JSS-2150

150W MF/HF RADIO EQUIPMENT

SERVICE MANUAL

JRC *Japan Radio Co., Ltd.*
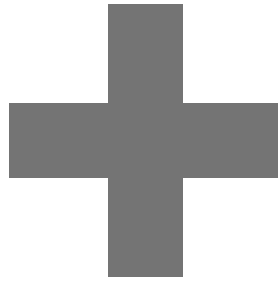
CAUTIONS AGAINST HIGH VOLTAGE

Radio and radar devices are operated by high voltages of anywhere from a few hundred volts up to many hundreds of thousands of volts. Although there is no danger with normal use, it is very dangerous if contact is made with the internal parts of these devices. (Only specialists should attempt any maintenance, checking or adjusting.)

There is a very high risk of death by even a few thousand volts, in some cases you can be fatally electrocuted by just a few hundred volts. To prevent accidents, you should avoid contact with the internal parts of these devices at all costs. If contact is inevitable as in the case of an emergency, you must switch off the devices and ground a terminal in order to discharge the capacitors. After making certain that all the electricity is discharged, only then can you insert your hand into the device. Wearing cotton gloves and putting your left hand in your pocket, in order not to use both hands simultaneously, are also very good methods of shock prevention.

Quite often, an injury occurs by secondary factors, therefore it is necessary to choose a sturdy and level working surface. If someone is electrocuted it is necessary to thoroughly disinfect the affected area and seek medical attention as soon as possible.

Cautions concerning treatment of electrocution victims

When you find an electrocution victim, you must first switch off the machinery and ground all circuits. If you are unable to cut off the machinery, move the victim away from it using a non-conductive material such as dry boards or clothing.

When someone is electrocuted, and the electrical current reaches the breathing synapses of the central nervous system inside the brain, breathing stops. If the victim's condition is stable, he or she can be administered artificial respiration. An electrocution victim becomes very pale, and their pulse can be very weak or even stop, consequently losing consciousness and becoming stiff.

Administration of first aid is critical in this situation.

First aid

☆Note points for first aid

Unless there is impending danger leave the victim where he or she is, then begin artificial respiration. Once you begin artificial respiration, you must continue without losing rhythm.

(1) Make contact with the victim cautiously, there is a risk that you may get electrocuted.

(2) Switch off the machinery and then move the victim away slowly if you must.

(3) Inform someone immediately (a hospital or doctor, dial emergency numbers, etc.).

(4) Lay the victim on his or her back and loosen any constrictive clothing (a tie, or belt).

(5) (a) Check the victim's pulse.
    (b) Check for a heartbeat by pressing your ear against the victim's chest.
    (c) Check if the victim is breathing by putting the back of your hand or face near the victim's face.
    (d) Check the pupils of the eyes.

(6) Open the victim's mouth and remove any artificial teeth, cigarette or chewing gum. Leave the mouth opened and flatten the tongue with a towel or by putting something into the mouth to prevent the victim's tongue from obstructing the throat. (If he or she is clenching the teeth and it is difficult to open the mouth, use a spoon or the like to pry open the mouth.)

(7) Continually wipe the mouth to prevent the accumulation of saliva.

☆If the victim has a pulse but is not breathing

("Mouth to mouth" resuscitation)   Figure 1

(1) Place the victim's head facing backward (place something under the neck like a pillow).

(2) Point the chin upward to widen the trachea.

(3) Pinch the victim's nose, take a deep breath, then put your mouth over the victim's mouth and exhale completely, making sure that your mouth completely covers the victim's mouth.   Then remove your mouth.   Repeat this routine 10 to 15 times per minute (holding the nostrils).

(4) Pay attention to the victim to notice if he or she starts to breath.   If breathing returns, stop resuscitation.

(5) If it is impossible to open the victim's mouth, put something like a plastic straw or vinyl tube into one of the nostrils then blow air in while covering the mouth and the other nostril.

(6) Occasionally, when the victim comes back to consciousness, they immediately try to stand up. Prevent this and keep them in a laying position.   Give them something warm to drink and be sure that they rest (do not give them any alcohol).

Administering artificial respiration by raising the head.

①
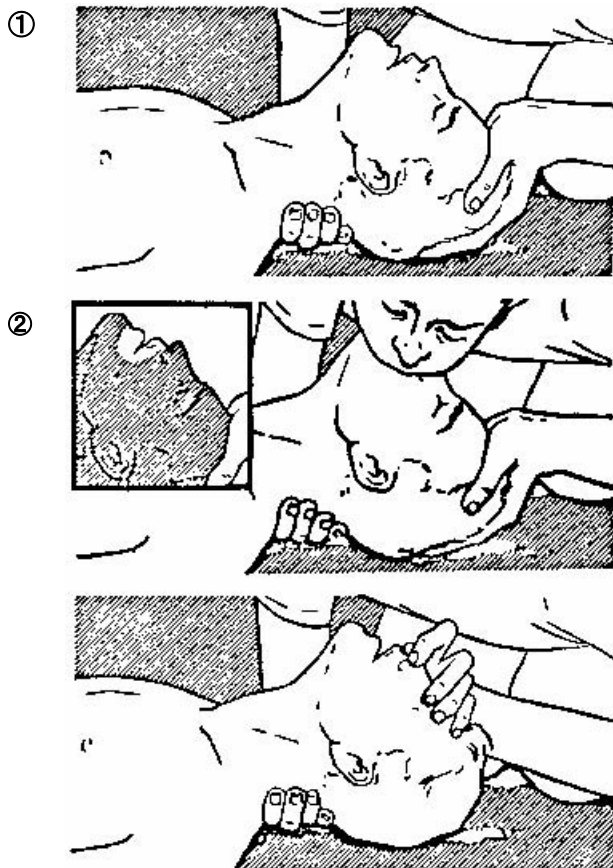
(1) Raise the back of head, then place one hand on the forehead and place the other hand under the neck. → ①
Most victims open their mouth when this is done, making "mouth to mouth" resuscitation easier.

②

(2) Cover the victim's mouth by opening your mouth widely, then push your cheek against the victim's nose, → ②
or pinch the victim's nose to prevent air from leaking out of it. → ③

(3) Completely exhale into the lungs.
Exhale into the lungs until the chest inflates.
You have to blow as rapidly as possible for the first 10 times.

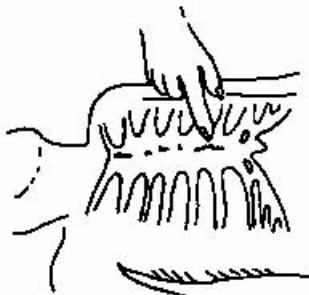"Mouse to mouse" artificial respiration

Figure 1

☆If the victim has no pulse and is not breathing

(Heart massage in combination with artificial respiration.)   Figure 2

If the victim has no pulse, his or her pupils are dilated, and if you cannot detect a heartbeat, the heart may have stopped, beginning artificial respiration is critical.

(1) Put both hands on the diaphragm, with hands on top of each other keeping both arms straight (If your elbows are bent, you cannot push with as much power).   Press the diaphragm with your body weight until the chest sinks about 2 cm (about 50 times per minute).

(2) If administering first aid when alone:
Perform the heart massage about 15 times then blow in twice.   Repeat this routine.
If administering first aid with two people:
One person performs the heart massage 5 times, and the other person blows air in once.   Repeat this routine (Heart massage and "mouth to mouth" resuscitation used together).

(3) Constantly check the pupils and the pulse, if the pupils become normal and the pulse steadies, keep them in a laying position and give them something warm to drink, be sure that they rest (do not give them any alcohol).   In any case you have to entrust major decision making to a doctor.   Having understanding people around is essential to the victim's recovery from the mental shock of electrocution.
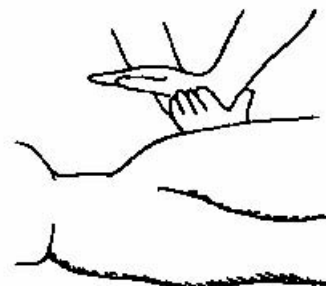
① ②

③ ④

Heart massage in combination with artificial respiration   Figure 2

Before Operation

Concerning the symbols

This manual uses the following symbols to explain correct operation and to prevent injury or damage to property.

The symbols and descriptions are as follows. Understand them before proceeding with this manual.

⚠ **WARNING** — Indicates a warning that, if ignored, may result in serious injury or even death.

⚠ **CAUTION** — Indicates a caution that, if ignored, may result in injury or damage to property.

Examples of symbols

The △ symbol indicates caution (including DANGER and WARNING). The illustration inside the △ symbol specifies the content of the caution more accurately. (This example warns of possible electrical shock.)
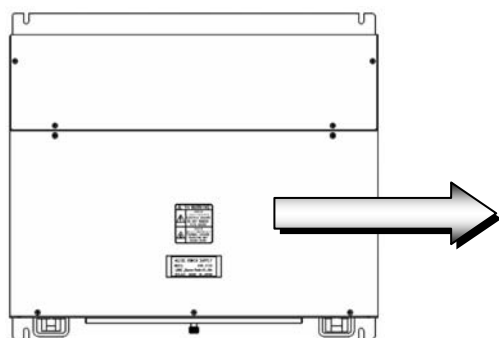
The ⊘ symbol indicates that performing an action is prohibited. The illustration inside the ⊘ symbol specifies the contents of the prohibited operation. (in this example disassembly is prohibited.)

The ● symbol indicates operations that must be performed. The illustration inside the ● symbol specifies obligatory instructions. (In this example unplugging is the obligatory instruction.)

Concerning the WARNING labels

The WARNING labels are put on the NTD-2150 MF/HF Transceiver, NFC-2150 Antenna tuner, NBD-2150 AC/DC Power supply, and NBB-724 Battery charger. Do not take off, destroy, or modify the labels.

⚠ 警告 WARNING

感電注意
このカバーをはずすな
ELECTRIC HAZARD
DO NOT REMOVE
THIS COVER

高温注意
触れると火傷の恐れあり
THERMAL HAZARD
TOUCHING MAY
CAUSE BURN

Ex) NBD-2150 AC/DC Power supply   (Upper view)

⚠ **CAUTION**

Do not distribute this INSTALLATION MANUAL to ordinary users, because it has been created and published only for use by our service engineers.

Do not use this equipment for anything other than specified.
Doing so may cause failure or malfunction.

Do not turn the trimmer resistors or the trimmer capacitors on the PCB unit, except when and if they need to be adjusted. Doing so may cause failure or malfunction. They are preset at the factory.

Do not install this equipment in a place near water or in one with excessive humidity, steam, dust or soot. Doing so may cause fire, electric shock, or malfunction.

Do not test the distress call as doing so will inconvenience local shipping and Rescue Centers.

Use an artificial antenna (antenna dummy load) in the case of the test of equipment, or adjustment.
When using an antenna unavoidably, shorten transmitting time,

When repairing a RoHS compatible unit, use RoHS compatible parts and lead-free solder, and also RoHS compatible wiring materials.

If a false distress alert is transmitted accidentally, follow the instructions below:
1. Press the `CANCEL` key on the controller (when appropriate, follow the commands on screen) and terminate the transmission of the distress call.
2. Report the false distress call to a nearby RCC (Rescue Coordination Center).
   (In Japan, inform the nearest Japan Coast Guard.)
   Information to be reported:
   The date/time, location, and reason why the false distress call was transmitted. Also report the ship's name, type, nationality, and ID number as well as the unit model name and manufacture number/date, if possible.
3. Report the false distress call to nearby ships using 2182.0 kHz or another frequency for distress and safety purposes on the radiotelephone.
4. If any acknowledgements to the distress call are received, inform the ships of the false distress call.

Do not short the lines of the mini plug. Doing so may cause malfunction.

⚠ CAUTION

Locate the antenna tuner, TX antenna and lead-in wire in locations as far as possible from people and surrounding structures to satisfy the following conditions.
- Far at least 30cm beyond anyone's reach.
- Low vibration.
- Good ventilation and drainage.
- Protected from water (for above deck installation).
- Not exposed to smoke or corrosive gasses from the smokestack.
- Not exposed to heat.
- Protected from icing.

In the field maintenance mode, all DSC functions including distress alert and NBDP functions cannot be used. So when setup is complete, always restart by powering off and on using breakers, or place the system in sleep mode.
If the equipment is left without operating in this mode, the maintenance mode off timer automatically put the system into sleep mode.

Use F2.3.3 Calibration menu only when having a margin of error obviously.

The batteries, except for sealed lead-acid batteries that require no equalization, should be carried out the equalizing charge at least every six months

Contents

1. CONFIGURATION AND SPECIFICATIONS

1.1 Basic configuration

1.1.1 DSC model

1.1.1.1 Standard components

No.	Description	Model	Qty	Notes
1	MF/HF transceiver	NTD-2150	1	
2	MF/HF controller	NCM-2150	1	
2-1	Controller cable	7ZCJD0343	1	5m
2-2	Handset	NQW-261	1	Includes the cradle
3	Antenna tuner	NFC-2150	1	
4	Instruction manual	7ZPJD0492	1	

1.1.1.2 Options

No.	Description	Model	Notes
1	AC/DC power supply	NBD-2150	
2	Battery charger	NBB-724	
3	Joint box	JQD-69C	For both RX and WKR
4	Junction box	NQD-2253	
5	Coaxial connector	M-P-7, M-A-JJ	For RG-12/UY and RG-10/UY
6	MF/HF controller	NCM-2150	One additional controller available.
6-1	Controller cable	7ZCJD0343	5m
6-2	Handset	NQW-261	Waterproof type (IP66 equivalent)
6-3	Flush mounting bracket	MPBC42957	
6-4	Mounting bracket	MPBX44354	
6-5	Connection box	NQD-2250	For extension and expansion of the controller
7	Printer	NKG-800	Desktop type
7-1	Printer connection cable	6ZCSC00407	
7-2	Printer power cable	6JNKD00100B	
7-3	Printer paper	5ZPCM00006	
7-4	Ink ribbon (SP-16051)	5ZZCM00003	
8	Printer	NKG-91	Wall mount or flush mount type
8-1	Printer connection cable	7ZCJD0254A	
8-2	Printer paper	7ZPJD0384	
8-3	Wall mounting bracket	MPBP31446	
9	Printer	DPU-414	Desktop type
9-1	Printer connection cable	7ZCJD0254A	
9-2	Printer power cable	7ZCJD0257C	
9-3	Printer paper	6ZCAF00252A	
10	Distress message controller	NCH-321A	

1.1.2   DSC/NBDP model

1.1.2.1 Standard components

No.	Description	Model	Qty	Notes
1	MF/HF transceiver	NTD-2150	1	
2	MF/HF controller	NCM-2150	1	
2-1	Controller cable	7ZCJD0343	1	5m
2-2	Handset	NQW-261	1	Includes the cradle
3	Antenna tuner	NFC-2150	1	
4	Data terminal	NDZ-227	1	
4-1	DTE cable	7ZCJD0388	1	
4-2	DTE power cable	7ZCJD0419	1	
4-3	Keyboard	NDF-369	1	NBDP option
5	Printer	NKG-800	1	
5-1	Printer connection cable	7ZCSC0205A	1	
5-2	Printer power cable	6JNKD00100B	1	
6	Instruction manual	7ZPJD0492	1	

1.1.2.2 Options

No.	Description	Model	Notes
1	AC/DC power supply	NBD-2150	
2	Battery charger	NBB-724	
3	Joint box	JQD-69C	For both RX and WKR
4	Junction box	NQD-2253	
5	Coaxial connector	M-P-7, M-A-JJ	For RG-12/UY and RG-10/UY
6	MF/HF controller	NCM-2150	One additional controller available.
6-1	Controller cable	7ZCJD0343	5m
6-2	Handset	NQW-261	Waterproof type (IP66 equivalent)
6-3	Flush mounting bracket	MPBC42957	
6-4	Mounting bracket	MPBX44354	
6-5	Connection box	NQD-2250	For extension and expansion of the controller
7	Data terminal	NDZ-227	For expansion of the controller
7-1	DTE cable	7ZCJD0388	
7-2	DTE power cable	7ZCJD0419	
7-3	Keyboard	NDF-369	
7-4	Mounting bracket	MPBP31721	
7-5	USB memory	UDG4-1GAR-JRC	Hagiwara Sys-Com / 1GB
8	Printer	NKG-800	Desktop type
8-1	Printer connection cable	7ZCSC0205A	
8-2	Printer power cable	6JNKD00100B	
8-3	Printer paper	5ZPCM00006	
8-4	Ink ribbon (SP-16051)	5ZZCM00003	
9	Printer	NKG-91	Wall mount or flush mount type
9-1	Printer connection cable	7ZCJD0254A	
9-2	Printer paper	7ZPJD0384	
9-3	Wall mounting bracket	MPBP31446	
10	Printer	DPU-414	Desktop type
10-1	Printer connection cable	7ZCJD0254A	
10-2	Printer power cable	7ZCJD0257C	
10-3	Printer paper	6ZCAF00252A	
11	Distress message controller	NCH-321A	

1.1.3   System configuration

NCM-2150 MF/HF Controller
NQW-261 Handset

NDZ-227 Data terminal
NDF-369 Keyboard
(DSC/NBDP model only)

NKG-800 Printer

Expansion Controller

GPS

NCH-321A DMC

NFC-2150
Antenna Tuner

NTD-2150 MF/HF Transceiver

NBD-2150 AC/DC Power Supply

*   The radiotelephone can also be used when connected to remote maintenance system equipment.

NBB-724 Battery Charger
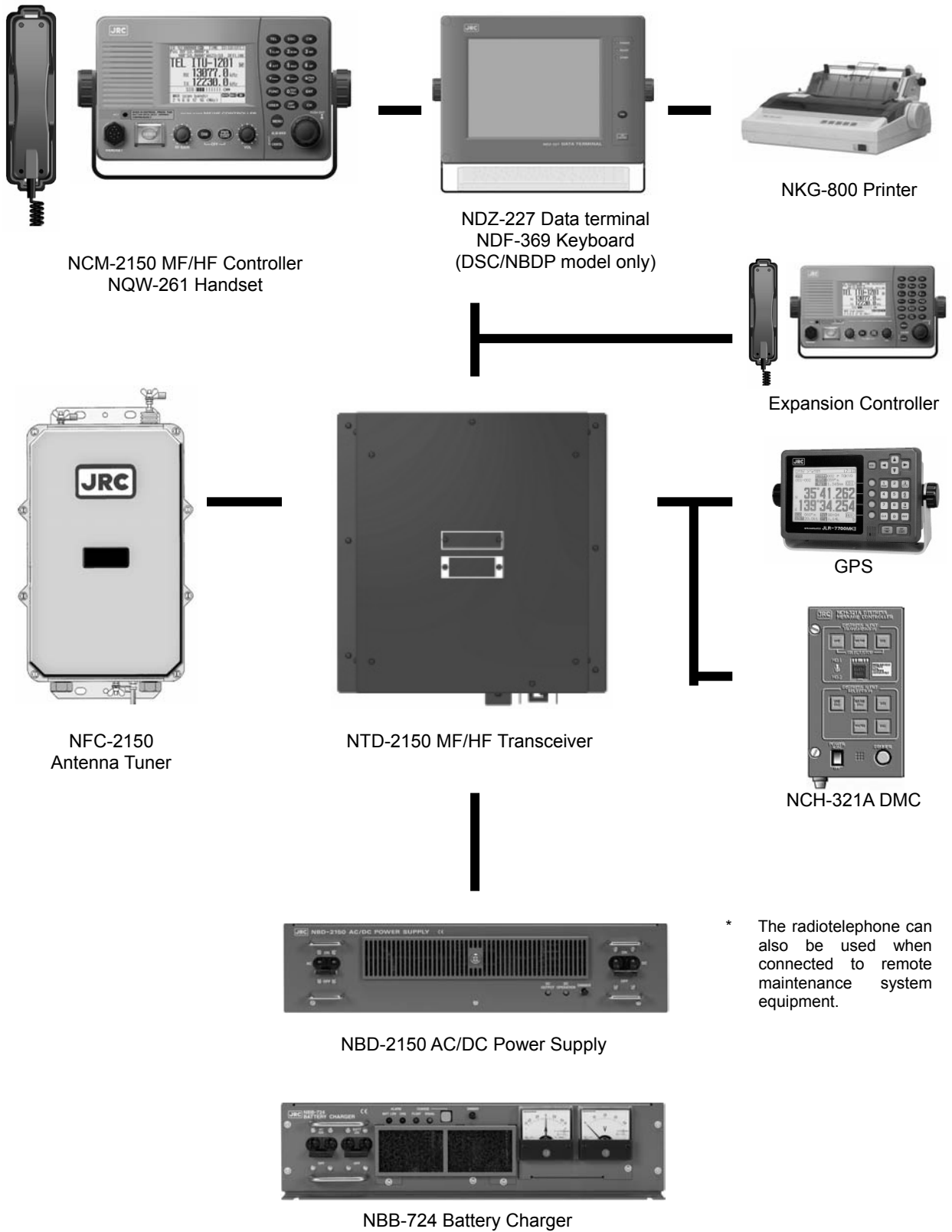
1.2   Block diagram

1.2.1   DSC model

1.2.2   DSC/NBDP model

Rx/WKR antenna

JQD-69C
Joint box

RG-12/UY

M-P-7

Tx antenna

Lead wire
TH-7/1.6

NQW-261
Handset

NCM-2150
MF/HF Controller

7ZCJD
0343
(5m)

TTYCS- 4
DPYC-2.5

RX/WKR ANT

NTD-2150
MF/HF Transceiver

TX
ANT

M-P-7

M-P-7/M-P-5
M-A-JJ

RG-10/UY

5D-2VH

TX ANT

NFC-2150
Antenna tuner

7ZCJD0419

7ZCJD0388

NQD-2250
Connection
box

TTYCYS-4

NQD-2253
Junction
box

NDZ-227
Data terminal

NDF-369
Keyboard

DPYC-10
24V DC

TTYCS-1

NBD-2150
AC/DC Power supply

DPYC-16

100V/220V AC
50/60Hz 1φ

7ZCJD0348

7ZCJD0347

7ZCSC0205A

6JNKD00100B

NKG-800
Printer

TTYCS- 4
DPYC-2.5

NBB-724
Battery charger

7ZCJD0349

24V DC
200Ah

NQD-2250
Connection
box

Expansion controller

TTYCS- 1

GPS

MPYCS- 7

NCH-321A
DMC

TTYCS- 1

RMS
(VDR)

TTYCS- 4

AME

1.3 Specifications

1.3.1 JSS-2150 MF/HF Radio Equipment

● General Specifications

Transmission frequency	1605.0 - 27500.0 kHz (100 Hz steps)
Reception frequency	90.0 - 29999.9 kHz (100 Hz steps)
Frequency stability	Within ±10 Hz
Type of emission	TEL mode : J3E DSC/TLX mode : F1B CW mode : A1A AM mode : H3E H2B mode : H2B DATA mode : J2D
Channels	User channels (TEL/CW/DSC) : Max. 400 ch (20ch x 20grp) User channels (TLX) : Max. 400 ch (20ch x 20sta) ITU preset channels : 1722 ch
Scan channels	Max. 20 channels (group specification method)
Nominal frequency	J3E/ A1A/ H3E/ H2B/ J2D : Carrier frequencies F1B : Assigned frequency
Communication method in TEL	Push-to-talk (simplex, semi-duplex)
Antenna impedance	50Ω unbalanced
Channel switching duration	15 sec or less
Interface	IEC61162-1 (GPS/AME/RMS)
Compass safety distance	1.9 m
Main controls	DSC call (sending and receiving), communication frequency/ channel settings, Tx power settings, RF gain adjustment, volume adjustment, LCD adjustment
Performance criteria	IMO A.806（19）、A.694（17）、MSC68（68）、MSC/Circ.862 IEC 60945 Ed.4 2002-08
Power supply voltage	24 VDC (21.6 VDC to 31.2 VDC)
Current consumption	150W transmission : Maximum 30 A Reception: : Maximum 5 A
Operating temperature range	-15°C - +55°C(parts exposed to condensation -25°C - +55°C)
Storage temperature range	-15°C - +55°C(parts exposed to condensation -25°C - +70°C)
Humidity resistance	No abnormality after standing 4 hours in +40°C, 93%RH
Vibration resistance (3 axes)	2 Hz - 5 Hz to 13.2 Hz : Full amplitude ±1 mm±10% 13.2 Hz to 100 Hz : Maximum acceleration 7 m/s^2 fixed No abnormality after testing resonance points or at 30 Hz for 2 hours or more
Continuous operation (TEL)	No abnormality after operating continuously for 8 hours
Continuous operation (DSC, WKR)	No abnormality after operating continuously for 24 hours
Protection rating	IP22 equivalent (controller panel)
Dimensions and mass	Transceiver 349mm(W) x 391mm(H) x 143mm(D) [excluding projections], approximately 12.3kg Antenna tuner 256mm(W) x 430mm(H) x 100mm(D) [excluding projections], approximately 3.3kg Controller 230mm(W) x 142mm(H) x 89mm(D) [excluding projections], approximately 1.3kg Data terminal 336mm(W) x 244mm(H) x 88mm(D) [excluding projections], approximately 4.6kg

● Transmitter

Antenna output power	1605.0 - 3999.9 kHz : 75/ 100Wpep (Low: 33Wpep) 4000.0 - 27500.0 kHz : 75/ 100/ 150Wpep (Low: 50Wpep)
Modulation method	Low-power stage balanced modulation
Occupied bandwidth	J3E/ J2D/ H2B : Within 3 kHz F1B/ A1A : Within 0.5 kHz
Carrier suppression (J3E)	40 dB or more
Unwanted emissions in the out-of-band domain	Mean power of 50 mW or lower, or 43 dB or more lower than the mean power of the basic frequency

Unwanted emissions in the spurious domain	At J3E:
	  1.5 to 4.5 kHz : 31 dB or more
	  4.5 to 7.5 kHz : 38 dB or more
	  7.5 kHz and upwards : 43 dB or more
	  (Peak power of unwanted emissions is 50 mW or less.)
	
	At F1B:
	
	Attenuation [dB] 15 / 31 / 43
	Mistuned frequency [Hz] 138 276 500

Overall distortion and noise	-20 dB or less
AF frequency response	Deviation is within 6 dB in 350 Hz to 2700 Hz range.
Tone frequency	1500 Hz or 1400 Hz

● Receiver

Receiving system	Double superheterodyne
1st IF	70.036 MHz
2nd IF	36 kHz
Reception frequency stability	Within ±10 Hz
Sensitivity (SINAD 20dB)	J3E :2.5 uV or less (1605.0 to 27500.0 kHz) F1B :0.7 uV or less (1605.0 to 27500.0 kHz) A1A :1.4 uV or less (1605.0 to 27500.0 kHz)

Pass band/Adjacent signal selectivity	J3E :2.4 - 3.0 kHz (6 dB bandwidth) within
	  ±2.1 kHz (66 dB bandwidth)
	F1B :270 - 300Hz (6 dB bandwidth) within
	  ±550 Hz (60 dB bandwidth)

Spurious response	J3E :60 dB or more F1B :Symbol error rate of 1% or better at a wanted signal level of 10 uV and an unwanted signal level of 31.6 mV separated by 750 Hz
Blocking/Desensitization	J3E :When an unwanted signal level separated by 3 kHz is added to the wanted signal level of 10 uV, the unwanted signal input voltage suppressing output of the wanted signal by 3 dB is 10 mV or more. F1B :Symbol error rate of 1% or better at a wanted signal level of 10 uV and an unwanted signal level of 1 mV separated by 500 Hz
Overall distortion and noise	When an input signal level of 30 uV is applied, the ratio between low-frequency output 1000 Hz and unwanted components contained in that output is 30 dB or more.
Conducted spurious emission	Power emitted from antenna terminal is 2 nW or less (9kHz - 2GHz) and 20 nW or less (2GHz - 4GHz).
Clarifier variable range	±200 Hz (1 Hz steps)
Antenna impedance	50Ω unbalanced
Line output	0 dBm 600Ω (balanced)

CONFIGURATION AND SPECIFICATIONS

● DSC Watch Keeping Receiver.

Reception frequency	Distress and safety frequencies of 2187.5 kHz and 8414.5 kHz, and additionally on one or more of the 4207.5 kHz/ 6312.0 kHz/ 12577.0 kHz/ 16804.5 kHz
Receiving system	Double superheterodyne
1st IF	40.04025 MHz
2nd IF	40.25 kHz
Frequency stability	Within ±10 Hz
Sensitivity	1% or lower symbol error rate at reception input voltage of 1µV
Passband	6 dB bandwidth : 270 - 300 Hz 30 dB bandwidth : Within ±380 Hz 60 dB bandwidth : Within ±550 Hz
Spurious response	Symbol error rate of 1% or better when an unwanted signal level of 31.6 mV is applied to a wanted signal level of 10 uv from an intermediate frequency separated by 750 Hz or more through to a frequency 3x the test frequency
Blocking/Desensitization	Symbol error rate of 1% or better at a wanted signal level of 10 uV and an unwanted signal level of 1 mV separated by 500 Hz
Conducted spurious emission	Power emitted from antenna terminal is 2 nW or less.
Antenna impedance	50Ω unbalanced

● DSC Modem

Modulation rate	Within 100 baud ±30 $\times 10^{-6}$	
Modulation method	FSK (sub-carrier: 1700 Hz)	
Mark frequency (Y)	Transmission	: Within 1615 Hz ±0.5 Hz
	Reception (permissible value)	: Within 1615 Hz ±20 Hz
Space frequency (B)	Transmission	: Within 1785 Hz ±0.5 Hz
	Reception (permissible value)	: Within 1785 Hz ±20 Hz
DSC protocol	ITU-R recommendation M.493-11 (Class A and B)	
DSC operation standards	ITU-R recommendation M.541-9, M.821-1	
DSC code	10-bit error detecting code	
Message storage	20 messages for distress and 20 messages for others	

● NBDP Modem

Modulation rate	Within 100baud ±30 $\times 10^{-6}$ 以内	
Modulation method	FSK　（sub-carrier：1700Hz）	
Mark frequency (Y)	Transmission	: Within 1615 Hz ±0.5 Hz
	Reception (permissible value)	: Within 1615 Hz ±20 Hz
Space frequency (B)	Transmission	: Within 1785 Hz ±0.5 Hz
	Reception (permissible value)	: Within 1785 Hz ±20 Hz
NBDP Protocol	ITU-R recommendation M.476-5,M.491-1,M.492-6,M.625-3 ITU-T recommendation F.1、F.130、S.6	
NBDP code	7-bit error detecting code	

● Antenna tuner

Frequency range	1605.0 - 27500.0 kHz	
Max. input power	1605.0 - 3999.9 kHz	: 150Wpep
	4000.0 - 27500.0 kHz	: 200Wpep
SWR after tuning	2:1 or less	
Tuning method	Preset or auto-tuning	
Tuning time	Preset tuning: 0.5 secs, auto-tuning: max. 45 secs	
Power supply	24 VDC (21.6 VDC to 31.2 VDC)	

● Controller

Communication speed	57.6 kbps
Communication interface	RS-485 and RS-232C, and Centronics compliant
Microphone input impedance	150Ω balanced
Standard modulation input	-54 dBm
Audio output	Internal loud speaker (8Ω)　　　: 5W max External speaker impedance　　: 8Ω or more Handset phone (150Ω)　　　　　: Rated 1mW or more
LCD display	3.8 inch FSTN monochrome, 320 x 240 dot, LED backlight

● Data terminal

Communication speed	4.8kbps
Communication interface	RS-232C
USB interface	USB 2.0, FAT16/32 file format
Keyboard interface	PS/2
Printer interface	Centronics compliant
LCD display	10.4 inch TFT color, 640x480 dots, CCFL backlight Standard brightness 450cd/m^2, Viewing angle 160°/140° Contrast 600 : 1

● Keyboard

Communication interface	Serial two wire interactive transmission
Connector	Mini DIN 5Pin
Durability	20,000,000 times

● Printer (NKG-800)

Printing system	Serial impact dot matrix
Communication interface	Centronics compliant
Supported fonts	ANK FX850 mode　　　　　　　: 324 characters IBM Proprinter II mode　　　　: 264 characters
Paper feed system	Roll paper holder
Paper type	209 - 216 mm (8.23 - 8.50") roll paper
Buffer size	ANK FX850 mode　　　　　　　: 21 kbytes IBM Proprinter II mode　　　　: 9.3 kbytes
Density adjustment	Manual (nonstepped)
Power supply voltage	10.2 VDC - 31.2 VDC
Power consumption	Maximum 35 W

1.3.2   Options

(1)   AC/DC Power supply (NBD-2150)

Source voltage	90 VAC to 264 VAC (50/60 Hz) and 24 VDC (21.6 VDC to 31.2 VDC)
Output voltage	AC operation : 24 VDC DC operation : Outputs the DC-IN directly
Maximum output current	30 A
Source switching function	Automatic switching to DC power when AC power is cut off. (uninterrupted output) Automatic switching from DC to AC when AC power is restored.
Alarm notification functions	AC power OFF, low battery voltage
Temperature range for full performance	-15°C - +55°C
Operating temperature range	-15°C - +55°C
Storage temperature range	-25°C - +65°C
Humidity resistance	No abnormality after standing 4 hours in +40°C, 93% RH
Vibration resistance (3 axes)	2 Hz - 5 Hz to 13.2 Hz: : Full amplitude ±1 mm±10% 13.2 Hz to 100 Hz: : Maximum acceleration 7 m/s^2 fixed No abnormality after testing resonance points or at 30 Hz for more than 2 hours
Continuous operation	No abnormality after operating continuously for 8 hours

(2)   Battery charger (NBB-724)

Source voltage	90 VAC - 132 VAC or 180 VAC to 264 VAC (50/60 Hz)
Current consumption	Charging : 15 A or less (100 VAC input) 8 A or less (220 VAC input) Discharging : 0.5 A or less (at 24 VDC operation)
Charging current	Float charging : 22 A Balanced charging : 22 A
Alarm notification functions	Abnormal charging, low battery voltage
Temperature range for full performance	-15°C - +55°C
Operating temperature range	-15°C - +55°C
Storage temperature range	-25°C - +65°C
Humidity resistance	No abnormality after standing 4 hours in +40°C, 93% RH
Vibration resistance (3 axes)	2 Hz - 5 Hz to 13.2 Hz: : Full amplitude ±1 mm±10% 13.2 Hz to 100 Hz: : Maximum acceleration 7 m/s^2 fixed No abnormality after testing resonance points or at 30 Hz for more than 2 hours
Continuous operation	No abnormality after operating continuously for 8 hours

(3) Printer (NKG-91)

Printing system	Thermal line dot
Communication interface	RS-232C, 4.8/9.6/38.4 kbps
Data control	RTS/CTS
Data buffer	4096 byte
Maximum print speed	20 mm/sec or more
Roll paper width	58 mm
Power supply voltage	6.5 VDC (5 VDC to 8.7 VDC)
Current consumption	Maximum 2 A

(4) Printer (DPU-414)

Printing system	Thermal serial dot
Communication interface	RS-232C, 4.8k/9.6k/38.4kbps
Data control	HW busy
Data buffer	About 28kbyte
Maximum print speed	52.5cps
Roll paper width	112mm
Power voltage	6.5VDC
Current consumption	Maximum 2A

1.3.3   Peripheral interfaces

(1)   GPS or other navigation aid interface

Interface standard	NMEA0183/IEC61162-1 compliant
Protocol	4800 bps, start 1 bit, data 8 bit, stop 1 bit Non parity
Input sentence	NMEA0183 V1.5 : GGA/GLL/RMC 　　　　　　　 V2.0 : GGA/GLL/RMC/ZDA 　　　　　　　 V2.3 : GGA/GLL/RMC/GNS/ZDA （Talker = "GP" or other）
Data type	Ship position & time information : GGA/GNS/GLL/RMC Date information : ZDA/RMC Equipment time information : ZDA/GGA/GNS/GLL/RMC

(1.1)   Electrical description
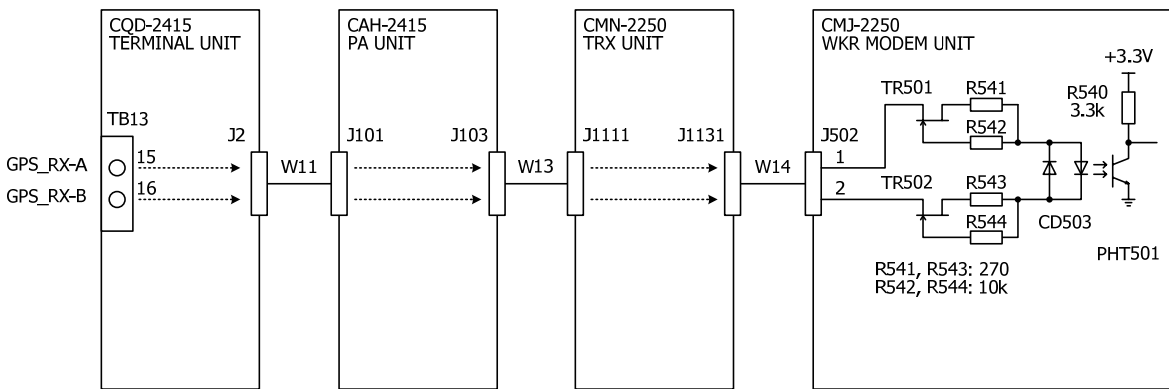
■   Load requirements

Current consumption   : 2mA at 2V or less

Maximum input voltage   : ±15V or more

Recommended operating current   : 2mA or more

(1.2) List of sentences and associated data fields

(1.2.1)   GGA – Global positioning system (GPS) fix data

$--GGA, hhmmss, llll.ll, a, yyyyy.yy, a, x, xx, x.x, x.x, M, x.x, M, x.x, xxxx *hh<CR><LF>

Differential reference

station ID, 0000-1023

Age of differential GPS data

Units of geoidal separation, m

Geoidal separation

Units of antenna altitude, m

Antenna altitude above/below mean sea level

(geoid)

Horizontal dilution of precision

Number of satellites in use, 00-12, may be different

from the number in view

GPS quality indicator

Longitude E/W

Latitude N/S

UTC of position

(1.2.2)   GLL – Geographic position – Latitude/longitude

$--GLL, llll.ll, a, yyyyy.yy, a, hhmmss.ss, A, a *hh<CR><LF>

Mode indicator:

A = Autonomous, D = Differential, E = Estimated

M = Manual input, S = Simulator, N = Data not valid

Status: A= data valid, V= data invalid

UTC of position

Longitude, E/W

Latitude, N/S
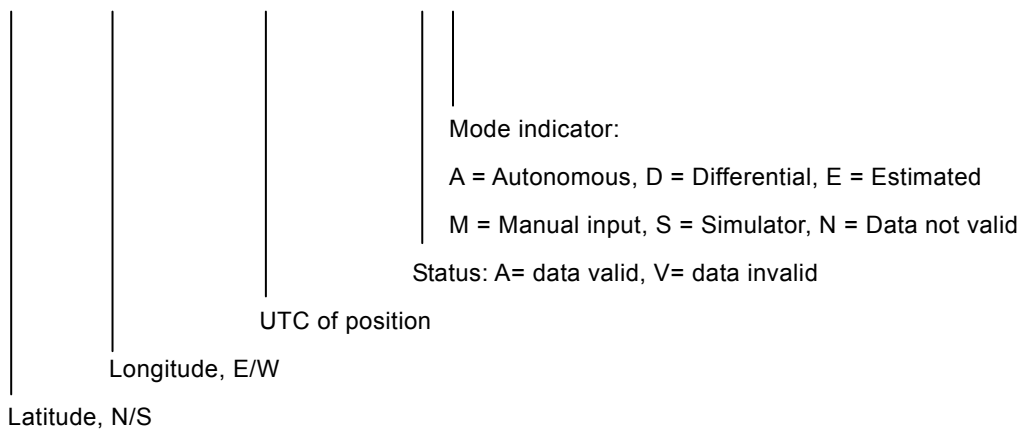
CONFIGURATION AND SPECIFICATIONS

(1.2.3)   RMC – Recommended minimum specific GNSS data

$--RMC, hhmmss.ss, A, llll.ll, a, yyyyy.yy, a, x.x, x.x, xxxxxx, x.x, a, a *hh<CR><LF>

Mode indicator:
A = Autonomous, D = Differential,
E = Estimated, M = Manual input,
S = Simulator, N = Data not valid

Magnetic variation, degrees, E/W

Date: dd/mm/yy

Course over ground, degrees true

Speed over ground, knots

Longitude, E/W

Latitude, N/S

Status: A = data valid, V = navigation receiver warning

UTC of position fix

(1.2.4)   GNS – GNSS fix data

$--GNS, hhmmss.ss, llll.ll, a, yyyyy.yy, a, c---c, xx, x.x, x.x, x.x, x.x, x.x *hh<CR><LF>

Differential reference station ID

Age of differential data

Geoidal separation, m

Antenna altitude, m, re:mean-sea-level (geoid)
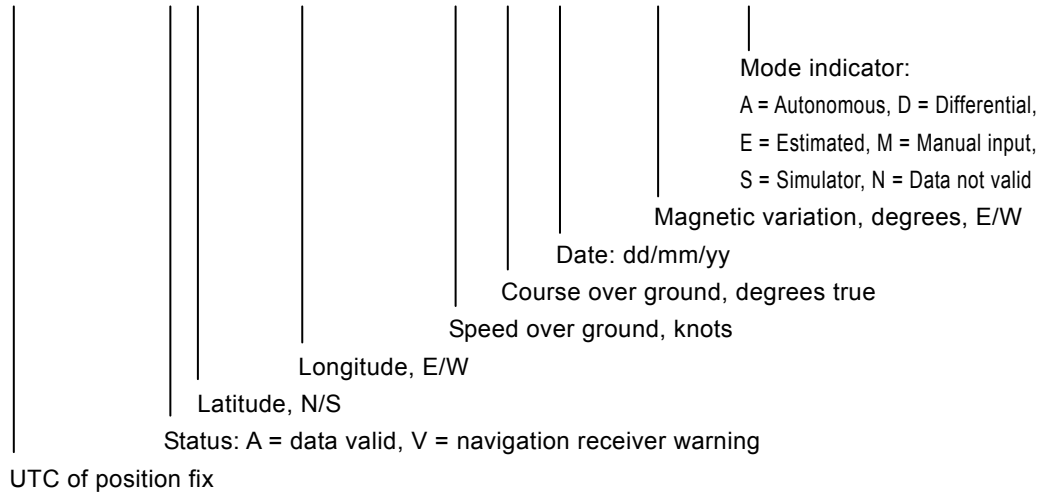
HDOP

Total number of satellites in use, 00-99

Mode indicator:
N = No fix, A = Autonomous, D = Differential,
P = Precise, R = Real Time Kinematic, F = Float RTK,
E = Estimated, M = Manual input, S = Simulator

Longitude, E/W

Latitude, N/S

UTC of position
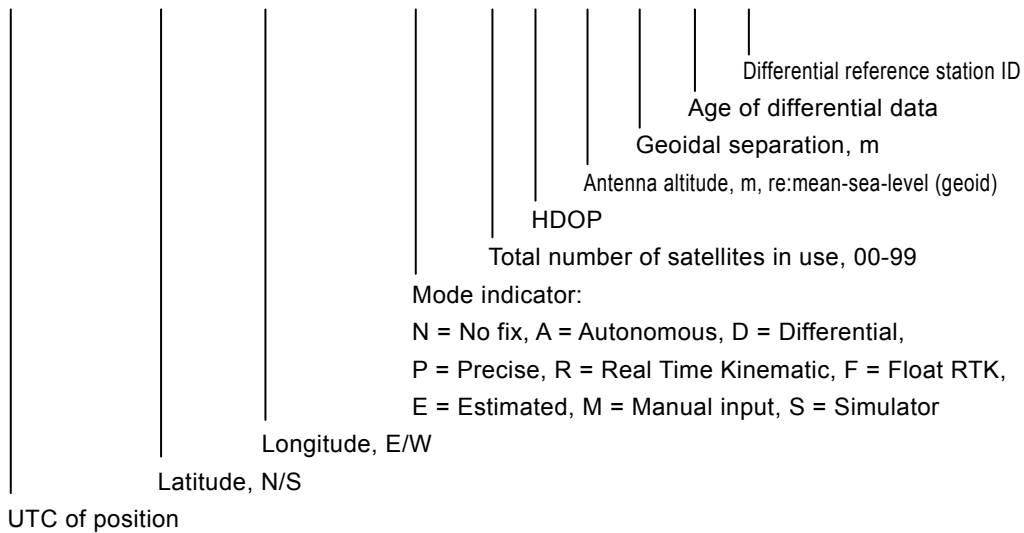
(1.2.5)   ZDA – Time and date

$--ZDA, hhmmss.ss, xx, xx, xxxx, xx, xx *hh<CR><LF>

Local zone minutes, 00 to +59

Local zone hours, 00 h to ±13 h

Year (UTC)

Month, 01 to 12 (UTC)

Day, 01 to 31 (UTC)

UTC
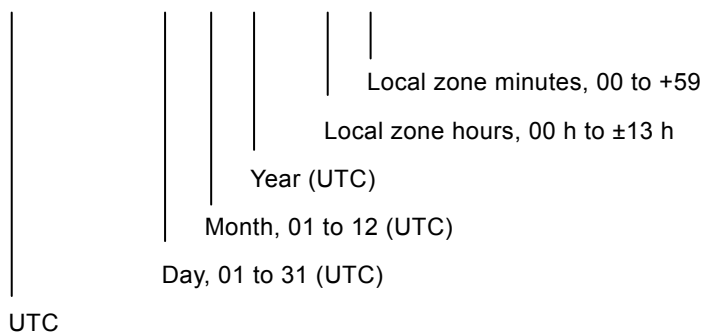
(2)   RMS interface

Interface standard	IEC61162-1 compliant
Protocol	4800 bps, start 1 bit, data 8 bit, stop 1 bit Non parity
Output message	IEC61162-1 compliant proprietary sentence $PJRCL sentence (for RMS log saving) $PJRCM sentence (Device ID = "CT")
Data type	Model number, serial number, self-diagnosis information, etc.

