

NX-300 E

NX-300 E4



Does not come with antenna. Antenna is available as an option.

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NX-300

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NXDN Transceivers:

The AMBE+2(TM) voice coding technology is embedded in the firmware under the license of Digital Voice Systems, Inc.

GENERAL

INTRODUCTION

SCOPE OF THIS MANUAL

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information for the equipment and is current as of the publication date. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions. These are issued as required.

ORDERING REPLACEMENT PARTS

When ordering replacement parts or equipment information, the full part identification number should be included. This applies to all parts : components, kits, or chassis. If the part number is not known, include the chassis or kit number of which it is a part, and a sufficient description of the required component for proper identification.

PERSONAL SAFETY

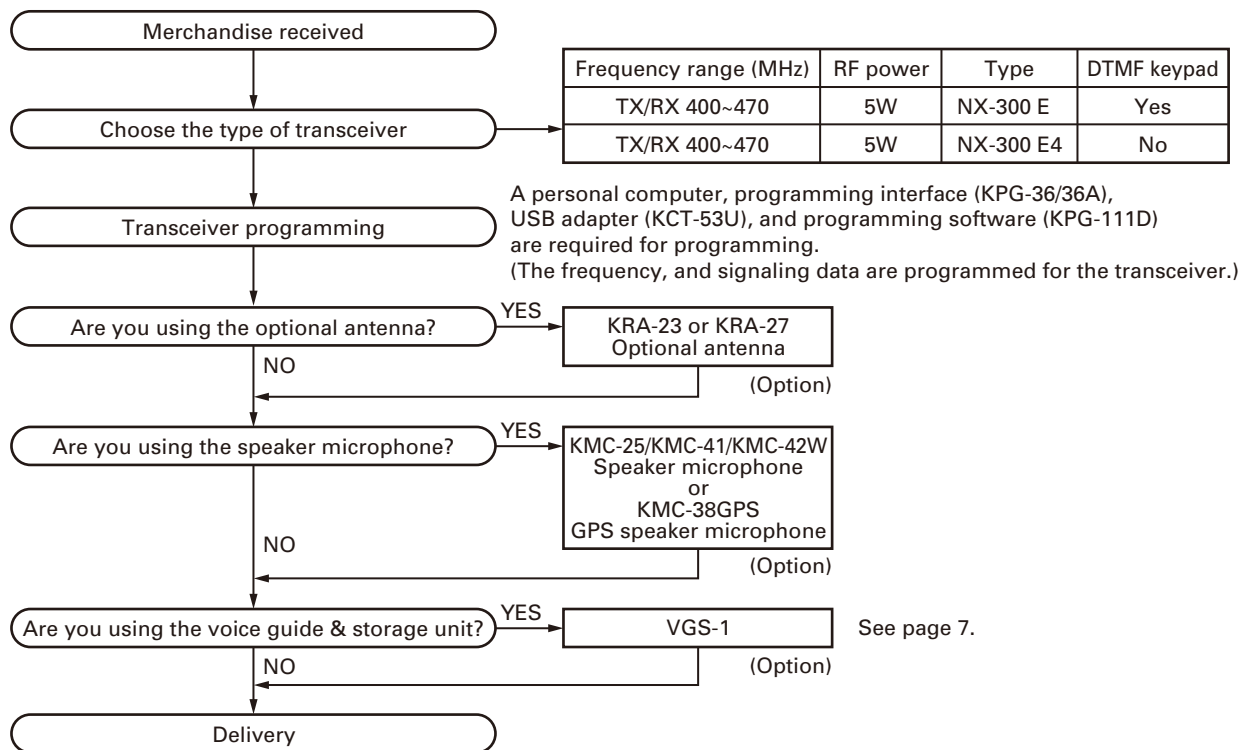
The following precautions are recommended for personal safety:

- DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- This equipment should be serviced by a qualified technician only.

SERVICE

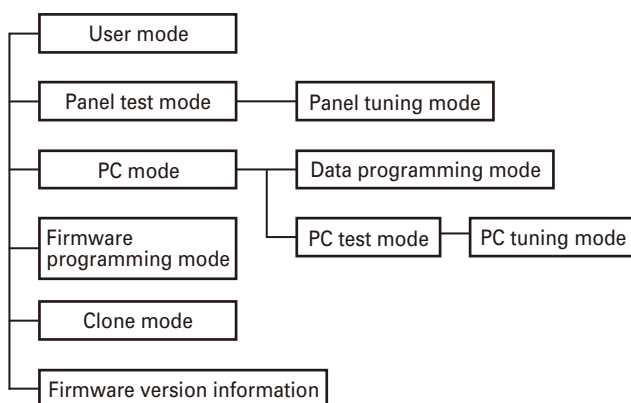
This transceiver is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained within.

SYSTEM SET-UP



REALIGNMENT

1. Modes



Mode	Function
User mode	For normal use.
Panel test mode	Used by the dealer to check the fundamental characteristics.
Panel tuning mode	Used by the dealer to tune the transceiver.
PC mode	Used for communication between the transceiver and PC.
Data programming mode	Used to read and write frequency data and other features to and from the transceiver.
PC test mode	Used to check the transceiver using the PC. This feature is included in the FPU. See pages 51 to 67.
Firmware programming mode	Used when changing the main program of the flash memory.
Clone mode	Used to transfer programming data from one transceiver to another.
Firmware version information	Used to confirm the internal firmware version.

REALIGNMENT

2. How to Enter Each Mode

Mode	Operation
User mode	Power ON
Panel test mode	[>] + Power ON
PC mode	Received commands from PC
Panel tuning mode	[Panel test mode] + [0]
Firmware programming mode	[0] + Power ON
Clone mode	[<] + Power ON
Firmware version information	[Side1] + Power ON

3. Panel Test Mode

Setting method refer to ADJUSTMENT.

4. Panel Tuning Mode

Setting method refer to ADJUSTMENT.

5. PC Mode

5-1. Preface

The transceiver is programmed by using a personal computer, programming interface (KPG-36/36A), USB adapter (KCT-53U) and programming software (KPG-111D).

The programming software can be used with a PC or compatible. Figure 1 shows the setup of a PC for programming.

