21.5 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.

⚠CAUTION	
	Turn off the main power source before inspecting and replacing parts. Otherwise, an electric shock or trouble may be caused.
	The liquid crystal monitor shall be replaced by two more persons. If only one person does this work, he may drop the LCD, resulting in injury.
	Even after the main power source is turned off, some high voltages remain for a while. Do not touch the inverter circuit in the LCD indicator with bare hands. Otherwise, an electric shock may be caused.

21.5.1 Parts required for periodic replacement

Here are parts required for periodic replacement.

Part type	Name	Part name	Interval	Replacement kit type
NWZ-207	19inch monitor	FAN	40,000 hours	7ZYNA4004
NWZ-208	26inch monitor	FAN	40,000 hours	7ZYNA4005
NBD-913	Power supply unit	FAN	100,000 hours	7ZYNA4007
NDC-1590	Central processing unit	FAN	40,000 hours	7ZYNA4006
NKE-1130	S band radar antenna	Magnetron	4,000 hours	5VMAA00104
		Motor	10,000 hours	MDBW10823
		FAN for motor driver circuit	20,000 hours	7BFRD0002
		FAN for modulation	20,000 hours	5BFAB00674
NKE-1139	S band radar antenna	Motor	10,000 hours	MDBW10823
NTG-3230	S band transceiver	Magnetron	4,000 hours	5VMAA00104

Part type	Name	Part name	Interval	Replacement kit type
NKE-1125	X band radar antenna	Magnetron	4,000 hours	5VMAA00106
		Motor	10,000 hours	MDBW10822
		Fan for magnetron	20,000 hours	7BFRD0002
		FAN for modulation	20,000 hours	7BFRD0002
NKE-1129	X band radar antenna	Motor	10,000 hours	MDBW10822
NTG-3225	X band transceiver	Magnetron	4,000 hours	5VMAA00106
NKE-2254-HS	X band radar antenna	Magnetron	4,000 hours	5VMAA00106
		Motor	10,000 hours	7BDRD0045A
		FAN for modulation	20,000 hours	7BFRD0002
		FAN for modulation	20,000 hours	7BFRD0002
NKE-2103	X band radar antenna	Magnetron	4,000 hours	5VMAA00102
		Motor	10,000 hours	7BDRD0048
NKE-1632	Solid state radar antenna	Motor	10,000 hours	MDBW10823
		FAN	100,000 hours	109L0912S410
NKE-2632	Solid state radar antenna	Motor	10,000 hours	MDBW10823
		FAN	100,000 hours	109L0912S410
NKE-2632-H	Solid state radar antenna	Motor	10,000 hours	MDBW10967
		FAN	100,000 hours	109L0912S410

21.5.2 Replacement of magnetron

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

Note

Replacement of magnetron must be made by a specialized service personnel.

For details, refer to Service Manual.

Use necessarily the parts to meet the part types in the above shown in the table.

Do not touch the magnet of the magnetron with a screwdriver or put the magnetron on an iron plate. When replacing the magnetron, connect the lead wire correctly.

21.5.2.1 Handling of magnetron under long-time storage

The magnetron that has been kept in storage for a long time may cause sparks and operate unstably when its operation is started. Perform the aging in the following procedures:

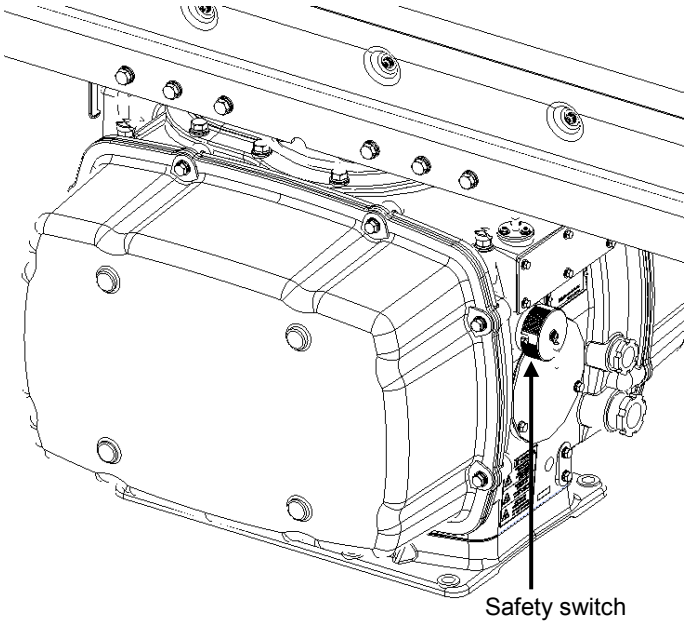
1 **Warm up the cathode for a longer time than usually. (20 to 30 minutes in the standby state.)**

2 **Start the operation from the short pulse range and shift it gradually to the longer pulse ranges.**

If the operation becomes unstable during this process, return it to the standby mode immediately. Keep the state for 5 to 10 minutes and repeat the operation.

21.5.2.2 Magnetron replacement procedure for radar antenna NKE-1130

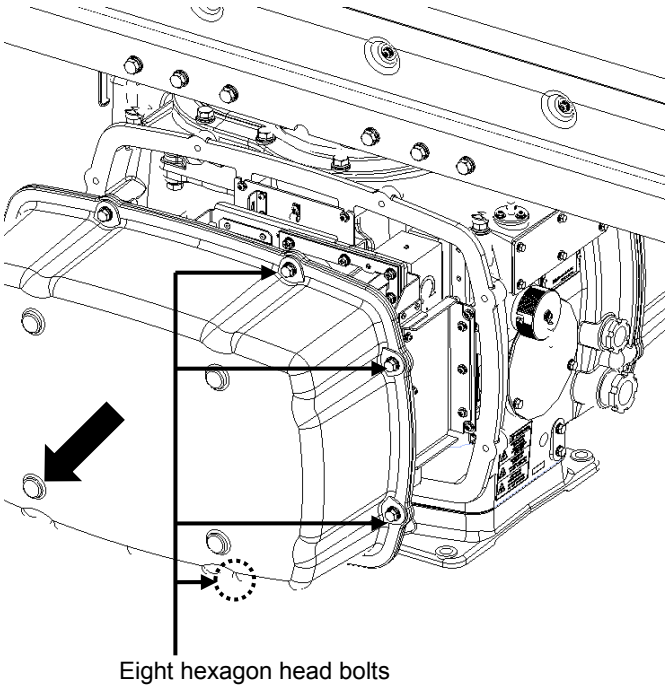
1 Turn Off the safety switch of the radar antenna.



⚠ When replacing a magnetron, ensure that the safety switch of the radar antenna is turned Off prior to commencing the replacement work.

The safety switch is located on the rear (stern) side of the radar antenna.
Remove the cover and turn Off (to the lower side) the safety switch.

2 Remove the cover.

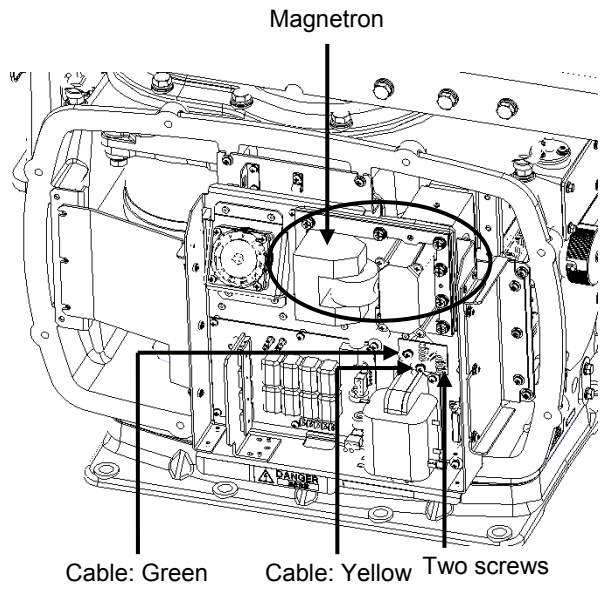


The magnetron is mounted on the left side (port side) of the radar antenna. Remove the left side cover.

The cover is secured in place with hexagon head bolts (M8, designed to be protected from falling out) at eight positions.

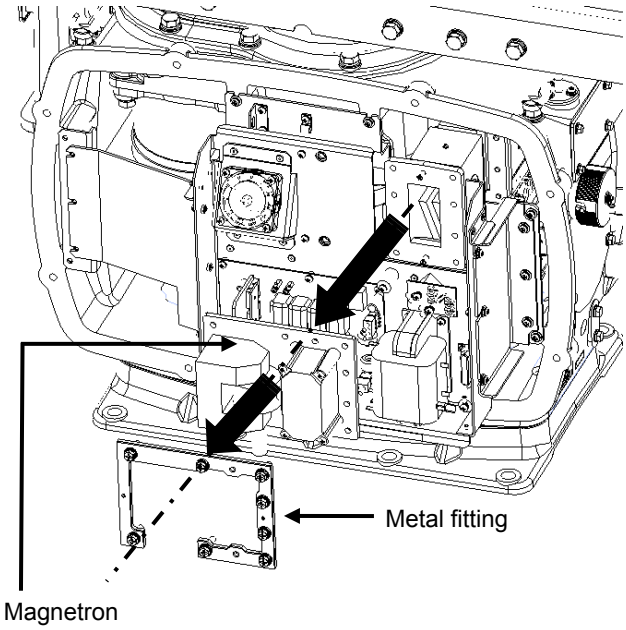
After removing the cover, place it in a safe area.
Exercise care to avoid dust or other foreign matters adhering to the packing.

3 Replace the magnetron.



To detach the cables to which the magnetron is connected, remove the two screws (M4×12) holding the cables.

Use caution not to lose the screws after removing them.



The magnetron is secured in place with a special metal fitting.
The fitting uses bolts protected from falling out. Loosen all bolts and demount the fitting and bolts together.

⚠ The magnetron is attached to the radar antenna with pins. Use caution not to drop the magnetron.

⚠ Use a shielded screwdriver for this work.

⚠ Contact with metal (tools) can cause performance degradation in the magnetron.

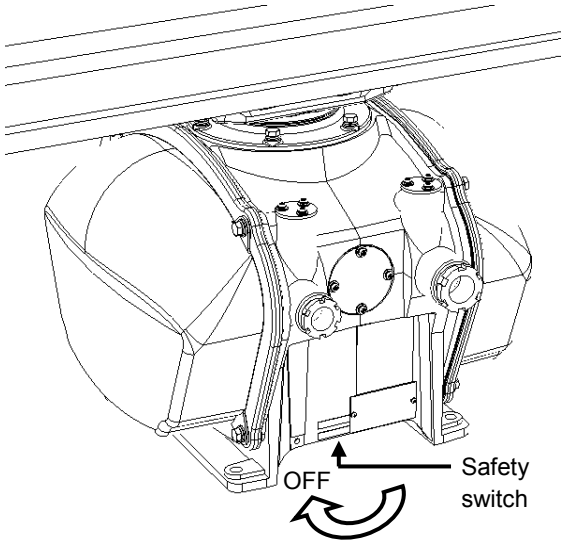
Install a replacement magnetron and cables.

After replacing the magnetron, reassemble the unit by following the same steps in reverse order.
Do not forget to tighten the bolts and screws, and do not forget to reconnect the cables.

The above steps complete the magnetron replacement procedure.

21.5.2.3 Magnetron replacement procedure for radar antenna NKE-1125

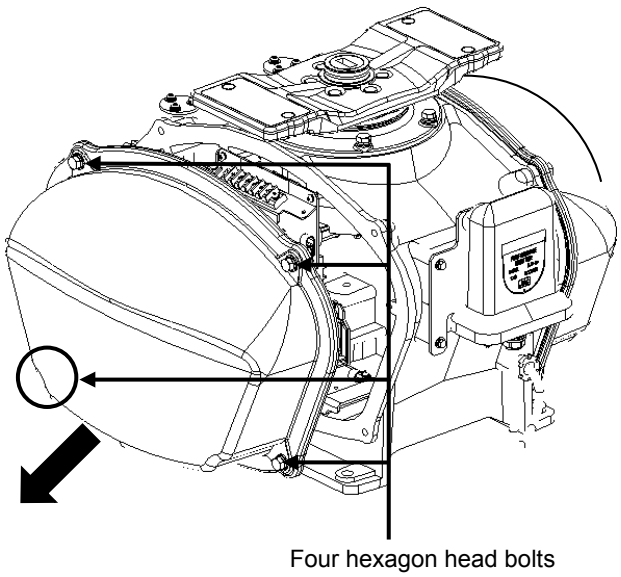
1 Turn Off the safety switch of the radar antenna.



⚠ When replacing a magnetron,, turn Off the safety switch of the radar antenna.

Turn off the safety switch located on the bottom of the stern side of the radar antenna.

2 Remove the cover.

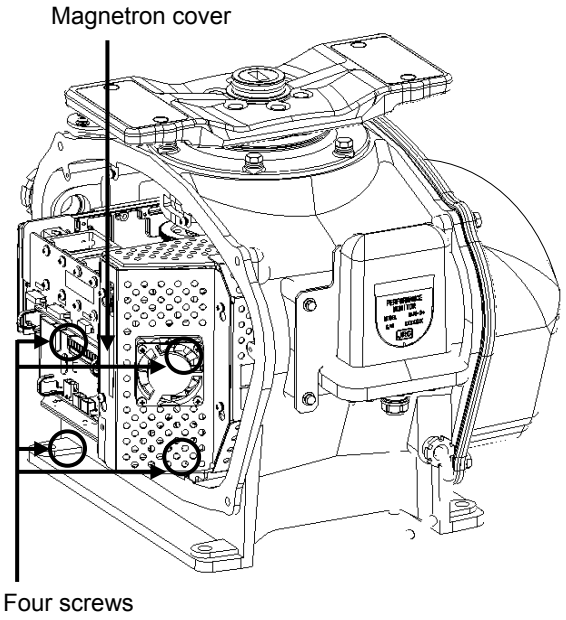


The magnetron is mounted on the right side (starboard side) of the radar antenna. Remove the right side cover.

The cover is secured in place with hexagon head bolts (M8, designed to be protected from falling out) at four positions.

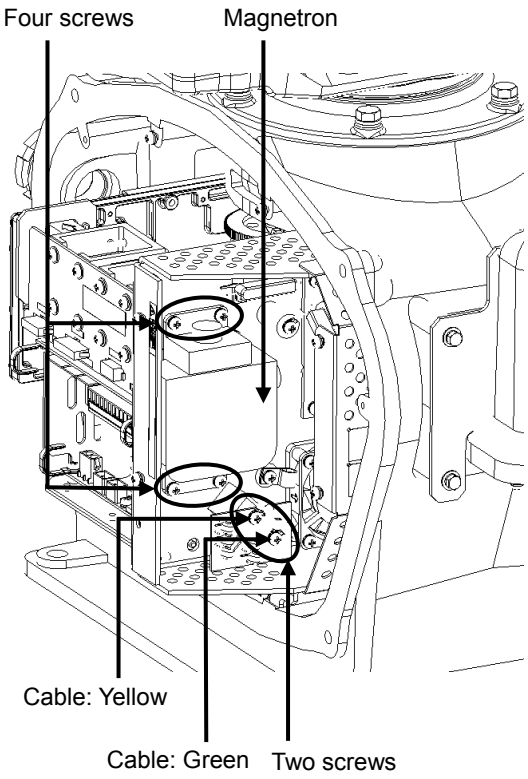
After removing the cover, place it in a safe area.
Exercise care to avoid dust or other foreign matters adhering to the packing.

3 Replace the magnetron.



Loosen the screws (M4×10) at four positions to remove the magnetron cover.

Remove the screws (M4×12) at two positions and detach the magnetron cables.



⚠ Use a shielded screwdriver for this work.
Contact with metal (tools) can cause performance degradation in the magnetron.

Remove the screws (M4×12) at four positions and demount the magnetron.

Exercise caution not to lose the screws after removing them.

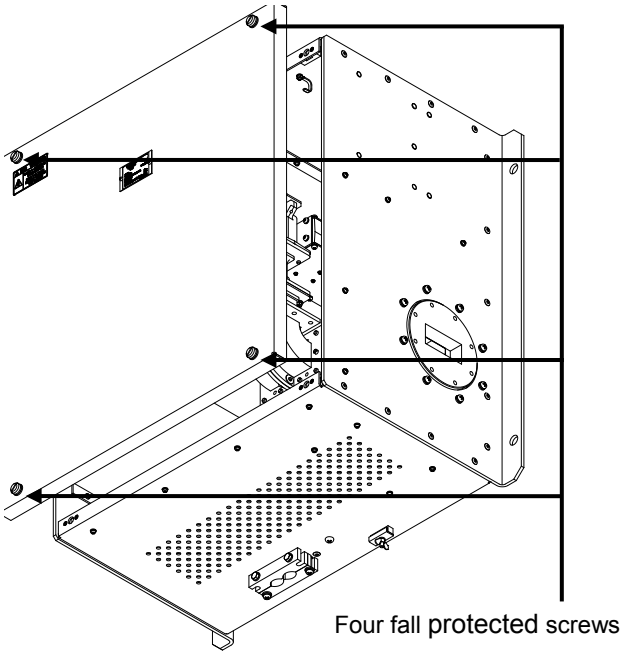
Install a replacement magnetron and cables.

After replacing the magnetron, reassemble the unit by following the same steps in reverse order.

Do not forget to tighten the bolts and screws, and do not forget to reconnect the cables.