(3)   Accessory interface

DC_OPE	Input circuit Input current(between a and b)	: Current loop (Photo coupler) : 4.4mA (DC24V)
+BK	Output voltage (normal) Maximum output	: DC24V : 0.5A
-BK	・Input 　Input current ・Output 　Maximum output current	 : 2mA : 0.5A
RBK	Maximum output current	: 1.5A
EXT_KEY	Input current	: 2mA
SEL_BK	Input current	: 2mA
RBK（NCM-2150/ EXT MODEM）	Maximum output current	: 0.3A

1.3.4 External dimensions

（1） MF/HF Transceiver (NTD-2150)
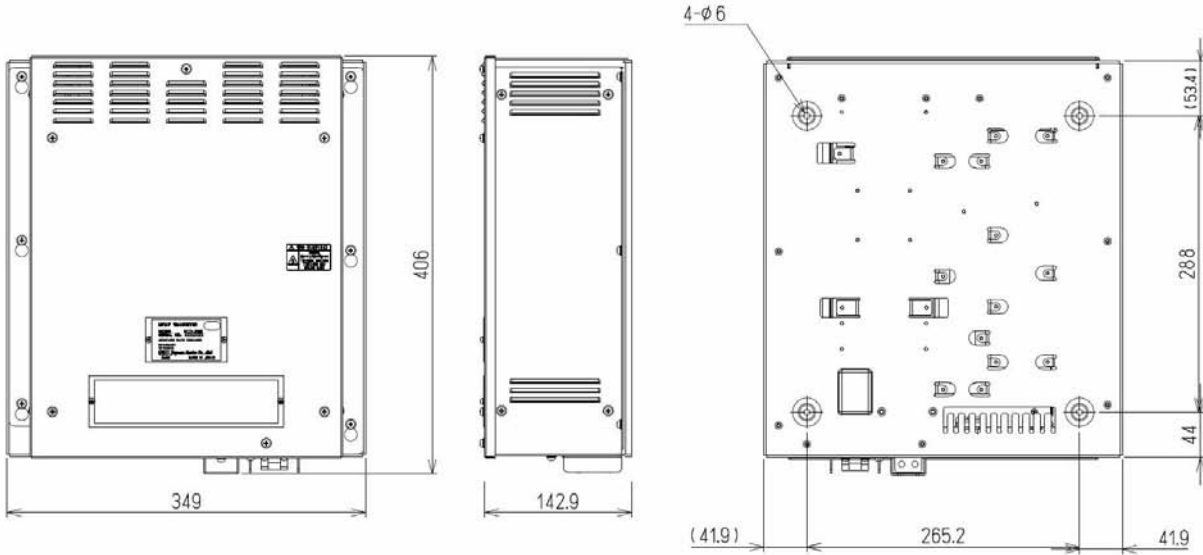
Unit: mm
Weight: Approx. 13 kg

（2） MF/HF Controller (NCM-2150)

Unit: mm
Weight: Approx. 1.3 kg

4-M4
MOUNTING HOLES
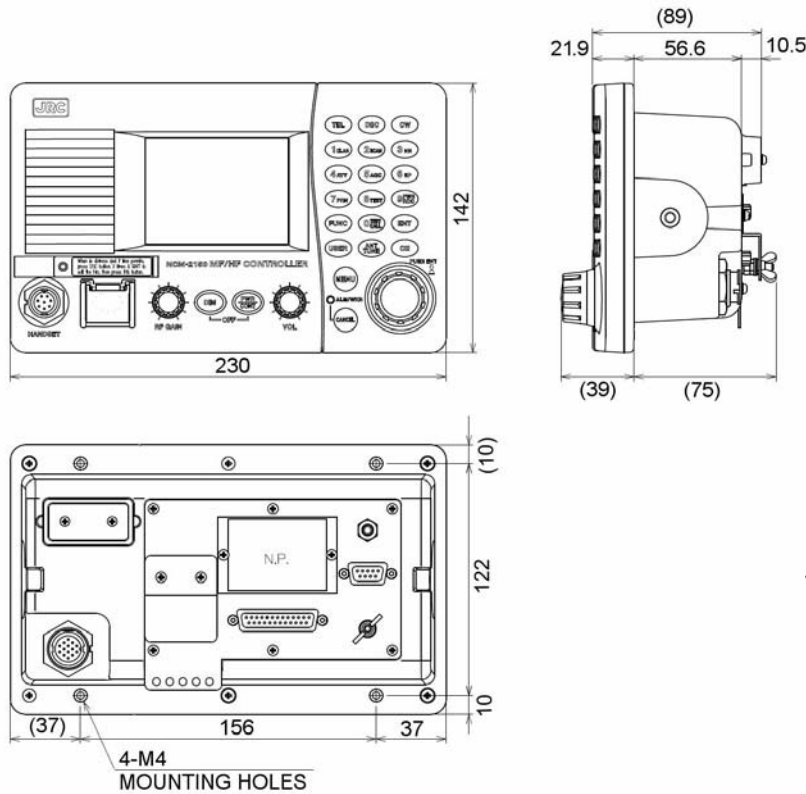
（3） Handset (NQW-261)
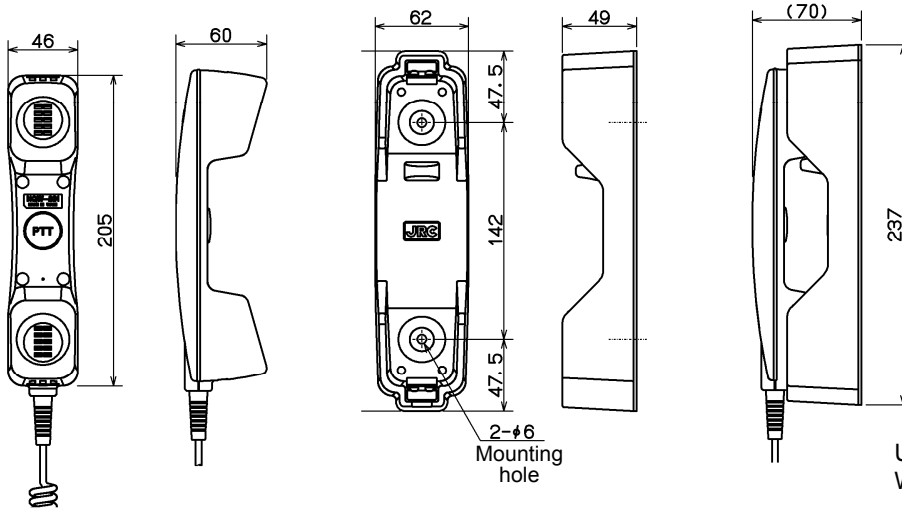
Unit: mm
Weight: Approx. 0.5 kg

（4） Connection box (NQD-2250)

Unit: mm
Weight: Approx. 0.6 kg

CONFIGURATION AND SPECIFICATIONS

（5） Antenna Tuner (NFC-2150)

Unit: mm
Weight: Approx. 3.3 kg

（6） Junction Box (NQD-2253)

Unit: mm
Weight: Approx. 1.2 kg
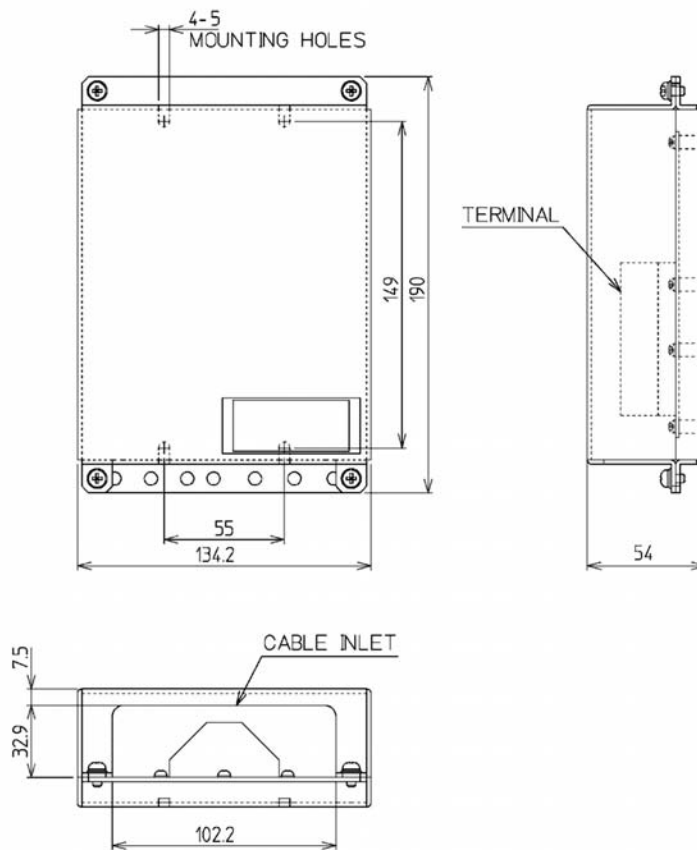
（7） **Data Terminal** (NDZ-227)

Unit: mm
Weight: Approx. 4.6 kg
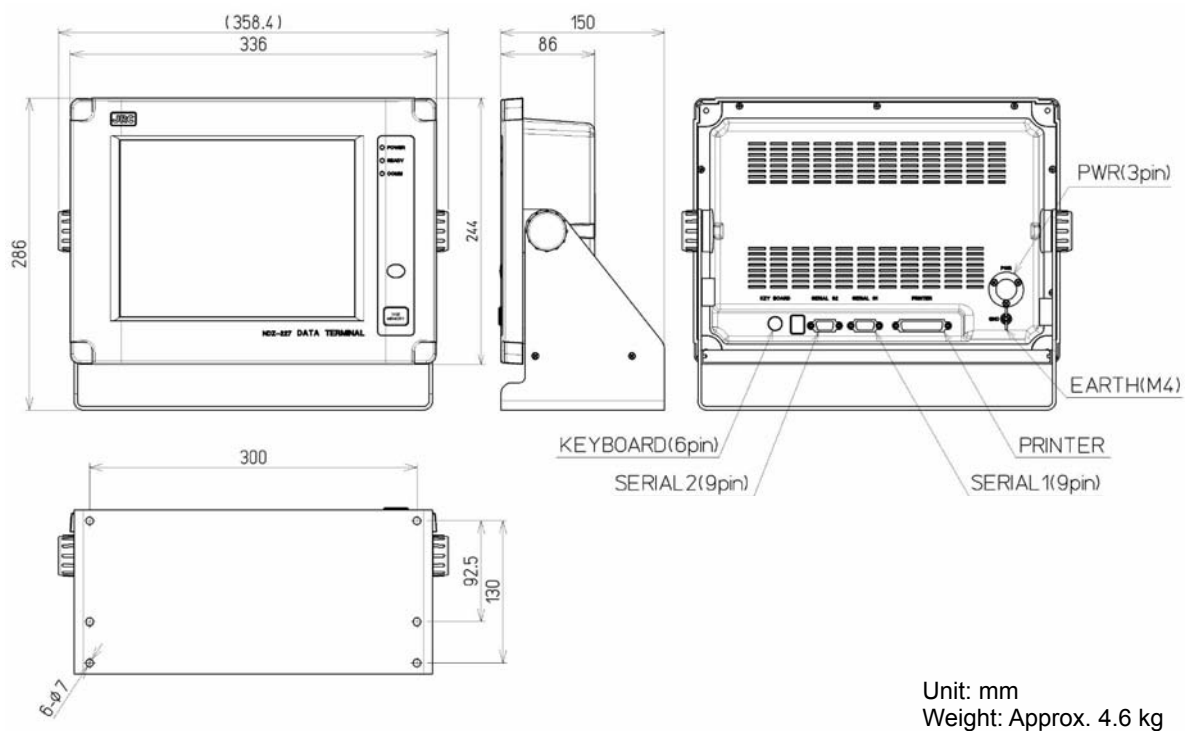
（8） Keyboard (NDF-369)
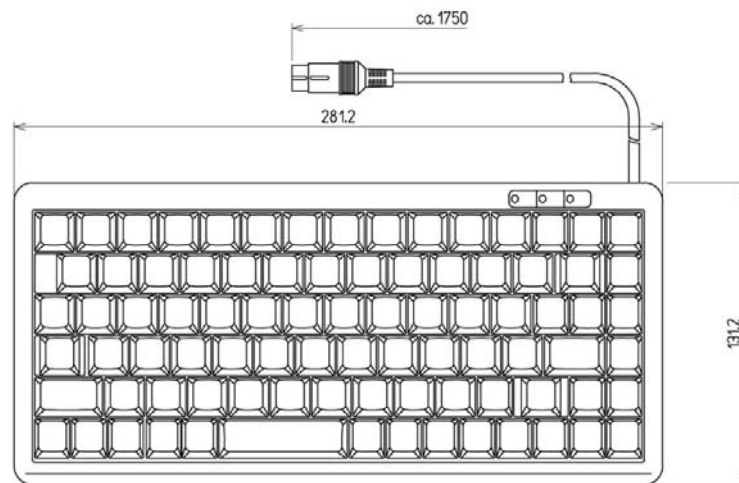
Unit: mm
Weight: Approx. 0.4 kg

CONFIGURATION AND SPECIFICATIONS

（9） AC/DC Power Supply (NBD-2150)
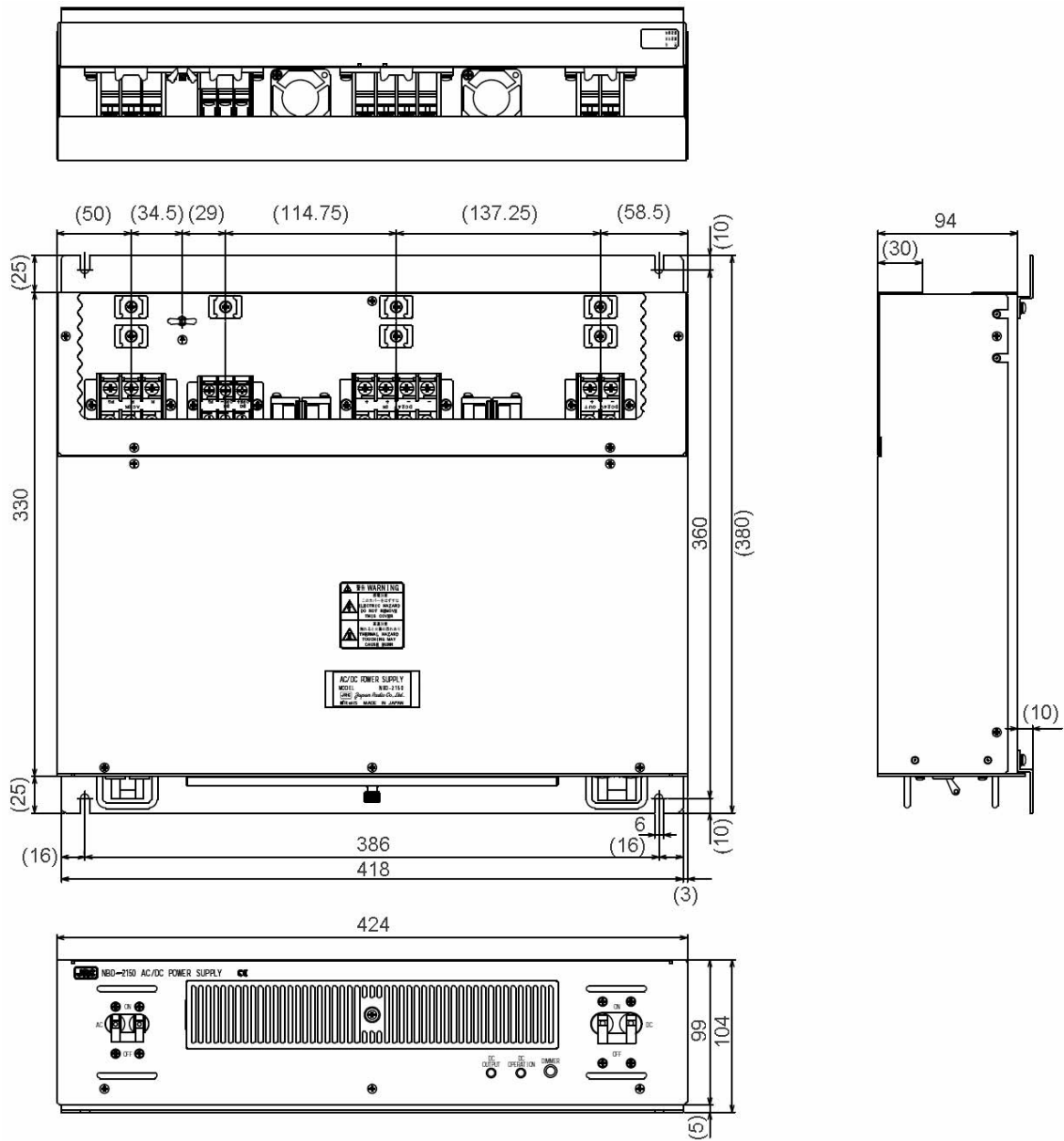
Unit: mm
Weight: Approx. 9.8 kg

（１０） Battery Charger (NBB-724)
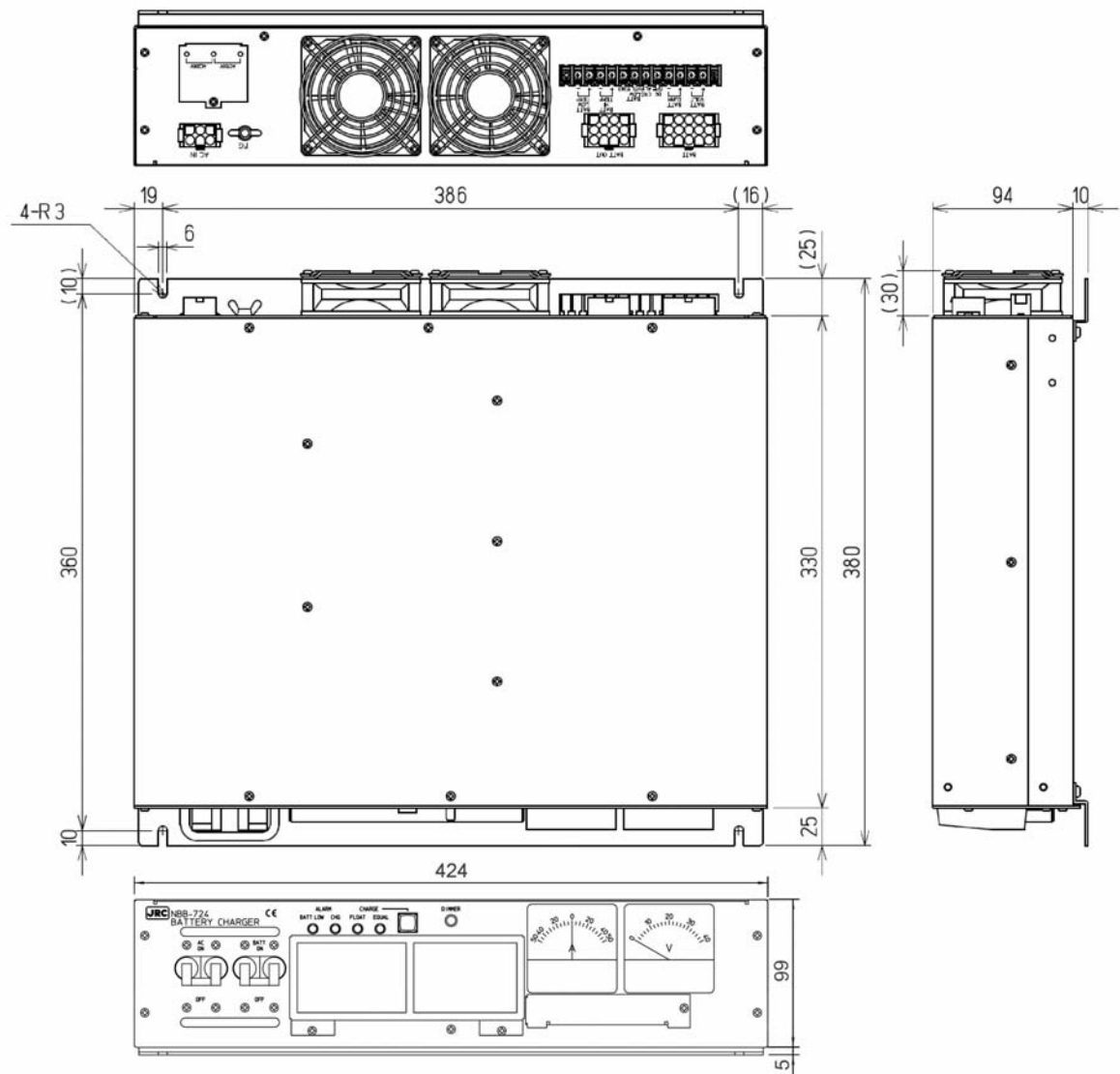
Unit: mm
Weight: Approx. 12.0 kg

CONFIGURATION AND SPECIFICATIONS

（１１） Printer (NKG-800)

● Desktop type
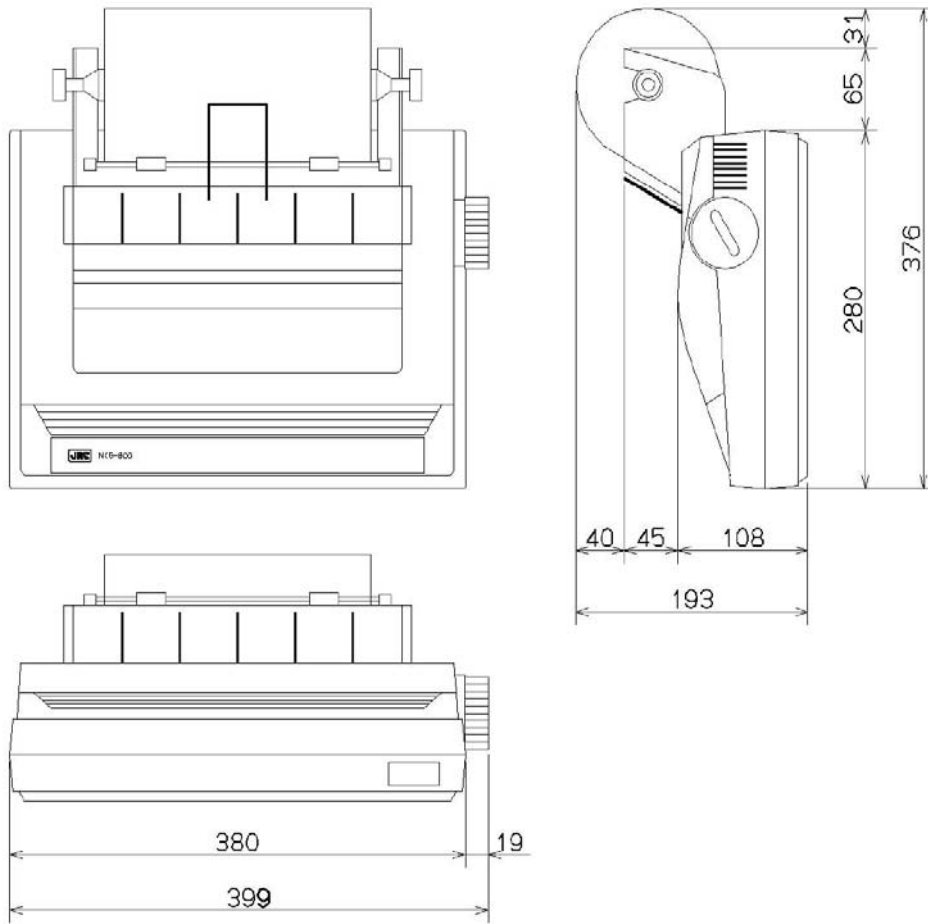
Unit: mm
Weight: Approx. 3.7 kg

（１２） Printer (NKG-91)

● Wall mount type

Wiring hole (side)

Wiring hole (back)

Mounting hole

6-φ5

Unit: mm
Weight: Approx. 1.5 kg

● Flush mount type

4-φ5
MOUNTING HOLES
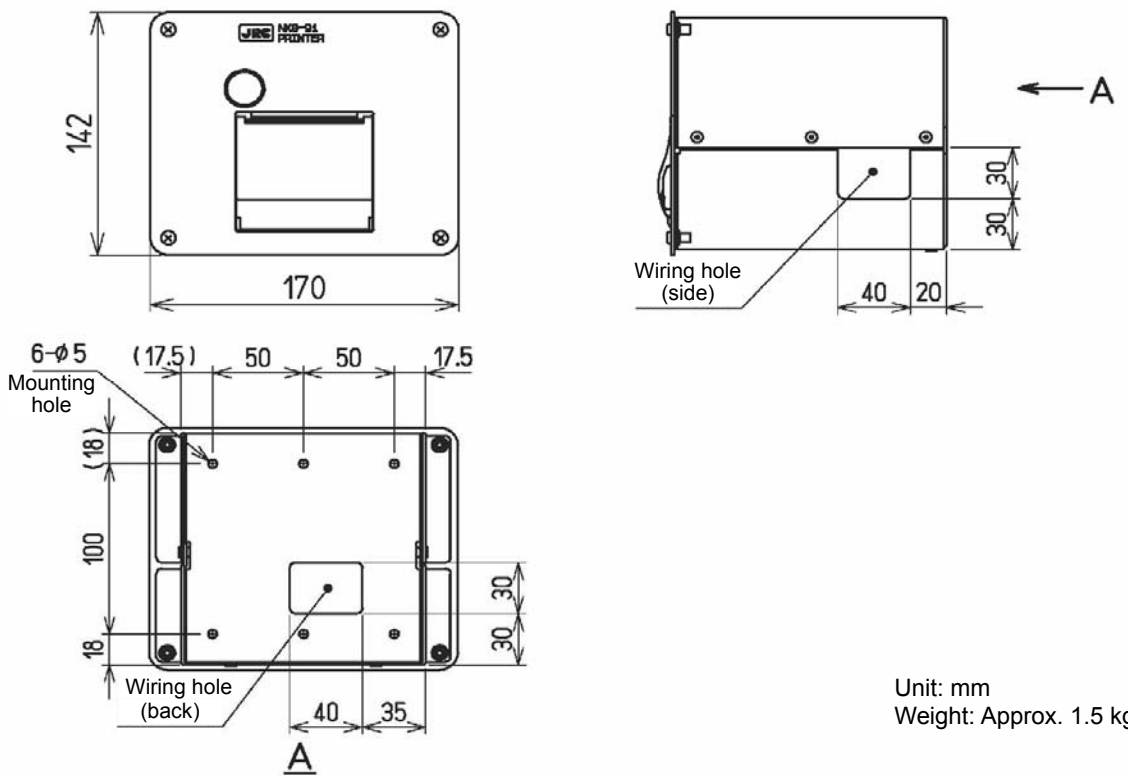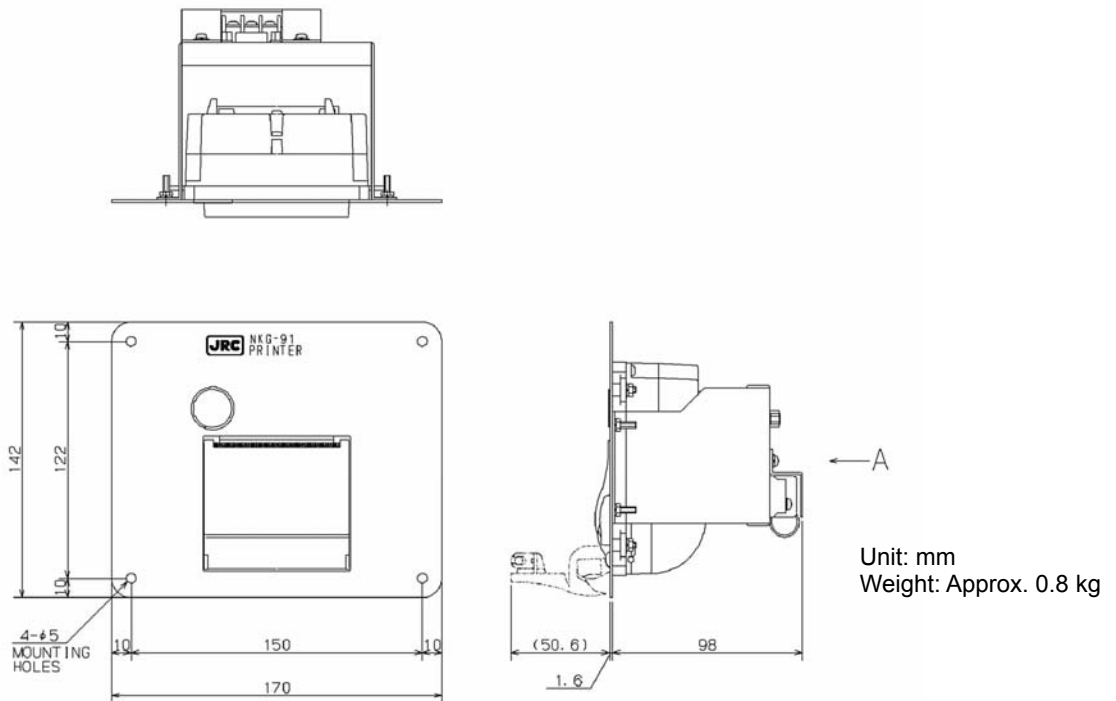
Unit: mm
Weight: Approx. 0.8 kg

（１３） Printer (DPU-414)

● Desktop type
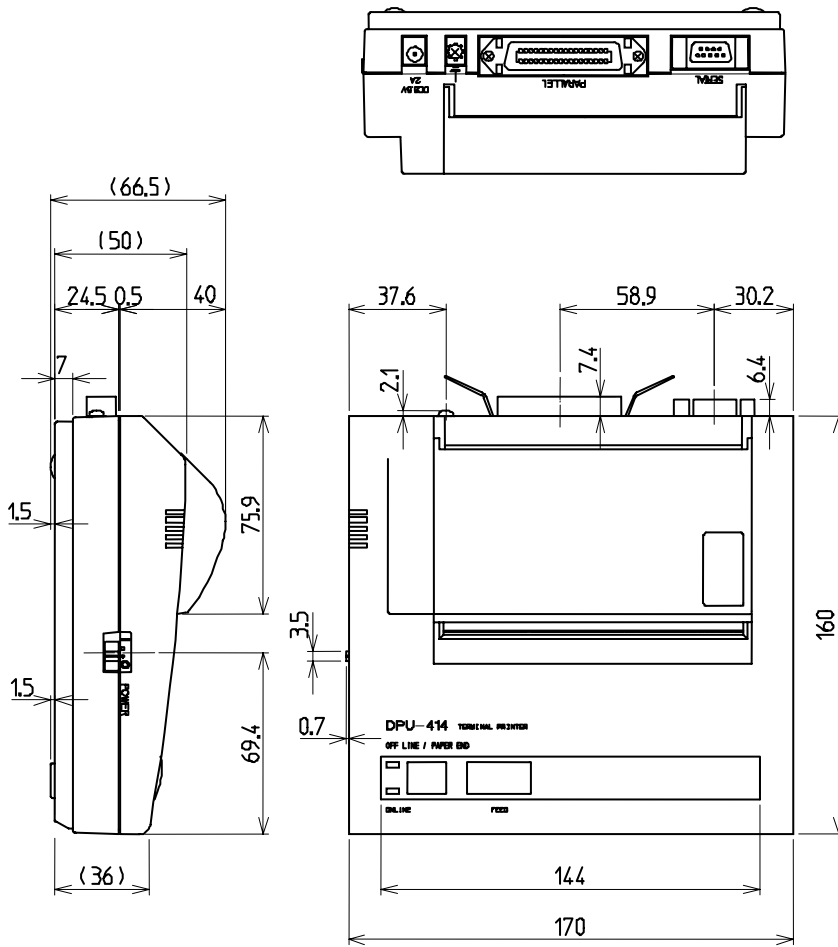
Unit: mm
Weight: Approx. 0.6 kg

1.4 Interconnection diagram

1.4.1 General configuration
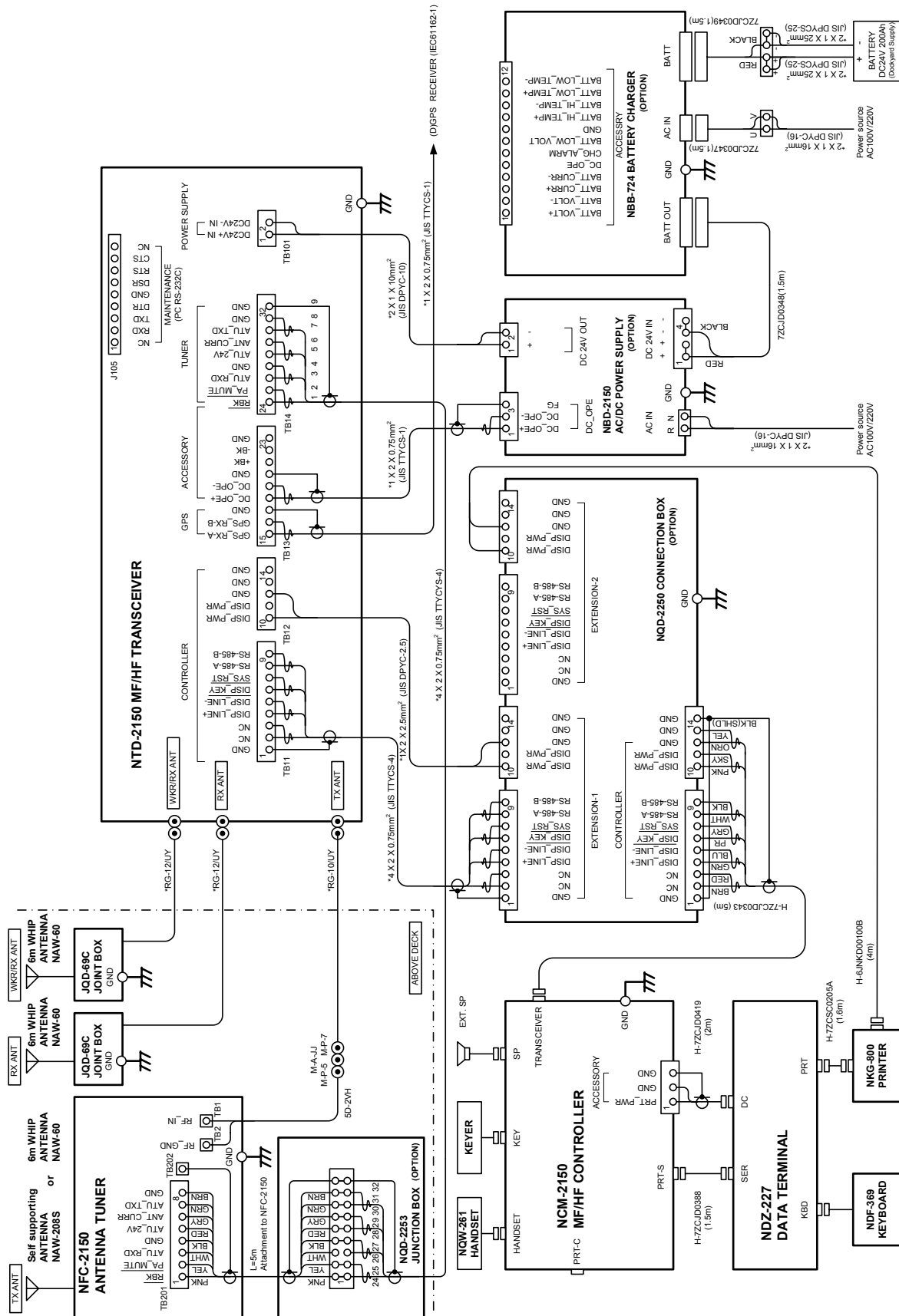
JSS-2150 MF/HF RADIO EQUIPMENT INTERCONNECTION DIAGRAM

Note: * marked cables are supplied by dockyard.

1.4.2 Overall configuration
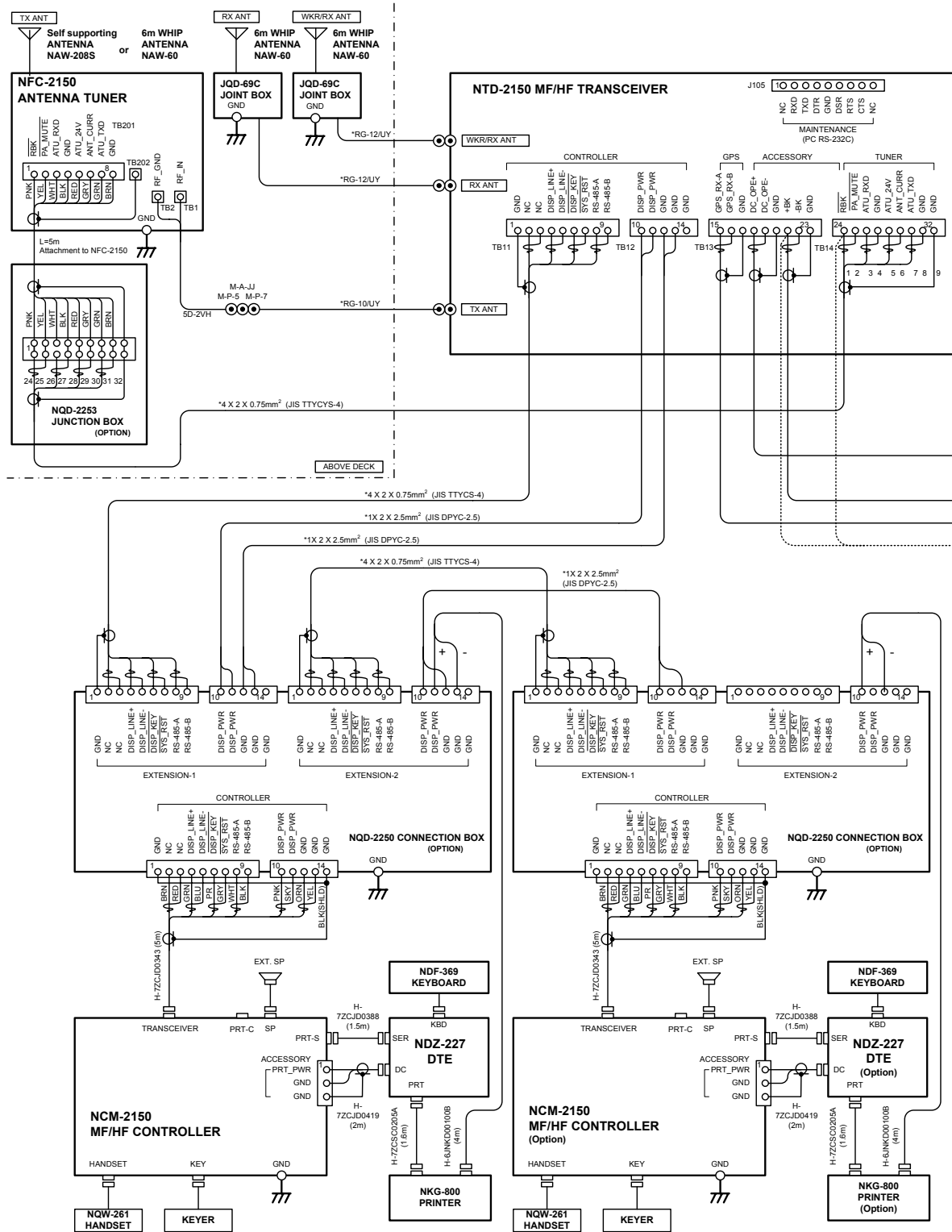
JSS−2150 MF/HF RADIO EQUIPMENT
INTERCONNECTION DIAGRAM（1/2）

Note: ※ marked cables are supplied by dockyard
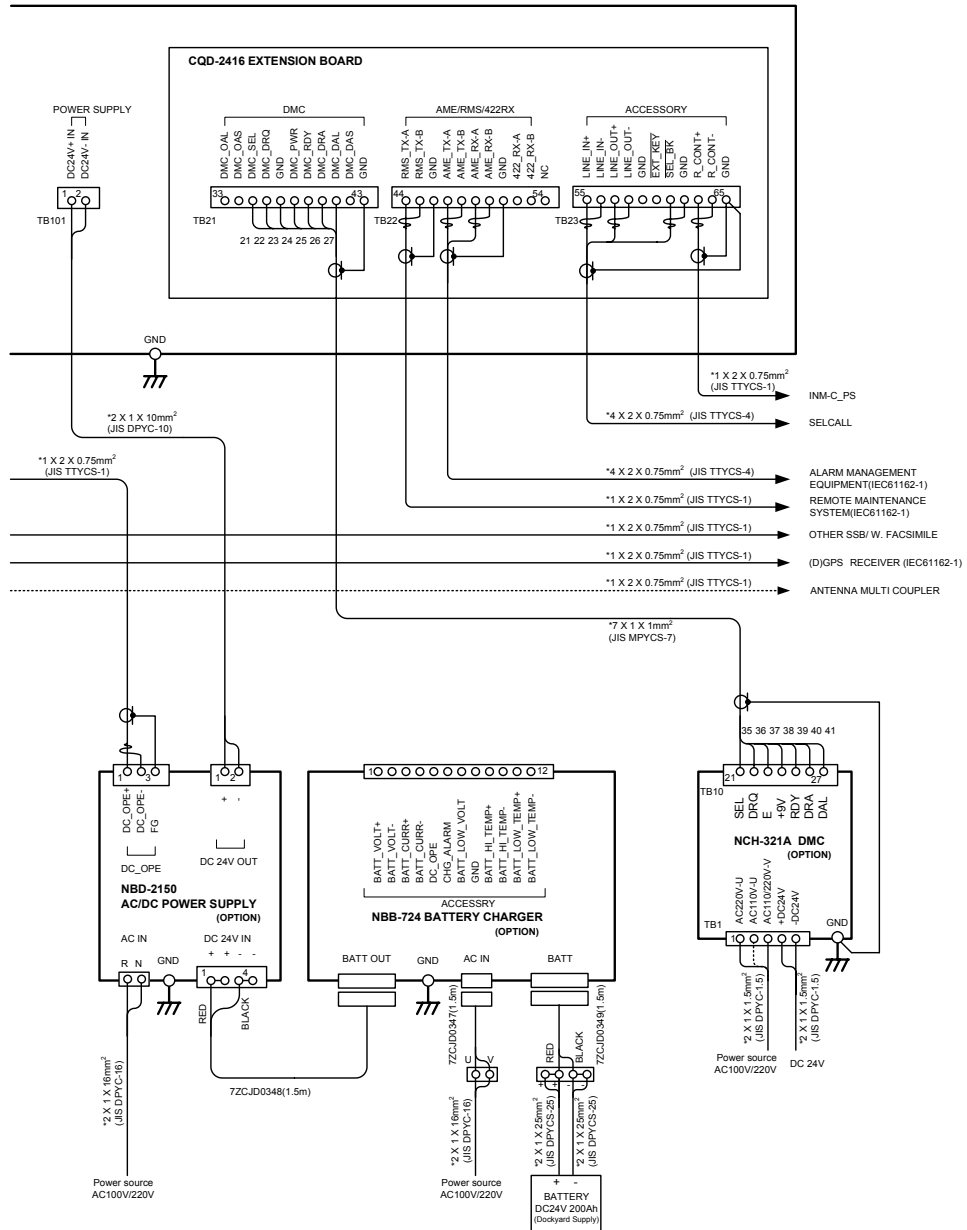
JSS−2150 MF/HF RADIO EQUIPMENT
INTERCONNECTION DIAGRAM （2/2）

1.5 Exploded views and wiring diagrams

1.5.1 NTD-2150 MF/HF Transceiver

(1)   MF/HF transceiver (NTD-2150) exploded view
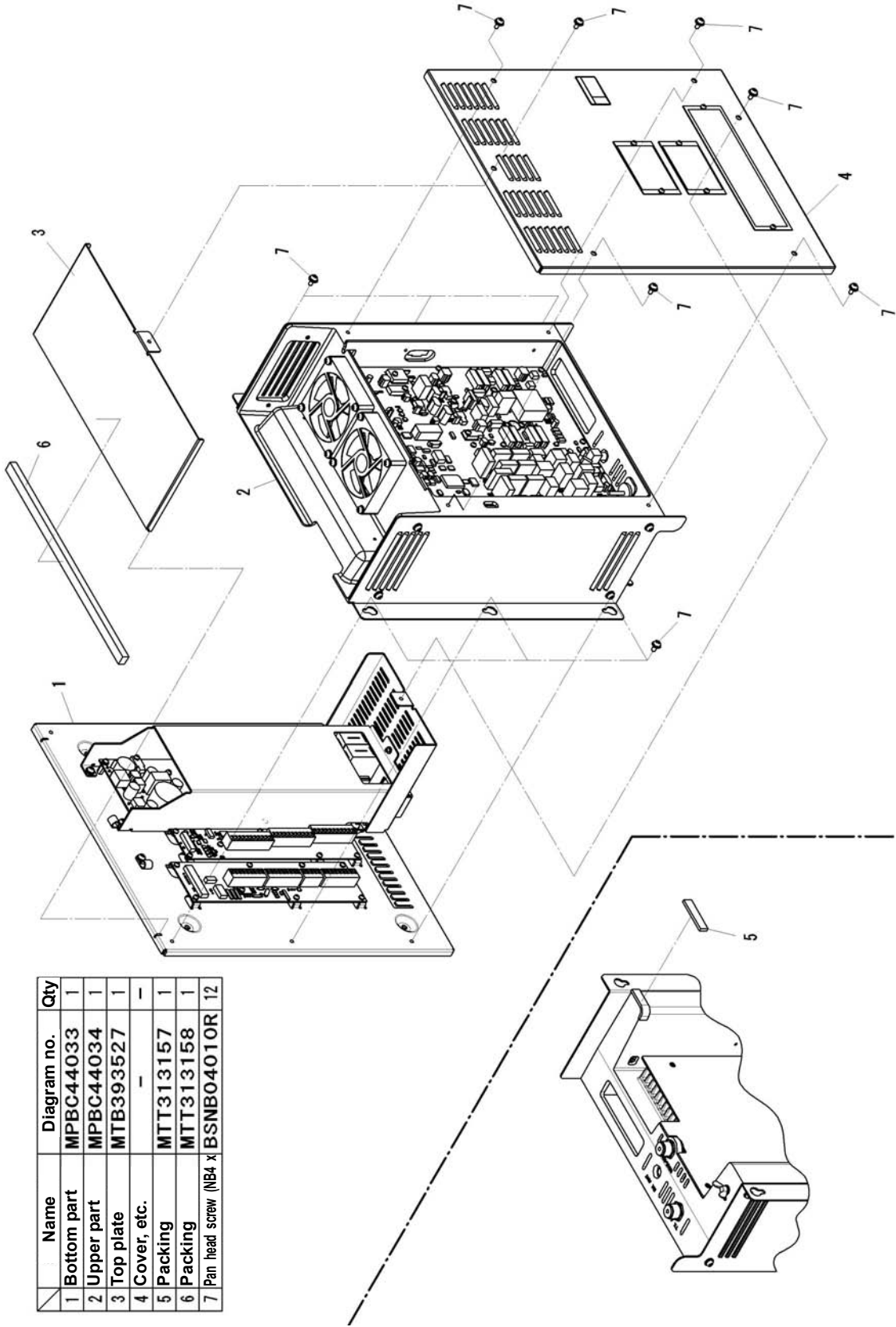
	Name	Diagram no.	Qty
1	Bottom part	MPBC44033	1
2	Upper part	MPBC44034	1
3	Top plate	MTB393527	1
4	Cover, etc.	–	–
5	Packing	MTT313157	1
6	Packing	MTT313158	1
7	Pan head screw (NB4 x)	BSNB04010R	12
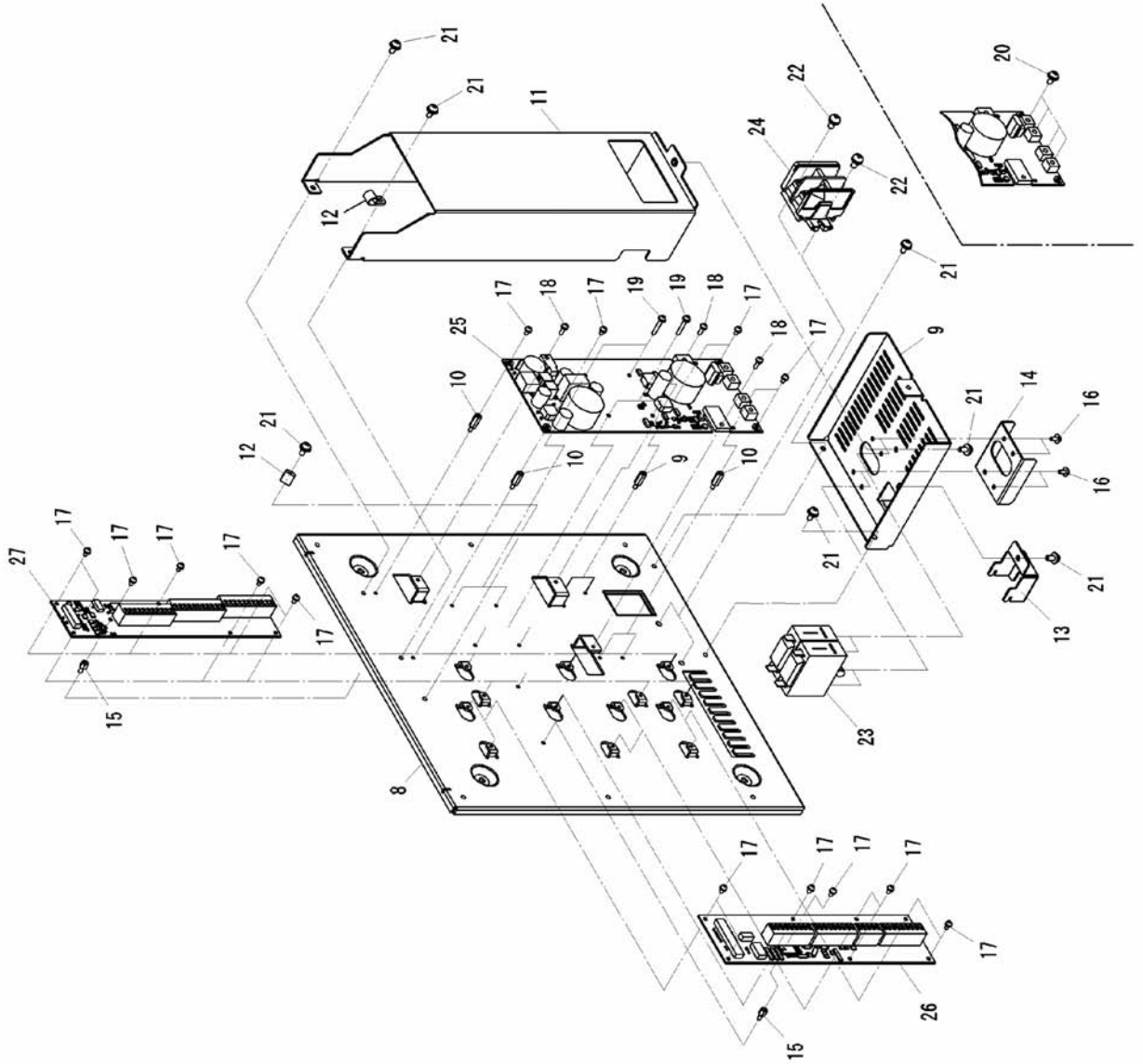
	Name	Diagram No.	Qty
1	Bottom part	MPBC44033	1
8	Base	MTB393519A	1
9	Rear panel	MTB393520	1
10	Eco spacer	BRBP06112	6
11	PS cover	MTB393522	1
12	Nylon clip	BRBP00007	2
13	Cable holder	MTB393125	1
14	Breaker cover	MTB393126	1
15	Brass spacer	BRBP06352	2
16	Pan head screw (NB3x8)	BSNB03008R	4
17	Pan head screw (NC3x6)	BSNC03006R	22
18	Pan head screw (NC3x10)	BSNC03010R	3
19	Pan head screw (NC3x20)	BSNB03020R	4
20	Pan head screw (NB4x8)	BSNB04008R	4
21	Pan head screw (NB4x10)	BSNB04010R	7
22	Pan head screw (NC5x12)	BSNC05012R	2
23	Circuit protector	7KDJD0004	1
24	Terminal block	7JTJD0045	1
25	PS UNIT	CBD−2415	1
26	TERMINAL UNIT	CQD−2415	1
27	EXTENSION BOARD	CQD−2416	1
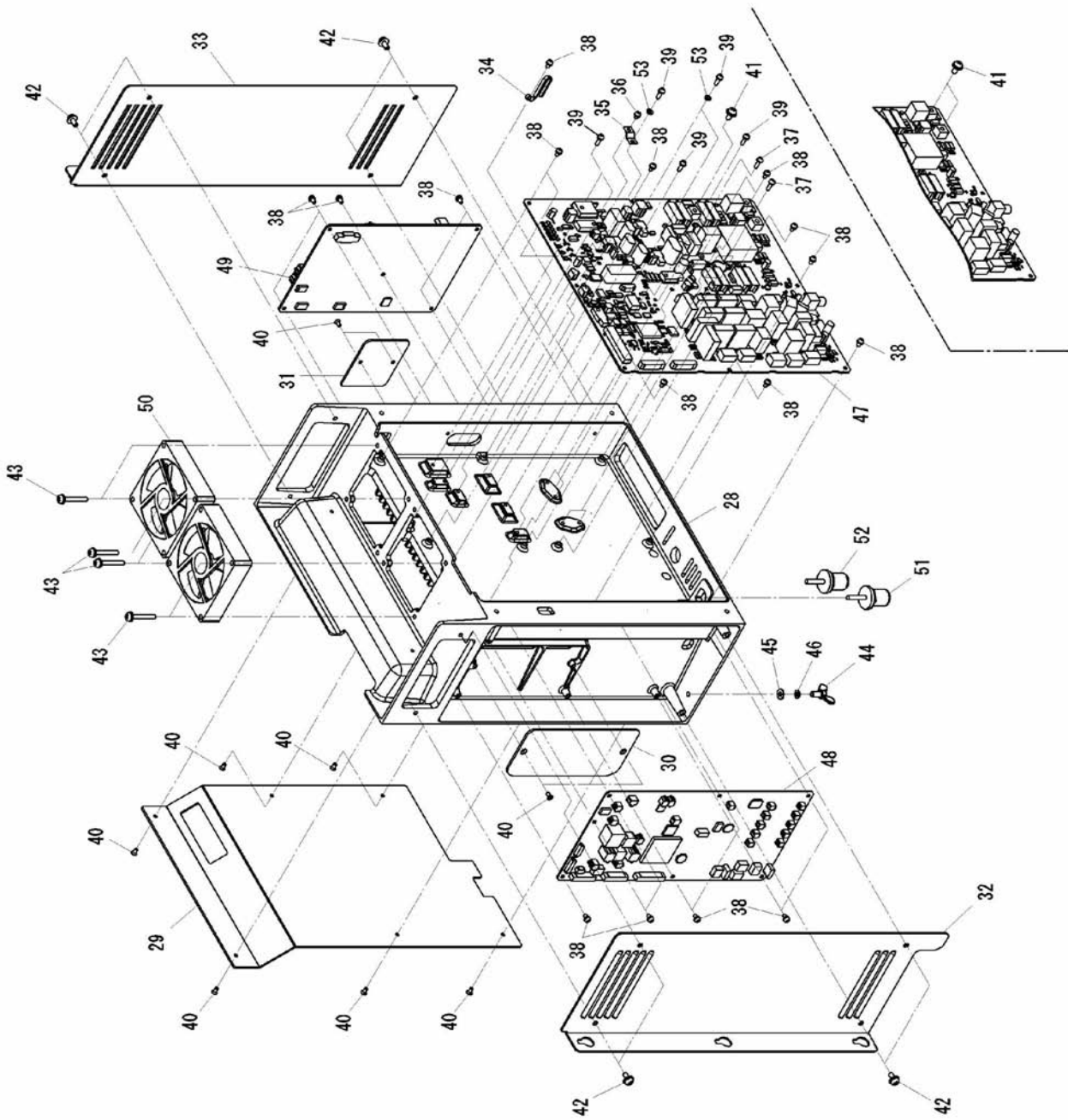
	Name	Diagram No.	Qty
2	Upper part	MPBC44034	–
28	Chassis	MTC301756	1
29	Cover	MTB393525	1
30	TRX shield cover	MTB393132	1
31	WKR shield cover	MTB393133	1
32	Side frame	MTB393523	1
33	Side frame	MTB393524	1
34	Coaching clip	BRBP05303	1
35	Ground plate	MTB393665	1
36	Pan head screw (M3x6)	BRTG06551	1
37	Pan head screw (NA3x10)	BSNA03010R	4
38	Pan head screw (NC3x6)	BSNC03006R	23
39	Pan head screw (NC3x10)	BSNB03010R	7
40	Flat head screw (S3x6)	BSNB04010R	10
41	Pan head screw (NB4x8)	BSNB04008R	3
42	Pan head screw (NB4x10)	BSNB04010R	8
43	Pan head screw (NB4x30)	BSNB04030R	8
44	Wing bolt	BSBB04010R	1
45	Plain washer	BSFW04000R	1
46	Spring washer	BSSW04000S	1
47	PA UNIT	CAH-2415	1
48	TRX UNIT	CMN-2250	1
49	WKR MODEM UNIT	CMJ-2250	1
50	Fan	5BFCM00011	2
51	RF cable	7ZCJDC001	1
52	RF cable	7ZCJDC002	1
53	Teflon bushing	BRNG05148	3

