250W/500W/800W MF/HF Radio Equipment

JSS-296/596/896

Service Manual

JRC Japan Radio Co., Ltd.

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JD-1307-05 Earth connection of Tx antenna in NFC-296 antenna tuner

JD-1303-05 JSS-296/596/896 DC breaker addition

JD-1301-04 JSB-196/196GM (JSS-296/596/896) software upgrading

JD-1297A Notice for FEC receiving in NBDP mode

1. INTRODUCTION

1.1 GENERAL

The installation of your JSS-296/596/896 (JSB-196GM, NCT-196N, NDZ-127J, NAH-692/695/698 and NFC-296/896) determines its efficiency and its performance. Careful planning and implementation of the installation are essential steps for the realization of maximum performance. Attention should be focused on the dc power source and the antenna ground system (counterpoise). Your radio power output is dependent upon the capability of the dc power source to supply and deliver the energy to your radio.

The antenna ground (counterpoise) is one half of your antenna system. Any skimping or short cuts reduce the capability of your antenna to radiate the signal power delivered to it by your radiotelephone. Your JSS-296/596/896 is designed to provide you with maximum signal radiation from your installation. The dc power source and especially the counterpoise system are paramount importance to the proper operation of you system.

1.1.1 Installation Location

Install the JSS-296/596/896 in a well-ventilated location, as free as possible from vibration so that the equipment can withstand long periods of operation. If the equipment is to be installed on the bridge, keep the equipment at a distance of 1.5 meters or more from the magnetic compass.

1.1.2 Grounding

Ground the JSS-296/596/896 by connecting grounding copper straps, between the ground such as metal hull in steel vessels or ground screen/large metal masses in wooden or fiberglass vessels and the equipment, at the minimum possible distance. For this purpose, use copper straps, which are at least 50 millimeter in width and from 0.4 to 1.5 millimeters thick.

1.1.3 Standard Components

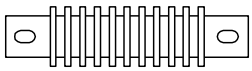
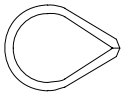
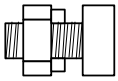
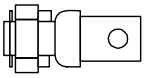
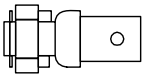
No.	NAME	TYPE			REMARKS	Q'TY
		JSS-296	JSS-596	JSS-896		
1	MF/HF Radiotelephone	JSB-196GM	JSB-196GM	JSB-196GM		1
2	DSC/NBDP Modem	NCT-196N	NCT-196N	NCT-196N		1
3	Power Amplifier	NAH-692	NAH-695	NAH-698	Built-in the Battery Charger	1
4	Data Terminal	NDZ-127J	NDZ-127J	NDZ-127J		1
5	Keyboard	NDF-268	NDF-268	NDF-268		1
6	Antenna Tuner	NFC-296	NFC-896	NFC-896		1

1.1.4 Options

No.	NAME	TYPE	REMARKS	Q'TY
1	GMDSS Console	NCU-331E/F/G	Standard console for JSS-296/596/896 and Inmarsat-C	1
2	GMDSS Console	NCU-324E/F/G	Desk top console for JSS-296/596/896 and Inmarsat-C	1
3	GMDSS Console	NCU-1960	Desk top console for JSS-296/596/896	1
4	PA Rack	NCU-692	For NAH-692/695/698	1
5	Printer	NKG-800		1
6	Roll Paper	5ZPCM00006	For NKG-800	1
7	FDD Unit	NDH-265	For Data Terminal	1
8	Whip Antenna (6m)	NAW-60	Rx antenna	1
9	Self-supporting Antenna	NAW-208S	Tx antenna	1
10	Joint Box	JQD-69C	For Rx antenna	1
11	Junction Box	NQD-4190	For Antenna Tuner	1
12	Feeder kit for NAW-208S	6ZPKD00073		1
13	Installation Materials	6ZPKD00074		1
14	Spare Parts	7ZXJD0030	Standard Spare Parts	1
15	Spare Parts	7ZXJD0031	Include FET spare for NAH-692	1
16	Spare Parts	7ZXJD0035	Include FET spare for NAH-695	1
17	Spare Parts	7ZXJD0036	Include FET spare for NAH-698	1
18	Antenna Materials	6ZXKD53125		1
19	Flashlight	-		1
20	Circuit Tester	PM3		1
21	Screw-Driver Set	D-75		1
22	Connection Box	NQE-3196	For connection between JSB-196GM and NCU-692	1
23	JSB-NQE signal cable	7ZCJD0178	L=2m	1
24	Printer Selector	SW-ATBK21K(2:1)		1
25	Printer cable	KP-DV1 (1m)		1
26	Printer-Selector cable	KPU-104K (1.5m)		1
27	Printer power cable	6JNKD00100A	L=4m	1
28	DTE signal cable	7ZCJD0072A	L=1.5m	1
29	DTE power cable	6ZCSC00582	L=2m	1
30	RX Splitter	7NZJD0001	CFF-801 with a Fixing Plate	1
31	Distress Message Controller	NCH-321A		
32	Antenna Changer	NKZ-224		

1.1.5 Feeder kit for NAW-208S

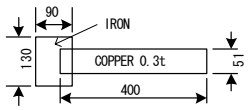
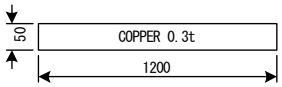
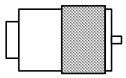
船番 SHIP No	予備品表 SPARE PARTS LIST FOR	用途 USE	台数 SETS PERVESS
	MF/HF RADIO EQUIPMENT JSS-296/596/896	FEEDER KIT FOR NAW-208S	

項目 ITEM No.	名称 NAME OF PART	外形図 OUTLINE	数量 QUANTITY 常用数 WORKING 1セット PER SET	数量 QUANTITY 常用数 WORKING 1船 PER VESS	数量 QUANTITY 予備 SPARE	備考 REMARKS
1	碍子 Insulator			3		NG-159A (MPNG00069)
2	連結用金具 Shackle			6		BP-O-58 (MPXP0023W)
3	はめ輪 Thimble			3		D=22 JISB2802 (BRXP00845)
4	ワイヤクリップ Wire Clip			16		PBC-3 (BRBP00043)
5	ワイヤクリップ Wire Clip			1		MPBP00481 φ8.2mm (MPBP00481)
6	ワイヤクリップ Wire Clip			1		MPBP00480 φ6.2mm (MPBP00480)

製造会社 MFR'S NAME	日本無線株式会社 JAPAN RADIO CO.,LTD.	図番 DRW. No.	6ZPKD00073 1/1

1.1.6 Installation Materials

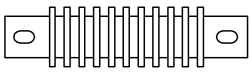
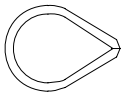
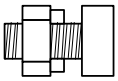
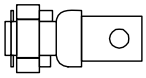
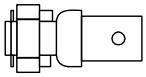
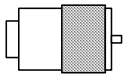
船番 SHIP No	予備品表 SPARE PARTS LIST FOR	用途 USE	台数 SETS PERVESS
	MF/HF RADIO EQUIPMENT JSS-296/596/896	INSTALLATION MATERIALS	

項目 ITEM No.	名称 NAME OF PART	外形図 OUTLINE	数量 QUANTITY 常用数 WORKING 1セット PER SET	数量 QUANTITY 常用数 WORKING 1船 PERVESS	予備 SPARE	備考 REMARKS
1	アース端子 Earth Terminal			4		6ZPKD00084 (6ZPKD00084)
2	アース板 Earth Plate			2		6ZZKD01031 (6ZZKD01031)
3	コネクタ Connector			5		M-P-7(Y-A1) (5JAAB00032)

製造会社 MFR'S NAME	日本無線株式会社 JAPAN RADIO CO.,LTD.	図番 DRW. No.	6ZPKD00074 1/1

1.1.7 Antenna Materials

船番 SHIP No	予備品表 SPARE PARTS LIST FOR	用途 USE	台数 SETS PERVESS
	MF/HF RADIO EQUIPMENT JSS-296/596/896	SPARE PARTS FOR ANTENNA MATERIALS	

項目 ITEM No.	名称 NAME OF PART	外形図 OUTLINE	数量 QUANTITY 常用数 WORKING 1セット PER SET	数量 QUANTITY 常用数 WORKING 1船 PER VESS	数量 QUANTITY 予備 SPARE	備考 REMARKS
1	碍子 Insulator				3	NG-159A (MPNG00069)
2	連結用金具 Shackle				6	BP-O-58 (MPXP0023W)
3	はめ輪 Thimble				3	D=22 JISB2802 (BRXP00845)
4	ワイヤ クリップ Wire Clip				16	PBC-3 (BRBP00043)
5	アンテナ ワイヤ Antenna Wire				25m	(Other packing) 19/1.2 (2746111112)
6	ワイヤ クリップ Wire Clip				1	MPBP00481 φ8.2mm (MPBP00481)
7	ワイヤ クリップ Wire Clip				1	MPBP00480 φ6.2mm (MPBP00480)
8	コネクタ Connector				5	M-P-7(Y-A1) (5JAAB00032)

製造会社 MFR'S NAME	日本無線株式会社 JAPAN RADIO CO.,LTD.	図番 DRW. No.	6ZXKD53125 1/1

2. SYSTEM DIAGRAM

2.1 GMDSS Console system configuration

NCU-331E /F/G(1)

Antenna Tuner is installed indoors.

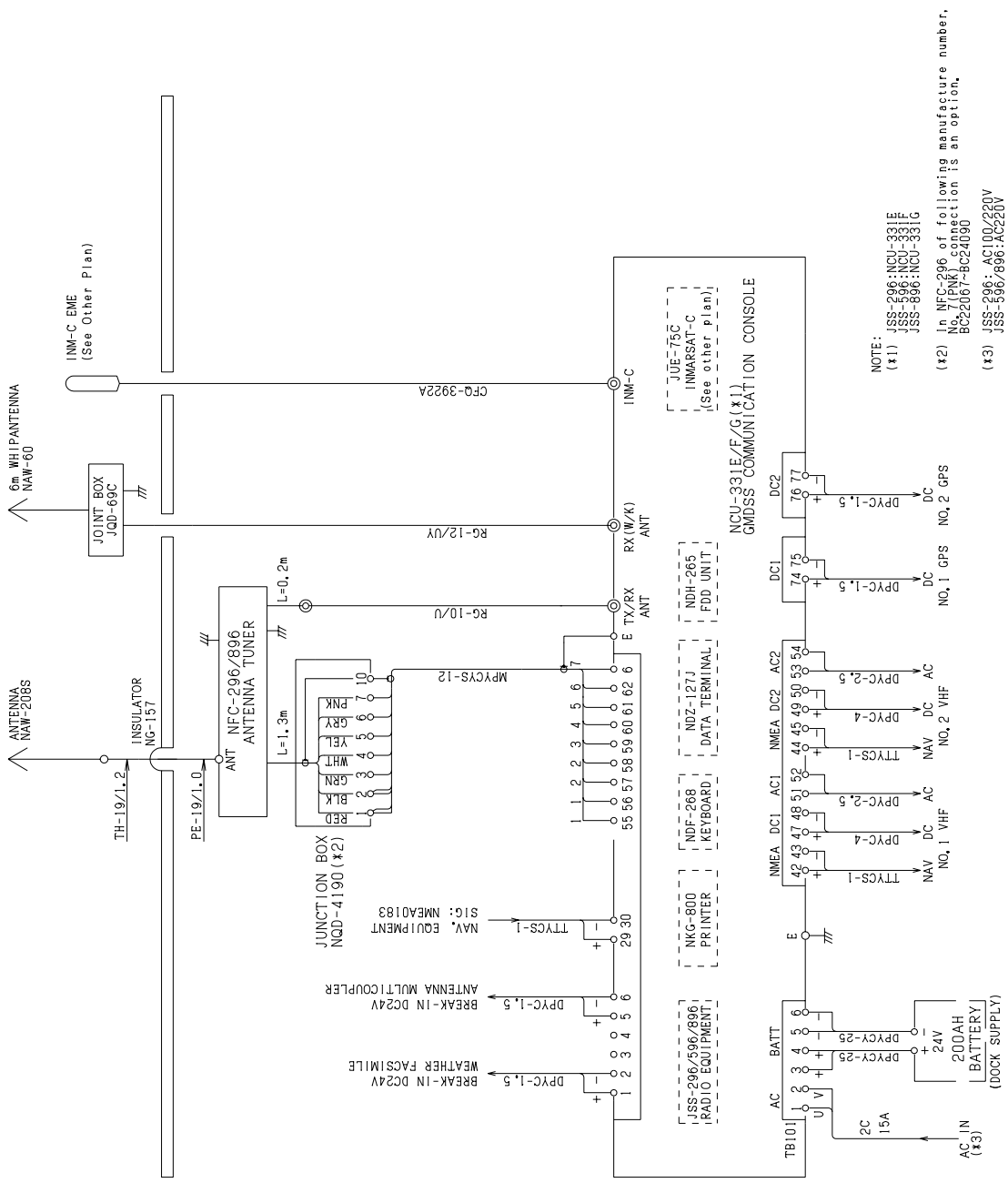


Figure 2-1 NCU-331E/F/G (1)

NCU-331E /F/G(2)

Antenna Tuner is installed in the outdoors.

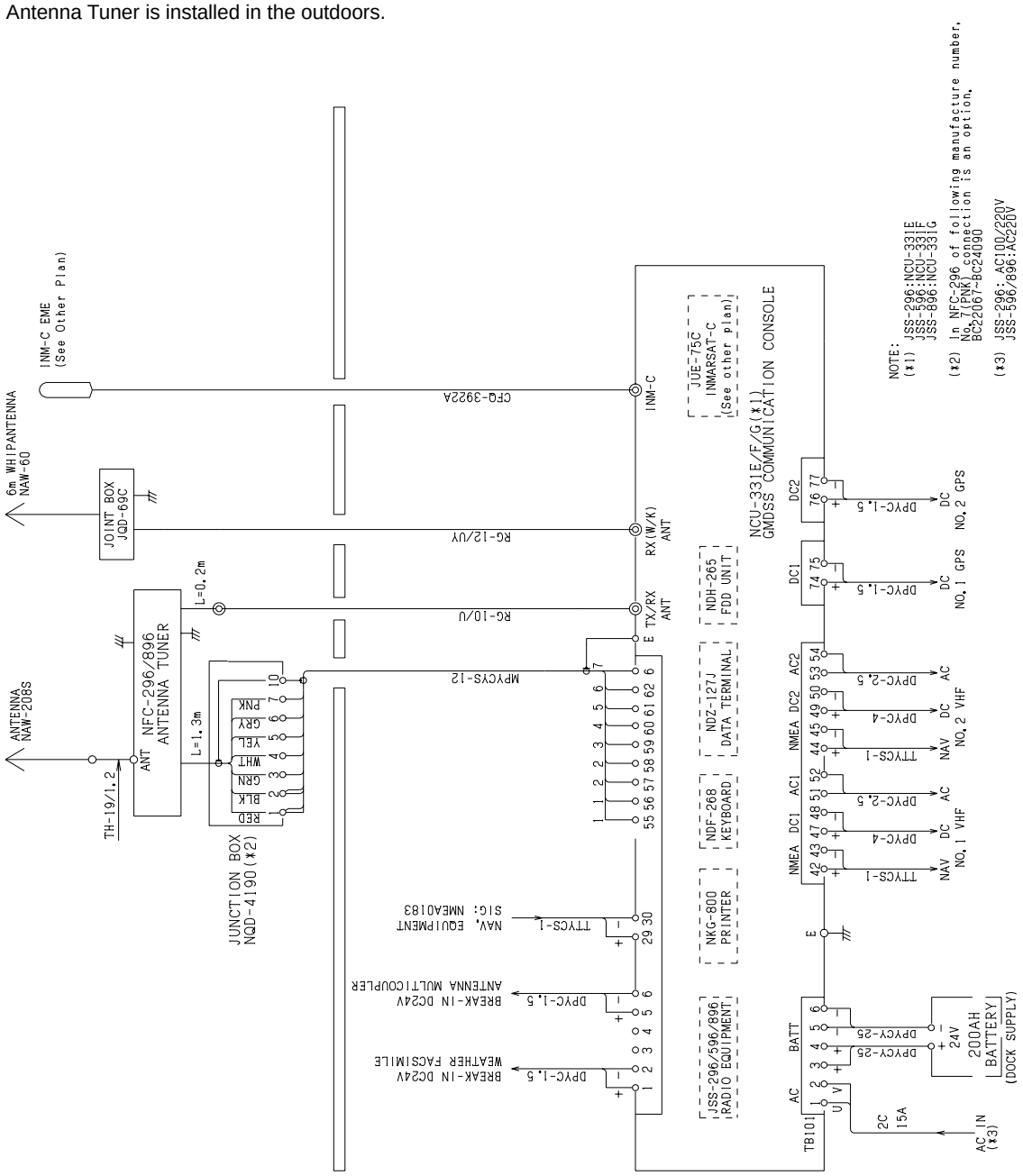
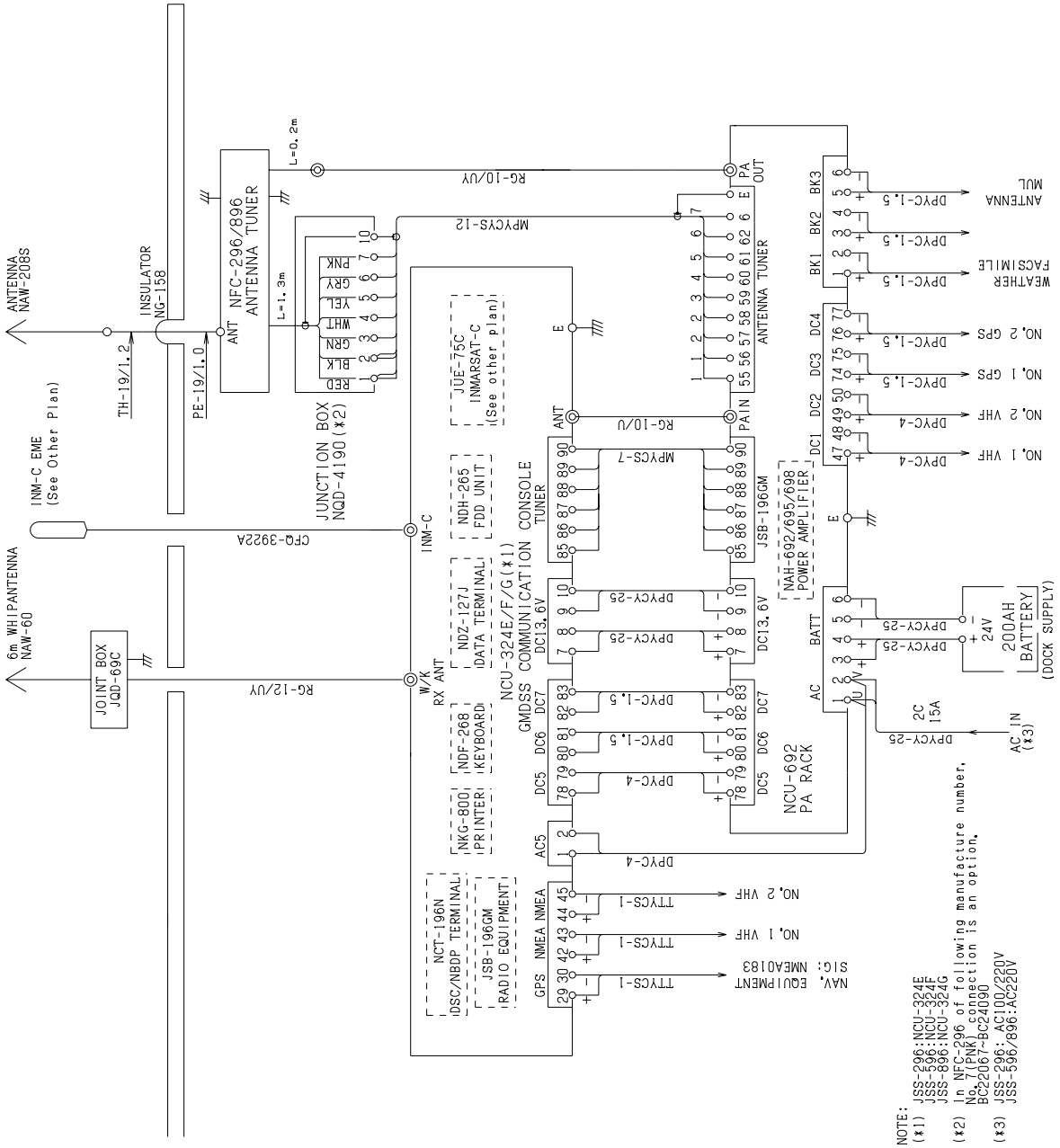


Figure 2-2 NCU-331E/F/G (2)

NCU-324E/E/F/G, NCU-692

Antenna Tuner is installed indoors.



NOTE:
(*1) JSS-296:NCU-324E
JSS-596:NCU-324F
JSS-896:NCU-324G
(*2) In NFC-296 of following manufacture number, No.7(PNK) connection is an option.
BC22067~BC24090
(*3) JSS-296: AC100/220V
JSS-596/896:AC220V

Figure 2-3 NCU-324E, NCU-692

NCU-1960, NCU-692

Antenna Tuner is installed indoors.

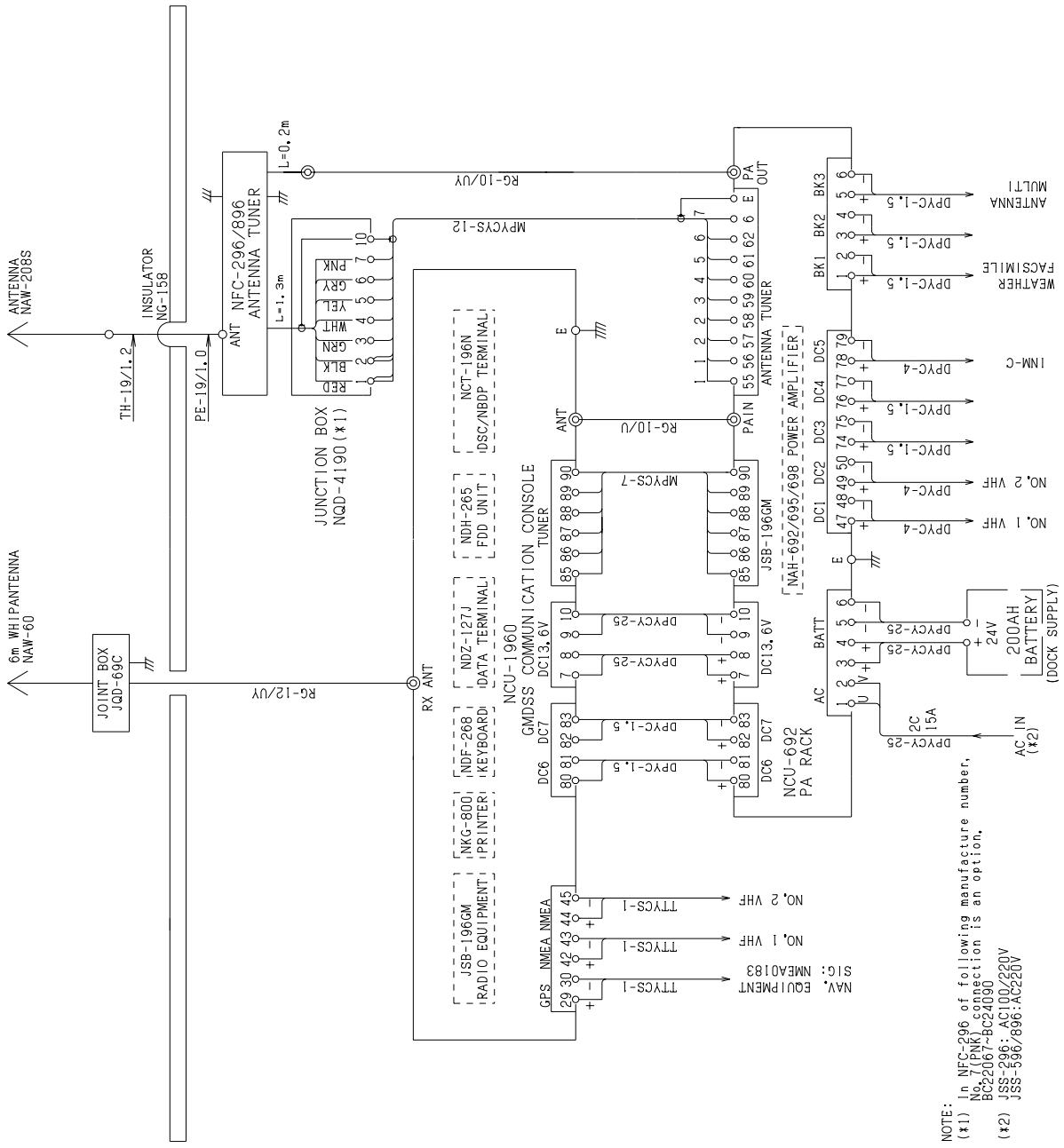


Figure 2-4 NCU-1960, NCU-692

NCU-692, NQE-3196

Antenna Tuner is installed indoors.

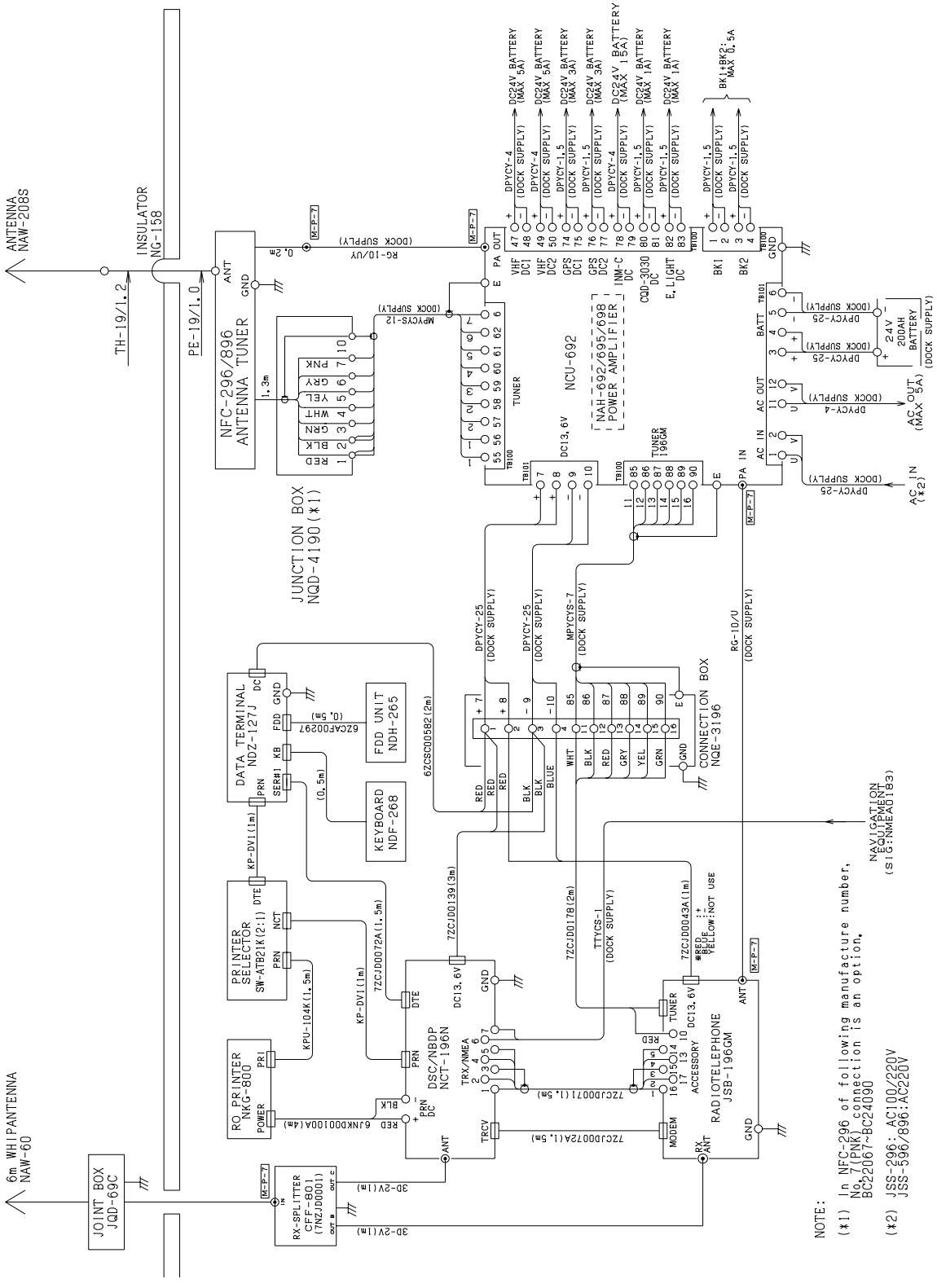


Figure 2-5 NCU-692, NQE-3196

2.2 GMDSS Console Interconnection diagram

NCU-331E/F/G

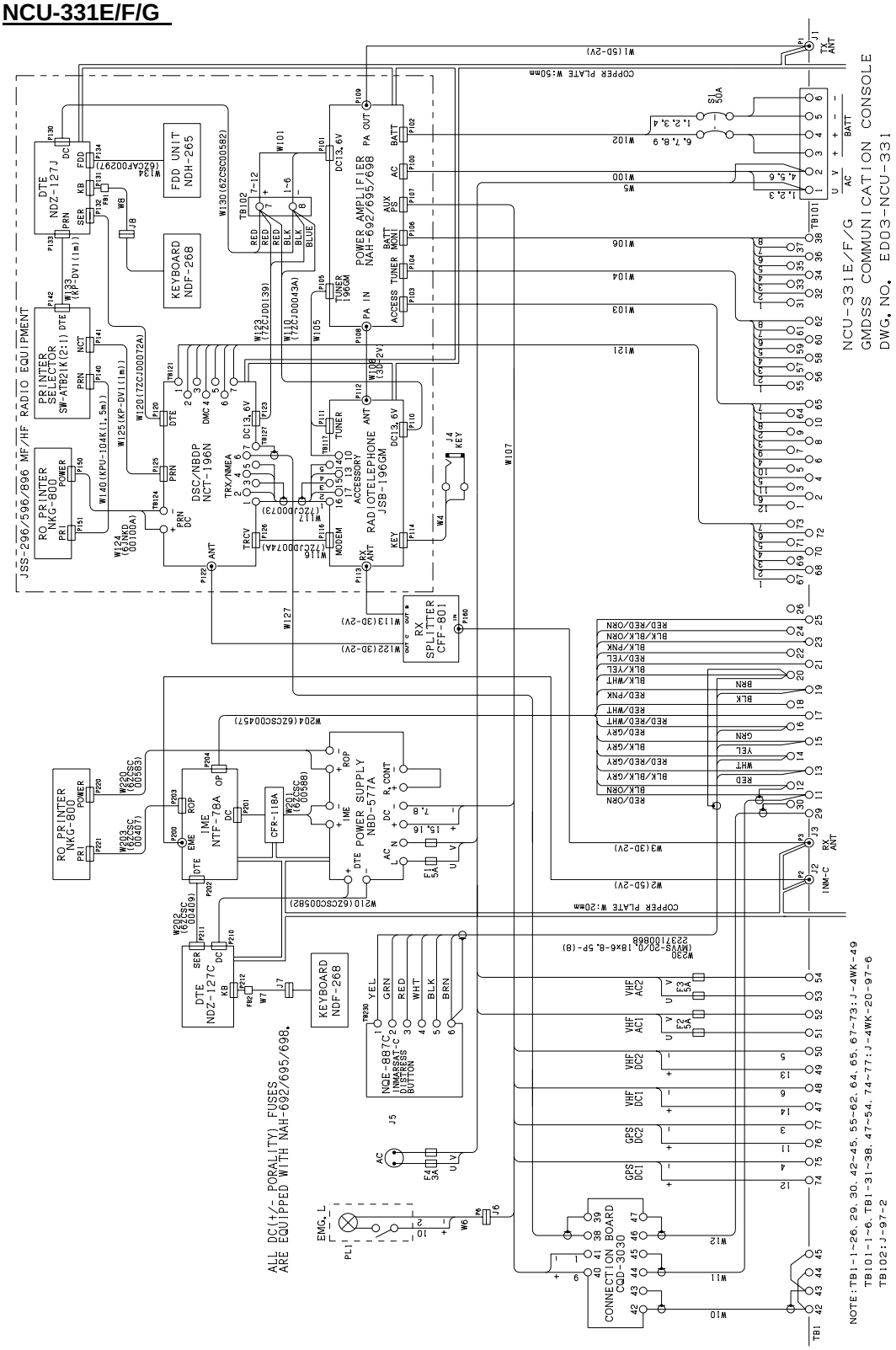


Figure 2-6 NCU-331E/F/G

NCU-324E/F/G

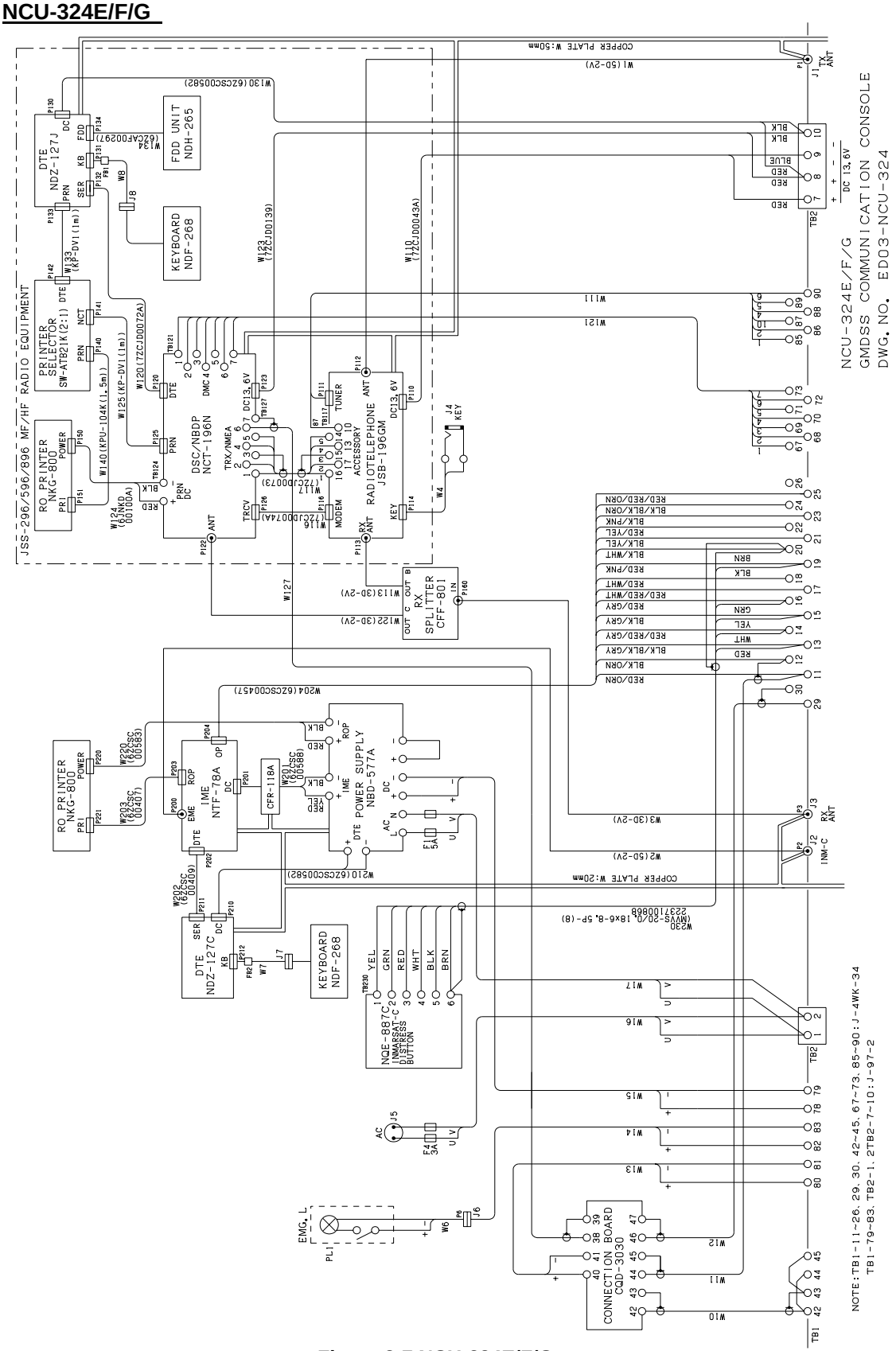


Figure 2-7 NCU-324E/F/G

NCU-1960

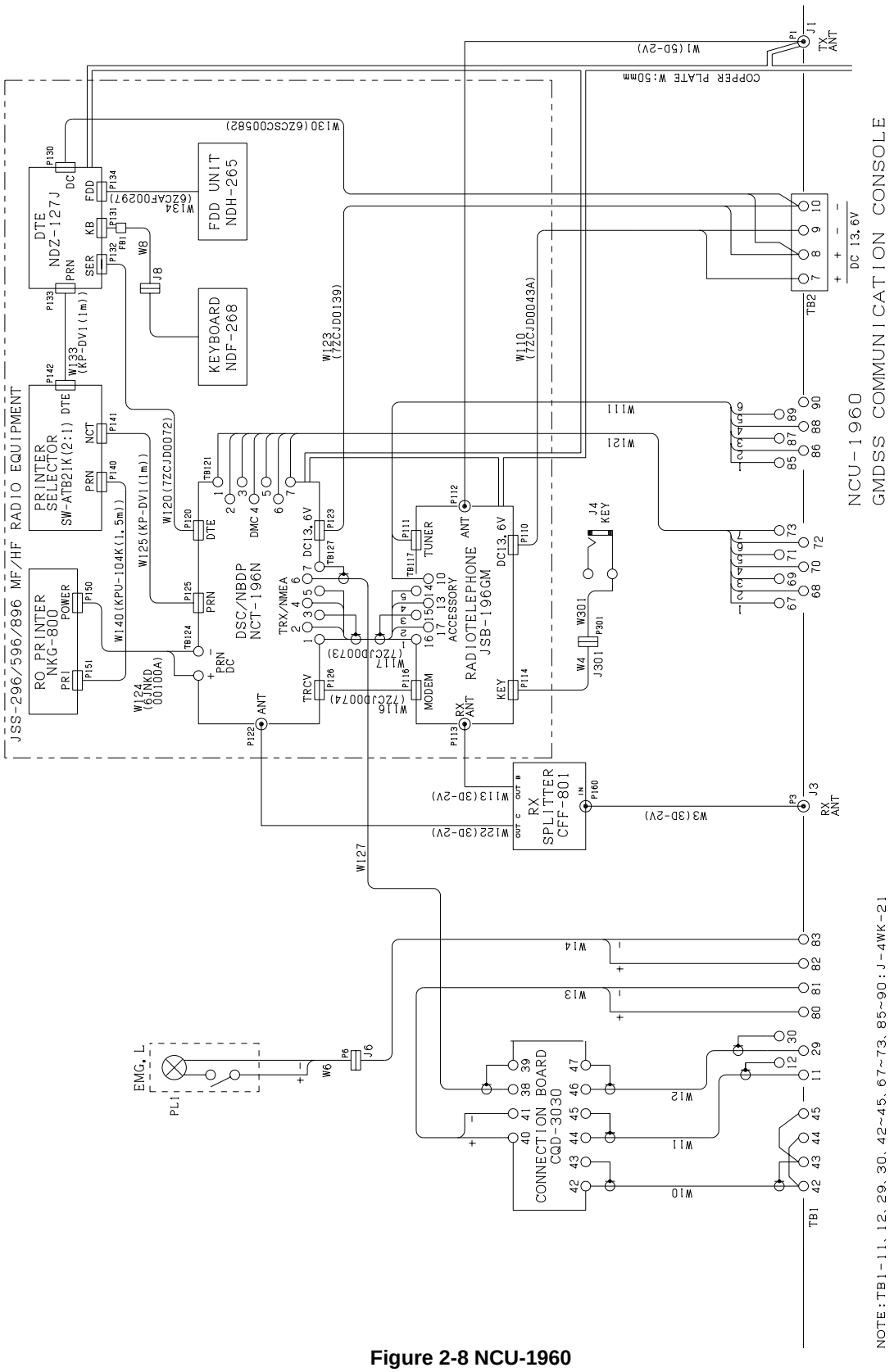


Figure 2-8 NCU-1960

NCU-692

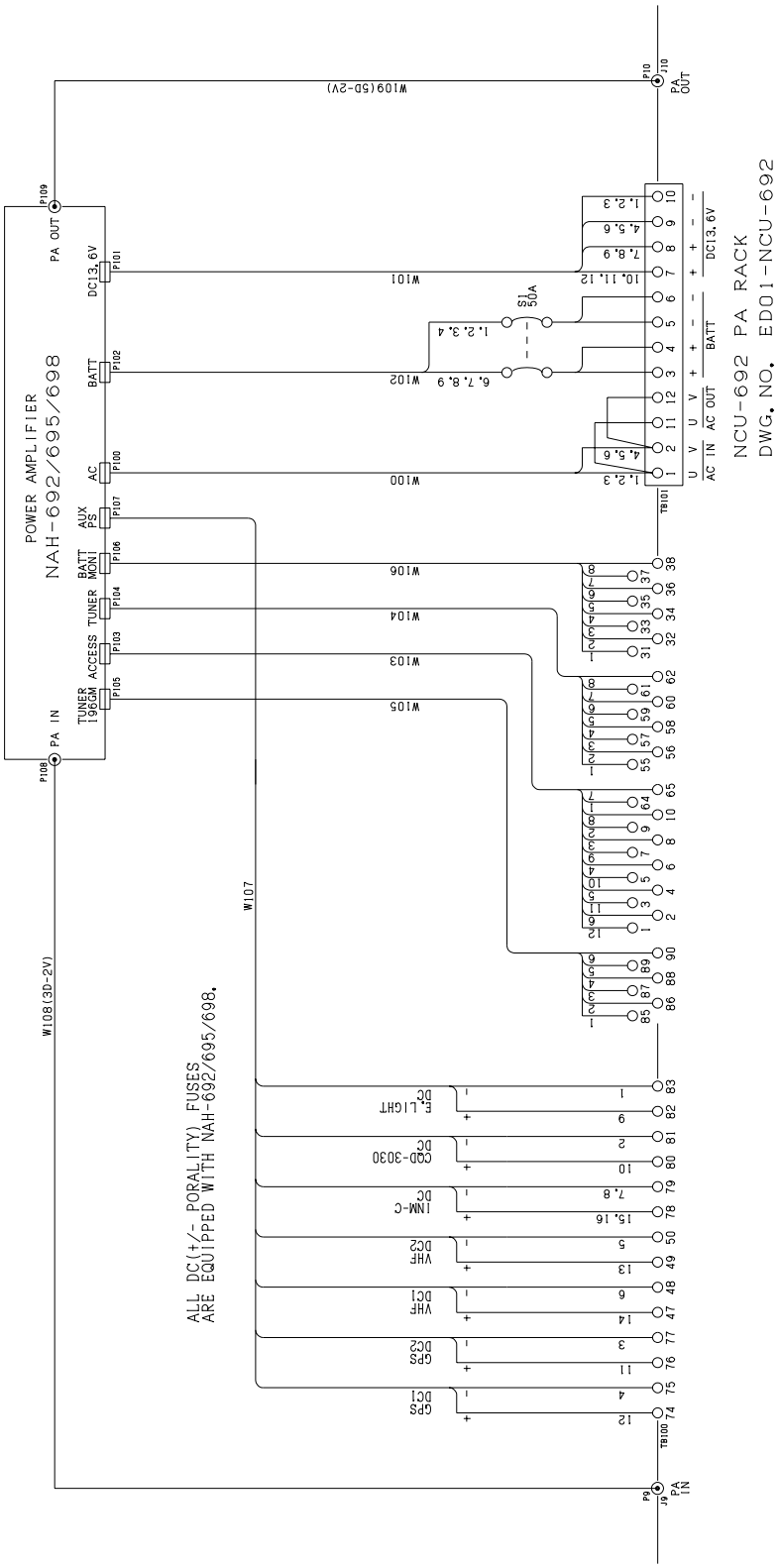


Figure 2-9 NCU-692

3. INSTALLATION

3.1 SELECTING THE ANTENNA LOCATION

The antenna is the electrical conductor that radiates the RF (Radio Frequency) energy from the transmitter and picks up radio signals from other stations for the receiver. There are many antenna types and configurations. The most common are the vertical whip (10 meters in length) and the long wires (10 to 20 meters in length). The vertical whip is most often used aboard motor vessels, tugs, tankers, and fishing boats. The long wire is found predominantly aboard in the from of an insulated side stay or spring stay, insulated back stay, or triadic stay.

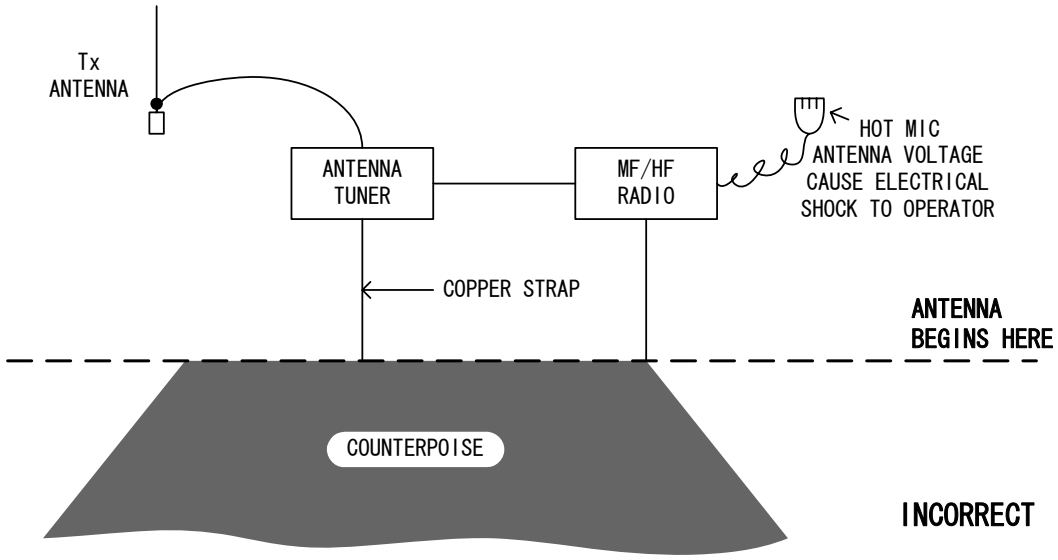
There are several important factors that must be considered when installing the antenna system. The antenna must be as unobstructed as possible and the antenna must be separated from any other antenna system, structure, metal stay, or guy wire. LORAN and OMEGA antennas should be as far away as possible. At least 10 meters is the recommended minimum distance. Even at these distanced, there will be some detuning and directivity to the radiation pattern. The maximum separation possible is preferable.

Should a major portion of the antenna be secured alongside a metal superstructure, a shift in the antenna characteristics causing poor radiation efficiency and difficulty in tuning is expected.

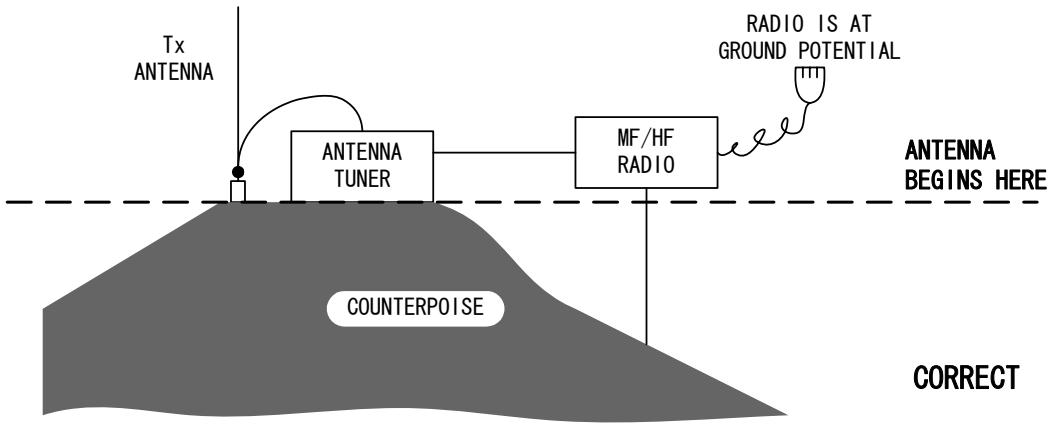
Proper high voltage insulators must be used for the antenna and lead wire and must never be painted or sand blasted.

When planning the installation of the antenna, you must remember that the antenna itself is only a small part of the total antenna system. Of utmost importance is the grounding system (counterpoise) which forms the “other half” of the antenna. The radiation efficiency of an antenna is directly proportional to the effective area of the counterpoise. The larger counterpoise (more area covered) the lower the radiation resistance and the higher the radiation efficiency. Counterpoise systems are no problem on large metal-hulled vessels. The larger the vessel, the better the counterpoise. On small and non-metal hulled vessels, however, the counterpoise requires much more thought and planning. In general, a surface of at least 30 square meters is recommended in addition to bonding all large metal objects together as a part of the counterpoise system.

Figure 3-1 (a) shows the effect of an improper counterpoise system with long grounding straps. This has the effect of including the radio, the antenna coupler, the microphone, and even the operator as part of the radiating system. This not only is inefficient but also is potentially harmful to the operator. The microphone may be “hot” and may “sting” or burn the lips. Figure 3-1 (b) illustration shows a proper system where the antenna actually begins at the counterpoise that keeps the radio (and operator) at “ground” potential.



(a) Improper counterpoise



(b) Proper counterpoise

Figure 3-1 Comparison of antenna Electrical Origin

3.2 MF/HF RADIO EQUIPMENT INSTALLATION

⚠CAUTION

Do not place this equipment anywhere vibration or impact is likely to occur. Doing so may cause a fall or damage to property and persons.

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.

Install the JSS-296/596/896 MF/HF Radio equipment in a location that meets the following conditions:

- A location with minimum vibration.
- A location with sufficient ventilation.
- A location 1.5 m or further from a magnetic compass.

3.2.1 AC and DC connections

JSS-296/596/896 is connected with power source by DPYCY cable. (Refer to Figure 3-2).

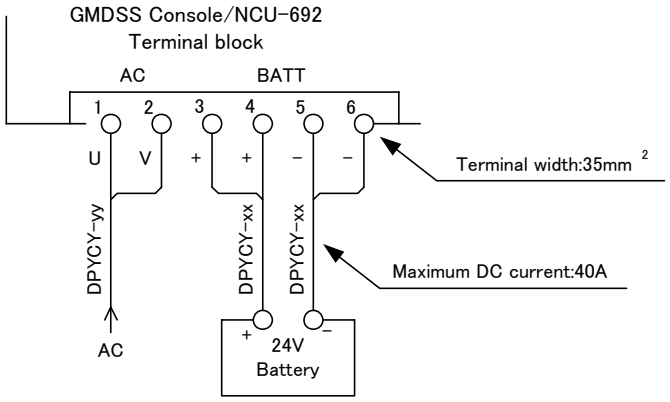


Figure 3-2 Power Cable connection

AC current

The maximum current is as follows.

Maximum current = JSS-296/596/896 + SES + VHF×2

It is as follows, in connecting JUE-75C as SES and connecting JHS-32B as VHF.

Maximum current of 220V operation (JSS-296)

= 7A (JSS-296) + 1.5A (SES:JUE-75C) + 1A×2 (VHF:JHS-32B)

=10.5A (220V)

DC current

The maximum current of DC24V is 40A.

Terminal block width

Even a 35mm^2 cable can connect with the Terminal block.

3.2.2 GMDSS Console Installation

NCU-331E/F/G

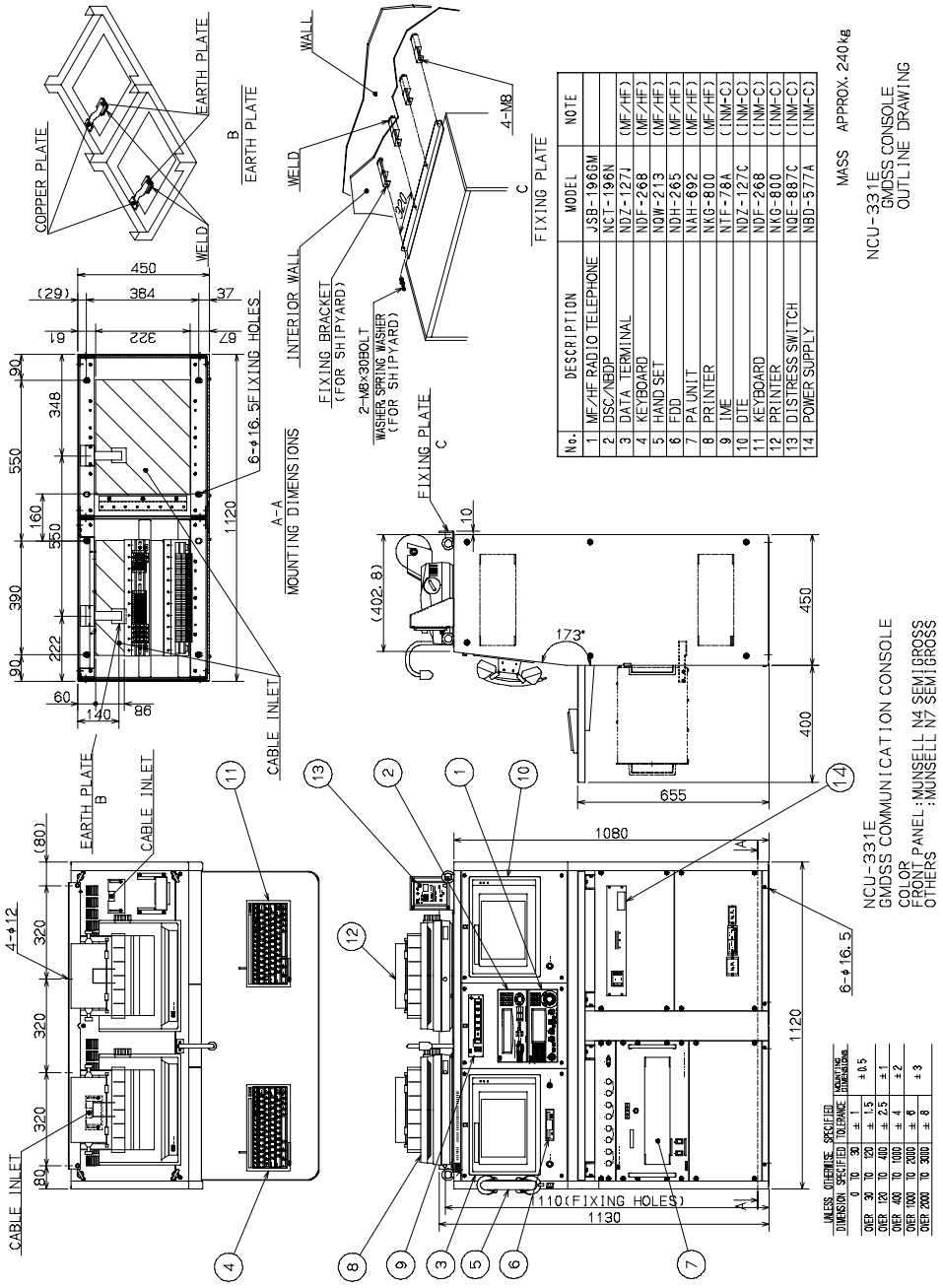


Figure 3-3 NCU-331E/F/G GMDSS Console

NOTE: The Power Amplifier of NCU-331F is the NAH-695.
The Power Amplifier of NCU-331G is the NAH-698.

NCU-324E/F/G

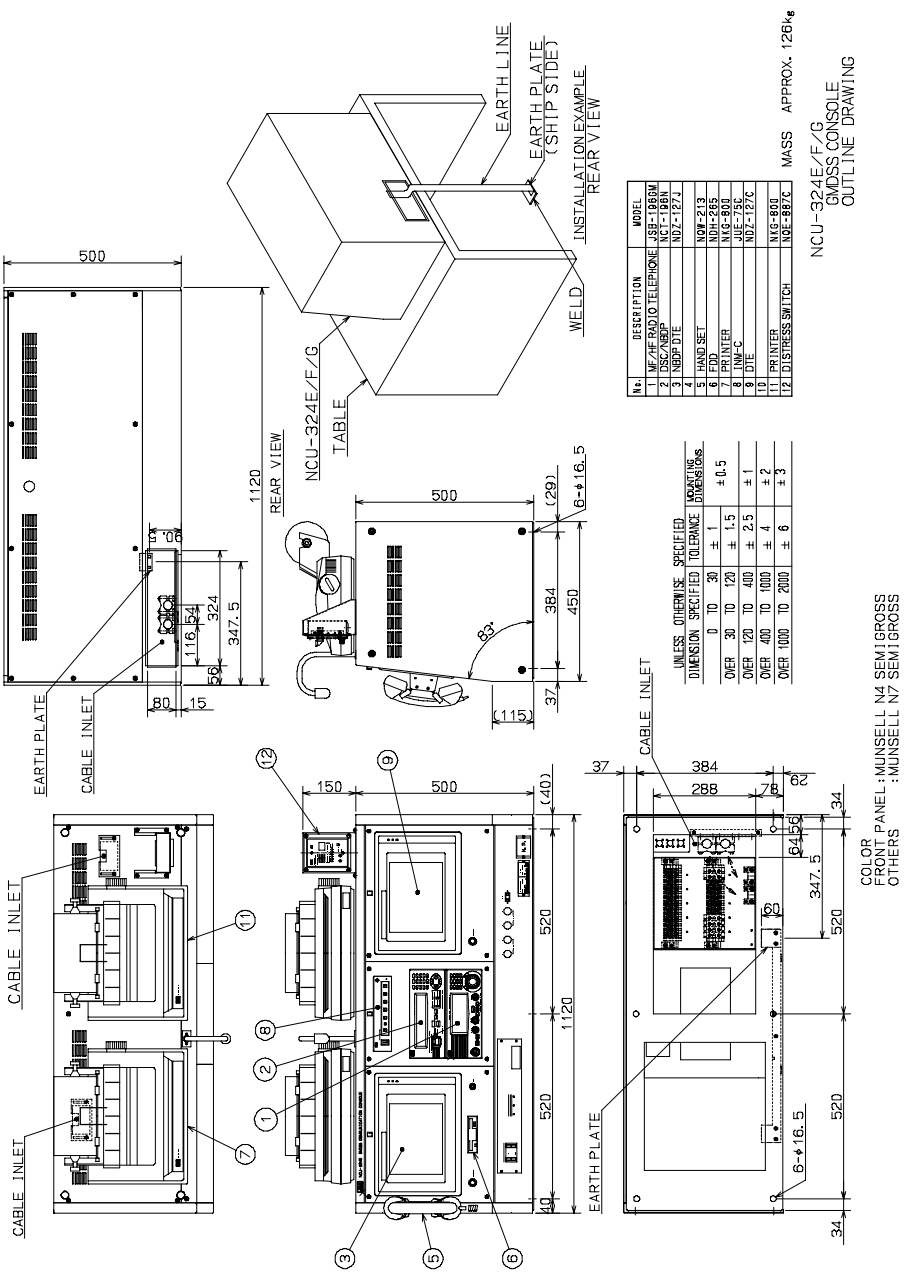


Figure 3-4 NCU-324E/F/G GMDSS Console

NCU-1960

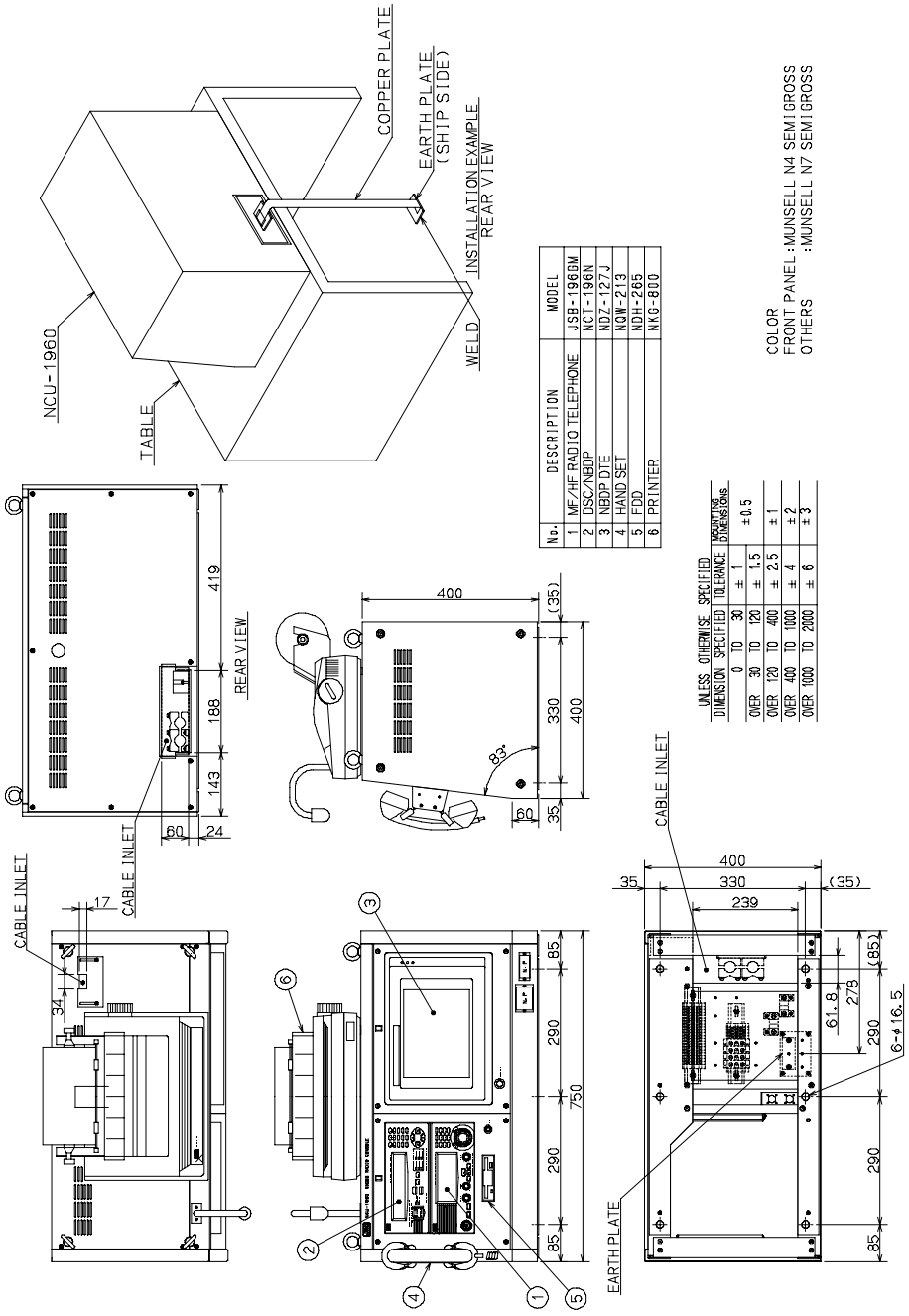


Figure 3-5 NCU-1960 GMDSS Console

3.3 NCU-692 PA RACK INSTALLATION

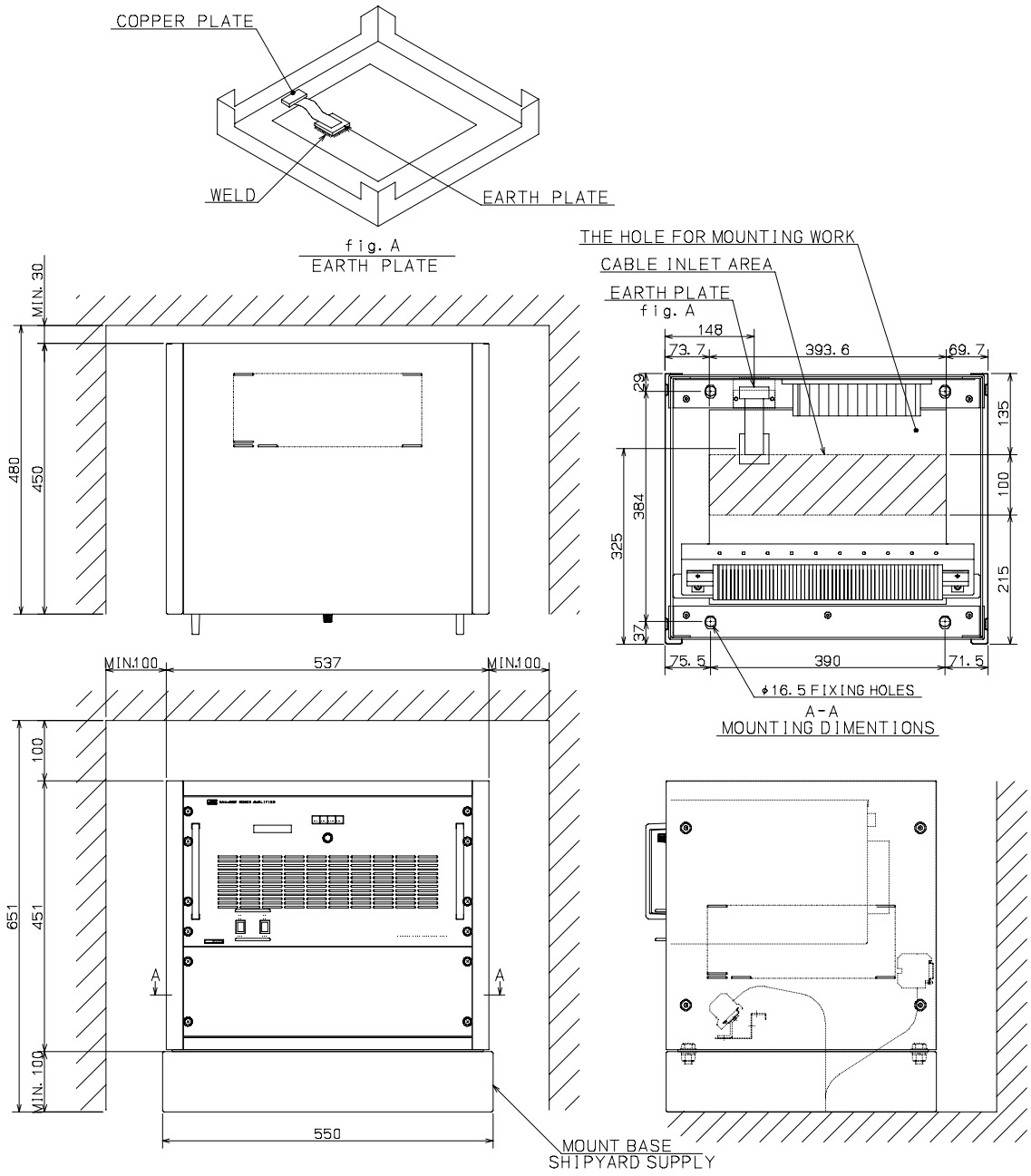


Figure 3-6 NCU-692 PA RACK

3.4 ANTENNA TUNER INSTALLATION

⚠CAUTION

Place Antenna Tuner, antenna and counterpoise in position where no one touches them. Doing not so, may cause electrical shock.

Install the Antenna Tuner in a location that meets the following conditions:

- A location with minimal vibration.
- A location with sufficient ventilation.
- A location capable of supporting a mass of approximately 13kg.
- A location 1.5m or further from a magnetic compass.
- A location with no wave.
- A location with sufficient water drainage.
- A location with no soot, smoke, noxious gas, dust, or heat.
- A location with no freezing or ice.
- A location where personal are not touched within 30cm from antenna and antenna terminal

3.4.1 Indoor Installation

Prior installation, complete the necessary preparation for the mounting brackets, grounding and laying of cables. Grounding is very important for the transmission and reception of radio waves not only by preventing induction impedance and reducing harmful noise but also by effecting antenna performance. Take sufficient caution when performing grounding work and follow the instructions carefully.

(a) Construct mounting brackets and weld them to the ship wall.
(b) Weld the grounding terminal to the wall of the ship.

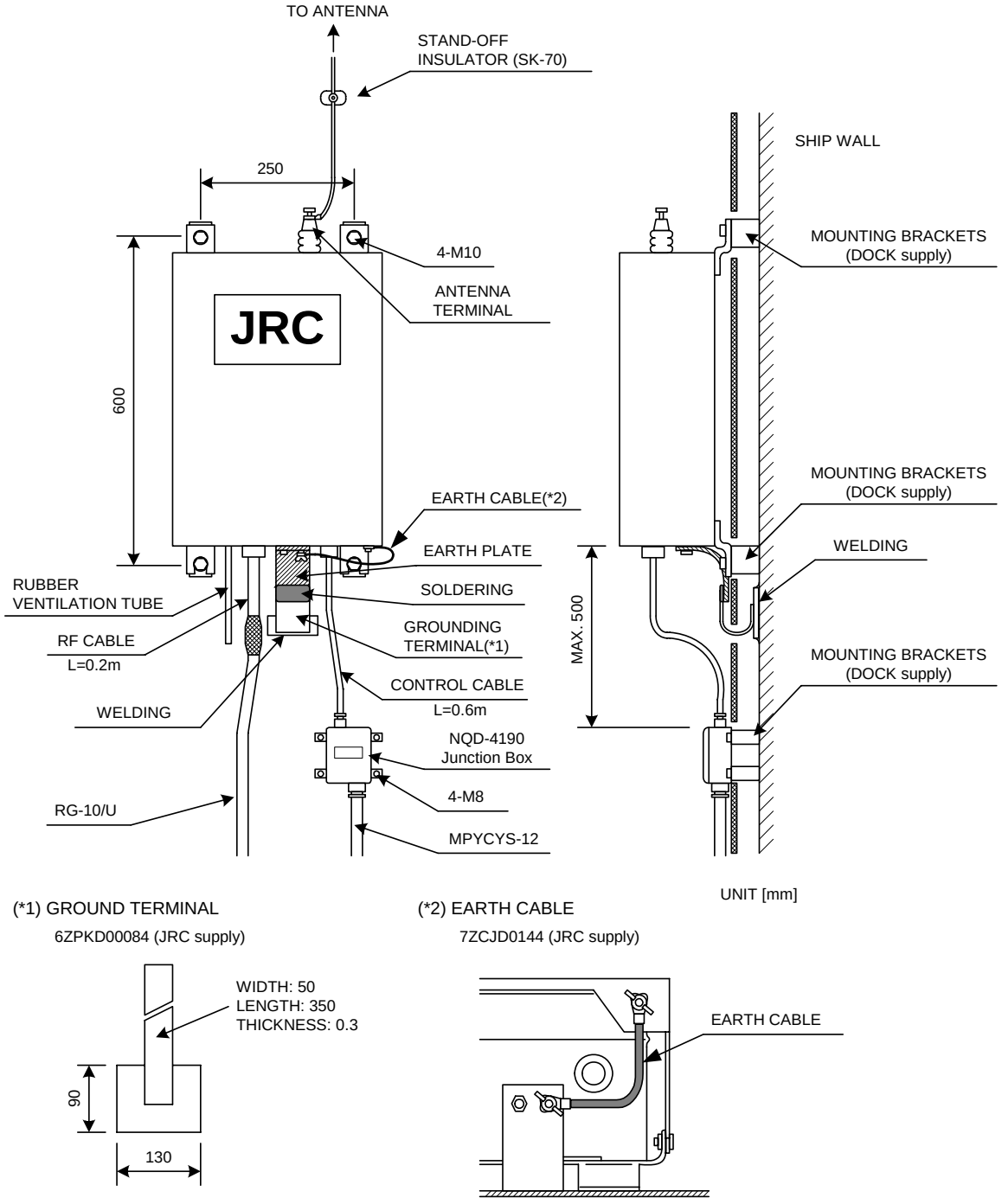


Figure 3-7 ANTENNA TUNER Installation (Indoor)

3.4.2 Outdoor Installation

Pre-installation Precautions

(a) If installing the Antenna Tuner on a pole, secure the pole to a cross beam plate for reinforcement, and if necessary, brace with a stay. Also remember to take into consideration the required strength and ability to withstand vibrations and corrosion when making the pole and setting the angle.