21.5.2.4 Magnetron replacement procedure for transmitter-receiver unit NTG-3230

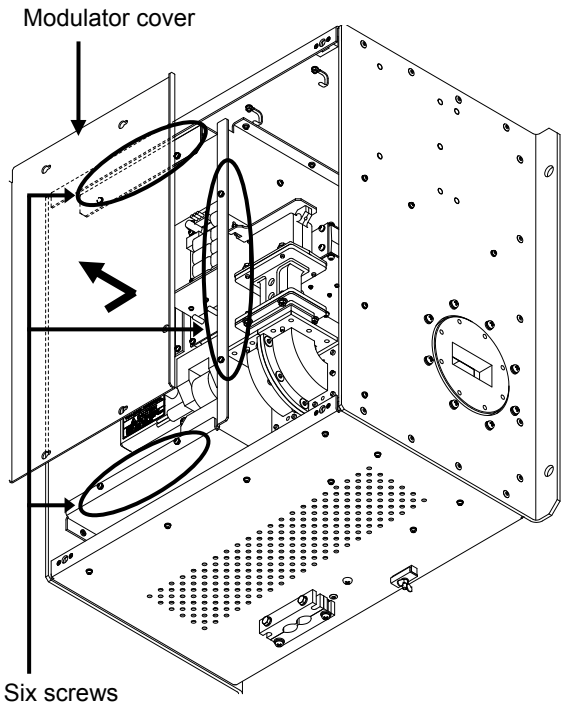
1 Remove the cover of the transmitter-receiver unit.



Loosen the four screws designed to be protected from falling out, and remove the cover.

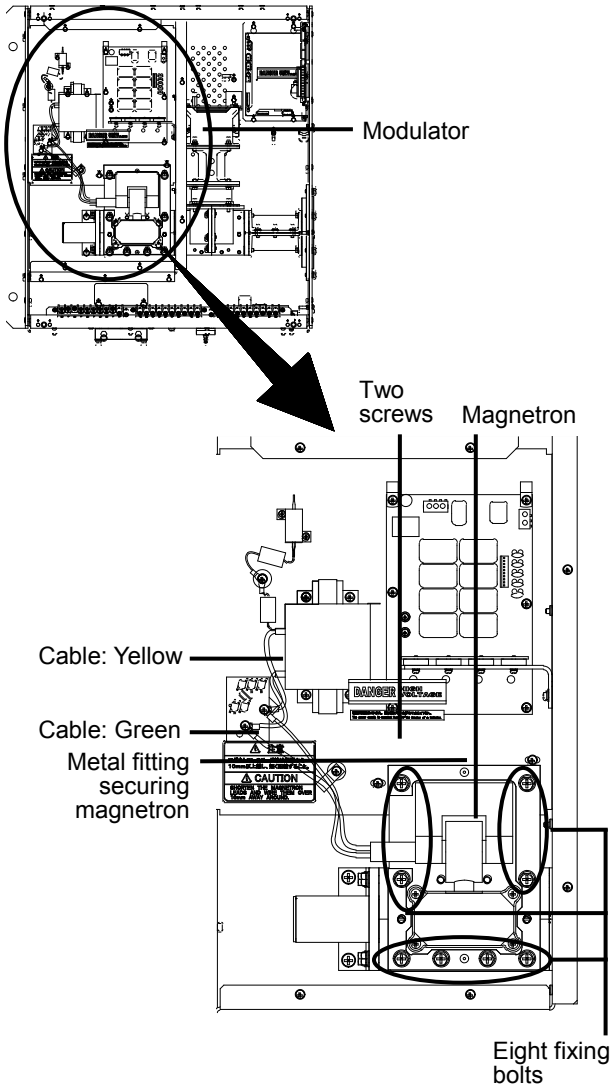
The fall protected screws have slotted heads.
Use a slotted screwdriver for this work.

2 Remove the modulator cover.



Loosen the screws (M4×12) at six positions and slide the modulator cover to the right to remove it.

3 Replace the magnetron.



Remove the screws (M4×12) holding the cables at two positions, and detach the cables.

⚠ Use a shielded screwdriver for this work.
Contact with metal (tools) can cause performance degradation in the magnetron.

Remove the bolts (M6×25) holding the magnetron in place at eight positions, and demount the metal fitting and magnetron.

Install a replacement magnetron by securing it in place with the metal fitting, and fix the cables in position.

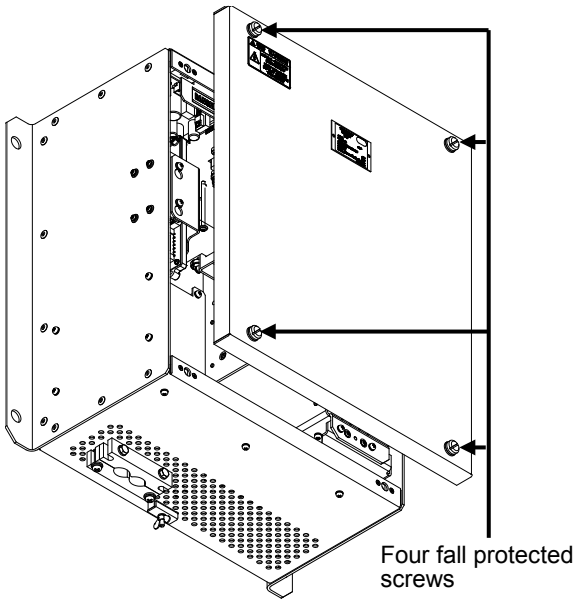
Pay special attention to the positions to which the cables (yellow and green) of the magnetron and pulse transformer are fixed.

After replacing the magnetron, install the cover by following the same steps in reverse order.

Do not forget to tighten the bolts and screws, and do not forget to reconnect the cables.

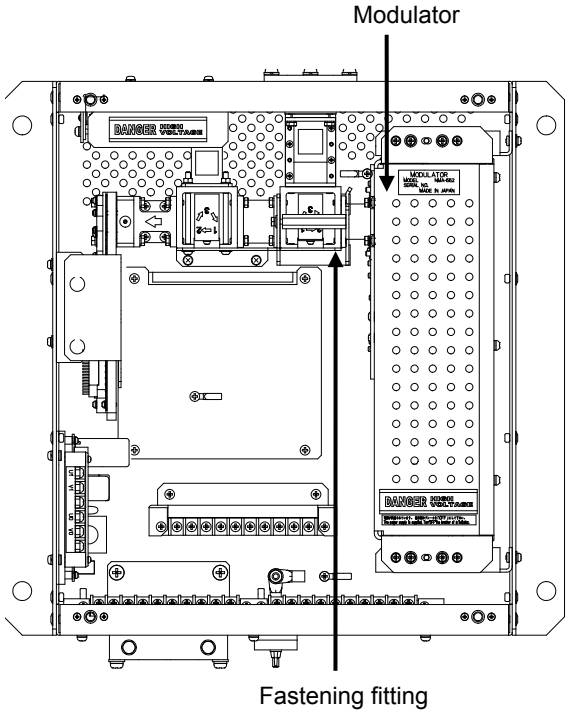
21.5.2.5 Magnetron replacement procedure for transmitter-receiver unit NTG-3225

1 Remove the cover of the transmitter-receiver unit.



Loosen the screws designed to be protected from falling out at four positions, and remove the cover.

The fall protected screws have slotted heads.
Use a slotted screwdriver for this work.

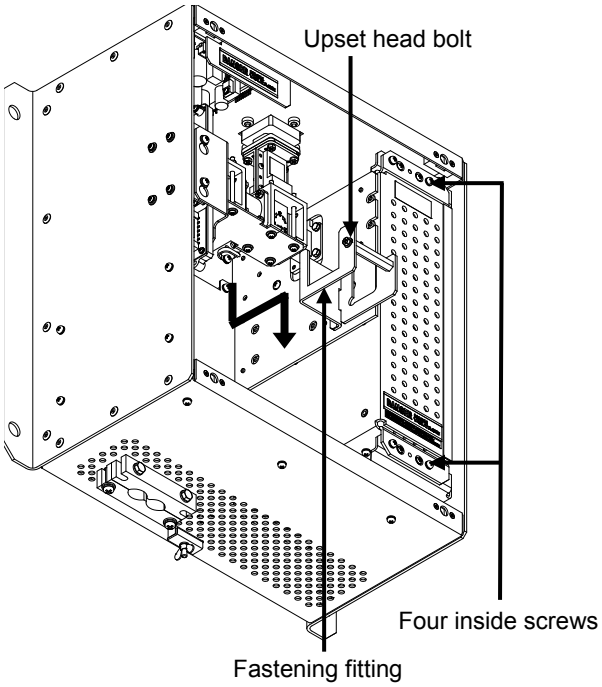


The magnetron is embedded inside the modulator.

The modulator can be demounted by removing the fastening fitting.
The cables connected to the unit shall be detached before removing the fitting.

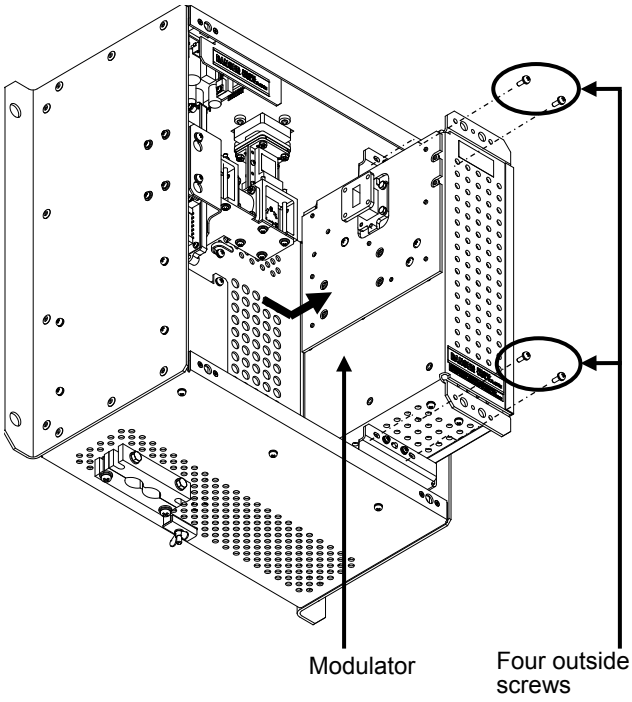
Transmitter-receiver unit after the cover is removed

2 Demount the modulator.



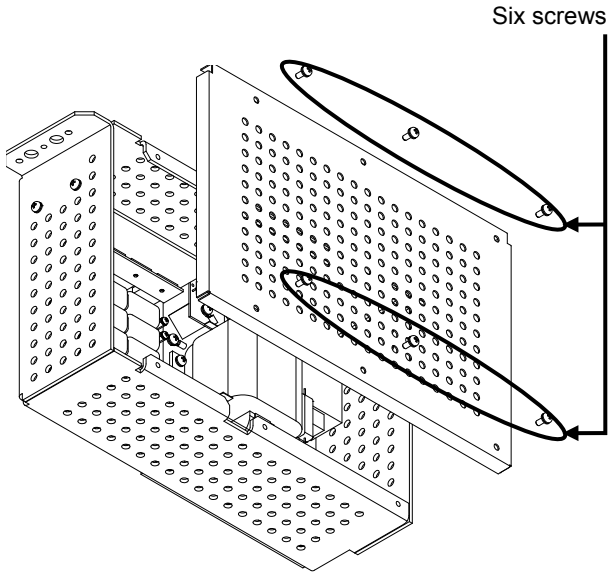
Loosen the upset head bolt (M4×12) and slide down the fastening fitting to remove it.

Loosen the inside screws of the modulator at four positions.
(Removing the outside screws makes it possible to slide the modulator.)

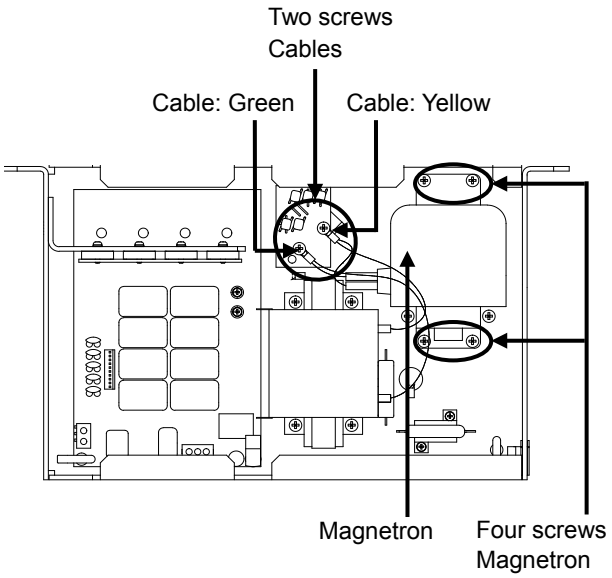


Loosen the outside screws (M4×12) at four positions and slide the modulator to the right to remove it.

3 Replace the magnetron.



Loosen the screws (M4×10) at six positions and remove the modulator cover.



Modulator after the cover is removed

Remove the screws (M4×12) holding the cables at two positions, and detach the cables.

⚠ Use a shielded screwdriver for this work.
Contact with metal (tools) can cause performance degradation in the magnetron.

Remove the bolts (M4×12) holding the magnetron in place at four positions, and demount the metal fitting and magnetron.

Install a replacement magnetron by securing it in place with the metal fitting, and fix the cables in position.

Pay special attention to the positions to which the magnetron and pulse transformer cables (yellow and green) are fixed.

After replacing the magnetron, reassemble the unit by following the same steps in reverse order.
Do not forget to tighten the bolts and screws, and do not forget to reconnect the cables.

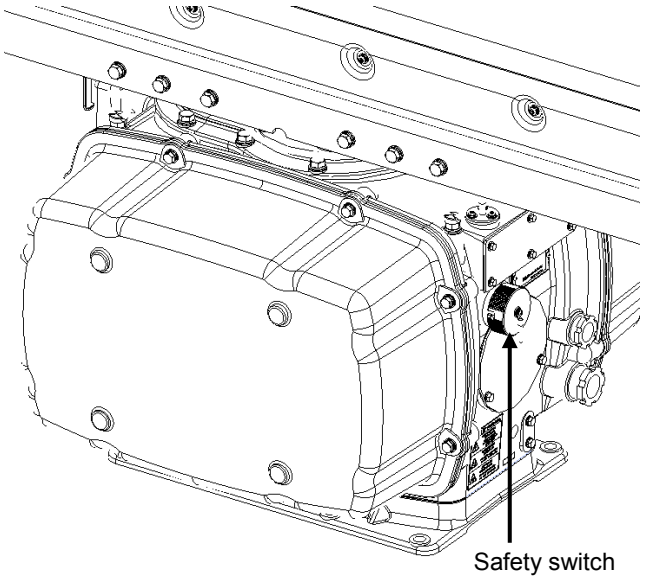
21.5.3 Replacing the motor

Note

Replacement of motor must be made by specialized service personnel.
For details, refer to Service Manual.
After replacement, connect the lead wire correctly.

21.5.3.1 Motor replacement procedure for radar antenna NKE-1130/1139

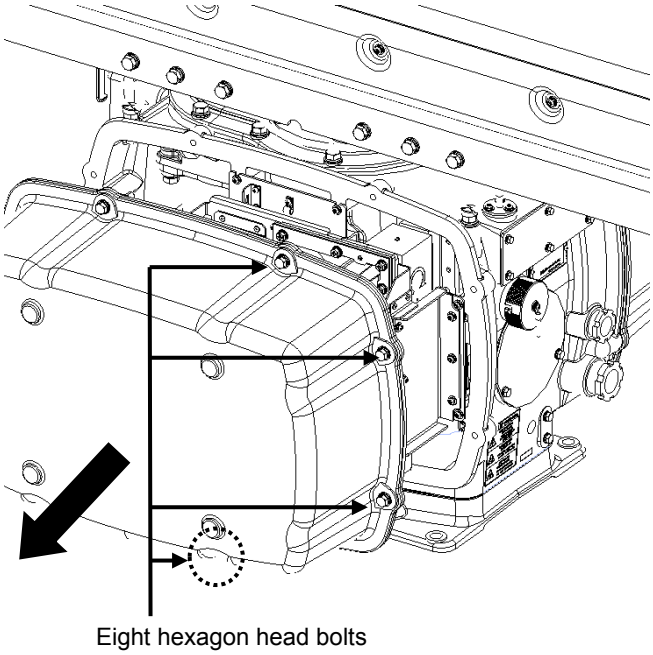
1 Turn Off the safety switch of the radar antenna.



⚠ When replacing a motor, ensure that the safety switch of the radar antenna is turned Off prior to commencing the replacement work.

The safety switch is located on the rear (stern) side of the radar antenna. Remove the cover and turn Off (to the lower side) the safety switch.

2 Remove the cover.

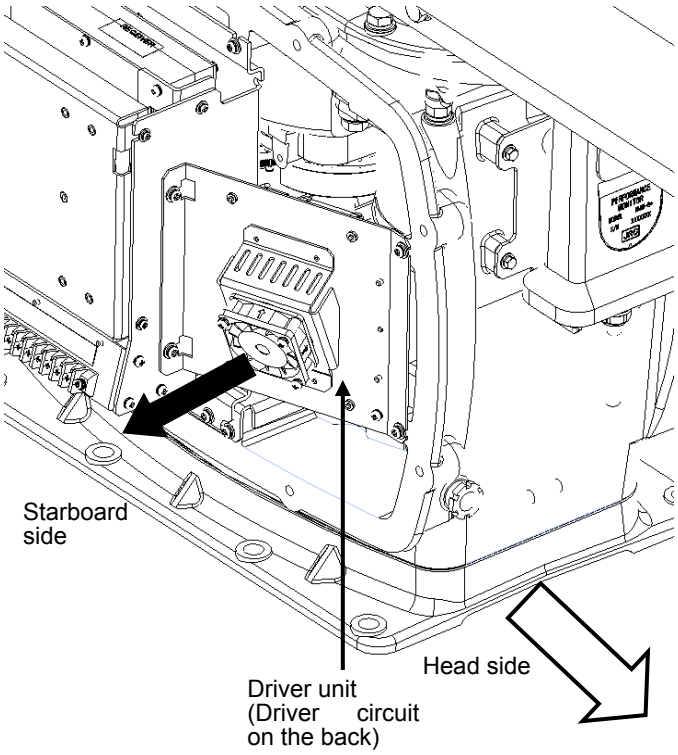


The motor is mounted on the front side (head side) of the radar antenna. Both left and right side covers need to be removed to carry out the motor replacement work.

