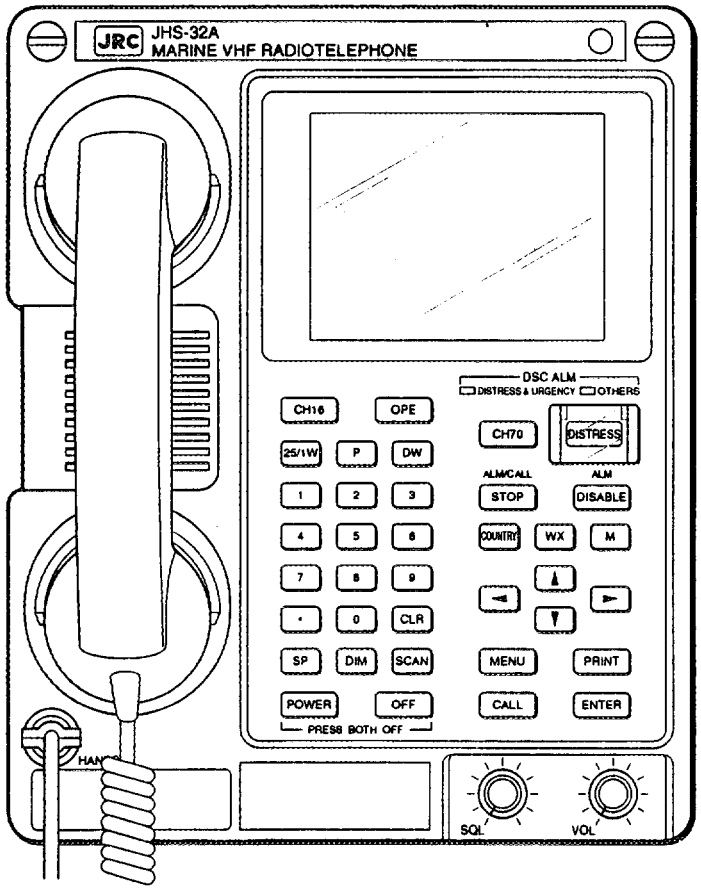
REVISED JAN. 1999

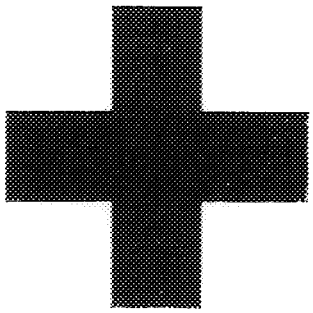
MARINE VHF RADIOTELEPHONE

JHS-32A

INSTALLATION MANUAL



JRC Japan Radio Co., Ltd.



CAUTIONS AGAINST HIGH VOLTAGE

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

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

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

Cautions concerning treatment of electrocution victims

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

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

Administration of first aid is critical in this situation.

First aid

☆ Note points for first aid

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

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

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

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

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

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

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

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

☆ If the victim has a pulse but is not breathing

("Mouth to mouth" resuscitation) Figure 1.

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

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

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

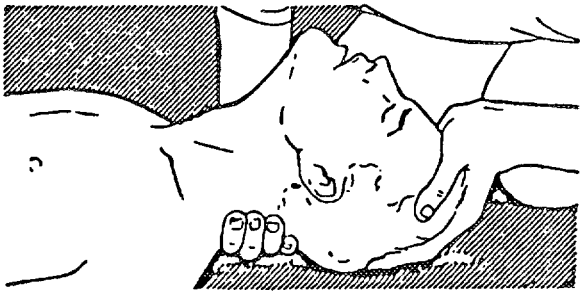
(4) Pay attention to the victim to notice if he or she starts to breath. If breathing returns, stop resuscitation.

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

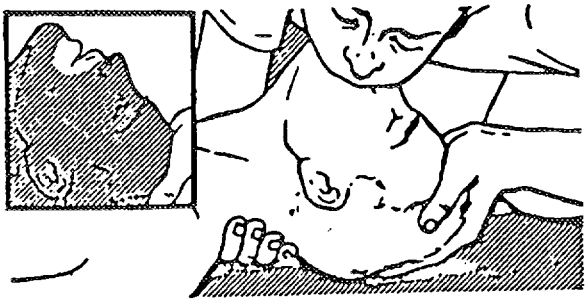
(6) Occasionally, when the victim comes back to consciousness, they immediately try to stand up. Prevent this and keep them in a laying position. Give them something warm to drink and be sure that they rest (do not give them any alcohol).

Administering artificial respiration by raising the head.

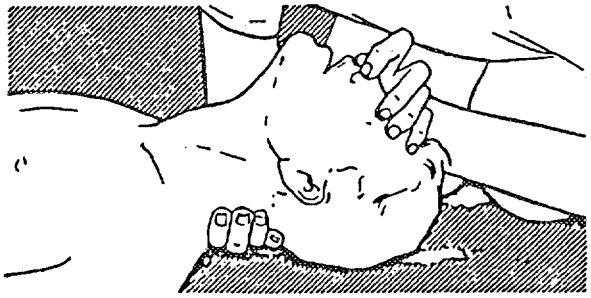
①



②



③



("Mouth to mouth " artificial respiration) Figure 1.

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

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

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

☆ If the victim has no pulse and is not breathing

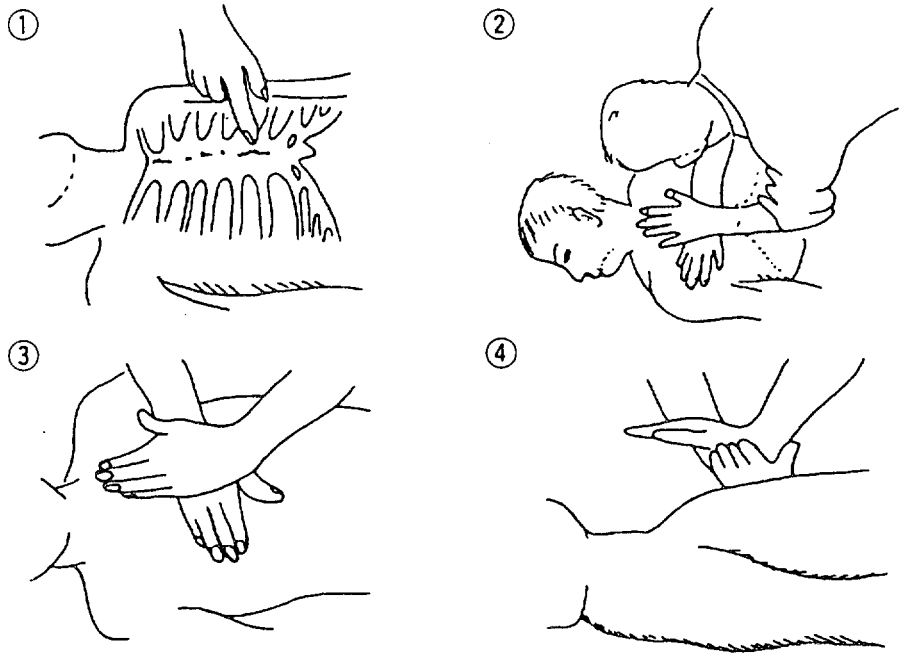
(Heart massage in combination with artificial respiration.) Figure 2

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

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

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

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



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

Before Operation

Concerning the symbols

This manual uses the following symbols to explain correct operation and to prevent injury or damage to property.
The symbols and descriptions are as follows. Understand them before proceeding with this manual.

⚠WARNING	Indicates a warning that, if ignored, may result in serious injury or even death.
⚠CAUTION	Indicates a caution that, if ignored, may result in injury or damage to property.

Examples of symbols

Electric Shock

The △ symbol indicates caution (including DANGER and WARNING). The illustration inside the △ symbol specifies the content of the caution more accurately. (This example warns of possible electrical shock.)

Disassembling prohibited

Prohibition

The ⃠ symbol indicates that performing an action is prohibited. The illustration inside the ⃠ symbol specifies the contents of the prohibited operation. (In this example disassembly is prohibited.)

Disconnect the power plug

Instruction

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

Handling Precaution

⚠WARNING

With the exception of qualified service personnel, do not attempt to service the interior of this equipment, as doing so may cause fire, electric shock or malfunction.
If internal inspection or repair is necessary, contact our service center or agents.

Do not use a voltage other than specified. Doing so may cause fire, electrical shock or malfunction.

Do not remove the protective covers on the high voltage terminals. Doing so may cause electrical shock.

If a distress call is received, make sure to inform the ship's captain or officer in charge.This affects life of the crew and passengers on the ship in distress.

⚠CAUTION

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

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

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

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

Do not insert anything flammable into the cable guide. Doing so may cause fire, electric shock or unit malfunction.

⚠CAUTION

Do not get this equipment wet or spill any liquids on or near this equipment. Doing so may cause electrical shock or malfunction.

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

To operate this unit, an ID number must be assigned to your ship. If one has not yet been assigned, contact our agent or service center.
To check if it is registered or not, see "4.3.19 Reviewing System Setup" in the Instruction Manual.

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

If a false distress call is transmitted accidentally, follow the instructions below:

1) Press (STOP) to terminate transmission of the distress call.

2) Report the false distress call to a nearby RCC (Rescue Co-ordinate Center).

In Japan:
Maritime Safety Agency, Guard and Rescue Department, Information Control Section (Tel: 03-3591-9000, International telex: 222-5193 JMSAHQ-J)
Or to the nearest Maritime Safety Department

Information to be reported:
The date/time, location, and reason why the false call was transmitted. Also report the name, type, nationality, ID number of the ship, as well as the unit model name and manufacture number/date when possible.

3) Report the false distress call to all nearby ships using CH16.

CONTENTS

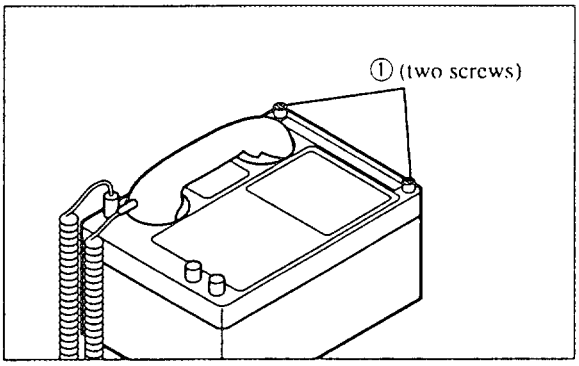
Chapter 1 Unit Installation

1.1 Wall Mount Type

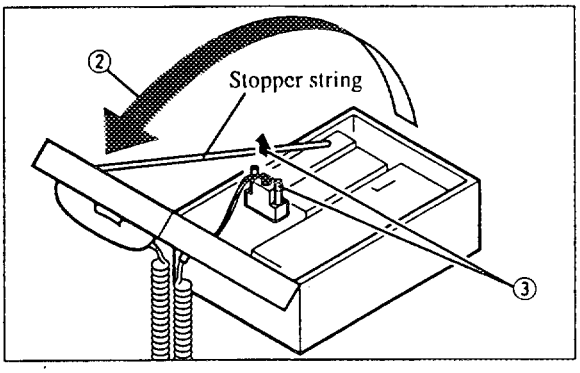
1.1.1 Main Unit (JHS-32A)

Procedure

(1) Loosen the two screws ① which secure the panel to the main body.



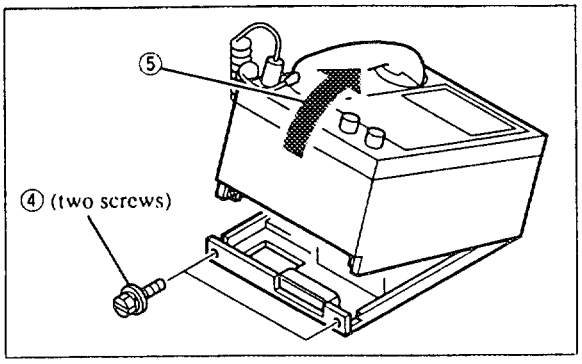
(2) Open the panel ② and remove the connector ③ inside the main body.



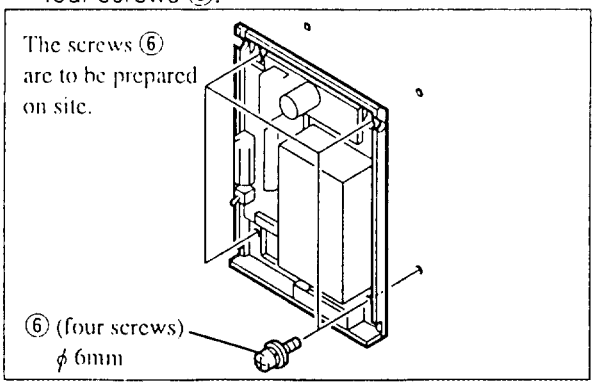
⚠ CAUTION

Do not overload the stopper string.

(3) Close the panel and separate the main body ⑤ from the terminal board by unscrewing the two hexagonal-head screws ④ which secure the main body to the terminal board.



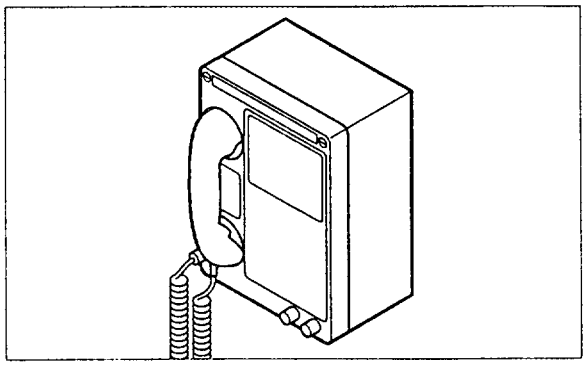
(4) Mount the terminal board on the wall using the four screws ⑥.



⚠ CAUTION

Mount the unit so that there is a space of approx. 300mm above and below the terminal board for tightening/loosening screws, connecting cables, and ventilation.
When running cables through the rear of the main unit, leave approx. 300 mm (approx.11 $^{13}/_{16}$ in.) behind the main unit.

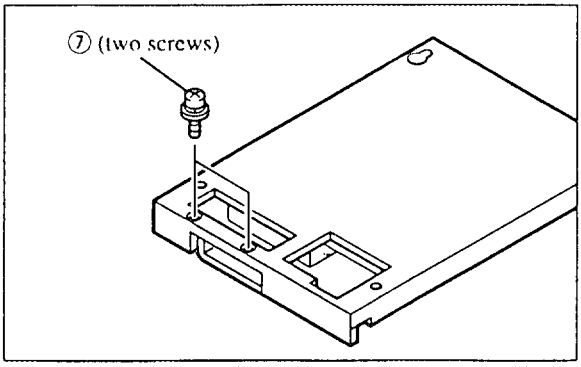
(5) After wiring, perform the reverse of steps (1)-(3) to re-assemble the main unit.



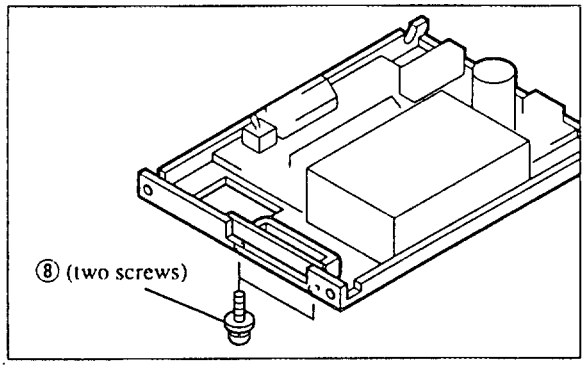
TIP: When mounting the main unit on the wall, cables can run through the cable inlet at the bottom of the main unit. However, it is also possible to run cables through the rear of the main unit.
Similarly, the direction of the connector attaching plate for both antenna and printer can be changed.
Follow the instructions below.

(A) Changing the Position of the Cable Clamp.

(a) Remove the two screws ⑦ which hold the cable clamp in place.

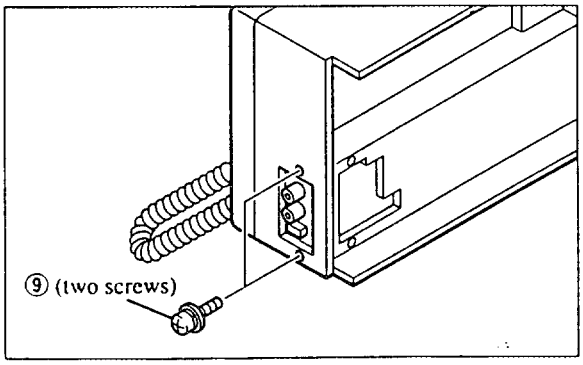


(b) Change the direction of the cable clamp as shown in the illustration, and secure it using two screws ⑧.

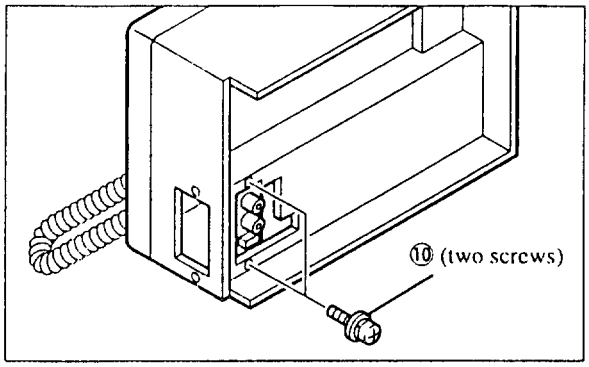


(B) Changing the Position of the Connector Attaching Plate.

(a) Remove the connector attaching plate by removing the two screws ⑨ which secure it.



(b) Change the position of the connector attaching plate on the rear of the main unit as shown in the illustration, and attach it using the two screws ⑩.



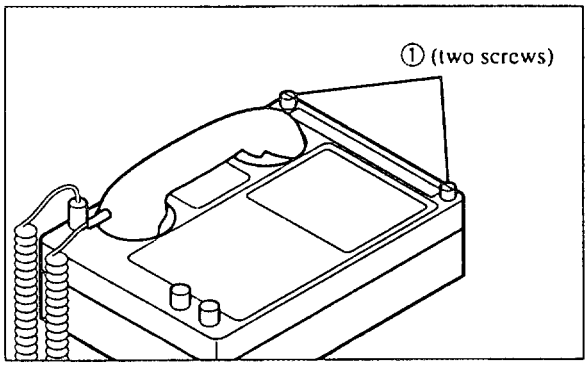
(C) Changing the Position of the Blank Panel

Cover the hole (which appears when the cable clamp or connector attaching plate is moved) using the supplied blank panel.

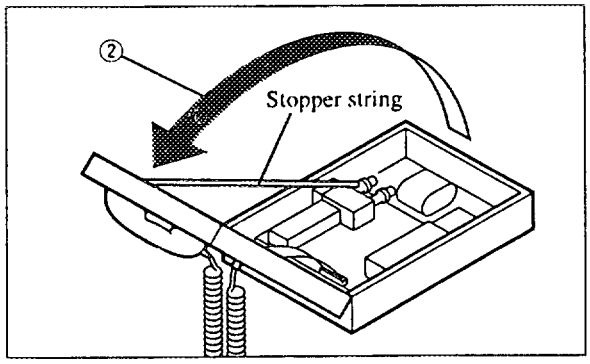
1.1.2 Remote Controller (NCH-414)

Procedure

(1) Loosen the two screws ① which secure the panel to the main body.



(2) Open the panel ②.

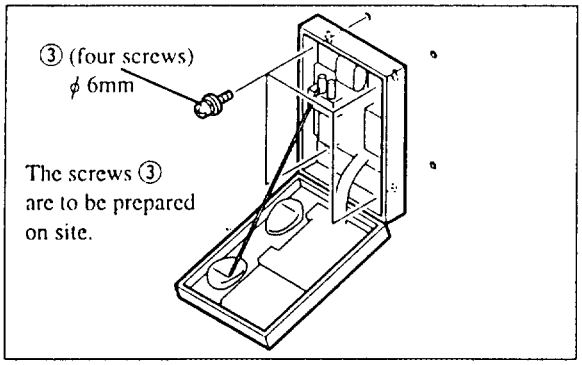


⚠ CAUTION

Do not overload the stopper string.

TIP: When changing the position of the cable clamp, refer to "1.1.1 Main Unit (JHS-32A)".

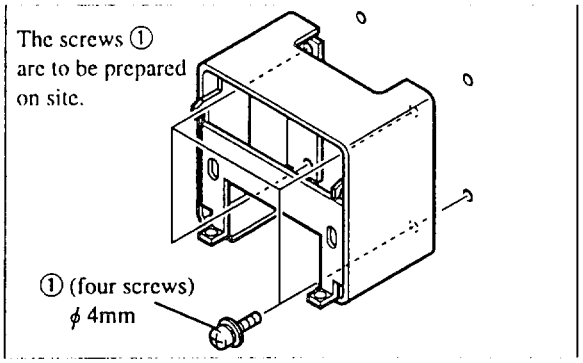
(3) Secure the main body using the four screws ③, and reattach the screws in step (1) after wiring.



1.1.3 Printer (NKG-52)

Procedure

(1) Secure the base unit to the wall using the four screws ① at the four corners.

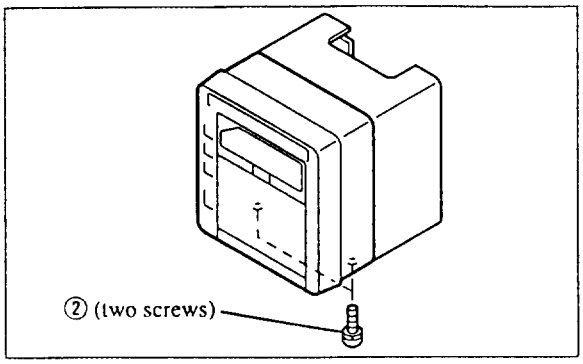


⚠ CAUTION

A space of approx. 300 mm (approx.11 $^{13}/_{16}$ in.) above and below the base unit is required for performing installation.

TIP: There are six holes on the base unit, however, securing at the four corners will be enough.

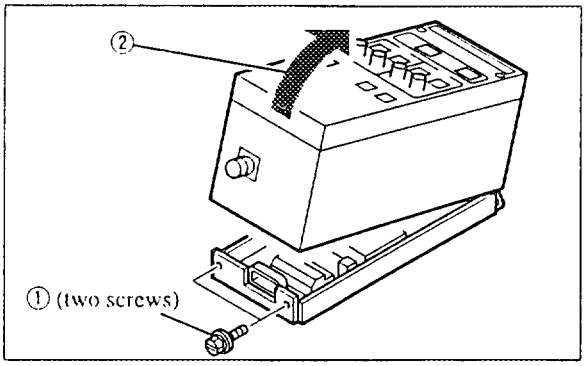
(2) Secure the printer main body to the base unit using the two screws ②.



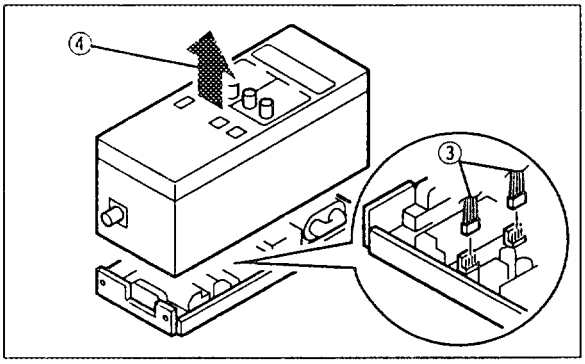
1.1.4 Guard Receiver (NRE-332)

Procedure

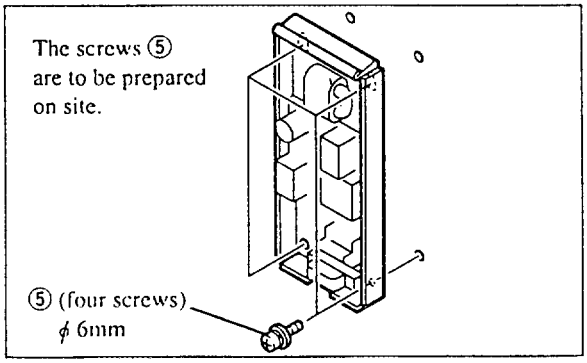
(1) After unscrewing the two hexagonal-head screws ① which secure the main body to the terminal board, open the main body ②.



(2) Remove the connectors P4 and P5 ③ and separate the main body ④ from the terminal board.



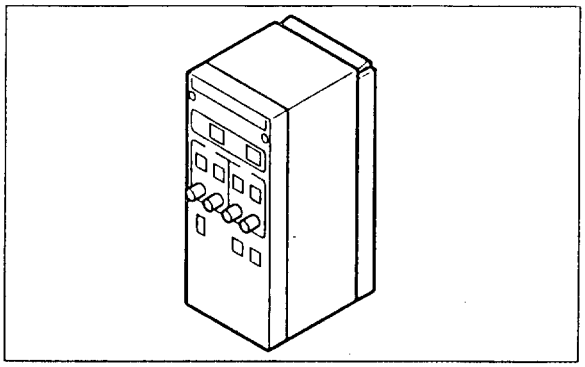
(3) Secure the terminal board to the wall using the four screws ⑤.



⚠ CAUTION

Leave a space of approx. 300 mm (approx.11 $^{13}/_{16}$ in.) above and below the terminal board for installation.

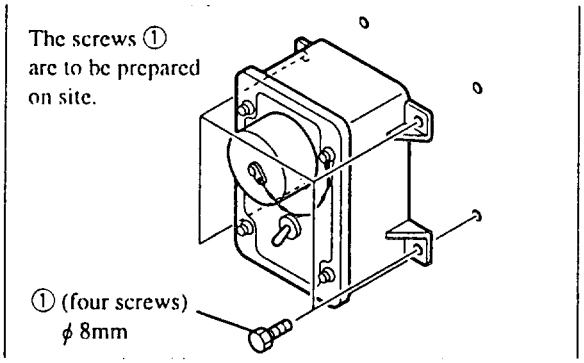
(4) Secure the main body by performing the reverse of steps (1) and (2).



1.1.5 Handset Connection Box (NQE-846)

Procedure

(1) Secure the handset connection box to the wall using the four screws ①.

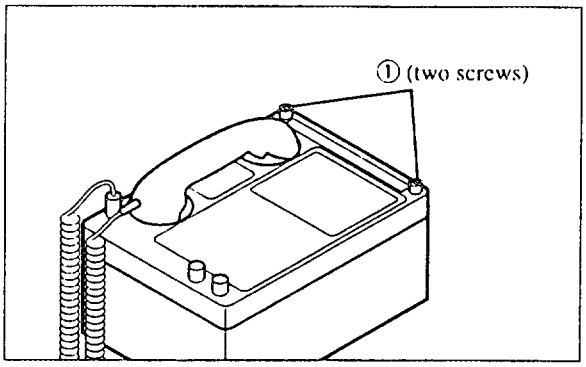


1.2 Flush Mount Type

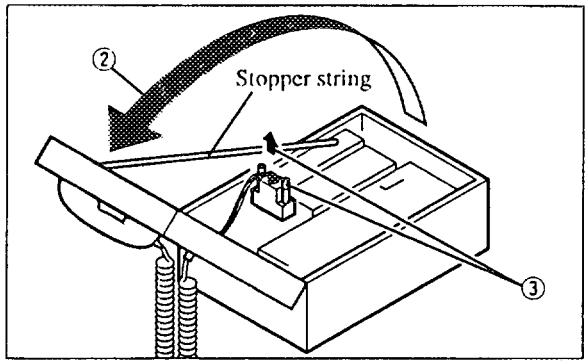
1.2.1 Main Unit (JHS-32A)

Procedure

(1) Loosen the two screws ① which secure the panel to the main body.



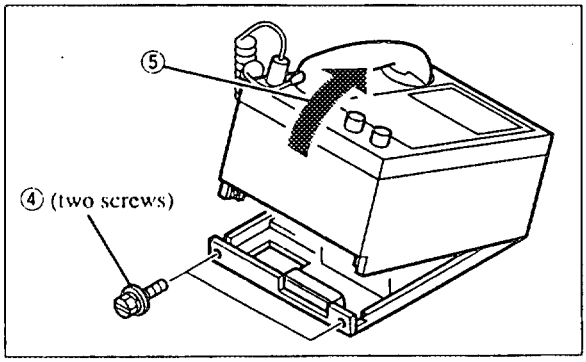
(2) Open the panel ② and remove the connector ③ inside the main body.



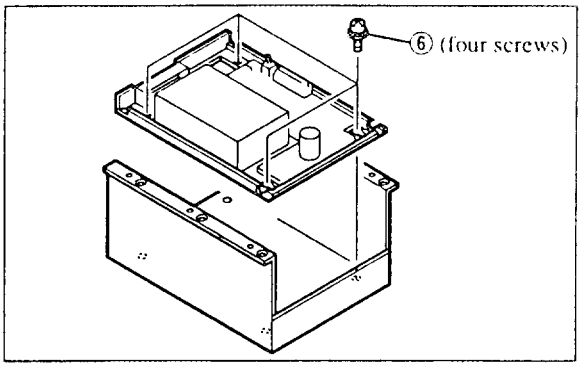
⚠ CAUTION

Do not overload the stopper string.

(3) Close the panel, unscrew the two hexagonal-head screws ④, and separate the main body ⑤ from the terminal board.

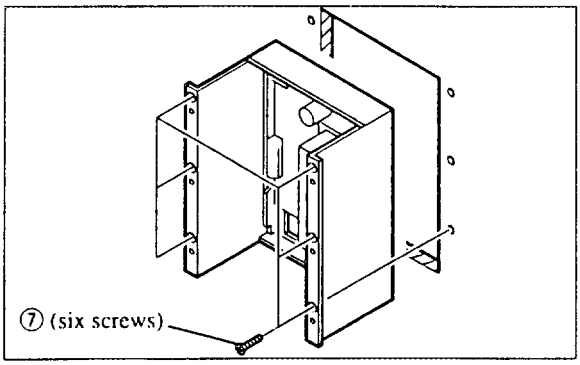


(4) Secure the terminal board to the flush mount main body using the four screws ⑥.

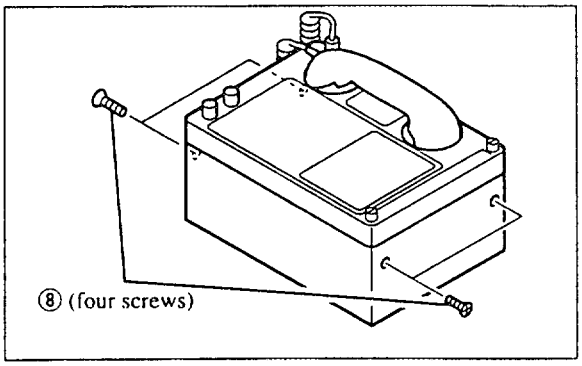


TIP: Refer to "1.1.1 Main Unit (JHS-32A)" for information about choosing where to install the unit, the cable inlet, and the connector attaching plate.

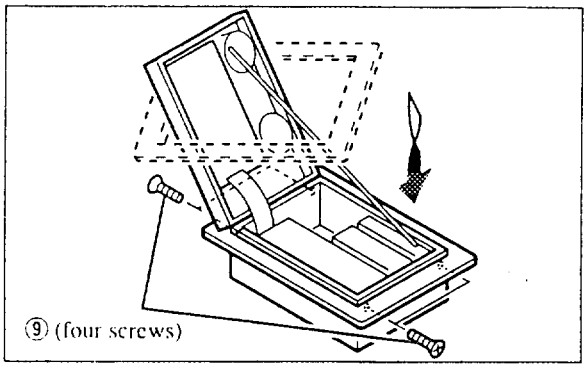
(5) Secure the flush mount main body (to which the terminal board is attached) using the six screws ⑦, and wire.



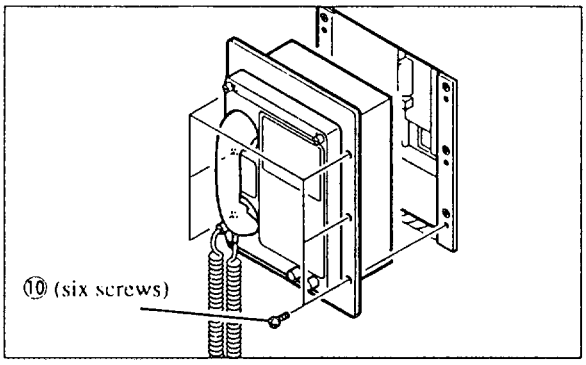
(6) Unscrew the four screws ⑧ from the main body.



(7) Open the panel and attach the flush mount frame to the main body using the four screws ⑨.



(8) Close the panel, secure the flush mount frame (to which the main body is attached) to the flush mount main body using the six screws ⑩, and secure the main body by performing steps (1) and (2) in reverse.



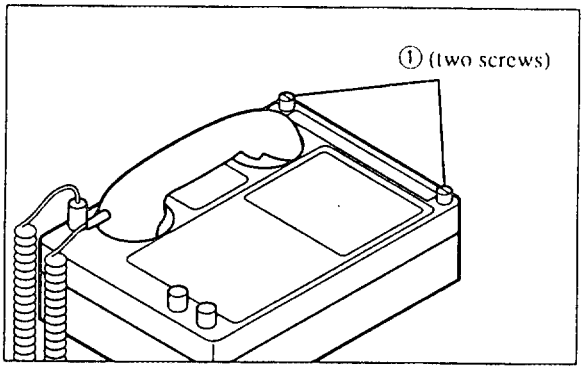
***NOTE 1:** Screws ⑥, ⑦, ⑨, and ⑩ are supplied with the flush mount fittings.*

***NOTE 2:** The supplied screws may be unusable depending on the wall material or thickness, in which case, prepare appropriate screws on site.*

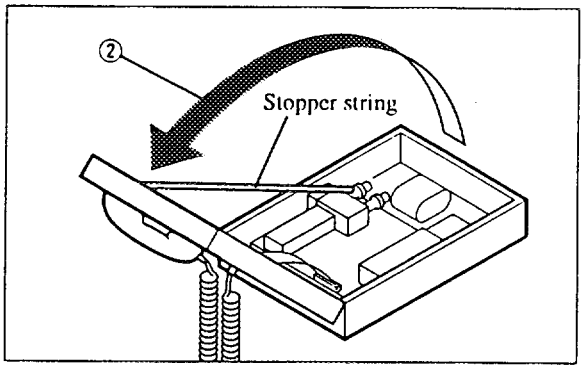
1.2.2 Remote Controller (NCH-414)

Procedure

(1) Loosen the two screws ① which secure the panel to the main body.



(2) Open the panel ②.

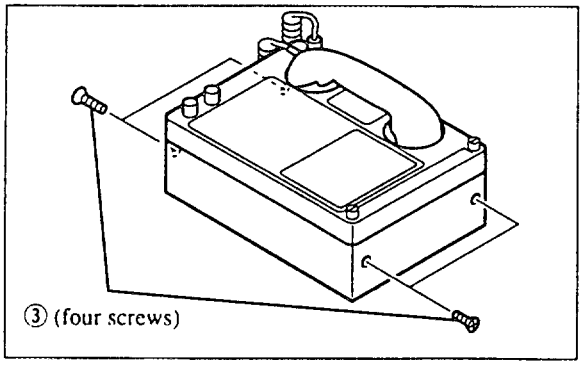


⚠ CAUTION

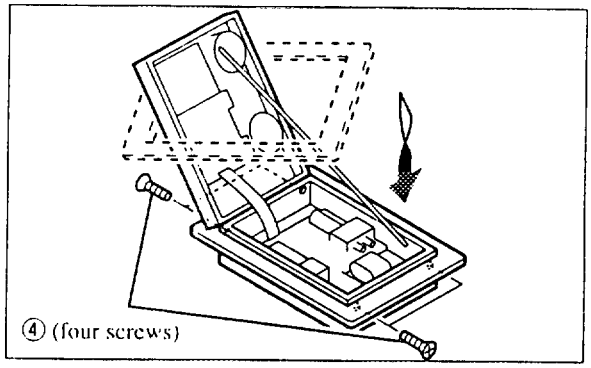
Do not overload the stopper string.

TIP: Refer to "1.1.1 Main Unit (JHS-32A)" when changing the position of the cable clamp.

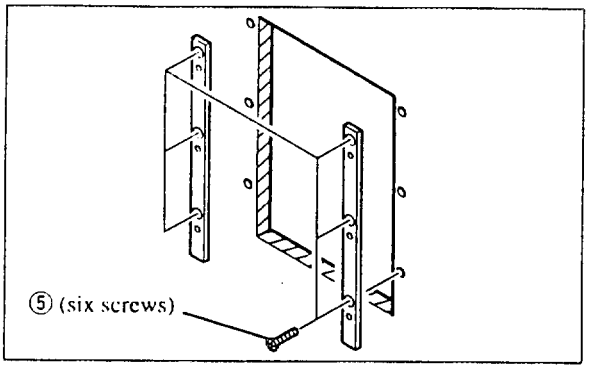
(3) Unscrew the four screws ③ from the main body.



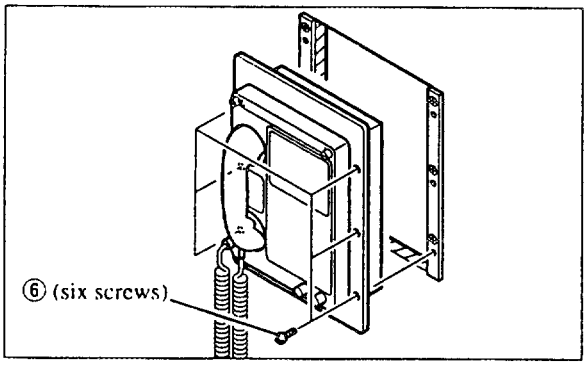
(4) Attach the flush mount frame to the main body using the four screws ④.



(5) Attach the two flush mount bars to the wall using the three screws ⑤ for each bar.



(6) Close the panel, attach the flush mount frame (to which the main body is attached) to the flush mount bars using the six screws ⑥, and perform wiring.



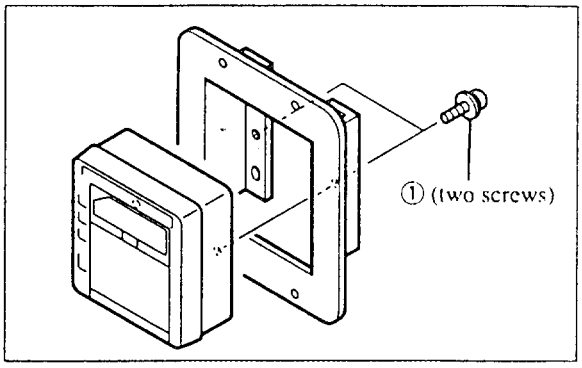
NOTE 1: Screws ④, ⑤, and ⑥ are supplied with the flush mount fittings.

NOTE 2: The supplied screws may be unusable depending on the wall material or thickness, in which case, prepare appropriate screws on site.

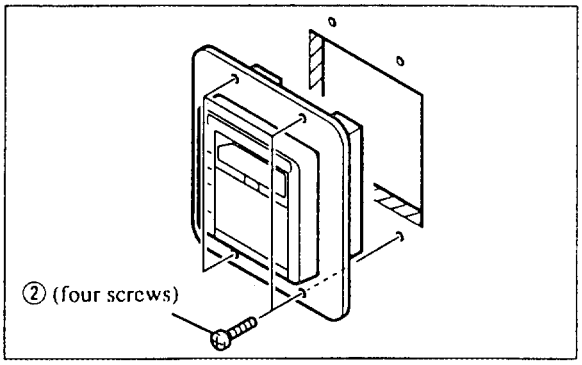
1.2.3 Printer (NKG-52)

Procedure

(1) Attach the main body to the flush mount panel using the two screws ①.



(2) Attach the flush mount panel to the wall using the four screws ②.



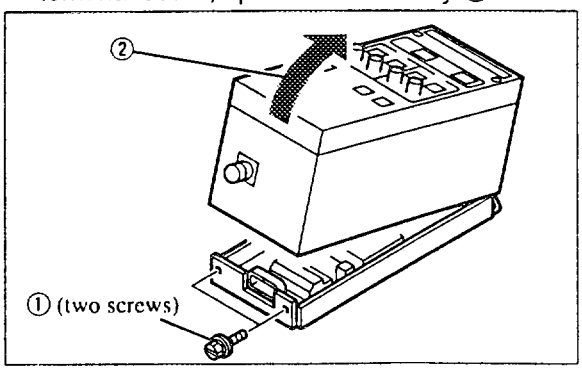
NOTE 1: Screws ① and ② are supplied with the flush mount panel.

NOTE 2: The supplied screws may be unusable depending on the wall material or thickness, in which case, prepare appropriate screws on site.

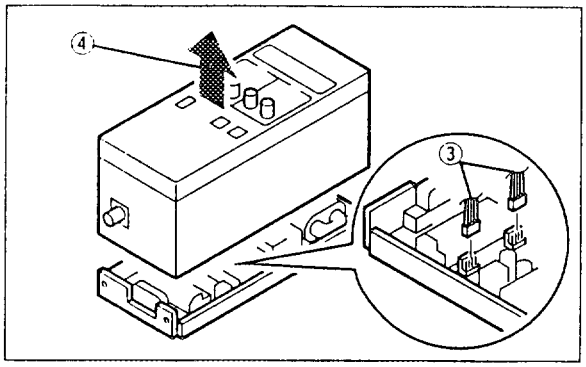
1.2.4 Guard Receiver (NRE-332)

Procedure

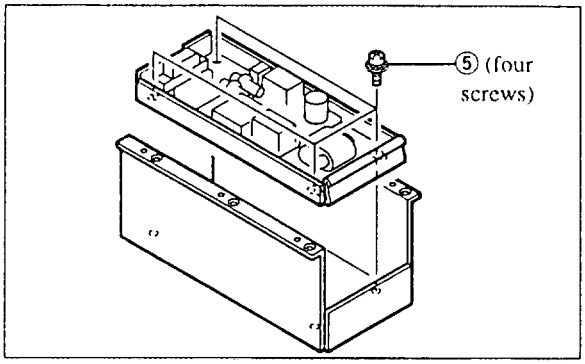
(1) After unscrewing the two hexagonal-head screws ① which secure the main body to the terminal board, open the main body ②.



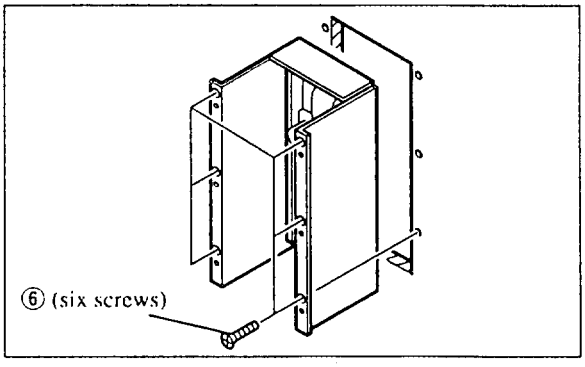
(2) Remove the connectors P4 and P5 ③ and separate the main body ④ from the terminal board.



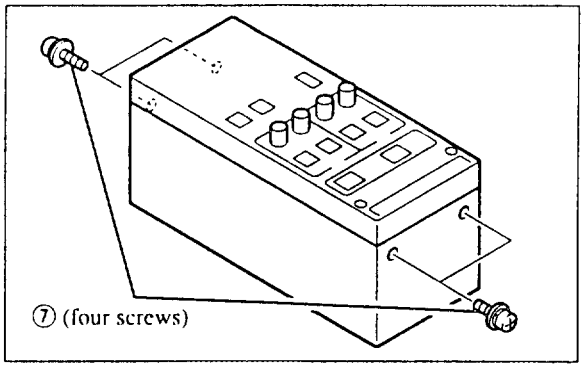
(3) Attach the terminal board to the flush mount main body using the four screws ⑤.