(b) If installing the Antenna Tuner on the ship wall, attach the tuner mounting bracket to a beam for reinforcement, and if necessary, provide further support. Take into consideration the required strength and ability to withstand vibrations and corrosion when making the mounting brackets.

(c) When installing the Antenna Tuner in protective sheltering, ensure that there is adequate space for future maintenance. (Use either removable or door type protective sheltering to allow access for maintenance)

(d) Ensure that the bolts and washers to be used for the Antenna Tuner and Junction Box installation are corrosion resistant.

Installation Precautions

(a) To ensure water resistance, install the Antenna Tuner so that the antenna terminal (insulator) side is up.

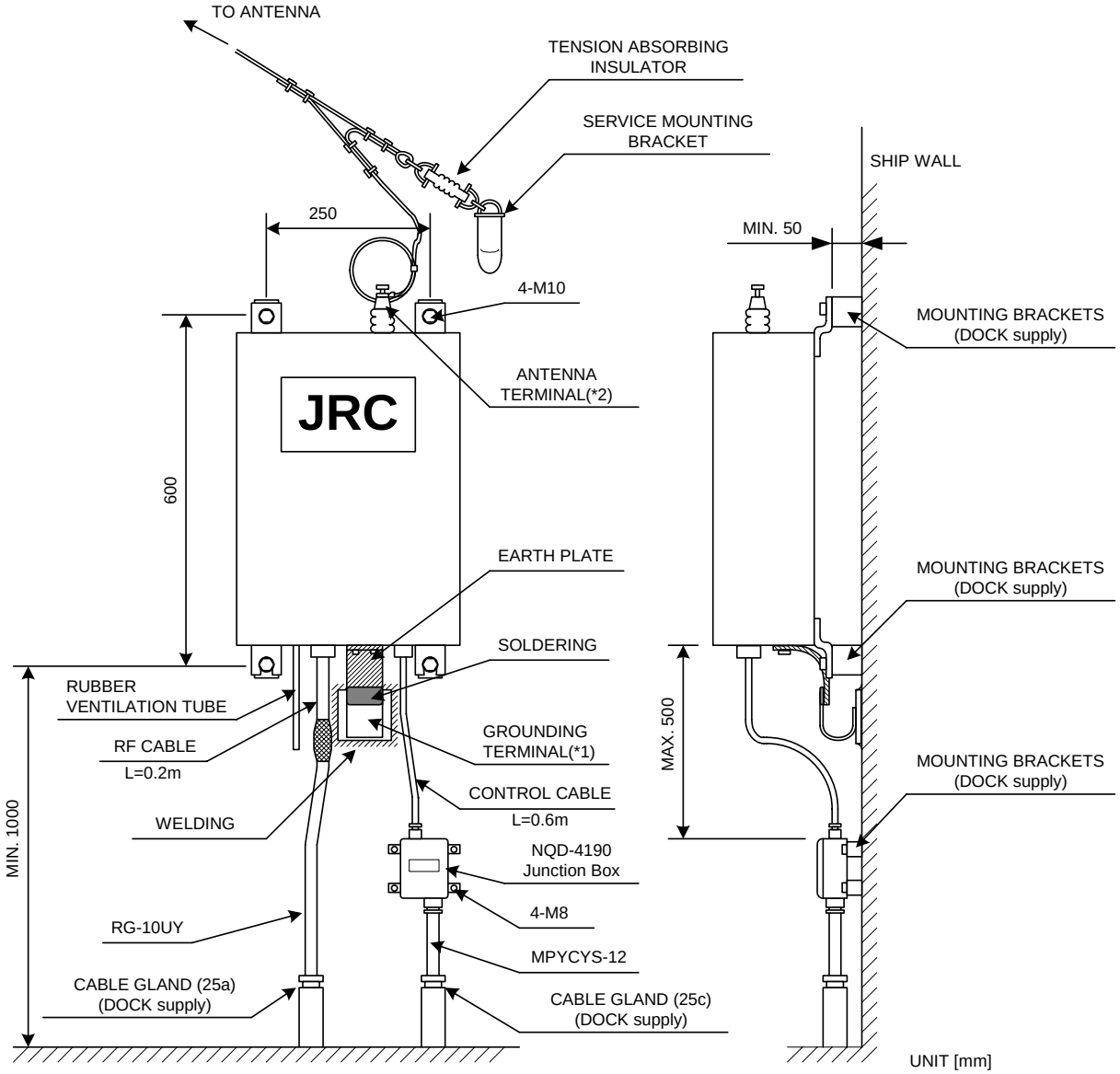
(b) To ensure water resistance, do not cut, remove, bend or attach with cables the rubber ventilation tube to lower part of the Antenna Tuner. Furthermore, to ensure proper ventilation do not allow the end of the tube to touch the floor

Post-installation Precautions

(a) Be sure to fully coat the 6ZPKD0084 Grounding Terminals extending from the Antenna Tuner and the ship wall with paint to prevent those parts from corrosion. It is recommended to reapply this coating once a year.

(b) After connecting cables between the Antenna and Junction Box, be sure to plug the remaining open space inside the lead-in cable tunnel with silicon glue.

Antenna Tuner



(*1) GROUND TERMINAL

6ZPKD00084 (JRC supply)

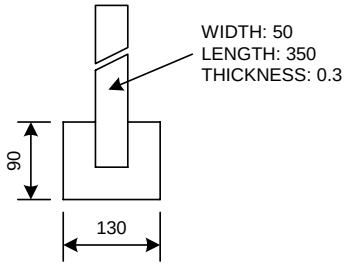


Figure 3-8 ANTENNA TUNER Installation (outdoor)

Bolting the Antenna Tuner

When bolting the Antenna Tuner, use the rubber bonded washers and anti-corrosion insulation sheets provided and affix in all four locations according to Figure 3-9.

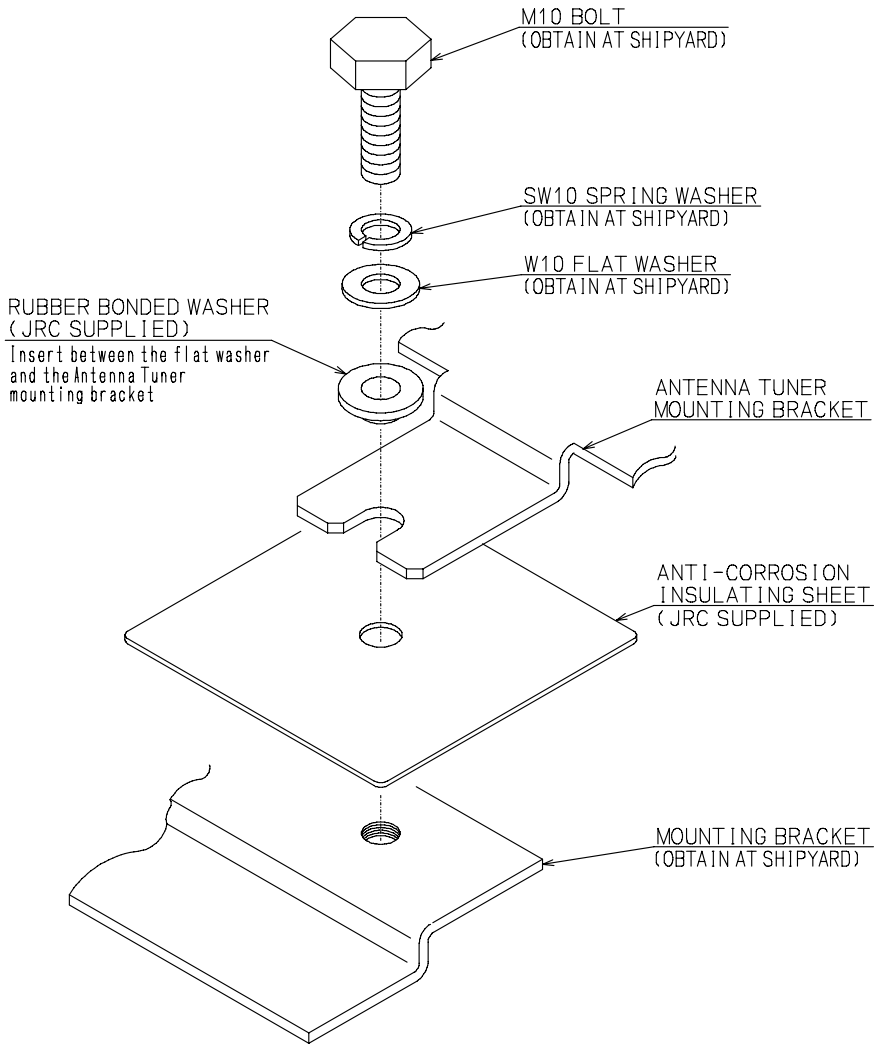


Figure 3-9 Bolting the Mounting Bracket

RF Cable

Use the connector to connector the high frequency cable and after sealing with self-fusion tape, wrap with vinyl tape.

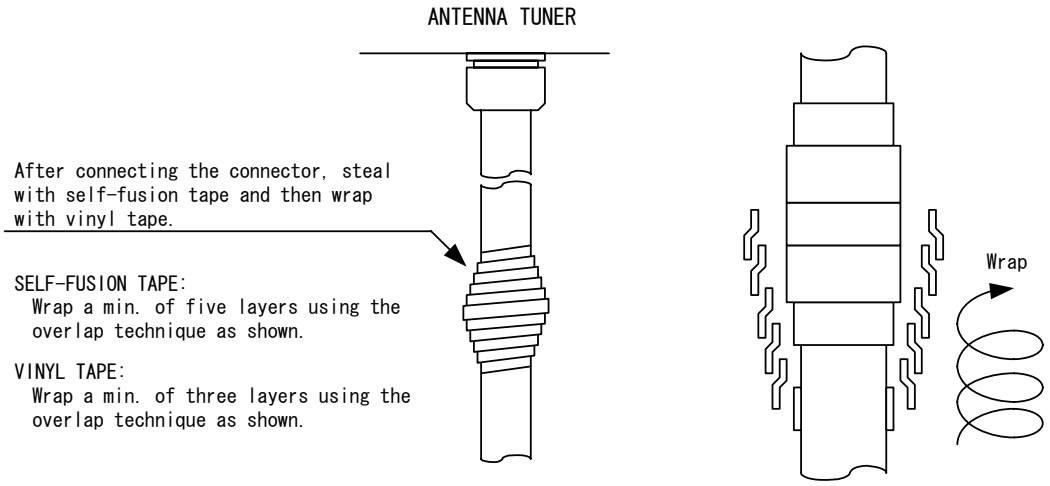


Figure 3-10 Wrapping RF Cable

Connecting the Antenna

Use the tension-absorbing insulator to connect the lead-in antenna cable as shown in figure 3-8. To connect the lead-in antenna cable and the antenna tuner terminal, first insert the cable through the terminal hole and then, after making a loop, affix with a bolt and a wire clip. Secondly, secure the end of the cable with a nut. If the cable is connected without a loop formation, the cable may become disconnected or severed.

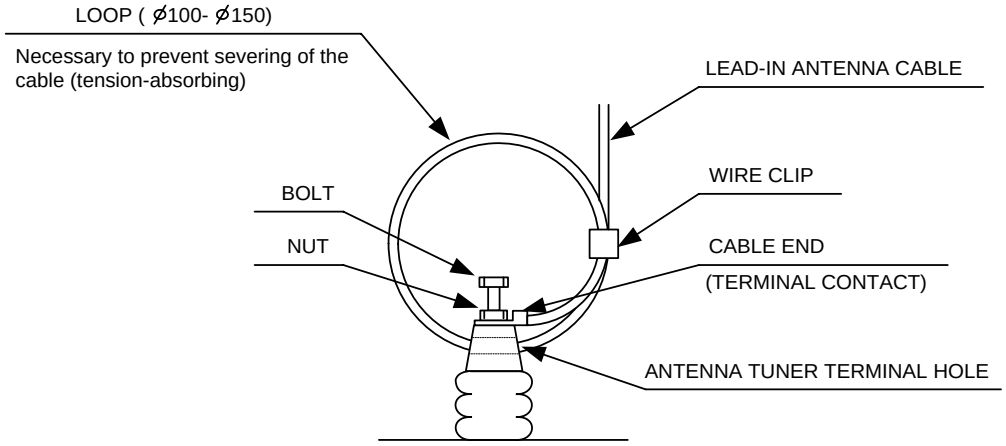


Figure 3-11 Connecting antenna cable

3.5 Junction Box INSTALLATION

Outline drawing

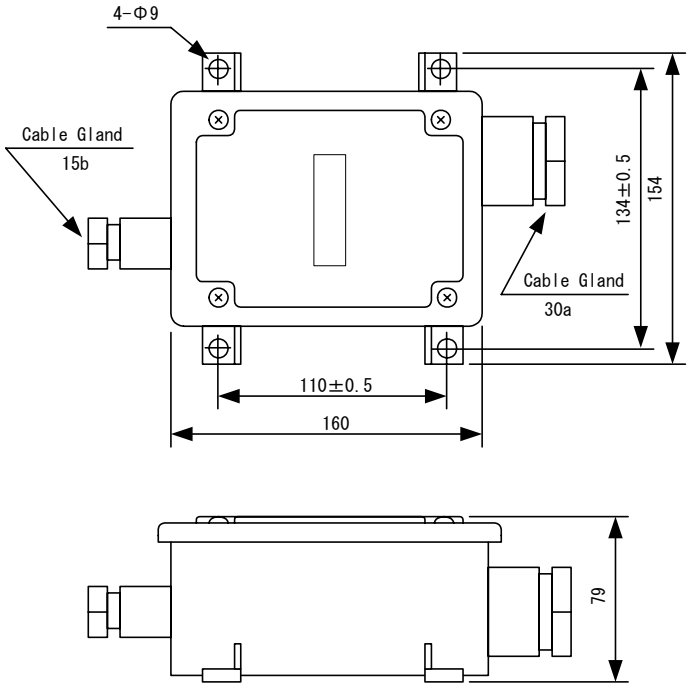


Figure 3-12 NQD-4190 Junction Box

⚠CAUTION

In NFC-296 numbered BC24351 or later, RBK signal cable is added to control signal. So confirm the serial number when installing the NFC-296.

Connection Diagram

NFC-296 numbered BC24351 or later / NFC-896

NQD-4190 Junction Box	NFC-296/896 ANTENNA TUNER ATTACHED CABLE		MPYCYS-12	GMDSS CONSOLE TERMINAL TB1		REMARK
TERMINAL NUMBERS	CABLE COLORS AND NAMES		CABLE NUMBERS	TERMINAL NUMBERS AND NAMES		
1	RED	13.6V+	1, 2	55, 56	13.6V+	
2	BLACK	GND	3, 4	57, 58	GND	
3	GREEN	ANTENNA TUNER Tx	5	59	ANTENNA TUNER Tx	
4	WHITE	ANTENNA TUNER Rx	6	60	ANTENNA TUNER Rx	
5	YELLOW	PA MUTE	7	61	PA MUTE	
6	GRAY	ANTENNA CURRENT	8	62	ANTENNA CURRENT	
7	PINK	RBK	9	6	RBK	
8	–	–	–	–	–	
9	–	–	–	–	–	
10	SHIELDING BRAIDED WIRES	GND	SHIELDING BRAIDED WIRES	SHIELDING BRAIDED WIRES	GND	

NFC-296 numbered from BC22067 to 24090

NQD-4190 Junction Box	NFC-296 ANTENNA TUNER ATTACHED CABLE		MPYCYS-12	GMDSS CONSOLE TERMINAL TB1		REMARK
TERMINAL NUMBERS	CABLE COLORS AND NAMES		CABLE NUMBERS	TERMINAL NUMBERS AND NAMES		
1	RED	13.6V+	1, 2	55, 56	13.6V+	
2	BLACK	GND	3, 4	57, 58	GND	
3	GREEN	ANTENNA TUNER Tx	5	59	ANTENNA TUNER Tx	
4	WHITE	ANTENNA TUNER Rx	6	60	ANTENNA TUNER Rx	
5	YELLOW	PA MUTE	7	61	PA MUTE	
6	GRAY	ANTENNA CURRENT	8	62	ANTENNA CURRENT	
7	–	–	–	–	–	
8	–	–	–	–	–	
9	–	–	–	–	–	
10	SHIELDING BRAIDED WIRES	GND	SHIELDING BRAIDED WIRES	SHIELDING BRAIDED WIRES	GND	

Refer to Figure 3-13, 3-14

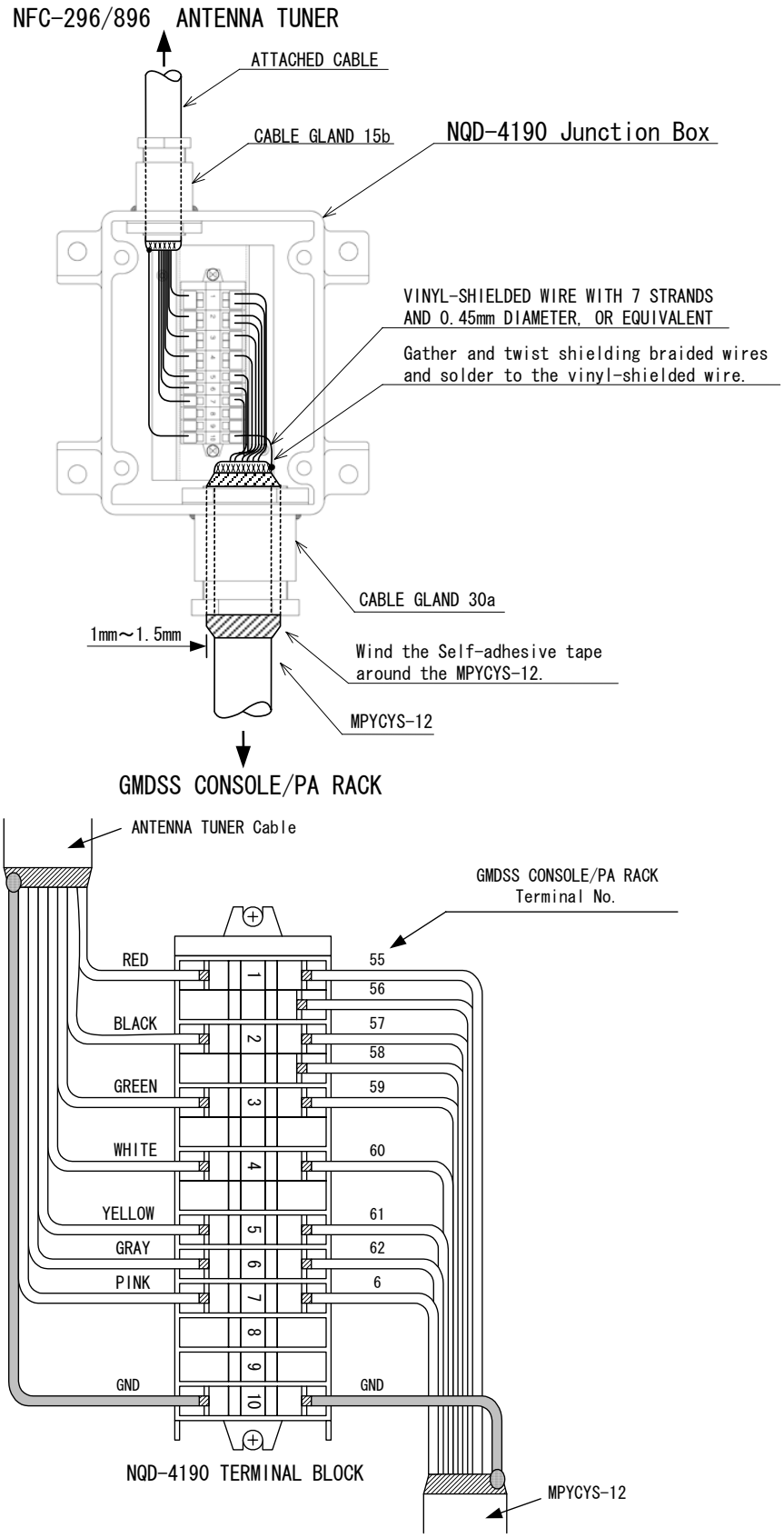


Figure 3-13 Antenna Tuner-Junction Box cable connection

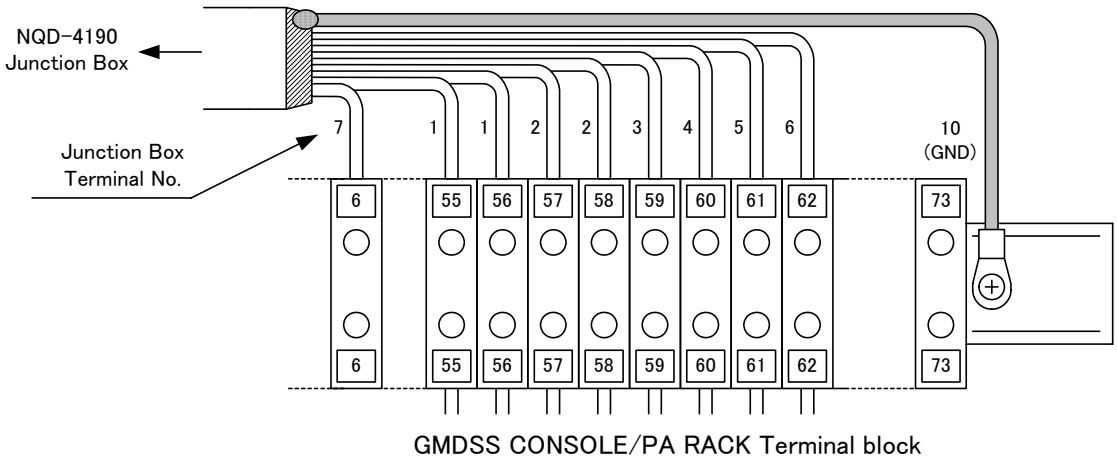


Figure 3-14 Junction Box-GMDSS CONSOLE/PA RACK cable connection

3.6 Printer INSTALLATION

Install the Printer in a location that meets the following conditions:

- A location with minimal vibration.
- A location where the distance between the Printer selector and Printer does not exceed the length of the dedicated cable with connector (L=1.5m).
- A location 1.5m or further from a magnetic compass.

3.6.1 Ensuring Maintenance Space and Positioning

When installing the unit, ensure that the required maintenance space, as shown in the Figure below, is provided. Assure that adequate maintenance space is available when selecting the installation. Also be sure to secure the printer using the supplied Velcro tape.

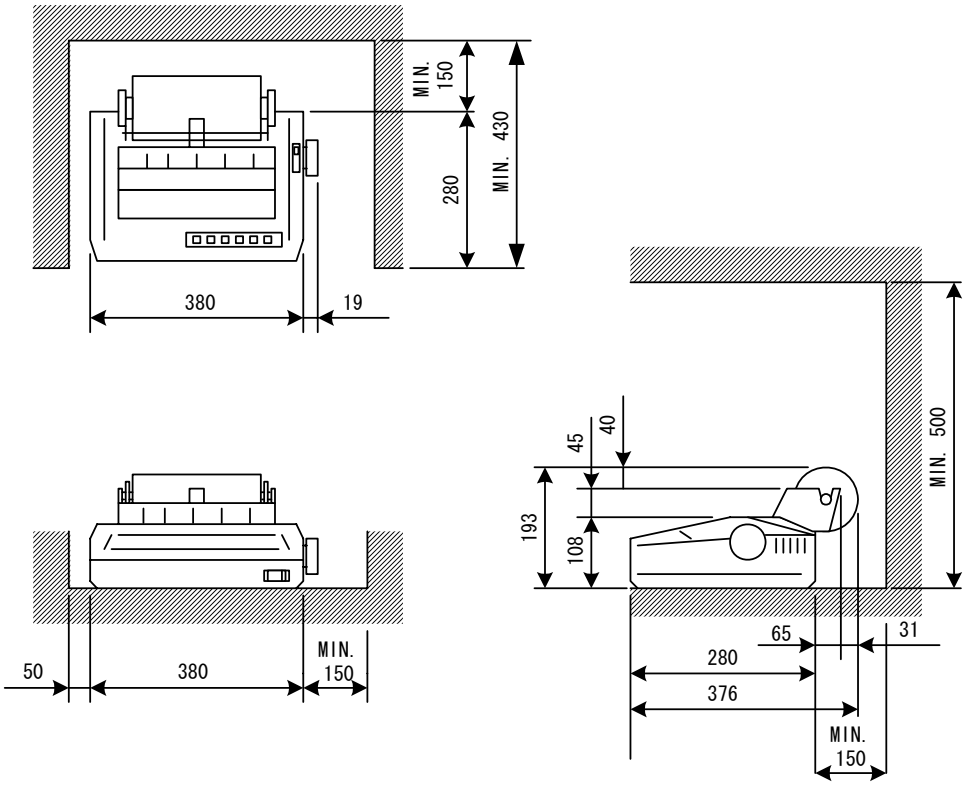


Figure 3-15 Printer Maintenance Space

⚠ CAUTION

Notes on using the printer

Be sure to turn OFF the printer's power when opening and closing the printer cover.
Failure to comply could result in electrical shock, failure, or injury.

Do not drop or strike the printer.
Doing so may cause failure or malfunction.

Just after printing, the temperature of the printing head is high.
Do not touch the printing head until the temperature goes down.
Doing so may cause a burn or an injury.

Never try to disassemble or repair the printer yourself.
Doing so may cause failure or malfunction.

Do not touch any part of the cutter.
Doing so is potentially dangerous.

When attaching the ribbon, be sure it does not get twisted.
Doing so may cause failure or malfunction.

Wait at least two seconds to restart the system after turning the power switch OFF.
Otherwise the initialization may not proceed correctly or a malfunction may occur.

Do not attempt to print without the ribbon cassette cartridge or paper.
Doing so may cause failure or malfunction.

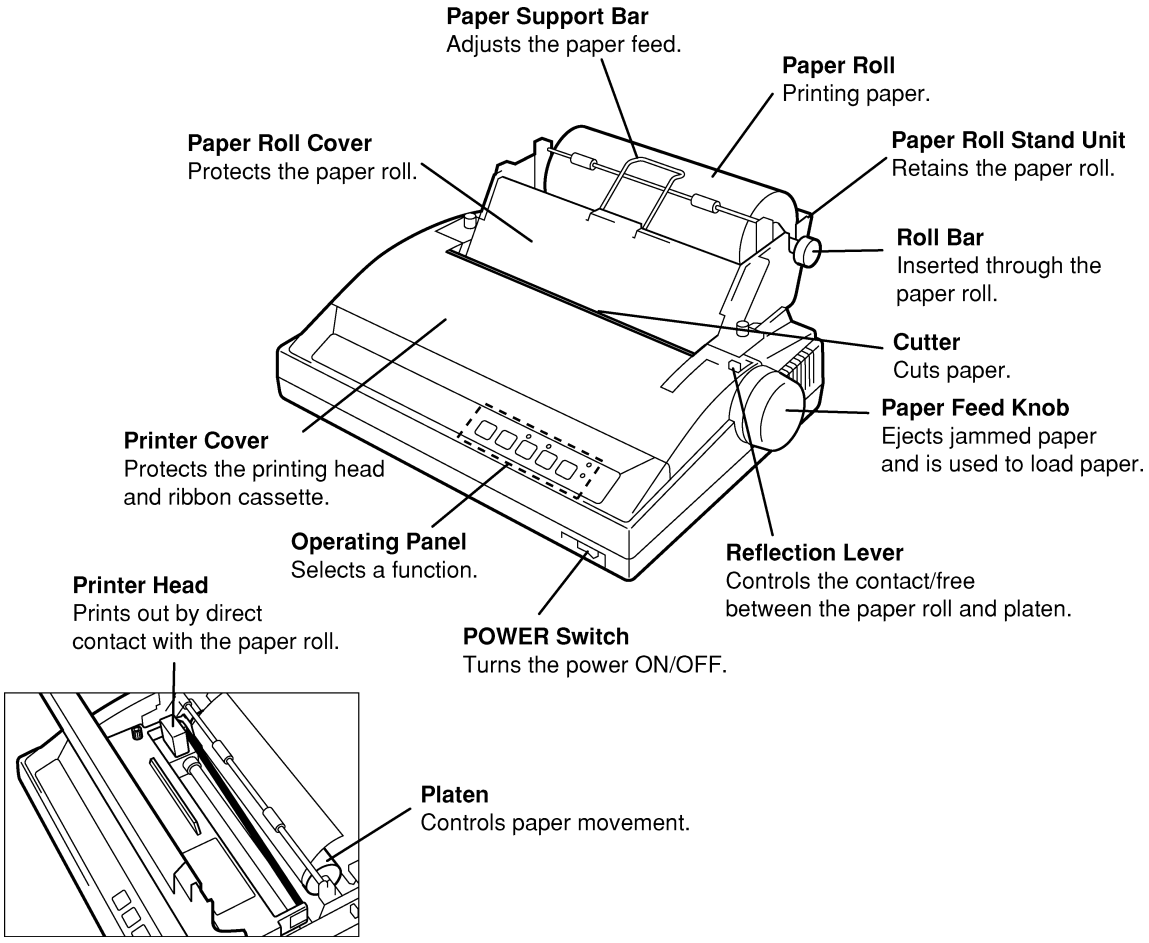
When the printer is working, be sure not to allow your hands, any articles of clothing or accessories (a necktie or jewelry for instance) too close to the unit.
Doing so may cause injury.

Do not place anything such as liquids or metals on top of the printer.
They may drop into the printer, causing fire or malfunction.

Do not install the printer in the following locations.
Doing so may cause a fire, malfunction or degradation of printing quality.

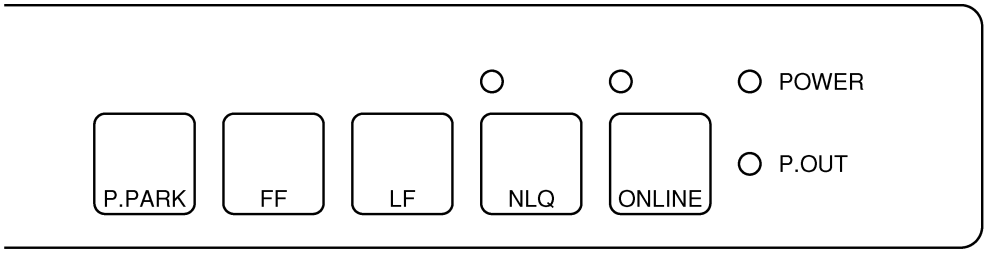
- On a surface that is not horizontal, or where the vibration is severe.
- In a location subject to direct sunlight or excessive dust.
- In a location subject to extremely high or low temperatures.
- In a location subject to excessive humidity.

3.6.2 Names and Functions



3.6.3 Operating Panel

From the operating panel, switching on-line/off-line, selecting of high quality characters, forced line feed, and forced page feed can be controlled.



P.PARK

Paper park switch (Not operable in this system)
While the paper roll is set, this function allows single sheet paper use, such as size A4, by moving the paper roll back to the tractor position.

FF

Page feed switch
Feeds paper one page at a time. The page length is set by DIP switch 6 (near end of paper sensor).

LF

Line feed switch
Each time FF is pressed, the line feeds by 1/6 of an inch. Continuous line feed is executed by holding down the switch.

○ NLQ

NLQ lamp
When selecting (NLQ) SERIF for high quality character: Lights
When selecting SANS SERIF for high quality character: Blinks
When selecting normal character (DRAFT): OFF

NLQ switch
Selects a character from among (NLQ) SERIF, Standard (DRAFT), and SANS SERIF. The relation of the printing mode, to the NLQ lamp, and number of beeps is as follows.

Printing mode	:	NLQ SERIF	→	DRAFT	→	SANS SERIF	→	NLQ SERIF
NLQ lamp	:	Lights		Off		Blinks		Lights
Beep	:		3 times		1 time		2 times	

○ ONLINE

ONLINE lamp
Lights when the printer is in an on-line state (data reception is set), and the light is off in the OFF line state. When the printing pitch and margin are set, the light blinks at 0.3 sec. intervals.

ONLINE switch
Switches the on-line/off-line state.

○ P.OUT

P.OUT lamp
Lights when there is no paper in the printer. When this happens, the printer is in an off-line state. The light goes off after loading the paper and pressing the ONLINE switch. When an error is detected, it blinks.

○ POWER

POWER lamp
Lights when the printer power is ON.

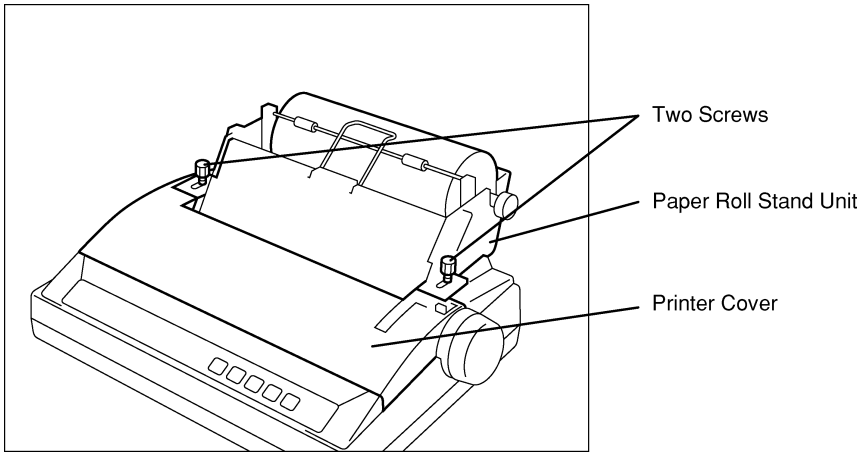
3.6.4 Opening / Closing the Printer Cover

When opening the printer cover, move the paper roll stand unit one step back. To open/close the printer cover, follow the procedures consecutively.

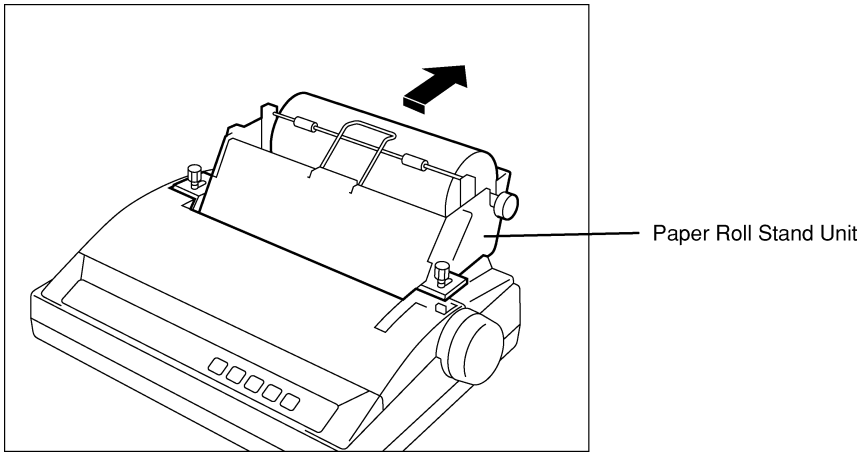
⚠ CAUTION
Be sure to turn OFF the printer's power when opening and closing the printer cover. Failure to comply could result in electrical shock, failure, or injury.
Just after printing, the temperature of the printing head is high. Do not touch the printing headuntil the temperature goes down. Failure to comply could result in a burn or injury.
Do not touch any part of the cutter. Doing so is potentially dangerous.

Procedure

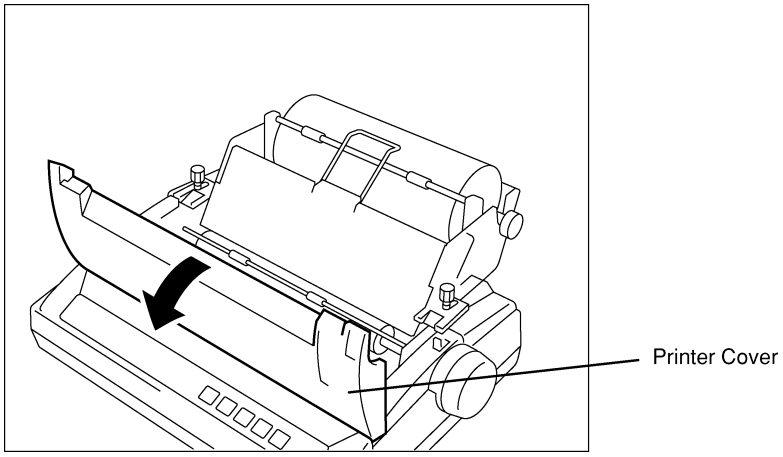
1. Loosen the two screws holding the paper roll stand unit fixed.
When closing the printer cover, follow the steps in reverse order.



2. Move the paper roll stand unit one step backwards.



3. Open the printer cover.



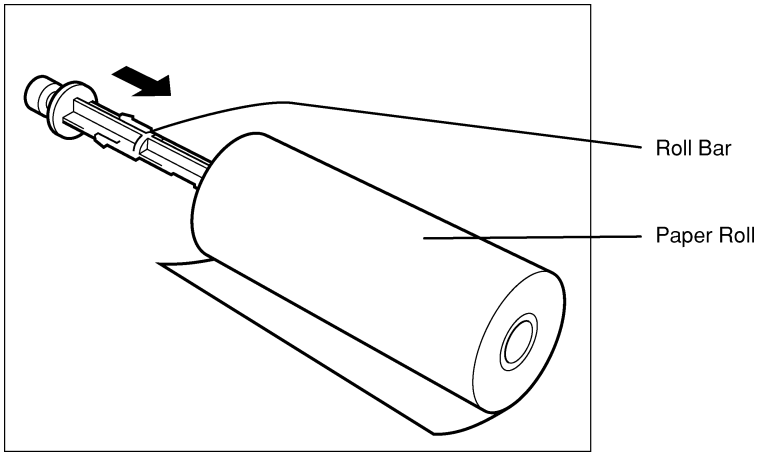
3.6.5 Replacing the Roll Paper

When replacing the paper roll, proceed as follows.

⚠ CAUTION	
	Be sure to turn OFF the printer power when opening and closing the printer cover. Failure to comply could result in electrical shock, failure, or injury.
	Just after printing, the temperature of the printer head is high. Do not touch the printer head until the temperature goes down. Failure to comply could result in a burn or injury.
	Do not touch any part of the cutter. Doing so may result in injury.

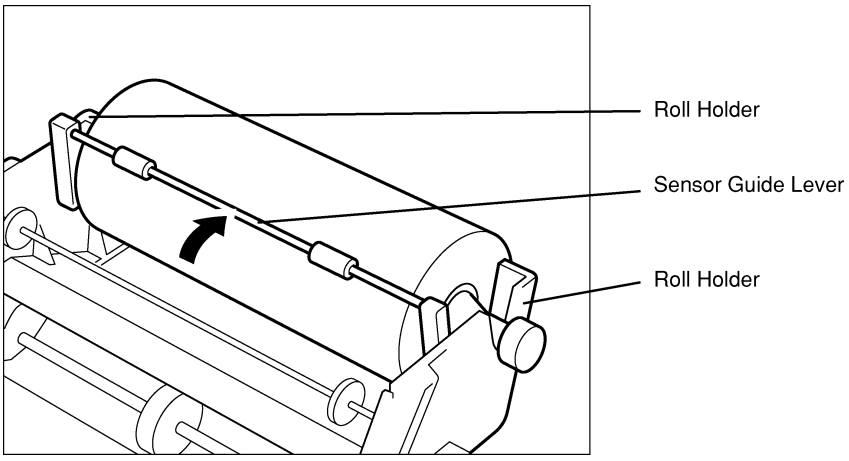
Procedure

1. Insert the roll bar through the center of the paper roll.
If the leading edge of paper is torn or bent, cut it off in a straight line.



2. Attach the roll bar with the paper roll onto the paper roll stand unit holder, taking care to notice he paper roll's direction.

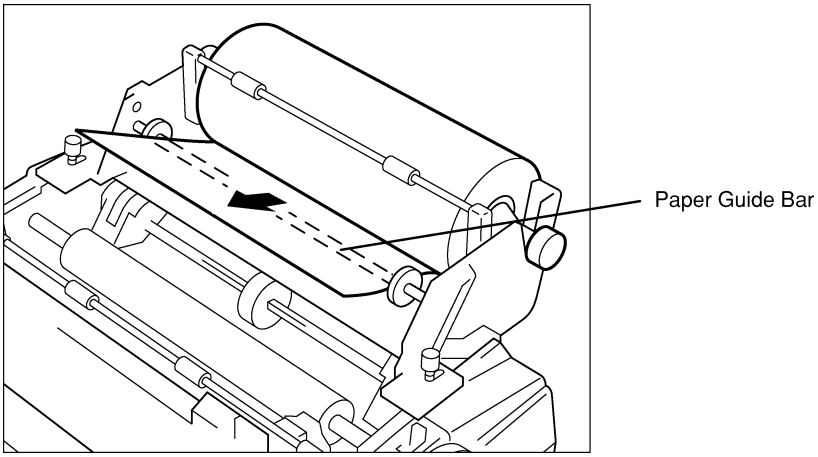
Set the sensor guide lever so that it touches the paper roll.



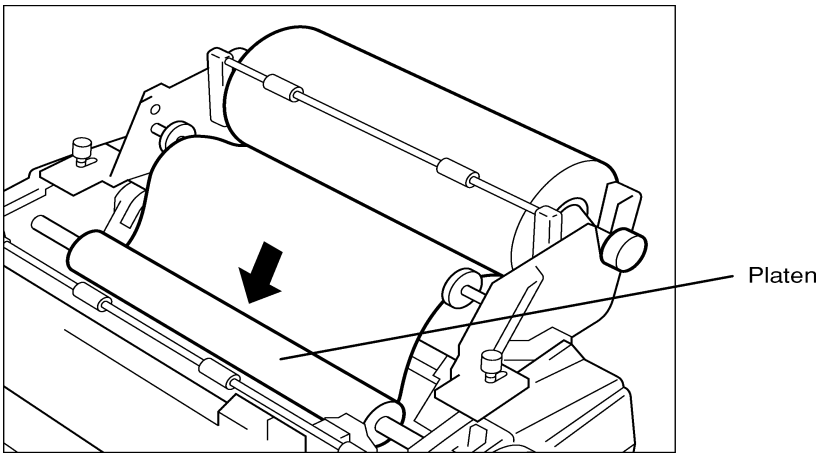
Note

- Perform the consecutive procedures while the printer cover is open.
- To open the printer cover, refer to 3.6.4.

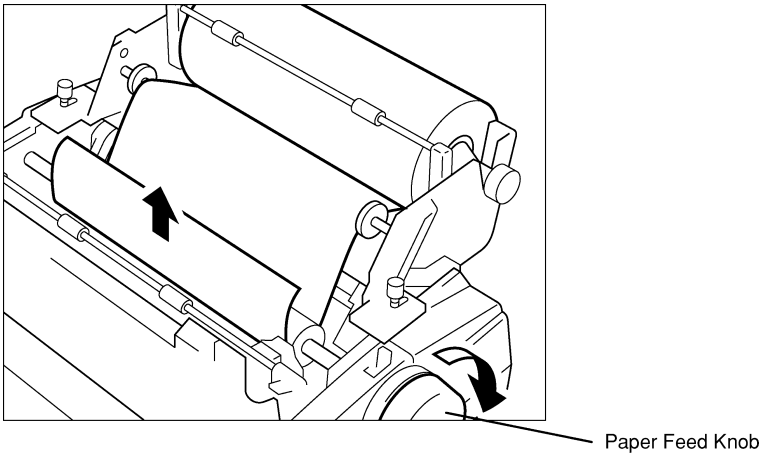
3. Pull out the leading edge of the paper onto the paper guide bar.



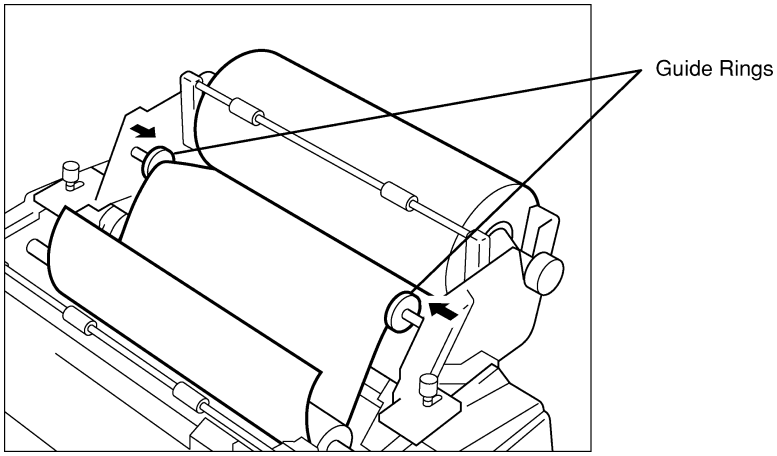
4. Insert the leading edge of the paper from behind the platen



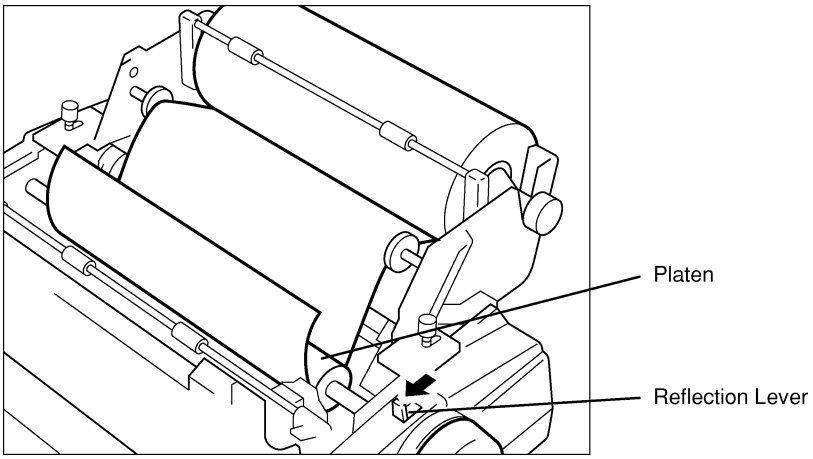
5. Turn the paper feed knob and pull out the leading edge of the paper.



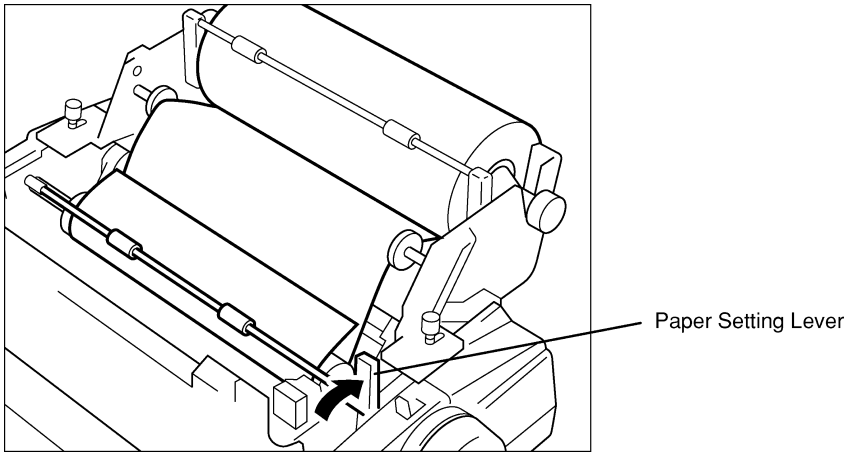
6. Adjust the paper position for both sides of paper in and paper out, so that the left and right guide rings of the paper guide bar support the paper lightly.



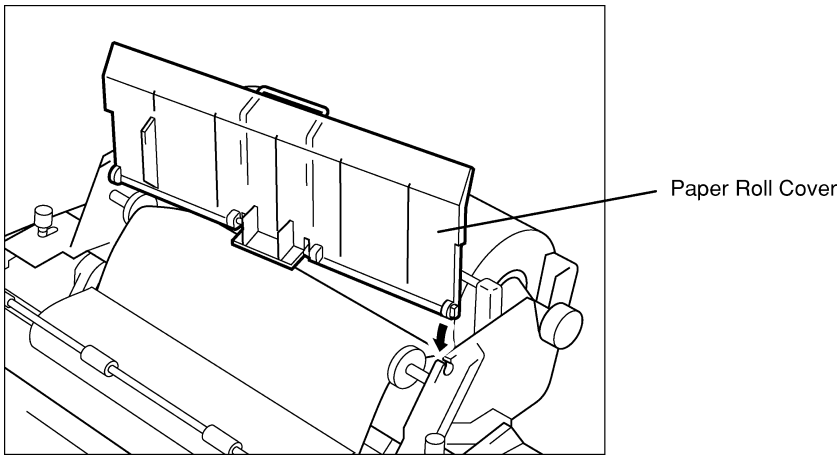
7. Pull down the reflection lever.
The paper touches the platen securely.



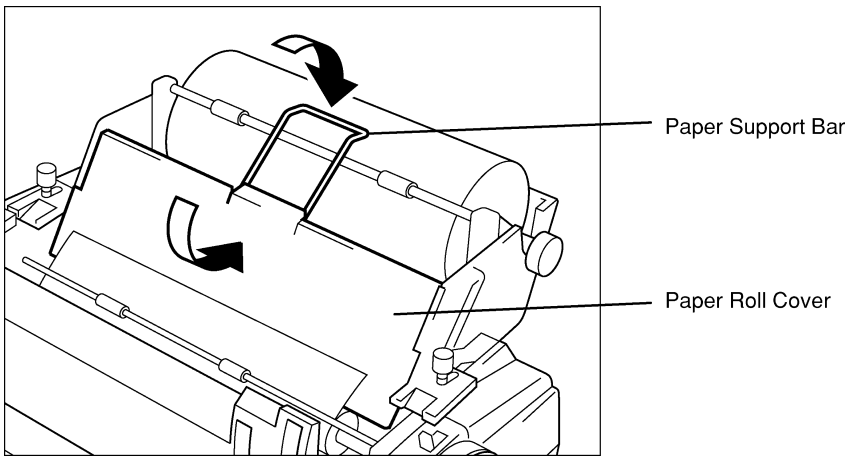
8. Pull down the reflection lever.
Lift the paper setting lever to harness the paper emerging from the platen.



9. First, insert the axis of the left side of the paper roll cover into the left hole of the paper roll stand, then set the right side.



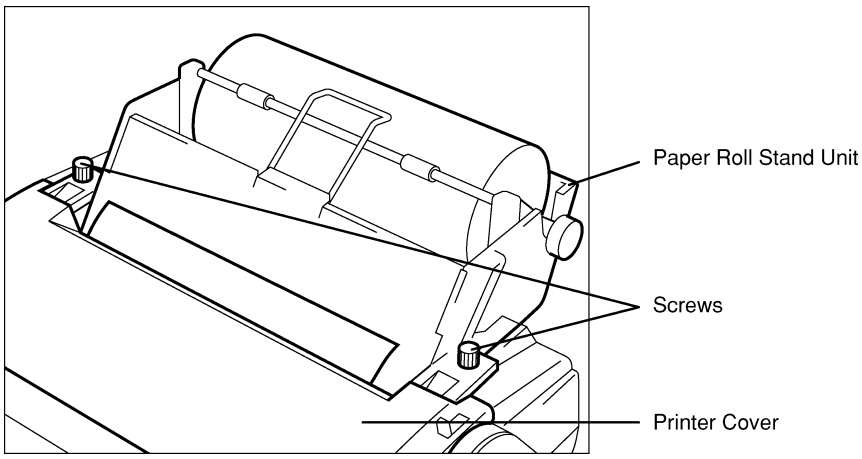
10. Lower the paper roll cover and then push down the paper support bar.



11. Close the printer cover.
For further details of steps 11 through 13, refer to 3.6.4.

12. Pull the paper roll stand unit one step forward.

13. Turn the screws tightly to stabilize the paper roll stand unit.



3.6.6 Replacing the Ribbon Cassette Cartridge

When the printing quality becomes faint, replace the ribbon cassette cartridge with a new one.
To replace, proceed as follows.

⚠ CAUTION

Be sure to turn OFF the printer power when opening and closing the printer cover.
Failure to comply could result in electrical shock, failure, or injury.

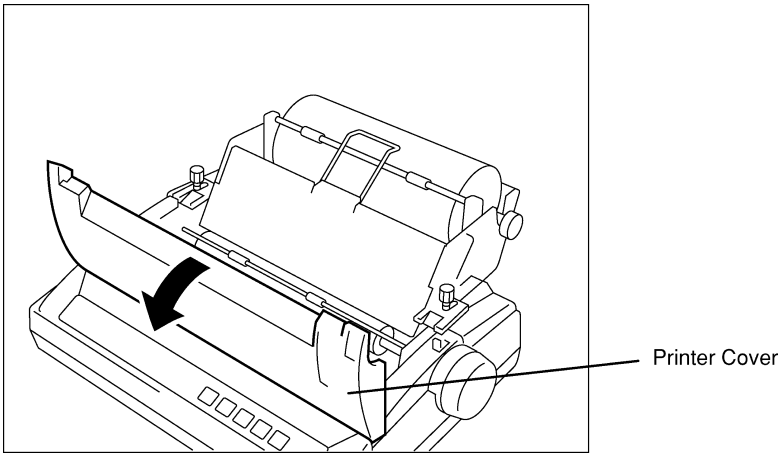
Just after printing, the temperature of the printer head is high. Do not touch the printer head until the temperature goes down.
Failure to comply could result in a burn or injury.

Do not touch any part of the cutter. Doing so may result in injury.

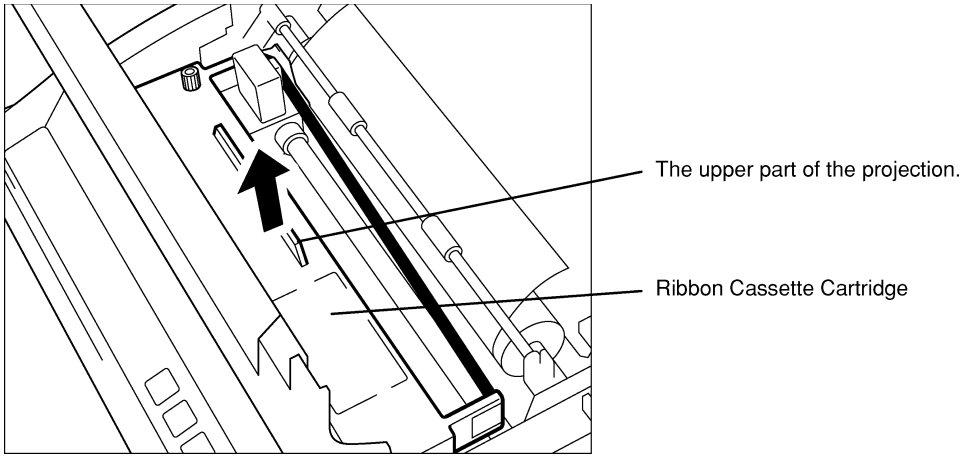
Procedure

1. Open the printer cover.

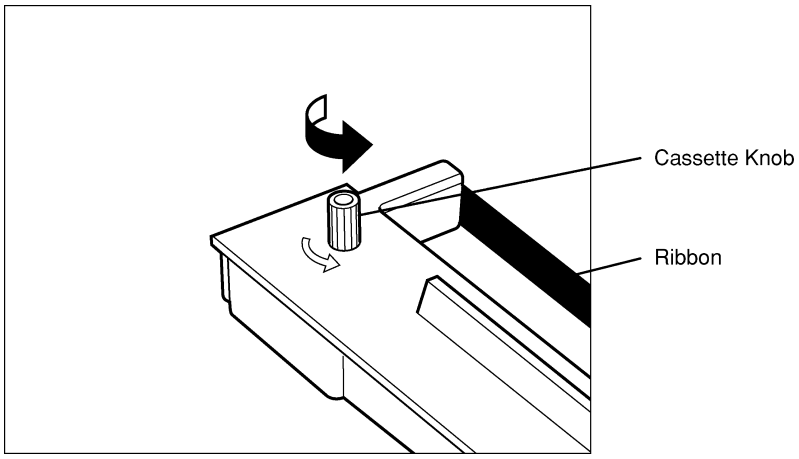
Note ・ To open the printer cover, refer to 3.6.4.



2. Lift up the tip of the ribbon cassette cartridge by grasping the projection on top, and remove it.



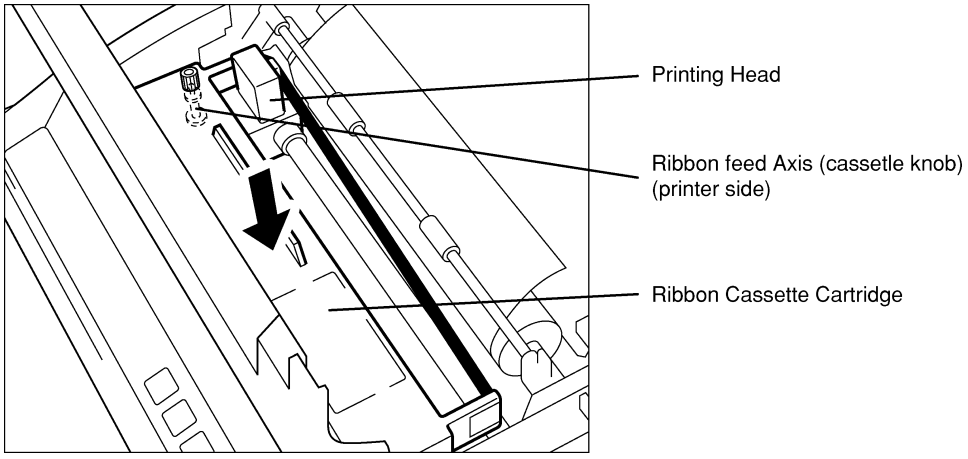
3. Turn the cassette knob of the new ribbon cassette cartridge counterclockwise to increase the tension of the ribbon.



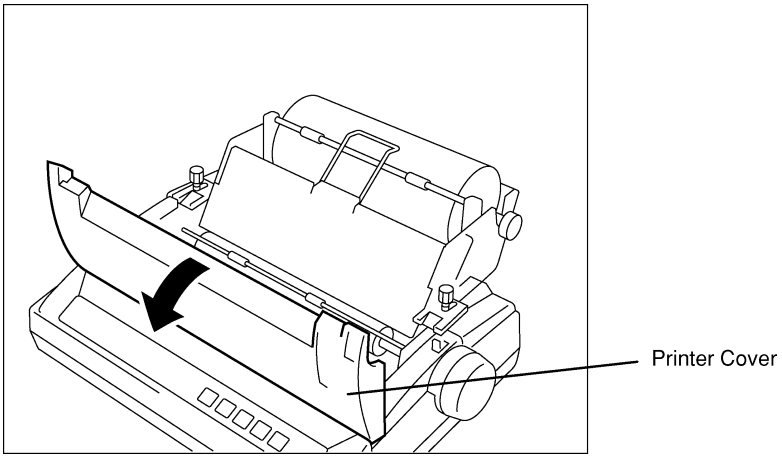
4. Manually, move the printing head to the home position (left side) and place the ribbon cassette cartridge in the printer so that the ribbon is positioned between the ribbon mask and the printing head. In this case, make sure that the ribbon feed axis is inserted through the hole under the ribbon cassette knob.

Note

- Lightly press the ribbon cassette cartridge at both ends.
- Turn the cassette knob again to increase the tension of the ribbon.
- Confirm that the ribbon is positioned properly in front of the printing head.



5. Close the printer cover



3.6.7 Adjusting the Printing Pressure (to Printing Paper Thickness)

The printing pressure can be adjusted with the head adjust lever located on the right side of the inner part of the printer.

⚠ CAUTION

Be sure to turn OFF the printer power when opening and closing the printer cover.
Failure to comply could result in electrical shock, failure, or injury.

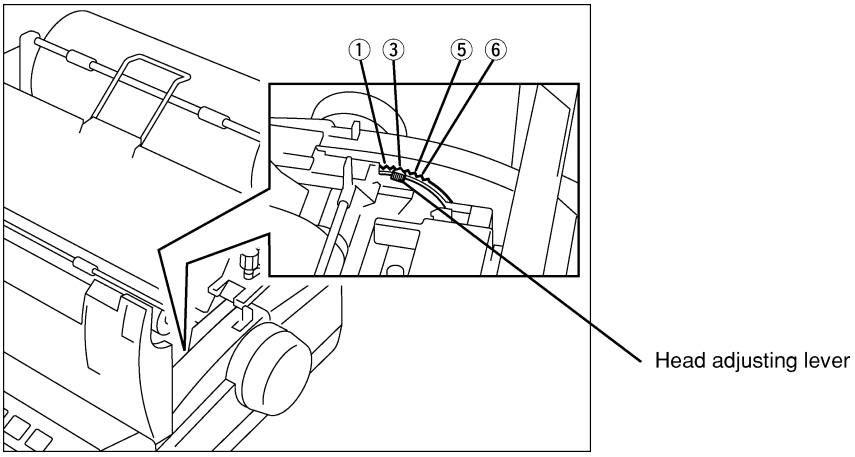
Just after printing, the temperature of the printer head is high. Do not touch the printer head until the temperature goes down.
Failure to comply could result in a burn or injury.

Do not touch any part of the cutter. Doing so may result in injury.

Procedure

1. Open the printer cover and set up the head adjusting lever.
Each type of paper should be set as follows:

Normal paper :	The optimal position among the numbers shown is ③.
Three layers of copying paper :	The optimum position is ⑤ or ⑥.

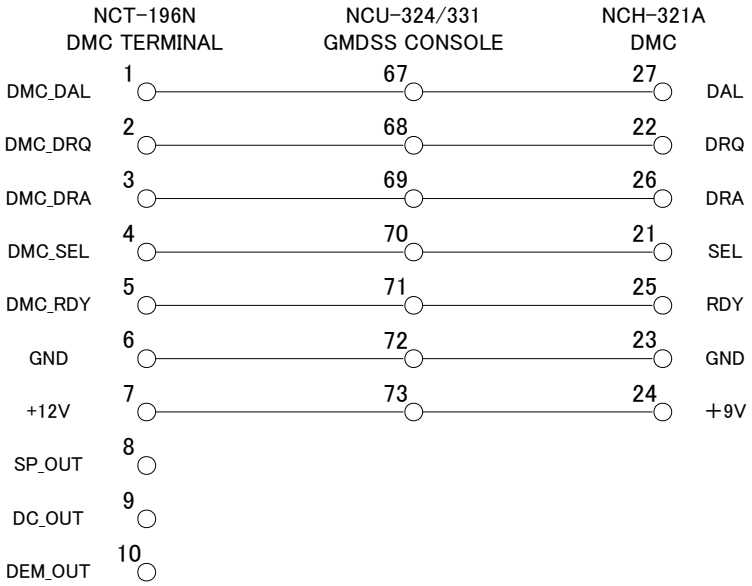


Note
- The printing pressure increases in numerical order (①→⑥).
- To open/close the printer cover, refer to 3.6.4.

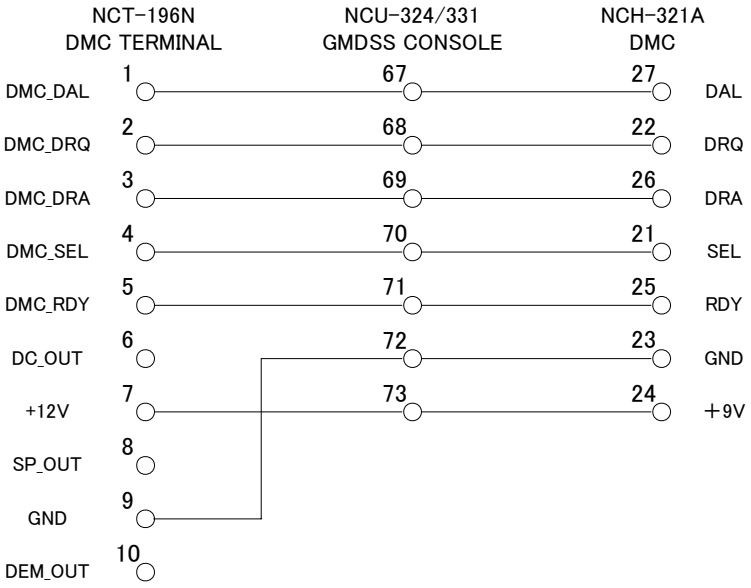
3.7 Connection of NCH-321A Distress Message Controller

Connect the NCH-321A Distress Message Controller according to the serial number of NCT-196N as follows.

NCT-196N numbered GA13417 or later.

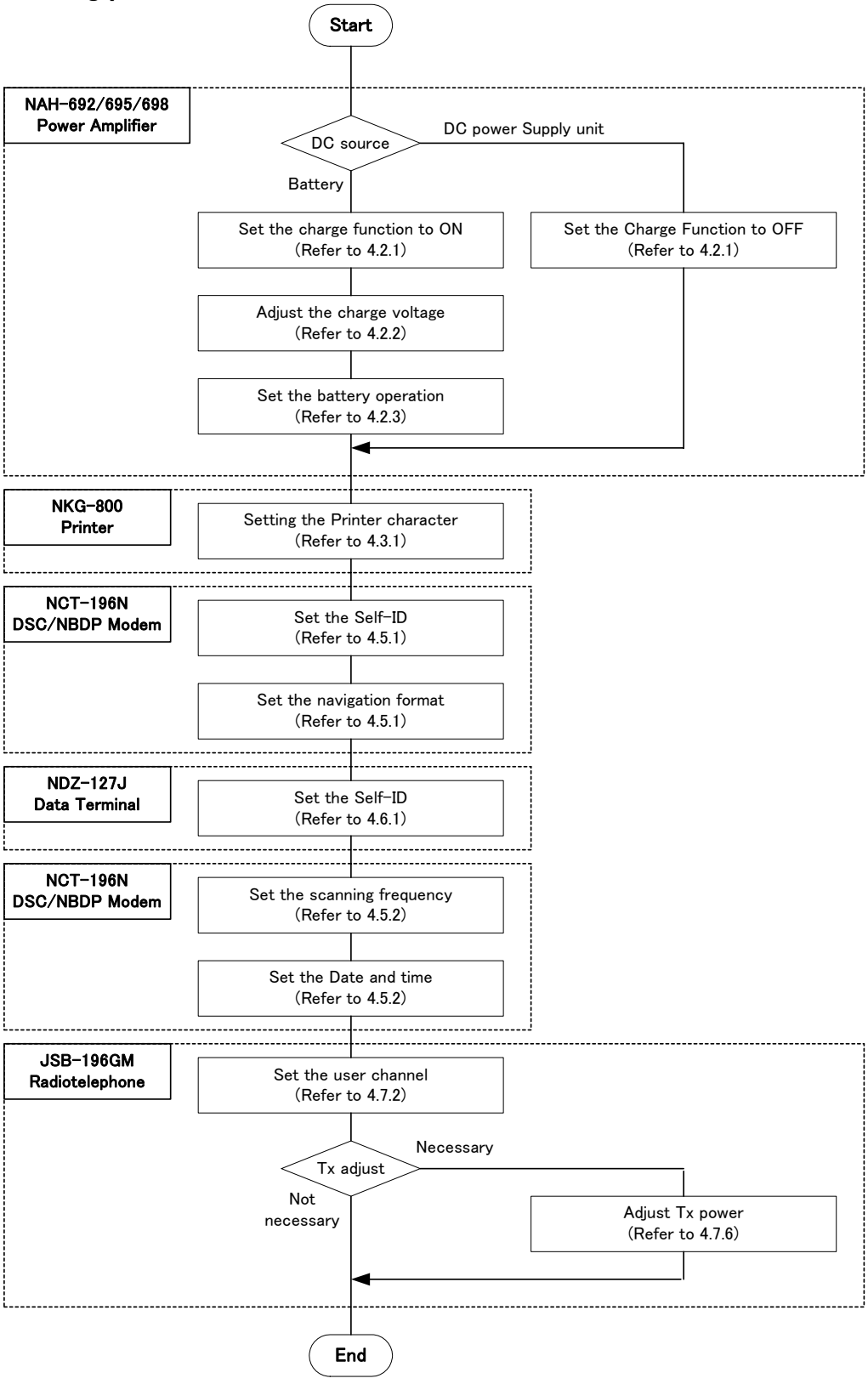


NCT-196N numbered from GA13195 to GA13244 and from GA13355 to GA13417.



4. INITIAL-SETTING

4.1 Unit setting procedure



4.2 NAH-692/695/698 Power Amplifier

4.2.1 Charge Function setting

If the battery charge function is not required, set the charge function to OFF by the “CHARGE FUNCTION” menu.

Procedure

(a) Turn on the “AC” and “DC” switch, pressing MENU .
(b) Press MENU and turn the dial to “CHARGE FUNCTION” menu on the LCD.
(c) Press ENT and set with the dial “ON” or “OFF” on the LCD.

```
CHARGE FUNCTION
      OFF
```

ON: DC source is battery.
OFF: DC source is DC power supply unit or other battery charger is equipped.

(d) Press ENT and turn off the “AC” and “DC” switch.

Note The Charger Function setting cannot select “ON”, unless the battery is connected.

4.2.2 Battery and Charge Voltage setting

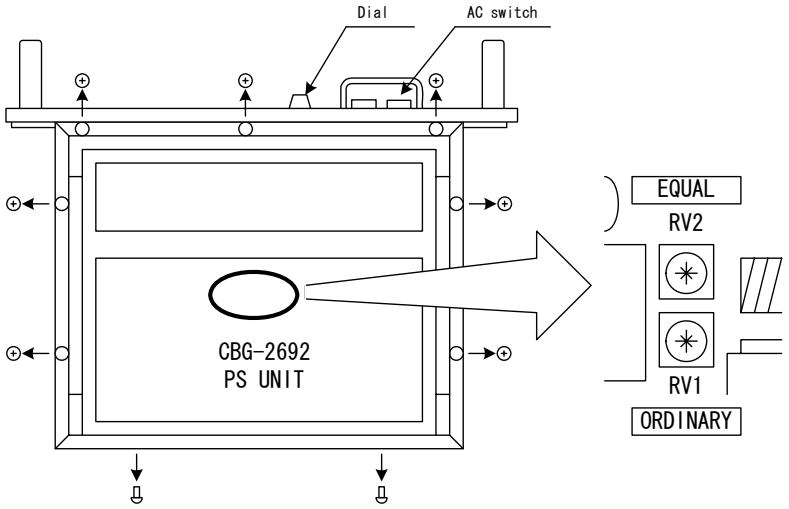
The voltage setting of battery charger in Power Amplifier is preset for the lead battery charging. When battery type is different, reset the charge voltage according to the table below.

Type	Model	Floating Charge Voltage	Equal charge Voltage
▶ Lead	SS-200	26.2V	29.4V
Lead(Cell type)	MSE	26.8V	26.8V
Alkaline	AM-P	28.4V	30.4V

Factory Default Setting

Procedure

(a) Turn off the “AC” and “DC” switches on the front panel.



(b) Pull out the Power Amplifier unit from console.
(c) Remove the upper panel of Power Amplifier unit.
(d) Turn on the “AC” switch, pressing MENU .
(e) Press MENU and turn the dial to “CHG VOLT ADJUST” menu on the LCD.

(f) Press ENT and turn the dial to “ORDINARY” voltage on the LCD.

CHG VOLT ADJUST	
ORDINARY	26.2V

(g) Adjust the Floating Charge Voltage by RV1.
(h) Turn the dial to “EQUAL” voltage on the LCD and adjust the Equal Charge Voltage by RV2.