The cover is secured in place with hexagon head bolts (M8, designed to be protected from falling out) at eight positions.

After removing the cover, place it in a safe area.
Exercise care to avoid dust or other foreign matters adhering to the packing.

3 Remove the motor cable.

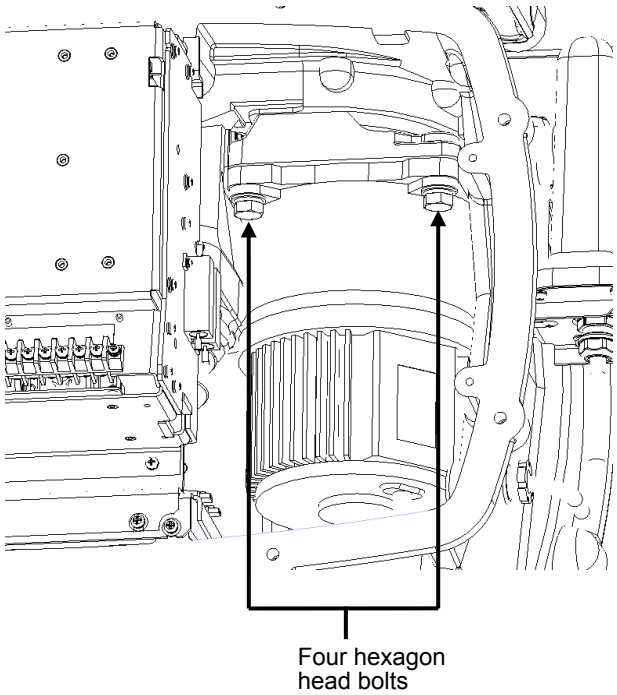


The motor driver unit is located on the right side (starboard side).

The motor driver is secured in place with screws (M5×12) at four positions.

Demount the motor driver unit and detach the motor cables connected to the driver circuit on the back of the driver unit.

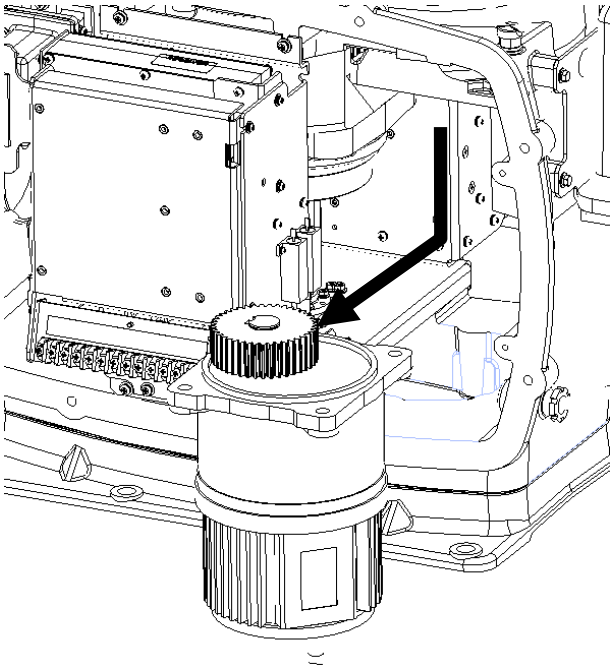
4 Replace the motor.



The motor is secured in place with hexagon head bolts (M10×40, SW10 and W10) at four positions.

Remove the four hexagon head bolts.

⚠ The weight of the motor is about 10 kg.
Use due caution when undertaking this procedure.



Remove the motor.

Apply grease to the gear wheel of the new motor.

Install the new motor in the radar antenna.

Fasten the hexagon head bolts with proper torque (380 kgf•cm) to ensure that none of the bolts is left without being tightened or tightened too loosely.

5 Connect the motor cables.

Connect each cable back to its original position on the motor driver circuit.

6 Install the cover.

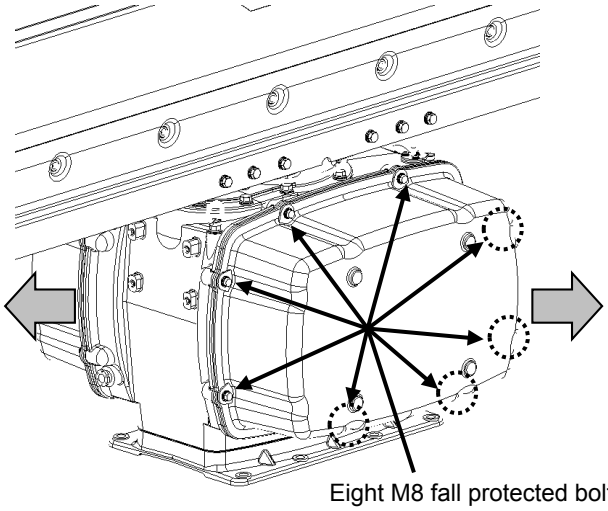
Before installing the cover on the radar antenna, check to confirm that there are no deformations, cracks or other abnormalities in the packing of the cover. Remove any foreign matters, dust or other contaminants if found.

Leaving any hexagon head bolts without tightened, or tightening them too loosely, may result in the waterproof performance of the radar antenna being adversely affected. Fasten the hexagon head bolts with proper torque to ensure that none of the bolts is left without being tightened or tightened too loosely.

When the motor replacement is complete, turn on the safety switch of the radar antenna and check if the equipment operates properly.

21.5.3.2 Motor replacement procedure for NKE-1632

1 Remove the cover.



Eight M8 fall protected bolts

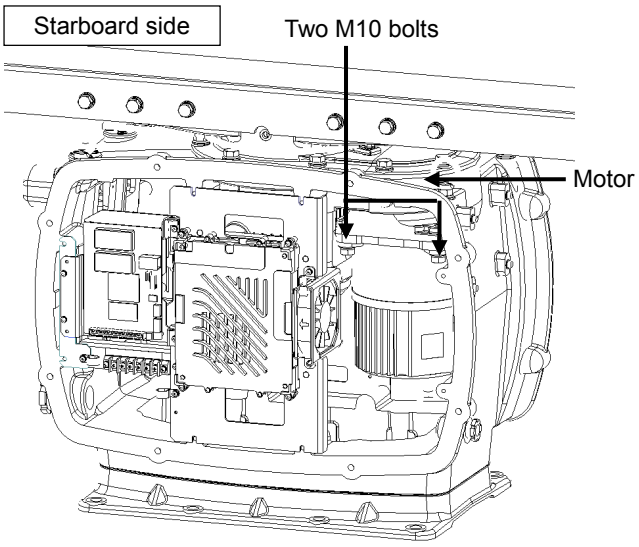
⚠ When replacing a motor, ensure that the safety switch of the radar antenna is turned Off prior to commencing the replacement work.

⚠ Exercise care not to lose bolts, screws and other parts removed from the radar antenna, as they will be used again in later steps.

Both left and right side covers need to be removed to carry out the motor replacement work.

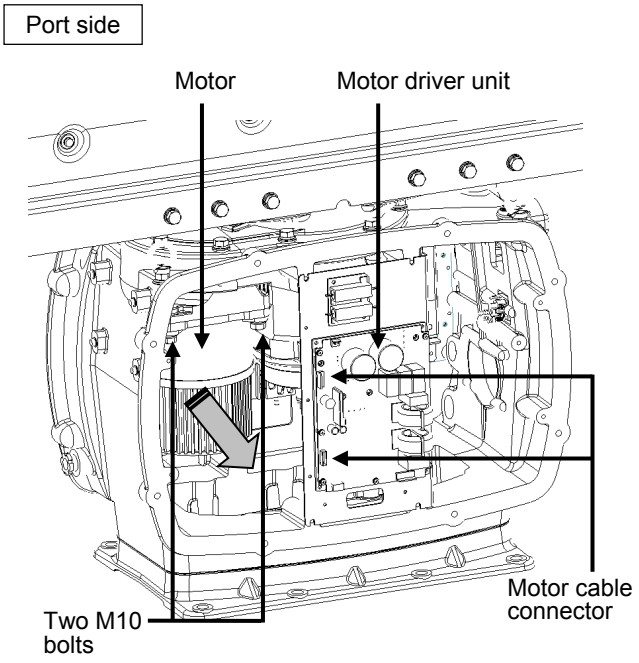
Loosen the M8 bolts designed to be protected from falling out at eight positions, and remove the cover.

2 Replace the motor.



[Starboard side]
Unscrew the M10 bolts at two positions.

[Port side]
Detach the motor cables connected to the motor driver.



Remove the M10 bolts at two positions and pull the motor carefully to demount it.

Apply grease to the gear wheel of the replacement motor prior to installation.

Install the new motor in the radar antenna.

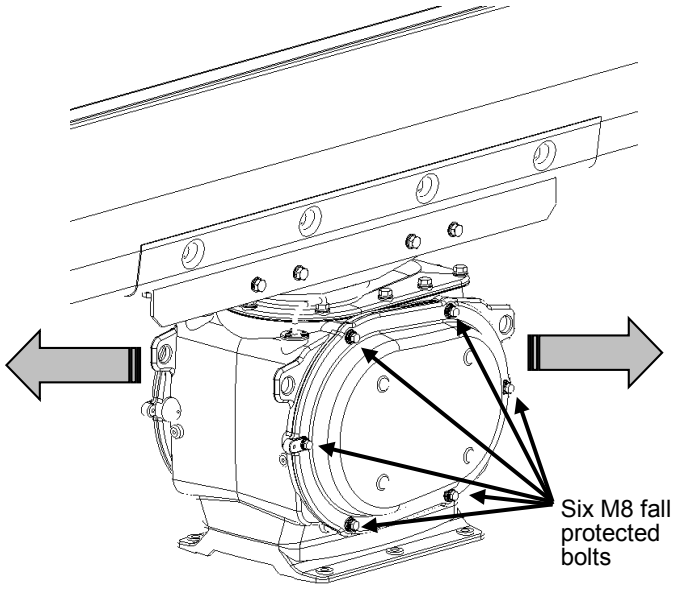
Fasten the hexagon head bolts with proper torque (380 kgf•cm) to ensure that none of the bolts is left without being tightened or tightened too loosely.

Install the cover by following the same steps in reverse order.

Turn On the safety switch and confirm if the equipment operates properly.

21.5.3.3 Motor replacement procedure for radar antenna NKE-2632/ NKE-2632-H

1 Remove the cover.



⚠ When replacing a motor, ensure that the safety switch of the radar antenna is turned Off prior to commencing the replacement work.

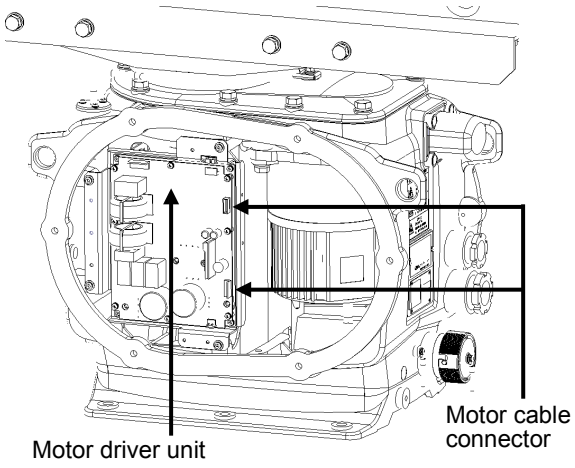
⚠ Exercise care not to lose bolts, screws and other **parts removed from the** radar antenna, as they will be used again in later steps.

Both left and right side covers need to be removed to carry out the motor replacement work.

Loosen the M8 bolts designed to be protected from falling out at six positions, and remove the cover.

2 (Port side) Detach the motor cable.

Port side

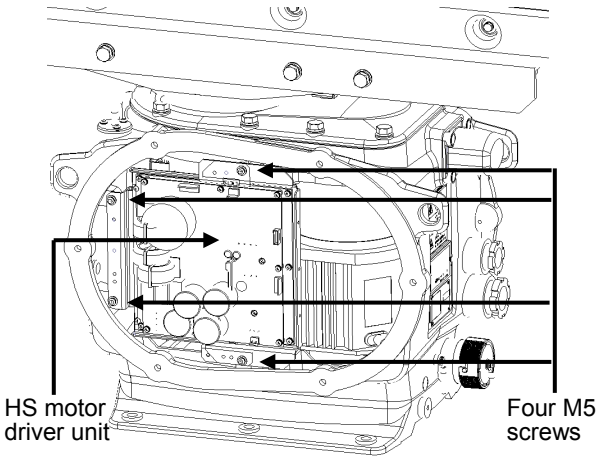


[Port side]

Detach the motor cables connected to the motor driver.

(Port side) Detach the motor cable. * In case of NKE-2632-H

Port side



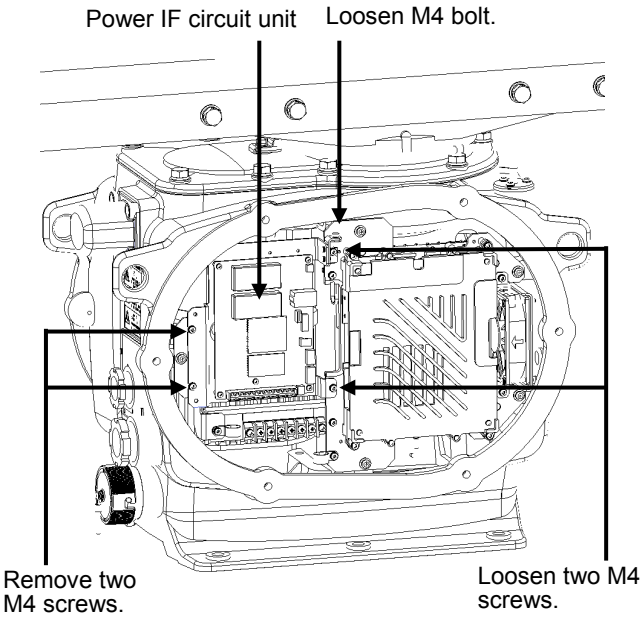
* In case of NKE-2632-H
Demount the HS motor driver unit.

[Port side]
Detach the cables connected to the HS motor driver unit.

Remove the M5 screws at four positions and demount the motor driver unit.

3 (Starboard side) Open the power IF circuit unit.

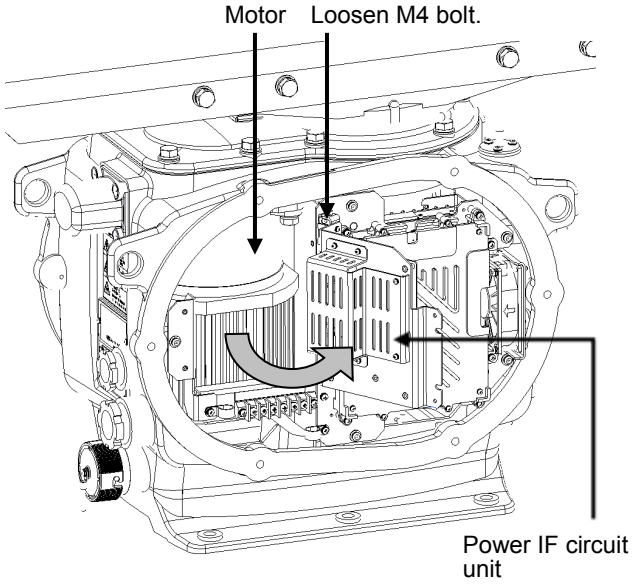
Starboard side



[Starboard side]

The power IF circuit unit can be opened to the near side by loosening the M4 bolts and two M4 screws while removing the other two M4 screws.

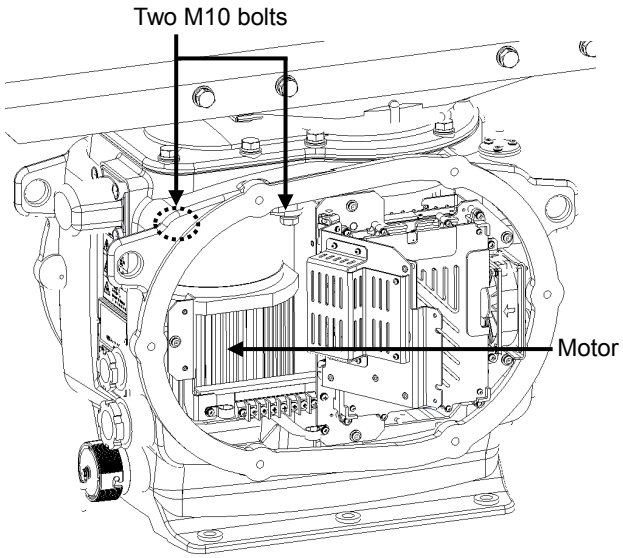
Starboard side



Loosen the M4 bolt and fix the power IF circuit unit with the unit open.