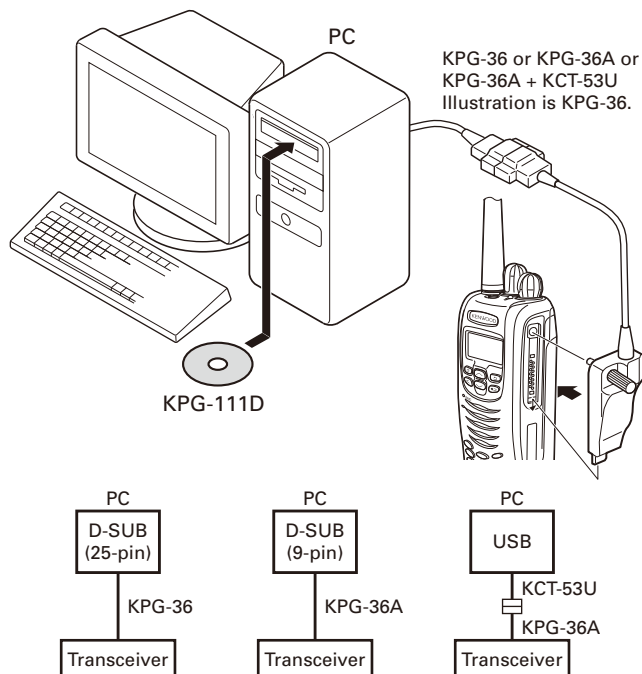


Fig. 1

5-2. Connection procedure

1. Connect the transceiver to the computer using the interface cable and USB adapter (When the interface cable is KPG-36A, the KCT-53U can be used.).

Note:

- You must install the KCT-53U driver in the computer to use the USB adapter (KCT-53U).
- When using the USB adapter (KCT-53U) for the first time, plug the KCT-53U into a USB port on the computer with the computer power ON.

2. When the POWER switch on, user mode can be entered immediately. When PC sends command the transceiver enter PC mode, and "PROGRAM" is displayed on the LCD.

When data transmitting from transceiver, the red LED is lights.

When data receiving to transceiver, the green LED is lights.

Note:

The data stored in the computer must match the "Model Name" when it is written into the flash memory.

5-3. KPG-36/KPG-36A description

(PC programming interface cable: Option)

The KPG-36/36A is required to interface the transceiver to the computer. It has a circuit in its D-sub connector (KPG-36: 25-pin, KPG-36A: 9-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-36/36A connects the universal connector of the transceiver to the RS-232C serial port of the computer.

5-4. KCT-53U description (USB adapter: Option)

The KCT-53U is a cable which connects the KPG-36A to a USB port on a computer.

When using the KCT-53U, install the supplied CD-ROM (with driver software) in the computer. The KCT-53U driver runs under Windows 2000, XP or Vista (32-bit).

5-5. Programming software KPG-111D description

The KPG-111D is the programming software for the transceiver supplied on a CD-ROM. This software runs under MS-Windows 2000, XP or Vista (32-bit) on a PC or compatible machine.

The data can be input to or read from the transceiver and edited on the screen. The programmed or edited data can be printed out. It is also possible to tune the transceiver.

6. Firmware Programming Mode

6-1. Preface

Flash memory is mounted on the transceiver. This allows the transceiver to be upgraded when new features are released in the future. (For details on how to obtain the firmware, contact Customer Service.)

REALIGNMENT

6-2. Connection procedure

Connect the transceiver to the personal computer using the interface cable (KPG-36/36A) and USB adapter (KCT-53U: when the interface cable is KPG-36A, the KCT-53U can be used.). (Connection is the same as in the PC Mode.)

6-3. Programming

1. Start up the firmware programming software (Fpro.exe (ver. 4.0 or later)). The Fpro.exe exists in the KPG-111D installed holder.
2. Set the communications speed (normally, 115200 bps) and communications port in the configuration item.
3. Set the firmware to be updated by File name item.
4. Press and hold the [⏏] key while turning the transceiver power ON. Then, the orange LED on the transceiver lights and "PROGRAM 115200" is displayed.
5. Check the connection between the transceiver and the personal computer, and make sure that the transceiver is in the Program mode.
6. Press "write" button in the window. When the transceiver starts to receive data, the [LOADING] display lights.
7. If writing ends successfully, the checksum is calculated and a result is displayed.
8. If you want to continue programming other transceivers, repeat steps 4 to 7.

Note:

This mode cannot be entered if the Firmware Programming mode is set to Disable in the Programming software.

6-4. Function

1. If you press the [Side2] key while "PROGRAM 115200" is displayed, the display changes to "PROGRAM 19200" (The LED blinks green) to indicate that the write speed is low speed (19200 bps). If you press the [Side2] key again while "PROGRAM 19200" is displayed, the display changes to "PROGRAM 38400" (The LED lights red and orange alternatively). If you press the [Side2] key again while "PROGRAM 38400" is displayed, the display changes to "PROGRAM 57600" (The LED blinks orange). If you press the [Side2] key again while "PROGRAM 57600" is displayed, the display returns to "PROGRAM 115200" (The LED lights orange).
2. If you press the [Side1] key while "PROGRAM 115200" is displayed, the checksum is calculated, and a result is displayed. If you press the [Side1] key again while the checksum is displayed, "PROGRAM 115200" is redisplayed.

Note:

Normally, write in the high-speed mode.

7. Clone Mode

Programming data can be transferred from one transceiver to another by connecting them via their external universal connectors. The operation is as follows (the transmit transceiver is the source and the receive transceiver is a target).

The following data cannot be cloned.

- Tuning data
- Embedded message with password
- Model name data
- ESN (Electronic Serial Number) data

Note:

The following data can be cloned.

- Fleet (own)/ID (own) for FleetSync
- Unit ID (own) for NXDN

Key guide on the Read authorization password input screen.

- CONFIRM ([↵] key): The password confirmation
- DELETE ([←] key): Delete the least digit from the current password number (Press and hold to delete all password numbers)
- SELECT ([⇐] key): Determine the least digit of the password number

1. Press and hold the [←] key while turning the transceiver power ON. If the Read authorization password is set to the transceiver, the transceiver displays "CLONE LOCK". If the password is not set, the transceiver displays "CLONE MODE".

2. When you enter the correct password, and "CLONE MODE" is displayed, the transceiver can be used as the cloning source. The following describes how to enter the password.

3.
 - **How to enter the password using the keypad (E models only);**

If one of keys 0 to 9 is pressed while the "CLONE LOCK" is displayed, the pressed number is displayed on the LCD.

Each press of the key shifts the display in order to the left.

When you enter the password and press the [↵] or [✱] key, "CLONE MODE" is displayed if the entered password is correct. If the password is incorrect, "CLONE LOCK" is redisplayed.

- **How to enter the password using the [↵] and [↵] keys (E, E4 models);**

If the [↵] / [↵] key is pressed while "CLONE LOCK" is displayed, the Read authorization password input screen is displayed.

If the [↵] key or [↵] key is pressed while the Read authorization password input screen is displayed, the number (0 to 9) blinks on the LCD. When you press the [↵] key, the currently selected number is determined.

REALIGNMENT

If you press the [↵] key after entering the password in this procedure, "CLONE MODE" is displayed if the entered password is correct. If the password is incorrect, "CLONE LOCK" is redisplayed.

