

JMA-5208/HS

JMA-5212-4/6

JMA-5222-7/9

JMA-5212-4HS/6HS

**MARINE RADAR
EQUIPMENT**

**INSTRUCTION
MANUAL**



Japan Radio Co., Ltd.

◆◆◆PRECAUTIONS BEFORE OPERATION◆◆◆

■Cautions for high voltage

High voltages from hundreds volts to tens of thousands volts are to be applied to the electronic equipment such radio and radar devices. You do not face any danger during normal operation, but sufficient cares are required for maintenance, inspection and adjustment of their internal components. (Maintenance, check-up and adjustment of the inside of the equipment are prohibited except by maintenance specialists.)

High voltages of tens of thousands volts are so dangerous as to bring an instantaneous death from electric shock, but even voltages of hundred volts may sometimes lead to a death from electric shock. To prevent such an accident, make it a rule to turn off the power switch, discharge capacitors with a wire surely earthed on an end make sure that internal parts are no longer charged before you touch any parts inside these devices. At the time, wearing dry cotton gloves ensures you further to prevent such danger. It is also a necessary caution to put one of your hands in the pocket and not to use your both hands at the same time.

It is also important to select a stable foothold always to prevent additional injuries once you were shocked by electricity. If you were injured from electric shock, disinfect the burn sufficiently and get it taken care of promptly.

■What to do in case of electric shock

When finding a victim of electric shock, turn off the power source and earth the circuit immediately.

If it is impossible to turn off the circuit, move the victim away promptly using insulators such as dry wood plate and cloth without touching the victim directly.

In case of electric shock, breathing may stop suddenly if current flows to the respiration center in the brain. If the shock is not so strong, artificial respiration may recover breathing. When shocked by electricity, the victim will come to look very bad with weak pulse or without beating, resulting in unconsciousness and rigidity. In this case, it is necessary to perform an emergency measure immediately.

◆◆◆FIRST-AID TREATMENTS◆◆◆

☆First-aid treatments

As far as the victim of electric shock is not in dangerous condition, do not move him and practice artificial respiration on him immediately. Once started, it should be continued rhythmically.

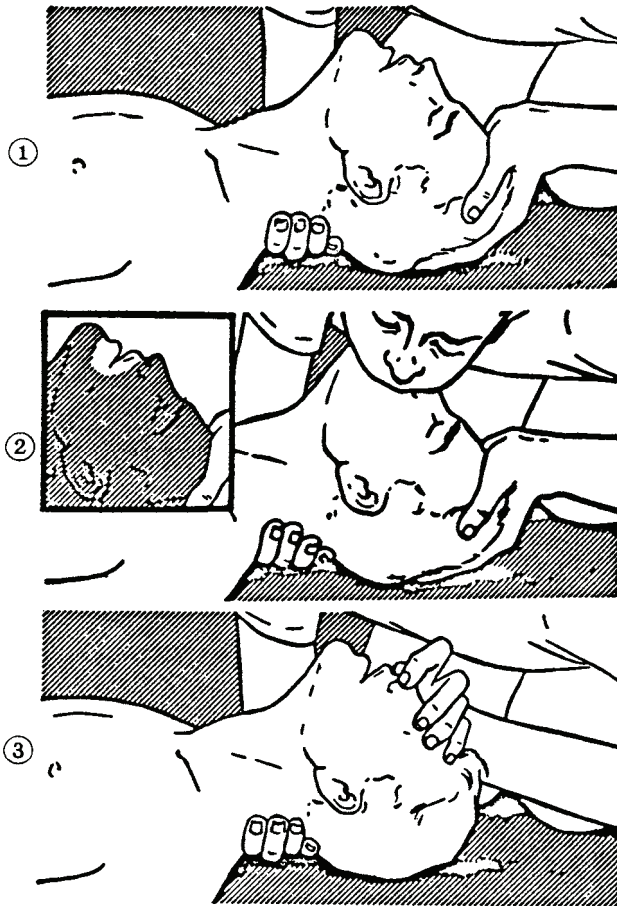
- (1) Do not touch the victim confusedly as a result of the accident, but the rescuer may also get an electric shock.
- (2) Turn off the power source calmly and move the victim away quietly from the electric line.
- (3) Call a physician or ambulance immediately or ask someone to call a doctor.
- (4) Lay the victim on this back and loosen his necktie, clothes, belt, etc.
- (5)
 - a. Examine the victim's pulse.
 - b. Examine his heartbeat bringing your ear close to his heart.
 - c. Examine his breathing bringing the back of your hand or your face close to his face.
 - d. Check the size of the pupils of his eyes.
- (6) Open the victim's mouth and take out artificial teeth, cigarette or chewing gum if any. Keep his mouth open, stretch his tongue and insert a towel or the like in his mouth to prevent the tongue from suffocating. (If it is hard to open his mouth due to set teeth, open it with a screwdriver and insert a towel in this mouth.)
- (7) Then, wipe his mouth so that foaming mucus does not accumulate inside.

☆When pulse is beating but breathing has stopped

(Mouth-to-mouth respiration) Fig. 1

- (1) Tilt the victim's head back as far as this face looks back. (A pillow may be inserted his neck.)
- (2) Push his jaw upward to open his throat wide (to spread his airway).
- (3) Pinch the victim's nostrils and take a deep breath, block his mouth completely with yours and blow into his mouth strongly. Take a deep breath again and blow into his mouth. Continue this 10 to 15 times a minutes (blocking his nostrils).
- (4) Carefully watch that he has recovered his natural breathing and atop practicing artificial respiration.
- (5) If it is difficult to open the victim's mouth, insert a rubber or vinyl tube into one of his nostrils and blow into it blocking the other nostril and his mouth completely.
- (6) When the victim recovers consciousness, he may try to stand up suddenly, but let him lie calmly and serve him with a cup of hot coffee or tea and keep him warm and quiet. (Never give him alcoholic drinks.)

Method of mouth-to-mouth respiration by raising head



- (1) Raise the victim's head. Support his forehead with one of your hand and his neck with the other hand. →①

When you tilt his head backward, the victim, in most cases, opens his mouth to the air. This makes mouth-to mouth respiration easy.

- (2) Cover his mouth as widely as possible with yours and press your cheek against his nose →②

or, pinch his nostrils with your fingers to prevent air from leaking. →③

- (3) Blow into his lungs. Continue blowing into his mouth until his breast swells. Blow into his mouth as quickly as possible for the first 10 times.

Fig. 1 Mouth-to mouth respiration

☆When both pulse and breathing have stopped

Perform the (Cardiac massage) Fig. 2 and (Mouth-to-mouth respiration) Fig. 1

When no pulse has come not to be felt, his pupils are open and no heartbeat is heard, cardiac arrest is supposed to have occurred and artificial respiration must be performed.

- (1) Place your both hands, one hand on the other, on the lower one third area of his breastbone and compress his breast with your elbows applying your weight on his breast so that it is dented about 2cm (Repeat compressing his breast 50 times or so a minutes). (Cardiac massage)
- (2) In case of one rescuer,
Repeat cardiac massages about 15 times and blow into his mouth 2 times quickly, and repeat this combination.
In case of two rescuers,
One person repeats cardiac massages 15 times while the other person blow into his mouth twice, and they shall repeat this combination. (Perform the cardiac massage and mouth-to-mouth respiration)
- (3) Examine his pupils and his pulse sometimes. When the both have returned to normal, stop the artificial respiration, serve him with a cup of hot coffee or tea and keep him warm and calm while watching him carefully. Commit the victim to a medical specialist depending on his condition. (Never give him alcoholic drinks.) To let him recover from the mental shock, it is necessary for persons concerned to understand his situations and the necessary treatment.

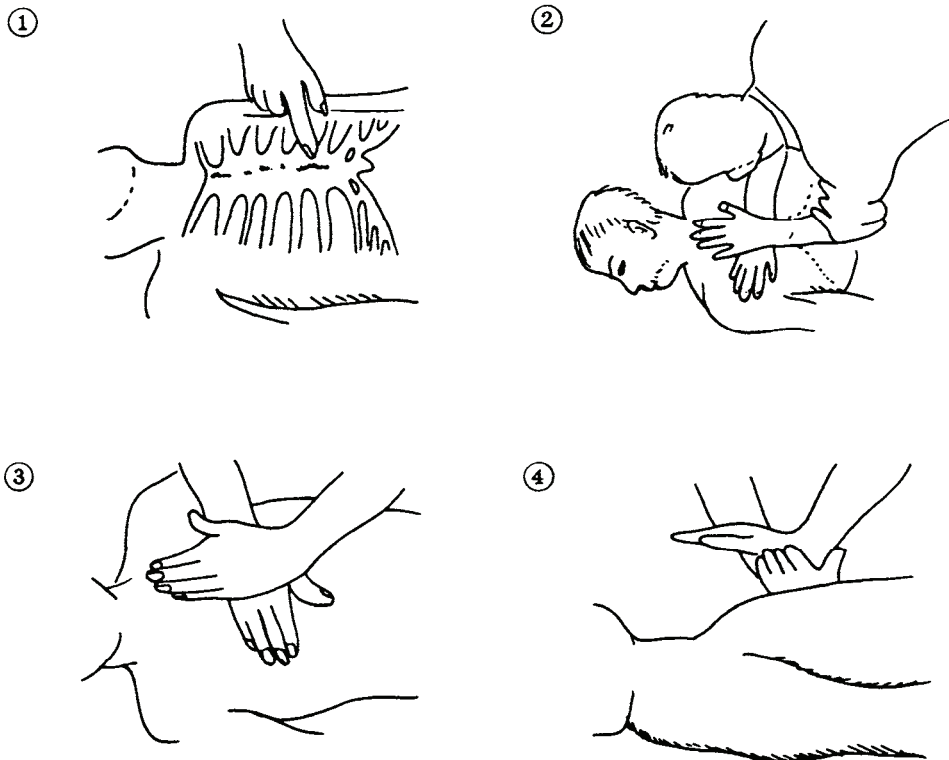


Fig. 2 Cardiac massage

PREFACE

Thank you very much for purchasing the JRC marine radar equipment, JMA-5200MK2 series.
This equipment is a marine radar equipment designed to obtain safe operation of marine ships.
This equipment consists of a radar signal transmitter-receiver unit, a LCD display unit and a scanner unit as its main units.