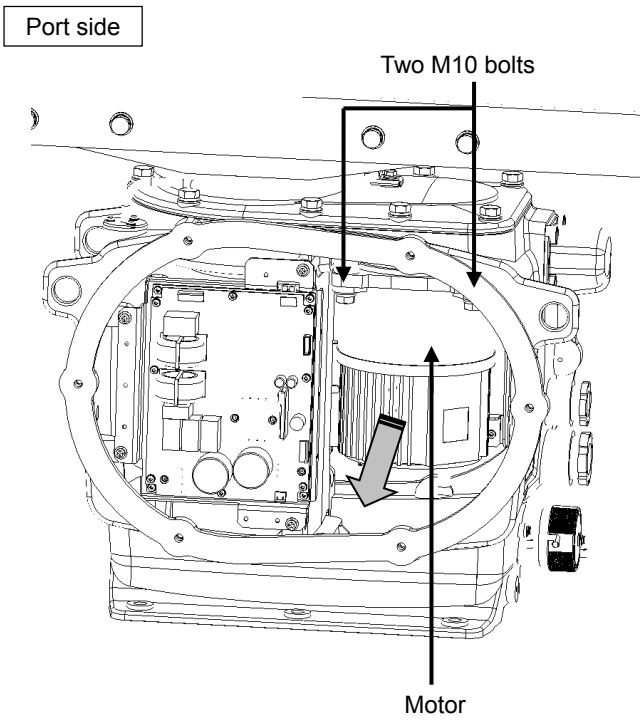
4 Replace the motor.

Starboard side



[Starboard side]

Remove the M10 bolts at two positions.



[Port side]

Remove the M10 bolts at two positions and pull the motor to demount it.

Apply grease to the gear wheel of the replacement motor prior to installation.

Install the new motor in the radar antenna.

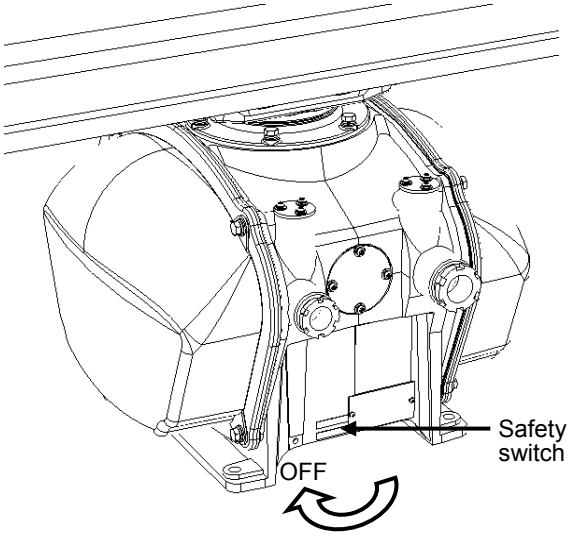
Fasten the hexagon head bolts with proper torque (380 kgf･cm) to ensure that none of the bolts is left without being tightened or tightened too loosely.

Install the cover by following the same steps in reverse order.

Turn On the safety switch and confirm if the equipment operates properly.

21.5.3.4 Motor replacement procedure for radar antenna NKE-1125/1129

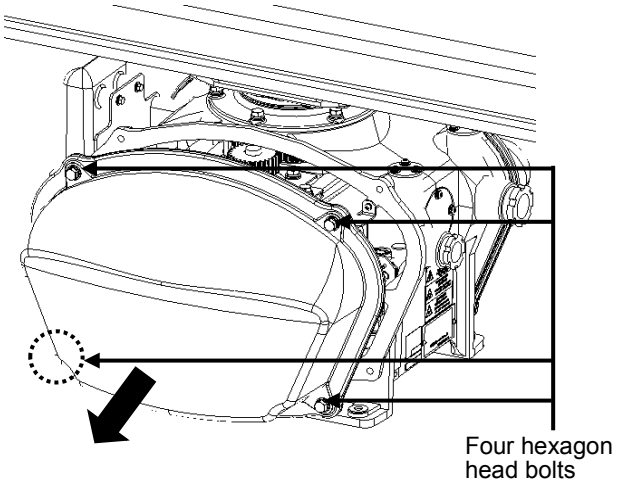
1 Turn Off the safety switch of the radar antenna.



⚠ When replacing a motor, ensure that the safety switch of the radar antenna is turned Off prior to commencing the replacement work.

Turn Off the safety switch located on the bottom of the stern side of the radar antenna.

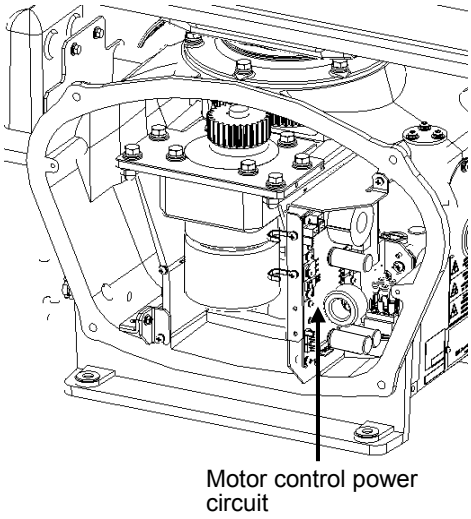
2 Remove the cover.



The motor is mounted on the left side (port side) of the radar antenna.
Remove the left side cover.
The cover is secured in place with hexagon head bolts (M8, designed to be protected from falling out) at four positions.

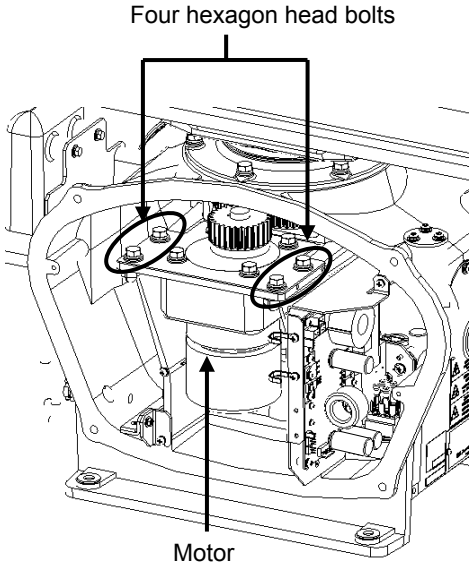
After removing the cover, place it in a safe area.
Exercise care to avoid dust or other foreign matters adhering to the packing.

3 Remove the cover.



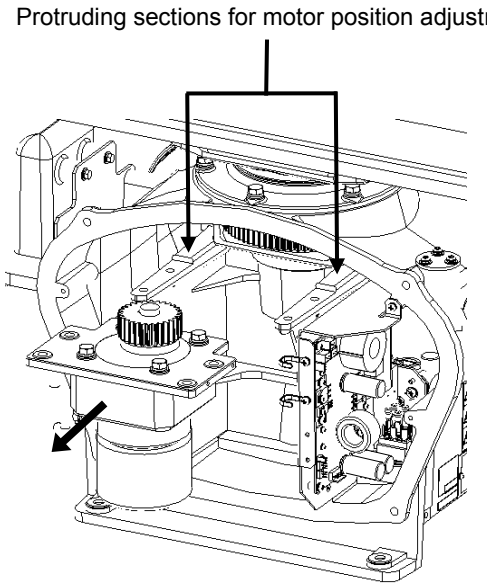
Detach the motor cables connected to the motor control power circuit.

4 Replace the motor.



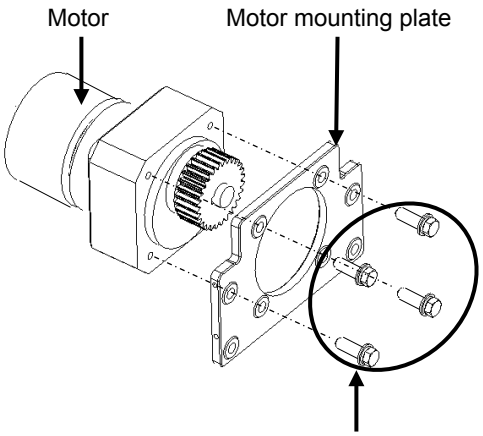
The motor is secured in place with hexagon head bolts (M8×20, SW + W assembled) at four positions.

Remove the four hexagon head bolts.



Demount the motor.

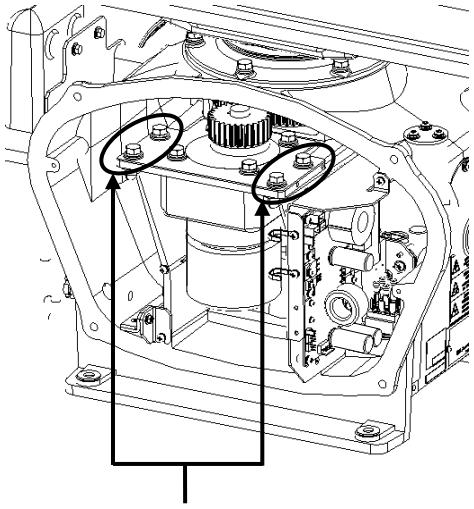
⚠ The weight of the motor is about 6 kg.
Use due caution when undertaking this procedure.



Set a mounting plate on a replacement motor.

Remove a motor mounting plate from the motor demounted from the radar antenna. The mounting plate is secured to the motor with stainless steel hexagon head bolts (M8×30, SW + W assembled) at four positions.

Attach the removed parts to the replacement motor.
Fasten the hexagon head bolts with proper torque (210 kgf•cm) to ensure that none of the bolts is left without being tightened or tightened too loosely.



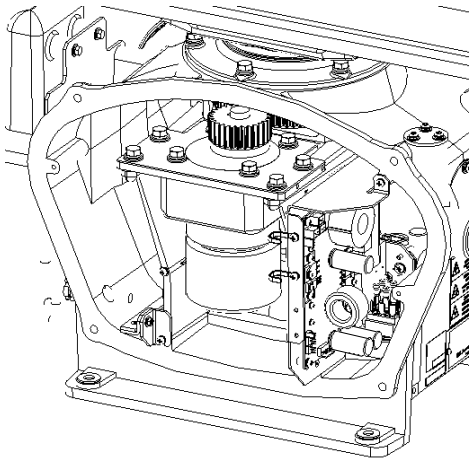
Install the motor in the radar antenna.

Press the motor against the mounting face of the motor-mounting arm projecting out from the cabinet, and secure it in place after making adjustment to minimize backlash.

Fasten the hexagon head bolts with proper torque (140 kgf•cm) to ensure that none of the bolts is left without being tightened or tightened too loosely.

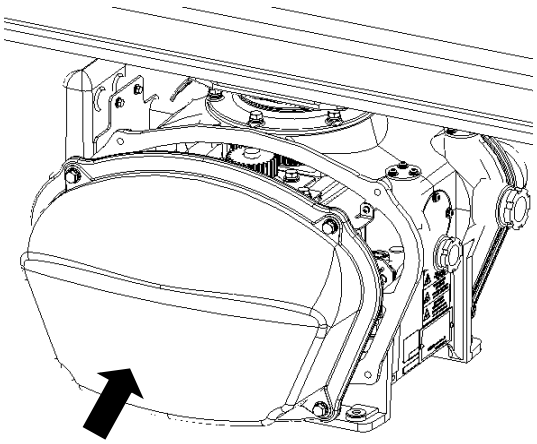
After installing the motor, apply grease to the gear wheel.

5 Connect the motor cables.



Connect each cable back to its original position on the motor control power circuit.

6 Install the cover.



Before installing the cover on the radar antenna, check to confirm that there are no deformations, cracks or other abnormalities in the packing of the cover.
Remove any foreign matters, dust or other contaminants if found.

Secure the cover in place with hexagon head bolts (M8) at four positions.

Leaving any hexagon head bolts without tightened, or tightening them too loosely, may result in the waterproof performance of the radar antenna being adversely affected. Fasten the hexagon head bolts with proper torque to ensure that none of the bolts is left without being tightened or tightened too loosely.

When the motor replacement is complete, turn on the safety switch of the radar antenna.

21.6 Software Update

This section describes software update of this equipment.

Note

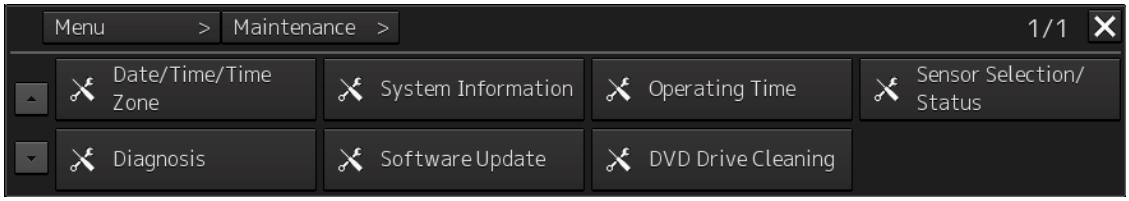
When software update starts, the tasks that are active are automatically terminated. Complete the necessary operation such as saving of settings prior to the start of update.

1 Set the CD/DVD or USB flash memory containing the update data.

2 Click on the [Menu] button on the left Toolbar.

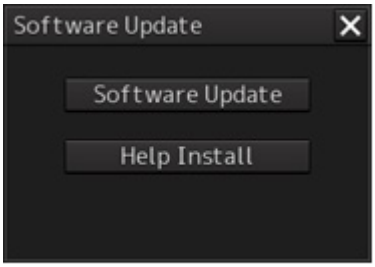
The menu is displayed.

3 Change over to the second page using the page switching button, and click [Maintenance] - [Software Update].

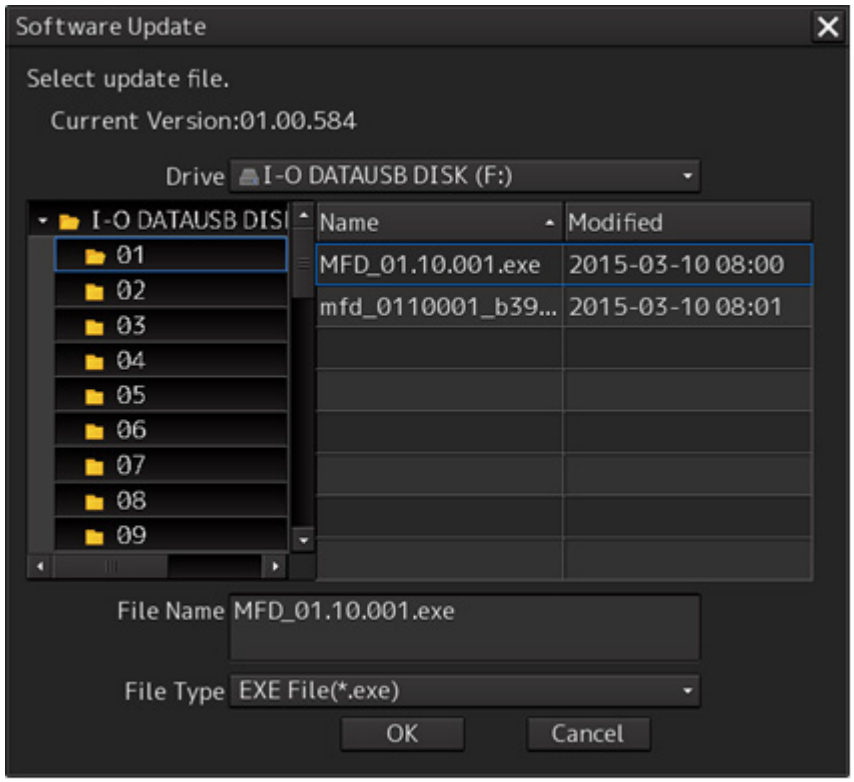


The "Software Update" dialog box appears.

4 Click on the [Software Update] button.



A file selection dialog box appears.



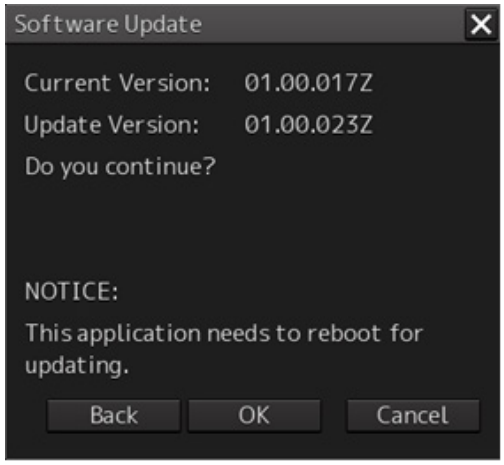
5 **From the [Drive] combo box, select the drive where the updating data is stored.**

6 **From the file list, select the file MFD_xx.xx.xxx.exe.**

MFD_xx.xx.xxx.exe is displayed in [File name].

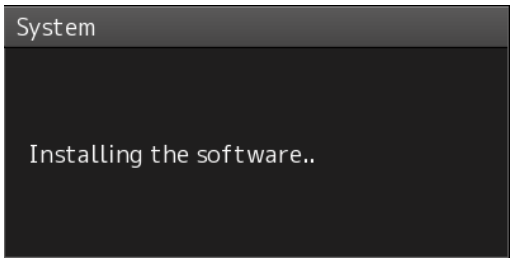
7 **Click the "OK" button.**

The update content confirmation dialog box appears.



8 Confirm the contents and click "OK".

Installation of the update is started and the following screen is displayed.



Wait for some time until the installation is completed.

> **Note**
> This equipment may restart during installation.

At completion of installation, the following screen is displayed.

9 Switch OFF the power supply of this equipment.

10 Restart this equipment.

11 Start MFD, and confirm that the software version number has been updated in the [Software] tab by selecting [Maintenance] - [System Information].

21.7 Updating Help Data

This section describes updating of help data of this product.