CHG VOLT ADJUST	
EQUAL	29.4V

(i) Press ENT and turn off the “AC” switch.
(j) Re-assemble the unit.

4.2.3 Battery operation setting

If the Power Generator for emergencies is not equipped, set the battery using setting to SINGLE (SES/HF) by the “BATT USE SET” menu.

Procedure

(a) Turn on the “AC” switch, pressing MENU .
(b) Press MENU and turn the dial to “BATT USE SET” menu on the LCD.
(c) Press ENT and set with the dial “DUAL (SES, HF)” or “SINGLE (SES/HF)” on the LCD.

BATT USE SET
SINGLE (SES/HF)

DUAL (SES, HF): The Power Generator for emergencies is equipped in ship.
SES and HF can be use simultaneously.
The Battery operation time is 1 hour or more.
SINGLE (SES/HF): The Power Generator for emergencies is not equipped in ship.
SES and HF can’t be use simultaneously.
The Battery operation time is 6 hours or more.

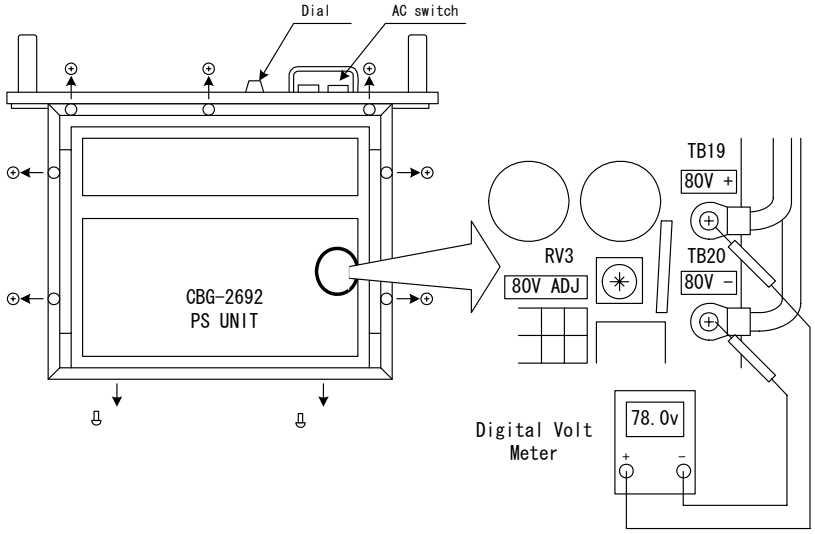
(d) Press ENT and turn off the “AC” switch.

4.2.4 PA Vc (78V) setting

Note Since PA Vc (78V) is already adjusted at the time of factory shipments, it is not necessary to adjust it at the time of installation.

Procedure

(a) Turn off the “AC” and “DC” switches on the front panel.



(b) Pull out the Power Amplifier unit from console.
(c) Remove the upper panel of Power Amplifier unit.
(d) Turn on the “AC” switch, pressing MENU .
(e) Press MENU and turn the dial to “80V ADJUST” menu on the LCD.
(f) Press ENT and adjust the PA(A) Vc to 78V by RV3.

```
80V ADJUST
PA(A) Vc 78.0V
```

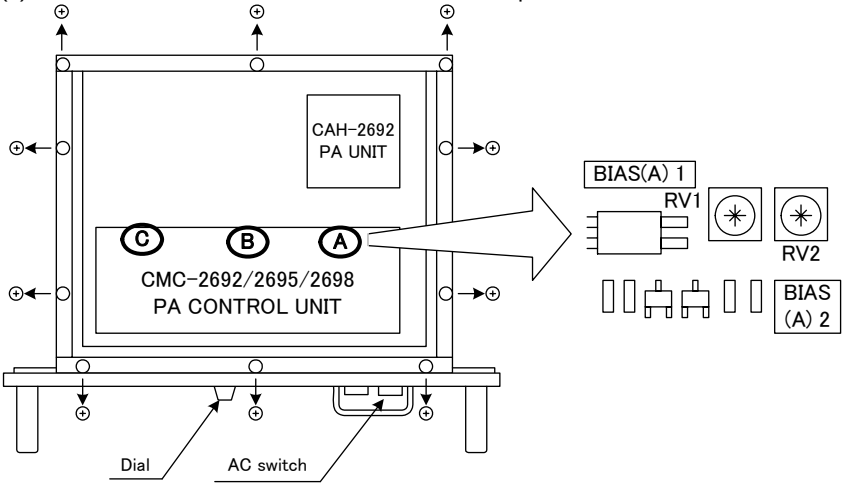
(g) Press ENT and turn off the “AC” switch.
(h) Re-assemble the unit.

4.2.5 BIAS-level adjustment

Note Since BIAS-level is already adjusted at the time of factory shipments, it is not necessary to adjust it at the time of installation.

Procedure

(a) Turn off the “AC” and “DC” switches on the front panel.



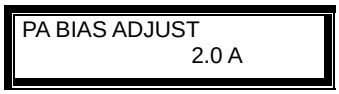
(b) Pull out the Power Amplifier unit form console
(c) Disconnect the all cables on the rear of Power Amplifier unit.
(d) Remove the under panel of Power Amplifier unit.
(e) Turn volumes* on the PA CONTROL UNIT (CMC-2692/2695/2698) fully counter-clockwise.
(*) CMC-2692: RV1, RV2
CMC-2695: RV1, RV2, RV101, RV102
CMC-2698: RV1, RV2, RV101, RV102, RV201, RV202
(f) Connect the AC power cable only.
(g) Turn ON the “AC” switch, while pressing MENU .
(h) Press MENU and turn the dial to “PA BIAS ADJUST” menu on the LCD of Power Amplifier.
(i) Press ENT to display the PA BIAS-level.

```
PA BIAS ADJUST
              0.0 A
```

(j) Gradually turn RV1 on the PA CONTROL UNIT clockwise until PA BIAS reading becomes 1.0A.

```
PA BIAS ADJUST
              1.0 A
```

(k) Then gradually turn RV2 on the PA CONTROL UNIT clockwise until PA BIAS reading becomes 2.0A.



(l) When PA CONTROL UNIT is CMC-2695 or CMC-2698, adjust RV101 and RV102 continuously.
RV101: 2.0A→3.0A
RV102: 3.0A→4.0A
(m)When PA CONTROL UNIT is CMC-2698, adjust RV201 and RV202 continuously.
RV201: 4.0A→5.0A
RV202: 5.0A→6.0A
(n) PA BIAS-level adjustment is finished.
(o) Turn off the “AC” switch and re-assemble the unit.

4.2.6 User Definitions (Level 2 MENU)

⚠CAUTION

Do not select “POWER DATA CLR” and “PA POWER SET” of menu item . Doing so may cause malfunction.

Turn on the “AC” and “DC” switch, pressing MENU to access the following the level 2 menu.

Item	Function	Parameter	Default Setting
PA IN, PA OUT	Display the RF input and RF output power.		
ARRESTOR VOLT	Display the PA arrester voltage.		
CHARGE FUNCTION	Set the battery charger ON or OFF.	ON/OFF	ON
BATT USE SET	Set the battery operation equipment.	DUAL/SINGLE	SINGLE(SES,HF)
USR SETTING CLR	Initialize the user setting parameter.		
POWER DATA CLR	Initialize the TX power setting data.		
80V ADJUST	Check and adjust PA 80V.		
PA BIAS ADJUST	Check and adjust PA BIAS current.		
CHG VOLT ADJUST	Check and adjust battery charger output voltage.	ORDINARY EQUAL	ORDINARY:26.2V EQUAL: 29.4V
PA POWER SET	Initialize the TX power setting data and start TX power setting.		
TERMINAL	Select the terminal unit to the NDZ-127J or NCH-1961/1962.	NDZ/NCH	NDZ

4.3 NKG-800 Printer

4.3.1 Character setting

Set the DIP switch to select a language, character set, or particular function.

⚠ ATTENTION

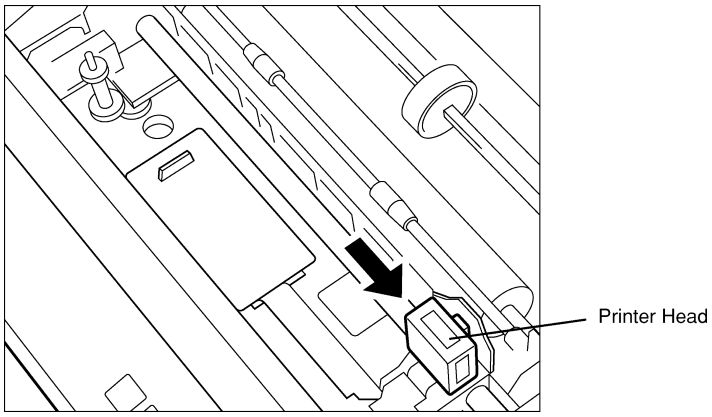
Before beginning the procedure, be sure to turn the power OFF.
Failure to do so may cause electrical shock, malfunction or injury.

Just after printing, the temperature of the printer head is high. Do not touch the printer head until the temperature goes down.
Doing so may cause burns or injury.

Do not touch any part of the cutter.
Doing so is potentially dangerous and may cause injury.

Procedure

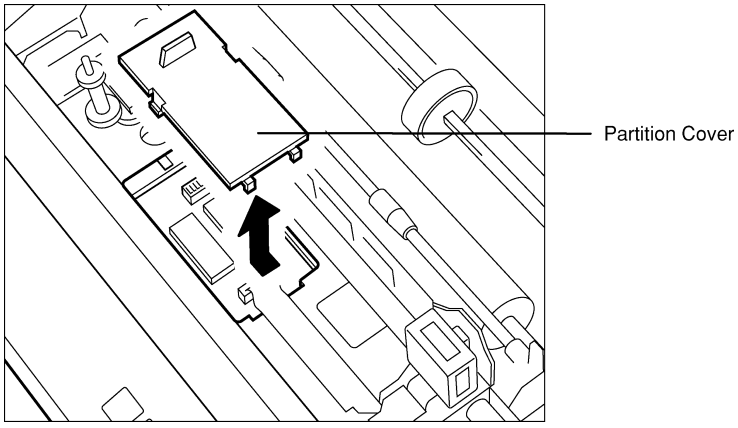
(a) Open the printer cover, remove the ribbon cassette cartridge, and move the printing head manually to the right end.



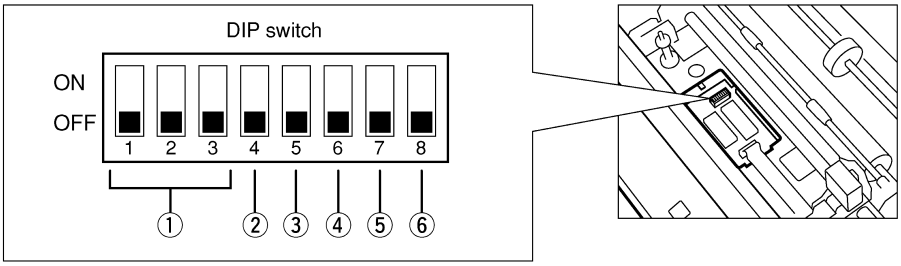
Note

- The printing pressure increases in numerical order (①→⑥).
- To open/close the printer cover, refer to 3.6.4.
- To remove the ribbon cassette cartridge, refer to 3.6.6.

(b) Hold the tip of the partition cover and slide it to the left to remove it.



(c) Set the all DIP switches as OFF.



① Selection of an international language

ON OFF 1 2 3 U.S.A. (English)	ON OFF 1 2 3 France (French)	ON OFF 1 2 3 Germany (German)	ON OFF 1 2 3 U.K. (English)
ON OFF 1 2 3 Denmark (Danish)	ON OFF 1 2 3 Sweden (Swedish)	ON OFF 1 2 3 Italy (Italian)	ON OFF 1 2 3 Spain (Spanish)

② Emulation

ON OFF 4 IBM

ON OFF 4 FX

③ Selection of character set (IBM mode)

ON OFF 5 SET 2

ON OFF 5 SET 1

③ One inch skip perforation (FX mode)

ON OFF 5 Valid

ON OFF 5 Invalid

④ Paper near end sensor

ON OFF 6 Valid

ON OFF 6 Invalid

⑤ Selection of AUTO CR (IBM mode)

ON OFF 7 Valid

ON OFF 7 Invalid

⑤ Selection of valid/invalid for DC1/DC3 (FX mode)

ON OFF 7 Invalid

ON OFF 7 Valid

DC3 code: Printer is set to ignore all data except DC1 code (By-pass state).
DC1 code: By-pass state in DC3 is canceled.

⑥ Selection of LF code (IBM mode)

ON OFF 8 LF+CR

ON OFF 8 LF only

⑥ Selection of LF code (FX mode)

ON OFF 8 Invalid

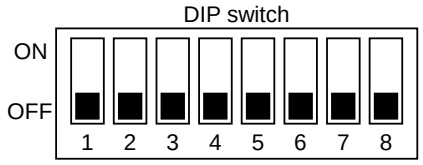
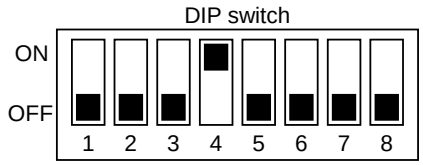
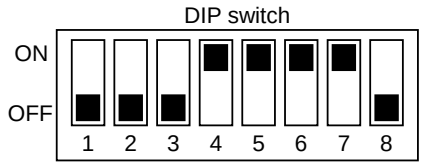
ON OFF 8 AUTO LF

(d) When settings are completed, put the partition cover back in its place, set up the ribbon cassette, and then close the printer cover.

Note

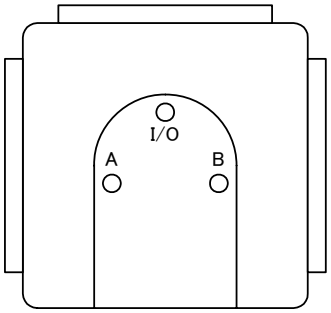
- When printing under the current setting status, the printer is set to an off-line state. When the test pattern is completely printed out, it is automatically set to an on-line state.

Note ・ Show the Dip switch setting for each equipment below.

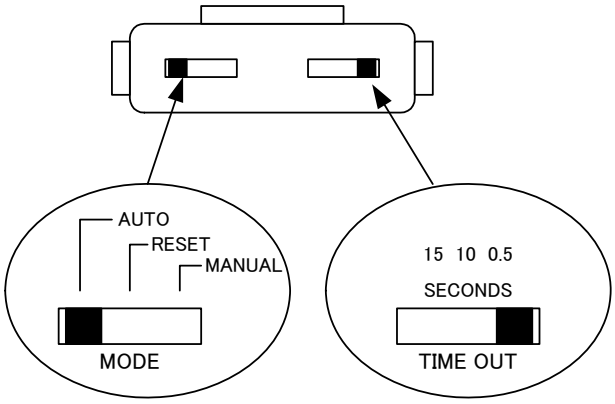
Equipment	DIP switch setting
JSS-296/596/896 (NCT-196N/NDZ-127J) JSS-825D (NCT-620D) NCT-196 NCT-196N	
JSS-296/596/896(NCH-1961/1962) JSS-850 JUE-75C (NDZ-127C)	
JSS-825NA/NC (NDZ-127N)	

4.4 Printer selector

Set the MODE and TIME OUT switches as follows.



Printer Selector SW-ATB21K(2:1)



MODE switch

Set the MODE switch to “AUTO”.

TIME OUT switch

Set the TIME OUT switch to “0.5”.

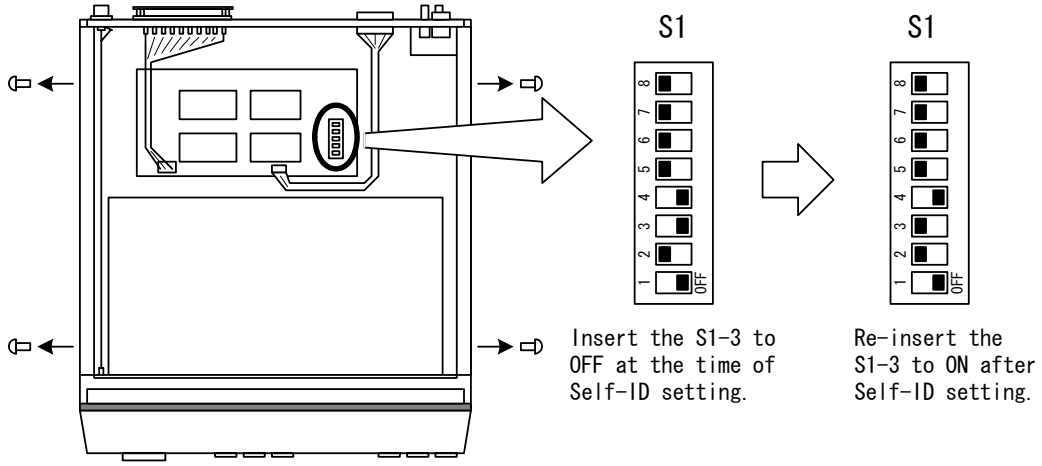
4.5 NCT-196N DSC/NBDP Modem

4.5.1 Self ID, Navigation and Radiotelephone Setting

The settings described in this section have been made prior to shipment from the factory.

ATTENTION

To enable setting adjustment, remove the cover of the NCT-196N DSC/NBDP MODEM and insert the switch(S1)-No.3 into the OFF. When adjustment is complete, re-insert the switch(S1)-No.3 into the ON and replace the cover.



Note Dip switch setting

Switch No.	Function		Default setting
S1-1	Modem function	ON: DSC only, OFF: DSC and NBDP	OFF
S1-2	EEPROM initialize	ON: Disenable, OFF: Enable (expect ID)	ON
S1-3	EEPROM writing	ON: Disenable, OFF: Enable	ON
S1-4	TEST signal sending	ON: Disenable, OFF: Enable	OFF
S1-5	AF signal wait	ON: Normal, OFF: Factory setting	ON
S1-6	HT signal using	ON: Not use, OFF: Use	ON
S1-7	-		ON
S1-8	-		ON

Procedure

(a) Both press [MENU] and “POWER SWITCH” to access the following the “INSTALLATIONSETUP” menu.

```
INSTALLATION SETUP
Self-ID    : 111111111
Group-ID   : 022222222
Navigation  : NMEA0183

Serial cont: ON
Data clear : OFF
SPACE signal send
MARK signal send
DOT signal send
70-TIME MESSAGE send
WKR frequency : 2,187.5
WKR step test
History
```

(b) Select “Self-ID” using [▼] / [▲] , input the Self-ID (9-digit) using the number keys and press [ENT] .

(c) If a Group-ID is assigned, select “Group-ID” using [▼] / [▲] , input the Group-ID (8-digit) and press [ENT] .

(d) Select “Navigation” using [▼] / [▲] , specify the navigation data format using [◀] / [▶] and press [ENT] .

ATTENTION

There are two types of navigation data formats, NMEA 0183 and JRC format. For normal operation, specify NMEA 0183.

NMEA0183 format

(A) Transmission format

Transmission method: Asynchronous
baud rate : 4800bps
Start bit : 1bit
Data bit : 8bit
Stop bit : 1bit
Parity : None

(B) Data format

GLL : Position data (Lat / Lon) and UTC time data (IEC61162-1)
Position data (Lat / Lon) (NMEA Version 1.5)
ZDA : UTC time data and date (year, month, day) data (IEC61162-1)
ZLZ : UTC time data (NMEA Version 1.5)
ZZU : UTC time data (NMEA Version 1.5)
VHW : Water speed and heading data (IEC61162-1)
VTG : Course over ground and ground speed (IEC61162-1)
RMC : Position data (Lat / Lon), UTC time data, and (year, month, day) data (IEC61162-1)

JRC format

(A) Transmission format

Transmission method: Asynchronous
baud rate : 1200bps
Start bit : 1bit
Data bit : 8bit
Stop bit : 2bit
Parity : None

(B) Data format

“F” or “D” +80H : Position (Lat / Lon), date (year, month, day) data and time data, “@” +80H.

Note If a time difference is set on JRC format navigation equipment, local time, not UTC time, is output. Set the time difference to zero or use the NMEA0183 format.

(e) Select “Serial cont” using [▼] / [▲] , specify “ON” using [◀] / [▶] and press [ENT] .

(f) Press [FUNC] and then [9] (SAVE). The contents of the settings are written to memory (saved) and the “DSC watching” display returns. This completes the operation setting.

Note Press [FUNC] and then [4] (QUIT) to cancel the set contents and end the setting operation.

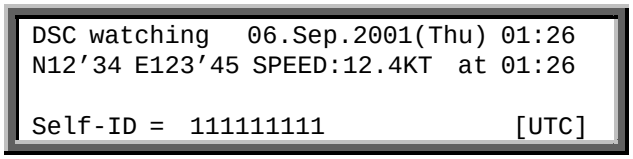
4.5.2 Frequency Scanning / Frequency Calling / Date & Time Settings

Perform these settings from the “SETUP” display.

4.5.2.1 Displaying the “SETUP” display

Procedure

(a) Confirm that the “DSC watching” display appears.

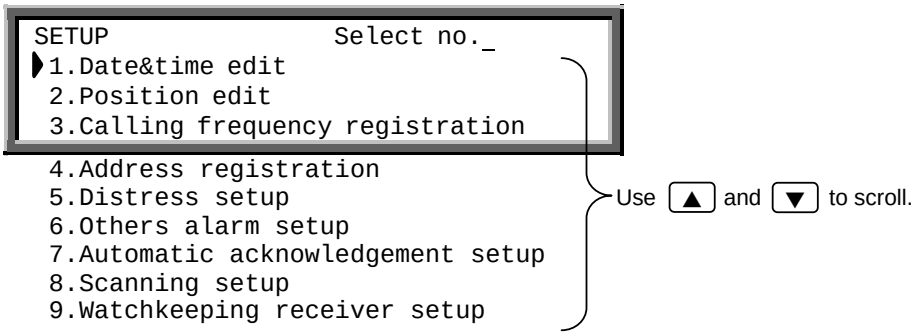


Note The “DSC watching” display appears when the power is turned on. Almost all operations start from this display. This display also returns when exiting each mode is closed.

(b) Press [MENU] .
The “MENU #1” display appears.

(c) Press [MENU] .
The “MENU #2” display appears.

(d) Select “3.Setup” and press [ENT] .
The “Setup” display appears.

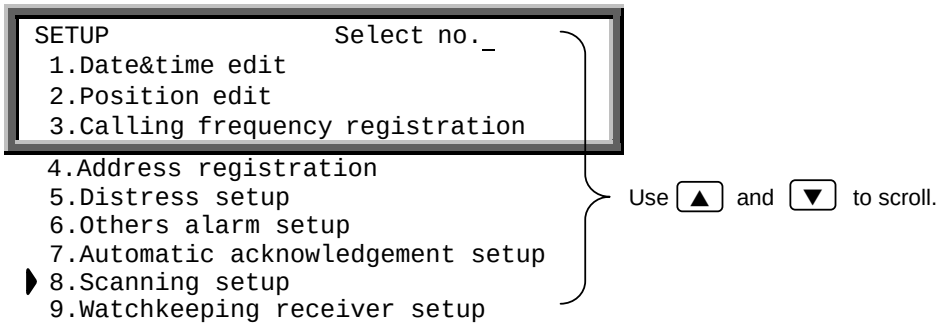


4.5.2.2 Scanning Frequency settings

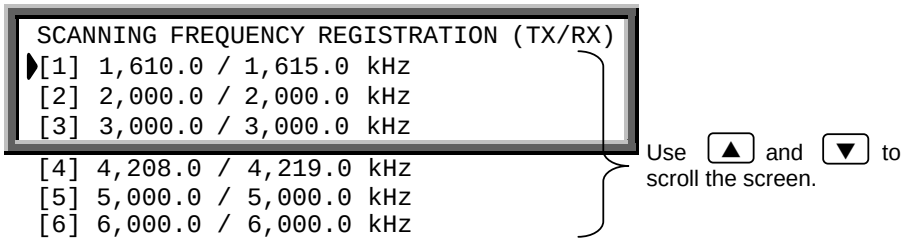
Set the frequency to a maximum of six channels, [1] through [6].

Procedure

(a) Press [8] from the “SETUP” display and then press [ENT] .



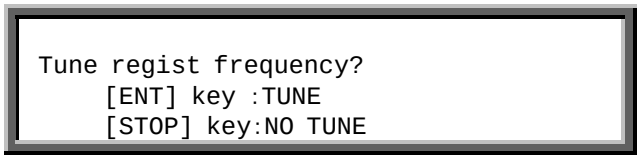
The “SCANNING FREQUENCY REGISTRATION (TX/RX)” display appears.



(b) Using the number keys, perform the frequency input for each channel in the following order, “TX frequency”, [ENT] , “RX frequency”, [ENT] .

Note To channel the settings for previously set items, press [CLR] and then press [ENT] .

(c) After input in complete, press [FUNC] and then [9] (SAVE) .
The following display appears.



Press [ENT] to tune the tuner and then return to the "SETUP" screen.

Press [STOP] to abort tuning and return to the "SETUP" screen.

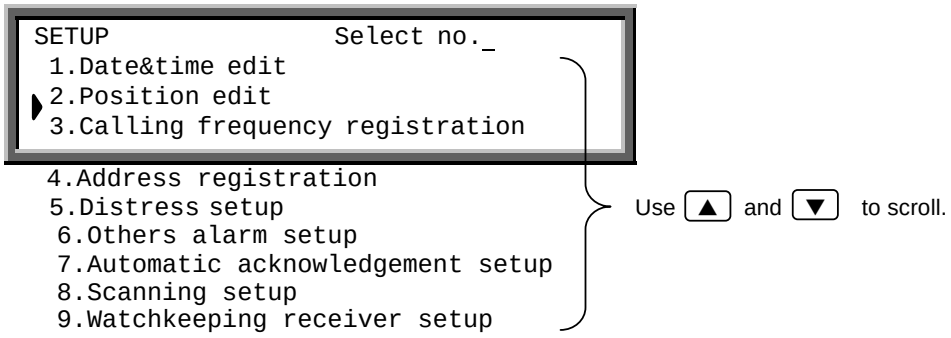
Note Channels 201-206 of the JSB-196GM Radiotelephone are allocated for scanning of the registered frequencies.

4.5.2.3 Calling Frequency settings

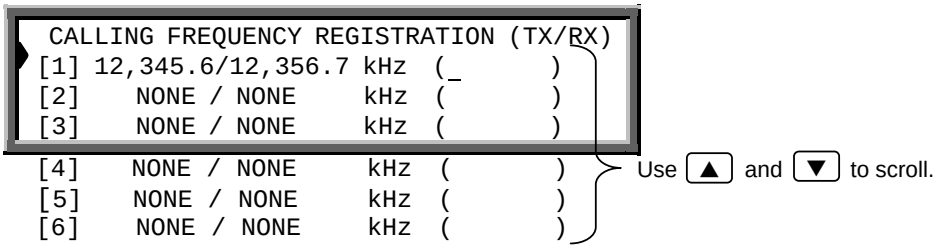
Set the frequency to a maximum of six channels, [1] through [6].

Procedure

(a) Press [3] from the "SETUP" display and then press [ENT] .



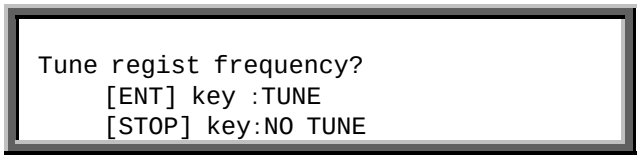
The "CALLING FREQUENCY REGISTRATION (TX/RX)" display appears.



(b) Using the number keys and [ENT] , input the "TX frequency"/"RX frequency" for each channel. Input a name into ( ) and then press [ENT] .

Note To skip the name input or to move to the next item, press [ENT] again.
Use [◀] / [▶] to select a character in ( ). When "D" is displayed, pressing [▶] displays "E", "F" and so on, and pressing [◀] displays "C", "B", and so on.
To enter the alphanumeric character input into ( ), press [ENT] after input of each character.

(c) After input in complete, press [FUNC] and then [9] (SAVE) .
The following display appears.



Press [ENT] to tune the tuner and then return to the "SETUP" screen.

Press [STOP] to abort tuning and return to the "SETUP" screen.

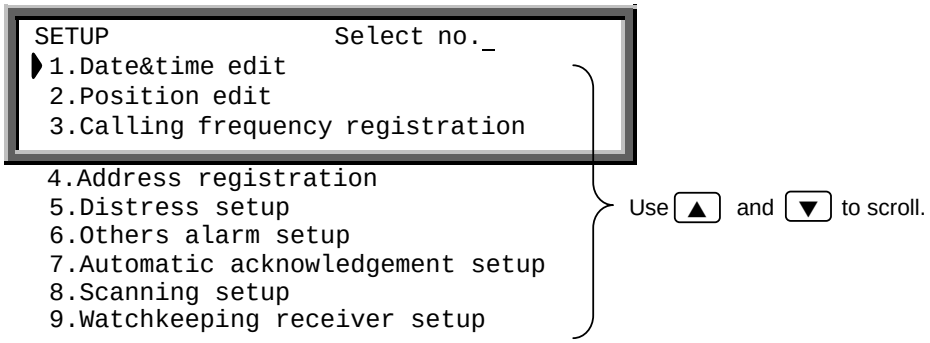
Note Press [FUNC] and then [4] (QUIT) to cancel the set contents and end the setting operation.

4.5.2.4 Date & Time Settings

Set the date(Year,Month,Day), time and the time difference between local time and UTC (Universal Time Coordinated) time.

Procedure

(a) Press [1] from the "SETUP" display and then press [ENT] .



The "DATE & TIME EDIT" display appears.

(b) Using the number keys, input the numerical value for each item and press [ENT] .

Note When set to display LT(Local Time), input the "Time difference" between local time and UTC.
Use [◀] / [▶] to toggle between "+/-" or "UTC/LT".

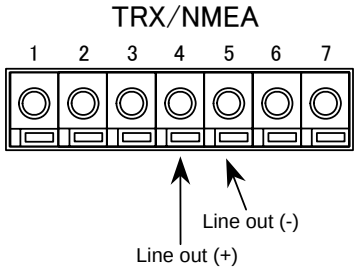
(c) After input is complete, press [FUNC] and then [9] (SAVE). The "SETUP" display returns.

Note The input contents are entered when [FUNC] is pressed followed by [9] in step (c), not when [ENT] is pressed in step (b).
Press [FUNC] and then [4] to cancel the set contents and end the setting operation.

4.5.3 DSC Space and Mark Measurement

Procedure

(a) Connect the frequency counter to Pin No.4 (Line out(+)) and Pin No.5 (Line out(-)) of the TRX/NMEA.



(b) Change the switch (SW1) No.4 to off before power on. And then both press [MENU] and "POWER SWITCH" to access the following the "INSTALLATION SETUP" menu.

(c) Select "SPACE signal send" or "MARK signal send" using [▲] / [▼] and then press [ENT] . Transmission of the space or mark signal starts.

```
INSTALLATION SETUP
Self-ID    : 111111111
Group-ID   : 022222222
Navigation  : NMEA0183
 Serial cont: ON
 Data clear : OFF
▶SPACE signal send
 MARK signal send
 DOT signal send
 70-TIME MESSAGE send
 WKR frequency : 2,187.5
 WKR step test
 History
```

(d) Measure the frequency.
The standards are as follows:

SPACE signal	: 1785Hz±0.5Hz
MARK signal	: 1615Hz±0.5Hz

(e) Press [STOP] to terminate the transmission.

(f) When measurement is complete, press [STOP] . The "Initial setting edit" display closes.

4.5.4 A reference method of Distress Transmission History

Procedure

(a) Change the switch (SW1) No.4 to off before power on. And then both press [MENU] and "POWER SWITCH" to access the following the "INSTALLATION SETUP" menu.
Select "History" using [▲] / [▼].

```
INSTALLATION SETUP
Self-ID    : 111111111
Group-ID   : 022222222
Navigation  : NMEA0183

Serial cont: ON
Data clear : OFF
SPACE signal send
MARK signal send
DOT signal send
70-TIME MESSAGE send
WKR frequency : 2,187.5
WKR step test
▶History
```

(b) Press [ENT] .

```
History
 1.1200012081245
 2.0200012081245
 3.-------------

 4.-------------
    .
    .
20.-------------
```

Note The case of following Transmission History,
1 200012081245
① ②

① : A leadoff character "1" ・・・ Transmitted the DISTRESS call to another ships
A leadoff character "0" ・・・ Pressed [DISTRESS] button over 3.5sec

② :The example of eccentric, indicates the date (day, month and year) and time.
08. Dec. 2000, 12:45 (This time is shown by "UTC")

ATTENTION
When the case of initialization for History, ID is initialized simultaneously.

(c) F When confirm the message, select the line for a leadoff character "1". Press [ENT] .

```
200012081245
 70 70 0B -- -- -- -- -- -- -- -- --
 -- -- -- -- -- -- -- -- -- -- -- --
 -- -- -- -- -- -- -- --
```

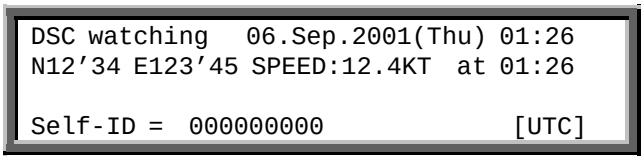
Note Output message is declared the ASCII character.

4.5.5 Operation Check

After installation, execute the operation check with the self-diagnosis function.

Procedure

(a) Confirm that the “DSC watching” display appears.



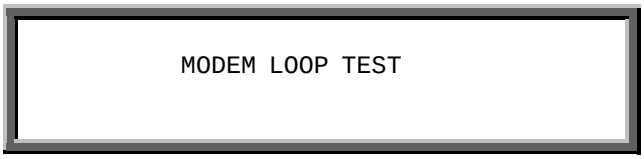
Note The “DSC watching” display appears when the power is turned on. Almost all operations start from this display. This display also returns when each mode is closed.

(b) Press [MENU] .
The “MENU #1” display appears.

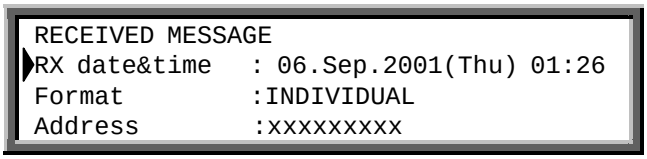
(c) Press [MENU] .
The “MENU #2” display appears.

(d) Select “4.Self test” and press [ENT] .
The “Self test” display appears.

(e) Select “1.Modem loop test” and press [ENT] .
The modem loop test starts.

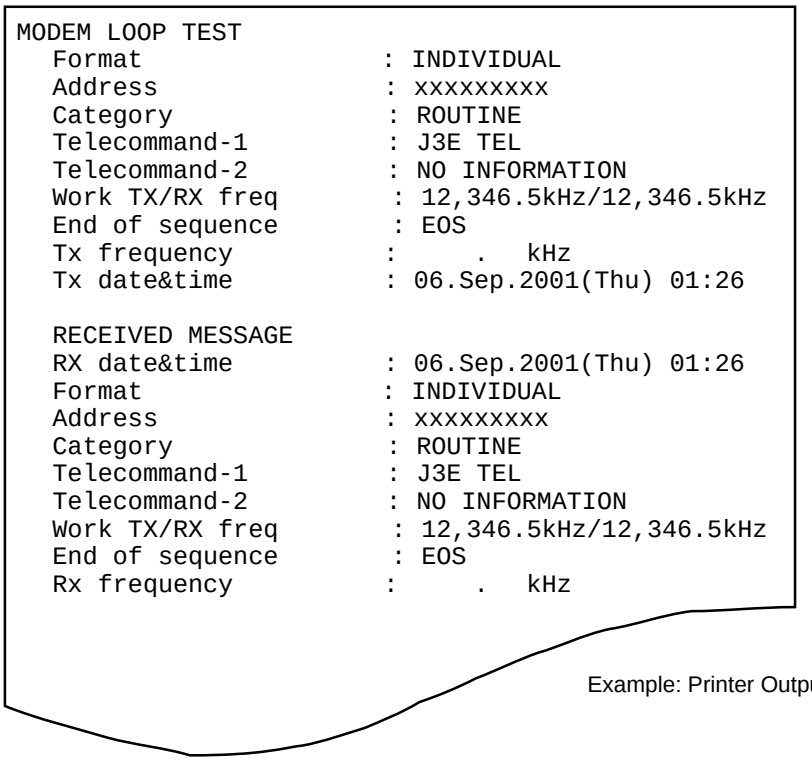


(f) After 10 seconds, “OTHERS” LED blinks in the front panel. Press [STOP] , the “RECEIVED MESSAGE” display appears.




```
Category        : ROUTINE
Telecommand-1   : J3E TEL
Telecommand-2   : NO INFORMATION
Work TX/RX freq : 12,346.5kHz/12,346.5kHz
End of sequence : EOS
Rx frequency    :     .   kHz
```

An internal loop is constructed when the modulator and demodulator are connected internally, then a preset test message is transmitted. Both the transmitted and received messages are printed out, as shown below, in order to confirm that both messages are the same.
If the printer is not connected, confirm the received message via the display.



```
MODEM LOOP TEST
  Format                : INDIVIDUAL
  Address               : xxxxxxxxx
  Category              : ROUTINE
  Telecommand-1         : J3E TEL
  Telecommand-2         : NO INFORMATION
  Work TX/RX freq       : 12,346.5kHz/12,346.5kHz
  End of sequence       : EOS
  Tx frequency          :     .   kHz
  Tx date&time          : 06.Sep.2001(Thu) 01:26

  RECEIVED MESSAGE
  RX date&time          : 06.Sep.2001(Thu) 01:26
  Format                : INDIVIDUAL
  Address               : xxxxxxxxx
  Category              : ROUTINE
  Telecommand-1         : J3E TEL
  Telecommand-2         : NO INFORMATION
  Work TX/RX freq       : 12,346.5kHz/12,346.5kHz
  End of sequence       : EOS
  Rx frequency          :     .   kHz
```

Example: Printer Output

ATTENTION

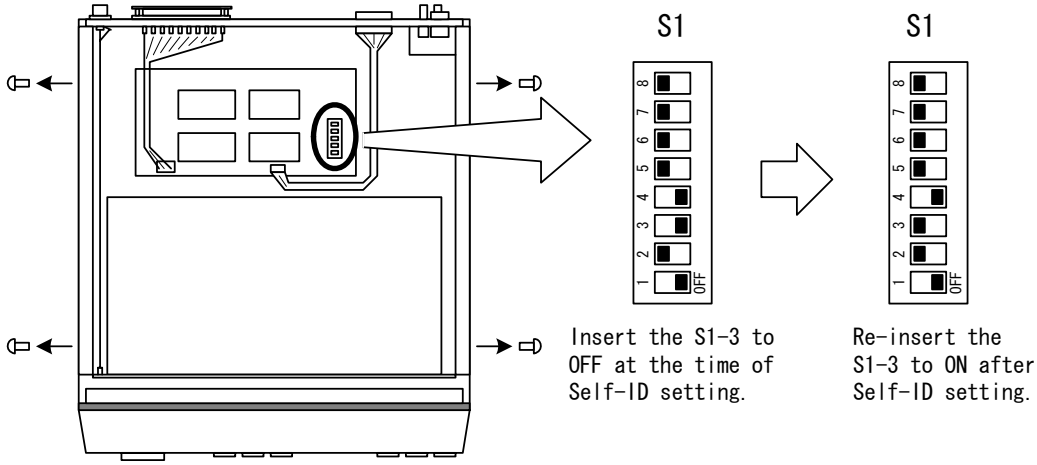
If this test cannot be performed correctly, and the printer operation is normal, there is a possibility of a malfunction with the internal main PC board.

4.6 NDZ-127J Data Terminal

4.6.1 NBDP setting

ATTENTION

To enable setting adjustment, remove the cover of the NCT-196N DSC/NBDP MODEM and insert the switch(S1)-No.3 into the OFF. When adjustment is complete, re-insert the switch(S1)-No.3 into the ON and replace the cover.



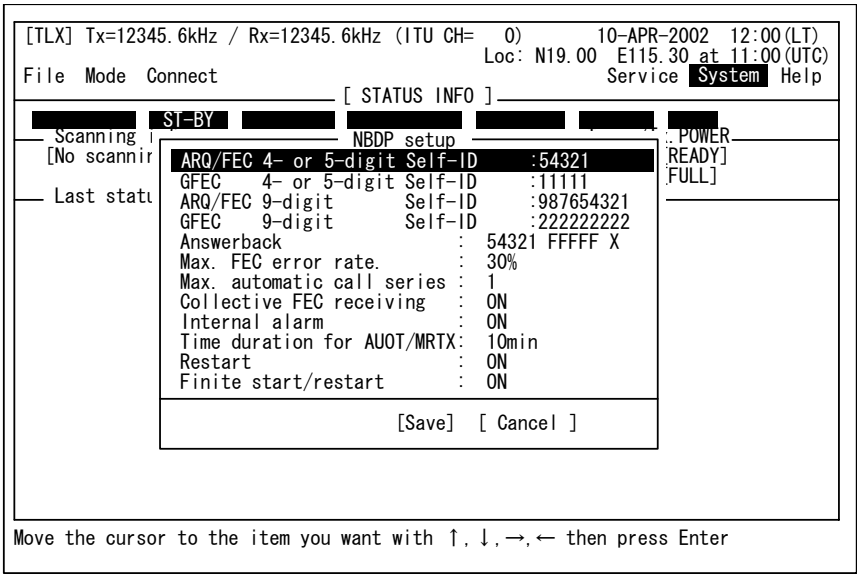
Procedure

(a) Turn on the Power Amplifier “AC” switch and NCT-196N “POWER SWITCH”.

(b) Press Enter of keyboard to change the NBDP mode.

(c) Select “System” from the initial display and press Enter .
The pull-down menu for “System” appears.

(d) Select “NBDP setup” from the pull-down menu and press Enter .
The following display (NBDP setup) appears.



Each parameter is set as follows:

ARQ/FEC 4- or 5-digit Self-ID	: Press	Enter	and setup ID number.
GFEC 4- or 5-digit Self-ID	: Press	Enter	and setup ID number.
ARQ/FEC 9-digit Self-ID	: Press	Enter	and setup ID number.
GFEC 9-digit Self-ID	: Press	Enter	and setup ID number.
Answerback	: Press	Enter	and setup answerback.
Max. FEC error rate	: Press	Enter	and setup in the input display.
Max. automatic call series	: Press	Enter	and set a value of 1-99 in the input display.
Collective FEC receiving	: Press	Enter	toggles the setting between ON and OFF.
Internal alarm	: Press	Enter	toggles the setting between ON and OFF.
Time duration for AUTO/MRTX	: Press	Enter	and set up the time in the input display.
Restart	: Press	Enter	toggles the setting between ON and OFF.
Finite start/restart	: Press	Enter	toggles the setting between ON and OFF.
Transmitter pre-key time	: Press	Enter	and set up in the input display.

After these settings are finished, select one of the following options to complete the setup.

Save	: Saves these settings.
Cancel	: The initial display returns without saving.

Note The meanings of the above items are as follows;

・Max. FEC error rate : The limit value of error rate to continue to receive CFEC/SFEC. When the error rate is beyond the value due to the noisy radio circuit condition or any other signals, the MODEM stops the receiving and return to stand-by.

・Max. automatic call series : The limit value of retrying the CALL mode sequence. The interval to retry is 15 minutes respectively.

・Collective FEC receiving :
- ON - CFEC receiving is permitted.
- OFF - CFEC receiving is prohibited.

・Internal alarm :
- ON - Internal alarm works.
- OFF - Internal alarm does not work.

・Time duration for AUTO : Time duration setting for AUTO mode

・Restart :
- ON - The MODEM tries to reconnect when the circuit established once is lost for 32 times of successive REPEAT condition
- OFF - The MODEM returns to stand-by when the circuit established once is lost for 32 times of successive REPEAT condition

・ Finite start/restart :
- ON - The MODEM returns to stand-by when the times of calling a partner station are reached to 128 in ARQ mode.
- OFF - The MODEM continues to call a partner station even if the times of calling are reached to 128 in ARQ mode.

・Transmitter pre-key time : Adjustment of timing from KEY ON to signal output for the transmitter electrical specification. It is also available to arrange the Send/Receive timing between long-ranged partner station.

4.7 JSB-196GM Radiotelephone

4.7.1 Operation Check

After installation, execute the operation check with the self-diagnosis function.

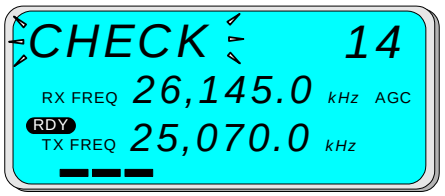
Procedure

(a) Select the MENU number 14 by the jog dial or 10key.

MENU [Turn the jog dial] ENT

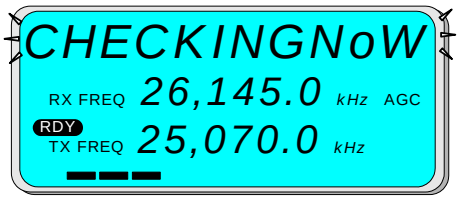
or

MENU [1] [4] ENT

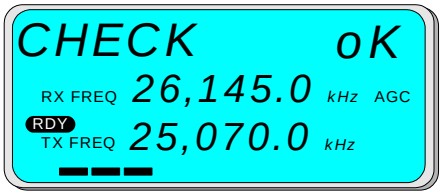


"**CHECKING NOW**" blinks in the LCD.

When the check is complete, confirm that "**CHECK OK**" is displayed.

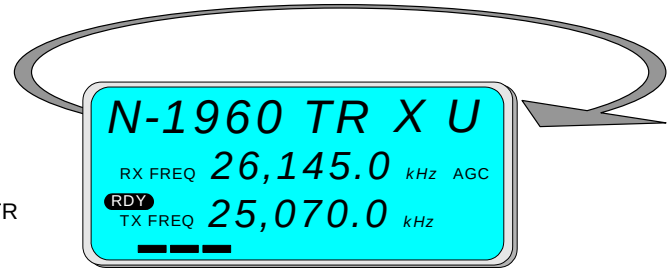


If the defected part is found, messages will be scrolled in the LCD.



Messages

- NAH-NFC SERIAL
- NO ATU
- DSP SERIAL
- CMN-1960 TRX UNIT
- CAH-1960 PA UNIT
- NAH CHARGER
- BATTERY
- BATTERY OUT
- NAH PA 80V
- NAH ARRESTER
- NAH PA(A) TR / NAH PA(B) TR / NAH PA(C) TR
- NFC DUMMY OR L-RELAY
- NFC DUMMY OR C-RELAY
- NFC
- NAH-NFC RF CABLE
- JSB-NAH RF CABLE
- NAH PA(A) OR COMBINER / NAH PA(B) OR COMBINER / NAH PA(C) OR COMBINER
- NAH SPLITTER



Note Refer to 5.5 about the details of a message.

4.7.2 User Channel Registration

Ups to 200 user channels, number 1 to 200, are available for frequently use.

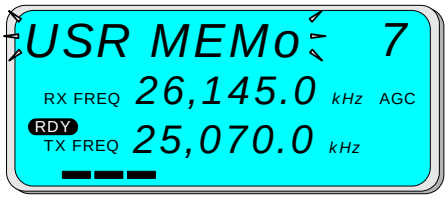
Procedure

(a) Select the MENU number 7 by the jog dial or keypad.

[MENU] [Turn the jog dial] [ENT]

or

[MENU] [7] [ENT]

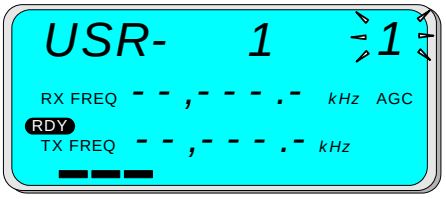


(b) Select channel number by the jog dial or keypad.

[Turn the jog dial] [ENT]

or

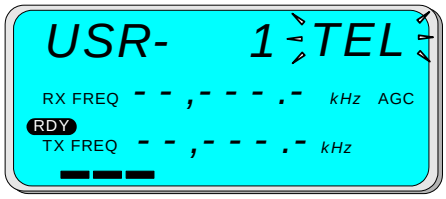
[Input the keypad] [ENT]



(c) Select the emission mode by the jog dial.

[Turn the jog dial] [ENT]

Note In a registered channel, if the mode is selected for "CLR", elimination of a channel can be performed.



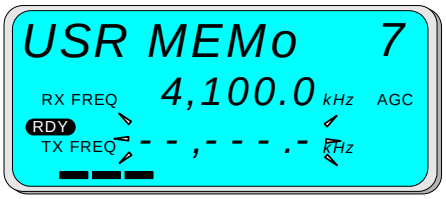
(d) Input the RX/TX frequency.

- **Simplex frequency registration**

  Input RX frequency and press [ENT] twice.

  (e.g. RX/TX=4100.0kHz)

  [4] [1] [0] [0] [0] [ENT] [ENT]

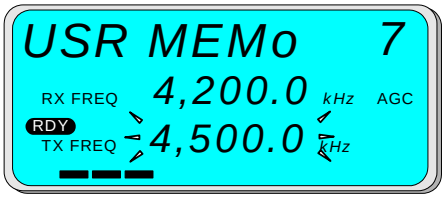


- **Semi-duplex frequency registration**

  Input RX frequency and TX frequency each.

  (e.g. RX=4200.0kHz, TX=4500.0kHz)

  [4] [2] [0] [0] [0] [ENT]
  [4] [5] [0] [0] [0] [ENT]

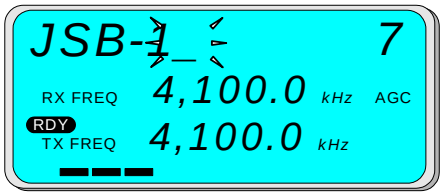


(e) Input the channel label.

"_ (Space)" blinks in the LCD.

If the channel label is not required, press the [ENT] and complete the registration.

Select an alphabet or number with the jog dial or keypad, and press [ENT] or [CLR] to set it.



After complete the registration, go to step (b) for further registration or press [CLR] to exit the registration mode.

4.7.3 Group Name Registration for User Channel

200 user channels are separated into 10 groups, 20 channels each, for scanning reception and labels are available for easy selection. Follow the steps below to register a group name.

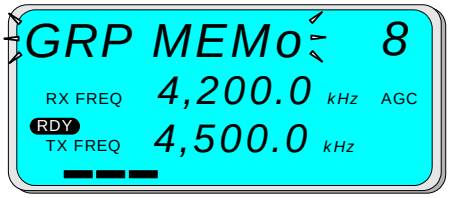
Procedure

(a) Select the MENU number 8 by the jog dial or keypad.

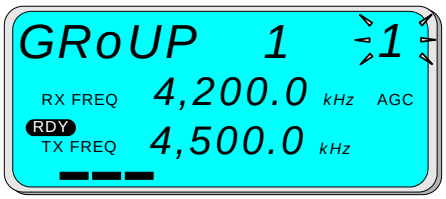
[MENU] [Turn the jog dial] [ENT]

or

[MENU] [8] [ENT]



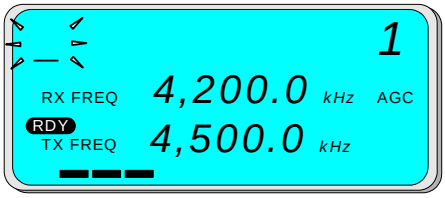
(b) Select the group number with the jog dial, and then press [ENT] .



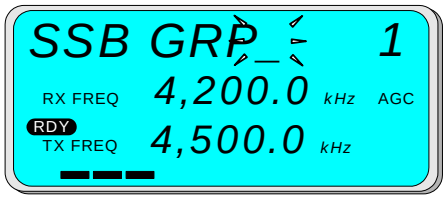
(c) Input the group name.

"_ (Space)" blinks in the LCD.

If the channel label is not required, press the [ENT] and complete the registration.



Select an alphabet or number with the jog dial or keypad, and press [ENT] or [CLR] to set it.



After complete the registration, go to step 3.3 for further registration or press [CLR] to exit the registration mode.

4.7.4 Test Tone setting

Transmission by the Test Tone can be performed in the TEL mode.

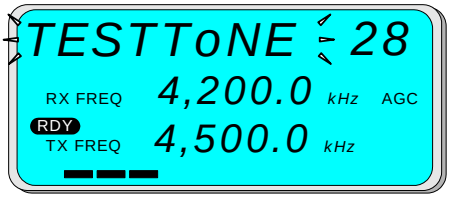
Procedure

(a) In the TEL mode, select the MENU number 28 by the jog dial or keypad.

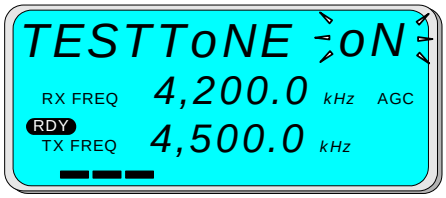
[MENU] [Turn the jog dial] [ENT]

or

[MENU] [2] [8] [ENT]



(b) Select “ON” or “OFF” by the jog dial and press [ENT] .



(c) Press [MENU] to exit the menu.

(d) Press PTT of Hand Microphone, in order to transmit.

Note Test Tone is still ON until it turns off the power supply of JSB-196GM or changes the mode.

4.7.5 Max power setting

Max TX power can be setting in the menu.

ATTENTION

If the Max power setting is changed, the BAND power setting is cleared.
This menu cannot be selected when a power setting by the menu 2 is LOW.

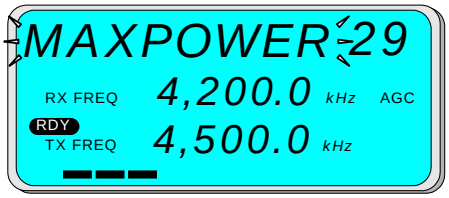
Procedure

(a) Select the MENU number 29 by the jog dial or keypad.

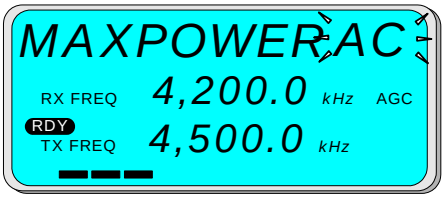
[MENU] [Turn the jog dial] [ENT]

or

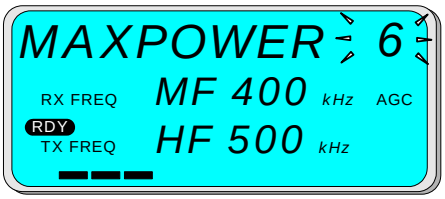
[MENU] [2] [9] [ENT]



(b) Select “AC” or “DC” by the jog dial and press [ENT] .



(c) Select TX power by the jog dial and press [ENT] .
Refer to the following TX power tables.



DC TX power table

JSS-296/596/896 (JSB-196GM)	50	75	100	125*	150*	

(*) TX power of MF band is 100W.

AC TX power table

Equipment		1	2	3	4	5	6
JSS-296	MF	50	75	100	150	150	200
	HF	50	75	150	150	250	250
JSS-596	MF	50	75	150	200	250	400
	HF	50	75	150	250	400	500
JSS-896	MF	50	75	150	200	250	400
	HF	50	75	250	500	800	800

(d) Press [MENU] to exit the menu.

4.7.6 TX power adjustment

The transmitting power of the frequency band and User Channel can be adjusted.

4.7.6.1 Band power setting

The band power setting is possible when a software version is 3.0 or more.

Band step

Frequency band [kHz]	Band power setting	
	AC operation	DC operation
1,600.0 - 1.999.9	HI, MID*, LOW	HI, LOW
2,000.0 - 2,999.9	HI, MID*, LOW	HI, LOW
…	…	…
26,000.0 - 26,999.9		
27,000.0 - 27,500.0	HI, MID*, LOW	HI, LOW

(*) There is no setting of MID power in JSS-296.

Procedure

(a) Set the Max power. (Refer to 4.7.5)

(b) Set the Test Tone as ON. (Refer to 4.7.4)

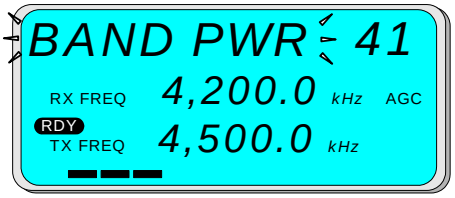
(c) Set the TX frequency by keypad.

(d) Select the MENU number 41 by the jog dial or keypad.

[MENU] [Turn the jog dial] [ENT]

or

[MENU] [4] [1] [ENT]



(e) Select “HI”, “MID” or “LOW” by the jog dial and press [ENT] .

Exciter level, Vc and Ic, are displayed on the LCD.

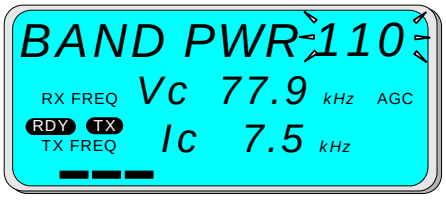
Vc,Ic: Transistor collector voltage and current(*1)

IA: Antenna current(*2)

(*1) In AC operation, NAH PA transistor’s Vc and Ic are displayed. In DC operation, JSB PA transistor’s Vc and Ic are displayed.

(*2) IA is displayed by pressing [CH] .

(e) Press PTT of Hand Microphone, in order to transmit.



(f) Turn the dial and adjust the Exciter level.

(g) Register the Exciter level and Exit menu.

Register the Exciter level and exit: [ENT] [MENU]

Not register and exit: [MENU]

back to the preceding menu: [CLR]

4.7.6.2 User Channel power setting

Procedure

(a) Set the BAND power. (Refer to 4.7.6.1)

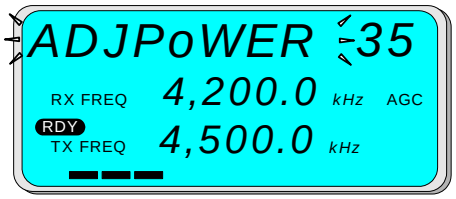
(b) Set the Test Tone as ON. (Refer to 4.7.4)

(c) Select the MENU number 35 by the jog dial or keypad.

[MENU] [Turn the jog dial] [ENT]

or

[MENU] [3] [5] [ENT]



(d) Press [ENT] .

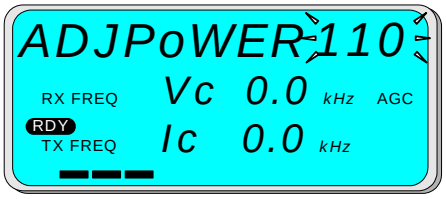
Exciter level, Vc and Ic, are displayed on the LCD.

Vc,Ic: Transistor collector voltage and current (*1)

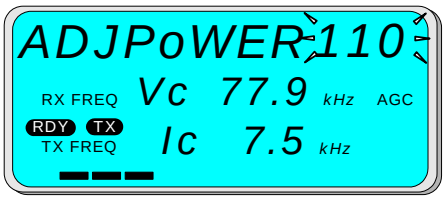
IA: Antenna current (*2)

(*1) In AC operation, NAH PA transistor's Vc and Ic are displayed. In DC operation, JSB PA transistor's Vc and Ic are displayed.

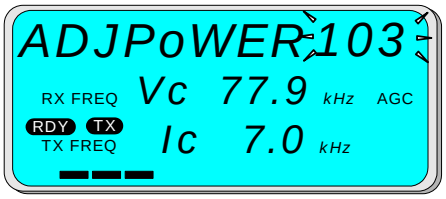
(*2) IA is displayed by pressing [CH] .



(e) Press PTT of Hand Microphone, in order to transmit.



(f) Turn the dial and adjust the Exciter level.



(g) Exit the menu.

Register the Exciter level and exit: [ENT] [MENU]

Not register and exit: [MENU]

Back to the preceding menu: [CLR]

4.7.7 User Definitions (Level 2 MENU)

Both press [MENU] and [POWER] to access the following the level 2 menu.

MENU No.	Item	Function	Parameter	Default Setting
16	INITIAL	Initialize storage memory except for TX power data.		
17	MEM CLR	Initialize storage memory individually.	MD: ATU matching data CH: All user channels USR: User setting parameter TX BAND power data PWR: TX power data PA : NAH TX power data	
18	DATADISP	Display the meter function.	ANT: Antenna current SWR: PA(PA output of JSB) ATU(ATU input) PA: Vc, Ic (Collector voltage and current of JSB)	
19	LC CONT	Display the ATU matching data and change the matching parameter.		
20	ATU CHK	Check the ATU relay. (Visual check)		
21	ATU PASS	Initialize the ATU relay. (Matching through)	ON/OFF	OFF
22	ATU SPD	Change the ATU matching speed.	NRM: Normal speed SLW: Slow speed	NRM
23	AUTOTUNE	Perform continuous tuning for user channels par 1 Group.		
24	2182MODE	Select the 2182kHz emission mode.	TEL/AME (H3E)	TEL
25	10KEY	Disable the free-input frequency operation. (Only user channel operation)	ON/OFF	ON
26	TX DELAY	Set the transmission switchover delay to 70ms. (for BK Relay)	ON/OFF	OFF
27	RFTHRUGH	Disable the Variable tuning function.	ON/OFF	OFF
28	TESTTONE	Use the test-tone for TEL or LSB mode.	ON/OFF	OFF
29	MAX POWER	Set the output model for the rated transmitting power.		
30	LSB MODE	Enable the LSB mode operation.	ON/OFF	OFF
31	LSB TRX	Enable the LSB transmission.	TRX: Enable transmitting RX: Reception only	RX
32	AME TRX	Enable the AME (H3E) transmission.	TRX: Enable transmitting RX: Reception only	RX
33	CHECK2	Perform the self-diagnosis with check item.		
34	MIC GAIN	Change the MIC gain.	0.0 (-25.0dB) ～ 25.0 (0.0dB) ～ 50.0(+25.0dB)	
35	ADJ POWER	Change the output power for user registration channel.	0 (no power) ～ 255 (+3.0dB)	
36	SPEECH-P	Set the Speech-processor function.	ON/OFF	ON
37	KOREA	Change the operation and parameter for sale to KOREA.	ON/OFF	OFF
38	ATU TYPE	Select the ATU type.	NFC: NFC-196/296/896 OP1: For other tuner setting 1 OP2: For other tuner setting 2	NFC

39	**PA CONT**	**Display the NAH Power Amplifier data.**	**AC/DC volt** **DC current (24Vdc current)** **PA in/out** **PA current** **PA (A) Vc/Ic** **PA (B) Vc/Ic** **PA (C) Vc/Ic** **PA SWR** **Arrester volt**	
40	**AC POWER**	**Display the Exciter level for every transmitting output in AC operation.**		
41	**BAND PWR**	**Set the TX power of frequency band.**	**AC: HI/MID/LOW** **DC: HI/LOW**	

4.7.8 Set up of the MENU items

○ : Enable setting.
× : Disable setting.
Comment : Enable setting only when the following conditions.

MENU No.	Item	Standard	No connect the Antenna Tuner	10KEY OFF	KOREA ON
1	MODE	○	○	×	TEL/DSC mode
2	POWER	○	○	○	○
3	AGC	○	○	○	○
4	SQL	○	○	○	○
5	SCAN	○	○	○	×
6	SCAN SPD	○	○	○	×
7	USR MEMO	○	○	×	×
8	GRP MEMO	○	○	×	×
9	METER	○	×	○	○
10	ATS	○	×	○	○
11	ATS WAIT	○	×	○	○
12	BEEP	○	○	○	○
13	SPEAKER	○	○	○	○
14	CHECK	○	○	○	○
15	VERSION	○	○	○	○
16	INITIAL	○	○	○	○
17	MEM CLR	○	○	○	○
18	DATADISP	○	○	○	○
19	LC CONT	○	×	○	○
20	ATU CHK	○	×	○	○
21	ATU PASS	○	×	○	○
22	ATU SPD	○	×	○	○
23	AUTOTUNE	○	×	○	×
24	2182MODE	×	×	×	×
25	10KEY	○	○	○	×
26	TX DELAY	○	○	○	○
27	RFTHRUGH	○	○	○	○
28	TESTTONE	TEL/LSB mode	TEL/LSB mode	TEL/LSB mode	TEL mode
29	MAX POWER	HI power	HI power	HI power	HI power
30	LSB MODE	○	○	○	×
31	LSB TRX	LSB MODE on	LSB MODE on	LSB MODE on	×
32	AME TRX	○	○	○	×
33	CHECK2	○	○	○	○
34	MIC GAIN	○	○	○	○
35	ADJ POWER	Select the User channel operation.	Select the User channel operation.	Select the User channel operation.	×
36	SPEECH-P	○	○	○	○
37	KOREA	TEL mode	TEL mode	TEL mode	○
38	ATU TYPE	×	×	×	×
39	PA CONT	○	○	○	○
40	AC POWER	○	○	○	○
41	BAND PWR	○	○	○	○

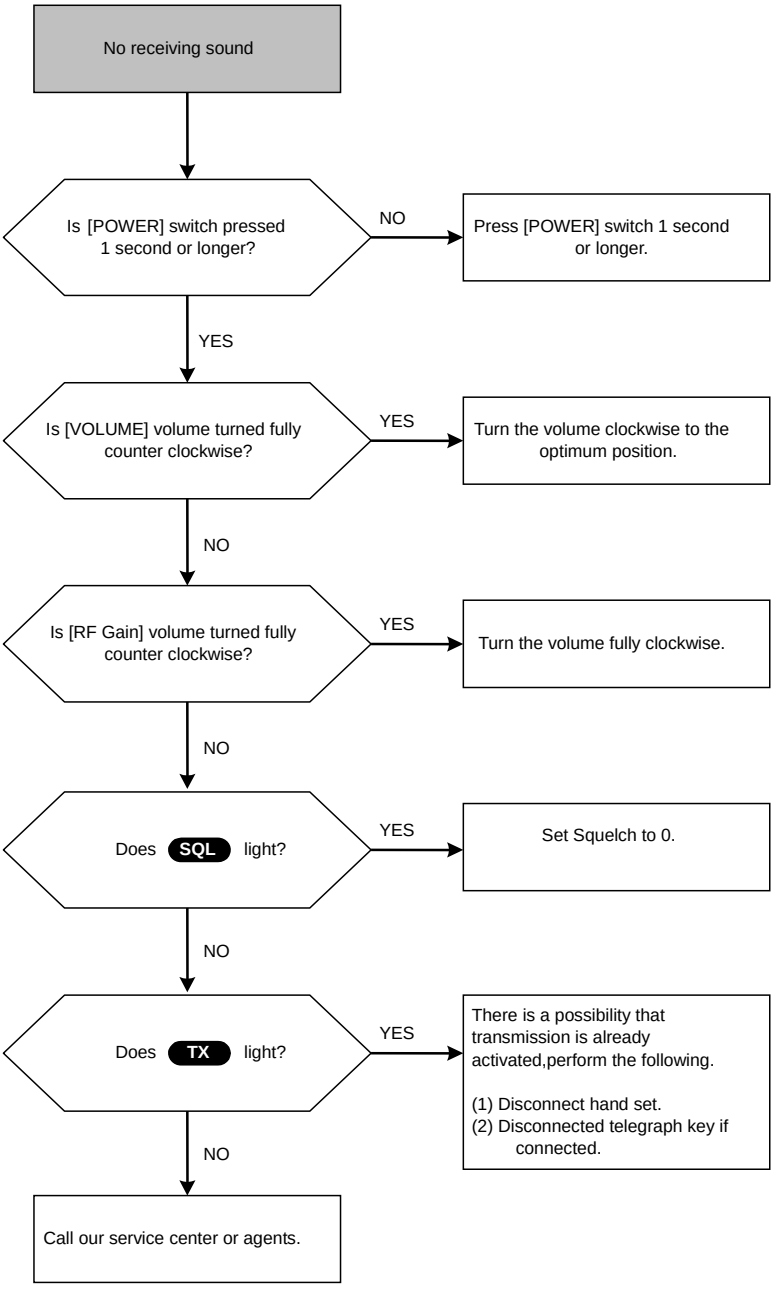
5. TROUBLESHOOTING

5.1 JSB-196GM

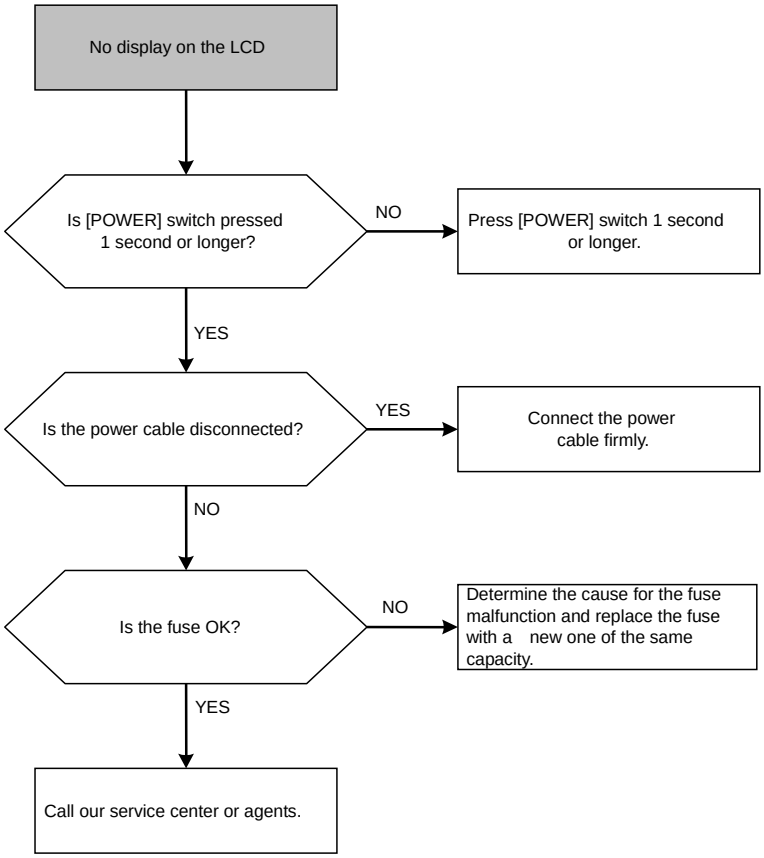
Each rectangle indicates process.

Each hexagon indicates decision.