	Name	Diagram No.	Qty
54	Cover	MTC01756	1
55	Name plate	MPNL39554	1
56	Name plate	MPNL39555	1
57	Warning plate	MPNN45780	1
58	Environmental seal (1/b small)	MPNN44289	1
59	Packing	MTT313110	1
60	Pan head screw (NC3x6)	BSNC03006R	6
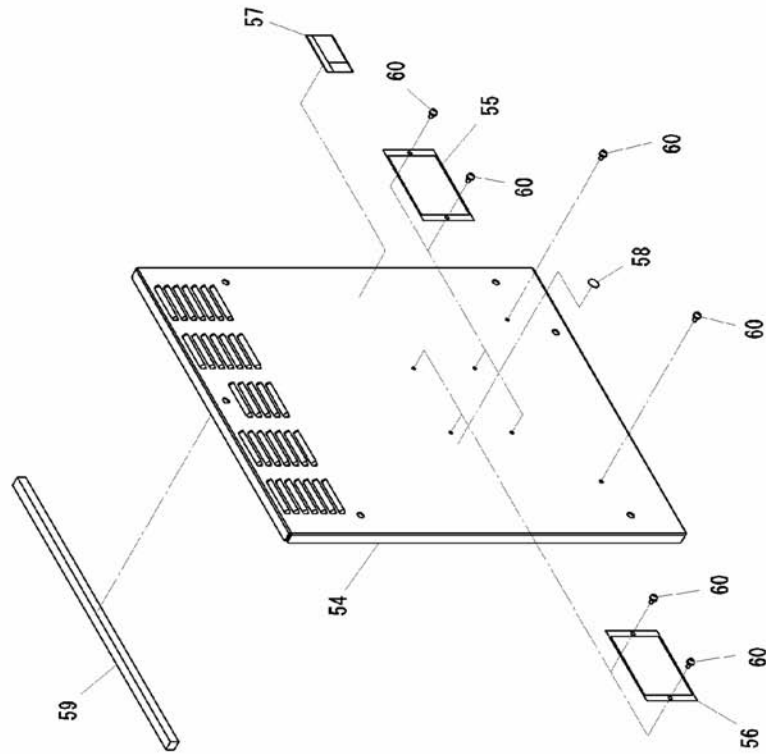
(2)   MF/HF transceiver (NTD-2150) wiring diagram
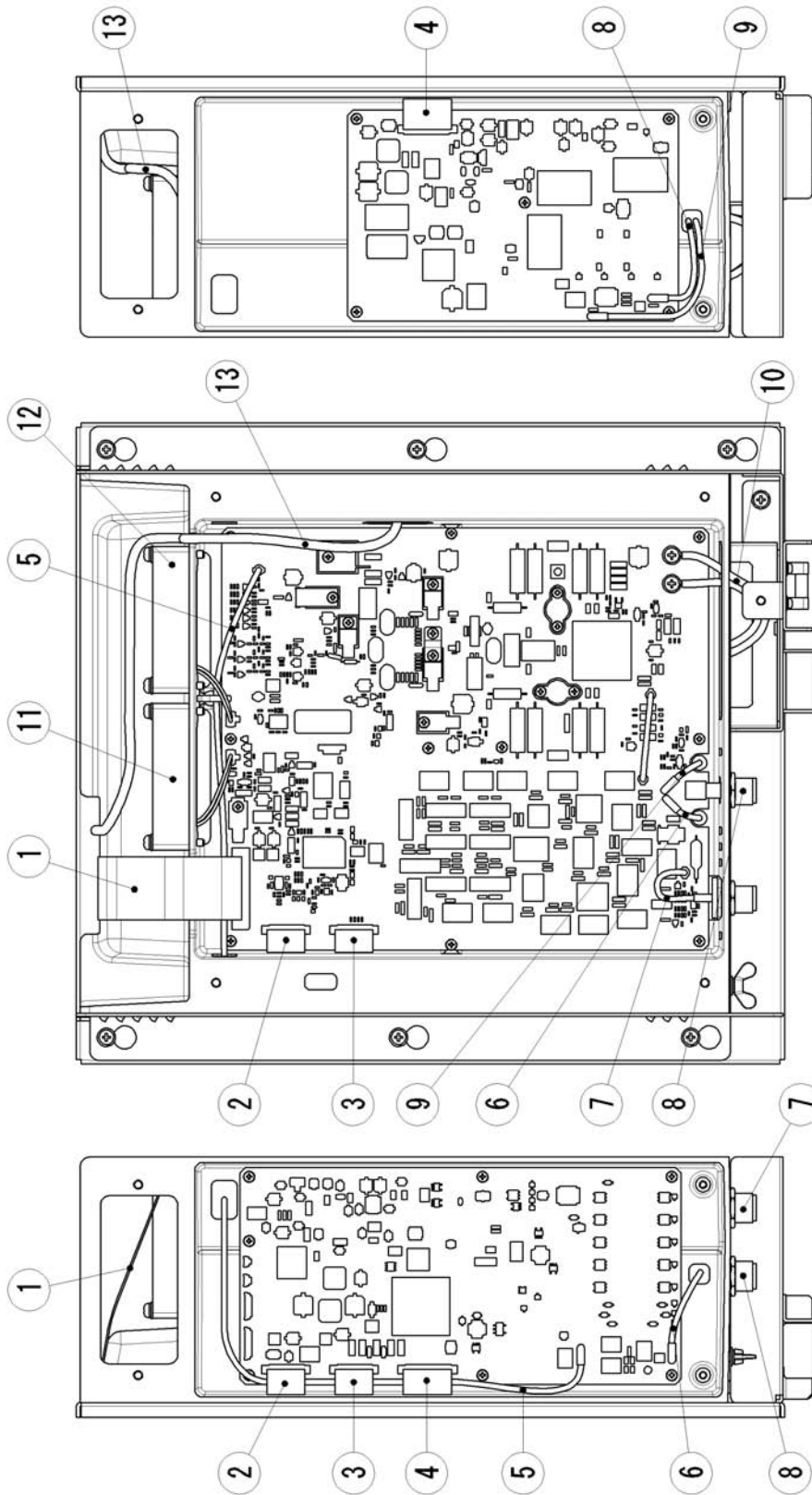
Right side view (no side frame)

	Name	Diagram no.	Note
13	Cable with connector	7ZCJD0334	To CQD-2416
14			
15			
16			
17			
18			

Top view (no cover)

	Name	Diagram no.	Note
7	RF cable	7ZCJDC001	
8	RF cable	7ZCJDC002	
9	RF cable	7ZCJDD002	
10	Power cable	7ZCJD0328	To CBD-2415
11	Fan	5BFCM00011	
12	Fan	5BFCM00011	

Left side view (no side frame)

	Name	Diagram no.	Note
1	Cable with connector	5ZCBS00400	To CQD-2415
2	Flat cable	5ZCMD00051	
3	Flat cable	5ZCMD00051	
4	Flat cable	5ZCMD00059	
5	RF cable	7ZCJDD003	
6	RF cable	7ZCJDD001	

1-32

Right side view (no upper part)

	Name	Diagram no.	Note
7	Cable with connector	7ZCJD0324	To CQD-2415
8			
9			
10			
11			
12			

Top view (no upper part)

	Name	Diagram no.	Note
1	Cable with connector	5ZCBS00400	To CAH-2415
2	Power cable	7ZCJD0325	
3	Power cable	7ZCJD0328	To CAH-2415
4	Power cable	7ZCJD0326	
5	Power cable	7ZCJD0327	
6	Cable with connector	7ZCJD0334	To CMJ-2250

1.5.2   NCM-2150 MF/HF Controller

(1)   MF/HF controller (NCM-2150) exploded view
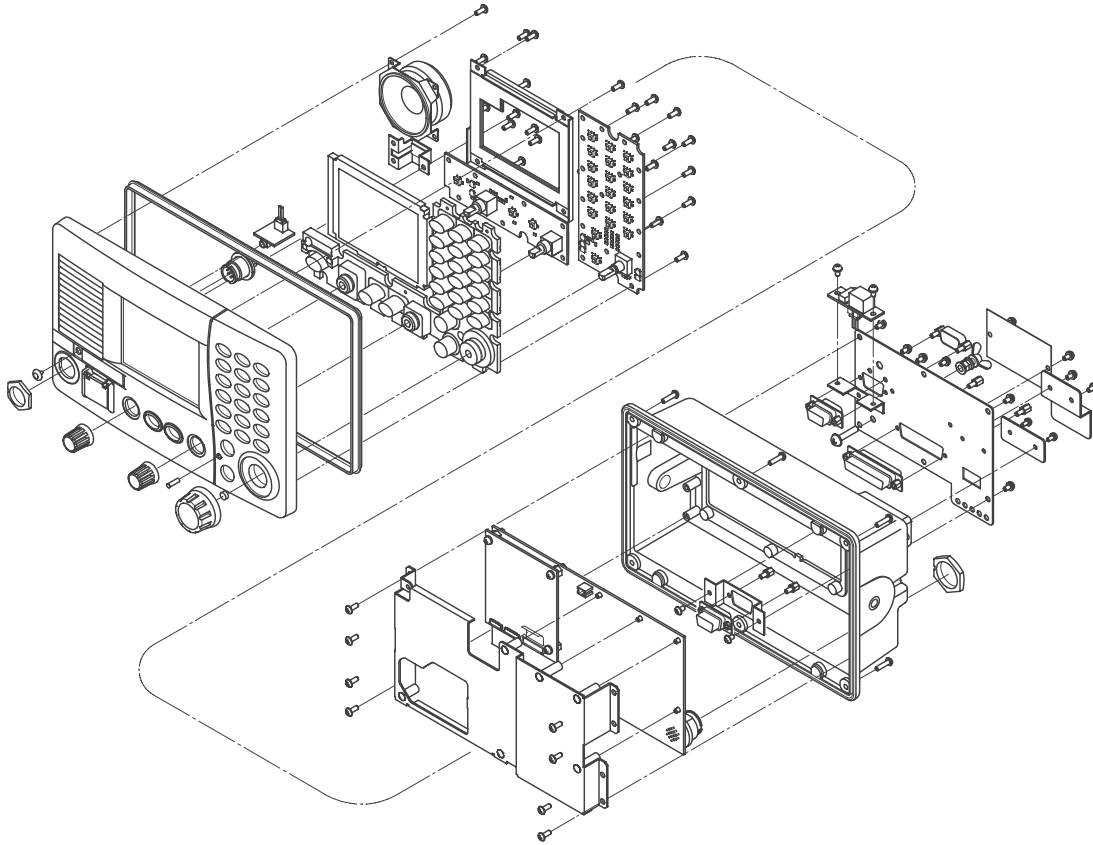
(2)   MF/HF controller (NCM-2150) wiring diagram

W1   5ZCMD00018   Flat cable

W2   5ZCMD00046   Flat cable

from SP

J2

J5

J4   J3

J1

J121

J321

J1

W7
7ZCJD0303

W3   7ZCJD0310

from LCD   Flat cable

W4   7ZCJD0300A   W6   7ZCJD0302A

J341

J351

J3

Dsub9pin

J322

Dsub25pin

W5   7ZCJD0301

W8   7ZCJD0304
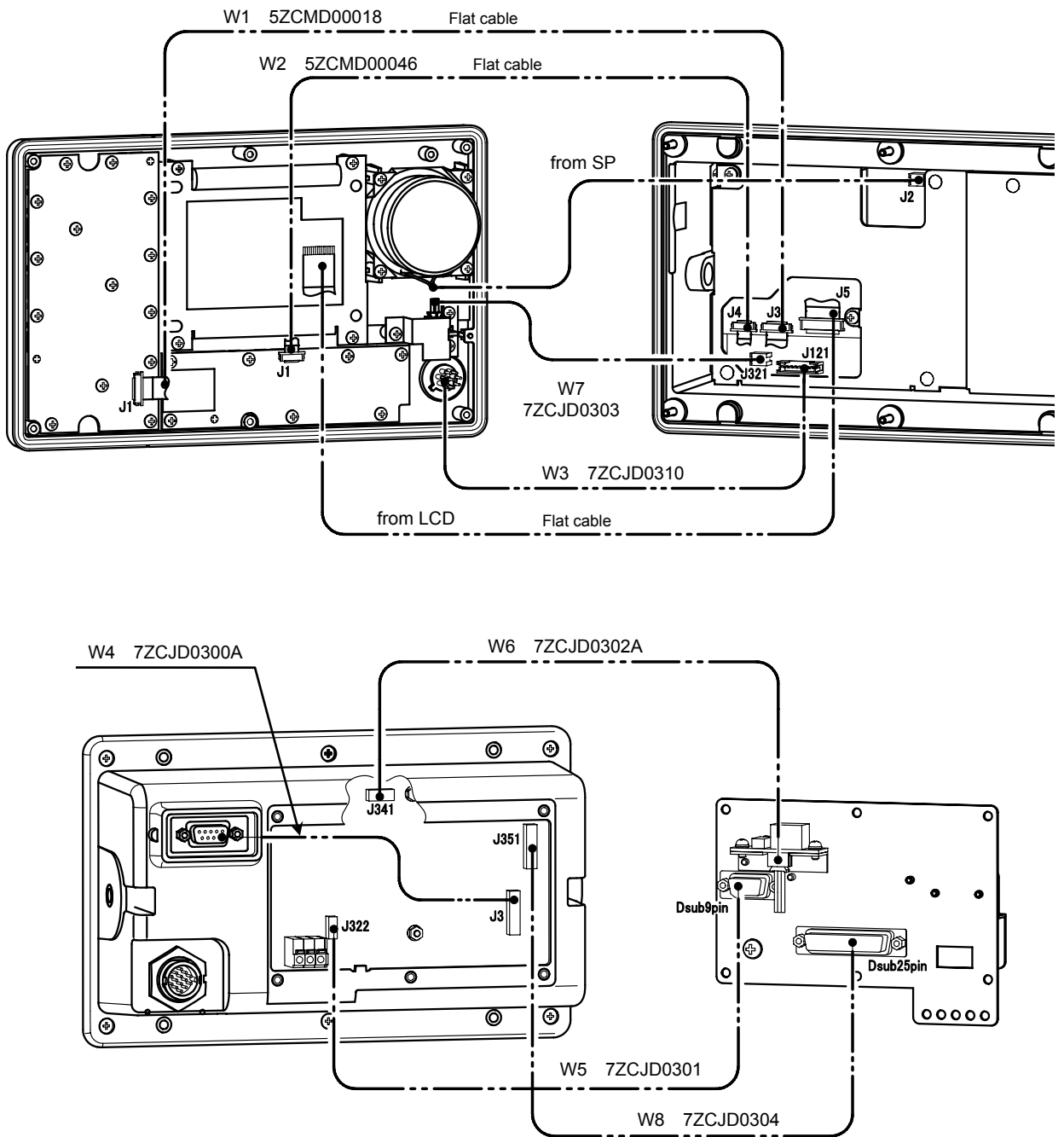
Note: To connect or disconnect the flat cables, refer to the following description. Additionally, when connecting
the flat cables, face up the blue tape and push the flat cable as far as it will go.

→ Release
← Lock

[Locked state of the connector]   [Unlocked state of the connector]
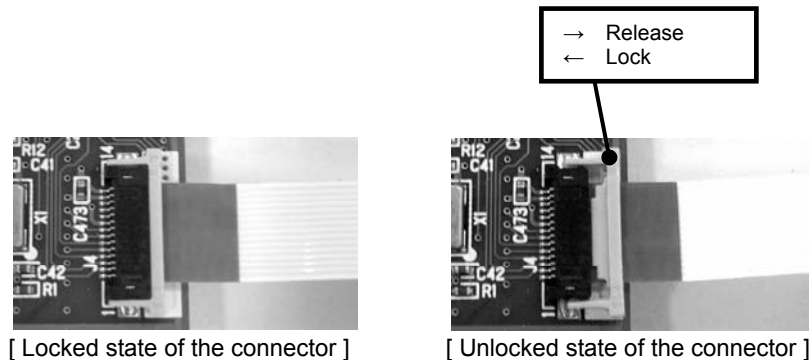
(3)   MF/HF controller (NCM-2150) handset terminal

NCM-2150 HANDSET terminal

Microphone DM-96 (150O)

PTT S/W

HOOK S/W
Hall IC

VCC
1u
100p 100p

Phone DH-60 (150O)

Connector: LTWBD-08BFFA-LL equivalent product

(Reference) NQW-261 handset connection diagram
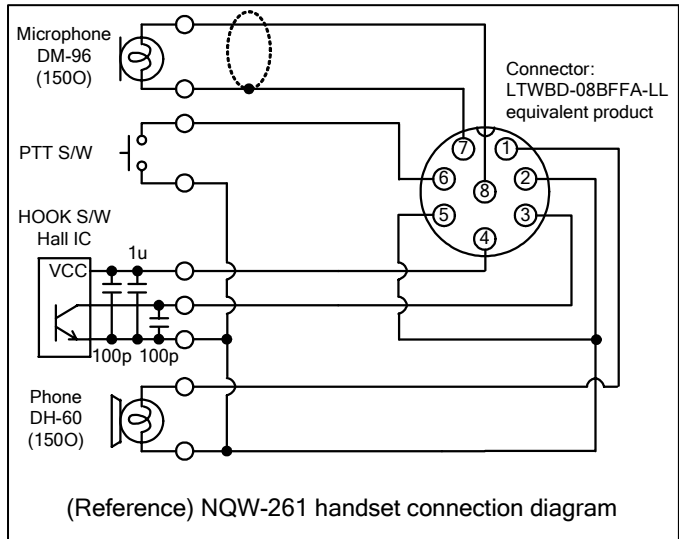
HANDSET terminal

No.	Name	Description	Connection point
1	PHONE +	For connecting the handset	NQW-261 or 7ZCJD0315 (For PC connection)
2	PHONE - (GND)	For connecting the handset	
3	HOOKSW (RXD)	Hook switch (also for RXD)	
4	BIAS (TXD)	Bias power supply 9 V - 1 kΩ (also for TXD)	
5	OCC	For detecting connection	
6	PTT	PTT switch	
7	MIC -	For connecting microphone	
8	MIC +	For connecting microphone	

Dsub-9 Female

9
8   CTS
7   RTS
6   DSR
5   GND-ISO
4   DTR
3   TXD
2   RXD
1

Connector for NCM-2150
LTWBD-08BFFA-LL

8
7
6
5
4   TXD
3   RXD
2   GND
1

Dsub-9 Female

LTWBD-08BFFA-LL

7ZCJD0315

2±0.1m

(Reference H-7ZCJD0315 Upgrade cable)
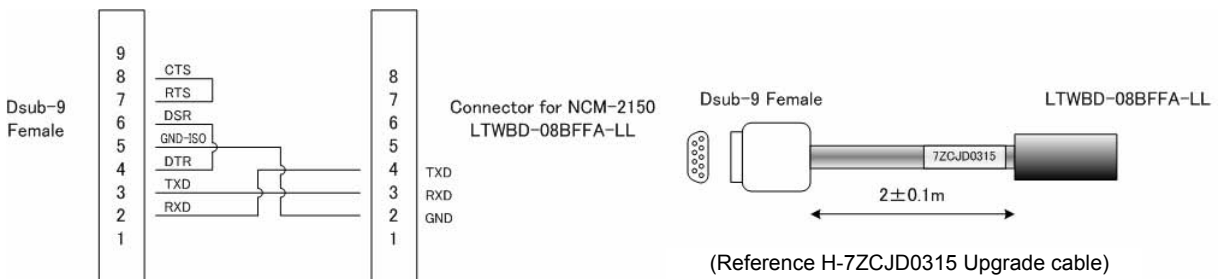
1.5.3   NFC-2150 Antenna tuner

(1)   Antenna tuner (NFC-2150) exploded view
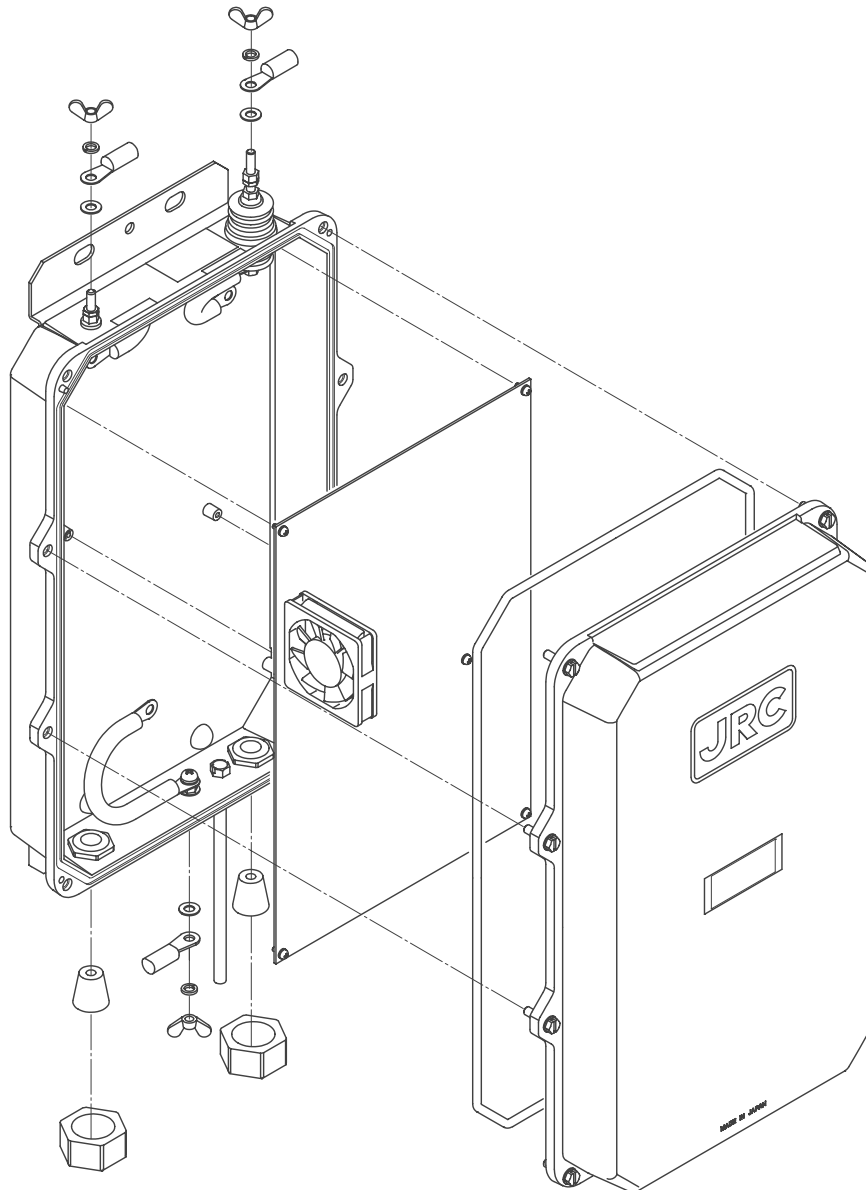
(2)   Antenna tuner (NFC-2150) wiring diagram
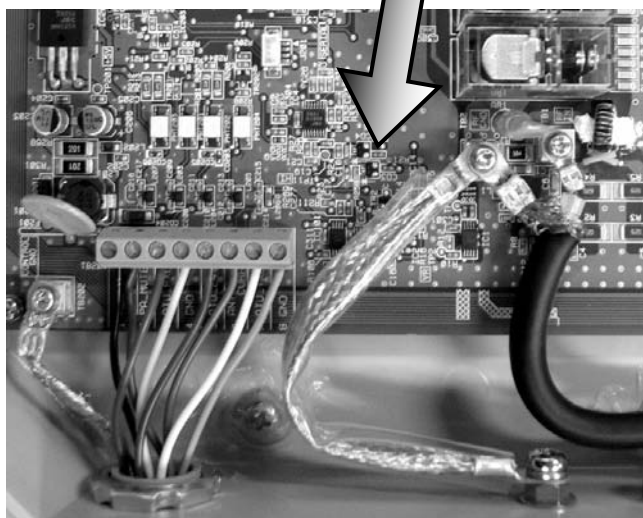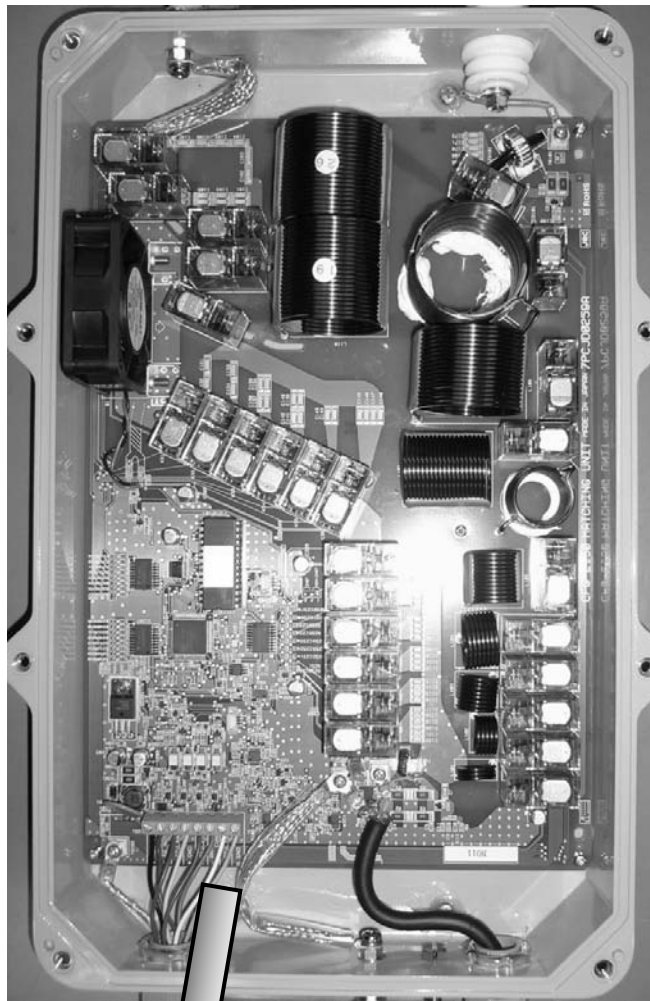
1.5.4   NDZ-227 Data terminal

(1)   Data terminal (NDZ-227) exploded view
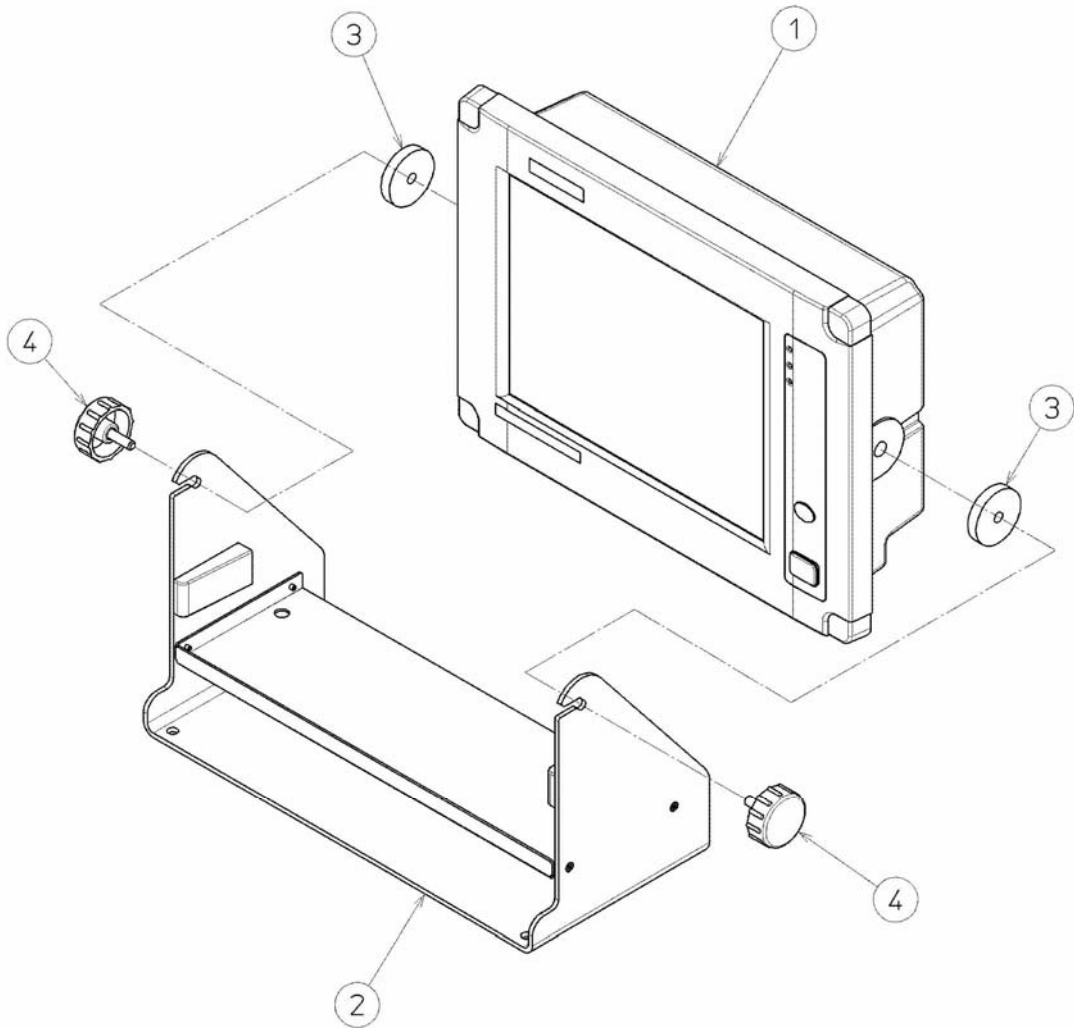
	Name	Diagram No.	Qty
1	DTE	REFER TO A.	
2	MOUNT METAL	REFER TO B.	
3	RUBBER	MTT310999	2
4	KNOB BOLT	MPTG30053	2

A
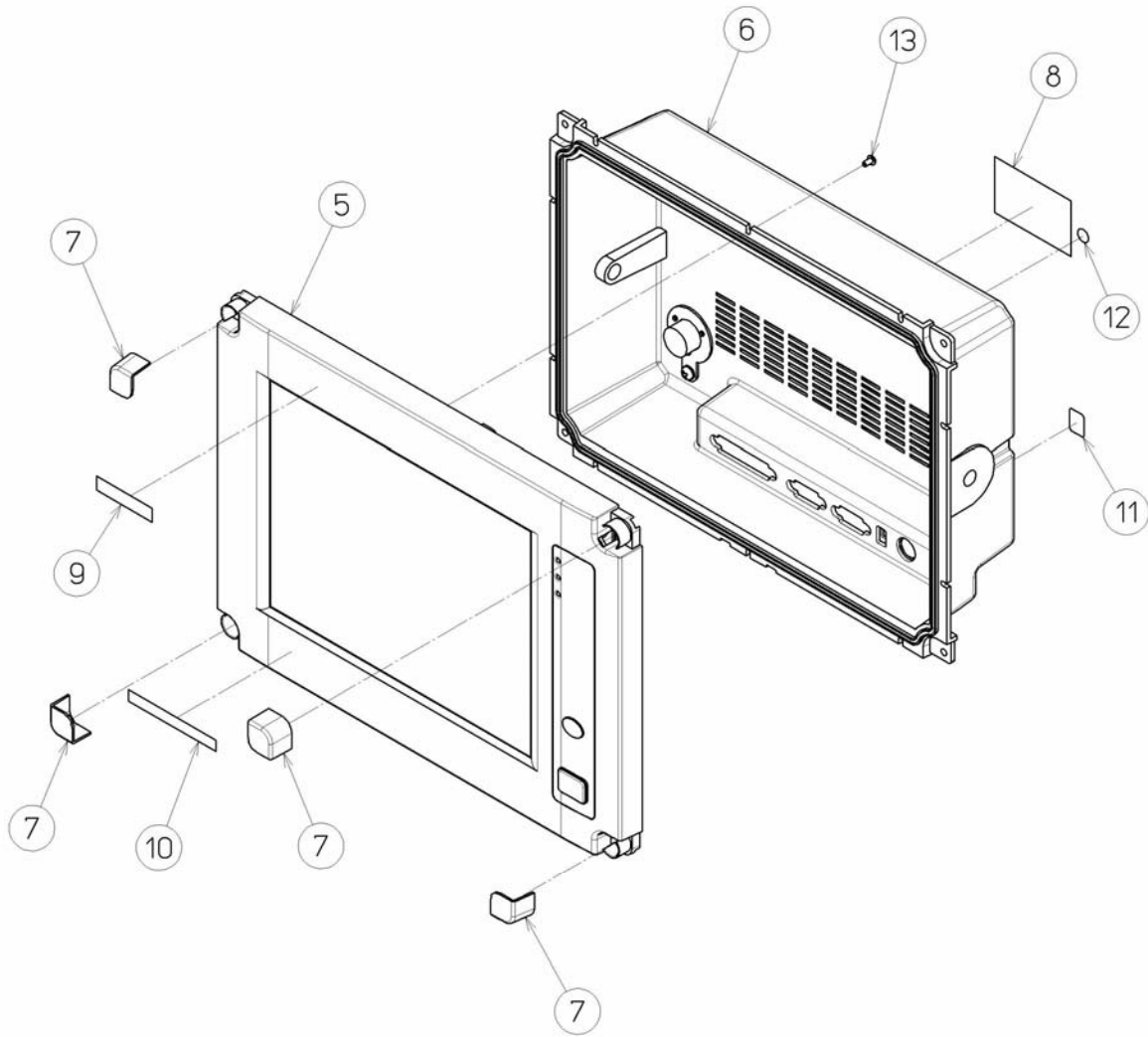
	Name	Diagram No.	Qty
1	DTE		
5	FRONT PANEL ASSY	REFER TO C	
6	REAR CASE ASSY	REFER TO D	
7	COVER	MTV304861	4
8	MAIN BODY LABEL	MPNN46514	1
9	MODEL LABEL	MPNN46516	1
10	OPERATION LABEL	MPNN46517	1
11	VOID LABEL	MPNN46515	1
12	LABEL	MPNN44289	1
13	PT SCREW	BRTG09223	12

B
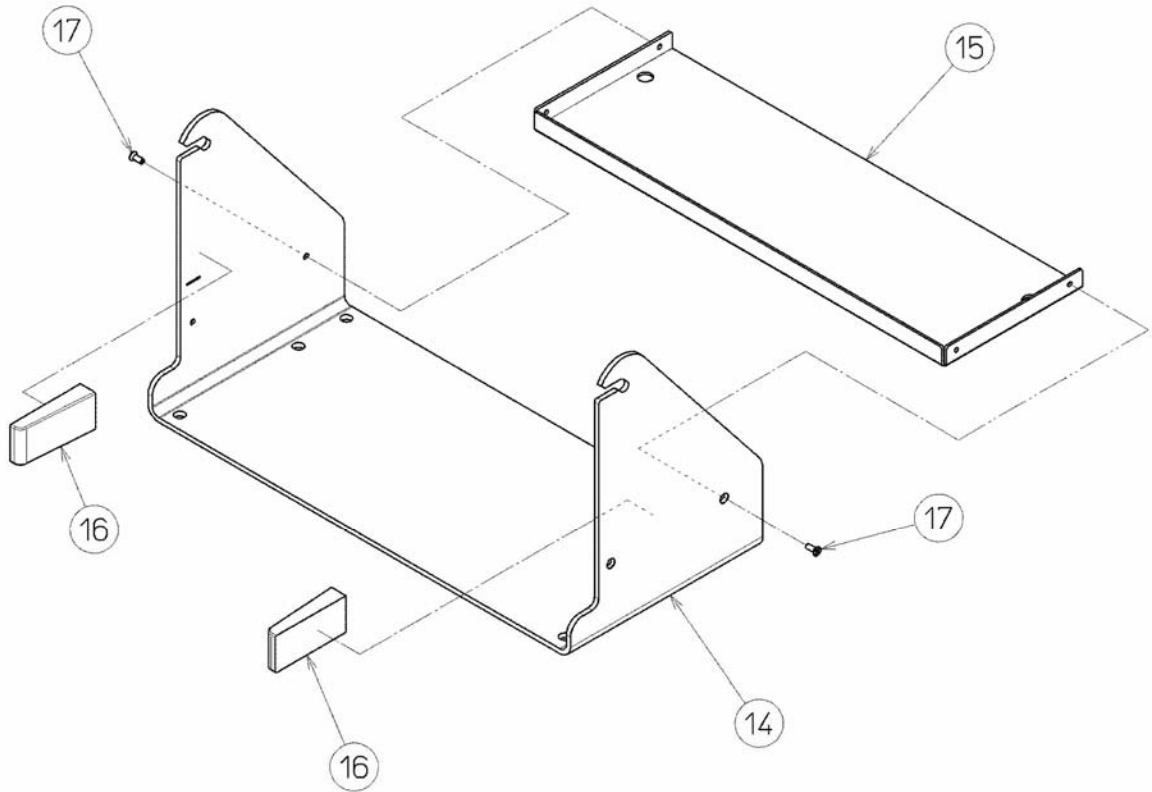
	Name	Diagram No.	Qty
2	MOUNT METAL		
14	MOUNT METAL	MTB396846	1
15	DIVIDED METAL	MTB396847	1
16	RUBBER VIBRATION ISOLATOR	MTV304863A	2
17	COUNTERSUBK HEAD SCREW	BRTG09152	4

C

	Name	Diagram No.	Qty
5	FRONT PANEL ASSY		
18	FRONT PANEL ASSY	REFER TO E	1
19	LCD BRACKET ASSY	REFER TO F	1
20	MF/HF COVER	MTV304859	1
21	USB COVER	MTT313662	1
22	KEY RUBBER	MTT313667	1
23	LIGHT PIPE	MTV304860	1
24	USB I/F BOARD	CQD-3227	1
25	PT SCREW	BRTG09224	19
26	PT SCREW	BRTG09223	2

D
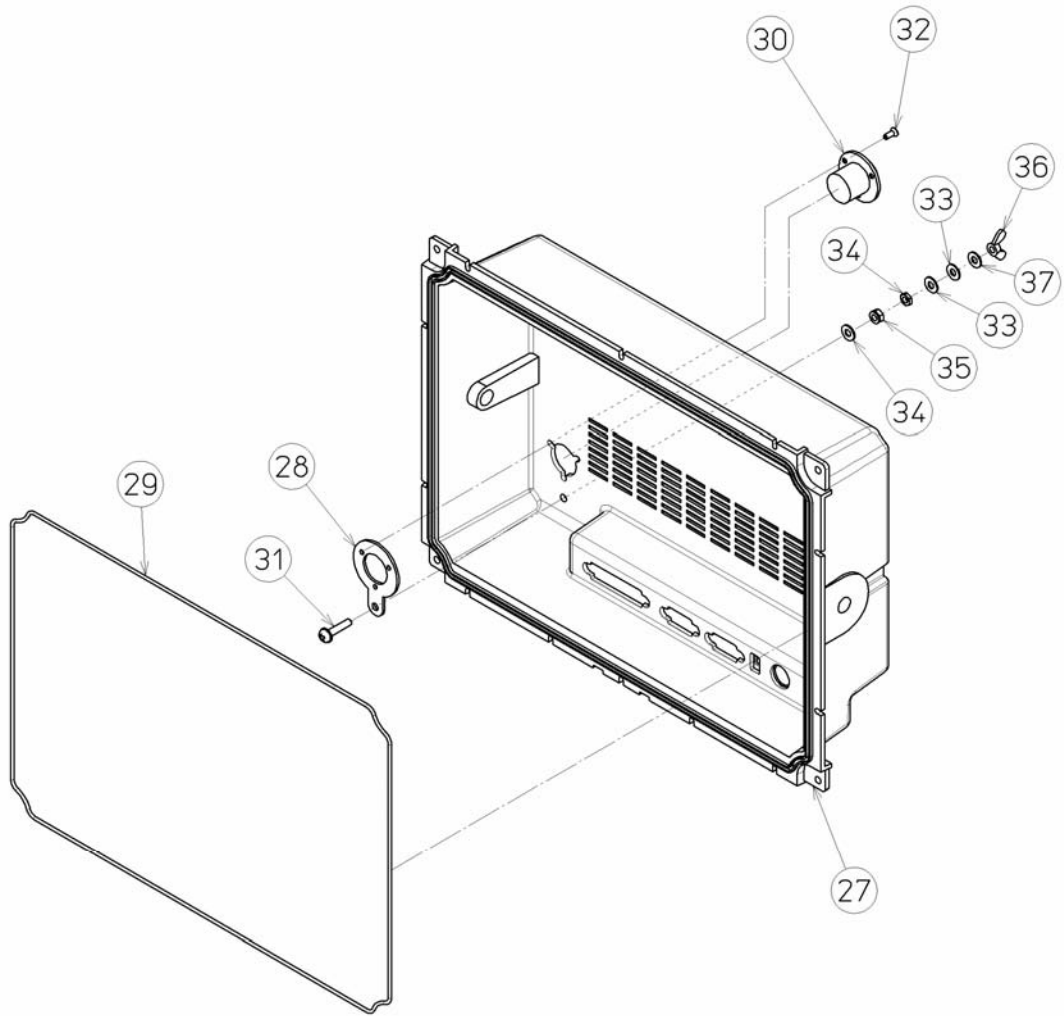
	Name	Diagram No.	Qty
6	REAR CASE ASSY		
27	REAR CASE	MTV304858	1
28	CONNECTOR MOUNT METAL	MTB396778	1
29	GASKET	MPPK31570	1
30	POWER CONNECTOR	—	1
31	PAN-HEAD SCREW	BSNB04020B	1
32	COUNTERSUBK HEAD SCREW	BSSK03008R	3
33	WASHER	BSFW04000B	3
34	NUT	BSHN04000W	1
35	NUT	BSLN04000W	1
36	WING NUT	BSBN04000B	1
37	SPRING WASHER	BSSW04000S	1

E
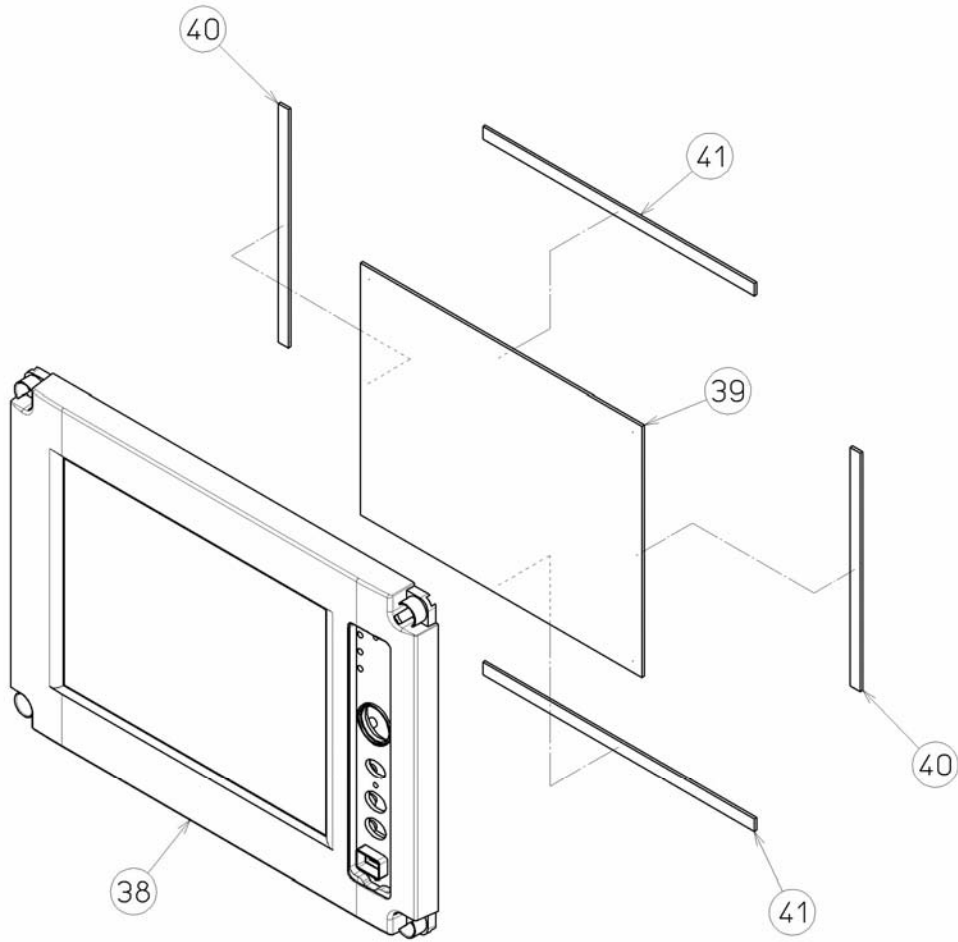
	Name	Diagram No.	Qty
18	FRONT PANEL ASSY		
38	FRONT PANEL	MTV304857A	1
39	FILTER	MTT313655	1
40	GASKET	MPPK31571	2
41	GASKET	MPPK31572	2

F
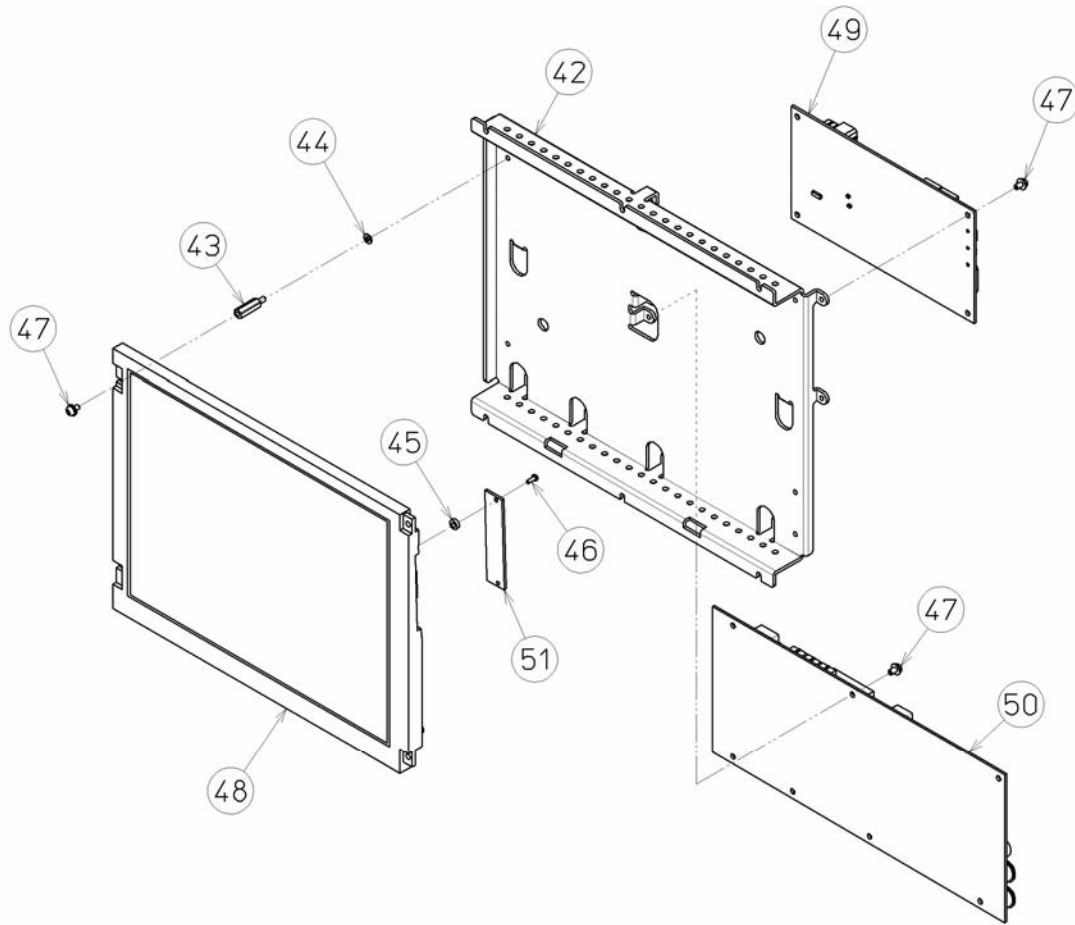
	Name	Diagram No.	Qty
19	LCD BRACKET ASSY		
42	LCD BRAKET	MTB396777	1
43	BRASS SPACER	BRBP06614	4
44	SPRING WASHER	BSSW03000S	4
45	SPACER	BRBP05062	1
46	TAPPING SCREW	BRTG09751	1
47	PAN-HEAD SCREW	BSNB03006R	15
48	COLOR LCD	CCN-3227	1
49	PROCESS CIRCUIT	CDC-1346B	1
50	INTERFACE UNIT	CMH-3227	1
51	LCD I/F BOARD	CQC-1262	1

CONFIGURATION AND SPECIFICATIONS

(2)   Data terminal (NDZ-227) wiring diagram
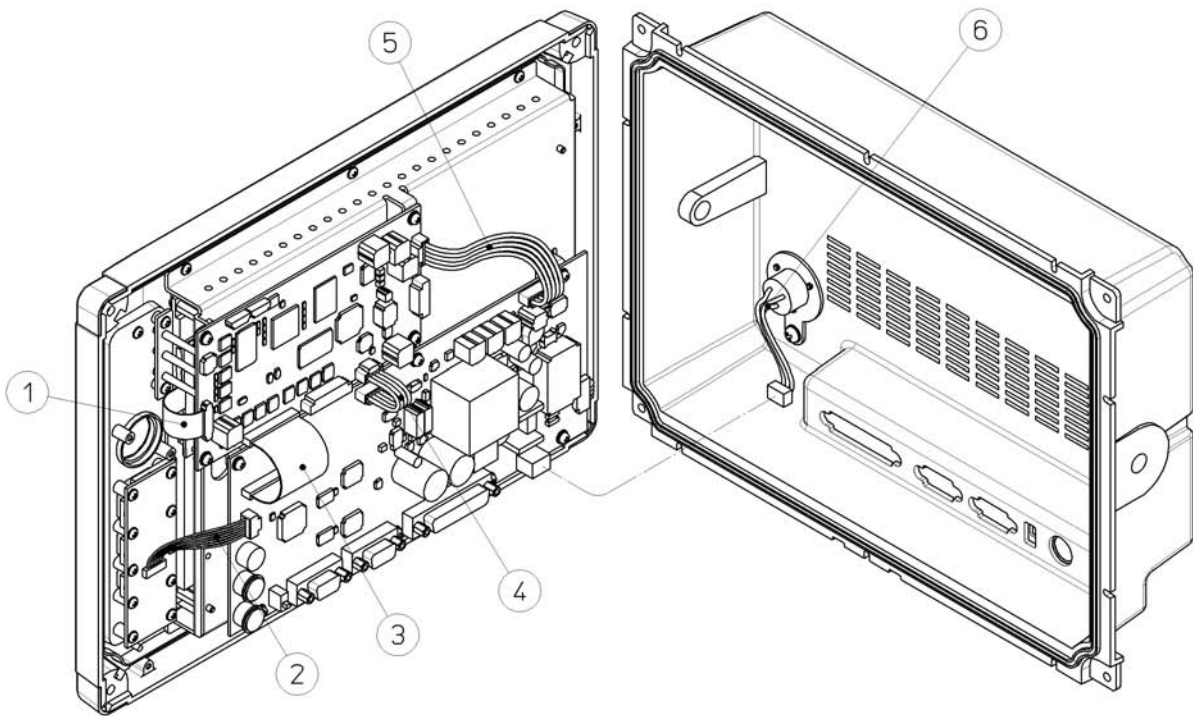
	Name	Diagram No.	Qty
1	FLAT CABLE	7ZCJD0365A	1
2	CABLE WITH CONNECTOR	7ZCJD0389A	1
3	FLAT CABLE	7ZCJD0364A	1
4	CABLE WITH CONNECTOR	7ZCJD0332B	1
5	CABLE WITH CONNECTOR	7ZCJD0363A	1
6	CABLE WITH CONNECTOR	7ZCJD0330B	1

2. SETUP AND ADJUSTMENT

2.1   Overview of setup

2.1.1   Overview

After installing the JSS-2150, configure the initial settings by referring to the setup procedure (flow chart) in the following section and the items below.

