

MARINE RADAR
JMA-5110
SYSTEM DESCRIPTION

THE JRC RADAR JMA-5110 consists of scanner unit, processing unit, keyboard unit and color LCD raster scan display.

Scanner unit

The MTR is installed within a scanner unit. The scanner weight is approximately 24kg.

The antenna is rotated 27 rpm by its driving motor.

This has a 1.2-degree horizontal beam width and 20 degrees for vertical.

The transmitter operates with 4-pulse length and 4 pulse repetition frequencies.

The magnetron, MSF1425B, rated output is 10kw and is driven by solid-state modulator.

The receiver has a microwave front end, containing the low noise amplifier, mixer, local oscillator, IF amplifier and detector.

Processing unit

The Processing unit weight is approximately 2.4kg.

Power supply inputs are DC 24 and 32V.

Range scale is 0.125 to 72 miles.

Display mode is HUP/NUP/CUP in relative motion mode and NUP/CUP in true motion mode.

Processing unit has two VRMs and two EBLs and Fixed marker.

Anti-clutter function is Anti-clutter sea and Anti-clutter rain

This function has auto mode and manual mode.

Radar wakes is memorized at intervals of 15sec to 30minute

Processing unit has three NMEA port

1'st port is connected with GPS receiver.

2'nd port is connected with other NMEA equipment.

3'd port is connected with magnetic compass or GPS compass ports by NMEA signal.

Keyboard unit

The keyboard unit has 19keys and 4volumes, track ball and jog dial.

Keyboard unit and a processing unit are connected with a communication line.

The length of a connection cable is 5m.

Display unit

Display unit is 10.4 inches color LCD display

Resolution size is 480x640 dots at VGA standard

Video signal is outputted from a DSUB-15P connector.

The length of connection cable is 5m.

General Specifications

1) Picture	Color PPI by raster scan system Resolution : 640 x 480 pixels 10.4-inch TFT Color LCD <JMA-5104> 0.125nm, 0.25nm, 0.5nm, 0.75nm, 1.5nm, 3nm, 6nm, 12nm, 24nm, 48nm <JMA-5106 / JMA-5110> 0.125nm, 0.25nm, 0.5nm, 0.75nm, 1.5nm, 3nm, 6nm, 12nm, 24nm, 48nm, 72nm
2) Display screen	
3) Range scale	Better than 25m Better than 25m Better than 1° Relative, or true with a compass <Temperature> Scanner unit : -25 °C to +55 °C Display unit : -15 °C to +50 °C <Relative humidity> Scanner unit : 93% maximum at +40 °C Display unit : 93% maximum at +40 °C
4) Minimum range	
5) Range discrimination	
6) Bearing accuracy	
7) Bearing representation	
8) Environmental condition	
9) Tolerance of input voltage	<JMA-5104 / JMA-5106> DC 12V/24V/32V (from DC 10.8 to 42V) <JMA5110> DC 24V/32V (from DC 21.6 to 26.4V) AC 100/110/115/200/220/230V ± 10% (by rectifier unit)
10) Power consumption	<JMA-5104> 70W <JMA-5106> 85W <JMA-5110> 100W
11) Preheating time	90 seconds
12) Dripproof	Scanner unit IPX6 Processing unit/Keyboard unit IPX2 Display unit IPX5
13) Vibrations	ICE60945
14) Language	English, French, Spanish, Norwegian, Italian, Danish, Japanese

Scanner Unit Specification

Scanner unit (NKE-2042 : Redome type)

1) Dimensions	Height : 275mm, Diameter of radome : 620mm
2) Mass	Approx. 10.5kg
3) Polarization	Horizontal
4) Beam width	
Horizontal (-3dB)	4°
Vertical (-3dB)	25°
Side lobe level	Less than -21dB within 10° of main beam
5) Rotation speed	Approx. 27rpm
6) Frequency	9410 ± 30MHz
7) Peak power	4kW
8) Pulse length/repetition frequency	0.08□s/2250Hz : 0.125nm, 0.25nm, 0.5nm, 0.75nm, 1.5nm(S) 0.25□s/1700Hz : 1.5nm(L), 3nm(S) 0.5□s/1200Hz : 3nm(L), 6nm(S) 1.0□s/650Hz : 6nm(L), 12nm, 24nm, 48nm (S: Short, L: Long)
9) Modulator	Solid-state modulator
10) Duplexer	Circulator/diode limiter
11) Front end module	Built in
12) IF amplifier	Logarithmic amplifier, Noise figure 6dB maximum.
13) Tuning	Manual/Auto