(1) No receiving sound

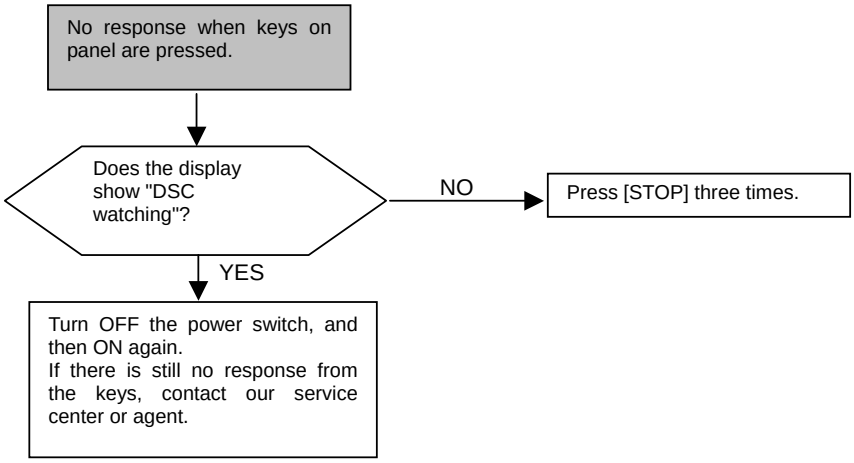


(2) No display on the LCD

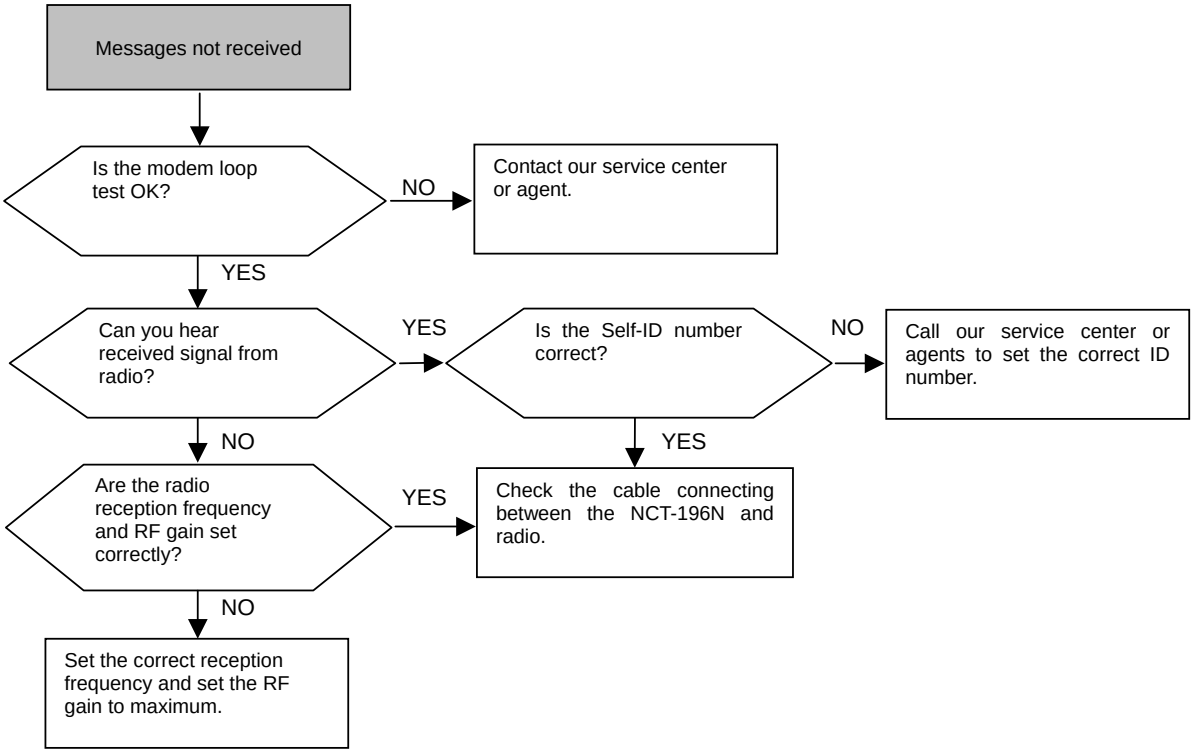


5.2 NCT-196N

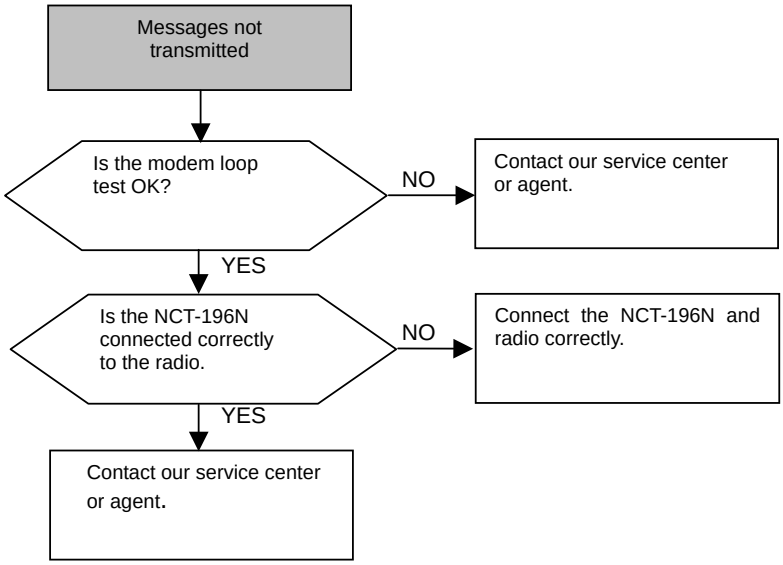
(1) No response from keys



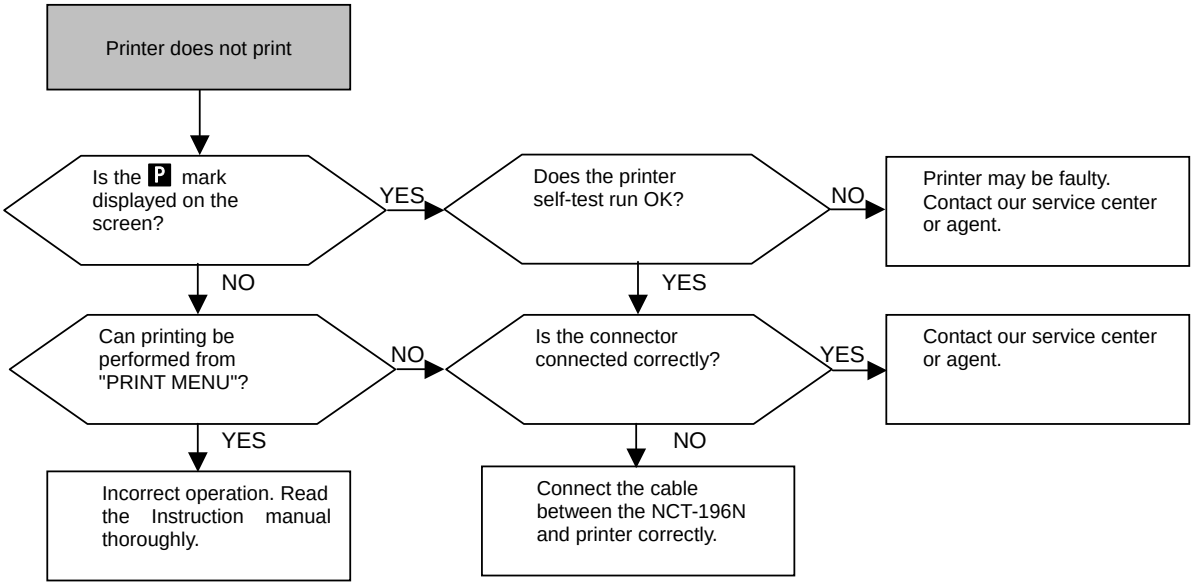
(2) Messages not received



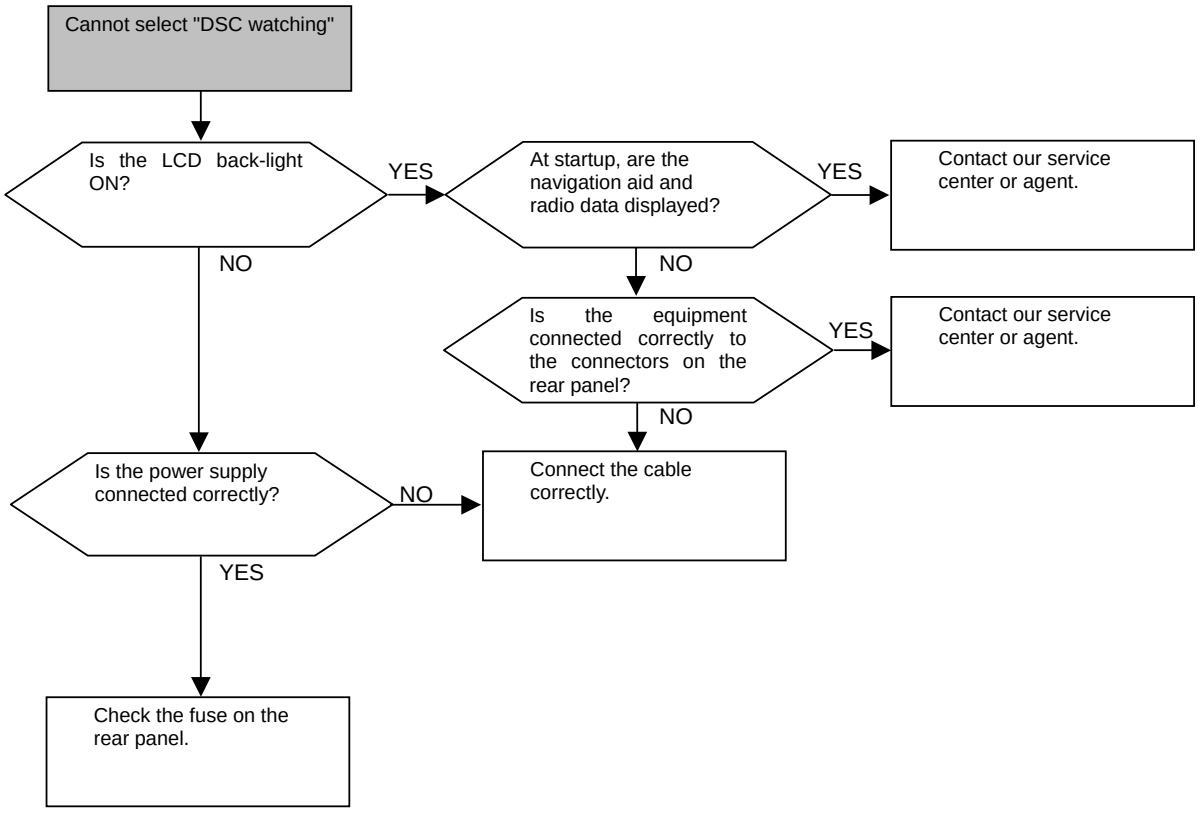
(3) Messages not transmitted



(4) Printer does not print

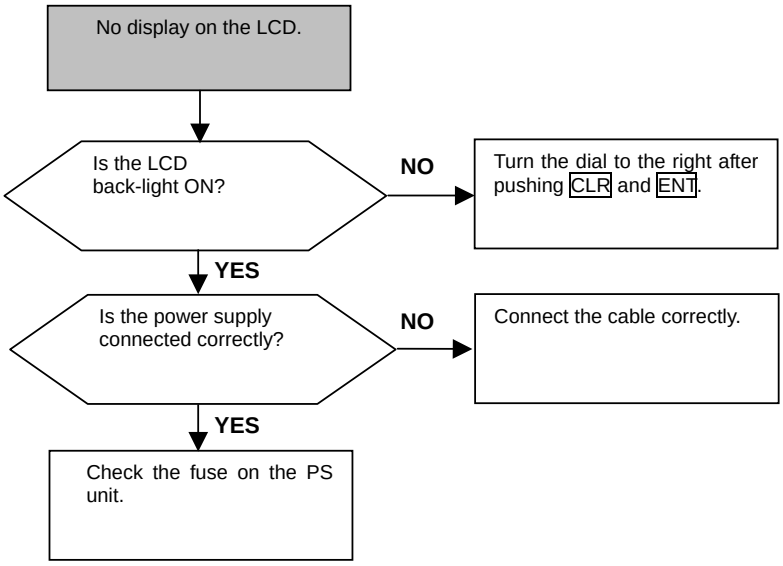


(5) Cannot select "DSC watching"



5.3 NAH-692/695/698

(1) No display on the LCD



5.4 NKG-800

There are two types of errors. When an error is detected, a beep sounds, and the P.OUT lamp blinks 5 times.

(1) Paper discharge error
When the "out of paper" state is not detected, even though an 18 inch line feed procedure is performed, a paper discharge error will result. The P.OUT lamp remains blinking until the error state is canceled. When this happens, manually pull the paper out of the printer, or remove the paper automatically by using LF or FF , then press ONLINE .

(2) Paper sending error
If the paper is not properly set, even though a 10 inch line feed procedure is performed, a paper sending error results. In addition, if this error happens when the printing instruction is entered, the P.OUT lamp remains blinking until the error state is canceled.

When this happens, follow the procedure below.

Procedure

1. **Press ONLINE switch.**
   The printer is set to an off-line state.

2. **Press FF switch, set the paper, then press ONLINE .**
   The printer is set to an on-line state.

5.5 Message of JSB-196GM Operation Check and Management

Message	Condition	Management	Remark
DSP SERIAL	Serial communication is unusual between CPU (CDJ-1960) and DSP (CMN-1960).	(a) Check the cable connection between CDJ-1960 (J2/J3) and CMN-1960 (J23/J22). (b) Check the cable connection between CAH-1960 (J9) and CMN-1960 (J21).	
NO ATU	Serial communication is unusual between JSB-196GM and NAH-692/695/698.	(a) Check the cable connection between JSB-196GM and NAH-692/695/698. (b) Check the cable connection between CDJ-1960 (J1) and CAH-1960 (J8). (c) Check the cable connection between CDJ-2692 (J2) and CBG-2692 (J5). (d) Check the cable connection between CBG-2692 (J8) and CHASSIS. (e) Check the I/F-circuit on the CAH-1960. (PHT1, 2, 3, T20 etc.) (f) Check the I/F-circuit on the CBG-2962. (PHT26, 27, 28 etc.)	
NAH-NFC SERIAL	Serial communication is unusual between NAH-692/695/698 and NFC296/896.	(a) Check the cable connection between NAH-692/695/698, NQD-4190 and NFC-296/896. (b) Check the cable connection between CDJ-1960 (J1) and CAH-1960 (J8). (c) Check the I/F-circuit on the CBG-2962. (PHT23, 24, 25 etc.) (d) Check the I/F-circuit on the CDJ-2960. (PHT1, 2, 3 etc.)	
CMN-1960 TRX UNIT	RX circuit is unusual or Exciter output is insufficient.	(a) Check the cable connection between CDJ-1960 (J2/J3) and CMN-1960 (J23/J22). (b) Check the cable connection between CAH-1960 (J8) and CMN-1960 (J21).	
CAH-1960 PA UNIT	RF output of CAH-1960 is less than 5W at the time of the NFC check 1.	(a) Check the cable connection between CDJ-1960 (J1) and CAH-1960 (J8). (b) Check the cable connection between CAH-1960 (J1) and CMN-1960 (J12). (c) Check the RF-Transistor (TR3-TR9). (d) Check the LPF circuit. (C50-C140, K10-K21 etc.)	
BATTERY	The battery voltage when turning off a charger is less than 20V.	Check the Battery voltage.	
BATTERY OUT	The electric discharge current of a battery is more than 10A at the time of AC operation	Check DC current of external unit. (VHF, GPS, Lamp etc.)	
NAH CHARGER	The output voltage of the battery charger is less than 24V.	Check the charge voltage setting (CBG-2692 RV1, RV2). (Refer to 4.2.2)	
NAH PA 80V	PA80V power supply of NAH is less than 70V or more than 90V.	(a) Check the cable connection between CBG-2692 (TB19/TB20) and CMC-2692/2695/ 2698(TB1/TB2). (b) Check the 80V setting (CBG-2692 RV3).	
NAH ARRESTOR	The voltage of a serge Suppressor circuit is as follows. JSS-296: Less than 150V or more than 250V. JSS-596: Less than 250V or more than 350V. JSS-596: Less than 300V or more than 400V.	(a) Check the cable connection between CBG-2692 (TB19/TB20) and CMC-2692/2695/2698 (TB1/TB2). (b) Check the 80V setting (CBG-2692 RV3).	
NAH PA(A) TR NAH PA(B) TR NAH PA(C) TR	Transistor bias current is less than 1.5A or more than 2.9A.	(a) Check the cable connection between CAH-2692 (TB1) and CMC-2692/2695/ 2698 (TB3/TB103/TB203). (b) Check the RF-Transistor (CAH-2692 TR1-TR4).	
NFC DUMMY OR L-RELAY	NFC check 1 : OK NFC check 2 : RF input level : OK SWR : NG	(a) Check the resistance of the dummy load. (CFG-296/896 R4) (b) Check the relay. CFG-296:K20-K35, K52, K53, K60,	

		K61 CFG-896:K20-K36, K60, K61 CFF-896:K200-202 (c) Check the control signal on CDJ-2960. (IC3-IC6, R101-R132, R54-R91)	
NFC DUMMY OR C-RELAY	NFC check 1 : NG NFC check 2 : RF input level : OK SWR : OK	(a) Check the relay. CFG-296:K10-K18, K40-K48, K51-K54, K60, K61 CFG-896:K10-K18, K40-K48, K50-K51 CFF-896:K200-K204 (b) Check the sensor circuit on CFG-296/896. (IC1-IC3, CD5-CD8 etc.) (c) Check the control signal on CDJ-2960. (IC3-IC6, R101-R132, R54-R91)	
NFC	NFC check 1 : NG NFC check 2 : RF input level : OK SWR : NG	(a) Check the resistance of the dummy load. (CFG-296/896 R4) (b) Check the all relay on CFG-296/896, CFF-896. (c) Check the sensor circuit on CFG-296/896. (IC1-IC3, CD5-CD8 etc.) (d) Check the control signal on CDJ-2960. (IC3-IC6, R101-R132, R54-R91)	
JSB-NAH RF CABLE	RF output of CAH-1960 is less than 5W at the time of the NFC check 1. AND NAH check 2 : RF input level : NG NFC check 1 : NG NFC check 2 : NG	(a) Check the RF-cable connection between JSB-196GM and NAH-692/695/698. (b) Check the RF-cable connection between CAH-1960 (J3) and CHASSIS.	
NAH-NFC RF CABLE	RF output of CAH-1960 is less than 5W at the time of the NFC check 1. AND NAH check 2 : RF input level : OK RF output level : OK NFC check 1 : NG NFC check 2 : NG	(a) Check the RF-cable connection between NAH-692/695/698 and NFC-296/896. (b) Check the RF-cable connection between CMC-2692/2695/2698 (J2) and CHASSIS. (c) Check the RF-cable connection on the CFG-296/896 (TB3, TB4).	
NAH SPLITTER	NAH check 2 : RF input level : NG NFC check 2 : RF input level : OK	(a) Check the cable connection between CDJ-2962 (J3) and CMC-2692/2695/2698 (J5). (b) Check the RF sensor on the CMC-2692/2695/2698. (CD1 etc.)	
NAH PA(A) OR COMBINER NAH PA(B) OR COMBINER NAH PA(C) OR COMBINER	NAH check 2 : RF input level : OK SWR : NG NFC check 2 : OK	(a) Check the RF-cable connection between CAH-2692 (J1) and CMC-2692/2695/2698 (J3/J100/J200). (b) Check the RF-cable connection between CAH-2692 (J2) and CMC-2692/2695/2698 (J4/J101/J201). (c) Check the RF-cable connection between CMC-2692/2695/2698 (J2) and CHASSIS.	

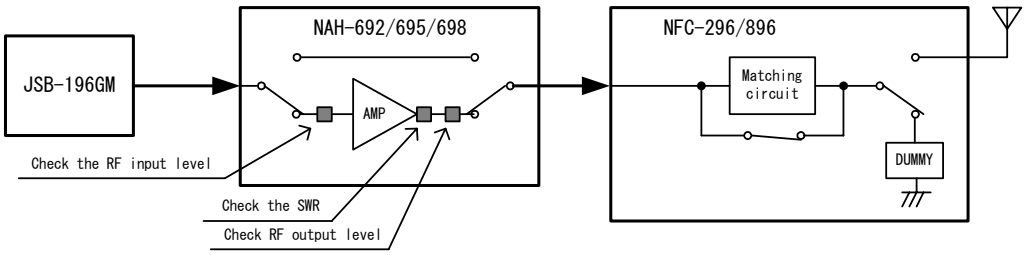
Note Refer to the next page about NAH check 2, NFC check 1 and NFC check 2.

NAH check 2:

NAH check 2 is the check of the PA. In this check, RF output is connected to the dummy load into the NFC. In the above-mentioned state, 1.6MHz RF signal is inputted into NAH Power Amplifier and check the RF input/output level, and the VSWR of the NAH.

Judgment conditions:

OK : SWR <3.0 and RF input level >= 0.1W and RF output level >=20W.
NG : SWR >=3.0 or RF input level <0.1 or RF output level < 20W.

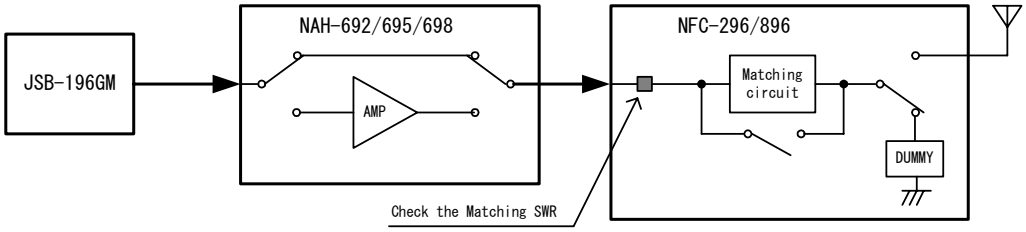


NFC check 1:

NFC check 1 is the check of the NFC matching circuit. In this check, RF output is connected to the dummy load and the check the matching on 6 frequencies.

Judgment conditions:

OK : The frequency of SWR<3 is 5 or more.
NG : The frequency of SWR>=3 is 2 or more.

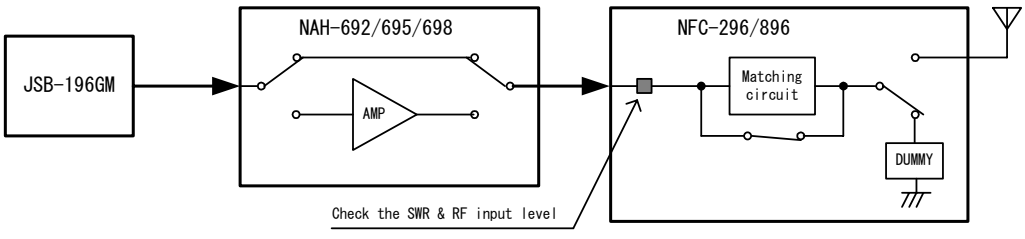


NFC check 2:

NFC check 2 is the check of the NFC short circuit. In this check, RF output is connected to the antenna dummy load. In the above-mentioned state, 1.6MHz RF signal is inputted into the antenna tuner and check the VSWR of NFC sensor circuit and antenna dummy.

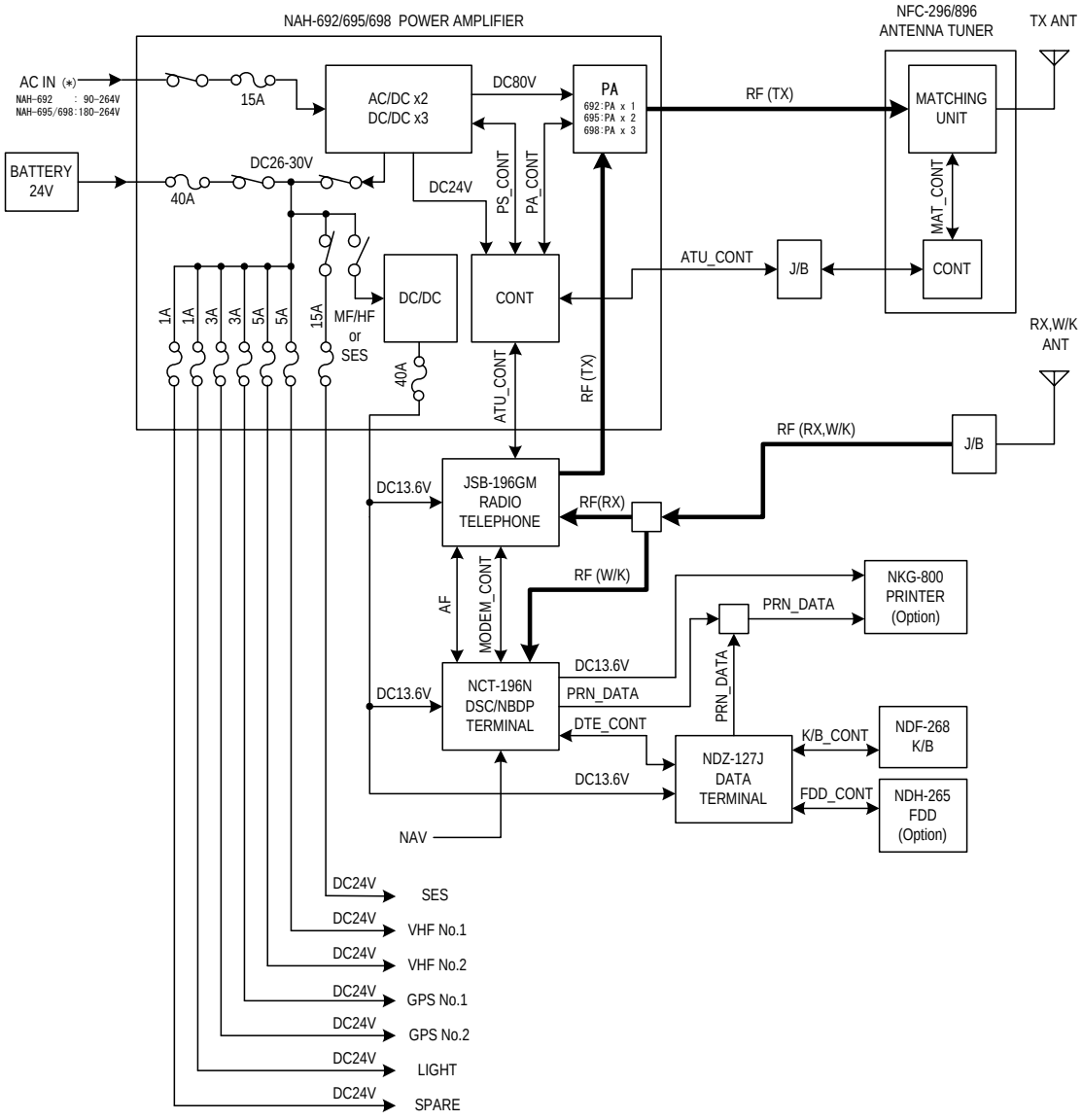
Judgment conditions:

OK : SWR <=2.0 and RF level >= 5W.
NG : SWR >2.0 or RF level <5W.

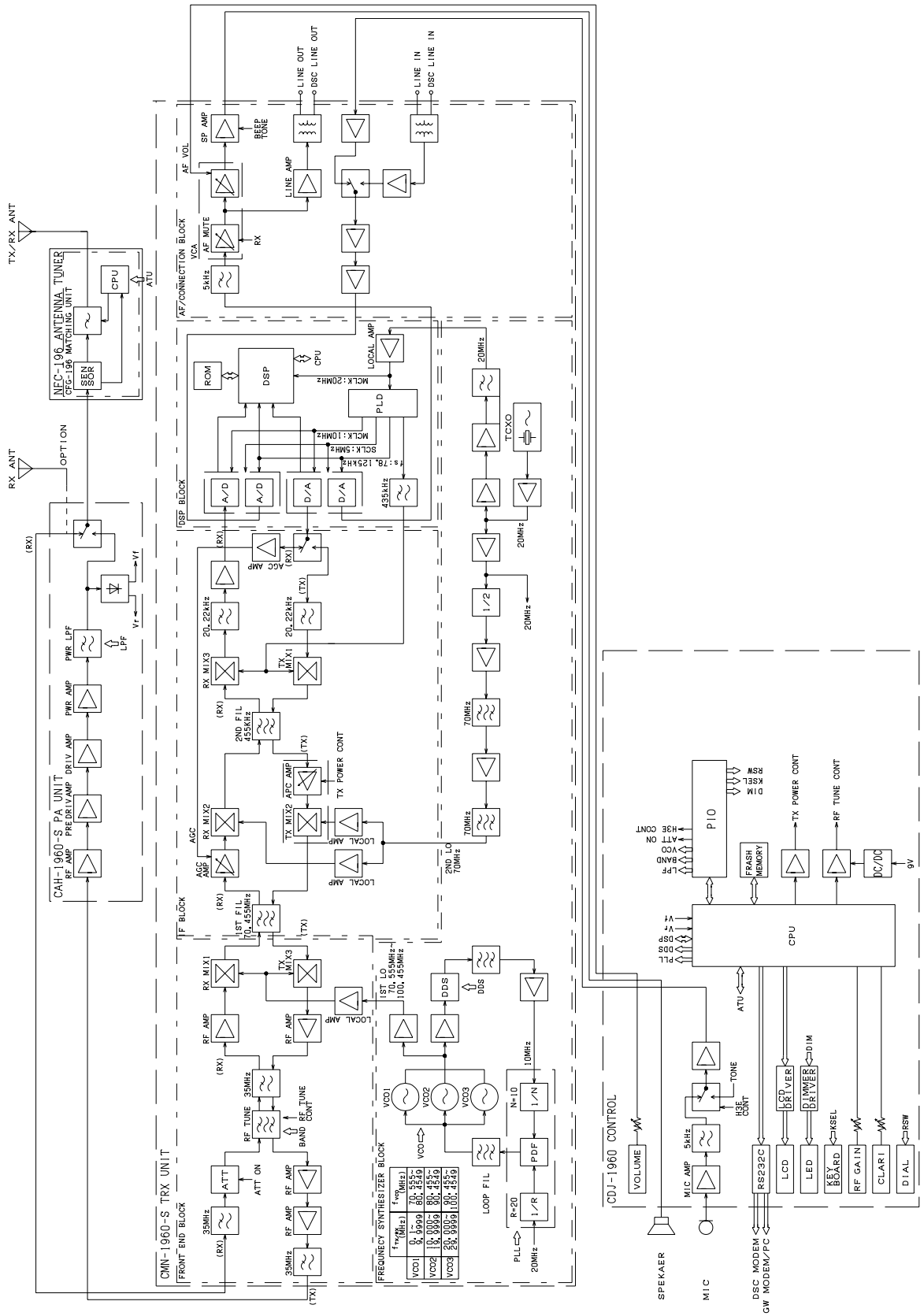


6 Block diagram

6.1 JSS-296/596/896 MF/HF Radio Equipment block diagram



6.2 JSB-196GM MF/HF Radio Equipment block diagram



6.2.1 Descriptions

The JSB-196GM consists TRX unit type CMN-1960, PA unit type CMN-1960 and Control unit type CDJ-1960.

The Control unit consists the CPU, audio amplifier for handset microphone and 1500Hz test tone generator. The CPU controls the TRX unit, PA unit and input/output signals from/to connected units.

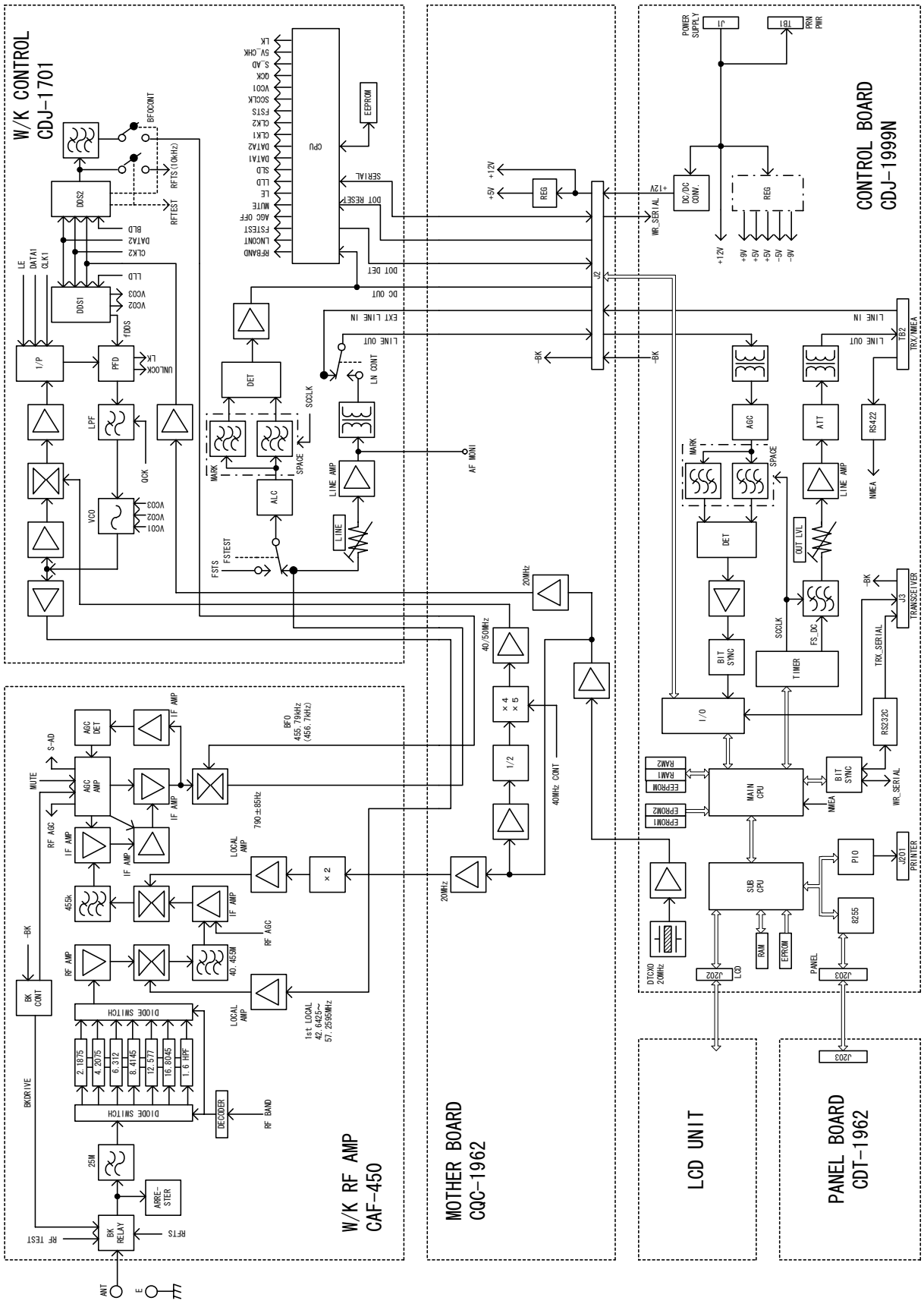
TRX unit consists AF block, IF block, RF block, DSP block and SYNTH block. The TRX unit uses the there kind of IF signals 70.455MHz, 455KHz and 20.22KHz for reception and transmission. DSP block converts the 20.22KHz IF signal to audio frequency. SYNTH block makes the 70.555 – 100.455MHz 1st local frequency and 70MHz local frequency. AF block selects the input signal to the DSP block. During DSC and NBDP mode the line input is passed to the DSP block, during TEL mode the microphone signal is passed.

PA unit amplifies the transmission signal to 1 – 2W during AC operation, to maximum 150W during DC operation, and to about 10W during tune.

6.2.2 Signals from/to the other units.

From/ To	Connecter Name	Pin No.	Signal Name	Description	
PA (NAH-692/ 695/ 698)	ANT		RF OUT	Transmission signal output. AC operation: 0 – 2 W DC operation: 100 W max. (2 MHz), 150 W max. (4 – 25 MHz)	
				Console terminal	(Console type NCU-324/1960)
	Tuner	1	TXD	85	Transmission data to the PA unit.
		2	GND	86	Signal ground.
		4	Analog	88	Antenna current analog data.
		5	PA mute	89	Transmission is prohibited by low signal.
		6	RXD	90	Received data from the PA unit.
	Accessory	10	-BK	87	Key signal to the PA unit.
Receive antenna	RX ANT		RF IN	Receive signal.	
Modem (NCT-196N)	Accessory	13	Line in (+)	Modulated audio frequency signal input for DSC and NBDP. 600 ohms 0 dBm (-20 -- +10 dBm)	
		14	Line in (-)		
		15	GND	Signal ground.	
		16	Line out (+)	Received audio frequency signal output for DSC and NBDP. 600 ohms 0 dBm (-20 -- +10 dBm)	
		17	Line out (-)		
	Modem	2	RXD	Reception data from the modem unit.	
		3	TXD	Transmission data to the modem unit.	
		4	-BK	Break signal output to mute the modem unit.	
		5	GND	Signal ground.	
		6	EXT KEY	External key signal input from the modem unit.	
		7	TX RDY	JSB-196GM ready to transmit when low signal.	
		8	Scan Stop	The modem unit stops the scanning when low signal.	

6.3 NCT-196N DSC/NBDP Modem block diagram



6.3.1 Descriptions

NCT-196N DSC/NBDP modem consists the control board type CDJ-1999N, the W/K RF AMP type CAF-450, W/K control type CDJ-1701 and the Mother board type CQC-1962.

The W/K RF AMP consists the RF filter, RF amplifier, IF amplifiers, IF filters, mixers and BK relay. It converts the received RF signal to audio frequency and passes it to the W/K control. The scanning frequencies are controlled by the W/K control.

The W/K control consists 1st local synthesizer, CPU and mark/space signal decoder. Normally it returns the audio signal that comes from the control board back directly. When it detects the dot signal in the audio signal that comes form the W/K RF AMP, it activate the DOT DET signal and pass the audio signal from the W/K RF AMP through to the control board. And keep the connection until dot reset signal from the control board has been activated.

The control board consists the 20MHz TCXO, Main CPU, Sub CPU, mark/space modulator and decoder. It receives the audio frequency from the transceiver type JSB-196GM and pass through it directly to the W/K control. The W/K control returns back the audio signal and it is inputted to mark/space decoder.

If the DOT DET signal form the W/K control is activated and the control board detects the DSC message addressed to own station in the audio signal, it stores the received DSC message in its memory and sounds the DSC alert. The control board activates the DOT RESET signal to the W/K control, after finishes the decoding or decides the DSC file is not addressed to own station during decoding.

At the DSC mode, the control board converts the DSC file to be sent in its memory to modulated audio frequency and send it to the JSB-196GM through the line out. The control board decodes the audio signal from the JSB-196GM. If it detects the DSC message that addressed to own station, it stores the DSC file in its memory and sounds the DSC alert.

At the NBDP mode, the control board is phasing to other station. After finish the phasing, the control board just decodes and modulates the audio frequency from/to JSB-196GM and pass characters from/to the data terminal NDZ-127J.

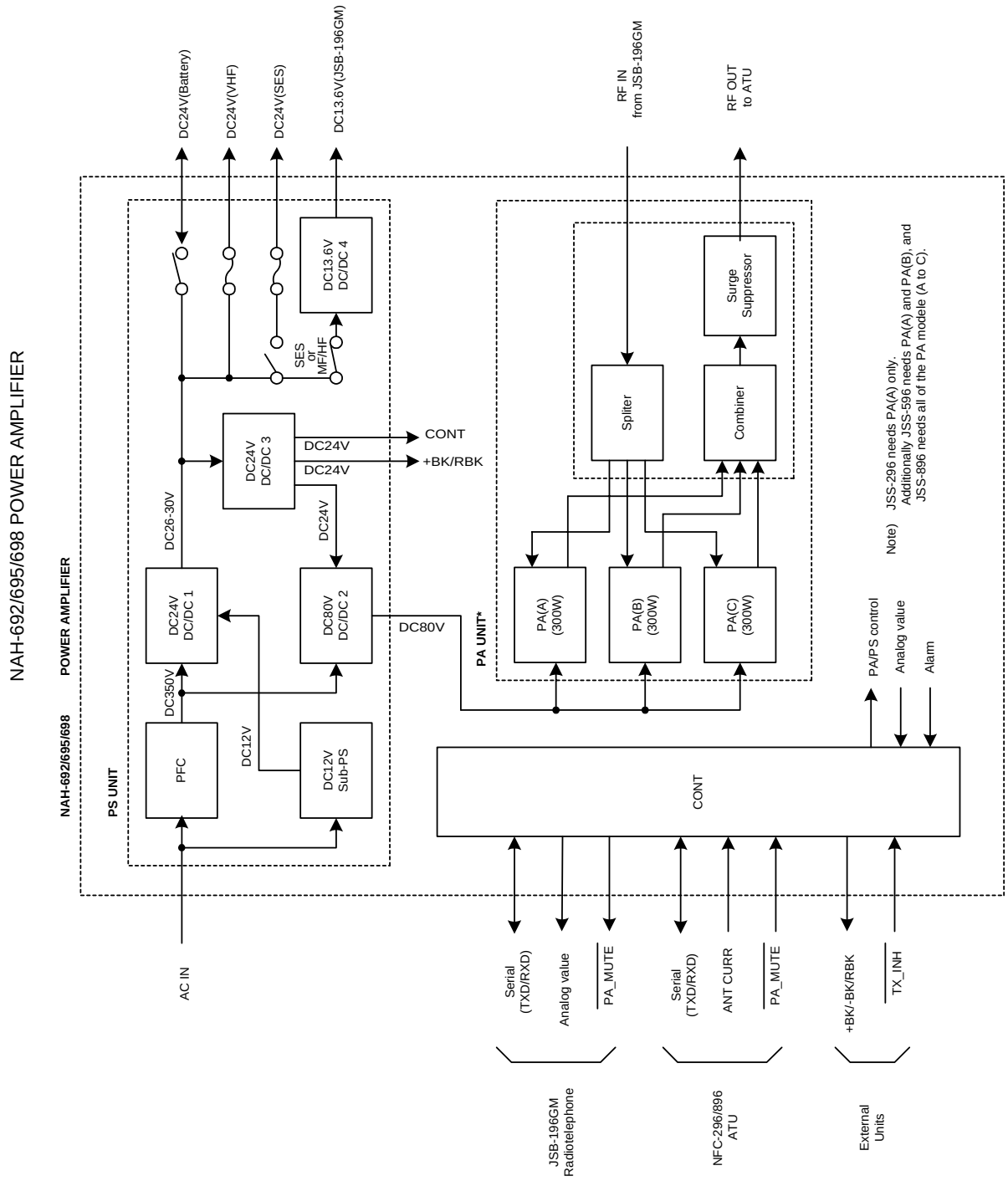
* The modem NCT-196N and the DTE NDZ-127J share the Printer NKG-800. The printer is connected via automatic printer selector type SW-ATB21K.

6.3.2 Signals from/to the other units

From/ To	Connecter Name	Pin No.	Signal Name	Description
Receive antenna	ANT		RF IN	Receive signal for watch keeping receiver.
TRX JSB-196GM	TRANS-CEIVER	2	RXD	Receive data from the Transceiver (JSB-196GM).
		3	TXD	Transmission data to the Transceiver (JSB-196GM).
		4	EXT KEY	External key signal to the Transceiver (JSB-196GM).
		5	GND	Signal ground.
		6	-BK	-BK signal form the Transceiver (JSB-196GM).
		7	Scan Stop	Scanning stop when low. (To Transceiver)
		8	TX Ready	Ready to transmission when low. (From Transceiver)
		9	HT	Not use.
	TRX/ NMEA	1	Line in (+)	Received audio frequency signal input from the Transceiver. 600 ohms 0 dBm (-20 -- +10 dBm)
		2	Line in (-)	
		3	GND	Signal ground.
		4	Line out (+)	Modulated audio frequency signal output to the Transceiver. 600 ohms 0 dBm (-20 -- +10 dBm)
		5	Line out (-)	
NDZ-127J	DTE	2	RXD	Receive data.
		3	TXD	Transmit data.
		5	GND	Signal ground.
		7	RTS	Request to send.
		8	CTS	Clear to send.
NKG-800	PRINTER	1	STB	Printer control signal.
		2 - 9	DATA 0 -- 7	Print out data.
		10	ACK	Printer control signals.
		11	BUSY	
		12	PE	
		13	SELECT	
		15	-ERROR	
		16	-PINIT	
		18 - 25	GND	Signal ground.

DMC (Option)	TB121			Console terminal	(Console type NCU-331/324/1960)	
		1	DMC_DAL	67	Low when distress alert has been received.	
		2	DMC_DRQ	68	Low to request distress transmission. (Input)	
		3	DMC_DRA	69	Low when distress request is accepted.	
		4	DMC_SEL	70	Low to change the system status distress or normal alternatively. (Input)	
		5	DMC_RDY	71	Low when the system ready to transmit distress.	
		6	GND	72	Signal ground.	
		7	+12V	73	+12V DC	
GPS				CQD-3030	Console terminal	(Console type NCU-331/324/1960)
	TRX/ NMEA	6	Nmea data1	38	---	Position data input from CQD-3030 (GPS buffer).
		7	Nmea data2	39	---	
	GPS buffer input		Nmea data1	46	29	Position data input from GPS.
			Nmea data2	47	30	
VHF	GPS buffer output		Nmea data1	42	42 44	Position data output to VHF 1 and 2.
			Nmea data2	43	43 45	
INMAR SAT-C	GPS buffer output		Nmea data1	44	11	Position data output to INMARSAT-C.
			Nmea data2	45	12	

6.4 NAH-692/695/698 Power Amplifier block diagram



6.4.1 Descriptions

The PA unit consists the PA control unit, the PA unit(s), the main control unit, and the PS unit. NAH-296 has one PA unit. NAH-695 has two PA units. NAH-698 has three PA units. The PA control sprits the RF IN signal for each PA unit and combine the output from each unit when AC operation. At DC operation and tuning the PA control pass the RF IN through to RF OUT directly.

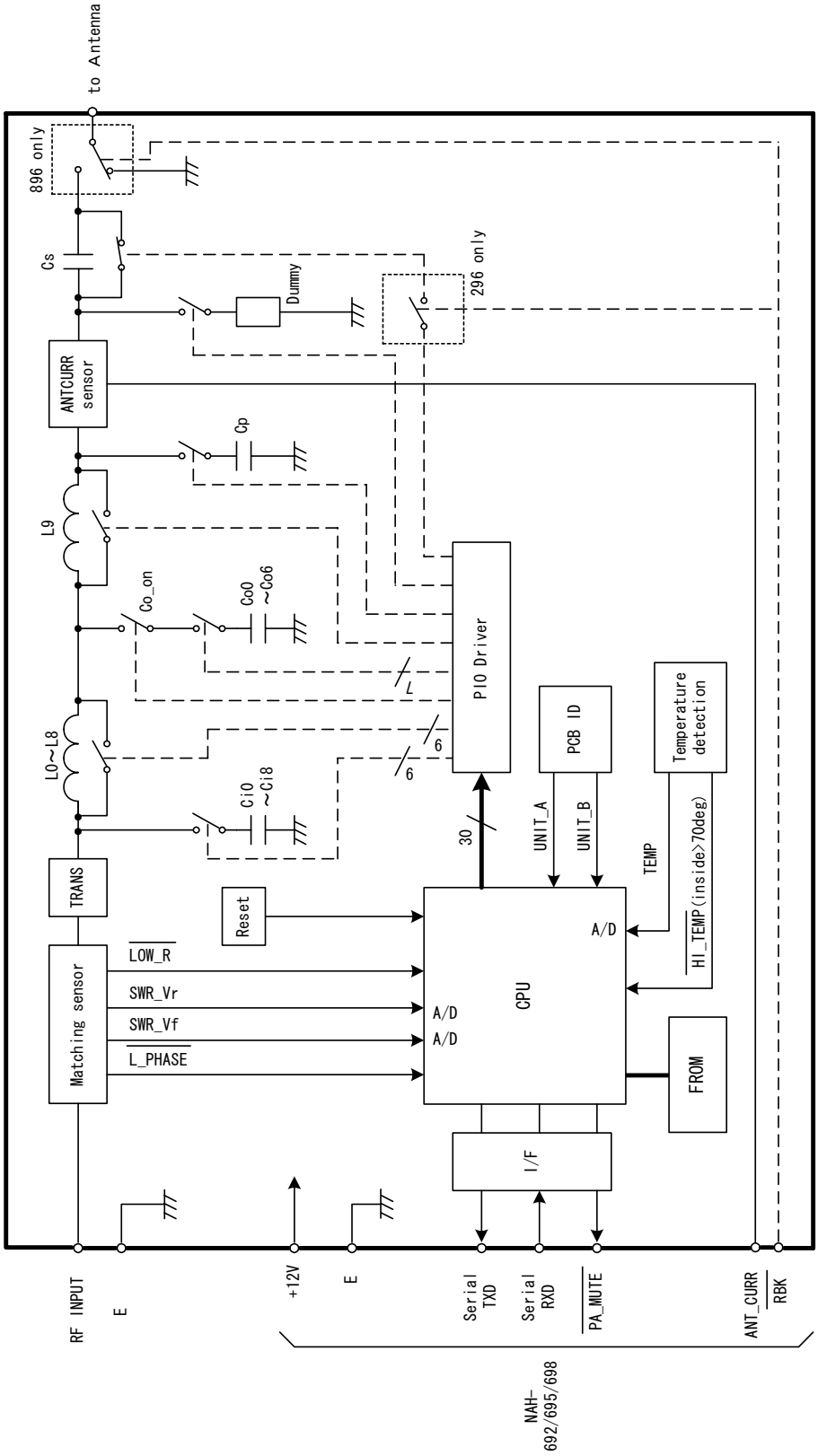
The PS unit makes the +24V for battery charging and +BK, +80V for PA, +13.6V for transceiver unit, modem unit, DTE and printer.

The PA unit makes the RBK signal from –BK signal. The RBK signal keeps low level 3 minutes more after –BK signal changes to high.

6.4.2 Signals from/to the other units

From/ To	Connecter Name	Pin No.	Console Terminal	Signal Name	Description
TRX JSB-196GM	PA IN		PA IN	RF IN	Input for power amplifier.
	Tuner JSB-196GM	1	85	TXD	Transmission data to the Transceiver.
		2	86	GND	Signal ground.
		3	87	-BK	Key signal from the Transceiver.
		4	88	Analog	Antenna current analog data.
		5	89	-PA mute	Prohibit the transmission of the Transceiver.
		6	90	RXD	Received data from the Transceiver.
Tuner NFC-296/ 896	PA OUT		PA OUT	RF OUT	Power amplifier output.
	Tuner	1	55	+13.6V	+13.6V power source for tuner.
		2	56	+13.6V	
		3	57	GND	DC power return. Signal ground.
		4	58	GND	
		5	59	TXD	Transmission serial data.
		6	60	RXD	Receive serial data.
		7	61	-PA MUTE	Transmission is prohibited when low.
		8	62	ANT CURR	Antenna current analog data.
	Accessory	4	6	RBK	Set the tuner ready to transmit when low.
Other	Accessory	12	1	+BK	+BK (+24V DC)
		6	2	-BK	-BK
		11	3	+BK	+BK (+24V DC)
		5	4	-BK	-BK
		10	5	+BK	+BK (+24V DC)
		9	7	GND	Signal ground.
		3	8	-TX INH	Transmission is prohibited when low.
		2	9	-CHG ALM	Low when battery charging is abnormal.
		8	10	DC OUT	Low when DC operation.
		1	64	-SES/HF	SES DC operation remote control output.
		7	65	-SES OUT	SES DC operation status output.
GPS 1	AUX P/S	12	74	+24V	DC power source for No.1 GPS. (Maximum current 3A)
		4	75	GND	
GPS 2	AUX P/S	11	76	+24V	DC power source for No.2 GPS. (Maximum current 3A)
		3	77	GND	
VHF 1	AUX P/S	14	47	+24V	DC power source for No.1 VHF. (Maximum current 5A)
		6	48	GND	
VHF 2	AUX P/S	13	49	+24V	DC power source for No.2 VHF. (Maximum current 5A)
		5	50	GND	
INM-C	AUX P/S	15, 16	78	+24V	DC power source for INMARSAT-C. (Maximum current 15A)
		7, 8	79	GND	
GPS Buffer	AUX P/S	10	80	+24V	DC power source for GPS buffer NQD-3030. (Maximum current 1A)
		2	81	GND	
EMG. LIGHT	AUX P/S	9	82	+24V	DC power source for emergency light. (Maximum current 1A)
		1	83	GND	

6.5 NFC-296/896 Antenna Tuning Unit block diagram



6.5.1 Descriptions

The tuner consists the PA control, the matching unit and CS unit. The PA control controls the tuning and store the tuning data for each channel. The matching unit consists the forward/return wave sensor, antenna current sensor, Ci, L, Co, Cp, Cs and relays. The CS unit ground the antenna when the RBK signal is not activated (High).

In case of the NFC-296 there is no CS unit. The Cs capacitance in the matching unit is always passed when the RBK signal is not activated to ground the antenna through the T2 in the matching unit.

When tuning the tuner check the VSWR by the preset tuner setting. If the VSWR is over than about 1.7, the tuner starts the tuning otherwise keeps the preset setting.

6.5.2 Signals from/to the other units.

From/ To	Connecter Name	Pin No.	NQD-4190	Console terminal	Signal name	Description
PA NAH-692 695 698	TB1	1	1	55, 56	+12V	DC power source for the tuner.
		2	2	57, 58	GND	DC power return.
		3	3	59	TXD	Serial data transmission.
		4	4	60	RXD	Serial data reception.
		5	5	61	-PA MUTE	Prohibit the transmission of the Transceiver.
		6	6	62	ANT CURR	Antenna current analog data.
	TB10 (NFC-896)		7	6	RBK	The antenna grounded at the CS UNIT when not activated (High).
	J2 (NFC-296)	1	7	6	RBK	The antenna grounded through the tuner when not activated (High).
	TB 3		M-J-J	RF OUT	RF OUT	Coaxial cable center conductor
	TB 4					Coaxial cable shield

7. Parts list

NAME		TYPE	CODE
TRANSCEIVER		JSB-196GM	JSB-196GM
	PA UNIT	CAH-1960	CAH-1960
	CONTROL UNIT	CDJ-1960	CDJ-1960
	TRX UNIT	CMN-1960	CMN-1960
	HANDSET	NQW-213	NQW-213
DSC/NBDP MODEM		NCT-196N	NCT-196N
	W/K RF AMP	CAF-450	CAF-450
	W/K CONTROL	CDJ-1701	CDJ-1701
	CONTROL BOARD	CDJ-1999N	CDJ-1999N
	PANEL BOARD	CDT-1962	CDT-1962
	MOTHER BOARD	CQC-1962	CQC-1962
PA (JSS-296)		NAH-692	NAH-692
PA (JSS-596)		NAH-695	NAH-695
PA (JSS-896)		NAH-698	NAH-698
(296x1 / 596x2 / 896x3)	PA UNIT	CAH-2692	CAH-2692
(296/596/896)	PS UNIT	CBG-2692-A	CBG-2692-A
(296/596/896)	CONTROL UNIT	CDJ-2692	CDJ-2692
(296)	PA CONTROL UNIT	CMC-2692	CMC-2692
(596)	PA CONTROL UNIT	CMC-2695	CMC-2695
(896)	PA CONTORL UNIT	CMC-2698	CMC-2698
(296/596/896)	AC/DC	7EPJD0005	7EPJD0005
TUNER (JSS-296)		NFC-296	NFC-296
TUNER (JSS-596/896)		NFC-896	NFC-896
(296/596/896)	TUNER CONT	CDJ-2960	CDJ-2960
(296)	MATCHING UNIT	CFG-296-A	CFG-296-A
(596/896)	MATCHING UNIT	CFG-896	CFG-896
(596/896)	CS UNIT	CFF-896	CFF-896
JUNCTION BOX		NQD-4190	NQD-4190
PRINTER		NKG-800	NKG-800
PRINTER SELECTOR		SW-ATB21K	5EZCQ00017
DTE		NDZ-127J	NDZ-127J
KEYBOARD		NDF-268	NDF-268
FDD UNIT		NDH-265	NDH-265
CABLE	JSB-196GM POWER CABLE	7ZCJD0043A	7ZCJD0043A
	NCT-196N POWER CABLE	7ZCJD0139	7ZCJD0139
	NKG-800 POWER CABLE	6JNKD00100A	6JNKD00100A
	NDZ-127J POWER CABLE	6ZCSC00582	6ZCSC00582
	JSB-NCT SIGNAL CABLE	7ZCJD0074A	7ZCJD0074A
	NCT-NDZ SIGNAL CABLE	7ZCJD0072A	7ZCJD0072A
	NCT/NDZ PRINTER CABLE	KP-DV1	5ZCXA00011
	PRINTER SELECTOR CABLE	KPU-104K	5ZCXA00012
	FDD SIGNAL CABLE	6ZCAF00297	6ZCAF00297

8. Check list

Check items			Content	Result
General	Antenna installation		There is no damage and have a good isolation against grounding.	
			Antenna type (Wire / Whip)	
	Tuner grounding		The ground plate is welded near the tuner and cupper plate is not damaged.	
			Tuner location (Indoor / Outdoor)	
	Self check		Carry out Menu 14.	
	Position update		Check the position in NCT-196N is updated.	
	DC operation		Possible to operate only by DC power source.	
Transmission	2MHz		Check and adjust by menu 41.	
			Level Vc Ic Ia	
	4MHz		Check and adjust by menu 41.	
			Level Vc Ic Ia	
	6MHz		Check and adjust by menu 41.	
			Level Vc Ic Ia	
	8MHz		Check and adjust by menu 41.	
			Level Vc Ic Ia	
	12MHz		Check and adjust by menu 41.	
			Level Vc Ic Ia	
	16MHz		Check and adjust by menu 41.	
			Level Vc Ic Ia	
	18MHz		Check and adjust by menu 41.	
			Level Vc Ic Ia	
	22MHz		Check and adjust by menu 41.	
			Level Vc Ic Ia	
	25MHz		Check and adjust by menu 41.	
			Level Vc Ic Ia	
TEL mode	Communication test		Communicate with suitable coast station.	
DSC mode	Self test		Carry out the modem loop test.	
	Communication test		Communicate with suitable coast station.	
	Printer operation		The received DSC file is printed out.	
NBDP mode	Self test			
	Communication test		Communicate with suitable coast station.	
	Printer operation		The communication result is printed out.	
W/K receiver	Frequency selection		Watch frequency can be selected.	
	Reception		Check the received distress messages.	
Software version	JSB-196GM		Check by menu 15.	
	NAH-692/695/698		Check by menu 15.	
	NCT-196N	DSC main	Check by start up screen of NCT-196N.	
		DSC sub	Check by start up screen of NCT-196N	
		NBDP main	Check by help menu of NDZ-127J.	
		NBDP sub	Check by ROM seal.	
	NDZ-127J		Check by help menu of NDZ-127J	
	NFC-296/896		Check by menu 15.	

Appendix A

A-1 JSB-196GM Radio telephone software update history.

Software version		Improvement and additional function	Date	JSB-196	JSS-196GM	JSS-296	JSS-596	JSS-896
CONTROL UNIT CDJ-1960	TRX UNIT (DSP) CMN-1960							
V2.3	V1.6	-	2002.08.20	V2.3	V2.3	V2.3	-	-
V2.5 – V2.9	↓	Improved the transmission problem which has difference of the TX power by the version of TRX UNIT board.	2003.01.10	V2.4	V2.4	V2.4	-	-
		Added the function for the Taiwan tuners.	2002.10.29	↓	↓	↓	-	-
		Added the control function of NAH-695/698 for JSS-596/896.	2002.11.10					
		Improved the memory problem which does not operate if the flash ROM data has been damaged.	2003.02.03					
		Added the adjustment function of transmitting power of each frequency band.	2003.02.10					
		Improved the DSC problem which is not changed into Work frequency by individual call.	2003.03.22					
		Improved the receiving performance in TLX and DSC mode.	2003.03.25					
		Improved the self-diagnosis problem that sometimes displays error of TRX UNIT in spite of normal condition.	2003.03.30					
		Improved the response speed at the quick operation by the JOG dial.	2003.06.19					
V3.0	↓	-		↓	↓	↓	V3.0	-
V3.1	↓	Improved the problem which can change frequency during ARQ communication.	2003.09.12	↓	↓	↓	↓	V3.1
V3.2	↓	-		↓	↓	↓	↓	↓
V3.3	↓	Improved the communication problem which sometimes can not communicate with Antenna Tuner at the time of the power supply ON.	2003.10.23	↓	↓	V3.3	V3.3	V3.3
V3.4	↓	Improved the self-diagnosis problem which sometimes displays error of PA OUT in spite of normal condition.	2003.12.04	↓	V3.4	V3.4	V3.4	V3.4
V3.5	↓	Added the control function of NCH-1961/1962.		↓	↓	↓	↓	↓
V3.6	↓	Improved the morse problem which miss the transmission of dot signal in high-speed morse communication.	2003.12.13	↓	V3.6	V3.6	V3.6	V3.6
		Improved the transmission problem which has difference of TX power by the software version.	2004.03.01					
		Improved the self-diagnosis problem which sets the TX power to 50W after executing of selfdiagnosis.	2004.04.05					
V3.7	V1.7	Improved the morse problem which miss the transmission of dash signal in high-speed morse communication.	2004.10.01	V3.7	V3.7	V3.7	V3.7	V3.7
		Improved the SQUELCH function so that SQUELCH level can be set up in 100 steps.	2004.10.01					
		Improved the receiving problem to which audio output will become small if NOISE REDUCTION is turned ON.	2004.10.01					

A-2 NAH-692/695/698 Power amplifier software update history.

Software version	Improvement and additional function	Date	NAH-692	NAH-695	NAH-698
V2.3			V2.3		
V2.4 – V2.9	Improved the memory problem which sometimes does not save the initial setting.	2003.01.31	↓	-	-
	Added the temperature monitoring function for 80V power supply unit.	2003.02.11			
	Added the control function of NAH-695/698 for JSS-596/896.	2003.04.22			
	Improved the problem which cannot upgrade the software of Antenna Tuner.	2003.07.03			
	Improved the self-diagnosis problem which displays error of BATTERY OUT if battery charger setting is OFF.	2003.07.17			
V3.0			↓	V3.0	
V3.1	Improved the problem which sometimes displays the alarm if service menu (PA BIAS ADJUST, PA 80V ADJUST) is selected.	2003.09.24	↓	↓	V3.1
V3.2	Added the control function of NCH-1961/1962.	2003.10.22	V3.2	V3.2	V3.2
	Improved the problem which can select the unusable menu.	2003.11.19			

A-3 NFC-296/896 antenna tuner software update history.

Software version	Improvement and additional function	Date	NFC-296	NFC-896
V2.3	-	2002.06.30	V2.2	-
V2.4	Add the Antenna Matching program for NFC-896.	2003.05.19	V2.4	V2.4

A-4 NCT-196N DSC/NBDP modem software update history.

Software version	Improvement and additional function	Date	Remarks
DSC-Main [IC2] : 2.01 DSC-Sub [IC204] : 2.00 NBDP-Main [IC402] : 2.01 NBDP-Sub [IC407] : 2.00	-		JSS-296 first lot
DSC-Main [IC2] : 2.10 DSC-Sub [IC204] : 2.10 NBDP-Main [IC402] : 2.10 NBDP-Sub [IC407] : 2.10	Improved the TLX problem which sometimes lacks characters in receiving FEC. Added AUTO-TELEX function. Improved the problem which cannot use without DTE (NDZ-127J). Improved the problem which does not have the left margin at the printed page.		JSS-596 first lot
DSC-Main [IC2] : 2.11 DSC-Sub [IC204] : 2.11 NBDP-Main [IC402] : 2.11 NBDP-Sub [IC407] : 2.10	Improved the problem which stops the scanning in AUTO-TELEX mode. Improved the problem which can not operate the JSB-196GM after sending DSC others message. Improved the problem which can not send distress message when test signal of Mark/Space/Dot is sending. Improved the problem which can not distinguish Tx/Rx of frequency displayed at the input menu of scan frequencies.		JSS-896 first lot
DSC-Main [IC2] : 2.12 DSC-Sub [IC204] : 2.11 NBDP-Main [IC402] : 2.11 NBDP-Sub [IC407] : 2.10	Improved the self-diagnosis problem which can not execute the WKR SELF TEST without DTE (NDZ-127J).	2003.01.06	

A-5 NDZ-127J Data terminal software update history.

Software version	Improvement and additional function	Date	Remarks
V2.01	-	2002.08.14	JSS-296 first lot
V2.10	Improved the problem which does not display position and frequencies in the DSC mode.	2003.02.20	JSS-596 first lot
	Improved the problem which does not erase channel indication when channel setting is canceled.		
	Improved the problem which does not start the scanning in AUTO-TELEX mode.		
	Improved the problem which does not perform scanning at the set speed.		
	Improved the problem which can send the unexpected directory's TLX-file at TLX communication.		
	Improved the problem which does not have the left margin at the printed page.		
V2.11	V2.11 Deleted unusable menu.	2003.09.30	JSS-896 first lot
	Added the function to reject incorrect position data.		
	Added the function to reject incorrect date and time data.		
	Added the function to reject incorrect frequency input.		
	Improved the readability of Destination list which is printed.		
	Improved the problem which mode indication of DTE (NDZ-127J) may differ from a Transceiver (JSB-196GM).		
	Improved the problem the status window of the format disappears if antenna tuning is executed during the formatting of floppy disk.		
	Improved the problem which is indicating the start frequency of scanning during scanning.		
V3.00	V3.00 Revised for new PC board.	2004.02.11	PCB was modified.
	Improved the problem which can not be viewed the characters of display if DTE (NDZ-127J) is rebooted after the display contrast is set to minimum or maximum.		
V3.01	V3.01 Improved the problem which is setting the NumLock to ON automatically during the start-up process.	2004.03.12	This problem occurs on modified PCB only.

