONS	PERMISSIBLE MOUNTING DIMENSIONAL DEVIATIONS
OVER	TO		
3	6	±0,5	±0,5
6	30	±1	
30	120	±1,5	
120	400	±2,5	±1
400	1000	±4	±2



## 12-3 EQUIPMENT OUTLINE

1) This equipment is a marine radar for vessels and work boats which consists of the display unit including 7 inch wide VGA color LCD Monitor unit, Keyboard unit, Processing unit and consists of the 1.5 ft /2ft radome type scanner unit. The processing unit uses SOC (LUPIM) developed by JRC and the LCD monitor unit uses panel with touch sensor (resistance film type). The operation can be realized intuitive and simple.

### 12-3-1 CONFIGURATION

1) Display unit NCD-2256

- Integrated the 7 inch wide VGA color LCD Monitor unit, Keyboard unit and Processing unit

2) Scanner unit

- X-band 1.5ft(4kW) radome type is NKE-1066

· X-band 2ft(4kW) radome type is NKE-2044

### 12-3-2 FEATURE

1) The screen resolution is 800x480dots (WVGA).

The LCD monitor unit with touch sensor (resistance film type).

2) Highly efficient signal processing using the SOC including DSP.

3) TT and AIS function are prepared by SOC using.

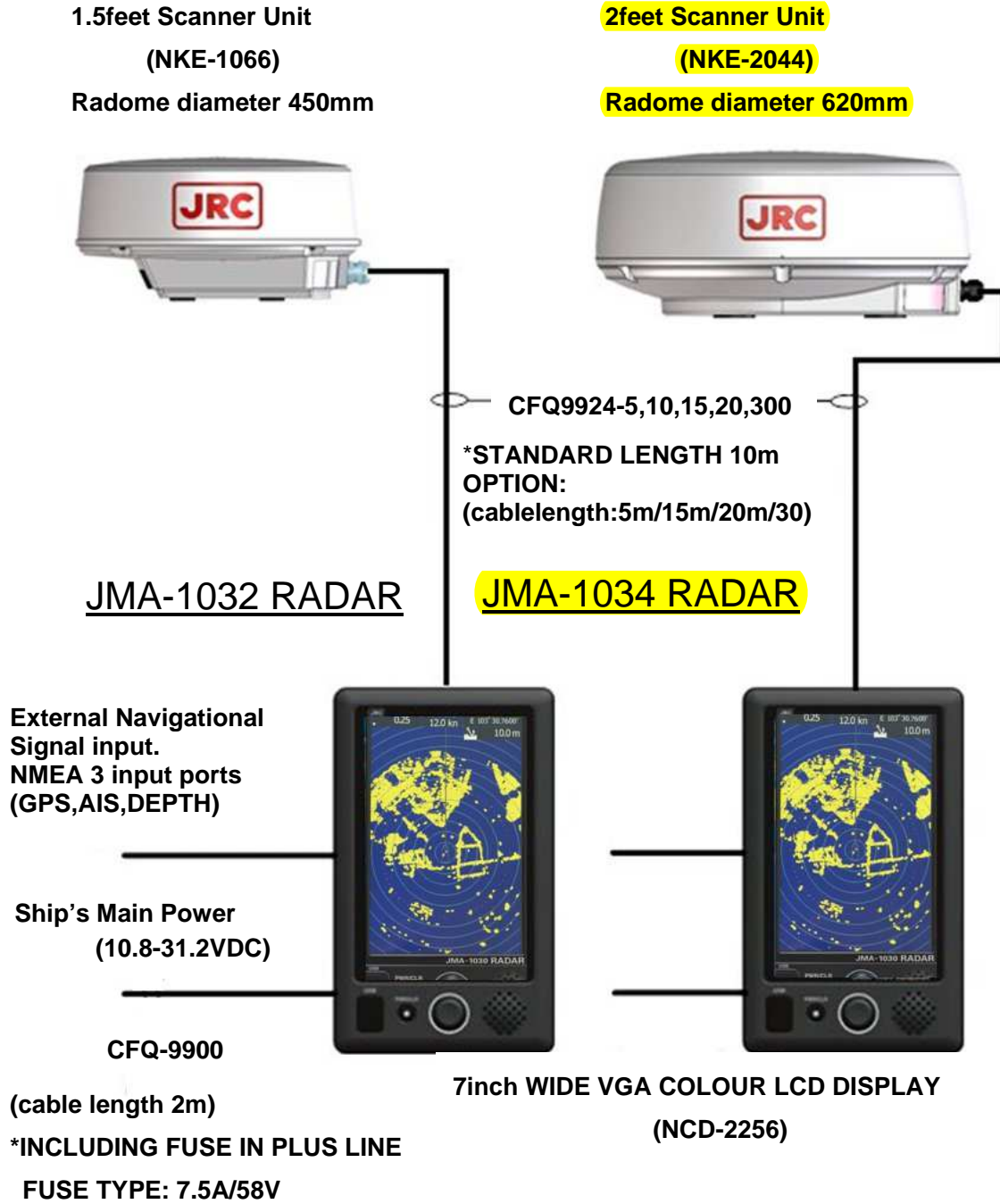
### 12-3-3 RADAR MODEL

**JMA-1032** 1.5ft Scanner unit

**JMA-1034** 2.ft Scanner unit

### 12-3-4 SYSTEM DIAGRAM

## JMA-1030 Series system diagram



## 12-4 GENERAL SPECIFICATIONS

(1) Class of Emission	P0N	
(2) Display	Color Raster Scan	
(3) Display capability	WVGA (800x480dots) Screen	
(4) Screen	7-inch Color LCD with touch sensor (resistance film type)	
(5) Range Scale	0.0625, 0.125, 0.25, 0.5, 0.75, 1.5, 3, 6, 12, 24, 48NM (48 NM: only 2feet type scanner is available) User can add 1, 2, 4, 8, 16, and 32NM (32 NM: only 2feet type scanner is available)	
(6) Range Resolution	Less than 30m	
(7) Minimum Detectable Range	Less than 40m	
(8) Range Accuracy	Less than 1% of the maximum distance of the range scale in use or less than 15m whichever is greater.	
(9) Bearing Accuracy	Less than $\pm 1^\circ$	
(10) Bearing Indication	RM: Head-up, North-up, Course-up TM: North-up, Course-up	
(11) Ambient Condition		
Standards	IEC60945 Ed.4.0	
Temperature		
Scanner	Operation: -25 to +55°C / Storage: -25 to +70°C	
Other Unit except Scanner	Operation: -15 to +55°C / Storage: -15 to +70°C	
Relative Humidity	+40°C, 93%	
Vibration	2 to 13.2 Hz, amplitude $\pm$ 1mm 13.2 to 100 Hz 0.7 G	
Velocity of the wind	100kn	
Waterproof/dustproof	Scanner	IP26
	Display unit	IP55
(12) Power Supply Input	DC 10.8-31.2V (DC12-24V-10%+30%)	
(13) Power Consumption	Approx. 50W (NKE-1066/NKE-2044). Maximum: 50W (NKE-1066: SP1, NKE-2044: LP2 transmitting)	
(14) Pre heat time	Approx. within 1min30sec.	
(15) Display unit	Refer to Display unit Specifications	
(16) Inter-unit Cables	Using common scanner connecting cable CFQ-9924-10 Standard Length 10m Maximum cable length 30m	