- Before operating the equipment, be sure to read this instruction manual carefully for correct operation.
- Maintain this instruction manual so that operators can refer to it at anytime.




Refer to this manual when any inconvenience or defect occurs.

● Before Operation ●

Pictorial Indication

Various pictorial indications are included in this manual and are shown on these equipment so that you can operate them safely and correctly and prevent any danger to you and/or to other persons and any damage to your property during operation. Such indications and their meanings are as follows.

Please understand them before you read this manual:

	DANGER	This indication is shown where incorrect equipment operation due to negligence may cause death or serious injuries.
	WARNING	This indication is shown where any person is supposed to be in danger of being killed or seriously injured if this indication is neglected and these equipment are not operated correctly.
	CAUTION	This indication is shown where any person is supposed to be injured or any property damage is supposed to occur if this indication is neglected and these equipment are not operated correctly.

Examples of Pictorial Indication



Electric Shock

The \triangle mark represents CAUTION (including DANGER and WARNING). Detailed contents of CAUTION (“Electric Shock” in the example on the left.) is shown in the mark.



Disassembling Prohibited



Prohibited

The \odot mark represents prohibition. Detailed contents of the prohibited action (“Disassembling Prohibited” in the example on the left.) is shown in the mark.



Disconnect the power plug



Instruction

The \bullet mark represents instruction. Detailed contents of the instruction (“Disconnect the power plug “ in the example on the left.) is shown in the mark.

Warning Label

There is a warning label on the top cover of the equipment. Do not try to remove, break or modify the label.

● PRECAUTIONS ●

DANGER



Never conduct inspection or repair work of equipment components.

Inspection or repair work by uncertified personnel may result in fire hazard or electrocution.

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.



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

Failure to comply may result in electrocution or injuries.



Make sure to turn off the antenna operation switch.

Failure to comply may result in injuries caused by physical contact with the rotating antenna.



Do not touch the radiator. Even if the power is turned off, the radiator may be rotated by the wind.

WARNING



Never directly touch the internal components of the antenna, receiver/transceiver, or indicator. Direct contact with these high-voltage components may cause electrocution. For maintenance, inspection, or adjustment of equipment components, consult with our branch office, branch shop, sales office, or our distributor in your district.



Do not get close to the radiant section of the antenna. It is a rotating part, and it may cause injuries if it suddenly starts rotating and consequently hits the body. It is recommended that the radiant section be installed at a high place such as on the roof of the wheelhouse, on the flying bridge, on the trestle, or on the radar mast so that no one can get close to it. When any work must be done on the antenna, make sure to turn the antenna switch off.



Microwave radiation level:

Keep away from a scanner when it is transmitting. The high level of microwave is radiated from the front face of the scanner specified below. The microwave exposure at close range could result in injuries (especially of the eyes).

System	50W/m ²	10W/m ²	2.5W/m ²
NKE-2062			
NKE-2103	n/a	26cm	123cm
NKE-2254	5cm	81cm	162cm



Make sure to install the antenna at a place higher than human height.

Direct exposure to electromagnetic waves at close range will have adverse effects on the human body.

WARNING



Do not change MBS Level/Area unless absolutely necessary.

Incorrect adjustment will result in deletion of nearby target images and thus collisions may occur resulting in death or serious injuries.



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.



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 radar process 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.



When disposing of used lithium batteries, be sure to insulate the batteries by attaching a piece of adhesive tape on the ⊕ and ⊖ terminals. Failure to comply may cause heat generation, explosion, or fire when the batteries get shorted out.

CAUTION



A malfunction may occur if the power in the ship is instantaneously interrupted during operation of the radar. In this case, the power should be turned on again.



Always use the automatic tuning mode.
Use the manual tuning mode only when the automatic tuning mode does not provide the best tuning state due to deterioration of magnetron for example.



If sensitivity is set too high, unnecessary signals such as noises in the receiver and false echoes increase to lower target visibility.

At the same time, if sensitivity is set too low, detection of targets such as ships and dangerous objects may be hindered.

Therefore, sensitivity must always be set to an optimal level.



When using the [AUTO SEA] function, never set the suppression level too high canceling out all image noises from the sea surface at close range.

Detection of not only echoes from waves but also targets such as other ships or dangerous objects will become inhibited.

When using the [AUTO SEA] function, make sure to choose the most appropriate image noise suppression level.

CAUTION



When using the [AUTO RAIN] function, never set the suppression level too high canceling out all image noises from the rain or snow at close range.

Detection of not only echoes from the rain or snow but also targets such as other ships or dangerous objects will become inhibited.

When using the [AUTO RAIN] function, make sure to choose the most appropriate image noise suppression level.



When the chart position is corrected, the display will be shifted away from the actual position. With this in mind, navigate your ship with attention to the surroundings. Otherwise, this may cause accidents.



Compact Flash Cards can be used with this system. The following shows the recommendations in use. However they do not guarantee that CF cards may properly work with this system. Depending on the hardware or software, the cards will not work correctly.

Any damage including loss of data caused by using the data created on this system is out of warranty. Important files should be backed up therefore.



Use the radar only as a navigation aid. The final navigation decision must always be made by the operator him/herself. Making the final navigation decision based only on the radar display may cause accidents such as collisions or running aground.

CAUTION



Use the target tracking function (TT) only as a navigation aid. The final navigation decision must always be made by the operator him/herself. Making the final navigation decision based only on the target tracking function (TT) information may cause accidents.

The target tracking function (TT) information such as vector, target numerical data, and alarms may contain some errors. Also, targets that are not detected by the radar cannot be acquired or tracked.

Making the final navigation decision based only on the radar display may cause accidents such as collisions or running aground.



Target Tracking Function Test is provided to test if the target tracking function is operating normally. Thus, do not use the function except when you test the target tracking function.

Note especially that, if this function is used during actual navigation, simulated targets are displayed and may become confused with other actual targets. Therefore, never use this function during actual navigation.



When a large value is set as an association condition, a tracked target near an AIS target is identified as the AIS target and may thus disappear from the display.

For example, when a pilot vessel equipped with the AIS function (a small target which is not a tracked target) goes near a cargo vessel which is a tracked target without the AIS function, the tracked target symbol for the cargo vessel may disappear.

CAUTION



When a small value is set as a hysteresis condition, a tracked target near an AIS target is identified as the AIS target and may thus disappear from the display. For example, when a pilot vessel equipped with the AIS function (a small target which is not a tracked target) goes near a cargo vessel which is a tracked target without the AIS function, the tracked target symbol for the cargo vessel may disappear.



Since these alarms may include some errors depending on the target tracking conditions, the navigation officer himself should make the final decision for ship operations such as collision avoidance. Making the final navigation decision based only on the alarm may cause accidents such as collisions.



When setting a automatic acquisition zone, make sure to properly adjust gain, sea-surface reflection suppression level, and rain/snow reflection suppression level so that the optimal target images are always on the radar screen. The automatic acquisition zone alarm will not be activated for targets undetected by the radar, and it may result in accidents such as collisions.



Any adjustments must be made by specialized service personnel. Incorrect settings may result in unstable operation.





Do not make any adjustments during navigation. Failure to comply may result in adverse effects on the radar function which may lead to accidents or equipment failure.





Optimal values have been set for Video Level and Vector Constant; therefore, never change their values unless absolutely necessary. Failure to comply may result in accidents that would lower target tracking performance.


CAUTION


 Do not change the quantization level settings unless absolutely necessary. If set at an inappropriate value, the acquisition or tracking function of the target tracking function (TT) deteriorates, and this may lead to accidents.


 Any adjustments must be made by specialized service personnel.
Failure to comply may result in accidents or equipment failure.

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

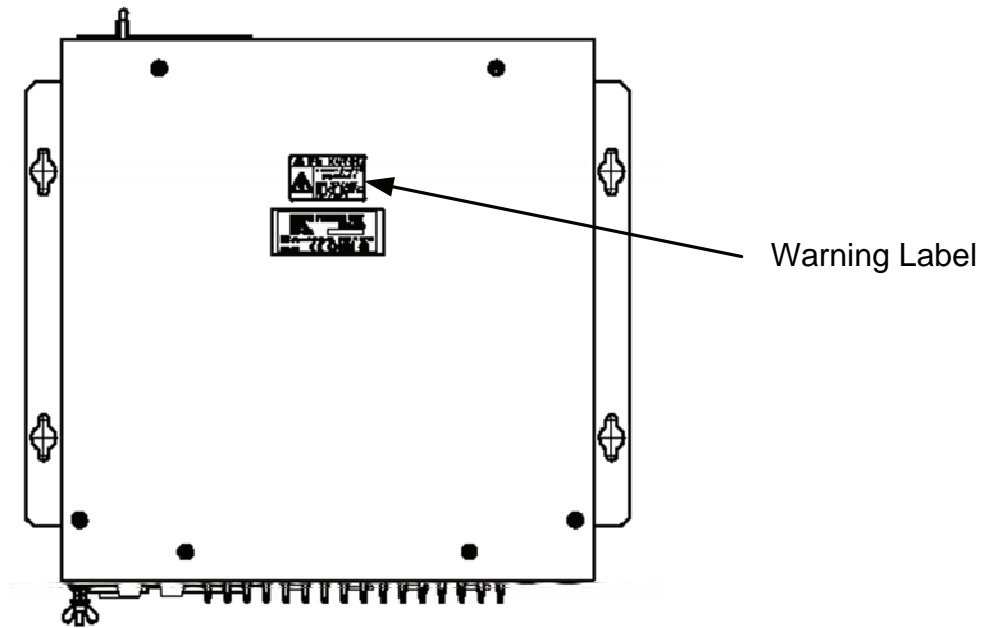
 When replacing magnetrons, make sure to shut off the main power and let the equipment stand for more than 5 minutes to discharge the high-voltage circuit. Failure to comply may result in electrocution.