● For settings according to the installation conditions, see section "2.1.3 Settings".

● For RS-485 terminator settings when two controllers are connected, see "2.2.2.2 (1) RS-485 signal line terminator settings" of the installation manual.

● For printer settings, see the concerned sections of the instruction manual (10.3 Printer (NKG-91) or 10.4 Printer (NKG-800)). Additionally regarding DPU-414 printer, see the DPU-414 OPERATION MANUAL in that printer package.

● For details on the controller setup menu, see section 2.2.

● For battery charging voltage settings using the NBB-724 Battery charger, see "2.2.8.4 Setting the battery charging voltage" of the installation manual.

2.1.2 Setup procedure (flowchart)

Setup flowchart (1/2)

No.	Item	Description	Default	Operation (Menu)
1	RS-485 terminator settings	If two controllers are connected, the terminal on the one nearest the transceiver must be turned off for RS-485 communications.	ON	Set TB101 inside back panel of controller
2	Address settings	If two controllers are connected, a different address must be set for each one.	1	F1.3.1 Address
3	MMSI registration	This is the ship's 9 digit ID number. Register the number assigned by the administration. * Entering all 0s erases the registration.	None	F1.1.1 ID setup
4	DMC settings	Set to ON if DMC (NCH-321A) is connected. Set the DMC setting to Exp if simple AME is connected.	OFF	F1.2.1.1 DMC
5	NBDP setup	Register 4 or 5 digit selcal number and the answerback code assigned by the administration	None	System – NBDP setup * DTE menu
6	Detecting DC operation mode	Use the NBD-2150 AC/DC power supply and set "Detect DC operation mode via DC_OPE" to ON.	OFF	F1.2.4.1 AC/DC detection
7	Inmarsat-C parallel operation settings during DC operation mode	Set whether or not to run Inmarsat-C in parallel while operating the JSS-2150 on DC power. Single: Disable parallel Inmarsat-C operation. Dual: Enable parallel Inmarsat-C operation *Set dual if the ship has an emergency generator.	Single	F1.2.4.2 BATT use set
8	Option settings	To use a printer, set 7.6.1 Connection to SerialPRN or NKG-800. Set the other settings (Data out, Baudrate, Flow control, and Print direction) like the examples below. NKG-91: Auto/4.8k/Hard/Invert DPU-414: Auto/4.8k/Hard/Upright NKG-800: Auto (Other than Data out is fixed.)	None/ CMD	7.6 Option

Flowchart:

- Are two controllers connected?
  - No
  - Yes → - Set RS-485 terminator - Set F1.3.1 Address
- Is it used as GMDSS?
  - No
  - Yes → Set F1.1.1 ID setup
- Is DMC or simple AME connected?
  - Yes → Set F1.2.1.1 DMC
  - No
- Is NDZ-227 data terminal connected?
  - Yes → Set NBDP setup
  - No
- Is NBD-2150 AC/DC power unit being used?
  - Yes → F1.2.4.1 AC/DC detection ON
  - No
- Is Inmarsat C running parallel during DC operation?
  - Yes → F1.2.4.2 BATT use set Dual
  - No
- Is a printer connected?
  - Yes → Set 7.6 Option
  - No

Setup flowchart (2/2)

No.	Item	Description	Default	Operation (Menu)
9	Serial number registration	Serial numbers are registered for each device as control information for the JSS-2150. * If the RMS (remote maintenance system) is used, it must be distributed as device information.	None	F1.1.2 Serial number
10	RMS settings	Set output to RMS to ON or OFF for the following items. 1. Status information : Equipment settings 2. Maintenance information : Software version 3. Alarm history : System alarm info	1. ON 2. ON 3. ON	F1.4 Remote maintenance
11	AME settings	Set to ON if using AME.	OFF	F1.2.1.3 AME
12	Tx power settings for each band (confirm)	The Tx power is set to 150W at the factory. Make sure that all bands are at the rated power according to the antenna installation and output. * Change the output if the ship's transmission power rating is not 150W.	100% (150W)	F2.3.1.1 TX band power adj
13	User channel registration	Before setting (checking) the transmission power, register frequently used channels as user channels.	None	7.4 User channels
14	Tx power settings for each channel	Set appropriate transmission power for user channels.	100% (150W)	F2.3.1.2 TX CH power adj

F1.1.2 Serial number registration

↓

Is an RMS (Remote Maintenance System) connected?

Yes → F1.4 Remote maintenance settings

No

↓

Is AME (Alarm Management Equipment) connected?

Yes → F1.2.1.3 AME settings

No

↓

Tx power settings for each band (confirm) (F2.3.1.1 TX band power adj)

↓

User channel registration (7.4 User channels)

↓

Is Tx power set for each user channel?

Yes → Use F2.3.2 TX CH power adj to set Tx power individually

No

↓

Basic settings finished

SETUP AND ADJUSTMENT

2.1.3   Settings

Configure the following initial settings according to the installation conditions.
- MMSI registration (Menu F1.1.1 ID setup)
- Tx power for each band (Menu F2.3.1.1 TX band power adj.)
- Settings for Tx power of each user channel (Menu F2.3.1.2 TX CH power adj.)
- Printer setup and operation check (Menu 7.6 Option)
- Detection settings DC operation (for Menu F1.2.4.1 AC/DC detection)
- Inmarsat C parallel operation settings during DC operation (Menu F1.2.4.2 BATT use set)
- Register the unit's serial number (Menu F1.1.2 Serial number)
- RMS connectivity settings (Menu F1.4 Remote maintenance)
- Connectivity settings for two controllers (Menu F1.3.1 Address)
- Connectivity settings for DMC or simple AME (Menu F1.2.1.1 DMC)
- AME connectivity settings (Menu F1.2.1.3 AME)

The following can be set as necessary.

Caution: Setting "GPS alarm" to off means non-compliance with international standards (ITU-R recommendation). Do not set it off, except for special ships. Additionally, setting "ATU use" to off means the invalidation of all DSC functions including distress alert. Do not set it to off unless using it as an SSB radiotelephone.

- WKR watch settings during RF transmission (Menu F1.2.2.1 WKR BK)
- DSC class B settings for A1 area navigation (Menu F1.2.2.2 DSC class)
- Auto sleep timer in the field maintenance mode (Menu F1.3.2 Maintenance mode off timer)
- GPS alarm settings (Menu F1.2.1.2 GPS)
- ATU connectivity settings for the SSB mode (Menu F1.2.3.1 ATU use)
- RBK OFF timer setting
- TX power for the antenna tuning

2.2　Using the field maintenance menu

2.2.1　Turning on the field maintenance mode

⚠CAUTION

🚫 In the field maintenance mode, all DSC functions including distress alert cannot be used. So when setup is complete, always restart by powering off and on using breakers, or place the system in sleep mode.
If the equipment is left without operating in this mode, the maintenance mode off timer automatically put the system into sleep mode.
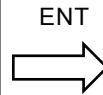

Turn on the field maintenance mode by following the procedure below.

1. Turn on the transceiver's breaker and start in user mode.

　　Note1.　When the equipment is first started after installing, the following screens appear. But this is not a malfunction. The screens no longer appear after setting correctly and restarting.
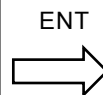
　　　●　Unregistered MMSI alarm

```
Detected MMSI lost!

 So concerned DSC functions
 no longer available now.




(Please contact our service
          center/agents.)
               [ OK ]
```
ENT ⟹
```
MMSI invalid      TIME 23:59(UTC)
Pos    °    .     ,
       °    .     ,  @  :      (EXT)
TEL
    RX   2182.0 kHz
    TX   2182.0 kHz

    SIG ▌▐▐▐ | | | | | |    ◁)))
DSC is disabled and     ATT12 AGC-F BC
the DISTRESS key will
not work.
```

　　　●　Controller address duplication alarm

```
Detected this controller's
       address setting error!

  So required initial set
  after restarting as the
  maintenance mode.

(Please contact our service
          center/agents.)
               [ OK ]
```
ENT ⟹
```



F1.3)Controller settings

1.Address     :1
2.Maintenance mode off timer
              :10min
3.FSI         :Invalid

0.Back
```

　　Note2.　On the controller address duplication alarm, when a controller is entered a new address, that controller is restarted automatically but another one is not restarted. So turn off/ on the equipment immediately by breakers or by continuously pressing [PWR CONT] key for 6 sec.
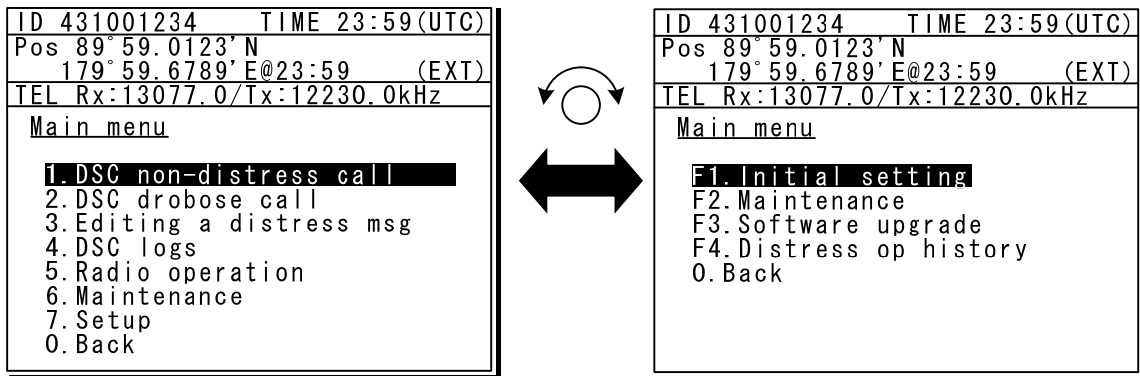
SETUP AND ADJUSTMENT

2. Press DIM and PWR/CONT simultaneously to enter sleep mode.

3. Holding down the MENU key, press the PWR/CONT key. An alarm is sounded and the equipment is turned on in the field maintenance mode.

Remark 1: The alarm volume is adjustable by the menu 7.3.2.2 Notification level.

Remark 2: Pressing and holding the PWR/CONT key for over 6 seconds restarts the equipment. Release the PWR/CONT key as soon the alarm sounds.

Remark 3: The status display after startup is the same as in user mode. After pressing MENU to display the menu screen, use the jog dial to scroll past 0. Back to display the menu for the field maintenance mode. Display is also possible by selecting the item numbers on each menu. For example, to select F1.1 Registration, press the MENU → FUNC → 1 → 1 keys.

```
ID 431001234    TIME 23:59(UTC)
Pos 89°59.0123'N
   179°59.6789'E@23:59    (EXT)
TEL Rx:13077.0/Tx:12230.0kHz
Main menu

  1.DSC non-distress call
  2.DSC drobose call
  3.Editing a distress msg
  4.DSC logs
  5.Radio operation
  6.Maintenance
  7.Setup
  0.Back
```

```
ID 431001234    TIME 23:59(UTC)
Pos 89°59.0123'N
   179°59.6789'E@23:59    (EXT)
TEL Rx:13077.0/Tx:12230.0kHz
Main menu

  F1.Initial setting
  F2.Maintenance
  F3.Software upgrade
  F4.Distress op history
  0.Back
```
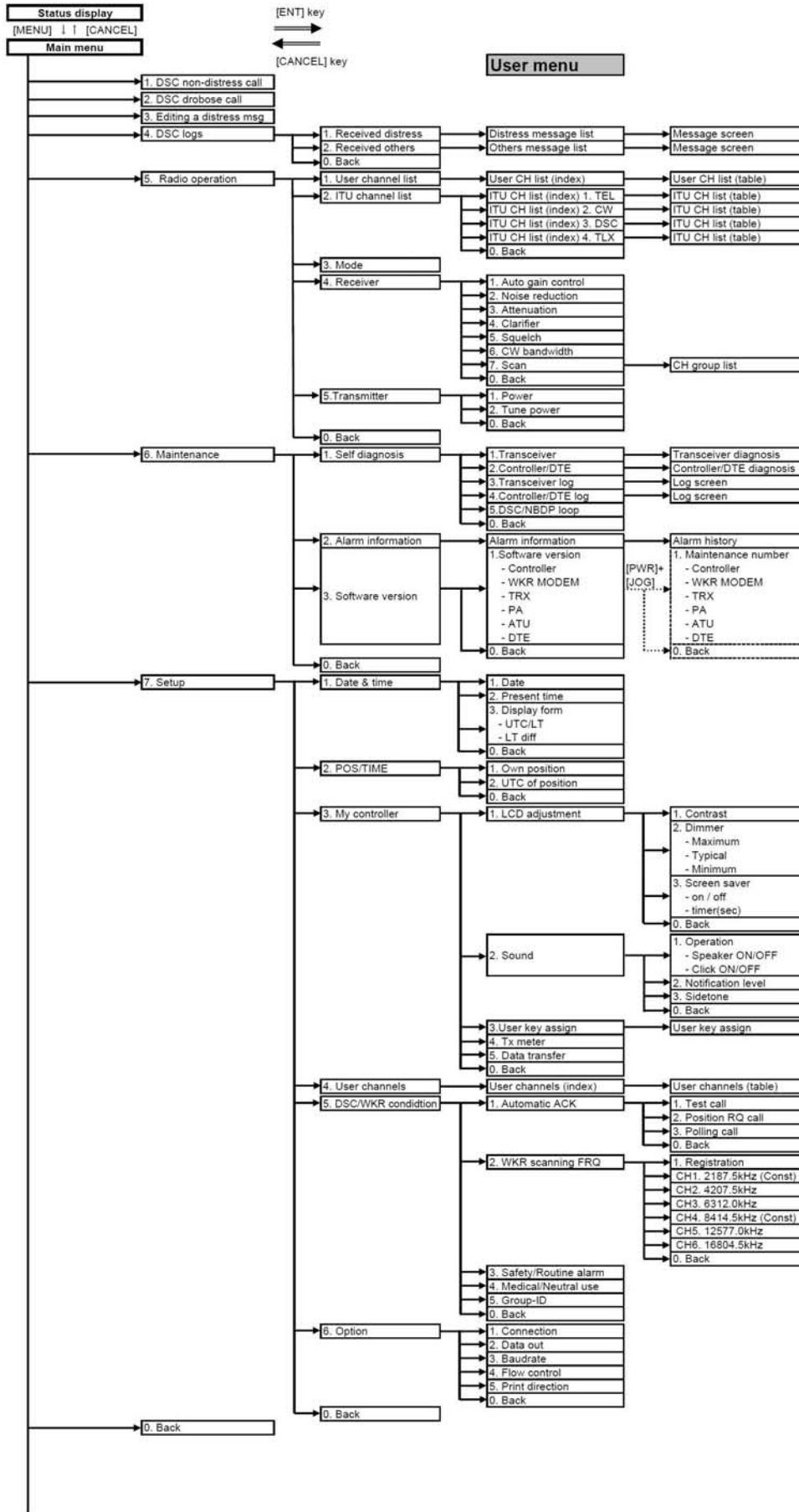
2.2.2   Exiting the field maintenance mode

The field maintenance mode is exited when the equipment enters sleep mode.

Note: When two controllers are connected and if putting only one of the controllers into sleep mode, the field maintenance mode is continued. In this case, place the system in sleep mode by pressing the DIM and PWR/CONT keys simultaneously on the controller with access rights (displaying no OCC mark) to display the following popup screen. Then, select EQP with the cursor and press ENT.

```
OK to sleep the MF/HF
equipment, or
only this controller?

[EQP] [CTRL] [Cancel]
```

2.2.3   Menu tree

Field maintenance menu

- **F1. Initial setting**
  - **1. Registration**
    - 1. ID setup
      - Self-ID(MMSI)
    - 2. Serial number
      - JSS-2150
      - Controller (ID=1, 2)
      - Transceiver
      - Antenna tuner
      - DTE of CTRL1, 2
    - 0. Back
  - **2. System setting**
    - 1. Port setting
      - 1.DMC
      - 2.GPS
      - 3.AME
      - 0.Back
    - 2. DSC/WKR setting
      - 1.WKR BK (valid/invalid)
      - 2.DSC class
      - 0.Back
    - 3. ATU setting
      - 1. ATU use
      - 0.Back
    - 4.PS setting
      - 1.AC/DC detection
      - 2.BATT use set
      - 0.Back
    - 0. Back
  - **3. Controller setting**
    - 1. Address
    - 2.Mainte-mode off timer
    - 3.FSI
    - 0. Back
  - **4. Remote maintenance**
    - 1. Status information
    - 2. Maintenance information
    - 3. Alarm history
    - 0. Back
  - 0. Back
- **F2. Maintenance**
  - **1. Port maintenance**
    - 1. Port selection
    - 2. Data output
    - 3. Port monitor → Port monitor screen
    - 4. Port monitor log → Port monitor log screen
    - 0. Back
  - **2. Self diagnosis(detail)**
    - 1.ATU → Diagnosis screen
    - 2.PA → Diagnosis screen
    - 3.TRX → Diagnosis screen
    - 4.MODEM → Diagnosis screen
    - 5.Controller/DTE → Diagnosis screen
    - 0.Back
  - **3. TX settings**
    - 1. TX power adj.
      - 1. TX band power adj.
      - 2. TX CH power adj.
      - 0.Back
    - 2. DSC/NBDP(AF)
      - 1.TX type
      - 2.TX level
      - 3.Output
      - 0.Back
    - 3.Calibration
      - 1.Ic meter
      - 2.Vc meter
      - 3.Ia meter
      - 4.Frequency
      - 0.Back
    - 4.Speech-processor
    - 5.RBK duration
    - 6.TX delay
    - 7.Model power
    - 0. Back
  - **4. RX settings**
    - 1.RX antenna
    - 2.RX busy
    - 3.RF through
    - 4.AGC setting
    - 0. Back
  - **5. Controller MIC gain**
  - **6. Data initialize**
    - 1. ATU/PA data
    - 2. TRX data
    - 3. MODEM data
    - 4. Controller data
    - 5.Alarm log
    - 6.Channel data
    - 7. All data
    - 0. Back
  - 0. Back
- **F3. Software upgrade**
  - 1. Baudrate
  - 2. Connector
  - 3. Target unit
  - 4. Execute → Upgrading screen
  - 0. Back
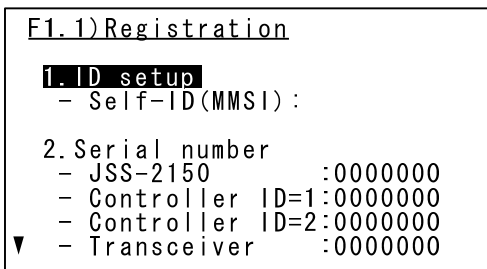- **F4. Distress op history** → Distress op history

2.2.4   How to configure settings

The details for the field maintenance menu (F1. Initial setting) are as follows (in order of menu numbers).

2.2.4.1 MMSI registration

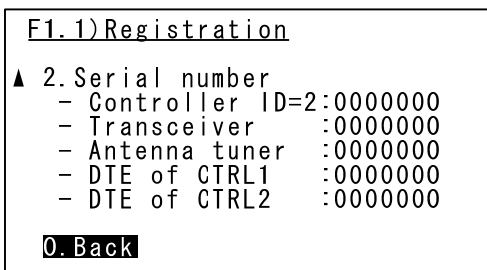To use DSC, register the ship's MMSI assigned by the supervising authority.

```
F1.1)Registration

1.ID setup
 - Self-ID(MMSI):

2.Serial number
 - JSS-2150        :0000000
 - Controller ID=1:0000000
 - Controller ID=2:0000000
▼ - Transceiver    :0000000
```

● Operate the ENT key to move the cursor to the right of Self-ID(MMSI). Use either the numeric keypad or the jog dial to enter the 9-digit MMSI and press ENT.

● Entering all 0s (000000000) erases the registration and the ID number displayed in the upper-left changes to "MMSI : invalid".

2.2.4.2 Serial number registration

Register the serial number (manufacture's number) written on the plate of each unit.

* Scrolling with the jog dial on the screen above displays the screen below.

```
F1.1)Registration

▲ 2.Serial number
 - Controller ID=2:0000000
 - Transceiver    :0000000
 - Antenna tuner  :0000000
 - DTE of CTRL1    :0000000
 - DTE of CTRL2    :0000000

0.Back
```

● Move the cursor to the right of the items under 2. Serial number on the screen above and then enter the serial number.

● After displaying the letters, such as BS, using the jog dial press ENT.

2.2.4.3 DMC/AME settings

Configure the connectivity settings if NCH-321A DMC or AME are connected.

Caution: Setting 2. GPS to off on this menu does not sound an alarm when GPS information has not yet been entered. Because this means non-compliance with international standards (ITU-R recommendation), always leave it on, except for special ships.

```
F1.2.1)Port setting

1.DMC      :OFF
2.GPS      :ON
3.AME      :OFF

0.Back
```
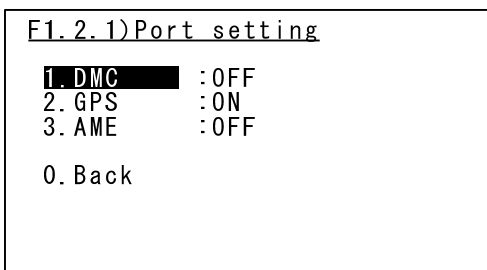
● DMC

To use DMC:	ON
To use simple AME:	Exp*
To not use DMC:	OFF

● GPS

To use GPS:	ON
To not use GPS:	OFF

● AME

To use AME:	ON
To not use AME:	OFF

* When installing a simple AME device for DSC receiving alarms and the alarms cancel, connect it to DMC_DAL, DMC_DAS, DMC_OAL, and DMC_OAS terminals on the CQD-2416 and set "DMC : Exp" here.

2.2.4.4 DSC/WKR settings

Configure the advanced settings for DSC and WKR (watch keeping receiver).

* Normally, operation is unnecessary.

```
F1.2.2)DSC/WKR setting

1.WKR BK     :Invalid
2.DSC class :Class A

0.Back
```

● WKR BK

　Watch DSC during transmitting:　　Invalid

　Break watch during transmitting:　　Valid

● DSC class

　Normally, set to Class A.

　　* Only set to Class B when requested for ships traveling in A1 areas.

2.2.4.5 ATU disconnection setting

When using as an SSB radiotelephone without ATU (NFC-2150), the ATU disconnection can be set.

* This menu cannot be set to OFF when connecting the ATU.

```
F1.2.3)ATU setting

1.ATU use  :ON

0.Back
```

● ATU use

　To use ATU:　　　　　　ON

　To not use ATU:　　　　OFF

2.2.4.6 Power operation settings

Configure the power operation settings to detect DC operation status with the DC_OPE signal using the NBD-2150 AC/DC power unit.

```
F1.2.4)PS setting

1.AC/DC detection :Invalid
2.BATT use set     :Single

0.Back
```

● AC/DC detection [Note1]

　To detect if operating in DC:　　Valid

　To not detect if operating in DC:　Invalid

● BATT use set [Note2]

　To run in parallel with Inmarsat C in DC:　Dual

　To prohibit Inmarsat C use in DC [Note3]:　Single

Note1.　To detect the condition if the equipment is operating in DC, besides the Valid selection here, it is necessary to connect the DC_OPE signal cable (see 2.2.7.2 Connecting the signal lines).

Note2.　The selection of "BATT use set" is available only when the "AC/DC detection" is Valid.

Note3.　When operating the Inmarsat C in DC if "Single" is selected here, turn off the power of the JSS-2150 or put it into sleep mode.

2.2.4.7 Controller settings

When connected two controllers, set the addresses here so they are not duplicated. Also set the time until the unit automatically goes into sleep mode when left idle in the field maintenance mode.

Note1.   After setting the addresses, immediately turn off and on by breakers or reset the equipment by pressing and holding the PWR/CONT key for 6 seconds.
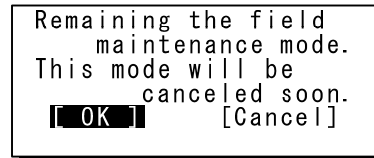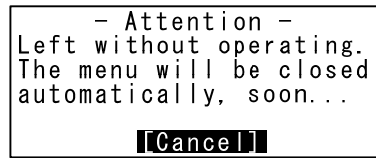
Note2.   There is no priority ranking between controllers.

```
F1.3)Controller settings

1.Address    :1
2.Maintenance mode off timer
             :10min
3.FSI        :Invalid

0.Back
```
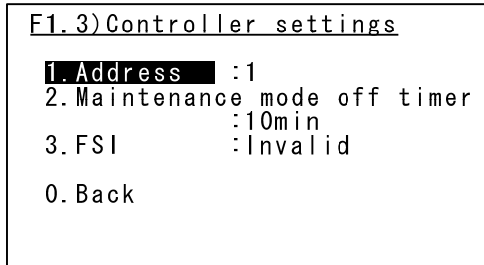
● Address
  Register either 1 or 2.

● Maintenance mode off timer
  Set within a range of 1 to 60 minutes.

● FSI
  When controlling the JSS-2150 by FSI commands of the EN standard, set to Valid. Normally this function is not used and left it as "Invalid" (factory default).

Note: The equipment operates as follows when left idle in the field maintenance mode.

- A popup screen appears in the lower left of the menu displayed and then returns to status display if left idle for 10 seconds.

- When left idle on the status display and the time set for the Maintenance mode off timer has expired, the popup screen on the right appears. If left idle for 1 minute, the equipment automatically goes into sleep mode.

```
   - Attention -
Left without operating.
The menu will be closed
automatically, soon...

        [Cancel]
```

```
Remaining the field
   maintenance mode.
This mode will be
       canceled soon.
[ OK ]      [Cancel]
```

2.2.4.8 RMS (remote maintenance system) settings

When RMS is connected, set the information sent to the RMS here.

```
F1.4)Remote maintenance

1.Status information :ON
2.Maintenance information
                     :ON
3.Alarm history      :ON

0.Back
```
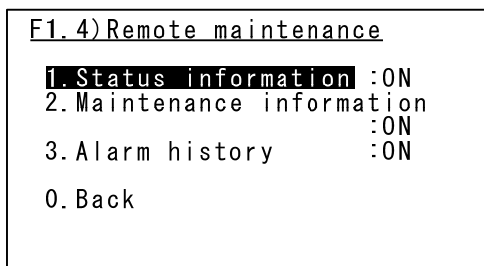
● Status information
  If set to ON, sends the occurring alarms and the results of self diagnosis.

● Maintenance information
  If set to ON, sends the software/ hardware version and production technology data.

● Alarm history
  If set to ON, sends a history of alarms.

* Details about the content sent and the output cycle are shown in the table on the following page.

SETUP AND ADJUSTMENT

Category		Sentence number and name	Output cycle/event
Status information	1	EQP info 1 (System/Transceiver/ATU/Controller)	1 hour
	6	Operation ID information	1 hour
	9	System alarm information	60 seconds
	12	PA/ATU alarm information	60 seconds
	13	TRX(Main/Sub)/ WKR MODEM alarm information	60 seconds
	14	Controller1/2 alarm information	60 seconds
	15	Controller3/Spare unit alarm information (Not used)	60 seconds
	17	Overall self-diagnosis information	60 seconds
	18	PA self-diagnosis information	After self-diagnosis
	19	ATU self-diagnosis information	After self-diagnosis
	20	TRX (MAIN) self-diagnosis information	After self-diagnosis
	21	TRX (SUB) self-diagnosis information (Not used)	After self-diagnosis
	22	WKR_MODEM self-diagnosis information	After self-diagnosis
	23	Controller 1/2/3 self-diagnosis information	After self-diagnosis
	24	Spare unit self-diagnosis information (Not used)	After self-diagnosis
	25	DISTRESS sent information	After DISTRESS sent
	26	EQP info 2 (DTE1/2/3)	1 hour
	28	DTE1/2/3 alarm information	60 seconds
Maintenance information	2	Production technology info (barcode info1)	1 hour
	3	Production technology info (barcode info2)	1 hour
	4	Software maintenance number information	1 hour
	5	Hardware version information	1 hour
	7	I/O port setup information	1 hour
	8	System setup information (PA/TRX)	1 hour
	10	System setup information (WKR MODEM)	1 hour
	11	System setup information (Controller)	1 hour
	27	Production technology info (barcode info3)	1 hour
Alarm history information	16	System alarm history information	60 seconds

2.2.5   Adjustments and inspections

The details for the adjustment and detection menu (F2. Maintenance) in the field maintenance mode are as follows (in order of menu numbers).

2.2.5.1 Maintenance menu (mic gain adjustment)
The menu screen of items for adjustment is as follows.

*Mic gain is adjusted here.

```
F2)Maintenance

1.Port maintenance
2.Self diagnosis(detail)
3.TX settings
4.RX settings
5.Controller MIC gain :23
6.Data initialize

0.Back
```
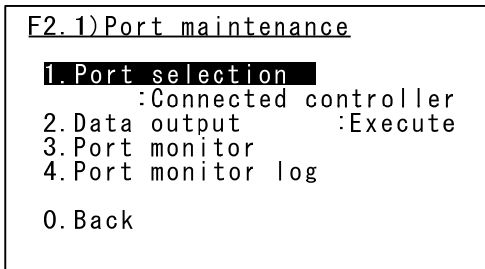
● Port maintenance
Used to check the I/O signal of each port. For details, refer to the explanation later.

● Self diagnosis (detail)
Used when self diagnosing at the equipment level. For details, refer to the explanation later.

● TX settings
Used when adjusting the radio (mainly transmitter). For details, refer to the explanation later.

● RX settings
Used when adjusting the receiver. For details, refer to the explanation later.

● Controller MIC gain
Adjust the MIC gain of the handset within a range of 1 to 32 levels.

Note: The handset's volume is linked to the panel's volume so adjustment is not necessary.

● Data initialize
Initializes individually or all at once to return them to the factory default settings. For details, refer to the explanation later.

2.2.5.2 Checking the I/O ports

Check the connection status by monitoring input signals or outputting simple data.

```
F2.1)Port maintenance

1.Port selection
         :Connected controller
2.Data output        :Execute
3.Port monitor
4.Port monitor log

0.Back
```

● Port selection

RS-485 monitor:	Connected controller
AME monitor/output:	AME
DMC output:	DMC
GPS monitor:	GPS
RMS monitor/output:	Remote maintenance

● Data output

When AME, DMC or Remote maintenance is selected at Port selection, pressing ENT on Execute outputs the data from that port.

● Port monitor

When other than DMC is selected at Port selection, the monitor screen appears and the monitoring begins.

● Port monitor log

After obtained logs at Port monitor, displays the log screen and that information.

Note:

➢ The signal output at Data output is as follows.

- For AME, [$CTALR,,999,,,*hh <CR><LF>] is output.

- For DMC, after RDY and DRA are turned on for 3 seconds, DAL is turned on for 3 seconds. At that time, [MF/HF], [DISTRESS], and [MF/HF DSC] lamps and buzzers operate respectively.
  * During this testing, no transmission is occurred.

- For Remote maintenance, [$PJRCM,CT,4,cxxx,cxxx,cxxx,cxxx,cxxx,cxxx,cxxx,cxxx,cxxx, *hh <CR><LF>] is output (Note: cxxx is the version of each unit).

➢ On the Port monitor, a screen like that to the lower left appears. Also, pressing ENT on this screen displays a popup screen like that on the lower right, and a log for a set period of time can be obtained.

```
F2.1.3)Data monitoring...

$11001,1*xx▲▼
$11001,2*xx▲▼
$21001,1*xx▲▼
$12001,2*xx▲▼
$41001,1*xx▲▼
$14001,2*xx▲▼
$51001,1*xx▲▼
$15001,2*xx▲▼
```

```
Data logging...
[Start]    [Cancel]
```

```
Data logging...
[Stop]    [Cancel]
```
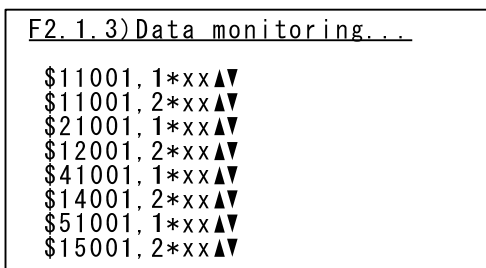
➢ On the Port monitor log screen, after pressing ENT on this screen to display the popup screen to the right, select OK and press ENT to output data from the maintenance port of the controller.

```
OK to output
      this data?
[ OK ]    [Cancel]
```
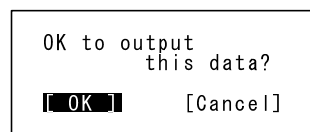
2.2.5.3 Self diagnosis in the field maintenance mode

The self diagnosis in the field maintenance mode can make an advanced self diagnosis of each item for each unit, in addition to self-diagnosis per unit in user mode.

Remarks: Histories of self diagnosis executed here are not saved.

```
F2.2)Self diagnosis(detail)
1.ATU
2.PA
3.TRX
4.MODEM
5.Controller/DTE

0.Back
```

```
F2.2.1)ATU
Target            :ALL

- ATU -
1.Serial I/F      :
2.Band1-Input     :
3.Band1-Tune      :
4.Band2-Input     :
5.Band2-Tune      :
6.Band3-Input     :
```
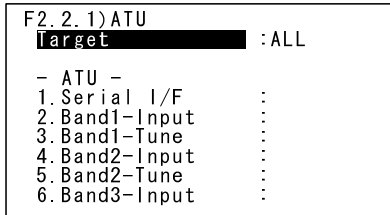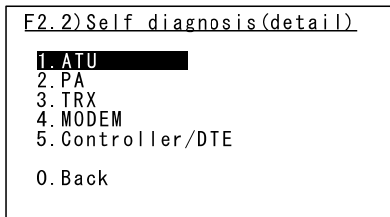
● Select an item from ATU/ PA/ TRX/ MODEM/ Controller/DTE for self diagnosis, and press ENT to display the self diagnosis screen on the unit.
(Image to the left is an example for ATU.)

● The diagnosis items for each unit are shown below.

●ATU

Item	Message
ALL	ALL
Serial I/F	Serial I/F
Band1-Input	Band1-In
Band1-Tune	Band1-Tune
Band2-Input	Band2-In
Band2-Tune	Band2-Tune
Band3-Input	Band3-In
Band3-Tune	Band3-Tune
Band4-Input	Band4-In
Band4-Tune	Band4-Tune
Band5-Input	Band5-In
Band5-Tune	Band5-Tune
Band6-Input	Band6-In
Band6-Tune	Band6-Tune

●PA

Item	Message
ALL	ALL
PA mute port	Mute port
RBK port	RBK port
Memory1	Memory1
Memory2	Memory2
Band1-Output	Band1-Out
Band2-Output	Band2-Out
Band3-Output	Band3-Out
Band4-Output	Band4-Out
Band5-Output	Band5-Out
Band6-Output	Band6-Out
Input voltage	Input volt

●TRX

Item	Message
ALL	ALL
Memory	Memory
Digital CKT	Digital CKT
BK port	BK port
PLL lock	PLL lock
Band1-TX output	Band1-TX
Band2-TX output	Band2-TX
Band3-TX output	Band3-TX
Band4-TX output	Band4-TX
Band1-RX BPF1	RX BPF1
Band2-RX BPF2	RX BPF2
Band3-RX BPF3	RX BPF3
Band4-RX BPF4	RX BPF4
Band5-RX BPF5	RX BPF5
Band6-RX BPF6	RX BPF6
Band7-RX BPF7	RX BPF7
Band8-RX BPF8	RX BPF8

●MODEM

Item	Message
ALL	ALL
Memory1	Memory1
Memory2	Memory2
Memory3	Memory3
PLL lock	PLL lock
Band1-RX BPF1	RX BPF1
Band2-RX BPF2	RX BPF2
Band3-RX BPF3	RX BPF3
Band4-RX BPF4	RX BPF4
Band5-RX BPF5	RX BPF5
Band6-RX BPF6	RX BPF6
Band7-RX BPF7	RX BPF7
DSC/NBDP Loop test1	Loop test1
DSC/NBDP Loop test2	Loop test2

●CONTROLLER/DTE

Item	Message
ALL	ALL
Memory1	Memory1
Memory2	Memory2
Memory3	Memory3
AF output	AF output
LCD & LED	LCD & LED
Speaker	Speaker
Printer	Printer
DTE memory1	DTE memory1
DTE memory2	DTE memory2
DTE LCD&LED	DTE LCD&LED
DTE buzzer	DTE buzzer

2.2.5.4 Setting the transmission conditions

Adjust the radio (mainly transmitter) as below.

```
F2.3)TX settings

1.TX power adj.
2.DSC/NBDP(AF)
3.Calibration
4.Speech-processor :ON
5.RBK duration    :0180sec
6.TX delay        :OFF
7.Model power     :Normal
0.Back
```
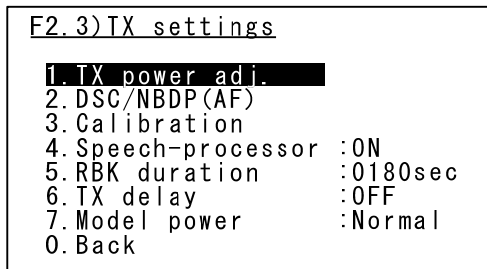
- TX power adj.

  Check and adjust the Tx output. For details, refer to the explanation later.

- DSC/NBDP (AF)

  Used to measure the DSC or NBDP audio frequency. For details, described below.

- Calibration

  Calibrate the meter and/or frequency. For details, described below.

- Speech-processor

  Set the speech-processor to active: ON

  Set the speech-processor to inactive: OFF

  Remarks: This function changes the ALC characteristics so they do not meet the performance criteria of the inspection standards. Turn it on only for ships using as a SSB radiotelephone.

  Note: The speech processor is a function that increases the average Tx power. Normally controls peaks with ALC and compresses the gain of small signals. When using this function, controls peaks with a limiter, so gain is not affected and the average Tx power is increased. This function is available in TEL and H2B modes.
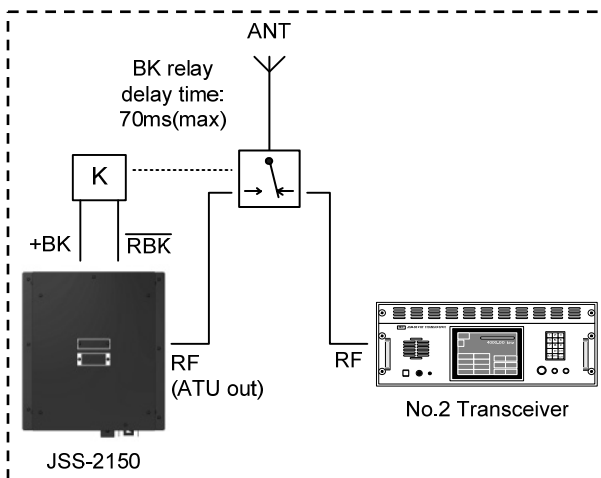
- RBK duration

  Set the time until RBK automatically turns off after transmission. (Default: 3 minutes)

- TX delay

  When a BK relay is installed to switch to an external antenna as shown to the left, set to on to delay the start of transmission.

  The delay time is 70msec.

- Model power

  Set to rated output of 150 W: Normal

  Set to rated output of 75 W: 75W

  Note) This does not affect the TX power adj. for bands or channels. In other words, an adjusted value (ex.95%) at 150W is applied at 75W as it is.

```
                          ANT
         BK relay          Y
         delay time:
         70ms(max)
                        ┌─────┐
         ┌───┐          │  •  │
         │ K │----------│ →\  │
         └───┘          └─────┘
        +BK │ RBK
        ┌─────────┐     ┌──────────────┐
        │         │     │ ▦▦▦▦▦▦▦▦▦▦▦ │
        │         │     │              │
        │  ▭      │     │              │
        │         │ RF  │          RF  │
        │         │(ATU │              │
        │         │ out)│  No.2 Transceiver
        └─────────┘     └──────────────┘
         JSS-2150
```

2.2.5.5 Tx power adjustment per band

The Tx power for each band (1 MHz to 27 MHz bands) is preset to a rated value with a dummy load when shipped. After installation check the Tx power for each band and, adjust it if necessary.

```
F2.3.1)TX power adj.

1.TX band power adj.
2.TX CH power adj.

0.Back
```

ENT ↓

```
F2.  Mode:TEL / PWR :High
     Frequency:12230.0kHz
1.   Type      :Test tone
2.   TX power  :100.0%
     [ TX ][Save][Cancel]
0.       Vc          Ic
      --.-V       --.-A
         Ia          SWR-P
      --.-A          -.-
```
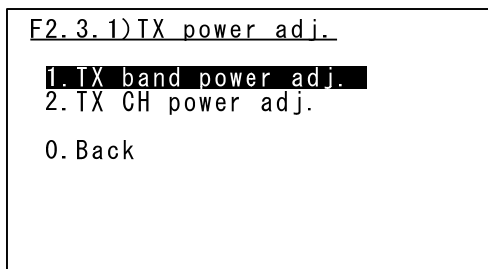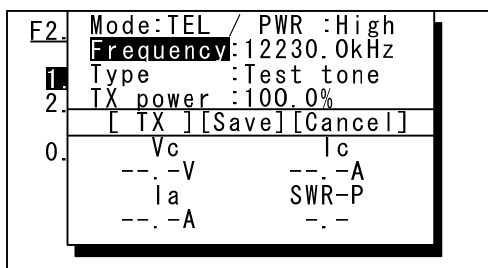
Note: Based on the PA voltage (Vc) and PA current (Ic) checked here and the efficiency η written in the inspection data attached to the equipment, the Tx power (antenna power) P is calculated as follows.

$P = Vc \times Ic \times \eta$

So check that P is within ±20% to the rated power.

Additionally, when Tx power is adjusted to an over-power, the circuit protection may reduce the Tx power to low. In this case, press ANT TUNE key to retune and adjust the Tx power again.

● Pressing ENT on "1. TX band power adj." displays a popup screen for adjusting the Tx power as shown on the left.
  Remark: Inaccessible in AM mode.

● Mode
  Select from TEL, DSC, CW or TLX.
  Remark: Used to select a TX type.
  Tx power is saved for the band, regardless of the communication mode.

● PWR
  Select either High (rated power) or Low* to adjust the Tx power.
  * Low power is 50W for HF and 33W for MF.

● Frequency
  Input a frequency for each band.
  * if not tuned, TUNE is displayed at PWR. Press the ANT TUNE key at that time.

● Type
  Select a TX type for the communication mode.
  ・ TEL: Test tone/MIC
  ・ DSC: 1615Hz/1785Hz/Dot
  ・ TLX: 1615Hz/1785Hz/Dot
  ・ CW: (setup unnecessary)

● TX power
  Can be set between 0.5 to 200.0% of typical (100%).
  Note1. The upper and lower limits might be refused by the PA limiter.
  Note2. TX power can be set at 0.5% steps.

● [TX]
  Starts transmitting by the conditions above.
  ・ During the transmission, this handling menu changes to [Stop]. Press ENT again to stop the transmission.
  ・ According to the communication mode, the PTT or CWKEY is available.
  ・ During the transmission, PA voltage (Vc), PA current (Ic), antenna current (Ia), and standing wave ratio (SWR-P) are displayed.

● [Save]
  Saves the TX power of the band.

2.2.5.6 Tx power adjustment per channel

Tx power for each user channel is applied from the Tx power for each band of the factory default setting. After installation check the Tx power for each user channel and, adjust it if necessary.

Furthermore, the user channels information are saved as below.

Controller : Group name, Channel number, Communication mode, Frequency

PA UNIT : Channel number, Frequency, Tx power

```
F2.3.1)TX power adj.

 1.TX band power adj.
 2.TX CH power adj.

 0.Back
```

ENT ↓

```
F2.  Mode:TEL / PWR :High
     Group-CH :U03-050
 1.  Type       :Test tone
 2.  TX power :100.0%
     [ TX ][Save][Cancel]
 0.      Vc         Ic
       --.-V       --.-A
         Ia         SWR-P
       --.-A         -.-
```
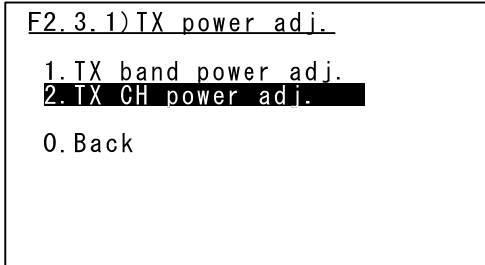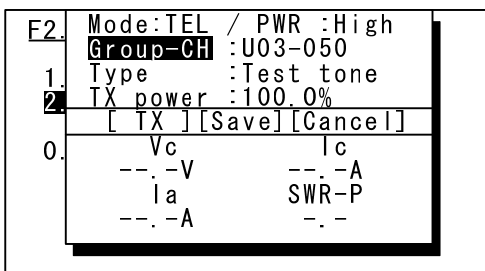
Note1: Based on the PA voltage (Vc) and PA current (lc) checked here and the efficiency η written in the inspection data attached to the equipment, the Tx power (antenna power) P is calculated as follows.

$$P = Vc \times Ic \times \eta$$

So check that P is within ±20% to the rated power.

Note2: If a user channel data of the controller differs from the data of the PA UNIT, e.g. in the case of exchanging either of them, Tx band power is applied and Tx power of that channel cannot be adjusted. (Displays PWR:Band.) To resume it, if exchanged the controller, send the original user channel table from the old controller to the new one using menu 7.3.5 data transfer. Or in the other case, reregister the channel(s) or initialize the controller and/or PA UNIT.

● Pressing ENT on "1. TX CH power adj." displays a popup screen for adjusting the Tx power as shown on the left.
  Remark: Inaccessible if no user channel is registered.

● Mode
  Not selectable.

● PWR
  Select either High (rated power) or Low* to adjust the Tx power.
  * Low power is 50W for HF and 33W for MF.

● Group-CH
  Select the user channels to be set.
  * if not tuned, TUNE is displayed at PWR. Press the ANT TUNE key at that time.

● Type
  Select a TX type for the communication mode.
  ・ TEL: Test tone/MIC
  ・ DSC: 1615Hz/1785Hz/Dot
  ・ TLX: 1615Hz/1785Hz/Dot
  ・ CW: (setup unnecessary)

● TX power
  Can be set between 0.5 to 200.0% of typical (100%).
  Note1. The upper and lower limits might be refused by the PA limiter.
  Note2. TX power can be set at 0.5% steps.

● [TX]
  Starts transmitting by the conditions above.
  ・ During the transmission, this handling menu changes to [Stop]. Press ENT again to stop the transmission.
  ・ According to the communication mode, the PTT or CWKEY is available.
  ・ During the transmission, PA voltage (Vc), PA current (lc), antenna current (la), and standing wave ratio (SWR-P) are displayed.

● [Save]
  Saves the TX power of the channel.

