

JRC MARINE RASTER-SCAN RADAR

JMA-3610 / JMA-3625

(3cm, 4/6ft, 10kW)
(14in, 96nm)

(3cm, 4/6/9ft, 25kW)
(14in, 96nm)

- *Easy-to-See Daylight Raster-Scan Display*
- *Easy-to-Use New Functions*
- *Add-On ARPA Unit (Option)*



Japan Radio Co., Ltd.

The JMA-3610/3625 is a new raster-scan radar designed for simple operation and high performance offering easy-to-use new functions. It incorporates movable markers for measuring the bearing and distance between two points, off-centering up to 60%, readouts of courses and speeds of target ships and zooming. By connecting an optional compact ARPA Unit, this radar can be used as a high-performance ARPA radar with sufficient ARPA functions comparable to the ARPA systems for large ships.

FEATURES

● High-Resolution, Raster-Scan CRT

The 14-inch square, high-resolution, raster-scan CRT display presents an easy-to-see, high-definition video in green multigradations. Target echo intensities, from weak to strong, can be discriminated and targets under rain and sea clutters can be clearly and distinctly displayed.

● Range Scale Selection by Touch Key

A desired range scale can be selected easily by pushing one of ten (10) touch keys.

● Two VRMs and Two EBLs

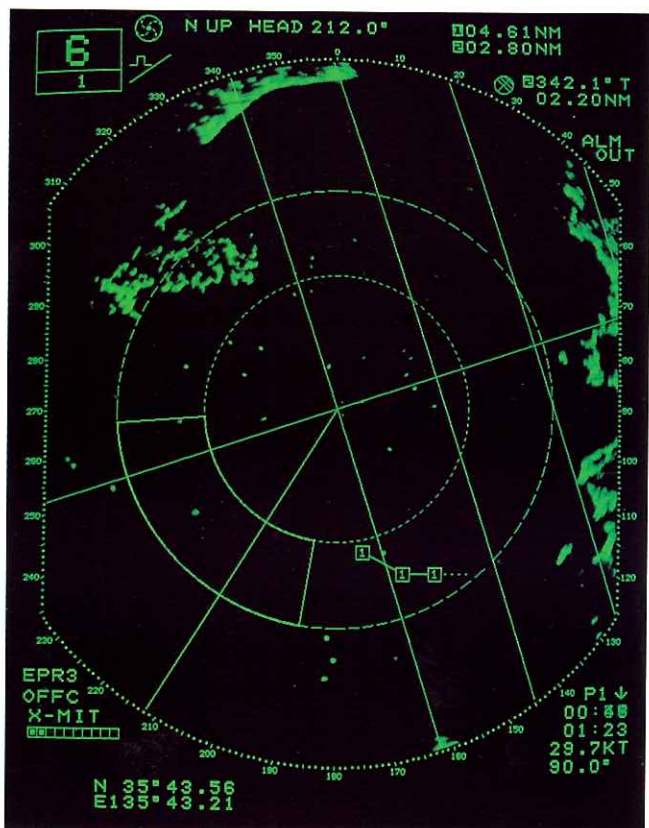
Two variable range markers and two electronic bearing lines can readily be displayed by operating individual switches and controls, ensuring fast, smooth operation. Bearings and ranges can be measured easily and the measured values are indicated on the screen.

● Floating EBL/VRM

The origins of VRM-1 and EBL-1 can be moved to a desired point to measure the bearing and range between two points.

● Parallel Cursors

Parallel cursors can be displayed in freely adjustable intervals, which are also numerically displayed, presenting own ship's relative aspects to parallel-going or opposing ships.



Example of Radar Display (JMA-3625)

● Off-Centering

The radar video on each range scale can be flexibly off-centered up to approx. 60% of its radius, permitting preventive observation of dangerous targets fore and aft.

● Double Zooming

The radar video echo can be zoomed up double in order to make very small targets easier to see.

● Watch on Guard Zone

Using the two EBLs and the two VRMs, a guard zone can be freely preset and displayed. If a target intrudes into the guard zone, an audible alarm is given. Further, a watch can be kept on certain targets within the guard zone, and if a target is off the area, an audible alarm is delivered.