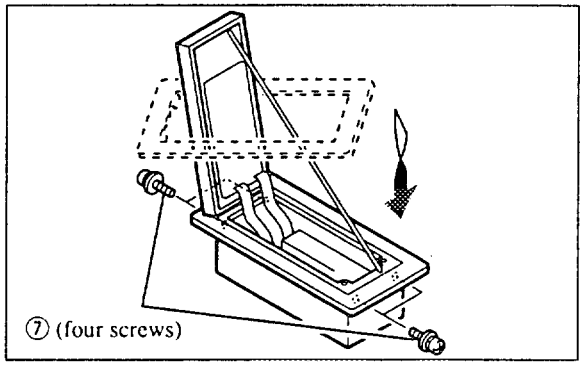
(4) Attach the flush mount main body (to which the terminal board is attached) to the wall using the six screws ⑥ and perform wiring.



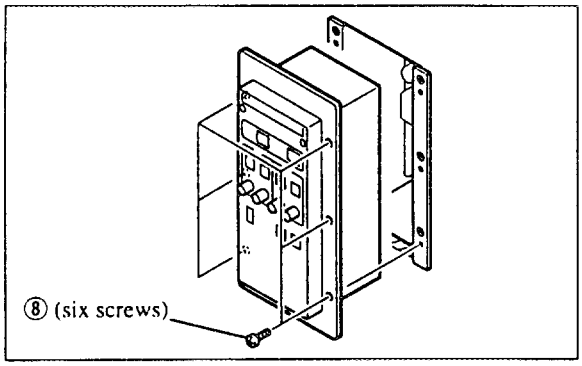
(5) Unscrew the four screws ⑦.



(6) Open the panel and attach the flush mount frame using the four screws ⑦.



(7) Close the panel and attach the flush mount frame (to which the main body is attached) to the wall using the six screws ⑧.



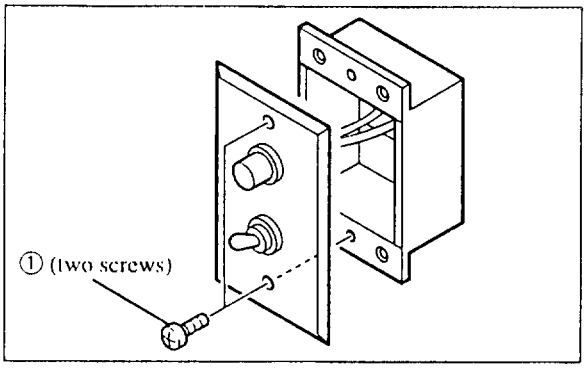
NOTE 1: Screws ⑤, ⑥, and ⑧ are supplied with the flush mount fittings.

NOTE 2: The supplied screws may be unusable depending on the wall material or thickness, in which case, prepare appropriate screws on site.

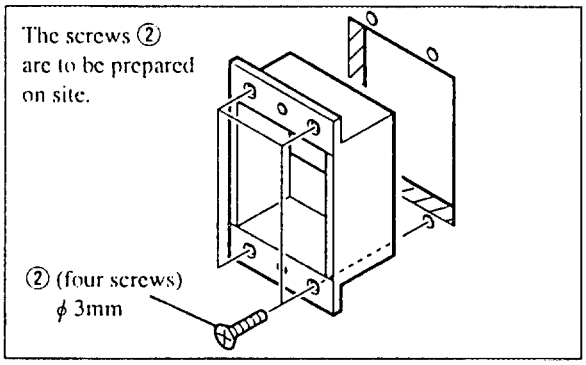
1.2.5 Handset Connection Box (NQE-847)

Procedure

(1) Unscrew the two screws ① which secure the panel to the main body and separate the panel from the main body.

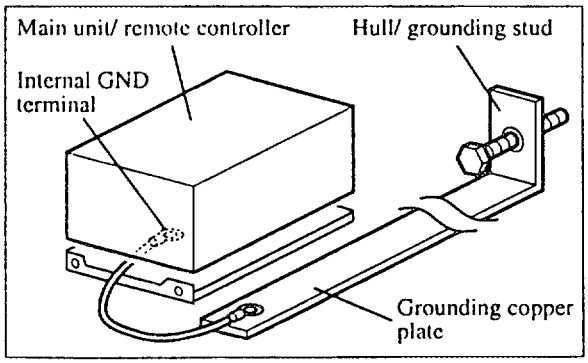


(2) Attach the main body to the wall using four screws ② and wire.



1.3 Unit Grounding

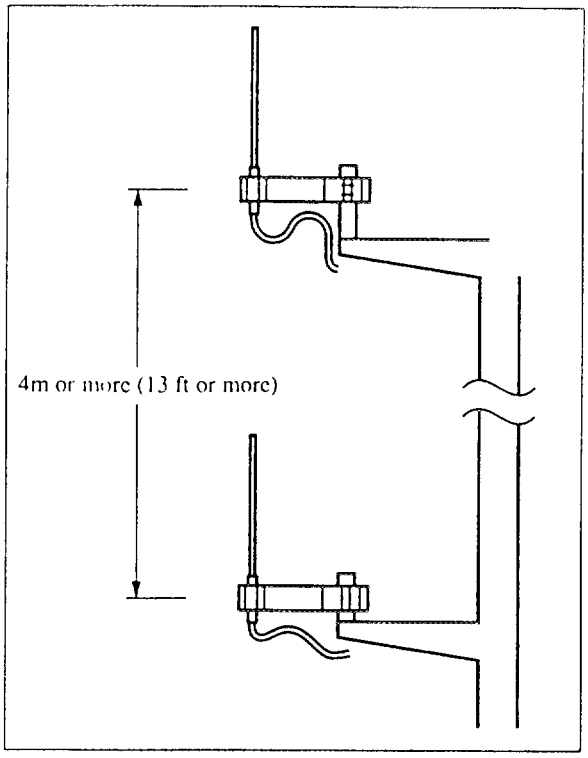
Ground the main unit and remote controllers using the wire 1.25-2.0 mm² (approx. $^{1}/_{16}$ in²).
If interference from MF/HF band transmitters is expected, ground them to the ship's body or transmitter using the copper plate 20-50 mm ($^{13}/_{16}$-1 $^{15}/_{16}$ in.) wide and 0.1-1.0 mm ($^{1}/_{160}$-$^{1}/_{16}$ in.) thick.



Chapter 2 Antenna Installation

2.1 Selecting Antenna Installation Position

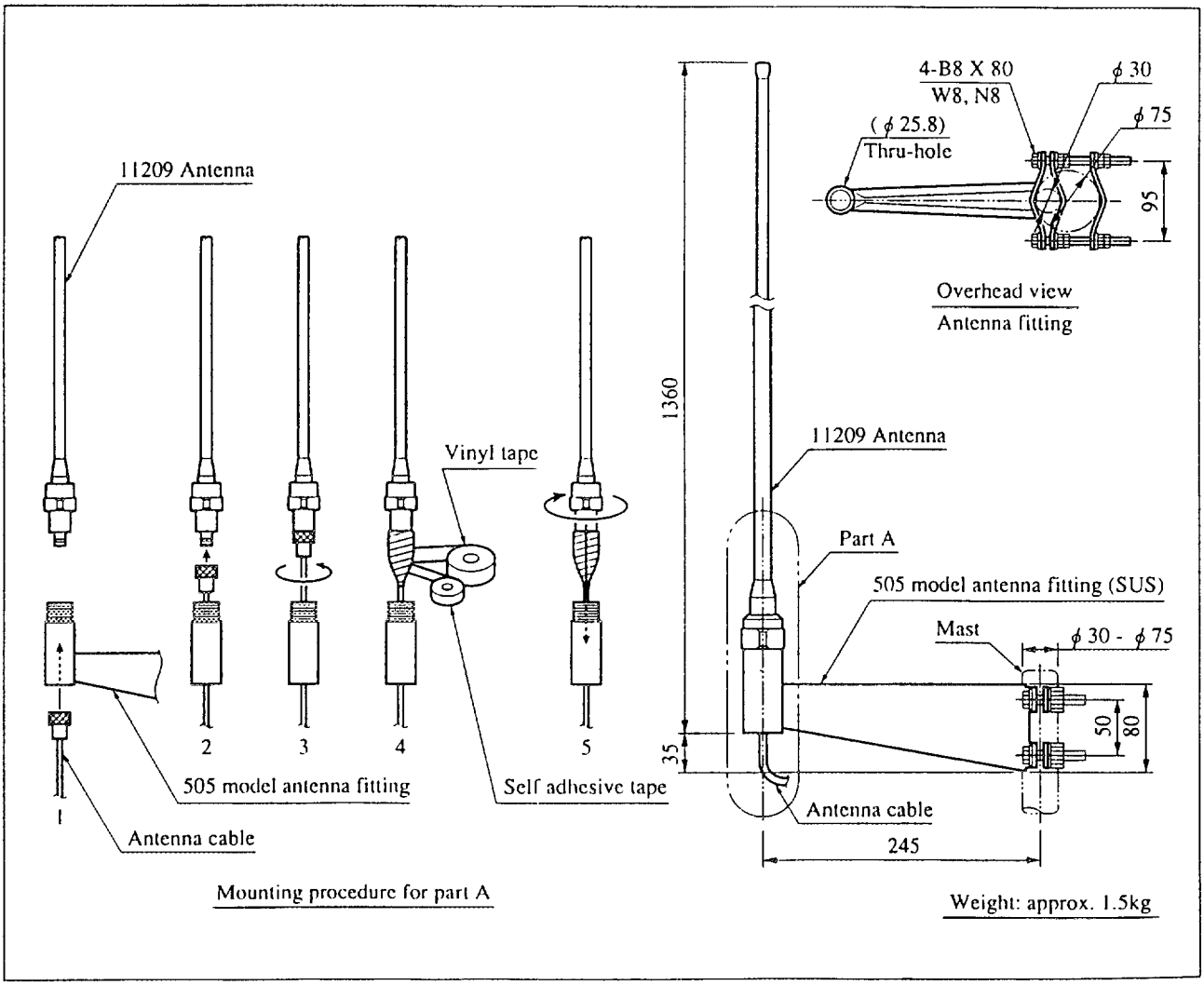
Install so that obstructions such as masts, bridges or vertical supports do not block signal reception.
When two or more antennas are installed for two or more VHF units, separate antennas 4 m or more (13 ft or more) vertically, to avoid interference. This also applies when installing two antennas, one for a VHF unit and one for the guard receiver.



2.2 Using the Antenna Fitting

2.2.1 Dipole Antenna (11209)

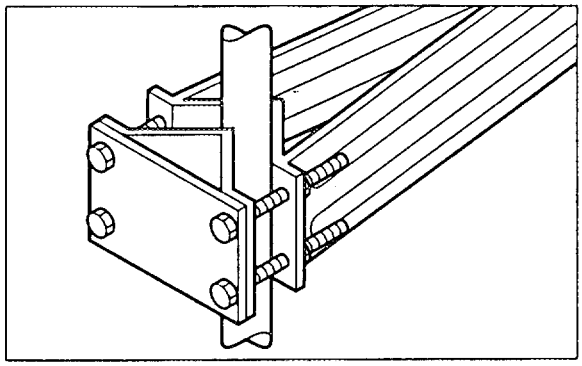
Follow the procedure described in the diagram below to attach antenna to the fitting.



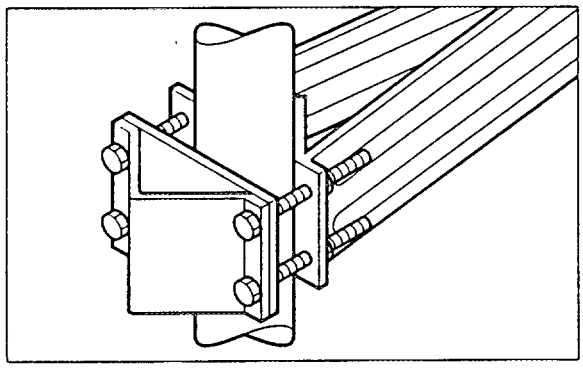
2.2.2 Whip Antenna (WH-150-3M)

Use an appropriate fitting method according to the diameter (30 mm - 90 mm, 1 13/16 in. - 3 9/16 in.) of the support (i.e. mast) used.

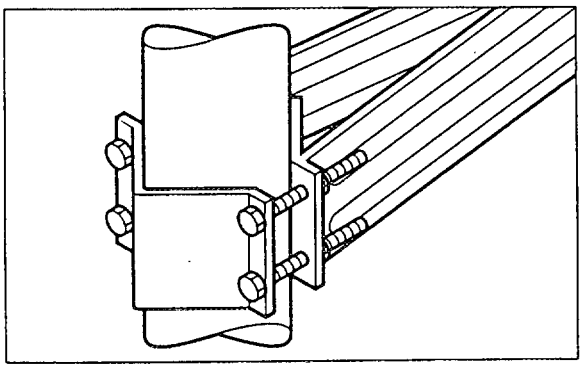
(1) Diameter: 30 mm - 40 mm (1 13/16 in. - 1 9/16 in.)



2) Diameter: 40 mm - 80 mm (1 9/16 in. - 3 1/8 in.)

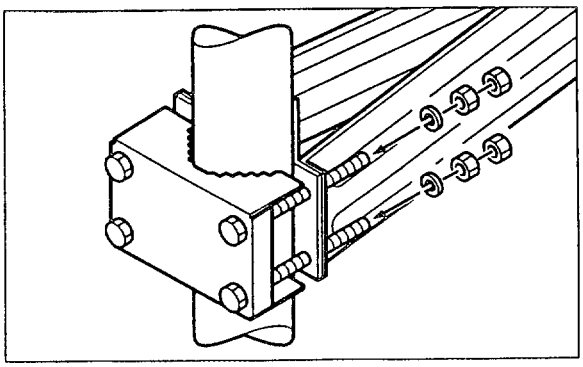


(3) Diameter: 80 mm - 90 mm (3 1/8 in. - 3 9/16 in.)

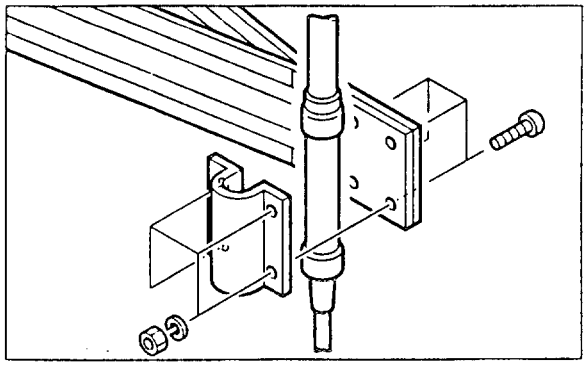


(4) A-8 (V2) bracket

Enables attachment to a mast with a diameter: 30 mm - 80 mm (1 13/16 in. - 3 1/8 in.).



Attach the antenna as follows.

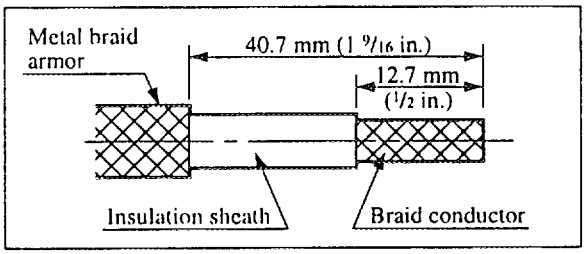


2.3 Connecting the Coaxial Connector

Assemble the N type connector (N-P-10U) and coaxial cable (RG-10/U or RQ-10/UY) as follows.

Procedure

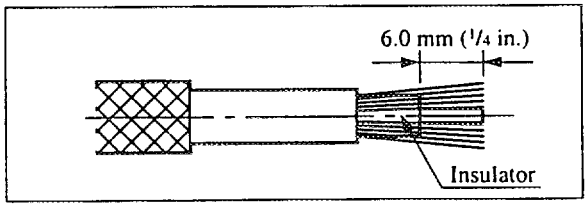
(1) Cut the metal braid armor and insulation sheath as shown below:



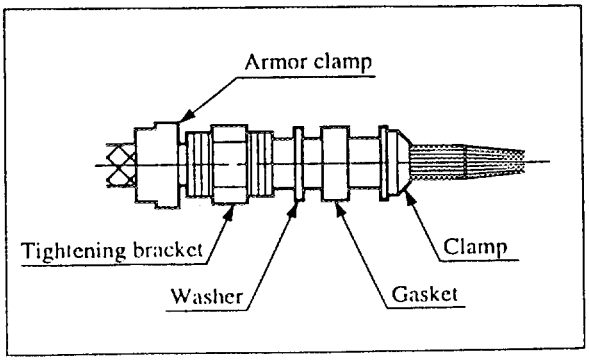
⚠ CAUTION

Do not damage the braid conductor.

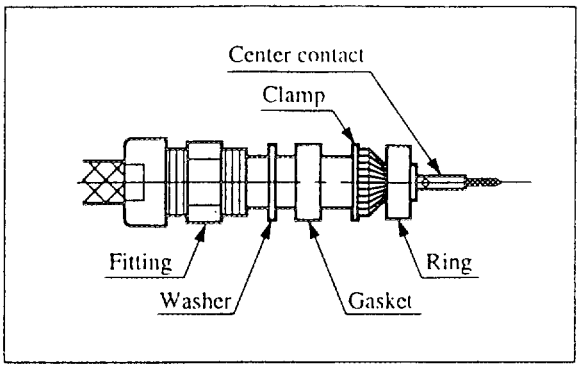
(2) Ravel the braid conductor and cut the insulator as shown below:



(3) Gather up the metal braid armor and raveled braid conductor, and insert the armor clamp, tightening bracket, washer, gasket, and clamp, in order.



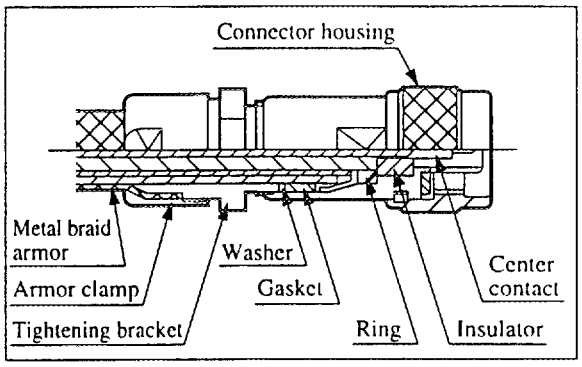
(4) Fold the raveled braid conductor between the ring and clamp, insert the center conductor, and solder the center contact.



NOTE 1: Align the ring with the tip of the insulator, carefully fold the raveled braid conductor on the clamp, and cut to an even length.

NOTE 2: Do not leave space between the center contact and insulator, and do not melt the insulator while soldering.

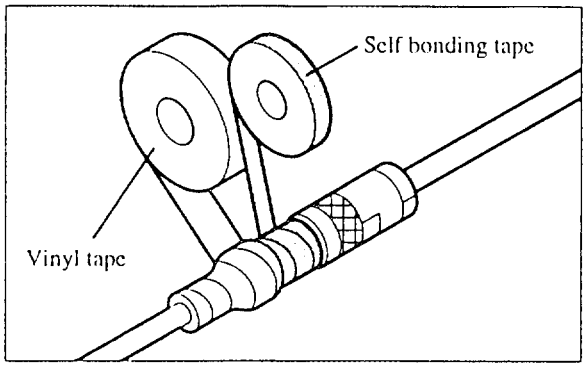
(5) Insert the cable into the connector housing and turn the tightening bracket to secure it.



(6) Turn the armor clamp to secure the metal braid armor.

2.4 Waterproofing the Coaxial Connector

After connecting the connectors, wind a self bonding tape (butyl rubber tape) to waterproof them.
In addition, after winding the self bonding tape, overlay a vinyl tape (vinyl chloride tape) over them to prevent degradation by ultraviolet rays.



2.5 Inspecting after Antenna Installation

After installing the VHF radio system, check the antenna and cables using a through-line power meter (CM power meter).
Normally, the forward power (Pf) is 20-25w (+20%, −50%) and the reflected power (Pr) will be less than 1W.
Example: When Pf=25w and Pr=1w, SWR=1.5

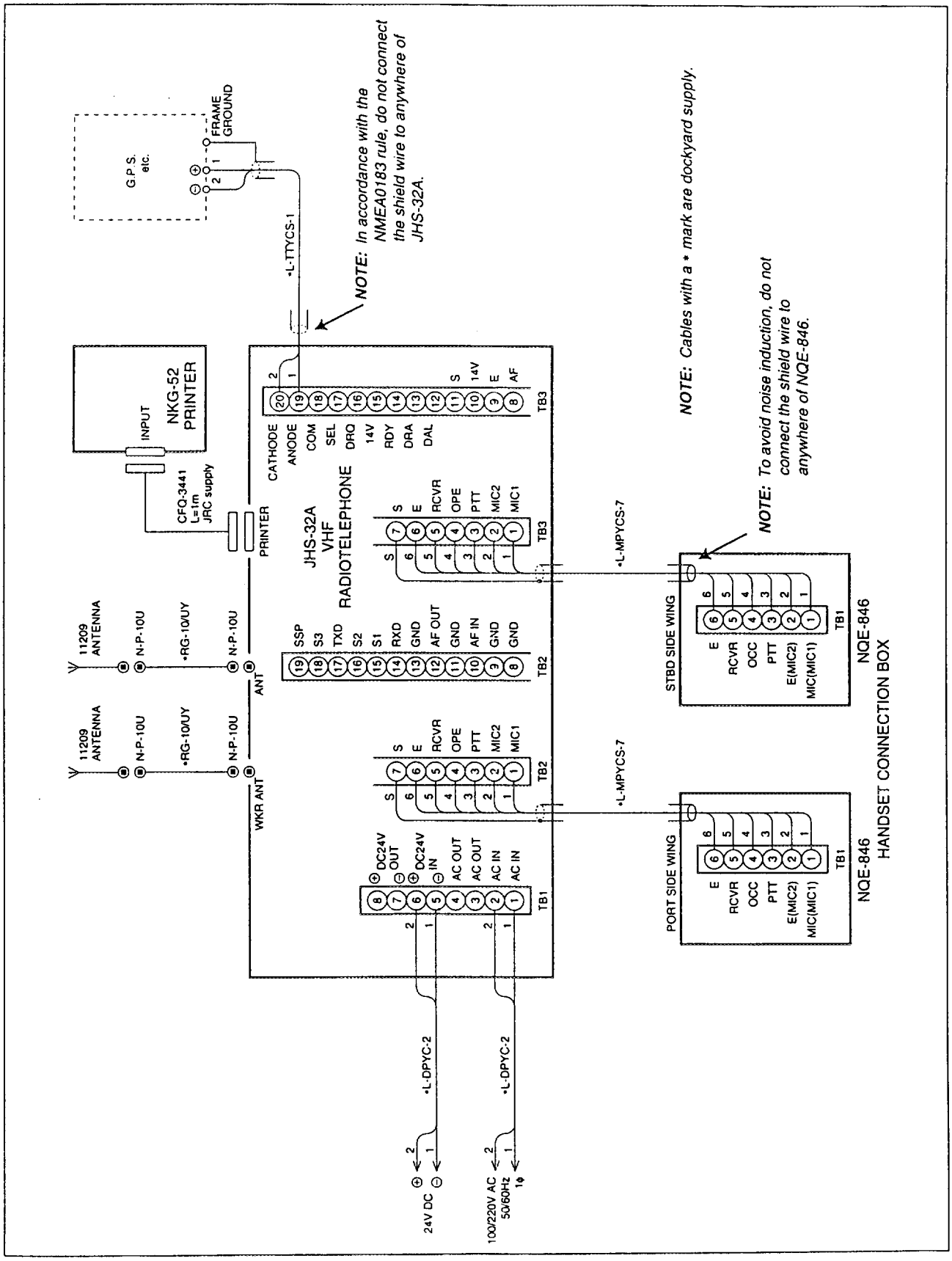
$$SWR=\frac{\sqrt{Pf}+\sqrt{Pr}}{\sqrt{Pf}-\sqrt{Pr}}$$

When carrying out a conductive test of the antenna and antenna cable from the radio unit side, 11209 and WH-150-3M will appear as short-circuited.

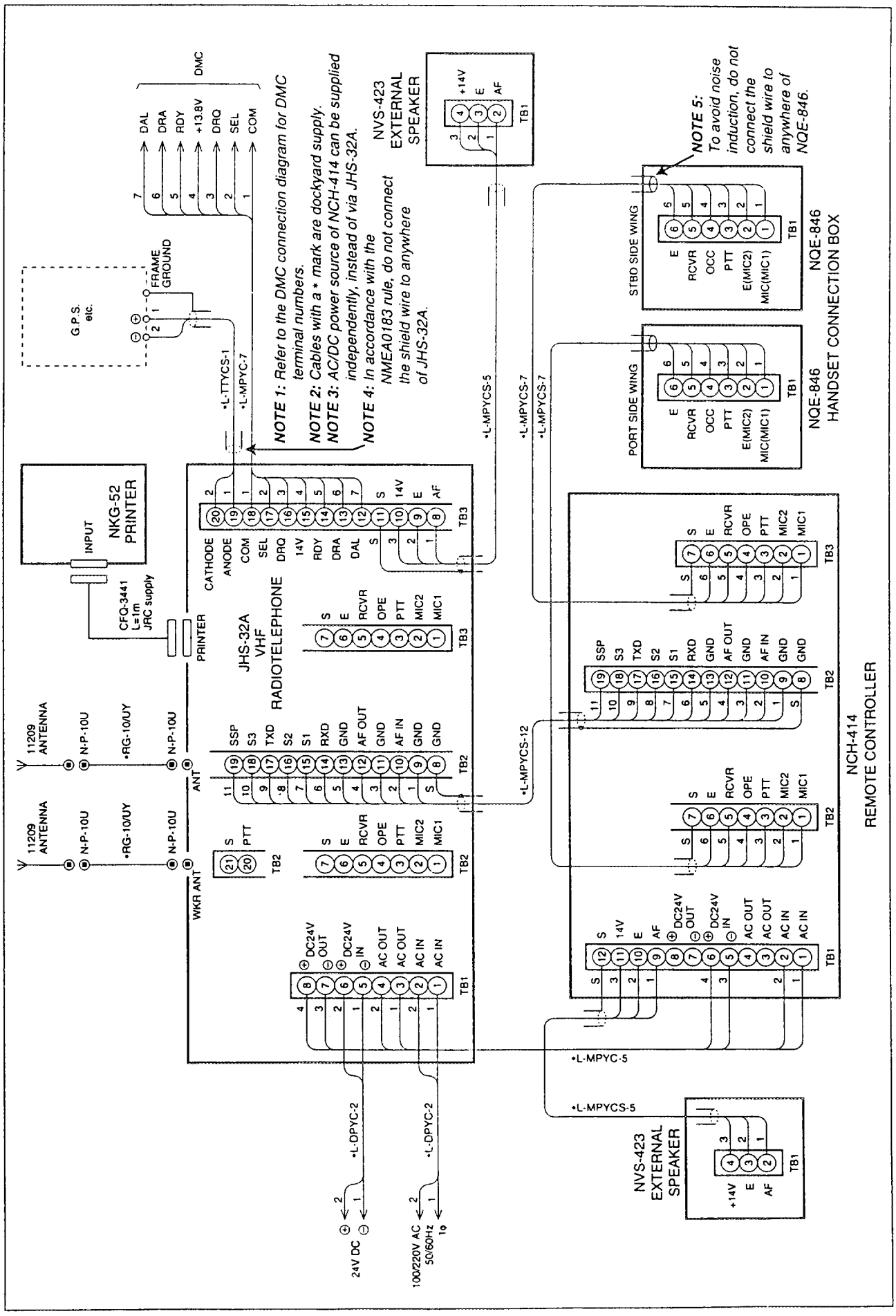
Chapter 3 Connection Diagrams and Initial Settings

3.1 Connection Diagrams

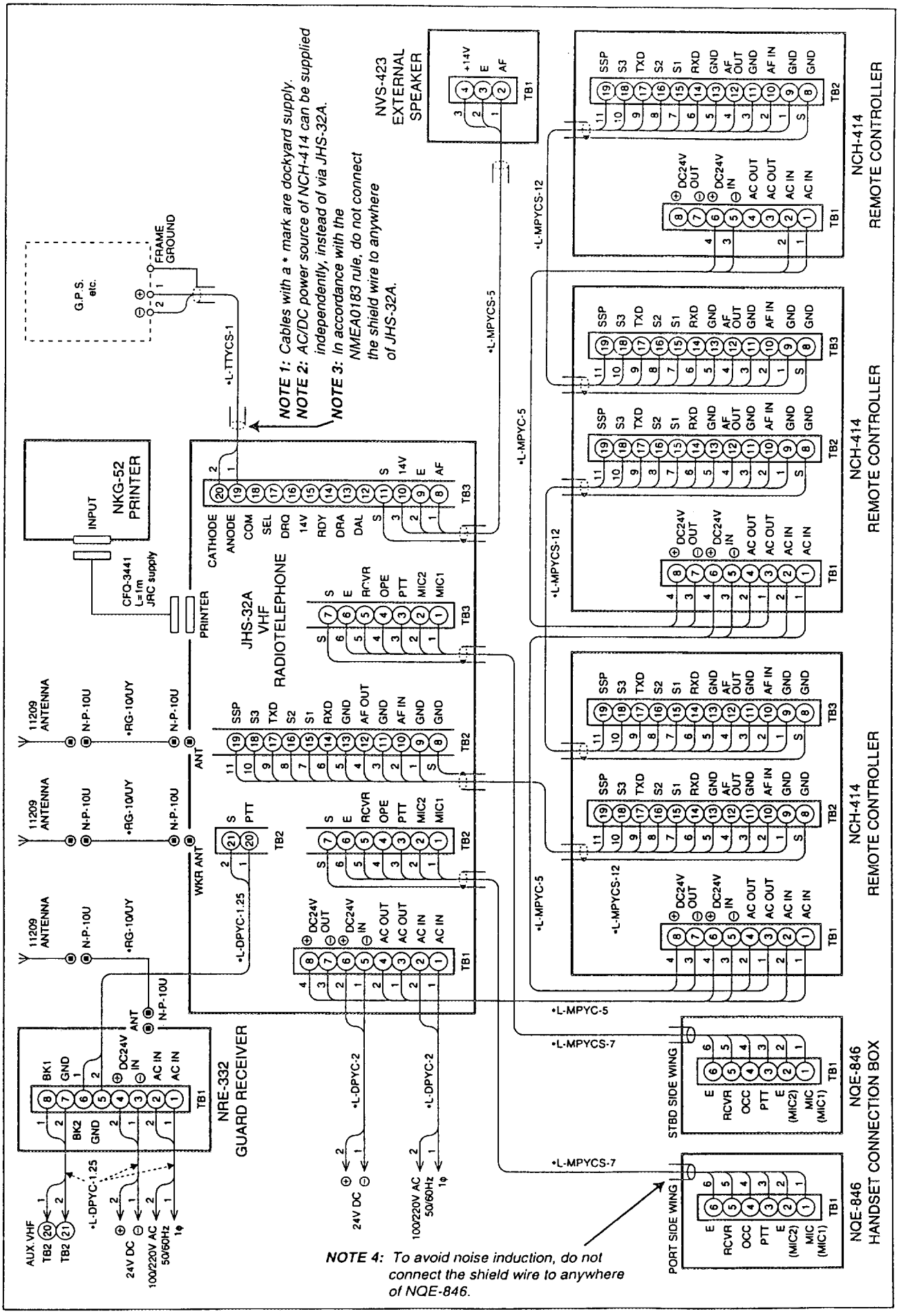
3.1.1 Connection Diagram with Options (Example 1)



3.1.2 Connection Diagram with Options (Example 2)

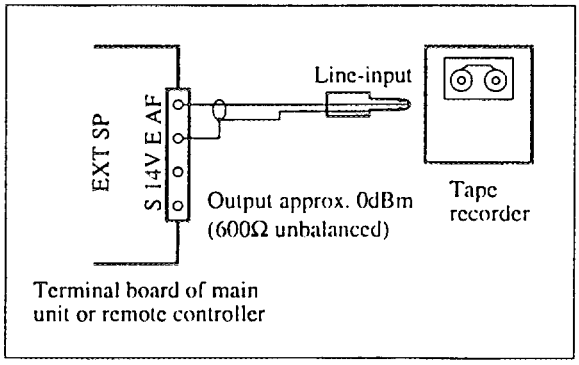


3.1.3 Connection Diagram with Options (Example 3)



3.1.4 Connecting a Tape Recorder

Connect the line-input of a tape recorder to EXT. SP terminals (AF, E) of the terminal board of the main unit (JHS-32A) or remote controller (NCH-414).
All transmitted and received voice signals from the main unit or remote controllers are gathered to the EXT. SP terminals, so all communications can be recorded by a tape recorder.
Refer to the instruction manual of the tape recorder for information on operating the tape recorder.

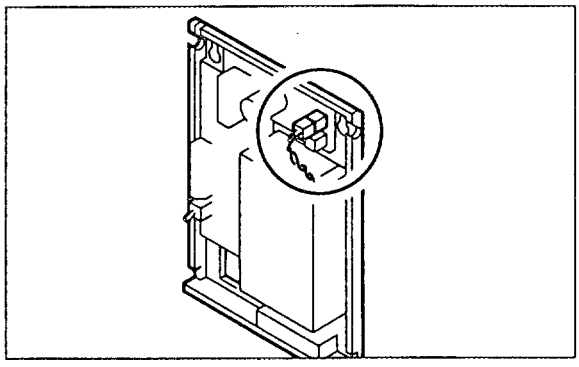


3.2 Setting the Power Supply Voltage

Plug in the voltage selecting connector P1 to suitable receptacle J1 or J2 for mains voltage as shown below. Unless otherwise specified, the voltage is set for 200-240V AC at shipment.

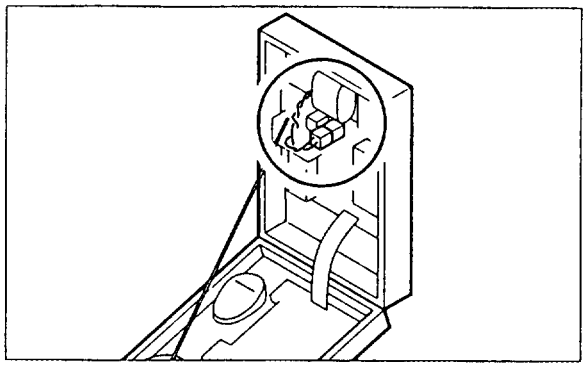
3.2.1 Main Unit (JHS-32A)

100-120VAC: Connect to J1
200-240VAC: Connect to J2



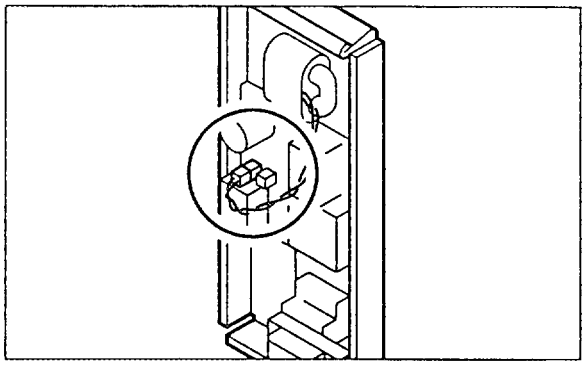
3.2.2 Remote Controller (NCH-414)

100-120VAC: Connect to J1
200-240VAC: Connect to J2



3.2.3 Guard Receiver (NRE-332)

100-120VAC: Connect to J1
200-240VAC: Connect to J2



3.3 Inspecting after Installation

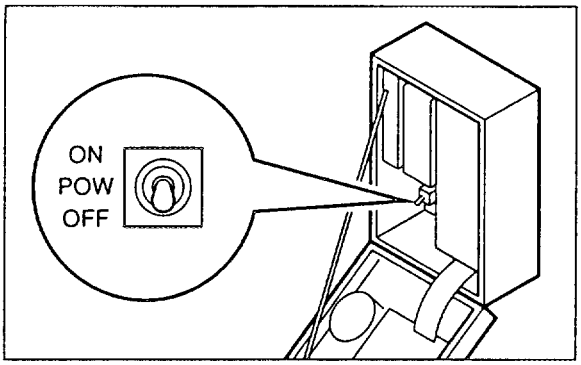
3.3.1 Checking Wiring

After installation and connections are completed, check voltage, wiring, and connections, before turning the power on.

3.3.2 Turning the Power On

Procedure

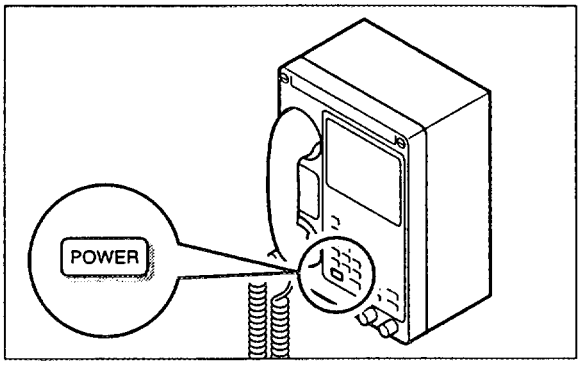
(1) Turn on the main switch inside the main unit.



NOTE 1: The main unit does not turn on when only the main switch is on.

NOTE 2: When a remote controller NCH-414 is installed, turn on the main switch inside the remote controller. The main switch of the remote controller is in almost the same place as on the main unit.

(2) Press (POWER) on the main unit panel.



TIP: When (POWER) of the main unit panel is pressed, all remote controllers are also activated.
But when both (POWER) and (OFF) are pressed at the same time (to turn the power off), only the main unit or controller on which the keys are pressed is turned off.

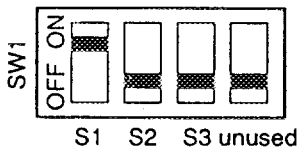
3.4 Assigning Numbers to the Remote Controllers

When one or more remote controllers are installed, it is necessary to assign an identification number to each controller.

Procedure

(1) Set the preset switch SW1 on the back of the panel, with the power turned off, as shown below.

(Example) When assigning S1 ("Slave 1") to remote controller (1), set S1 to ON and all others to OFF.
Assign S2 and S3 to other controllers in the same way.



⚠ CAUTION

- Do not set two or more switches to ON.
- Do not assign the same number (e.g. S1) to different remote controllers.

[NOTE]
Unless otherwise specified, S1 is set to ON at shipment.

3.5 Initial Settings

Confirm whether the settings are already done or not, before performing initial settings.

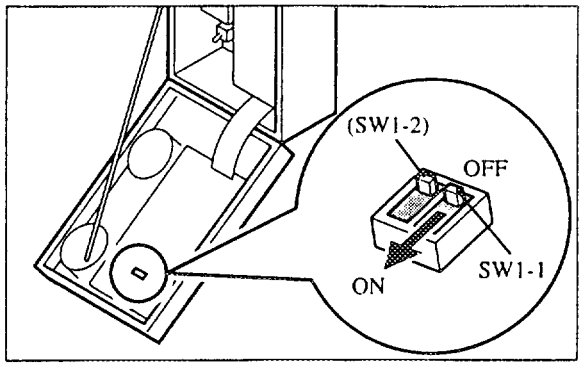
3.5.1 Confirming Initial Settings

Refer to "4.3.19 Reviewing System Setup" of the instruction manual for details.

Procedure

CH16 Status Display
↓ (MENU)
DSC MENU Display
↓ (▼)/(▲)
13.DSC SETUP CONFIRMATION
↓ (ENTER)
DSC SETUP CONFIRMATION Display

(1) When performing the initial settings (3.5.2-3.5.5), set the switch SW1-1 to ON with the power off.
(2) Set SW1-1 to OFF after completing initial settings.
(3) Always set SW1-2 to OFF.



3.5.2 Initializing DSC

Procedure

INSTALLATION SETUP Display
↓ (ENTER) *NOTE: DSC INITIALIZE is highlighted.*
DSC INITIALIZE Display
INITIALIZE YES/NO
↓ (◄)/(►), (ENTER)

When YES is selected, the following items are initialized.

SELF-ID	(000 000 000)
GROUP-ID	(000 000 000)
NAV CONNECTION	(NO CONNECTION)
PRINTER SELECTION	(NKG-52)
TX/RX MESSAGE	(Blanks)
TEL NUMBER	(Blanks)

↓ (STOP)
INSTALLATION SETUP Display

⚠ CAUTION

When the system is installed for the first time or the control unit PCB (CDJ-1490) is replaced for repair, select YES and press (ENTER) to initialize (to delete unnecessary data).

[NOTE]
- If NO is selected, no item is initialized.
- Data in brackets ( ) is the default after initialization.
- Initialization takes approx. 3 seconds.

3.5.3 Initializing VHF

Procedure

INSTALLATION SETUP Display
↓ (▼)/(▲)
2.VHF INITIALIZE
↓ (ENTER)
VHF INITIALIZE Display
INITIALIZE YES/NO
↓ (◄)/(►), (ENTER)

When YES is selected, the following items are initialized.

MEMORY CH	(Blanks)
SELECT CH	(Blanks)
PRIVATE CH	(Blanks)
SPECIAL CH SETUP	
SPECIAL FUNCTION SETUP	
PRIORITY SETUP	
WKR SETUP	

↓ (STOP)
INSTALLATION SETUP Display

⚠ CAUTION

When the system is installed for the first time or the control unit PCB (CDJ-1490) is replaced for repair, select YES and press (ENTER) to initialize (to delete unnecessary data).

[NOTE]
- If NO is selected, no item is initialized.
- Data in brackets ( ) is the default after initialization.
- Initialization takes approx. 3 seconds.

3.5.4 DSC Setup

Procedure

INSTALLATION SETUP Display
↓ (▼)/(▲)
3.DSC SETUP
↓ (ENTER)
DSC SETUP Display
1. SELF-ID
↓ Enter nine digits. (ENTER)
2. GROUP-ID
↓ Enter eight digits. (ENTER)
NOTE: The first digit is always zero.
3. NAVIGATION
↓ (◄)/(►), (▼)
4. PRINTER
↓ (◄)/(►), (STOP)
INSTALLATION SETUP Display

⚠ CAUTION

When the system is installed for the first time or the control unit PCB (CDJ-1490) is replaced for repair, perform initial settings.

When a centronics printer is connected to the main unit JHS-32A, use the dedicated cable 6ZCJD61001 (1m long) or 6ZCJD61010 (10 m long) and change the printer settings.

3.5.5 VHF Setup

Procedure

INSTALLATION SETUP Display
↓ (▼)/(▲)
4.VHF SETUP
↓ (ENTER)
VHF SETUP Display
1.PRIORITY
2.WKR
3.PRIVATE CH
4.SPECIAL CH
5.SPECIAL FUNCTION

1. Setting Priority

The SOLAS convention requires that the main unit (JHS-32A) or a remote controller (NCH-414) installed in the wheelhouse have priority. Unless otherwise specified, priority is given to the main unit (M) at the shipment.
When the system is only the main unit, the main unit automatically has priority (M).

Procedure

VHF SETUP Display
↓ (▼)/(▲)
1.PRIORITY
↓ (ENTER)
PRIORITY SETUP Display
PRIORITY: M (The main unit JHS-32A has priority)
: S1 (Remote controller SLAVE-1 has priority)
: S2 (Remote controller SLAVE-2 has priority)
: S3 (Remote controller SLAVE-3 has priority)
: NO PRIORITY (No controller has priority)
↓ (▼)/(▲), (STOP)
VHF SETUP Display

2. Setting the CH70 Watchkeeping Receiver

Procedure

VHF SETUP Display
↓ (▼)/(▲)
2.WKR
↓ (ENTER)
WKR SETUP Display
1.WKR: ENABLE/DISABLE
ENABLE : The built-in CH70 watchkeeping receiver is used.
DISABLE : The built-in CH70 watchkeeping receiver is not used (the CH70 watchkeeping receiver is deactivated).
2.WKR CONTROL: NON-BK/BK
NON-BK: CH70 reception is available even while the JHS-32A is transmitting.
BK : CH70 reception is not available while the JHS-32A is transmitting.
↓ (▼)/(▲), (◄)/(►), (STOP)
VHF SETUP Display

⚠ CAUTION

When two main units (JHS-32A) are installed for duplication of the VHF system, and duplication of CH70 watchkeeping receivers are not required, set the built-in CH70 watchkeeping receiver of the second main unit (JHS-32A) to WKR:DISABLE.