Scanner unit (NKE-2062 : 6kW rotation type)

1) Dimensions	Height : 432mm, Swing circle : 1220mm
2) Mass	Approx. 24kg
3) Polarization	Horizontal
4) Beam width	
Horizontal (-3dB)	2°
Vertical (-3dB)	30°
Side lobe level	Less than -23dB within 10° of main beam Other than -26dB within 10° of main beam
5) Rotation speed	Approx. 27rpm
6) Frequency	9410 ± 30MHz
7) Peak power	6kW
8) Pulse length/repetition frequency	0.08□s/2250Hz : 0.125nm, 0.25nm, 0.5nm, 0.75nm, 1.5nm(S) 0.25□s/1700Hz : 1.5nm(L), 3nm(S) 0.5□s/1200Hz : 3nm(L), 6nm(S) 1.0□s/650Hz : 6nm(L), 12nm, 24nm, 48nm, 72nm (S: Short, L: Long)
9) Modulator	Solid-state modulator
10) Duplexer	Circulator/diode limiter

- 11) Front end module
- 12) IF amplifier
- 13) Tuning

Built in
Logarithmic amplifier, Noise figure 6dB maximum.
Manual/Auto

Scanner unit (NKE-2102 : 10kW rotation type)

- 1) Dimensions
- 2) Mass
- 3) Polarization
- 4) Beam width
 - Horizontal (-3dB)
 - Vertical (-3dB)
 - Side lobe level
- 5) Rotation speed
- 6) Frequency
- 7) Peak power
- 8) Pulse length/repetition frequency
- 9) Modulator
- 10) Duplexer
- 11) Front end module
- 12) IF amplifier
- 13) Tuning

Height : 448mm, Swing circle : 1910mm
Approx. 33kg
Horizontal

1.2°
20°
Less than -26dB within 10° of main beam
Other than -30dB within 10° of main beam
Approx. 27rpm
9410 ± 30MHz
10kW
0.08□s/2250Hz : 0.125nm, 0.25nm, 0.5nm, 0.75nm,
1.5nm(S)
0.25□s/1700Hz : 1.5nm(L), 3nm(S)
0.5□s/1200Hz : 3nm(L), 6nm(S)
1.0□s/650Hz : 6nm(L), 12nm, 24nm, 48nm, 72nm
(S: Short, L: Long)
Solid-state modulator
Circulator/diode limiter
Built in
Logarithmic amplifier, Noise figure 6dB maximum.
Manual/Auto

Processing Unit Specifications

1) Dimensions	Width : 300mm Height : 125mm Depth : 210mm
2) Mass	Approx. 2.4kg
3) Installation	Floor setting type
4) Range scale/rings	0.125nm/0.065nm, 0.25nm/0.125nm, 0.5nm/0.1nm, 0.75nm/0.25nm, 1.5nm/0.5nm, 3nm/0.5nm, 6nm/1nm, 12nm/2nm, 24nm/4nm, 48nm/8nm, 72nm/12nm(except JMA-5104)
5) Range accuracy	Better than $\pm 1.5\%$ of maximum range in use or $\pm 70\text{m}$ whichever is greater
6) Bearing scale	360° scale graduate at intervals of 1°
7) Ship's heading marker	Electronic line suppressible by automatic resetting key.
8) EBL(EBL1/EBL2)	Digital read-out on the screen (3 characters)
9) VRM(VRM1/VRM2)	Digital read-out on the screen (3 characters)
10) Off-centering	90% of the picture radius
11) Trails	OFF/30 to 59sec/1 to 59min/continuous Mode 1 : OFF Mode 2 : Timing trail display Mode 3 : Continuous trail display Mode 4 : Timing trail display and continuous trail display
12) Indication on the screen	Selected range Selected range ring distance Motion mode/azimuth mode Interference rejection indication Echo stretch Wakes time Speed/Course indication Guard zone mode STC/FTC mode Pulse Tuning indicator Own position (lat./lon.) EBL1/EBL2 read-out (3 characters) VRM1/VRM2 read-out (3 characters) Cursor read-out (Bearing and range / or lat./lon.) TX/ST-BY indication
13) Color	
Radar echo	
Gradation	16 level
Color	4 colors (yellow, green, orange, color)