4. Power ON the target transceiver.
5. Connect the cloning cable (part No. E30-3325-05) to the universal connectors on the source and target.
6. Press the [↵] key on the source while the source displays "CLONE MODE". The data of the source is sent to the target. While the target is receiving the data, "PROGRAM" is displayed. When cloning of data is completed, the source displays "END", and the target automatically operates in the User mode. The target can then be operated by the same program as the source.
7. The other target can be continuously cloned. When the [↵] key on the source is pressed while the source displays "END", the source displays "CLONE MODE". Carry out the operation in step 4 to 6.

Note:

- Cannot be cloned if the password (overwrite password) is programmed to the target.
- "Model Name" must be same to clone the transceiver.

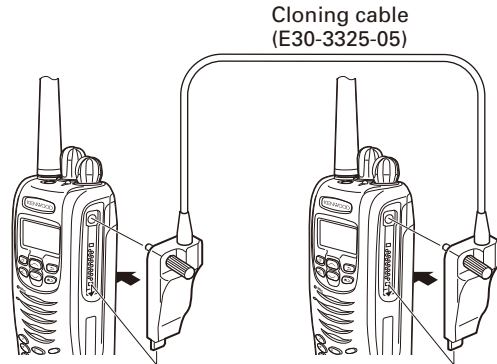


Fig. 2

8. Firmware Version Information

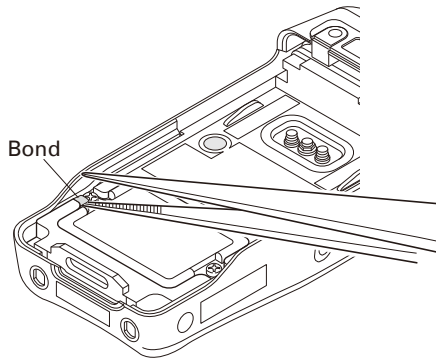
Press and hold the [Side1] key while turning the transceiver power ON and then keep pressing and holding the [Side1] key, the firmware version information appears on the LCD.

INSTALLATION

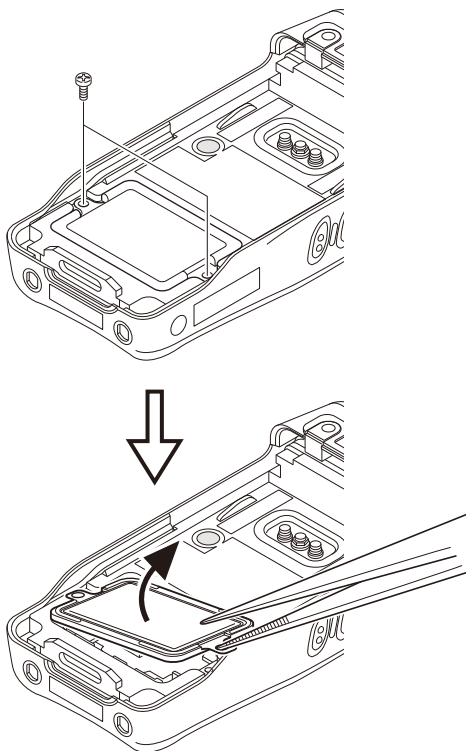
Voice Guide & Storage Unit (VGS-1: Option)

■ Installing the VGS-1 (Voice Guide & Storage Unit) in the transceiver

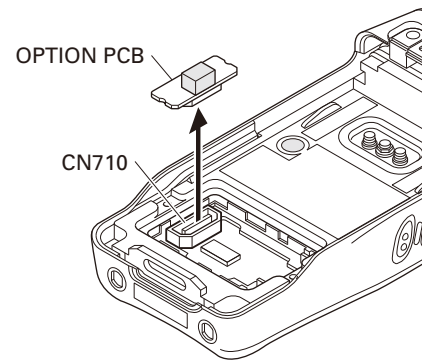
1. Remove the bond from between the chassis and the screw for the option board cover using a pair of tweezers.



2. Remove the two screws from the cover.
3. Remove the cover by inserting the tip of a pair of tweezers into the screw hole of the cover and prying it open.



4. Remove the OPTION PCB from the connector (CN710) of the Control PCB.



5. Attach the flat spring (G02-1846-03) to the VGS-1 as shown in the figure.

Note:

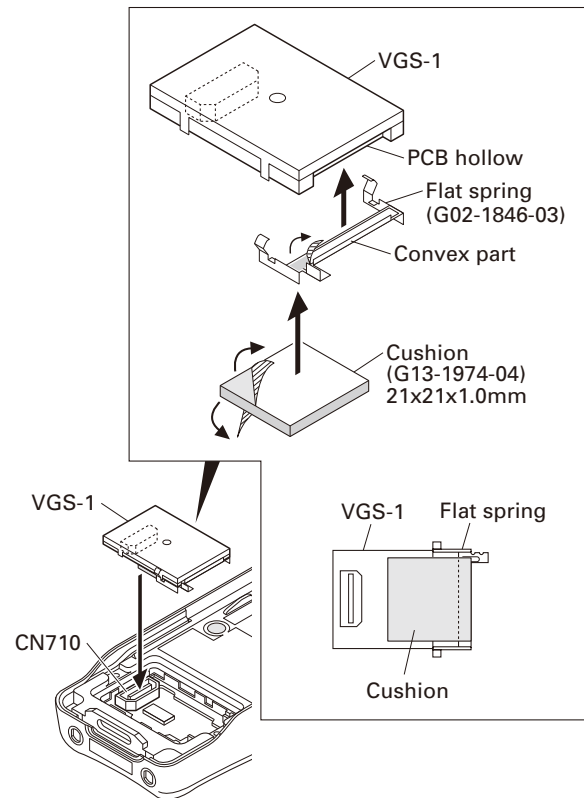
Attach the flat spring so that its convex fits the PCB hollow of the VGS-1.

6. Attach the cushion (G13-1974-04) to the VGS-1 as shown in the figure.

Note:

Be sure not to cover the VGS-1 connector with the cushion.

7. Insert the VGS-1 connector into the connector (CN710) of the Control PCB.

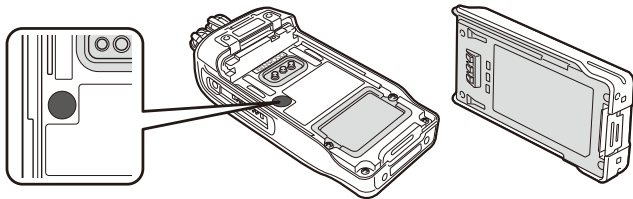


8. Reinstall the cover using the two screws removed in step 2.
9. Perform the water resistance confirmation and then apply the bond to the two left side screws, tightened in the rear of the transceiver. (Refer to pages 14 to 17.)