Appendix B

Circuit diagram

JSB-196GM RADIOTELEPHONE

JSB-196	CHASSIS
CDJ-1960	CONTROL UNIT
CAH-1960	PA UNIT
CMN-1960	TRX UNIT

NCT-196N DSC/NBDP

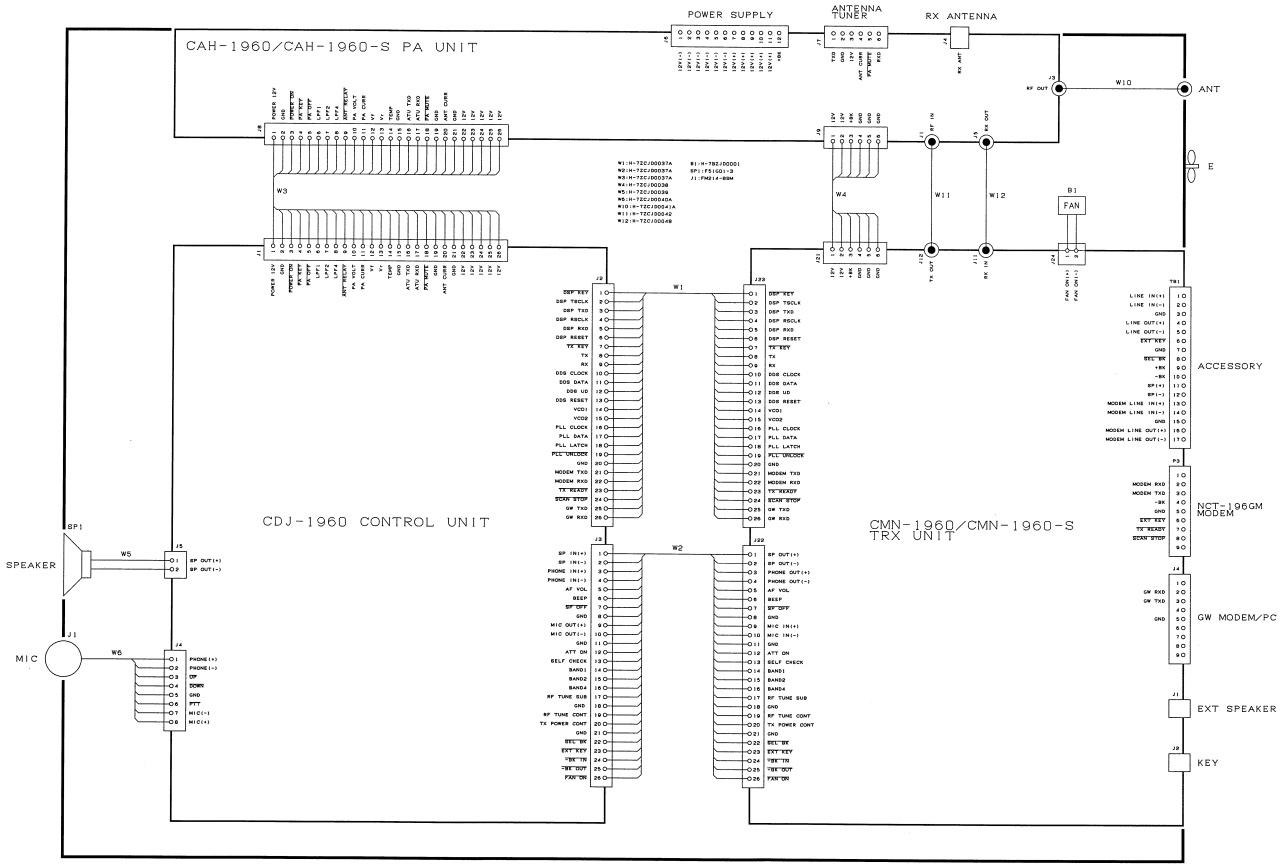
NCT-196N	CHASSIS
CDJ-1999N	CONTROL BOARD
CDJ-1701	W/K CONTROL
CAF-450	W/K RF AMP
CDT-1962	PANEL BOARD
CQC-1962	MOTHER BOARD

NAH-692/695/698 POWER AMPLIFIER

NAH-692	CHASSIS
NAH-695	CHASSIS
NAH-698	CHASSIS
CDJ-2692	MAIN CONTROL UNIT
CMC-2692	PA CONTROL
CMC-2695	PA CONTROL
CMC-2698	PA CONTROL
CAH-2692	PA UNIT
CBG-2692	PS UNIT

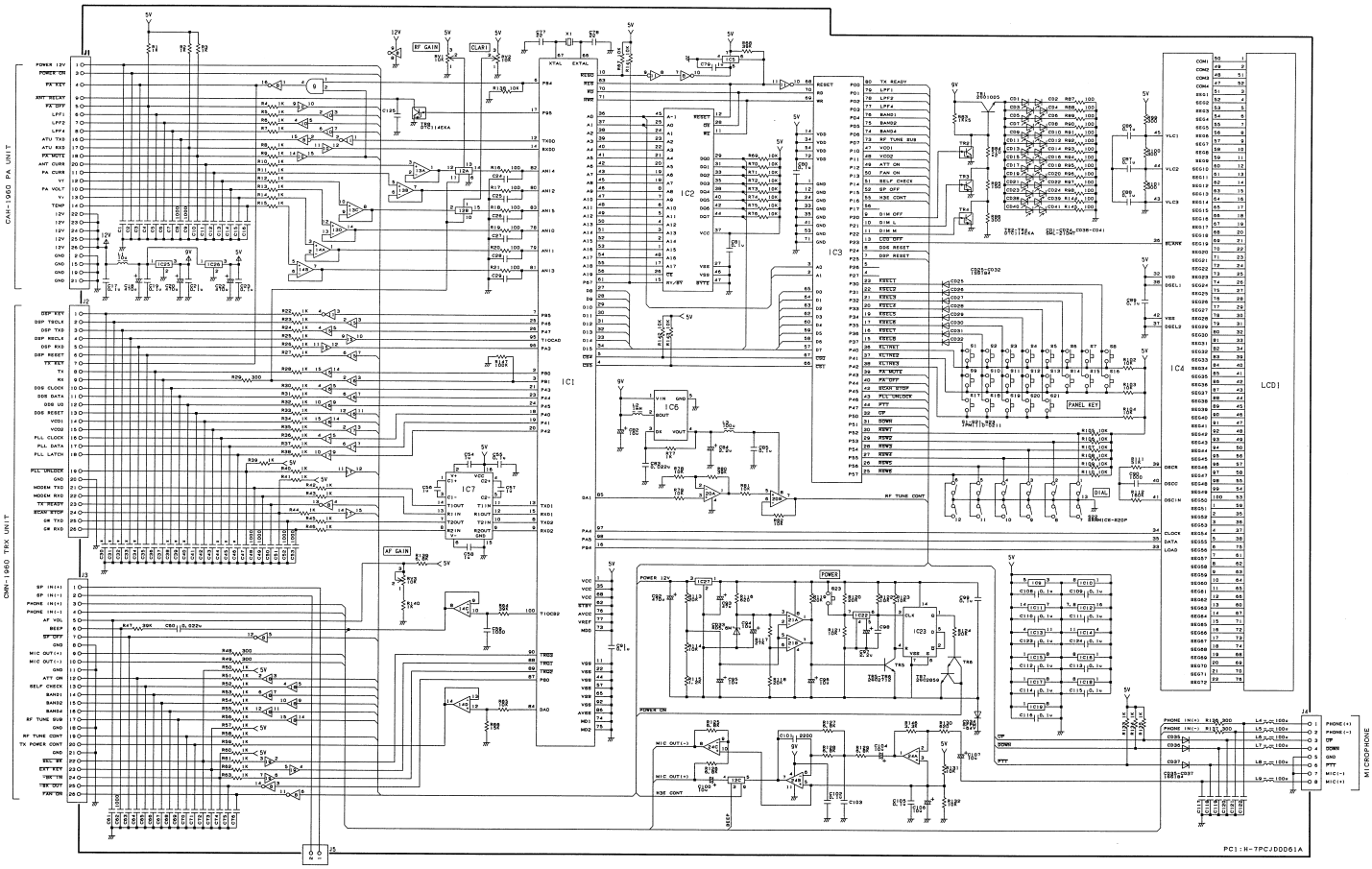
NFC-296/896 ANTENNA TUNER

NFC-296	CHASSIS
NFC-896	CHASSIS
CDJ-2960	TUNER CONT
CFG-296	MATCHING UNIT
CFG-896	MATCHING UNIT
CFF-896	CS UNIT



JSB-196 CHASSIS (1/1)

DWG.NO. ED01-JSB-196



IC1:MD6413007F20
IC2:M5M29F400BC-90PFTN
IC3:H-66DJ0000Z4
IC4:M5M6775TS-K
IC5:M51953BFP
IC6:TK11818M
IC7:MAX232EWE
IC8:TD62003AF
IC9:TC4S81F
IC10:TC74HC4050AFT

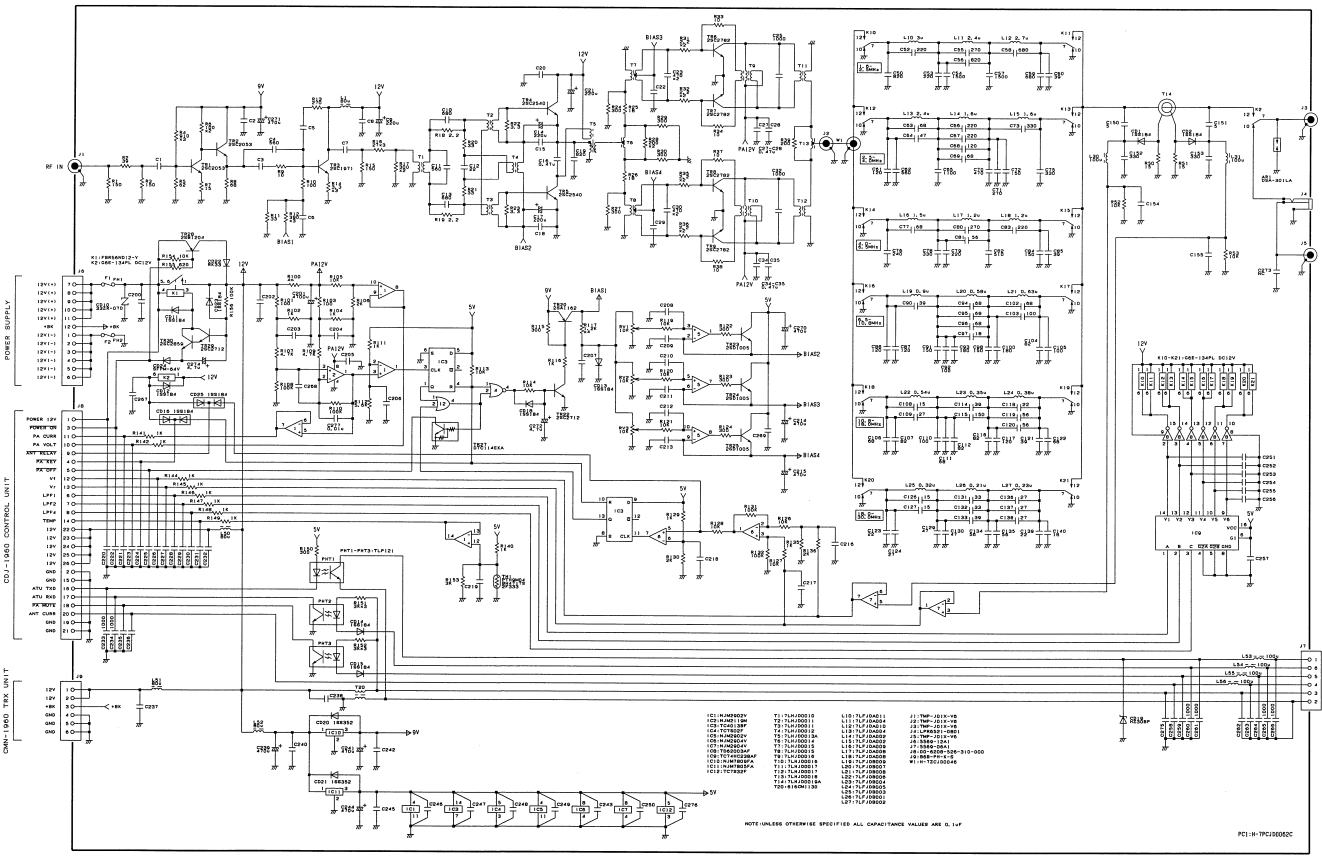
IC11:TC74VHC04FT
IC12:TC74HC4053AFT
IC13:NJM2902V
IC14:NJM2902V
IC15:TC74HC4050AFT
IC16:TC74HC4050AFT
IC17:TC74HC4050AFT
IC18:TC74HC4050AFT
IC19:TC74HC4050AFT
IC20:NJM2904V

IC21:NJM2903V
IC22:M51953BFP
IC23:TC4013BF
IC24:NJM2902V
IC25:NJM7809FA
IC26:NJM7805FA
IC27:AN7710M
X1:AT-51 F=19.660MHz
LCD1:H-TM8J0001A

NOTE:UNLESS OTHERWISE SPECIFIED ALL CAPACITANCE VALUES ARE 0.01uF
x:No Connected

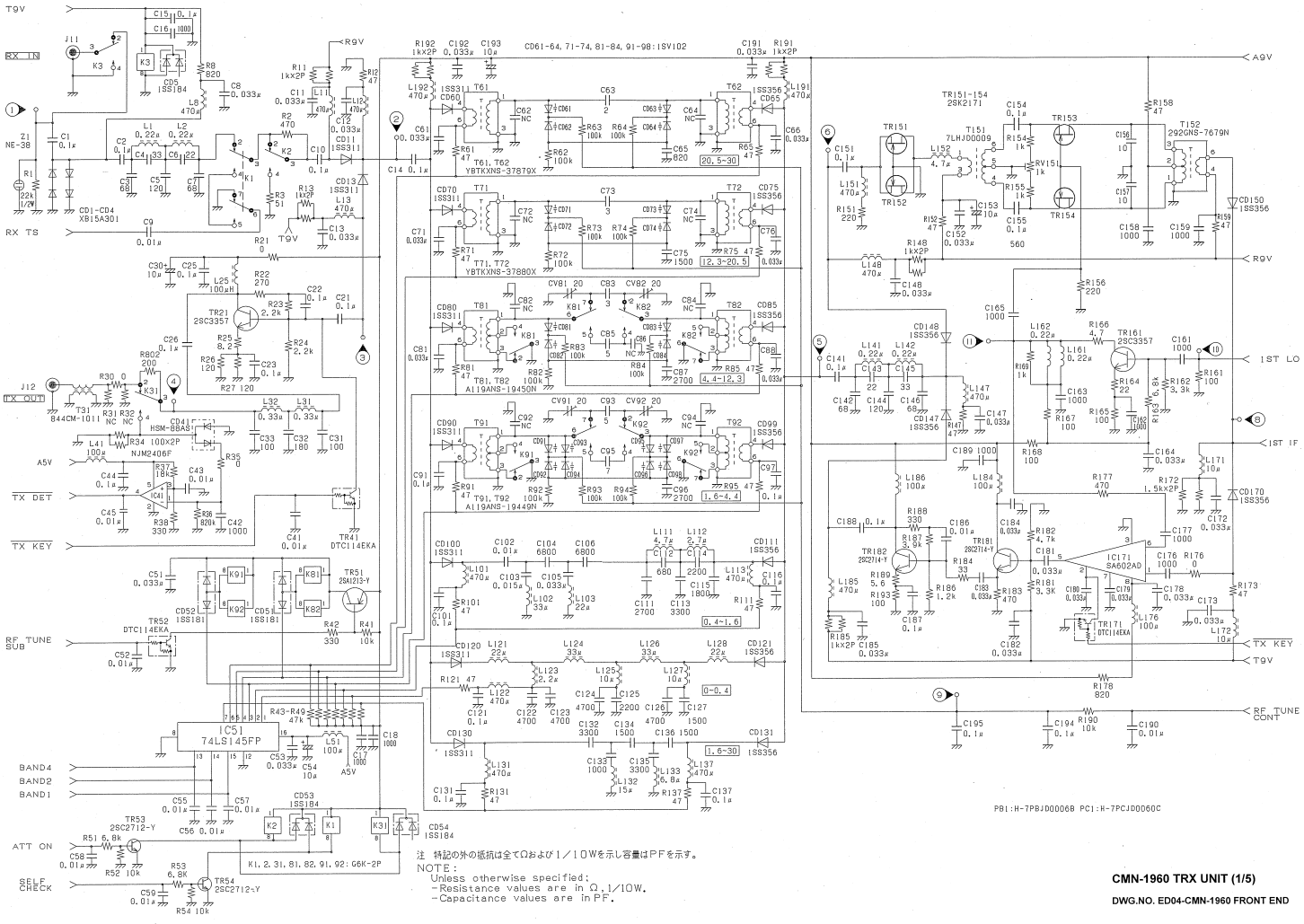
CDJ-1960 CONTROL UNIT (1/1)

DWG.NO. ED02-CDJ-1960



CAH-1960 PA UNIT (1/1)

DWG.NO. ED00-CAH-1960



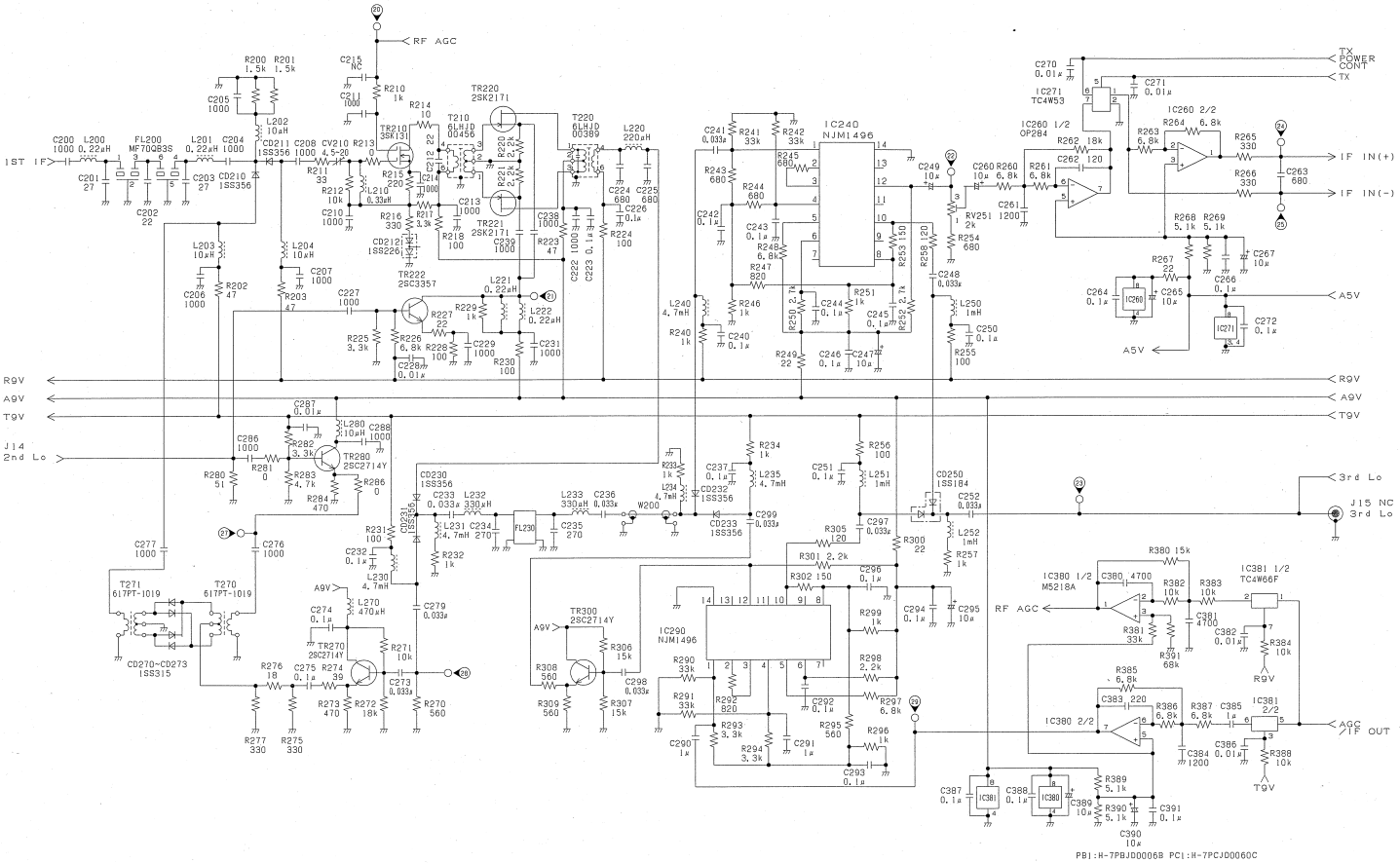
PB1:H-7PBJD0006B PC1:H-7PCJD0060C

注 特記の外の抵抗は全てΩおよび1／10Wを示し容量はPFを示す。

NOTE:
Unless otherwise specified:
-Resistance values are in Ω, 1/10W.
-Capacitance values are in PF.

CMN-1960 TRX UNIT (1/5)

DWG.NO. ED04-CMN-1960 FRONT END



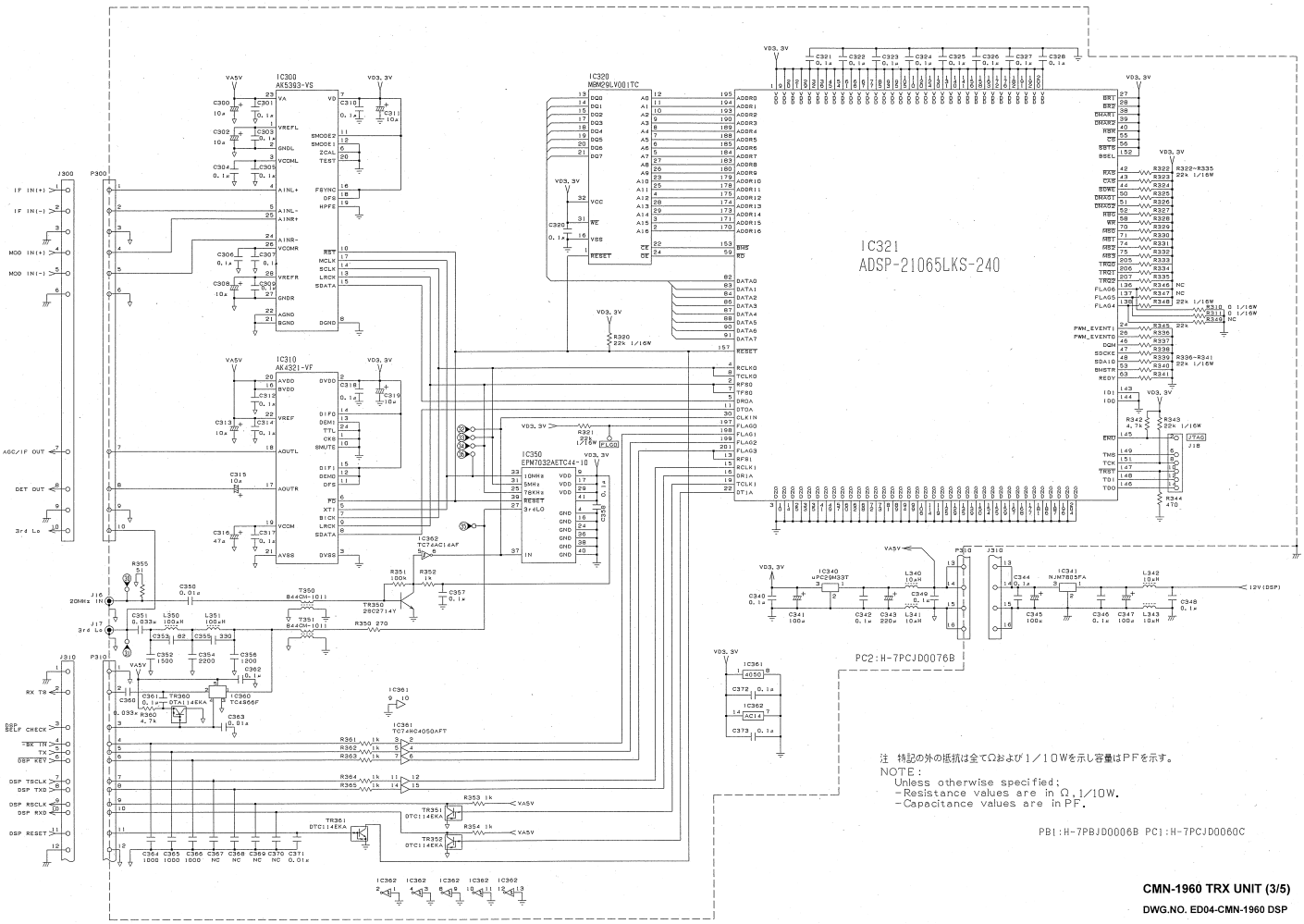
PBI:H-7PBJD0006B PCI:H-7PCJD0060C

注 特記の外の抵抗は全てΩおよび1／10Wを示し容量はPFを示す。

NOTE:
Unless otherwise specified;
-Resistance values are in Ω, 1/10W.
-Capacitance values are in PF.

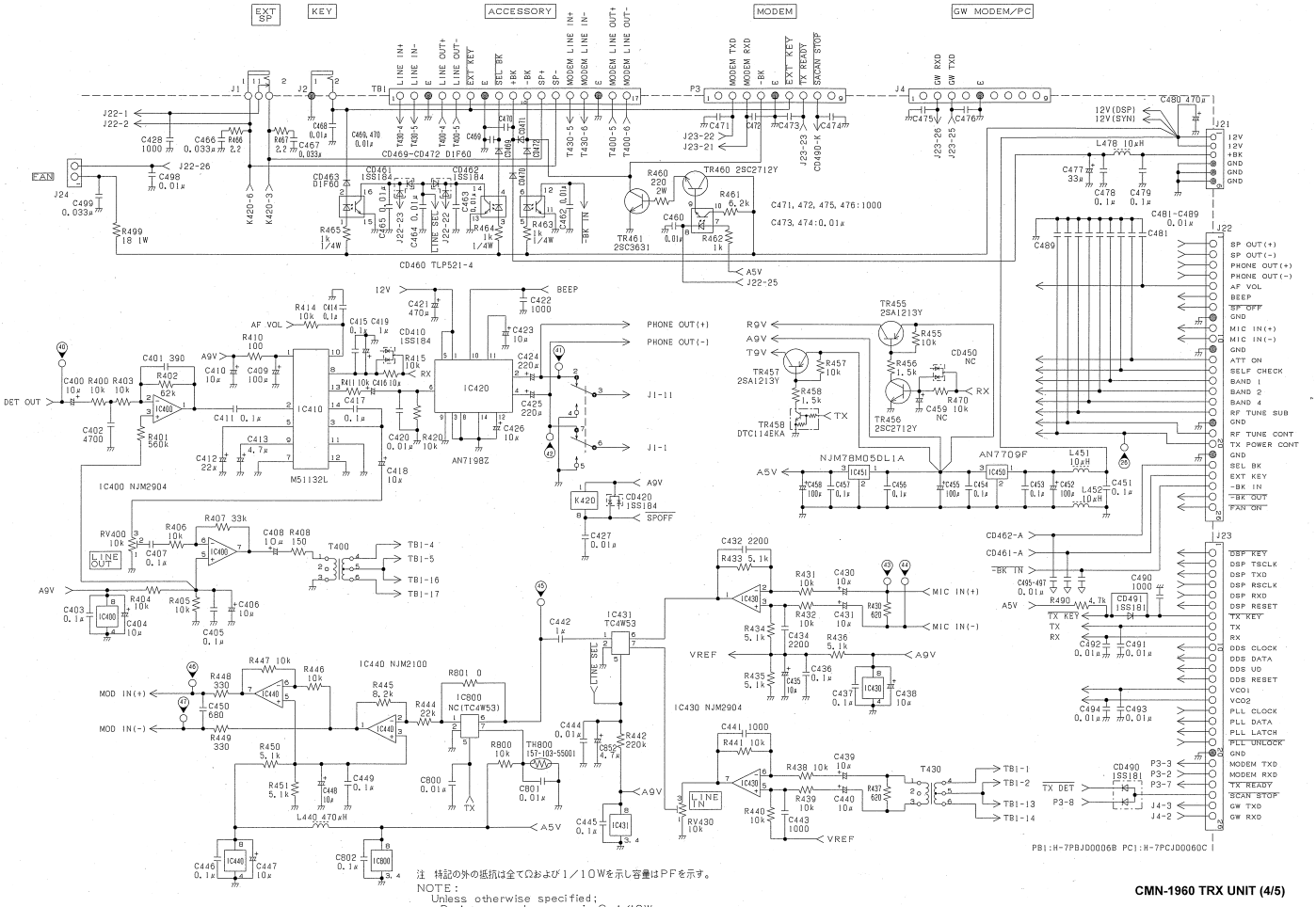
CMN-1960 TRX UNIT (2/5)

DWG.NO. ED04-CMN-1960 IF



CMN-1960 TRX UNIT (3/5)

DWG.NO. ED04-CMN-1960 DSP

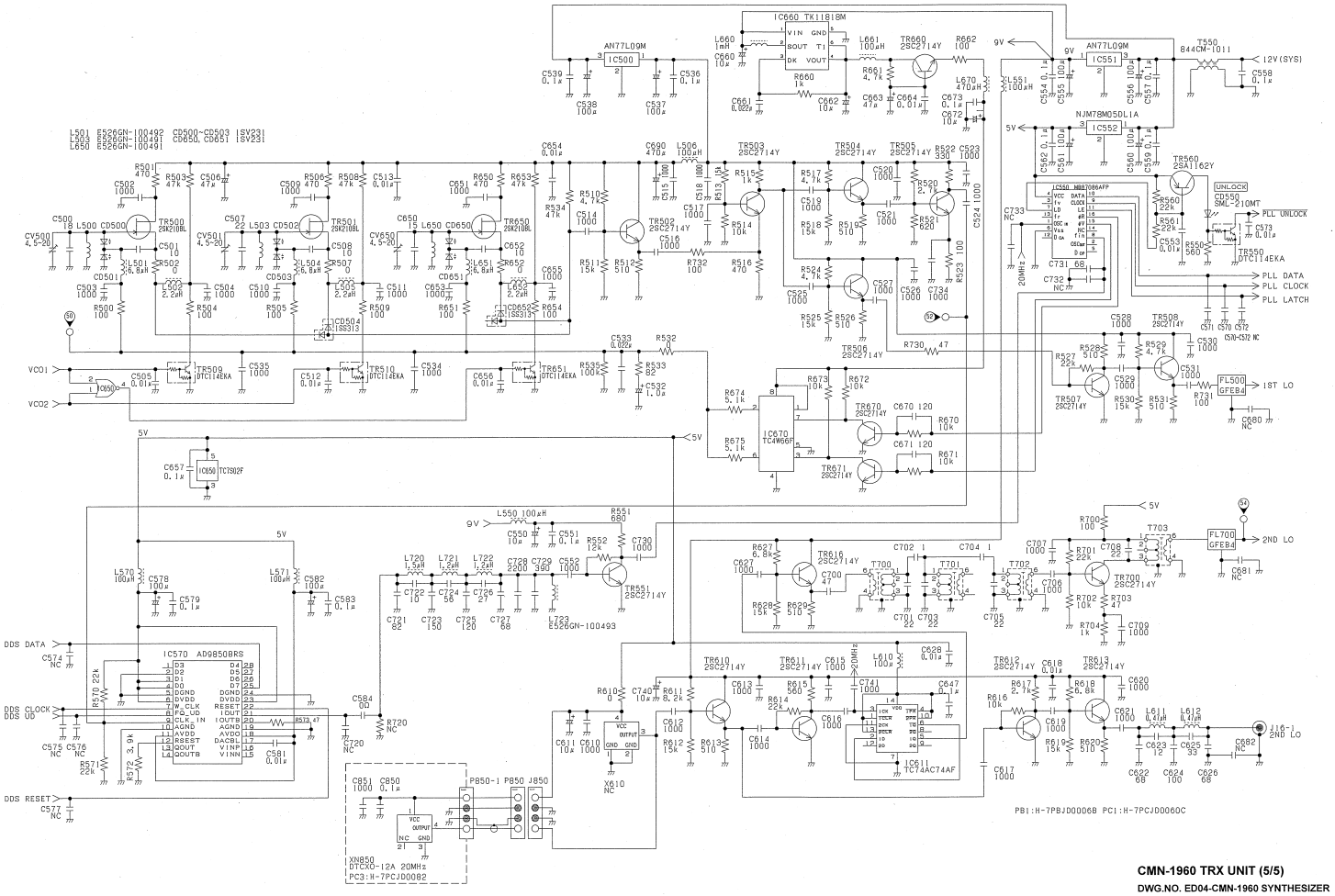


注　特記の外の抵抗は全てΩおよび1／10Wを示し容量はPFを示す。

NOTE:
Unless otherwise specified;
-Resistance values are in Ω, 1/10W.
-Capacitance values are in PF.

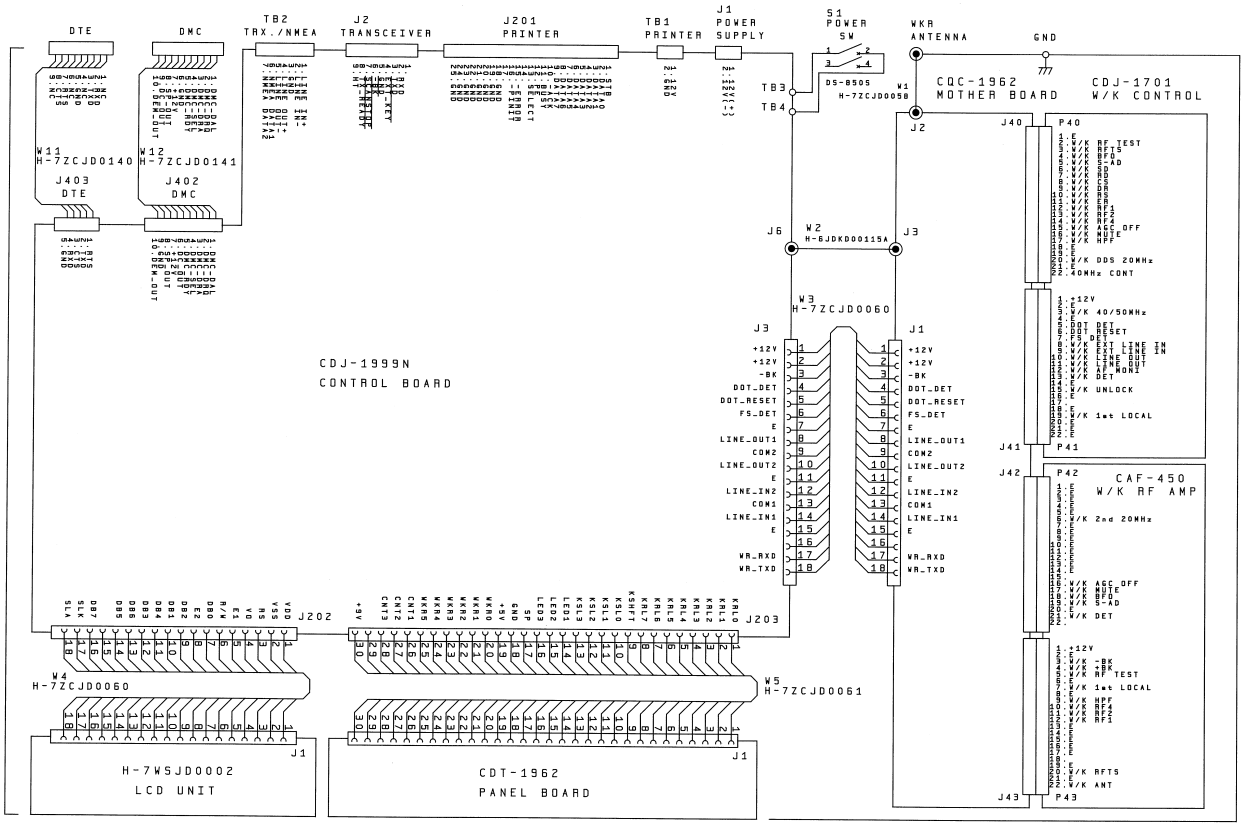
CMN-1960 TRX UNIT (4/5)

DWG.NO. ED04-CMN-1960 AF/CONNECTION



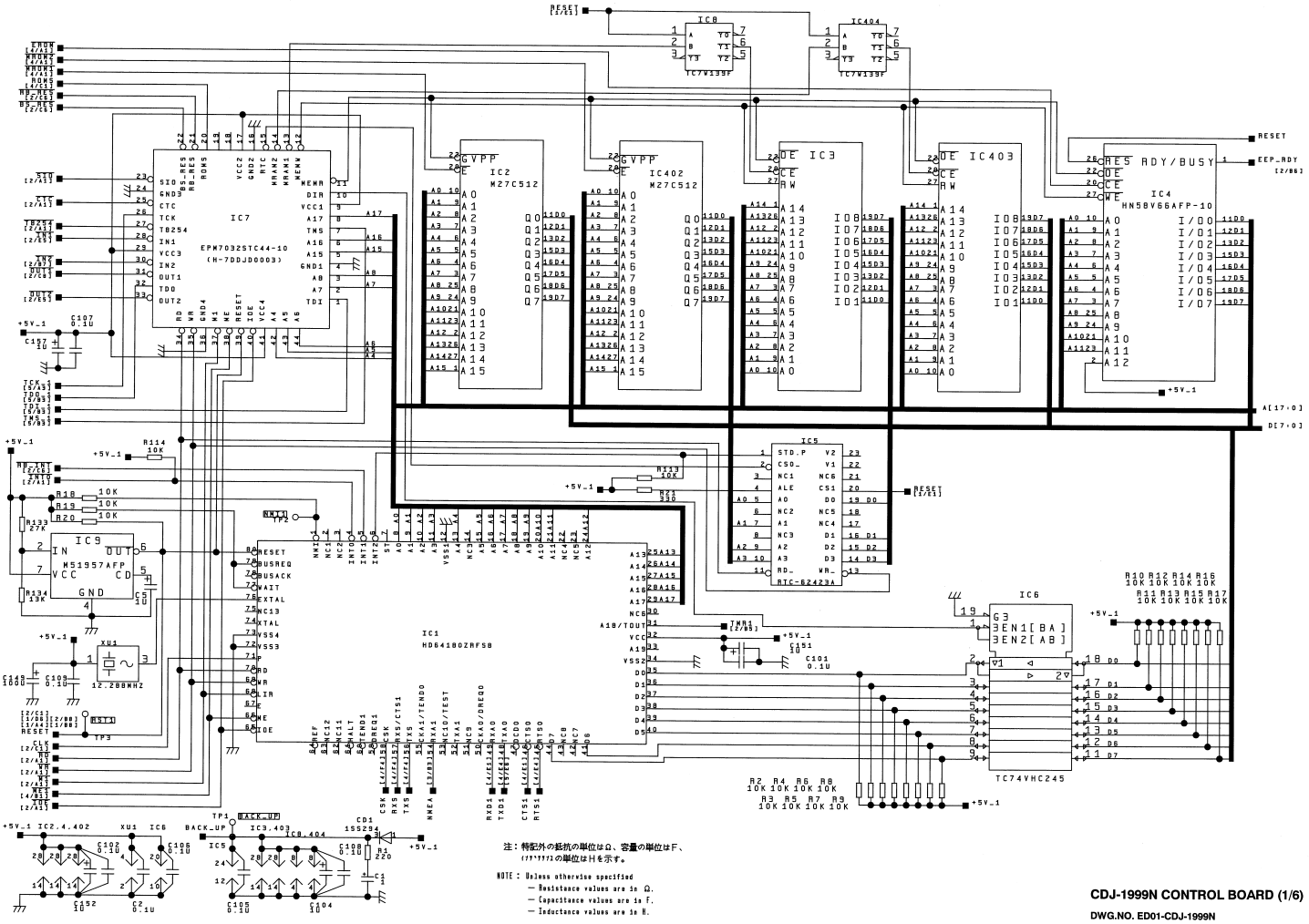
CMN-1960 TRX UNIT (5/5)

DWG.NO. ED04-CMN-1960 SYNTHESIZER



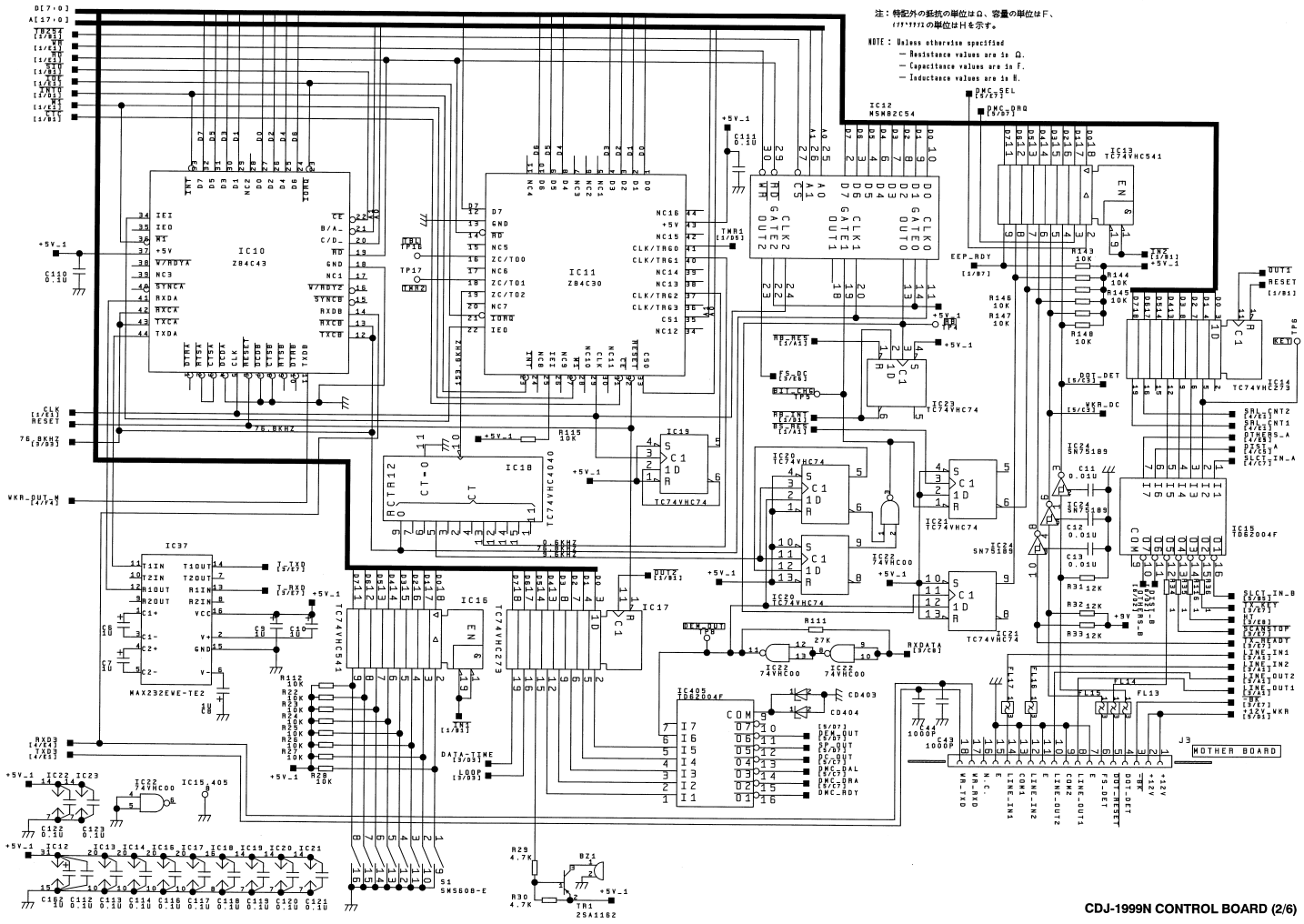
NCT-196N CHASSIS (1/1)

DWG.NO. ED01-NCT-196N



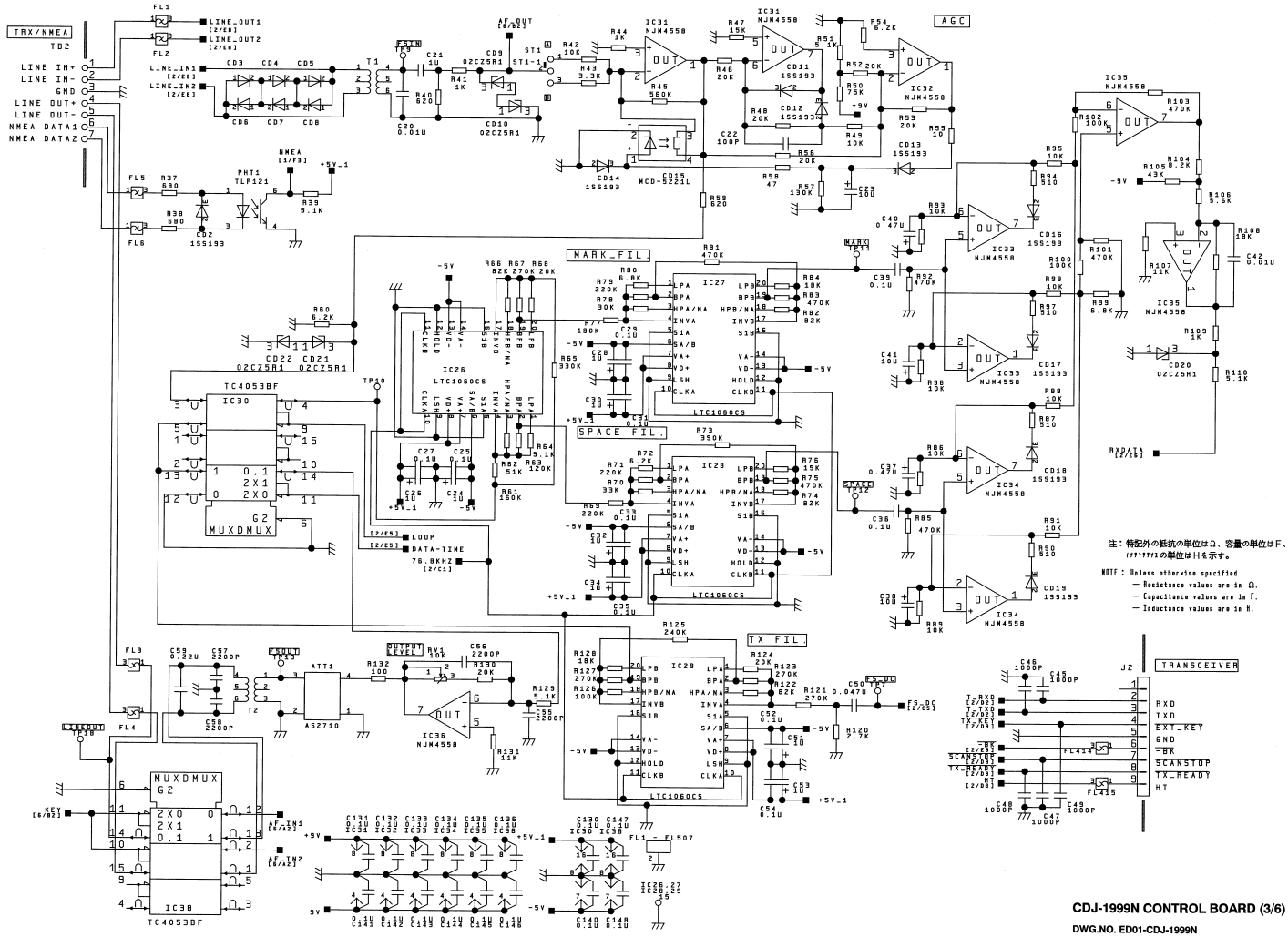
CDJ-1999N CONTROL BOARD (1/6)

DWG.NO. ED01-CDJ-1999N



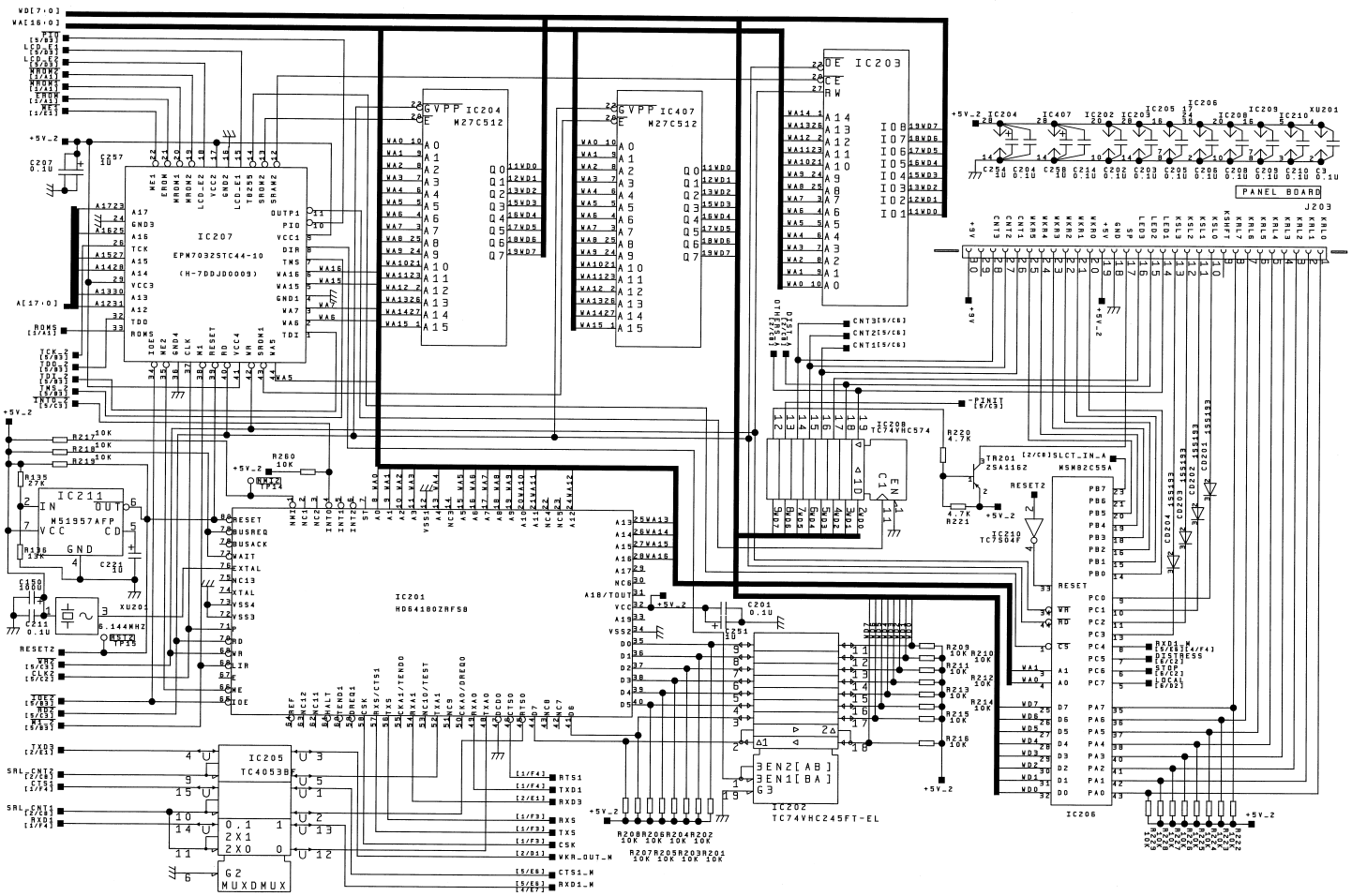
CDJ-1999N CONTROL BOARD (2/6)

DWG.NO. ED01-CDJ-1999N



CDJ-1999N CONTROL BOARD (3/6)

DWG.NO. ED01-CDJ-1999N

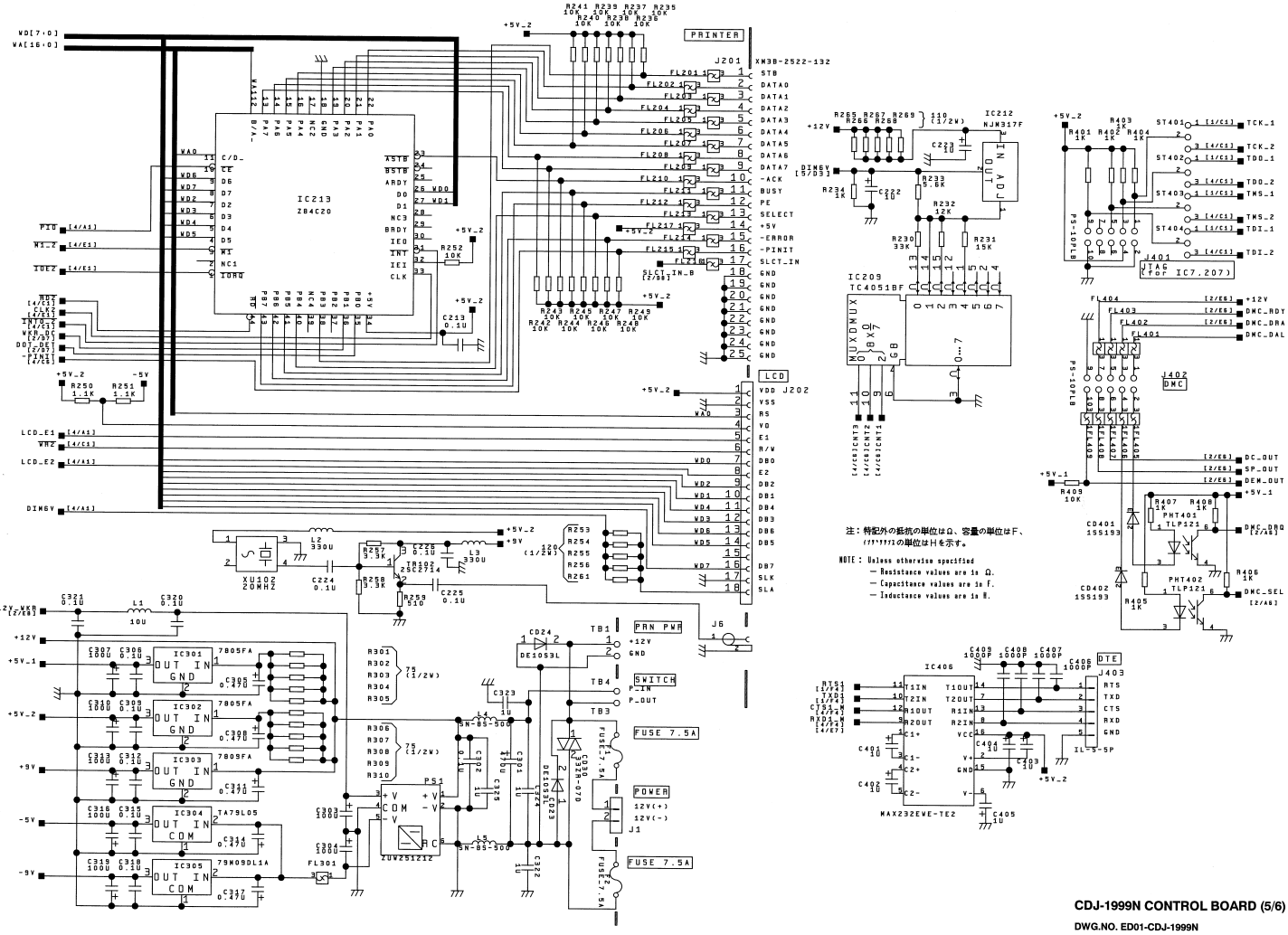


NOTE : Unless otherwise specified
— Resistance values are in Ω.
— Capacitance values are in F.
— Inductance values are in H.

注：特記外の抵抗の単位はΩ、容量の単位はF、
(**.****)の単位はHを示す。

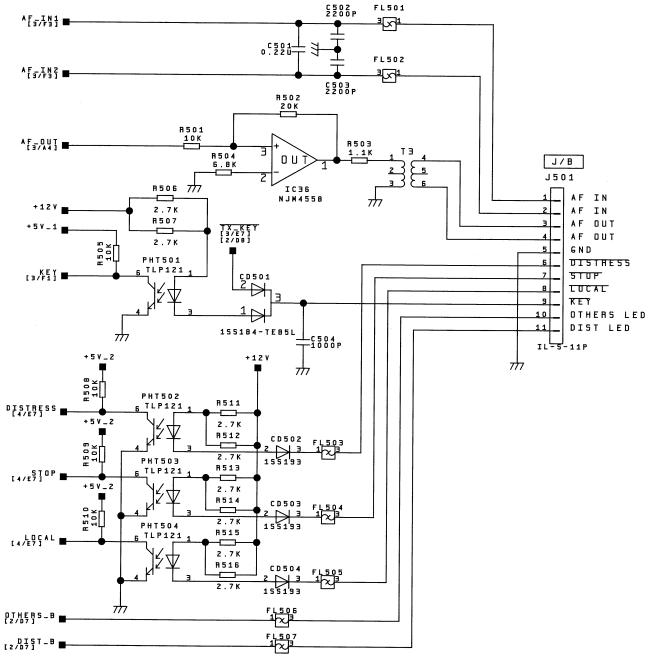
CDJ-1999N CONTROL BOARD (4/6)

DWG.NO. ED01-CDJ-1999N



CDJ-1999N CONTROL BOARD (5/6)

DWG.NO. ED01-CDJ-1999N

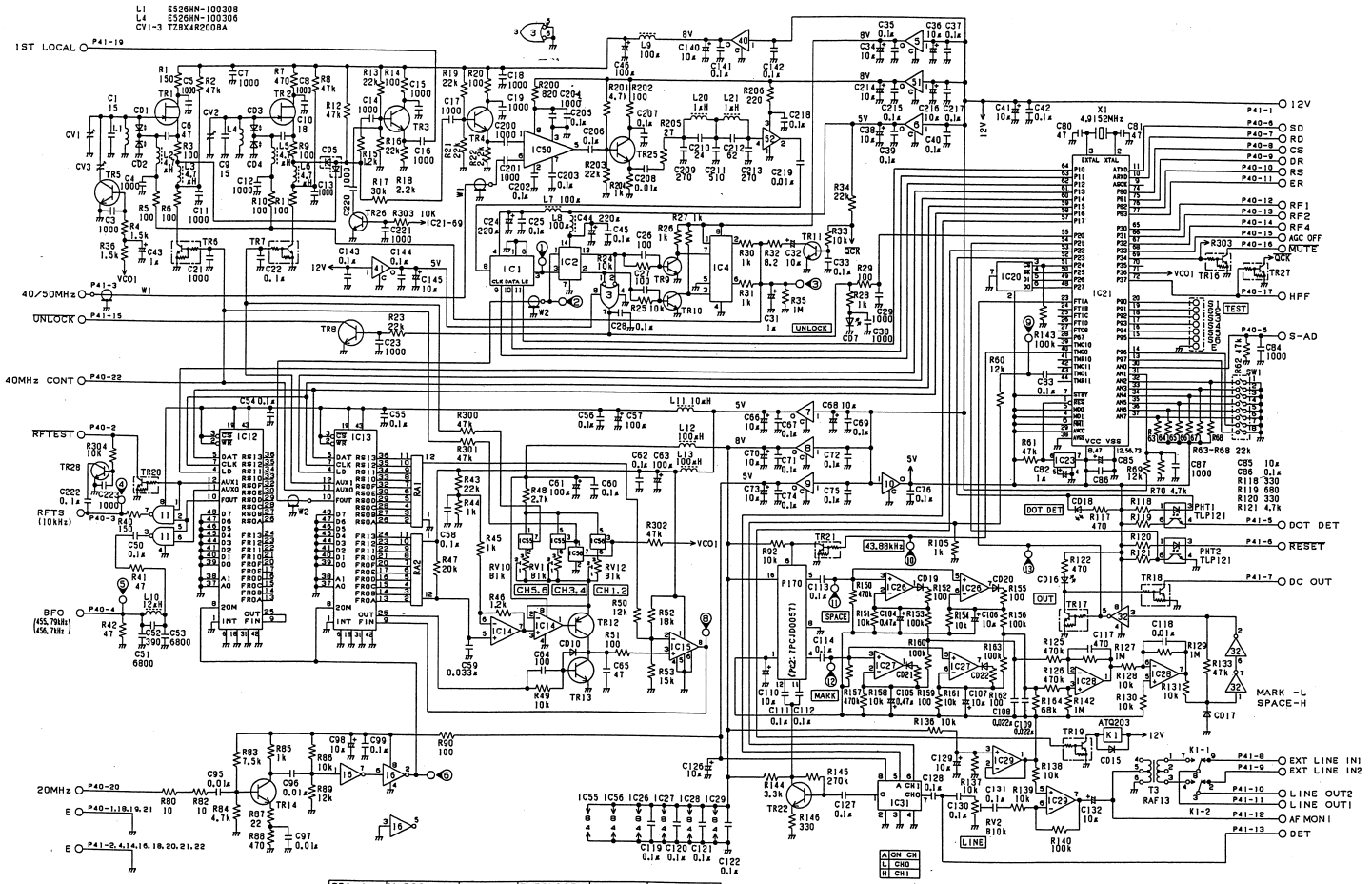


注：特記外の抵抗の単位はΩ、容量の単位はF、
(')'''')の単位はHを示す。

NOTE : Unless otherwise specified
— Resistance values are in Ω.
— Capacitance values are in F.
— Inductance values are in H.

CDJ-1999N CONTROL BOARD (6/6)

DWG.NO. ED01-CDJ-1999N



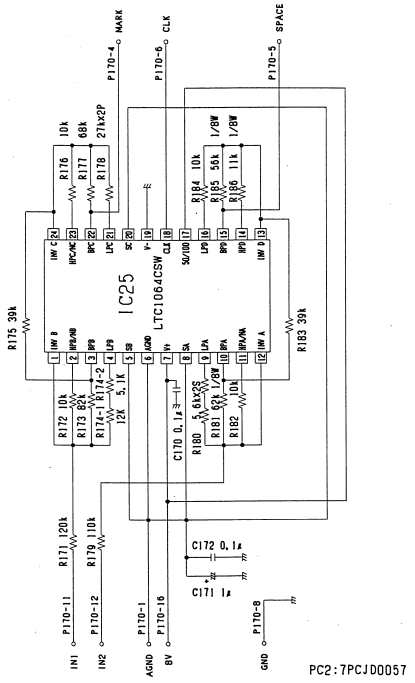
注 特記の外の抵抗は全てΩおよび1／10Wを示し容量はPFを示す。

NOTE:
Unless otherwise specified;
-Resistance values are in Ω, 1/10W.
-Capacitance values are in PF.

CD1-4	MA366	IC6,9,10,41	TA78L05F	IC26-29	M5218AFP
CD5	HSM2694	IC7	TA7805S	IC31	TC4W53F
CD7,16,18	MPR437JF	IC12, 13	M8671490	IC50	SA602AD
CD10,15,19-22	1SS226	IC14	NJM4404AM	IC52	UPC1688G
CD17	R05,1MB	IC15	LT1016CN	TR1,2	2SK210BL
IC1	M88708BA	IC16, 32	TC7WU04F	TR3,4,11,13,14,24	2SC2714Y
IC2	MC4044P	IC20	AK93C45AF	TR6,7,16-21	2SC3398
IC3,11	TC7W00F	IC21	HD647330BRF	TR8,22	2SC2712Y
IC4,55,56	TC4W66F	IC23	M51953BFP	TR12	2SA1162Y
IC5,8,40,51	TA78L08F	IC25	LTC1064CSW	TR26, 28	2SC2714Y
				TR27	RN1402

CDJ-1701 W/K CONTROL (1/2)

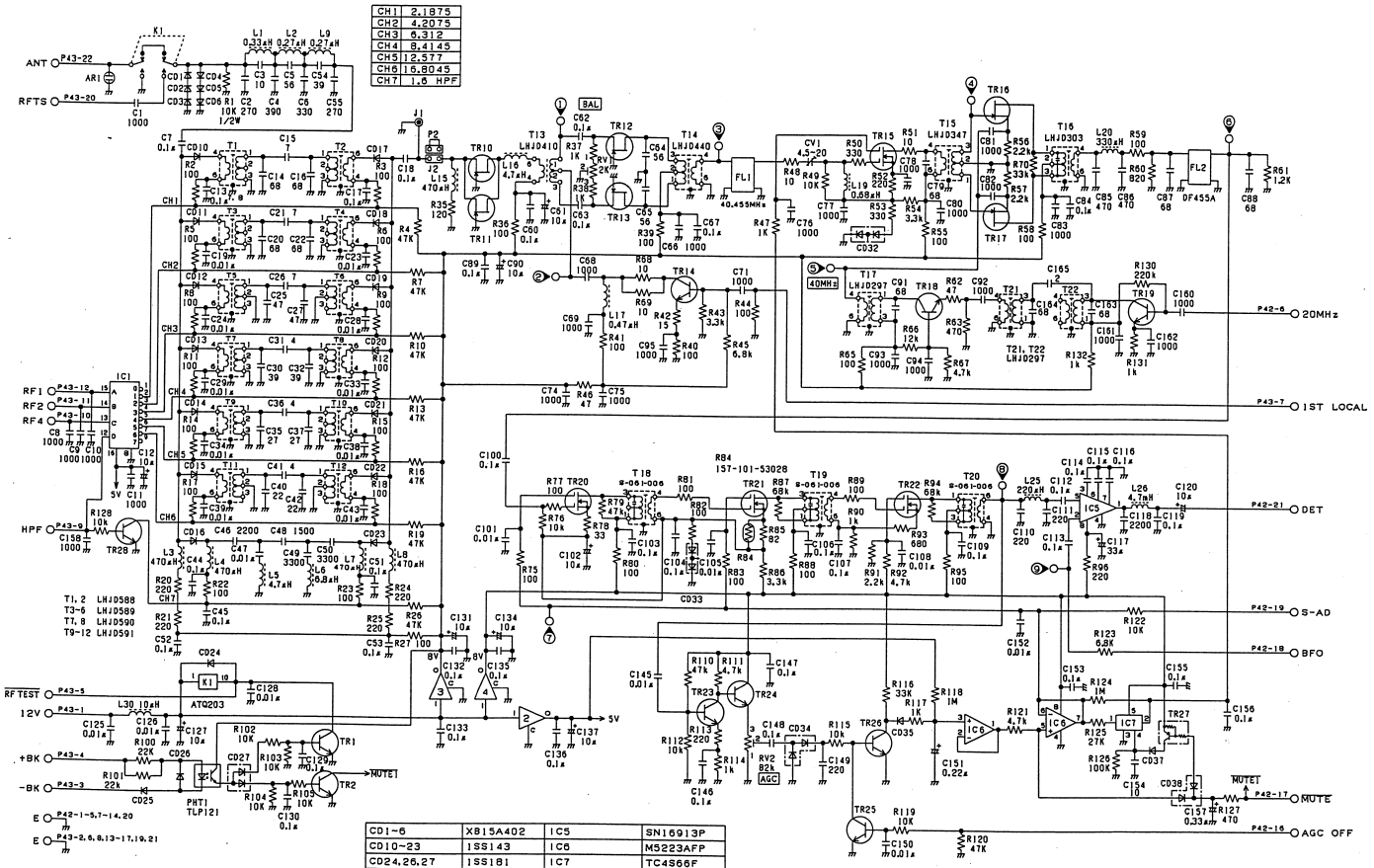
DWG.NO. ED00-CDJ-1701



注 特記の外の抵抗は全てΩおよび1／10Wを示し容量はPFを示す。
NOTE:
-Unless otherwise specified;
-Resistance values are in Ω, 1/10W.
-Capacitance values are in PF.

CDJ-1701 W/K CONTROL (2/2)

DWG.NO. ED00-CDJ-1701

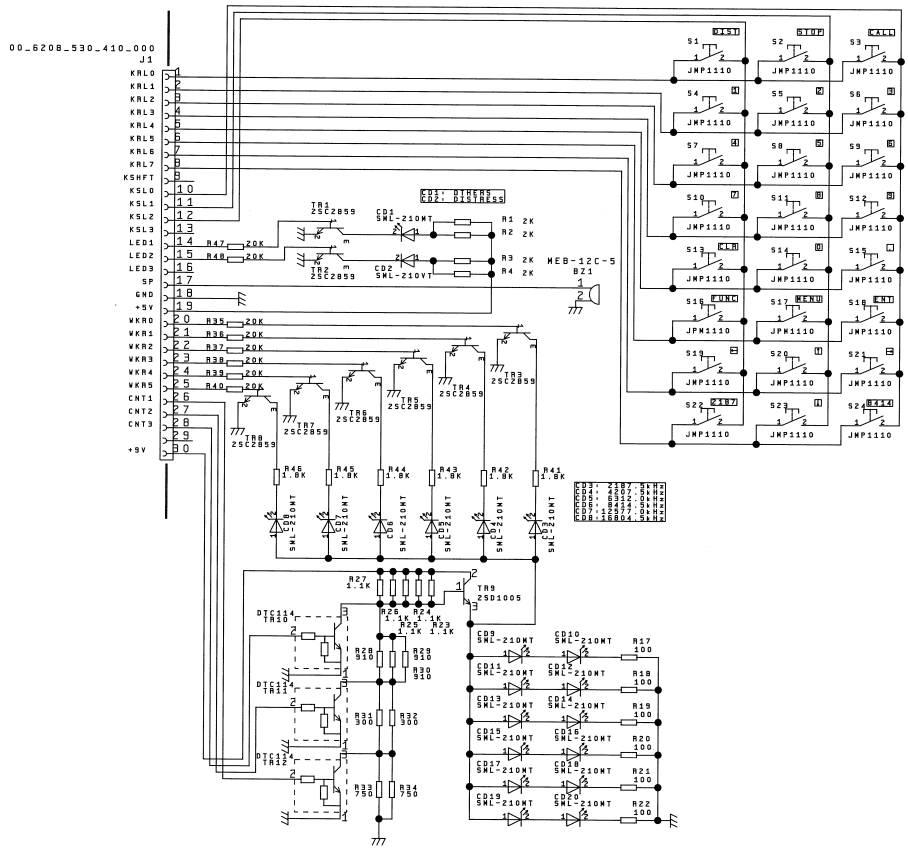


CD1~6	X815A402	IC5	SN16913P
CD10~23	1SS143	IC6	M5223AFP
CD24, 26, 27	1SS181	IC7	TC4S66F
CD25	V07J	TR1, 2, 18, 23~26, 28	2SC2712Y
CD32~35	1SS226	TR10~13, 16, 17	2SK937-Y5
CD37, 38	1SS184	TR14	2SC3357
IC1	74LS145	TR15, 20~22	3SK131-V12
IC2	TA78L05F	TR19	2SC2714Y
IC3, 4	TA78L08F	TR27	2SA1344

注 特記の外の抵抗は全てΩおよび1/10Wを示し容量はPFを示す。
NOTE:
Unless otherwise specified;
-Resistance values are in Ω, 1/10W.
-Capacitance values are in PF.

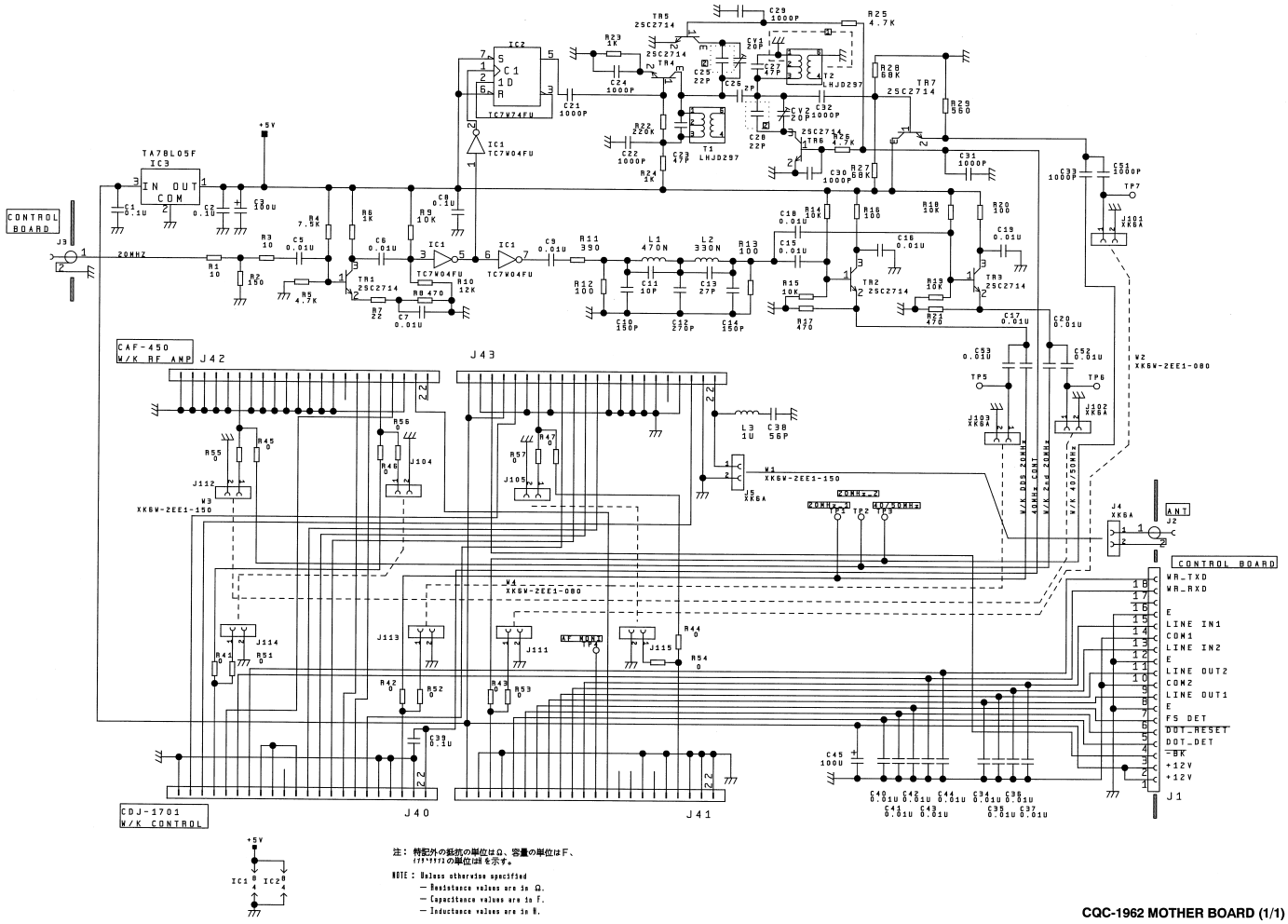
CAF-450 W/K RF AMP (1/1)

DWG.NO. ED00-CAF-450



CDT-1962 PANEL BOARD (1/1)

DWG.NO. ED00-CDT-1962

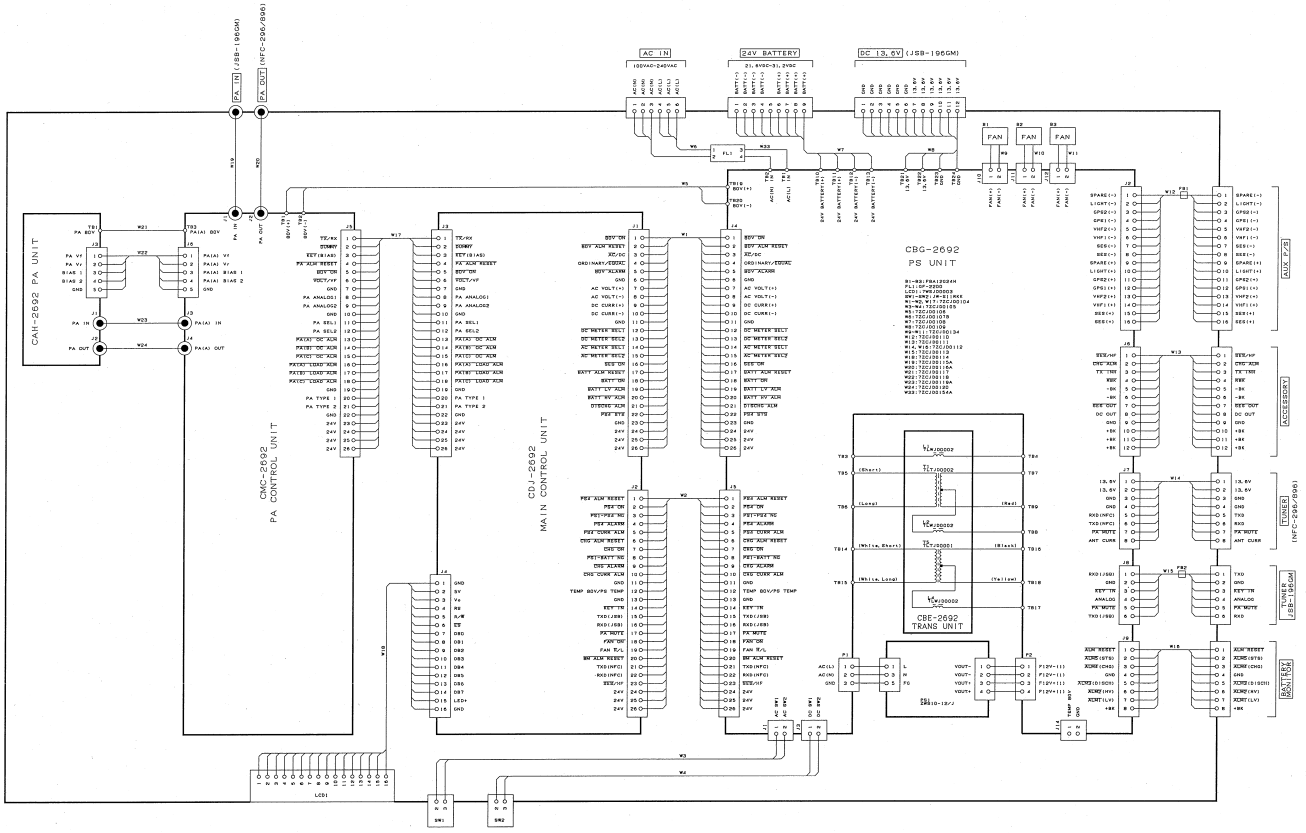


注： 特記外の抵抗の単位はΩ、容量の単位はF、
(???)???Ω の単位はΩを示す。

NOTE : Unless otherwise specified
— Resistance values are in Ω.
— Capacitance values are in F.
— Inductance values are in H.