2.2.5.7 DSC/NBDP AF measurement

Outputs the DSC/NBDP AF signal to the controller's audio output port such as the external speaker plug and handset terminal (Phone: Between 1 - 2).

```
F2.3.2)DSC/NBDP(AF)

1.TX type  :DSC/NBDP 1615Hz
2.TX level :127
3.Output   :Start

0.Back
```

● TX type

Select the signal from DSC/NBDP 1615Hz, DSC/NBDP 1785Hz, or DSC/NBDP Dot.

● TX level

Set the signal output level.

● Output

Start or stop output of the signal selected for TX type.

Note: During output, the display changes to [Stop]. Pressing ENT again here ends output.

2.2.5.8 Calibration for meters and radio frequency

Calibrate the meters on the TX power adjustment screen, and/or the frequency of TCXO.

⚠CAUTION

Use F2.3.3 Calibration menu only when having a margin of error obviously.

```
F2.3.3)Calibration

1.Ic meter  :+00
2.Vc meter  :+01
3.Ia meter  :-01
4.Frequency :+01.0Hz

0.Back
```

● Ic meter

Adjust the value displayed for the PA current meter within a range of -99 to +99.

* When entering a value with the numeric keypad, the + of ± can be entered with 1, and the - with 2 (same below).

● Vc meter

Adjust the value displayed for the PA voltage meter within a range of -99 to +99.

● Ia meter

Adjust the value displayed for the antenna current meter within a range of -99 to +99.

● Frequency

Adjust the 20 MHz TCXO of the CMN-2250 TRX unit within a range of -60 to +60 Hz.

Note: This calibration is based on 20 MHz. In case of +01.0 Hz and when the nominal frequency is 10000.0 kHz, the calibration results in +0.5 Hz.

2.2.5.9 Setting the receiving conditions

Adjust the receiver.

```
F2.4)RX settings

1.RX antenna   :WKR/RX
2.RX busy      :+00
  (Input level:-20 to +78)
3.RF through   :OFF
4.AGC setting  :Normal

0.Back
```

● RX antenna

Split and use the WKR antenna: WKR/RX

Use the TX antenna in common: TX

Note: The factory default is WKR/RX.

When connecting a receiving antenna to the RX ANT connector, the antenna is connected to the receiver by the hardware, regardless of the above setting.

● RX busy

When making routine calls or safety test calls with DSC, it detects call frequency (DSC) busy at a receiving signal strength set between -20 to +78 dBuV.

Note: The factory default is +40(dBuV).

Additionally it can be set to off to ignore the channel busy. But normally set any value here.

● RF through

Use a wide band BPF (1.6 - 30MHz):   ON

Use a normal BPF for each band: OFF

Note: The factory default is OFF.

If there is a external system that uses a common receiving antenna, when scanning using a normal BPF that system may experience interference from noise of BPF switching in response to the frequency. In this case, turning this setting on and applying a wide band BPF (1.6 to 30 MHz) can prevent switching noise.

● AGC setting

Set to the normal characteristic: Normal

Set to the flat characteristic: Flat

Note: The factory default is Normal.

2.2.5.10 Initializing stored information

Initialize each unit and item, resetting them to their factory defaults.

```
F2.6)Data initialize

1.ATU/PA data       :User
2.TRX data          :User
3.MODEM data        :User
4.Controller data   :User
5.Alarm log         :Execute
6.Channel data      :Execute
7.All data          :User
0.Back
```

(Example of ATU/PA data - User selected)

```
F2.6)Data initialize

1.ATU/PA data       :User

Initialization items:
 Power reduction
 Tune power

[Initialize]         [Cancel]
```

(Example of ATU/PA data - All selected)

```
F2.6)Data initialize

1.ATU/PA data       :All

Initialization items:
 Power,Tune pwr,Matching data
 Freq band pwr,Batt use set,
 RBK duration,TX delay,
▼ Model pwr,ATU set
```

```
F2.6)Data initialize

1.ATU/PA data       :All

▲ Initialization items:
 RX antenna,AC/DC detection


[Initialize]         [Cancel]
```

● ATU/PA data

Initialize items selected from the ATU and PA stored information below.

* In any situation, moving the cursor to Initialize on the screen (see right) displayed after selecting items and pressing ENT initializes the items (same for other items).

Power reduction, Tune power: User

Tx power for each band: Power

Antenna matching information: Matching

All ATU/PA save data: All

Note: The following are initialized when All is selected.

The above User items, BATT use set, RBK duration, TX delay, Model power, ATU setting, RX antenna, AC/DC detection

● TRX data

The selected content below is initialized for TRX stored information.

Mode, CH, TRX Frequency, AGC,

ATT, NR, SQL, CW BW: User

All TRX stored information: All

Note: The following are initialized when All is selected.

The above user items, Speech-processor, AGC setting, RX busy, RF through

● MODEM data

The selected content below is initialized for WKR MODEM stored information.

DSC logs, DSC/WKR condition,

Diagnosis log(transceiver):   User

All WKR MODEM stored information: All

Note: The following are initialized when All is selected.

The above user items, Port settings, DSC/WKR setting, Remote maintenance, Serial number

● Controller data

The selected content below is initialized for controller stored information.

Scan speed, Display form, My controller, Self diagnosis log (NCM), Option: User

All controller stored information: All

Note: The following are initialized when All is selected.

The above user items, Controller settings, MIC gain

● Alarm log

Initializes the system alarm history.

● Channel data

Initializes all user channel information (name, type, mode, TRX frequency, CH power, Scan speed).

● All data

The selected content below is initialized for all units.

User information for all units: User

All information for all units: All

Remarks: Self-ID (MMSI) is not initialized.

If necessary, erase at F1.1.1 ID setup by entering 9 digits of zeros.

2.2.5.11 Upgrading the software

Software is embedded in the NCM-2150 CONTROLLER, CAH-2415 PA UNIT, CMN-2250 TRX UNIT, CMJ-2250 WKR MODEM UNIT and NDZ-227 DATA TERMINAL. Normally connect a notebook PC or similar device to the controller, set the necessary items on the menu below, and then upgrade the unit. Note that the data terminal software is upgraded via the USB memory or the serial port of itself.

* Refer to "4.3 Upgrading the software" for details on the upgrade environment and instructions.

```
F3)Software upgrade

1.Baudrate      :38.4kbps
2.Connector    :Front
3.Target unit :Controller
4.Execute

0.Back
NB) DTE cable can be removed
     without DTE lost alarm.
```

● Baudrate
Select the communication speed with the connected notebook PC from 38.4 k, 57.6 k, or 115.2 k.

● Connector
Select the connector for connecting the notebook PC.

Controller handset: Front

Controller rear (Dsub9pin):   Rear

● Target unit
Select the equipment to be upgraded.

Controller: Controller

Unit inside the transceiver: Transceiver

Note: When upgrading the unit inside the transceiver, select Transceiver and then select the target unit (PA, TRX, or WKR MODEM) on the application software of the notebook PC.

● Execute
Waits for the software reception from the notebook PC.

2.2.5.12 Checking the DISTRESS key operation history

Used to check the DISTRESS key operation history.

```
Main menu

F1.Initial setting
F2.Maintenance
F3.Software upgrade
F4.Distress op history
0.Back
```

● Select F4. Distress op history on the Main menu and press ENT to display a screen as shown in the lower left.
● This history cannot be erased.

```
F4)Distress op history

1.1,1,090123123456
2.1,1,090123123450
3.1,1,090122123056
```

3. OPERATION CHECK AFTER INSTALLATION

3.1 Checks and procedures

3.1.1 Checklist

After the installation, configuration, and adjustment of the JSS-2150 is complete, do the checks in the table below. For details, refer to the explanation later.

Procedure	Item	Description	Note
1	Check the circumstances	Location, fixing	
2	Check wiring	Types of cables, connections, fixing	
3	Check antenna installation	Antenna fixing, waterproof of connectors	
4	Check voltage of power source	AC/DC voltage, NBD-2150 input voltage switching, NBB-724 charge voltage/ charge and discharge current	
5	Check registration items	MMSI, serial numbers	
6	Run self diagnosis	Self diagnosis of each unit	
7	Check GPS connection	Longitude and latitude display, matches GPS display	
8	Check of 2 controllers operation	Individual addresses and RS-485 terminator settings	If existing 2 controllers
9	Check basic operation	LCD settings, frequency settings, antenna tuning, TEL/CW transmission	
10	Check Tx power and frequency	Tx power and transmission frequency	
11	Check antenna VSWR	Antenna VSWR, ATU cable connection	
12	Communication test	Communication test	If possible
13	DSC communication test	Communication test using DSC (safety test calls and acknowledgement)	If possible
14	NBDP communication test	Communication test using NBDP ARQ mode	If possible
15	Check documentation and explanation of operations	Manual, operation card (Bridge card)	
16	Recheck installation	Equipment is fixing, retighten screws, recheck connector installation	
17	Power off	Transceiver power breaker off	

3.1.2	Checking procedures

3.1.2.1   Checking the installation of the equipment
- Is the equipment installed in the correct location?
- Check if there is enough space for removing the side and top plates of the NTD-2150, and that there is nothing obstructing the cooling fan.
- Is any equipment installed upside down?
- Are all the screws tight?
- Is the equipment's name plate installed so it is easily visible?
- Is the handset cradle installed in an easy-to-use location?
- Is the AC/DC power supply (NBD-2150) in the path of the exhaust?
- Is the battery charger (NBB-724) in the path of the exhaust?
- Is the equipment's ground properly connected?
- Have dust and other debris from installation work been cleaned up?

3.1.2.2   Checking the wiring
- Are the cable types, connections, and wiring to the terminal blocks done correctly?
- Is the cable properly fixed to the terminal block so it does not disconnect when pulled?
- Has too much insulation been stripped from the wires so too much bare wire is exposed near the terminal block?
- Is the cable fixed to the cable clamp?
- Are the 3 antenna cables in the NTD-2150 securely inserted into the board connectors?
- Are the flat cable (W4) and power cable (W5) in the NTD-2150 securely inserted into the board connectors?
- Is the coaxial cable between the transceiver's Tx power (TX ANT) and the antenna tuner OK?
    * Check the cable itself for shorts between the central conductor and the shielding, if the central conductor is broken, etc.
- Is any cable caught between the upper part and bottom part of the NTD-2150?

3.1.2.3   Checking the antenna installation
* Check the following for all of the antennas (TX, RX, WKR) used.
- Is the antenna installed in a suitable location?
- Is the antenna fixed?
- Is the connector of the coaxial cable securely connected?
- Has the connector been properly waterproofed?

3.1.2.4   Checking the voltage of power source
- Check the AC power voltage at the AC IN terminal of the AC/DC power supply (NBD-2150) with a tester.
  Rating: 90 to 132 VAC or 180 to 264 VAC
- Check the DC power voltage at the 24 VDC IN terminal of the AC/DC power supply (NBD-2150) with a tester.
  Rating: 21.6 to 31.2 VDC
- Check if the DC power voltage is within the ratings at the NTD-2150 24 V input terminal with a tester.
  Rating: 21.6 to 31.2 VDC
- Check if the DC power voltage during transmission is within the ratings at the NTD-2150 24 V input terminal with a tester.
- Check if the AC/DC power supply (NBD-2150) automatically switch to DC input when AC input

shuts off.
- Check both the floating and equalizing charge voltages by the panel meter of the NBB-724.
- Check both the charge and discharge currents by the panel meter of the NBB-724.

3.1.2.5 Checking the registration items

- Is the ship's ID, assigned by the administration, registered and displayed in the upper-left of the status display?
- Is the serial number (manufacturer's number) of each unit registered? (Menu F1.1.2 Serial number)

3.1.2.6 Checking the equipment condition by the self diagnosis

- Is the transceiver's self diagnosis OK? (Run All at Menu 6.1.1 Transceiver)
- Is the controller's self diagnosis OK? (Run All at Menu 6.1.2 Controller)
  * When two controllers are connected, run a self diagnosis for each controller.

3.1.2.7 Checking the GPS connection

- Is the latitude and longitude displayed at the top of the status display, and is EXT displayed at the far right?
- Does the information above match the position information displayed on the GPS?
  * Make an appropriate decision to any discrepancies in the significant digits.

3.1.2.8 Checking items for 2 controllers

- Are individual addresses set? (Menu F1.3 Controller settings)
- Is the terminator set correctly?
  * Refer to "2.2.2.2 (1) RS-485 signal line terminator settings" of the installation manual.

3.1.2.9 Checking the basic operation

- Does pressing the [DIM] key switch the brightness of the LCD?
- Does pressing the [PRW/CONT] key adjust the contrast of the LCD?
- Can the frequency be set with the jog dial and numeric keypad, or can the antenna be tuned to all bands (for example, 4100.0 kHz for the 4M band)?
- Check that all the keys, except the DISTRESS key, function.
- When the squelch is off, can the speaker volume be adjusted by the RF GAIN or VOL controls?
- Does sound come from the handset?
- Does the send mark (TX or TX ON) appear when pressing the push-to-talk switch (PTT) on the handset in TEL mode?
  * In an environment where an antenna changer (NKZ-224) is connected, check that transmission is terminated from the antenna to connection with RBK.
- Does the send mark (TX or TX ON) appear when pressing the keyer in CW mode?
  * In an environment where an antenna changer (NKZ-224) is connected, check that transmission is inhibited until the antenna connection is completed after RBK ON.

3.1.2.10 Checking the Tx power and frequency

* Do these checks in all the 2, 4, 6, 8, 12, and 16 M bands in TEL mode. Do not transmit on distress and safety frequencies (2182.0, 4125.0, 6215.0, 8291.0, 12290.0, and 16420.0 kHz).
* Use the test tone in the Menu F2.3.1.1 TX band power adj. for the following.
  - Check if the Tx power is within the ratings using a high frequency power meter.
    Rating: For 4, 6, 8, 12 M band: 120 to 180 W (high), 40 to 60 W (low)
    For 2 M band: 80 to 100 W (high), 26 to 40 W (low)
  - Check if the deviation of the TX frequency is within the ratings using a frequency counter.

Rating: Within ±10 Hz

3.1.2.11   Checking the antenna VSWR

- Check the output power (Pf) and reflected power (Pr) using a through watt meter (CM power meter).

Reference: When Pf = 150 W and Pr = 6 W, VSWR = 1.5 using the following equation.

$$VSWR = \frac{\sqrt{Pf} + \sqrt{Pr}}{\sqrt{Pf} - \sqrt{Pr}}$$

Note 1: When Pf is 150 W (±20%), it is best when Pr is less than 6 W.

Note 2: When VSWR is over approximately 2.5, the TUNE mark blinks on the LCD.

3.1.2.12   Radiotelephone communication test

- If possible, test radiotelephone communications with another station.

* Always get permission from the ship's officer in charge before sending a radio signal.

3.1.2.13   DSC communication test

- If possible, test DSC communications with another station.

* Always get permission from the ship's officer in charge before sending a radio signal.

** In the field maintenance mode, operate the DSC menu after restarting in the normal mode because the DSC menu is unavailable in the field maintenance mode.

[Test instructions (example)]

① On the status display, hold down the **FUNC** key and press **0 TEST CALL** to display 1. DSC non-distress call.

② Enter the MMSI of the objective station (coast station or other ship) being called in Address.

③ As necessary, enter the call frequency in Calling FRQ. (Default: 2187.5 kHz)

④ Move the cursor to Call and press ENT to transmit a DSC test call.

⑤ Once a response from the objective station has been received, check that that message displays as Received safety message.

Note: Depending on conditions of the objective station, a response may not be received.

3.1.2.14   NBDP communication test

- If possible, test NBDP communications with another station.

* Always get permission from the ship's officer in charge before sending a radio signal.

** In the field maintenance mode, operate the data terminal after restarting in the normal mode because that telex menu is unavailable in the field maintenance mode.

3.1.2.15   Checking the documentation and explain operations

- Is the bridge card placed close to the controller?
- Is the instruction manual stored in an appropriate location?
- Explain how to use the equipment to the users.

3.1.2.16   Rechecking the installation

Once again at the end, check that the controller, transceiver, antenna tuner, and other units are fixed.

Then while retightening all screws to ensure they are securely tightened, check that the coaxial and other cables are securely connected.

3.1.2.17   Power off

Turn the transceiver's power breaker off, and exit field maintenance mode.

3.2 Troubleshooting

Diagnose malfunctions while referring to the table below.

Operating condition	Symptoms	Cause and items to check	Solution (example)
(1) Power on	Unable to start/ DC OUTPUT on the NBD-2150 does not light.	Insufficient voltage from power source	Provide appropriate voltage to the NBD-2150. (90 VAC to 132 VAC, 180 VAC to 264 VAC, 21.6 VDC to 31.2 VDC)
		NBD-2150 failure	Replace NBD-2150
	Unable to start/ DC OUTPUT on the NBD-2150 lights red.	Overvoltage from power source/ insufficient voltage	Provide appropriate voltage to the NBD-2150. (90 VAC to 132 VAC, 180 VAC to 264 VAC, 21.6 VDC to 31.2 VDC)
		Overcurrent is output	Check the connections for each wire
		NBD-2150 failure	Replace NBD-2150
	Unable to start/ Controller does not startup	Overvoltage from power source/ insufficient voltage	Provide appropriate voltage to the NTD-2150. (21.6 VDC to 31.2 VDC)
		Incorrect wiring of terminal board	Check the connections for each wire
	Unable to start/ Data terminal does not startup	Overvoltage from power source/ insufficient voltage	Provide appropriate voltage to the NTD-2150. (21.6 VDC to 31.2 VDC)
(2) Controller startup screen	Address setting error appears	Duplicate controller addresses	Set an individual address for each controller. (Menu F1.3.1 Address)
	MMSI lost appears	MMSI is not registered	Register the MMSI assigned by the supervising authority. (Menu F1.1.1 ID setup)
	Barcode number lost appears	The controller's production technology information is missing	Replace CDJ-3775
	This controller's SIO error appears	RS-485 line error (CTRL 485 test error)	• Check wiring between the NCM-2150 and NTD-2150 • Replace CMV-3775
	PA UNIT lost or this controller's SIO error appears	RS-485 line error (PA Polling cannot be received)	• Check wiring between the NCM-2150 and NTD-2150 • Check wiring inside the NTD-2150, such as the W11 between the CQD-2415 and CAH-2415. • Replace either the NCM-2150 or CAH-2415
	TRX UNIT lost appears	TRX UNIT is disabled (TRX communication err)	• Check wiring inside the NTD-2150, such as the W12 between the CMN-2250 and CAH-2415. • Replace either the CMN-2250 or CAH-2415
	SSB screen appears without MMSI or position information.	Cannot recognize WKR MODEM.	• Check wiring inside the NTD-2150, such as the W14 between the CMJ-2250 and CMN-2250. • Replace either the CMJ-2250 or CMN-2250
	Check sum comparing error appears	Refer to 3.2.1	
	Text is unreadable	Dimmer, contrast	Adjust brightness with the DIM key and contrast with the PWR/CONT key.
	Display is abnormal.	LCD unit	Replace either CDE-3770 LCD or CMV-3775 AF CONT
(3) Self-diagnosis	Refer to 3.2.2		
(4) Alarm	Refer to 3.2.3		
(5) Other malfunctions	Refer to 3.2.4		

3.2.1   PA software errors

Each unit communicates using a single master/multi-slave protocol, such as Modbus. When polling with the PA as master (semaphore), the other units respond in order (same as JHS-770S). If the software does not function correctly due to a PA ROM (FROM) malfunction, all functions, including upgrades, stop functioning. In this case, it is possible to reboot the PA and only PA upgrades can be done from the following screen.

[Upgrade screen directly after a PA software error has occurred]

```
[Transceiver]
Check sum comparing error.
Please re-install the
           program again now.

  Target unit      :PA
  Baudrate         :-----kbps
  Connector        :-----


(Please contact our service
            center/agents.)
```

The screen above appears when upgrading by connecting a notebook PC to connector J105 (Dsub9) on the CAH-2415 PA UNIT board. Connecting a notebook PC to a controller displays the following upgrade screen.

[Upgrade screen after connecting a notebook PC to a controller]

```
[Transceiver]
Check sum comparing error.
Please re-install the
           program again now.

  Target unit      :PA
  Baudrate         :38.4kbps
  Connector        :Rear
  Current status   :Ready

(Please contact our service
            center/agents.)
```

* Refer to the explanation later for details on the upgrade environment and instructions.

3.2.2	Locating faults by the self diagnosis and the countermeasures

(1) Self diagnosis of the transceiver (Menu 6.1.1)

Test item	Description	Result	Countermeasure if NG
ATU	• Serial I/F: Serial communication	OK: Normal NG: Error	• Check wiring between the NFC-2150, NQD-2253, and NTD-2150 • Replace CFG-2150
	• Band1-Input: 2200 kHz input value • Band2-Input: 4100 kHz input value • Band3-Input: 6300 kHz input value • Band4-Input: 8400 kHz input value • Band5-Input: 16800 kHz input value • Band6-Input: 26200 kHz input value	OK: Normal NG: Error	• Check RF cable between the NFC-2150 and NTD-2150 • Adjust tuning output under Menu 5.5.2 Tune power • Replace CFG-2150
	• Band1-Tune: 2200 kHz tuning operation • Band2-Tune: 4100 kHz tuning operation • Band3-Tune: 6300 kHz tuning operation • Band4-Tune: 8400 kHz tuning operation • Band5-Tune: 16800 kHz tuning operation • Band6-Tune: 26200 kHz tuning operation	OK: Normal NG: Error*	• Check antenna connection • Check antenna changer operation and RBK wiring • Check and replace burned out relays • Replace CFG-2150
PA	• PA mute port: Check PA diagnosis	OK: Normal NG: Error	• Check wiring between the NFC-2150, NQD-2253, and NTD-2150 • Replace CFG-2150 • Replace CAH-2415
	• RBK port: RBK overcurrent detection	OK: Normal NG: Error	• Check RBK wiring (short-circuit) • Replace CAH-2415
	• Memory1: EEPROM1 operation	OK: Normal NG: Error	Replace EEPROM1 (IC102)
	• Memory2: EEPROM2 operation	OK: Normal NG: Error	Replace CAH-2415
	• Band1-Output: 2200 kHz output value • Band2-Output: 4200 kHz output value • Band3-Output: 6300 kHz output value • Band4-Output: 8400 kHz output value • Band5-Output: 16800 kHz output value • Band6-Output: 26200 kHz output value	OK: Normal NG: Error	• Check RF cable W5 between CMN-2250 and CAH-2415 • Check and replace burned out relays • Replace CAH-2415
	• Input voltage: Checking PA 24V	OK: Normal NG: Error	• Check RF cable W32 between CBD-2415 and CAH-2415 • Replace CAH-2415
TRX	• Memory: EEPROM operation • Digital CKT: FPGA operation • BK port: BK signal status • PLL lock: Status of PLL for DDS/DUC clock • Band1-TX output: 1600 kHz output • Band2-TX output: 22000 kHz output • Band3-TX output: 27500 kHz output • Band4-TX output: RX diagnosis circuit • Band1-RX BPF1: 1600 kHz Rx level • Band2-RX BPF2: 390 kHz Rx level • Band3-RX BPF3: 1590 kHz Rx level • Band4-RX BPF4: 3190 kHz Rx level • Band5-RX BPF5: 6090 kHz Rx level • Band6-RX BPF6: 10490 kHz Rx level • Band7-RX BPF7: 17990 kHz Rx level • Band8-RX BPF8: 27500 kHz Rx level	OK: Normal NG: Error	• Replace CMN-2250 • If BK port is NG, the transceiver alarm 023 is occurred. In this case, take measures referring to 3.2.3 List of system alarms and solutions without replacing the CMN-2250

* When the resonance frequency of the TX antenna is close to the ATU self diagnosis frequency, NG may be occurred. In this case, adjust the wire length such as the lead wire of the TX antenna.

Test item	Description	Result	Countermeasure if NG
WKR MODEM	• Memory1: FROM operation • Memory2: EEPROM operation • Memory3: SDRAM operation • PLL lock: Status of PPL for DDS clock • Band1-RX BPF1: 2187.5 kHz Rx level • Band2-RX BPF2: 4207.5 kHz Rx level • Band3-RX BPF3: 6312.0 kHz Rx level • Band4-RX BPF4: 8414.5 kHz Rx level • Band5-RX BPF5: 12577.0 kHz Rx level • Band6-RX BPF6: 16804.5 kHz Rx level • Band7-RX BPF7: 2187.5/8414.5/16804.5kHz Rx level • DSC/NBDP Loop1: MODEM AF loop • DSC/NBDP Loop2: MODEM&TRX AF loop	OK: Normal NG: Error	• With Memory2, replace EEPROM (IC502) • When Loop test2 is NG, replace CMN-2250 or CMJ-2250, or check W14 wiring • Replace CMJ-2250

(2) Self diagnosis of the controller (Menu 6.1.2)

Test item	Description	Result	Countermeasure if NG
DGT CKT	• Memory1: FROM operation • Memory2: EEPROM operation • Memory3: SDRAM operation	OK: Normal NG: Error	Replace CDJ-3775
AF output	AF connection up to TRX	OK: Normal NG: Error	• Check wiring between the NCM-2150 and NTD-2150 • Check W11/W12 wiring in NTD-2150 • Replace CMV-2150 • Replace CMN-2250
LCD& LED	Screen and ALM lamp display operation *Check visually if every dot and red and green ALM lamp alternately work normally for 3 seconds.*	DONE	• Replace CDE-3770 (LCD) • Replace CCK-3775 (LED)
Speaker	Sound circuit operation *Check that a single tone sounds. Press ENT on the popup screen to exit.*	DONE	• Replace 7USJD0007 • Replace CMV-3775
Printer	Printer operation *Output data if a printer is connected. Check the print results.*	DONE	• With NKG-91/DPU-414 Check cable connection Check power of 5 to 8.7 V Replace printer • With NKG-800 Check cable connection Check power of 10.2 to 31.2 V Replace printer
DTE	• DTE memory1: FROM operation • DTE memory2: SDRAM operation	OK: Normal NG: Error	Replace CDC-1346B
	• DTE LCD&LED: Screen and lamps operation Note: Check visually if every dot alternating colors of red, green, blue and white with the lamp blink work normally for 5 seconds.	DONE	Replace CCN-3227
	• DTE buzzer: DTE buzzer operation Note: Check if the buzzer sounds correctly. After 3 seconds, sounding stops automatically	DONE	Replace CMH-3227

3.2.3   System alarm list and countermeasures

The types, descriptions, and countermeasures for system alarms displayed when an error is detected on the equipment are as follows. Even if a system alarm report screen is closed, the current alarm can still be checked on the Menu 6.2 Alarm information screen. Also, press ENT on this screen to display the "View alarm history?" confirmation screen, then pressing ENT displays the system alarm history (maximum of 100 alarms).

(1)   Transceiver alarms

No.	Location	Message	Description	Countermeasure
001	PA	Overcurrent	Detected an overcurrent (20 A or more) in the PA power supply.	Re-tune or operate on another frequency.
007	PA	SWR/Overload	Detected the condition SWR > 3.	• Re-tune or operate on another frequency. • Check Antenna
008	PA	High temperature	Detected an out-of-range temperature (110 C or more) at the radiator.	Stop transmission, or reduce output.
010	PA	RBK overcurrent	Detected RBK overcurrent.	• Check RBK wiring (short-circuit) • Check current-carrying capacity of RBK relay.(max. 1.5 A)
055	PA	24V low voltage	Detected a drop (12V or less) in the PA power supply voltage.	• Check W32 wiring between CBD-2415 and CAH-2415 • Replace CAH-2415
091	PA	EEPROM	Detected a memory error.	• Replace EEPROM1 (IC102) • Replace CAH-2415
017	ATU	ATU lost	Detected a serial communication error with the tuner.	• Check wiring between the NFC-2150, NQD-2253, and NTD-2150 • Replace CFG-2150
018	ATU	High voltage	Detected a high voltage (3.5 kV or more) in antenna output.	• Re-tune or reduce output • Check Antenna
019	ATU	High temperature	Detected an out-of-range temperature (70 C or more) inside the enclosure.	Stop transmission or reduce output
020	TRX	DISP_KEY	An incorrect ON signal was detected on the PTT or other controller transmission control line	• Check if it was started up while PTT or CW key was on • Check wiring between NCM-2150 or NTD-2150, or W11 or W12 wiring in the NTD-2150 • Replace CQD-2415
021	TRX	EXT_KEY	An incorrect ON signal was detected on the transceiver external key.	• Check if it was started up while EXT_KEY was on • Check W11, W13, or W22 wiring in NTD-2150 • Replace CQD-2416
022	TRX	SEL_BK	An incorrect Selcall key ON signal was detected on the transceiver.	
023	TRX	-BK	-BK Overcurrent was detected during transmission.	• Check CQD-2415 wiring • Check the rated current of the BK relay.(max. 0.5 A)
024	TRX	PLL unlock	DDS or DUC clock's PLL unlock was detected.	Replace CMN-2250
030	WKR MODEM	PLL unlock	DDS clock's PLL unlock was detected.	Replace CMJ-2250

No.	Location	Message	Description	Countermeasure
031	WKR MODEM	MCDSP WDT	MCDSP stop was detected.	Replace CMJ-2250
032	WKR MODEM	VDSP WDT	VDSP stop was detected.	Replace CMJ-2250
033	WKR MODEM	MMSI lost	Detected that MMSI is not registered or missing.	• Replace CMJ-2250 EEPROM (IC502) • Replace CMJ-2250
094	WKR MODEM	Memory	Detected a memory error.	• Replace CMJ-2250 EEPROM (IC502) • Replace CMJ-2250
047	PA	PA lost	Detected a serial communication error with the PA.	• Check wiring between the NCM-2150 and NTD-2150 • Check wiring inside the NTD-2150, such as the W11 between the CQD-2415 and CAH-2415. • Replace CAH-2415 • Replace NCM-2150
048	TRX	TRX lost	Detected a serial communication error with TRX.	• Check wiring inside the NTD-2150, such as the W12 between the CMN-2250 and CAH-2415. • Replace CMN-2250 • Replace CAH-2415
050	WKR MODEM	MODEM lost	Detected a serial communication error with WKR MODEM.	• Check wiring inside the NTD-2150, such as the W14 between the CMJ-2250 and CAH-2415. • Replace CMJ-2250 • Replace CAH-2415

(2) Controller alarms

No.	Location	Message	Description	Countermeasure
035	Controller	CTRL1 RBK OC	Detected an overcurrent on the RBK circuit of controller 1.	• Check the EXT MODEM RBK connection or load (maximum of 0.3 A) • Replace CMV-3775
036	Controller	CTRL1 PTT	Detected an error with the PTT key on of controller 1.	• Check if it was started up while PTT was on • Check handset * Remove the handset, and reboot to check if the error occurs. • Check W3 in the NCM-2150 • Replace CMV-3775
037	Controller	CTRL1 CW KEY	Detected an error with the CW-keyer on of controller 1.	• Check if it was started up while CW key was on • Check W7 in the NCM-2150 • Replace CMV-3775

No.	Location	Message	Description	Countermeasure
038	Controller	CTRL1 EXT KEY	Detected an error with the EXT KEY of controller 1.	• Check if was started up while EXT KEY on EXT MODEM was on • Check W5 in the NCM-2150 • Replace CMV-3775
039	Controller	CTRL2 RBK OC	Detected an overcurrent on the RBK circuit of controller 2.	• Check the EXT MODEM RBK connection or load (maximum of 0.3 A) • Replace CMV-3775
040	Controller	CTRL2 PTT	Detected an error with the PTT key signal of controller 2.	• Check if it was started up while PTT was on • Check handset * Remove the handset, and reboot to check if the error occurs. • Check W3 in the NCM-2150 • Replace CMV-3775
041	Controller	CTRL2 CW KEY	Detected an error with the CW-key key signal of controller 2.	• Check if it was started up while CW key was on • Check W7 in the NCM-2150 • Replace CMV-3775
042	Controller	CTRL2 EXT KEY	Detected an error with the EXT KEY of controller 2.	• Check if was started up while EXT KEY on EXT MODEM was on • Check W5 in the NCM-2150 • Replace CMV-3775
051	Controller	CTRL1 lost	Detected a serial communication error on controller 1.	• Check wiring between the NCM-2150 (No.1) and NTD-2150 • Replace NCM-2150 (No.1)
052	Controller	CTRL2 lost	Detected a serial communication error on controller 2.	• Check wiring between the NCM-2150 (No.2) and NTD-2150 • Replace NCM-2150 (No.1)
095	Controller	CTRL1 memory	Detected a memory error on controller 1.	• Initialize All under Menu F2.6.4 Controller data • Replace CDJ-3775 (No. 1)
096	Controller	CTRL2 memory	Detected a memory error on controller 2.	• Initialize All under Menu F2.6.4 Controller data • Replace CDJ-3775 (No. 2)

(3) Data terminal alarms

No.	Location	Message	Description	Countermeasure
059	Data terminal	My/OTH DTE lost	Detected a serial communication error between controller (ID:1) and DTE. Note) My or OTH indicates the relationship between that data terminal and the controller displaying this alarm.	・ Check the data terminal cable connection, or the condition of the data terminal. ・ Replace CDC-1346B

060	Data terminal	My/OTH DTE lost	Detected a serial communication error between controller (ID:2) and DTE. Note) My or OTH indicates the relationship between that data terminal and the controller displaying this alarm.	・Check the data terminal cable connection, or the condition of the data terminal. ・Replace CDC-1346B
062	Data terminal	My/OTH DTE USB-IC	Detected the SPI communication error at the USB circuit of the data terminal connected to the controller (ID:1). Note) My or OTH indicates the relationship between that data terminal and the controller displaying this alarm.	・Replace CMH-3227 ・Replace CDC-1346B
063	Data terminal	My/OTH DTE USB-IC	Detected the SPI communication error at the USB circuit of the data terminal connected to the controller (ID:2). Note) My or OTH indicates the relationship between that data terminal and the controller displaying this alarm.	・Replace CMH-3227 ・Replace CDC-1346B

3.2.4	Countermeasures for other malfunctions

The instructions for finding other malfunctions are as follows.

No.	Symptom	Major cause and/or countermeasure
1	GPS position information is not displayed.	• Check the connections with the GPS. • Check the input sentence from the GPS device. * Menu F2.1 Port maintenance
2	After turning the power on and waiting a while, the POS/TIME screen appears and an alarm sounds.	

3	Even if PTT is pressed, TX appears, but sound is not transmitted.	• Handset malfunction → Replace handset
		• Poor contact at controller connection cable
		• AF signal transmission circuit malfunction
		  * Check AF OUTPUT on Menu F2.2.5 Controller
		  → Check connections and replace handset connector; W3 inside CMV-3775, CMN-2250, and NCM-2150; and W11 and W12 inside NTD-2150.

4	Even if PPT is pressed, TX is not displayed and transmission is impossible	• Handset malfunction → Replace handset
		• AF signal transmission circuit malfunction
		  * Check AF OUTPUT on Menu F2.2.5 Controller
		  → Check handset connector; W3 inside CMV-3775, CMN-2250, and NCM-2150; W11 and W12 inside NTD-2150, and controller connection cable; replace if necessary.

5	Reception level is poor.	• Check antenna position • Change receiving antenna (TX ANT ⇔ WKR/RX ANT) * Menu F2.4.1 RX antenna • Connect a dedicated reception antenna to the NTD-2150 • Antenna damaged → Replace antenna • Antenna cable is cut, shorted, exposed to water → replace cable • Poor contact at antenna connector → Retighten connector • Reception circuit malfunction → Replace CMN-2250

6	Operation may be unstable.	• RS-485 line communication malfunction
		  → Check terminator settings
		• Induction from transmission frequency
		  → Strengthen equipment grounding. Or check shield of connection cable.

7	When transmitting a routine call or safety test call, cannot transmit while "Waiting for CH free" is displayed.	• Change DSC transmission frequency.
		• Noise floor reception level of DSC transmission frequency is high.
		  → Select another DSC frequency. Or raise the busy acceptance level of the reception frequency.
		    * Menu F2.4.2 RX busy

4. MAINTENANCE

4.1   Periodic inspections

4.1.1   Checklist

Check the following items during periodic checks. If there are other regulations directed by the concerned administration or inspection body, follow those regulations.

Procedure	Item	Description
1	Check installation of the equipment	Check if the equipment is fixed properly and if screws are tight.
2	Check cleanliness	Check if the equipment is clean. If the exhaust is covered with dust, use a cloth to clean it.
3	Check antenna installation	Check if the antenna and antenna tuner are properly fixed, and if there are problems with the waterproofing.
4	Check voltage of power source	Check the AC and DC power voltage. Check that the equipment automatically switches to the backup DC power input when AC power is cut.
5	Check registration ID	Check the ship's MMSI and the equipment's manufacture number. * Menu F1.1 Registration
6	Check basic operation	Check basic operations of the equipment, including the power on and off switch, adjust frequencies with the jog dial, RF GAIN and VOL knob operation, jog dial operation, and transmission with the PTT and CW KEYER keys.
7	Checking the alarm history	Check the alarm history. * Press ENT twice on the Menu 6.2 Alarm information screen
8	Run self diagnosis	Run the self diagnosis for each unit. * Menu 6.1 Self diagnosis
9	Check Tx power and frequency	Check Tx power using the equation $P = V_c \times I_c \times \eta$. * F2.3.1 TX power adj. (mentioned above) Check Tx frequency using a frequency counter.
10	Modulation frequency	Check the DSC/NBDP AF (see 4.1.2), or if needed, check the test tone frequency (see 4.1.3).

4.1.2   Measuring DSC/NBDP AF

Measure the DSC or NBDP modulation frequency (1615 Hz/1785 Hz) as follows.

1) Connect the frequency counter to the external speaker output terminal (φ3.5-mm jack) on the rear of the controller.

2) Open Menu F2.3.2 DSC/NBDP (AF).

3) Select the frequency to measure from 1615 Hz or 1785 Hz at 1. TX type.

4) Start outputting the AF signal by selecting Start at 2. Output and pressing ENT.

5) Measure the modulation frequency using the frequency counter.

6) Measure the other frequency following steps 3 through 5 above.

7) Check that the frequency is within the ranges below.

   Rating   1615 Hz (Y):   Within ±1 Hz of 1615 Hz

              1785 Hz (B):   Within ±1 Hz of 1785 Hz

8) After the measurement, stop the AF signal output by pressing ENT at Stop button of 2. Output.

4.1.3   Measuring the test tone

Measure the test tone (1500 Hz. Note: 1400 Hz for Korea mode) used in TEL mode as follows.

Note: Transmission occurs while outputting a test tone. Before measuring the test tone, always check the radio frequency is free. Then perform that measuring for as short a time as possible.

1) Connect the frequency counter to the external speaker output terminal (φ3.5-mm jack) on the rear of the controller.

2) Press TEL key, and move the cursor to 1. TX band power adj. on the F2.3.1 TX power adj. menu, and press ENT. The transmission output adjustment pop-up screen appears as shown to the right.

```
F2.3.1)TX power adj.

1.TX band power adj.
2.TX CH power adj.

0.Back
```

ENT
→

```
F2.  Mode:TEL / PWR :High
     Frequency:12230.0kHz
1.   Type     :Test tone
2.   TX power :100.0%
     [ TX ][Save][Cancel]
0.      Vc          Ic
      --.-V        --.-A
         Ia        SWR-P
      --.-A         -.-
```
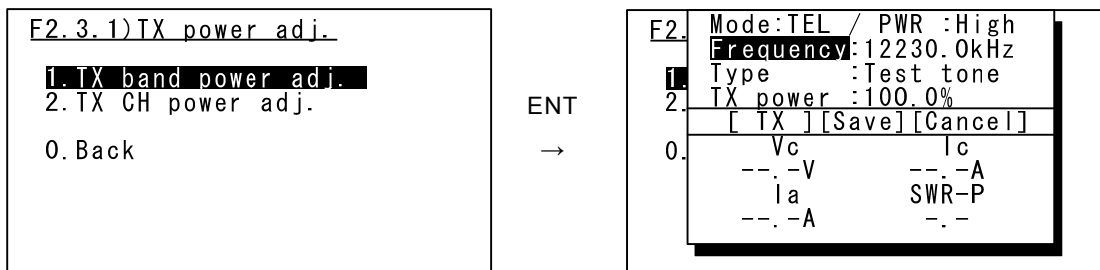
3) Set the frequency assigned to the ship, and set PWR to low to reduce the Tx power.

4) Check that Type is set to Test tone.

5) Move the cursor to [TX] and press ENT to start outputting a test tone.

6) Measure the test tone frequency using the frequency counter.

4.2 Unit replacement

4.2.1 Service parts list

Category	Equipment		Devices, etc.		Circuits, etc.		Note
	Model	Name (JPN/ENG)	Model	Name (JPN/ENG)	Model	Name (JPN/ENG)	
Basic configuration	JSS-2150	MF/HF 無線装置 MF/HF RADIO EQUIPMENT	NTD-2150	MF/HF トランシーバ MF/HF TRANSCEIVER	CMN-2250	送受信部 TRX UNIT	
					CAH-2415	電力増幅部 PA UNIT	
					CMJ-2250	聴守受信機内蔵モデム部 WKR MODEM UNIT	
					CBD-2415	電源部 PS UNIT	
					CQD-2415	接続端子部 TERMINAL UNIT	
					CQD-2416	拡張基板 EXTENSION BOARD	To connect the external units such as RMS
					(NTD-2150)	筐体 CHASSIS	
					M-P-7	付属コネクタ COAXIAL CONNECTOR	2pcs
					7ZPJD0461	操作カード BRIDGE CARD	JPN：7ZPJD0460
					MPNN46153	警告ラベル WARNING LABEL	
					7ZPJD0065	レジスタリスト WARRANTY LIST	
					7ZPJD0477	遭難警報ガイダンス GUIDANCE ON DISTRESS ALERTS	JPN：7ZPJD0478

Category	Equipment		Devices, etc.		Circuits, etc.		Note
	Model	Name (JPN/ENG)	Model	Name (JPN/ENG)	Model	Name (JPN/ENG)	
(Continued)	(Continued)	(Continued)	NCM-2150	MF/HF コントローラ MF/HF CONTROLLER	CDJ-3775	制御部 CONTROL UNIT	
					CMV-3775	音声制御部 AF CONT UNIT	
					CCK-3775	メインパネル部 MAIN PANEL UNIT	
					CCK-3776	サブパネル部 SUB PANEL UNIT	
					CDE-3770	液晶表示部 LCD UNIT	
					(NCM-2150)	筐体 CHASSIS	
					MPNN45689	舵輪マーク MED PLATE	
					MPNN45781A	シリアル銘板 NAME PLATE	
			NQW-261	ハンドセット HANDSET			Includes the cradle
			7ZCJD0343	コントローラ用ケーブル ATTACHED CABLE			L=5m
			NFC-2150	アンテナチューナ ANTENNA TUNER	CFG-2150	同調部 MATCHING UNIT	
					(NFC-2150)	筐体 CHASSIS	
					HC-ESV-8X20A WG-20/0.18	制御ケーブル CONTROL CABLE	L=5m
					7ZCJD0045	RF ケーブル RF CABLE	L=5m
					MPTG32066B	付属品 INSTALLATION PARTS	Mounting screws / Terminal

Category	Equipment Model	Name (JPN/ENG)	Devices, etc. Model	Name (JPN/ENG)	Circuits, etc. Model	Name (JPN/ENG)	Note
(Continued)	(Continued)	(Continued)	(Continued)	(Continued)	MPBC44578	交換用カバー REPLACEMENT COVER	With the packing rubber attached
			7ZPJD0492	取扱説明書 INSTRUCTION MANUAL			JPN : 7ZPJD0491
			7ZPJD0499	装備要領書 INSTALLATION MANUAL			JPN : 7ZPJD0498
			7ZPJD0501	サービスマニュアル SERVICE MANUAL			JPN : 7ZPJD0500
NBDP options			NDZ-227	データターミナル DATA TERMINAL	CDC-1346B	ルパンボード PROCESS CIRCUIT	
					CMH-3227	I/F ユニット INTERFACE UNIT	
					CCN-3227	LCD ユニット COLOR LCD UNIT	
					CQC-1262	LCD I/F ユニット LCD I/F UNIT	
					CQD-3227	USB I/F ユニット USB I/F UNIT	
			NDF-369	キーボード KEYBOARD			
			7ZCJD0388	DTE 信号ケーブル DTE CABLE			L=1.5m
			7ZCJD0419	DTE 電源ケーブル DTE POWER CABLE			
			NKG-800	プリンタ PRINTER			Desktop parallel printer* *See note2 below.
			7ZCSC0205A	プリンタ信号ケーブル PRINTER CABLE			For the NKG-800 connected to the data terminal
			6JNKD00100B	プリンタ電源ケーブル PRINTER POWER CABLE			For NKG-800

Category	Equipment		Devices, etc.		Circuits, etc.		Note
	Name (JPN/ENG)	Model	Model	Name (JPN/ENG)	Model	Name (JPN/ENG)	
Options			NAW-60	ホイップアンテナ WHIP ANTENNA			For transmitter: 1 For receiver/WKR: 1
			JQD-69C	接続筐 JOINT BOX			For receiver/WKR: 1
			M-P-7	アンテナコネクタ COAXIAL CONNECTOR			
			NBD-2150	AC/DC 電源 AC/DC POWER SUPPLY			
			NBB-724	充電器 BATTERY CHARGER			
			7ZCJD0347	AC IN ケーブル AC-IN CABLE			For NBB-724
			7ZCJD0348	BATT OUT ケーブル BATT-OUT CABLE			For NBB-724
			7ZCJD0349	BATT ケーブル BATT CABLE			For NBB-724
			NQD-2250	コントローラ接続筐 CONNECTION BOX	CQD-2250	接続端子板 CONNECTION BOARD	
					(NQD-2250)	筐体 CHASSIS	
			MPBC42957	フラッシュマウントパネル CONSOLE MOUNTING KIT			For NCM-2150
			MPBX44354	U字架台 CONTROLLER BRACKET			For NCM-2150
			NQD-2253	ATU 接続筐 JUNCTION BOX			
			UDG4-1GAR-JRC	USB メモリ USB MEMORY			Maker: Hagiwara Sys-Com Capacity: 1GB

Category	Equipment		Devices, etc.		Circuits, etc.		Note
	Model	Name (JPN/ENG)	Model	Name (JPN/ENG)	Model	Name (JPN/ENG)	
(Continued)			NKG-91	プリンタ PRINTER			
			7ZCJD0254A	プリンタケーブル PRINTER CABLE			For NKG-91/DPU-414 L=1.5m
			7ZPJD0384	プリンタ用紙 ROLL PAPER			For NKG-91
			MPBP31446	壁掛用パネル WALL MOUNTING KIT			For NKG-91
			DPU-414	プリンタ PRINTER			Desktop type
			7ZCJD0257C	プリンタ電源ケーブル PRINTER PS CABLE			For DPU-414
			6ZCAF00252A	プリンタ用紙 ROLL PAPER			For DPU-414
			NKG-800	プリンタ PRINTER			Desktop parallel printer* *See note2 below.
			6ZCSC00407	プリンタケーブル PRINTER CABLE			For NKG-800
			6JNKD00100B	プリンタ電源ケーブル POWER CABLE			For NKG-800
			5ZPCM00006	プリンタ用紙 ROLL PAPER			For NKG-800
			NKZ-224	アンテナ切替器 ANTENNA CHANGER			
			NQE-2150	AC/DC ヒューズボックス AC/DC FUSE BOX			For GM console
			NQE-2160	DC ヒューズボックス DC FUSE BOX			For stand-alone installation

Category	Equipment		Devices, etc.		Circuits, etc.		Note
	Model	Name (JPN/ENG)	Model	Name (JPN/ENG)	Model	Name (JPN/ENG)	
(Continued)			7ZZJD0072	ラックマウントキット RACK MOUNT KIT			For NBD-2150
			7ZZJD0073	ラックマウントキット RACK MOUNT KIT			For NBB-724
			NQD-2724	端子台ボックス TERMINAL BOX			For NBB-724

Note1: Unit replacement procedure

- NTD-2150 MF/HF transceiver

    1) Replacement   : Refer to chapter 5.

    2) Setup after replacement : Refer to chapter 2.

- NCM-2150 MF/HF controller

    1) Replacement   : Refer to chapter 5.

    2) Setup after replacement : Refer to chapter 2.

- NFC-2150 Antenna tuner

    1) Replacement   : Refer to chapter 5.

    2) Setup after replacement : Refer to chapter 2.

- NDZ-227 Data terminal

    1) Replacement   : Refer to chapter 5.

    2) Setup after replacement : Refer to chapter 2.

*1. When replacing other units, refer to chapters 2 and 5 as described above.

*2. After replacing a unit, check flat cables, antenna cables, and power cables are properly inserted.

*3. After replacing a unit, fill out a copy of the "MF/HF JSS-2150 Maintenance Record" included at the end of this chapter and return it to the Marine Service Department.

Note2: For the spare parts of the NKG-800 Printer, refer to the following table and figures.