DISASSEMBLY FOR REPAIR

1. Precautions for Waterproof

- Do not remove the black sheet from the reverse side of the transceiver (refer to the illustration below). Removal of this sheet decreases the waterproof efficiency of the transceiver and may cause malfunctions if water seeps into the transceiver.
- The orange packing material on the reverse side of the transceiver is important with respect to the waterproof efficiency of the transceiver. Do not place stickers or other materials on or around the packing material shown in the figure, or on the reverse side of the battery pack. Doing so will impair the waterproof efficiency of the transceiver and may cause it to break down. Additionally, in order to prevent damage to the packing material, do not allow it to come in contact with foreign materials.



■ Water resistance maintenance of the transceiver

The transceiver satisfies protection levels (IP standard) IP67 specified by international standard IEC 60529. IP indicates a level of dust resistance and water resistance. The first characteristic numeral indicates "dust resistance", and the second characteristic numeral indicates "water resistance".

The overview of the IP67 requirements are provided below:

- IP6* (Dust resistant type): Reduce pressure in the set to a maximum of 2kPa to prevent entry of dust of 25 microns.
- IP*7 (Water immersion endurance): There is no ill effect on performance or function when the unit is immersed in water at a depth of 0.15 to 1m (0.49 to 3.28 feet) for 30 minutes. (In case of the test unit with a height less than 850mm, the bottom part of test unit can be placed 1000mm below the surface of the water.)

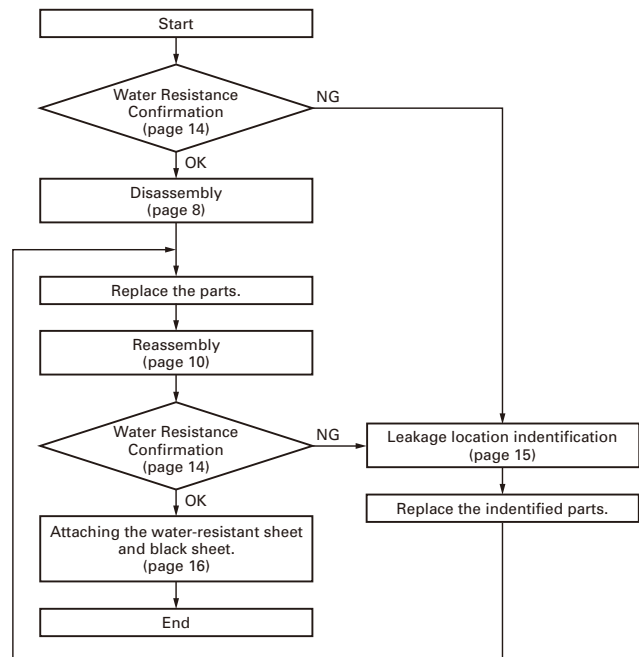
Disassemble the transceiver with the facility or in the environment in which water resistance can be fully confirmed.

Those who perform the procedure described here must be experienced qualified engineers who understand the contents of this service manual (B51-8859-00).

Perform the following work when you restore the waterproof performance of the transceiver at the IP67 level after the transceiver is repaired.

Attach the two pieces of double-sided adhesive tape (J99-0727-04, J99-0728-04) between the top packing and the chassis.	Refer to page 9.
Apply the silicon grease (W05-1492-00) onto the speaker part of the key top and around the chassis.	Refer to page 11.
Apply the silicon grease (W05-1492-00) around the hole of the negative (-) terminal in the rear of the chassis.	Refer to page 11.
Perform "Leakage Location Identification" and identify the location where air is leaking.	Refer to page 15.
Repair the location where air is leaking. (step 8 of "Leakage Location Identification")	Refer to page 16.
Apply bond to the top of the left side screw for the chassis and between the chassis and the left side screw for the option board cover.	Refer to page 16.

■ Repair procedure flow chart



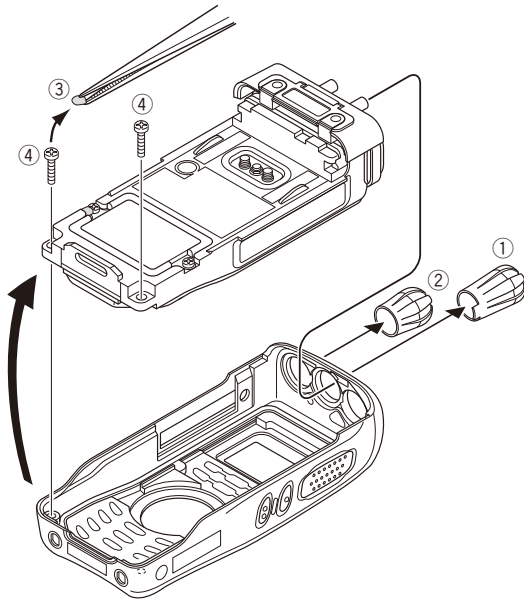
2. Precautions for Disassembly

Perform "Water Resistance Confirmation" on page 14 before disassembling the transceiver. If it fails, perform "Leakage Location Identification" on page 15.

■ Disassembly procedure

- Remove the channel knob ① and volume knob ②.
- Remove the bond ③ from the screw using a pair of tweezers.
- Remove the two screws ④.
- Lift and remove the chassis from the case.

DISASSEMBLY FOR REPAIR

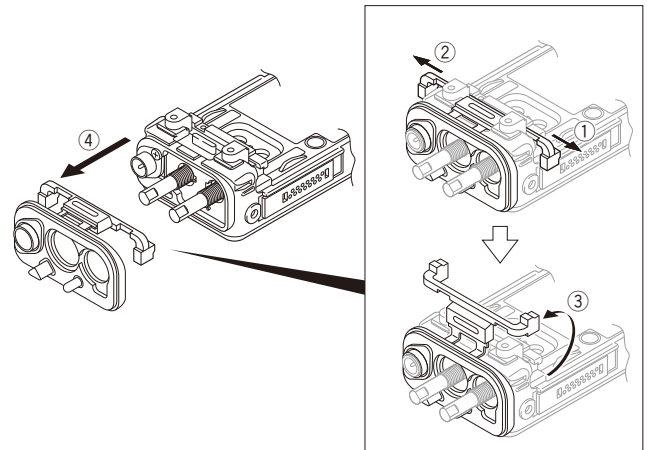


■ Removing the TOP packing (G53-1762-02)

1. Pull the TOP packing to the left to remove the packing that is fit into the left groove of the chassis ①.
2. Pull the TOP packing to the right to remove the packing that is fit into the right groove of the chassis ②.
3. Turn back the TOP packing as shown in the figure ③.
4. Remove the TOP packing ④.