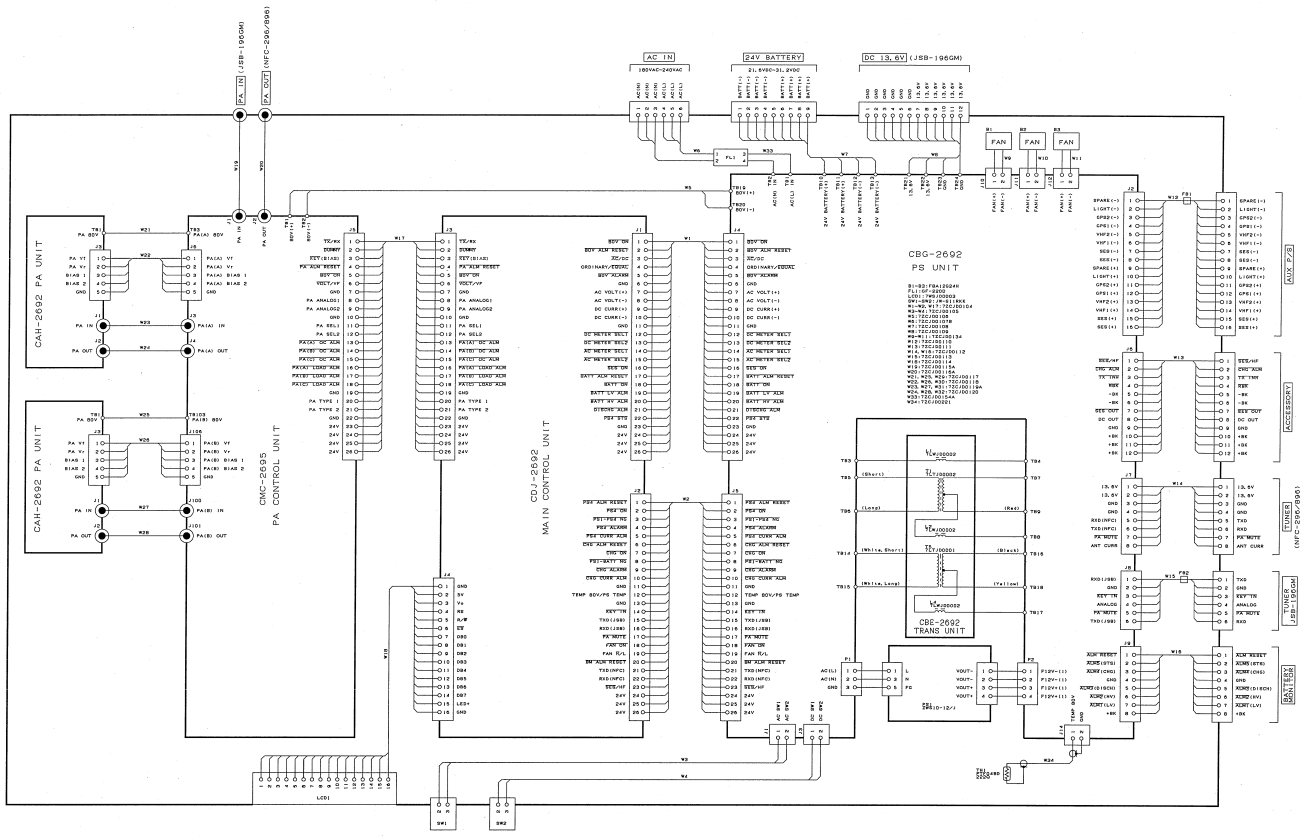
CQC-1962 MOTHER BOARD (1/1)

DWG.NO. ED02-CQC-1962



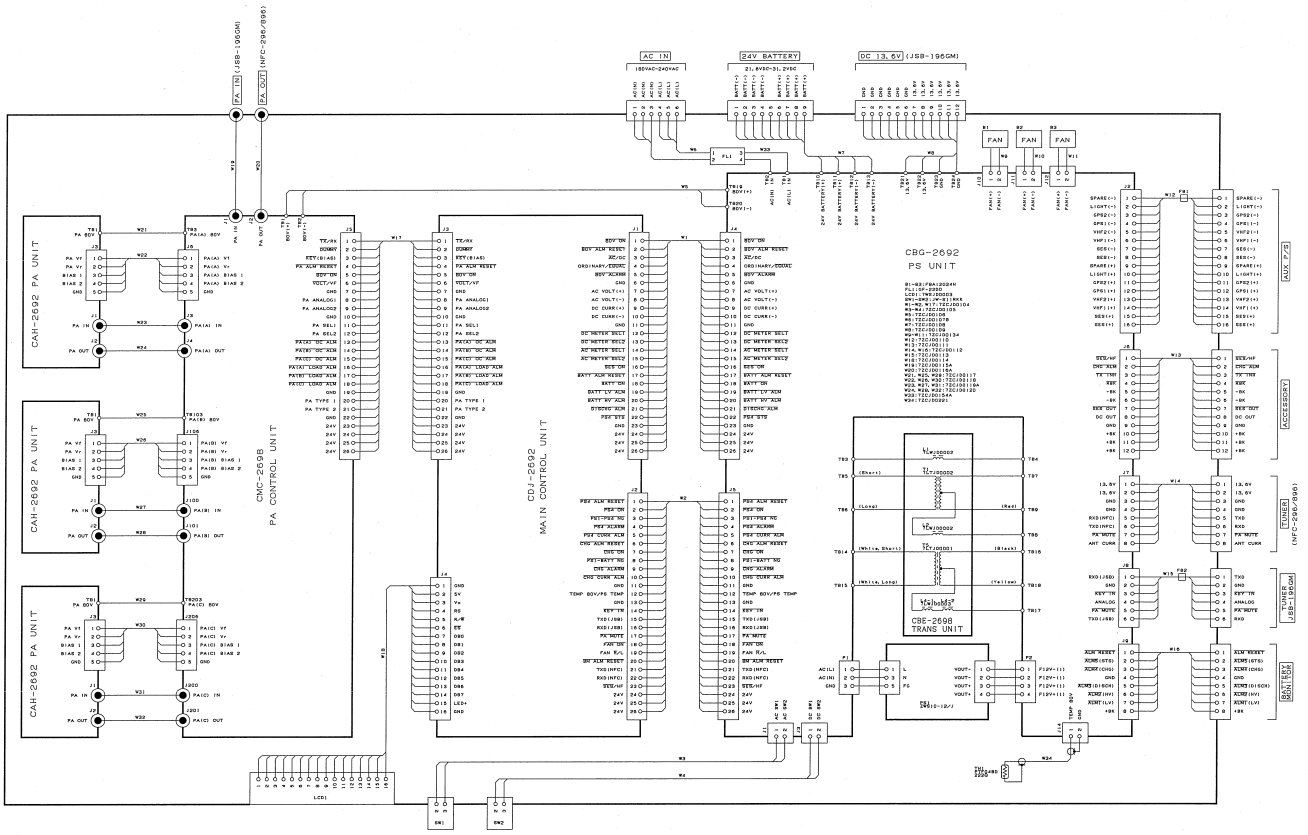
NAH-692 CHASSIS (1/1)

DWG.NO. ED03-NAH-692



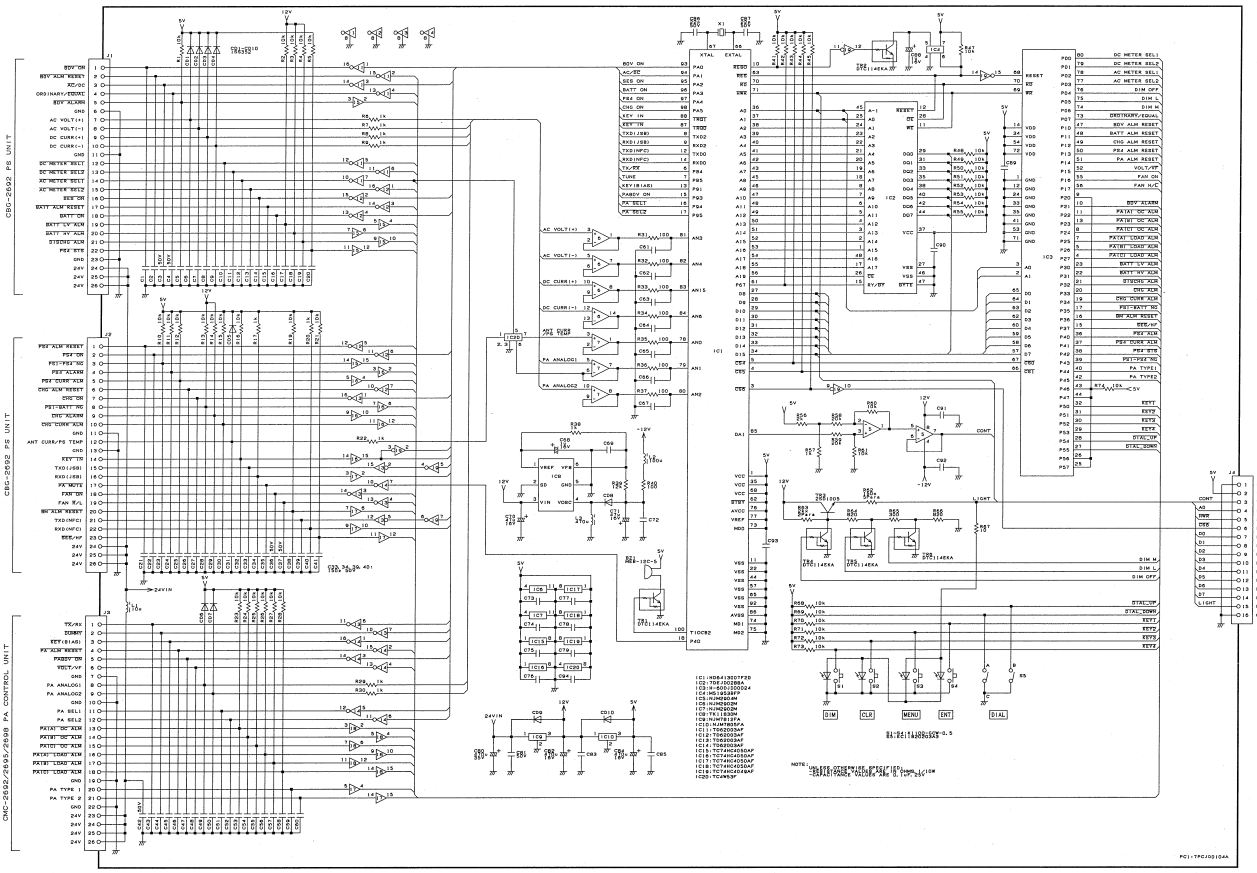
NAH-695 CHASSIS (1/1)

DWG.NO. ED02-NAH-695



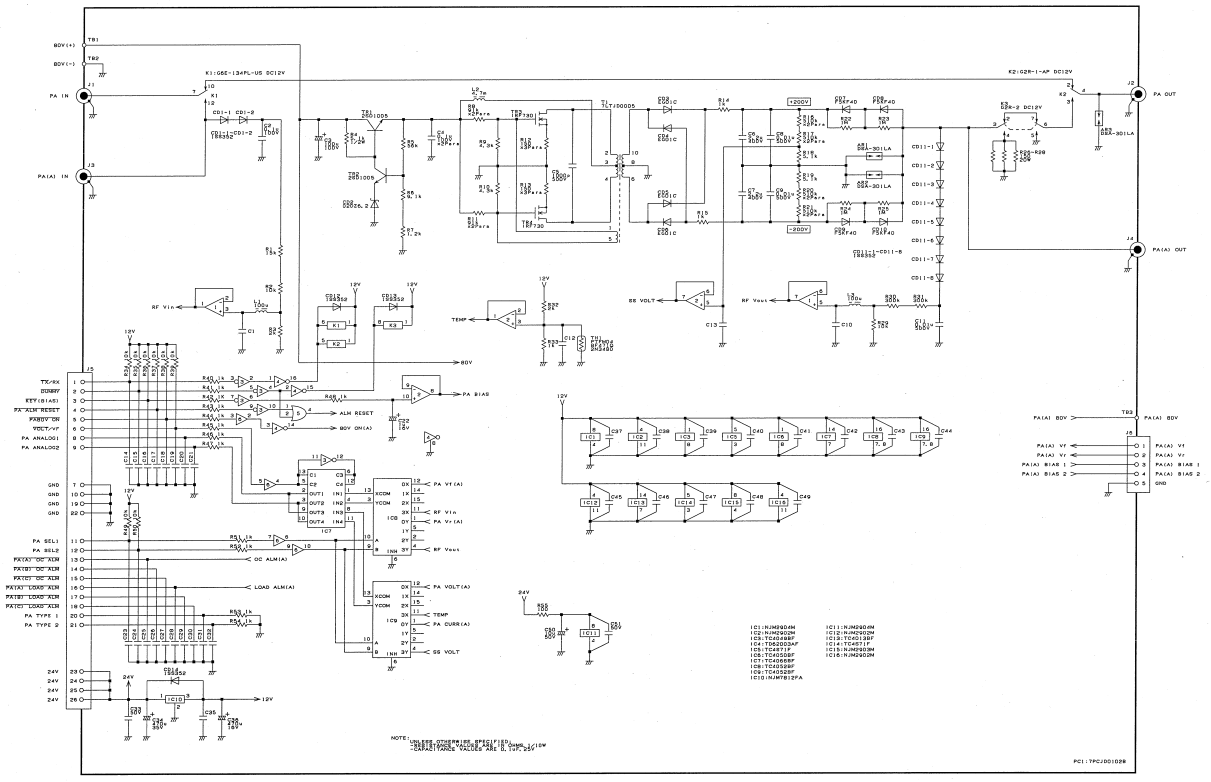
NAH-698 CHASSIS (1/1)

DWG.NO. ED02-NAH-698



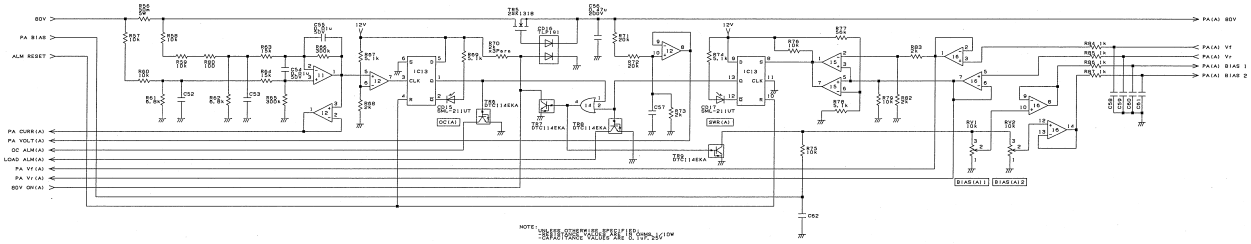
CDJ-2692 MAIN CONTROL UNIT (1/1)

DWG.NO. ED01-CDJ-2692



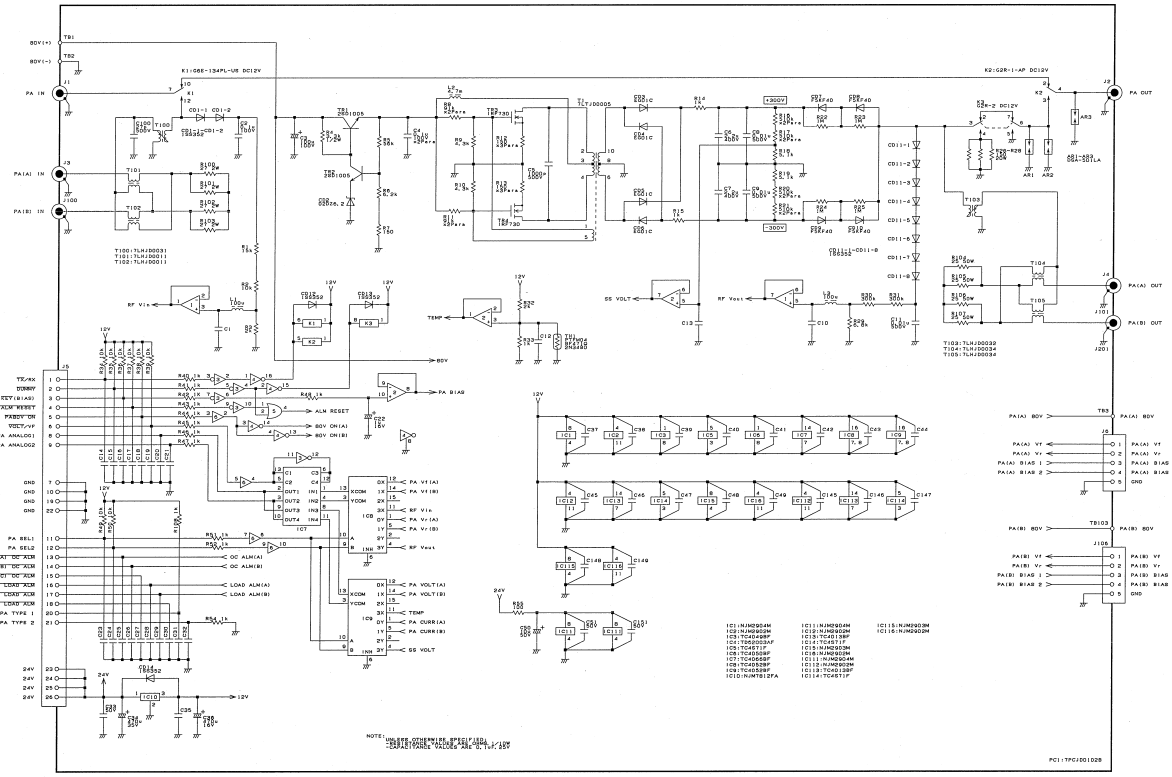
CMC-2692 PA CONTROL UNIT (1/2)

DWG.NO. ED04-CMC-2692



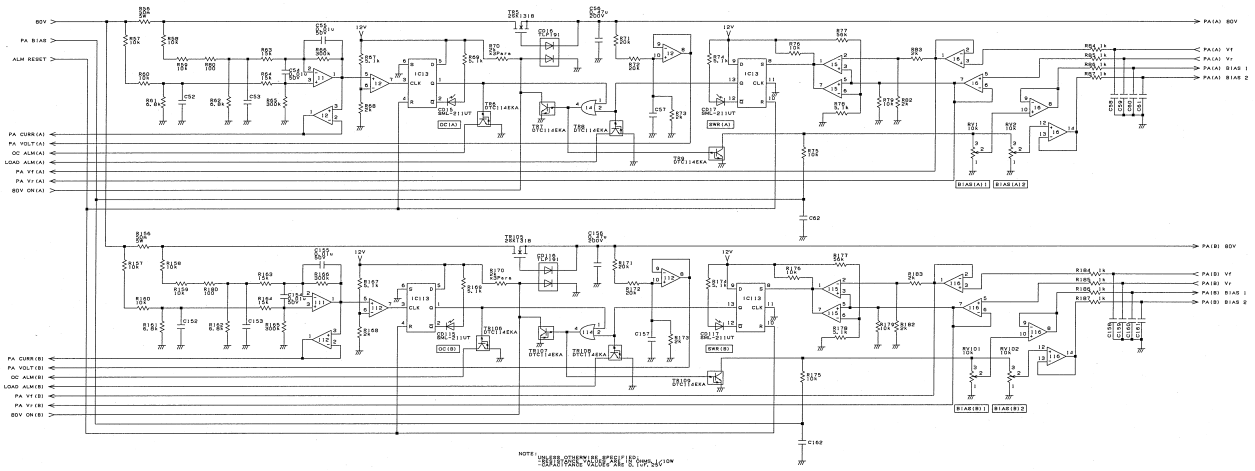
CMC-2692 PA CONTROL UNIT (2/2)

DWG.NO. ED04-CMC-2692



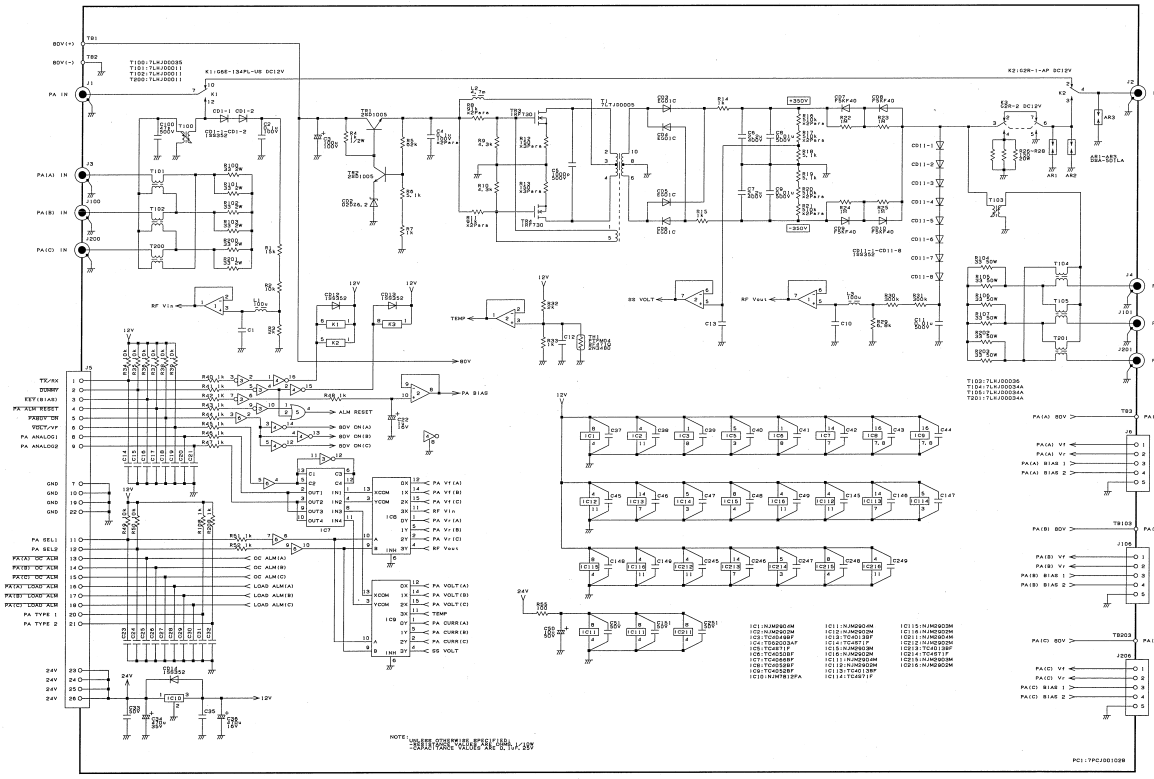
CMC-2695 PA CONTROL UNIT (1/2)

DWG.NO. ED01-CMC-2695



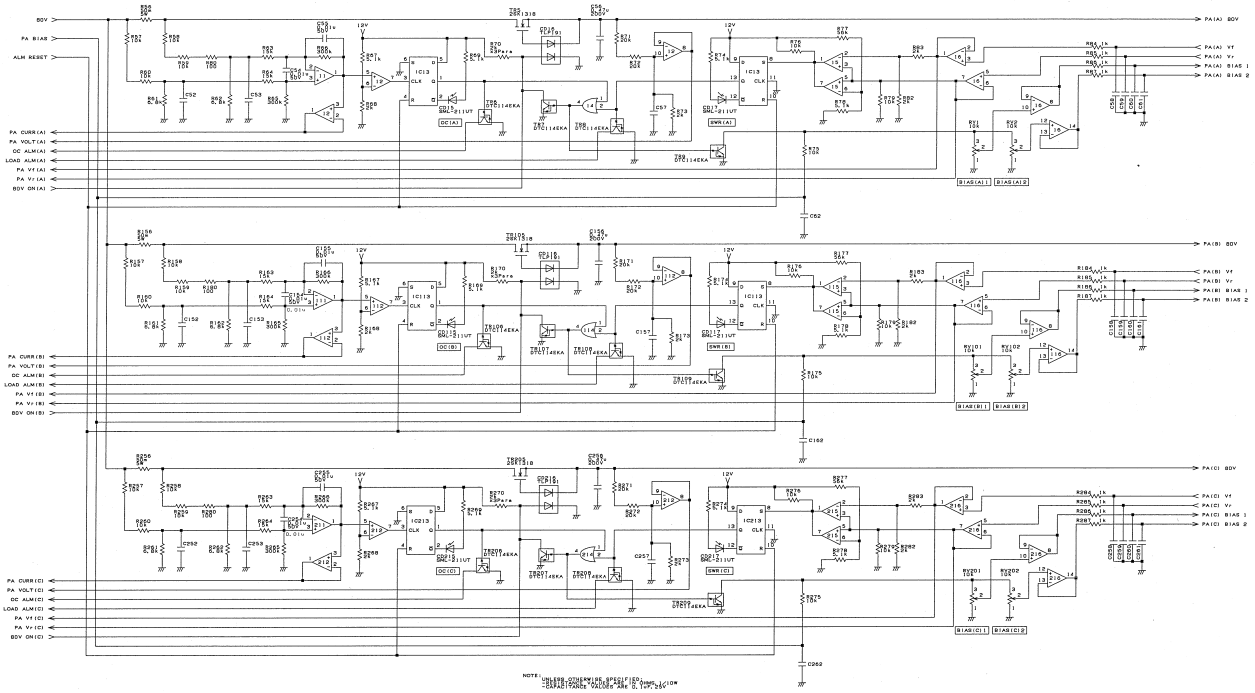
CMC-2695 PA CONTROL UNIT (2/2)

DWG.NO. ED01-CMC-2695



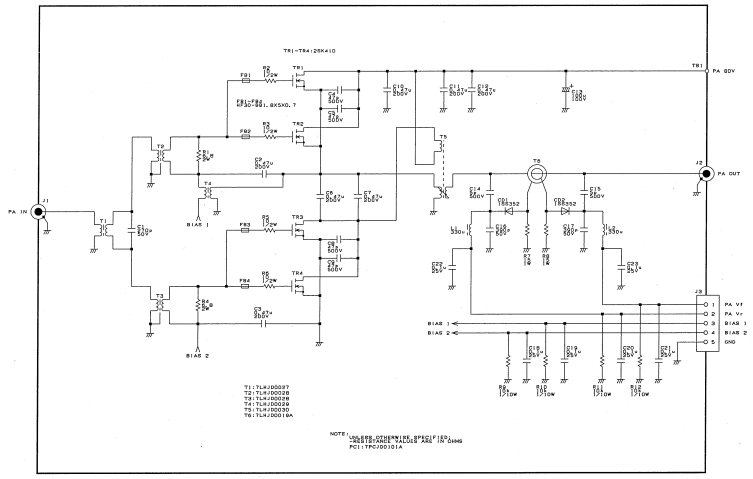
CMC-2698 PA CONTROL UNIT (1/2)

DWG.NO. ED01-CMC-2698



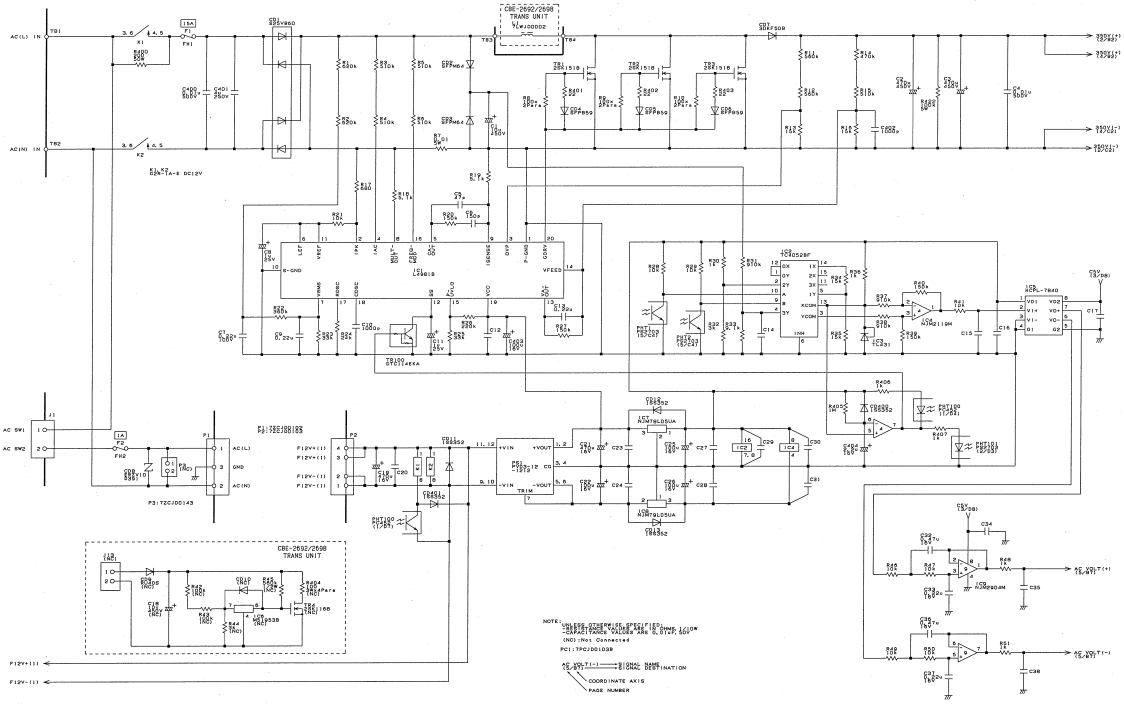
CMC-2698 PA CONTROL UNIT (2/2)

DWG.NO. ED01-CMC-2698



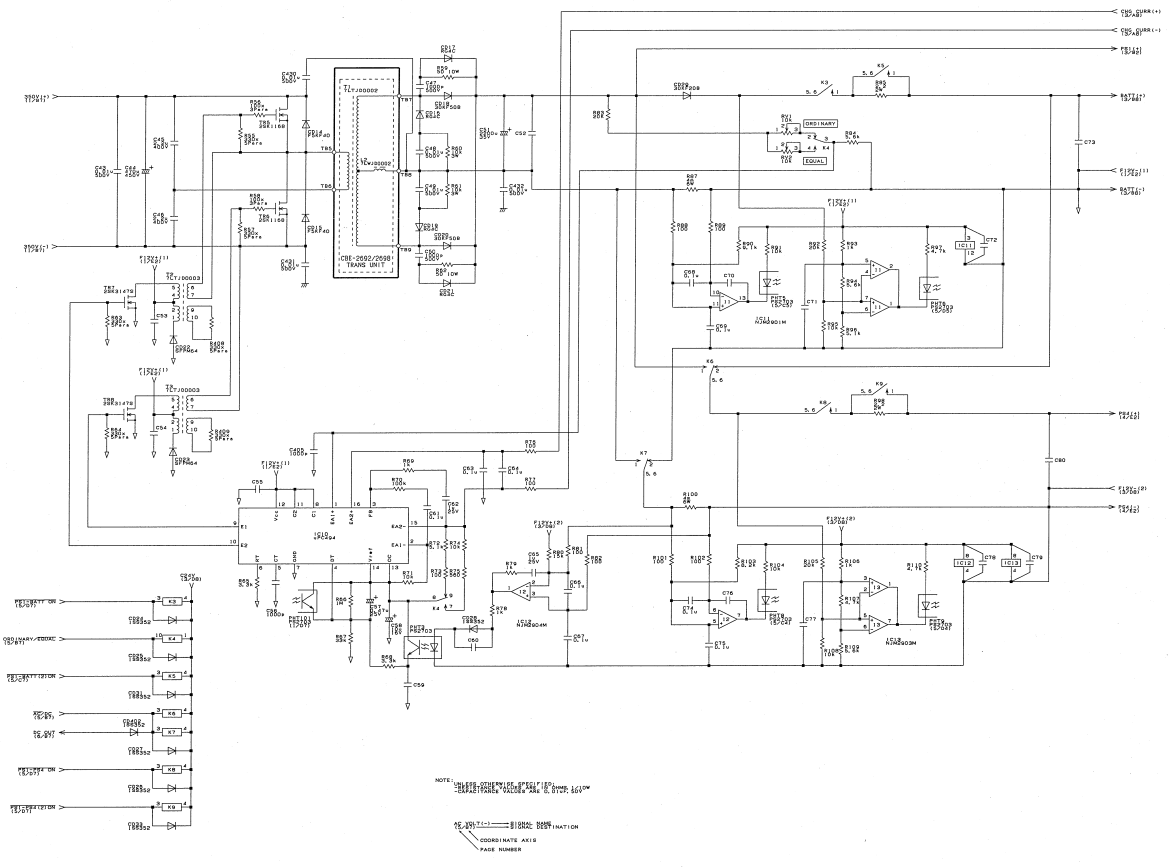
CAH-2692 PA UNIT (1/1)

DWG.NO. ED01-CAH-2692



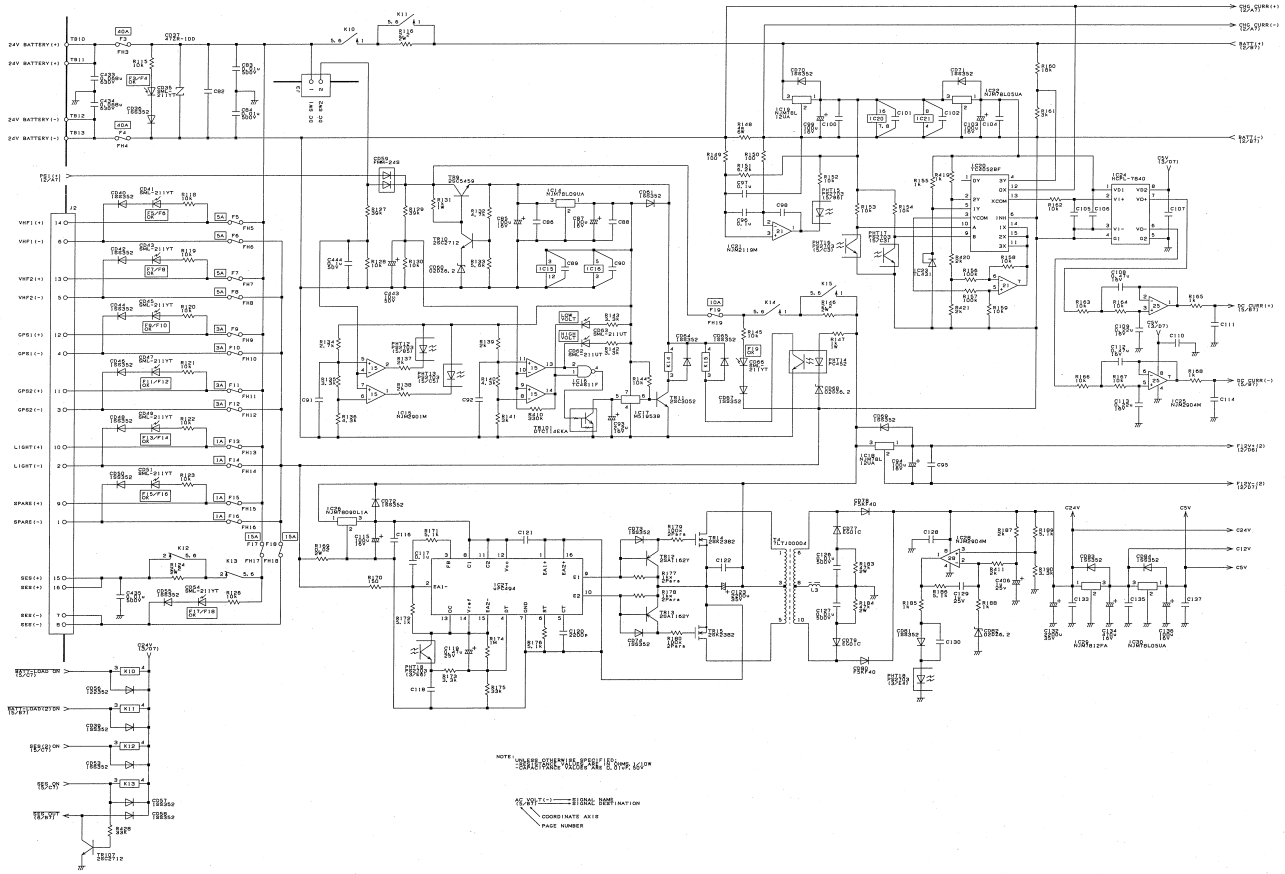
CBG-2692 PS UNIT (1/6)

DWG.NO. ED11-CBG-2692



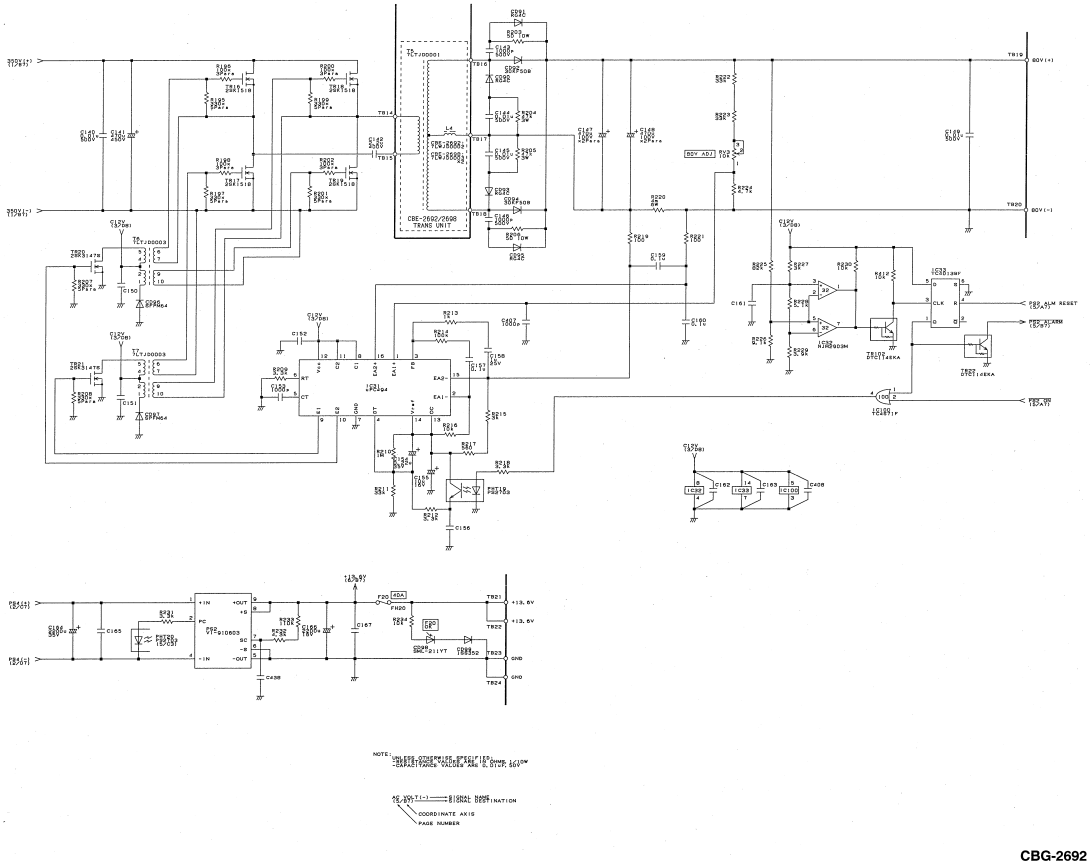
CBG-2692 PS UNIT (2/6)

DWG.NO. ED11-CBG-2692



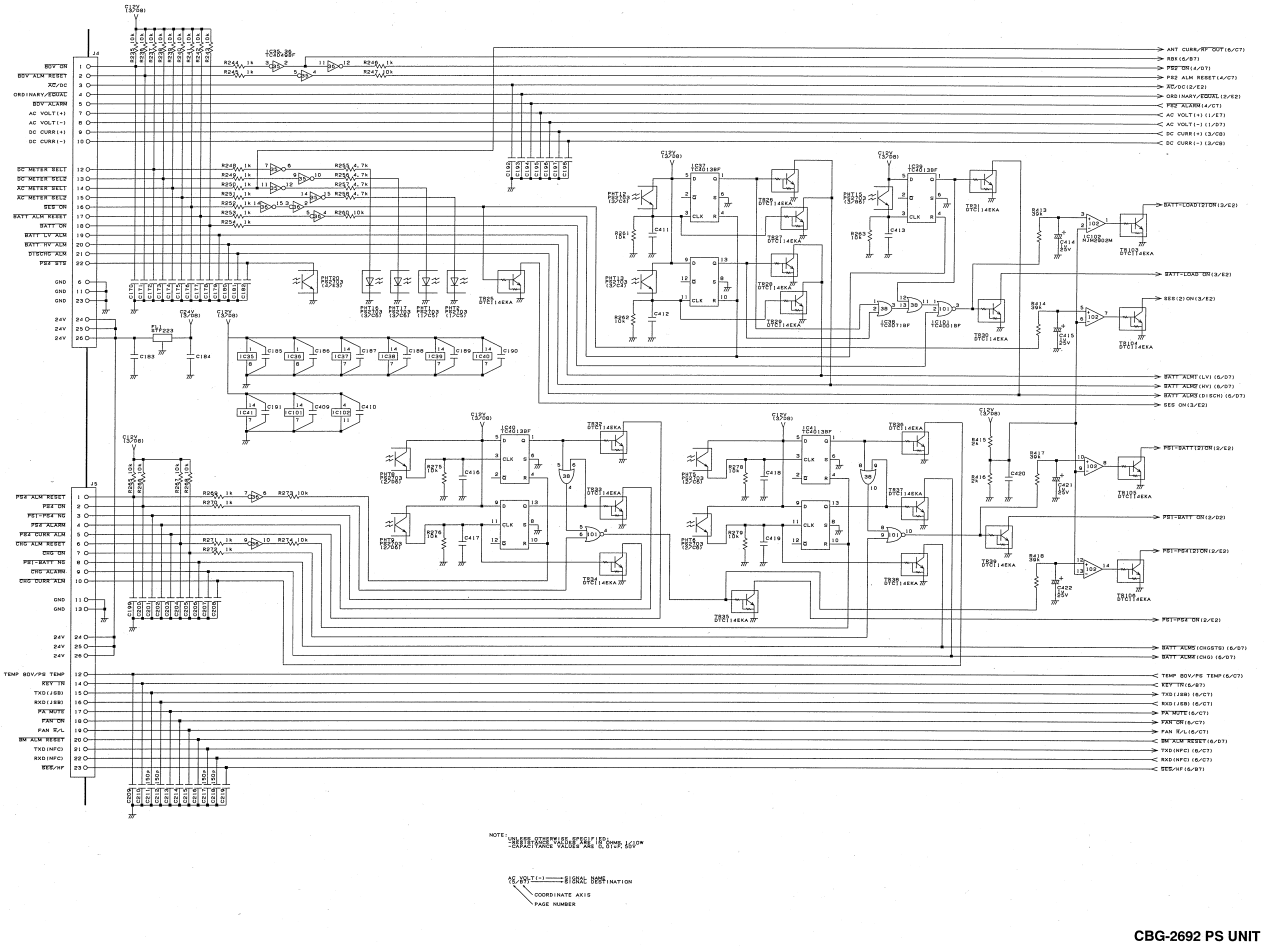
CBG-2692 PS UNIT (3/6)

DWG.NO. ED11-CBG-2692



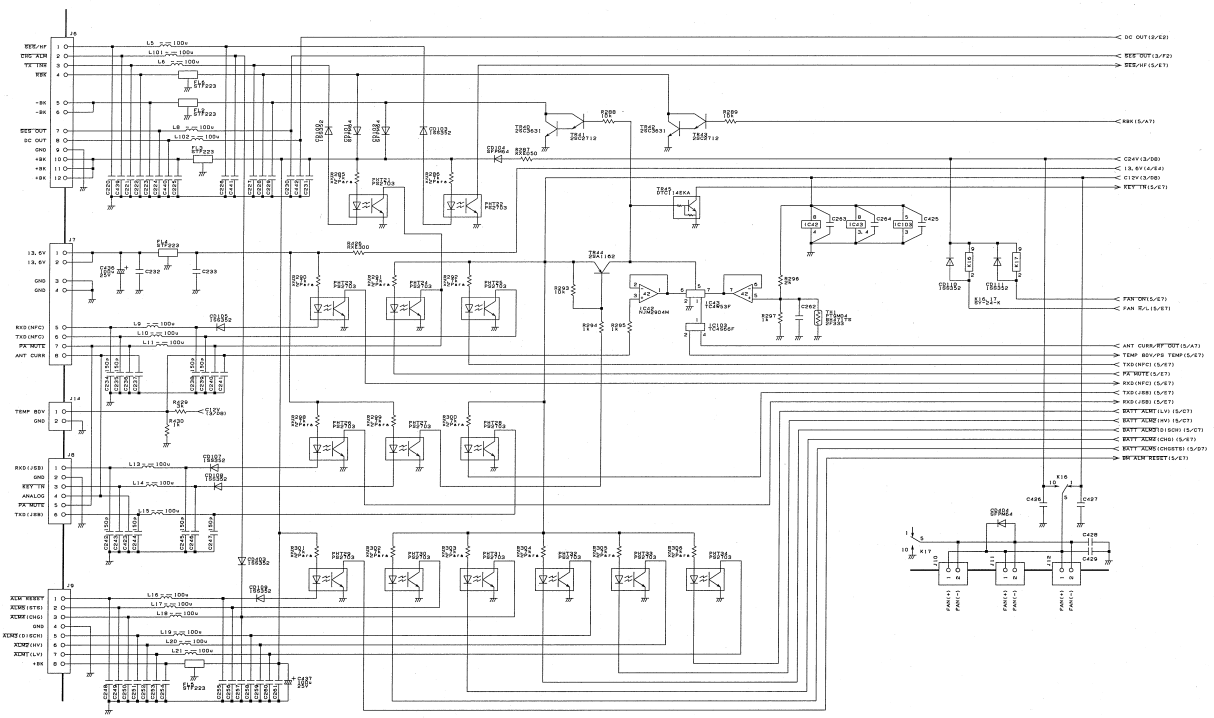
CBG-2692 PS UNIT (4/6)

DWG.NO. ED11-CBG-2692



CBG-2692 PS UNIT (5/6)

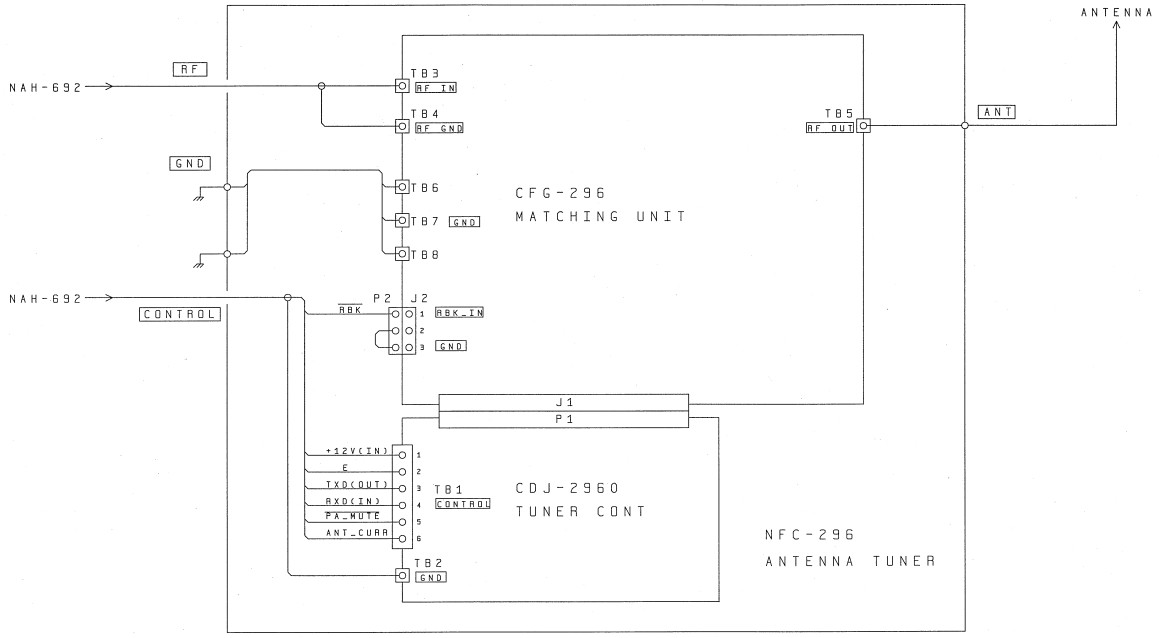
DWG.NO. ED11-CBG-2692



NOTE:
UNLESS OTHERWISE SPECIFIED:
-RESISTANCE VALUES ARE IN OHMS, 1/10W
-CAPACITANCE VALUES ARE 0.01uF, 50V

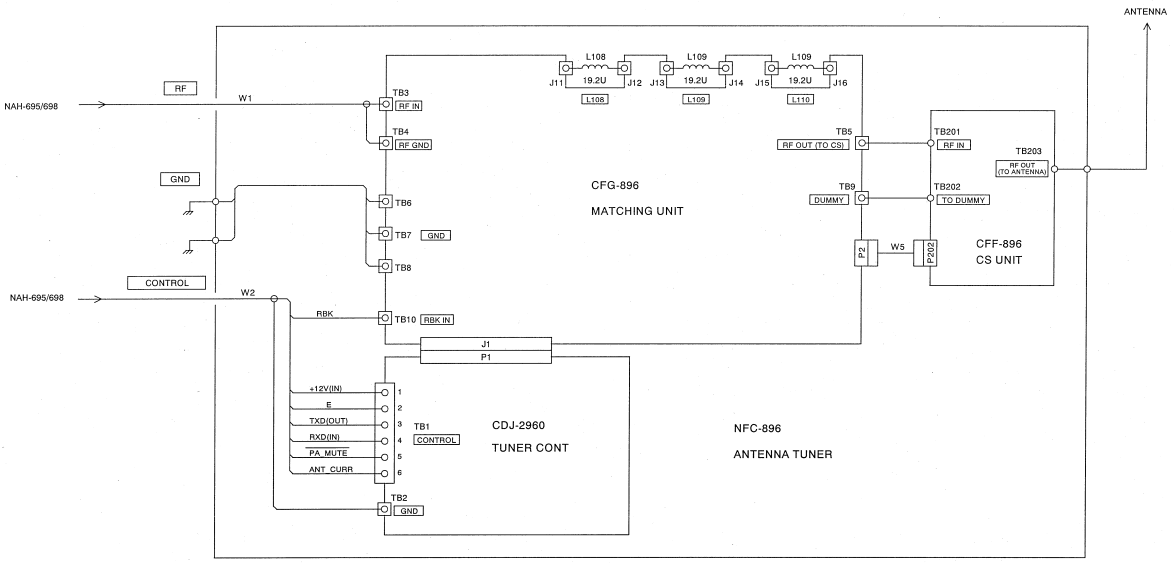
CBG-2692 PS UNIT (6/6)

DWG.NO. ED11-CBG-2692



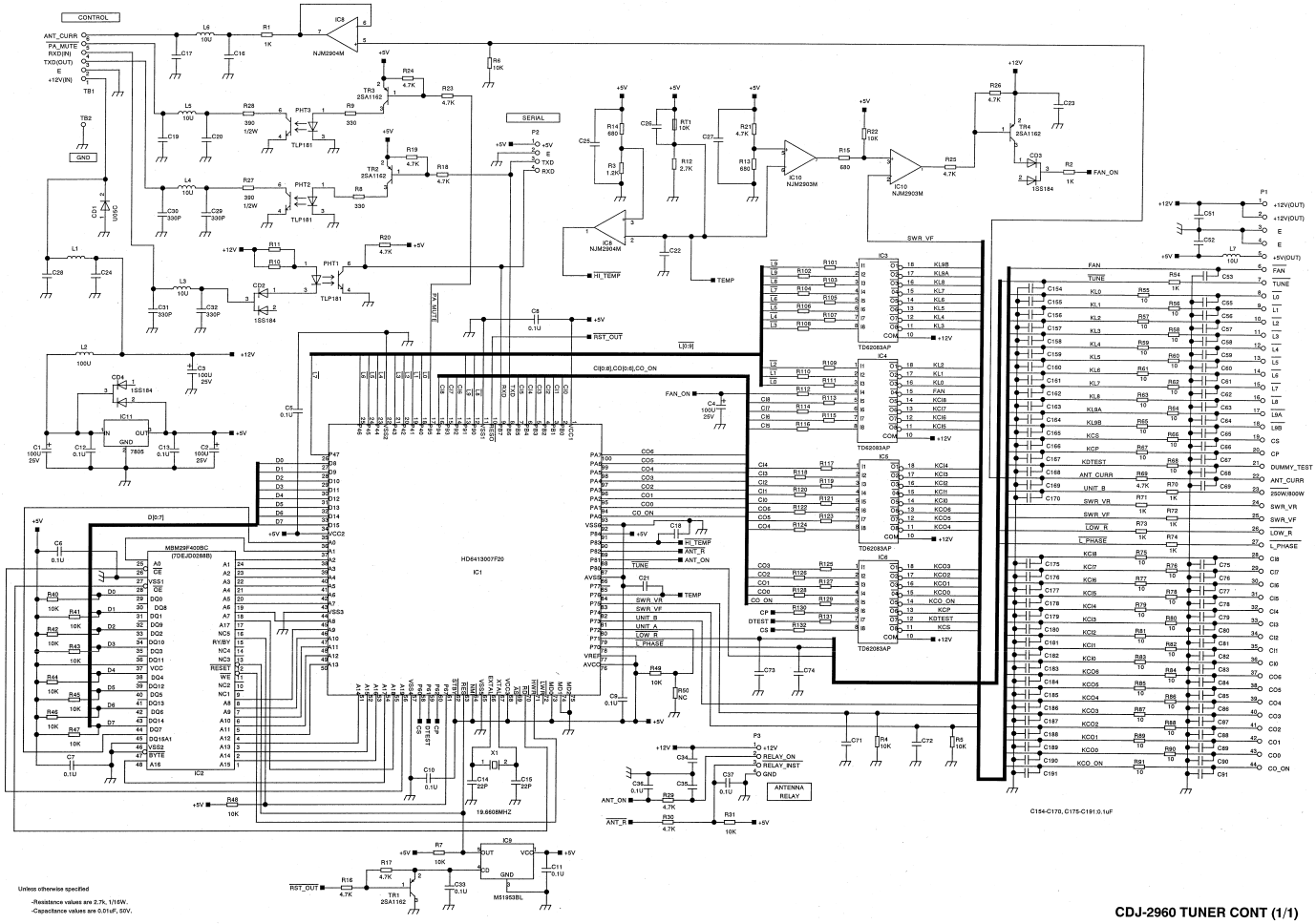
NFC-296 CHASSIS (1/1)

DWG.NO. ED01-NFC-296



NFC-896 CHASSIS (1/1)

DWG.NO. ED00-NFC-896



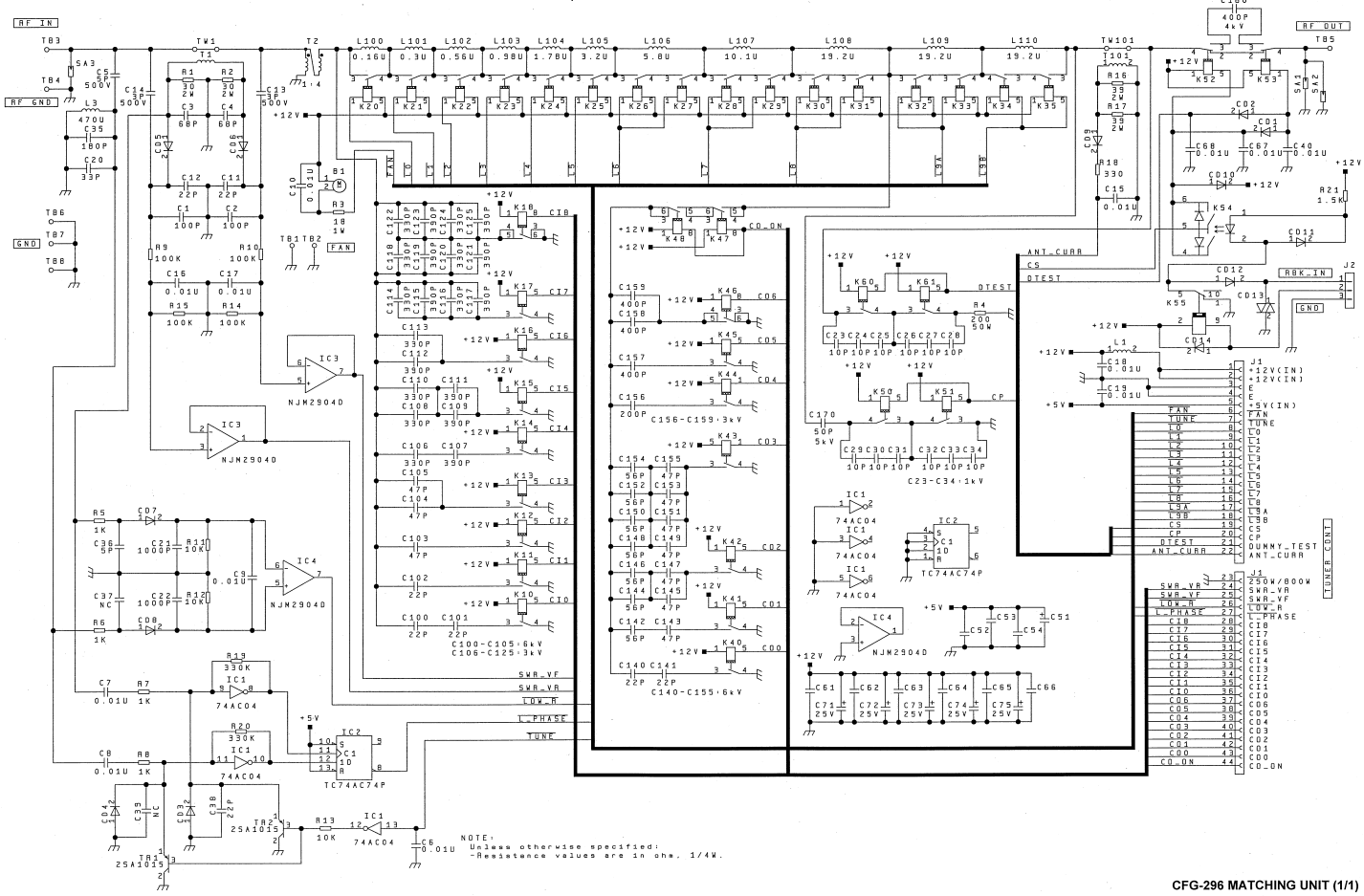
Unless otherwise specified

-Resistance values are 2.7k, 1/16W.

-Capacitance values are 0.01uF, 50V.

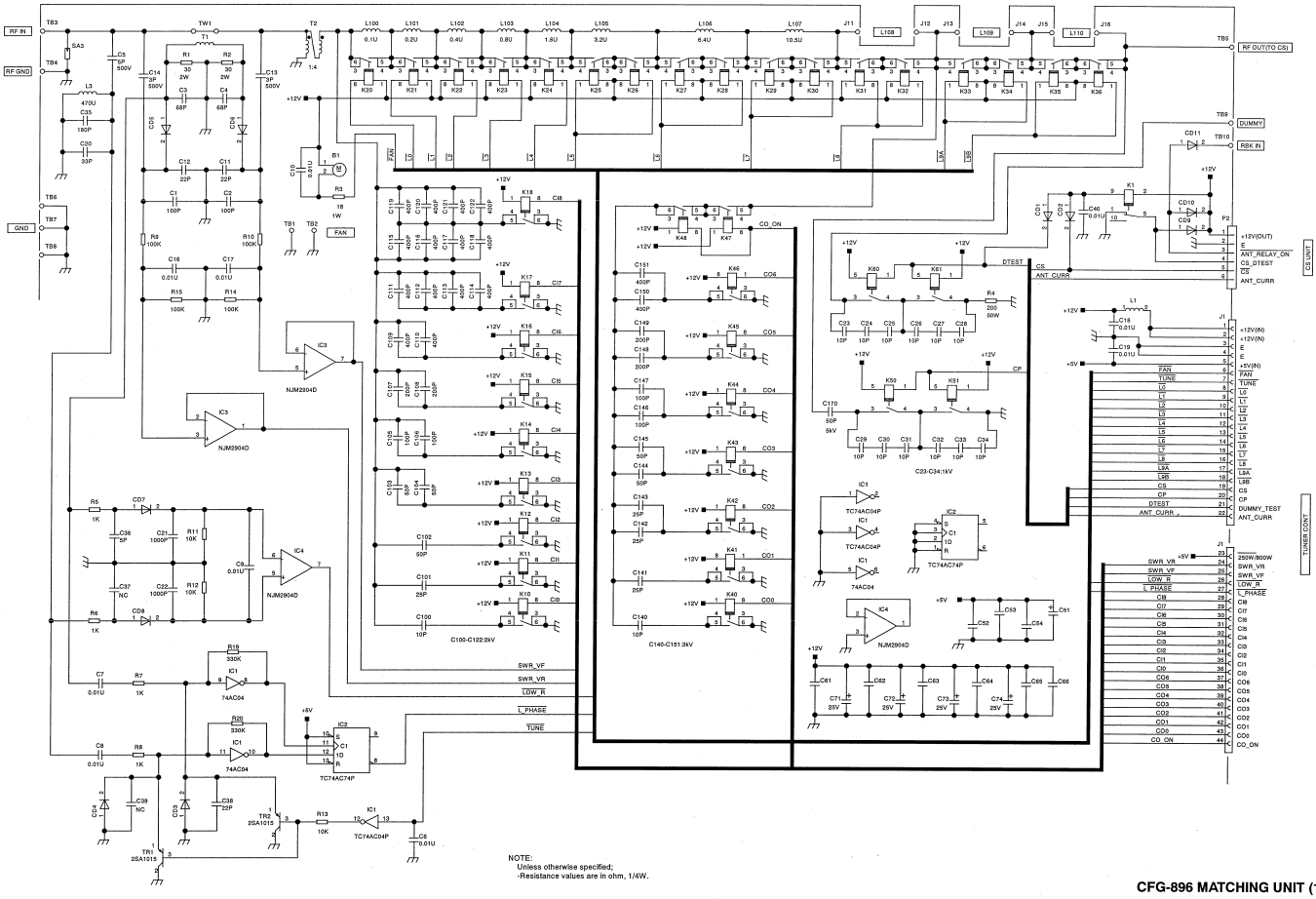
CDJ-2960 TUNER CONT (1/1)

DWG.NO. ED01-CDJ-2960



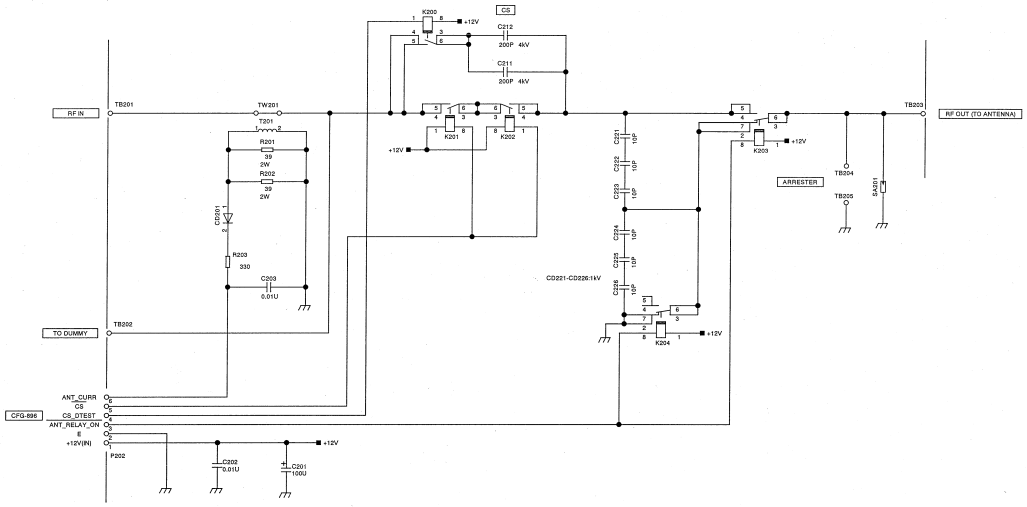
CFG-296 MATCHING UNIT (1/1)

DWG.NO. ED01-CFG-296



CFG-896 MATCHING UNIT (1/1)

DWG.NO. ED01-CFG-896



NOTE:
Unless otherwise specified;
-Resistance values are in ohm, 1/4W.

CFF-896 CS UNIT (1/1)

DWG.NO. ED00-CFF-896

TECHNICAL INFORMATION

FROM

NETWORK AND COMMUNICATION GROUP

Subject : Earth connection of TX antenna in NFC-296 Antenna Tuner

Equipment : NFC-296 Antenna Tuner for JSS-296 MF/HF Radio Equipment

Date : Feb 22, 2005

Issue Number : JD-1307-05

M.Takayama
Manager,
Network and Communication Group
Engineering Department
Marine Electronics Division

Priority
- ☐ A: Carry out immediately
- ☐ B: Carry out at periodical inspection
- ☒ C: Carry out upon client's request
- ☐ D: Information and news

1. Subject

Earth connection of TX antenna in NFC-296 Antenna Tuner

2. Objective Equipment

The following numbered NFC-296 Antenna Tuner within Tanker.

Serial number: From BC22067 to BC24090

3. Outlines

Problem:

In NFC-296 Antenna Tuner for JSS-296 MF/HF Radio Equipment, TX antenna may be not connected to the earth in standby condition.

Countermeasure:

Replace CFG-296 Matching Unit and Control cable in NFC-296 Antenna Tuner with followings according to attached document "CFG-296 Matching Unit replacement procedures"

CFG-296 Matching Unit of PCB version 7PCJD0099C (Stock code: CFG-296-A)
Control cable (Stock code: 7ZCJD0258)

4. Attached document

Attachment1: CFG-296 Matching Unit replacement procedures
Attachment2: NFC-296 Antenna Tuner/CFG-296 Matching Unit circuit diagram

CFG-296 Matching Unit replacement procedures

Outline

In CFG-296 Matching Unit of NFC-296 Antenna Tuner, there are the following PCB versions.

PCB version: 7PCJD0099A (Stock code: CFG-296)

PCB version: 7PCJD0099C (Stock code: CFG-296-A)

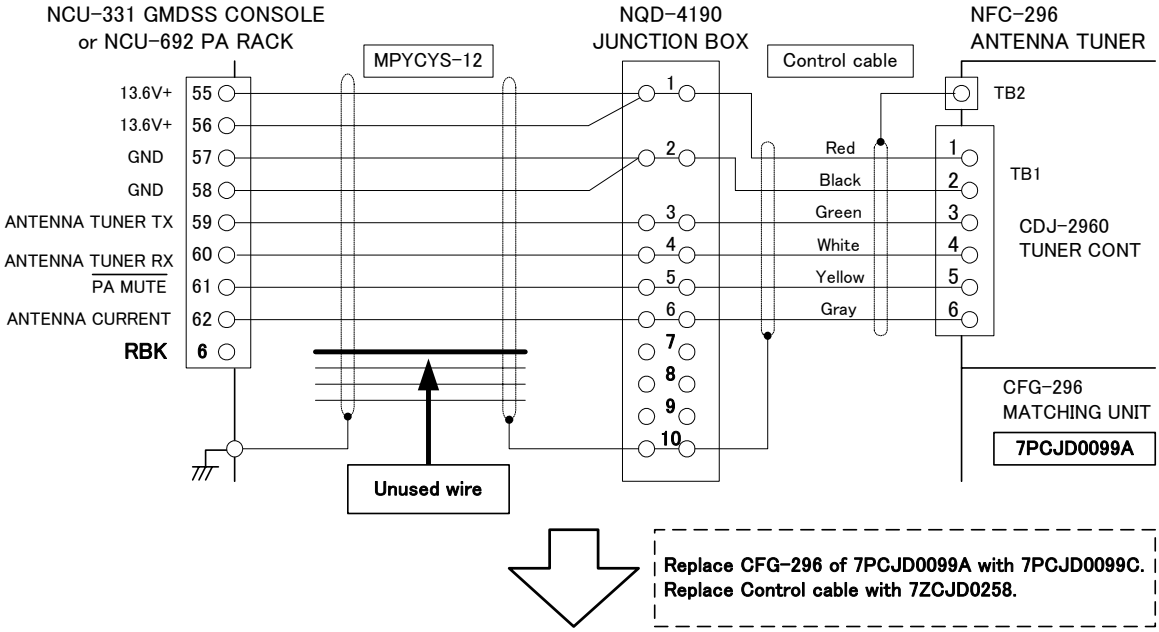
Therefore, in replacing CFG-296 Matching Unit, refer to the following table and choose the PCB version.

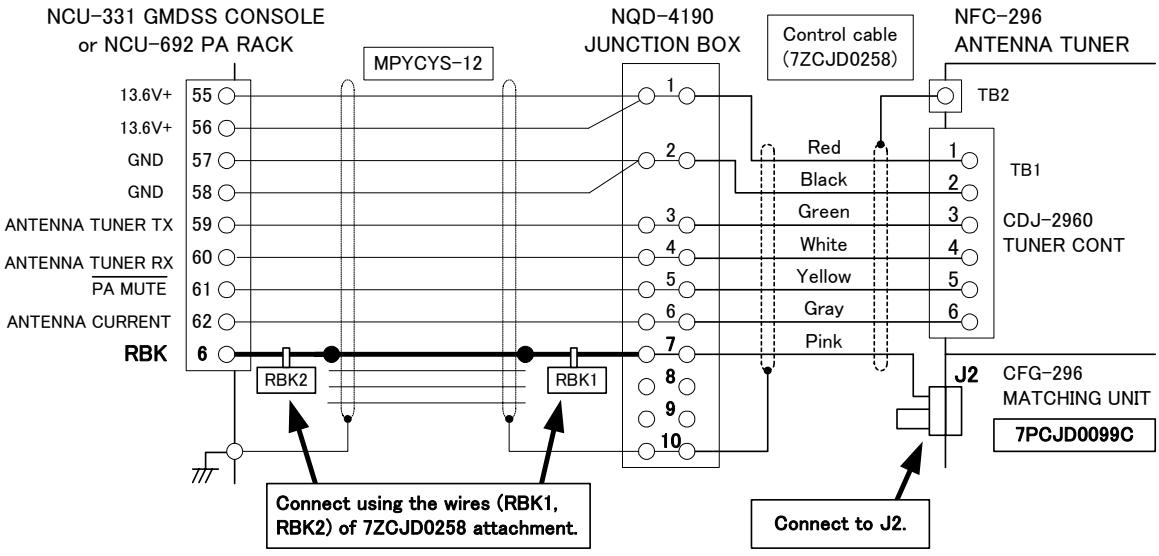
The PCB version before replacement	Ship kind	Replaceable PCB version	Item for replacement	Condition of Tx antenna in the standby		Reference procedure
				Before replacement	After replacement	
7PCJD0099A Serial No.: From BC22067 to BC24090	Tanker	7PCJD0099C	PCB Stock code: CFG-296-A Control Cable Stock code: 7ZCJD0258 Vinyl tape	Tx antenna may not be connected to the earth.	Tx antenna is connected to the earth.	A
	Others	7PCJD0099C	PCB Stock code: CFG-296-A	Tx antenna may not be connected to the earth.	Same as left	B
		7PCJD0099A	PCB Stock code: CFG-296			
7PCJD0099C Serial No.: BC24351 or later	—	7PCJD0099C	PCB Stock code: CFG-296-A	Tx antenna is connected to the earth.	Same as left	C

CFG-296 replacement procedures A

At ship (Tanker etc.) which needs to connect Tx antenna to the earth at standby condition, replace the PCB of 7PCJD0099A of CFG-296 with 7PCJD0099C according to this procedures.