 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.

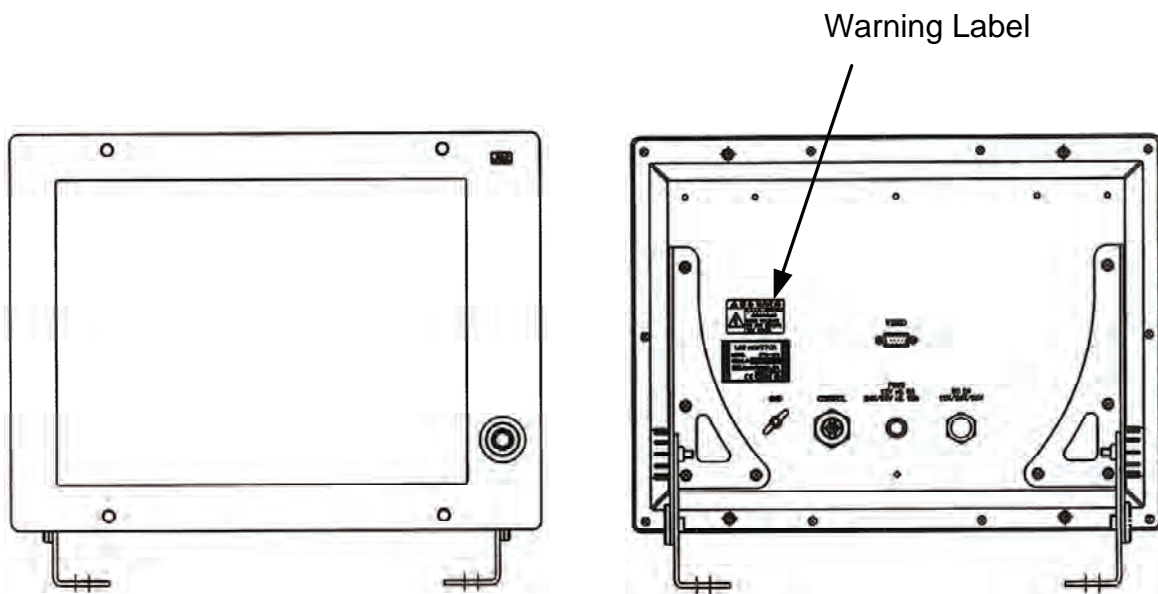
 Make sure that two or more staff member work together when replacing the LCD. If only one person attempts to replace the LCD, he/she may drop it and become injured.

 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.

The Mounting Point of the Warning Label



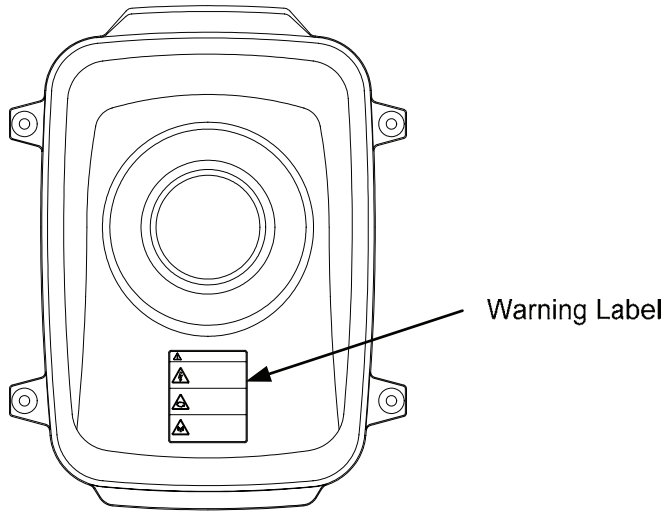
NCD-4380 Radar Process Unit



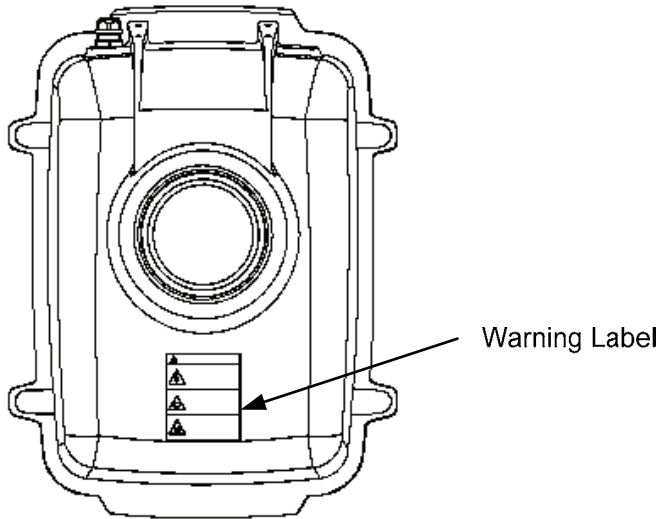
Front face

Back face

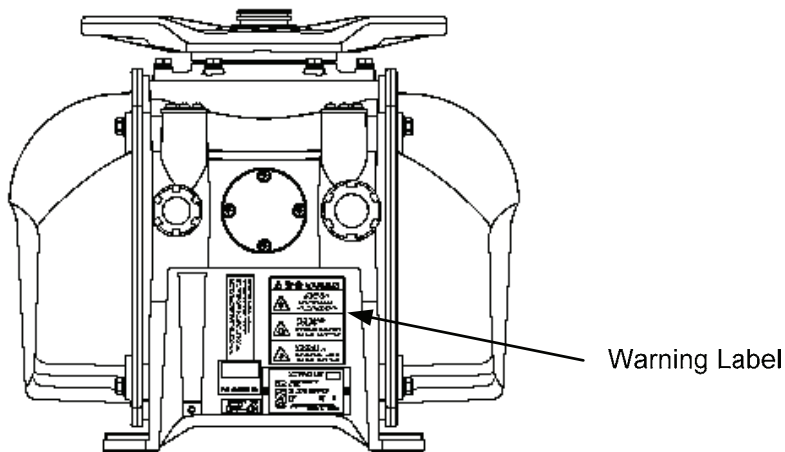
NWZ-164 LCD Monitor



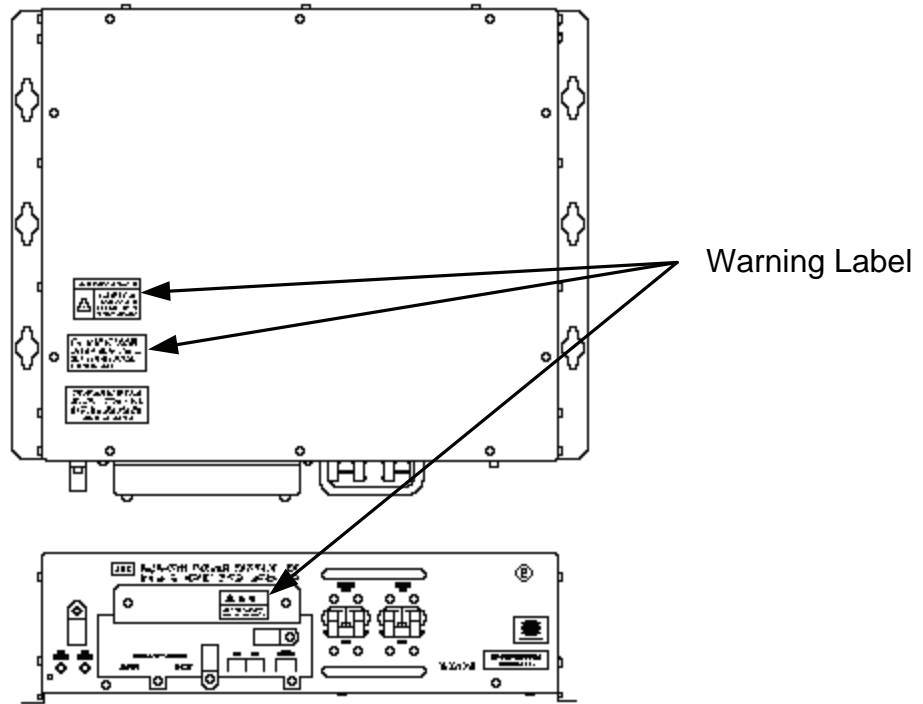
NKE-2062 Scanner Unit



NKE-2103-4/6/4HS/6HS Scanner Unit



NKE-2254-7/9 Scanner Unit



NBA-5111 Power Supply

EQUIPMENT APPEARANCE



Scanner Unit Type NKE-2062



Scanner Unit Type NKE-2103-4/4HS (4 feet)



Scanner Unit Type NKE-2103-6/6HS (6 feet)



Scanner Unit Type NKE-2254-7 (7 feet)



Scanner Unit Type NKE-2254-9 (9 feet)



NDC-1460 Processor Unit (Desktop Type)



NWZ-164 Display Unit (Desktop Type)
NCE-7699A Operation Unit (Desktop Type)

NCD-4380 Display Unit (Desktop Type)

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GLOSSARY

This section describes the main terms used for this equipment and general related maritime terms.