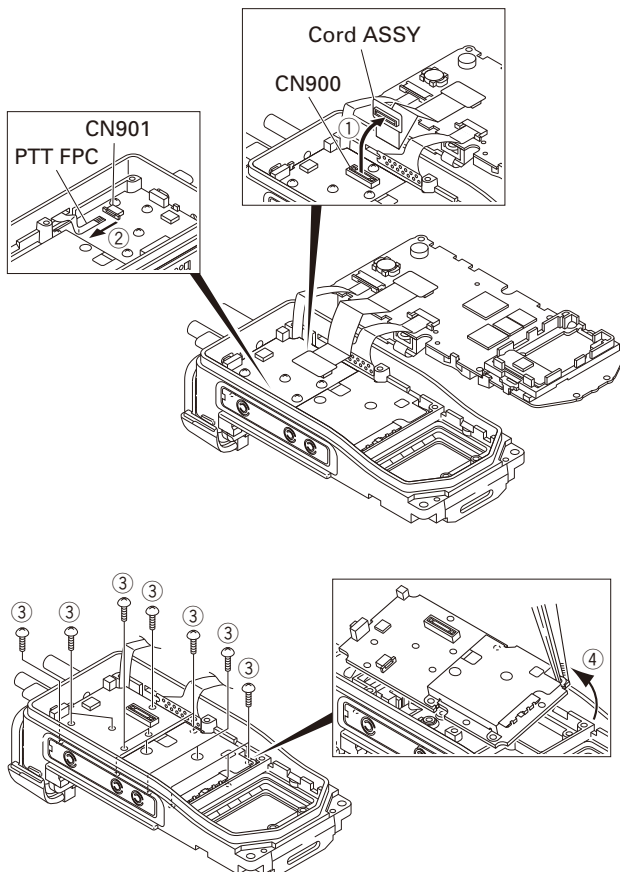
Note:

Take care not to damage the TOP packing when peeling off, as it is attached to the chassis with two pieces of double-sided adhesive tape (J99-0727-04, J99-0728-04).



■ Removing the TX-RX unit from the chassis

1. Remove the cord ASSY from the connector of the TX-RX unit (CN900) ①.
2. Remove the PTT FPC from the connector of the TX-RX unit (CN901) ②.
3. Remove the 14 screws ③.
4. Anchor the screw hole of the TX-RX unit using the tip of a pair of tweezers as shown in the figure. Then, lift the TX-RX unit to remove it from the chassis ④.

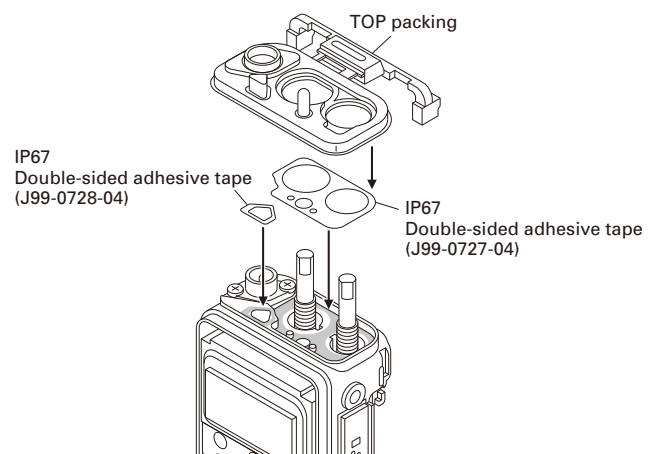


Note:

The two pieces of double-sided adhesive tape attached to the TOP packing cannot be reused.

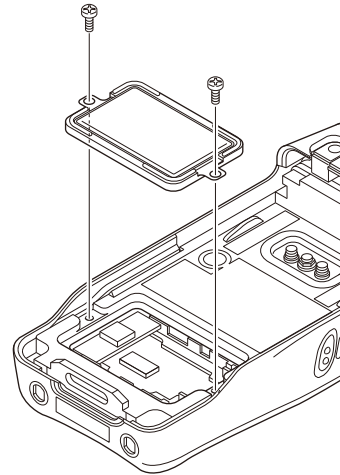
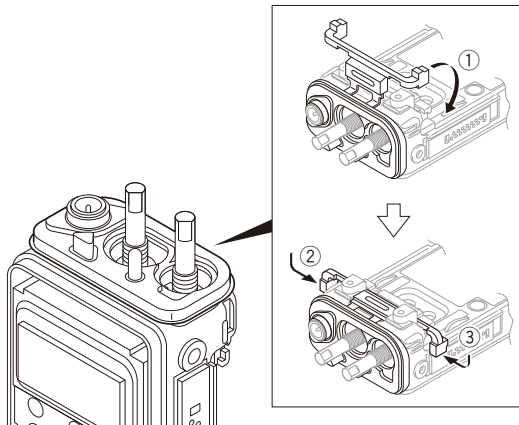
Perform the following procedures when you reassemble the TOP packing.

- 1) Attach the TOP packing after attaching new double-sided adhesive tape to the chassis as shown in the figure.



DISASSEMBLY FOR REPAIR

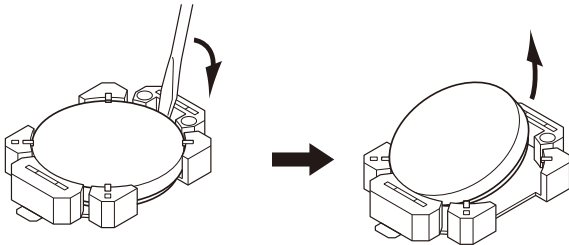
- 2) Move the TOP packing as shown in the figure, and attach it to the chassis ①.
- 3) Fit the TOP packing into the right groove of the chassis ②.
- 4) Fit the TOP packing into the left groove of the chassis ③.



2. Perform the water resistance confirmation and then apply the bond to the two left side screws, tightened in the rear of the transceiver. (Refer to pages 14 to 17.)

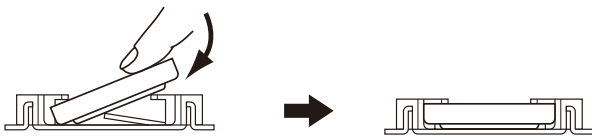
■ Removing the lithium cell (W09-0971-05)

Insert a non-conductive screwdriver to groove of one side of the socket (CN401) and pry the lithium cell up from the socket.



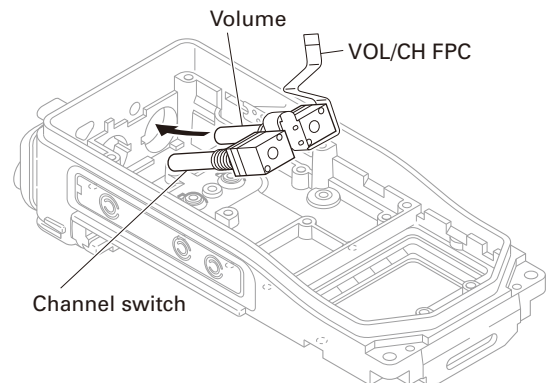
■ Installing the lithium cell (W09-0971-05)

Insert a lithium cell into one side of the socket (CN401). Push the lithium cell to insert the lithium cell into the socket.