● Electronic Plotter

The tracks of up to 10 targets (other ships) can be electronically plotted on the radar echo by manual switch operation, up to 5 plots being displayed for each target. This function, when used with the ship trail function, is very helpful in observing the movements of other ships. By using the electronic plotter, the course and speed of a target can be calculated and numerically displayed on the screen.

● Ship Trail Display

The trails of target ships can be presented on the display. The directions and speeds of other ships can be seen from the directions and lengths of those trails at a glance, permitting effective use in collision avoidance and ship operations.

● Echo Process (EPR) Function

The use of the newest radar signal processing technique permits echo processing, substantially improving the sea clutter rejection.

● Stabilized Bearing and TM Presentation

The North Stabilizing Kit (NCT-27 – option) is available to offer a stabilized bearing presentation in the North-Up or Course-Up mode, and a true motion presentation in which the realistic movements of other ships can be seen on the chart as if they were moving actually at sea.

● Digital Display of Own Ship's Position

By connecting a navaid equipment (with JRC standard or NMEA0183 BWC), own ship's latitude/longitude position is digitally indicated and waypoint information such as marks, lat/long, direction and range is presented on the screen.

● ARPA Functions (Option)

By interfacing with the optional ARPA Unit (NCA-780) and the NSK Unit (NCT-27), the JMA-3610/3625 can offer full-scale ARPA functions, ensuring improved radar functionality and convenient use of ARPA functions on smaller ships.



NSK Unit NCT-27

Revolutional Development – Functional ARPA Unit, NCA-780

1. High-Performance ARPA Functions

● Automatic Target Acquisition and Tracking

Target acquisition can be made automatically and/or manually, and the targets can be automatically tracked.

● Two Exclusion Sectors

Two exclusion sectors (a pair of 4 segment lines) can be set and displayed in the LAND mode related to fixed land or in the SHIP mode related to own ship, for making the automatic target acquisition efficient. A suppression ring can be also set and displayed in order to avoid target acquisition under sea clutter.

● Danger Warnings

The movements of the targets under tracking are displayed as relative or true vectors, and their collision risk grades are marked with ○ (safe), △ (dangerous), and ◇ (very dangerous). An audible alarm is given against a very dangerous target.

● Guard Rings

Two fixed and/or variable guard rings can be preset. If a target intrudes the guard ring, audible and visual alarms are given. The guard rings can be used in common with the guard zones of the radar.

● Digital Readouts of Target Data

For a tracked target as identifiable with 1 through 9 on

the screen, its bearing, range, course and speed, as well as its CPA (closest point of approach) and TCPA (time to CPA) can be digitally displayed.

● Data Display Unit (Option)

The NWW-44 Data Display Unit is optionally available to simultaneously display the bearings, ranges, courses and speeds as well as CPA's and TCPA's of four targets.

● Easy-to-Use Operating Panel

The operating panel of the keyboard is designed for fast touch-key operation, and the cursor control on the display is smoothly made by a trackball.

● Target Vector Display

The course and speed variations and vector stability of a designated target ship can be checked by displaying its past vectors (up to 6 vectors in one-minute intervals). The vector response time of a target which has changed its course and speed can be easily preset from the keyboard.

● Self-Testing Function

The ARPA functions can be easily checked and monitored by the internal self-testing programs, ensuring fast recovery in event of a failure.

2. New Calculating Functions

● Encounter Simulation

The optimum course on which own ship easily encounters a tracked target as fast as possible can be calculated and displayed on the radar display. In this simulation, own ship's course follows the course and speed variations of the target.

● Own Ship's Position Calculation

By entering the position (lat/long) of a fixed target under tracking, own ship's position (lat/long) can be calculated accurately. As far as the fixed target is tracked stably, the newest position is displayed, ensuring high position accuracy.

3. Compact and Lightweight

The ARPA Unit is of compact and lightweight design so as to be installed on small ships. Its power-on/off operation is interlocked with that of the radar display, and a single cable interconnects between both units, ensuring ease of installation and operation.