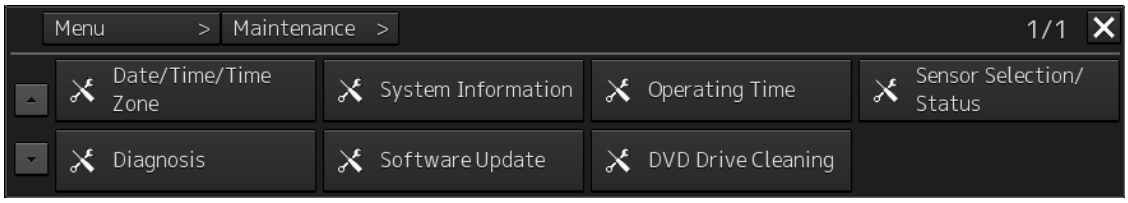
Note

- Help data is classified to the data for RADAR, data for ECDIS, and data for Conning Display. To display help information on each of the RADAR screen, ECDIS screen, and Conning Display screen, install the help data for each display.
- When Help update starts, currently active tasks are terminated automatically. Complete the necessary operations, such as saving the settings, before the start of update.

1 Set the CD/DVD or USB memory where update data is stored.

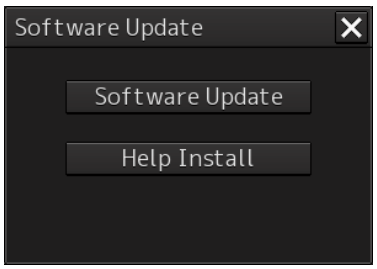
2 Click the [Menu] button on the Left Tool Bar.
A menu is displayed.

3 Switch the page to the 2nd page by using the page switching button and click [Maintenance] - [Software Update].

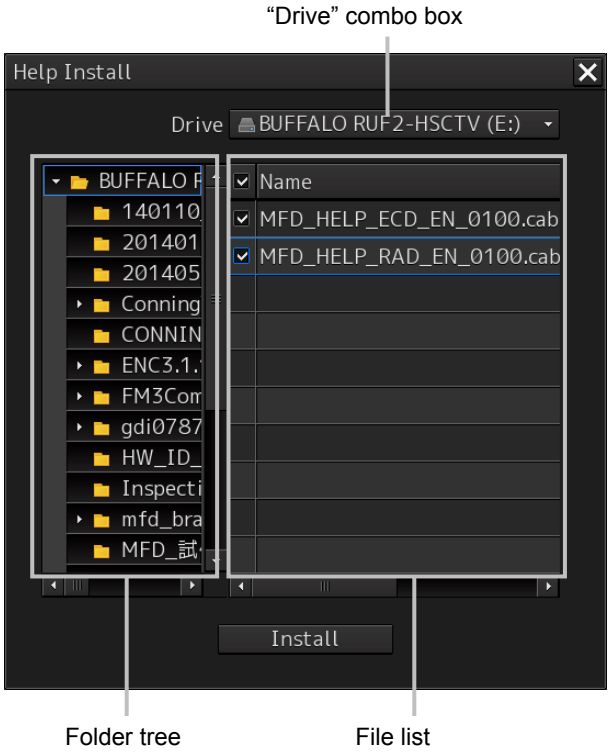


The “Software Update” dialog is displayed.

4 Click the [Help Install] button.



A file selection dialog is displayed.

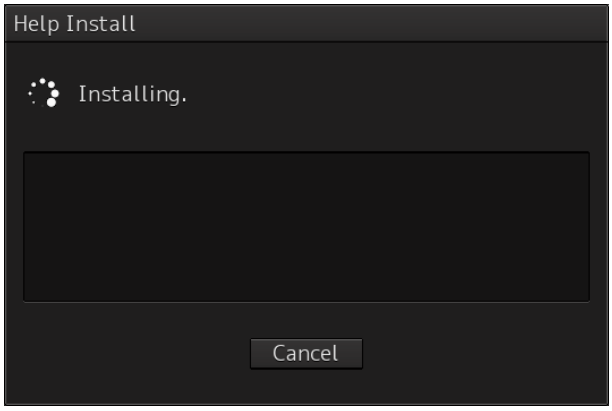


5 **Select the drive containing update data from the [Drive] combo box.**

6 **Select the folder containing update data from the folder tree and check the file to be updated from the file list.**

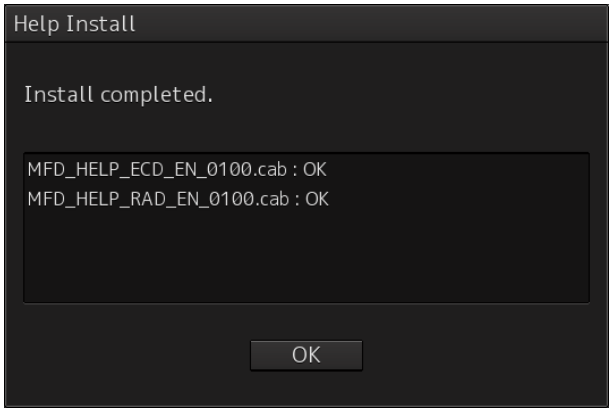
7 **Click the [Install] button.**

Installation starts and the following screen is displayed.



Wait until installation is completed.

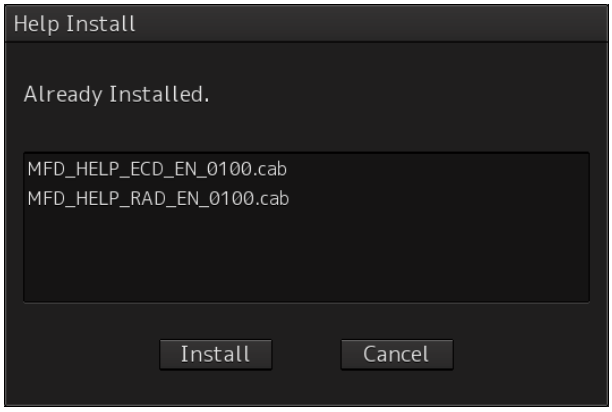
When installation is completed, the following screen is displayed.



8 Click the [OK] button.

Memo

- When the [Cancel] button is clicked during installation, installation of subsequent files is cancelled after the installation of the file that is currently being installed is completed.
- When the selected update file already exists, the following screen is displayed.



End the operation by clicking on the [Cancel] button.

21.8 Data Backup/Restore

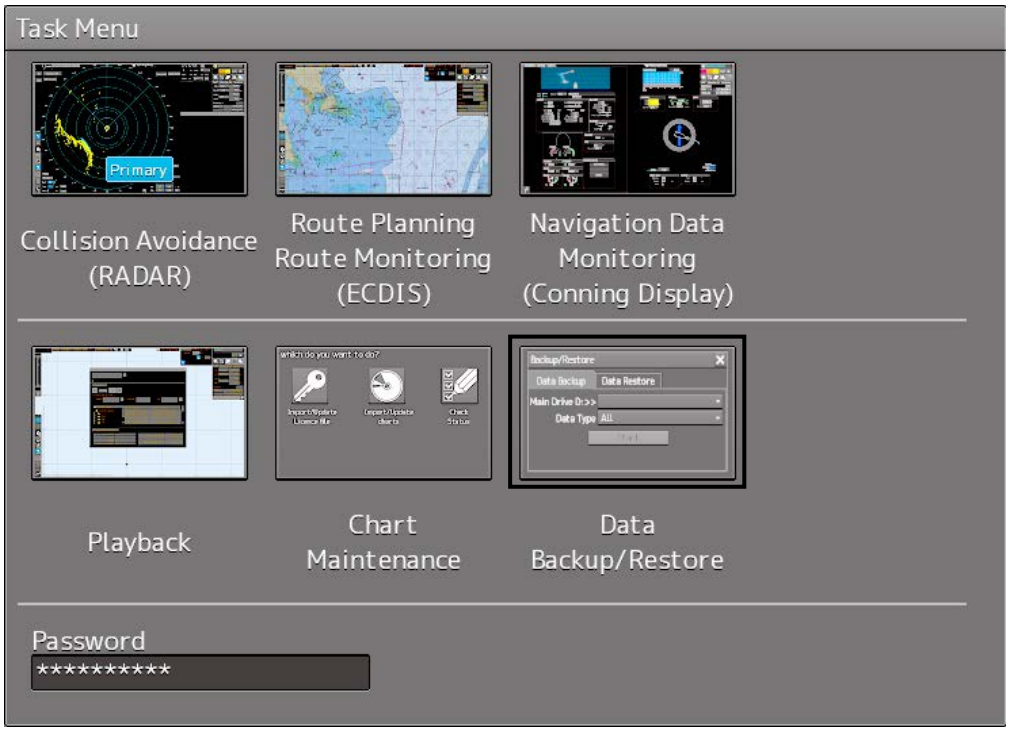
⚠CAUTION	
	Do not turn off the power supply during backup/restore. Otherwise, a function fault occurs, leading to the possibility of an accident.
	Do not back up data during sailing. To start backup data, the radar application must be terminated. Otherwise, observation using a radar is disabled, leading to the possibility of an accident.

21.8.1 Backing up data

To maintain customer data, back up the data regularly by using the following procedure.
Connect an external medium such as USB memory for backup.

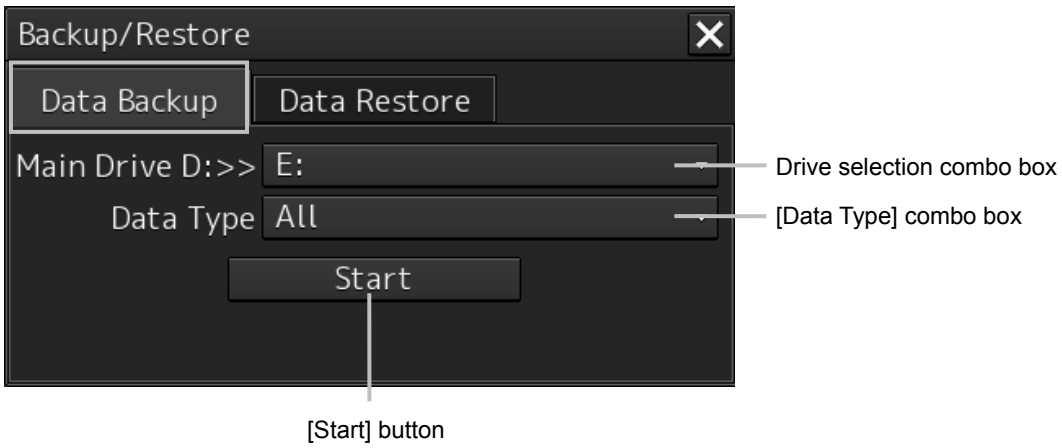
1 **Press the Power supply button of the operation unit.**
The power supply button is lit. Then, the task menu is displayed.

2 **Click on the [Data Backup/Restore] button in the task menu.**



The "Backup/Restore" dialog is displayed.

3 **Click on the [Data Backup] tab.**



4 **Select a drive of the data backup destination from the drive selection combo box.**

5 **Select the type of the data to be backed up in the [Data Type] combo box.**

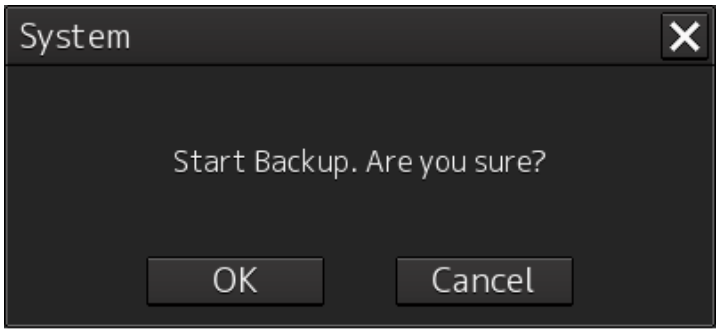
All: The entire user data is backed up.

Except Charts: The user data excluding chart data is backed up.

> **Note**
>
> When All is selected and there are many charts, backup operation may require a long period of time.

6 **Click on the [Start] button.**

A confirmation dialog is displayed.



7 **Click on the [OK] button.**

Copying of data to the backup destination that is selected in the drive selection combo box starts.

> **Note**
>
> Do not perform any other operations until backup is completed. Otherwise, backup may fail.

21.8.2 Restoring backed up data

Use the following procedure to restore backed up data into this equipment.
Connect the external medium (USB memory, etc.) in which backup data has been saved.

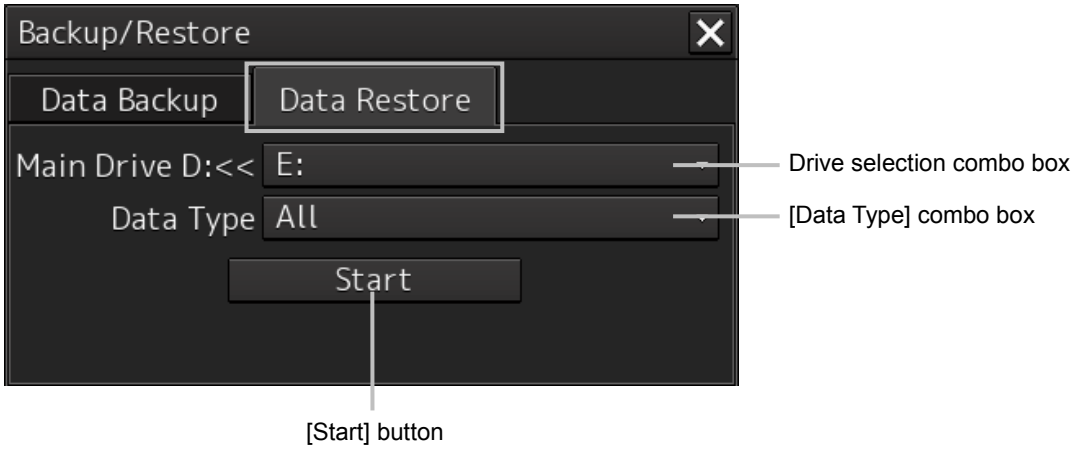
1 Press the power supply button of the operation unit.

The power supply button is lit. Then the task menu is displayed.

2 Click on the [Data Backup/Restore] button in the task menu.

The "Backup/Restore" dialog is displayed.

3 Click on the [Data Restore] tab.



4 Select the drive in which backup data has been saved from the drive selection combo box.

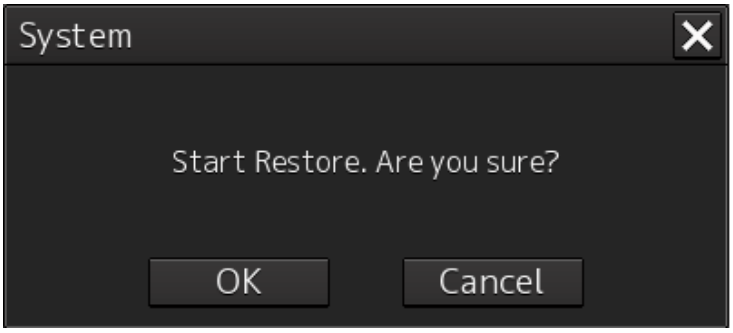
5 Select the type of the data to be restored in the [Data Type] combo box.

All: The entire user data is restored.

Except Charts: The user data excluding chart data is restored.

6 Click on the [Start] button.

A confirmation dialog is displayed.



7 Click on the [OK] button.

Restoration of data from the drive that was selected from the drive selection combo box to the hard disk of this equipment starts.

If data already exists in the hard disk, an overwriting confirmation dialog is displayed.

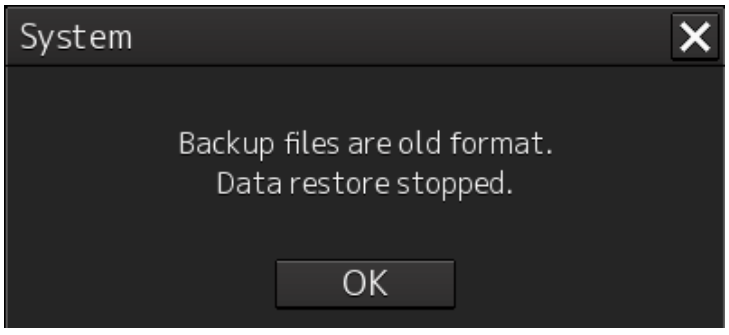
To start restoration, click the [OK] button.

Note

- Do not perform any operation until restoration is completed. If some operation is performed, restoration may fail.
- If backup is executed while enough free space is not available in the USB memory, the “Error” message is displayed. Secure free space before executing backup. For the size of the data to be backed up, check the “Usage” column in the “File Information” list in “19.4.2 Managing storage”. (For instance, when the AVCS chart for the entire world is installed, the size will be about 11GB.)

Memo

If the data to be restored is incompatible with this equipment, the following dialog is displayed and data is not restored.



Cancel the task by clicking on the [OK] button.

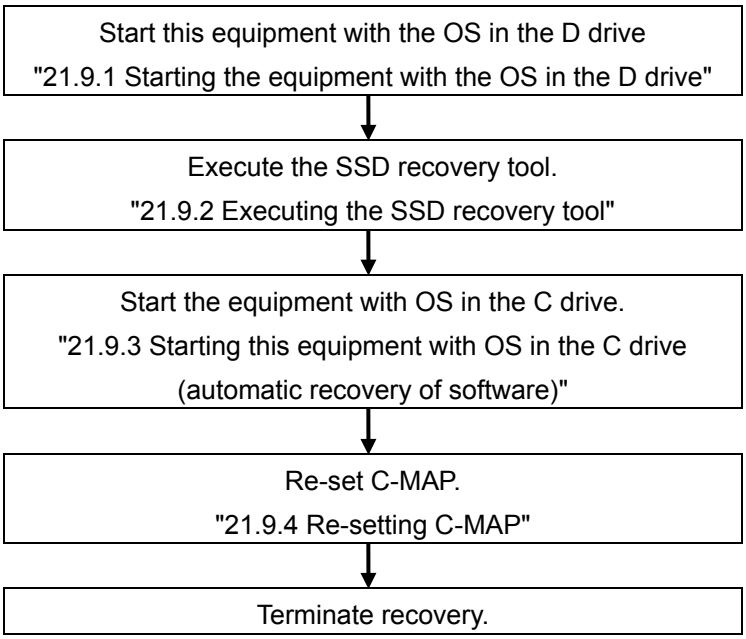
21.9 Recovery of the Images in the C Drive

⚠CAUTION	
	The backup power supply (DC power supply, etc.) of the equipment must be connected when recovery of the C drive image is performed. If the power supply stops during recovery, an accident may occur.
	Do not turn off the power supply during recovery of the C drive image. Otherwise, equipment malfunction occurs, possibly causing an accident.