Ref No.	Description	Model	Note
1-1	Printer cover	94465-2002	
1-2	Paper guide board	94447-2410	
1-3	LF knob	94410-2090	
1-4	Top enclosure	94450-2001	
1-13	Indicator plate	94478-2010	
4-2	Print head unit	#SP-24090AI	Not shown in the following figure
10-1	Paper holder	84930-2074-1	
10-2	Cover	94447-2030	
10-3	Paper guide G	94447-2300	
10-4	Paper guide shaft	84930-2440	
10-5	Spring B	94447-2421	2 peaces for 1 unit
10-6	Guide ring	94447-2075	2 peaces for 1 unit
10-7	Spring A	84930-2420	2 peaces for 1 unit
10-8	Roller holder	94447-2079	
10-9	Roller	84300-1155-1	2 peaces for 1 unit
10-10	Roller step	84300-1407	2 peaces for 1 unit
10-11	Arm	94447-2340-2	2 peaces for 1 unit
10-12	Spring C	94447-2422-1	
10-13	Spring D	94447-2423-1	
10-14	Sensor harness A assembly	94447-5164A	
10-15	Cord Keeper SKB-1M	84009-1050	
10-16	Roll paper stand	94447-2230-2	
10-17	Cap	94478-2105	2 peaces for 1 unit
10-18	Lock metal	94478-1477	2 peaces for 1 unit
E-32	E-32 ring	84005-3202	4 peaces for 1 unit
S-23	Pan head tapping screw (2x14)	84001-2027	
S-31	Pan head tapping screw (3x16)	84001-3028	8 peaces for 1 unit
S-39	Stand holding screw	94478-2100	2 peaces for 1 unit
W-1	Plain washer M3	84003-3005	2 peaces for 1 unit
W-2	Plain washer M2	84003-2004	
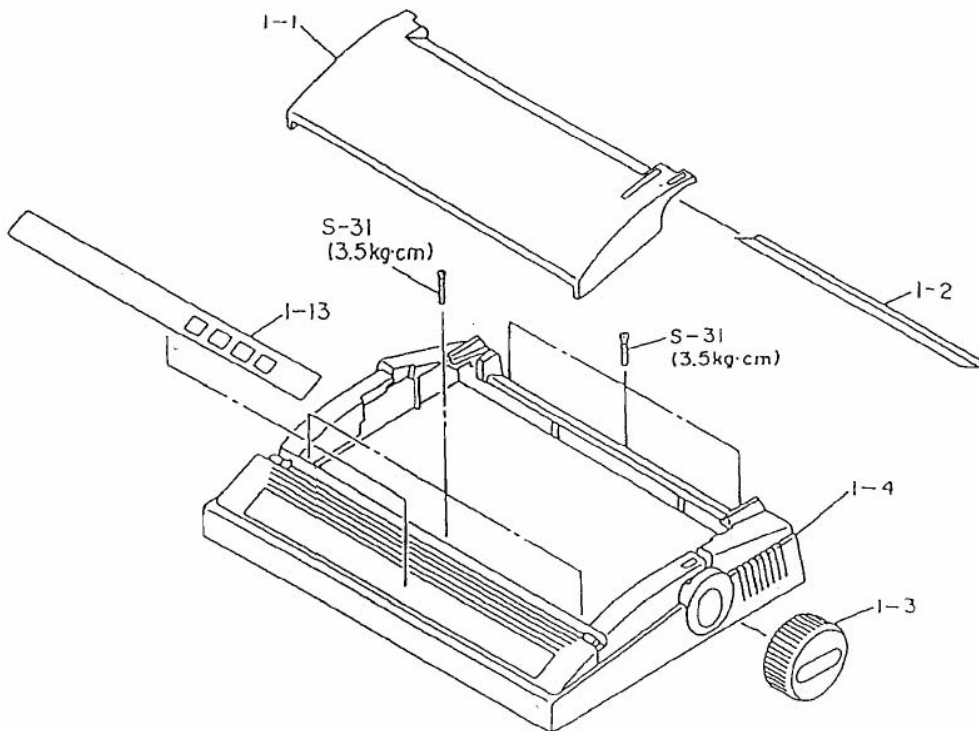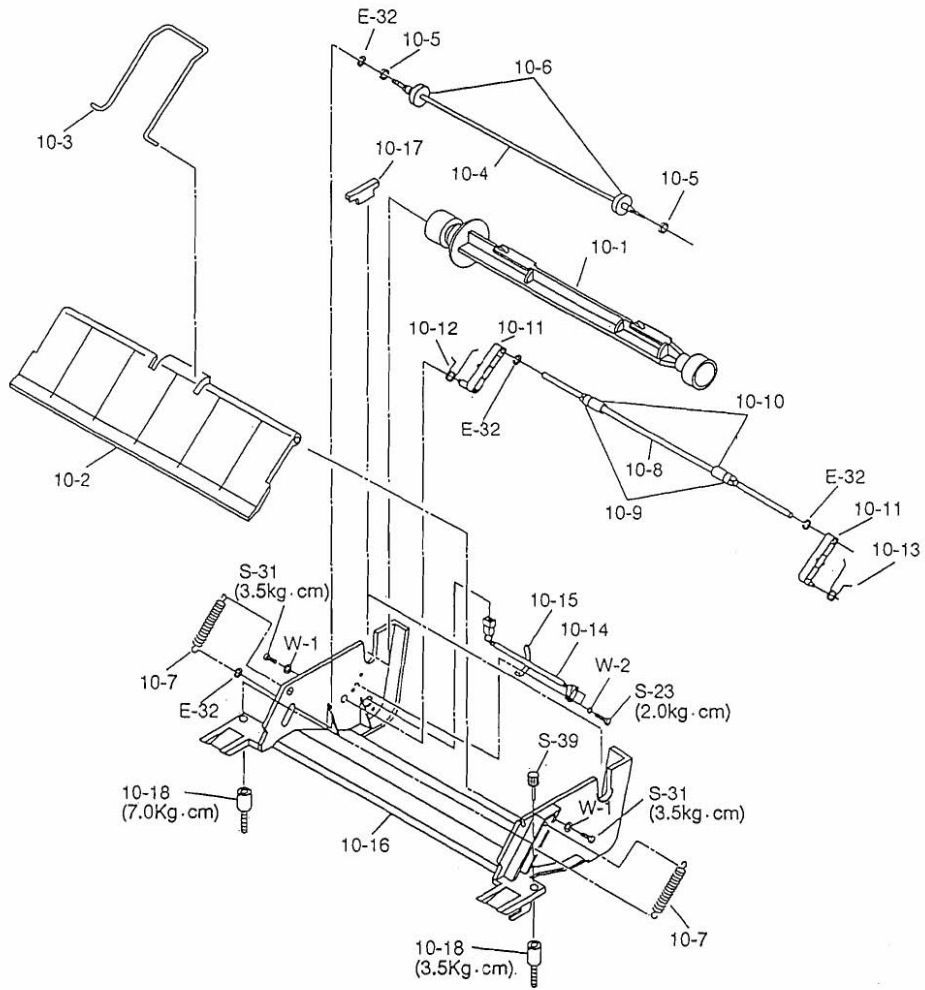
4.2.2   Stored information list

● Transceiver (NTD-2150)

Board name	Stored item	Description		Remark
PA	Operational settings	Main controller ID	Default: 0	These information are portable by IC102 on the IC socket. Note: After moving the IC102, always check settings normality, about the TX band power and TX CH power in particular, since if a checksum error is occurred, the data returns to the factory default value without alarm in this case.
		Tx power reduction (high/low)	Default: High	
		Tune power (Normal/+1/+2/+3)	Default: Normal	
	User channels	Channel number		
		Send and receive frequencies		
	Field maintenance mode settings	DC operation (single/dual)	Default: Single	
		RBK off time	Default: 180 sec	
		TX delay	Default: Off	
		ATU use	Default: On	
		Korea mode	Default: Off (inaccessible)	
		RX antenna (WKR/TX)	Default: WKR	
		AC/DC detection	Default: Invalid	
		Calibration (Ic)	Default: Adjustment value in the factory	
		Calibration (Vc)	Default: Adjustment value in the factory	
		TX band power adj.	Default: Adjustment value in the factory	
		TX CH power adj.	Default: TX band power	
	Backup information	User channels, Field maintenance mode settings		Not portable
	Production technology	Barcodes and other production technology information		Not portable
TRX	Communication mode	USB/LSB/H3E/DSC/TLX/CW	Default: USB	Not portable
	Operation channel	Channel information at startup		Not portable
	TX frequency	TX frequency at startup	Default: 2,182.0 kHz	Not portable
	RX frequency	RX frequency at startup	Default: 2,182.0 kHz	Not portable
	AGC USB/LSB	Slow/Fast/OFF	Default: Slow	Not portable
	AGC CW	Slow/Fast/OFF	Default: Fast	Not portable
	Receive ATT	0 db (OFF)/6 dB/12 dB/18 dB	Default: 0 dB (off)	Not portable
	NR	NR1/NR2/BC/OFF	Default: Off	Not portable
	SQL	0 to 100	Default: 0	Not portable
	BW	Narrow/Wide	Default: Narrow	Not portable
	Speech proc	On/off	Default: Off	Not portable
	AGC characteristics	Normal/flat	Default: Normal	Not portable
	RF THROUGH	On/off	Default: Off	Not portable
WKR MODEM	MMSI (9 digits)	Ship's individual MMSI		These information are portable by IC502 on the IC socket.
	Group ID	Ship's group MMSI		
	DMC port settings	NCH-321A/Exp DMC settings	Default: Disabled	
	GPS port settings	GPS connection settings	Default: Enabled	
	AME port settings	AME connection settings	Default: Disabled	
	RMS port settings	Output to RMS settings	Default: All output	
	BK port settings	WKR BK settings	Default: Invalid	
	DSC class	DSC class selection	Default: Class A	
	WKR frequency	WKR scan frequency	Default: All 6 frequencies	
	Automatic acknowledgement	Polling call	Default: on	
		Safety test call	Default: on	
		Position request call	Default: off	
	Non-distress RX log	Received non-distress calls (maximum of 20 messages)		
	Self diagnosis log	Self diagnosis log for transceiver (maximum of 10 records)		
	Alarm log	Log of past system alarms (maximum of 100 records)		
	JSS S/N	Serial number of the radio equipment (BS)		
	NFC S/N	Serial number of the ATU (BC)		
	NTD S/N	Serial number of the transceiver (BS)		
	NCM1 S/N	Serial number of controller 1 (BJ)		
	NCM2 S/N	Serial number of controller 2 (BJ)		
	Production technology	Barcodes and other production technology information		Not portable (FROM)

Maintenance

● Controller (NCM-2150)

Board name	Stored item	Description		Remark
CONTROL UNIT (CDJ-3775)	Scan speed	TEL/DSC/CW scan speed	Default: 3/0.3/3	Not portable
	Self diagnosis log	Self diagnosis log for controller		Not portable
	UTC/LT	System clock UTC/LT information	Default: UTC	Not portable
	LT diff	Time difference when LT set	Default: 00:00	Not portable
	Contrast	Contrast value	Default: 7	Not portable
	Dimmer (max)	Maximum brightness value	Default: 10	Not portable
	Dimmer (typ)	Standard brightness value	Default: 7	Not portable
	Dimmer (min)	Minimum brightness value	Default: 4	Not portable
	Screen saver	Screen saver	Default: On	Not portable
	Scr saver time	Screen saver count value	Default: 60	Not portable
	Speaker	Speaker output setting	Default: On	Not portable
	Click	Click sound	Default: On	Not portable
	Notification level	Alarm volume	Default: 7	Not portable
	Sidetone	CW side tone	Default: On	Not portable
	User key	USER key assignments		Not portable
	Tx meter	Meter selection during transmission	Default: PWR	Not portable
	CH group name	User channel group name		Transferable by data transfer
	Type	User channel group attribute	Default: TEL	Transferable by data transfer
	Rx FRQ	RX frequency of the user channel table		Transferable by data transfer
	Tx FRQ	TX frequency of the user channel table		Transferable by data transfer
	Mode	User channel communication mode	Default: TEL	Transferable by data transfer
	Connection	Printer and other connection settings	Default: None	Not portable
	Data out	Printer output mode (auto/manual)		Not portable
	Baudrate	Printer and other serial communication speeds		Not portable
	Flow control	Flow control at printer output		Not portable
	Print direction	Specify print direction		Not portable
	Controller ID	Controller address	Default: 1	Not portable
	Maintenance mode off timer	Allowable idle time in field maintenance mode	Default: 60	Not portable
	MIC gain	Handset microphone gain	Default: 23	Not portable
	Tone power	Tone Tx power level	Default: High	Not portable
	RCV msg alarm	Audible alarm for routine and safety calls	Default: ON	Not portable
	Production technology	Barcodes and other production technology information		Not portable

● Antenna tuner (NFC-2150)

Board name	Stored item	Description	Remark
MATCHING UNIT (CFG-2150)	TUNE information	Tuning circuit setting information for each frequency	Not portable
	Field setting	Calibration (Ia)	Not portable

● Data terminal (NDZ-227)

Board name	Stored item	Description		Remark
PROCESS CIRCUIT (CDC-1346B)	Communication file	Prepared telex communication files		Transferable to a USB memory
	Call logging history	Communication logs		Transferable to a USB memory
	Station list	Frequency list for stations		Transferable to a USB memory
	Station database	Frequency list database		Transferable to a USB memory
	Destination list	Autotelex address list		Not portable
	Sunspot number	Sunspot numbers for MUF calculation		Not portable
	LCD/LED dimmer	LCD/LED brightness value	Default: 13	Not portable
	LCD/LED dimmer button setting	Maximum/Typical/Minimum dimmer settings		Not portable
	Screensaver setting	・Function ON/OFF ・Starting time	Default: ON Default: 3	Not portable
	Display color pattern	Basic coloring pattern	Default: Ocean day	Not portable
	User defined color setting	User defined coloring pattern		Not portable
	Scan speed	Scan speed	Default: 3	Not portable
	Time duration for AUTO (NBDP setup)	Interval time to retry	Default: 10	Not portable

4.3   Upgrading the software

To upgrade the transceiver (CAH-2415 PA UNIT, CMN-2250 TRX UNIT, and CMJ-2250 WKR MODEM) and controller (NCM-2150), connect a notebook PC to either of them appropriately. This section explains how to remotely upgrade via the controller.

Note 1: Refer to the next section when directly connecting a notebook PC to the transceiver.

Note 2: To upgrade the software of the antenna tuner (NFC-2150), the EPROM IC must be replaced.
To replace the EPROM IC, prepare the replacement kit by the stock code notified previously.

Note 3: To upgrade the controllers for a system where 2 controllers are connected, connect the notebook PC to each controller one by one.

Note 4: If the baudrate is 38.4kbps, the approximate time required to upgrade each unit is as follows.

> ➢   CAH-2415 PA UNIT   ....   3 minutes
> ➢   CMN-2250 TRX UNIT   ....   5 minutes
> ➢   CMJ-2250 WKR MODEM   .... 14 minutes
> ➢   NCM-2150 MF/HF CONTROLLER   ....   7 minutes

Note 5: Regarding the upgrading for the data terminal, see the description of "Data terminal maintenance mode".

● Preparing to upgrade

Prepare the following items before doing an upgrade.

- Notebook PC   ....OS: Windows Me/ NT/ 2000/ XP/ Vista/ 7, at least 10 MB of hard disk space, COM (RS-232C) port available

- Upgrade cable   ....RS-232C straight cable (Dsub 9 female - Dsub 9 male) or 7ZCJD0315 (handset connector - Dsub 9 female) as necessary

- Upgrade tool (PC application)   ....JSS-2150 FLASH Writer x.x.exe
  * x.x represents the version number

- Upgradeable software   ....2150_PA_xxxx.P1M   For CAH-2415
  2150_TRX_xxxx.T1M   For CMN-2250
  2150_MODEM_xxxx.M1M   For CMJ-2250
  2150_CONT_xxxx.C1M   For NCM-2150
  * Save in a folder on the notebook PC.

4.3.1	Normal upgrade

■ Upgrade procedure ■

(1) Connect a notebook PC to the NCM-2150 controller as follows and then turn on the notebook PC.
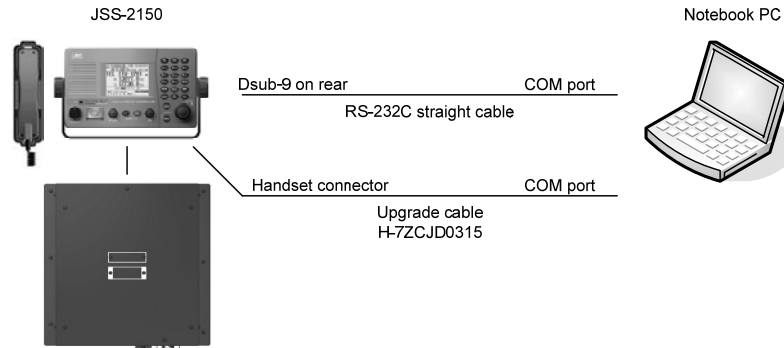
(2) Start the JSS-2150 in maintenance mode.

(3) On the F3. Software upgrade screen on the maintenance menu, select the baudrate, connector, and target unit as follows.

```
F3)Software upgrade

1.Baudrate      :38.4kbps
2.Connector     :Front
3.Target unit   :Controller
4.Execute

0.Back
```

● Baudrate

Select the communication speed with the connected notebook computer from 38.4 k, 57.6 k, or 115.2 k.

● Connector

Select the connector for connecting the notebook PC.

Controller handset: Front

Controller rear (Dsub 9-pin): Rear

● Target unit

Select the equipment to be upgraded.

Controller: Controller

Unit inside the transceiver: Transceiver

(4) Press ENT on Execute and the "OK to upgrade?" popup screen appears. Select OK and press ENT to display the following screen that indicates the equipment is waiting for a software upgrade from the notebook PC.

   * The following is an example when upgrading the PA. The "Current status..." changes depending on the status of progress, in the following order: Ready (preparation finished), Loading (transferring), and Succeeded (upgrade finished).

```
- Software upgrade mode -


Target unit      :Transceiver
Baudrate         :38.4kbps
Connector        :Front


Current status...Ready
```

Maintenance

(5) Launch the PC application software (JSS-2150 FLASH Writer x.x.exe) on the notebook PC.
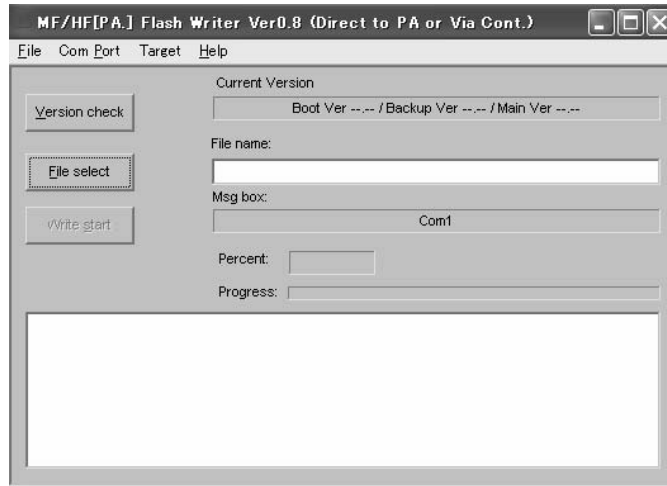
(6) Select the RS-232C Com port on the notebook PC and select the same communication speed set earlier for the baudrate.
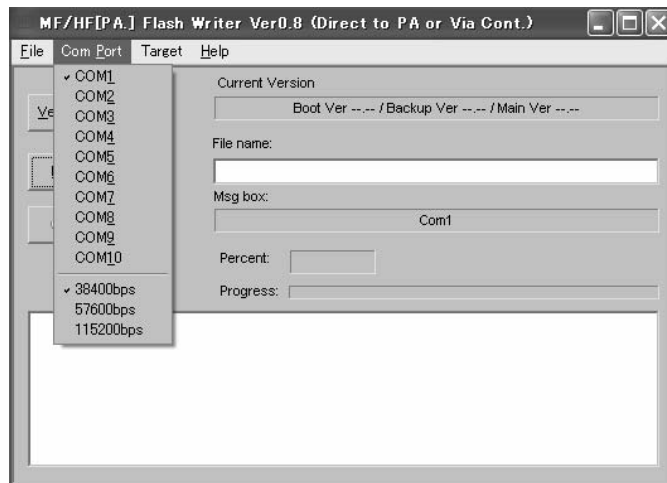
(7) Select the target unit to upgrade by the Target pull-down menu. Note that if a controller program error is occurred and the controller upgrading is performed on the boot program displayed as shown in the following right, always select CNT (ID=1) regardless of the address of that controller.

* PA is selected for this example.
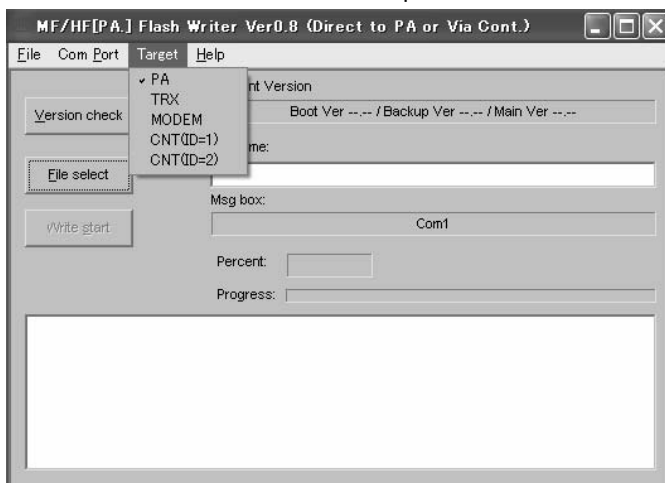
【Startup screen of the boot program】

(8) Press the file select button and select the software to upgrade.
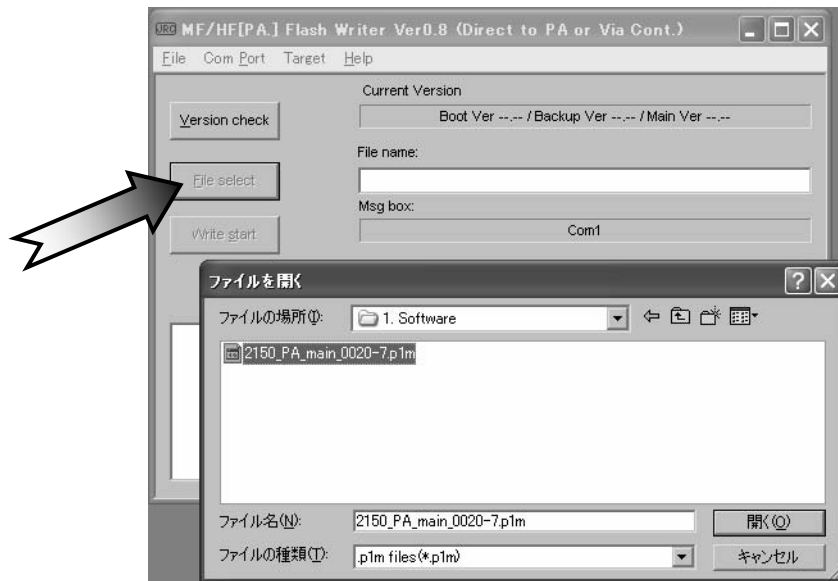
* After selecting a file, the file name appears as follows in the file name field.
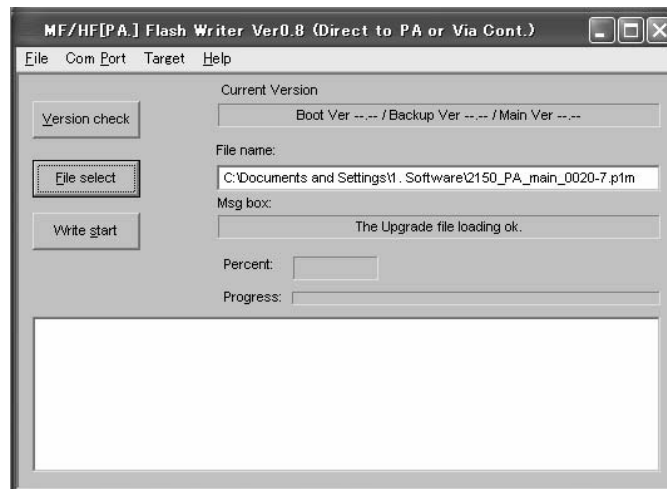
Maintenance

(9)   Press the Write start button to start the upgrade.
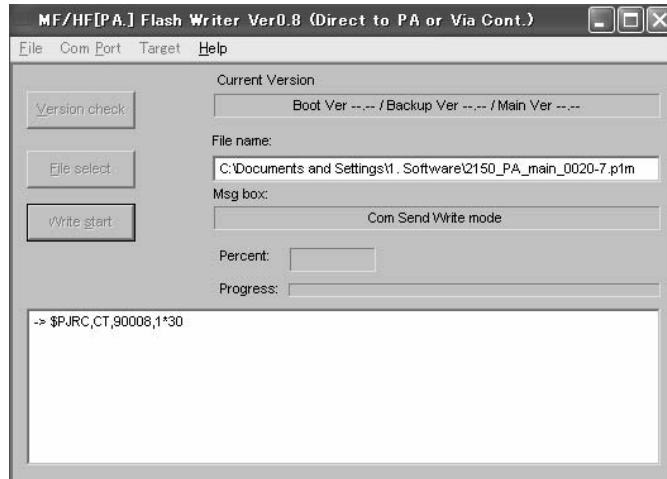
   * If there is a problem with the JSS-2150 reception settings discussed previously or the
      cable connection at this time, the following error message appears. Correct the problem
      and press Write start again.
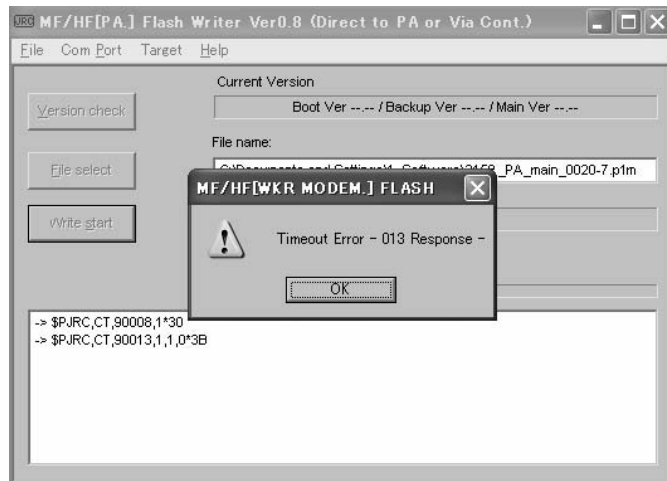
(10)   After the upgrade starts, the percent and progress of the transfer status is displayed as follows.
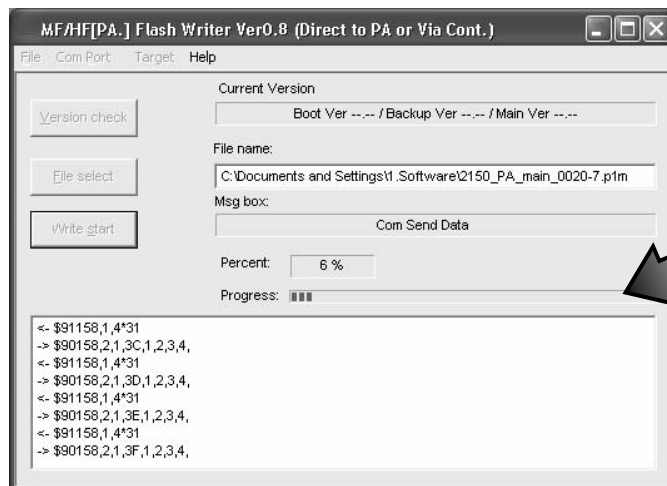
(11) When Percent reaches 100%, "Writing processing Complete!" appears in Msg box and the upgrade is finished.

Note1: In the case of the system including the data terminal, the controller shows "NB) Reconnect the DTE cable and press ENT." here. Then reconnect the data terminal cable and press ENT key of the controller to restart the system.
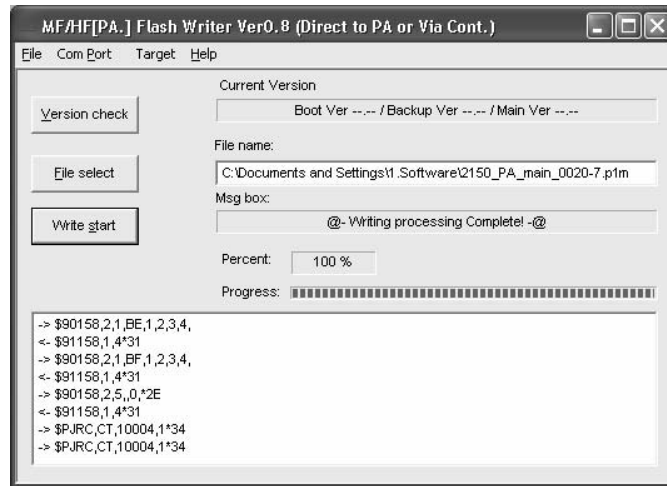
(12) Clicking the X in the window closes the PC application software.

Note 1: The "Restart the JSS-2150 radio?" dialog box is displayed. Normally, click "No" here.

Note 2: To continue upgrading other units, repeat the procedure above.

4.3.2 Upgrading at the transceiver

The following explains how to upgrade the units in the transceiver by connecting the notebook PC directly to the transceiver.

Caution: Controllers cannot be upgraded with this procedure.

■Upgrade procedure■

(1) Open the cover of the transceiver.

(2) Connect an RS-232C straight cable to the J105 connector (Dsub-9) on the CAH-2415 PA UNIT to configure as shown below.

JSS-2150

Notebook PC

PA UNIT(CAH-2415)
Dsub-9 on board   COM port
RS-232C straight cable
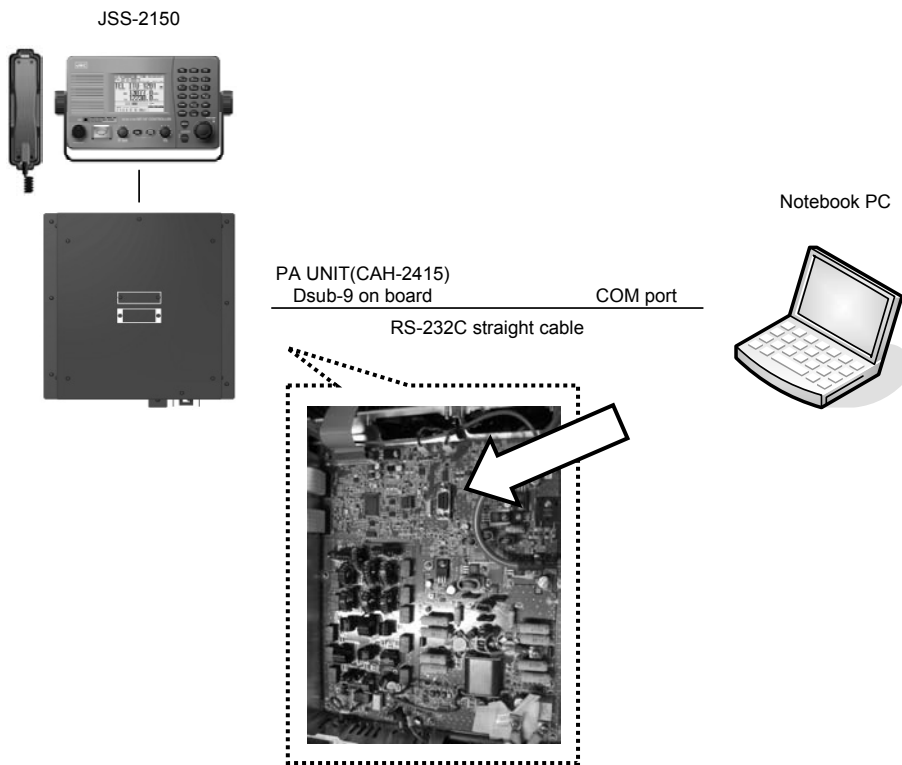
(3) Start the JSS-2150 in user or maintenance mode.

```
ID 431001234      TIME 23:59(UTC)
Pos 89°59.0123'N
   179°59.6789'E@23:59      (EXT)

TEL ITU-1201          DUP

  RX 13077.0 kHz

  TX 12230.0 kHz

    SIG ████|||||||   ◁〣

WKR scan bands:       ATT12 AGC-F BC
2 4 6 8 12 16 (MHz)
```

(4) Turn on the notebook PC and launch the upgrade tool (JSS-2150 FLASH Writer x.x.exe) discussed previously.
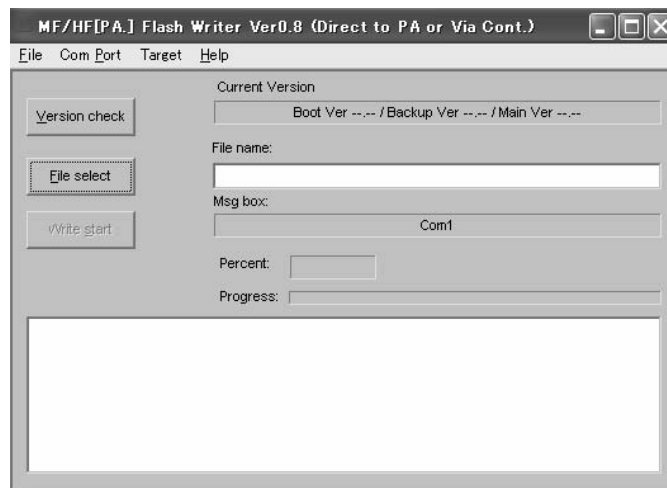
(5) Select the RS-232C Com port on the notebook PC and select "38400 bps" as the fixed communication speed.   (In this case, do not select "57600 bps" or "115200 bps".)
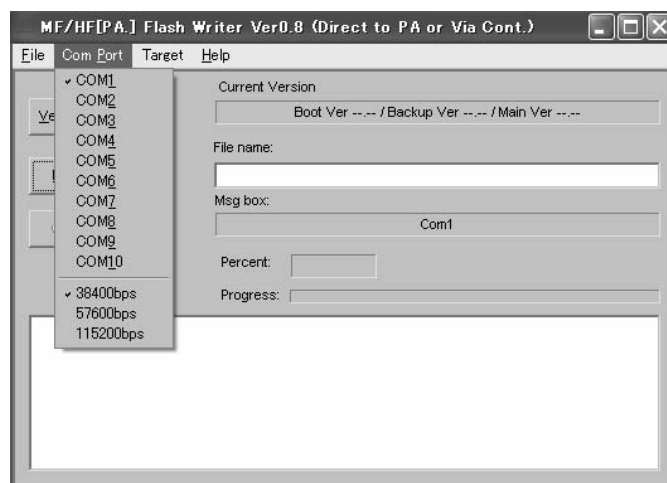
(6) Select the target unit (PA, TRX, or MODEM) to upgrade by the Target pull-down menu.
   * PA is selected for this example.
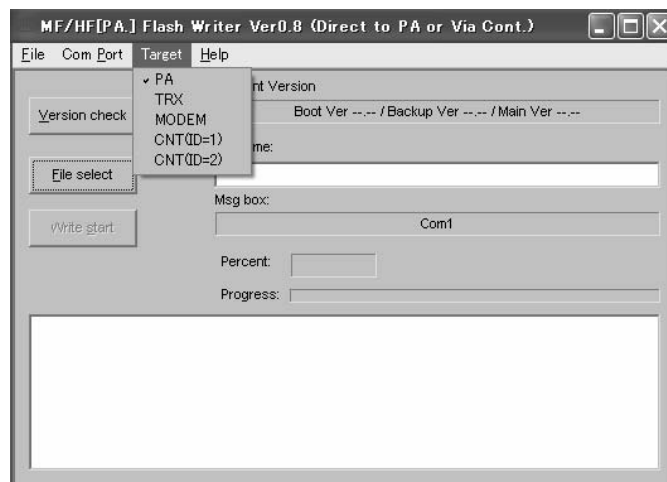
(7) Press the file select button and select the software to upgrade.
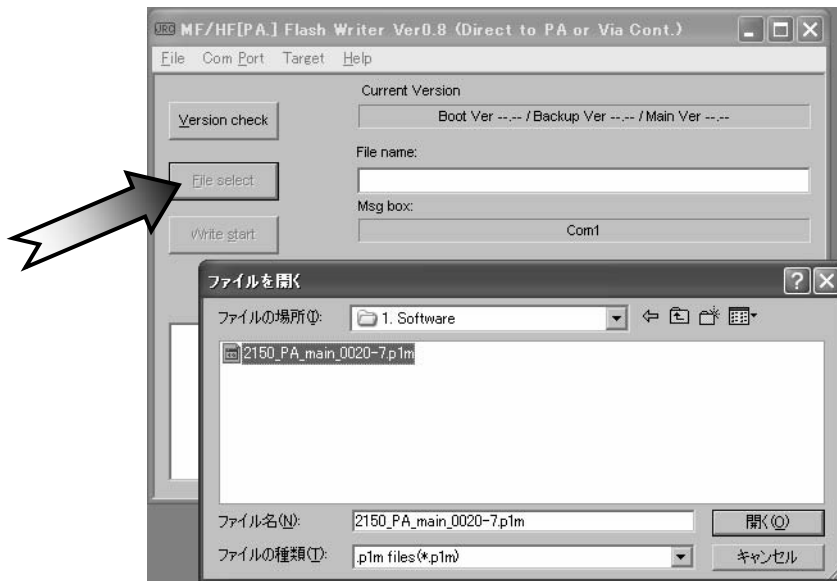
* After selecting a file, the file name appears as follows in the file name field.
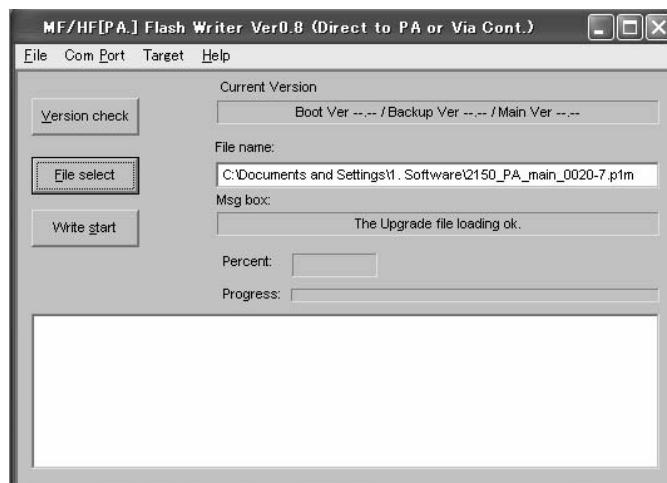
(8) Press the Write start button to start the upgrade.
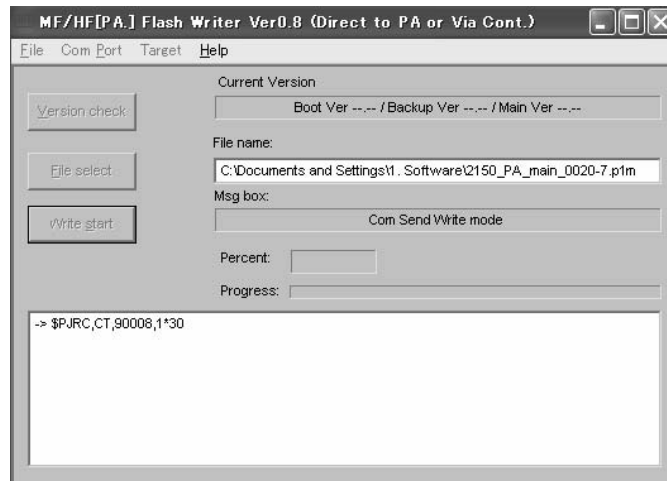
*1. Once the upgrade starts, the display on the controller's LCD is as follows.

```
        - Software upgrade mode -


   Target unit      :PA
   Baudrate         :-----kbps
   Connector        :-----
```
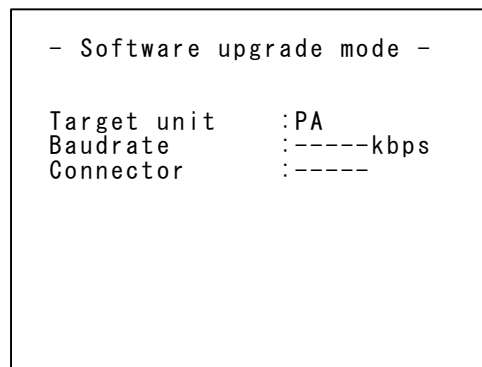
*2. If there is a problem with the JSS-2150 reception settings or the cable connection at this
    time, the following error message appears. Correct the problem and press Write start
    again.
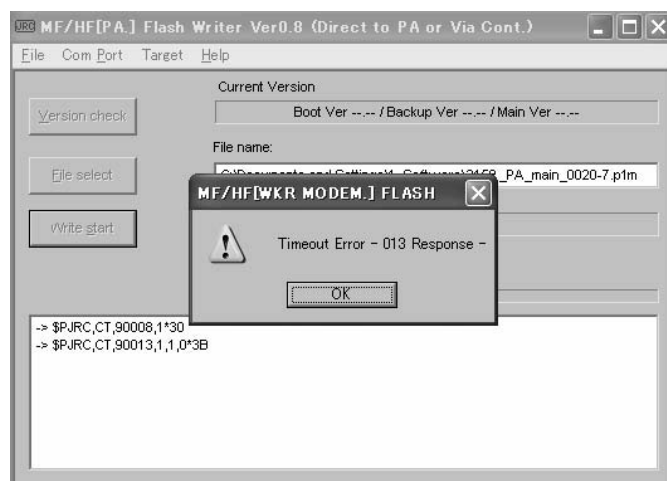
Maintenance

(10) After the upgrade starts, the percent and progress of the transfer status is displayed as follows.
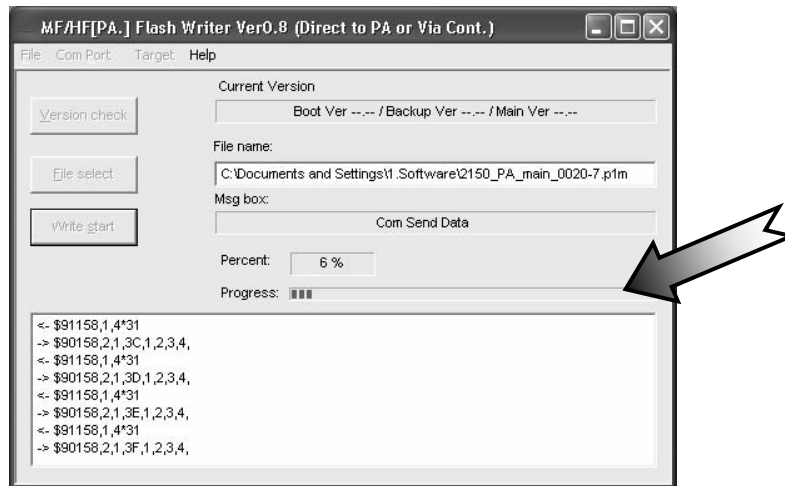
(11) When Percent reaches 100%, "Writing processing Complete!" appears in Msg box and the upgrade is finished.
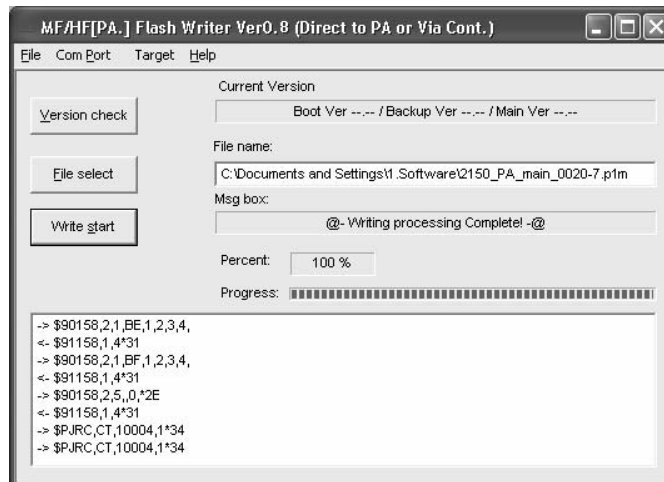
(12) Clicking the X in the window closes the PC application software.

Note 1: The "Restart the JSS-2150 radio?" dialog box is displayed. Normally, click "Yes" here.

Note 2: To continue upgrading other units, repeat the procedure above.

4.4　Data terminal maintenance mode

4.4.1　Turning on/off the maintenance mode

Turn on the maintenance mode of the data terminal by following the procedure below.

1. Turn on the JSS-2150 in field maintenance mode.

2. Through the controller hierarchical menus, select F3. Software upgrade to stop watching the DTE lost alarm.

```
F3)Software upgrade

1.Baudrate     :38.4kbps
2.Connector    :Front
3.Target unit :Controller
4.Execute

0.Back
NB) DTE cable can be removed
    without DTE lost alarm.
```

3. Restart the data terminal by pressing the Ctrl, Alt, and Del keys simultaneously. Then during displaying the "MFHF" logo and self-diagnosis as shown at right, press N, D, and Z keys simultaneously.

4. The data terminal becomes the maintenance mode showing the following items.

1.	Initial setting	: Serial number confirmation
2.	Maintenance check	: Self diagnosis such as internal/external circuits
3.	Data initialize	: Initialization to the factory default settings
4.	Software upgrade	: Upgrading procedures via USB memory or SIO

5. Operate the data terminal in the maintenance mode.

6. To finish the maintenance mode, restart the data terminal by pressing the Ctrl, Alt, and Del keys simultaneously, or power off and on at the breaker of the radio equipment.

Note.　When connecting the USB memory during the maintenance mode, the **USB** icon is shown at the top of the screen. Additionally, to remove the USB memory, always unmount it by pressing Shift and R keys simultaneously, and check the **USB** erased before removing it.

4.4.2   Operation

4.4.2.1 Initial setting

Confirm the serial number of the data terminal on the "1.Serial No." menu, and register the number to the JSS-2150 via the F1.1.2 Serial number menu of the NCM-2150 MF/HF controller.

Note.   All of these menus ("1.Serial No.", "2.Model barcode" and "3.Board barcode") are inaccessible.

4.4.2.2 Maintenance check

Practice the self diagnosis or the signal output using the following menu.

1.   Basic

2.   Screen

3.   Peripheral connection

4.   USB memory

The contents are as follows.

Menu	Target	Description
1. Basic	ROM	Checking the flash ROM
	RAM	Checking the RAM
	UART 0	Checking the Serial#1 port (control)
	UART 1	Checking the keyboard control CPU
	UART 2	Checking the Serial#2 port (upgrading)
	Printer	Outputting the test message***
	LCD/LED brightness	Check the dimmer control (0/4/13/15)*
	Buzzer	Check the buzzer sound*
	Dimmer button	Check the Dimmer button*
2. Screen	Red	Check the dots of the red color**
	Green	Check the dots of the green color**
	Blue	Check the dots of the blue color**
	White	Check the dots of the white color**
	Black	Check the dots of the black color**
	Yellow	Check the dots of the yellow color**
	Magenta	Check the dots of the magenta color**
	Cyan	Check the dots of the cyan color**
	Test	Check the dots while changing tones**
	JRC	Check the power-up screen**
3. Peripheral connection/ Port selection	Printer	Outputting the test message***
	Serial1	Outputting the test message***
	Serial2	Outputting the test message***
	Buzzer	Check the sound of 0.5s ON/OFF cycle for 5s
4. USB memory	USB	Check creating, loading and deleting a file

*   After checking the target item, select OK or NG to register the result.

**   To finish checking, press ESC or ENT key manually.

*** TEST MESSAGE/ THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG. 1234567890/ END OF MESSAGE
    Serial1 (Cross) & Serial2 (Straight) protocol: 38.4kbps/ 8bits/ Stop 1bit/ Non-parity

4.4.2.3 Data initialize

Initialize the following data saved in the data terminal to the factory default setting.

1.   Config data initialize   : Initializes the all data saved in the Config menu.

2.   All data initialize   : Initializes all data in the data terminal.

4.4.2.4 Software upgrade

Upgrade the software of the data terminal through the condition given by the following menu.

1. Target : Selects the object program from Main or keyboard*.
2. Input port : Selects the input port from USB memory or Serial**.
3. Maintenance No. : Indicates the current software version.
4. File selection : Selects the target file from the USB memory***.

* To upgrade the keyboard program, always select Serial as the input port.

** Connect the RS-232C signal cable to the SERIAL#2, that protocol is as follows

- Communication speed : 38.4 kbps
- Data length : 8 bits
- Stop bit(s) : 1 bit
- Parity : None

*** This menu is available only when the USB memory is selected as the input port. And up to five files in the USB memory are listed to select one file. Note that the folder name and the filename should be followed below.

¥NDZ-227J¥NDZ227J_xxxx.bin （xxxx: 4 digits of the version number)

1) **Input port : USB memory**

1. After setting as described above, press * (asterisk) key to display the popup screen as shown at right.

> *Software Upgrade*
> Are you sure?
> [OK]   [Cancel]
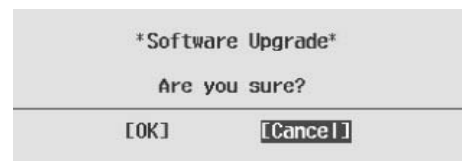
2. Select OK and press Enter key to start the upgrade*.

    * It takes about 2 minutes.
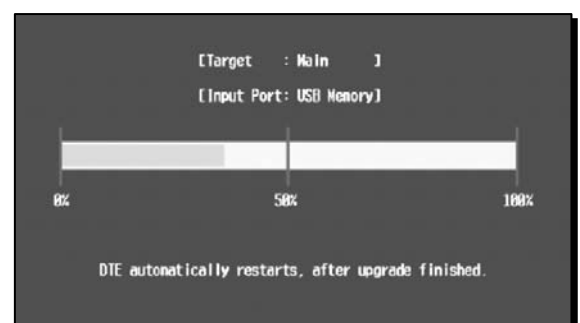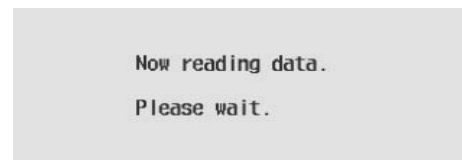
> Now reading data.
> Please wait.

↓

> [Target   : Main   ]
> [Input Port: USB Memory]
>
> 0%   50%   100%
>
> DTE automatically restarts, after upgrade finished.

3. After completing the software upgrade, starts the countdown as shown at right and the data terminal restarts after 5s automatically.

> Countdown until restart.
> 2

2) Input port : Serial

1. After setting as described above, press *
(asterisk) key to display the popup screen
as shown at right.

```
*Software Upgrade*

Are you sure?

[OK]          [Cancel]
```
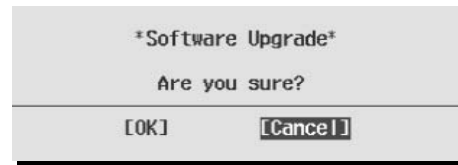
2. Select OK and press Enter key to set the
data terminal to the receiving condition.

```
[Target    : Main     ]
[Input Port: Serial   ]




Upgrade preparation complete
Please send the upgrade command via the serial port

- To return to menu, press 'ESC' key -
```
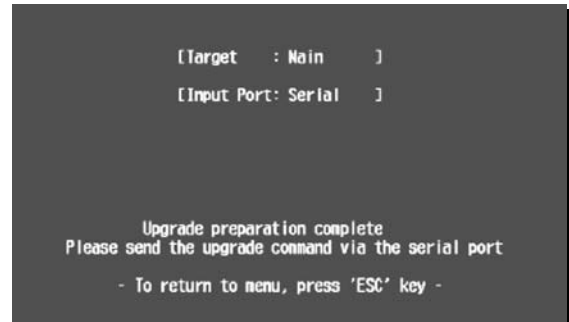
3. Start sending the object file from the external
computer with the upgrade software
(NDZ-227 FLASH WRITER) as shown at
right. During receiving the file, displays the
message of "Now upgrading the data
terminal" blinking as shown at right.
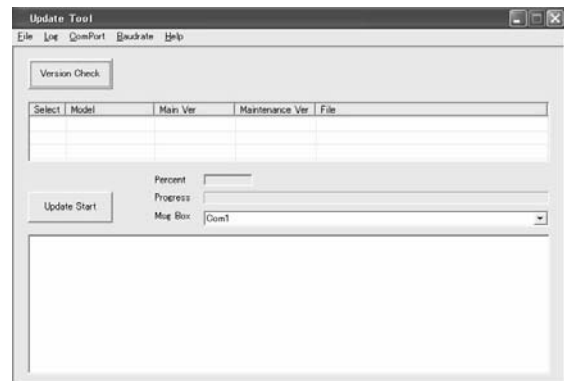

```
Now upgrading the data terminal

[Target    : Main     ]
[Input Port: Serial   ]




DTE automatically restarts, after upgrade finished.
```

4. After completing the software upgrade,
starts the countdown as shown at right and
the data terminal restarts after 5s
automatically.

```
Countdown until restart.

2
```
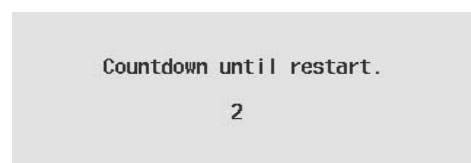
MF/HF JSS-2150 変更記録

MF/HF Maintenance Record

ソフトウェアバージョンの変更または各機器交換後、必要事項を記入して速やかに返却願います。

Fill in this form and return it promptly after changing software versions or replacing an apparatus.