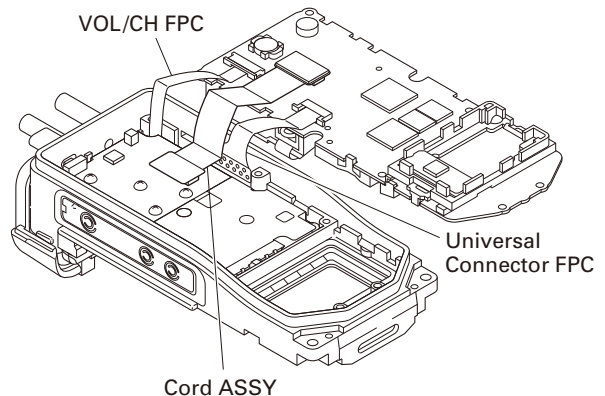
■ Inserting the Volume and Channel switch into the chassis

Insert the volume and channel switch into the chassis with the VOL/CH FPC formed as shown in the figure.



■ Forming the VOL/CH FPC, Cord ASSY and Universal connector FPC

Form the VOL/CH FPC, Cord ASSY and Universal connector FPC as shown in the figure.



3. Precautions for Reassembly

■ Installing the option board cover onto the chassis

1. Install the option board cover onto the chassis using the two screws.

Note:

Confirm that there is no foreign matters on the waterproof rib of the option board cover. (Wipe it clean when foreign matters adhere to it.)

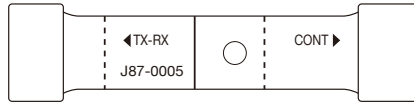
DISASSEMBLY FOR REPAIR

Note:

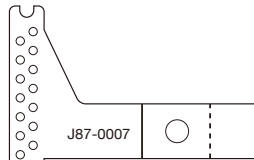
Fold indications are printed on the Cord ASSY and Universal Connector FPC.

"——" line shows creased line on the top.

"- - - -" line shows creased line on the bottom.



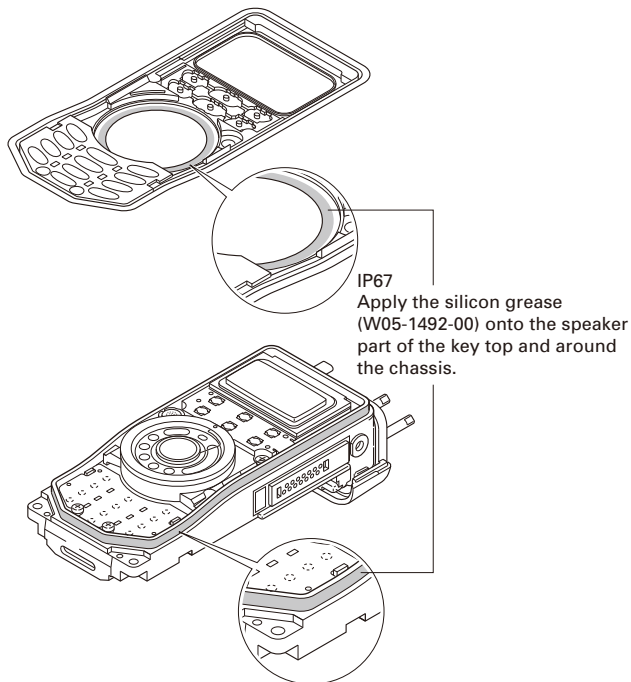
Cord ASSY



Universal Connector FPC

■ **Mounting the chassis onto the case**

1. Apply the silicon grease (W05-1492-00) onto the speaker part of the key top and around the chassis.



IP67
Apply the silicon grease (W05-1492-00) onto the speaker part of the key top and around the chassis.

2. Place the key top on the chassis. Then, fit the chassis tightly into the groove of the key top ①.

Note:

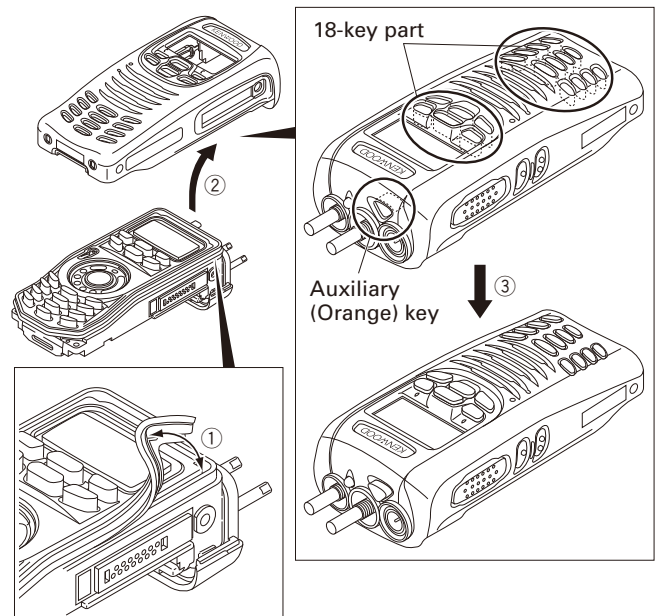
Confirm that the entire groove of the key top fits to the chassis tightly.

3. Mount the chassis onto the case ②.

Note:

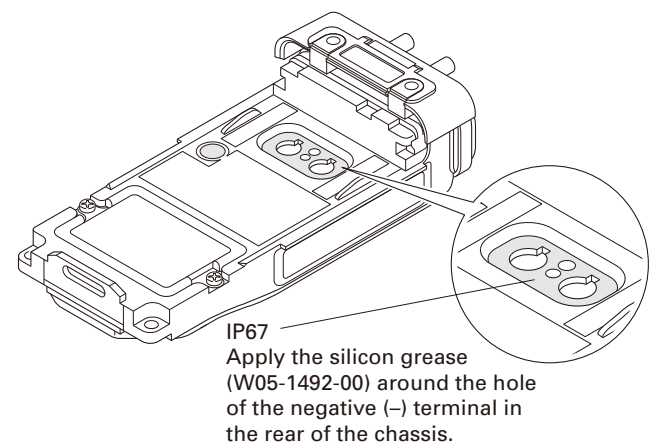
After mounting the chassis onto the case, if the 18-key part on the key top or the Auxiliary (Orange) key part of the VOL/CH packing gets stuck inside the case as shown in the figure, return it to the normal position using a soft tipped item (e.g., finger) ③.

Prying it with a pointed metal tool such as forceps, may damage the key top or packing.



■ **Correspondence when replacing the Terminal block (E72-0425-03) or Packing (G53-1763-03)**

Apply the silicon grease (W05-1492-00) around the hole of the negative (-) terminal in the rear of the chassis when replacing the terminal block (E72-0425-03) or packing (G53-1763-03).