Stick the attached label [CH70 WKR] on the front panel when the built-in watchkeeping receiver is set to [WKR:ENABLE].

3. Registering Private Channel

Procedure

VHF SETUP Display
↓ (▼)/(▲)
3.PRIVATE CH
↓ (ENTER)
PRIVATE CH Display
Select a private channel No. using (▼)/(▲)
(Example) 03. TX: RX:
Press (ENTER) after entering a transmission frequency. Press (ENTER) after entering a reception frequency. Press (STOP) when frequency entry is complete.
When the transmission and reception frequencies are the same, press (ENTER) three times after entering the transmission frequency.
The decimal point of MHz digit is automatically entered.
↓ (STOP)
VHF SETUP Display

⚠ CAUTION

- If a frequency out of the private channel frequency range is entered, a alarm sounds and the display prompts an reentry. If this happens, re-enter the current frequency.
- Do not register a private channel if no particular frequency is to be assigned for it.

4. Selecting the Transmitting Power of a Particular Channel

Procedure

VHF SETUP Display
↓ (▼)/(▲)
4.SPECIAL CH
↓ (ENTER)
SPECIAL CH SETUP Display
↓ Select using (▼)/(▲) and (◀)/(▶). After setting, press (STOP).
VHF SETUP Display

⚠ CAUTION

- Do this only when regulation restricts the transmitting power on certain channels.

5. Enabling/Disabling Scanning, Dualwatch, Transmission Monitor and 5-minute TX Timer

Procedure

VHF SETUP Display
↓ (▼)/(▲)
5.SPECIAL FUNCTION
↓ (ENTER)
SPECIAL FUNCTION Display
1.SCAN (Select scanning)
2.DUAL WATCH (Select dual watch with CH16)
3.TX MONITOR (Select monitoring of other controllers)
4.5 MIN. TX TIMER (Select automatic transfer to the receive status for when 5MIN. TX TIMER times out)
↓ Use (▼)/(▲) and (◀)/(▶).
After selecting, press (STOP).
VHF SETUP Display

⚠ CAUTION

- Set SCAN:DISABLE when the British MPT restriction applies.
- When a remote controller is installed that should not be monitored by other panels, select TX MONITOR : DISABLE.
- Select 5 MIN. TIMER:ENABLE when the US FCC restriction applies.

3.5.6 Adjustment

Procedure

INSTALLATION SETUP Display
↓ (▼)/(▲)
5.ADJUSTMENT
↓ (ENTER)
ADJUSTMENT Display
1.25W POWER (Adjustment of 25w output power)
2.1W POWER (Adjustment of 1w output power)
3.MAX DEVIATION (Adjustment of frequency deviation)
4.INTERNAL SQL LEVEL (Adjustment of internal squelch level)
↓ Use (▼)/(▲) and (◀)/(▶).
After selecting, press (STOP).
INSTALLATION SETUP Display

⚠ CAUTION

- Adjust only when the transmitting power is too low or high and adjustment is required.
- Adjust in 256 steps.
  The values in ORIGINL are factory defaults (original values).

3.5.7 Quitting Initial Settings

Procedure

Press (STOP) to return to the INSTALLATION SETUP Display.
↓
Press (POWER) and (OFF) at the same time (to turn power off).
↓
Set SW1-1 on the rear panel to OFF.
↓
Press (POWER) to turn power on.
↓
The CH16 Status Display returns.

⚠ CAUTION

- After completing Initial Settings, check them using the procedure in 3.5.1.

3.6 Testing Communication

Conduct a communication test (voice and DSC communication) between two main units, which are usually installed for duplication system.
If only one main unit is installed, perform the communication test with another station, or using the self test function.

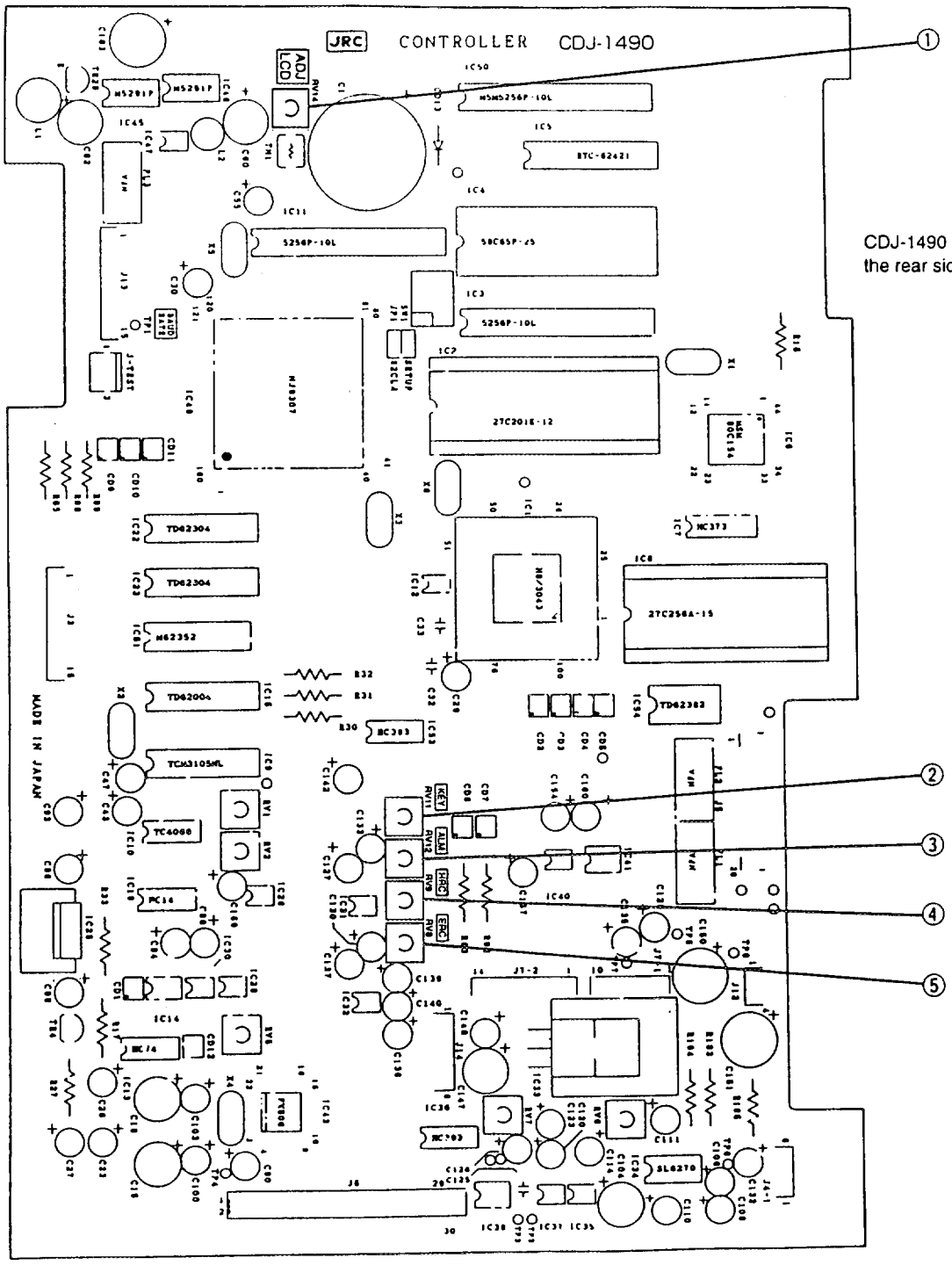
⚠ CAUTION

- Perform the communication test after completing "3.4 Assigning Numbers to the Remote Controllers" and "3.5 Initial Settings."
- Be careful not to transmit DISTRESS signals.

3.7 Other Adjustments

To adjust the contrast of the LCD pannel or speaker volume for the alarm tone, follow the instructions listed in the table while referring to the diagram shown below. Do not touch any other part of the PCB board as adjustments other than those described here require specialized measuring instruments.
Furthermore, do not touch any switches and pins not described in this manual.

No.	Points	Adjustable items	Remarks
①	RV14	LCD contrast	Perform adjustment after sufficient warm-up of the LCD
②	RV11	Key-click volume	
③	RV12	Alarm volume	Never decrease the volume to zero.
④	RV 9	Receiver handset volume	
⑤	RV 8	External handset connection box receiver volume	



CDJ-1490 Controller pannel on the rear side of the Main Unit

3.8 External Interface Signal

3.8.1 GPS Input

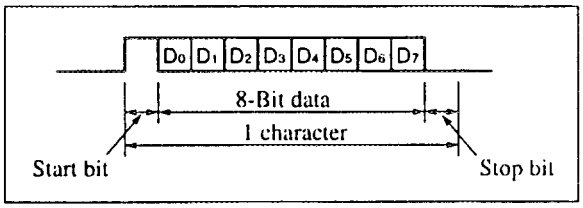
Transmission format and data format.

NOTE: Data from the navigation systems such as Loran C and GPS can be received.

(1) GPS Navigation Equipment (NMEA0183 format)

(A) Transmission format

- Transmission method : Asynchronous
- Baud rate : 4800 BPS
- Start bit : 1 bit
- Data bit : 8 bits
- Stop bit : 1 bit
- Parity : None



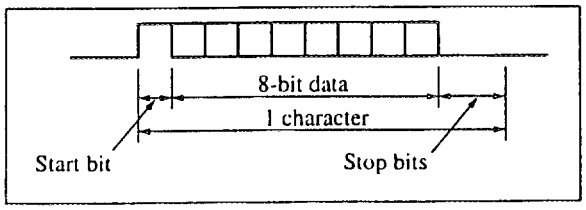
(B) Data Format of Navigation Equipment

- GGA : Position data (Lat/Lon) and UTC time data
- GLL : Position data (Lat/Lon) and UTC time data (V2.0)
  : Position data (Lat/Lon) (V1.5)
- RMC : Position data (Lat/Lon), UTC time data, and date (year, month, day) data
- ZDA : UTC time data and date (year, month, day) data
- ZLZ : UTC time data
- ZZU : UTC time data

(2) GPS Navigation Equipment (JRC format)

(A) Transmission format

- Transmission method : Asynchronous
- Baud rate : 1200 BPS
- Start bit : 1 bit
- Data bit : 8 bits
- Stop bit : 2 bits
- Parity : None



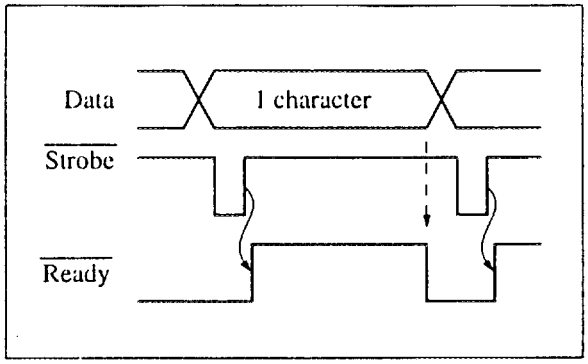
(B) Data Format

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

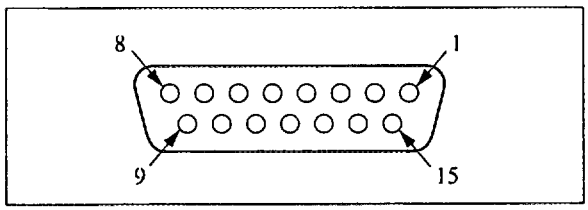
⚠ CAUTION

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.

3.8.2 Printer Output



3.8.3 Printer Connector Signal Table



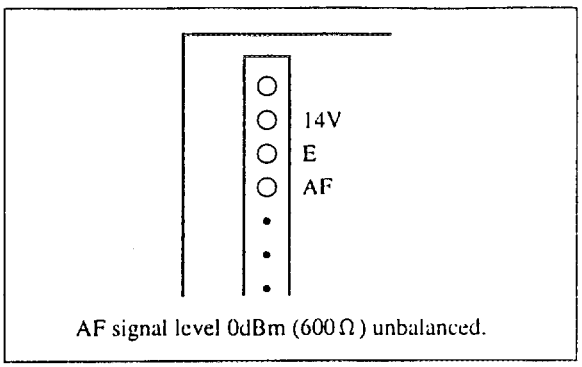
NOTE: The illustration is as seen from the JHS-32A.

Terminal No.	Signal Name	Direction	Description
1	GND	-	Ground
2	+5V	O	(Up to 0.5A output)
3	D0	O	Data bus signal
4	D1	O	Data bus signal
5	D2	O	Data bus signal
6	D3	O	Data bus signal
7	D4	O	Data bus signal
8	D5	O	Data bus signal
9	D6	O	Data bus signal
10	D7	O	Data bus signal
11	$\overline{\text{P.RESET}}$	O	Printer reset signal
12	$\overline{\text{P.READY}}$	I	Printer ready signal
13	$\overline{\text{P.STROBE}}$	O	Printer strobe signal
14	P.END	I	Printer paper end signal
15	$\overline{\text{POWER}}$	I	Printer power on signal

NOTE: "I" means input.
"O" means output.

3.8.4 External Speaker Output

The signal is fed from the terminal board of the main unit (JHS-32A) and remote controller (NCH-414) to an external speaker.



AF signal level 0dBm (600Ω) unbalanced.

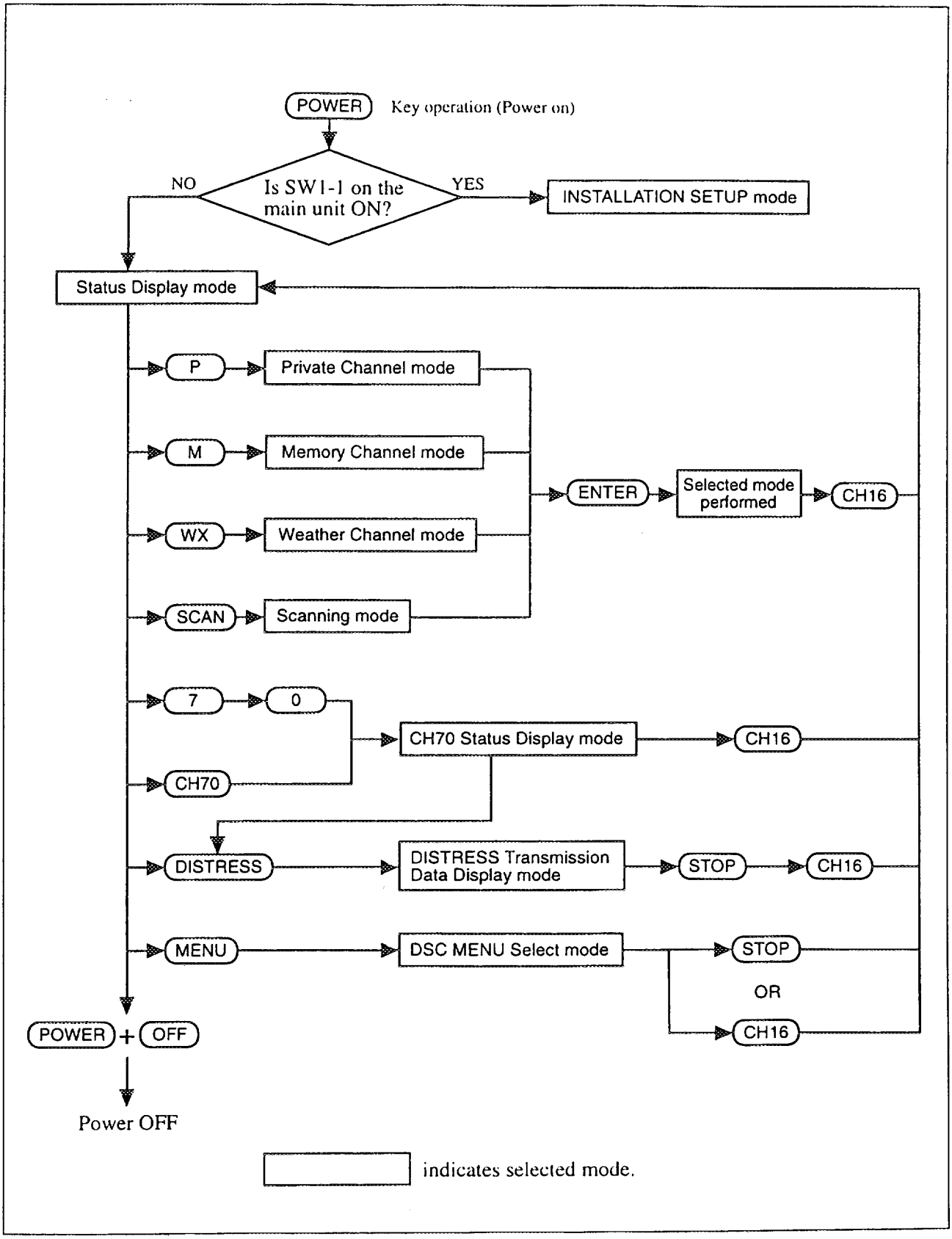
NOTE 1: *Refer to "3.1.2 Connection Diagram with Options (Example 2)" for information on connections.*

NOTE 2: *A tape recorder can be connected to this terminal. Refer to "3.1.4 Connecting a Tape Recorder" for information on connections.*

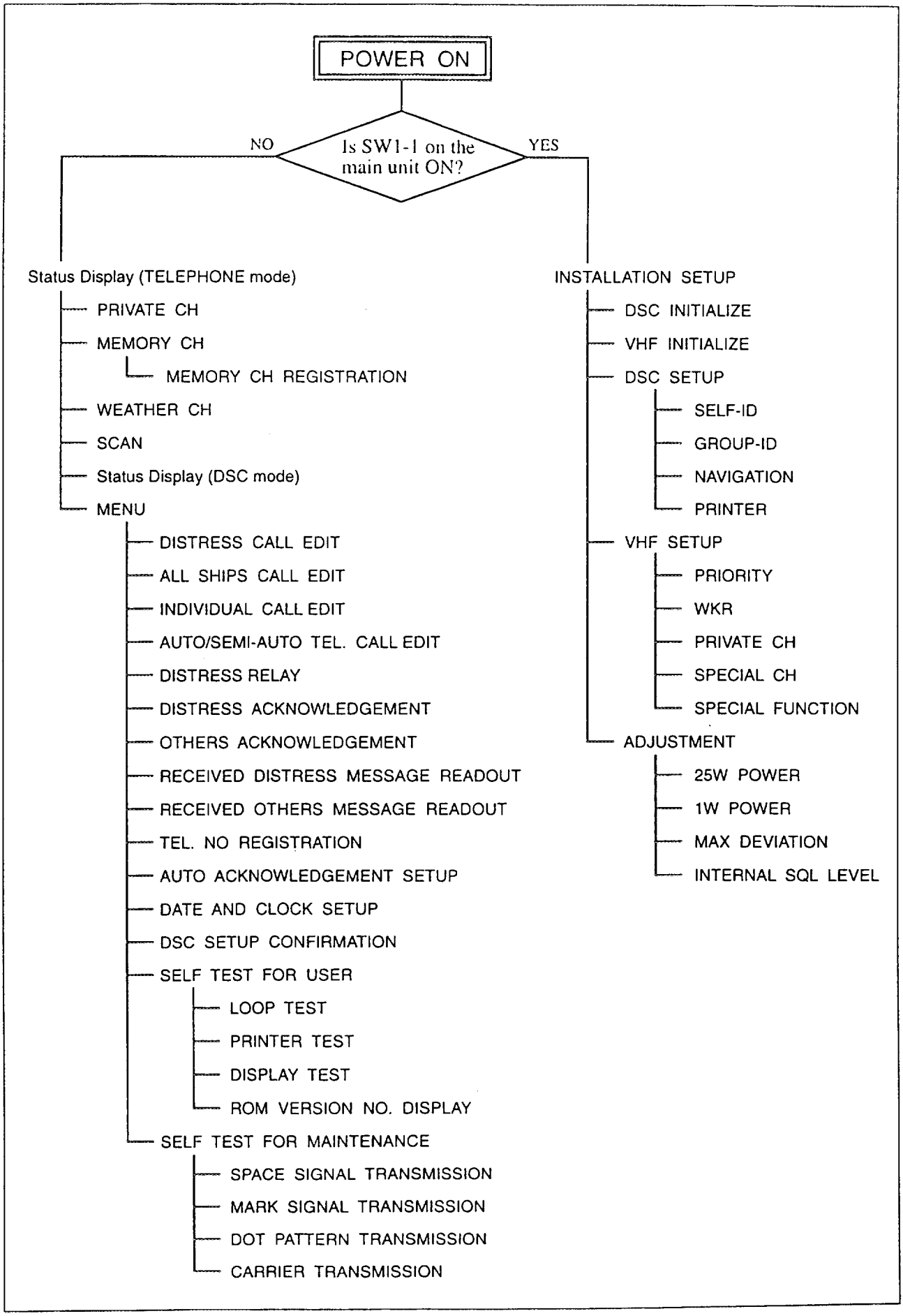
Chapter 4 Description of Operation

4.1 Mode Change and LCD Display Flow Charts

4.1.1 Mode Change Flow Chart



4.1.2 LCD Display Flow Chart



4.2 Outline

The JHS-32A VHF Radiotelephone System is equipped with Digital Selective Call (DSC) function for distress calls and general calls, and telephone mode for voice communication.
Since the DSC receiver (CH70 watchkeeping receiver) is built in the JHS-32A, CH70 signal is fed to the DSC FSK MODEM at any time, even when another channel is selected on the main unit. Therefore, it is possible to receive distress calls and general calls on CH70 at any time.
In addition, a power supply circuit is built in the JHS-32A so that AC/DC power sources are connected directly.
Any remote controller NCH-414 can control radio and DSC operation in a location other than that of the main unit.
Up to two handset connection boxes can be connected to each terminal board of the main unit JHS-32A or remote controller NCH-414. The handset connection box on both wings as well as the handset on the operation panel can be used for voice communication.

Refer to the block diagrams and schematic diagrams in the instruction manual while reading the following.

4.3 Main Unit (JHS-32A)

4.3.1 Radio Unit (CMN-383)

The radio unit consists of the transmitter, PLL frequency synthesizer, receiver, and CH70 watchkeeping receiver.

(1) Transmitter
The transmitter consists of the modulation circuit, power amplifier, and APC circuit, as described below.

(A) Modulation Circuit
The AF signal from the microphone is fed to transmission VCO1 via the control unit to modulate the VCO directly.

(B) Power Amplifier
The output of transmission VCO1 is fed to PLL circuit and transmission power amplifier. The transmission power amplifier consists of IC6, TR7, TR8 and IC7. They amplify VCO output to 25w or more and feed it to the antenna duplexer.

(C) APC Circuit
The transmission power signal, of which the forward power components are detected by the directional coupler in the antenna duplexer, is applied to IC8. The voltage control circuit consisting of IC8, TR12 and TR11 generates the control voltage of TR8 to maintain transmission power constant at the desired level.

(2) PLL Frequency Synthesizer
The PLL frequency synthesizer consists of the VCO, PLL IC, loop filter and TCXO, as described below.

(A) VCO
There are three VCOs in the radio unit: for transmission frequency oscillation, reception local frequency oscillation, and CH70 watchkeeping reception local frequency oscillation.
The outputs of reception and CH70 watchkeeping reception VCOs are fed to both the 1st mixer in the receiver and PLL IC.
The output of the transmission VCO is fed to both the transmission power amplifier and PLL IC.
The frequency of the VCO is controlled by the output of the phase detector of the PLL IC.

(B) PLL IC
The PLL IC (IC5, 18, 19) is equipped with three counters (R, N, A): prescaler, lock detector, and phase detector.
R counter divides the oscillation frequency of the standard oscillator XU1 into reference frequency.
N counter further divides the VCO output frequency (already divided by the prescaler) by N.
A counter divides the remainder of the frequency (already divided by N counter) by between 0 and 63.
These counters are controlled by the CPU of the control unit so that VCO oscillates at the desired frequency.
The lock detector (LD) generates the signal when the PLL is unlocked.
The lock detector signal is a control signal which turns off transmission power when the PLL is unlocked, to prevent transmission on the wrong frequency.
The phase detector (D0) compares the reference frequency with the frequency obtained by dividing VCO output, and sends the difference to the loop filter.

(C) Loop Filter
The loop filter minimizes reference frequency leakage and controls the PLL.
The loop filter receives the control voltage, from the phase detector, and feeds the control voltage to each VCO, controlling the oscillation frequency of each VCO.

(D) TCXO
TCXO XU1 is a highly stable crystal controlled oscillator which provides the standard frequency. The stability of this oscillator determines the stability of the transmission/reception frequency.

(3) Receiver
The receiver consists of the RF amplifier, 1st mixer, and intermediate frequency circuit, as described below.

(A) RF Amplifier
Signals received from the antenna are amplified and fed to the 1st mixer (Z2) via a double-tuned circuit. The CPU sends a turning voltage via R95 to the double-tuned circuit, enabling optimum tuning at desired frequency.

(B) 1st Mixer
The signal fed from the RF amplifier is sent to the "RF" of the 1st mixer (Z2), and the signal from the reception VCO is applied to "LO" via buffer amplifier IC16, respectively. The resulting signal is sent to crystal filter FL3 of the next stage.

The 1st IF frequency (F1st IF) is obtained as follows.

F1stIF = FR-FL = 21.4MHz
FR: Receiving frequency
FL: 1st local frequency

(C) Intermediate Frequency Circuit
The 1st IF signal passes through crystal filter FL3 and is amplified by TR22, then applied to IC14, which is an IF IC.
IC14 has the 2nd local oscillator, 2nd mixer, limiter amplifier, and demodulator. The 1st IF signal is mixed with the 2nd local frequency (20.945MHz) and converted to the 2nd IF signal of 455kHz.
The 2nd IF signal is fed through ceramic filter FL4 and the limiter amplifier, and demodulated by the demodulator. The demodulated output signal is amplified by IC15 and sent to the control unit as the received signal.

(4) CH70 Watchkeeping Receiver
The CH70 watchkeeping receiver consists of the RF amplifier, 1st mixer and intermediate frequency circuit, as described below.

(A) RF Amplifier
The signal received from the antenna unit is amplified and fed to the 1st mixer (Z1) via double-tuned circuit HC1.

(B) 1st Mixer
The signal fed from the RF amplifier is sent to the "RF" of the 1st mixer (Z1), and the signal from the reception VCO to "LO" via buffer amplifier IC11, respectively, and the resulting signal is sent to crystal filter FL1 of the next stage.

F1stIF = FL-FR = 58.1MHz
FR: Receiving frequency =156.525MHz
FL: 1st local frequency = 214.625MHz

(C) Intermediate Frequency Circuit
The 1st IF signal passes through crystal filter FL1 and is amplified by TR20, then applied to IC12, which is an IF IC.
IC12 contains the 2nd local oscillator, 2nd mixer, limiter amplifier, and demodulator. The 1st IF signal is mixed with the 2nd local frequency (57.645 MHz) and converted to the 2nd IF signal (455 kHz).
The 2nd IF signal is fed through ceramic filter FL2 and the limiter amplifier, and demodulated by the demodulator.
The demodulated output signal is amplified by IC13 and fed to the control unit as the received signal.

4.3.2 Control Unit (CDJ-1490)

The control unit consists of CPU and AF circuits.
The function of the control unit is controlled by two CPUs, a 16-bit CPU (H8/3040) and an 8-bit CPU (80C154).

(1) CPU Circuit
The 16-bit CPU (H8/3040) controls the radio equipment and DSC-related operation.
The 16-bit CPU (H8/3040) operates with several types of memory such as ROM, RAM, EEPROM, RTC, and the gate array.
The gate array contains the LCD controller, asynchronous serial I/F, baud rate generator to receive data from GPS equipment, 62 channel I/O port to control radio-related and handset related operations, AF circuit, and DMC.

(2) Operating DSC Reception
The DSC signal (AFSK modulated signal) received by the DSC watchkeeping receiver or main receiver is demodulated by the modem IC.
The demodulated signal is read by the 8-bit CPU (80C154) and then transferred to the 16-bit CPU (H8/3040) via synchronous serial I/F. The 16-bit CPU (H8/3040) follows any instructions contained in the data.
In addition, reception on CH70 is maintained even when the main receiver is tuned to any channel other than CH70 by the built-in DSC watchkeeping receiver.

(3) Operating DSC Transmission
DSC transmission, using (DISTRESS) and other keys, is read through the I/O port of the 16-bit CPU (H8/3040).
The 16-bit CPU edits DSC messages as instructed by the user, and transfers the data to the 8-bit CPU (80C154) via the synchronous serial I/F.
The 8-bit CPU (80C154) edits the data according to DSC protocols and feeds it to the AFSK modem IC at a rate of 1200BPS.
The data, modulated to an AFSK signal by the modem IC, is fed to the transmitter of the radio unit.

(4) Operating Remote Controller

The asynchronous serial I/F built into the 16-bit CPU (H8/3040) controls remote controller NCH-414 communication. The AF signal is converted to digital data using PWM modulation, then intercommunicated between the main unit and the remote controller.

(5) AF Circuit

The AF circuit feeds voice signals from the receiver of the radio unit to the panel speaker and handset receiver of the main unit and remote controller(s), external handset receiver, and external speaker.
It also feeds voice signals from handsets of the main unit and remote controller and external handsets to the transmitter of the radio unit.
The AF circuit uses a one-chip IC to process AF signals for FM radio equipment. The IC contains a pre-emphasis circuit, IDC, and 3 kHz splatter filter for transmission; and a band pass filter and de-emphasis for reception.
The one-chip IC for AF signal processing is controlled by the 16-bit CPU (H8/3040).

4.3.3 Antenna Duplexer (CFF-460)

(1) Simplex Operation

During reception, relays K3 and K4 are activated when the voltage of collectors of TR1 and TR4 increases to 8 volts. Received signals are fed from J1-1 and sent to P11 via relays K5 and K3.
During transmission, all relays are deactivated.
Signals being transmitted are fed from P10 to J1-1 via relays K4 and K5 and then to forward/reflected power detecting transformer T1.

(2) Duplex Operation

In duplex mode, the voltage of the collector of TR4 increases to 8 volts. This causes relays K4 and K5 to activate and CD9 to turn on. Transmission/reception signals are separated by the duplex filter, enabling simultaneous transmission and reception.
When transmitting at 156.025MHz-156.350MHz, relays K1 and K2 are turned on and the band of the duplex filter is switched for low frequency duplex channel.

4.3.4 Power Supply (CBD-1230)

The power supply unit consists of the noise suppression filter and DC-DC converter (PS1). The power source from the connection unit CQD-1250 is fed through the filter to the DC-DC converter, generating a 14 V voltage. This voltage is fed to radio unit CMN-383. RV1 controls the output voltage. The input of the 24 VDC circuit is not grounded, but the negative terminal of the output is grounded.

4.3.5 Connection Unit (CQD-1250)

The connection unit consists of the terminal board for connecting external equipment, AC rectifier, and DC power circuit. The AC power source is fed to CD2 via transformer T1, and smoothed by C4. When voltage detector IC1 detects a voltage of 1.25V or more at pin No.2, the output of pin No.5 changes to L level, TR1 turns on, TR3 turns off, and priority is switched to AC.

4.4 Remote Controller (NCH-414)

4.4.1 Control Unit (CDJ-1489)

The control unit consists of CPU and AF circuits, and is controlled by the 16-bit CPU (H8/3040).

(1) CPU Circuit

The 16-bit CPU (H8/3040) controls communication with the main unit (JHS-32A), key operation, and the LCD display.
The 16-bit CPU (H8/3040) operates with various types of memory including ROM, RAM, and the gate array. The gate array has an LCD controller and I/O ports to control both handset operation and the AF circuit.

(2) Controlling Communication with Main Unit (JHS-32A)

The asynchronous serial I/F built in the 16-bit CPU (H8/3040) controls communication with the main unit.
AF signals are converted to digital signals using PWM modulation and intercommunicated with the main unit.

(3) AF Circuit

The AF Circuit feeds voice signals from the receiver unit of the main unit (JHS-32A) to panel speakers and handset receivers of remote controller(s) NCH-414, external handset receivers, and external speakers.
It also feeds voice signals from the handset of remote controllers and external handsets to the transmitter of the main unit.

4.4.2 Connection Unit (CQD-1249)

The connection unit consists of the terminal board to connect external equipment, AC rectifier, DC power circuit, and DC-DC converter.
The AC power source is fed to CD2 via transformer T1, and smoothed by C2.
When voltage detector IC1 detects a voltage of 1.25V or more at pin No.2, the output of pin No.5 changes to L level, TR1 turns on, TR3 turns off, and priority switches to AC.
The output is applied to the DC-DC converter via CD7, resulting in a 14 V output.

RV1 controls the over-voltage protection level. Refer to "7.2.6" of the instruction manual for information about adjustment.

4.5 Printer (NKG-52)

4.5.1 Introduction

The printer consists of the CDG-316 interface unit and the CQB-52 printer unit. 8-bit parallel input data from the JHS-32A is converted to 7x5 dot matrix character data in the interface unit. The data is then fed to the printer unit to be printed out.

4.5.2 Interface Circuit (CDG-316)

(1) Input Data

8-bit parallel data (ASCII data) from connector J1 is fed to IC1 (one-chip CPU) via IC10 (buffer) and written to the data buffer in the CPU using STROBE signals from J1-13.

However, the data is not written to the data buffer if there is no READY signal from the CPU. The READY signal allows access to CPU memory.

When the data reaches 40 characters (equivalent to one line) or the carriage return (CR) is entered, the CPU feeds 7-bit data (which is 7x5 dot matrix character data converted from 8-bit data) to DB0-DB6, and also feeds the printer driver signal to DB7.

This printer driver data is fed through the buffer ICs of IC2 and IC3 and printed out.

The sequence of operations is shown in the timing chart below.

(2) Pulse Generator

The pulse generator consists of TR1 and four gates in the IC5. It controls the time taken to print one dot, which determines print density.

The oscillation frequency is variable between 7kHz to 40kHz, with RV1 (PWADJ). Pulses are read by the CPU and up to 20 pulses correspond to the time required to print one dot.

Therefore, a lower frequency (with RV1 rotating clockwise) takes a longer time, resulting in a greater print density.

(3) Printer Error Control Circuit

The printer unit outputs tachogenerator (TG) signals (printer motor rotation detecting signals) during printing which are read by the CPU of IC1, after waveforms are shaped by TR4.

TG signals are also used to check printer operation and to adjust print timing.

(A) Paper Jam Detection

When a paper jam occurs during printing, the printer motor stops and TG signals are terminated. If this state lasts for more than 3 seconds, the CPU regards it as an error state and the printer enters error mode.

In error mode, 7 bit printer data (DB0-DB6) and one bit printer motor drive data (DB7) outputs are terminated. This stops printing and changes the READY signal to HIGH (input data read disable).

The printer error control circuit consists of gates of IC6, IC7 and IC4, IC8.

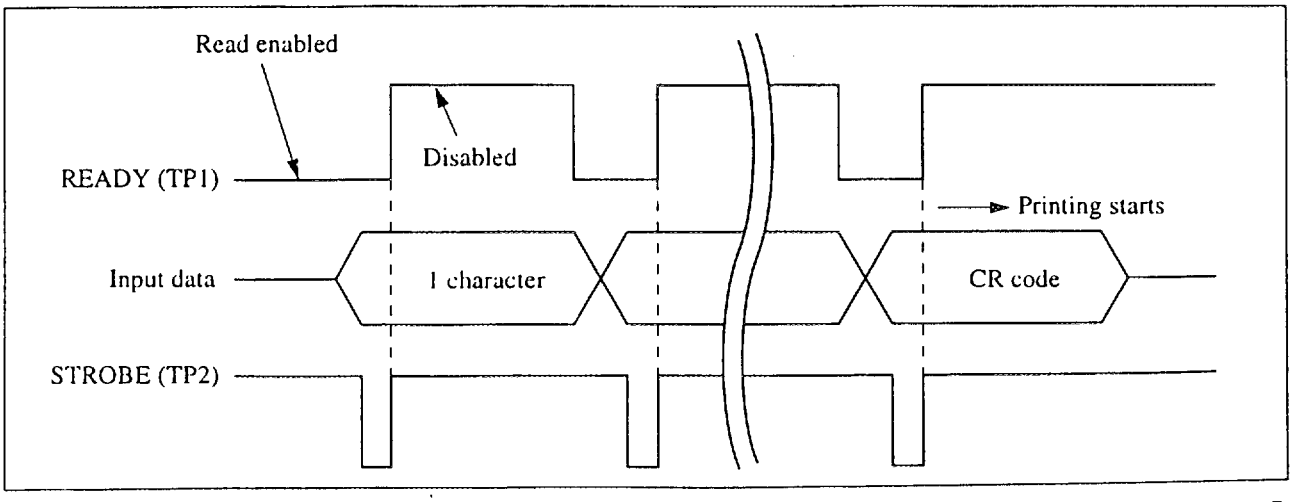
This circuit performs the following control sequence when it detects the error state mentioned above (where the READY signal is HIGH for four seconds or more).

In the normal state, HIGH does not last for four seconds. HIGH lasts for two seconds or less during printing.

If the READY signal is HIGH for four seconds or more, IC6 outputs a pulse to switch the two latches of IC7 (1/2 and 2/2) into the set condition.

The latch output of IC7 (1/2) drives the buzzer BZ1 and sounds an alarm. The latch output IC7 (1/2) sends a FAULT signal (HIGH data) to the main unit (JHS-32A) to inform it of the error condition.

The error state is released only when the RESET switch on the front panel is pressed or when external RESET signal is applied.



(B) Detecting Paper Out

The photo interrupter (CD1) of the printer unit (CQB-52) is ON or OFF depending whether there is print paper. Its signal (ON when paper exists and OFF when not) controls TR3.

When there is paper, the printing is not affected because CD1 is ON and TR3 is OFF.

When paper runs out, CD1 turns OFF, changing TR3 to ON, which in turn changes the TG signal to LOW. This terminates the TG signal and activates the error state (same as for paper jams). The error state activates the buzzer and outputs the error signal.

4.5.3 Printer Unit (CQB-52)

The printer unit consists of the printer mechanism and photo interrupter CD1 which determines whether or not there is paper in the printer.

This is connected to the above-mentioned interface.

4.6 Guard Receiver (NRE-332)

The guard receiver contains two receivers, the controller, and the antenna divider. The controller reads panel key operation data and controls the two receivers.

The guard receiver enables reception of two channels independently at the same time.

100 VAC or 200 VAC power source (selected at installation), and 24 VDC power source, are directly supplied to the built-in power supply unit.

4.6.1 Receiver Unit (CMA-433)

(1) PLL and Channel Switch

The PLL frequency synthesizer generates local oscillation signals. Refer to the figure below.

(2) RF Amplifier

Received signals are fed through double tuning circuits T1 and T2, amplified by TR1, and fed to 1st mixer Z1 via double turning circuits T3 and T4.

(3) IF Circuit and AF Amplifier

The first IF circuit consists of FL1, TR2 and TR3. It outputs to IC1 (MC3371).

IC1 contains the second local oscillator, second mixer, second IF amplifier, and demodulator. Demodulated signals are fed from pin No.9 of IC1 and amplified by IC2 (2/2).

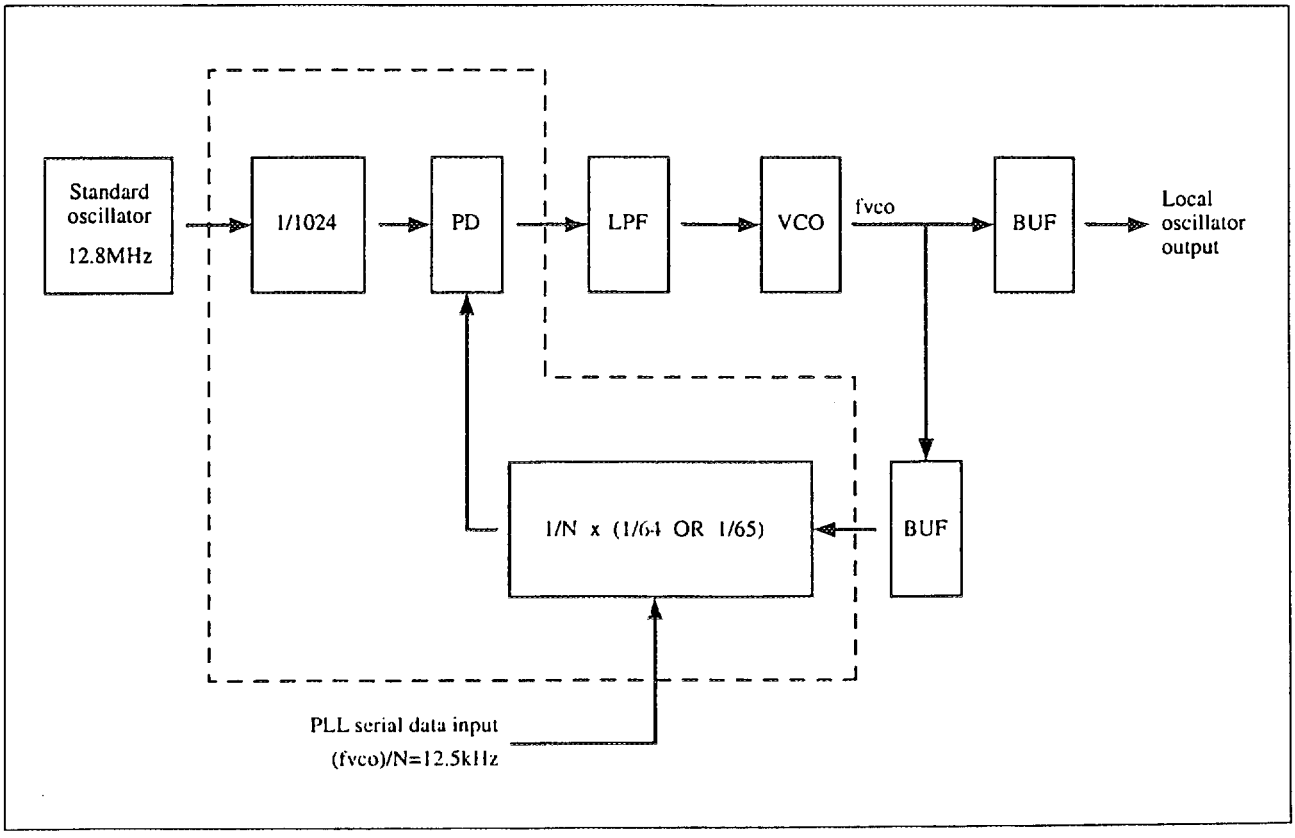
(4) Squelch Controller

Demodulated noise when no signal is being received is amplified by IC2 (1/2) and detected by CD9.

IC5 (1/2) is a comparator which controls TR4 and turns on/off AF signals (opens/closes squelch).

4.6.2 Control Unit (CDJ-1114)

The CPU of the controller reads panel key operation data and feeds PLL data (channel data) to the receiver (CMA-433), simultaneously feeding channel data to the display unit (CDE-689).



The controller processes the AF circuit internally. The AF circuit amplifies voice signals from receiver CMA-433 to the speaker on the panel.

4.6.3 Connection Unit (CQD-1292)

The connection unit consists of the terminal board to connect external equipment, AC rectifier, DC power circuit, and DC-DC converter.
The AC power source is fed through transformer T1, rectified by CD2, and smoothed by C2. When voltage detector IC1 detects a voltage of 1.25 V or more at pin No.2, the output of pin No.5 changes to "L" level, TR1 turns on, TR3 turns off, and priority is switched to AC. The output is sent via CD7 to the DC-DC converter, generating 14 V output. RV1 adjusts the over-voltage protection level.
Refer to "7.2.8" of the instruction manual for information about adjustment.