## 12-5 SCANNER

### 12-5-1 SCANNER (NKE-1066) SPECIFICATION

(1) Dimensions	Height 231mm×Diameter of radome 450mm
(2) Mass	Approx. 5.5kg
(3) Polarization	Horizontal (antenna length 1.5 feet)
(4) Antenna Directivity	Horizontal Beam Width (-3dB) 5.2° Vertical Beam Width (-3dB) 25°
Side lobe Level	Less than -21dB (less than ±10° from the main lobe)
(5) Rotation	Approx. 27rpm (16/27/36/48rpm are available)
(6) Transmitting Frequency	9410±30MHz
(7) Peak Power	4 kW
(8) Transmitting Tube	Magnetron [M1624]
(9) Pulse width/ Repetition Frequency (Bandwidth)	SP1: 0.08μs/4000 Hz (Wide 20MHz) SP2: 0.08μs/2250 Hz (Wide 20MHz) SP3: 0.13μs/1700 Hz (Wide 20MHz) MP1: 0.25μs/1700 Hz (Middle 6MHz) MP2: 0.5μs/1200 Hz (Narrow 3MHz) LP1: 0.8μs/750 Hz (Narrow 3 MHz) (S: Short pulse, M: Middle pulse, L: Long pulse)
(10) Range Information	0.0625NM SP1 0.125NM SP1 0.25 NM SP1 0.5 NM SP1 / MP1 0.75 NM SP2 / MP1 1.5 NM SP2 / MP1 / MP2 3 NM SP3 / MP1 / MP2 6 NM MP2 / LP1 12 NM MP2 / LP1 24 NM LP1
(11) Duplexer	Circulator + Diode Limiter (Diode Limiter is included in the frontend)
(12) Front End Module	MIC
(13) IF Frequency	60MHz
(14) IF AMP	Log Amplifier (Gain: more than 90dB)
(15) Overall Noise Figure	6dB(Average)
(16) Tuning	Manual/Auto

**12-5-2 SCANNER (NKE-2044) SPECIFICATION**

(1) Dimensions	Height 280mm×Diameter of radome 620mm
(2) Mass	Approx. 10.5kg
(3) Polarization	Horizontal (antenna length 2 feet)
(4) Directional Characteristic	Horizontal Beam Width (-3dB) 4° Vertical Beam Width (-3dB) 25°
Side lobe Level	-21dB or less (less than ±10° from the main lobe)
(5) Rotation	Approx. 27rpm (16/27/36/48rpm are available)
(6) Transmitting Frequency	9410±30MHz
(7) Peak Power	4 kW
(8) Transmitting Tube	Magnetron [MSF1421B]
(9) Pulse width/ Repetition Frequency (Bandwidth)	SP1: 0.08μs/4000 Hz (Wide 20MHz) SP2: 0.08μs/2250 Hz (Wide 20MHz) SP3: 0.13μs/1700 Hz (Wide 20MHz) MP1: 0.25μs/1700 Hz (Middle 6MHz) MP2: 0.5μs/1200 Hz (Narrow 3MHz) LP1: 0.8μs/750 Hz (Narrow 3 MHz) LP2: 1.0us/650Hz (Narrow: 3MHz) (S: Short pulse, M: Middle pulse, L: Long pulse)
(10) Range Information	0.0625NM SP1 0.125NM SP1 0.25 NM SP1 0.5 NM SP1 / MP1 0.75 NM SP2 / MP1 1.5 NM SP2 / MP1 / MP2 3 NM SP3 / MP1 / MP2 6 NM MP2 / LP1/ LP2 12 NM MP2 / LP1/ LP2 24 NM LP2 48 NM LP2
(11) Duplexer	Circulator + Diode Limiter
(12) Front End Module	MIC
(13) IF Frequency	60MHz
(14) IF AMP	Log Amplifier (Gain: more than 90dB)
(15) Overall Noise Figure	6dB(Average)
(16) Tuning	Manual/Auto

## 12-6 DISPLAY

### 12-6-1 INTEGRATED DISPLAY UNIT (NCD-2256)

1) Structure	Desk Top Integrated Type (LCD Monitor Unit/Keyboard Unit/Processor Unit Integrated Structure) Vertical installation only desk top integrated type Option: Overhead Mounted kit installation
2) Dimensions	Height 235.2mm x Width 162mm x Depth 77.3mm (The U style mount base and the both sides knob bolts are included.)
3) Mass	Approx. 1.8kg
4) Tune Method	Manual / Auto (Bar-graph indication is displayed at the time of adjustment.)
5) STC (SEA)	Manual / Auto
6) FTC (RAIN)	Manual / Auto
7) Radar Interference Rejection	Built-in (The effect can be adjusted by three stages.)
8) Bearing Marker	360° in 5° digit
9) Heading Line	Electronic
10) Off Center	move to the defined coordinates of 4 patterns (4 patterns are back side 64dots, left side 92dots, front side 92dots, right side 92dots from the default center position) Transition of the radar trails is possible during Off Center mode.
11) True Motion Unit	Built-in (Not available at the maximum range)
12) True Motion Reset Position	40% of radius of any range
13) Radar trail indication	True motion mode: Only true motion trails Relative motion mode: Only relative motion trails Trail time length: 15 sec to 15 min/Continuous 30 sec to 30 min/Continuous 1 min to 1 hr/Continuous 30 min to 12 hr/Continuous Arbitrary trail time length can be displayed at any time. Possible to display time series trail and continuous trail by color classification.

\* When switching to true/relative trails, the radar trails are cleared. Transition of the trails is possible during Off Center mode (Relative motion). (Scroll)

When the bearing mode is switched (RM (T), TM), the radar trails are taken over at between RM (T) and TM.





## 12-6-2 OPERATIONAL PANEL

- |  |  |  |  |  |                      |  |  |
|--|--|--|--|--|----------------------|--|--|
| 1) Structure   | Integrated on the display unit   |  |  |  |                      |  |  |
| 2) Key   | <table border="0"> <tr> <td><span style="border: 1px solid black; padding: 2px;">PWR</span>/CLR</td> <td>Short push: Power ON ( at the time of Power OFF)</td> </tr> <tr> <td></td> <td>Long push: Power OFF</td> </tr> <tr> <td>PWR/<span style="border: 1px solid black; padding: 2px;">CLR</span></td> <td>Short push: input cancel, back to a up-layer</td> </tr> </table> | <span style="border: 1px solid black; padding: 2px;">PWR</span> /CLR | Short push: Power ON ( at the time of Power OFF) |  | Long push: Power OFF | PWR/ <span style="border: 1px solid black; padding: 2px;">CLR</span> | Short push: input cancel, back to a up-layer |
| <span style="border: 1px solid black; padding: 2px;">PWR</span> /CLR | Short push: Power ON ( at the time of Power OFF)   |  |  |  |                      |  |  |
|  | Long push: Power OFF   |  |  |  |                      |  |  |
| PWR/ <span style="border: 1px solid black; padding: 2px;">CLR</span> | Short push: input cancel, back to a up-layer   |  |  |  |                      |  |  |
| 3) Knob Controller   | <p>PUSH : Menu or Icon selection and execution, control<br/>EBL/VRM, number input, Enter, etc.</p> <p>PUSH + rotation: Brilliance control</p>  |  |  |  |                      |  |  |
| 4) Touch control   | <p>Tap: Menu or Icon selection and execution, control, etc.</p> <p>Double tap: Brilliance menu</p> <p>Icon Double tap: EBL/VRM disappear</p> <p>Icon Long tap: Entry of short cut Icon</p>   |  |  |  |                      |  |  |

## 12-6-3 AIS FUNCTION (STANDARD BUILT IN)

- |                        |  |
|------------------------|--|
| 1) Display             |  |
| Number of targets      | Up to 50 targets (stores up to 500 ship static data)   |
| Target information     | Displays MMSI, call sign, ship name, COG, SOG, CPA, TCPA, direction, distance, latitude, longitude, status, etc. |
| Filters                | Distance only  |
| Active targets         | Not available  |
| Dangerous ship targets | No CPA/TCPA decision   |
| 2) Operation           | Built-in   |

## 12-6-4 TT FUNCTION (STANDARD BUILT IN)

- |                        |  |
|------------------------|--|
| 1) Acquisition         | MANUAL/AUTO (by automatic acquisition/activation zone)                                   |
| 2) Tracking            | 10 targets (Automatic tracking)  |
| 3) Display             |  |
| Tracking data          | 1 ship (AIS or TT)   |
| Maximum tracking range | 20NM (This varies depending on the range)  |
| Target information     | Displays items selected from true bearing, distance, true course, true speed, CPA, TCPA. |
| Display of Vectors     | True/Relative  |
| 4) Operation           | Built-in   |