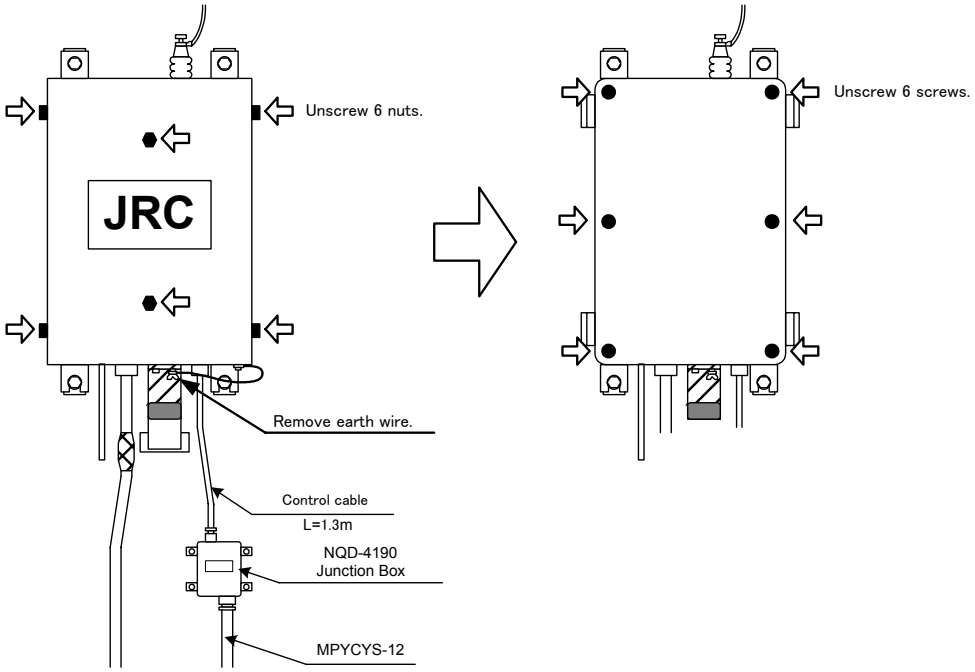
Outline figure



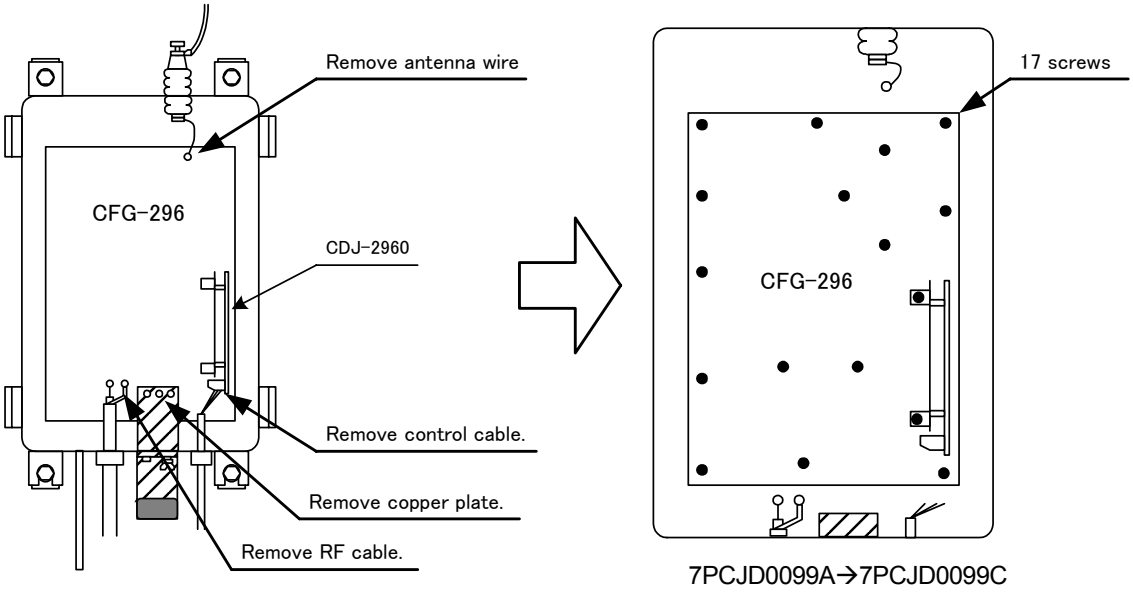


Procedure

1. Turn off AC and DC switches of NAH-692/695/698.
2. Remove earth wire, shade cover and upper cover.



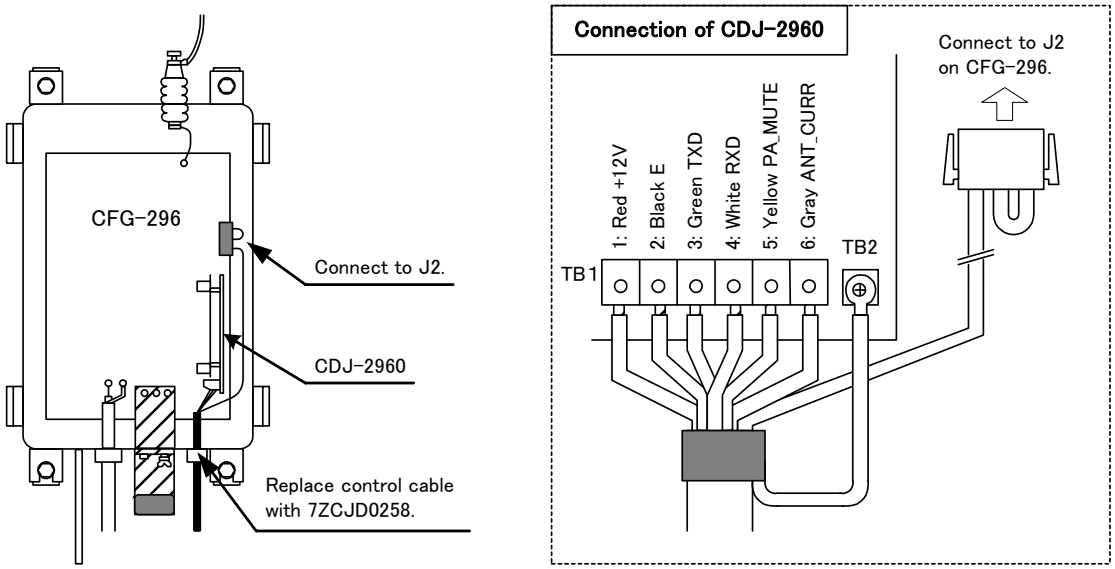
3. Replace CFG-296 of 7PCJD0099A with 7PCJD0099C.



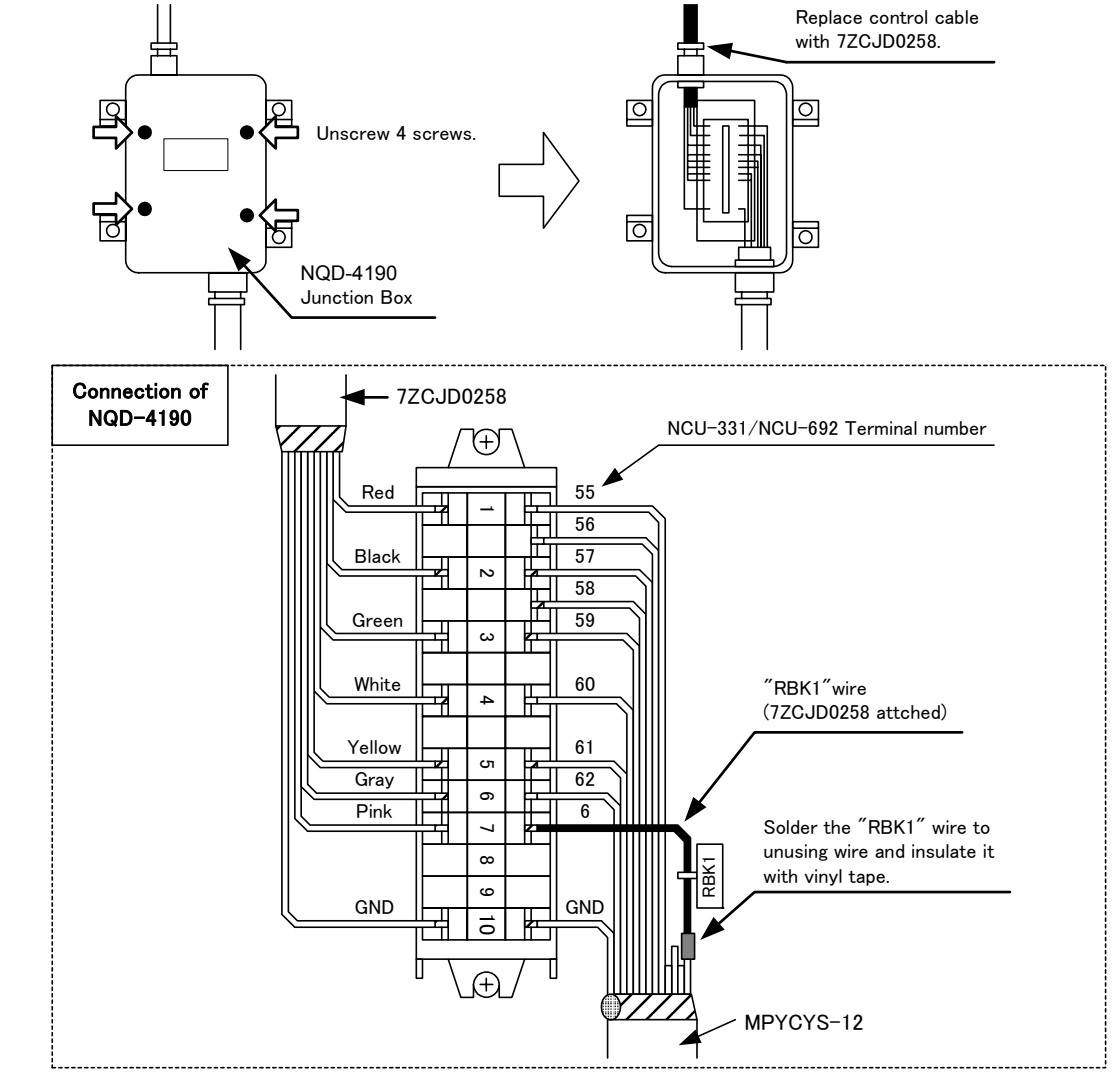
4. Connect the antenna wire, copper plate and RF cable disconnected in the paragraph 3.

5. Replace control cable between NFC-296 and NQD-4190 with 7ZCJD0258.

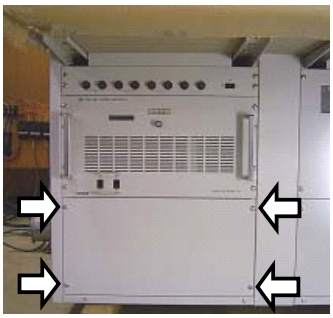
NFC-296 side



NQD-4190 side

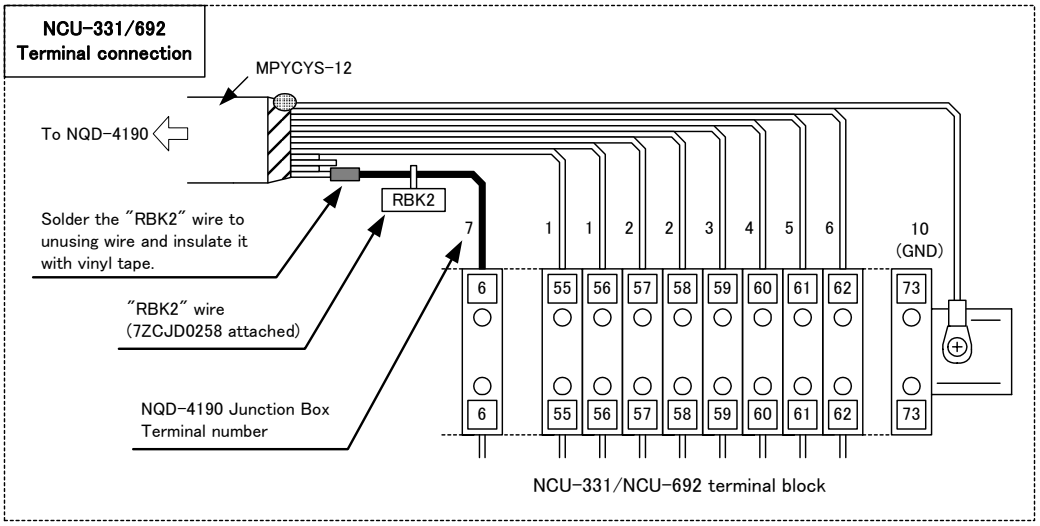


6. Remove the front panel of NCU-331/692.

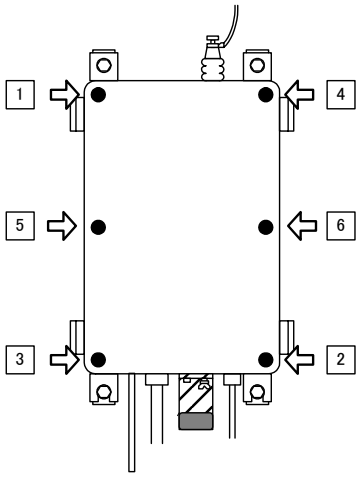


Unscrew 4 screws.

7. Connect “RBK2” wire to NCU-331/692 terminal block No.6.



8. Return the front panel of NCU-331/692.
9. Return the upper cover of NQD-4190.
10. Return the upper cover of NFC-296.



Note

(a) Confirm connections of cables and connector before returning the upper cover.

(b) Screw the upper cover in order of figure.
(The standard of tightening torque is 15 kgf･cm.)

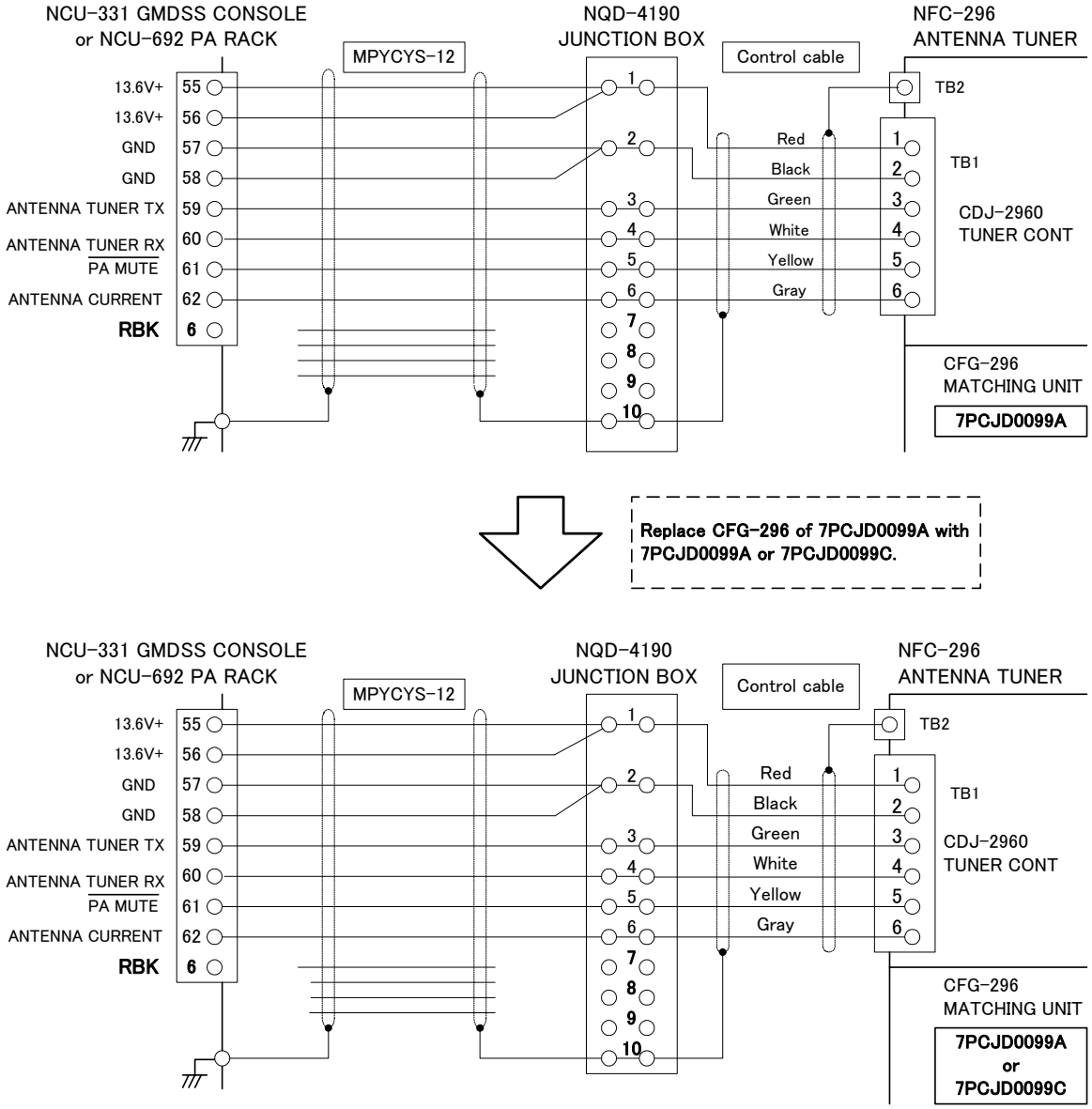
11. Return the shade cover and earth wire.

Replacing the CFG-296 Matching Unit in the NFC-296 is finished.

CFG-296 replacement procedures B

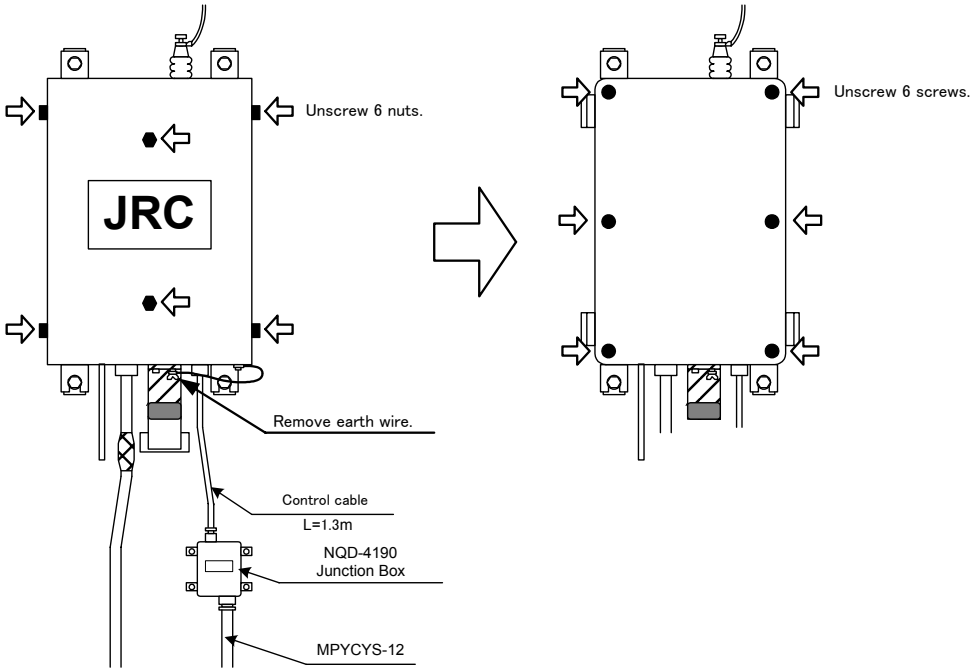
At ship which does not need to connect Tx antenna to the earth at standby condition, the replaceable PCB versions of CFG-296 are 7PCJD0099A and 7PCJD0099C. When replacing CFG-296 of 7PCJD0099A with 7PCJD0099A or 7PCJD0099C is needed, refer to this procedures.

Outline figure

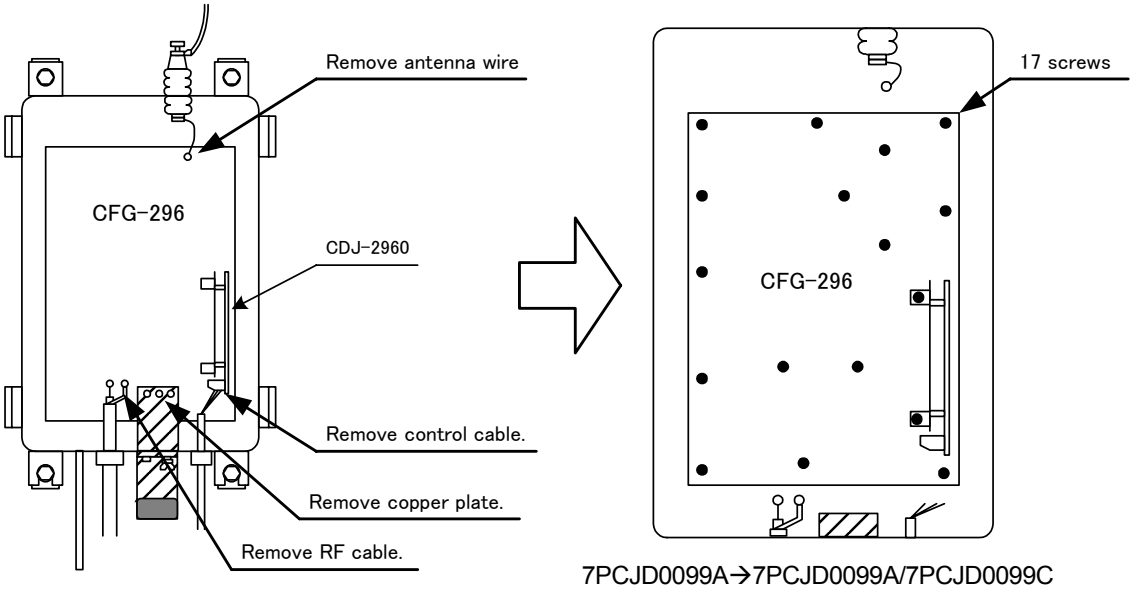


Procedure

1. Turn off AC and DC switches of NAH-692/695/698.
2. Remove earth wire, shade cover and upper cover.

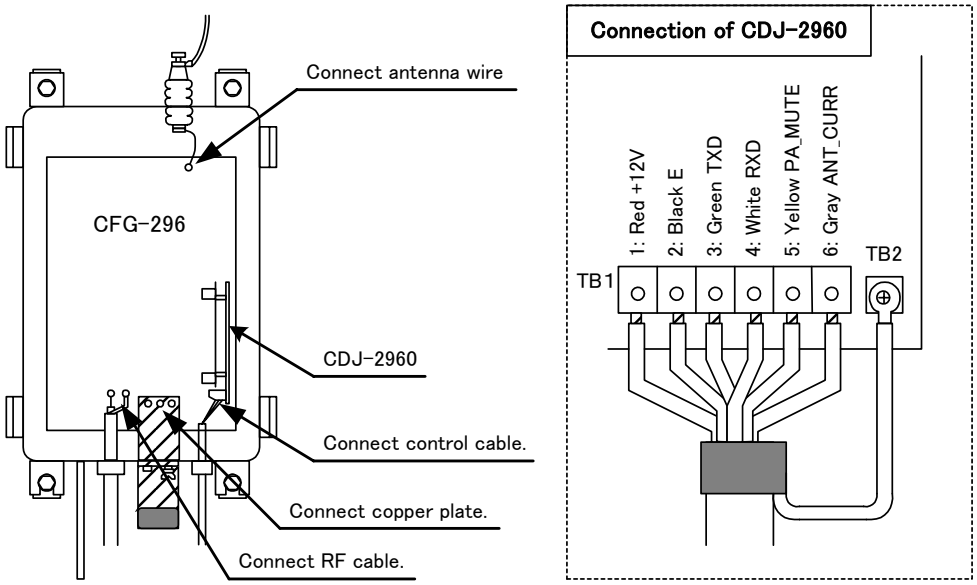


3. Replace CFG-296 of 7PCJD0099A with 7PCJD0099A or 7PCJD0099C.

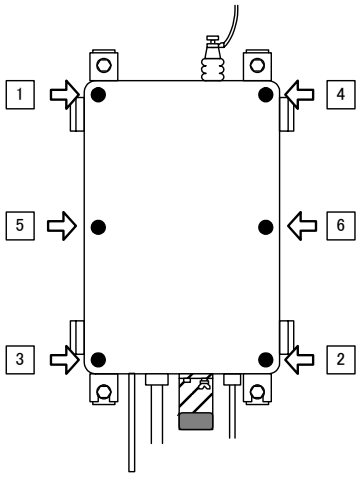


7PCJD0099A→7PCJD0099A/7PCJD0099C

4. Connect the control cable, antenna wire, copper plate and RF cable disconnected in the paragraph 3.



5. Return the upper cover of NFC-296.



Note

(a) Confirm connections of cables and connector before returning the upper cover.

(b) Screw the upper cover in order of figure.
(The standard of tightening torque is 15 kgf･cm.)

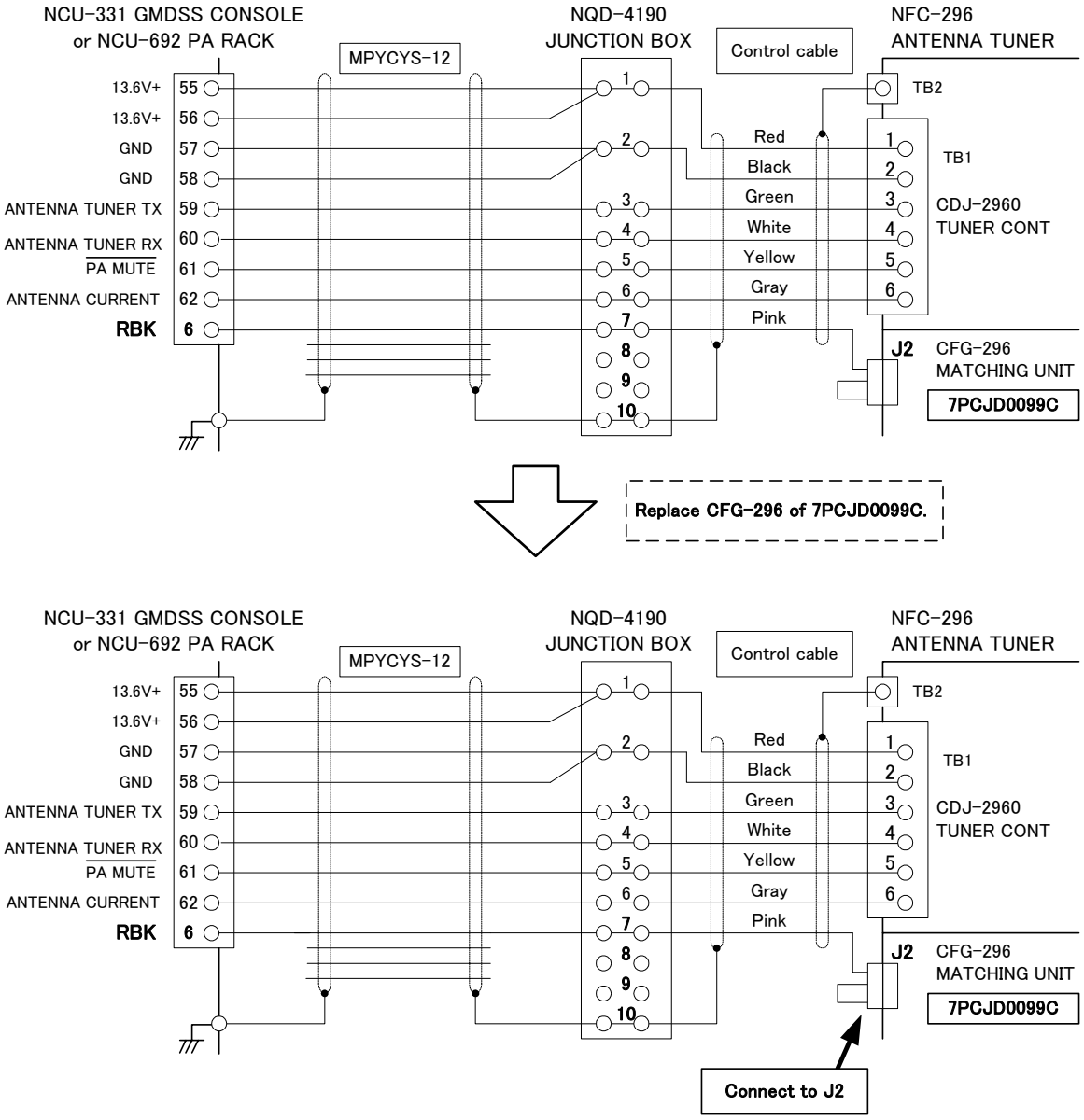
6. Return the shade cover and earth wire.

Replacing the CFG-296 Matching Unit in the NFC-296 is finished.

CFG-296 replacement procedures C

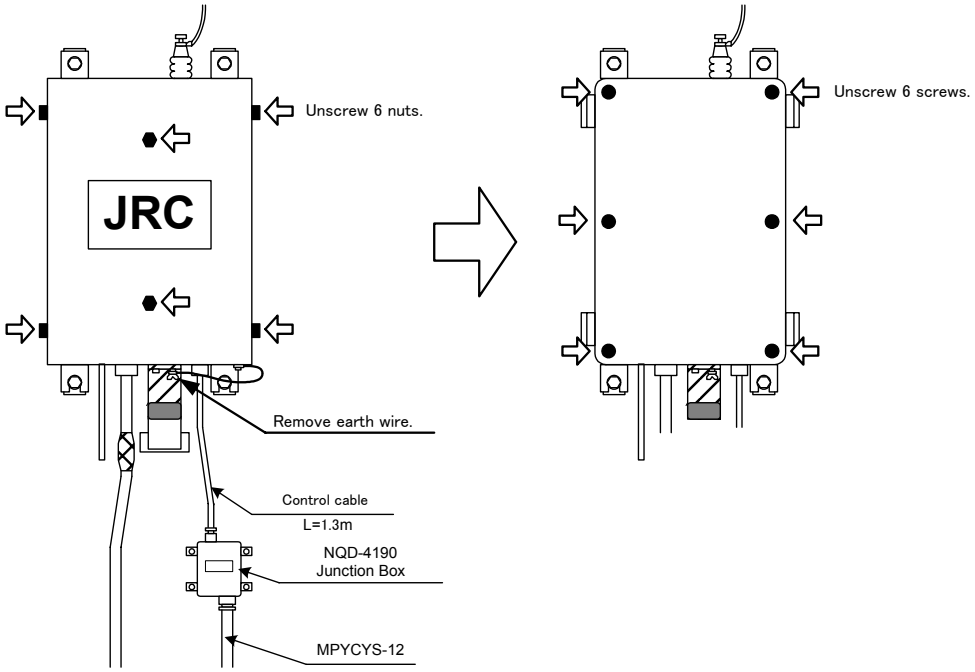
If PCB version of CFG-296 in NFC-296 is 7PCJD0099C, the replaceable PCB version of CFG-296 is 7PCJD0099C only. When replacing CFG-296 of 7PCJD0099C is needed, refer to this procedures.

Outline figure

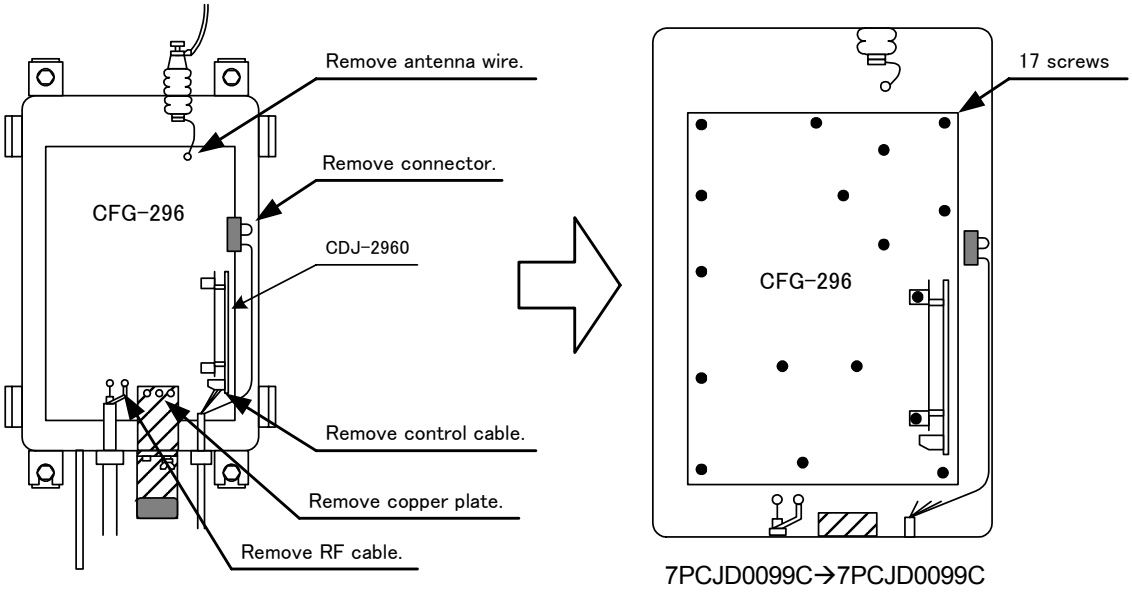


Procedure

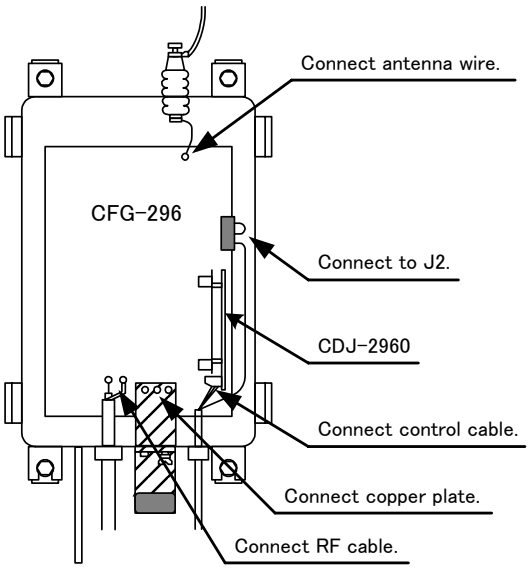
1. Turn off AC and DC switches of NAH-692/695/698.
2. Remove earth wire, shade cover and upper cover.

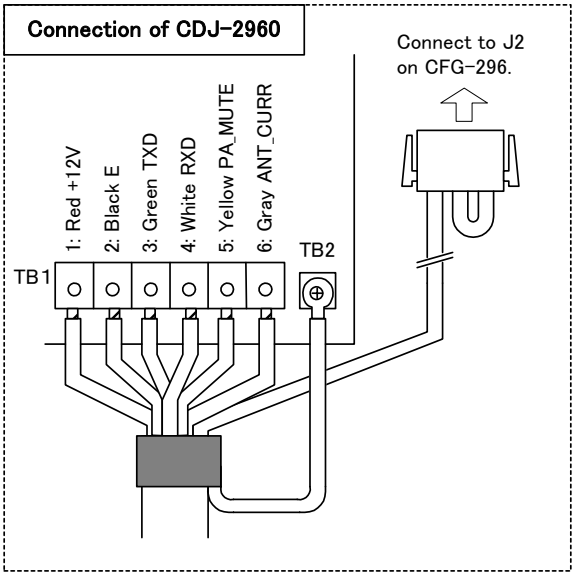


3. Replace CFG-296 of 7PCJD0099C.

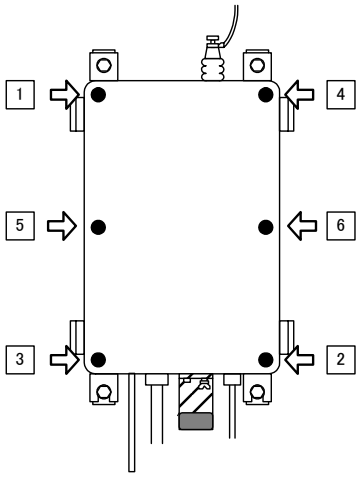


4. Connect the control cable, antenna wire, copper plate and RF cable disconnected in the paragraph 3.





5. Return the upper cover of NFC-296.



Note

(a) Confirm connections of cables and connector before returning the upper cover.

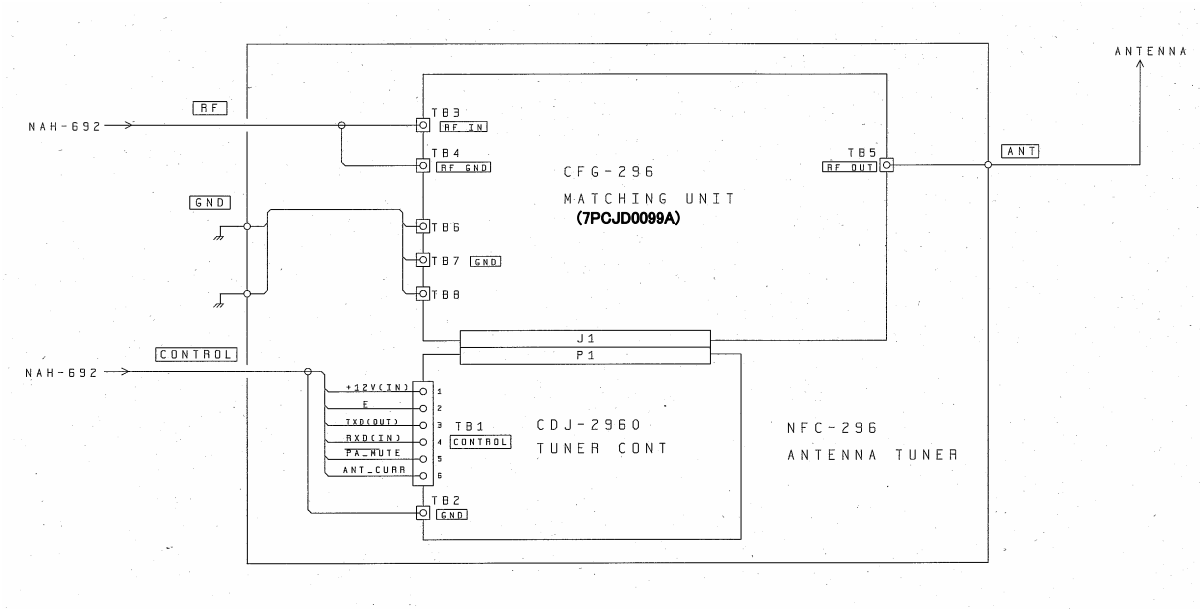
(b) Screw the upper cover in order of figure.
(The standard of tightening torque is 15 kgf･cm.)

6. Return the shade cover and earth wire.

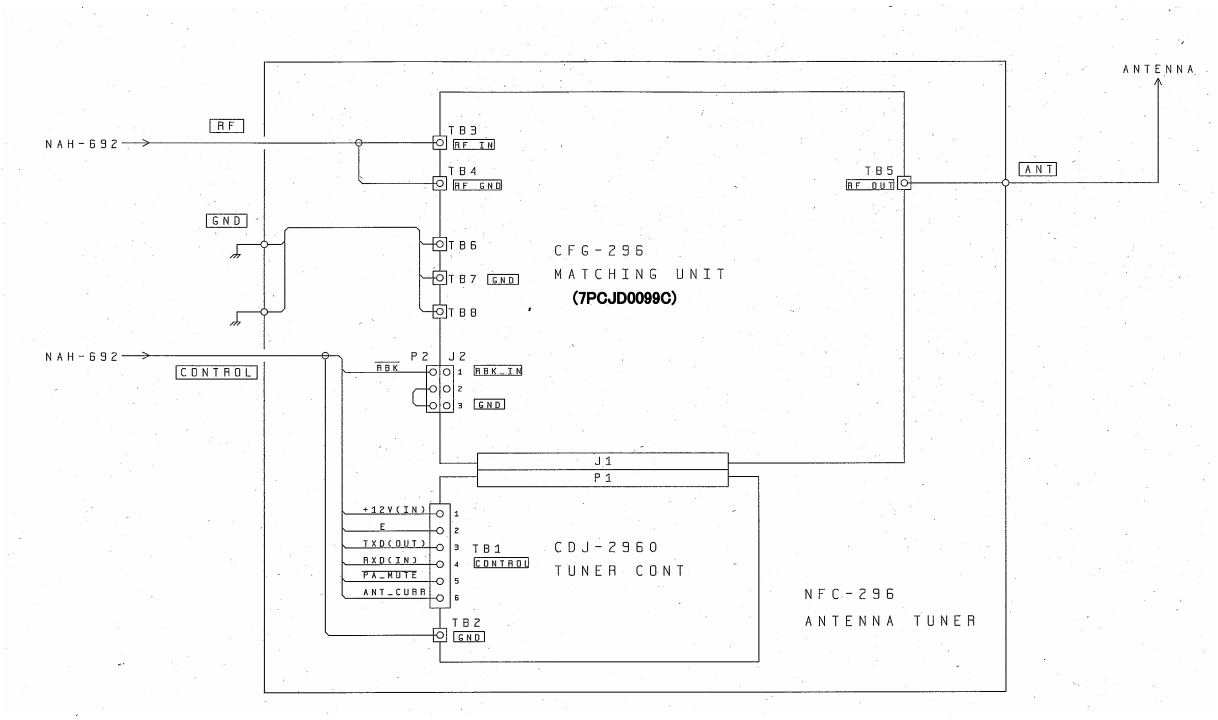
Replacing the CFG-296 Matching Unit in the NFC-296 is finished.

NFC-296 Antenna Tuner / CFG-296 Matching Unit circuit diagram

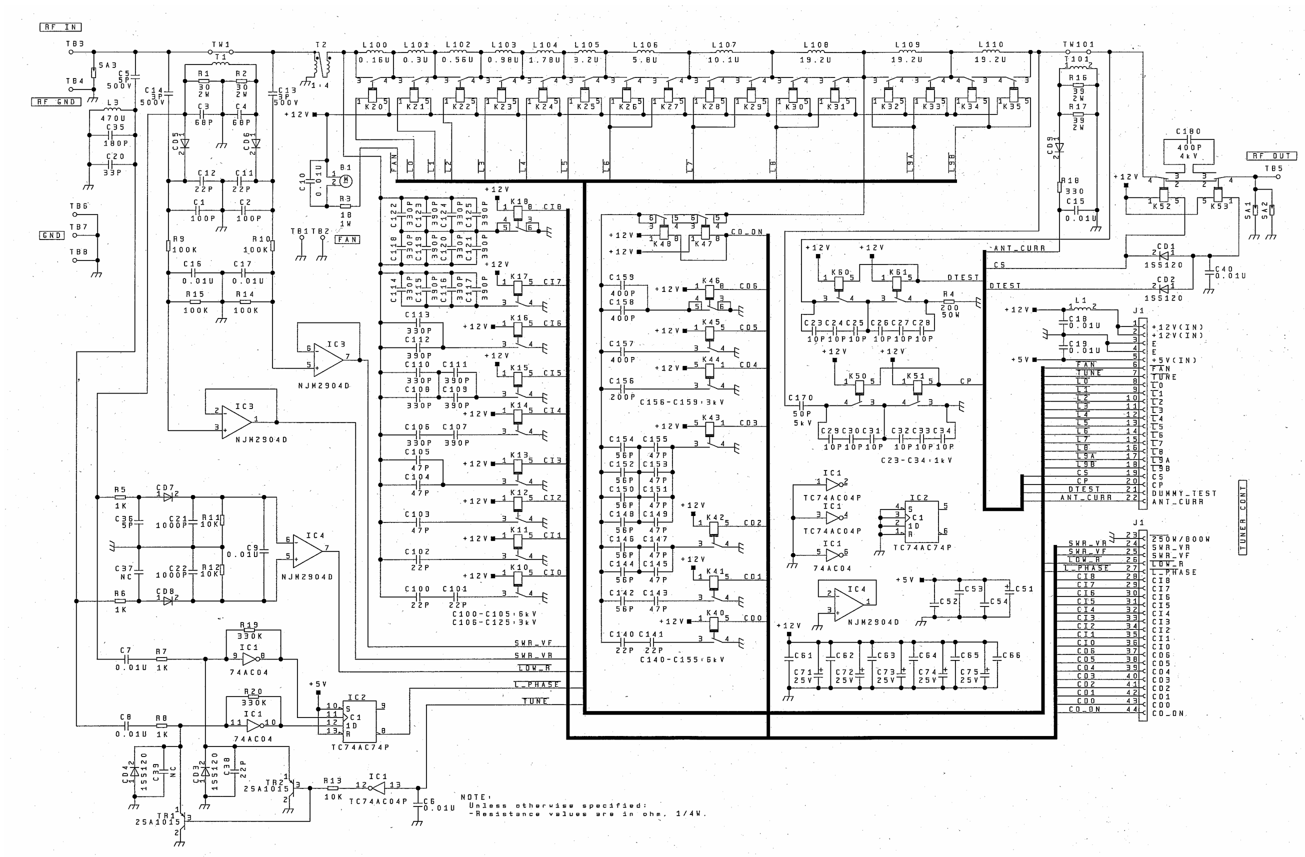
1. NFC-296 Antenna Tuner (PCB version of CFG-296 is 7PCJD0099A)



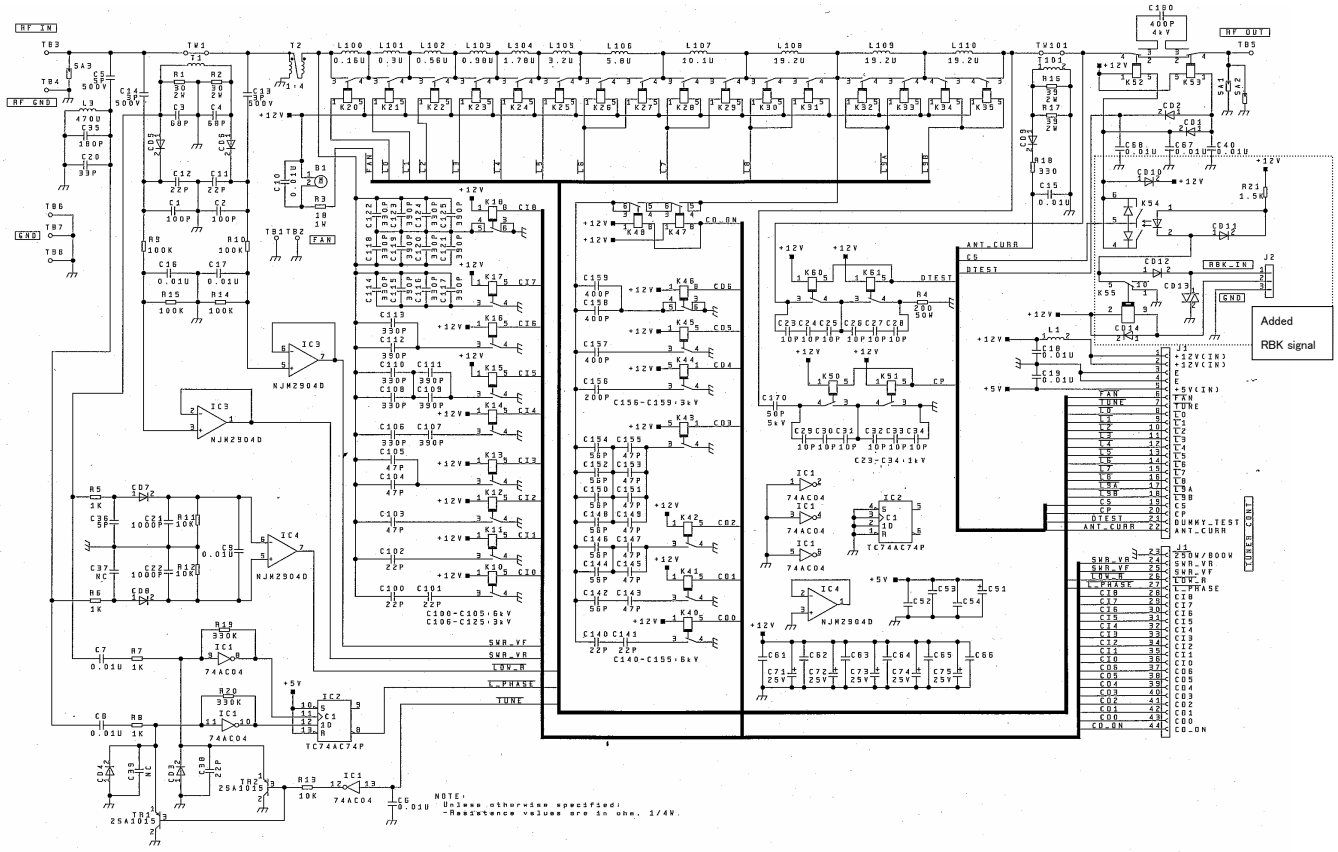
2. NFC-296 Antenna Tuner (PCB version of CFG-296 is 7PCJD0099C)



3. CFG-296 Matching Unit (PCB version is 7PCJD0099A)



4. CFG-296 Matching Unit (PCB version is 7PCJD0099C)



TECHNICAL INFORMATION

FROM

NETWORK AND COMMUNICATION GROUP

Subject : DC Breaker addition

Equipment : NCU-331E/F/G, NCU-692 (JSS-296/596/896)

Date : Jan 26, 2005

Issue Number : JD-1303-05

M.Takayama
Manager,
Network and Communication Group
Engineering Department
Marine Electronics Division

Priority
- ☐ A: Carry out immediately
- ☐ B: Carry out at periodical inspection
- ☒ C: Carry out upon client's request
- ☐ D: Information and news

1. Subject

DC Breaker addition

2. Objective Equipment

NCU-331E/F/G GMDSS CONSOLE and NCU-692 PA RACK shipped before September, 2004.

3. Outlines

The objective NCU-331 GMDSS CONSOLE or NCU-692 PA RACK stops charging ship's battery when turning off AC switch on it, but could not stop supplying battery power to peripheral equipment such as VHF radios even when turning off DC switch mounted next to the AC switch. As the result, the ship's battery may be consumed and its voltage may drop according to the operating condition of the peripheral equipment.

As the countermeasures against this problem, add the DC breaker switch using "Breaker kit" if required. The kit is available by contacting SERVICE GROUP (PARTS TEAM) of MARINE SERVICE DEPARTMENT with the following code.

Breaker Kit for NCU-331 made from JRC	(Stock code: 7KDJD0001)
Breaker Kit for NCU-692	(Stock code: 7KDJD0002)
Breaker Kit for NCU-331 made from MRC	(Stock code: 7KDJD0003)

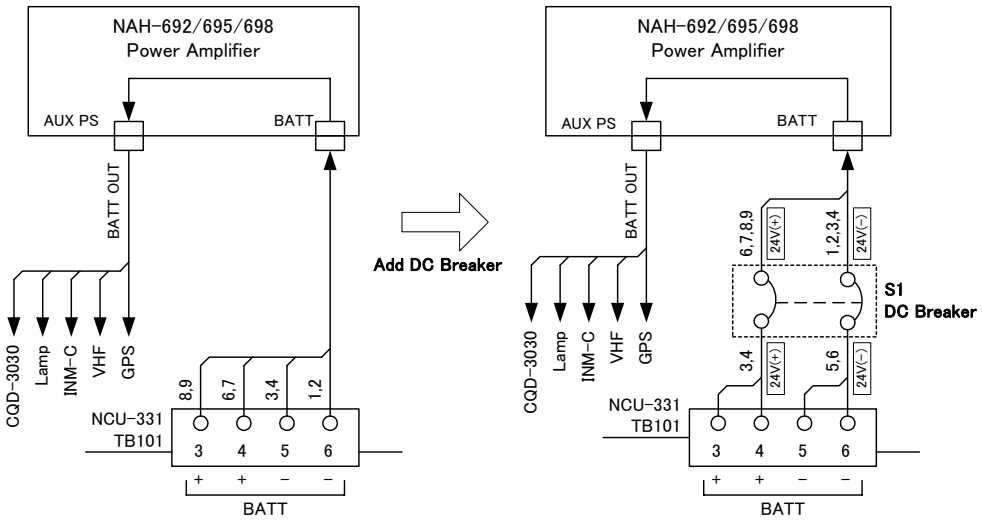
4. Attached document

NCU-331 DC Breaker Addition procedures
NCU-692 DC Breaker Addition procedures

NCU-331　DC Breaker Addition procedures

Add the DC Breaker to GMDSS CONSOLE (NCU-331E/F/G) referring to the following procedures.

Connection Diagram



Procedure

(1) Turn off AC and DC switches on POWER AMPLIFIER (NAH-692/695/698).

(2) Disconnect cables between NCU-331 and ship's battery.

⚠CAUTION

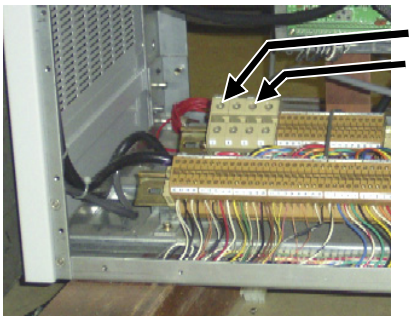
To avoid fire, electric shock and/or whatever malfunction of the equipment, be sure to disconnect the cables. Further, confirm voltage at DC input terminals if the battery output is certainly shut off referring to (6) paragraph mentioned below.

(3) Unscrew twelve screws of the front panel.

(4) Pull out the POWER AMPLIFIER.

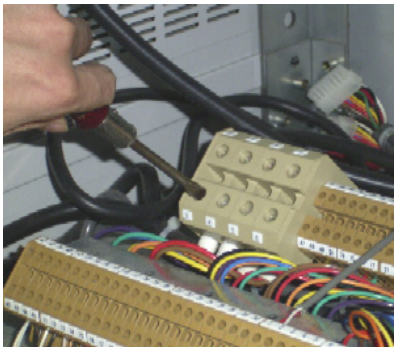
(5) Disconnect all cables on back of the POWER AMPLIFIER.

(6) Check voltage between No. 3 and No. 5 of DC terminal.

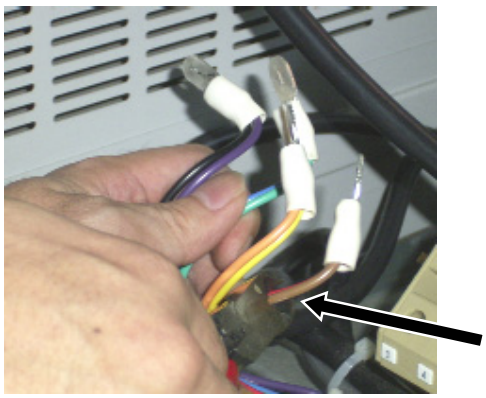


Check the voltage between No.3 and No.5.

(7) Disconnect cables of No.3, No.4, No.5 and No.6 of the DC terminal.

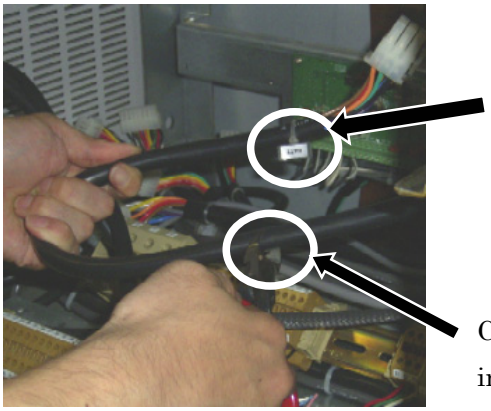


(8) Cut the disconnected cables as shown below and insulate the tips of them with vinyl tape.



Cut each cable at this point and insulate it.

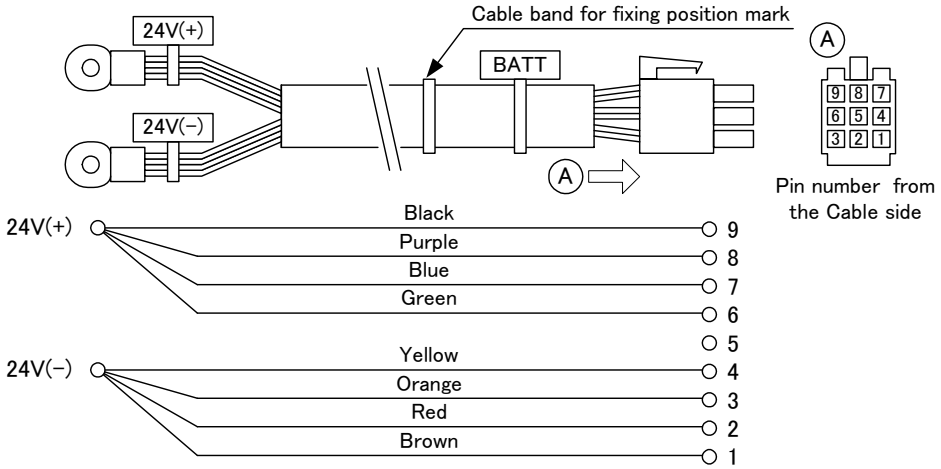
(9) Cut the BATT cable as shown below and insulate it with vinyl tape.



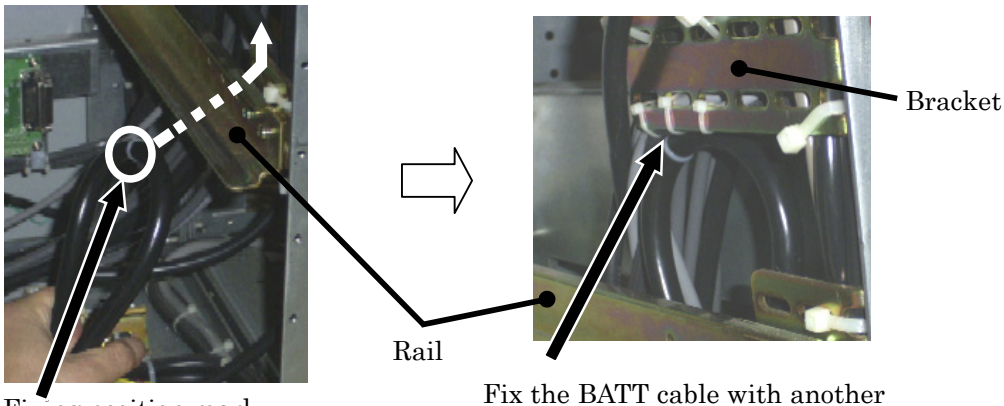
Cut the BATT cable at this point and insulate it.

(10) Pick out the new BATT cable from Breaker Addition Kit.

BATT cable

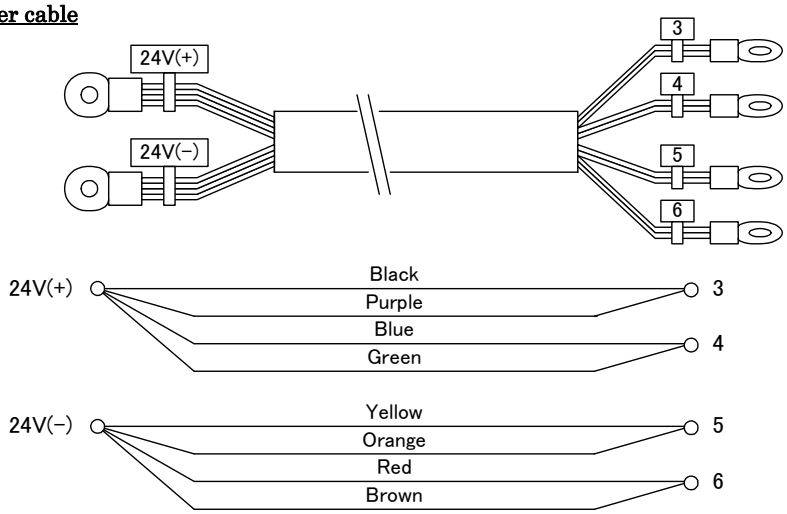


(11) Insert this BATT cable inside the rail and fix to the bracket as shown below.

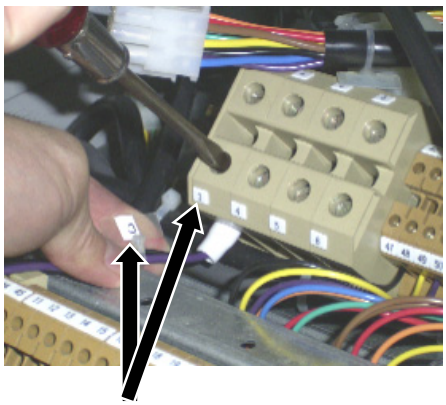


(12) Pick out the Breaker cable from Breaker Addition Kit.

Breaker cable



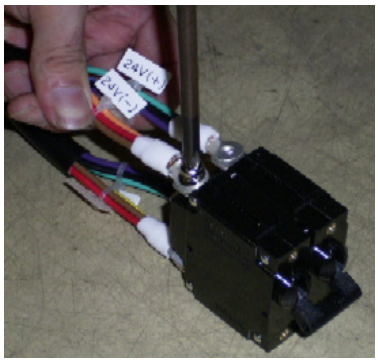
(13) Connect the Breaker cable numbered from 3 to 6 to the DC terminal respectively as follows.

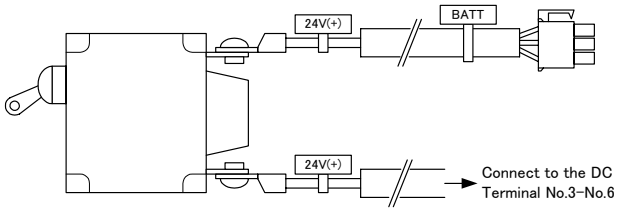


Cable No.	Terminal No.	Names
3	3	24V(+)
4	4	24V(+)
5	5	24V(-)
6	6	24V(-)

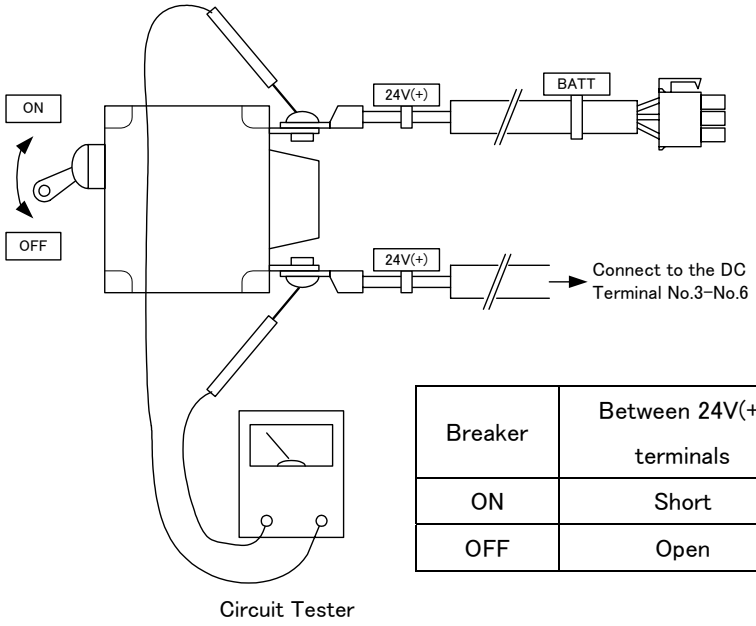
Wire to coincide with the cable number and terminal number.

(14) Connect the Breaker Cable and the BATT Cable to the breaker with four M5X8-screws contained in the Breaker Addition Kit.





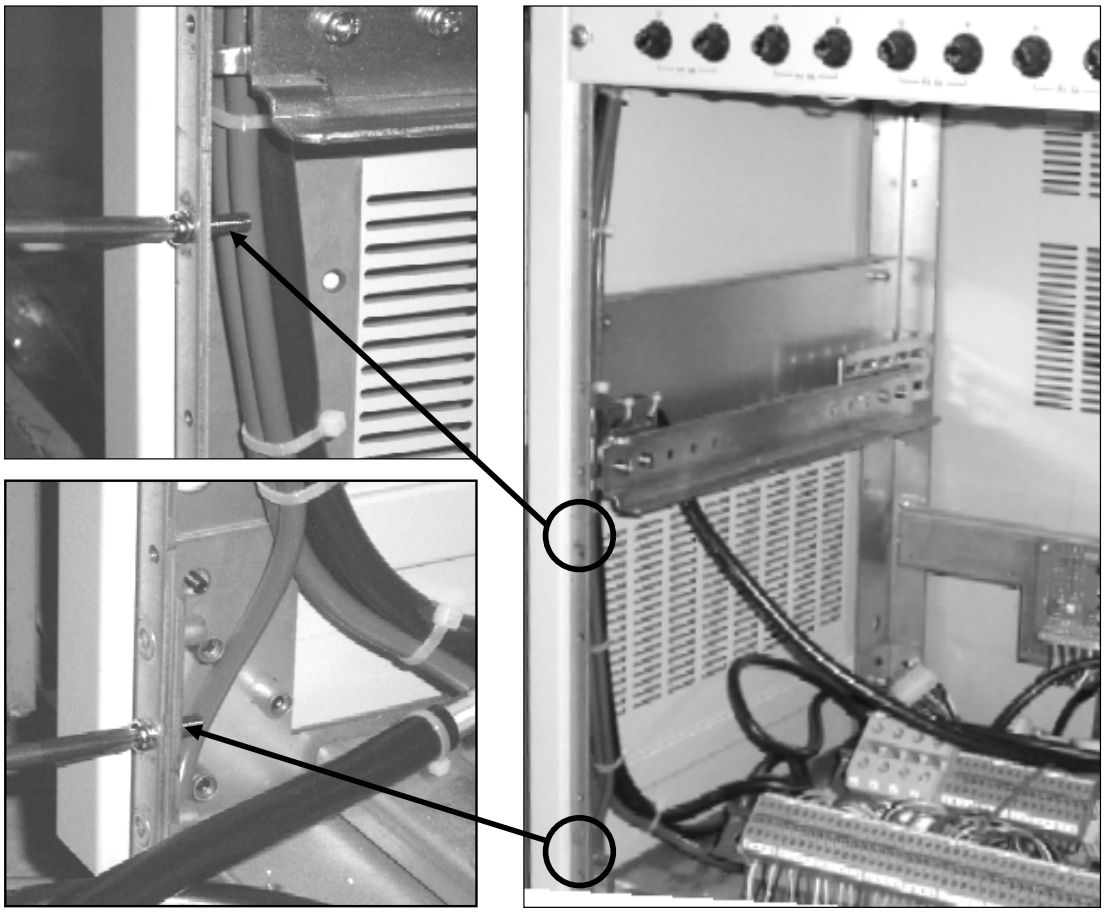
(15) Check the Breaker connection as the following table shows.



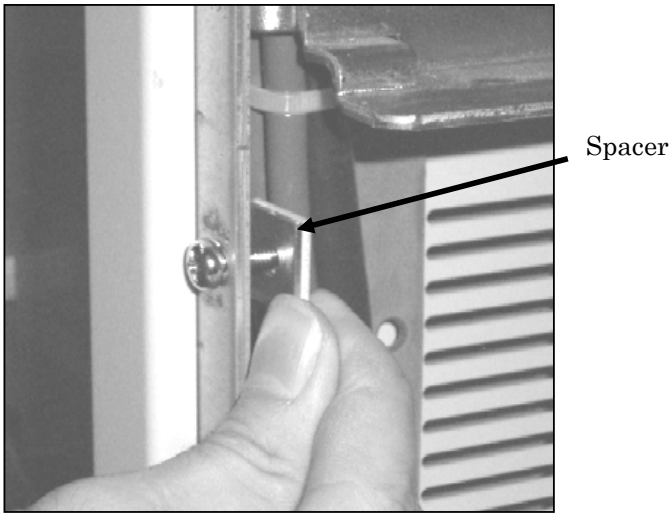
Breaker	Between 24V(+) terminals	Between 24V(–) terminals
ON	Short	Short
OFF	Open	Open

Note: Turn off the breaker after checking.

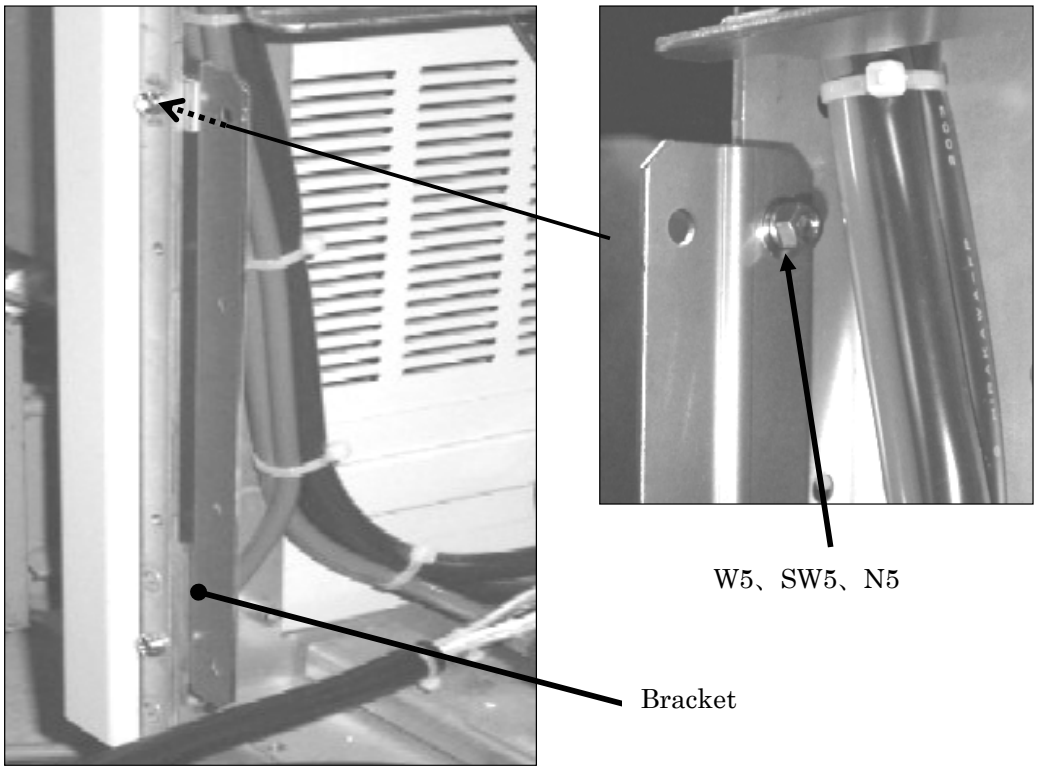
(16) Fix the two M5X20-screws contained in the Breaker Addition Kit to tapped holes used to fix the front panel as shown below.



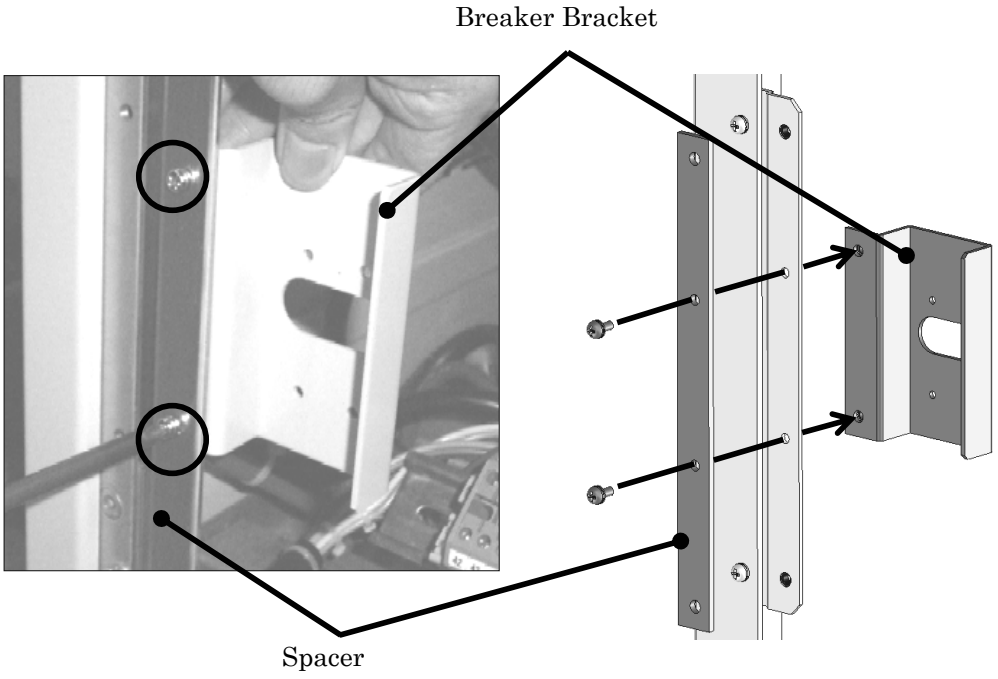
(17) Attach Spacer contained in the Breaker Addition Kit to the upper screw only.