A

AZ	Acquisition/Activation zone A zone set up by the operator in which the system should automatically acquire radar targets and activate reported AIS targets when entering the zone.
Activated target	A target representing the automatic or manual activation of a sleeping target for the display of additional information.
AIS	Automatic Identification System A system which enables ships and shore stations to obtain identifying and navigation information about other ships at sea, using an automated transponder.
Anti-clutter rain	Rain/snow clutter suppression.
Anti-clutter sea	Sea clutter suppression.
Associated target	A target simultaneously representing a tracked target and a reported AIS target having similar parameters (position, course, speed) which comply with an association algorithm.
AZI	AZImuth stabilization mode
B	
BCR/BCT	Bow Crossing Range and Bow Crossing Time
C	
C up	Course up Own ship's course is pointed to the top center of the radar display.
CCRP	The Consistent Common Reference Point A location on own ship, to which all horizontal measurements such as target range, bearing, relative course, relative speed, CPA or TCPA are referenced, typically the conning position of the bridge.
Clutter	Unwanted reflections on a radar screen, from sea surface, rain or snow.
COG	Course Over Ground The direction of the ship's movement relative to the earth, measured on board the ship, expressed in angular units from true north

CORREL	CORRELation
CPA/TCPA	The distance to the Closest Point of Approach and Time to the Closest Point of Approach. Limits are set by the operator and are related to own ship.
CTW	Course Through Water The direction of the ship's movement through the water
D	
DRIFT	The current velocity for manual correction or the current speed on the horizontal axis of the 2-axis log is displayed.
E	
EBL	Electronic Bearing Line An electronic bearing line originated from own ship's position.
ENH	Enhance
ETA	Estimated Time of Arrival
G	
Ground stabilization	A display mode in which speed and course information are referred to the ground, using ground track input data.
H	
HDG	Heading The horizontal direction that the bow of a ship is pointing at any instant, expressed in angular units from a reference direction .
HL	Heading line A graphic line on a radar presentation drawn from the consistent common reference point to the bearing scale to indicate the heading of the ship
HSC	Vessels which comply with the definition in SOLAS for high speed craft
H up	Head up Own ship's heading line is always pointed to the top center of the radar display.
I	
IMO	International Maritime Organization
Interswitch Unit	A device to switch over two or more radar display units and two or more scanners.
IR	radar Interference Rejecter

ISW InterSWitch

L

Lost AIS target A target symbol representing the last valid position of an AIS target before the reception of its data was lost, or its last dead-reckoned position.

Lost tracked target One for which target information is no longer available due to poor, lost or obscured signals.

LP Long Pulse

M

MMSI Maritime Mobile Service Identity

MOB Man OverBoard

MON Performance monitor

MP Medium Pulse

N

nm 1nm=1852m

NSK North Stabilization Kit

N up North up
The north is always pointed to the top center of the radar display.

O

Own track Display function of own ship's track

P

PI Parallel Index line

Past positions Equally time-spaced past position marks of a tracked or AIS target and own ship.

POSN POSitioN

PRF Pulse Repetition Frequency
The number of radar pulses transmitted each second.

PROC PROCess
Radar signal processing function

R

Radar beacon A navigation aid which responds to the radar transmission by generating a radar signal to identify its position and identity

Radar cross-section	Radar cross-section of a target determines the power density returned to the radar for a particular power density incident on the target
Range Rings	A set of concentric circles labeled by distance from CCRP.
Reference target	A symbol indicating that the associated tracked stationary target is used as a speed reference for the ground stabilization
Relative course	The direction of motion of a target relative to own ship motion
Relative speed	The speed of a target relative to own ship's speed data
Relative vector	A predicted movement of a target relative to own ship's motion
RM	Relative Motion A display on which the position of own ship remains fixed, and all targets move relative to own ship.
RM(R)	Relative Motion. Relative Trails.
RM(T)	Relative Motion. True Trails.
ROT	Rate Of Turn Change of heading per time unit.
Route	A set of waypoints.
RR	Range Rings
S	
SART	Search And Rescue Transponder Radar transponder capable of operating in the 9GHz band
Sea stabilization	A display mode in which speed and course information are referred to the sea.
Sea state	Status of the sea condition due to the weather environment, expressed as a sea state 0 for flat conditions with minimal wind, to sea state 8 for very rough sea conditions.
SET	The current direction for manual correction or the current speed on the horizontal axis of the 2-axis log is displayed.
Sleeping AIS target	A target indicating the presence and orientation of a vessel equipped with AIS in a certain location.

SOG Speed Over the Ground
The speed of the ship relative to the earth, measured on board of the ship.

SP Short Pulse

STAB STABilization

STW Speed Through Water
The speed of the ship relative to the water surface.

T

TCPA Time to Closest Point of Approach to own ship

Test target Radar target of known characteristics used for test requirement

TM True Motion
A display across which own ship moves with its own true motion.

Trails Display Radar Trails (Other Ships' Trails)

Trial maneuver A graphical simulation facility used to assist the operator to perform a proposed maneuver for navigation and collision avoidance purposes.

True course The direction of motion relative to ground or to sea, of a target expressed as an angular displacement from north

True speed The speed of a target relative to ground, or to sea

True vector A vector representing the predicted true motion of a target, showing course and speed with reference to the ground or sea

TT Target Tracking.
A computer process of observing the sequential changes in the position of a radar target in order to establish its motion. Such a target is a Tracked Target.

TTG Time To Go.
Time to next waypoint.

TXRX Transceiver Unit

U

UTC Universal Time Coordinated.
The international standard of time, kept by atomic clocks around the world.

V

VRM

Variable Range Marker

An adjustable range ring used to measure the distance to a target.

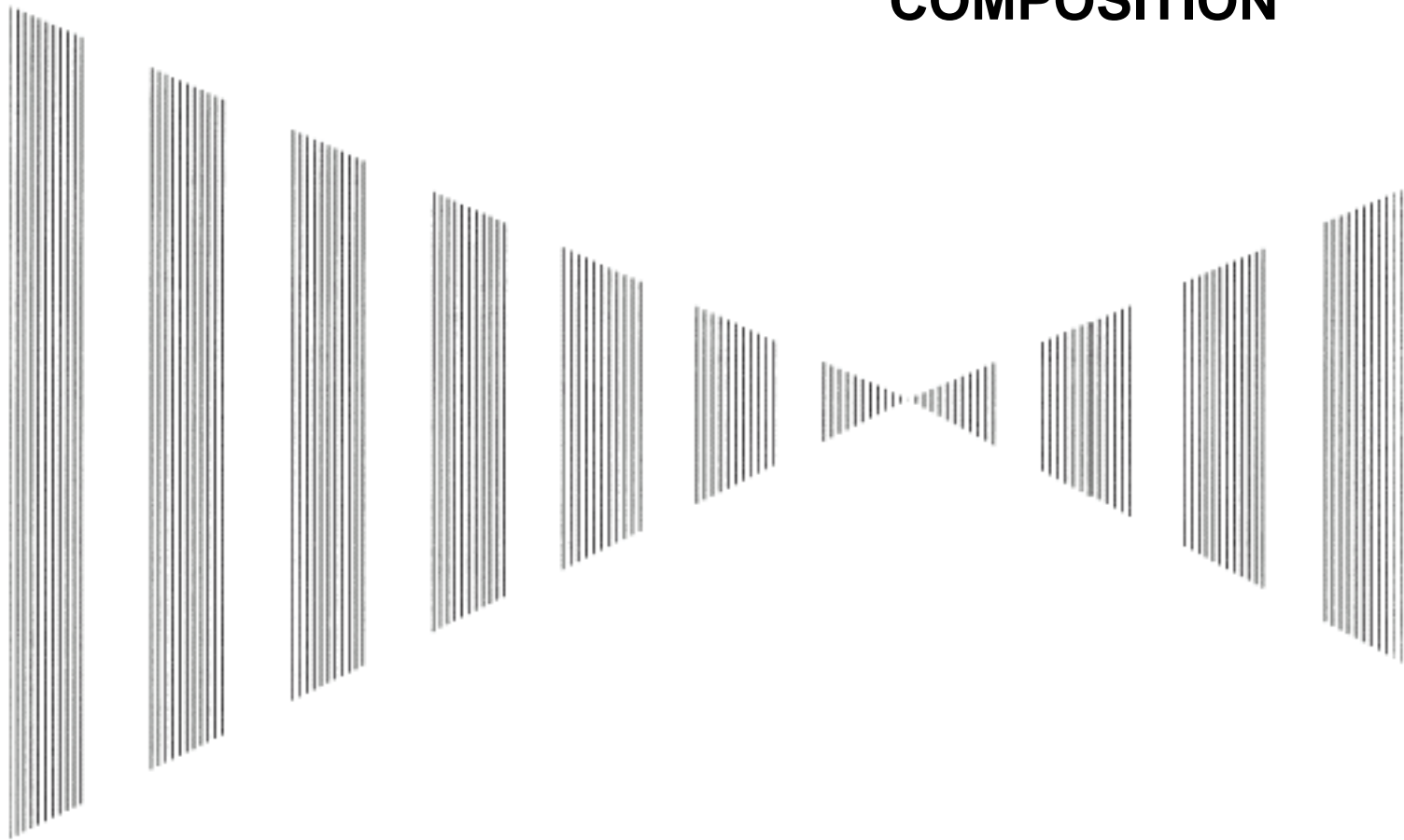
W

Waypoint

A geographical location on a route indicating a event.

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SECTION 1 GENERAL AND EQUIPMENT COMPOSITION



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1.1 FUNCTIONS

This equipment is a high-performance radar equipment consisting of a scanner unit, a transmitter-receiver unit and a high resolution color LCD display unit.

1.1.1 Function of This System

The JMA-5200MK2 series is a color radar system designed to comply with the international standards of the IMO.