Radar trails	1 level (time wakes, continuance, trails)
Gradation	Time trails : 3 colors (sky, white, green)
Color	Continuance trails : 3 colors (sky, white, green)
Fixed marker / VRM1/2 / EBL1/2	
Color	cyan
Character	
Color	white
Heading line/cursor	
Color	white
Background color inside PPI	black, blue, gray
Background color outside PPI	black, blue, gray
14) Heading	Head up/North up/Course up
15) Motion	Relative motion/True motion/Centerd true motion
16) Guard zone alarm	Can be wsitched between "OFF", "IN" and "OUT"
17) Anti-clutter function	Anti-Clutter sea : Manual/Auto
	Anti-Clutter rain : Manual/Auto
18) Scan correlation function	Built in
19) Floating EBL	Built in
20) Echo stretch function	Built in
21) Parallel index	Built in
22) Zoom function	Built in
23) Timed TX	TX : 1 to 99 rotation
	ST-BY : 1 to 99 minutes
24) Cable length	20m (standard)
	30m (option) : DC 24V in only
25) Interface	
Power in	Ship's main
Inputs signal	GPS or GPS receiver
	GPS compass or electronic compass
	GYRO (need NSK unit : option)
	NMEA data (need GPS data)
	Cursor position (RSD)
	Own data (OSD)
26) Output	MARPA target data (TTM) with optional MARPA pcb
	Ext buzz

Keyboard Unit Specifications

1) Dimensions

Width : 290mm

Height : 45mm

Depth : 123mm

2) Mass

1.0kg

3) Controls and keys

Gain control

Tuning control

Anti-clutter sea control

Anti-clutter rain control

Power on/STBY switch (ON/OFF)

X-MIT key

MOB key

EBL key (ON/OFF/SELECT)

VRM key (ON/OFF/SELECT)

Dimmer key

Alarm ack key

Function key

Off center key

TM/RM key

Trails key

Bearing key

Range ring key

Cursor position key

Data key

Clear key

Range scale key (UP and DOWN)

Menu key

Acq/Enter key

4) Track ball

Built in

5) Cable length

5m

Display Unit Specifications

1) Dimensions

Landscape

Width : 290mm

Height : 290mm

Depth : 165mm

Portrait

Width : 230mm

Height : 325mm

Depth : 165mm

2) Mass

2.8kg

3) Power

DC 12V in

4) Resolution

640 x 480 pixels input signal

5) Signal impedance

Video (R, G, B) : 75 Ω

Sync horizontal : 1k Ω

Sync vertical : 1k Ω

6) Cable length

5m

Option

Interunit cable

Interunit cable	30m
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Rectifier unit

Rectifier unit	NBA-797
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Flash mounting kit

1) Flash mounting kit (For display unit)	MPTG31339
2) Flash mounting kit (For keyboard unit)	MPTG31340

MARPA

MARPA	NCA-868
1) Acquisition	
Acquisition mode	Manual (10 targets max)
Manual canceling of unnecessary target	By 1 target each or all targets
Tracking range	0.1 to 20NM
2) Tracking	
Tracking mode	Automatic
3) Vectors	
Mode	Relative/True
Length	1 to 99minutes
4) Dangerous target limits	
CPA	CPA 0,0 to 9.9NM
TCPA	TCPA 0 to 99minutes
5) Numbering target	Automatic or manual applied
6) Numerical display	
Target Data	Simultaneous and continuous display for 1 target. True Bearing (3 digit), Range (3 digit), True course (3 digit), True speed (3 digit), CPA, TCPA
7) Collision point	Calculate predicted collision point for 1 target collision course Estimated time to collision

NSK unit

NSK UNIT	NCT-4106
Gyro	
SYNC/PULSE	360X, 180X, 90X and 36X
Log	
SYNCHRO	360X, 180X, 90X and 36X
PULSE	800, 400, 200 and 100

Sub indicator unit signal out

Signal

Trigger, video, bearing pulse and reference pulse

Sub keyboard unit

Sub keyboard unit

NCE-7640

Rectifier

NBA-797

1) Dimentions	Width : 270mm Height : 430mm Depth : 175mm
2) Construction	Waterproof construction of wall tapestry type
3) Mass	Approx. 18kg
4) Tolerance of input voltage	AC 100/110/115/200/220/230V $\pm 15\%$ 50/60Hz, single phase
5) Power consumption	200VA
6) Output	DC 26, 7A

Cable Length between Equipment Units

	Maximum cable length	Standard cable length
1) From scanner unit to indicator unit	30m	20m
* In case of JMA-5104 or JMA-5106, the input voltage beyond 24V is required for 30m.		
2) From indicator unit to rectifier unit	2m	2m
3) From indicator unit to keyboard unit	5m	5m
4) From indicator unit to display unit	5m	5m