## 12-7 INPUT/ OUTPUT SIGNAL

<b>Telecommunications standard</b>	NMEA0183 / 61162 -1/2
<b>Communications protocol</b>	4800 bps, start 1bit, data 8bit, stop 1bit, non parity
<b>Input sentence</b>	NMEA0183: V1,5: GGA/ GLL/ RMC V2,0: GGA/G LL/ RMC/ZDA V2,3 : GGA/GLL/RMC/GNS/ZDA (Talker="GP" etc.)
<b>Information classification</b>	position and time GGA/G NS/G LL/RMC date ZDA/RMC Time ZDA/GGA/GNS/GLL/RMC

### 12-7-1 INPUT ENABLE SIGNAL

(Three-port input GPS/HDG/AIS)

(1) Navigation equipment IEC61162-1/2(※1)

L/L: GGA>RMC>RMA>GNS>GLL  
 SOG/COG: RMC>RMA>VTG  
 Log speed: VBW>VHW  
 HEADING: THS>HDT>HDG>HDM  
 DEPTH: DPT>DBT  
 WATER TEMP: MTW  
 ROT: ROT  
 RUDDER: RSA  
 AIS: VDM, VDO, ALR  
 WIND: MWV>VWT, VWR  
 WAYPOINT: WPL

(2) Bearing signal JRC-NSK format (JLR-10/20/30)(by NMEA3 port)

IEC61162-1/2(※1) 4800bps/38400bps: THS>HDT>HDG>HDM

(3) Speed signal IEC61162 4800bps: VBW, VHW

※1:IEC61162-2 Conformity is unnecessary.

(Insulation is unnecessary. Input electrical tests are unnecessary.)

## 12-7-2 OUTPUT POSSIBLE SIGNAL (THREE-LINE GPS/HDG/TTM)

(1) Navigation equipment

Radar data: RSD

Own ship's data: OSD

TT data: TTM, TTL, TTD

Latitude/ Longitude data: GGA, RMC, GNS, GLL,

COG/SOG: VTG (Received GPS data)

Bearing signal: THS, HDT (Received GPS Compass data)

(2) External Buzzer Factory presetting: normal open contacts

(3) Output RGB signal To incorporate optional kit (NQA-2447) is necessary

※In this case, waterproofing (IPx5) of rear side of display unit is not guaranteed

(4) Slave display no function

(5) LAN no function

## 12-7-3 STANDARD CONFIGURATION

Scanner: 1unit

Display Unit: 1unit

Sun cover: 1unit

Scanner cable: 1pc. (10m)

Power cable: 1pc. (2m)

Standard included accessories: 1set (2 pieces. fuse)