The main functions include:

- sensitivity adjustment
- sea clutter and rain/snow clutter suppression
- interference rejecter
- bearing and range measurement using a cursor, fixed/variable range markers, and electronic bearing line
- own track display
- NAV line and marker displays
- TM (True Motion) presentation
- self-diagnostic facilities
- radar performance monitoring (Performance Monitor)
- TT functions (manual/automatic, target acquisition and tracking, vector and trail displays and alarm displays) (option)
- simple plotter functions (marker and line display, destination/route setting) (option)

1.2 FEATURES

Realization of Easy-to-see Screen with High Resolution

The 15-inch color LCD with high resolution of 1024×768 pixels can display radar images of 180 mm or more in diameter. Even short-range targets can also be displayed as high-resolution images.

Target Detection by Latest Signal Processing Technology

The system employs the latest digital signal processing technology to eliminate undesired clutter from the radar video signals that are obtained from the receiver with a wide dynamic range, thus improving the target detection.

Advanced Technology Based TT Functions (Option)

The TT target acquisition and tracking performance is enhanced by the use of the fastest DSP and tracking algorithm. So stable operation in target tracking under clutter is ensured.

- Acquisition and tracking of 30 targets.
- Hazardous conditions are represented by shapes and colors of symbols as well as sounds.
- Tracks of up to 20 target ships can be stored with a maximum of 1,500 points for each of them, and displayed distinguished by using seven different colors.

Overlay of Radar Images, Coastlines, and Own Ship's Track

As well as operator-created NAV lines, the data of coastlines, objects such as buoys, and own ship's tracks/TT tracks/AIS tracks, which is stored on the memory card can be superimpose-displayed with radar images and radar trails in all display modes including the head-up mode.

Use of the optional plotter function enables the creation/display of marks and lines and the settings of waypoints/courses.

Easy Operation with GUI

All the radar functions can be easily controlled by simply using the trackball and two switches to operate the buttons shown on the radar display.

Improved Day/Night Mode

Two types of background colors are available in each Day/Dusk/Night mode (total 4 background colors). Each background color can be reproduced to be suited for the user's operating environment by simple key operation. The radar echoes and a variety of graphics can also be represented in different colors, ensuring easy-to-see displays.

Self-diagnostic Program Incorporated

The Self-diagnostic program always monitors all the functions of the system. If any function deteriorates, an alarm message will appear on the radar display and an alarm sounds at the same time. Even when the system is operating, the functionality test can be carried out. (except on some functions)

Performance Monitor (Option)

The radar performance (transmitted output power and receiving sensitivity) can appear on the radar display.
* The PM unit (NJU-85) is needed separately.

Simplified Inter-switch Operation (Option)

If an simplified inter-switch unit (option) is installed, up to two JMA-5200MK2 radars can be switched over by performing simple operation.
* An simplified inter-switch connection cable (optional) CFQ-5251 (5m) is required separately.

Various Functions

- RADAR TRAILS (Other ship's track display)
- TM (True Motion) display
- Head-up/North-up/Course-up display
- Own ship's track display
- Automatic acquisition and activation area setting function

1.3 CONFIGURATION

Scanners and Transmitted Output Powers

SCANNER TYPE	TRANSMITTED OUTPUT POWER	BAND	RATE OF ROTATION	CATEGORY
JMA-5208 4 FT SLOT ANTENNA	6 KW	X	27rpm	
JMA-5212-4 4 FT SLOT ANTENNA	10 KW	X	27rpm	CAT 3
JMA-5212-6 6 FT SLOT ANTENNA	10 KW	X	27rpm	CAT 3
JMA-5222-7 7 FT SLOT ANTENNA	25 KW	X	24rpm	CAT 3
JMA-5222-9 9 FT SLOT ANTENNA	25 KW	X	24rpm	CAT 3
JMA-5208HS 4FT SLOT ANTENNA	6 KW	X	48rpm	
JMA-5212-4HS 4 FT SLOT ANTENNA	10 KW	X	48rpm	
JMA-5212-6HS 6 FT SLOT ANTENNA	10 KW	X	48rpm	

Radar Configuration and Ship's Mains

RADAR MODEL	SCANNER UNIT	PERFORMANCE MONITOR UNIT	DISPLAY UNIT	SHIP'S MAINS
JMA-5208	NKE-2062	-	NCD-4380	DC 12/24/32V #1
JMA-5212-4	NKE-2103-4	NJU-85	NCD-4380	DC 24V
JMA-5212-6	NKE-2103-6	NJU-85	NCD-4380	DC 24V
JMA-5222-7	NKE-2254-7	NJU-85	NCD-4380	DC 24V
JMA-5222-9	NKE-2254-9	NJU-85	NCD-4380	DC 24V
JMA-5208HS	NKE-2062HS	-	NCD-4380	DC 24V
JMA-5212-4HS	NKE-2103-4HS	NJU-85	NCD-4380	DC 24V
JMA-5212-6HS	NKE-2103-6HS	NJU-85	NCD-4380	DC 24V

Notes:

1. An optional rectifier NBA-5111 is necessary for using Ship's Mains 100/110/115/200/220/230 VAC.
 2. The scanner unit except NKE-2103 series can be equipped with a deicing heater as an option, and '-D' shall be suffixed to the type name.
(e.g. NKE-2254-7D, NKE-2254-9D).
 3. The display system NCD-4380 has a separate structure consisting of the following:
Monitor unit NWZ-164
Processor unit NDC-1460
Keyboard unit NCE-7699A
 4. The ship with radar of IMO conformity must mount a PM unit.
- #1 When the ship's main is DC12, the maximum cable length between the display unit and scanner unit is 20 m.