Data Display Unit NWW-44 (Option)



Processor Unit NDB-23



Keyboard NCE-4450

ARPA Unit NCA-780

SPECIFICATIONS

RADAR SPECIFICATIONS

● SCANNER UNIT

Scanner length	JMA-3610: 6/4 feet (NKE-1004-6/4) JMA-3625: 9/6/4 feet (NKE-1021-9/6/4)
Polarization:	Horizontal
Beamwidths:	Horizontal 1.9° (4 feet) 1.2° (6 feet) 0.8° (9 feet) Vertical 25°
Sidelobe levels:	-23dB or less within ±10° (4 feet) -26dB or less within ±10° (6/9 feet) -30dB or less outside ±10°
Rotation speed:	Approx. 20 rpm (JMA-3625), Approx. 24 rpm (JMA-3610)
Wind velocity:	51.5m/s (100 knots), relative
Transmitting frequency:	9410 ± 30MHz
Peak power:	10kW (JMA-3610) 25kW (JMA-3625)
Pulse length/PRF:	
	0.08μs/2000Hz (0.25 - 1.5nm) 0.4μs/1500Hz (3 - 6nm) 0.8μs/750Hz (12 - 24nm) 1.2μs/500Hz (48 - 96nm)
10kW	In the case of long pulses selected: 0.4μs/1500Hz (1.5nm) 0.8μs/750Hz (3 - 6nm) 1.2μs/500Hz (12 - 24nm)
	0.08μs/2000Hz (0.25 - 1.5nm) 0.25μs/2000Hz (3nm) 0.75μs/1000Hz (6 - 12nm) 1.0μs/750Hz (24 - 48nm)
25kW	1.0μs/500Hz (96nm) In the case of long pulses selected: 0.25μs/2000Hz (1.5nm) 0.75μs/1000Hz (3nm) 1.0μs/750Hz (6 - 12nm)
Modulator:	Solid-state modulator
Duplexer:	Circulator + diode limiter
Receiver:	Linear characteristic with MIC front end (RF-amplifier)
Intermediate frequency:	60MHz, IF bandwidth - 15MHz/3MHz

● DISPLAY UNIT, NCD-1481

CRT type: 14-inch monochrome, with effective diameter of more than 180mm

Range scales	0.25	0.5	0.75	1.5	3	6	12	24	48	96nm
Range rings	0.125	0.25	0.25	0.25	0.5	1	2	4	8	16nm

Bearing presentation:	Relative (North-Up/Course-Up - option)
Range ring accuracy:	Within 1.5% of the maximum of range scale in use, or 70m whichever is the greater.
Bearing Scale:	1° scale, 360°, bearing value of 10° steps (no change even in case of off-center)
Variable range marker:	Two VRMs, 4-digit readout 0.000 to 237.0nm
Electronic bearing line:	Two EBLs, 4-digit readout 0.000 to 359.9°
Tuning:	Manual (with tuning indicator)
Ship's heading marker:	Electronic, less than 0.5° width with accuracy of less than 1°
Off-centering:	Up to 60% of the radius of the screen (except on 96nm)
Guard zone:	Presetable by two VRMs and two EBLs
Electronic plotting:	Available for up to 5 plots per target for up to 10 targets
Ship trail display:	Available (short, long, full memory)
Power supply:	21 - 42VDC, approx. 200W AC operation - with the NBA-797 rectifier unit (option)

ARPA UNIT SPECIFICATIONS

Target acquisition

Mode: Automatic/manual
Exclusion areas: Two 4-segment-line sectors and a suppression ring

Tracking: Automatic

Displays

Bearing mode: Head-Up/North-Up/Course-Up
Vector mode: True/relative vector presentation
Vector length variable from 0 to 60 min.
Past vectors: 6 vectors in intervals of 1 min.
Past positions: 6 marks per target in mark intervals of 0.5, 1, 2 and 4 min.
Vector indication: One minute or less
Vector stabilizing time: Less than 3 min.

Warning alarms

Guard rings: Two (fixed/variable) with audible/visual alarm
Dangerous target: Audible/visual alarm
Lost target: Audible/visual alarm

Data displays

Target data: True bearing, distance, true course and speed, CPA, TCPA (one target)
Own ship data: Course and speed
The use of the NWW-44 Data Display Unit (option) can continuously indicate the target data of up to 4 targets.

Trial maneuver: Course and speed

Display accuracy: To IMO standard

New functions

Encounter simulation: Own ship's course to encounter a tracked target fastest is calculated and displayed.