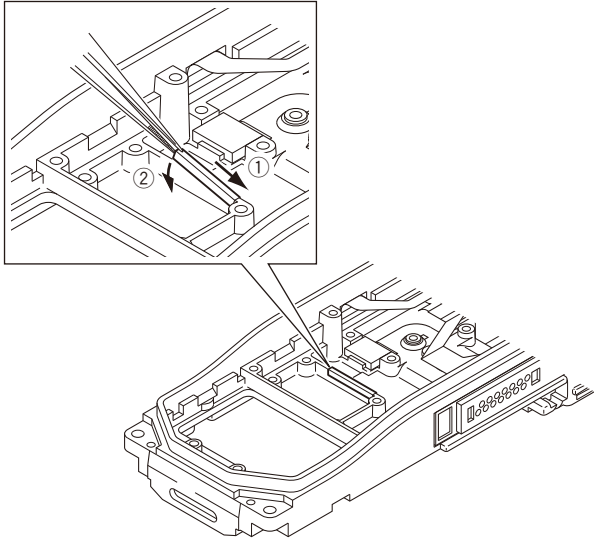


IP67
Apply the silicon grease (W05-1492-00) around the hole of the negative (-) terminal in the rear of the chassis.

DISASSEMBLY FOR REPAIR

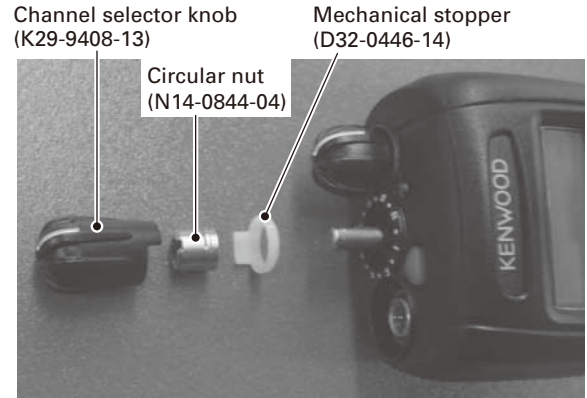
■ Relay hardware (E29-1221-14) installation procedure

1. Fit one side of the relay hardware to a right corner of the chassis using a pair of tweezers ①.
2. Fit the other side of the relay hardware to the rib of the chassis ②.



■ Changing the channel selector from 16-channel operation to free

1. Remove the channel selector knob.
2. Remove the circular nut.
3. Remove the mechanical stopper.
4. Reassemble the circular nut and channel selector knob that were removed in steps 1 and 2, in their original positions.



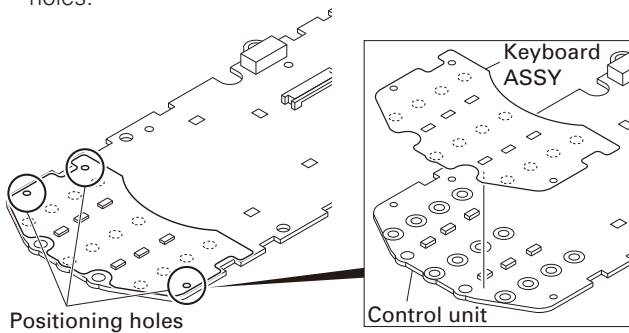
■ Affixing the keyboard ASSY (S79-0472-05)

Affix the keyboard ASSY to the Control unit as shown in the figure.

After affixing the keyboard ASSY to the Control unit, confirm that the three positioning holes of the keyboard ASSY and the Control unit are not misaligned.

Note:

If the holder (Option board) is removed from the Control unit, it becomes easy to confirm the three positioning holes.



DISASSEMBLY FOR REPAIR

■ Assembly information (Sheet/Cushion)

When "Main Parts" is changed (ordered), "Assembled Sheet/Cushion" should also be changed (ordered) together.

The Sticker and Sheet etc are non-reusable parts. It requires the new one to get the radio's performance after repairs.

For example, when "Plastic Cabinet (A02-4002-23 (6-key)/A02-4003-23 (18-key))" is changed, "Sticker (B42-7296-04)", "Badge (B43-1606-04)" and "Fibrous Sheet (G10-1373-04)" should be ordered and changed together because Sticker (B42-7296-04), Badge (B43-1606-04) and Fibrous Sheet (G10-1373-04) are non-reusable.

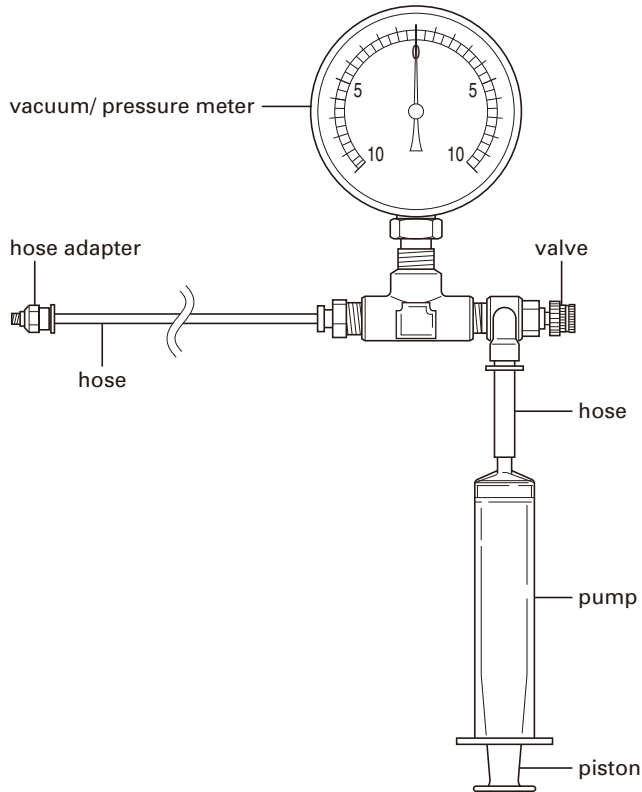
Main Parts		Assembled Sheet/ Cushion		
Part Name	Part Number	Part Name	Part Number	Remark
Plastic Cabinet (6-key)	A02-4002-23	Sticker	B42-7296-04	"NXDN" is printed.
		Badge	B43-1606-04	"KENWOOD" is printed.
Plastic Cabinet (18-key)	A02-4003-23	Fibrous Sheet (SP)	G10-1373-04	
LCD ASSY	B38-0923-05	Adhesive Sheet (LCD)	J99-0714-04	Used for fixing the LCD ASSY on the Illumination Guide (LCD). Also used for fixing the Illumination Guide (LCD) on the Control Unit.
Cord ASSY (50-pin FPC)	X42-3340-10	Cushion (50-pin FPC)	G13-2258-04	
Speaker	T07-0755-15	Rubber Cushion (SP)	G11-4272-14	
		Sheet (SP)	G11-4458-14	Used for stabilizing the waterproof performance. "•" (a hole) on the Sheet (SP) shows the upper side (6-key FPC side).
Switch Unit (6-key FPC)	X41-3720-10	Adhesive Sheet (6-key FPC)	J99-0390-04	Used for fixing the Switch Unit (6-key FPC) from the back side of the Holder (FG-SP) before soldering.
		Adhesive Sheet (6-key FPC)	J99-0712-14	Used for fixing the Switch Unit (6-key FPC) on the Holder (FG-SP).
Switch Unit (PTT FPC)	X41-3710-10	Sheet (PTT)	G11-4428-04	Used for fixing the Push Knob (PTT) on the Switch Unit (PTT FPC) and stabilizing the waterproof performance.
		Adhesive Sheet (PTT FPC)	J99-0711-04	Used for fixing the Switch Unit (PTT FPC) on the Chassis.
Chassis	A10-4127-01	Relay Hardware (VCO-Chassis)	E29-1221-14	Used for stabilizing the shield performance of the VCO.
		Sheet (Air)	G11-4331-04	This sheet is put on the leak check hole. This sheet lets air through, but does not let water through.
		Rubber Sheet (FET)	G11-4429-04	Used for stabilizing the radiation performance of the FET.
		Sheet (Air)	G11-4440-04	This sheet is a protect cover of the sheet (G11-4331-04).
		Cushion (ANT)	G13-2220-04	Used for fixing the Terminal ASSY.
Terminal Block	E72-0425-03	Adhesive Sheet (Terminal Block)	J99-0725-04	Used for fixing the Terminal Block and the Packing (Terminal Block).