1.4 EXTERIOR DRAWINGS

Fig. 1.1 Exterior Drawing of Scanner Unit, Type NKE-2062/HS

Fig. 1.2 Exterior Drawing of Scanner Unit, Type NKE-2103-4/4HS

Fig. 1.3 Exterior Drawing of Scanner Unit, Type NKE-2103-6/6HS

Fig. 1.4 Exterior Drawing of Scanner Unit, Type NKE-2254-7

Fig. 1.5 Exterior Drawing of Scanner Unit, Type NKE-2254-9

Fig. 1.6 Exterior Drawing of Monitor Unit, Type NWZ-164

Fig. 1.7 Exterior Drawing of Processor Unit, Type NDC-1460

Fig. 1.8 Exterior Drawing of Keyboard Unit, Type NCE-7699A

Fig. 1.9 Exterior Drawing of NSK Unit, Type NCT-4106A

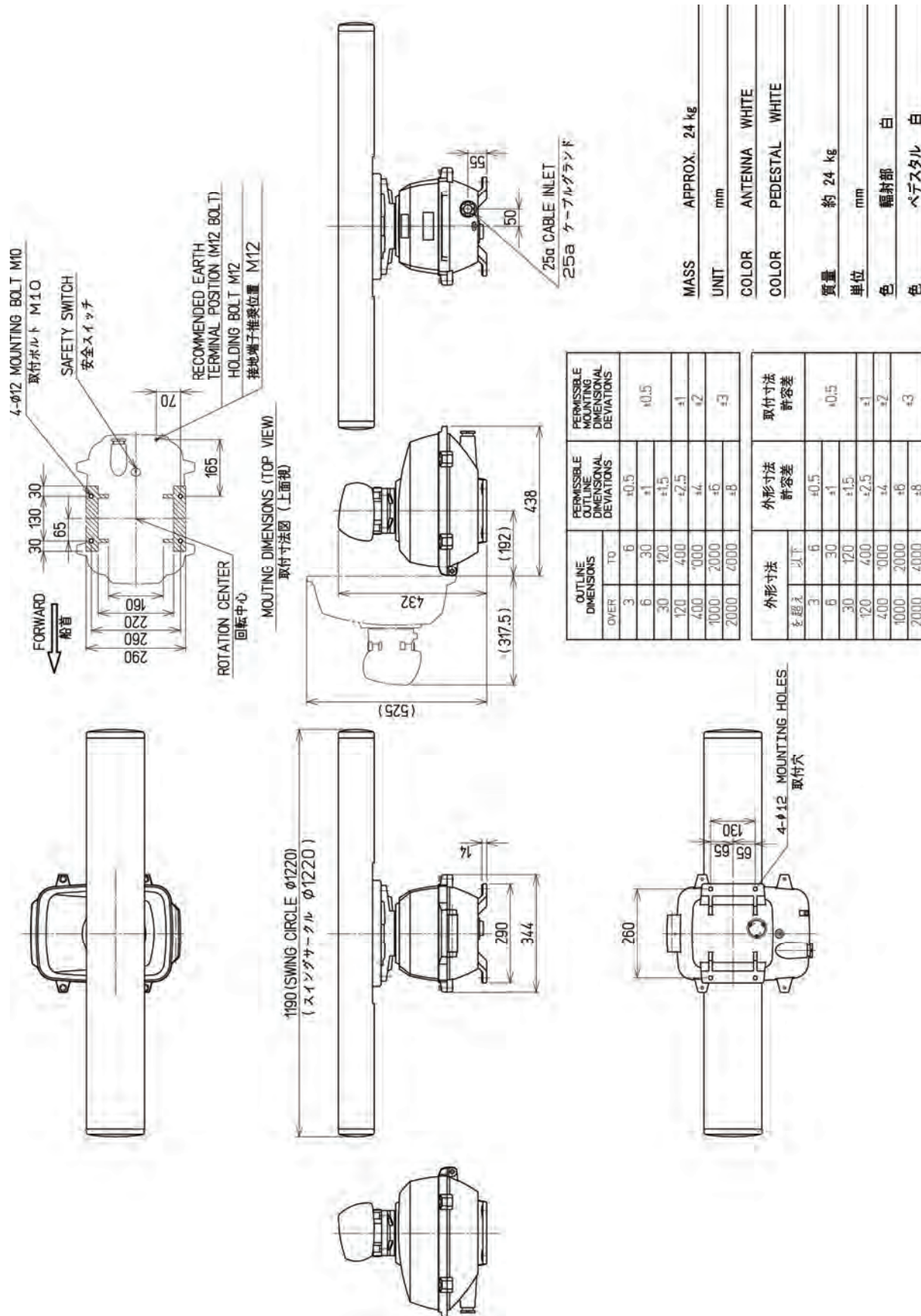


Fig. 1.1 Exterior Drawing of Scanner Unit, Type NKE-2062/HS

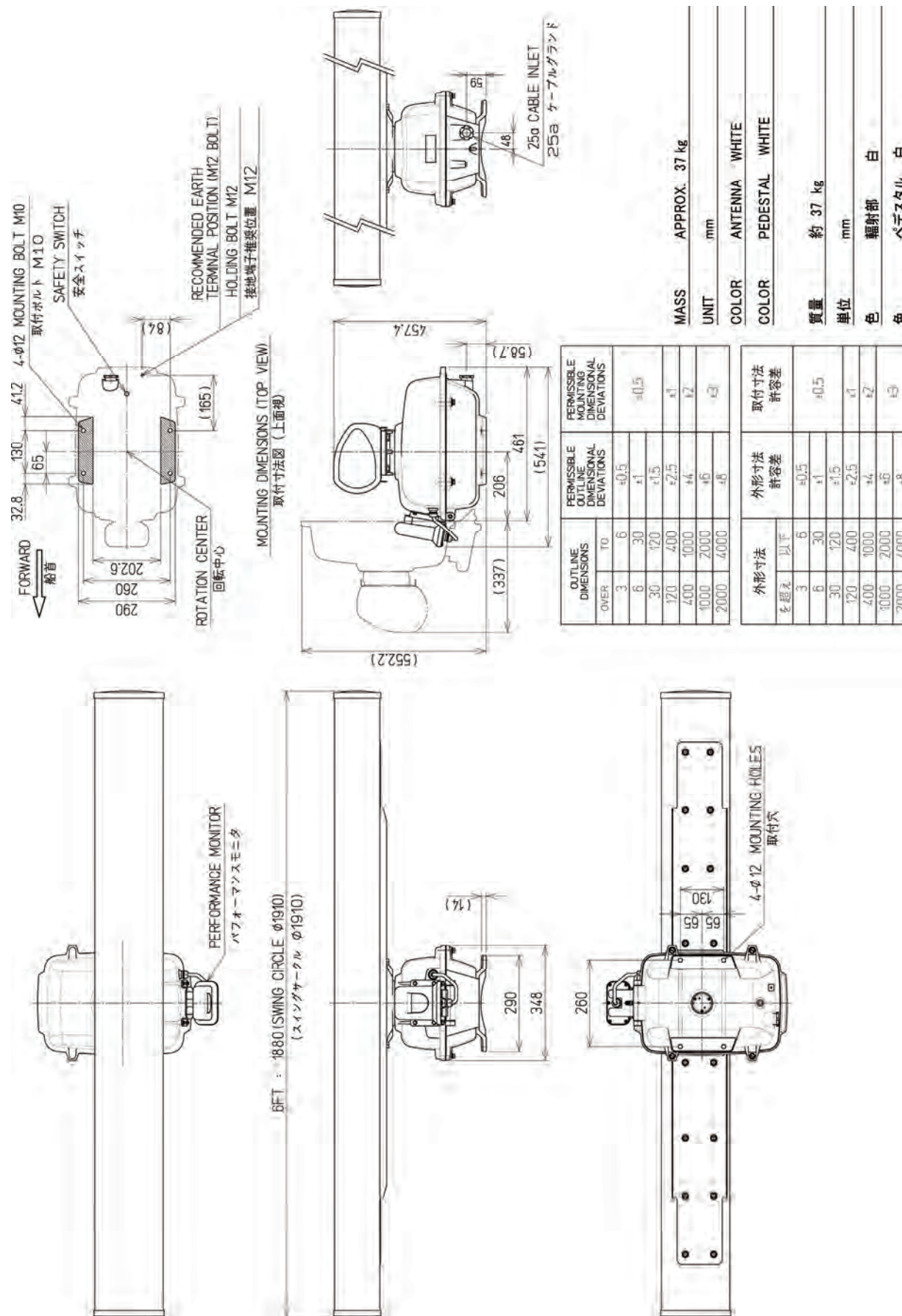


Fig. 1.3 Exterior Drawing of Scanner Unit, Type NKE-2103-6/6HS

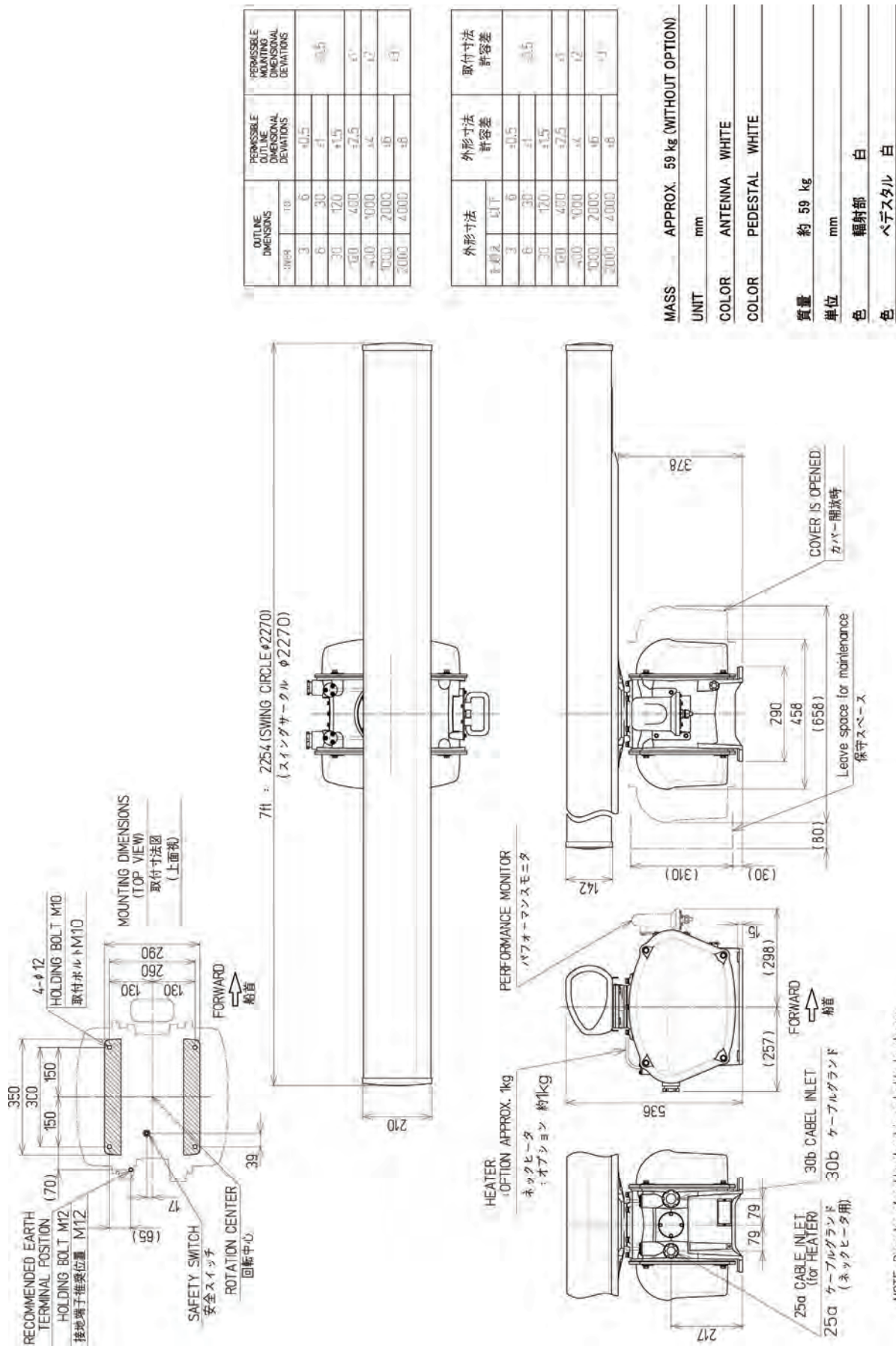


Fig. 1.4 Exterior Drawing of Scanner Unit, Type NKE-2254-7

OUTLINE DIMENSIONS	PERMISSIBLE OUTLINE DIMENSIONAL DEVIATIONS		PERMISSIBLE MOUNTING DIMENSIONAL DEVIATIONS	
	mm	inch	mm	inch
3	6	-0.5		
6	30	±1		
30	120	±1.5		
60	400	±2.5		
100	1000	±4		
1000	2000	±6		
2000	4000	±8		

外形寸法	外形寸法許容差		取付寸法許容差	
	mm	inch	mm	inch
以下				
3	6	-0.5		
6	30	±1		
30	120	±1.5		
60	400	±2.5		
100	1000	±4		
1000	2000	±6		
2000	4000	±8		

MASS	APPROX. 59 kg (WITHOUT OPTION)
UNIT	mm
COLOR	ANTENNA WHITE
COLOR	PEDESTAL WHITE
質量	約 59 kg
単位	mm
色	輻射部 白
色	ベースタル 白