MARINE SERVICE DEPARTMENT (PRODUCT SUPPORT)

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日本無線株式会社

マリンサービス部

FAX　03 3779 1420

船名 Name of Vessel			
識別番号 MMSI No.			
総合番号 JSS-2150 System serial No.		BS	
機器名 Unit name	項目 Item	交換前 Old	交換後 New
MF/HF トランシーバ MF/HF Transceiver NTD-2150	機器製造番号 Unit serial No.	BS	BS
	ソフトウェアメンテナンス番号 Software maintenance number	Ver.	Ver.
MF/HF コントローラ MF/HF Controller NCM-2150	機器製造番号 Unit serial No.	BJ	BJ
		BJ	BJ
	ソフトウェアメンテナンス番号 Software maintenance number	Ver.	Ver.
データターミナル Data terminal NDZ-227	機器製造番号 Unit serial No.	BJ	BJ
		BJ	BJ
	ソフトウェアメンテナンス番号 Software maintenance number	Ver.	Ver.
アンテナチューナ Antenna tuner NFC-2150	機器製造番号 Unit serial No.	BC	BC
	ソフトウェアメンテナンス番号 Software maintenance number	Ver.	Ver.
工事日 Service Date			
港 Service Port			
オーダ Service Order			
代理店 Service Agent			
作業者 Service Engineer			
作業後に動作(送受信など)が正常であることを確認 The normal operation check after work		YES　　　　　　　NO	
装置は装備モードから通常モードに戻しましたか？ Did you return to normal mode from maintenance mode?		YES　　　　　　　NO	
備考 Remarks			

Maintenance

5. APPENDIX

5.1 Block diagram

5.1.1 NTD-2150 MF/HF TRANSCEIVER

5.1.2   CAH-2415 PA UNIT

5.1.3   CMN-2250 TRX UNIT
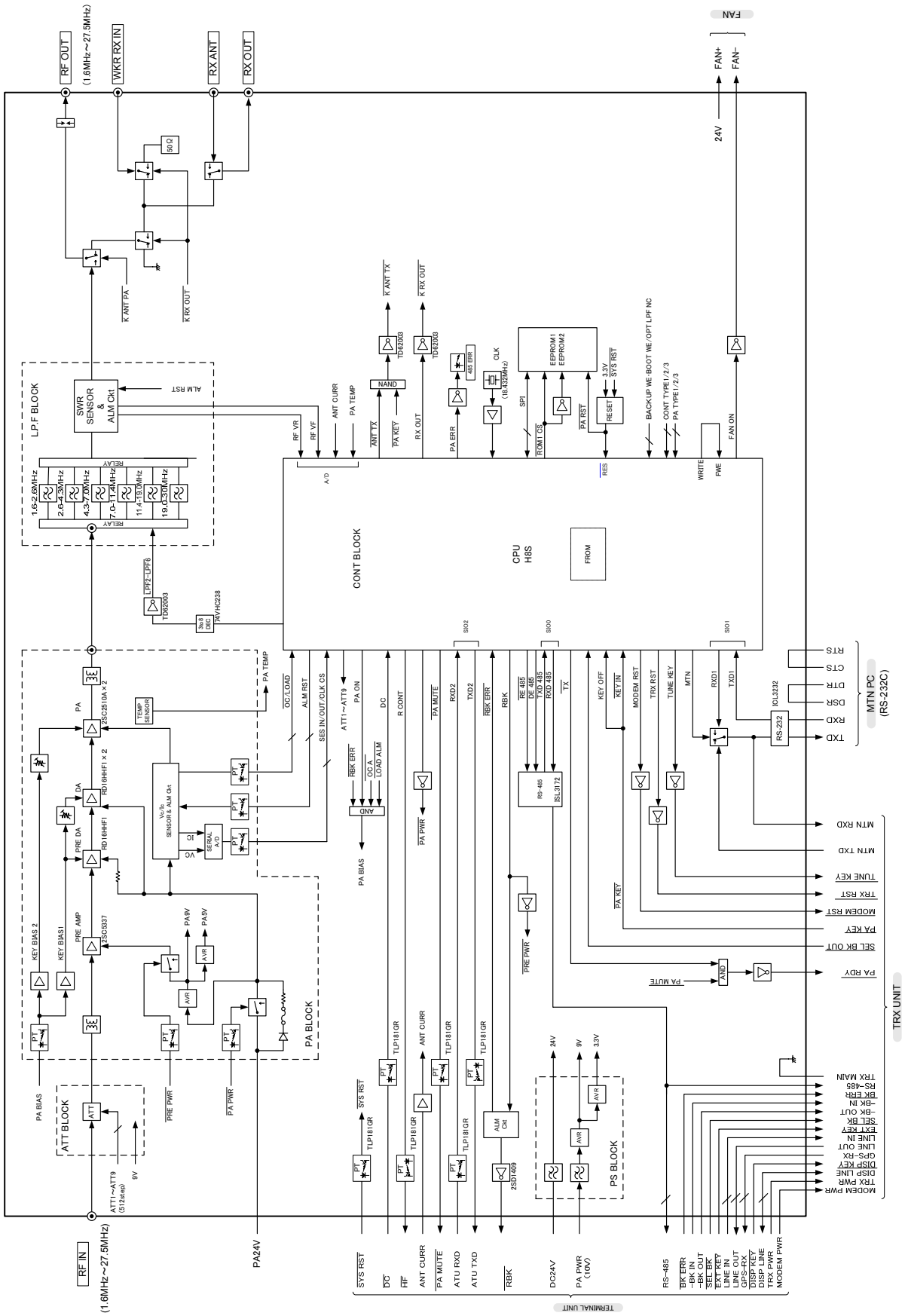
5.1.4 CMJ-2250 WKR MODEM UNIT
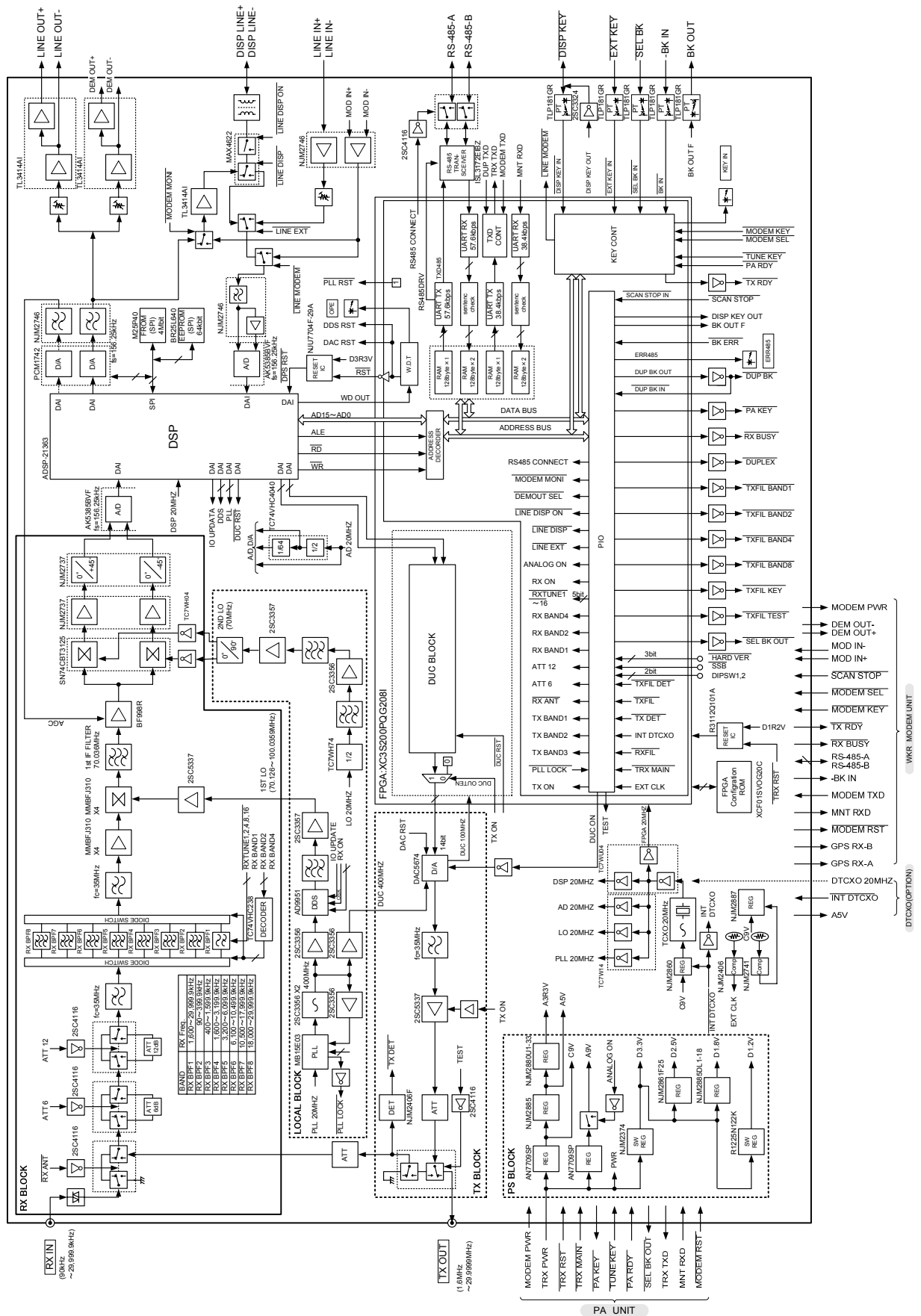
5.1.5   NCM-2150 MF/HF CONTROLLER
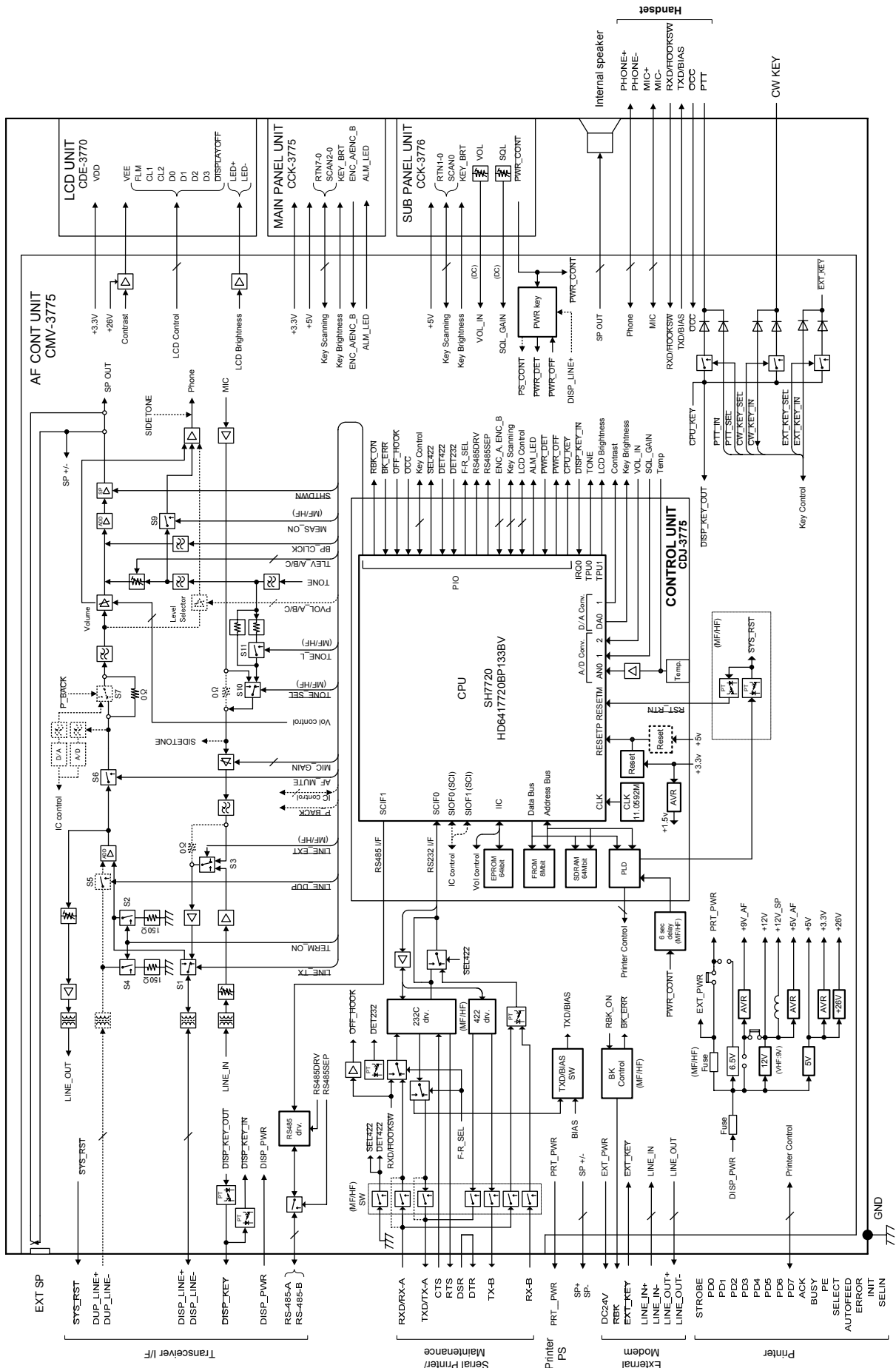
5.1.6   NDZ-227 DATA TERMINAL
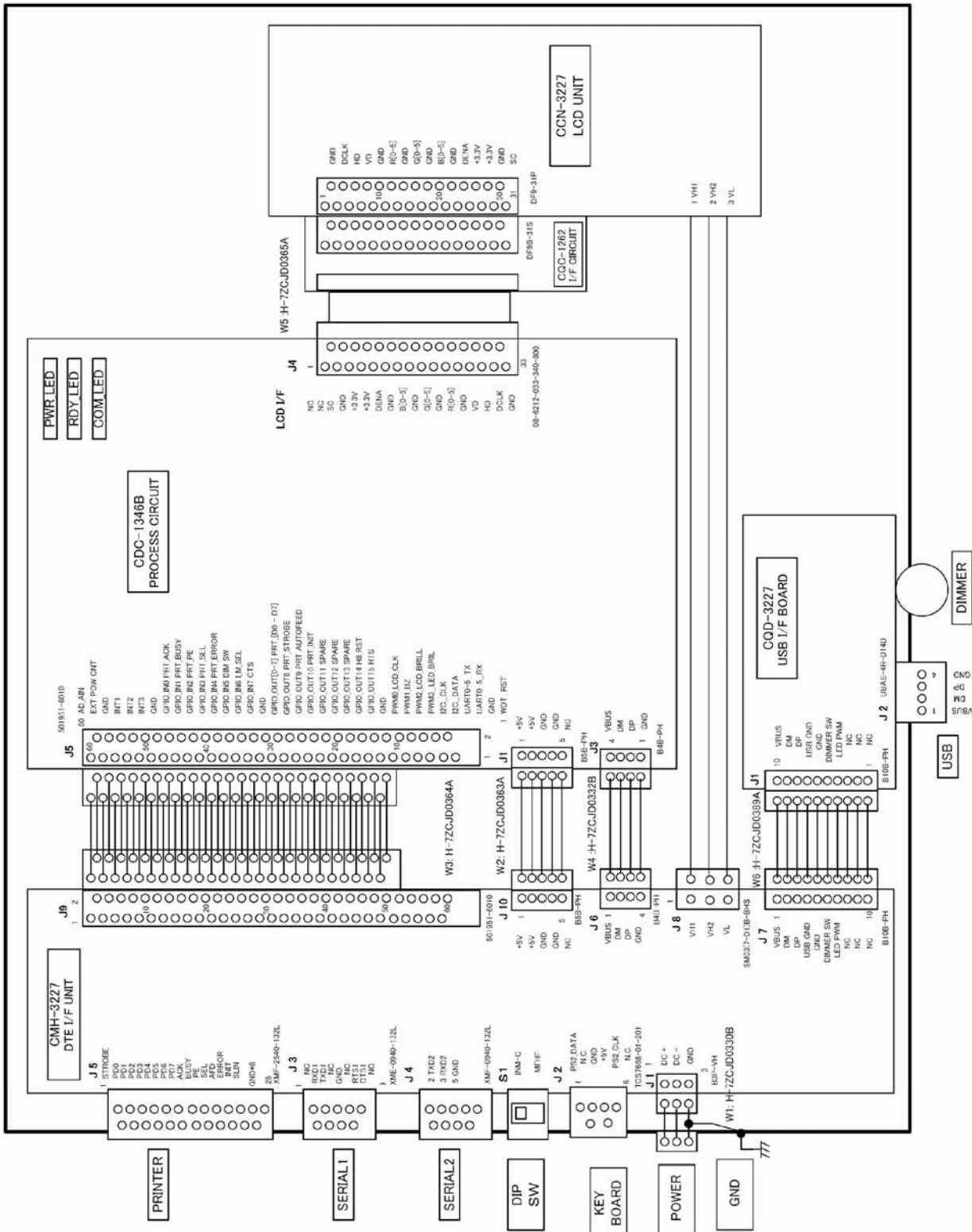
5.1.7   NFC-2150 ANTENNA TUNER (CFG-2150 MATCHING UNIT)
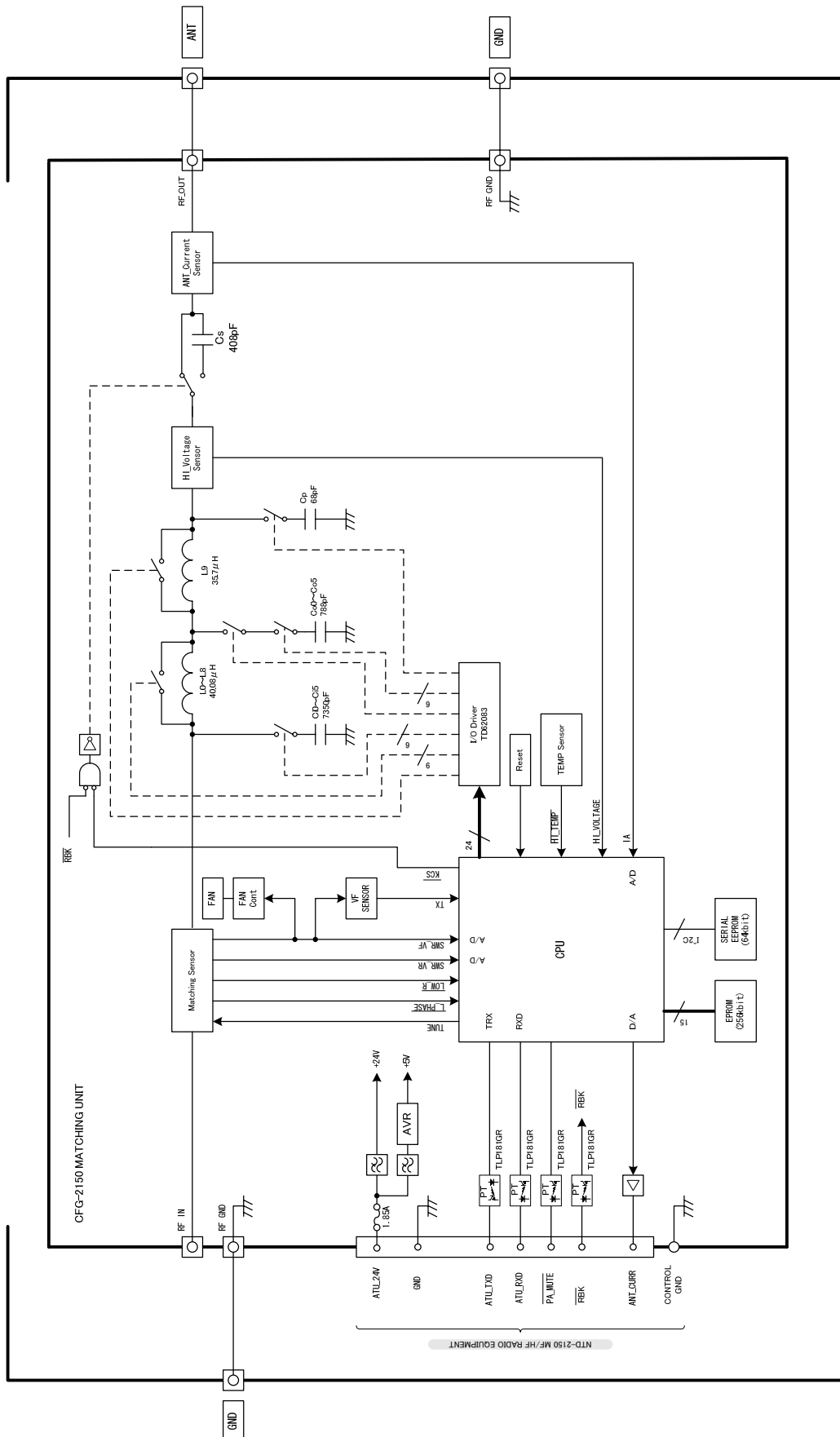
5.2 Examples of inspection data and PA efficiency

周波数 Frequency (kHz)	電波型式 Emission	定格出力試験 3.1.1.1 Rated output test									感度 3.1.2.1 Sensitivity (dBμV) emf
		電力低減 Power reduction	PA電圧 PA voltage Vc(V)	PA電流 PA current Ic(A)	空中線電流 Antenna current Ia(A)	出力 Output power (W)	効率 Efficiency (%)	抑圧搬送波電力 Carrier suppression (dB)	スプリアス領域における不要発射 Spurious radiation (dB) 第2次高調波 2nd harmonic	第3次高調波 3rd harmonic	
1650.0	J3E	H	23.2	13.0	3.2	102	33.8	————	————	————	1.4
2182.0		H	23.3	12.1	3.1	96	34.1	-70 or less	-52.5	-63.6	1.2
		L	23.5	7.0	2.0	40	24.3	————	————	————	————
2187.5	F1B	H	23.2	12.0	3.1	96	34.5	————	————	————	-5.4
3700.0	A1A	H	23.3	11.0	3.1	96	37.5	————	————	————	-2.0
4100.0	J3E	H	23.2	14.4	————	148	44.3	-70 or less	-70 or less	-70 or less	1.8
		L	23.4	8.5		57	28.7	————	————	————	————
6200.0		H	23.1	14.5	————	145	43.3	————	-70 or less	-70 or less	1.7
8200.0		H	23.2	14.1	————	146	44.6	————	-70 or less	-70 or less	1.1
8414.5	F1B	H	————					————	————	————	-10.9
12300.0	J3E	H	23.1	14.1	————	151	46.4	————	-70 or less	-67.4	1.4
16500.0		H	23.0	15.5	————	147	41.2	————	-69.3	-65.5	0.6
16804.5	F1B	H	————					————	————	————	-6.6
18700.0	J3E	H	23.0	16.7	————	147	38.3	————	-70 or less	-70 or less	2.8
22100.0		H	23.0	15.5	————	153	42.9	————	-70 or less	-70 or less	2.5
25100.0		H	23.0	17.4	————	145	36.2	————	-70 or less	-70 or less	2.6

項目 Item	規格 Specification	周波数 Frequency	定格出力 Rated output power	擬似空中線 Dummy antenna	出力算出方法 Calculation
定格出力 Rated output power	-50%, +20%	1600-3999.9kHz	100/75W	250pF+10Ω	Ia x Ia x 10
		4000.0-27500.0kHz	150/100/75W	50Ω	電力計 Power meter

抑圧搬送波電力 Carrier suppression	-40dB以下 or less			
スプリアス領域における不要発射 Spurious radiation	-43dB以下 or less	項目 Item		規格 Specification
		感度 3.1.2.1 Sensitivity	J3E/F1B: SINAD=20dB A1A: (S+N)/N=20dB	J3E/A1A: 8dBμV以下 or less F1B: 0dBμV以下 or less

項目 Item	規格 Specification		結果 Result	
占有周波数帯域幅 3.1.1.2 Occupied bandwidth	A1A/F1B: 0.5kHz以下 or less 測定周波数 Measured at 8414.5kHz, Mode: F1B J3E: 3.0kHz以下 or less 測定周波数 Measured at 8291.0kHz, Mode: J3E	A1A/F1B	0.32	kHz
		J3E	2.46	kHz
送信周波数偏差 3.1.1.3 Frequency tolerance	Within ±10Hz以内 測定周波数 Measured at 25100.0kHz, Mode: A1A その他の周波数における偏差はこの値以下である。 It is this data or less at the other frequencies.		0	Hz
総合周波数特性 3.1.1.4 Frequency response	350〜2700Hz Within 6dB以内 測定周波数 Measured at 8291.0kHz, Mode: J3E		1.0	dB
帯域外領域における スプリアス発射 3.1.1.5 Intermodulation	1.5kHz〜4.5kHz: 31dB以上 or more 4.5kHz〜7.5kHz: 38dB以上 or more 7.5kHz〜: 43dB以上 or more (REL. to below PEP) 測定周波数 Measured at 4100.0kHz, Mode: J3E 変調周波数 MOD. Frequencies 700/2500Hz	1.5kHz〜4.5kHz	43.6	dB
		4.5kHz〜7.5kHz	52.9	dB
		7.5kHz〜	70.8	dB
総合歪 3.1.1.6 Overall distortion	20dB以上 or more 測定周波数 Measured at 4100.0kHz, Mode: J3E		63.0	dB

PA効率の参考例
PA efficiency for reference

測定条件）サンプル：第一ロット、送信出力：MF 100W / HF 150W
Measurement conditions) Samples : 1st lot, TX pow er : MF 100W / HF 150W

周波数（kHz）
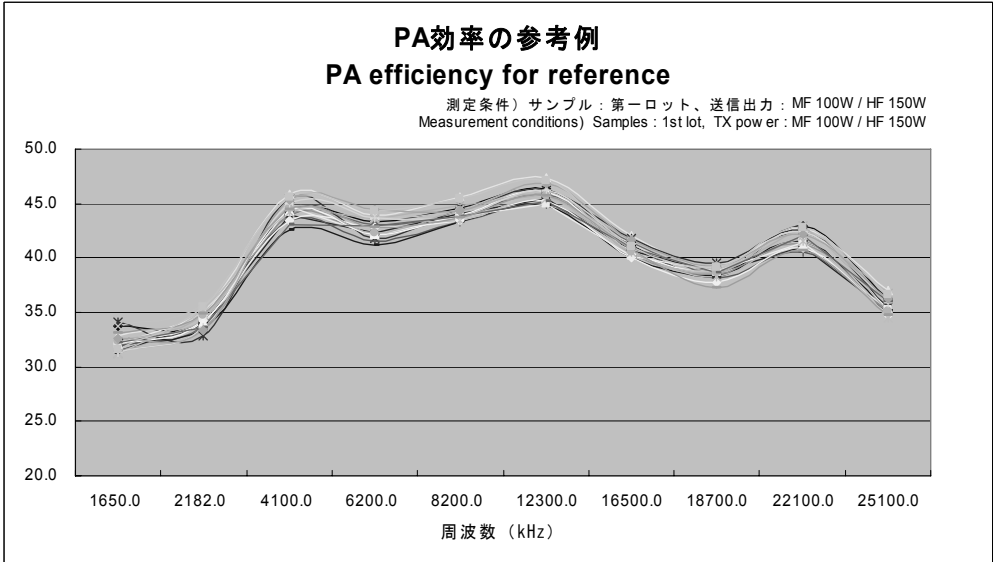
CAH-2415 PA ユニット交換要領書
REPLACEMENT PROCEDURE for the CAH-2415 PA UNIT

下記工具を用意します。
プラスドライバ（3 ミリ）
Prepare the following tool;
　Phillips screwdriver (3 mm)

1. シャーシの外し方
   Removing the chassis
   1) ブレーカが切れていることを確認します。カバーを固
      定している 6 つのビスを緩めます。(図 1)
      Confirm that the circuit breaker of NTD-2150
      MF/HF Transceiver is turned off. Loosen the
      screws (six places) fixing the cover. [Fig.1]
   2) 天板を取り外します。(図 2)
      Remove the top cover. [Fig.2]
   3) フレキシブルケーブルをコネクタ(J101)から外します。
      次に、電源ケーブル(TB301 と TB302)を端子から外
      します。(図 2)
      Remove the flexible flat cable from the connector
      (J101), and then remove the power cable from
      each terminal (TB301 and TB302).〔Fig.2]
   4) 筐体両側の 6 つのビスを緩め、筐体上部を取り外し
      ます。(図 2)
      Loosen the screws (six places) fixing the both
      sides of chassis, and then remove the upper part.
      [Fig.2]

取り付けは、取り外しと逆の手順で行ってください。
After the replacement, assemble the every part by
reversing the above procedure.
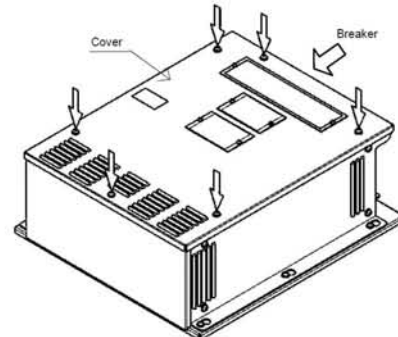
図 1 [Fig.1]
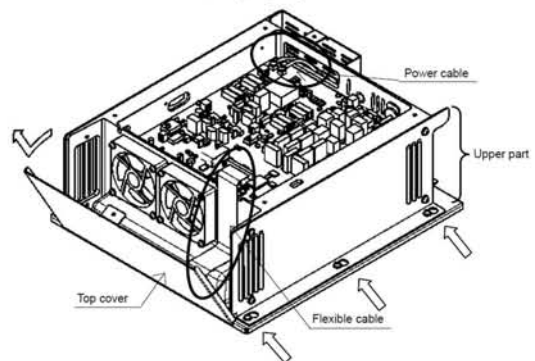
図 2 [Fig.2]

2. CAH-2415 PA ユニットの交換方法 (図 3, 図 4)
   Replacing the CAH-2415 PA unit [Fig.3, Fig.4]
   1) オプションのCQD-2416 拡張ボードが組み込
      まれている場合, 拡張ボードの制御ケーブル
      をコネクタから取り外します。①
      If the optional extension board CQD-2416
      is installed in the MF/HF transceiver,
      remove the control cable 1 from the
      connector of the WKR MDOEM unit. ①
   2) 同軸ケーブルをコネクタから外します。②
      Remove the coaxial cable 1 from the
      connector (J201).②
   3) ファンケーブルをコネクタから外します。
      ③
      Remove fan cables from the connectors
      (J202, J203). ③
   4) アンテナの同軸ケーブルをコネクタから外しま
      す。④
      Remove the coaxial cables 2 from the
      connectors (J303, J305 and J306). ④
   5) フレキシブルケーブルをコネクタから外します。
      ⑤
      Remove the flexible flat cables from the
      connectors (J102, J103).⑤

図 3 [Fig.3]

7ZPJD0467
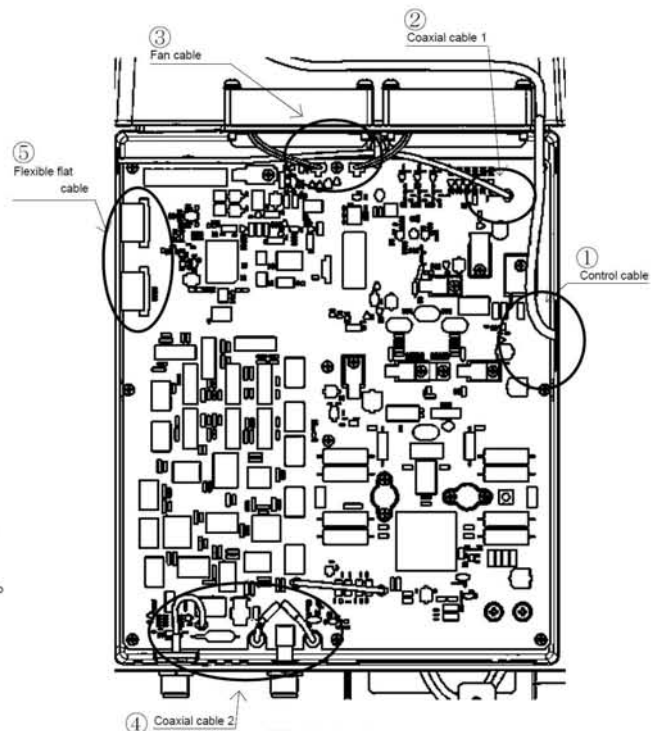
6) PA ユニットを固定している 22 本のビスを緩め、
PA ユニットを取り外します。
Loosen the screws (Twenty-two places)
fixing the PA unit, and then remove the PA
unit.

7) PA ユニットのデバイスを固定するシャーシの
表面に放熱シートを敷きます。⑥
Lay a thermal sheet on the surface of the
chassis where the devices (TR204, TR205
and TR206) of the PA unit are fixed. ⑥

8) PA ユニットの取り付けは、取り外しと逆の手
順で行ってください。
After the replacement, assemble the every
part by reversing the above procedure.

TR204 ⑥
TR206 ⑥
TR205 ⑥

図 4 [Fig.4]

7ZPJD0467
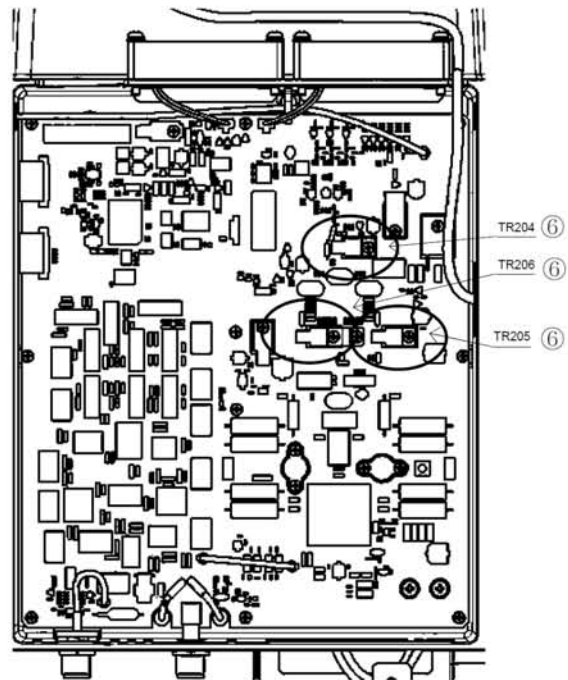
CMN-2250 TRX ユニット交換要領書
REPLACEMENT PROCEDURE for the CMN-2250 TRX UNIT

下記工具を用意します。
プラスドライバ（3 ミリ）
Prepare the following tool;
Phillips screwdriver (3 mm)

1. シャーシの外し方
   Removing the chassis
   1) ブレーカが切れていることを確認します。カバーを固定している６つのビスを緩めます。（図 1）
      Confirm that the circuit breaker of the NTD-2150 MF/HF Transceiver is turned off. Loosen the screw (six places) which is fixing the cover. [Fig.1]
   2) 天板を取り外します。（図 2）
      Remove the top cover. [Fig.2]
   取り付けは取り外しと逆の手順で行ってください。
   After the replacement, assemble the every part by reversing the above procedure.
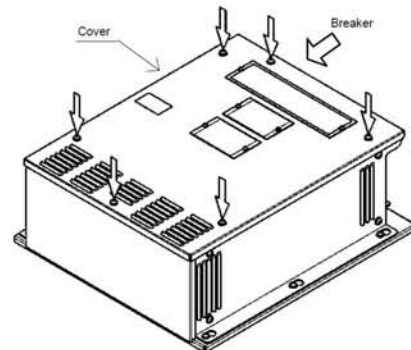
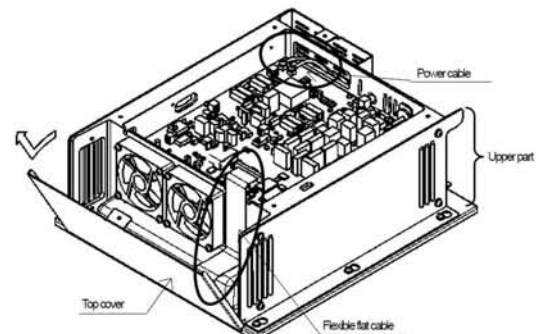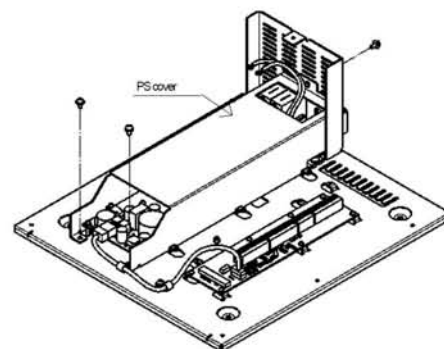2. CMN-2250 TRX ユニットの交換方法
   Replacing the CMN-2250 TRX unit
   1) 側板を固定している 4 つのビスを緩めます。（図 3）
      Loosen the screws (four places) fixing the cover. [Fig.3]
   2) フレキシブルケーブル 3 本をコネクタ(J1101, J1111 及び J1131)から外します。次に、同軸ケーブル 2 本(J101 と J661)をコネクタから外します。（図 4）
      Remove the three flexible flat cables from each connector (J1101, J1111 and J1131), and then remove the two coaxial cables from each connector (J101 and J661). [Fig.4]
   3) TRX ユニットを固定している 7 本のビスを緩め、TRX ユニットを取り外します。
      Loosen the screws (seven places) fixing the TRX unit, and then remove the TRX unit.
   4) TRX ユニットの取り付けは、取り外しと逆の手順で行ってください。
      After the replacement, assemble the every part by reversing the above procedure.
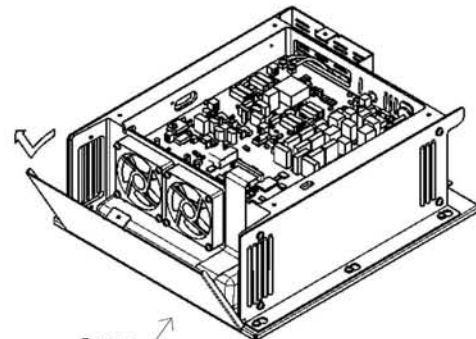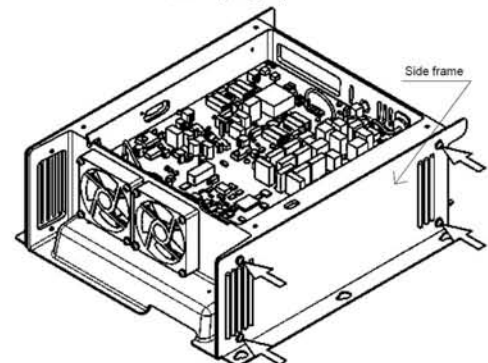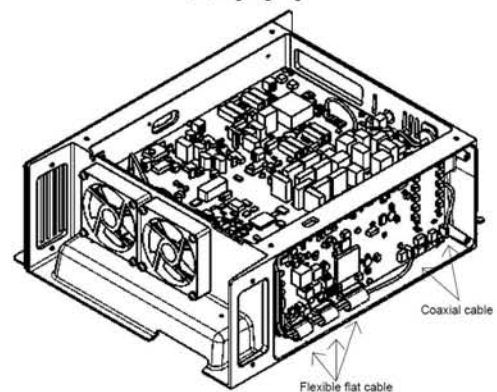
3. 設定と動作確認
   Setup and Examination
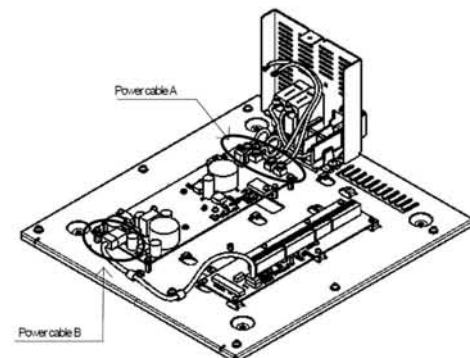   1) サービスマニュアルを参照し次の項目を必要に応じて設定して下さい。
      - スピーチプロセッサ
      - RFスルー
      - AGC設定
      According to the JSS-2150 service manual, set the following items if needed.
      - Speech-processor
      - RF through
      - AGC setting
   2) MF/HFトランシーバが正常に動作することを確認して下さい。
      Examine that the MF/HF transceiver normally operates.

図 1 [Fig.1]

図 2 [Fig.2]

図 3 [Fig.3]

図 4 [Fig.4]

7ZPJD0468

CMJ-2250 WKR MODEM ユニット交換要領書
REPLACEMENT PROCEDURE for the CMJ-2250 WKR MODEM UNIT

下記工具を用意します。
プラスドライバ（3 ミリ）
Prepare the following tool;
  Phillips screwdriver (3 mm)

1. シャーシの外し方
   Removing the chassis
   1) ブレーカが切れていることを確認します。カバ
      ーを固定している６つのビスを緩めます。(図1)
      Confirm that the circuit breaker of the
      NTD-2150 MF/HF Transceiver is turned off.
      Then loosen the screws (six places) fixing
      the cover. [Fig.1]
   2) 天板を取り外します。(図 2)
       Remove the top cover. [Fig.2]
   取り付けは、取り外しと逆の手順で行ってくださ
   い。
   After the replacement, assemble the every part
   by reversing the above procedure.
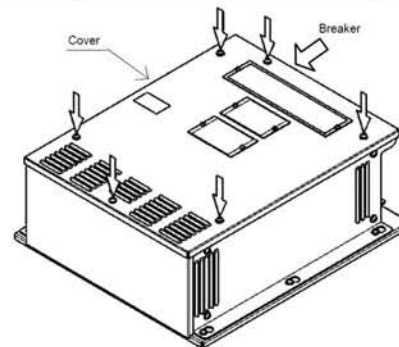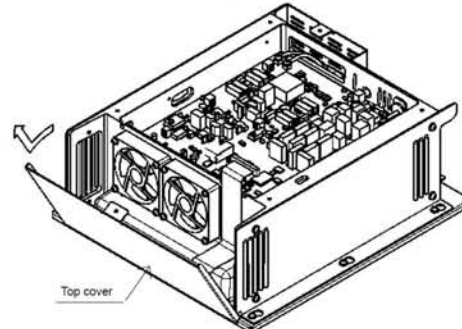
2. CMJ-2250 WKR MODEM ユニットの交換方法
   Replacing the CMJ-2250 WKR MODEM unit
   1) 側板を固定している 4 つのビスを緩めます。
      (図 3)
      Loosen the screws (four places) fixing the
      cover. [Fig.3]
   2) フレキシブルケーブルをコネクタ(J520)から外
      します。次に、同軸ケーブル2本(J101とJ102)
      をコネクタから外します。(図 4)
      Remove the flexible flat cable from the
      connector (J520), and then remove the two
      coaxial cables from each connector (J101
      and J102). [Fig.4]
   3) WKR MODEM ユニットを固定している 5 本の
      ビスを緩め、WKR MODEM ユニットを取り外し
      ます。(図 4)
      Loosen the screws (five places) fixing the
      WKR MODEM unit, and then remove the
      WKR MODEM unit. [Fig.4]
   4) WKR MODEM ユニットの取り付けは、取り外
      しと逆の手順で行ってください。
      After the replacement, assemble the every
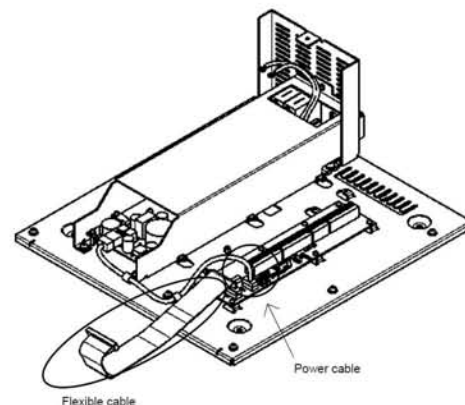   part by reversing the above procedure.
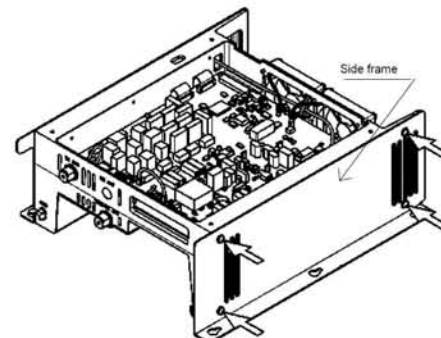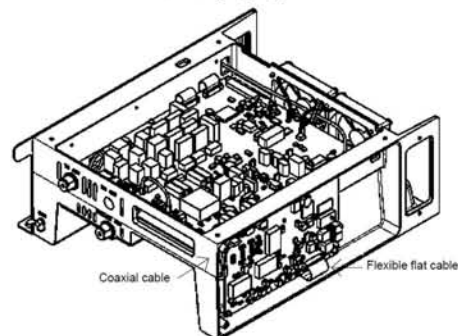
3. 設定と動作確認
   Setup and Examination
   1) サービスマニュアルを参照し次の項目を設定し
      て下さい。
      ● ID登録
      ● ポート設定
      ● DSC/WKR設定
      ● リモートメンテナンス
   According to the JSS-2150 service manual,
   set the following items;
      ● Registration,
      ● Port setting,
      ● DSC/WKR setting,
      ● Remote maintenance

図 1 [Fig.1]

図 2 [Fig.2]

図 3 [Fig.3]

図 4 [Fig.4]

2) MF/HFトランシーバが正常に動作することを確認
   して下さい。
   Examine that the MF/HF transceiver normally
   operates.

7ZPJD0469

CBD-2415 PS ユニット交換要領書
REPLACEMENT PROCEDURE for the CBD-2415 PS UNIT

プラスドライバ（3ミリ）を用意します。
Prepare the Phillips screwdriver (3 mm)

1. シャーシの外し方
   Removing the chassis
   1) ブレーカが切れていることを確認します。カバーを固定
      している6つのビスを緩めます。(図1)
      Confirm that the circuit breaker of the NTD-2150 MF/HF
      Transceiver is turned off. Loosen the screws (six places)
      fixing the cover. [Fig.1]
   2) 天板を取り外します。(図2)
      Remove the top cover. [Fig.2]
   3) フレキシブルケーブルをコネクタ(J101)から外します。
      次に、電源ケーブル(TB301とTB302)を端子から外しま
      す。(図2)
      Remove the flexible flat cable from the connector
      (J101), and then remove the power cable from each
      terminal (TB301 and TB302). [Fig.2]
   4) 筐体両側の6つのビスを緩め、筐体上部を取り外します。
      (図2)
      Loosen the screws (six places) fixing the both sides of
      chassis, and then remove the upper part. [Fig.2]
   取り付けは、取り外しと逆の手順で行ってください。
   After the replacement, assemble the every part by reversing
   the above procedure.

2. CBD-2415 PS ユニットの交換方法
   Exchanging CBD-2415 PS unit
   1) PSカバーを固定している3つのビスを緩め、PSカバー
      を取り外します。(図3)
      Loosen the screws (three places) fixing the PS cover,
      and then remove the PS cover. [Fig.3]
   2) 電源ケーブルAを端子(TB31-TB34)から外します。次に、
      電源ケーブルB(J31)をコネクタから外します。(図4)
      Remove the power cable A from the terminal
      (TB31-TB34), and then remove the power cable B from
      the connector (J31). [Fig.4]
   3) PSユニットを固定している13本のビスを緩め、PSユニ
      ットを取り外します。(図4)
      Loosen the screws (thirteen places) fixing the PS unit,
      and then remove the PS unit. [Fig.4]
   4) PSユニットのデバイスを固定するシャーシの表面に放熱
      シートを敷きます。(図4)
      Lay a thermal sheet on the surface of the chassis where
      the parts (CD2, PS1, TR1 and TR51) of the PS unit are
      fixed. [Fig.4]
   5) PS ユニットの取り付けは、取り外しと逆の手順で行って
      ください。
      After the replacement, assemble the every part by
      reversing the above procedure.

3. 設定と動作確認
   Setup and Examination
   1) MF/HFトランシーバが正常に動作することを確認して下さ
      い。
      Examine that the MF/HF transceiver normally operates.