Instruction /Installation/Quick manual: 1 book

## 12-7-4 OPTION CABLE

Scanner cable: 5m, 15m, 20m,30m

NMEA cable (waterproof (IPx5)): 1m

# Chapter 13 APPENDIX

## NKE-1066(1.5FT) SCANNER INTRCONNECTION DIAGRAM

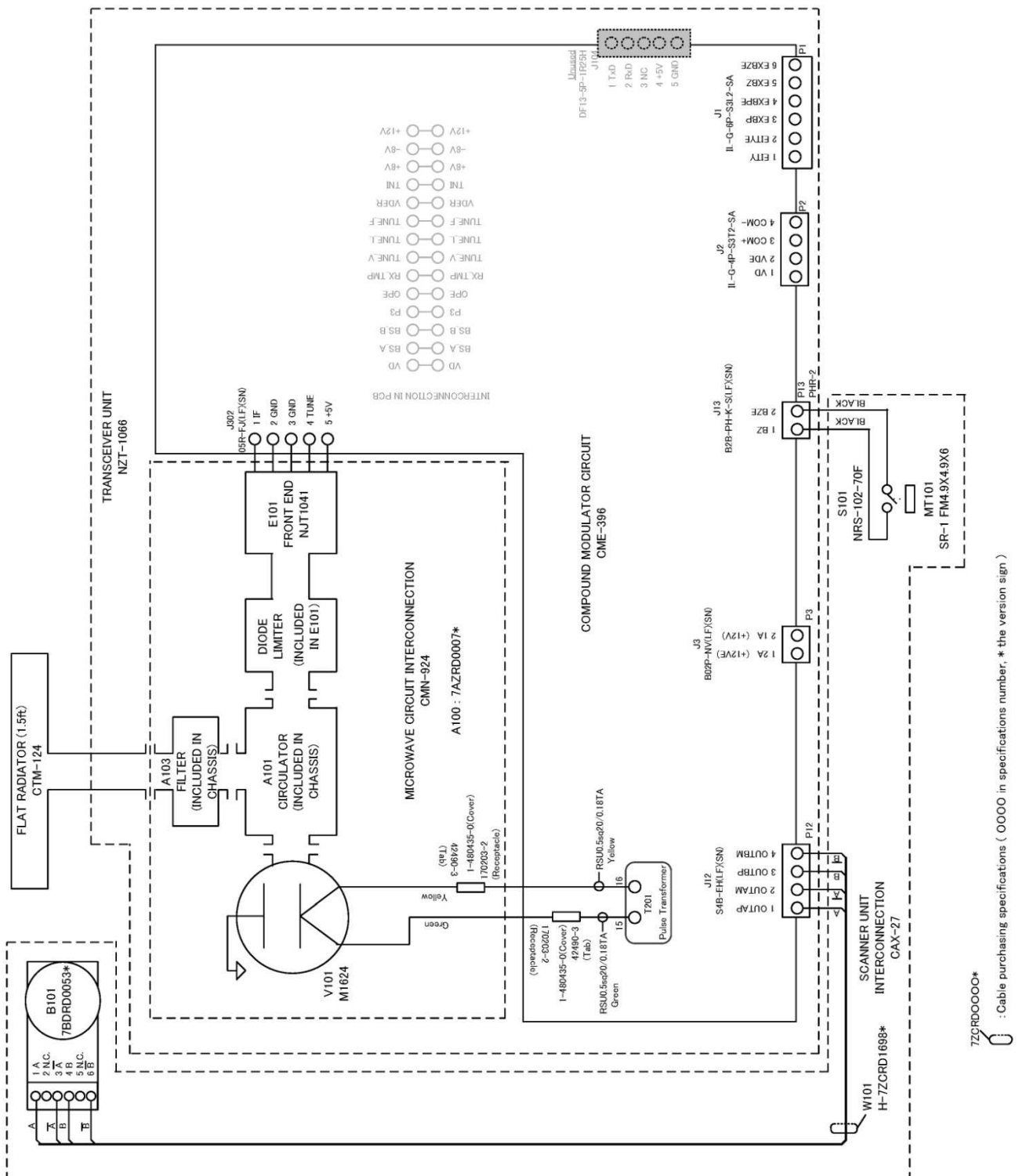


FIG A1