Chapter 5 Maintenance and Inspection

5.1 Self Test for Maintenance

Procedure

DSC MENU Display
↓ (▼)/(▲)
15.SELF TEST FOR MAINTENANCE
↓ (ENTER)
SELF TEST FOR MAINTENANCE Display
1.SPACE SIGNAL TRANSMISSION
Transmits space signals for two minutes.
2.MARK SIGNAL TRANSMISSION
Transmits mark signals for two minutes.
3.DOT PATTERN TRANSMISSION
Transmits dot patterns for two minutes.
4.CARRIER TRANSMISSION
Transmits non-modulated carrier for two minutes.
↓ (▼)/(▲), (ENTER)
The selected test is carried out.
↓ (STOP) Termination

NOTE 1: When measuring the frequency of space and mark signals, connect a frequency counter to TP4 of the control unit (CDJ-1490) using an oscilloscope probe.
TP4 is located next to the flat-cable J6 on the bottom of the control unit.

NOTE 2: When measuring the frequency of dot patterns for DSC baud rate confirmation, connect a frequency counter to TP1 of the control unit using an oscilloscope probe.
TP1 is located next to the connector J13, which is at the top of the control unit.
600.000 Hz corresponds to the 1200 baud rate.

NOTE 3: Use non-modulated carrier transmission mode to measure the S/N ratio for dot pattern transmission mode.

NOTE 4: Each transmitting mode is automatically terminated in two minutes so that the unit does not remain in transmission mode.

5.2 Standard Voltage Table of Semiconductors

● Transistors, FETs

Unit name	Transistor		B (G)	C (D)	E (S)	Remarks
CMN-383	TR1	2SA1235-T12 1F	5	0	5	With PLL locked (IC5-7:5V)
Radio unit	TR2	2SC3052-T12 1G	0	5	0	With PLL locked (IC5-7:5V)
	TR3	2SA1235-T12 1F	5	0	5	With PLL locked (IC19-7:5V)
	TR4	2SC3052-T12 1G	0	5	0	With PLL locked (IC19-7:5V)
	TR5	2SC3052-T12 1G	8	8	7.3	
	TR6	2SK1577-T7	7.9	0	2.3	
	TR7	2SC2407A	–	7.8	0.7	During transmission
	TR8	2SC2053	–	14	0	During transmission
	TR9	2SC3052-T1 1G	0.8	0	0	During transmission
	TR10	2SA1020-Y-TPE6	13.4	14	14	During transmission
	TR11	2SA1235-T12 1F	7.4 7.4	–0.2 1.7	8 8	During 1W transmission During 25W transmission
	TR12	2SC3052-T12 1G	0.9 1.1	7.3 7.3	0.2 0.4	During 1W transmission During 25W transmission
	TR13	2SA1307-Y	13.5	14	14	
	TR14	2SA1366-T12 1F	7.3	8	8	During transmission
	TR15	2SA1366-T12 1F	7.3	8	8	
	TR16	2SA1366-T12 1F	7.3	8	8	
	TR17	2SA1366-T12 1F	8	8	7.3	
	TR18	2SK1577-T7	0	7.8	2.6	
	TR19	2SK1577-T7	0	7.6	2.6	
	TR20	2SK1577-T7	0	7.6	2.4	
	TR21	2SK1577-T7	0	7.1	2.2	
	TR22	2SK1577-T7	0	7.6	2.3	
	TR23	2SC3052-T12 1G	8	8	7.3	
	TR24	2SK1577-T7	0	7.7	2.7	
	TR25	2SA1235-T12 1F	5	0	5	With PLL locked (IC18-7:5V)
	TR26	2SC3052-T12 1G	0	5	0	With PLL locked (IC18-7:5V)
	TR27	2SC3052-T12 1G	2.5	7.7	1.9	
	TR28	UN5211-TX	7.3	0	0	

Unit name	Transistor		B (G)	C (D)	E (S)	Remarks
CDJ-1490 Control unit	TR1	DTA143	0	5	5	When LCD and keyboard backlighting is set to maximum.
	TR2	2SD1005	5	0	0	Same as above.
	TR3	DTC114	5	–	–	
	TR4	2SD1020	13.2	14	14	
	TR5	2SD1001	0.8	0	0	
	TR6	2SD1001	0.8	–	0	When remote controller (NCH-414) is not interfaced with UART.
	TR7	DTC114	0	8	0	When AFSK-MODEM.IC TX-A is selected for AFSK-MODEM.IC input.
	TR8	DTC114	0	8	0	When the main receiver is selected for AFSK-MODEM.IC input.
	TR9	DTC114	0	8	0	When DSC receiver is selected for AFSK-MODEM.IC input.
	TR10	DTC114	5	–	0	During $\overline{\text{PTT}}$ signal output to the guard receiver.
	TR11	DTC114	5	–	0	During DMC $\overline{\text{RDY}}$ signal output.
	TR12	DTC114	5	–	0	During DMC $\overline{\text{DRA}}$ signal output.
	TR13	DTC114	5	–	0	During DMC $\overline{\text{DAL}}$ signal output.
	TR14	DTC114	5	–	0	During DMC $\overline{\text{PTT}}$ signal output.
	TR15	DTC114	5	–	0	During $\overline{\text{ST}}$ signal output to the duplexer.
	TR16	DTC114	5	–	0	During $\overline{\text{DUP}}$ signal output to the duplexer.
	TR17	DTC114	5	–	0	During $\overline{\text{DLT}}$ signal output to the duplexer.
	TR18	DTC114	5	–	0	During $\overline{\text{ON}}$ signal output to DSC receiver.
	TR19	DTC114	5	–	0	During $\overline{\text{ON}}$ signal output to the main receiver.
	TR20	2SK160	4	4	4	When EXT.SP of the main receiver is ON.
	TR21	2SK160	4	4	4	When output from the main receiver to the panel speaker is ON.
	TR22	2SK160	4	4	4	When output from the main receiver to the handset receiver is ON.
	TR23	2SK160	4	4	4	When output from the handset microphone to EXT.SP is ON.
	TR24	2SK160	4	4	4	When output from the handset microphone to the panel speaker is ON.
	TR25	2SD1001	–	–	0	
	TR26	2SD1001	–	–	0	
	TR27	2SK160	4	4	4	
	TR29	2SA1020	–	–	5	

Unit name	Transistor		B	C	D	Conditions
CQD-1250 Terminal board	TR1	2SB1193	29.4	30.0	30.7	Input voltage 100V or 200VAC (during standby for reception).
	TR2	RN1202-TPE4	15.0	0.1	0	
	TR3	2SB947A-P	0.1	0.5	0.1	
	TR4	RN1224-TPE4	0.1	0.1	0	
	TR1	2SB1193	25.4	26.1	27.0	Input voltage 100V or 200VAC (during transmission).
	TR2	RN1202-TPE4	13.2	0	0	
	TR3	2SB947A-P	0.1	0.5	0.1	
	TR4	RN1224-TPE4	0.1	0.1	0	
	TR1	2SB1193	0.4	0.8	0.4	Input voltage 24VDC (during standby for reception).
	TR2	RN1224-TPE4	0.1	0.2	0	
	TR3	2SB947A-P	23.2	23.9	24.0	
	TR4	RN1224-TPE4	12.8	0.07	0	
	TR1	2SB1193	0.3	0.7	0.3	Input voltage 24VDC (during transmission).
	TR2	RN1224-TPE4	0.1	0.2	0	
	TR3	2SB947A-P	23.2	23.9	24.0	
	TR4	RN1224-TPE4	12.5	0.1	0	

Unit name	Transistor		B (G)	C (D)	E (S)	Remarks
CDJ-1489 Control unit	TR1	DTA143	–	–	5	
	TR2	2SD1005	–	–	0	
	TR3	2SA1020	13.8	14	14	
	TR4	2SD1001	0.8	13.8	0	
	TR5	DTC114	–	–	0	
	TR6	DTC114	–	–	0	
	TR7	DTC114	–	–	0	
	TR8	2SD1001	–	–	0	
	TR9	2SK160	4	–	–	
	TR10	2SK160	4	–	–	
	TR11	2SK160	4	–	–	
	TR12	2SK160	4	–	–	
	TR13	2SK160	4	–	–	
	TR14	2SD1001	–	–	0	
	TR15	2SA1020	–	–	5	

Unit name	Transistor		B	C	D	Conditions
CQD-1249 Terminal board	TR1	2SB1193	26.8	26.1	27.5	Input voltage 100V or 200VAC.
	TR2	RN1202-TPE4	0	2.7	0	
	TR3	2SB947A-P	0.1	0.5	0.1	
	TR4	RN1224-TPE4	0.05	0.1	0	
	TR5	2SA1020-Y-TPE6	13.3	14.0	14.0	
	TR1	2SB1193	0.6	1.0	0.6	Input voltage 24VDC.
	TR2	RN1202-TPE4	4.6	0	0	
	TR3	2SB947A-P	23.2	24.0	24.0	
	TR4	RN1224-TPE4	5.1	0.1	0	
	TR5	2SA1020-Y-TPE6	13.3	14.0	14.0	

Unit name	Transistor		B	C	D	Conditions
CQD-1292 Terminal board	TR1	2SB1193	26.8	26.1	27.5	Input voltage 100V or 200VAC.
	TR2	RN1202-TPE4	0	2.7	0	
	TR3	2SB947A-P	0.1	0.5	0.1	
	TR4	RN1224-TPE4	0.05	0.1	0	
	TR1	2SB1193	0.6	1.0	0.6	Input voltage 24VDC.
	TR2	RN1202-TPE4	4.6	0	0	
	TR3	2SB947A-P	23.2	24.0	24.0	
	TR4	RN1224-TPE4	5.1	0.1	0	

● IC

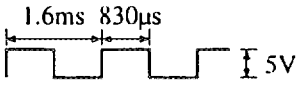
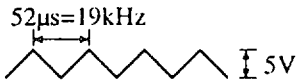
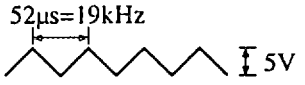
Unit name	IC	Pin number															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CMN-383	HC1 42P00192	2.8	–	0	7.6	–	0										
Radio unit	HC2 42P00192	2.4	–	0	7.6	–	0										
	IC1 LPF-4K	–	0	8	0	–											
	IC2 uPC7805	14	0	5													
	IC3 uPC7805	14	0	5													
	IC4 NJM78L05	8	0	5													
	IC5 MB1504PF	–	–	8	5	2.3	0	5	–	–	–	–	–	–	–	–	–
	IC6 uPC1656C	–	0	0	0	–	7.7	7.7	0	(when transmitting)							
	IC7 M57710A	–	14	14	–	(when transmitting)											
	IC8 NJM3404	0	0	0	0	4	1	7.3	8	(during standby for reception)							
		0.9	0.5	0.5	0	4	1	7.3	8	(when 1 W transmitting)							
		0.9	3	3	0	4	1	7.3	8	(when 25 W transmitting)							
	IC9 uPC7808	14	0	8													
	IC10 uPC7808	14	0	8													
	IC11 uPC1656C	–	0	0	0	–	7.5	7.5	0	(when transmitting)							
	IC12 M3372M	–	–	–	8	–	–	–	–	–	–	–	0	–	0	0	–
	IC13 NJM3404	–	–	–	0	4	–	–	8								
	IC14 M3372M	–	–	–	8	–	–	–	–	–	–	–	0	–	0	0	–
	IC15 NJM3404	–	–	4	0	4	–	–	8								
	IC16 uPC1656C	–	0	0	0	–	7.5	7.5	0								
	IC17 NJM78L05	8	0	5													
	IC18 MB1504PF	–	–	8	5	3.4	0	5	–	–	–	–	–	–	–	–	–
	IC19 MB1504PF	–	–	8	5	3	0	5	–	–	–	–	–	–	–	–	–
	IC20 NJM78L05	8	0	5													
	VC01 43P00406	–	0	0	–	6.5	0	0	2.3								
	VC02 43P00407	–	0	0	–	6.3	0	0	3								
	VC03 43P00408	3.4	5.8	–													
	XU1 NX0-2C	0	–	5	–	0											

Unit name	IC		1	2	3	4	5	Conditions
CQD-1250	IC1	M51958BL	15.1	1.7	0	1.3	0.1	Input voltage 100V or 200VAC
Terminal	IC3	μPC78L05J-T1	14	0	5	–	–	(during standby for reception)
board	IC1	M51958BL	15.1	1.7	0	1.3	0.1	Input voltage 100V or 200VAC
	IC3	μPC78L05J-T1	14	0	5	–	–	(during transmission)
	IC1	M51958BL	0.3	0	0	0	0	Input voltage 24VDC
	IC3	μPC78L05J-T1	14	0	5	–	–	(during standby for reception)
	IC1	M51958BL	0	0	0	0	0	Input voltage 24VDC
	IC3	μPC78L05J-T1	14	0	5	–	–	(during transmission)

Unit name	IC		1	2	3	4	5	Conditions
CQD-1249	IC1	M51958BL	15.1	1.7	0	1.2	0.1	Input voltage 100V or 200VAC
Terminal	IC2	M5231L	27.0	1.4	2.6	1.8	0	
board	IC3	μPC78L05J-T1	14.0	0	5.0	–	–	
	IC1	M51958BL	0.5	0	0	0.5	0	Input voltage 24VDC
	IC2	M5231L	0.5	0	0	0.7	0	
	IC3	μPC78L05J-T1	14.0	0	5.0	–	–	

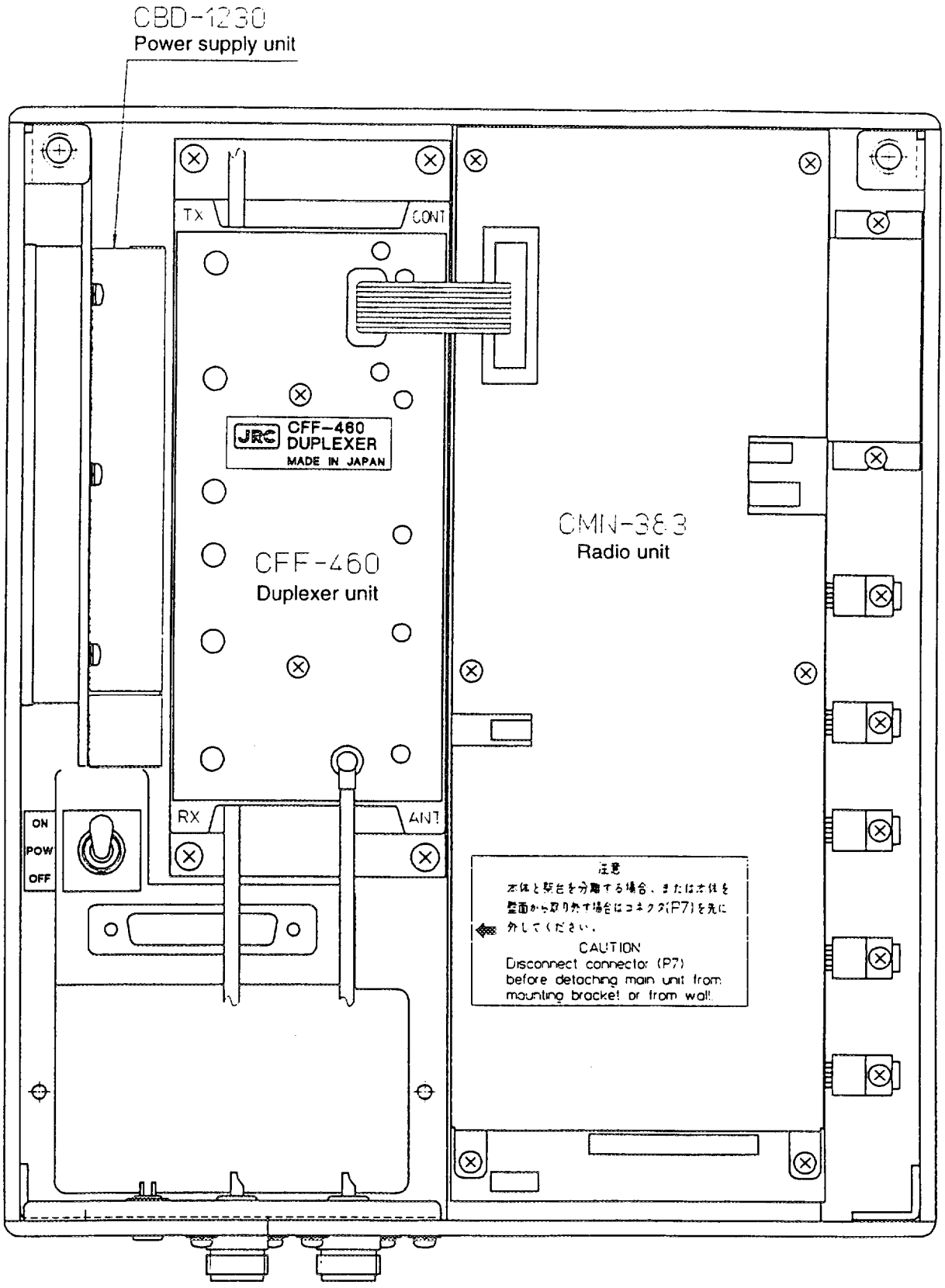
Unit name	IC		1	2	3	4	5	Conditions
CQD-1292	IC1	M51958BL	15.1	1.7	0	1.2	0.1	Input voltage 100V or 200VAC
Terminal	IC2	M5231L	27.0	1.4	2.6	1.8	0	
board	IC1	M51958BL	0.5	0	0	0.5	0	Input voltage 24VDC
	IC2	M5231L	0.5	0	0	0.7	0	

5.3 Voltage and Wave Form at Test Point

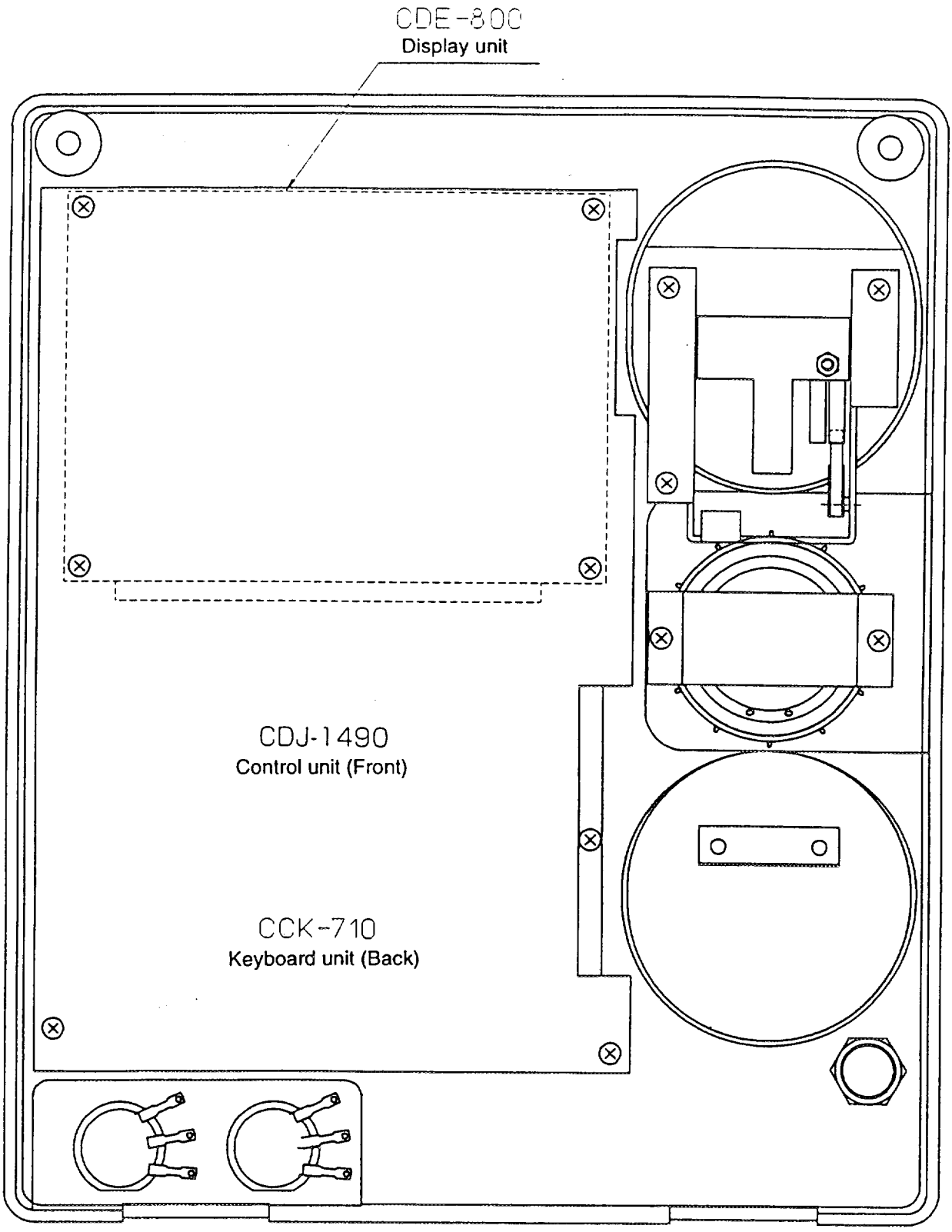
Unit name	Test point	Voltage AC(V) or wave form (oscilloscope)	Remarks
CDJ-1490 Control unit	TP1		In DSC dot pattern transmission mode
	TP2		Microphone input: –53dBm with modulated frequency of 1 kHz balanced.
	TP3		
	TP4		Microphone input: –53dBm with modulated frequency of 1 kHz balanced.
	TP5		Received RF signal: 1 kHz, Δf=3kHz
	TP6		Received RF signal: 1 kHz, Δf=3kHz
	TP7		Received RF signal: 1 kHz, Δf=3kHz
	TP9		Received RF signal: 1 kHz, Δf=3kHz
CDJ-1489 Control unit	TP1		Microphone input: –53dBm with modulated frequency of 1 kHz balanced.
	TP2		
	TP3		Received RF signal: 1 kHz, Δf=3kHz
	TP4		Received RF signal: 1 kHz, Δf=3kHz
	TP5		Received RF signal: 1 kHz, Δf=3kHz

5.4 Main Unit (JHS-32A) Parts Layout and Adjustment

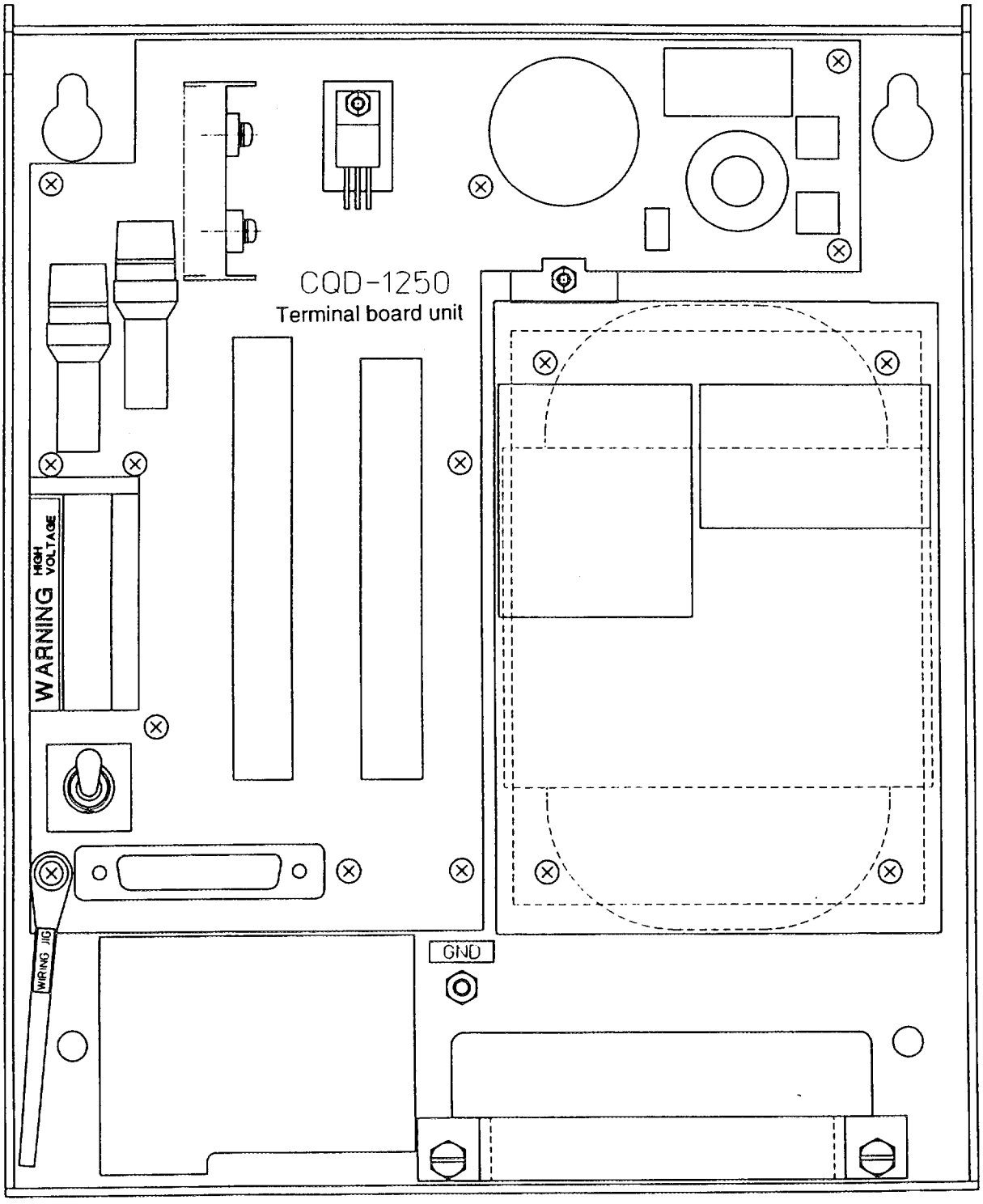
● Unit Layout



Inside of Case of Main Unit

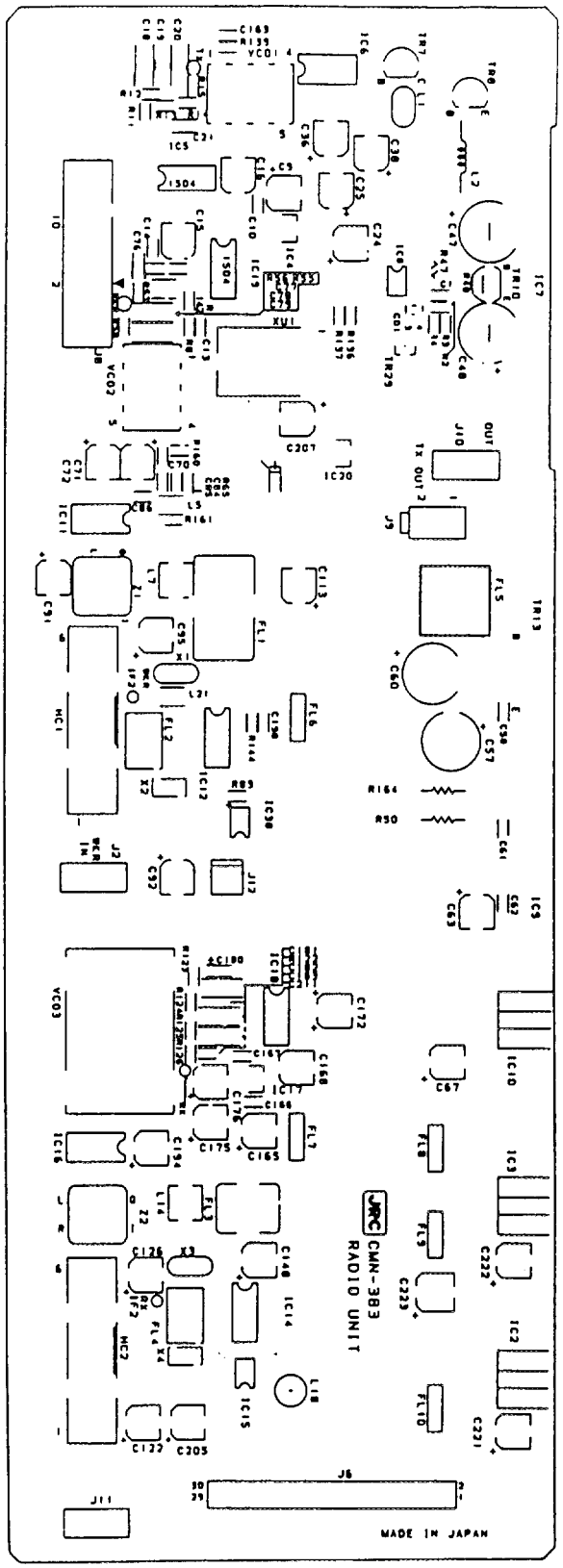

CDE-800
Display unit
CDJ-1490
Control unit (Front)
CCK-710
Keyboard unit (Back)

Back Panel

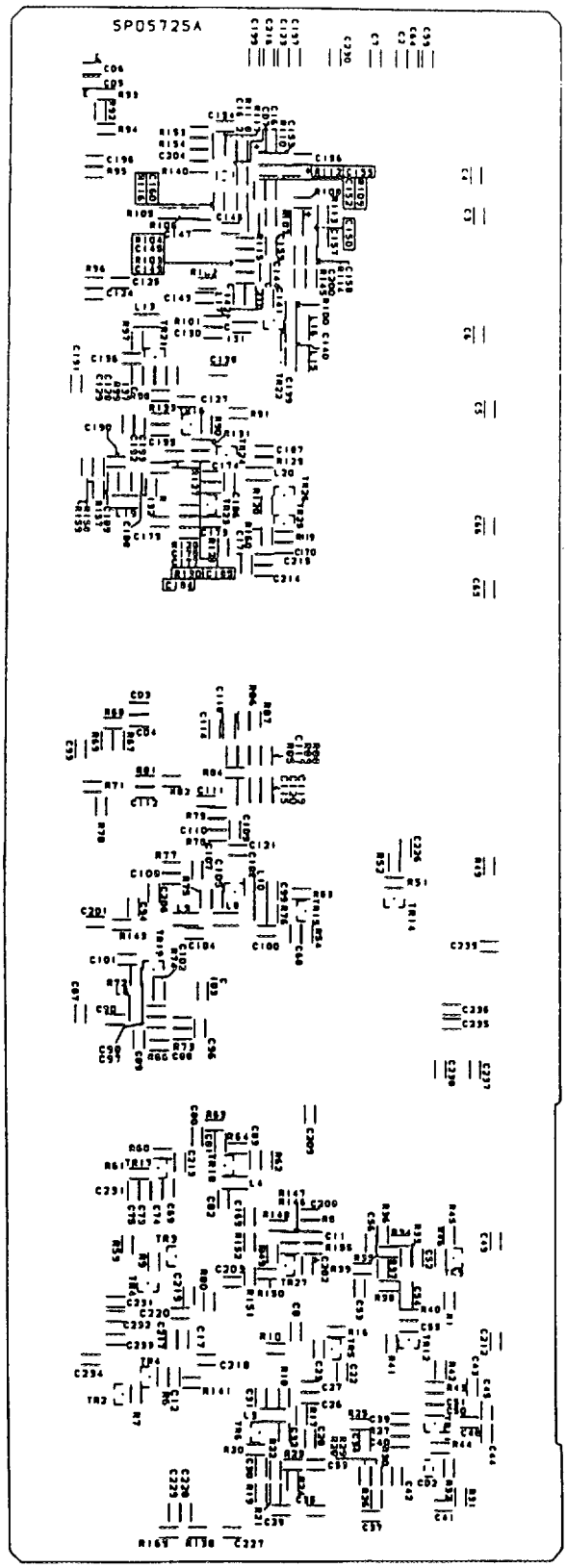


Terminal Board

Radio Unit (CMN-383) Parts Layout

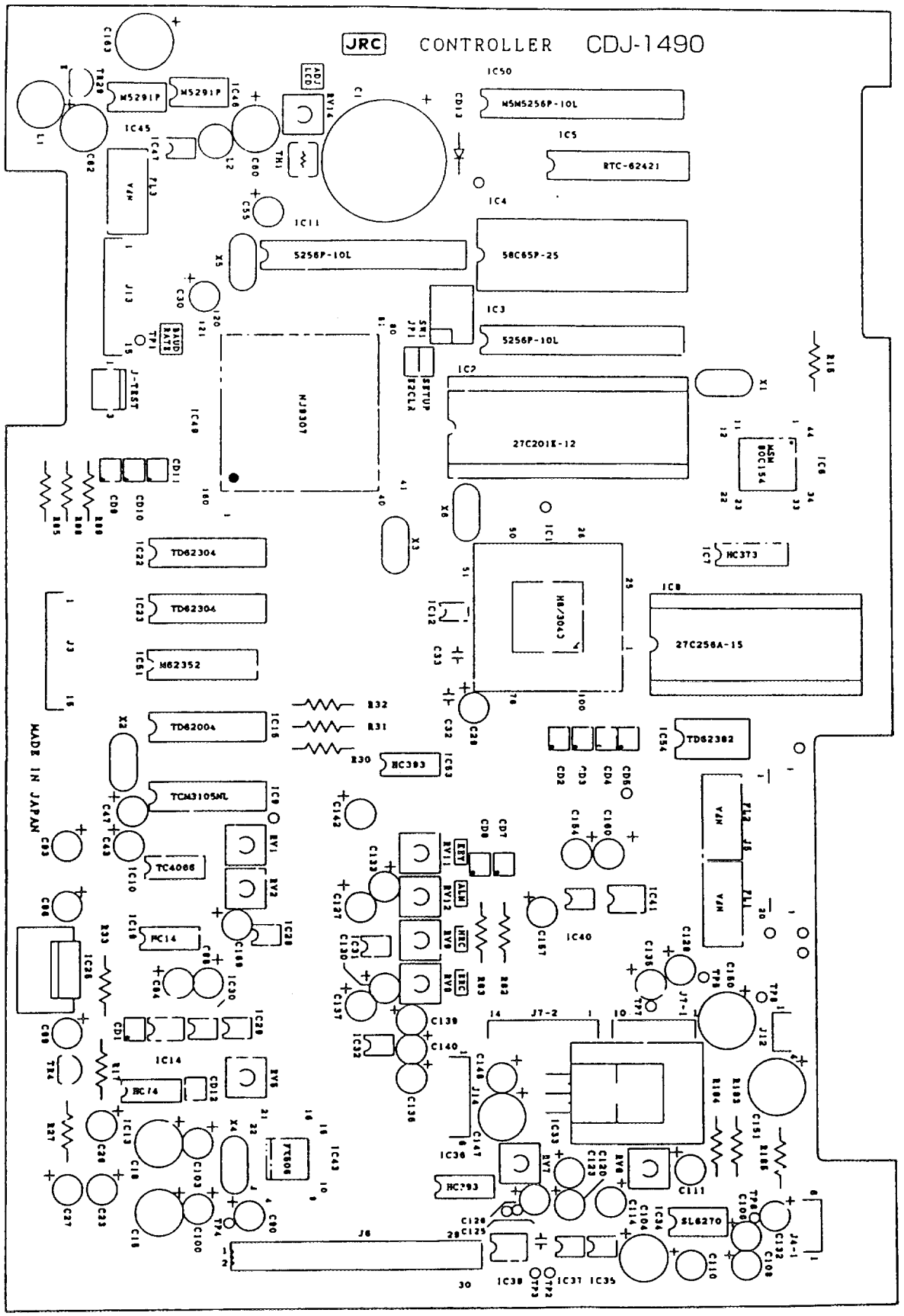


Front

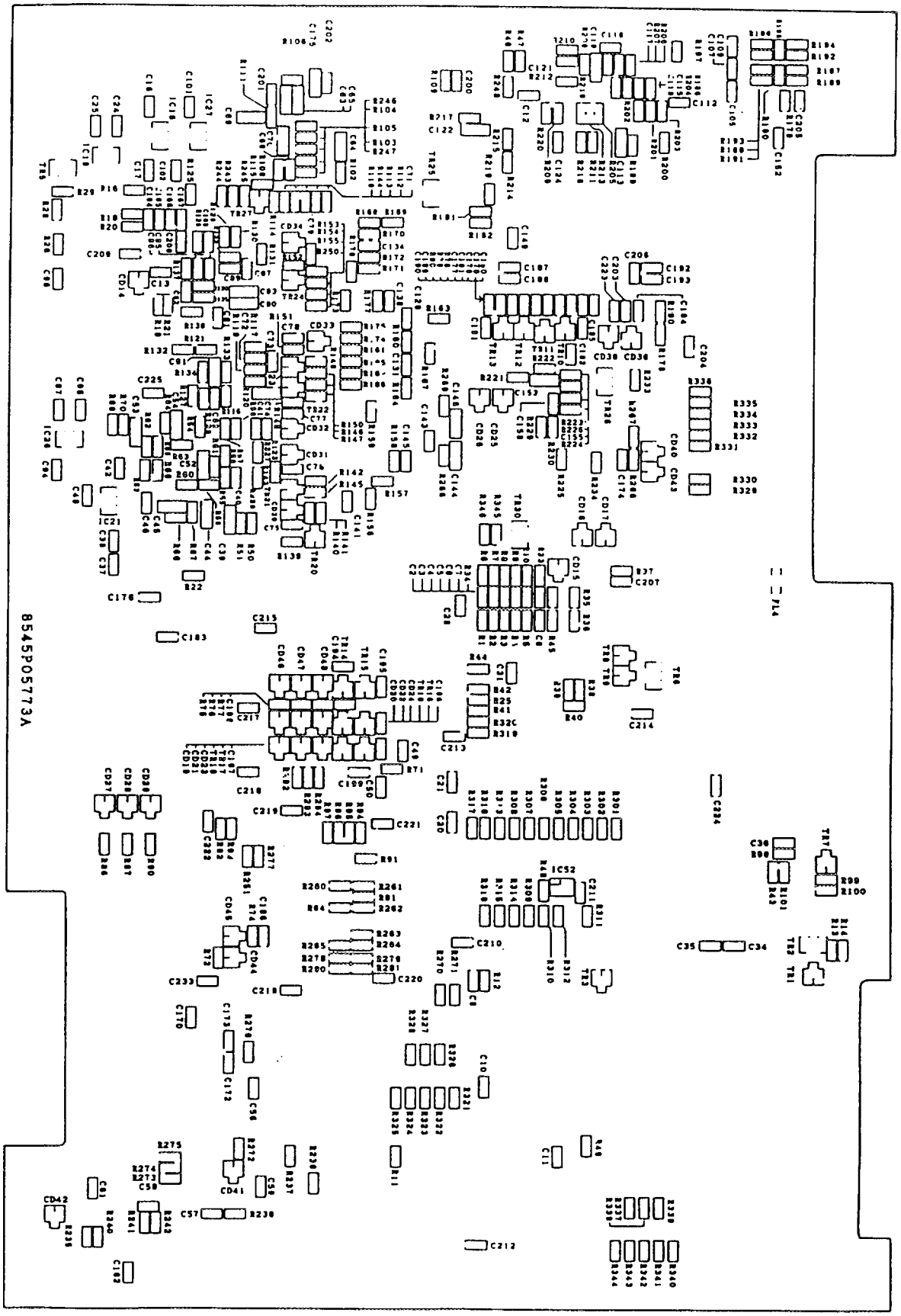


Back

Control Unit (CDJ-1490) Parts Layout



Front



Back

● Adjustment of Control Unit (CDJ-1490)

⚠ CAUTION

Do not perform adjustment without appropriate measuring instruments. Doing so may cause malfunction of the unit.

• Adjusting the microphone level

Input a balanced 1 kHz signal of -53dBm to the microphone line of the handset. Adjust RV6 so that a sine wave of 130mVp-p is output from pin No. 8 of IC34 (SL6270).

• Adjusting the control wave for PWM

Adjust RV7 so that the control wave of 5Vp-p is output to pin No.7 of IC37. The control wave has a frequency of about 19 kHz.

• Transmission AF level

Input a balanced 1 kHz signal of -53dBm to the microphone line of the handset. Adjust RV5 so that the voltage of pin No.1 of IC29 is 1.46Vp-p.

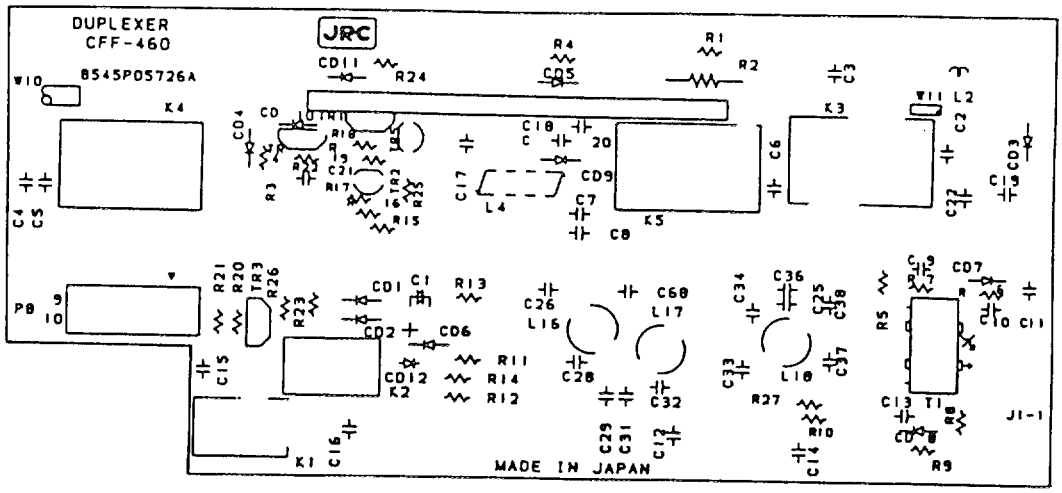
• Adjusting key click volume

Press any keys to output click tone. Adjust RV11 so that the speaker output is about 0.1 W.