図1 [Fig.1]

図2 [Fig.2]

図3 [Fig.3]

図4 [Fig.4]

7ZPJD0470

APPENDIX

CQD-2415 ターミナルユニット交換要領書
REPLACEMENT PROCEDURE for the CQD-2415 TERMINAL UNIT

下記工具を用意します。
プラスドライバ(3 ミリ)
Prepare the following tool;
　Phillips screwdriver (3 mm)

1. シャーシの外し方
   Removing the chassis
   1) ブレーカが切れていることを確認します。
      カバーを固定している 6 つのビスを緩め
      ます。(図 1)
      Confirm that the circuit breaker of the
      NTD-2150 MF/HF Transceiver is turned off.
      Then loosen the screws (six places) fixing
      the cover. [Fig.1]
   2) 天板を取り外します。(図 2)
      Remove the top cover. [Fig.2]
   3) フレキシブルケーブルをコネクタ(J101)から外
      します。次に、電源ケーブル(TB301 と TB302)
      を端子から外します。(図 2)
      Remove the flexible flat cable from the
      connector (J101), and then remove the
      power cables from each terminal (TB301
      and TB302). [Fig.2]
   4) 筐体両側の 6 つのビスを緩め、筐体上部を取
      り外します。(図 2)
      Loosen the screws (six places) fixing the
      both sides of chassis, and then remove the
      upper part. [Fig.2]
   取り付けは、取り外しと逆の手順で行ってください。
   After the replacement, assemble the every part
   by reversing the above procedure.
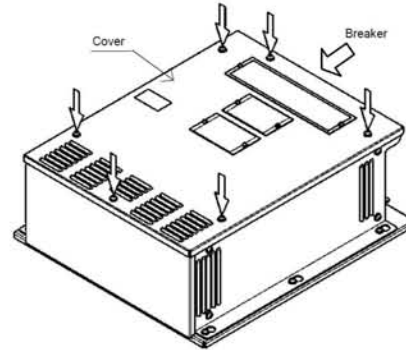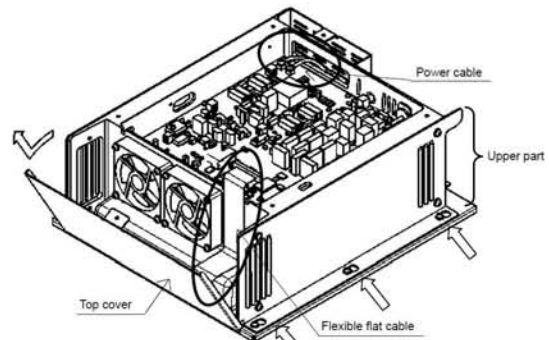
2. CQD-2415 ターミナルユニットの交換方法
   Replacing the CQD-2415 Terminal unit
   1) フレキシブルケーブルをコネクタ(J2)から外し
      ます。次に、電源ケーブル(J1)をコネクタから
      外します。(図 3)
      Remove the flexible flat cable from the
      connector (J2), and then remove the power
      cable from the connector (J1). [Fig.3]
   2) ターミナルユニットを固定している 8 本のビスを
      緩め、ターミナルユニットを取り外します。(図 3)
      Loosen the screws (eight places) fixing the
      Terminal unit, and then remove the Terminal
      unit. [Fig.3]
   3) ターミナルユニットの取り付けは、取り外しと逆
      の手順で行ってください。
      After the replacement, assemble the every
      part by reversing the above procedure.

3. 設定と動作確認
   Setup and Examination
   1) MF/HFトランシーバが正常に動作することを確
      認して下さい。
      Examine that the MF/HF transceiver normally
      operates.

図 1 [Fig.1]

図 2 [Fig.2]

図 3 [Fig.3]

7ZPJD0471

5-14

CMV-3775　AF コントロールユニット交換要領書
REPLACEMENT PROCEDURE for the CMV-3775 AF CONTROL UNIT

下記工具を用意します。
　プラスドライバ(3 ミリ)、スパナ(ナット寸法:25.4mm)
Prepare the following tools;
　Phillips screwdriver (3 mm), Adjustable wrench (Nut flat size: 25.4mm)

1. フロントパネルの外し方　(図 1)
   Removing the Front Panel [Fig.1]
   1) フロントパネルを固定している 6 つのビス
      を緩めます。①
      Loosen the screws (six places) fixing
      the front panel. ①
   2) フロントパネルとリアケースを分け、6 本の
      ケーブル(W1, W2, W3, W4, W5 及び W6)
      をリアケースのユニットから外します。
      Separate the front panel and the rear
      case, remove six cables (W1, W2, W3,
      W4, W5 and W6) from the units installed
      rear case.

   取り付けは、取り外しと逆の手順で行ってくだ
   さい。
   After the replacement, assemble the every
   part by reversing the above procedure.
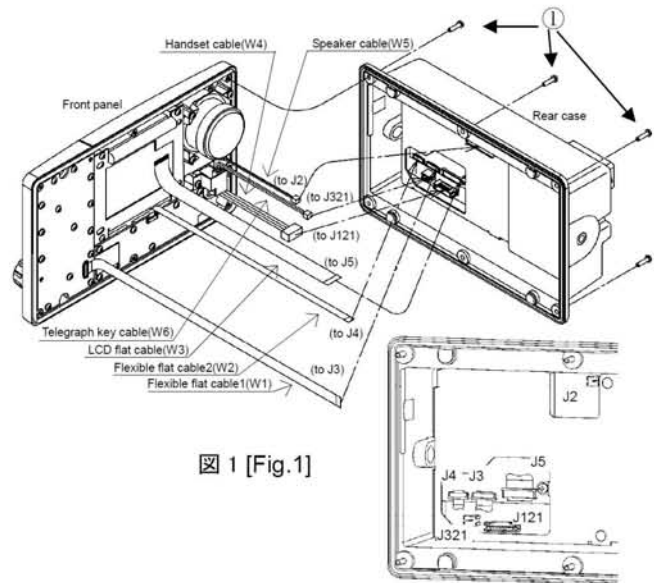
図 1 [Fig.1]

2. コントロールモジュールの外し方　(図 2)
   Removing Control Module [Fig.2]
   1) レンチを使用して、リアコネクタを固定して
      いるナットを外します。②
      Using a wrench, loosen the nut which is
      fixing the rear connector. ②
   2) コントロールモジュールを固定している 8 本
      のビスを緩め、コントロールモジュールをリ
      アケースから外します。③
      Loosen the screws (eight places) fixing
      the control module, and remove the
      control module from the rear case. ③
   3) コントロールモジュールのコネクタからケー
      ブルを外します。
      Remove the cable from the connector of
      the control module.

   取り付けは、取り外しと逆の手順で行ってくださ
   い。
   After the replacement, assemble the every
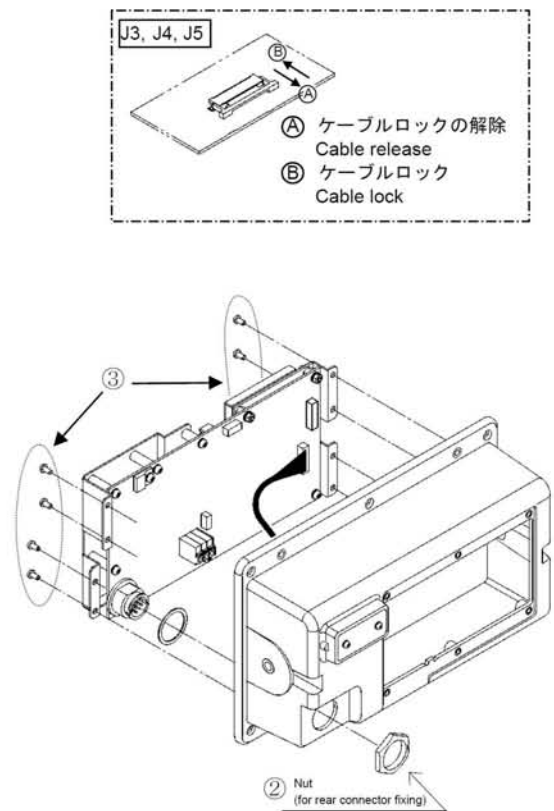   part by reversing the above procedure.

図 2 [Fig.2]

7ZPJD0475
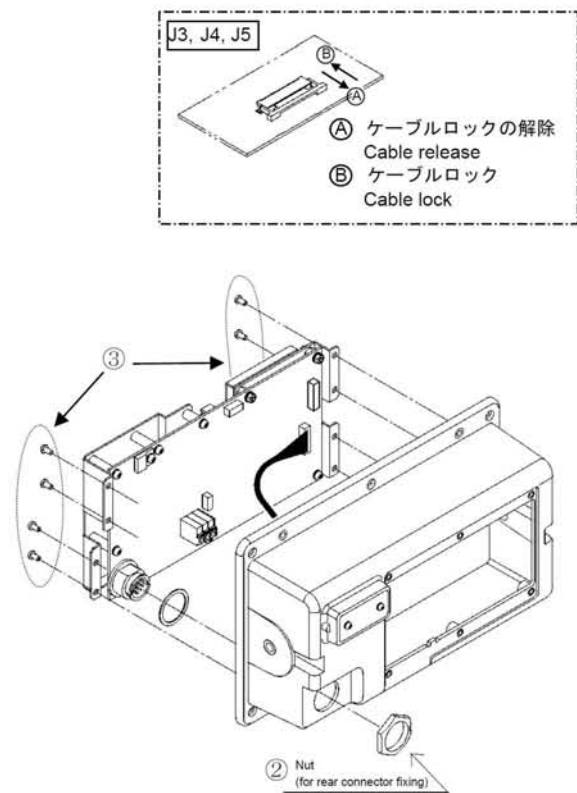
3. CMV-3775 AF コントロールユニットの交換方法 (図 3)
   Exchanging CMV-3775 AF Control Unit [Fig.3]

   1) AF コントロールユニットを固定している 6 本
      のネジと 3 つのナットを緩め、AF コントロー
      ルユニット CMV-3775 をコントロールモジュ
      ールの固定用金具から外します。④
      Loosen the screws (six places) and the
      nuts (three places) fixing the AF cont unit,
      and remove the AF cont unit from the
      control module fixing bracket. ④

   2) 新しい AF コントロールユニットのコネクタを
      コントロールモジュールの固定用金具に取り
      付けられた CDJ-3775 コントロールユニット
      のコネクタに接続します。
      Join the connectors of a new AF control
      unit to the connectors of the control unit
      CDJ-3775 on the control module fixing
      bracket.

   3) AF コントロールユニットを 6 本のネジと 3 つ
      のナットを使用して、コントロールモジュール
      の固定用金具に固定して下さい。④
      Fix new AF control unit on the control
      module fixing bracket by tightening the
      screws (six places) and the nuts (three
      places). ④
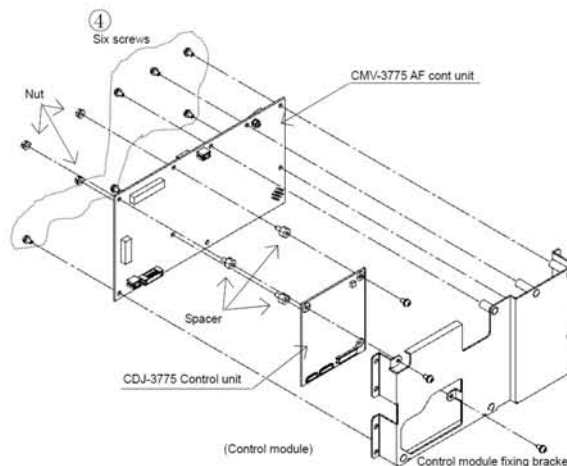
図 3 [Fig.3]

4. 設定と動作確認
   Setup and Examination

   1) サービスマニュアルを参照し、次の項目を設定して下さい。
      • RS-485シリアル通信の終端設定 (TB101)
      • プリンタの電源設定 (TB1)
      According to the JSS-2150 service manual, set the following items;
      • Setup the terminator ON/OFF of the RS-485 communication line with the jumper pin (TB101),
      • Setup the printer power supply setting (TB1)

   2) セットアップ完了後、MF/HFコントローラが正常に動作することを確認して下さい。
      After the MF/HF controller setup is completed, examine that the MF/HF controller normally operates.

7ZPJD0475

CDJ-3775 コントロールユニット交換要領書
REPLACEMENT PROCEDURE for the CDJ-3775 CONTROL UNIT

下記工具を用意します。
プラスドライバ（3ミリ）、スパナ（ナット寸法:25.4mm）
Prepare the following tools;
Phillips screwdriver (3 mm), Adjustable wrench (Nut flat size: 25.4mm)

1. フロントパネルの外し方 （図 1）
   Removing the Front Panel [Fig.1]
   1) フロントパネルを固定している６つのビスを緩めます。①
      Loosen the screws (six places) fixing the front panel. ①
   2) フロントパネルとリアケースを分け、６本のケーブル(W1, W2, W3, W4, W5 及び W6)をリアケースのユニットから外します。
      Separate the front panel from the rear case, and remove six cables (W1, W2, W3, W4, W5 and W6) from the rear case.

   取り付けは、取り外しと逆の手順で行ってください。
   After the replacement, assemble the every part by reversing the above procedure.
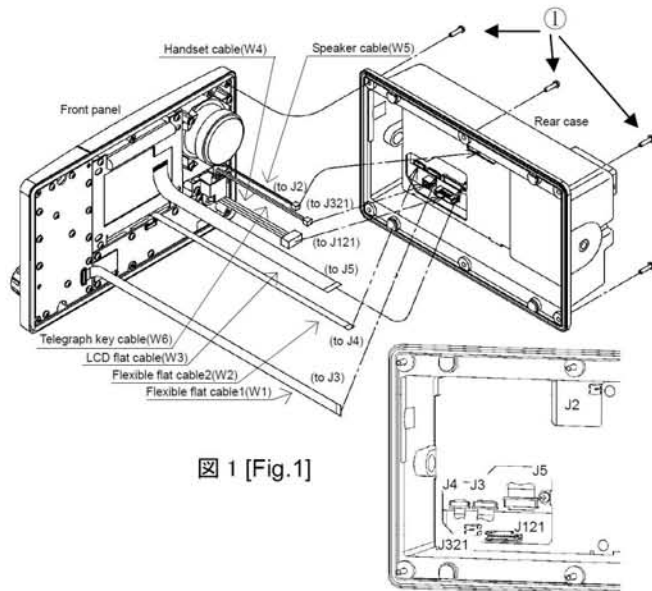

図 1 [Fig.1]

2. コントロールモジュールの外し方 （図 2）
   Removing Control Module [Fig.2]
   1) レンチを使用して、リアコネクタを固定しているナットを外します。②
      Using a wrench, loosen the nuts fixing the rear connector. ②
   2) コントロールモジュールを固定している 8 本のビスを緩め、コントロールモジュールをリアケースから外します。③
      Loosen the screws (eight places) fixing the control module, and remove the control module from the rear case. ③
   3) コントロールモジュールのコネクタからケーブルを外します。
      Remove the cable from the connector of the control module.

   取り付けは、取り外しと逆の手順で行ってください。
   After the replacement, assemble the every part by reversing the above procedure.

Ⓐ ケーブルロックの解除
   Cable release
Ⓑ ケーブルロック
   Cable lock

② Nut
(for rear connector fixing)

図 2 [Fig.2]

7ZPJD0474

3. <u>CDJ-3775 コントロールユニットの外し方</u>（図3）
<u>Removing the CDJ-3775 Control Unit</u> [Fig.3]
コントロールユニットを固定している 8 本のネジを
緩め、コントロールユニット CDJ-3775 をコントロー
ルモジュールの固定用金具から外します。④
Loosen the screws (eight places) fixing the
Control unit, remove the Control unit from the
control module fixing bracket. ④

取り付けは、取り外しと逆の手順で行ってください。
After the replacement, assemble the every part
by reversing the above procedure.

4. <u>CDJ-3775 コントロールユニットの交換方法</u>
<u>Replacing the CDJ-3775 Control Unit</u>
1) コントロールユニットを固定している1本のネジ
を緩め、AFコントロールユニット CMV-3775 か
ら外します。⑤
Loosen the screws (one place) fixing the
Control unit, and remove the Control unit
from the AF cont unit. ⑤

2) 新しいコントロールユニットを 1 本のネジを使
用して、AF コントロールユニット CMV-3775 に
固定して下さい。⑤
Fix a new control unit on the AF cont unit by
tightening a screw (one place). ⑤
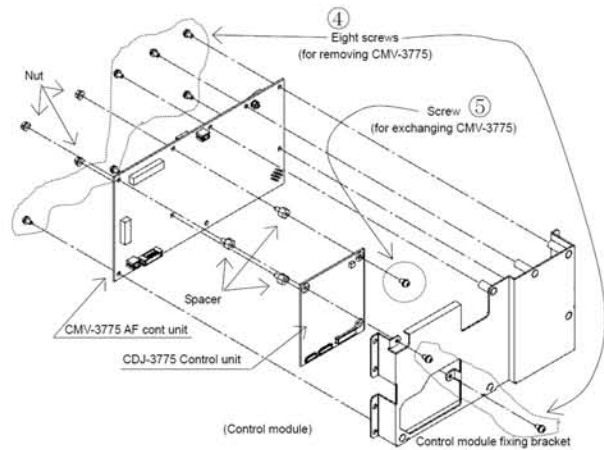
図 3 [Fig.3]

5. <u>設定と動作確認</u>
<u>Setup and Examination</u>
1) サービスマニュアルを参照し、次の項目を設定して下さい。
- コントローラアドレス
- コントローラマイクゲイン
- プリンタ設定
According to the JSS-2150 service manual, set the following items;
- Controller address,
- Controller MIC gain,
- Printer settings
2) セットアップ完了後、MF/HFコントローラが正常に動作することを確認して下さい。
After the MF/HF controller setup is completed, examine that the MF/HF controller normally operates.

7ZPJD0474

CCK-3775 メインパネルユニット交換要領書
REPLACEMENT PROCEDURE for the CCK-3775 MAIN PANEL UNIT

下記工具を用意します。
　プラスドライバ（3ミリ）、六角レンチ（1.5mm）
Prepare the following tools;
　Phillips screwdriver (3 mm), Hex wrench (1.5mm)

1. フロントパネルの外し方（図1）
   Removing the Front Panel [Fig.1]
   1) フロントパネルを固定している6つのビスを
      緩めます。①
      Loosen the screws (six places) fixing
      the front panel. ①
   2) フロントパネルとリアケースを分け、6本の
      ケーブル(W1, W2, W3, W4, W5及びW6)
      をリアケースのユニットから外します。
      Separate the front panel from the rear
      case, and remove six cables (W1, W2,
      W3, W4, W5 and W6) from the rear
      case.

   取り付けは、取り外しと逆の手順で行ってくだ
   さい。
   After the replacement, assemble the every
   part by reversing the above procedure.

図1 [Fig.1]

2. CCK-3775 サブパネルユニットの交換方法（図2）
   Replacing the CCK-3775 MAIN PANEL UNIT [Fig.2]
   1) ジョグダイヤル横のボルトを緩め、ジョグダイヤ
      ルを外します。②
      Loosen the screws (two places) securing the
      jog dial by using a hexagon wrench, and
      remove the jog dial. ②
   2) メインパネルユニットを固定している14本のビ
      スを緩め、メインパネルユニットをフロントパネ
      ルユニットから外します。③
      Loosen the screws (fourteen places) fixing
      the main panel unit, remove the main panel
      unit from the front panel. ③
   3) 新しいメインパネルユニットをフロントパネルに
      取り付け、14本のビスでフロントパネルにメイン
      パネルユニットを固定します。③
      Fix a new main panel unit on the front panel
      by tightening the screws (fourteen places).
      ③
   4) ジョグダイヤルの固定用ネジを締め付けて取り
      付けて下さい。②
      Fix the jog dial by tightening the screws (two
      places). ②

J3, J4, J5

Ⓐ ケーブルロックの解除
   Cable release
Ⓑ ケーブルロック
   Cable lock
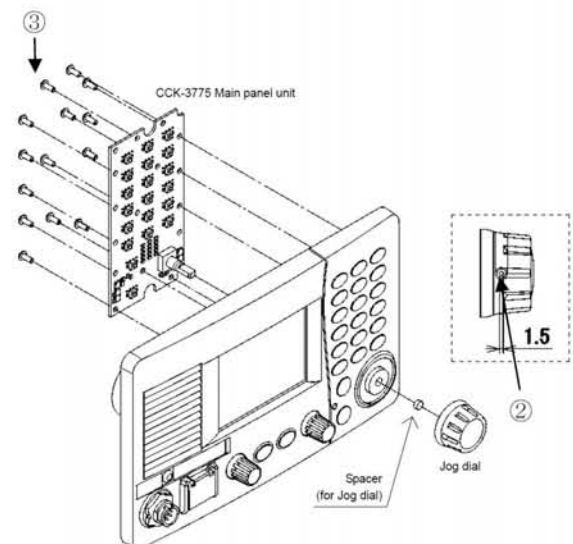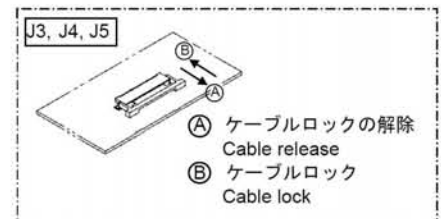
図2 [Fig.2]

3. 動作確認
   Examination
   メインパネルユニットの交換完了後、キーとジョグダイヤルが正常に動作することを確認して下さい。
   After the replacement of the main panel unit is completed, examine that the key and the jog dial normally
   operate.

7ZPJD0472

APPENDIX

CCK-3776 サブパネルユニット交換要領書
REPLACEMENT PROCEDURE for the CCK-3776 SUB PANEL UNIT

下記工具を用意します。
プラスドライバ（3ミリ）、六角レンチ（1.5mm）
Prepare the following tools;
Phillips screwdriver (3 mm), Hex wrench (1.5mm)

1. フロントパネルの外し方（図1）
   Removing the Front Panel [Fig.1]
   1) フロントパネルを固定している６つのビスを緩めます。①
   Loosen the screws (six places) which is fixing the front panel. ①
   2) フロントパネルとリアケースを分け、6本のケーブル(W1, W2, W3, W4, W5及びW6)をリアケースのユニットから外します。
   Separate the front panel and the rear case, remove six cables (W1, W2, W3, W4, W5 and W6) from the rear case.

   取り付けは、取り外しと逆の手順で行ってください。
   After the replacement, assemble the every part by reversing the above procedure.

図1 [Fig.1]

2. CCK-3776 サブパネルユニットの交換方法（図2）
   Replacing the CCK-3776 SUB PANEL UNIT [Fig.2]
   1) ツマミのボルトを緩め、2つのツマミを外します。②
   Loosen screws securing the knob by using a hexagon wrench, remove two knobs. ②
   2) サブパネルユニットを固定している8本のビスを緩め、サブパネルユニットをフロントパネルユニットから外します。③
   Loosen screws (eight places) fixing the sub panel unit, and remove the sub panel unit from the front panel. ③
   3) 新しいサブパネルユニットをフロントパネルに7本のビスで固定します。③
   Fix a new sub panel unit on the front panel by the screws (seven places). ③
   4) 2つのツマミの固定用ネジを締め付けて取り付けて下さい。②
   Fix two knobs by the screws (two places). ②
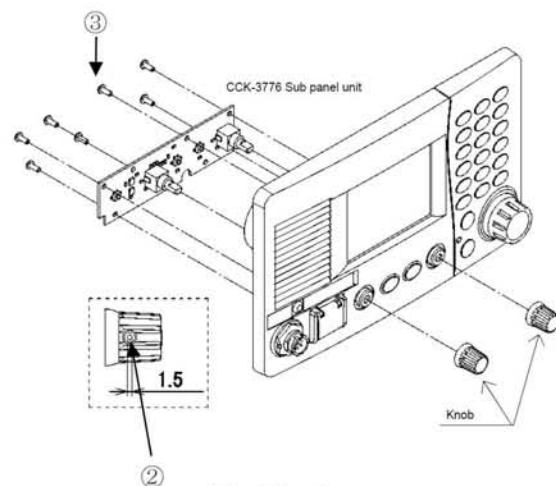
図2 [Fig.2]

3. 動作確認
   Examination
   サブパネルユニットの交換完了後、キーとツマミが正常に動作することを確認して下さい。
   After the replacement of the sub panel unit is completed, examine that the key and knob normally operate.

7ZPJD0473

CFG-2150 マッチングユニット交換要領書
REPLACEMENT PROCEDURE for the CFG-2150 MATCHING UNIT

下記工具を用意します。
　プラスドライバ(3 ミリ)、マイナスドライバ(3 ミリ)
Prepare the following tools;
　Phillips screwdriver (3 mm), Slotted screwdriver (3 mm)

1. シャーシの外し方
　　Removing the chassis
　　1) NTD-2150 MF/HF トランシーバのブレーカが切れて
　　　　いることを確認します。
　　　　Confirm that the circuit breaker of the NTD-2150
　　　　MF/HF Transceiver is turned off.
　　2) カバーを固定している 8 つのビスを緩めて、カバーを
　　　　取り外します。(図 1)
　　　　Loosen the screws (eight places) which is fixing
　　　　the cover, and then remove the top cover. [Fig.1]
　　取り付けは、取り外しと逆の手順で行ってください。
　　After the replacement, assemble the every part by
　　reversing the above procedure.

2. CFG-2150 マッチングユニットの交換方法
　　Replacing the CFG-2150 MATCHING unit
　　1) 次のケーブルを外します
　　　　- 同軸ケーブル及びグランドを端子(TB1, TB2)か
　　　　　ら外します。①
　　　　- 制御ケーブルとグランドを端子(TB201, TB202)
　　　　　から外します。②、③
　　　　- グランドケーブルを端子(TB102)から外します。
　　　　　④
　　　　- RF ケーブルを端子(TB101)から外します。⑤
　　　　Remove following cables;
　　　　- Remove the coaxial cable and ground cable
　　　　　from the terminal (TB1, TB2). ①
　　　　- Remove the control cable and ground from the
　　　　　terminal (TB201, TB202). ②, ③
　　　　- Remove the ground cable from the terminal
　　　　　(TB102). ④
　　　　- Remove the RF cable from the terminal
　　　　　(TB101). ⑤
　　2) マッチングユニットを固定している 6 本のビスを緩め、
　　　　マッチングユニットを取り外します。⑥
　　　　Loosen the screws (six places) fixing the
　　　　MATCHING unit, and then remove the
　　　　MATCHING unit. ⑥
　　3) 新しいマッチングユニットに同梱のゴムを貼り付けま
　　　　す(次ページ 図 2 参照)。
　　　　Stick attached rubbers on a new MATCHING unit
　　　　(refer to next page; Fig 2).
　　4) マッチングユニットの取り付けは、取り外しと逆の手
　　　　順で行ってください。
　　　　After the replacement, assemble the every part by
　　　　reversing the above procedure.
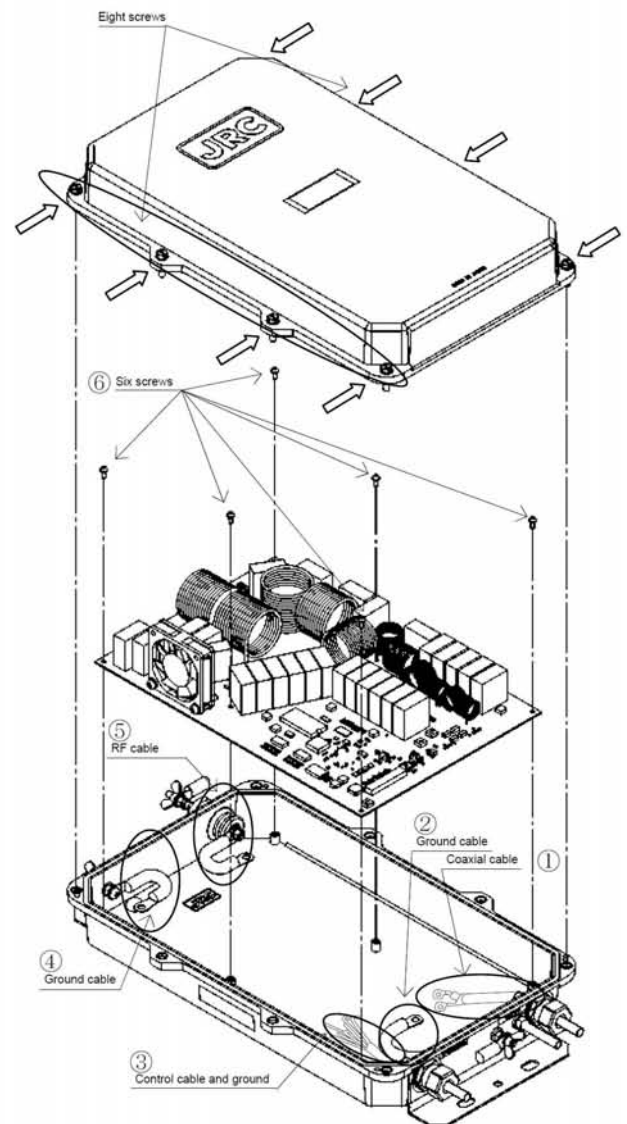
3. 設定と動作確認
　　Setup and Examination
　　1) アンテナチューナが正常に動作することを確認して
　　　　下さい。
　　　　Examine that the Antenna tuner normally
　　　　operates.

図 1 [Fig.1]

7ZPJD0476

ゴムの取付け方法
Attachment of rubbers

添付のゴムをCFG-2150の裏側に5箇所貼り付けま
す。貼り付ける位置は、下図を参考にしてください。
According to the figure below, stick five rubbers
on the backside of the CFG-2150.

ゴムをパターンに平行に貼る
Stick the rubber parallel to the foil area.

図 2 [Fig.2]

7ZPJD0476
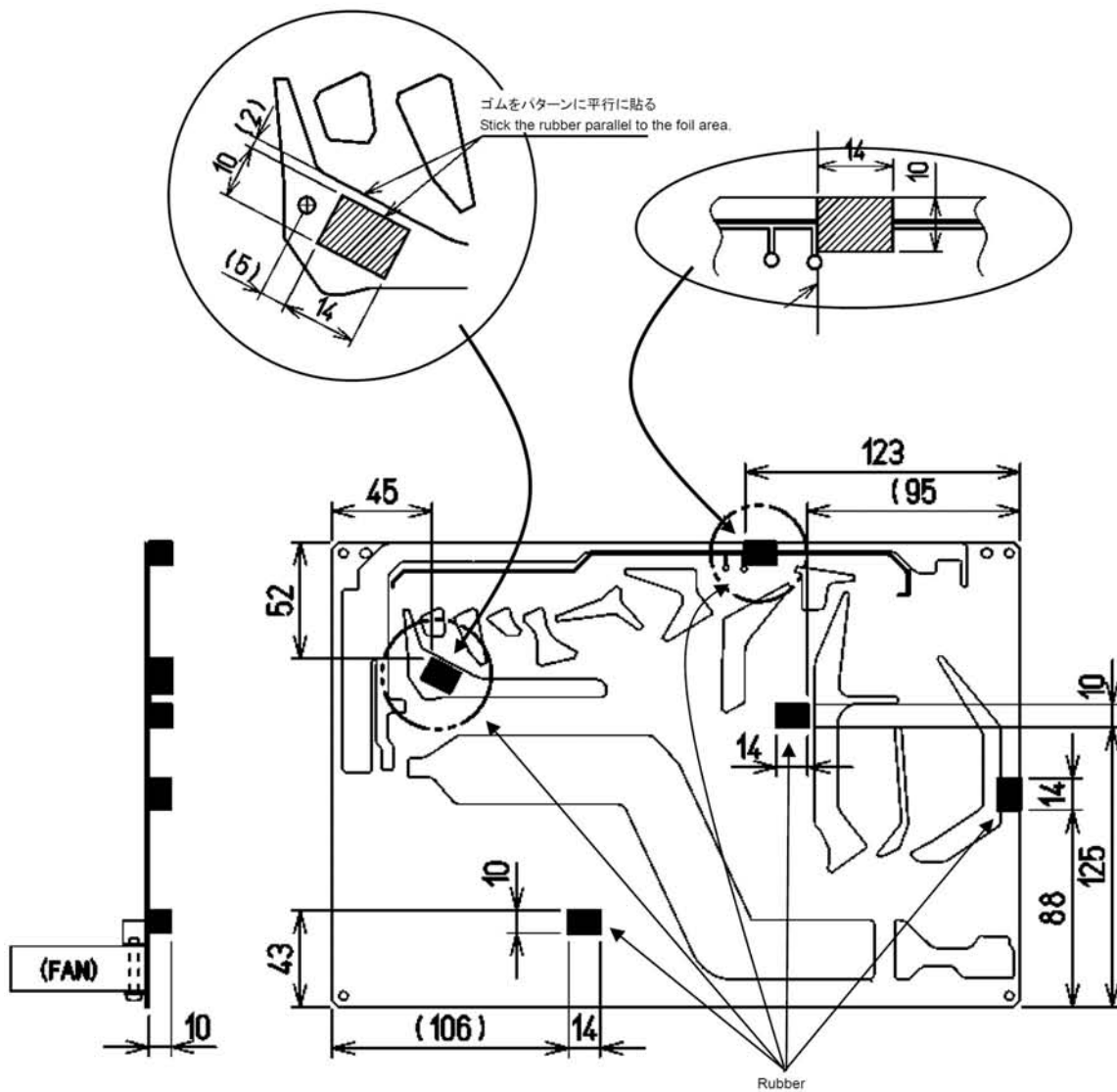
3108NL-05W-B50-L09 ファン交換要領書
REPLACEMENT PROCEDURE for cooling fans (3108NL-05W-B50-L09)

下記工具を用意します。
プラスドライバ（3 ミリ）
Prepare the following tool;
 Phillips screwdriver (3 mm)

1. シャーシの外し方
 Removing the chassis
  1) ブレーカが切れていることを確認します。カバー
   を固定している 6 つのビスを緩めます。（図 1）
   Confirm that the circuit breaker of the
   NTD-2150 MF/HF Transceiver is turned off.
   Loosen the screws (six places) fixing the
   cover. [Fig.1]
  2) 天板を取り外します。（図 2）
   Remove the top cover. [Fig.2]

取り付けは、取り外しと逆の手順で行ってください。
After the replacement, assemble the every part by
reversing the above procedure.
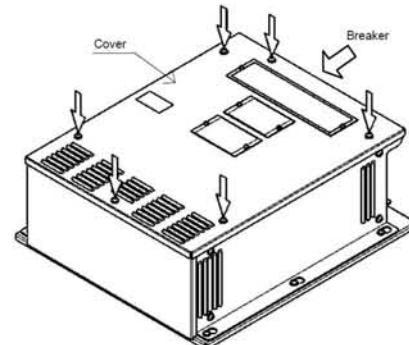
図 1 [Fig.1]
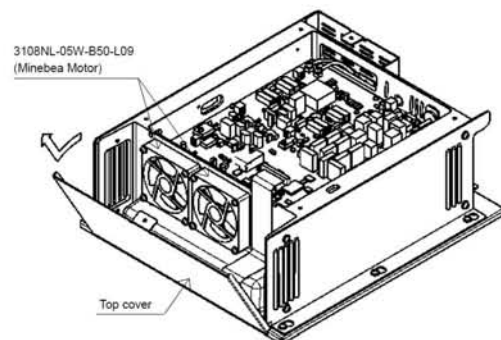
図 2 [Fig.2]

2. ファンの交換方法
 Replacing the cooling fans
  1) ファンケーブルをコネクタ（J202またはJ203）
   からはずします。（図3）①
   Remove the fan cable(s) from the
   connector (J202 or J203). [Fig.3]①
  2) ファンを固定している4つのビスを緩めます。
   （図4）
   Loosen the screws (four places) fixing the
   fan motor. [Fig.4]

取り付けは、取り外しと逆の手順で行ってください。
After the replacement, assemble the every part
by reversing the above procedure.

図 3 [Fig.3]

図 4 [Fig.4]

7ZPJD0481
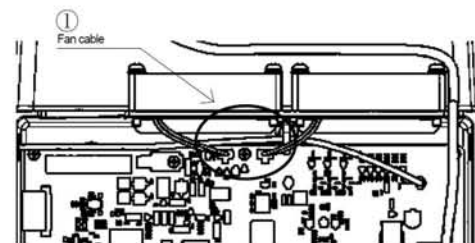
CCN-3227　LCD ユニット交換要領書
REPLACEMENT PROCEDURE for the CCN-3227 COLOR LCD UNIT
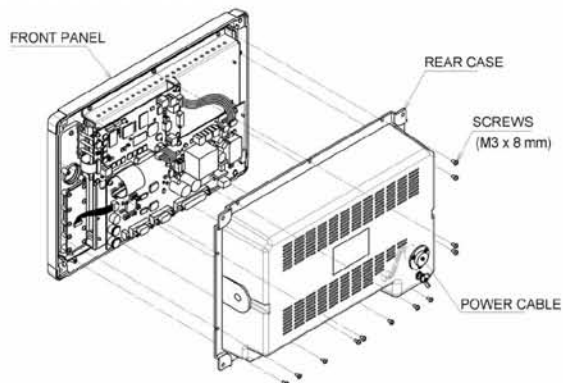
下記工具を用意します。
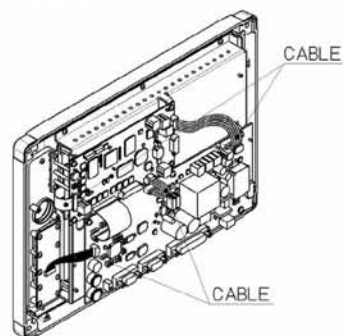　プラスドライバ（2 ミリおよび 3 ミリ）
Prepare the following tools;
　Phillips screwdriver (2 mm and 3 mm)

1) リアケースの 12 本の木ねじとケース内部
　 の電源ケーブルを外して、リアケースを取
　 り外します。
　 Loosen and remove 12 self-tapping
　 screws, then disconnect the power cable
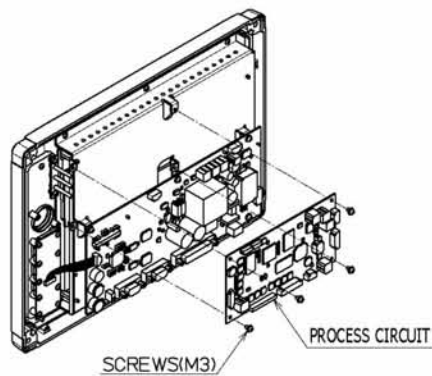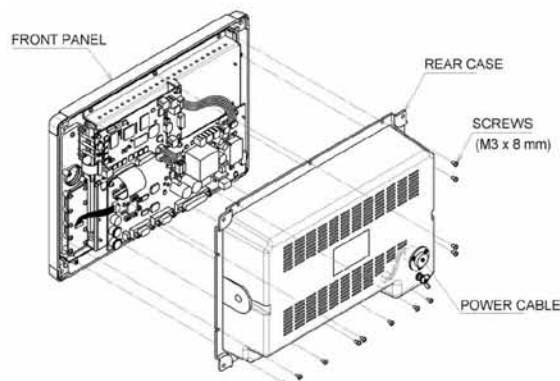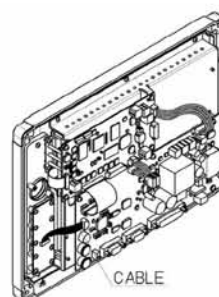　 inside and remove the rear case.
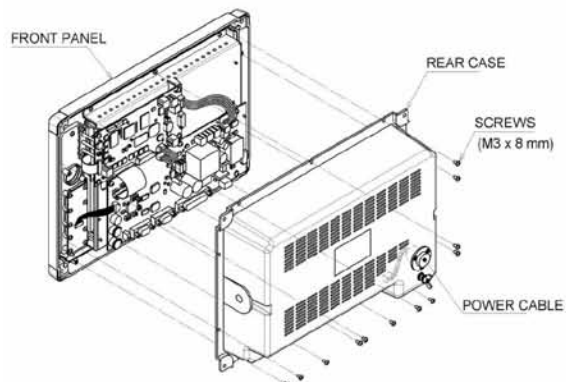
2) 右記の 1 本のケーブルを外します。
　 Disconnect 1 cable as shown at right.
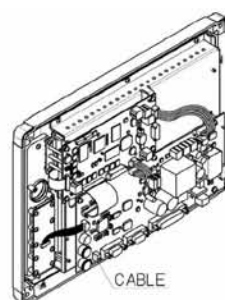
3) 6 本の木ねじを外して LCD ブラケット
　 ASSY を取り外します。
　 Loosen and remove 6 self-tapping
　 screws, then remove the LCD
　 BLACKET ASSY.
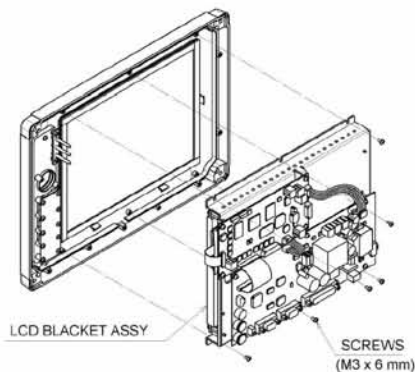
4) 右記の 2 本のケーブルを外します。
　 Disconnect 2 cables as shown at right.

7ZPJD0494
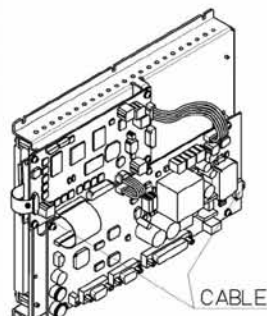
5) 4本のねじを外してLCDを取り外します。
Loosen and remove 4 screws, then remove the LCD.
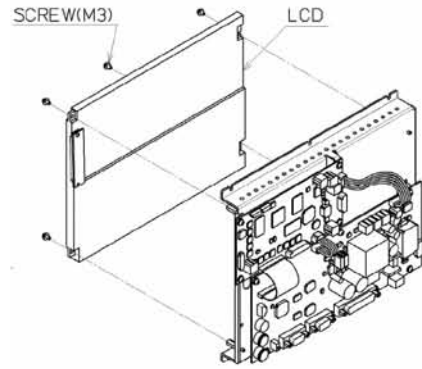
6) 1本のねじを外してCQC-1262 LCD I/Fを取り外します。
Loosen and remove 1 screw, then remove the SUB BOARD (CQC-1262 LCD I/F).
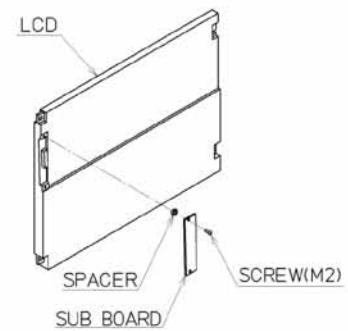
取り付けは、上記取り外しと逆の手順で行ってください。なお木ねじは6mmと8mmの二種類がありますので間違えないようにご注意ください。
After the replacement, assemble the every part by reversing the above procedure. However note that, there are two kinds of self-tapping screws (6 mm, 8 mm), so use them correctly to avoid damage to the data terminal.

7ZPJD0494

CDC-1346B PROCESS CIRCUIT 交換要領書
REPLACEMENT PROCEDURE for the CDC-1346B PROCESS CIRCUIT

下記工具を用意します。
プラスドライバ（3 ミリ）
Prepare the following tools;
 Phillips screwdriver (3 mm)

1) リアケースの 12 本の木ねじとケース内部
   の電源ケーブルを外して、リアケースを取
   り外します。
   Loosen and remove 12 self-tapping
   screws, then disconnect the power cable
   inside and remove the rear case.

2) 右記の 4 本のケーブルを外します。
   Disconnect 4 cables as shown at right.

3) 4 本のねじを外して CDC-1346B PROCESS
   CIRCUIT を取り外します。
   Loosen and remove 4 screws, then
   remove the CDC-1346B PROCESS
   CIRCUIT.

取り付けは、上記取り外しと逆の手順で行ってください。
After the replacement, assemble the every part by reversing the above procedure.

7ZPJD0495

CQD-3227　USB I/F 交換要領書
REPLACEMENT PROCEDURE for the CQD-3227 USB I/F BOARD

下記工具を用意します。
　プラスドライバ（3 ミリ）
Prepare the following tools;
　Phillips screwdriver (3 mm)

1) リアケースの 12 本の木ねじとケース内部
　　の電源ケーブルを外して、リアケースを取
　　り外します。
　　Loosen and remove 12 self-tapping
　　screws, then disconnect the power cable
　　inside and remove the rear case.

FRONT PANEL
REAR CASE
SCREWS (M3 x 8 mm)
POWER CABLE

2) 右記の 1 本のケーブルを外します。
　　Disconnect 1 cable as shown at right.

CABLE

3) 10 本の木ねじを外して CQD-3227 USB
　　I/F 基板を取り外します。
　　Loosen and remove 10 self-tapping
　　screws, then remove the CQD-3227
　　USB I/F BOARD.
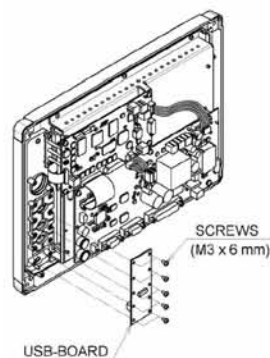
SCREWS (M3 x 6 mm)
USB-BOARD

取り付けは、上記取り外しと逆の手順で行ってください。なお木ねじは 6mm と 8mm の二種類がありますので間
違えないようにご注意ください。
After the replacement, assemble the every part by reversing the above procedure. However note that,
there are two kinds of self-tapping screws (6 mm, 8 mm), so use them correctly to avoid damage to the
data terminal.

7ZPJD0497

CMH-3227　I/F ユニット交換要領書
REPLACEMENT PROCEDURE for the CMH-3227 INTERFACE UNIT

下記工具を用意します。
　プラスドライバ（3 ミリ）
Prepare the following tools;
　Phillips screwdriver (3 mm)

1) リアケースの 12 本の木ねじとケース内部
　　の電源ケーブルを外して、リアケースを取
　　り外します。
　　Loosen and remove 12 self-tapping
　　screws, then disconnect the power cable
　　inside and remove the rear case.
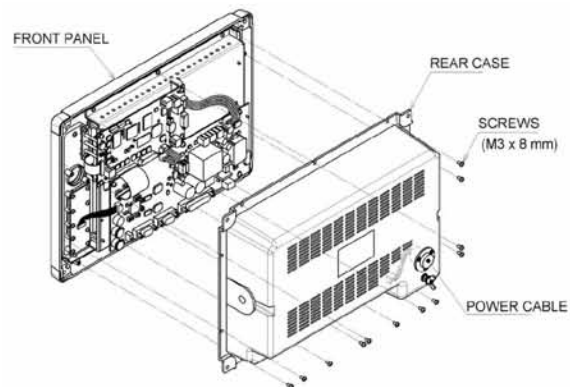
2) CMH-3227 I/F ユニットの 5 本のケーブル
　　を外します。
　　Disconnect 5 cables connected to the
　　CMH-3227 INTERFACE UNIT.
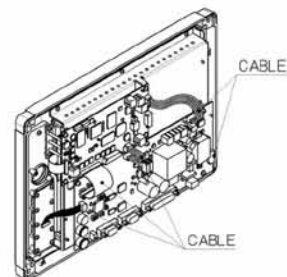
3) 7 本のねじを外して CMH-3227 I/F ユニット
　　の基板を取り外します。
　　Loosen and remove 7 screws, then
　　remove the CMH-3227 INTERFACE
　　UNIT.
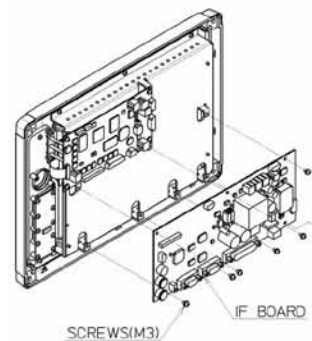
取り付けは、上記取り外しと逆の手順で行ってください。
After the replacement, assemble the every part by reversing the above procedure.

7ZPJD0496

NDZ-227 データターミナル ディップスイッチ設定要領書
NDZ-227 Data terminal DIP switch setting procedures

NDZ-227 データターミナルを装備の際は、以下に従ってディップスイッチほかの設定を行ってください。
To install NDZ-227 Data terminal, always set the DIP switch and other items as follows.

1. MF/HF モードの設定
MF/HF mode selection

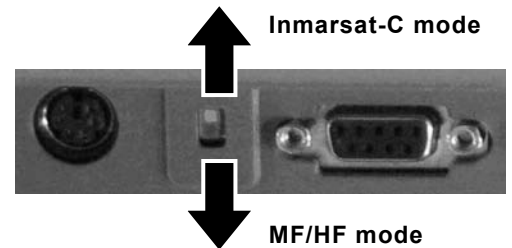a. NDZ-227 本体背面のディップスイッチを右記に従って MF/HF モードに設定してください。
（工場出荷時設定：インマルサット C モード）
To select the MF/HF mode, set the DIP switch on the back of the NDZ-227 as shown at right.
(Factory default setting: Inmarsat-C mode)

Inmarsat-C mode

MF/HF mode

b. NDZ-227 に同梱のボイドシールを右記のように貼付してください。
Put a void sticker included with the NDZ-227 as shown at right.

Void sticker
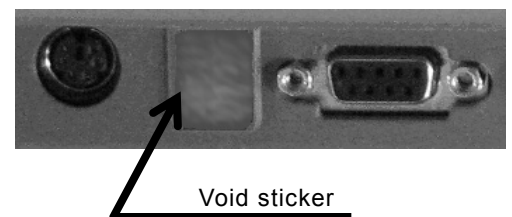
2. 品名シールの貼付
Sticking the model name

NDZ-227 に同梱の MF/HF シールを右記のように貼付してください。
Put the MF/HF sticker included with the NDZ-227 as shown at right.

3. 起動画面の確認
Start screen check

装置の電源を入れて起動画面を確認してください。
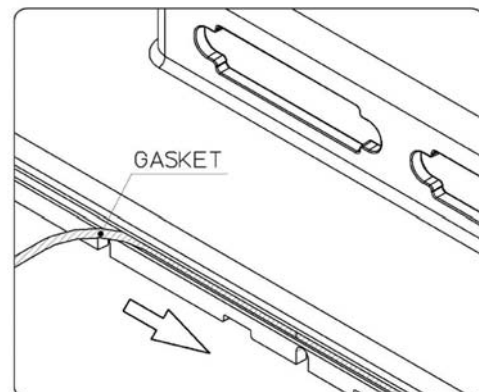Power on the equipment to check the start screen.

NDZ-227 データターミナル パッキン取付要領書
NDZ-227 Data terminal gasket fitting procedures

NDZ-227 データターミナルのリアケースのパッキンが外れたときは、以下に従って取り付けてください。
If the gasket of the NDZ-227 Data terminal comes off, fit it again as follows.

1. パッキンの先端と末端をリアケース下側の切り欠き
中央を目印にして溝にはめる。
Insert the start and the end of the gasket in the slot,
making bottom center notch of the rear case a sign.
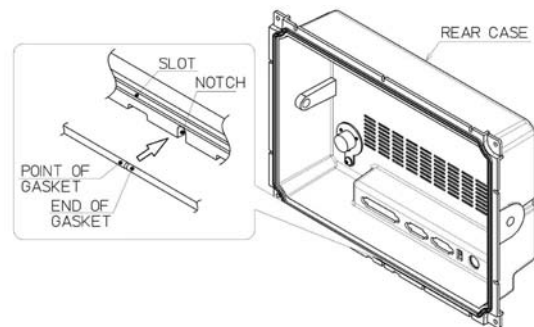
2. 矢印の方向に押し込みながら、パッキンを末端まで溝
にはめる。
Insert the gasket in the slot until the end pushing it
into the direction of the arrow.

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