The operating system (OS) of this equipment runs on the C drive.
The contents of the C drive including the images are stored in the D drive.
When the OS operation on the C drive becomes unstable, the images in the C drive can be written back from the D drive.

Note
When the images in the C drive are written back, the information relating to C-MAP is cleared. After writing back of images, re-register the database and license of C-MAP and perform update as required.

The flow of writing back of images in the C drive is as follows.

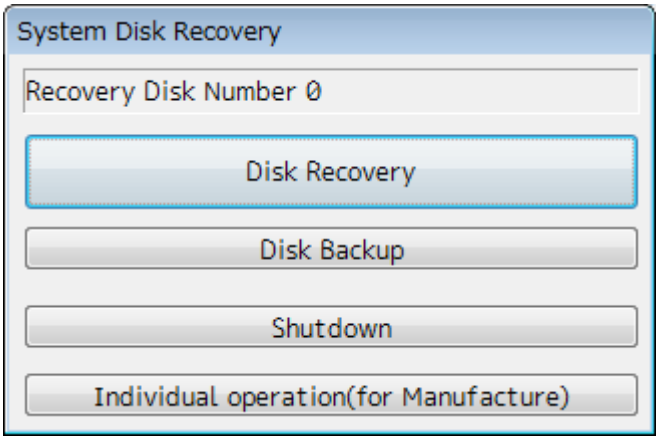


21.9.1 Starting the equipment with the OS in the D drive

Start this equipment with OS in the D drive by using the following procedure.

1 **Turn on the power supply of this equipment while pressing the [SILENCE] key and the [ZOOM OUT] key of the trackball operation unit simultaneously. The power is supplied to this equipment.**

When the equipment starts, the following screen is displayed.



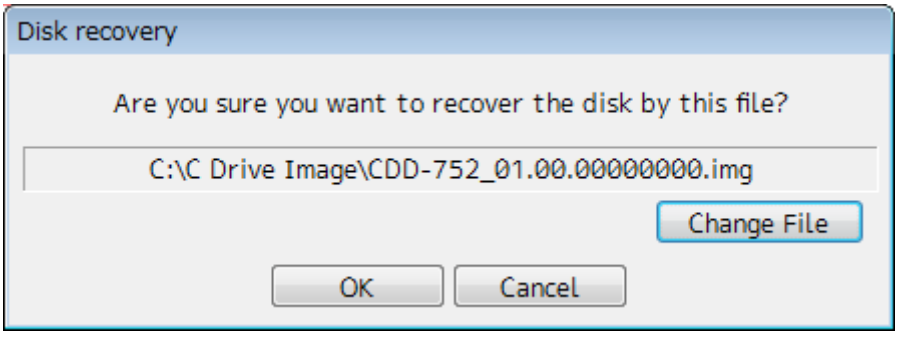
The SSD recovery tool can be executed in this state.

21.9.2 Executing the SSD recovery tool

Write back the images in the C drive by executing the SSD recovery tool.

1 **Click on the [Disk Recovery] button on the screen that is displayed at activation from the D drive.**

The following screen is displayed.



2 **Select an image file to be written back to the C drive.**

Normally, proceed with the next step with the image file that is currently displayed.

To specify a different image file, select a required image file from the list that is displayed by clicking on the [Change File] button.

Note

Since the equipment is started from the D drive, the usual C drive is displayed as the D drive and the usual D drive is displayed as C drive. Therefore, note this point when selecting an image file.

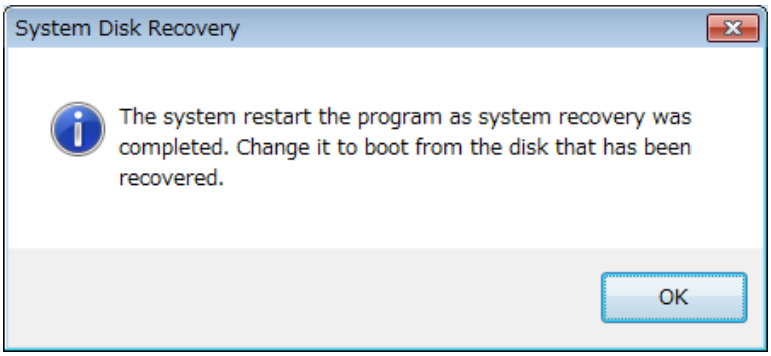
3 **Click on the [OK] button.**

Image file write-back operation starts.

Note

Do not perform any operation until write-back operation is completed. If any operation is performed, the image write-back operation may fail.

At termination of recovery, the following screen is displayed.



21.9.3 Starting the equipment with the OS in the C drive (Software automatic recovery)

Start this equipment with the OS that is written back to the C drive.

1 **Click on the [OK] button on the screen that is displayed at termination of write-back operation.**

The equipment starts from the C drive and, at the same time, the applications and various OS settings on the C drive are recovered automatically.

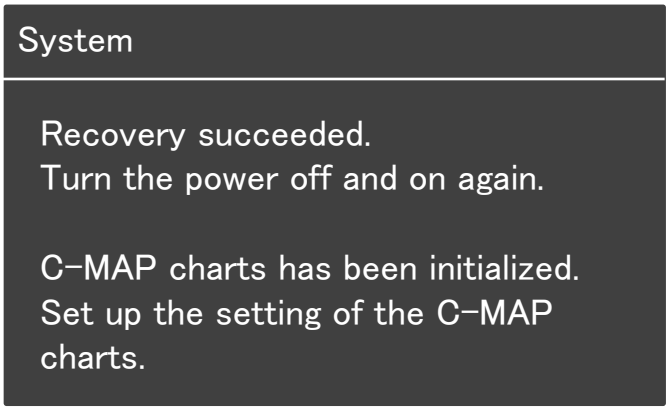
When recovery starts, the following screen is displayed for several seconds.

Note

This equipment restarts during the recovery operation. Do not perform any other operations until the recovery is completed.

Otherwise, recovery may fail, possibly causing an accident.

After completion of recovery, the following screen is displayed.



2 Turn off the power supply of this equipment by pressing the power button of the operation unit.

21.9.4 Re-setting C-MAP

Re-set the settings of C-MAP by restarting this equipment.
Re-register the database and the license.
Update as required.

Section 22 Failures and After-Sale Services

22.1 Failure Detection

Semiconductor circuits can be considered to be almost free from defective semiconductors and/or performance deterioration except when there are design and inspection errors, or external and human induced causes. Generally, the causes of comparably frequent failures include line disconnection due to humidity of the high resistor, failure of the variable resistor as well as contact failures of switches and relays.
In addition to faulty parts, faulty adjustments (especially faulty tuning) or faulty maintenance (especially faulty cable contact) occasionally make up causes of failures; thus, it is effective to reinspect or readjust these items.

22.1.1 About alerts

Failures can be detected from alerts.
For details on alerts, please refer to "Appendix B, Alert List."

22.1.2 Alert description

For a description of alerts to be displayed, please refer to "Appendix B, Alert List."

22.1.3 S-57/63 chart related error message list

For more information about error messages that are displayed when the S-57/63 charts are imported and updated on the ECDIS, please refer to "Reference Data 1: Notes on Alert Information of the S-57/63 Charts" in the Instruction Manual provided separately from charts.

22.1.4 ARCS chart related error message list

For more information about error messages that are displayed when the ARCS charts are displayed, please refer to "Reference Data 2: Notes on Alert Information of the ARCS Charts" in the Instruction Manual provided separately from charts.

22.1.5 Fuse inspection

Because there is a specific cause for any fuse meltdown, it is necessary to check the related circuits even if there is no abnormality after changing a fuse. However, please give consideration that the fuse meltdown characteristics vary significantly. The following table shows a list of the fuses used in this unit.

List of Fuses Used

Fuse Name	Name of Model Used	Placement Location	Count	Part Spec.	Change Kit Model Name
Blade fuse (Auto fuse)	NBD-913	Power supply unit	2	32VDC 15A part	1015(5ZFCK00008)
Blade (mini) fuse (Auto fuse)	NQE-1143	JB	1	32VDC 15A part	1215(5ZFCK00017)
Blade (mini) fuse (Auto fuse)			2	32VDC 3A part	1203(5ZFCK00016)
Glass fuse			4	250V 0.5A part	MF51NR 250V 0.5(5ZFGD00019)

22.2 Countermeasures for Failures

Because radar equipment is composed of complex circuits, please ask a qualified technician for repair or instructions regarding countermeasures in case of failure.
Note that failures may be caused by the following causes, so check them during inspection or repair of failure.

- Contact failure in terminal blocks of cables between equipment
    a) Contact failure in terminal blocks
    b) Cable terminal treatment failure - In contact with other grounded terminal
    c) Cable disconnection
- Contact failure of connectors inside equipment

22.2.1 Special parts

[I] NKE-1125/2254 (JMR-9225-6X/6XH/9X)

Part No.	Item Name	Model Name	Manufacturer	Location of Use	Code
V101	Magnetron	M1568BS	New Japan Radio	Radar antenna	5VMAA00106
A101/A102	Circulator	NJC3901M	New Japan Radio	Radar antenna	5AJBV00007
A103	Dummy	NJC4002	New Japan Radio	Radar antenna	5ANDF00001
A104	Filter	NJC9952	New Japan Radio	Radar antenna	5AWAX00002
A301	Diode limiter	NJS6930	New Japan Radio	Radar antenna	5ATBT00006

[II] NTG-3225 (JMR-9225-7X3/9X3)

Part No.	Item Name	Model Name	Manufacturer	Location of Use	Code
V101	Magnetron	M1568BS	New Japan Radio	Transmitter-receiver	5VMAA00106
A101/A102	Circulator	NJC3901M	New Japan Radio	Transmitter-receiver	5AJBV00007
A103	Dummy	NJC4002	New Japan Radio	Transmitter-receiver	5ANDF00001
A104	Filter	NJC9952	New Japan Radio	Transmitter-receiver	5AWAX00002
A301	Diode limiter	NJS6930	New Japan Radio	Transmitter-receiver	5ATBT00006
A302	PIN attenuator	NJS6926	New Japan Radio	Transmitter-receiver	5ATBT00007

[III] NKE-1130 (JMR-9230-S)

Part No.	Item Name	Model Name	Manufacturer	Location of Use	Code
V101	Magnetron	M1555	New Japan Radio	Radar antenna	5VMAA00104
A101	Circulator	NJC3316	New Japan Radio	Radar antenna	5AJBV00008
A301	Diode limiter	NJS6318	New Japan Radio	Radar antenna	5ATBT00005

[IV] NTG-3230 (JMR-9230-S3)

Part No.	Item Name	Model Name	Manufacturer	Location of Use	Code
V101	Magnetron	M1555	New Japan Radio	Transmitter-receiver	5VMAA00104
A101	Circulator	NJC3317	New Japan Radio	Transmitter-receiver	5AJBV00009
A301	TR limiter	TL378A	New Japan Radio	Transmitter-receiver	5VLAA00037

[V] NKE-2103-6/6HS (JMR-9210-6X/6XH)

Part No.	Item Name	Model Name	Manufacturer	Location of Use	Code
V101	Magnetron	MAF1565N	New Japan Radio	Radar antenna	5VMAA00102
A101/A102	Circulator	FCX68R	Orient Microwave	Radar antenna	5AJIX00027
A103	Dummy	NJC4002	New Japan Radio	Radar antenna	5ANDF00001
A104	Filter	NJC9952	New Japan Radio	Radar antenna	5AWAX00002
A301	Diode limiter	NJS6930	New Japan Radio	Radar antenna	5ATBT00006

22.2.2 Repair circuit block

Repair Circuit Block (JMR-9225-6X/9X)

Location	Circuit Block Name	Model Name	Remarks
Radar antenna	Geared motor	MDBW10822*	Common to 100/220VAC * indicates a revision such as A and B.
	Encoder circuit	CHT-71A	
	Motor driver circuit	H-7EPRD0034*	For 220VAC * indicates a revision such as A and B.
	Motor driver circuit	H-7EPRD0035*	For 100VAC * indicates a revision such as A and B.
	Brake circuit	CFA-253	
	Brake control circuit	CCB-655	
	Brake circuit unit	NZR-16	Including the CFA-259/260
	Performance monitor	NJU-85	
	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-550-1	Including the CPA-264 Including the CMB-404 Including the CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-162A	Including the CMA-866A
	Power supply circuit	CBD-1682A	
	Relay filter circuit	CSC-656	
	Fan	H-7BFRD0002	
Display	Display unit	NWZ-208	26-inch
	26-inch MNU replacement FAN kit	H-7ZYNA4005	Incorporated into NWZ-208
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	

Location	Circuit Block Name	Model Name	Remarks
Display	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	Incorporated into NCE-5625
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair Circuit Block (JMR-9225-7X3/9X3)

Location	Circuit Block Name	Model Name	Remarks
Radar antenna	Geared motor	MDBW10822*	Common to 100/220VAC * indicates a revision such as A and B.
	Encoder circuit	CHT-71A	
	Motor driver circuit	H-7EPRD0034*	For 220VAC * indicates a revision such as A and B.
	Motor driver circuit	H-7EPRD0035*	For 100VAC * indicates a revision such as A and B.
	Brake circuit	CFA-253	
	Brake control circuit	CCB-655	
	Brake circuit unit	NZR-15	Including the CFA-259/260
	Performance monitor	NJU-85	
Transmitter-receiver	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-552-1	Including the CPA-264 Including the CMB-404 Including the CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-162A	Including the CMA-866A
	Power supply circuit	CBD-1682A	
	Relay filter circuit	CSC-656	
Display	Display unit	NWZ-208	26-inch
	26-inch MNU replacement FAN kit	H-7ZYNA4005	Incorporated into NWZ-208
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	Incorporated into NCE-5625
	ϕ22 button	MPHD30459	

Location	Circuit Block Name	Model Name	Remarks
Display	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-9230-S)

Location	Circuit Block Name	Model Name	Remarks
Radar antenna	Geared motor	MDBW10823*	Common to 100/220VAC * indicates a revision such as A and B.
	Encoder circuit	CHT-71A	
	Motor driver circuit	H-7EPRD0034*	For 220VAC * indicates a revision such as A and B.
	Motor driver circuit	H-7EPRD0035*	For 100VAC * indicates a revision such as A and B.
	Brake circuit	CFA-225	
	Brake control circuit	CCB-655	
	Brake circuit unit	NZR-17	Including the CFA-261/262
	Performance monitor	NJU-84	
	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-551-1	Including the CPA-264 Including the CMB-406 Including the CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-229	Including the CAF-595/CAE-499
	Power supply circuit	CBD-1682A	
	Relay filter circuit	CSC-656	
	Fan	H-7BFRD0002	
Display	Display unit	NWZ-208	26-inch
	26-inch MNU replacement FAN kit	H-7ZYNA4005	Incorporated into NWZ-208
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	

Location	Circuit Block Name	Model Name	Remarks
Display	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-9230-S3)

Location	Circuit Block Name	Model Name	Remarks
Radar antenna	Geared motor	MDBW10823*	Common to 100/220VAC * indicates a revision such as A and B.
	Encoder circuit	CHT-71A	
	Motor driver circuit	H-7EPRD0034*	For 220VAC * indicates a revision such as A and B.
	Motor driver circuit	H-7EPRD0035*	For 100VAC * indicates a revision such as A and B.
	Brake circuit	CFA-255	
	Brake control circuit	CCB-655	
	Brake circuit unit	NZR-17	Including the CFA-261/262
	Performance monitor	NJU-84	
Transmitter-receiver	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-553-1	Including the CPA-264 Including the CMB-407 Including the CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-229	
	Power supply circuit	CBD-1682A	
	Relay filter circuit	CSC-656	
Display	Display unit	NWZ-208	26-inch
	26-inch MNU replacement FAN kit	H-7ZYNA4005	Incorporated into NWZ-208
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated to NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	

Location	Circuit Block Name	Model Name	Remarks
Display	ϕ38 button	MPHD30460	Incorporated into NCE-5625
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (MR-9225-6XH)

Location	Circuit Block Name	Model Name	Remarks
Radar antenna	Geared motor	H-7BDRD0045A	DC brushless
	Encoder circuit	CHT-71A	
	Motor control circuit	CBD-1779	
	Brake circuit	CFA-257	
	Performance monitor	NJU-85	
	Heater control circuit	CHG-216	Option (100VAC)
	Power supply circuit	CBD-1682A	
	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-550-1	Including the CPA-264, CMB-404, CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-162A	Including the CMA-866A
	Fan	H-7BFRD0002	
Display	Display unit	NWZ-208	26-inch
	26-inch MNU replacement FAN kit	H-7ZYNA4005	Incorporated into NWZ-208
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated to NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair Circuit Block (JMR-9210-6X/6XH)