NOTE: Diameter of cable gland is not able to change.
 (注) ケーブルグランド径は変更できません。

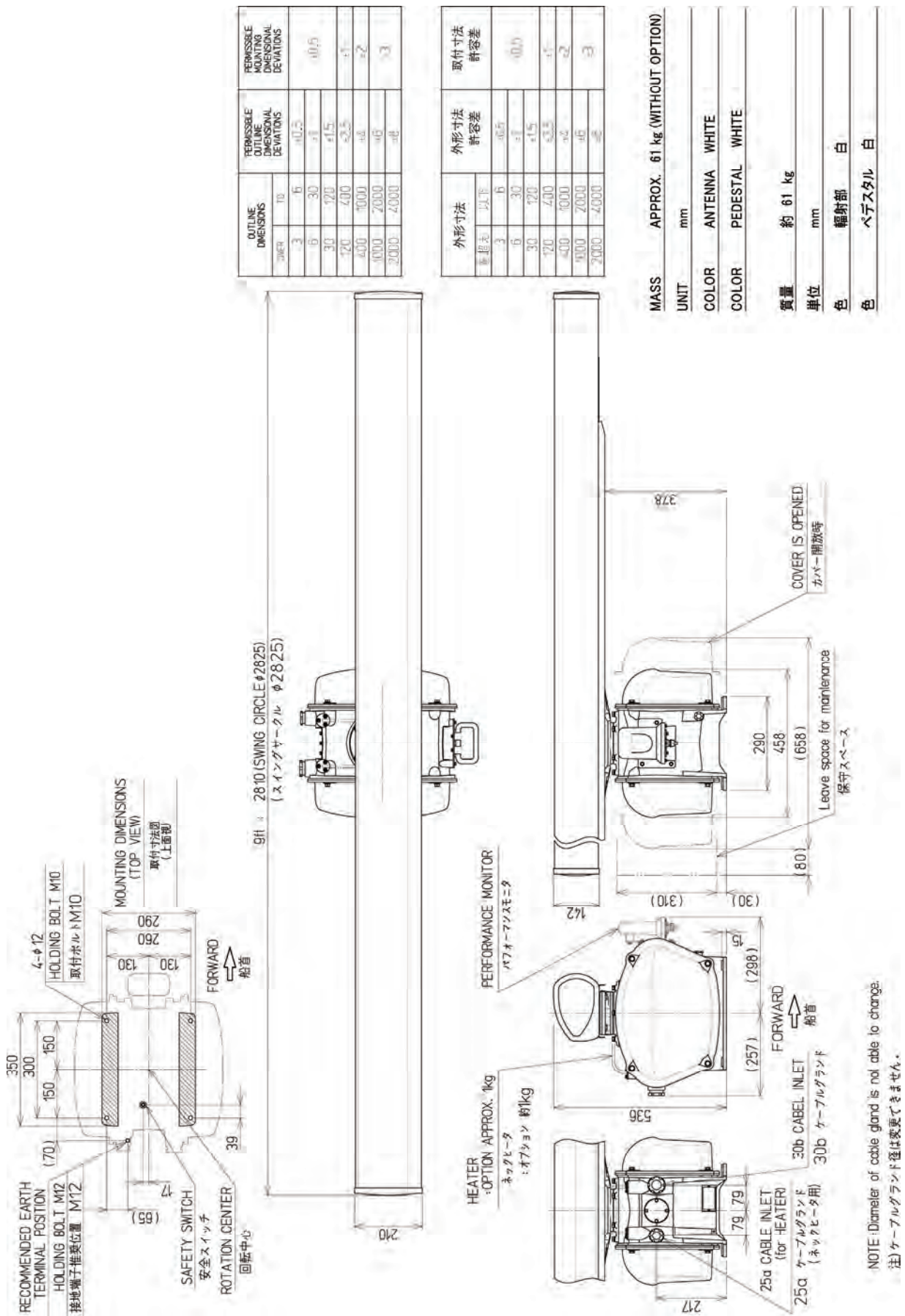


Fig. 1.5 Exterior Drawing of Scanner Unit, Type NKE-2254-9

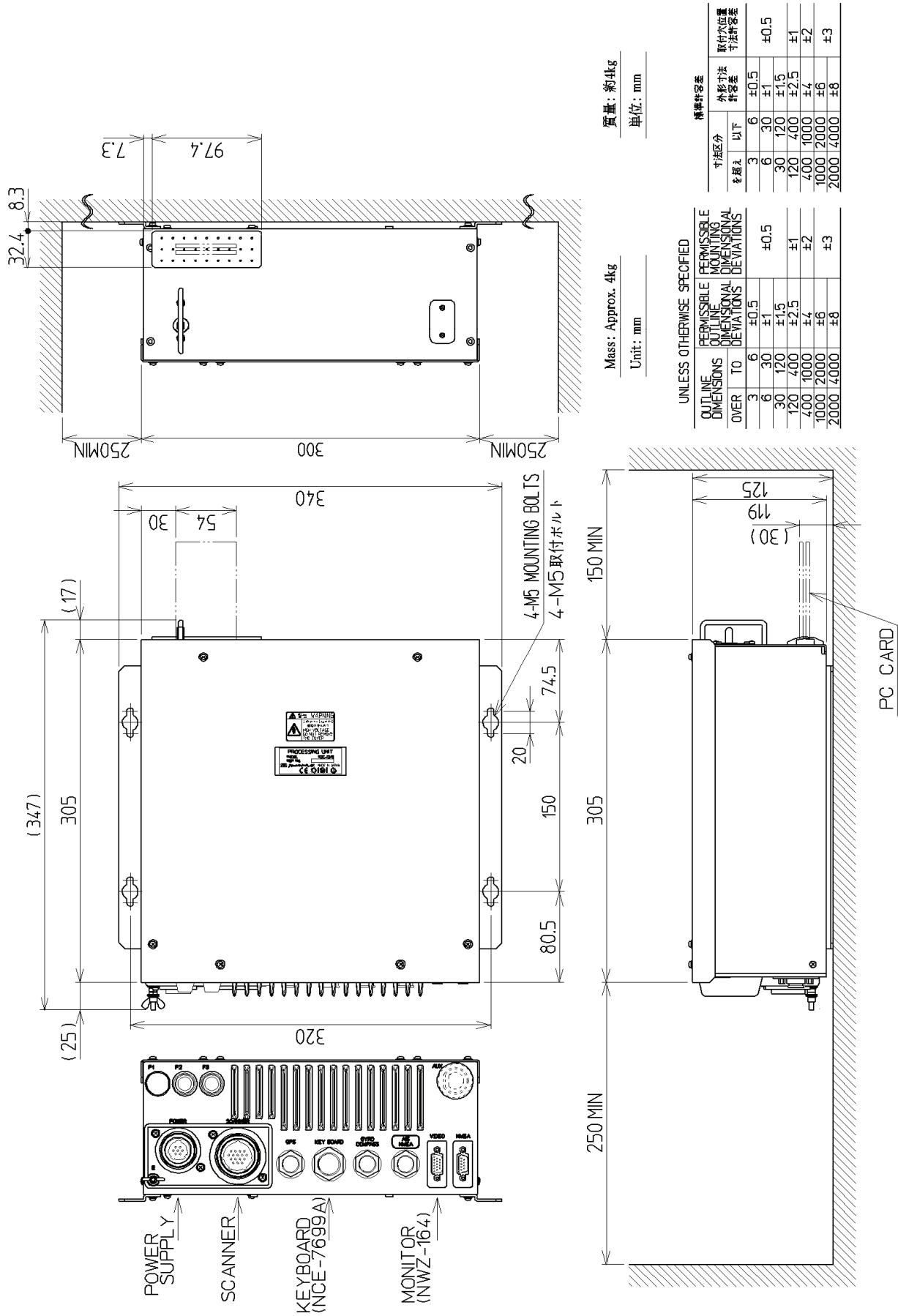


Fig. 1.7 Exterior Drawing of Processor Unit, Type NDC-1460

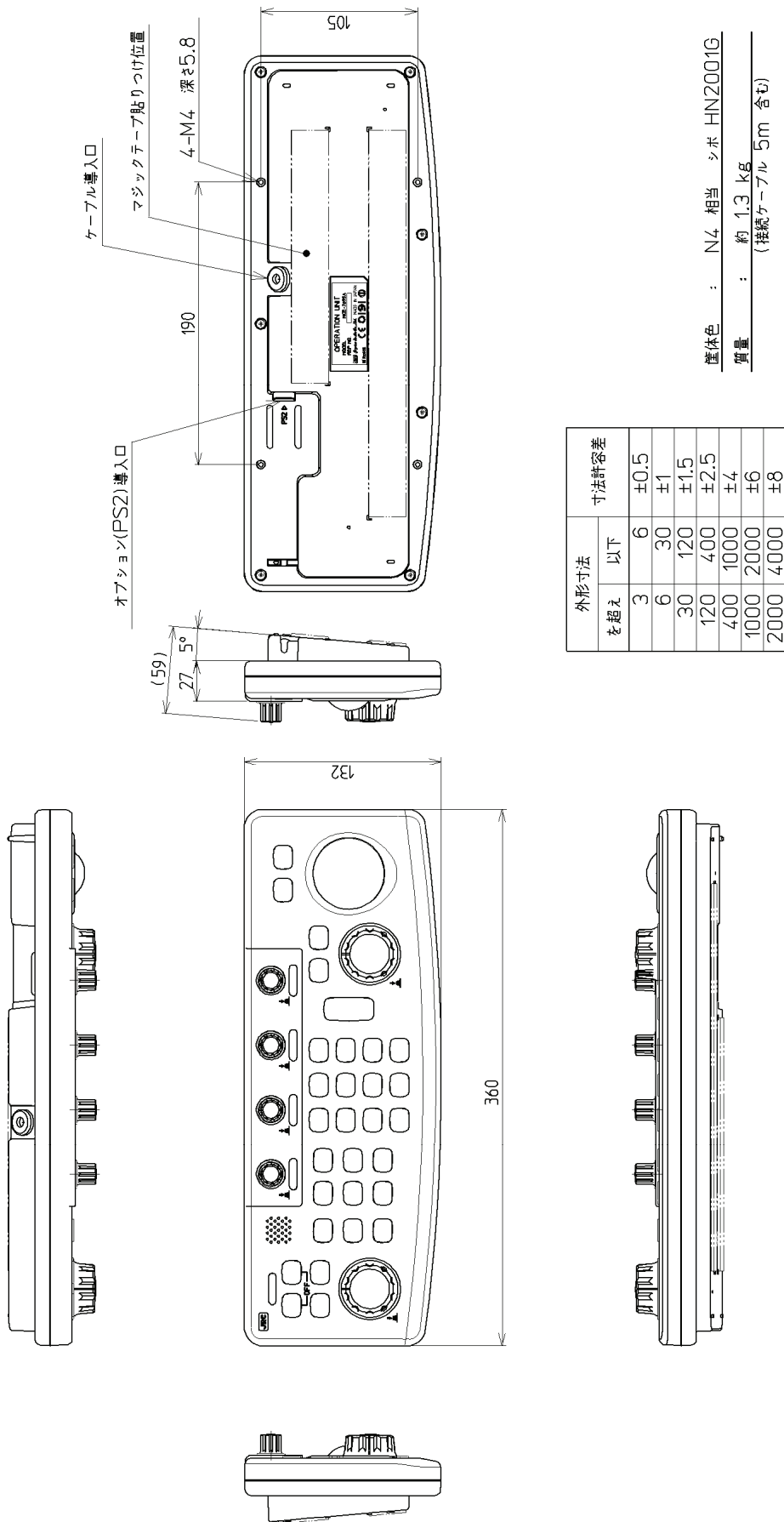


Fig. 1.8 Exterior Drawing of Keyboard Unit, Type NCE-7699A

1.5 GENERAL SYSTEM DIAGRAMS

Fig. 1.10 General System Diagram of Radar, Type JMA-5208/HS

Fig. 1.11 General System Diagram of Radar, Type JMA-5212-4/6/4HS/6HS

Fig. 1.12 General System Diagram of Radar, Type JMA-5222-7/9

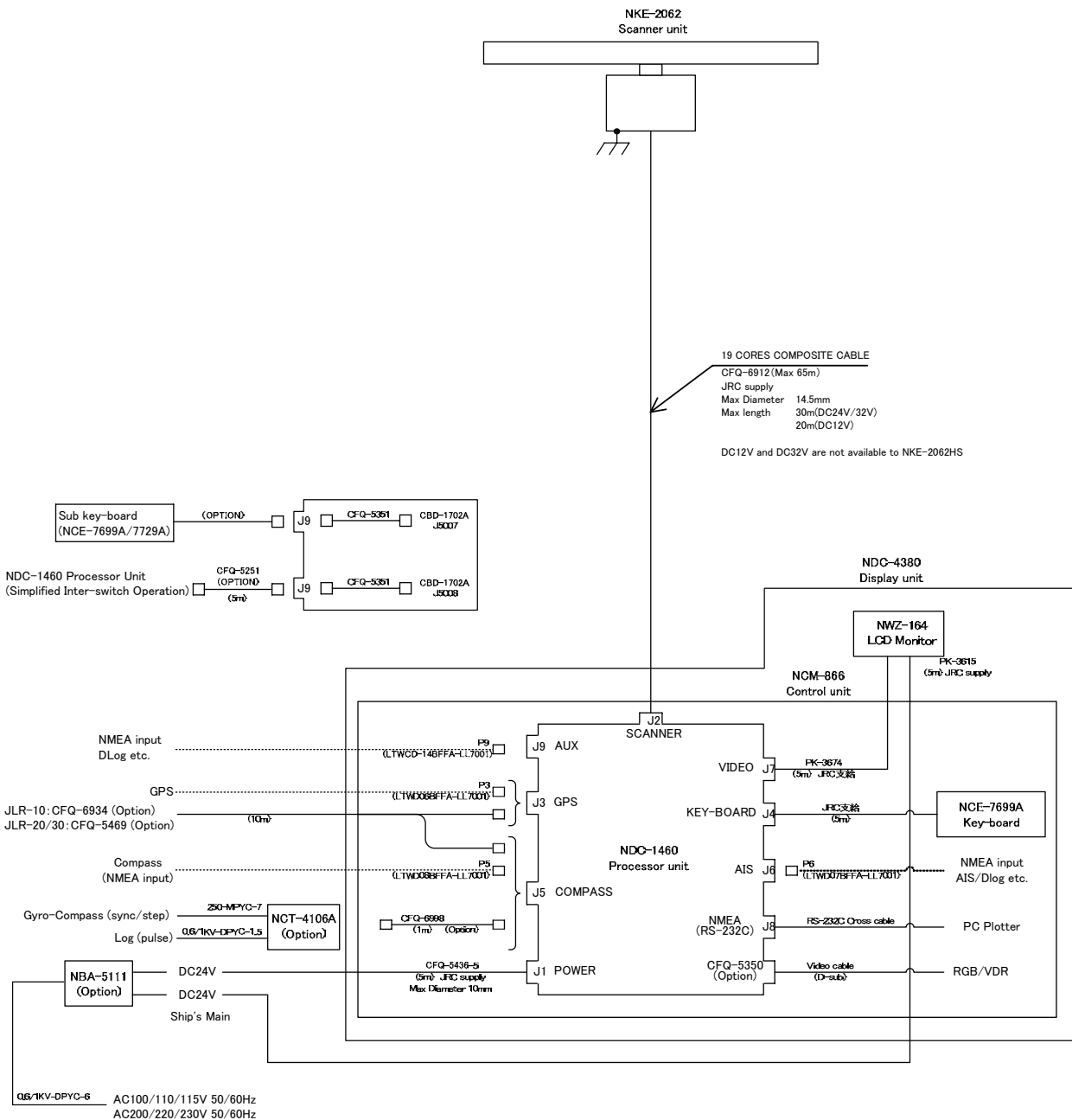