**NKE-2044(2FT) SCANNER INTRCONNECTION DIAGRAM**

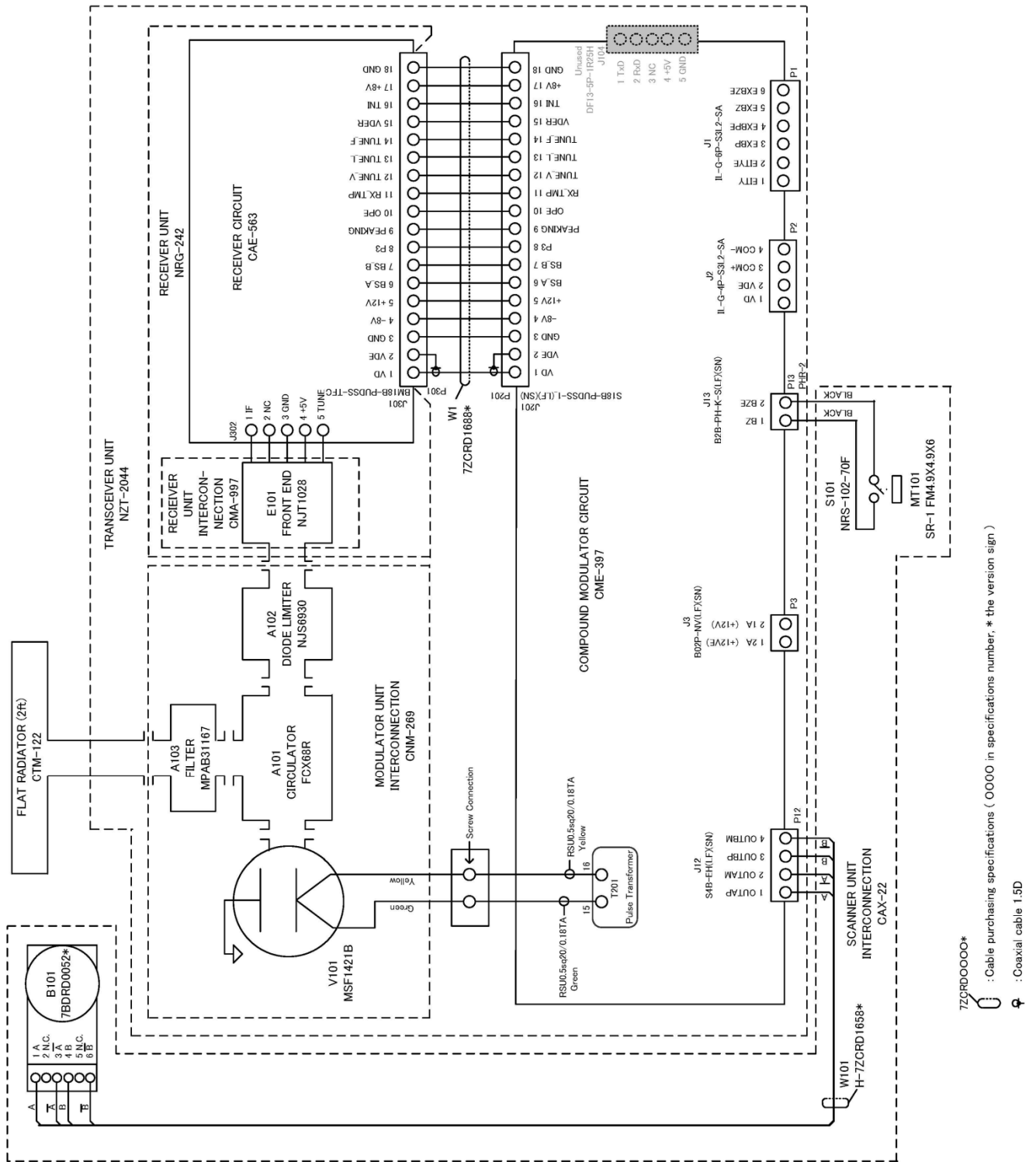


FIG A2

# NCD-2256 DISPLAY UNIT INTER CONNECTION DIAGRAM

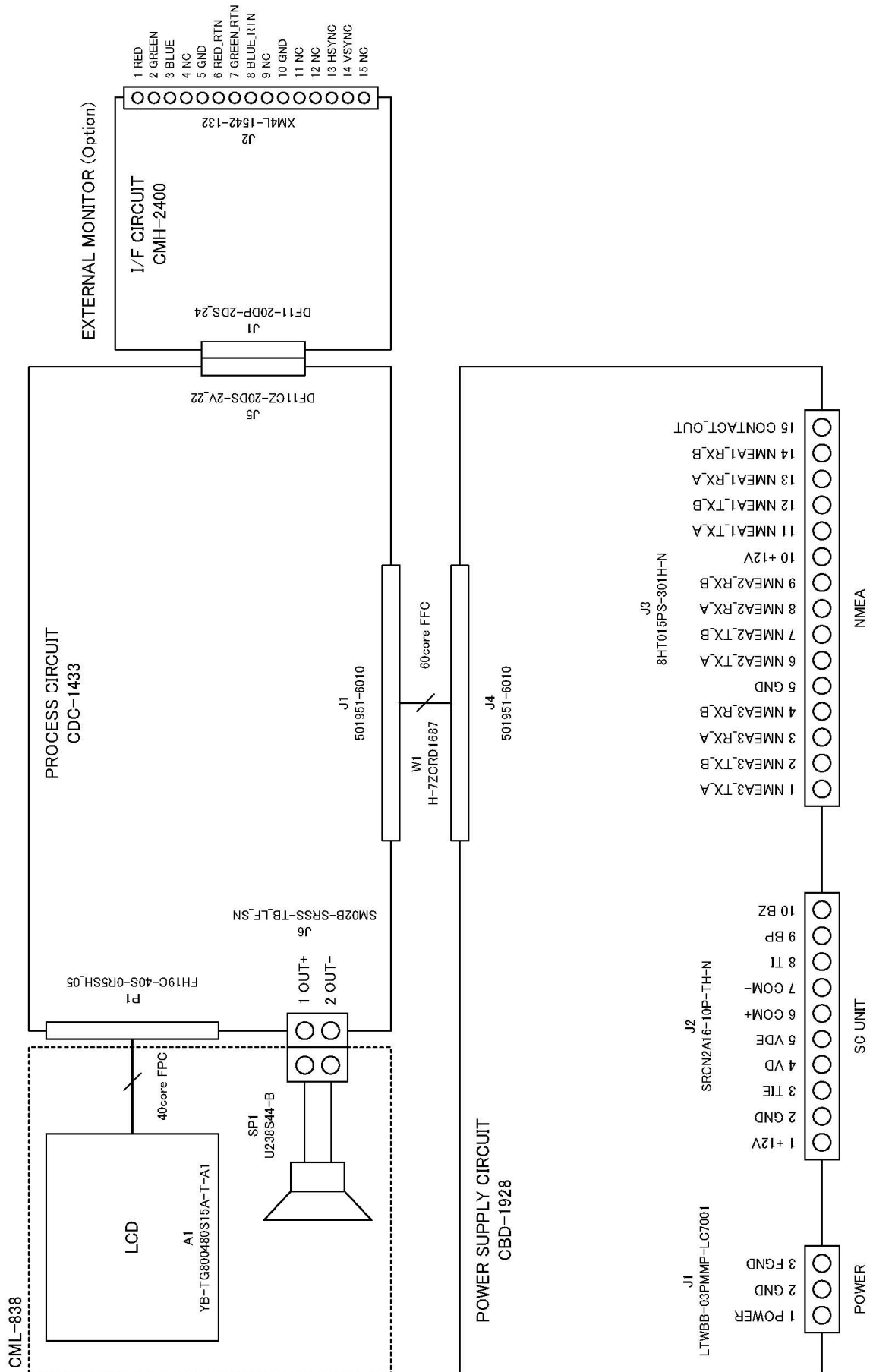


FIG A3

# JMA-1030 PRIMARY POWER SUPPLY DIAGRAM

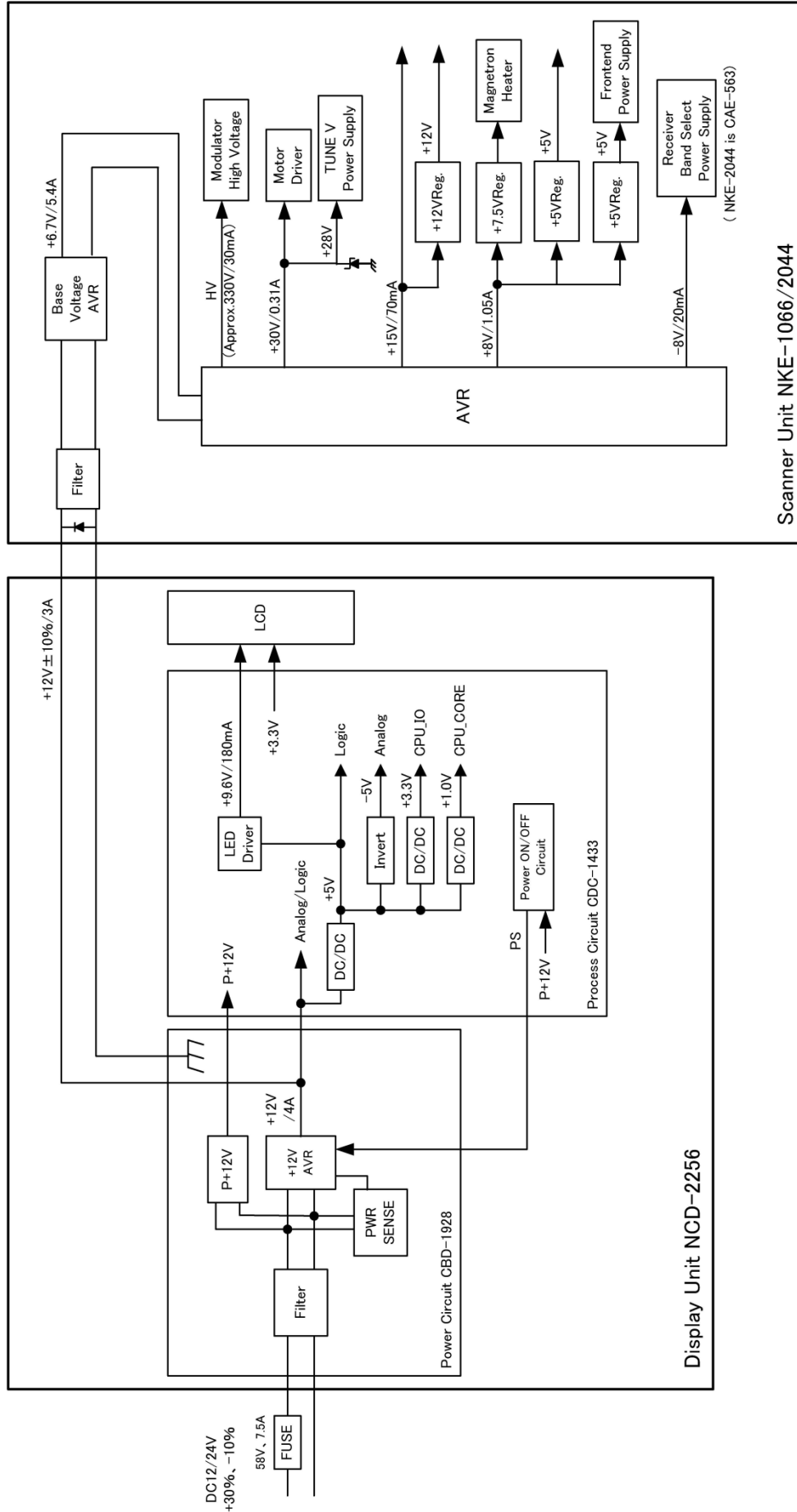
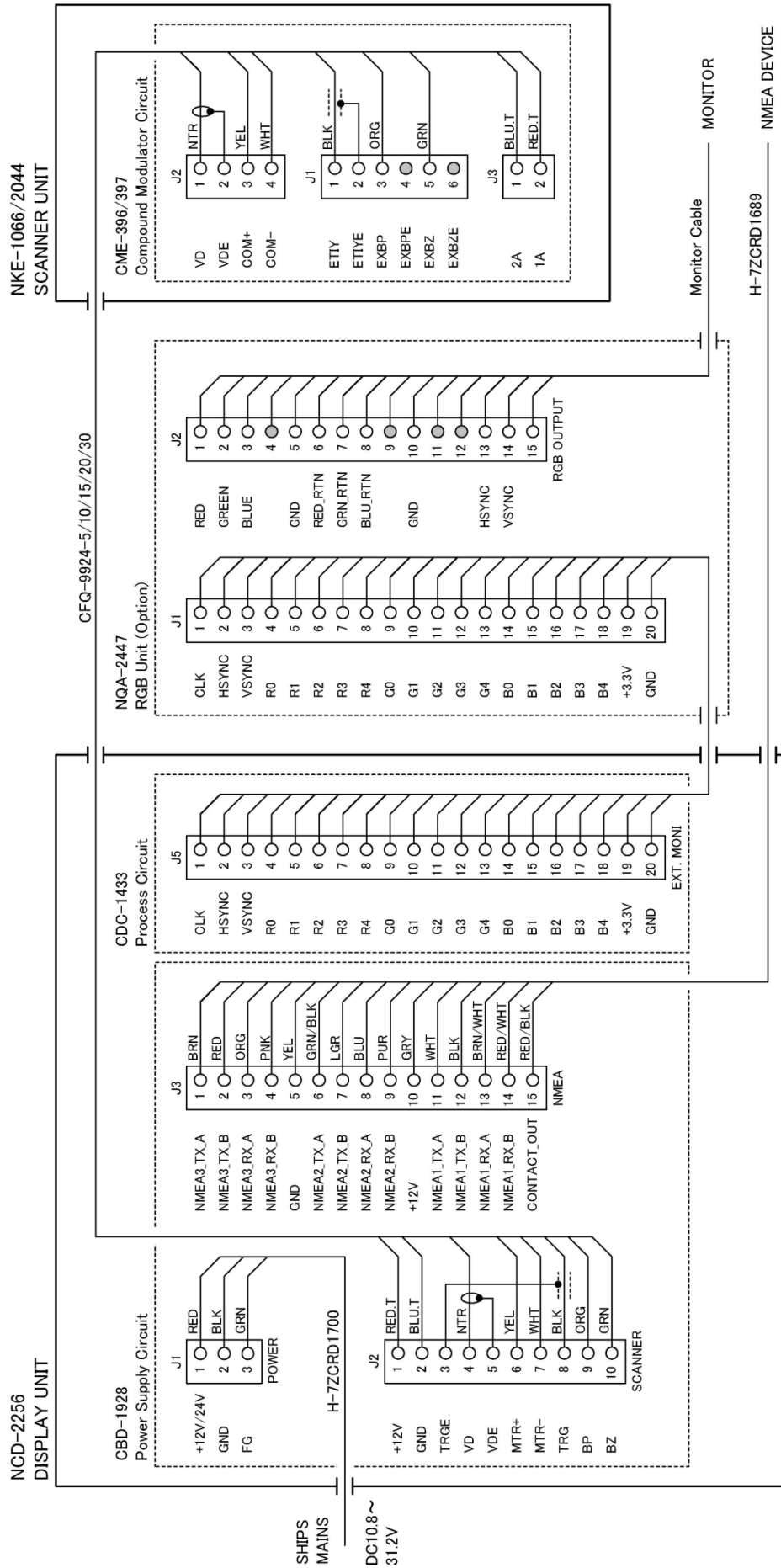