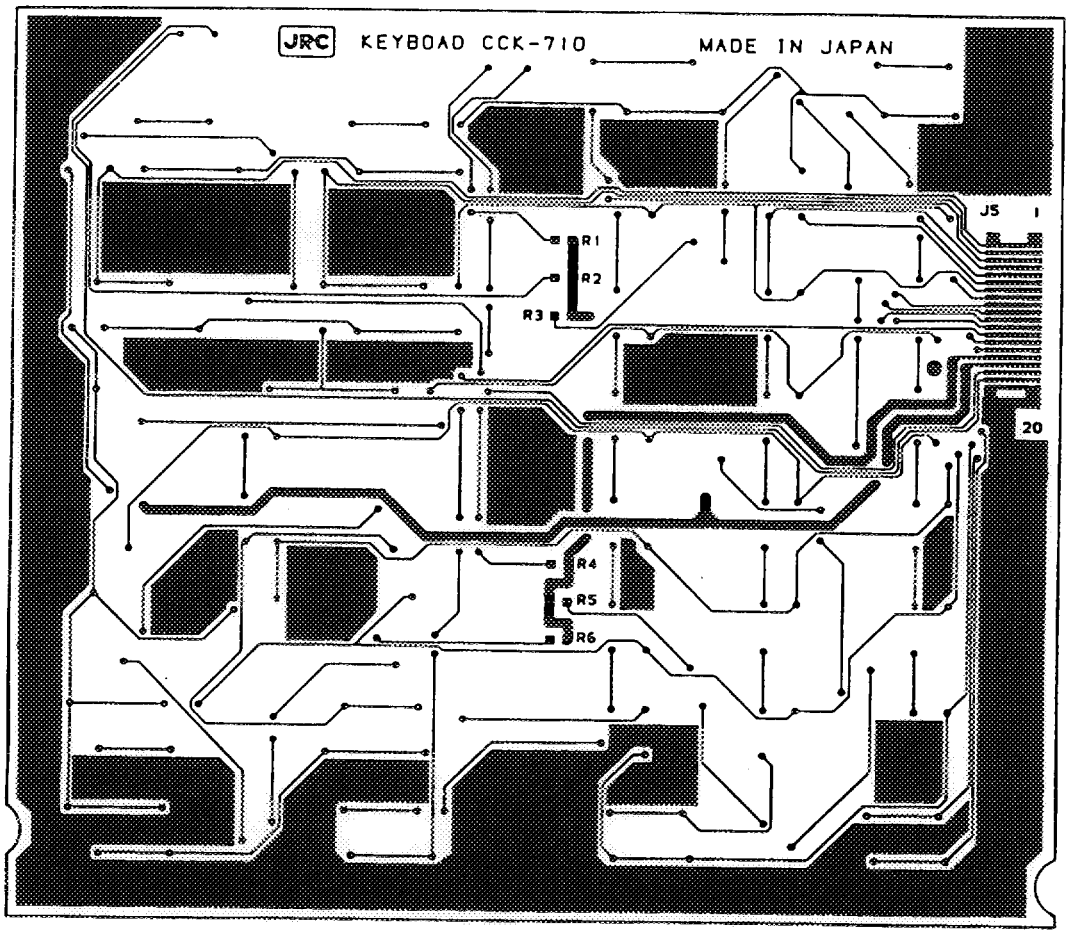
• Adjusting the handset receiver output level

Connect SG to the antenna terminal of the main unit, then input an RF signal with 1 kHz modulation at Δf = 3kHz. Connect the handset to the main unit (JHS-32A) and adjust RV9 so that the output voltage from pin No.7 of IC31 is about 1.3Vp-p.

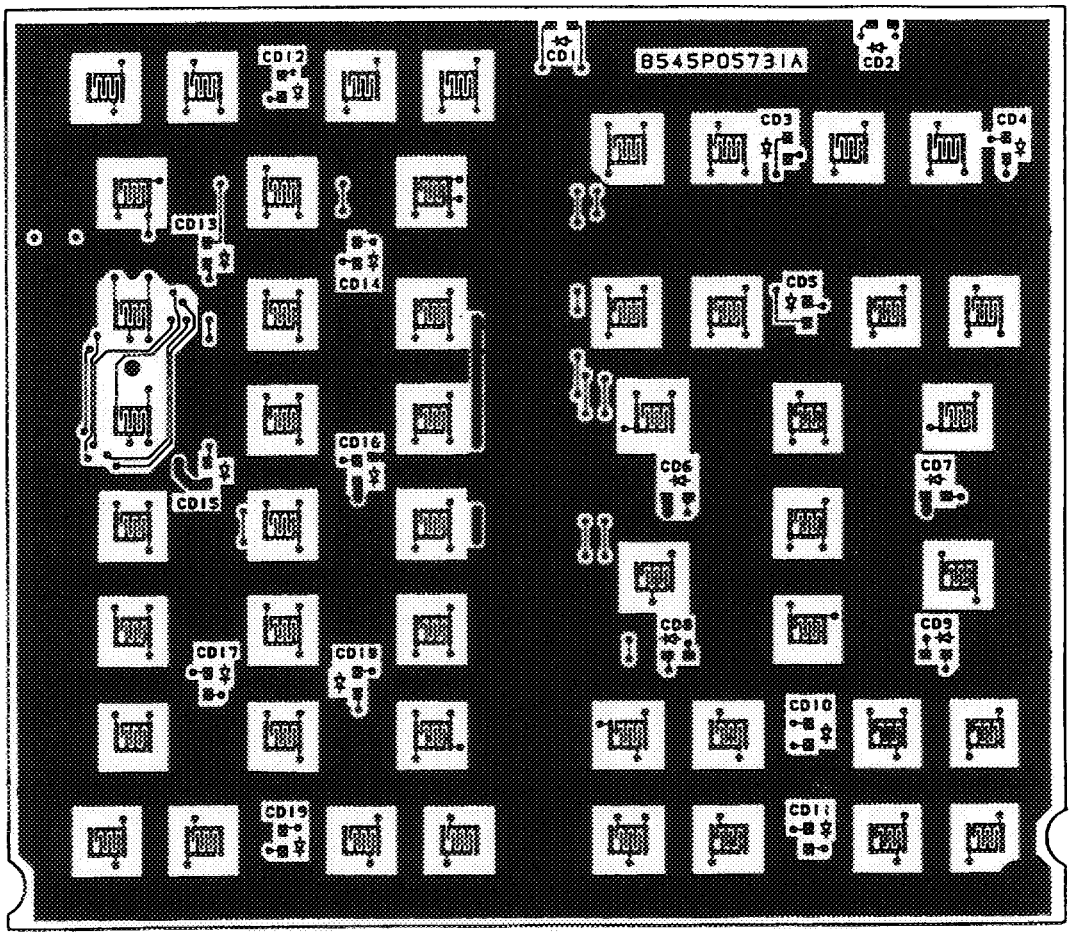
● Duplexer Unit (CFF-460) Parts Layout



● Keyboard Unit (CCK-710) Parts Layout

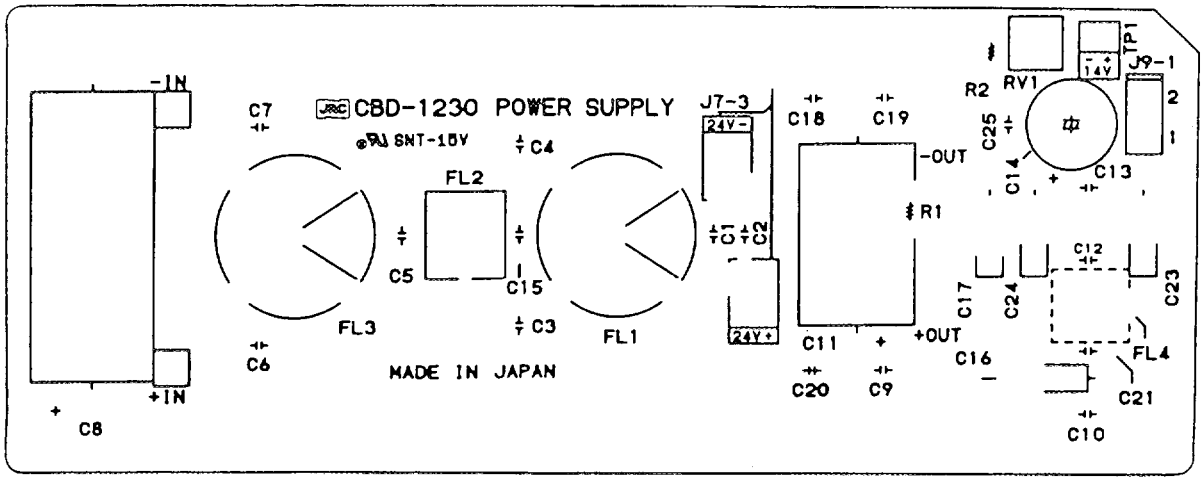


(Front)


B545P0573 1A
CD1
CD2
CD3
CD4
CD5
CD6
CD7
CD8
CD9
CD10
CD11
CD12
CD13
CD14
CD15
CD16
CD17
CD18
CD19

(Back)

● Power Supply Unit (CBD-1230) Parts Layout



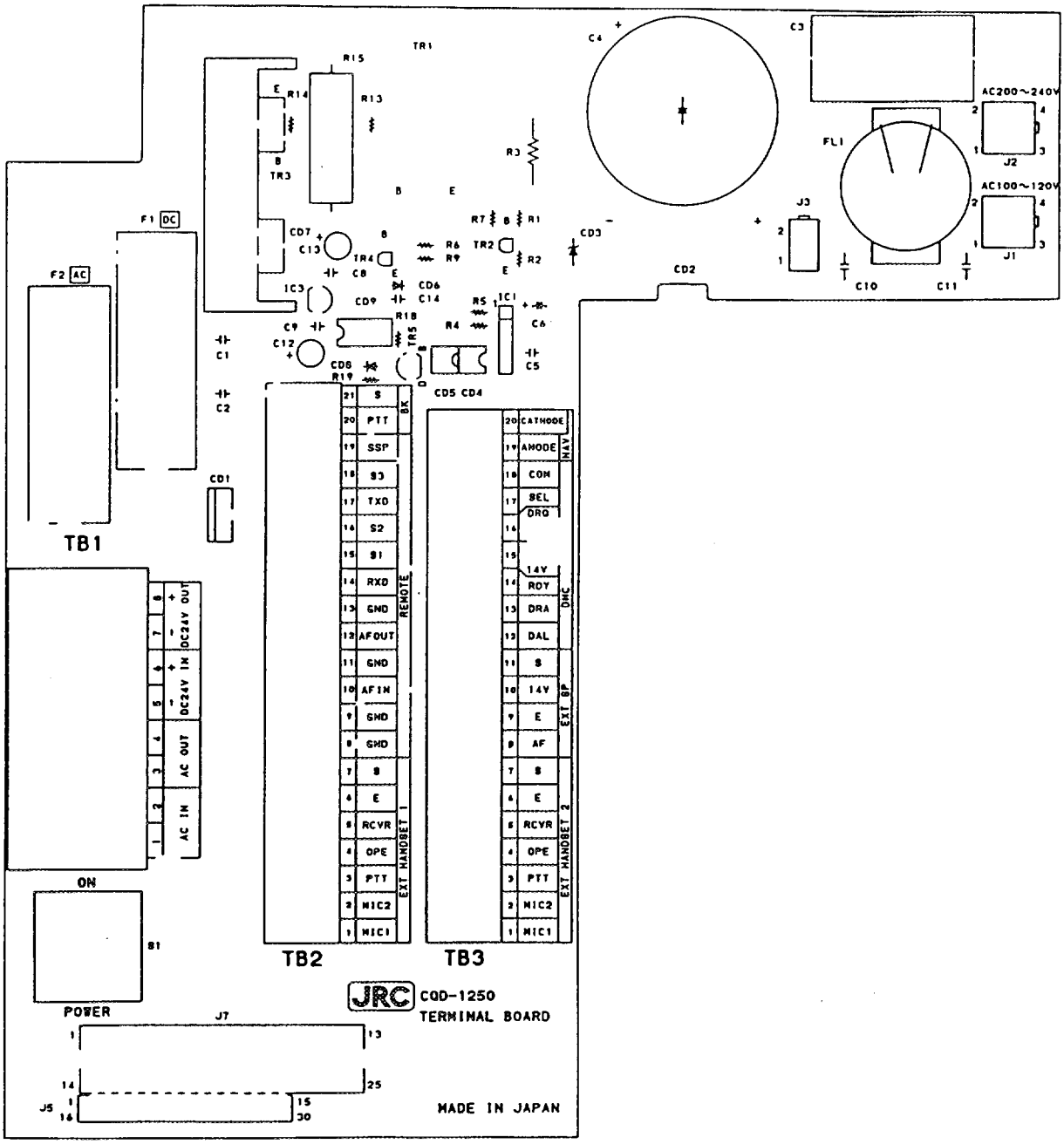
● Power Supply Unit (CBD-1230) Adjustment

Adjust the output voltage to 14V at RV1, and measure it at TP1.

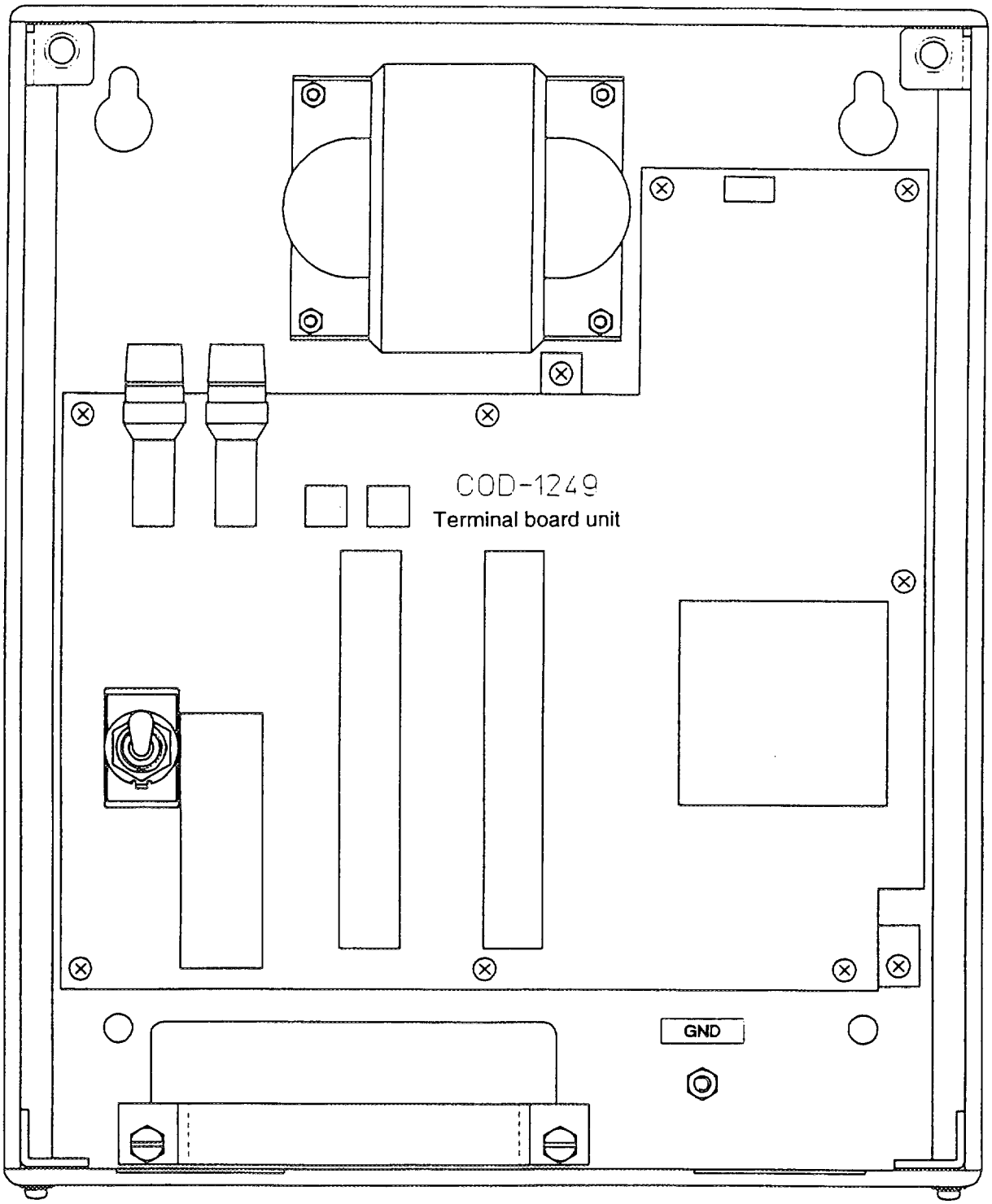
⚠ CAUTION

Do not perform adjustment without the appropriate measuring instruments. Doing so may cause malfunction of the unit.

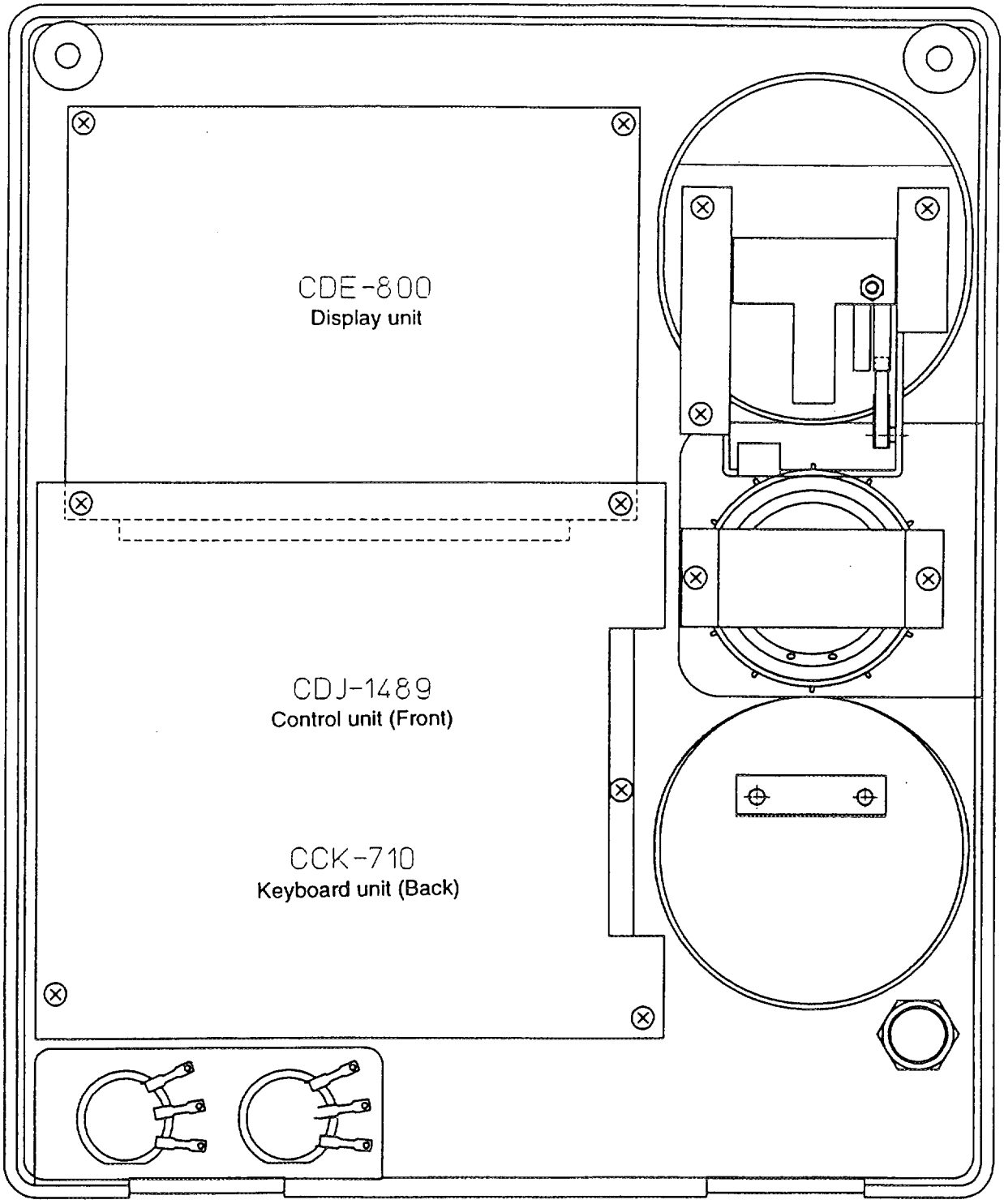
● Terminal Board Unit (CQD-1250) Part Layout



5.5 Remote Controller (NCH-414) Parts Layout and Adjustment

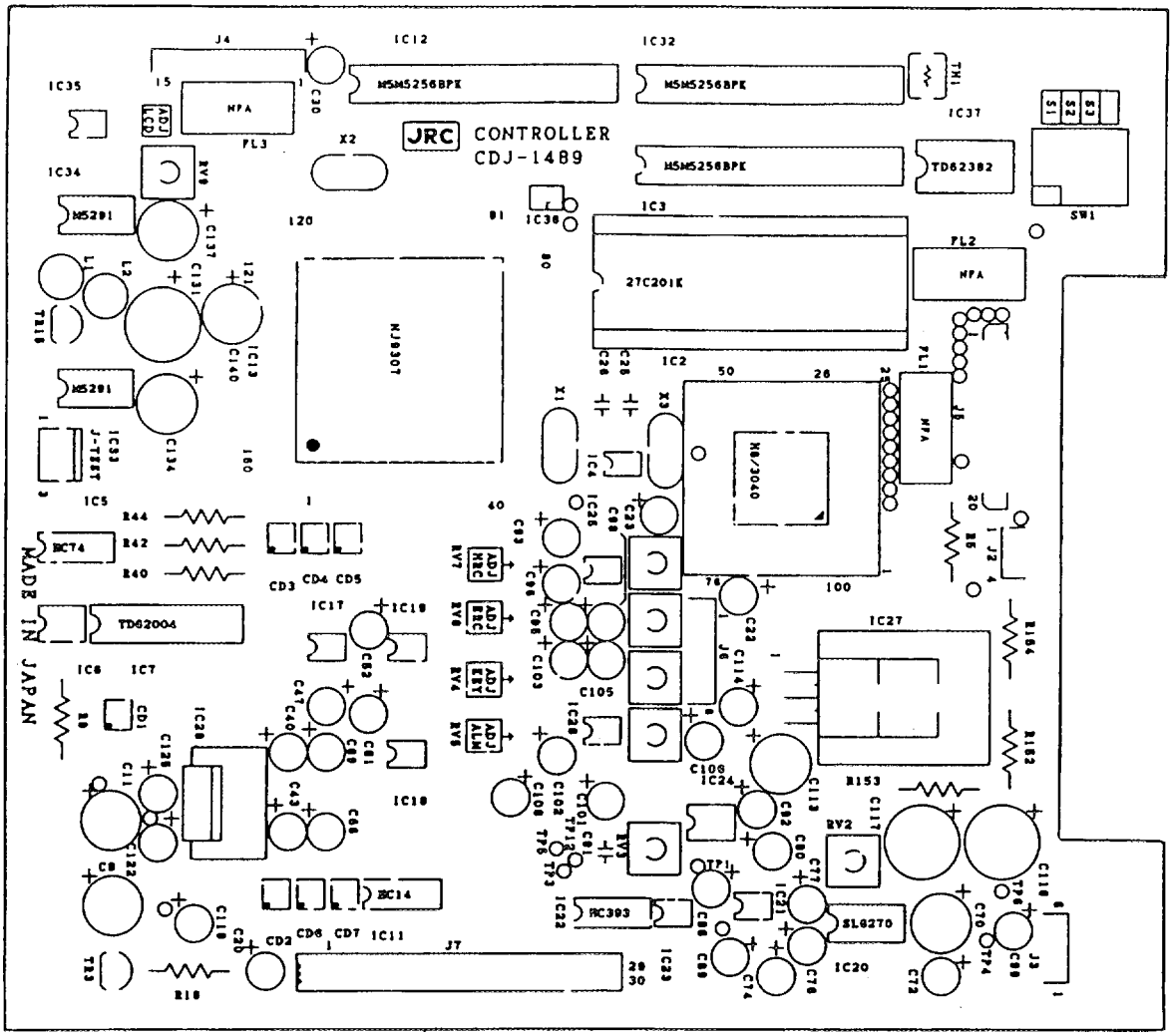


Inside the Case

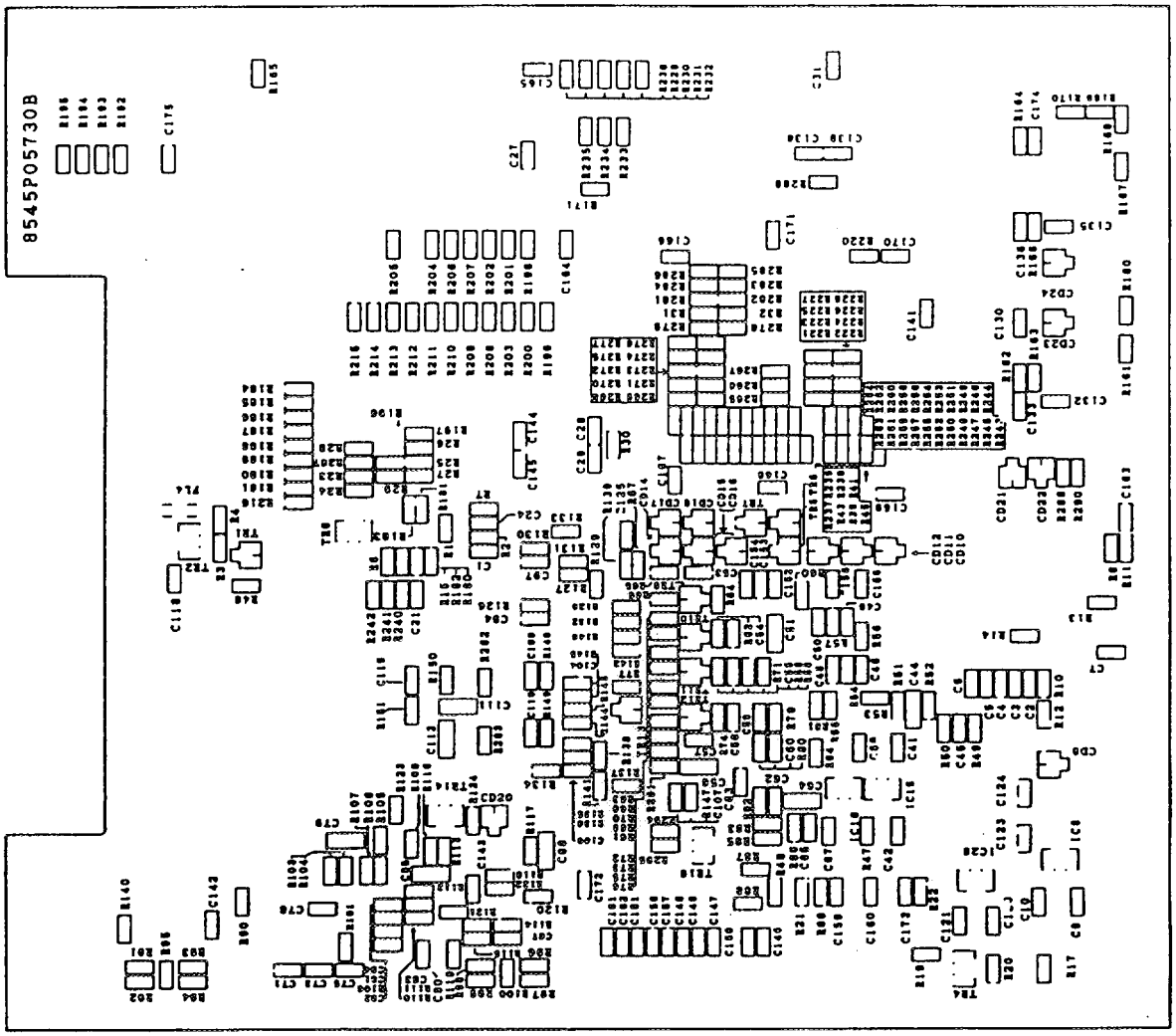

CDE-800
Display unit
CDJ-1489
Control unit (Front)
CCK-710
Keyboard unit (Back)

Back Panel

● Control Unit (CDJ-1489) Parts Layout



(Front)



(Back)

● Adjustment of Control Unit (CDJ-1489)

⚠ CAUTION

Do not perform adjustment without appropriate measuring instruments. Doing so may cause malfunction of the unit.

• Adjusting the microphone level

Input a balanced 1 kHz signal of -53dBm to the microphone line of the handset. Adjust RV2 so that the sine wave of 130mVp-p is output from pin No. 8 of IC20 (SL6270).

• Adjusting the control wave for PWM

Adjust RV3 so that the control wave of 5Vp-p is output to pin No.7 of IC32. The control wave has a frequency of about 19 kHz.

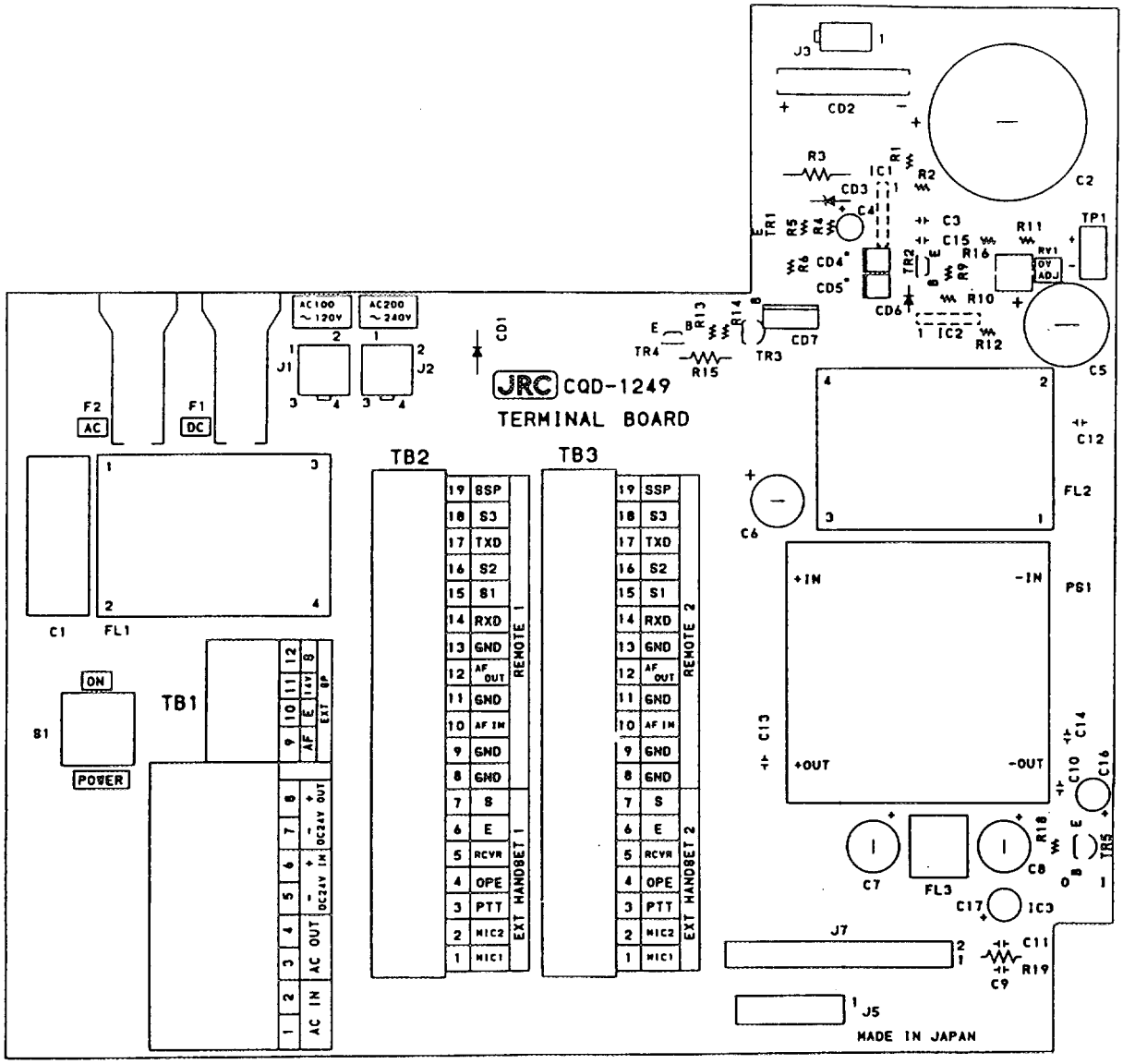
• Adjusting key click volume

Press keys to output click tone. Adjust RV4 so that the speaker output is about 0.1 W.

• Adjusting the handset receiver output level

Connect SG to the antenna terminal of the main unit, then input an RF signal with 1 kHz modulation at Δf = 3kHz. Connect the handset to the NCH-414 Remote controller and adjust RV7 so that the output voltage from pin No.7 of IC25 is about 1.3Vp-p.

❁ Terminal Board Unit (CQD-1249) Parts Layout



❁ Terminal Board Unit (CQD-1249) Adjustment

⚠ CAUTION

Do not perform adjustment without appropriate measuring instruments. Doing so may cause malfunction of the unit.

• Setting the protection trigger level against overvoltage input

(Purpose)

The DC-DC converter (PS1) has an input voltage range of 18V to 36VDC.

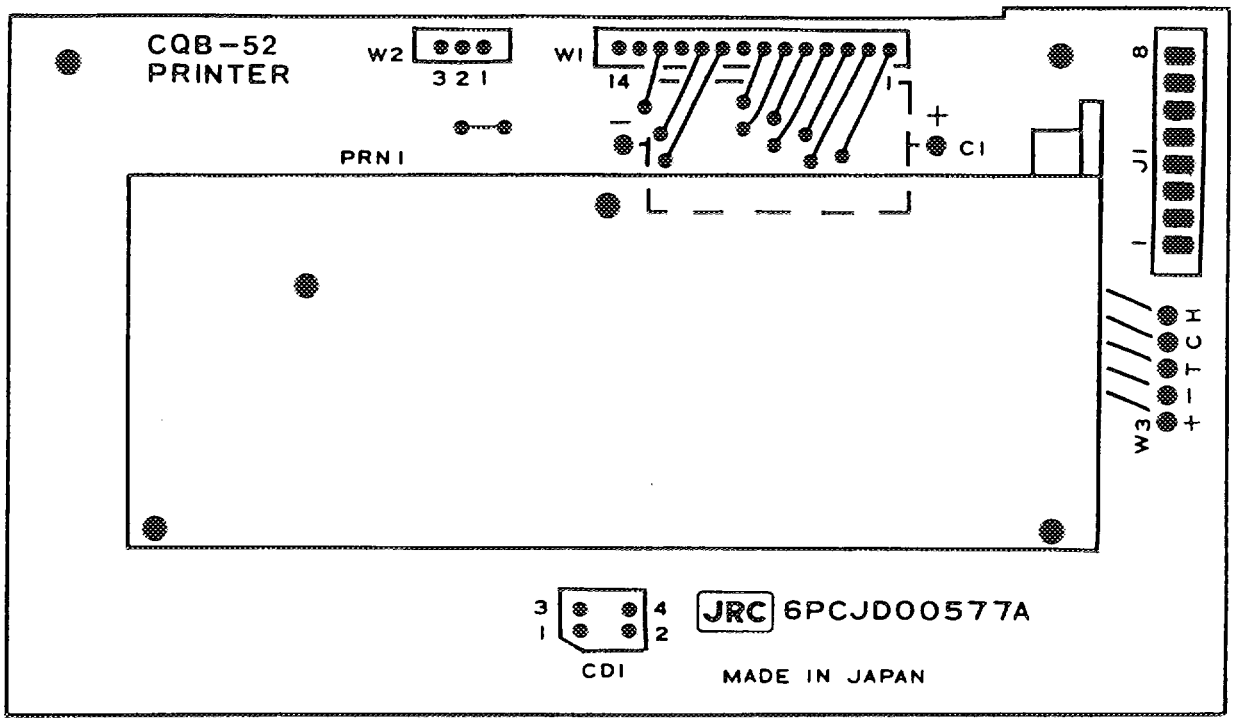
Use RV1 to set PS1 protection trigger level to 34V.

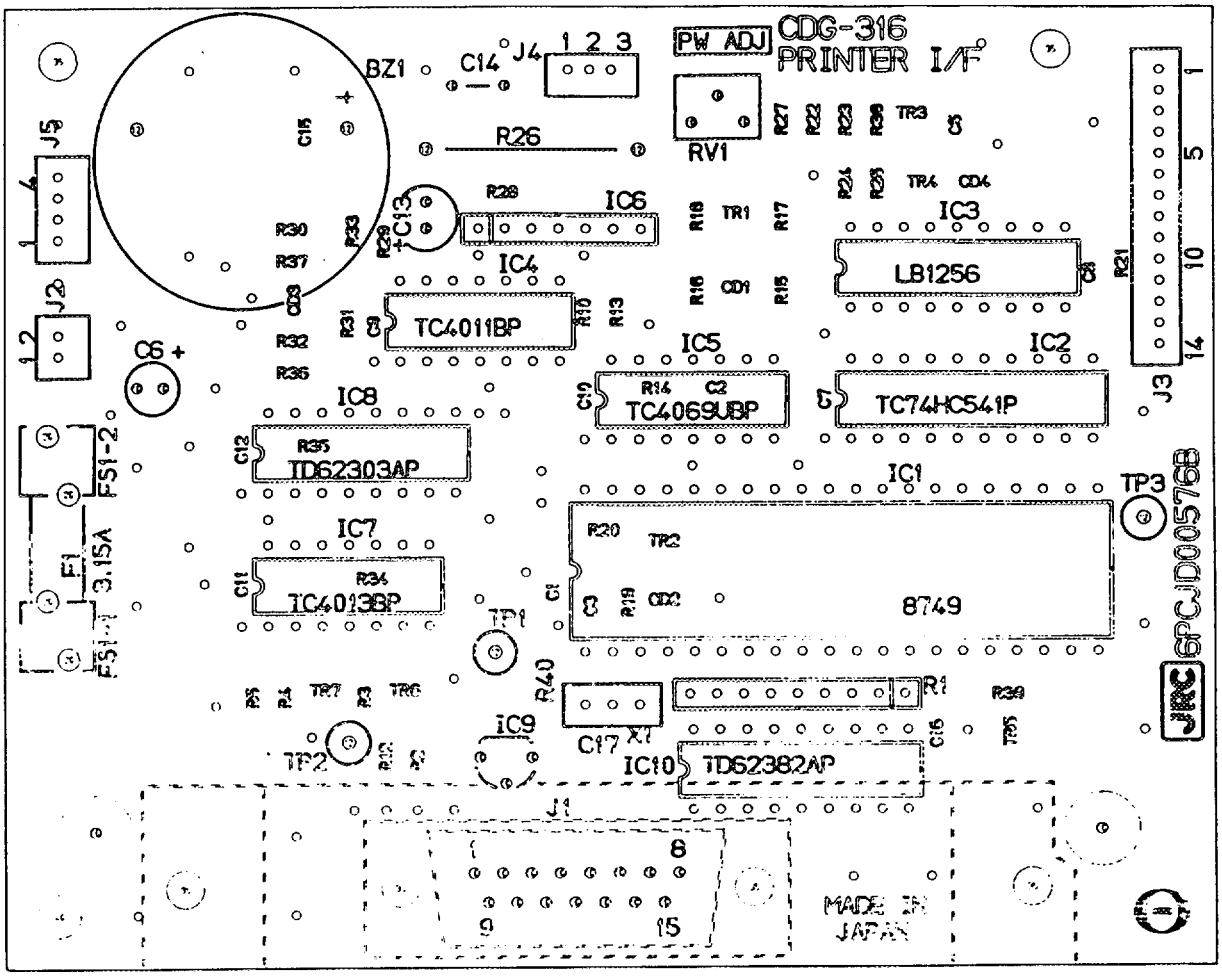
(Method)

In the 100-120VAC system, for example, first adjust RV1 to the minimum level. Apply 120VAC and adjust RV1 so that the cathode voltage of CD7 is 34V.

5.6 Printer (NKG-52) Parts Layout and Adjustment

● Printer (NKG-52) Parts Layout





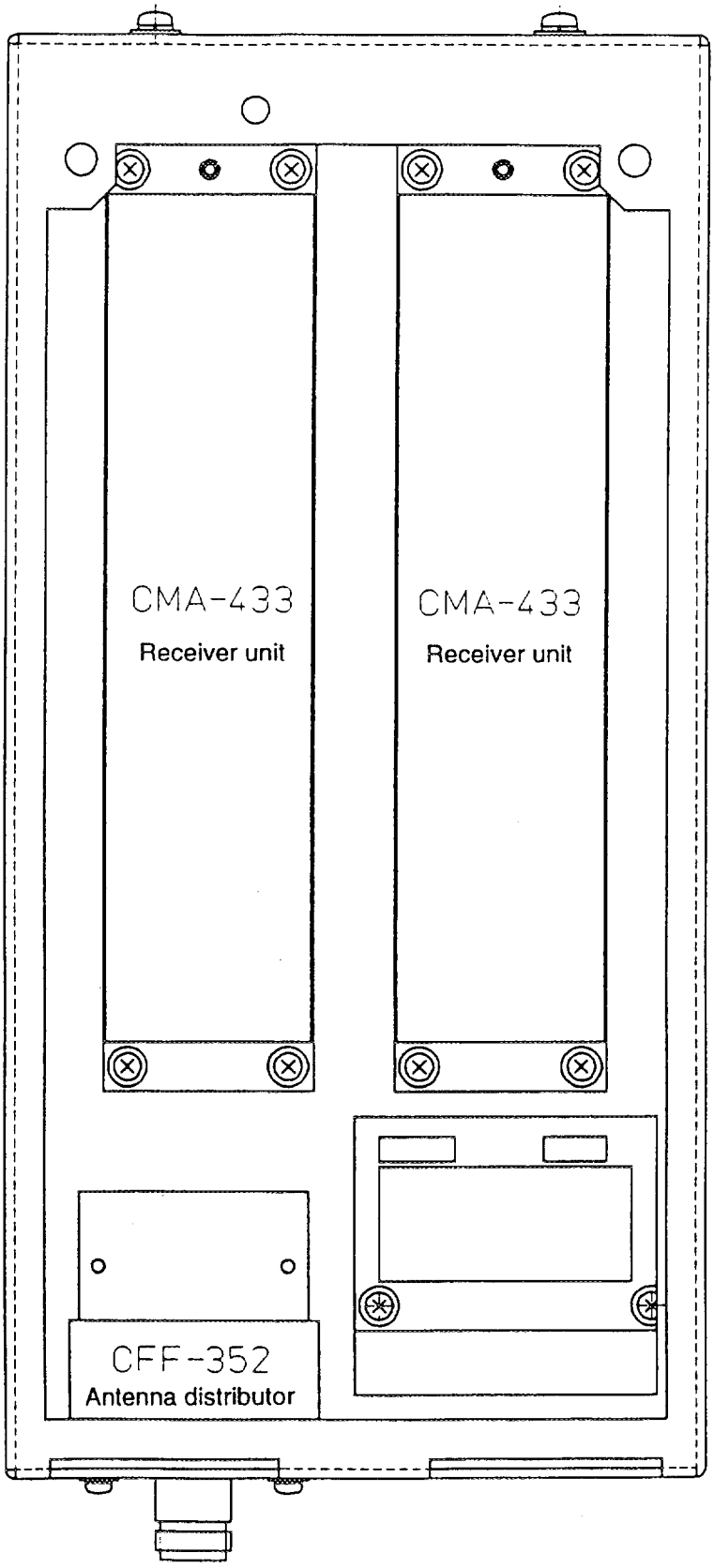
● Printer (NKG-52) Adjustment

Only print density can be adjusted on the printer.