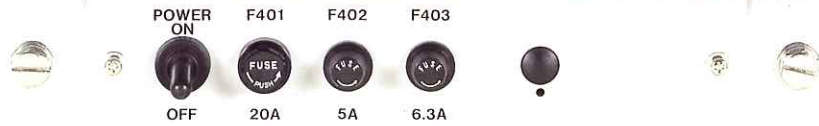
Own ship's position calculation: Own ship's position (lat/long) is calculated accurately and displayed by designating the position (lat/long) of a fixed target under tracking.

● STANDARD COMPONENTS

Item	Model	Q'ty	Remarks
JMA-3610 Radar Scanner Unit	NKE-1004-4	Either	4 feet, 10kW
	NKE-1004-6		6 feet, 10kW
Scanner Unit Cable	CFQ-4385-1	1	15m standard, w/connector
JMA-3625 Radar Scanner Unit	NKE-1021-4	Any one	4 feet, 25kW
	NKE-1021-6		6 feet, 25kW
	NKE-1021-9		9 feet, 25kW
Scanner Unit Cable	H269511143	1	15m standard
Display Unit	NCD-1481	1	
Spare Parts	6ZXR000187	1	Standard

● OPTIONS

Item	Model	Remarks
ARPA UNIT	NCA-780	Processor Unit NDB-23 Keyboard NCE-4450 Installation Cable (3m) Spare Parts (standard)
Data Display Unit	NWW-44	For ARPA Unit
NSK Unit	NCT-27	With 2m special cable
Rectifier Unit	NBA-797	With 5m cable (CVVS2 x 5.5)



Presentation with ARPA information



4feet Scanner Unit for JMA-3610



4feet Scanner Unit for JMA-3625



6feet Scanner Unit for JMA-3610



6feet Scanner Unit for JMA-3625



9feet Scanner Unit for JMA-3625

CONNECTION DIAGRAM

● JMA-3625

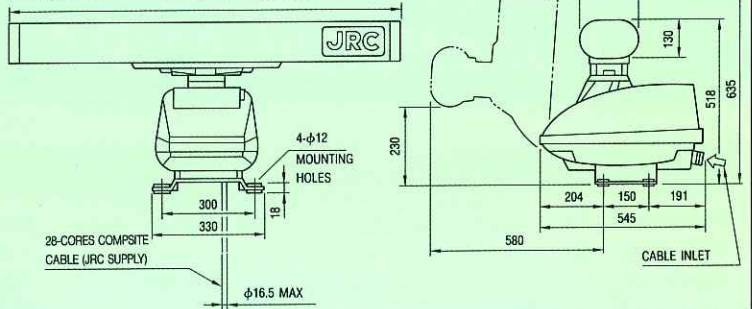
9 FEET SCANNER UNIT NKE-1021-9 WEIGHT APPROX. 51kg
 6 FEET SCANNER UNIT NKE-1021-6 WEIGHT APPROX. 39kg
 4 FEET SCANNER UNIT NKE-1021-4 WEIGHT APPROX. 37kg