FIG A4

# JMA-1030 INTER CONNECTION DIAGRAM





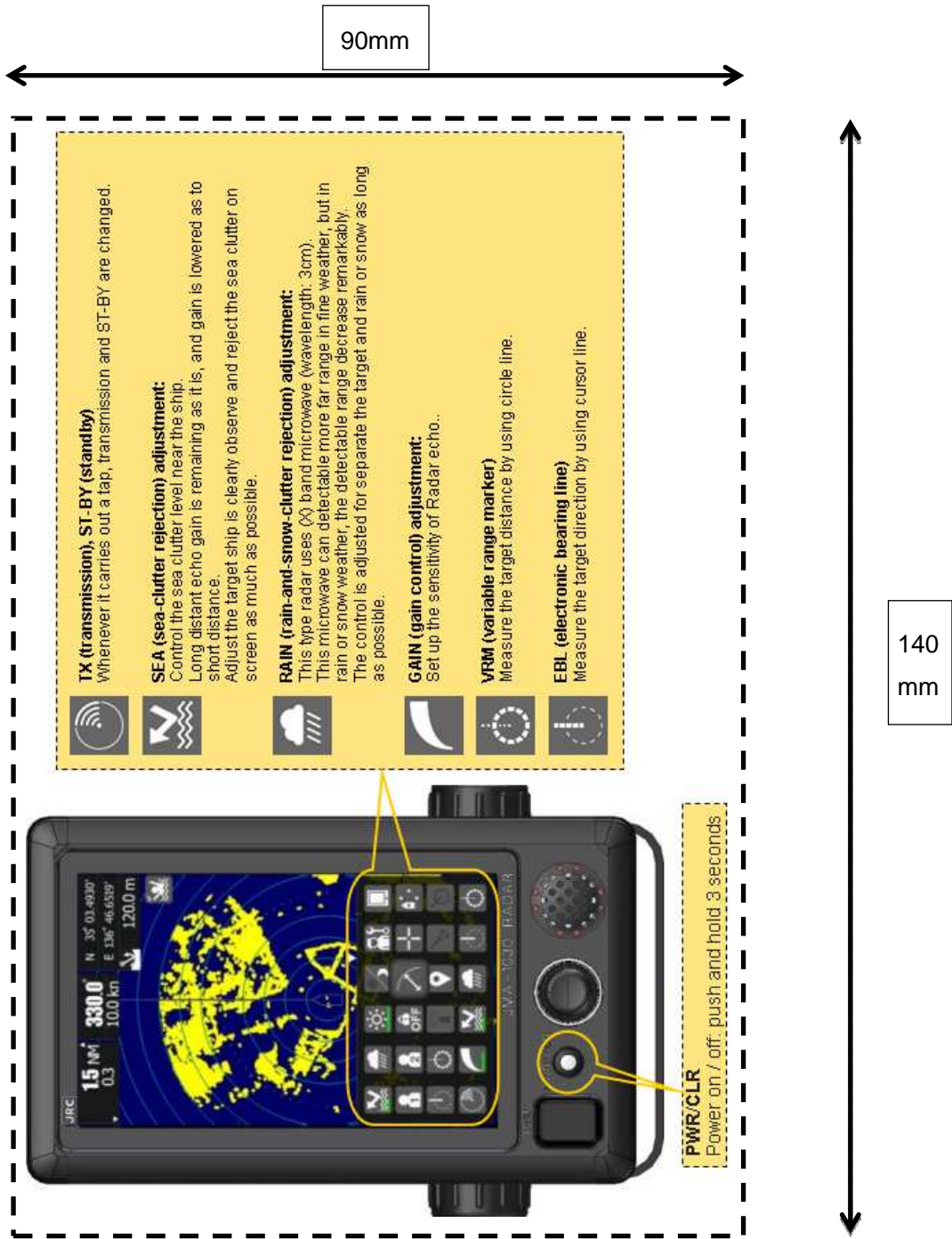


FIG A6

## OPERATION SHEET

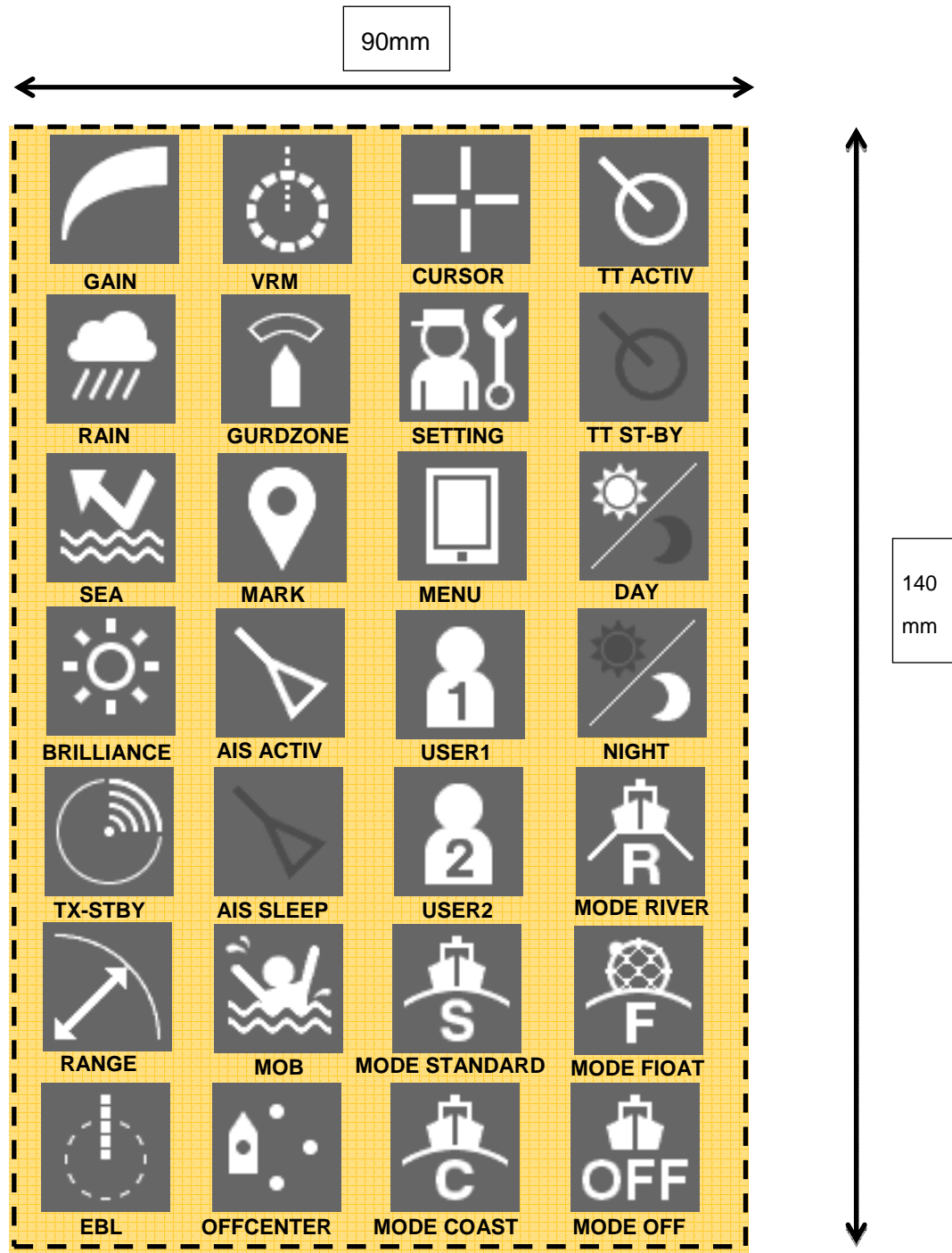


FIG A7

# MENU FUNCTION LIST

## Main Menu

Item	Setting Contents
1. RADAR Echo	
1. Pulse Length	SP/MP/LP
2. IR	OFF / Low / Middle / High
3. Target Enhance	OFF / Level1 / Level2 / Level3
4. Process	OFF / 3Scan COREL / 4Scan COREL / 5Scan COREL / Remain / Peak Hold
5. Zoom	OFF / ON
6. Video Latitude	Narrow / Normal / Wide1 / Wide2
7. Video Noise Rejection	OFF / Level1 / Level2 / Level3
8. Timed TX	OFF / ON
2. Tuning	
3. Motion Mode	
1. Motion	RM, TM
2. Bearing Mode	HUP/NUP/CUP
4. Radar trail	
1. Trails REF Level	Level1 / Level2 / Level3 / Level4
2. Time/All Combine	OFF / ON
3. Trails Mode	True/Relative
4. Trails Interval	OFF/15sec/30sec/1min/2min/3min/4min/5min/6min/10min/15min/CONT
5. Vector Length	
1. Vector Mode	True/Relative
2. Vector Length	1 - 60min
6. Maker	
1. Maker Mode	True/Relative
2. VRM Unit	NM/km/sm
3. EBL Bearing Mode	Heading Fix / Screen Fix
4. Range Rings(RR)	OFF / ON
7. Target	
1. Function ON/OFF	
1. TT	OFF / ON
2. AIS	OFF / ON
2. CPA Limit	0.1 - 9.9NM
3. TCPA Limit	1 - 99min

Item	Setting Contents
4. CPA Ring Display	OFF / ON
5. Target Number Display	
1. TT	OFF / ON
2. AIS	OFF / ON
6. ALR Alarm From AIS	OFF / ON
7. AIS Display Targets	20 / 30 / 40 / 50
8. AIS List Display	OFF / ON
8. NMEA Info. Set	