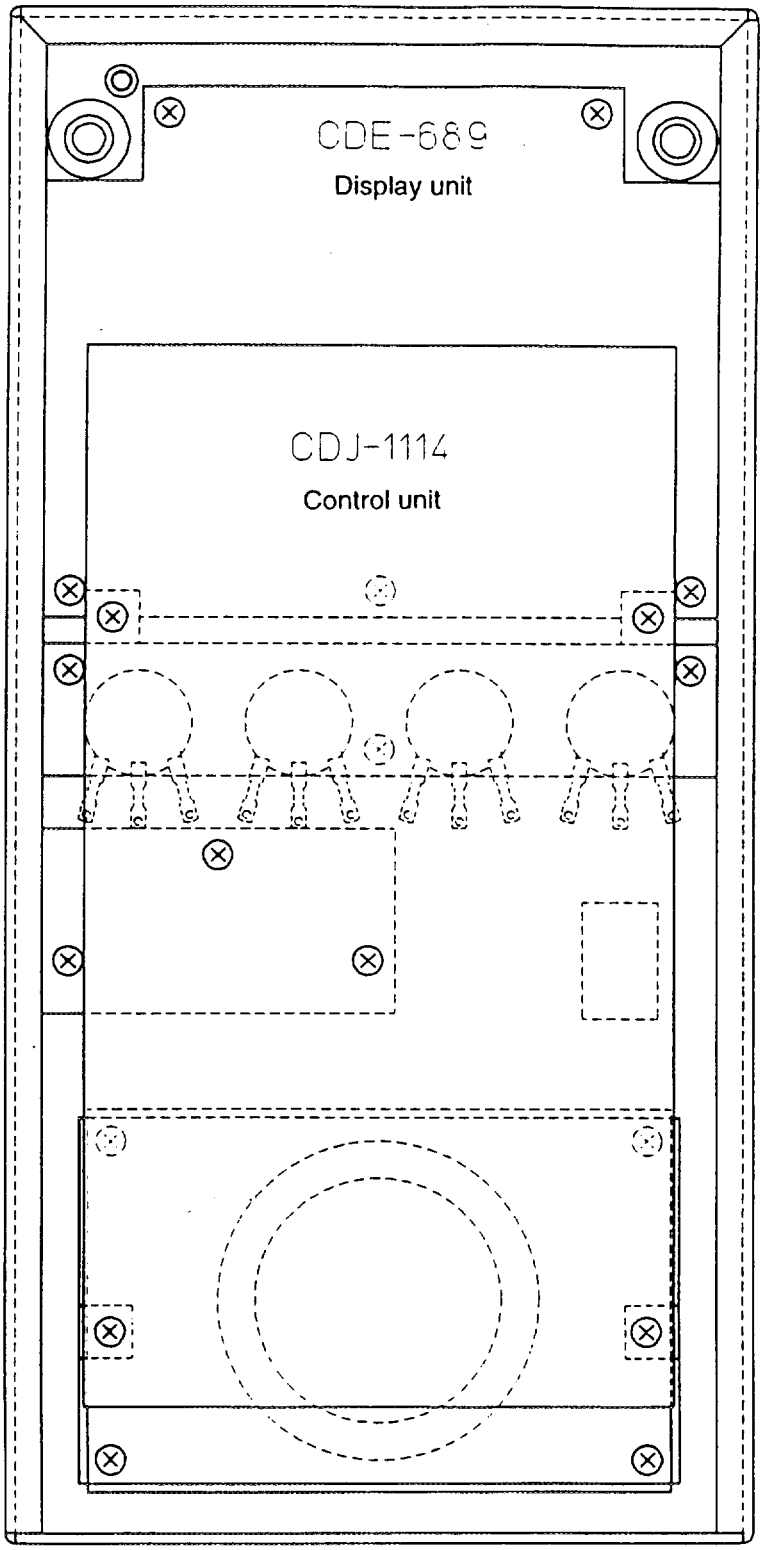
1. Send a print test request from the JHS-32A to make a test printout.
2. Adjust PWADJ volume (RV1) on the CDG-316 interface circuit to obtain the desired print density.

5.7 Guard Receiver (NRE-332) Parts Layout and Adjustment

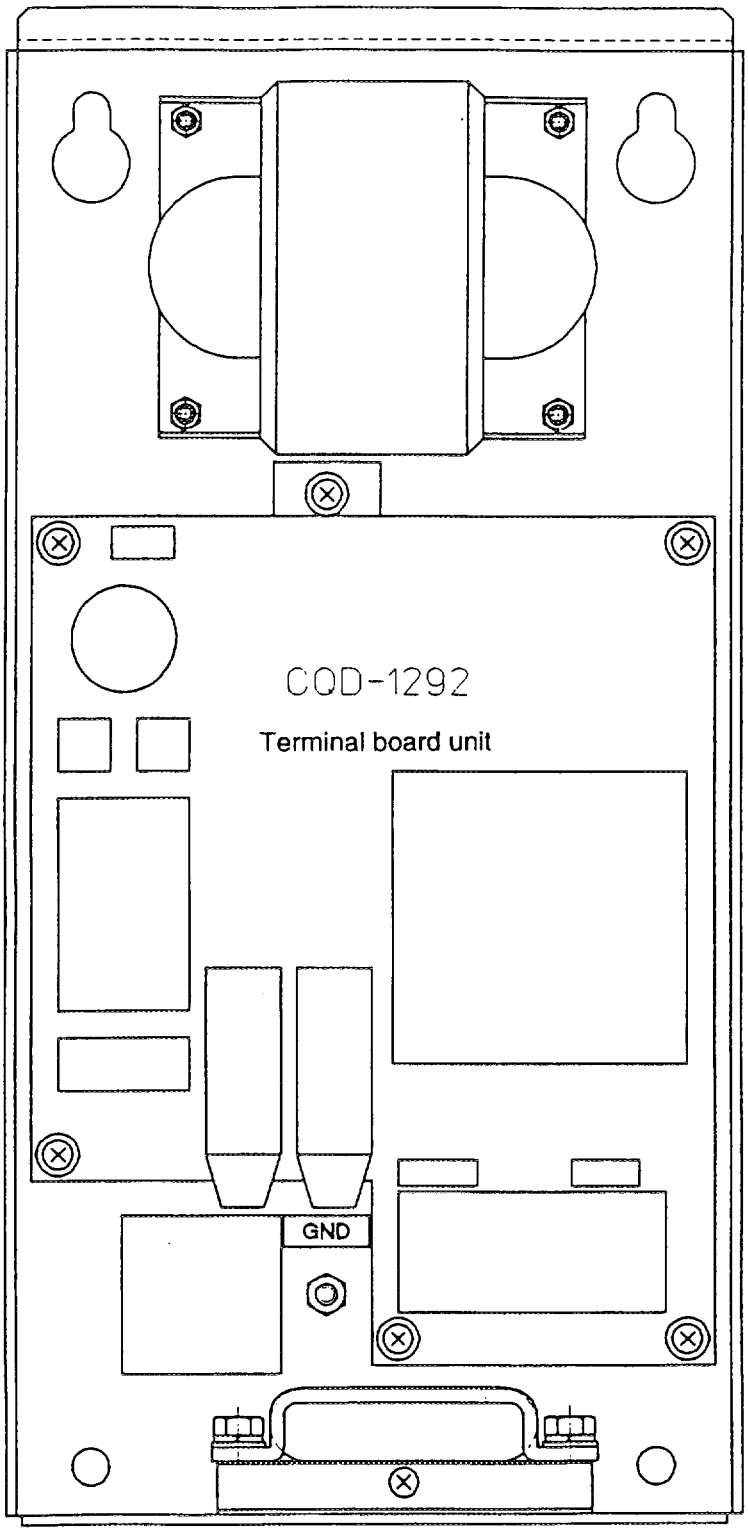
● Guard Receiver (NRE-332) Parts Layout



Inside the Main Body

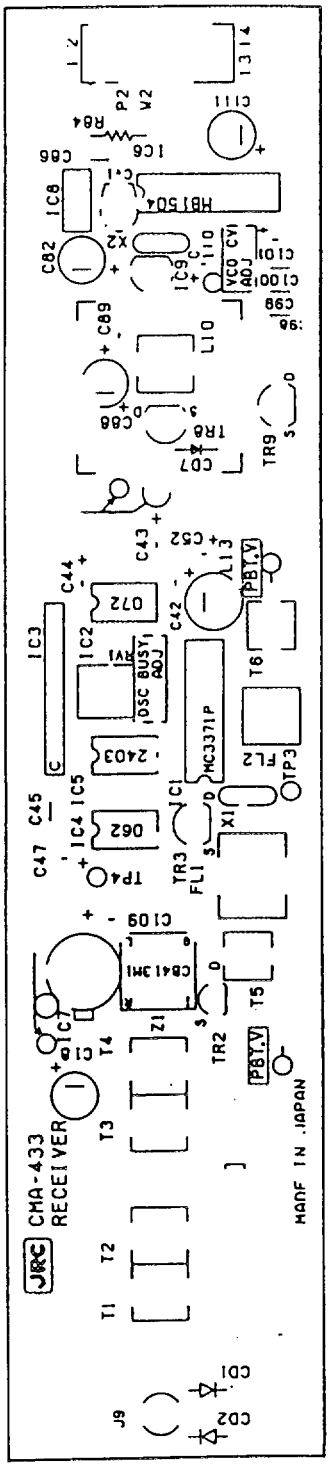


Back Panel

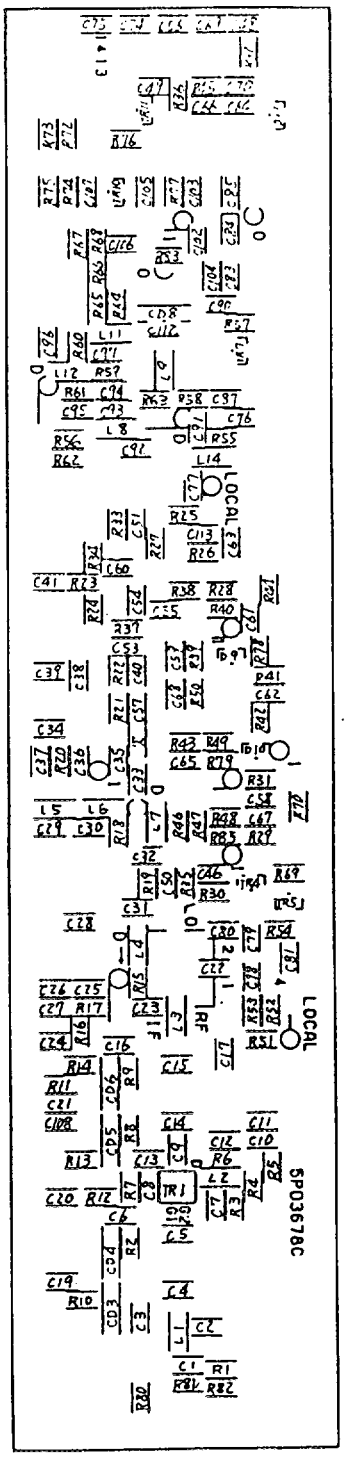


Terminal Board

● Receiver Unit (CMA-433) Parts Layout



(Front)



(Back)

❁ Receiver Unit (CMA-433) adjustment

⚠ CAUTION

Do not perform adjustment without appropriate measuring instruments. Doing so may cause malfunction of the unit.

• Adjusting the first local oscillator frequency

Connect a frequency counter to TP2, then adjust CV1 to obtain a frequency of receiving frequency + 21.4 MHz (i.e. for CH16, adjust CV1 so that the local frequency is 156.8 + 21.4 = 178.2 MHz ± 100Hz).

• Setting the VCO voltage

Adjust L10 so that TP1 voltage on CH16 is 4.3V.

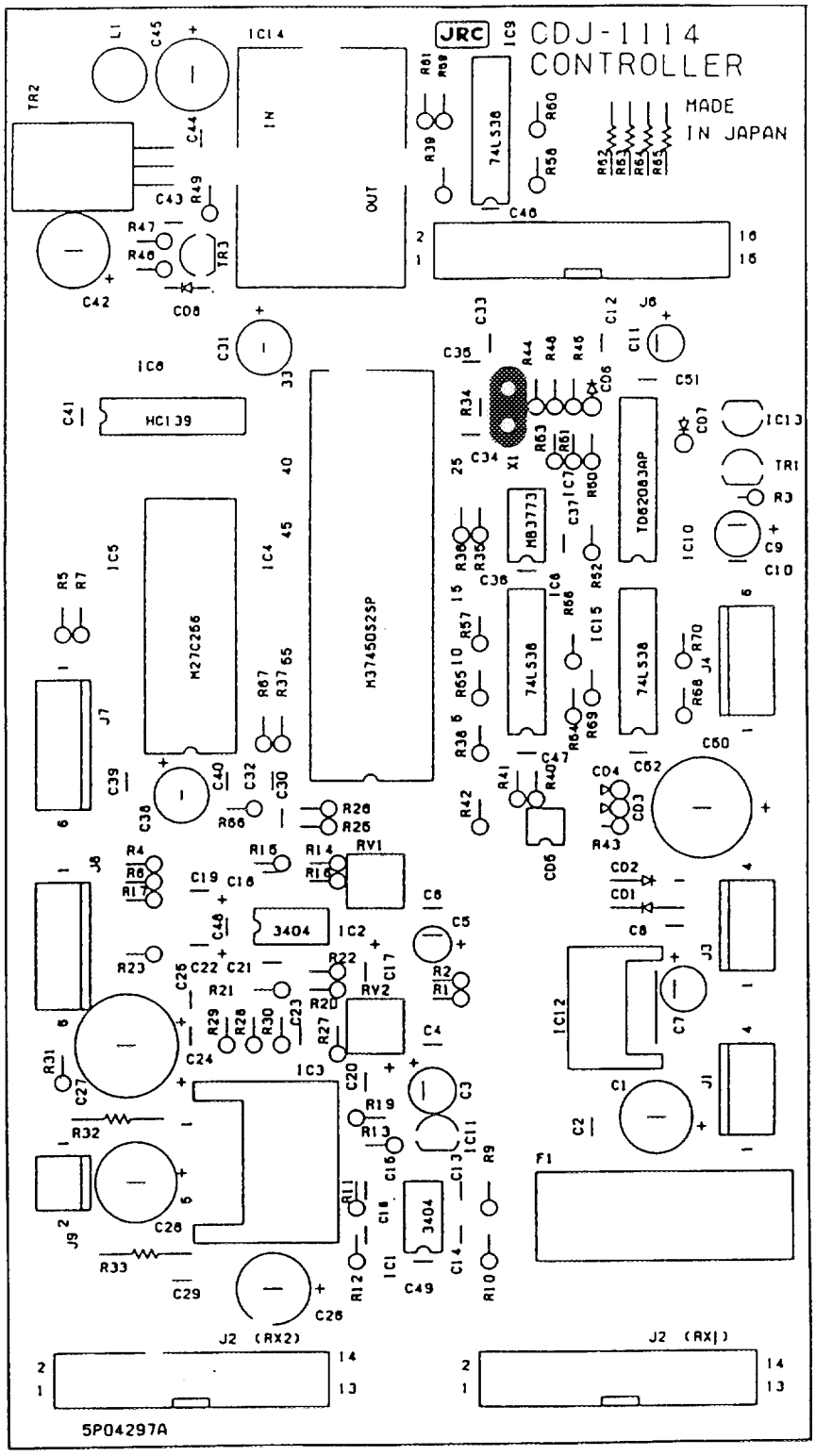
• Adjusting sensitivity

(1) Adjust T1, T2, T3, T4 and T5 to obtain the optimum 20 dB NQ sensitivity. Continue adjusting until the optimum setting is obtained.

(2) Apply a signal of 60 dBμV modulation (1 kHz, 3kHz DEV) from SG, then adjust T6 to maximize the low-frequency output.

(3) Check that, after having completed the above adjustments, the low-frequency output is −10dBm (0.7Vp-p) ±3dB.

● Control Unit (CDJ-1114) Parts Layout



● Control Unit (CDJ-1114) Adjustment

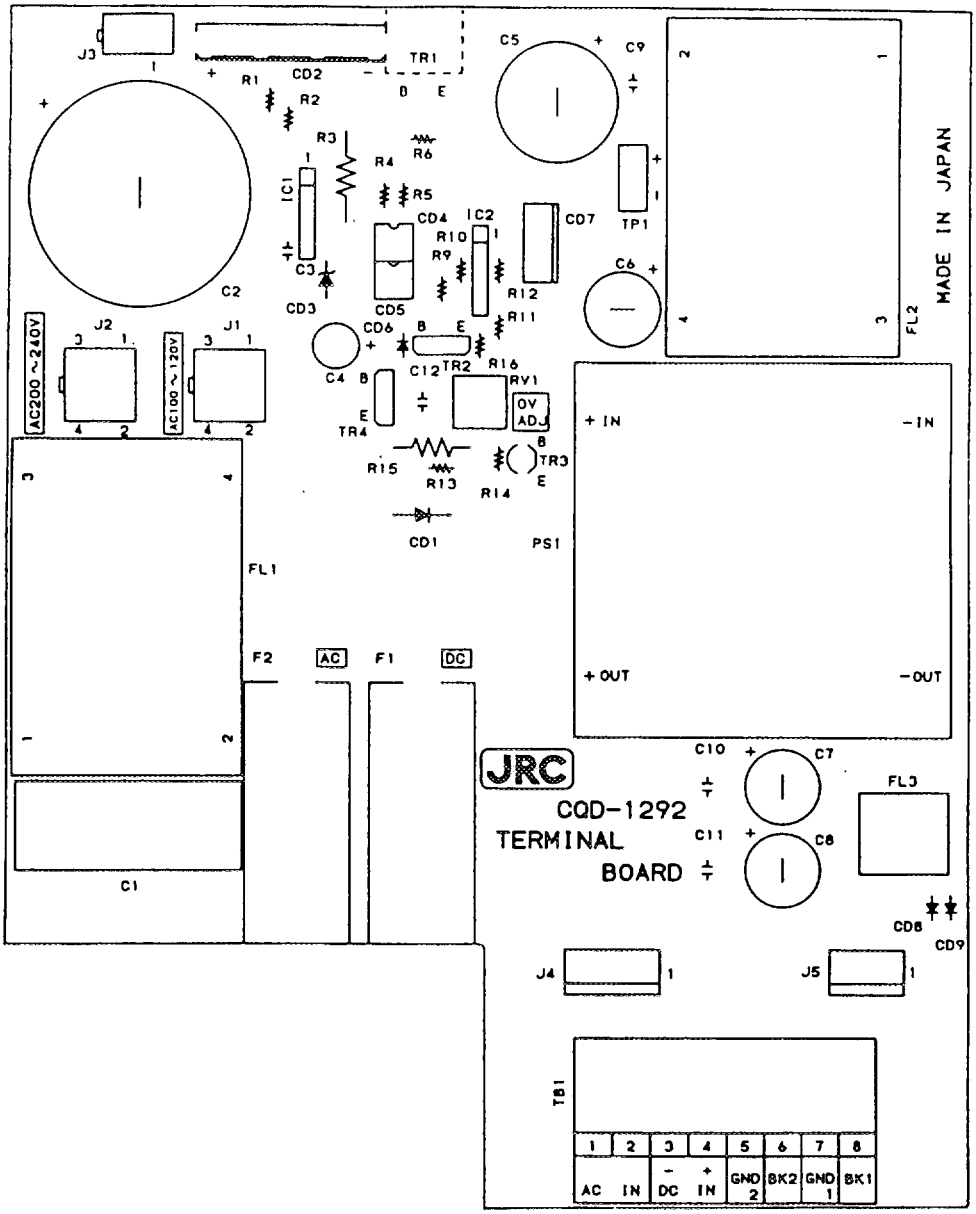
⚠ CAUTION

Do not perform adjustment without appropriate measuring instruments. Doing so may cause malfunction of the unit.

• Adjusting AF level

Connect SG to the antenna terminal, apply a signal of 1 kHz modulation with 3 kHz frequency deviation, then adjust RV1 so that pin No.1 of the connector J8 is 140 mVrms. Also adjust RV2 so that pin No.4 of the connector J8 is 140 mVrms.

● Terminal Board Unit (CQD-1292) Parts Layout



● Terminal Board Unit (CQD-1292) Adjustment

⚠ CAUTION

Do not perform adjustment without appropriate measuring instruments. Doing so may cause malfunction of the unit.

• Setting the protection trigger level against overvoltage input

(Purpose)

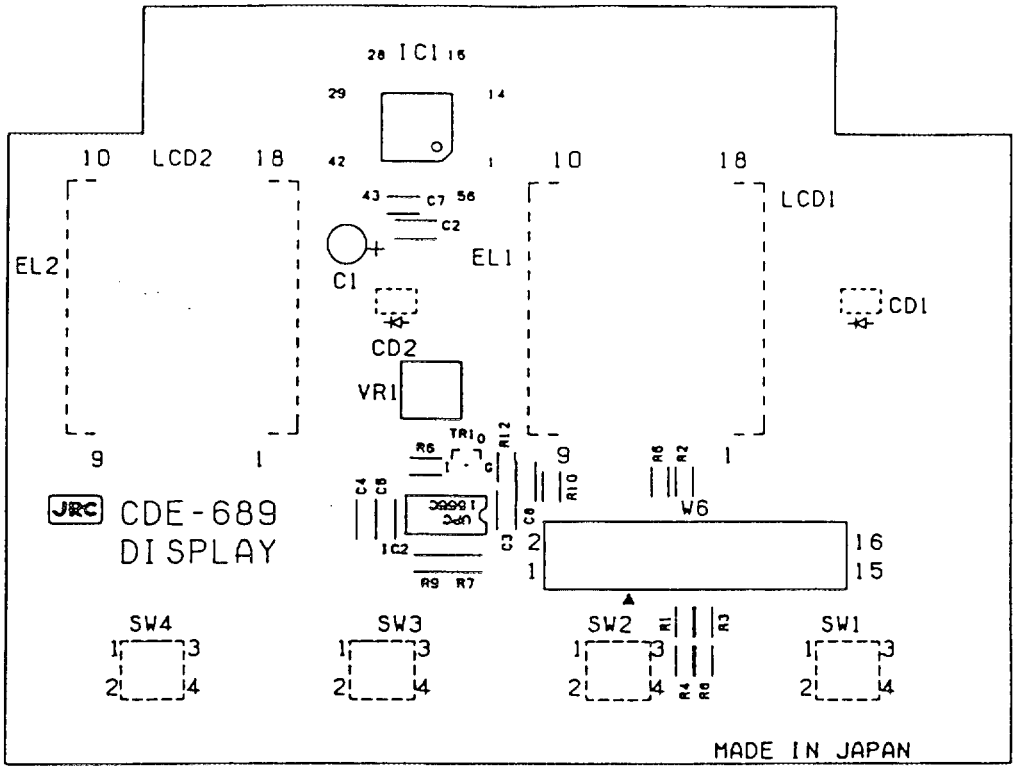
The DC-DC converter (PS1) has an input voltage range of 18V to 36VDC.

Use RV1 to set the PS1 protection trigger level to 34V.

(Method)

In the 100-120VAC system, for example, first adjust RV1 to the minimum level. Apply 120VAC and adjust RV1 so that the cathode voltage of CD7 is 34V.

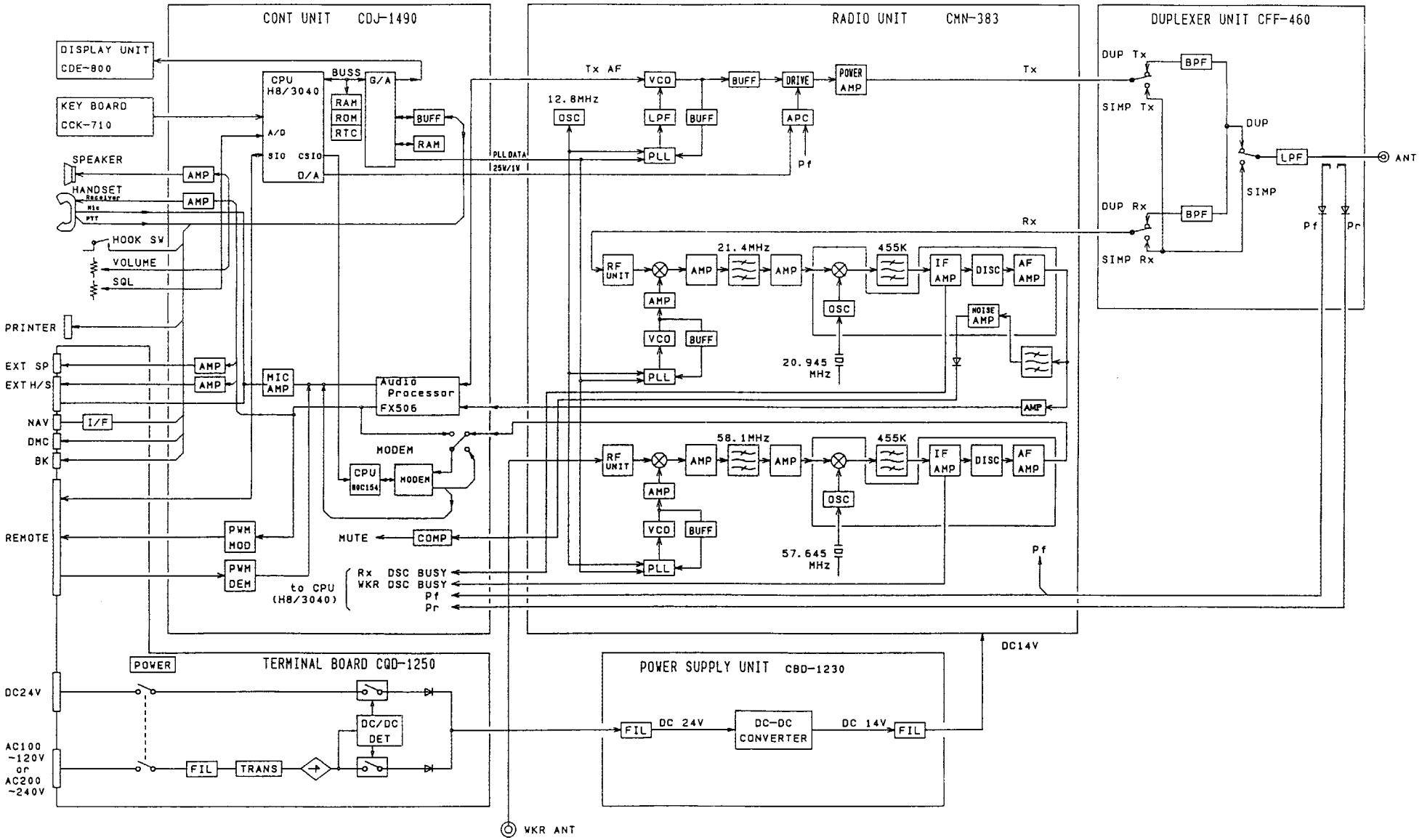
Display Unit (CDE-689) Parts Layout



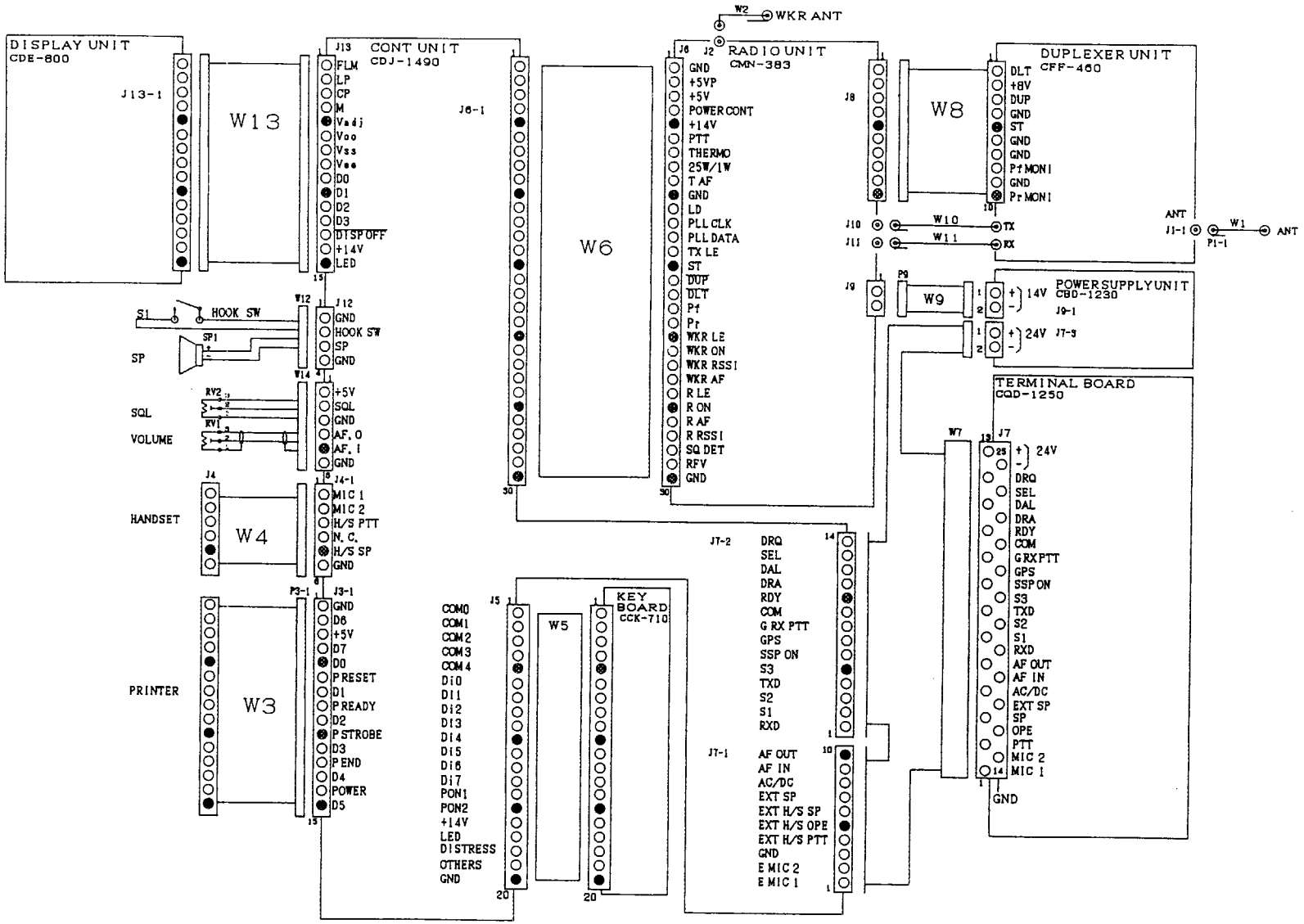
Chapter 6 System Diagrams/Connection Diagrams

6.1 Main Unit (JHS-32A)

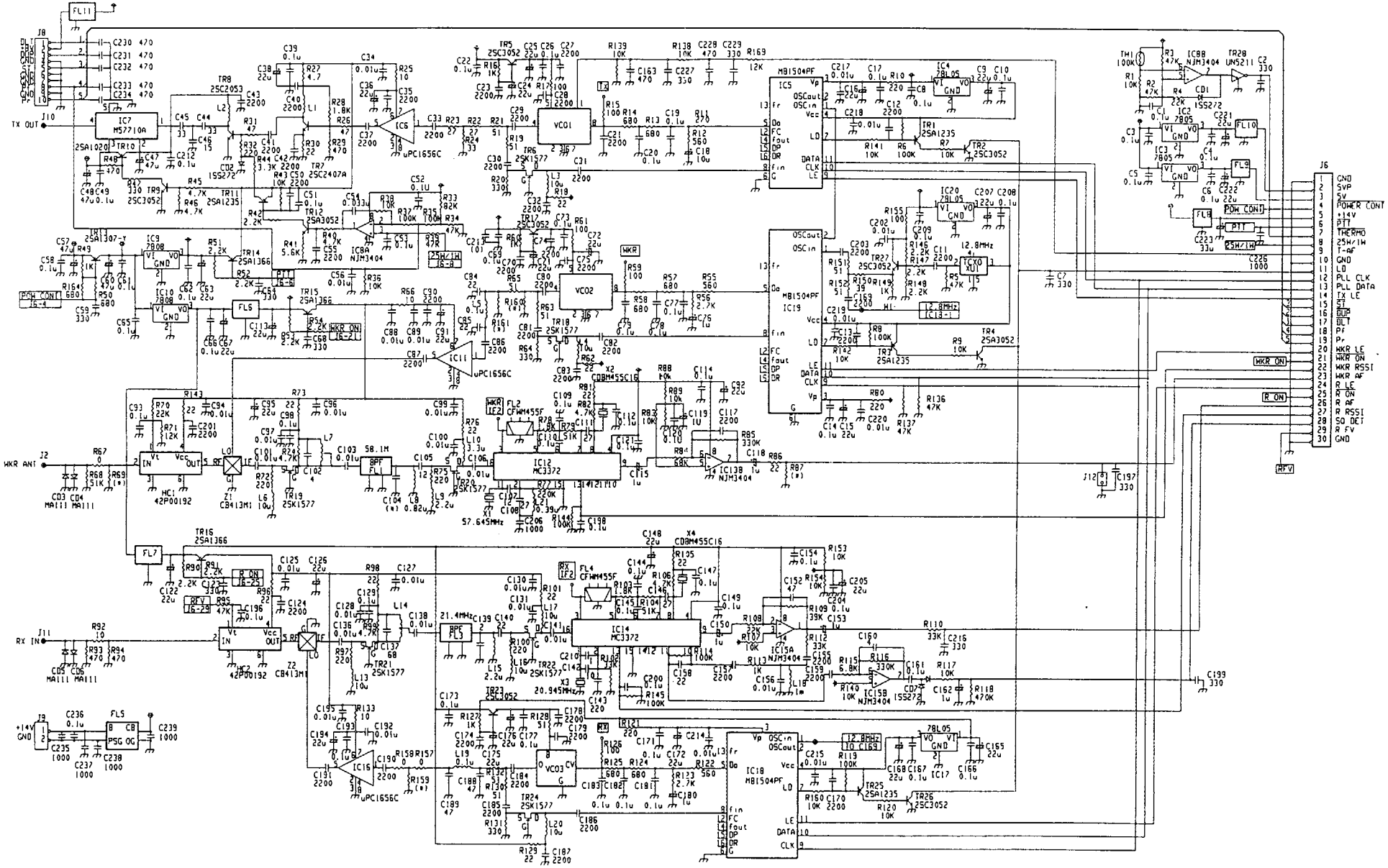
❶ Block Diagram



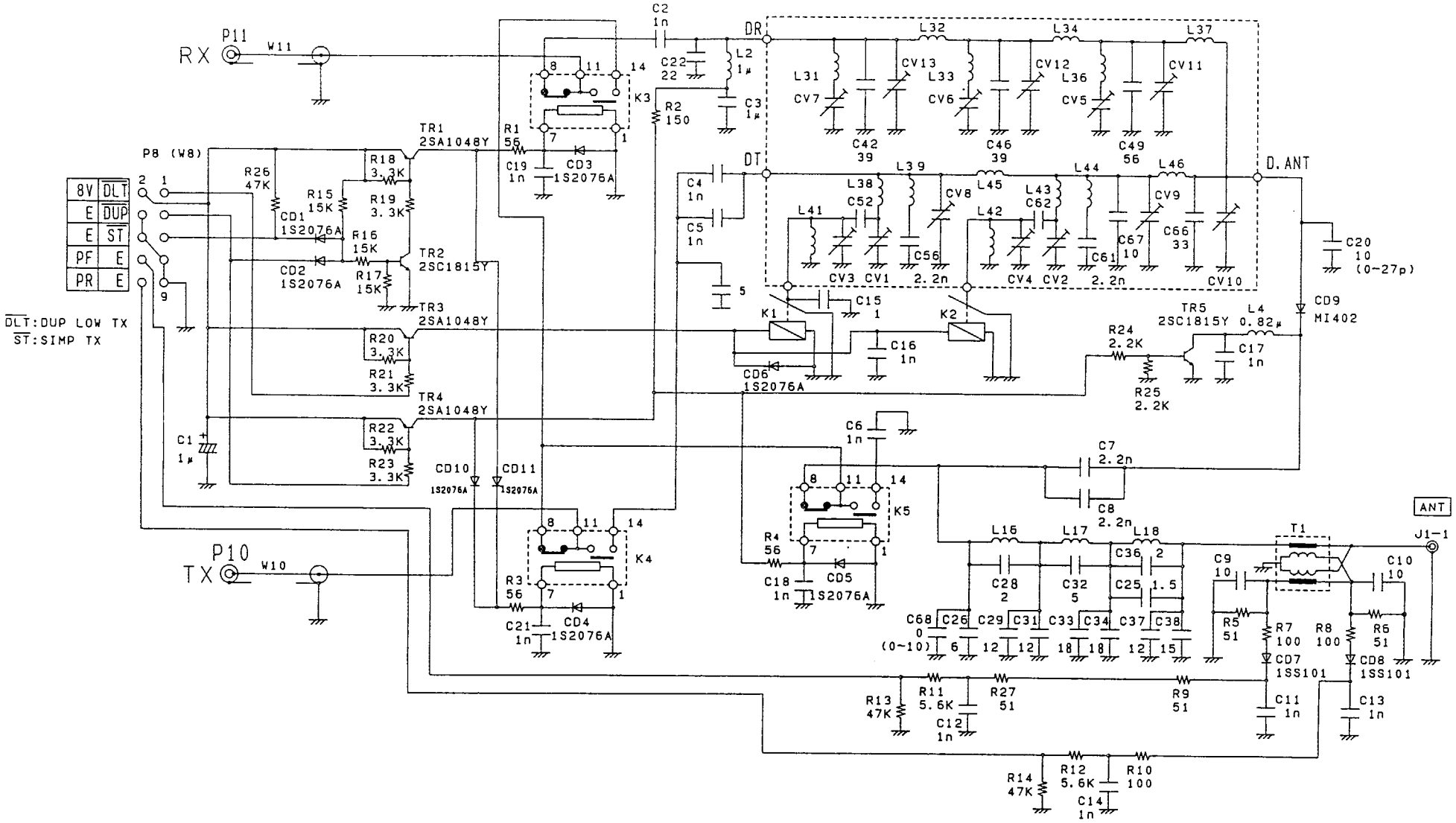
● Schematic Diagram (JHS-32A)



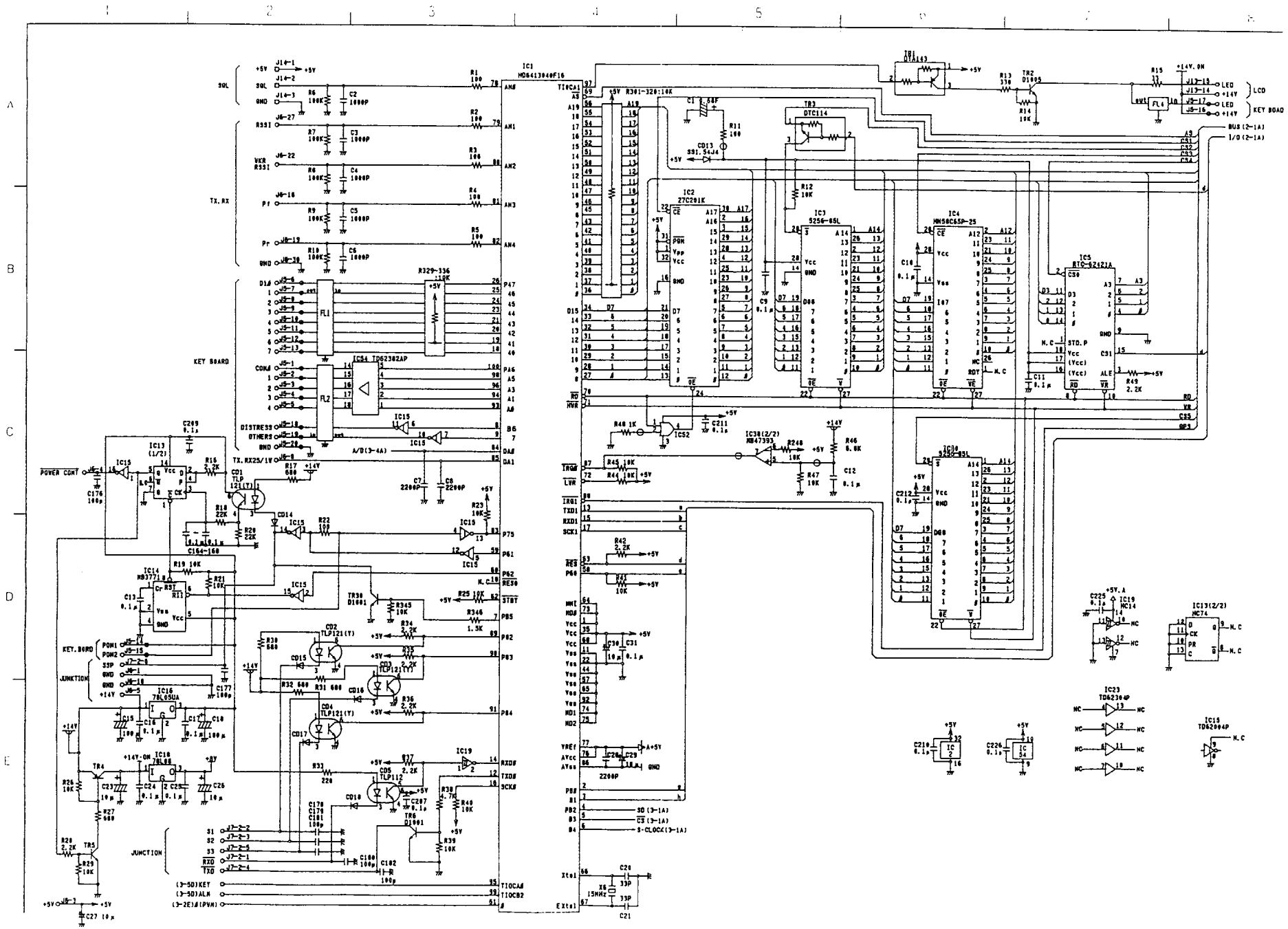
❸ Schematic Diagram (CMN-383)



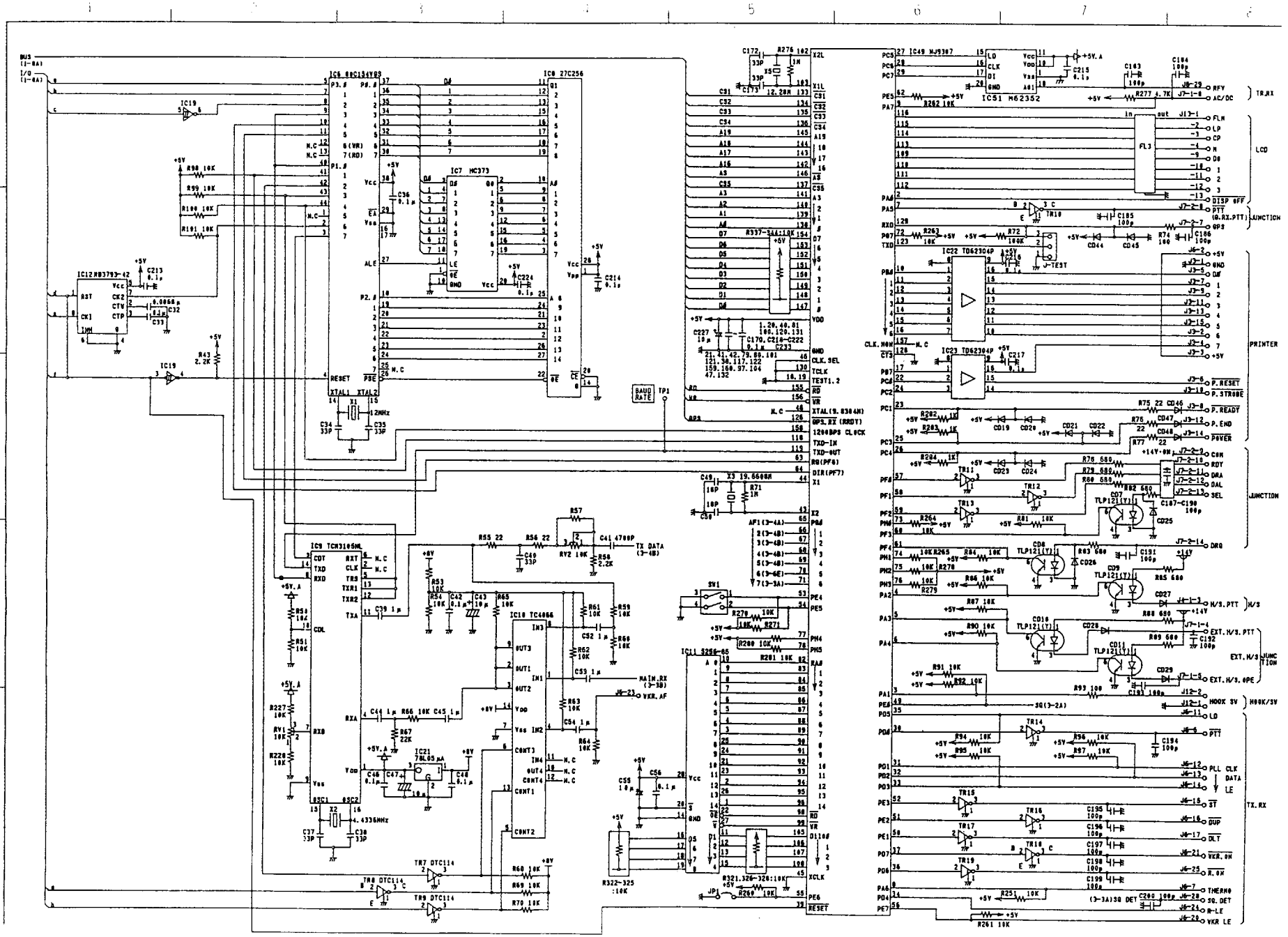
● Schematic Diagram (CFF-460)