Location	Circuit Block Name	Model Name	Remarks
Radar antenna	Geared motor	7BDRD0048	DC brushless (common to HS)
	Modulation circuit	CME-363	Not including the magnetron
	Receiver	NRG-610	Including the CAE-529-1
	Power supply circuit	CBD-1783	
	Encoder circuit	CHT-71A	
	Motor control power supply circuit	CBD-1779	
	Brake circuit	CFA-252	
	Fan	H-7BFRD0002	
Display	Display unit	NWZ-208	26-inch
	26-inch MNU replacement FAN kit	H-7ZYNA4005	Incorporated into NWZ-208
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated to NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-9272-S)

Location	Circuit Block Name	Model Name	Remarks
Radar antenna	TRX module	CMN-797	
	Signal processing unit	NDC-4920	
	Power supply/interface circuit	CMP-493	
	Encoder	CHT-85	
	Fan	109L0912S410	
	Motor driver circuit	CBD-1949	Common to AC100/220V
	Motor with gear	MDBW10823*	Common to AC100/220V * indicates a revision such as A and B.
Display	Display unit	NWZ-208	26-inch
	26-inch MNU replacement FAN kit	H-7ZYNA4005	Incorporated into NWZ-208
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated to NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-9282-S)

Location	Circuit Block Name	Model Name	Remarks
Antenna	TRX module	CMN-797	
	Signal processing unit	NDC-4920	
	Power supply/IF circuit	CMP-493	
	Encoder	CHT-85	
	Fan	109L0912S410	
	Motor driver circuit	CBD-1949	Common to AC100/220V
	Motor with gear	MDBW10823*	Common to AC100/220V * indicates a revision such as A and B.
Display	Display unit	NWZ-208	26-inch
	26-inch MNU replacement FAN kit	H-7ZYNA4005	Incorporated into NWZ-208
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated to NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-9282-SH)

Location	Circuit Block Name	Model Name	Remarks
Antenna	TRX module	CMN-797	
	Signal processing unit	NDC-4920	
	Power supply/IF circuit	CMP-493	
	Encoder	CHT-85	
	Fan	109L0912S410	
	Motor driver circuit	CBD-1950	Common to AC100/220V
	Motor with gear	MDBW10967	Common to AC100/220V
Display	Display unit	NWZ-208	26-inch
	26-inch MNU replacement FAN kit	H-7ZYNA4005	Incorporated into NWZ-208
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair Circuit Block (JMR-7225-6X/9X)

Location	Circuit Block Name	Model Name	Remarks
Antenna	Motor with gear	MDBW10822*	Common to AC100/220V * indicates a revision such as A and B.
	Encoder circuit	CHT-71A	
	Motor driver circuit	H-7EPRD0034*	For AC220V * indicates a revision such as A and B.
	Motor driver circuit	H-7EPRD0035*	For AC100V * indicates a revision such as A and B.
	Brake circuit	CFA-253	
	Brake control circuit	CCB-655	
	Brake circuit unit	NZR-16	Including CFA-259/260
	Performance monitor	NJU-85	
	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-550-1	Including CPA-264 Including CMB-404 Including CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-162A	Including CMA-866A
	Power supply circuit	CBD-1682A	
	Relay filter circuit	CSC-656	
	Fan	H-7BFRD0002	
Display	Display unit	NWZ-207	19-inch
	19-inch MNU replacement FAN kit	H-7ZYNA4004	Incorporated into NWZ-207
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	

Location	Circuit Block Name	Model Name	Remarks
Display	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair Circuit Block (JMR-7225-7X3/9X3)

Location	Circuit Block Name	Model Name	Remarks
Antenna	Motor with gear	MDBW10822*	Common to AC100/220V * indicates a revision such as A and B.
	Encoder circuit	CHT-71A	
	Motor driver circuit	H-7EPRD0034*	For AC220V * indicates a revision such as A and B.
	Motor driver circuit	H-7EPRD0035*	For AC100V * indicates a revision such as A and B.
	Brake circuit	CFA-253	
	Brake control circuit	CCB-655	
	Brake circuit unit	NZR-15	Including CFA-259/260
	Performance monitor	NJU-85	
Transceiver	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-552-1	Including CPA-264 Including CMB-405 Including CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-162A	Including CMA-866A
	Power supply circuit	CBD-1682A	
	Relay filter circuit	CSC-656	
Display	Display unit	NWZ-207	19-inch
	19-inch MNU replacement FAN kit	H-7ZYNA4004	Incorporated into NWZ-207
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	

Location	Circuit Block Name	Model Name	Remarks
Display	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-7230-S)

Location	Circuit Block Name	Model Name	Remarks
Antenna	Motor with gear	MDBW10823*	Common to AC100/220V * indicates a revision such as A and B.
	Encoder circuit	CHT-71A	
	Motor driver circuit	H-7EPRD0034*	For AC220V * indicates a revision such as A and B.
	Motor driver circuit	H-7EPRD0035*	For AC100V * indicates a revision such as A and B.
	Brake circuit	CFA-225	
	Brake control circuit	CCB-655	
	Brake circuit unit	NZR-17	Including CFA-261/262
	Performance monitor	NJU-84	
	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-551-1	Including CPA-264 Including CMB-406 Including CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-229	Including CAF-595/CAE-499
	Power supply circuit	CBD-1682A	
	Relay filter circuit	CSC-656	
	Fan	H-7BFRD0002	
Display	Display unit	NWZ-207	19-inch
	19-inch MNU replacement FAN kit	H-7ZYNA4004	Incorporated into NWZ-207
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	

Location	Circuit Block Name	Model Name	Remarks
Display	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-7230-S3)

Location	Circuit Block Name	Model Name	Remarks
Antenna	Motor with gear	MDBW10823*	Common to AC100/220V * indicates a revision such as A and B.
	Encoder circuit	CHT-71A	
	Motor driver circuit	H-7EPRD0034*	For AC220V * indicates a revision such as A and B.
	Motor driver circuit	H-7EPRD0035*	For AC100V * indicates a revision such as A and B.
	Brake circuit	CFA-255	
	Brake control circuit	CCB-655	
	Brake circuit unit	NZR-17	Including CFA-261/262
	Performance monitor	NJU-84	
Transceiver	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-553-1	Including CPA-264 Including CMB-407 Including CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-229	
	Power supply circuit	CBD-1682A	
	Relay filter circuit	CSC-656	
Display	Display unit	NWZ-207	19-inch
	19-inch MNU replacement FAN kit	H-7ZYNA4004	Incorporated into NWZ-207
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	

Location	Circuit Block Name	Model Name	Remarks
Display	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (MR-7225-6XH)

Location	Circuit Block Name	Model Name	Remarks
Antenna	Motor with gear	H-7BDRD0045A	DC brushless
	Encoder circuit	CHT-71A	
	Motor control circuit	CBD-1779	
	Brake circuit	CFA-257	
	Performance monitor	NJU-85	
	Heater control circuit	CHG-216	Optional (AC100V)
	Power supply circuit	CBD-1682A	
	T/R control circuit	CMC-1205R	
	Modulation unit	NMA-550-1	Including CPA-264, CMB-404, and CFR-229 Not including the magnetron
	Modulation circuit	CPA-264	
	Receiver	NRG-162A	Including CMA-866A
	Fan	H-7BFRD0002	
Display	Display unit	NWZ-207	19-inch
	19-inch MNU replacement FAN kit	H-7ZYNA4004	Incorporated into NWZ-207
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair Circuit Block (JMR-7210-6X/6XH)

Location	Circuit Block Name	Model Name	Remarks
Antenna	Motor with gear	H-7BDRD0048	DC brushless (shared with HS)
	Modulation circuit	CME-363	Not including the magnetron
	Receiver	NRG-610	Including CAE-529-1
	Power supply circuit	CBD-1783	
	Encoder circuit	CHT-71A	
	Motor control power supply circuit	CBD-1779	
	Brake circuit	CFA-252	
	Fan	H-7BFRD0002	
Display	Display unit	NWZ-207	19-inch
	19-inch MNU replacement FAN kit	H-7ZYNA4004	Incorporated into NWZ-207
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-7272-S)

Location	Circuit Block Name	Model Name	Remarks
Antenna	TRX module	CMN-797	
	Signal processing unit	NDC-4920	
	Power supply/IF circuit	CMP-493	
	Encoder	CHT-85	
	Fan	109L0912S410	
	Motor driver circuit	CBD-1949	
	Motor with gear	MDBW10823*	Common to AC100/220V * indicates a revision such as A and B.
Display	Display unit	NWZ-207	19-inch
	19-inch MNU replacement FAN kit	H-7ZYNA4004	Incorporated into NWZ-207
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-7282-S)

Location	Circuit Block Name	Model Name	Remarks
Antenna	TRX module	CMN-797	
	Signal processing unit	NDC-4920	
	Power supply/IF circuit	CMP-493	
	Encoder	CHT-85	
	Fan	109L0912S410	
	Motor driver circuit	CBD-1949	Common to AC100/220V
	Motor	MDBW10823*	Common to AC100/220V * indicates a revision such as A and B.
Display	Display unit	NWZ-207	19-inch
	19-inch MNU replacement FAN kit	H-7ZYNA4004	Incorporated into NWZ-207
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

Repair circuit block (JMR-7282-SH)

Location	Circuit Block Name	Model Name	Remarks
Antenna	TRX module	CMN-797	
	Signal processing unit	NDC-4920	
	Power supply/IF circuit	CMP-493	
	Encoder	CHT-85	
	Fan	109L0912S410	
	Motor driver circuit	CBD-1950	Common to AC100/220V
	Motor	MDBW10967	Common to AC100/220V
Display	Display unit	NWZ-207	19-inch
	19-inch MNU replacement FAN kit	H-7ZYNA4004	Incorporated into NWZ-207
	Power supply unit	NBD-913	
	PSU replacement FAN kit	H-7ZYNA4007	Incorporated into NBD-913
	Central control unit	NDC-1590	
	DVD drive	CDD-754	Incorporated into NDC-1590
	CCU replacement FAN kit	H-7ZYNA4006	
	CCU repair kit	NZC-1590	
	Trackball operation unit	NCE-5605	
	Trackball	CCK-1060	Incorporated into NCE-5605
	Operation circuit A	CCK-1050	
	Operation circuit SW	CCK-1069	
	Operation circuit CN	CCK-1070	
	Keyboard operation unit	NCE-5625	
	Operation circuit B	CCK-1059	Incorporated into NCE-5625
	Optional keyboard	CCK-1061	
	ϕ38 button	MPHD30460	
	ϕ22 button	MPHD30459	
	Screw cover bottom	MTV305169	
	Screw cover top	MTV305170	
	Serial LAN interface circuit	CMH-2370	
	Gyro interface circuit	CMJ-554	
	Radar interface circuit	CQD-2273	
	Analog option circuit	CMJ-560	
	Sensor LAN switch	NQA-2443	

22.3 Troubleshooting

When this equipment does not operate correctly, check the following points before asking for repairs. Consult with your nearest subsidiary company, branch office, or sales office if the problem does not get solved even after checking and correcting these points, or if there are any abnormally locations other than the following items.

Symptom	Cause	Action
The power is not supplied. Alternatively, the equipment does not start even if the Power button of the operation unit is pressed.	The AC or DC power supply is not connected.	Connect the AC or DC power supply.
	The breaker at the front of the power supply unit (NBD-913) is not set to ON.	Set the breaker to ON by pushing up the lever of the breaker.
	The AC or DC power supply is not input within the specified voltage range.	Connect the AC or DC power supply within the specified voltage range.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The power supply unit (NBD-913) is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
	The operation unit (NCE-5605) is faulty.	Make a request to the distributor for repair.
The power is not supplied to the monitor.	The display unit is not activated.	Activate the display unit.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	Display (NWZ-208/NWZ-207) is faulty.	Make a request to the distributor for repair.
Although the power is supplied to the monitor, the screen is not displayed.	The brightness of the monitor is set to the minimum level.	Adjust the brightness of the monitor to the appropriate level.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	Display (NWZ-208/NWZ-207) is faulty.	Make a request to the distributor for repair.
The brightness of the monitor cannot be adjusted.	The display (NWZ-208/NWZ-207) is faulty.	Make a request to the distributor for repair.
The trackball or the option keyboard cannot be operated.	The internal wiring is faulty.	Make a request to the distributor for repair.
	The display unit (NCE-5605/NCE5625) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
The trackball does cannot be moved smoothly.	The trackball is dirty.	Clean the trackball.
Although the power is supplied and the screen is displayed, the display is frozen, disabling processing to advance up to display of the task menu.	The central control unit (NDC-1590) is abnormal.	Make a request to the distributor for repair.
Some task menus cannot be selected.	The device license has not been installed.	Install the license of the device to be used.
The cursor is not displayed correctly.	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
Characters/symbols are not displayed correctly.	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
Position information (GPS) is not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the GPS equipment is not turned on.	Turn on the power supply for the GPS equipment.
	The GPS equipment does not perform positioning.	Check the state of the GPS equipment.
	The connection with the GPS equipment is abnormal.	Check the connection with the GPS equipment. When GPS equipment is connected to the serial LAN interface circuit, check if the LED of the corresponding port is lit at data reception.
	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on. (Case where the GPS equipment is connected to the serial-LAN interface circuit)	Turn on the power supply for the serial-LAN interface circuit.
	The serial-LAN interface circuit (CMH-2370) is faulty. (Case where the GPS equipment is connected to the serial-LAN interface circuit)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
AIS information is not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the AIS equipment is not turned on.	Turn on the power supply for the AIS equipment.
	The AIS equipment does not perform positioning.	Check the state of the AIS equipment.
	The connection with the AIS equipment is abnormal.	Check the connection with the AIS equipment. When AIS equipment is connected to the serial LAN interface circuit, check if the LED of the corresponding port is lit at data reception.
	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on. (Case where the AIS equipment is connected to the serial-LAN interface circuit)	Turn on the power supply for the serial-LAN interface circuit.
	The serial-LAN interface circuit (CMH-2370) is faulty. (Case where the AIS equipment is connected to the serial-LAN interface circuit)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
The azimuth of the Gyro compass is not displayed. Alternatively, the azimuth rotation direction is not displayed correctly.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the Gyro compass equipment is not turned on.	Turn on the power supply for the Gyro compass equipment.
	The connection with the Gyro compass equipment is abnormal.	Check the connection with the Gyro compass equipment. When gyro compass equipment is connected to the serial LAN interface circuit or gyro interface circuit, check if the corresponding LED is lit at signal reception.
	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on. (Case where the Gyro compass equipment is connected to the serial-LAN interface circuit)	Turn on the power supply for the serial-LAN interface circuit.
	The serial-LAN interface circuit (CMH-2370) is faulty. (Case where the Gyro compass equipment is connected to the serial-LAN interface circuit)	Make a request to the distributor for repair.

Symptom	Cause	Action
The azimuth of the Gyro compass is not displayed. Alternatively, the azimuth rotation direction is not displayed correctly.	The Gyro interface circuit (CMJ-554) is not set correctly (Case where the Gyro compass equipment is connected to the Gyro interface circuit)	Set the Gyro interface circuit correctly according to the Gyro compass equipment.
	The fuse of the gyro interface circuit (CMJ-554) has blown.	Replace the fuse of the gyro interface circuit.
	The Gyro interface circuit (CMJ-554) is faulty. (Case where the Gyro compass equipment is connected to the Gyro interface circuit)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
Log is not displayed or the values are not displayed correctly.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the log equipment is not turned on.	Turn on the power supply for the log equipment.
	The connection with the log equipment is abnormal.	Check the connection with the log equipment. When log equipment is connected to the serial LAN interface circuit or gyro interface circuit, check if the corresponding LED blinks at signal reception.
	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on. (Case where the log equipment is connected to the serial-LAN interface circuit).	Turn on the power supply for the serial-LAN interface circuit.
	The serial-LAN interface circuit (CMH-2370) is faulty. (Case where the log equipment is connected to the serial-LAN interface circuit).	Make a request to the distributor for repair.
	The Gyro interface circuit (CMJ-554) is not set correctly. (Case where the log equipment is connected to the Gyro interface circuit).	Set the Gyro interface circuit correctly according to the log equipment.
	The Gyro interface circuit (CMJ-554) is faulty. (Case where the log equipment is connected to the Gyro interface circuit).	Make a request to the distributor for repair.