Initial setting Menu

Item	Setting Contents
1. Basic Adjustment	
1. Bearing Adjustment	0.0 - 359.9
2. Range Adjustment	0 - 999
3. Tune Adjustment	0 - 127
4. Antenna Height	~5m/5~10m/10~20m/20m~
5. Noise Level	0 - 255
6. Language	English/Spanish/Turkish/Indonesian/Thai/Malay/Vietnamese/ Chinese/Japanese/Korean/Russian
2. RADAR Echo	
1. Main Bang Suppression	
1. MBS Level	0 - 255
2. MBS Area	0 - 255
2. Target Enhance Level	Level1/Level2/Level3/Level4
3. Gain Preset	0 - 255
4. STC	
1. STC Curve Select	Sea/River
2. STC Slope Correction	0.0 - 2.0
3. STC Offset	0 - FF
1. FTC	
1. FTC Curve Select	Sea/River
2. FTC Slope Correction	0.0 - 2.0
3. FTC Offset	0 - FF
6. RADAR Alarm	
1. RADAR Alarm1 Level	Level1/Level2/Level3/Level4
2. RADAR Alarm2 Level	Level1/Level2/Level3/Level4
3. RADAR Trails	
1. MAX Interval	Short/Middle/Long/Super Long
2. Suppression Distance	0 - 1000
4. TT	
1. Vector Constant	1 - 8
2. Gate Display	OFF / ON
3. Gate Size	0 - 64
5. Scanner	
1. PRF Fine Tuning	0 - 31
2. Stagger Trigger	OFF / ON
3. Antenna Rotation Speed	
1. SP1	0 - 7
2. SP2	0 - 7
3. SP3	0 - 7
4. MP1	0 - 7
5. MP2	0 - 7
6. LP1	0 - 7
7. LP2 (*NKE-2044 only)	0 - 7
4. PRF Mode	Normal/Economy/High Power
5. Timed TX	
1. TX Time	1 - 99
2. STBY Time	1 - 99
3. Adaptation	ON/OFF
6. Tune Peak Adjustment	0 - 127
7. Tune Indicator Level	0 - 127
6. I/F Device	
1. Heading Equipment	AUTO/GYRO/Compass/GPS/Manual
2. Manual Heading	0.0 - 359.9
3. Speed Equipment	GPS/Log/2axis Log/Manual
4. Manual Speed	0.0 - 100.0kn
5. MAG Compass Setting	
1. Heading Correction	OFF / ON
2. Correct Value	W9.9 - E9.9°

Item		Setting Contents
7. COM Port Setting		
1. Baud Rate		
1.	NMEA1	AUTO/4800bps/38400bps
2.	NMEA2	AUTO/4800bps/38400bps
3.	NMEA3	AUTO/4800bps/38400bps
2. RX Port		
1.	GPS	AUTO/NMEA1/NMEA2/NMEA3
2.	Log	AUTO/NMEA1/NMEA2/NMEA3
3.	2axis Log	AUTO/NMEA1/NMEA2/NMEA3
4.	Depth	AUTO/NMEA1/NMEA2/NMEA3
5.	Temperature	AUTO/NMEA1/NMEA2/NMEA3
6.	Wind	AUTO/NMEA1/NMEA2/NMEA3
7.	WPT	AUTO/NMEA1/NMEA2/NMEA3
8.	Rate of Turn	AUTO/NMEA1/NMEA2/NMEA3
9.	Rudder	AUTO/NMEA1/NMEA2/NMEA3
3. TX Port		
1.	TTM	OFF/NMEA1/NMEA2/NMEA3
2.	TLL	OFF/NMEA1/NMEA2/NMEA3
3.	TTD	OFF/NMEA1/NMEA2/NMEA3
4.	TLB	OFF/NMEA1/NMEA2/NMEA3
5.	GGA	OFF/NMEA1/NMEA2/NMEA3
6.	GLL	OFF/NMEA1/NMEA2/NMEA3
7.	RMC	OFF/NMEA1/NMEA2/NMEA3
8.	GNS	OFF/NMEA1/NMEA2/NMEA3
9.	VTG	OFF/NMEA1/NMEA2/NMEA3
10.	THS	OFF/NMEA1/NMEA2/NMEA3
11.	HDT	OFF/NMEA1/NMEA2/NMEA3
12.	OSD	OFF/NMEA1/NMEA2/NMEA3
13.	RSD	OFF/NMEA1/NMEA2/NMEA3
4. TX Data Format		
1.	TX Interval	1 - 9sec
2.	NMEA Version	V1.5/V2.0/V2.3
3.	NMEA Talker	Normal/GP
5. Target Info. TX		
1.	TX Target	TT/AIS/TT-AIS
2.	TTM Range Accuracy	1/2/3
3.	TT Average Mode	OFF / ON
4.	TT Average Scan	2 - 10
8. JRC GPS		
1. GPS Status		
2. GPS Setting		
1.	NMEA Version	AUTO/V1.5/V2.0/V2.3
2.	Correction Method	GPS Single/SBAS/Beacon/AUTO
3.	Fix Mode	2D/3D/AUTO
4.	Elevate Mask	5 - 89°
5.	HDOP	4/10/20
6.	Smoothing LL	0 - 99sec
7.	Smoothing SOG	0 - 99sec
8.	Smoothing COG	0 - 99sec
9.	Smoothing	0 - 99sec (R29.04 - R33.99) 1 - 99sec (R26.01 - R29.03)
10.	Smoothing	0sec/10sec/40sec
11.	RAIM Accuracy Level	OFF/10/30/50/100m
12.	Exclusion Satellite	
	1. Exclusion Satellite1	0 - 32
	2. Exclusion Satellite2	0 - 32
	3. Exclusion Satellite3	0 - 32
	4. Exclusion Satellite4	0 - 32
	5. Exclusion Satellite5	0 - 32
	6. Exclusion Satellite6	0 - 32

# MENU FUNCTION LIST

Item		Setting Contents
	13. Send Data	
	14. GPS Adjust	
	1. Position	
	2. Antenna Height	0 - 8191m
	3. Time	00:00:00 - 23:59:59
	4. Date	2013/1/1/ - 2099/12/31
	5. Master Reset	
	6. Send Data	
	3. Beacon Setting	
	1. Station Select	AUTO/Manual
	2. Frequency	283.5 - 325.0kHz
	3. Baud Rate	50 / 100 / 200bps
	4. Send Data	
	4. SBAS Setting	
	1. Satellite Search	AUTO/Manual
	2. Ranging	OFF / ON
	3. SBAS Satellite Number	120 - 138
	4. Send Data	
	9. Control	
	1. Touch Panel Calibration	
	2. Bearing Reference (*NKE-2044 only)	True/Relative
	3. Buzzer	
	1. Key ACK	OFF/1 - 5
	2. Operation Error	OFF/1 - 5
	3. CPA/TCPA	OFF/1 - 5
	4. AZ/Alarm Zone	OFF/1 - 5
	5. Target Lost	OFF/1 - 5
	6. System Alarm	OFF/1 - 5
	10. Maintenance	
	1. Partial Reset	
	1. All Menu	
	2. RADAR Echo	
	3. Function Setting	
	4. Initial Setting Menu	
	5. Main Menu	
	6. Adjust Menu (*NKE-2044 only)	
	7. System Information 1 (*NKE-2044 only)	
	8. System Information 2 (*NKE-2044 only)	
	2. All Reset	
	3. System Time Clear	
	4. Scanner Time Clear	
	1. TX Time Clear	
	2. Motor Time Clear	
	3. ANT to DISP Unit	
	4. DISP to ANT Unit	
	5. Table Update	
	1. Initial Value	
	1. All Menu	
	2. RADAR Echo	
	3. Function Setting	
	4. Initial Setting Menu	
	5. Main Menu	
	6. Adjust Menu (*NKE-2044 only)	
	7. System Information 1 (*NKE-2044 only)	
	8. System Information 2 (*NKE-2044 only)	
	2. Insert Language	
	3. Echo Simulation (*NKE-2044 only)	
	4. STC Curve	
	5. Color Pallet (*NKE-2044 only)	