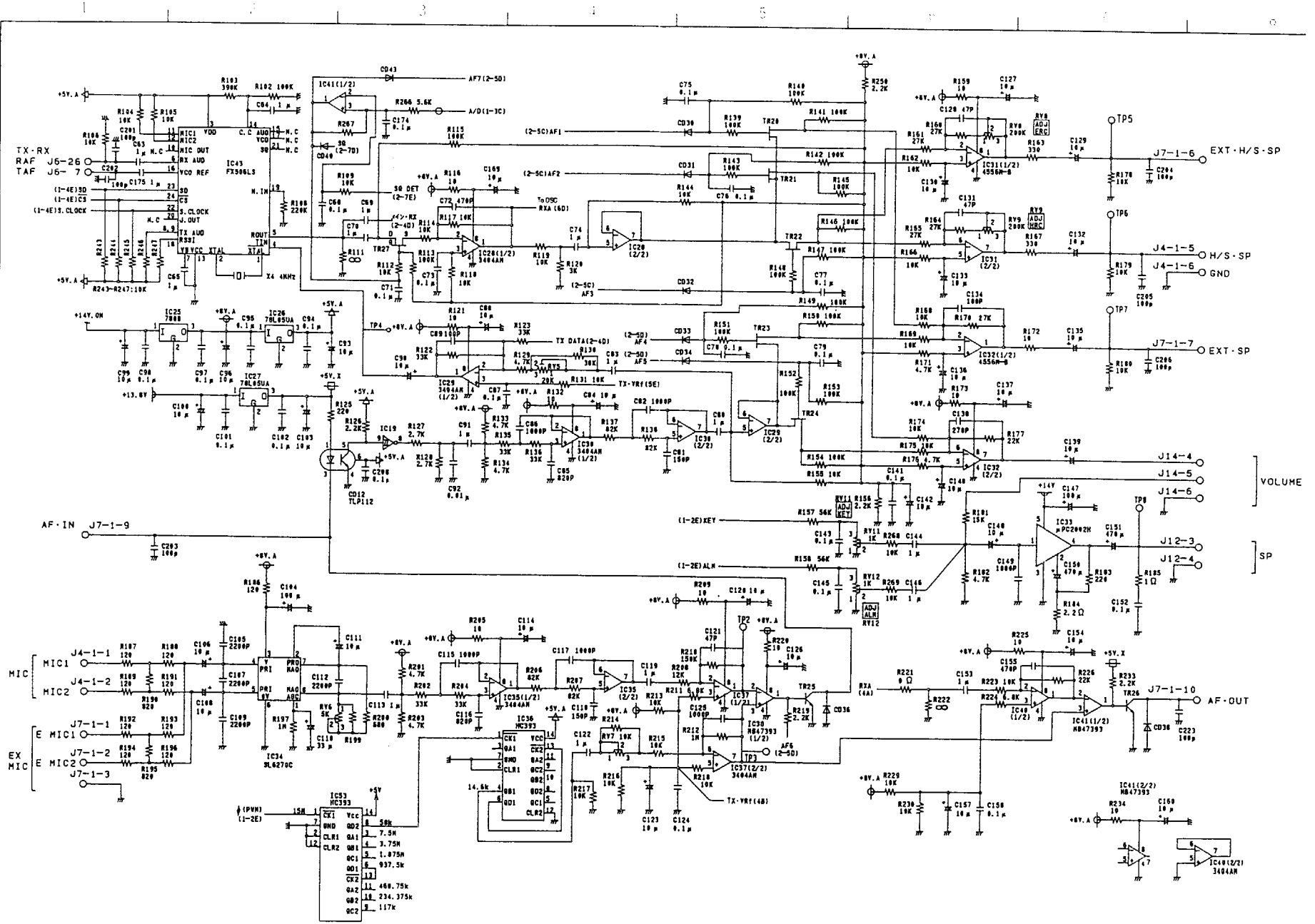
● Schematic Diagram (CDJ-1490)-1/4



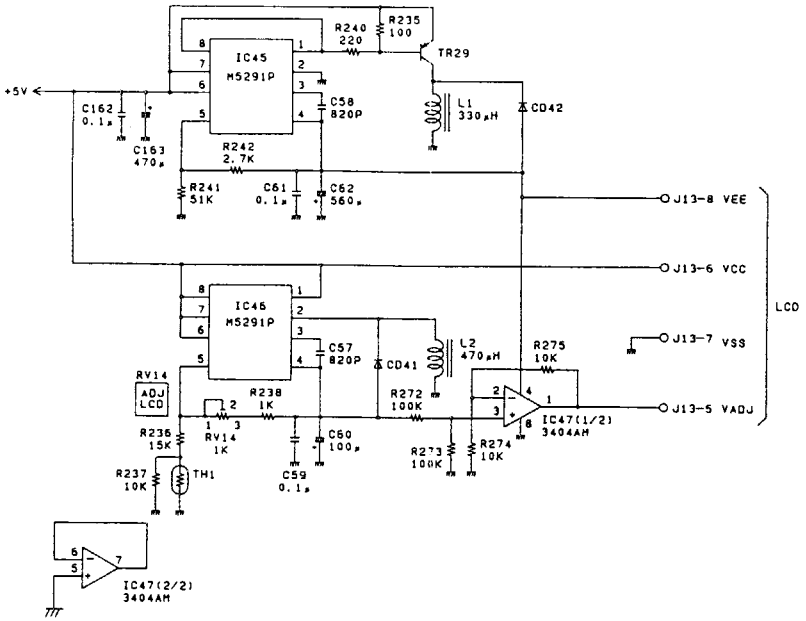
● Schematic Diagram (CDJ-1490)-2/4



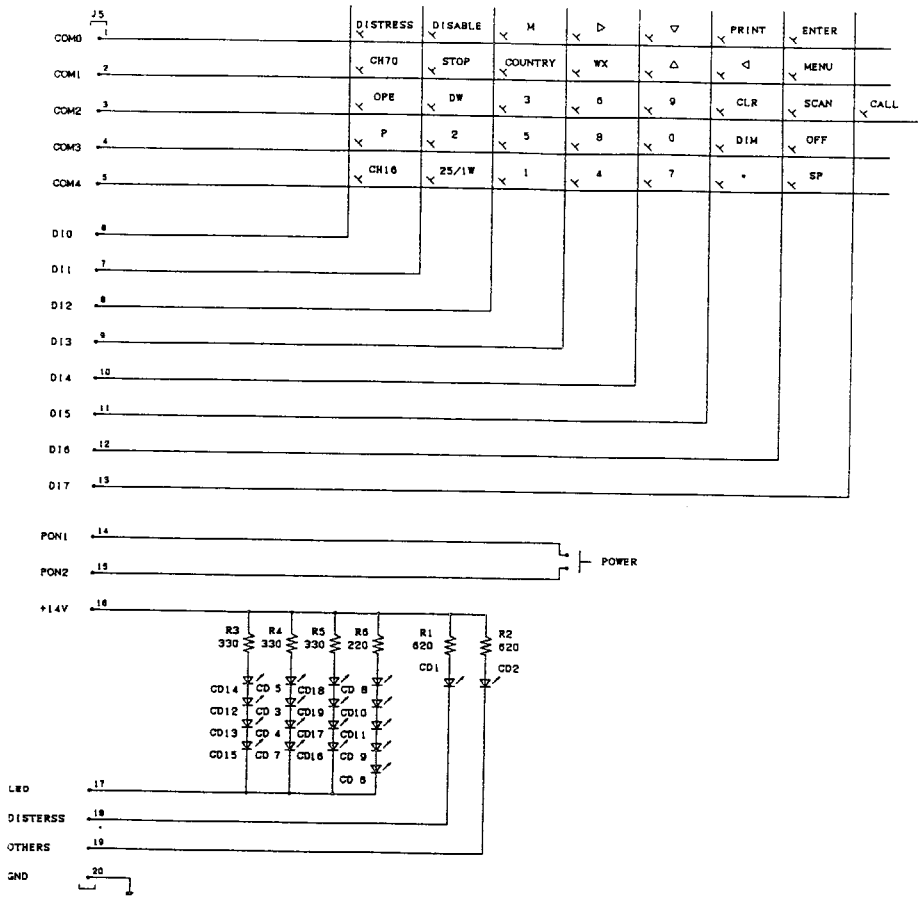
● Schematic Diagram (CDJ-1490)-3/4



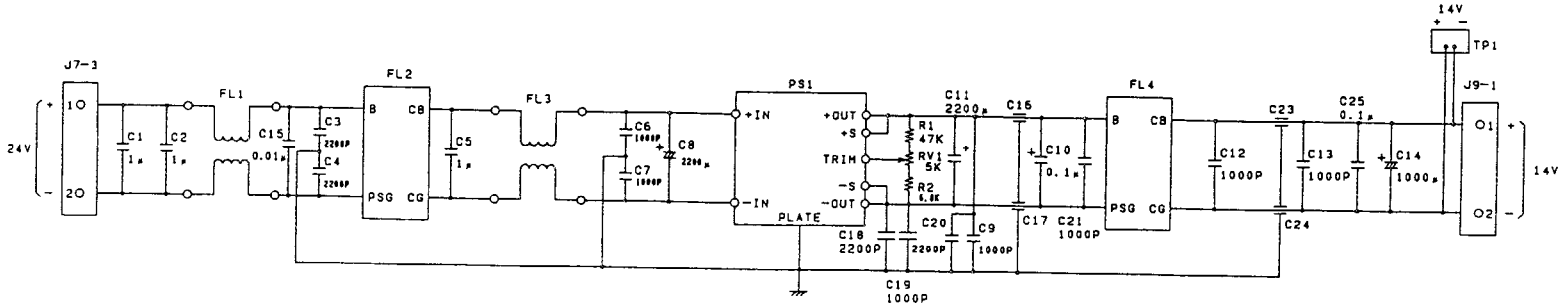
● Schematic Diagram (CDJ-1490)-4/4



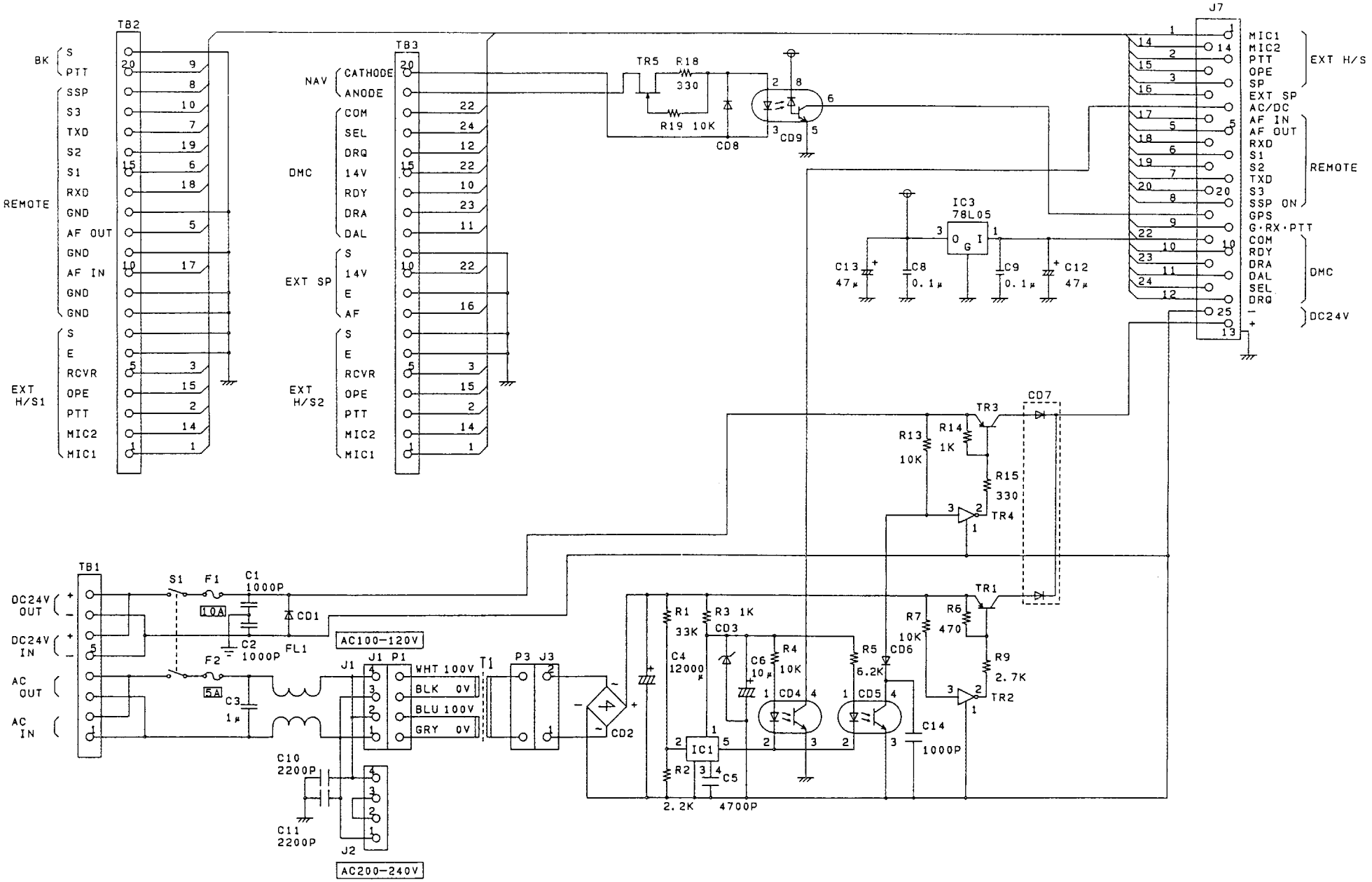
● Schematic Diagram (CCK-710)



● Schematic Diagram (CBD-1230)

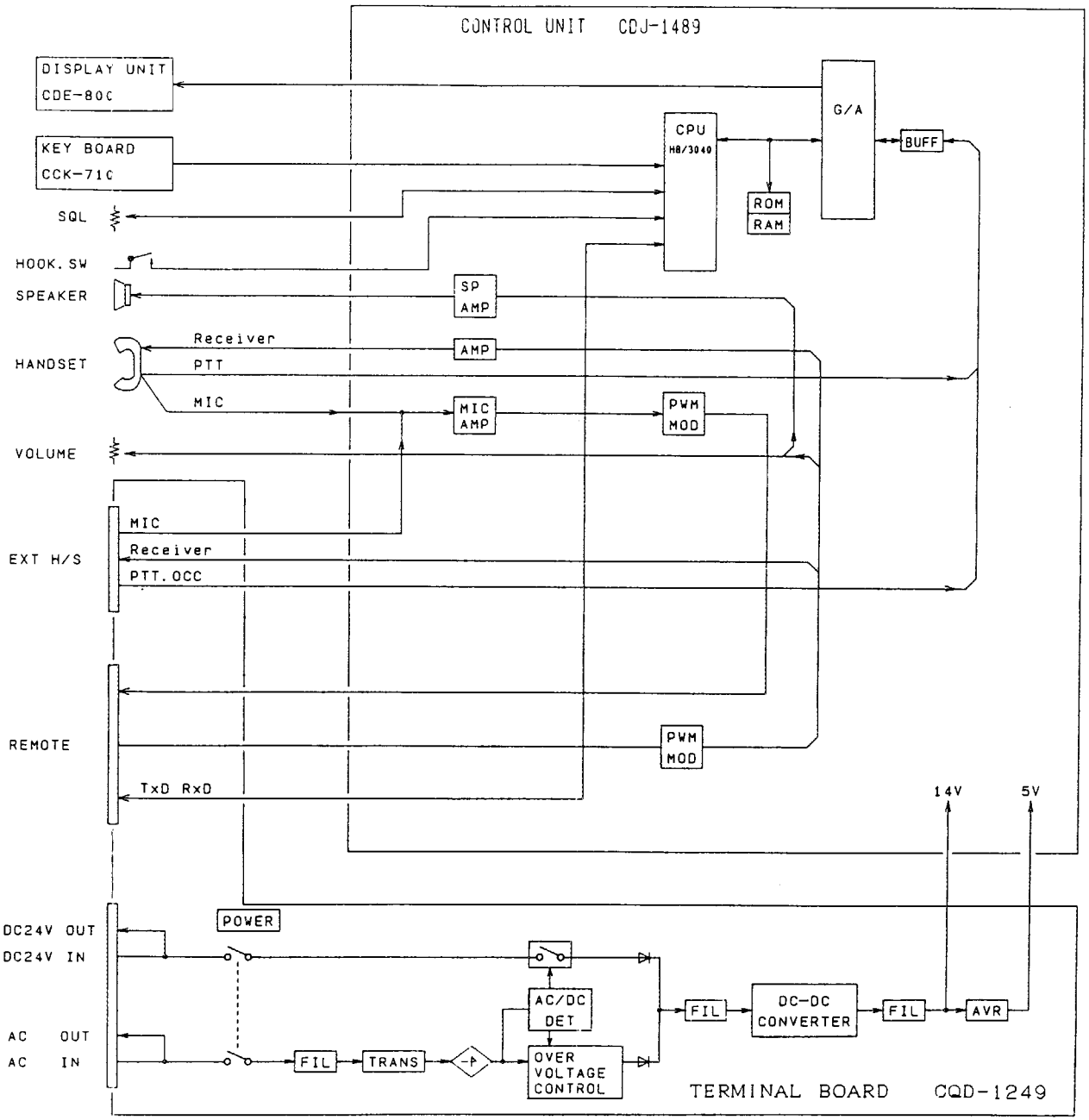


● Schematic Diagram (CQD-1250)

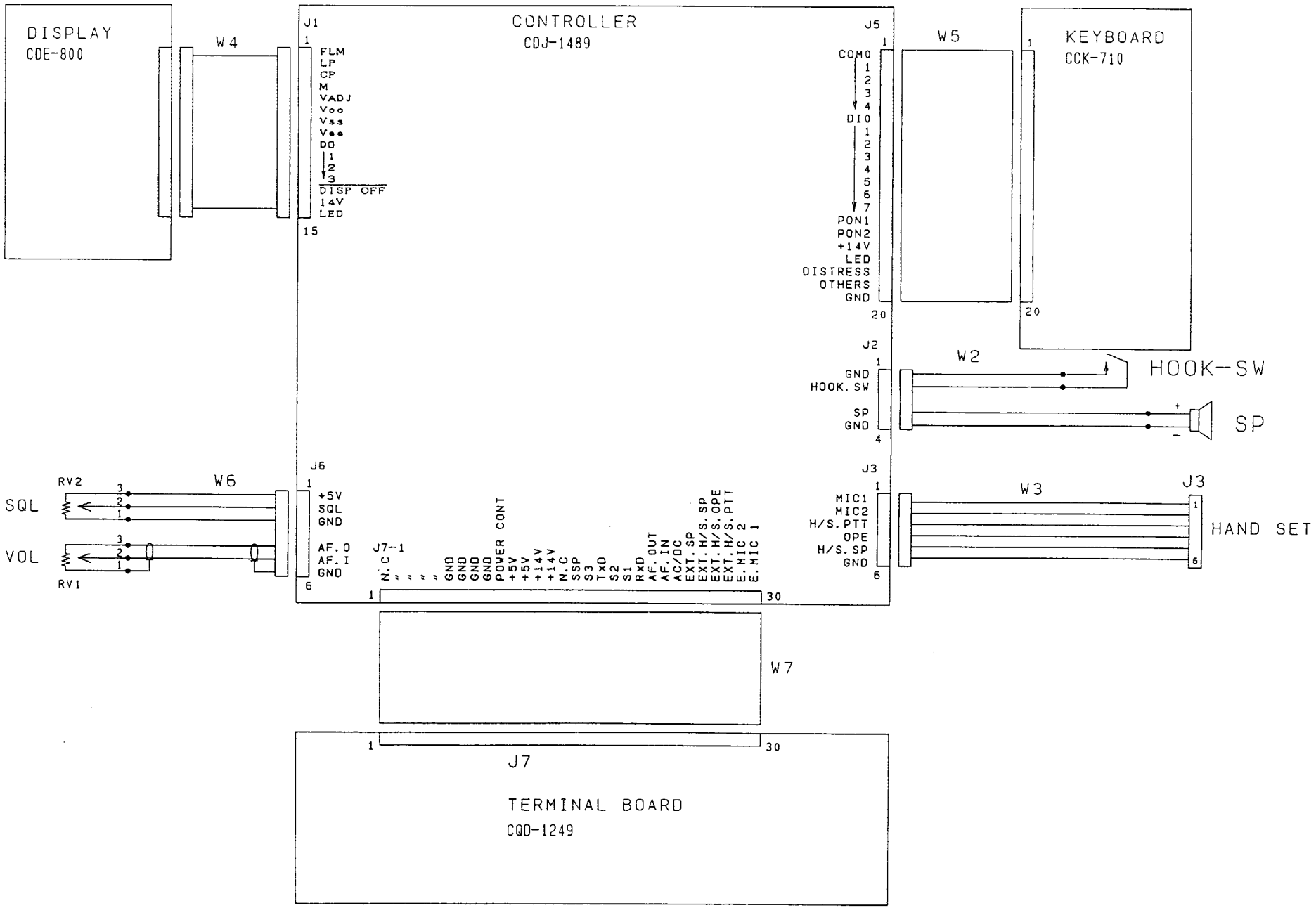


6.2 Remote Controller (NCH-414)

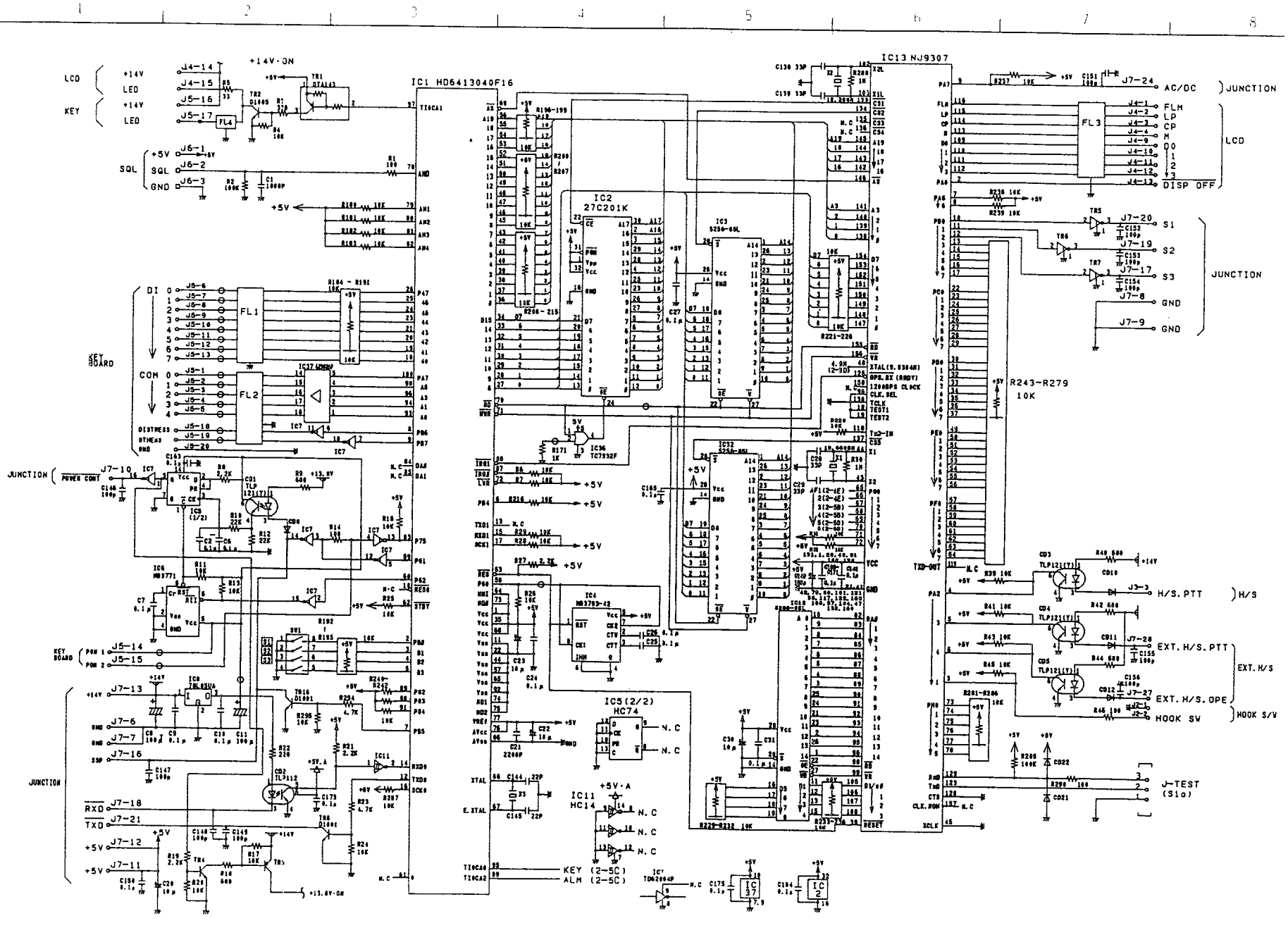
● **Block Diagram**



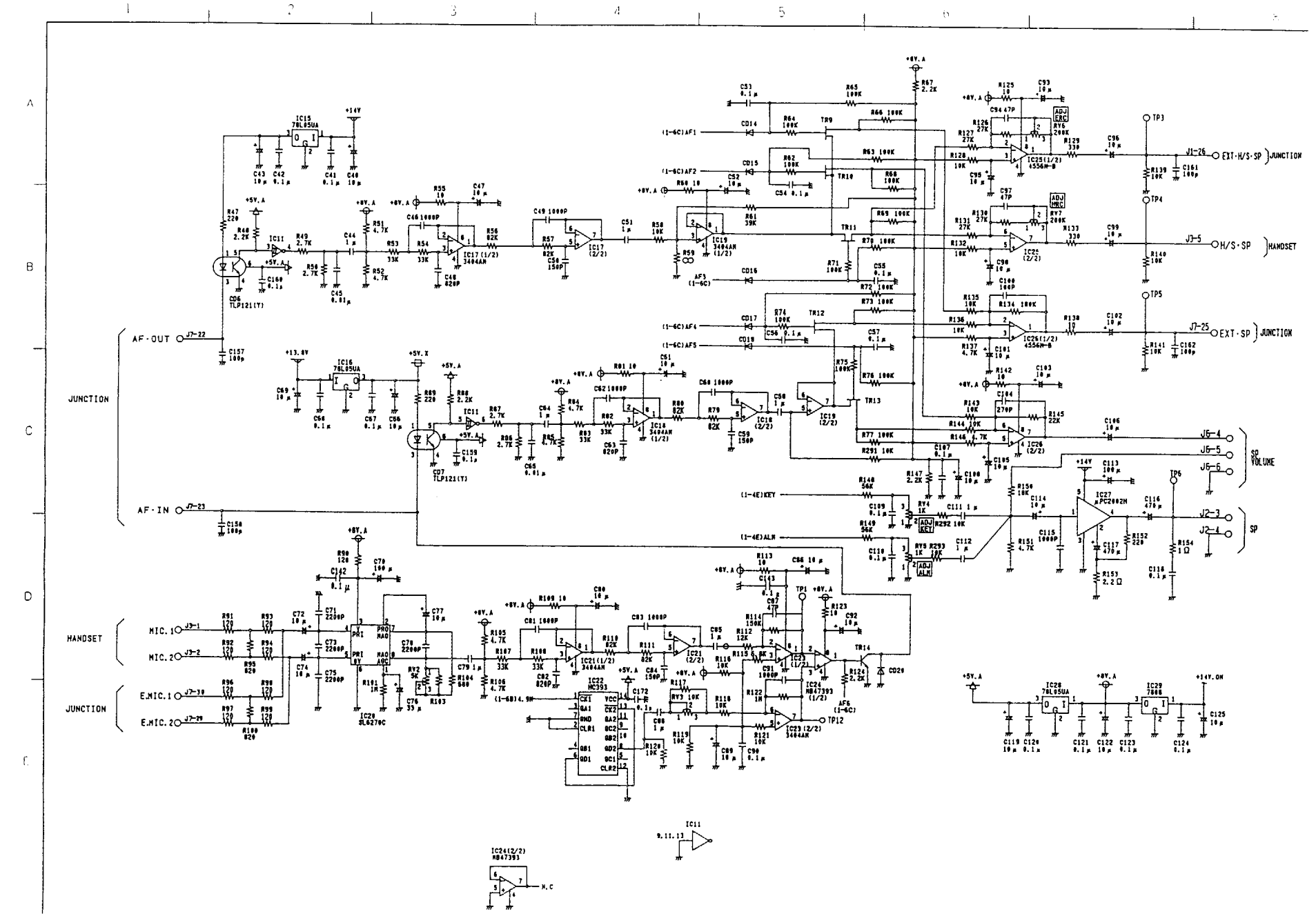
● Schematic Diagram (NCH-414)



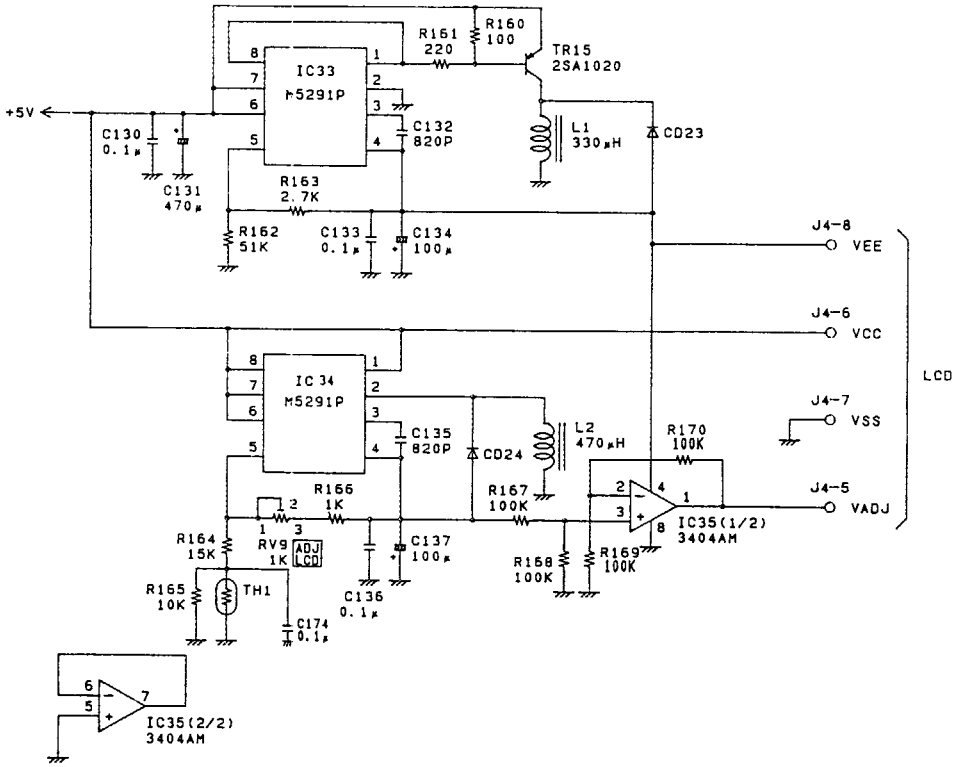
❸ Schematic Diagram (CDJ-1489)-1/3



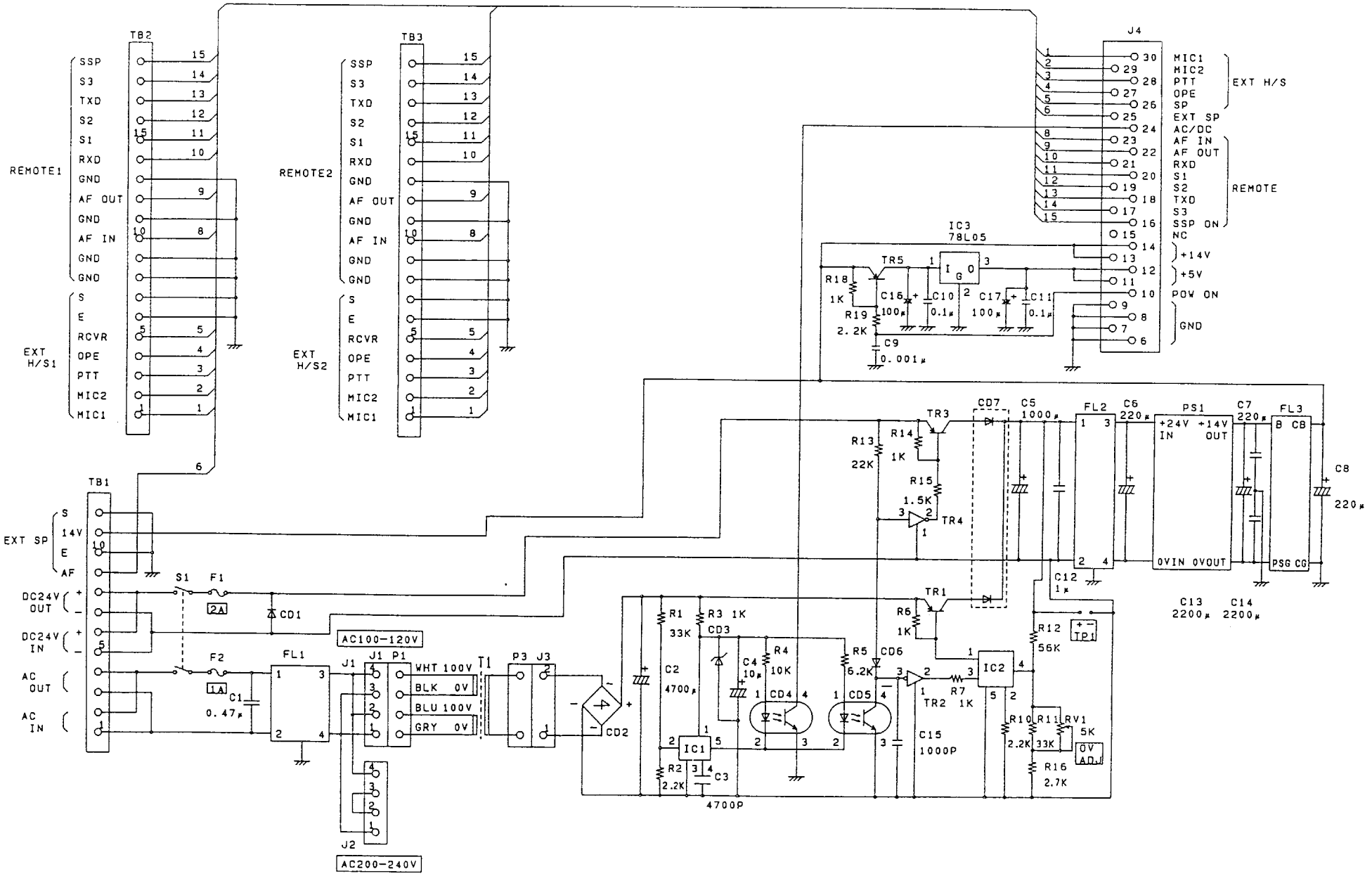
● Schematic Diagram (CDJ-1489)-2/3



● Schematic Diagram (CDJ-1489)-3/3

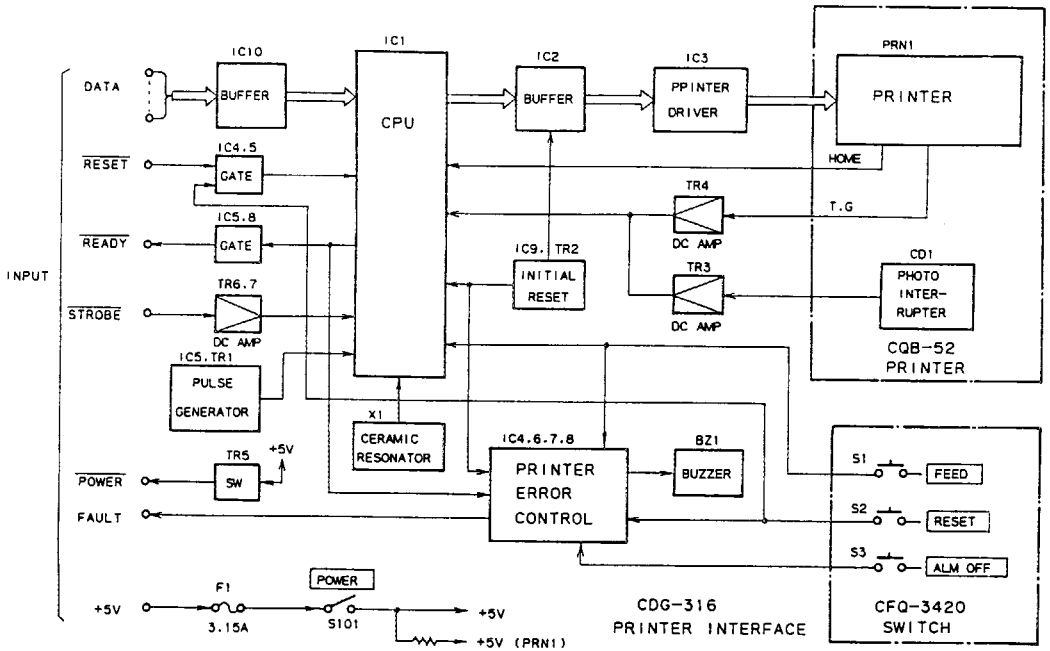


● Schematic Diagram (CQD-1249)

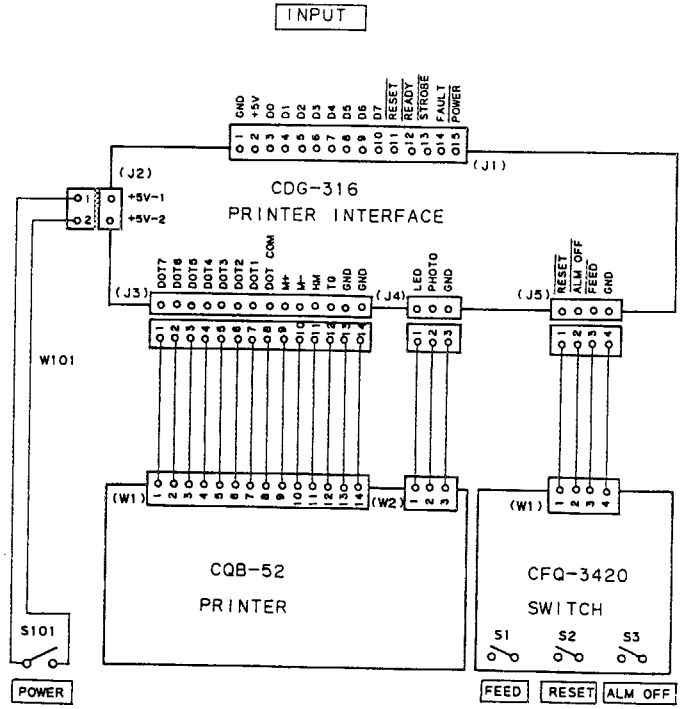


6.3 Printer (NKG-52)

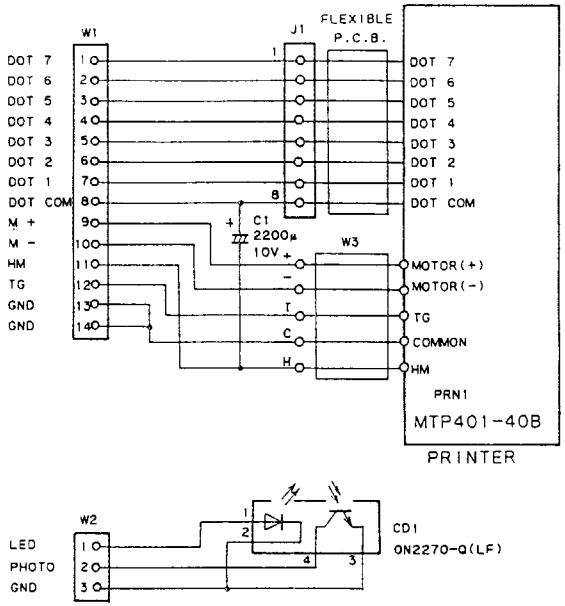
❶ Block Diagram



❷ Schematic Diagram

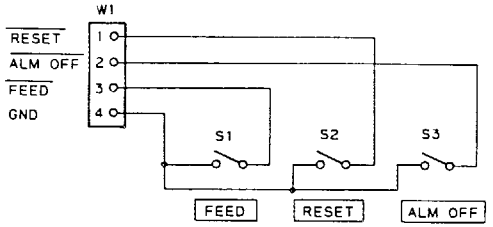


❶ Schematic Diagram (CQB-52)



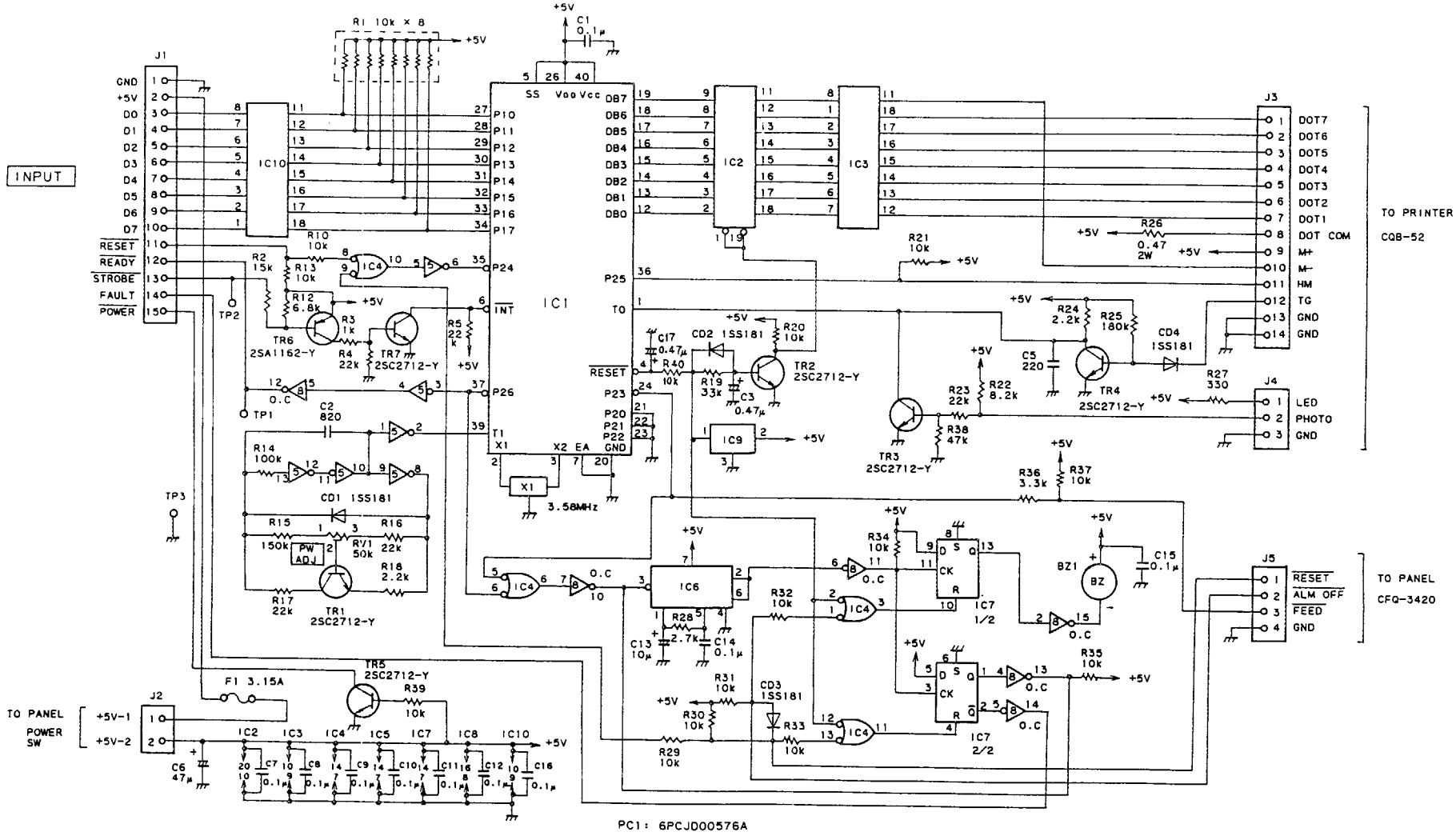
PC1 : 6PCJD00577A

❷ Schematic Diagram (CFQ-3420)



PC1 : 6PCJD00578

● Schematic Diagram (CDG-316)



PC1: 6PCJD00576A

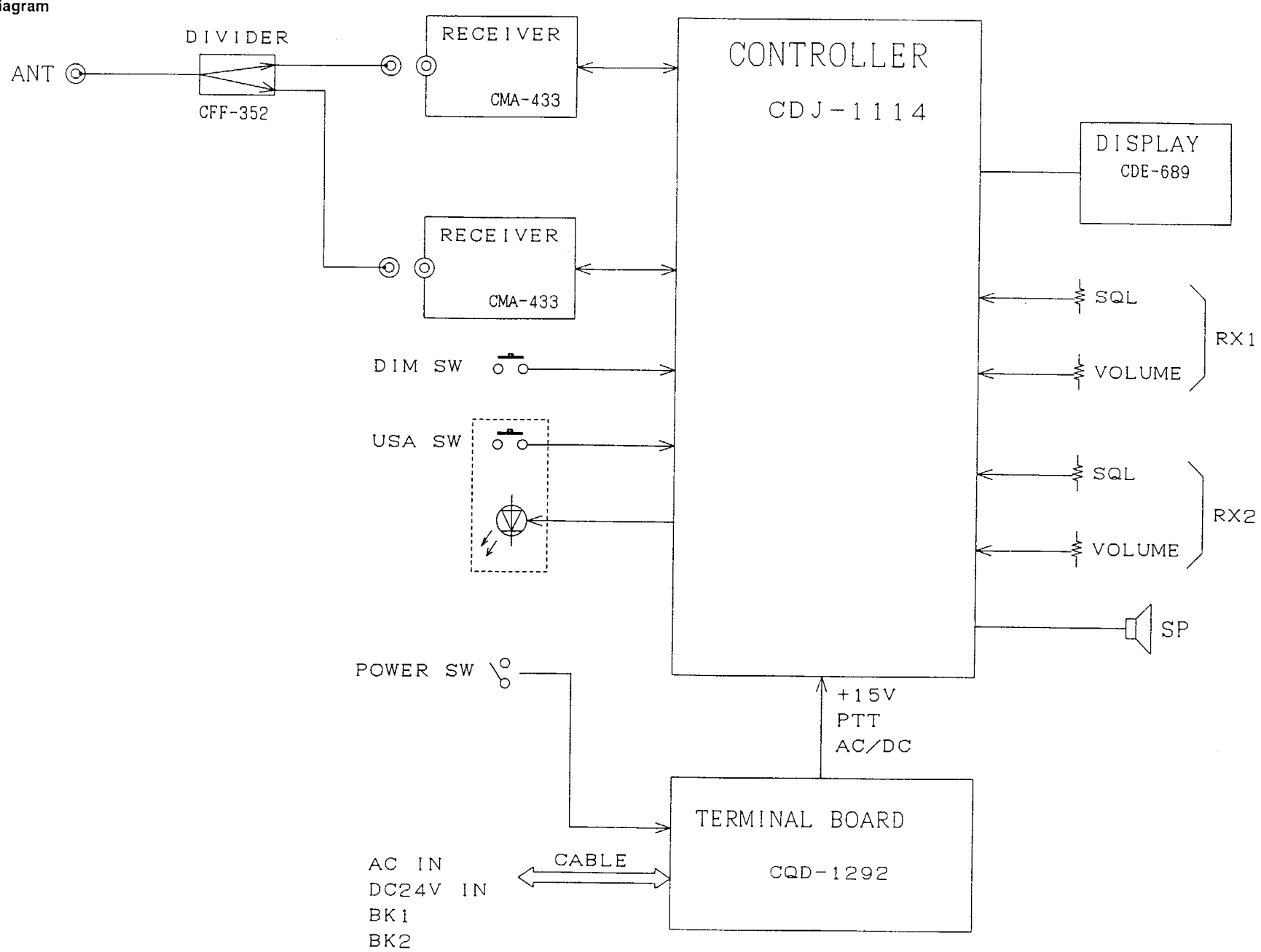
NOTE:

UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN Ω, 1/8W;
CAPACITANCE VALUES ARE IN pF.