Fig. 1.10 General System Diagram of Radar, Type JMA-5208/HS

Note: Install the radar cable as far as from the cables of other radio equipment in order to prevent other radio equipment from interfering with the radar operations. In particular, do not install the antenna cable parallel to the cables of other radio equipment.

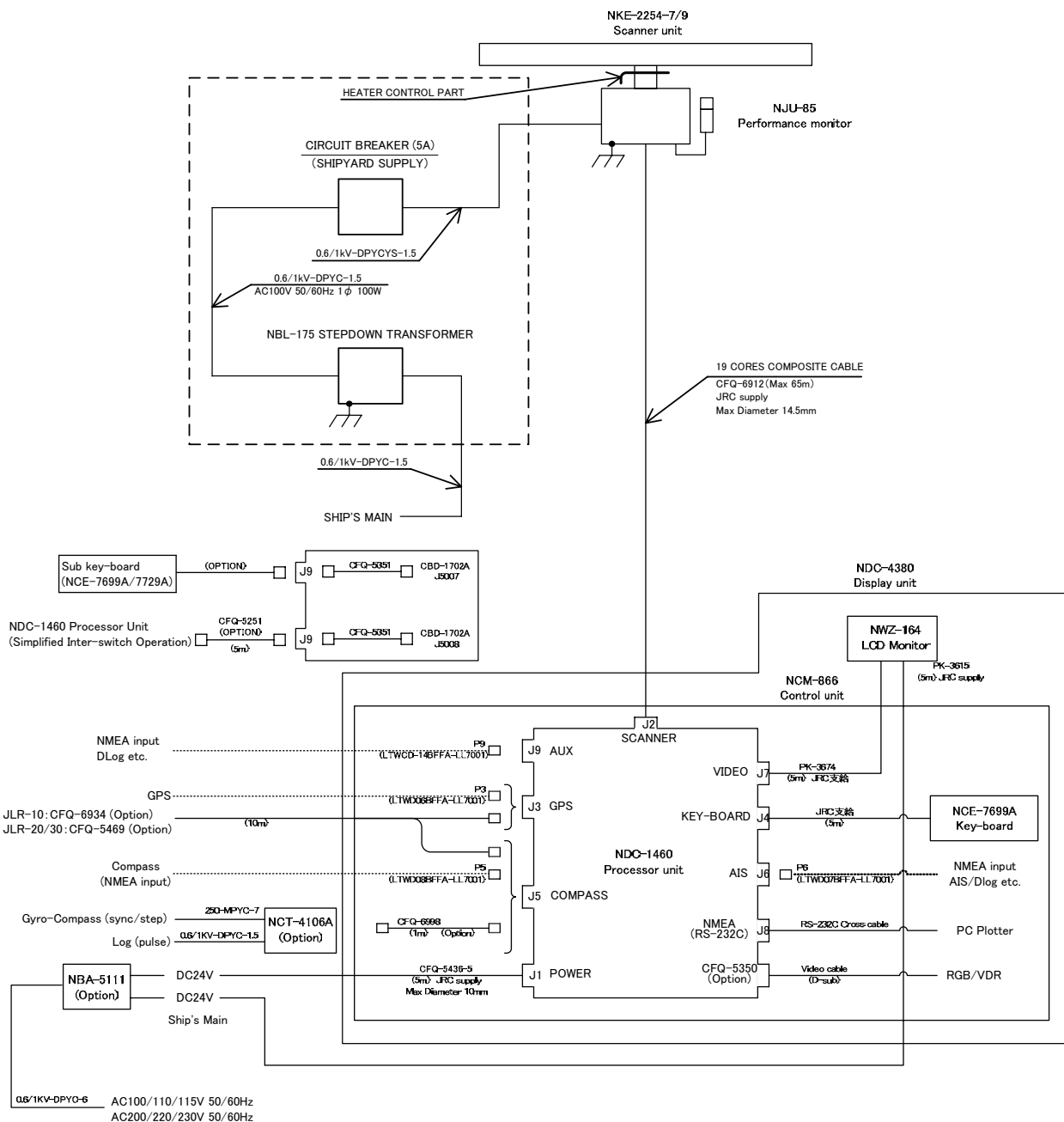


Fig. 1.12 General System Diagram of Radar, Type JMA-5222-7/9

Note: Install the radar cable as far as from the cables of other radio equipment in order to prevent other radio equipment from interfering with the radar operations. In particular, do not install the antenna cable parallel to the cables of other radio equipment.