2811 (SWING CIRCLE 2820) 9 FEET
 1920 (SWING CIRCLE 1940) 6 FEET
 1320 (SWING CIRCLE 1340) 4 FEET

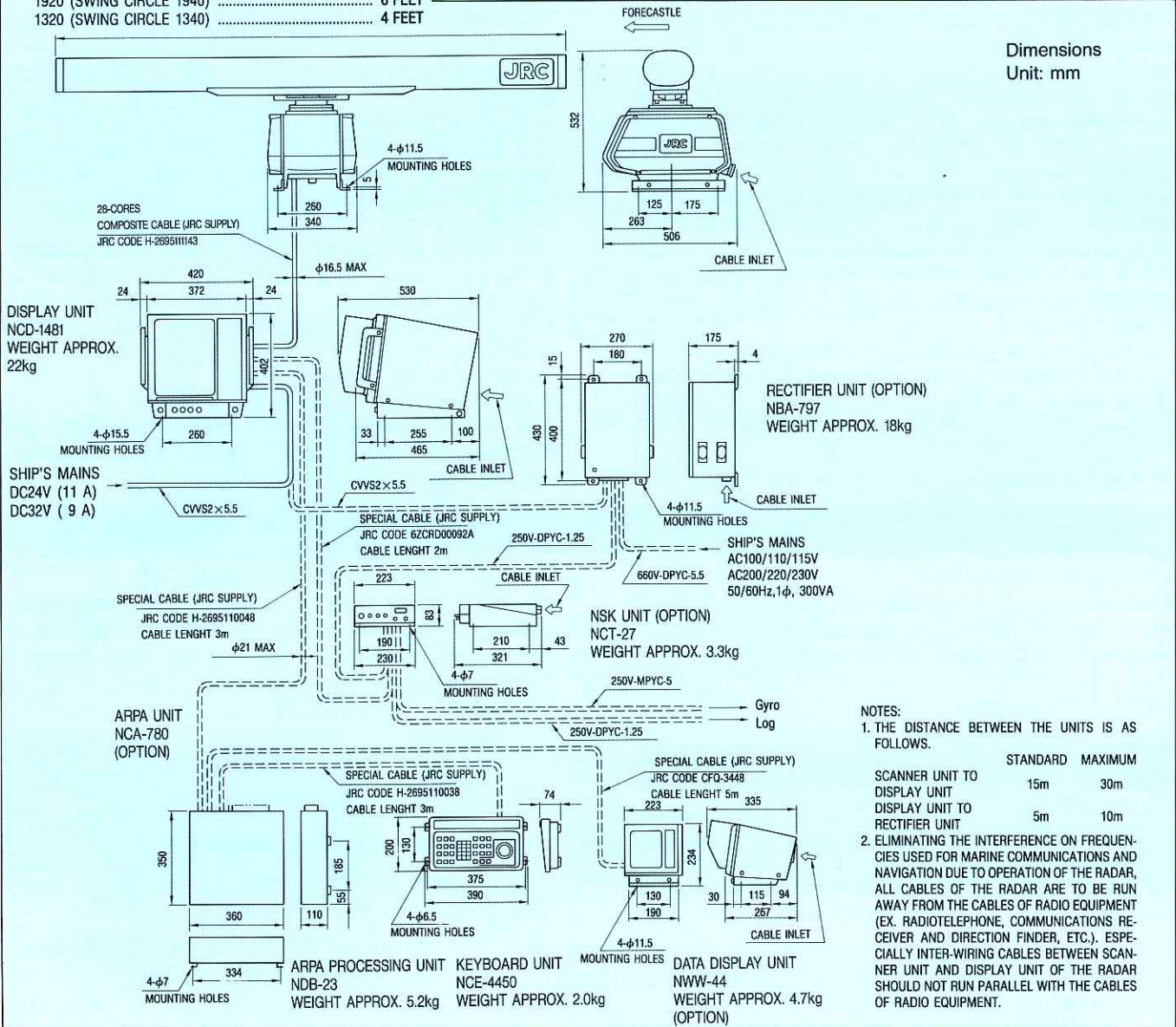
● JMA-3610

6 FEET SCANNER UNIT WEIGHT APPROX. NKE-1004-6 44kg
 4 FEET SCANNER UNIT WEIGHT APPROX. NKE-1004-4 42kg

1920 (SWING CIRCLE 1940) 6 FEET
 1320 (SWING CIRCLE 1340) 4 FEET



Dimensions
Unit: mm



- NOTES:
- THE DISTANCE BETWEEN THE UNITS IS AS FOLLOWS.
- | | STANDARD | MAXIMUM |
|--------------------------------|----------|---------|
| SCANNER UNIT TO DISPLAY UNIT | 15m | 30m |
| DISPLAY UNIT TO RECTIFIER UNIT | 5m | 10m |
- ELIMINATING THE INTERFERENCE ON FREQUENCIES USED FOR MARINE COMMUNICATIONS AND NAVIGATION DUE TO OPERATION OF THE RADAR, ALL CABLES OF THE RADAR ARE TO BE RUN AWAY FROM THE CABLES OF RADIO EQUIPMENT (EX. RADIOTELEPHONE, COMMUNICATIONS RECEIVER AND DIRECTION FINDER, ETC.). ESPECIALLY INTER-WIRING CABLES BETWEEN SCANNER UNIT AND DISPLAY UNIT OF THE RADAR SHOULD NOT RUN PARALLEL WITH THE CABLES OF RADIO EQUIPMENT.

Specifications subject to change without notice.

For further information, contact:

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