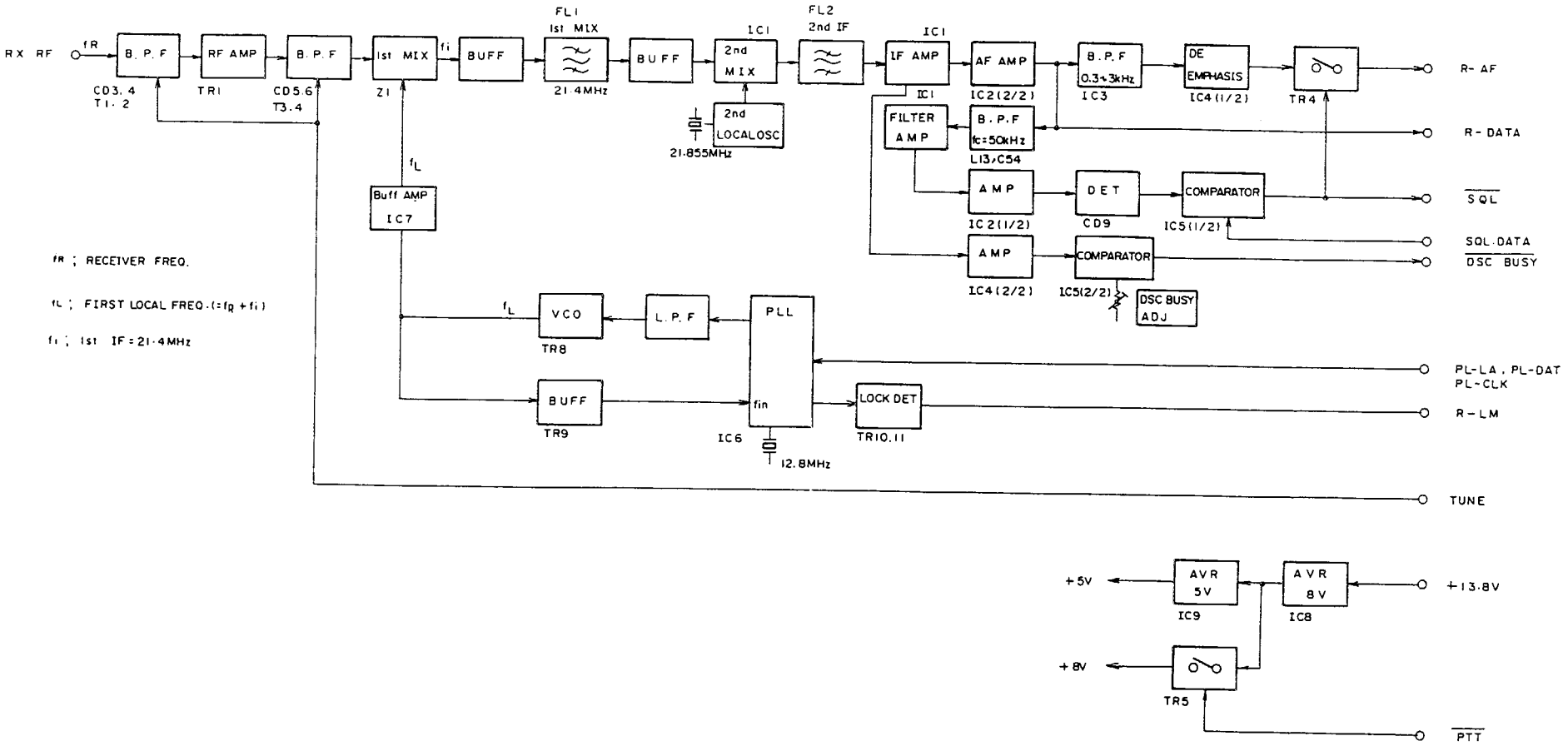
IC1	μPD8749HC	IC6	AN6780
IC2	TC74HC541P	IC7	TC4013BP(NEW)
IC3	LB1256	IC8	TD62303AP
IC4	TC40118P	IC9	S-8053ALR
IC5	TC4069UBP	IC10	TD62382AP

6.4 Guard Receiver (NRE-332)

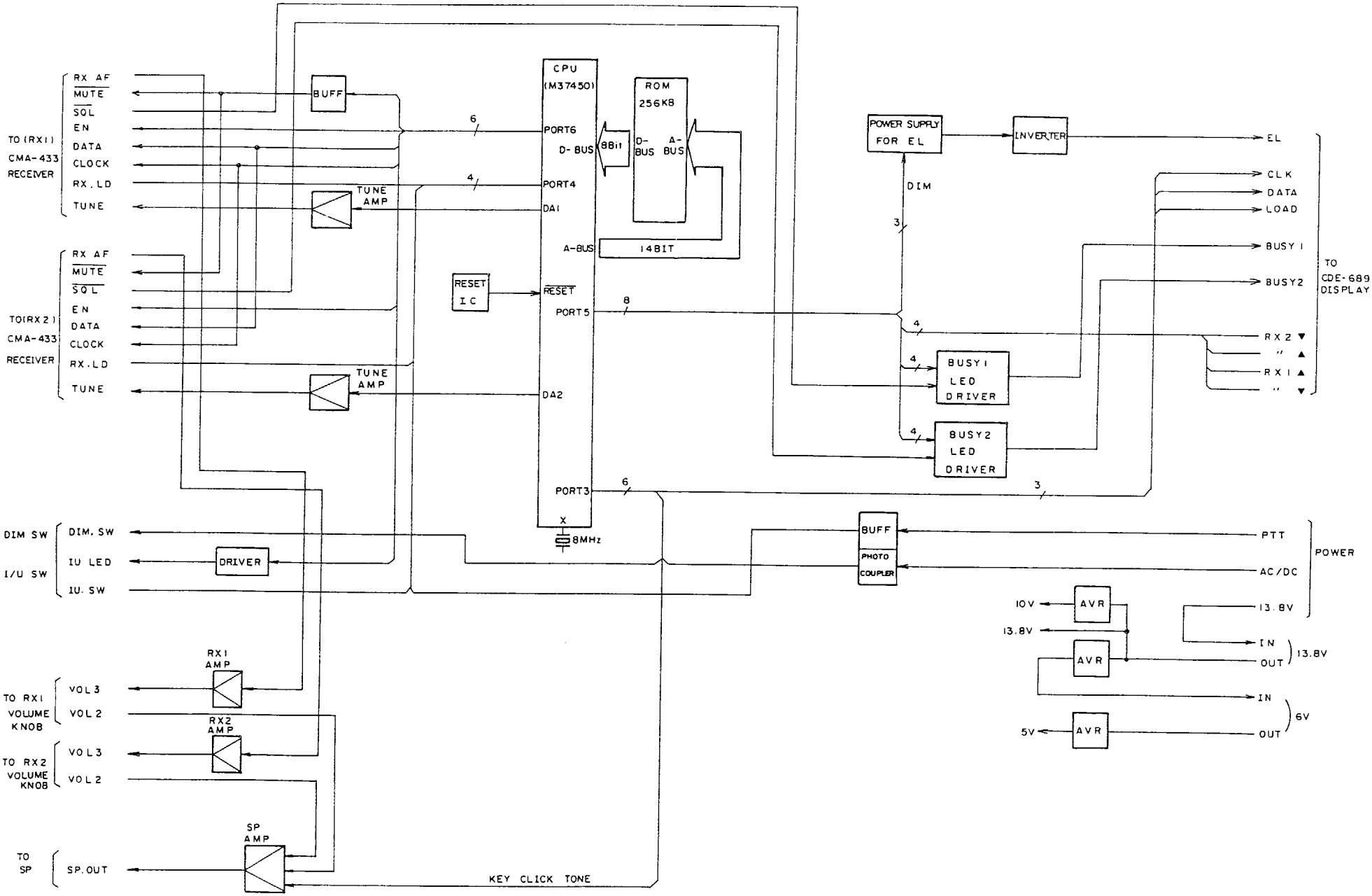
● Block Diagram



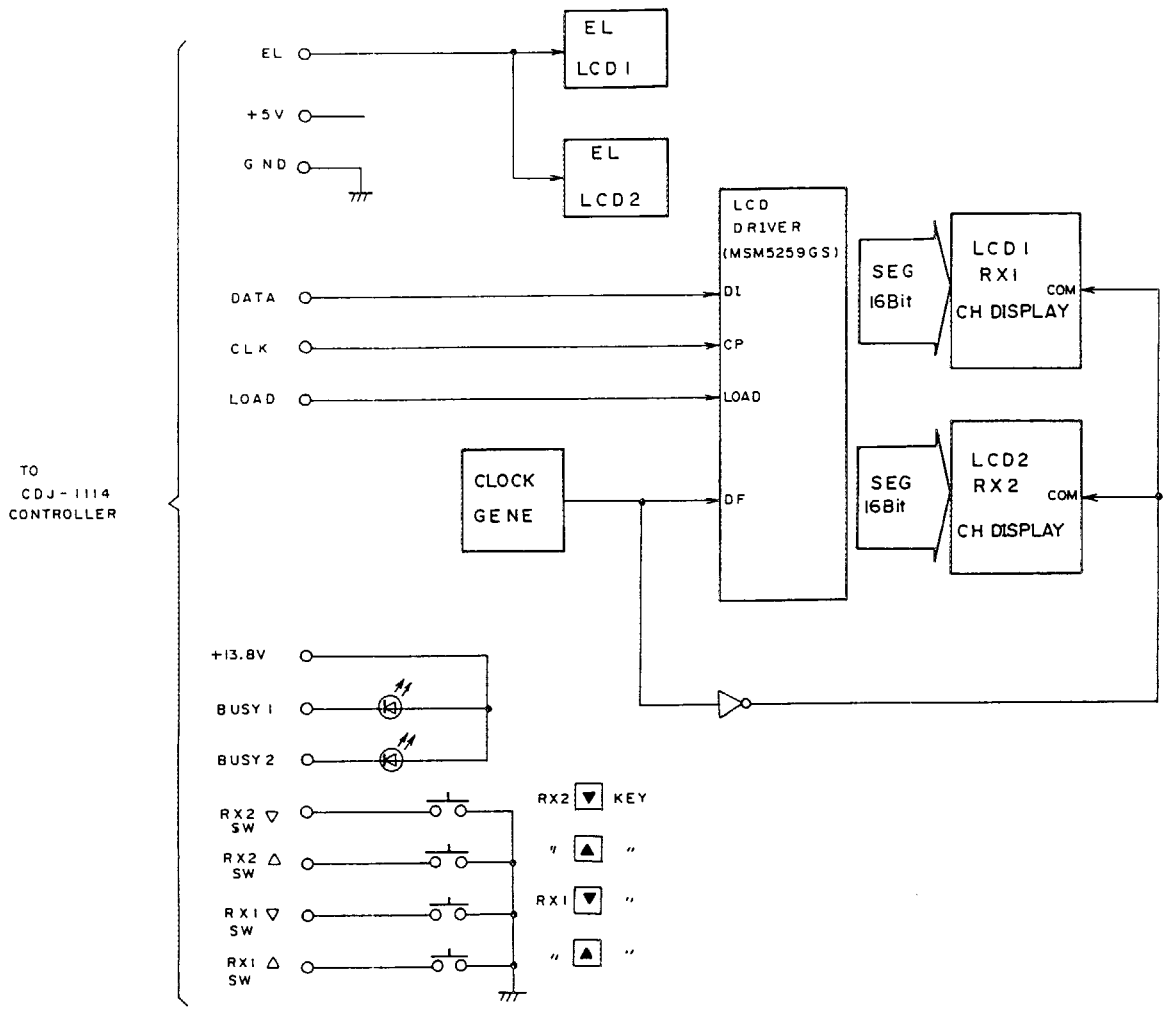
❸ Block Diagram (CMA-433)



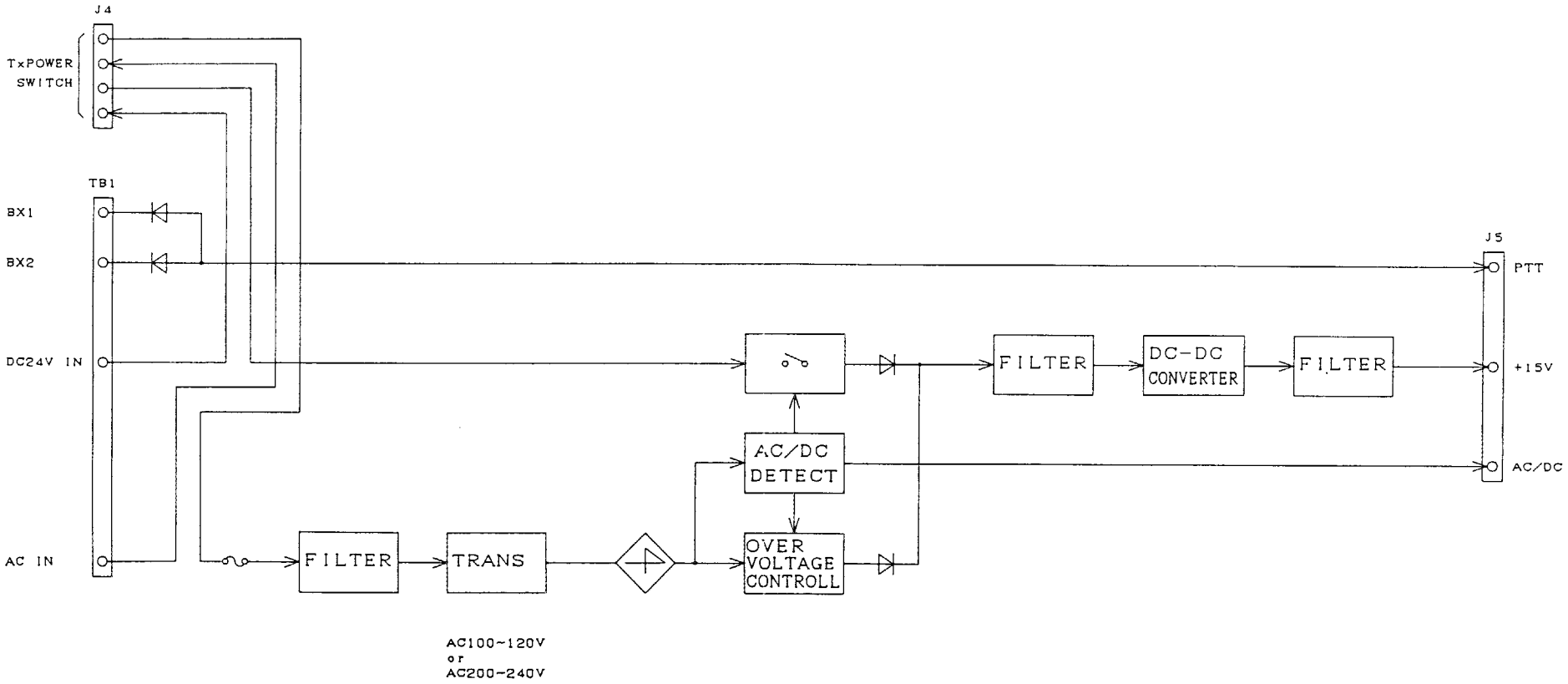
● Block Diagram (CDJ-1114)



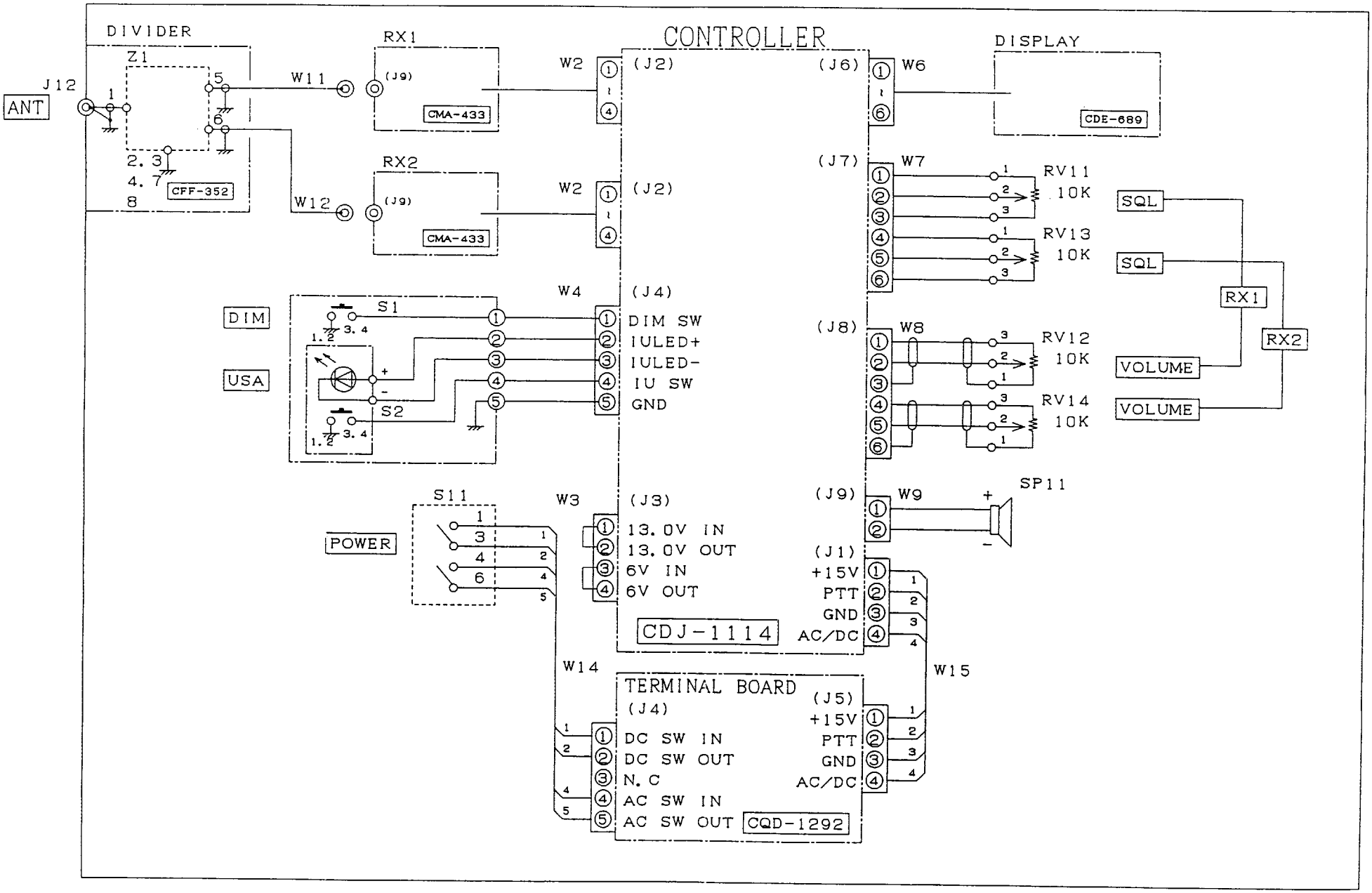
● Block Diagram (CDE-689)



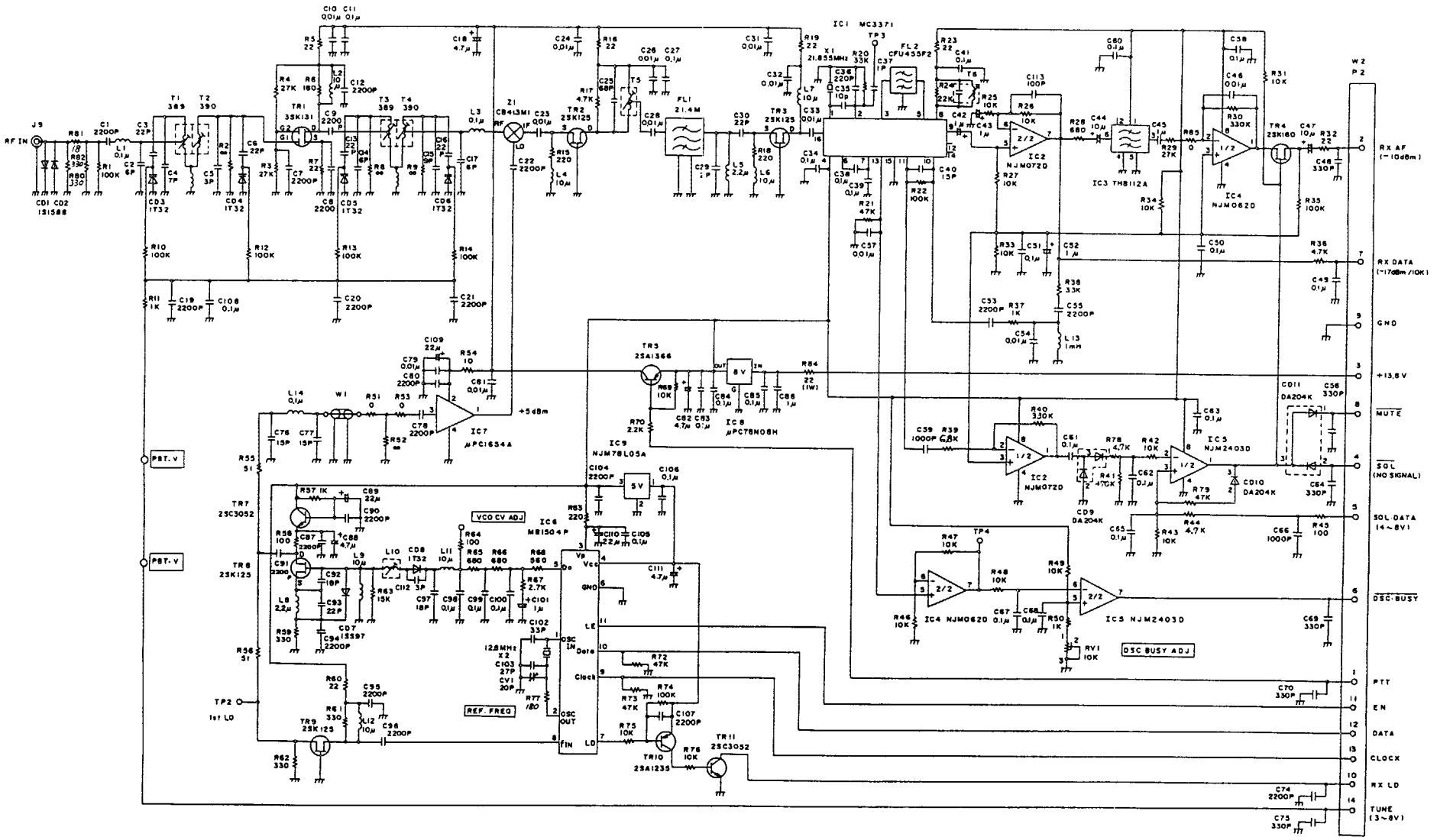
❸ Block Diagram (CQD-1292)



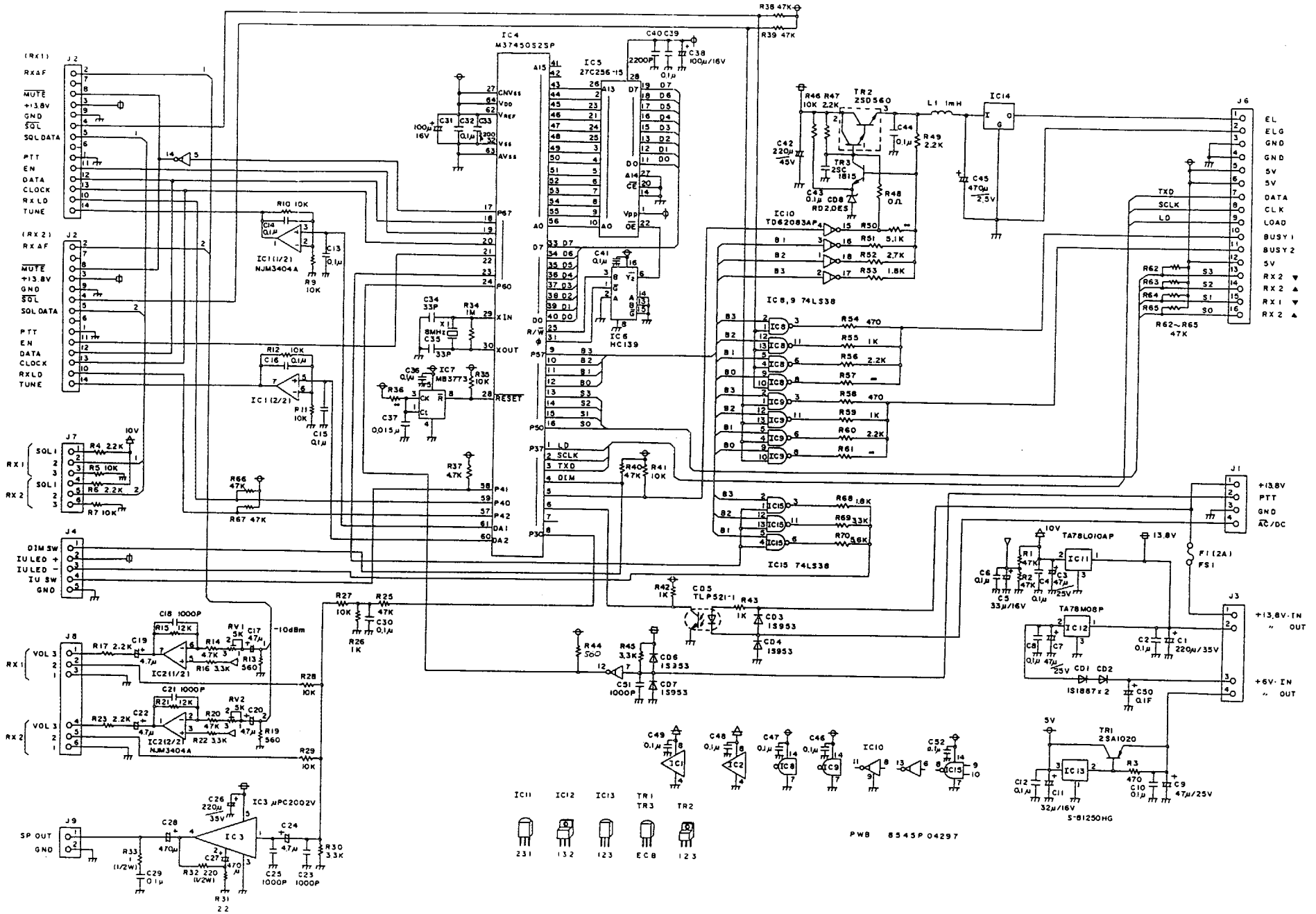
● Schematic Diagram (NRE-332)



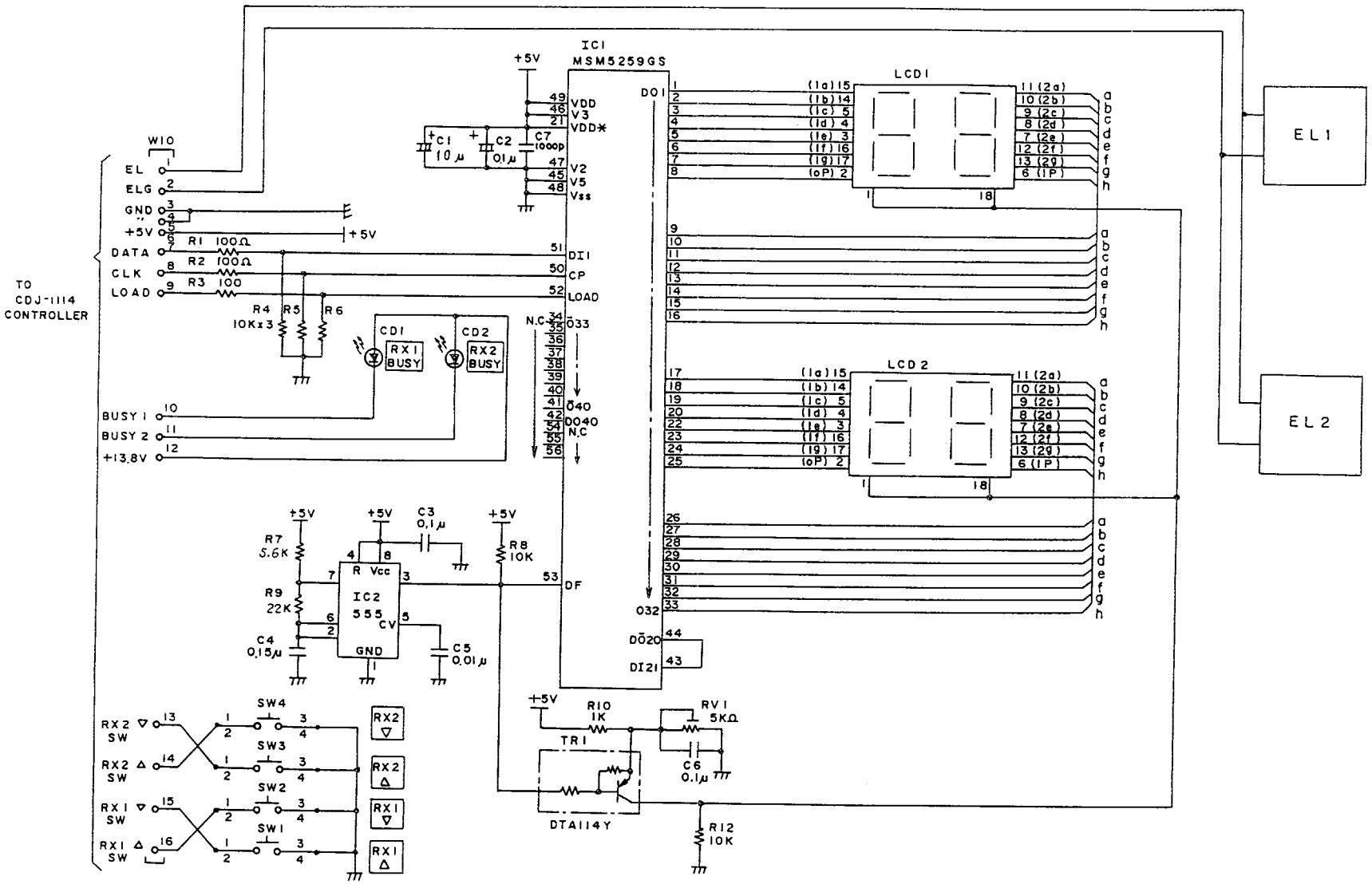
● Schematic Diagram (CMA-433)



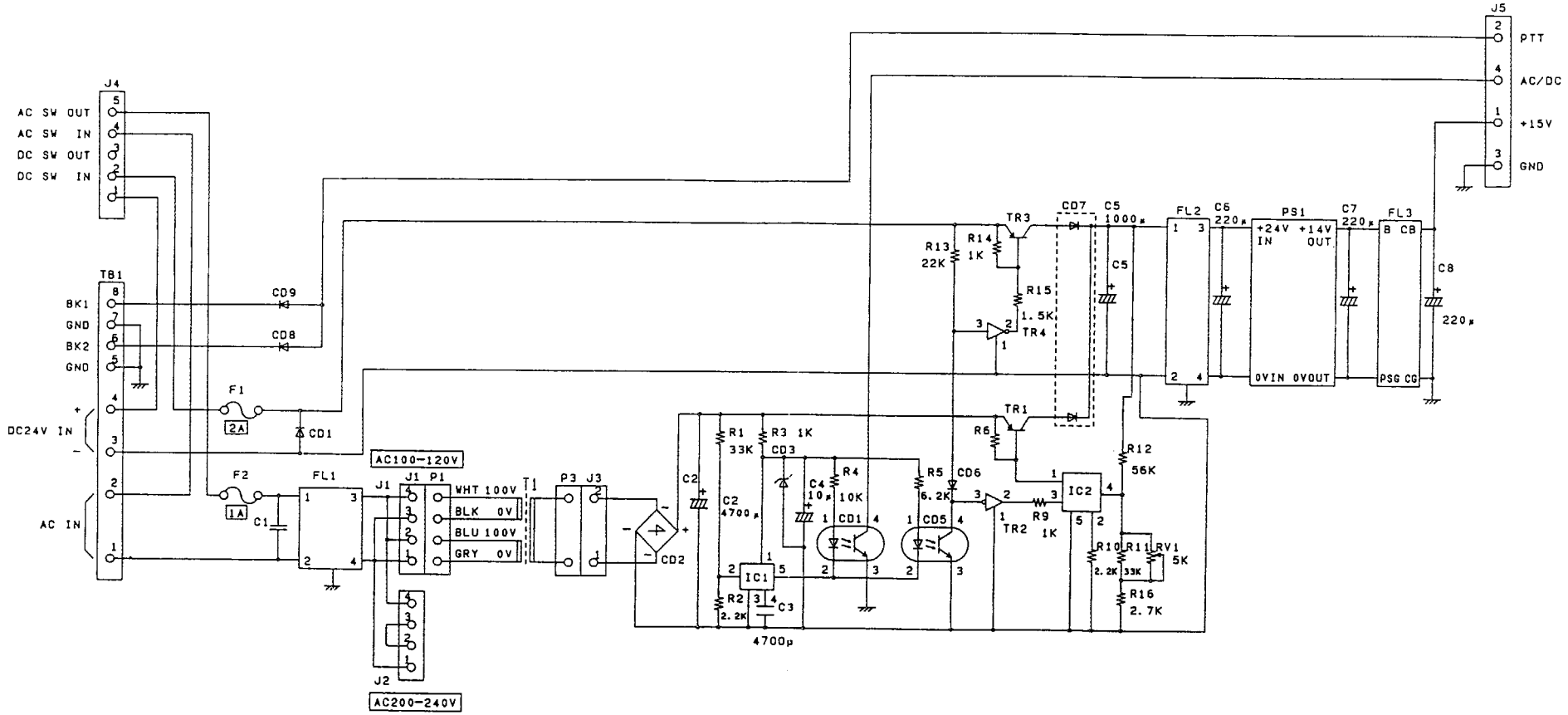
● Schematic Diagram (CDJ-1114)



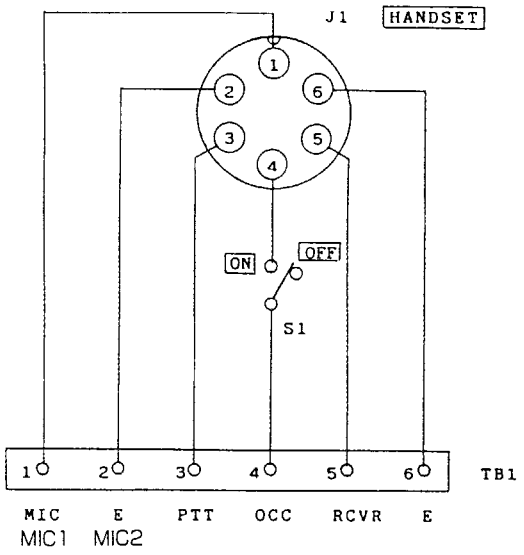
● Schematic Diagram (CDE-689)



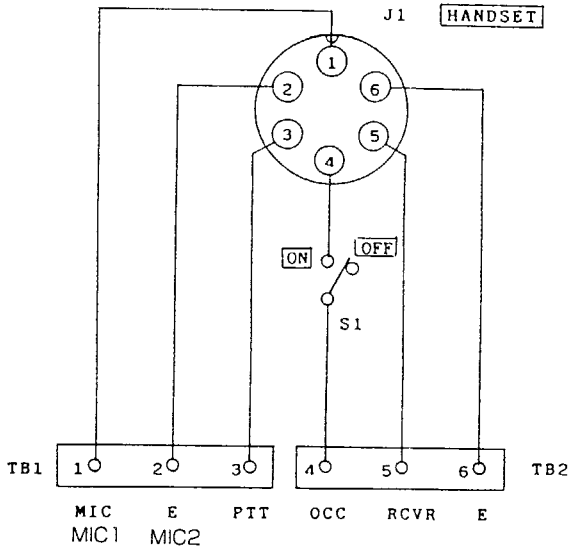
❸ Schematic Diagram (CQD-1292)



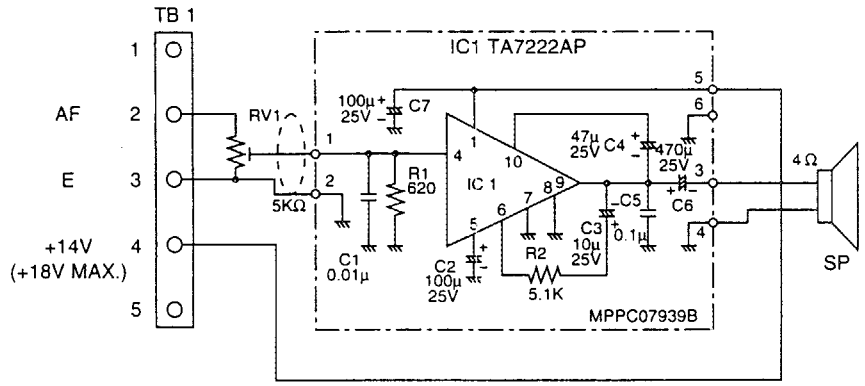
6.5 Handset Connection Box (NQE-846) (Waterproof for wing installation)



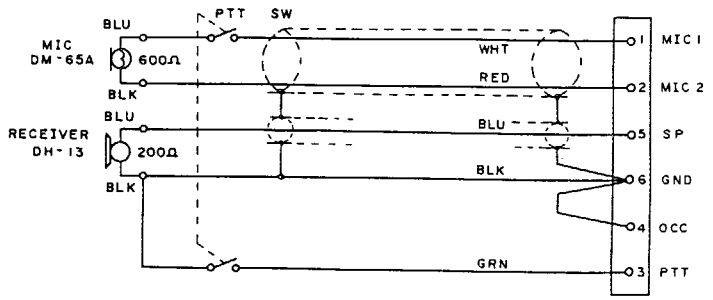
6.6 Handset Connection Box (NQE-847) (Indoor flush mount)



6.7 External Speaker (NVS-423/423A)



6.8 Handset (HS-6000J5)



For further information contact:

JRC *Japan Radio Co., Ltd.*

Since 1915

HEAD OFFICE &
SALES DEPT.

Akasaka Twin Tower (Main),
17-22, Akasaka 2-chome, Minato-ku,
Tokyo 107-8432 JAPAN
Phone : +81-3-3584-8711
Fax : +81-3-3584-8715
Telex : 0242-5420 JRCTOK J

MAIN PLANT

1-1, Shimorenjaku 5-chome, Mitaka-shi,
Tokyo 181-8510 JAPAN
Phone : +81-422-45-9111
Fax : +81-422-45-9110
Telex : 02822-351 JRCMTK J

CODE No.: 6ZPJD00122A