Symptom	Cause	Action
Log is not displayed or the values are not displayed correctly.	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
Rudder angles are not displayed. Alternatively, the values are not displayed correctly.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the rudder angle indicator is not turned on.	Turn on the power supply for the rudder angle indicator.
	The connection with the rudder angle indicator is abnormal.	Check the connection with the rudder angle indicator. When a rudder angle indicator is connected to the serial LAN interface circuit, check if the LED of the corresponding port is lit at data reception.
	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on. (Case where the rudder angle indicator is connected to the serial-LAN interface circuit or the rudder angle indicator is connected to the analog option circuit)	Turn on the power supply for the serial-LAN interface circuit.
	The serial-LAN interface circuit (CMH-2370) is faulty. (Case where the rudder angle indicator is connected to the serial-LAN interface circuit or the rudder angle indicator is connected to the analog option circuit)	Make a request to the distributor for repair.
	The analog option circuit (CMJ-560) is not set correctly. (Case where the rudder angle indicator is connected to the analog option circuit)	Set the analog option circuit correctly according to the rudder angle indicator.
	The analog option circuit (CMJ-560) is faulty. (Case where the rudder angle indicator is connected to the analog option circuit)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Wind direction/wind speed (anemoscope/anemometer) data is not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the anemoscope/anemometer is not turned on.	Turn on the power supply for the anemoscope/anemometer.
	The connection with the anemoscope/anemometer is abnormal.	Check the connection with the anemoscope/anemometer. Check if the LED of the corresponding port of the serial LAN interface circuit is lit at data reception.
	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on.	Turn on the power supply for the serial-LAN interface circuit.
	The serial-LAN interface circuit (CMH-2370) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
Water depth values are not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the echo sounder is not turned on.	Turn on the power supply for the echo sounder.
	The connection with the echo sounder is abnormal.	Check the connection with the echo sounder. Check if the LED of the corresponding port of the serial LAN interface circuit is lit at data reception.
	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on.	Turn on the power supply for the serial-LAN interface circuit.
	The serial-LAN interface circuit (CMH-2370) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Sensor signals are not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the sensor equipment is not turned on.	Turn on the power supply for the sensor equipment.
	The connection with the sensor equipment is faulty.	Check the connection with the sensor equipment. Check if the LED of the corresponding port of the serial LAN interface circuit is lit at data reception.
	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on.	Turn on the power supply for the serial-LAN interface circuit.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The display unit such as the serial-LAN interface circuit (CMH-2370), analog option circuit (CMJ-560), and central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
Autopilot is disabled.	The communication is not set correctly.	Set the communication correctly.
	The autopilot function is not operated correctly.	Operate autopilot correctly.
	The power supply for the autopilot equipment is not turned on.	Turn on the power supply for the autopilot equipment.
	The connection with the autopilot equipment is faulty.	Check the connection with the autopilot equipment. Check if the LED of the corresponding port of the serial LAN interface circuit is lit at data reception.
	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on.	Turn on the power supply for the serial-LAN interface circuit.
	The serial-LAN interface circuit (CMH-2370) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Contact signals are not output.	The power supply for the serial-LAN interface circuit (CMH-2370) is not turned on. (Case where contact signal output is acquired from the serial-LAN interface circuit)	Turn on the power supply for the serial-LAN interface circuit.
	The serial-LAN interface circuit (CMH-2370) is faulty. (Case where contact signal output is acquired from the serial-LAN interface circuit)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
The radar antenna is not acknowledged.	The connection with the radar antenna is abnormal.	Check the connection with the radar antenna.
	Power is not supplied from the power supply unit to the radar antenna.	Check the power supply wiring between the power supply unit and the radar interface circuit. Check the power supply connection inside of the radar antenna. [Note] For checking wiring inside of the radar antenna, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	Only AC power is supplied to the power supply unit. (NKE-2254 or NKE-2103 is connected as the radar antenna)	To connect the NKE-2254 or NKE-2103 antenna, the DC power supply must be connected to the power supply unit.
	The radar interface circuit (CQD-2273) is not set correctly.	Set the radar interface circuit correctly.
	The radar interface circuit (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The radar antenna is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
The radar antenna is not acknowledged.	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
The power is not supplied to the radar antenna.	The connection with the radar antenna is abnormal.	Check the connection with the radar antenna.
	The connection with the radar antenna is abnormal and overcurrent protection is functioning in the power supply unit.	Check the connection with the radar antenna and remove the cause of short-circuit.
	DC power is not supplied to the power supply unit. (NKE-2254 or NKE-2103 is connected as the radar antenna)	To connect the NKE-2254 or NKE-2103 radar antenna, DC power supply must be connected to the power supply unit.
	The 24V DC output fuse is blown out. (NKE-2254 or NKE-2103 is connected as the radar antenna.)	After removing the cause of fuse blow-out, replace the fuse. The fuse is the 15A blade fuse at the front of the power supply unit (NBD-913).
	The radar interface circuit (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The power supply unit (NBD-913) is abnormal.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
The preheat count down of the radar antenna is not displayed.	The connection with the radar antenna is abnormal.	Check the connection with the radar antenna.
	The safety switch of the radar antenna is set to OFF.	Set the safety switch of the radar antenna to ON. [Note] For operating the safety switch of the radar antenna, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	A solid-state radar antenna is connected.	Preheat count-down is not displayed for a solid-state radar antenna.
	The radar antenna is faulty.	Make a request to the distributor for repair.
	The radar interface circuit (CQD-2273) is not set correctly.	Set the radar interface circuit correctly.
	The radar interface circuit (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
The radar antenna does not rotate even if the [Transmit] button is pressed.	The connection with the radar antenna is abnormal.	Check the connection with the radar antenna.
	The safety switch of the radar antenna is set to OFF.	Set the safety switch of the radar antenna to ON. [Note] For operating the safety switch of the radar antenna, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	Power is not supplied from the power supply unit to the radar antenna.	Check the power supply wiring between the power supply unit and the radar interface circuit. Check the power supply connection inside of the radar antenna. [Note] For checking the wiring inside of the radar antenna, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	The motor driver circuit inside of the radar antenna is not set correctly. (NKE-1632, NKE-2632, or NKE-2632-H is connected as the radar antenna.)	Set the motor driver circuit correctly. [Note] For setting the motor driver circuit, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	The radar antenna rotation unit is frozen.	De-freeze the frozen section by using the neck heater option.
	Strong wind of relative wind velocity exceeding 100kt (about 51.5m/s) is blowing.	When strong wind of relative wind velocity exceeding 100kt is blowing, the radar antenna does not rotate due to the protection function.
	The radar antenna is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
The radar antenna does not rotate even if the [Transmit] button is pressed.	The radar interface circuit (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The power supply unit (NBD-913) is abnormal.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
If the power supply is turned off, the track data is cleared without being stored.	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
No radar image is displayed.	The connection with the radar antenna is abnormal.	Check the connection with the radar antenna.
	The GAIN value is set to the minimum.	Set a proper value for GAIN.
	The SEA/RAIN value is set to the maximum.	Set a proper value for SEA/RAIN.
	The magnetron is deteriorated significantly. (Case where an radar antenna that uses a magnetron is connected)	Replace the magnetron. [Note] For magnetron replacement, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	The radar antenna is faulty.	Make a request to the distributor for repair.
	The radar interface circuit (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The power supply unit (NBD-913) is abnormal.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Radar images cannot be tuned.	The magnetron is deteriorated significantly. (Case where an radar antenna that uses a magnetron is connected)	Replace the magnetron. [Note] For magnetron replacement, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	A solid-state radar antenna is connected.	Tuning bar is not displayed for a solid-state radar antenna.
The azimuth of the radar image is not displayed correctly.	Azimuth is not set correctly.	Set the azimuth correctly.
	CCRP is not set correctly.	Set CCRP correctly.
	The GPS radar antenna position is not set correctly.	Set the GPS radar antenna position correctly.
The range of the radar image is not displayed correctly.	The range is not set correctly.	Set the range correctly.
	CCRP is not set correctly.	Set CCRP correctly.
	The GPS radar antenna position is not set correctly.	Set the GPS radar antenna position correctly.
Interswitch does not function.	Power for the interswitch is not turned on.	Turn on the power for the interswitch.
	The connection with the interswitch is abnormal.	Check the connection with the interswitch.
	The interswitch is faulty.	Make a request to the distributor for repair.
	The radar interface circuit (CQD-2273) is not set correctly.	Set the radar interface circuit correctly.
	The radar interface circuit (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
If the power supply is turned off, the trail data is cleared without being stored.	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
Radar images cannot be superimposed.	The radar overlay option license does not exist.	Install the radar overlay option license.
	The connection with the radar antenna is abnormal.	Check the connection with the radar antenna.
	The connection with the radar indicator is abnormal.	Check the connection with the radar indicator.
	The radar interface circuit (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The power supply unit (NBD-913) is faulty.	Make a request to the distributor for repair.
	The central control unit (NDC-1590) is faulty.	Make a request to the distributor for repair.
UPS does not function.	The connection with UPS is faulty.	Check the connection with UPS.
	UPS is not set correctly.	Set UPS correctly.
	The UPS battery is extremely depleted.	Replace the battery. [Note] At the battery replacement, make a request for the work to the specialized service staff. During the replacement, turn off the corresponding power supply breaker in the ship. Otherwise, an unexpected accident may occur.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	UPS is faulty.	Make a request to the distributor for repair.

22.4 After-Sale Services

22.4.1 About the retaining period of service parts

The retaining period of the performance-critical parts for servicing this product (parts required to maintain the functionality of the product) is 10 years after the discontinuation of production.

22.4.2 When requesting a repair

If you suspect a failure, please read "22.3 Trouble shooting" thoroughly and check the unit again.
If you still detect abnormality, stop using the product and contact your sales representative, our sales department, nearest branch office or sales office.

- **Repair during the warranty period**: If a failure occurs in the course of using the product correctly according to the explanations and instructions in the Instruction Manual, your sales representative or our company shall repair the product at no charge. However, repairs of failures caused by misuse, negligence, or act of God such as natural disasters and fire shall be chargeable.
- **If the warranty period has expired**: If functionality can be recovered by repair, repair shall be made by the request of the customer for a fee.
- **Please provide the following information**:
  - Product name, model name, manufacturing date, serial number
  - Description of abnormality (as detail as possible) (Please refer to the next page "Radar Failure Checklist.")
  - Business name or organization name, address, phone number

22.4.3 Recommendation of inspection and maintenance

Although it depends on the usage state, performance may deteriorate by change in parts over time,
Separately from regular care, inspection and maintenance are recommended.
Regarding inspection and maintenance, please contact your sales representative, our sales department, nearest branch office or sales office.
Please note that there is a charge for inspection and maintenance.

If you have questions regarding after-sale services, please inquire your sales representative, our sales department, nearest branch office or sales office.

Radar Failure Checklist

[Important] Before ordering a repair, please check and fill in the following items and then contact the applicable repair office.
If there are unknown items, please contact the ship and fill in as accurate as possible.

Ship Name: _____ Phone: _____ Fax:_____

Integrated Radar Model Name: JMR- _____ Serial Number: _____
(Please fill in all digits accurately.)

(1) Check the following items sequentially and circle either YES or NO for each item.
If none is applicable, please write down the specific reason in No. (18) Others.
(2) If any of check items (1) through (5) is NO, please check the fuses of the equipment. (See "22.1.5 Fuse inspection.")
(3) Check items (4) through (17) with transmission (TX) ON.

* It may not be possible to use (14), (15) and (17) unless options and external devices are not connected; if they are not connected, it is not necessary to answer these items.

No.	Check Item	Result	
(1)	The power turns ON. (The light of the operation unit illuminates.)	YES	NO
(2)	The unit is placed in the standby state several minutes after turning the power ON.	YES	NO
(3)	When the power is turned ON (or transmission ON), something is displayed on the LCD/LED monitor. (Illuminates)	YES	NO
(4)	When transmission (TX) is turned ON, the Radar antenna rotates. (Check all of the following items with transmission ON.)	YES	NO
(5)	Magnetron current flows. (See the Instruction Manual.)	YES	NO
(6)	Tuning can be performed. (Check in a range of 6NM or above.)	YES	NO
(7)	Fixed markers are displayed.	YES	NO
(8)	The VRM is displayed.	YES	NO
(9)	White noise is displayed with minimum STC and FTC, maximum GAIN, IR-OFF and range 48NM.	YES	NO
(10)	Target reflection echoes are displayed,	YES	NO
(11)	The sensitivity of reflection echoes is normal.	YES	NO
(12)	The EBL is displayed.	YES	NO
(13)	The cursor symbols move.	YES	NO
*(14)	The GYRO course can be set up and is displayed normally.	YES	NO
*(15)	The LOG speed is displayed normally.	YES	NO
(16)	The target tracking function operates normally.	YES	NO
*(17)	If the straight mode (II) is switched to the cross mode (X) when an interswitch is provided, the failed (NO) items in (1) through (16) above are swapped between the right and left display units.	YES	NO
(18)	Other description (error messages, etc.)		

22.4.4 Extending the functions

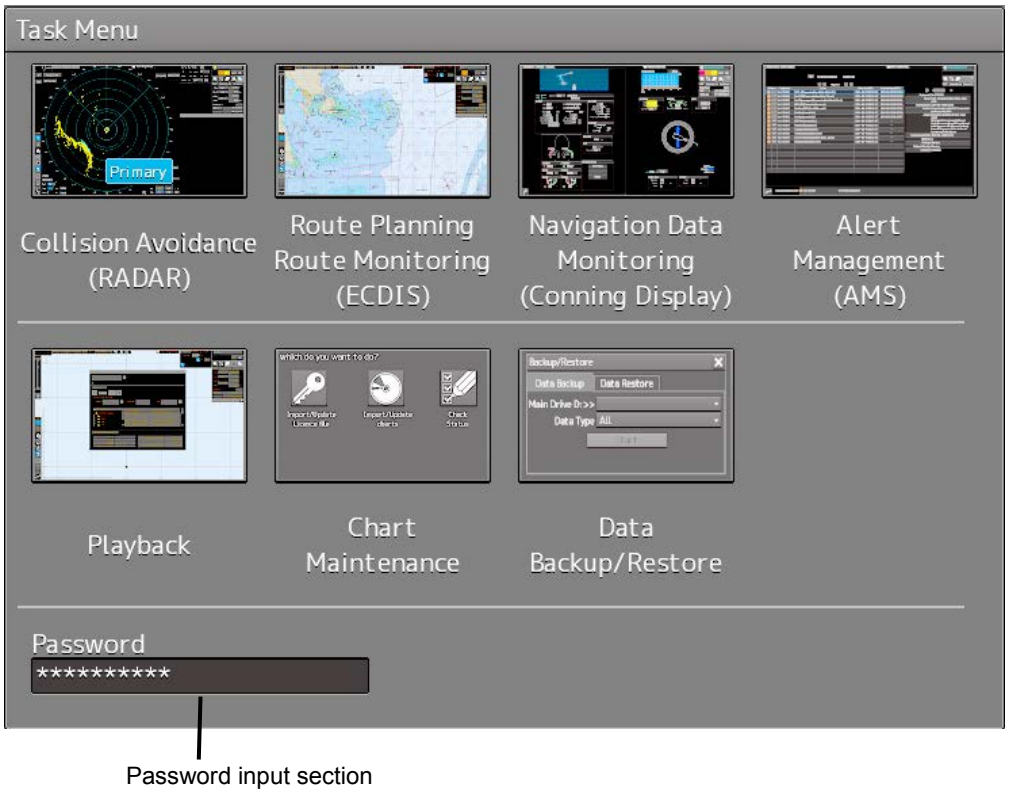
The functions that are available for this equipment can be extended.
To extend a function, new license information (file) must be obtained and imported to this equipment. For function extension, please request to our sales department or our branch office, sales office, or agent near your premises.

22.4.4.1 Importing the license information

Import the license information that was obtained (license file) to this equipment via the USB flash memory.
Connect the USB flash memory in which the license information is stored.

1 Press the Power button of the operation unit.

The Power button is lit. After a while, a task menu is displayed.

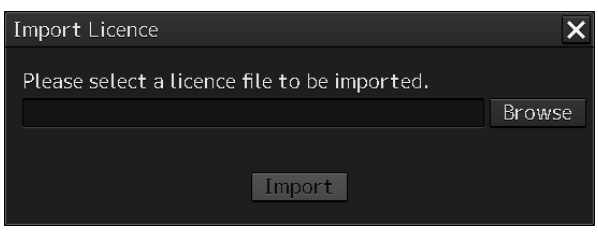


2 Click on the password input section.

A password input dialog is displayed.

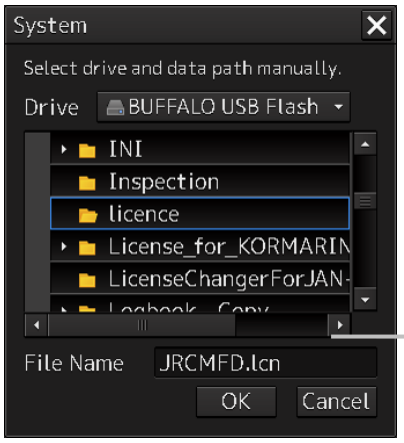
3 Enter the password, 9380.

The "Import License" dialog is displayed.



4 Click on the [Browse] button.

The "System" dialog is displayed.



[File Name] combo box

5 Select the name of the license file (example: JRCMFD.lcn) that is stored in the USB flash memory from the [File Name] combo box and click on the [OK] button.

The "System" dialog is closed.

6 Click on the [Import] button.

When import is completed, a confirmation dialog box appears.

Close the dialog box by clicking on the [OK] button.

7 Close the "import License" dialog box by clicking on [x] button and return to the task menu.

In this case, a new license is adopted.

Section 23 About Disposal

23.1 About Disposal of This Equipment

When disposing of this equipment, follow the regulations and/or rules of the local regulatory authority which has control over the location of disposal.

23.2 About Disposal of Used Magnetrons

A magnetron is used in the radar antennas (NKE-1125/1130/2254/2103) and the transmitter/receiver unit (NTG-3230/3235) of this equipment.

- When a magnetron is changed with new one, please return the old magnetron to our dealer or sales office.
  For more information, please inquire our dealer or sales office.

23.3 About Disposal of TR Tubes

If a TR tube used in the transmitter/receiver (NTG-3230/3235) of this equipment is indicated by either one of the radiation warning symbols shown below, that TR tube contains an isotope. Thus, it cannot be disposed of as an industrial waste in Japan.

- When TR tubes indicated with a radiation warning symbol need to be disposed of in Japan, please return them to our dealer or sales office.
  For more information, please inquire our dealer or sales office.
- The leakage radiation from these TR tubes is as little as the natural exposure level, so there is no harm to the human body.
- Never disassembly TR tubes.

23.4 Chinese Version 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): JMR-7200 Series　　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 (OperationUnit) ・信号处理装置 (Central Control Unit)	×	×	○	×	○	○
外部设备 (Peripherals) ・选择 (Options) ・电线类 (Cables) ・手册 (Documennts)	×	×	○	×	○	○

○：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/T11363-2006.)

×：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.)