Item		Setting Contents
6. Internal Setting		
1. Internal Memory to USB		
	1. All Menu	
	2. RADAR Echo	
	3. Function Setting	
	4. Initial Setting Menu	
	5. Main Menu	
	6. Mark Setting	
	7. Adjust Menu (*NKE-2044 only)	
	8. System Information 1 (*NKE-2044 only)	
	9. System Information 2 (*NKE-2044 only)	
2. USB to Internal Memory		
	1.All Menu	
	2. RADAR Echo	
	3. Function Setting	
	4. Initial Setting Menu	
	5. Main Menu	
	6. Mark Setting	
	7. Adjust Menu (*NKE-2044 only)	
	8. System Information 1 (*NKE-2044 only)	
	9. System Information 2 (*NKE-2044 only)	
7. USB Format		
11. System Setting		
1. Master/Slave/DEMO		Master/Slave/Demo
2. Own Ship Outline		
	1. All Length	0.0 - 600.0m
	2. All Width	0.0 - 200.0m
	3. Scanner (from Bow)	0.0 - 600.0m
	4. Scanner (from Cntr.)	-100.0 - 100.0m
3. Unit		
	1. Range	NM/km/sm
	2. Distance	NM/km/sm
	3. Speed	kn/ km/h /mph
	4. Depth	ft/fm/m/user
	5. User Depth	0.1 - 10.0
	6. Temperature	°C /°F
	7. Wind	m/s / km/h / kn / Bft.
4. Move Own Ship		
	1. Ship's Move Method	LL / COG/SOG
5. Range		
1. NM		
	1. 0.0625NM	OFF / ON
	2. 0.125NM	OFF / ON
	3. 0.25NM	OFF / ON
	4. 0.5NM (*NKE-2044 only)	OFF / ON
	5. 0.75NM (*NKE-2044 only)	OFF / ON
	4. 1NM	OFF / ON
	5. 2NM	OFF / ON
	6. 4NM	OFF / ON
	7. 8NM	OFF / ON
	8. 16NM	OFF / ON
	9. 24NM	OFF / ON
	10. 32NM	OFF / ON
	11. 48NM	OFF / ON



# MENU FUNCTION LIST

Item		Setting Contents
	2. km	
	1. 0.15km	OFF / ON
	2. 0.3km	OFF / ON
	3. 0.5km (*NKE-2044 only)	OFF / ON
	4. 1.2km	OFF / ON
	5. 2km	OFF / ON
	6. 8km	OFF / ON
	7. 16km	OFF / ON
	8. 32km	OFF / ON
	3. sm	
	1. 0.0625sm	OFF / ON
	2. 0.125sm	OFF / ON
	3. 0.25sm	OFF / ON
	4. 1sm	OFF / ON
	5. 2sm	OFF / ON
	6. 4sm	OFF / ON
	7. 8sm	OFF / ON
	8. 16sm	OFF / ON
	9. 24sm	OFF / ON
	10. 32sm	OFF / ON
	11. 48sm	OFF / ON
12. Display Screen		
	1. Own Vector Display	OFF / ON
	2. STBY Disp. Select	Normal / Graphical / Numeric Display
	3. Operation Num Disp.	OFF / ON
	4. Display Color	
	1. PPI	
	1. Color	Black/ Blue/ White
	2. Brilliance	Level1/ Level2/ Level3/ Level4
	2. Inner PPI (*NKE-2044 only)	
	1. Color (*NKE-2044 only)	Black/ Blue/ White
	2. Brilliance (*NKE-2044 only)	Level1/ Level2/ Level3/ Level4
	3. Character	
	1. Color	White/Cyan/Green/Black/Red/Gold/Amber
	2. Brilliance	Level1/ Level2/ Level3/ Level4
	4. RADAR Echo	
	1. Color	Yellow/Green/Blue/White/Magenta/Gold/Amber/Color
	2. Brilliance	Level1/ Level2/ Level3/ Level4
	5. RADAR Trails (Time)	
	1. Color	Green/Blue/Cyan
	2. Brilliance	Level1/ Level2/ Level3/ Level4
	6. RADAR Trails (All)	
	1. Color	Green/Blue/Cyan
	2. Brilliance	Level1/ Level2/ Level3/ Level4
	7. Own Ship's	
	1. Color	Cyan/Green/Red/White/Gold/Amber
	2. Brilliance	Level1/ Level2/ Level3/ Level4
	8. Target (TT/AIS)	
	1. Color	Cyan/Green/White
	2. Brilliance	Level1/ Level2/ Level3/ Level4
	9. EBL/VRM	
	1. Color	Cyan/Black/Magenta/White
	2. Brilliance	Level1/ Level2/ Level3/ Level4
	10. Range Ring	
	1. Color	Cyan/Green/Red/White/Gold/Amber
	2. Brilliance	Level1/ Level2/ Level3/ Level4
	11. Cursor	
	1. Color	White/Red/Magenta/Yellow
	2. Brilliance	Level1/ Level2/ Level3/ Level4

Item		Setting Contents	
	12. AZ/Alarm Zone		
		1. Color	White/Green/Orange/Black/Red
		2. Brilliance	Level1/ Level2/ Level3/ Level4
	5. Waypoint Display		ON/OFF
	6. AIS Filter		0.0 - 48.0
	13. Error Alarm Mask		
	1. Scanner		
	1. Scanner(Time Out)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 - 999sec
	2. Scanner(Data)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 - 999sec
	3. Scanner(Video)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 - 999sec
	4. Scanner (Trigger)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 - 999sec
	5. Scanner(AZI)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 -999sec
	6. Scanner(HL)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 -999sec
	7. Scanner(MHV)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 -999sec
	8. Scanner(Heater)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 -999sec
	2. Display Unit		
	1. Display Unit(Video)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 -999sec
	2. Display Unit(Trigger)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 -999sec
	3. Display Unit(AZI)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 -999sec
	4. Display Unit(HL)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 -999sec
	5. Display Unit(DSP)		
		1. Alarm Sensitivity	OFF / ON
		2. Sensitivity Time	0 -999sec
	6. COM Port		
		1. Alarm Sensitivity	OFF / ON
	3. Connection Device (*NKE-2044 only)		
	1. GYRO(Time Out) (*NKE-2044 only)		
		1. Alarm Sensitivity (*NKE-2044 only)	OFF / ON
		2. Sensitivity Time (*NKE-2044 only)	0 -999sec
	2. Log(Time Out) (*NKE-2044 only)		
		1. Alarm Sensitivity (*NKE-2044 only)	OFF / ON
		2. Sensitivity Time (*NKE-2044 only)	0 -999sec
	3. GPS(Time Out) (*NKE-2044 only)		
		1. Alarm Sensitivity (*NKE-2044 only)	OFF / ON
		2. Sensitivity Time (*NKE-2044 only)	0 -999sec



Item		Setting Contents
2. System Time		
	1. Scanner Transmit Time	
	2. Scanner Motor Time	
	3. Scanner Running Time	
	4. Indicator Running Time	
3. Scanner Information		
	1. Scanner Transmit Power	
	2. Motor Type	
	3. Magnetron Current	
4. Hardware Information		
	1. Serial Number	
	2. MAC Address	
5. Error Log		
	1. Display	
	2. Erase	
6. Line Monitor		
	1. Scanner	
	2. NMEA1	
	3. NMEA2	
	4. NMEA3	
7. Self Test		
	1. Key Test	
	2. Touch Panel Test	
	3. Buzzer Test	
	4. Key Light Test	
	5. Monitor Display Test	
	Pattern1	
	Pattern2	
	Pattern3	
	Pattern4	
	Pattern5	
	Pattern6	
	Pattern7	
	RGB Setting	
	Red	
	Green	
	Blue	
	Display	
6. Memory Test		
	1. SDRAM	
	2. Flash ROM	
	3. USB	
7. Line Test		
	1. Scanner	
	2. NMEA1 or GPS(JRC)	
	3. NMEA2	
	4. NMEA3 or NSK	
8. Scanner Test		
	1. SSW Off	
	2. BP	
	3. BZ	
	4. Mod.HV	
	5. Trigger	
	6. Video	











Not use the asbestos

**JRC** *Japan Radio Co., Ltd.*

JRC website <http://www.jrc.co.jp/>

Marine Service Department

Telephone: +81-3-3492-1305

Facsimile: +81-3-3379-1420

e-mail [tmisc@jrc.co.jp](mailto:tmisc@jrc.co.jp)

Amsterdam branch

Telephone: +31-(0)20-658-0750

Facsimile +31-(0)20-658-0755

e-mail [service@jrceurope.com](mailto:service@jrceurope.com)

Seattle branch

Telephone: +1-(0)206-654-5644

Facsimile: +1-(0)206-654-7030

e-mail [service@jrcamerica.com](mailto:service@jrcamerica.com)

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