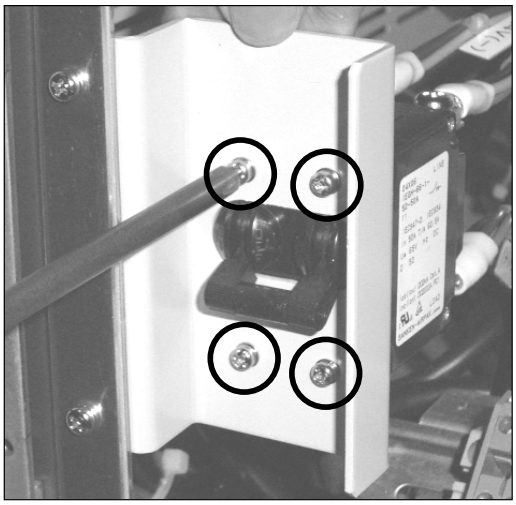
(18) Fix Bracket with two M5-nuts, spring washers and washers contained in the Breaker Addition Kit.



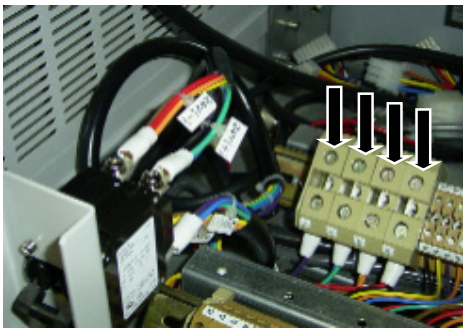
(19) Fix the Spacer and the Breaker Bracket with two M4X12-screws contained in the Breaker Addition Kit.



(20) Fix the breaker with four M3X6-screws on the Breaker Bracket contained in the Breaker Addition Kit.



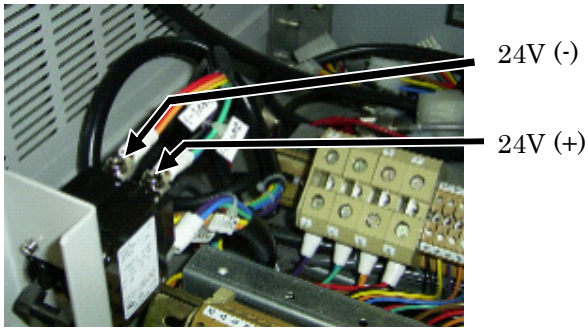
(21) Check the Open/short circuit of each DC terminal by a Circuit Tester.



Check Item	Normal Condition
No.3 and No.4	Short
No.3 and No.5	Open
No.3 and No.6	Open
No.4 and No.5	Open
No.4 and No.6	Open
No.5 and No.6	Short

(22) Connect the cables disconnected in the (2) paragraph to the battery and confirm the voltage outputted from the battery between No.3 and No.5 of the DC terminal.

(23) Turn on the breaker and check the voltage between 24V (+) and 24V (-) breaker terminals as the same value with the battery voltage confirmed above.



(24) Turn off the breaker and restore the POWER AMPLIFIER to the NCU-331.

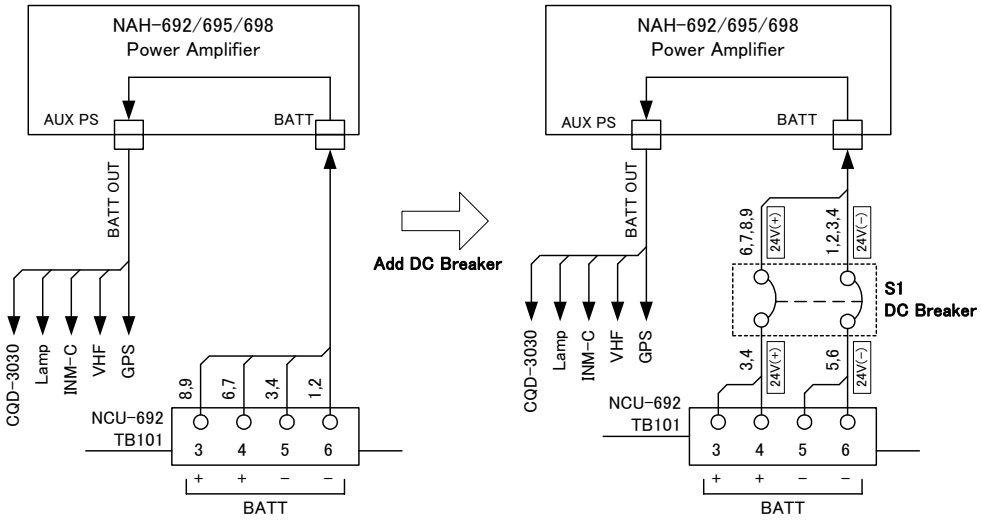
(25) Fix the new front panel contained in the Breaker Addition Kit using M5-screws removed in (3) paragraph.

(26) Complete this procedure by sticking the attached seal on the front panel of Radio Equipment.

NCU-692　DC Breaker Addition procedures

Add the DC Breaker to PA RACK (NCU-692) referring to the following procedures.

Connection Diagram



Procedure

(1) Turn off AC and DC switches on POWER AMPLIFIER (NAH-692/695/698).

(2) Disconnect cables between NCU-692 and ship's battery.

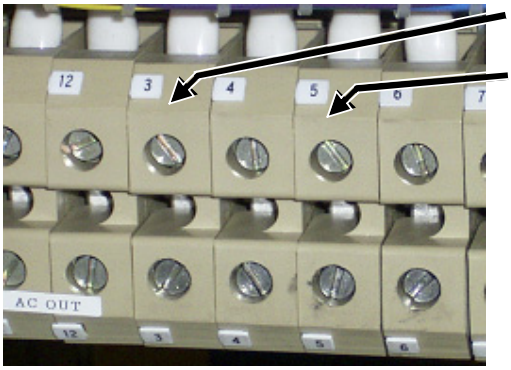
> **⚠CAUTION**
>
> To avoid fire, electric shock and/or whatever malfunction of the equipment, be sure to disconnect the cables. Further, confirm voltage at DC input terminals if the battery output is certainly shut off referring to (6) paragraph mentioned below.

(3) Unscrew twelve screws of the front panel.

(4) Pull out the POWER AMPLIFIER.

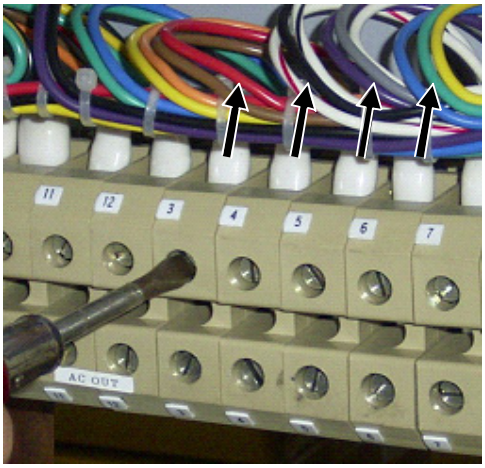
(5) Disconnect all cables on back of the POWER AMPLIFIER.

(6) Check voltage between No. 3 and No. 5 of DC terminal.

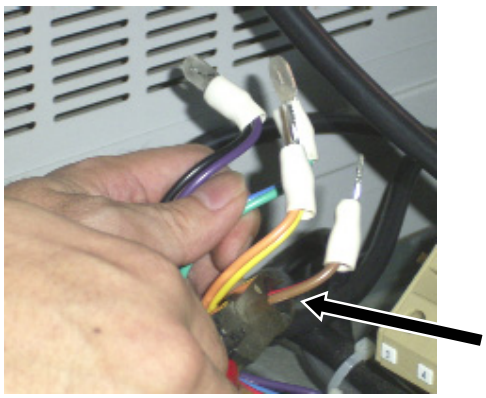


Check the voltage between No.3 and No.5.

(7) Disconnect cables of No.3, No.4, No.5 and No.6 of the DC terminal.

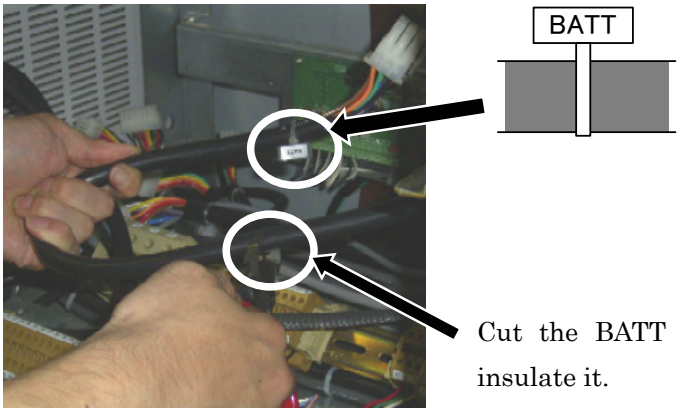


(8) Cut the disconnected cables as shown below and insulate the tips of them with vinyl tape.



Cut each cable at this point and insulate it.

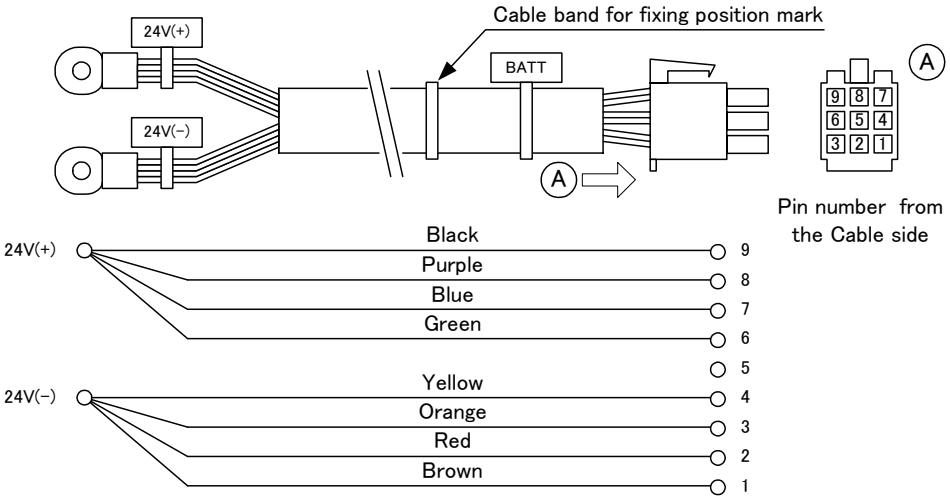
(9) Cut the BATT cable as shown below and insulate it with vinyl tape.



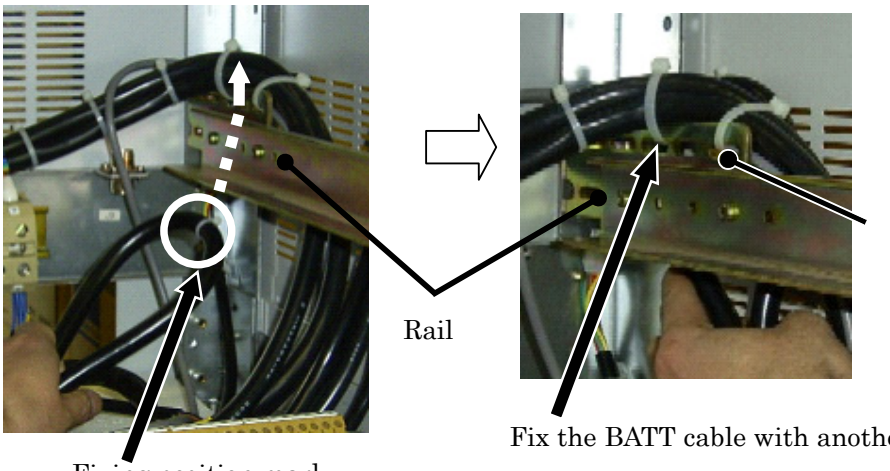
Cut the BATT cable at this point and insulate it.

(10) Pick out the new BATT cable from Breaker Addition Kit.

BATT cable

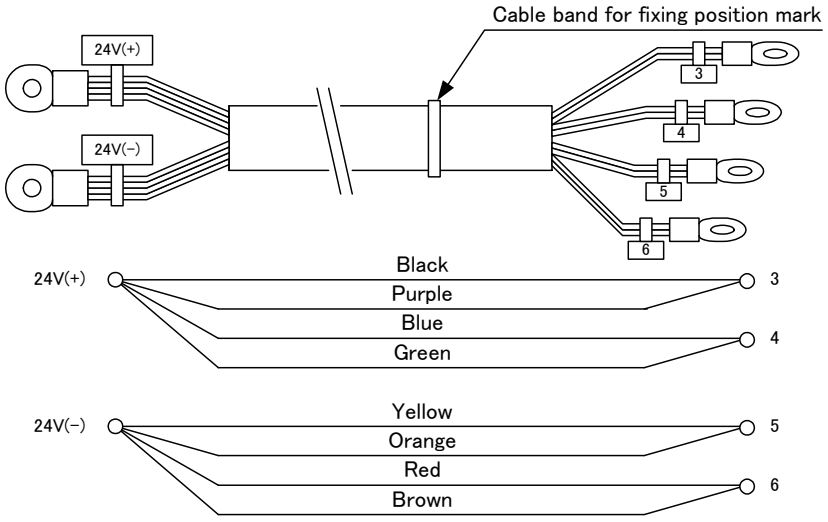


(11) Insert this BATT cable inside the rail and fix to the bracket as shown below.

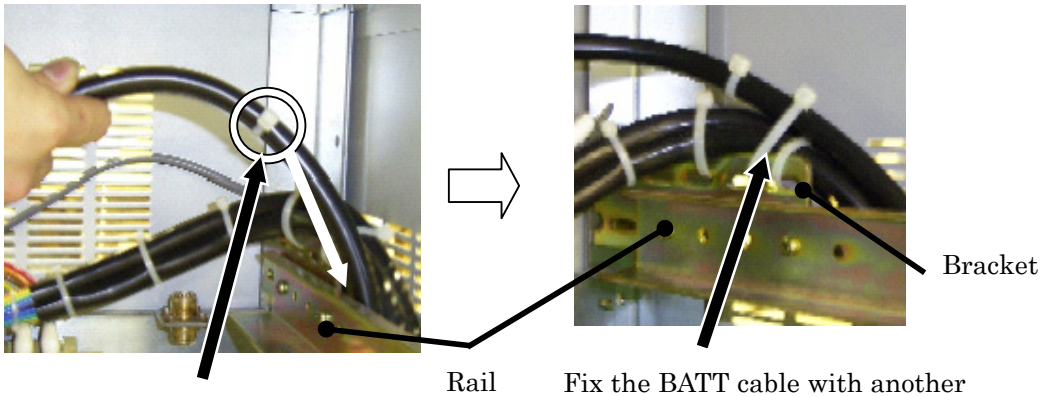


(12) Pick out the Breaker cable from Breaker Addition Kit.

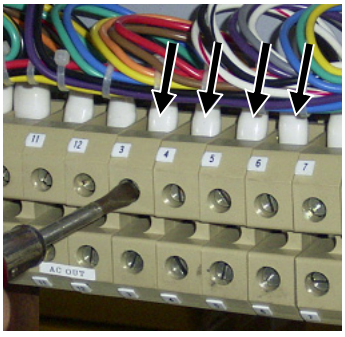
Breaker cable



(13) Insert this Breaker cable inside the rail and fix to the bracket as shown below.



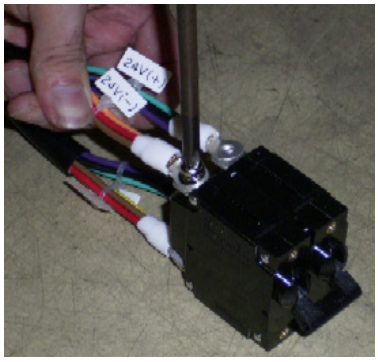
(14) Connect the Breaker cable numbered from 3 to 6 to the DC terminal respectively as follows.

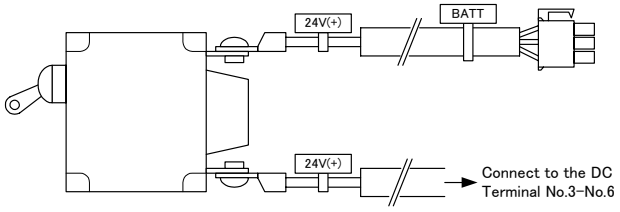


Cable No.	Terminal No.	Names
3	3	24V(+)
4	4	24V(+)
5	5	24V(-)
6	6	24V(-)

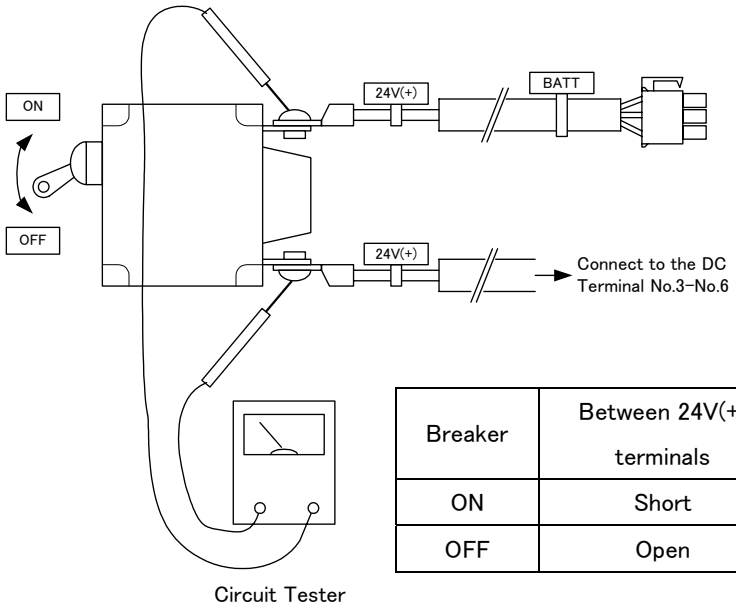
Wire to coincide with the cable number and terminal number.

(15) Connect the Breaker Cable and the BATT Cable to the Breaker with four M5X8-screws contained in the Breaker Addition Kit.





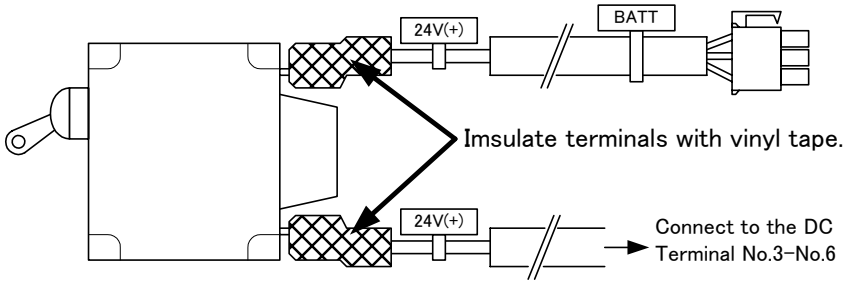
(16) Check the Breaker connection as the following table shows.



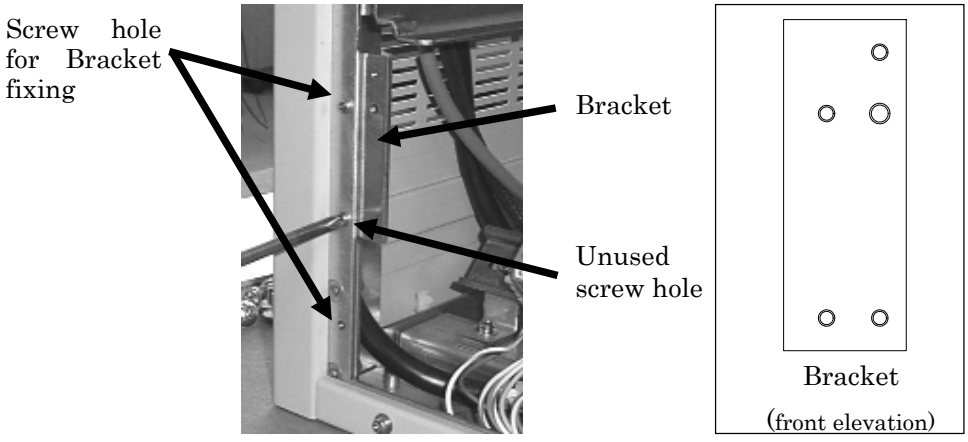
Breaker	Between 24V(+) terminals	Between 24V(–) terminals
ON	Short	Short
OFF	Open	Open

Note: Turn off the Breaker after checking.

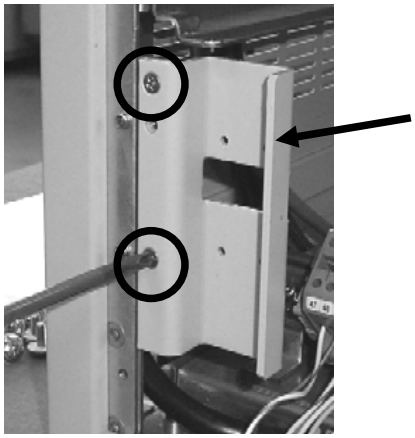
(17) Turn off the Breaker and insulate Breaker terminals with vinyl tape.



(18) Fix the Bracket two M4 X 10-screws (with SW) to the upper left of the front panel and not use screw hole (M5) as shown below.

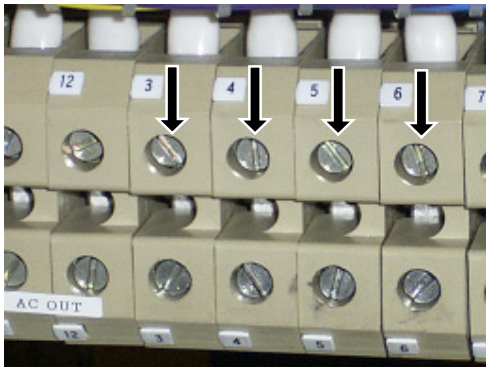


(19) Fix the the Breaker Bracket with two S4 X 10-screws to the bracket.



(20) Fix the Breaker with four M3X8-screws on the Breaker Bracket contained in the Breaker Addition Kit.

(21) Check the Open/short circuit of each DC terminal by a Circuit Tester.



Check Item	Normal Condition
No.3 and No.4	Short
No.3 and No.5	Open
No.3 and No.6	Open
No.4 and No.5	Open
No.4 and No.6	Open
No.5 and No.6	Short

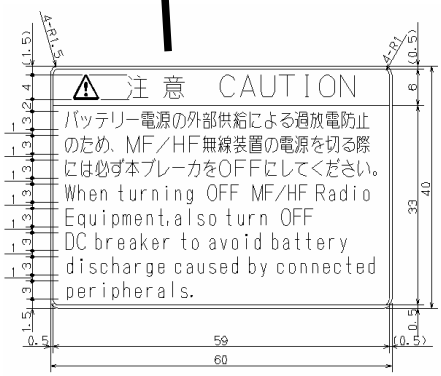
(22) Connect the cables disconnected in the (2) paragraph to the battery and confirm the

voltage outputted from the battery between No.3 and No.5 of the DC terminal.

(23) Restore the POWER AMPLIFIER to the NCU-692.

(24) Fix the new front panel contained in the Breaker Addition Kit using M5-screws removed in (3) paragraph.

(25) Complete this procedure by sticking the attached seal on the front panel of Radio Equipment.



TECHNICAL INFORMATION

FROM

NETWORK AND COMMUNICATION GROUP

Subject : Software upgrading

Equipment : JSB-196/JSB-196GM MF/HF RADIO TELEPHONE
(JSS-296/596/896)

Date : Nov 8, 2004

Issue Number : JD-1301-04

M.Takayama
Manager,
Network and Communication Group
Engineering Department
Marine Electronics Division

Priority
- ☐ A: Carry out immediately
- ☐ B: Carry out at periodical inspection
- ☒ C: Carry out upon client's request
- ☐ D: Information and news

1. Subject

Software upgrading

2. Objective Equipment

JSB-196/JSB-196GM Radio Telephone of the following Serial Number at software version 3.6 or earlier.

(JSB-196GM-R (JSB-196GM for NCH-1961/1962) is not an object)

Serial Number: BS53500-BS58107

Note: If the software of NCT-196N and NDZ-127J are following versions, upgrade them.

NCT-196N: IC2 Ver2.11 or earlier, IC204 Ver2.11 or earlier, IC402 Ver2.11 or earlier, IC407 Ver2.10 or earlier

NDZ-127J: U28 Ver2.10 or earlier

3. Outlines

Problem:

- Transmission of Mark signal may be missed if high-speed MORSE communication is performed in CW mode.
- An audio output will become small if the NOISE REDUCTION is turned ON.
- SQUELCH may remain closing on a receiving level, since the step of SQUELCH level is large.

Countermeasure:

Upgrade the software according to attached document "JSB-196/GM Upgrading procedures (JD-1301-04)". Moreover, replacement of ROM and parts on TRX UNIT (CMN-1960/CMN-1960-S) are also required. Therefore get the following Modification kit from the SERVICE GROUP (PARTS TEAM) of MARINE SERVICE DEPARTMENT and replace them.

Modification Kit	(JRC code: 7DEJD0319)		
Contents:	ROM	7DEJD0289C (DSP ROM Ver1.7)	1 piece
	Capacitor	ECEA1EKS4R7 (4.7uF, 25V)	1 piece
	Resistor	ERJ6GEYJ224V (220k ohm (2012 chip))	1 piece

4. Attached document

JSB-196/JSB-196GM Upgrading Procedures (JD-1301-04)

JSB-196/JSB-196GM Upgrading Procedures (JD-1301-04)

Nov 5, 2004

1. Preparation

1.1 Checking of JSB-196/JSB-196GM, NCT-196N, and NDZ-127J software versions.

Check the software versions according to attached document 1 “Checking of JSB-196 /JSB-196GM, JSS-296/596/896 software versions”. If software versions are the following versions, upgrade software according to this procedures.

JSB-196/JSB-196GM:	TRX Ver3.6 or earlier, DSP Ver1.7 or earlier
NCT-196N:	IC2 Ver2.12 or earlier, IC204 Ver2.11 or earlier,
	IC402 Ver2.11 or earlier, IC407 Ver2.10 or earlier
NDZ-127J:	U28 Ver2.10 or earlier

1.2 Item for upgrading

1.2.1 Program files

(1) Download the following file from the Homepage of the MARINE SERVICE DEPARTMENT.

JSB-196/JSB-196GM, JSS-296/596/896 software: file name “JSS_041105.exe”

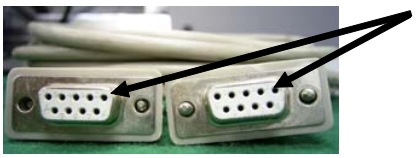
(2) Execute the downloaded file (“JSS_041105.exe”).

The following files are retrieved.

JSB-196/JSB-196GM:	TRX	Ver3.7	file name	”196_V372.hex”
NAH-692/695/698：			Ver3.2	file name “nah_V320.hex”
NCT-196N:	IC2	Ver2.12	file name	“nct_ic2_V212.hex”
	IC204	Ver2.11	file name	“nct_ic204_V211.hex”
	IC402	Ver2.11	file name	“nct_ic402_V211.hex”
	IC407	Ver2.10	file name	“nct_ic407_V210.hex”
NDZ-127J: U28	Ver3.01	file name	“ndz_u28_V301.bin”	
Updating program		Ver1.00	file name	“JSSflash_V100.exe”

1.2.2 In the case of JSB-196/JSB-196GM

- JSB-196/JSB-196GM TRX Software Ver3.7 file name ”196_V372.hex”
- Modification Kit (JRC code: 7DEJD0319)
- Soldering iron (for replacement of capacitor and chip resistor)
- Personal computer with RS-232C port (OS: Windows95/98/2000/XP)
- D-sub cross cable (Connector type: 9pin, female-female)



D-sub 9pin Female cross cable

1.2.3 **In the case of NCT-196N**

・ROMs for replacement

Write the files downloaded by "1.2.1 Program files" into ROMs using ROM writer.

Refer to the following about the setup of the ROM writer.

File type:	INTELLEC HEX		
ROM type (Quantity):	M27C512-12F1	(4 pieces)	
	(*) Size: 512kbit, Access time: 120nsec		
Checksum:	IC2	Ver2.12	1A07
	IC204	Ver2.11	B5D6
	IC402	Ver2.11	FDAA
	IC407	Ver2.10	55BB

1.2.4 **In the case of NDZ-127J**

・ROM for replacement

Write the file downloaded by "1.2.1 Program files" into ROM using ROM writer.

Refer to the following about the setup of the ROM writer.

File type:	DG BINARY		
ROM type (Quantity):	M27C4001-12F1	(1 piece)	
	(*) Size: 4Mbit, Access time: 120nsec		
Checksum:	U28	Ver3.01	F80F

Note: ROMs for replacement of NCT-196N and NDZ-127J can also be obtained with following code from the SERVICE GROUP (PARTS TEAM) of MARINE SERVICE DEPARTMENT.

Service pack of ROMs for replacement: 7DEJD0318

2. JSB-196/GM software upgrading

2.1 Checking of user channel data

In the software of JSB-196/JSB-196GM, Ver3.0 or later cannot inherit the user channel had been set in Ver2.9 or earlier. Therefore, when upgrading from Ver2.9 or earlier to Ver3.7, be sure to record the data of user channels before upgrading and re-input these channels after upgrading.

Note1: Refer to attached document 2 (1) "Checking of JSB-196/JSB-196GM channel data" about the channel recording method.

Note2: Refer to attached document 2 (2) "Setting of JSB-196/JSB-196GM user channel" about the channel inputting method.

2.2 Upgrading of TRX software

Upgrade the JSB-196/JSB-196GM software according to attached document 3 “JSB-196/JSB-196GM TRX Software upgrading procedures”

2.3 Upgrading of DSP software

Upgrade the DSP software according to attached document 4 “JSB-196/GM DSP ROM replacement procedures”. Replace the parts (C852, R442) according to attached document 5 “JSB-196/GM TRX UNIT Modification procedures”.

3. NCT-196N upgrading

Update the NCT-196N software according to attached document 6 “NCT-196N (MODEM) ROMs replacement procedures”

4. NDZ-127J upgrading

Update the NCT-196N software according to attached document 7 “NDZ-127J (DTE) ROM replacement procedures”

5. Filling in the Upgrade Recode

Fill in the required matter in attached document 8 “JSB-196/JSB-196GM, JSS-296/596/896 Software Upgrade Record”, and return it to the following address.

Marine Service Department
E-mail: tmsc@m1.jrc.co.jp
Fax: +81 3 3779 1420

Note: Input a "TRP: " into the head of the subject name of an e-mail.

Attached documents:

Attached documents 1:	Checking of JSB-196/JSB-196GM, JSS-296/596/896 software versions
Attached documents 2 (1):	Checking of JSB-196/JSB-196GM channel data
Attached documents 2 (2):	Setting of JSB-196/JSB-196GM user channel
Attached documents 3:	JSB-196/JSB-196GM TRX Software upgrading procedures
Attached documents 4:	JSB-196/JSB-196GM DSP ROM replacement procedures
Attached documents 5:	JSB-196/JSB-196GM TRX UNIT Modification procedures
Attached documents 6:	NCT-196N (MODEM) ROMs replacement procedures
Attached documents 7:	NDZ-127J (DTE) ROM replacement procedures
Attached documents 8:	JSB-196/JSB-196GM, JSS-296/596/896 Software Upgrade Record

Checking of JSB-196/JSB-196GM, JSS-296/596/896 Software versions

Oct 15, 2004

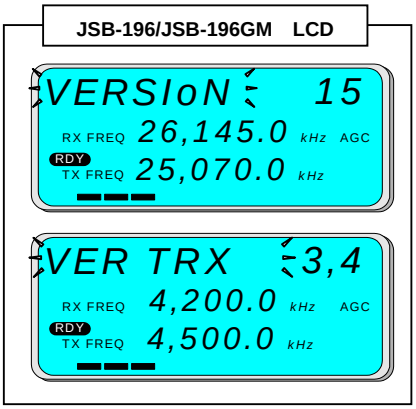
JSB-196/JSB-196GM, NAH-692/695/698, NFC-196/296/896

(1) Press POWER of JSB-196/JSB-196GM.

(2) Press MENU, 1, 5 and ENT to select the VERSION menu.

(3) TRX (JSB-196/JSB-196GM) software version will be displayed on the LCD, by turning the dial, e.g. the software version of DSP (DSP of JSB-196/JSB-196GM), ATU (NFC -196/296/896 Antenna Tuner), and PA (NAH-692/695/698 Power Amplifier).

JSB-196/JSB-196GM LCD



NCT-196N

The software versions of DSC MAIN (IC2) and DSC SUB (IC204) are displayed for several seconds on the LCD after turning on the POWER switch. The software version of NBDP MAIN (IC402) can be checked on NDZ-127J. The software version of NBDP SUB (IC407) is as follows depending on the versions of NBDP MAIN (IC402).

NBDP MAIN (IC402): Ver2.01→NDBP SUB (IC407): Ver2.00

NBDP MAIN (IC402): Ver2.11→NDBP SUB (IC407): Ver2.10

NCT-196N LCD

```
JRC NCT-196N MF/HF DSC TERMINAL
 Software version MAIN: 2.12  SUB: 2.11
  Navigation:  NMEA0183
  Transceiver: JSB-196GM
```

NDZ-127J

(1) Turn ON the AC switch of NAH-692/695/698 and turn on the POWER switch of NCT-196N.

(2) Set to the TLX mode by pressing the ENT key of the keyboard.

(3) Select the “Help” menu by cursor key and press the ENT key.

(4) Select the “About” in the help menu by cursor and press the ENT key.

(5) The software versions of NDZ-127J (U28) and NCT-196N NBDP MAIN (IC402) will be displayed on the screen of NZD-127J.

NDZ-127J LCD

```
JSS-296/596/896 SHIP RADIO STATION

NDZ-127J DTE [Ver 2.11]
Copyright (c) 2002
by
Japan Radio Co., Ltd.
Last modify: [Sep 29 2003]

NCT-196N MODEM soft Ver 2.11

>OK<
```

←Software version of NBDP MAIN (IC402)

Checking JSB-196/JSB-196GM channel data

Nov 5, 2004

In upgrading the software of JSB-196/JSB-196GM from 2.9 or earlier to Ver3.0 or later, be sure to record the data of channels in the following procedures. And after upgrading, input these channels according to the attached documents 2 (2) "Setting of JSB-196/JSB-196GM user channel".

Procedure

(1) In case of JSS-296/596/896, turn ON the AC switch of NAH-692/695/698. In case of JSB-196/JSB-196GM, turn ON the DC power supply.

(2) Press both MENU and POWER to access the level 2 menu of JSB-196/JSB-196GM.

(3) Press CH and turn the dial to select the channel group. (JSB-196/JSB-196GM has 10 groups and each group has 20 channels. “Group 1” may be changed to other name. In this case, record each group name.)

(4) Press ENT to select the group.
The first channel of the selected group will be displayed.

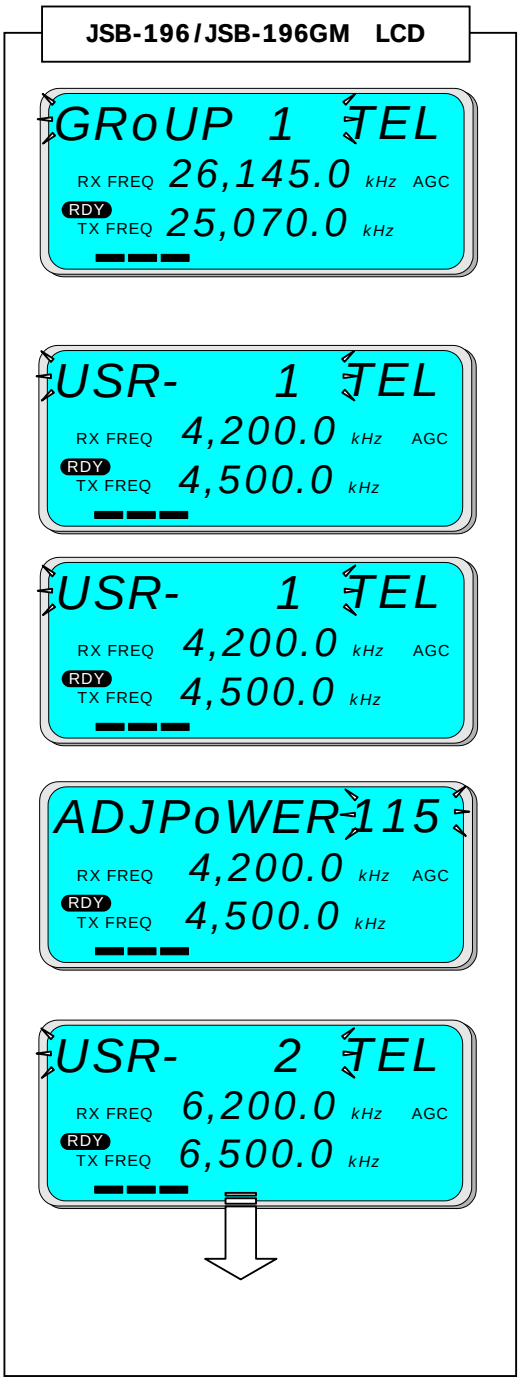
(5) Turn the dial to select the channel.
Record channel name, TX/RX frequencies and mode.

(6) Press MENU, 3, 5, ENT to select the ADJPOWER menu.
The TX power level is displayed on the right of LCD so record it.

(7) Press MENU to exit the ADJPOWER menu.

(8) Turn the dial to select the next channel.
Record the all channel data in the same procedure.

(9) In case of JSS-296/596/896, after recording the all channel data, turn off the AC switch and turn on the DC switch.
Record channel data again according to the procedure from (2) to (8).



Channel data record

Group name:

Channel number	Channel name	Mode	RX frequency	TX frequency	TX power level on AC operation	TX power level on DC operation

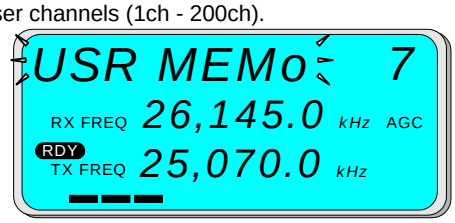
Setting of JSB-196/JSB-196GM user channel

Nov 5, 2004

Register the user channel and Group name, and adjust the channel power as follows.

1. User Channel Registration

The frequencies used frequently can be registered into the user channels (1ch - 200ch).



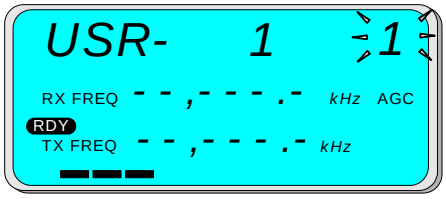
Procedure

(a) Select the MENU number 7 by the jog dial or keypad.

[MENU] [Turn the jog dial] [ENT]

or

[MENU] [7] [ENT]

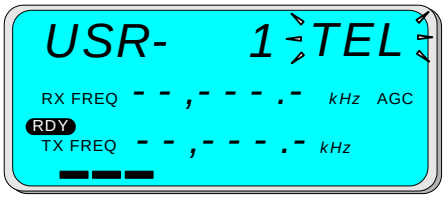


(b) Select channel number by the jog dial or keypad.

[Turn the jog dial] [ENT]

or

[Input the keypad] [ENT]



(c) Select the emission mode by the jog dial.

[Turn the jog dial] [ENT]

Note In a registered channel, if the mode is selected for "CLR", elimination of a channel can be performed.

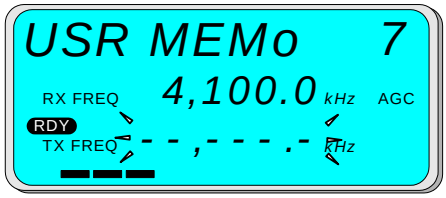
(d) Input the RX/TX frequency.

- **Simplex frequency registration**

Input RX frequency and press [ENT] twice.

(E.g. RX/TX=4100.0 kHz)

[4] [1] [0] [0] [0] [ENT] [ENT]

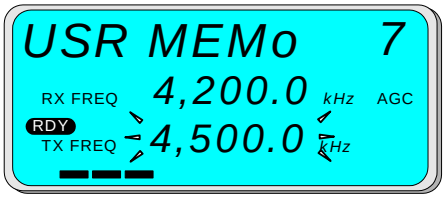


- **Semi-duplex frequency registration**

Input RX frequency and TX frequency each.

(E.g. RX=4200.0 kHz, TX=4500.0 kHz)

[4] [2] [0] [0] [0] [ENT]
[4] [5] [0] [0] [0] [ENT]

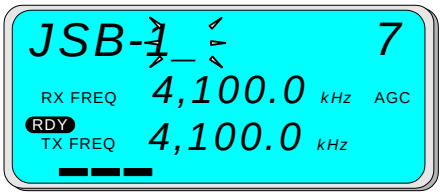


(e) Input the channel label.

"_ (Space)" blinks in the LCD.

If the channel label is not required, press the [ENT] and complete the registration.

Select an alphabet or number with the jog dial or keypad, and press [ENT] or [CLR] to set it.



After complete the registration, go to step (b) for further registration or press [CLR] to exit the registration mode.

2. Group Name Registration for User Channel

200 user channels are separated into 10 groups, 20 channels each, for scanning reception and labels are available for easy selection. Follow the steps below to register a group name.

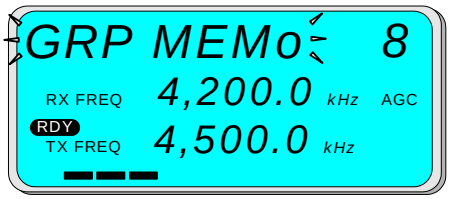
Procedure

(a) Select the MENU number 8 by the jog dial or keypad.

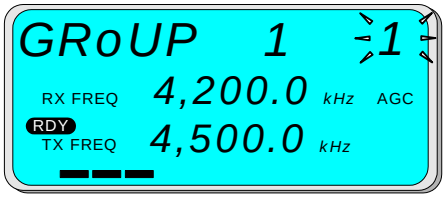
[MENU] [Turn the jog dial] [ENT]

or

[MENU] [8] [ENT]



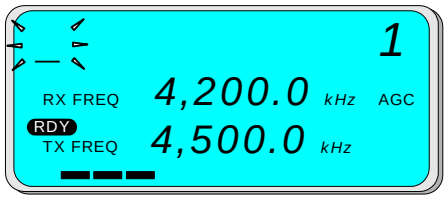
(b) Select the group number with the jog dial, and then press [ENT] .



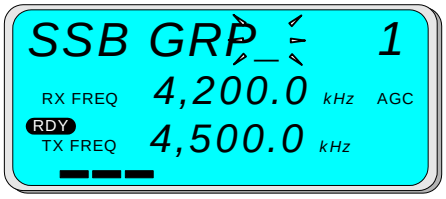
(c) Input the group name.

"_ (Space)" blinks in the LCD.

If the group label is not required, press the [ENT] and complete the registration.



Select an alphabet or number with the jog dial or keypad, and press [ENT] or [CLR] to set it.



After complete the registration, go to step (b) for further registration or press [CLR] to exit the registration mode.

3. Channel power adjustment

The transmitting power of the user channel can be adjusted.

Procedure

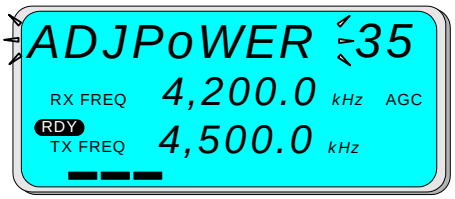
(a) Select the MENU number 28 and set the Test Tone to ON.

(b) Select the MENU number 35 by the jog dial or keypad.

[MENU] [Turn the jog dial] [ENT]

or

[MENU] [3] [5] [ENT]



(c) Press [ENT] .

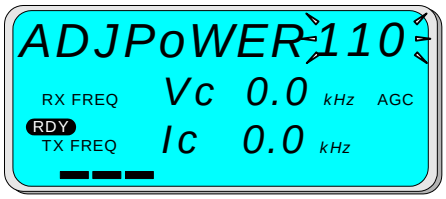
Exciter level, Vc and Ic are displayed on the LCD.

Vc, Ic: Transistor collector voltage and current (*1)

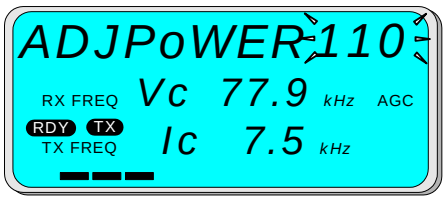
IA: Antenna current (*2)

(*1) In AC operation, NAH PA transistor's Vc and Ic are displayed. In DC operation, JSB PA transistor's Vc and Ic are displayed.

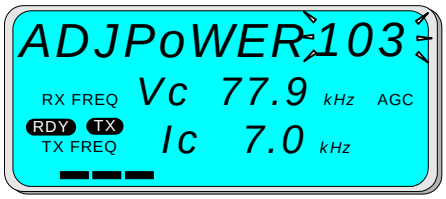
(*2) IA is displayed by pressing [CH] .



(d) Press PTT of Hand Microphone, in order to transmit.



(e) Turn the dial and adjust the Exciter level.



(f) Exit the menu.

Register the Exciter level and exit: [ENT] [MENU]

Not register and exit: [MENU]

Back to the preceding menu: [CLR]

JSB-196/JSB-196GM TRX Software upgrading procedures

Nov 5, 2004

Note: Read the "JSB-196/JSB-196GM Upgrading procedures (JD-1301-04)" carefully, before upgrading.

1. Preparation of software

Copy the JSB-196/JSB-196GM update software (ex. 196_V360.hex) and updating program (JSSflash_V100.exe) to the desktop of personal computer.

2. Turn OFF

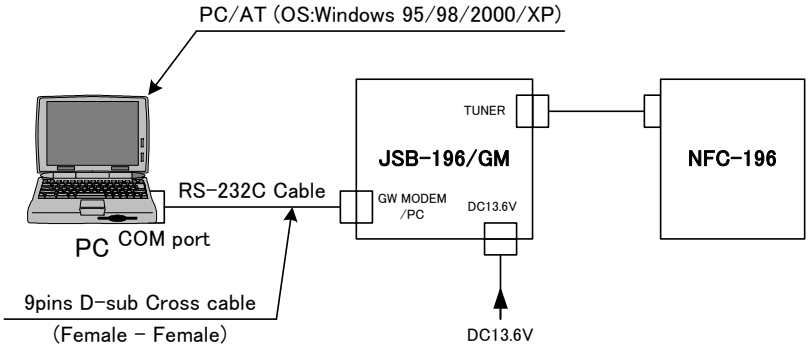
2.1 If the Radio Equipment is JSS-296/596/896, turn OFF the AC and DC switches of NAH-692/695/698.

2.2 Turn OFF the power switch of NCT-196N.

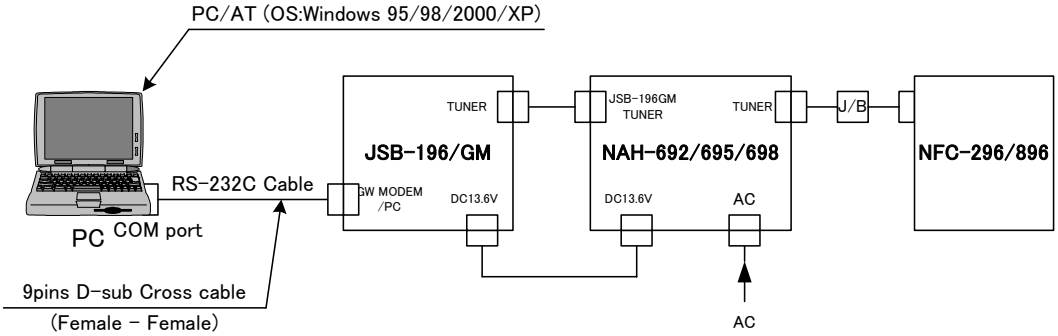
3. Connection

Connect the personal computer as follows.

JSB-196/JSB-196GM

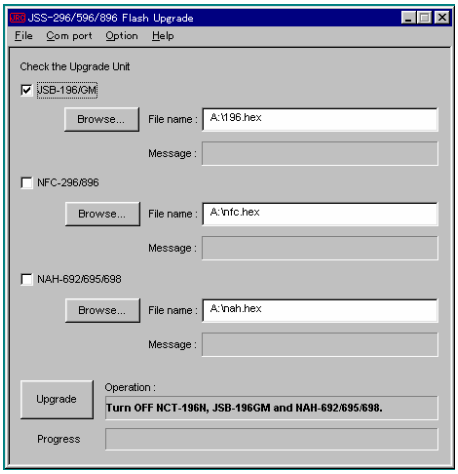


JSS-296/596/896

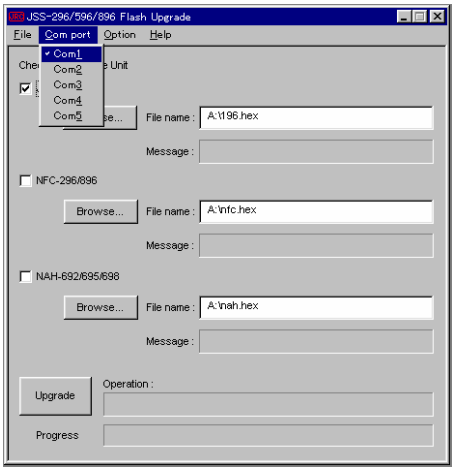


4. Executing of updating

4.1 If other applications are operating, close them. Start the updating program (JSSflash_V100.exe) on the personal computer.

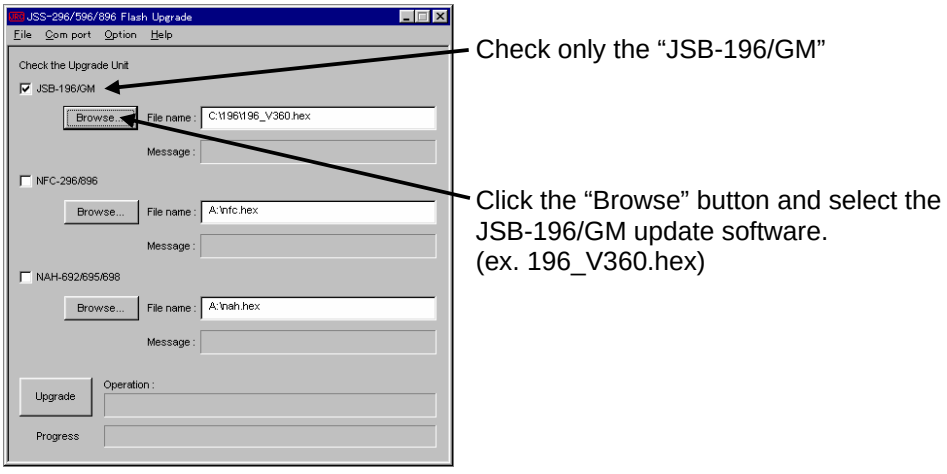


4.2 Select “Com port” menu, and select the connected Com port.



4.3 Check only the check box of JSB-196/GM.

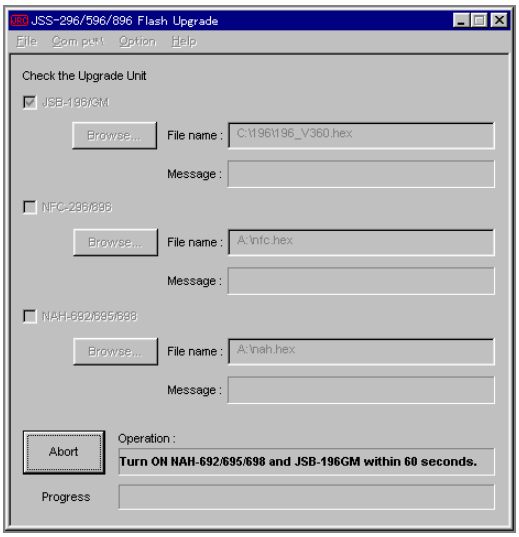
4.4 Click the “Browse” button and select the JSB-196/JSB-196GM upgrade software (ex. 196_V360.exe).



4.5 Click the “Upgrade” button.

(*) When alarm message is displayed, redo from 4.2 after checking the setting according to the message.

4.6 Confirm that the message of “Turn ON NAH-692/695/698 and JSB-196GM within 60 seconds” is displayed on the “Operation” text box.

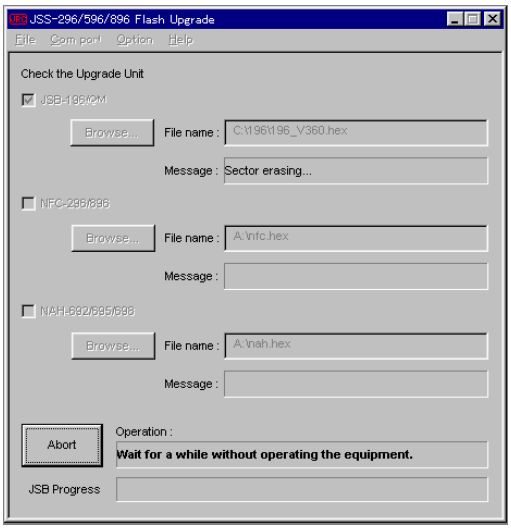


4.7 In case of JSS-296/596/896, turn on the AC and DC switches of NAH-692/695/698.

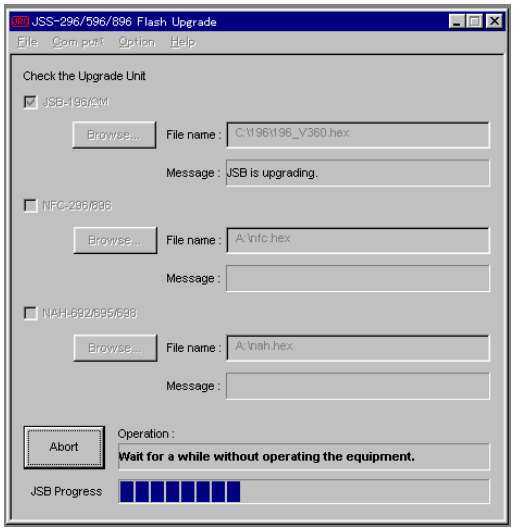
4.8 Turn on the JSB-196/JSB-196GM.

4.9 Confirm that the message of “Wait for a while without operating equipment.” is displayed on the “Operation” text box.

(*) When alarm message is displayed, redo from 4.2 after checking the setting according to the message.



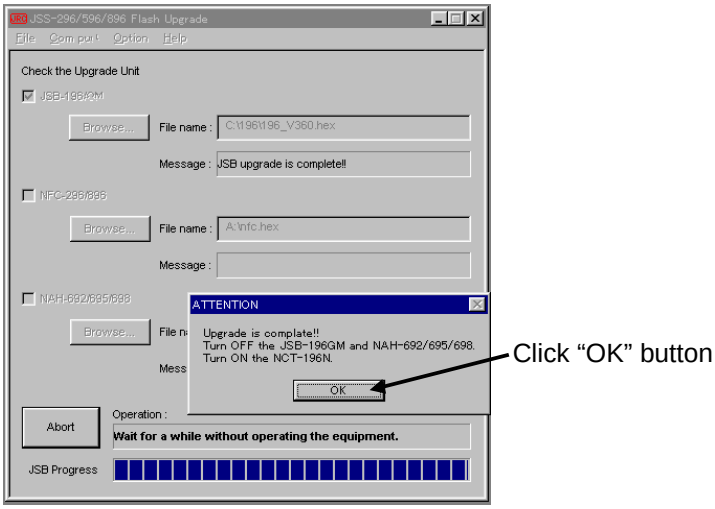
4.10 Confirm that the message of “JSB is upgrading” is displayed on the “Message” text box.



4.11 About 5 minutes later, “Upgrade is complete!!” is displayed on the message window.

(*) When alarm message is displayed, redo from 4.2 after checking the setting according to the message.

4.12 Click the “OK” button and close the updating program “JSSflash_V100.exe”.



5. Checking of software version

Select the menu 15 (VERSION) of JSB-196/JSB-196GM and check the version of TRX.

JSB-196/JSB-196GM DSP ROM Replacement procedures

Nov 5, 2004

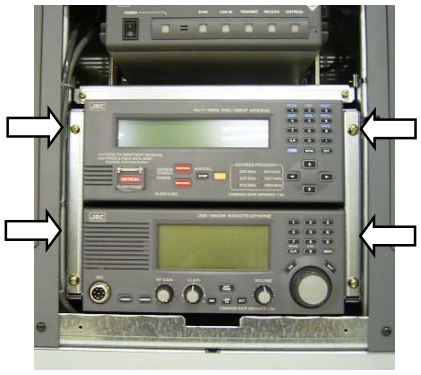
Replace the ROM as follows.

1. **If the Radio Equipment is JSS-296/596/896, turn off the “AC” and “DC” switches of NAH-692/695/698.**

2. **Remove the front panel.**

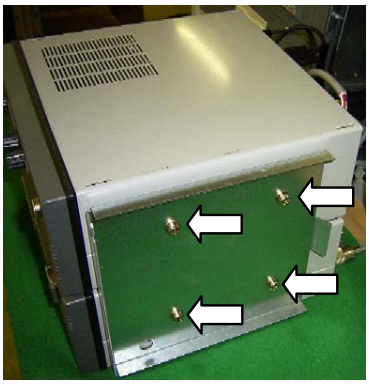
Unscrew 4 screws.

3. **Pull out the Unit.**



Unscrew 4 screws.

4. **Remove the rail board.**

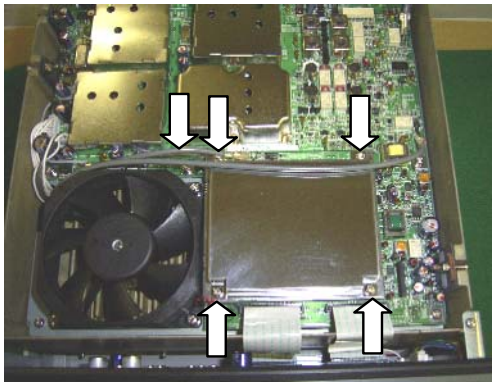


Unscrew 8 screws.

5. Remove the under cover of the JSB-196/JSB-196GM

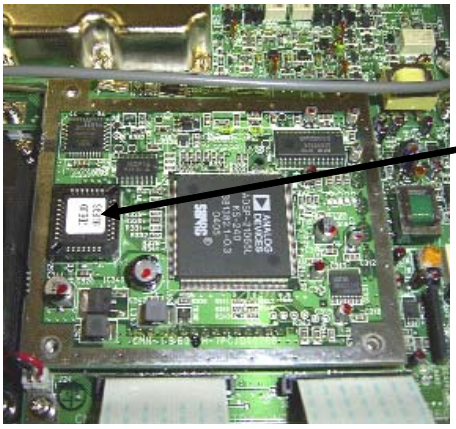
Unscrew 4 screws.

6. Remove the shield case



Unscrew 4 screws and RF cable.

7. Replace the ROM.



8. Return them in the reverse order.

9. Check the software version as follows

(1) In case of JSS-296/596/896, turn on the “AC” and “DC” switches of NAH-692 /695/698

(2) Turn on the JSB-196/JSB-196GM.

(3) Select the menu 15 (VERSION) of JSB-196/JSB-196GM and check the version of DSP.

Replacement the DSP ROM in the JSB-196/JSB-196GM is finished.

JSB-196/JSB-196GM TRX UNIT Modification procedures

Nov 5, 2004

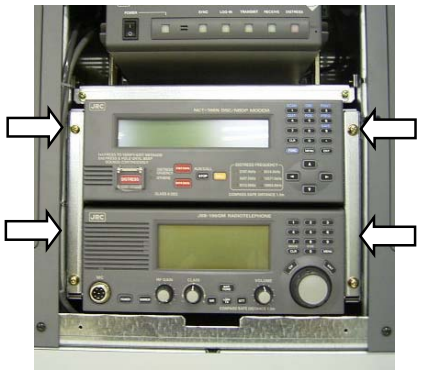
Improve the TRX UNIT CMN-1960/CMN-1960-S as follows.

1. **If the Radio Equipment is JSS-296/596/896, turn off the “AC” and “DC” switches of NAH-692/695/698.**

2. **Remove the front panel.**

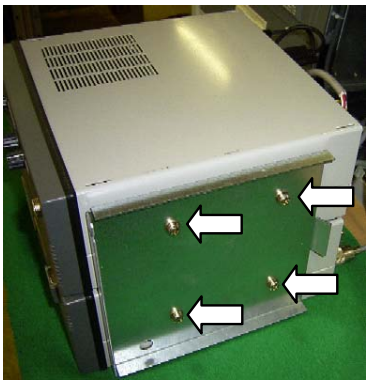
Unscrew 4 screws.

3. **Pull out the Unit.**



Unscrew 4 screws.

4. **Remove the rail board.**

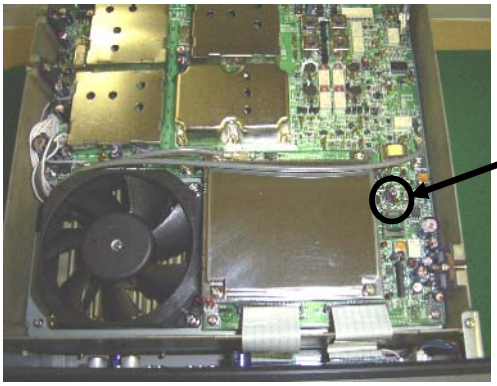


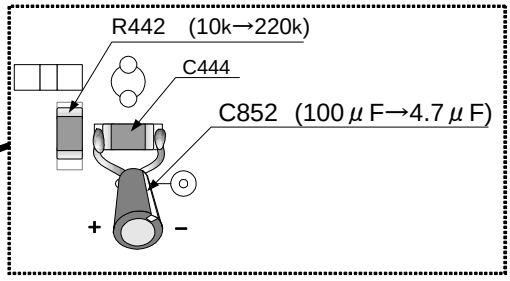
Unscrew 8 screws.

5. Remove the under cover of the JSB-196/JSB-196GM

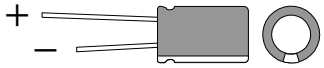
Unscrew 4 screws.

6. Replace C852, R442





Note: Be careful of the polarity of C852.
(Refer to the following figure)



7. Return them in the reverse order.

Improving the TRX UNIT of the JSB-196/JSB-196GM is finished.

NCT-196N (MODEM) ROMs Replacement procedures

Nov 5, 2004

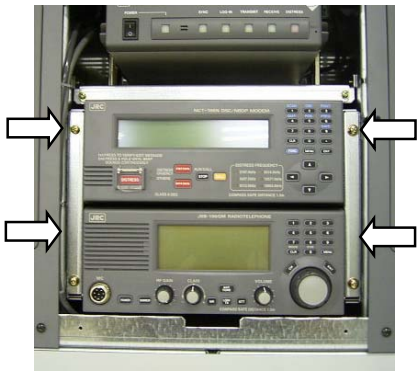
Replace the ROMs as follows.

1. **Turn OFF the “AC” and “DC” switch of NAH-692/695/698.**

2. **Remove the front panel.**

Unscrew 4 screws.

3. **Pull out the Unit.**

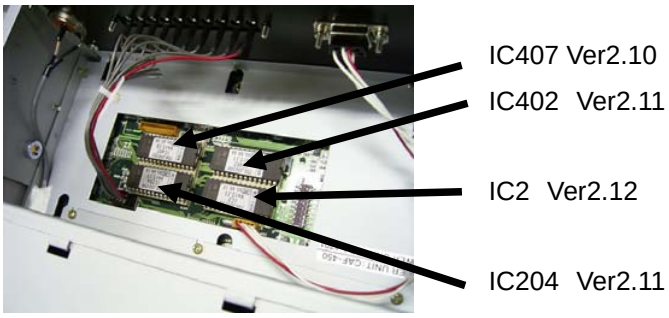


Unscrew 4 screws.

4. **Remove the upper cover of the NCT-196N.**

Unscrew 4 screws.

5. Replace the ROMs.



6. Return them in the reverse order.

Replacing the ROMs of the NCT-196N is finished.

Turn on the power of the NAH-692/695/698 and restart the NCT-196N.

NDZ-127J (DTE) ROM Replacement procedures

Nov 5, 2004

1. ROM replacement

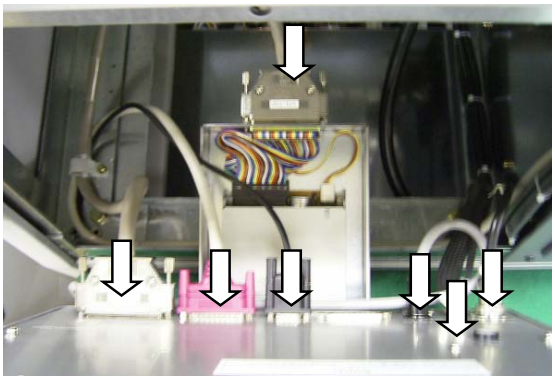
Replace the ROM as follows.

1.1 Turn OFF the “AC” and “DC” switch of the NAH-692/695/698.

1.2 Remove the front panel.

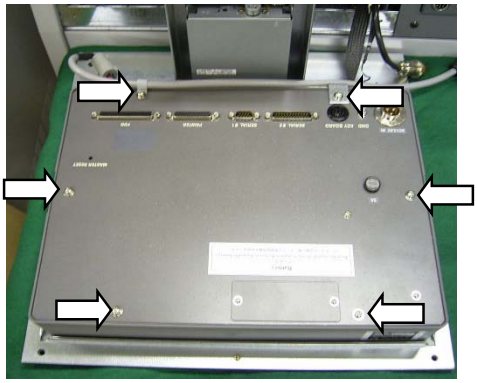
Unscrew 4 screws.

1.3 Disconnect the connectors.



Disconnect each connector and earth wires.

1.4 Remove the rear panel.



Unscrew 6 screws.

1.5 Replace the ROM.

Replace the ROM of the U28.

1.6 Return them in a reverse order.

2. Update

The NDZ-127J operates on RAM program, so update the RAM program by copying ROM program as follows.

2.1 Turn on the NDZ-127J.

Turn on the “AC” switch of the NAH-692/695/698.

2.2 To finish the program of NDZ-127J, input as follows from the keyboard.

[Alt] + [X]

(*) After the input, the mode becomes the MS-DOS, and the current drive becomes C:.

2.3 To update the program, input as follows from the keyboard.

[U], [P], [D], [A], [T], [E], then [ENT].

2.4 Finish the update.

Updating is finished.

Turn on the power of the NAH-692/695/698 and restart the NDZ-127J.

JSB-196/JSB-196GM, JSS-296/596/896 Software Upgrade Record

After software is upgraded, please fill in this sheet, and return it to the following address.

Note : Input a "TRP: " into the head of the subject name of an e-mail.

Be sure to send back the removed ROM to the COMMUNICATION GROUP, QUALTY ASSURANCE DEPARTMENT, MARINE ELECTRONICS DIVISION Via MARINE SERVICE DEPARTMENT.

MARINE SERVICE DEPARTMENT (PRODUCT SUPPORT)
Japan Radio Co., Ltd.
18-7 Oosaki-1-chome
Shinagawa-ku, Tokyo 141-0023 Japan
E-mail: tmsc@m1.jrc.co.jp
FAX +81 3 3779 1420

Name of Vessel		
Production Serial No.	JSS-296/596/896	BS
	JSB-196/JSB-196GM	BS
	NAH-692/695/698	BP
	NFC-196/296/896	BC
	NCT-196N	GA
	NDZ-127J	
Software Version	JSB-196/JSB-196GM	TRX : DSP :
	NAH-692/695/698	PA :
	NFC-196/296/896	ATU :
	NCT-196N	IC2 : IC204: IC402: IC407:
	NDZ-127J	U28 :
Service Date		
Service Port		
Service Order		
Service Agent		
Service Engineer		
Remarks		

TECHNICAL INFORMATION
FROM
NETWORK AND COMMUNICATION GROUP

Subject : Notice for FEC receiving in NBDP mode

Equipment : MF/HF Radio Equipment

Date : September 15th, 2004

Issue Number : JD-1297-04

M. Takayama
Manager,
Network and Communication Group
Marine Electronics Engineering Department
Marine Electronics Division

Priority:
- ☐ A: Carry out immediately
- ☐ B: Carry out at periodical inspection
- ☐ C: Carry out upon client's request
- ☑ D: Information and news

Subject: Notice for FEC receiving in NBDP mode

1. Objective Equipment

JSS-710/720/800/825/850/296/596/896 etc. MF/HF Radio Equipment

2. Outline

When receiving FEC broadcast in NBDP mode using MF/HF Radio Equipment, the receiving signal strength would be often changed by fading or external noise as the characteristic of MF/HF frequency band. If the signal strength would be less than the receiver sensitivity level, any garbled characters and/or "*" would appear on the display or printer output, and furthermore the equipment would stop the FEC receiving and return to stand-by mode if these symptoms occur continuously. Such as these symptoms have been well-known to telecommunication operators as usual symptoms of radio communication, but mates are taking place of them and tend to misjudge it as a malfunction of equipment these days.

3. Countermeasure

All of the MF/HF radio equipment cannot avoid such symptoms, so if reported similar symptom, explain the above-mentioned reason to customers referring the attachment. Note that this case is out of warranty, thus please don't apply compensation order for it.

4. Attachment

Notice for FEC-broadcasting reception using NBDP in MF/HF radio equipment

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JRC Japan Radio Co.,Ltd.
Mitaka Plant
5-1-1, Shimorenjaku Mitaka-shi,
Tokyo, 181-8510 Japan
Tel: +82 422 45 9538 Fax: +82 422 45 9957

To Whom It May Concern:

Notice for FEC-broadcasting reception using NBDP in MF/HF radio equipment

1. Objective Equipment

All kind of MF/HF radio models

2. Notice

The symptoms mentioned below may be occurred when receiving FEC broadcasting under noisy or fading conditions.

- DTE (or Controller) displays and printer outputs " * (asterisk) ", unpredicted and/or meaningless (garbled) characters.
- The equipment closes the link of channel and returns to stand-by mode by itself.

Please note that these symptoms are NOT malfunction of radio equipment because they are occurred by the MF/HF frequency band characteristic and the occurrence mechanism could be explained as below.

The external noise and fading often change the receiving-signal-strength and may make it impossible to receive signal at all even under linking in MF/HF frequency band. However NBDP would try to continue to detect signals, and decode noises at that time. In such a case, the occurred symptoms and the causes could be predicted as follows.

Symptoms	Causes
Both LCD and Printer output show * (asterisk).	By NBDP function to notify of receiving noises detected.
Both LCD and Printer output show unpredicted and meaningless (garbled) characters.	By decoding of noise misjudged as correct data. Note) TELEX communication certainly makes use of error detection standardized by ITU-R M625 & M476 so each character code should be consisted of both 3bits for "1" and 4bits for "0". But this error check might misjudge noises as correct data if it were detected as the correct rate accidentally.
FEC reception is stopped and equipment returns to stand-by mode.	By NBDP specification prescribed by the above-mentioned regulation so that FEC reception should be discontinued by force if detected error frequently and judged continuous reception to be hard any more.

Therefore the * (asterisk) marks and/or garbled characters, shown on the display and printer output, and the process such as returning to stand-by mode on FEC reception are symptoms caused by the unstable environment of radio wave propagation, and the equipment can be considered as normal.

3. Countermeasure against the symptom mentioned-above

Please adjust the RF GAIN volume to the maximum and/or select channel or FEC broadcast station so that NBDP could obtain the receiving level as strong as possible.

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M. Takayama,
Manager
Network and Communication Group
Engineering Department
Marine Electronics Division

JSS-296/596/896 HF/MF RADIO EQUIPMENT

SERVICE MANUAL