DISASSEMBLY FOR REPAIR

4. Water-resistant Inspection Method

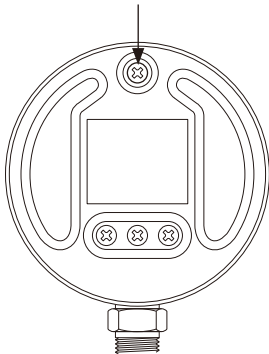
Preparation

• Water-resistant Inspection Jig (W05-1499-00)



Note:

0 point adjustment of the meter needle can be done by turning the screw on the rear of the meter.

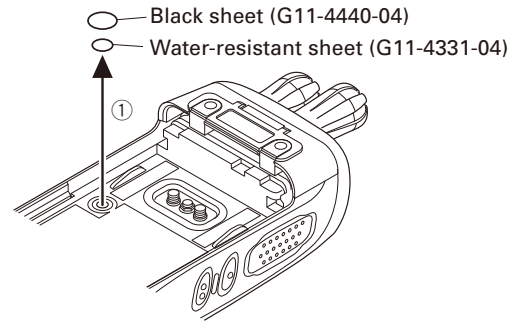


■ Water Resistance Confirmation

- 1) Install the universal connector cap over the universal connector.
- 2) Remove the water-resistant sheet (G11-4331-04) and black sheet (G11-4440-04) attached to the right side of the rear of the chassis using a pair of tweezers ①. This water-resistant sheet allows air to pass, but not water.

Note:

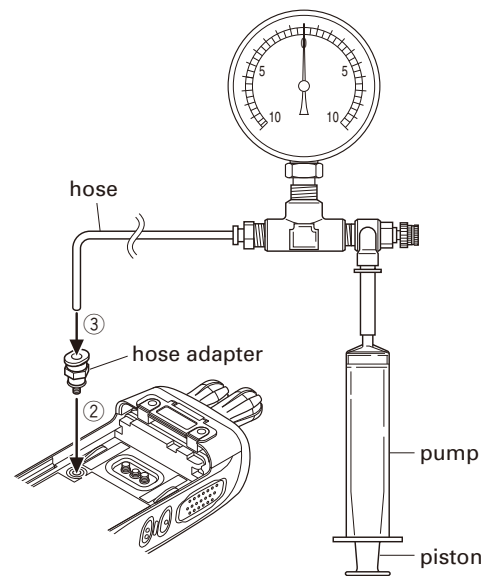
Take sufficient care to prevent damage to the surface of the chassis when removing the water-resistant sheet.



- 3) There is a screw hole under the water-resistant sheet. Insert the hose adapter into this screw hole while turning it ②.
- 4) Insert the water-resistant inspection jig hose into the hose adapter ③.

Note:

The piston of the water-resistant inspection jig pump must be pushed in to the end.



- 5) Turn and open the valve on the side of the pump of the water-resistant inspection jig, then pull the pump piston to reduce the pressure in the transceiver. Pull the piston until the meter needle of the water-resistant inspection jig indicates 10kPa (left side of meter). If the meter needle does not reach 10kPa when the piston is pulled to the end, perform the following steps.
 - a) Close the valve on the side of the pump.
 - b) Remove the pump from the hose.
 - c) Push the piston of the removed pump to the end.
 - d) Insert the pump into the hose.
 - e) Open the valve and pull the pump piston.
 Repeat steps a) to e) until the meter needle indicates 10kPa (left side of meter). Disassemble and reassemble the transceiver when you do not reach 10kPa even if the step from a) to e) is repeated three times.

DISASSEMBLY FOR REPAIR

Note:

Do not push the piston with the pump inserted in the hose because the meter needle of the water-resistant inspection jig will break with excessive pressure.

- When the meter needle reaches 10kPa (left side of meter), close the valve on the side of the pump and observe the movement of the meter needle.

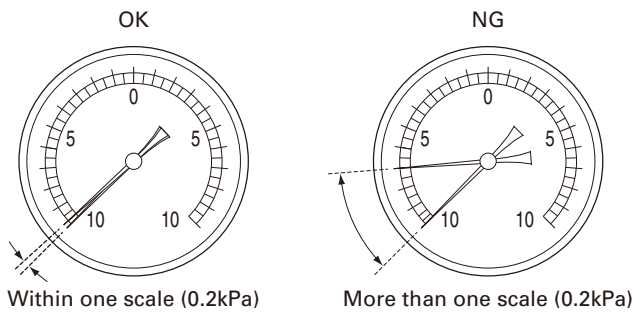
If the change of the meter needle is within one scale (0.2kPa) in 30 seconds, the transceiver will retain normal water resistance.

It is not necessary to perform the "Leakage Location Identification" test on page 15 under these conditions.

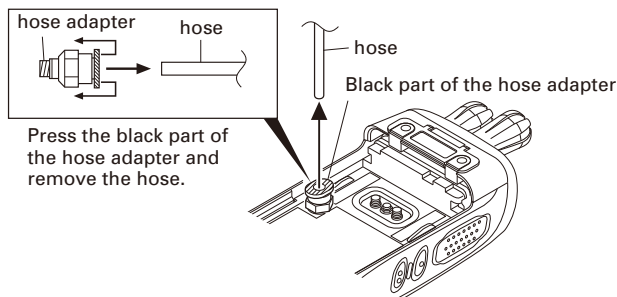
If the change of the meter needle is more than one scale (0.2kPa), water resistance is not adequate. Perform the "Leakage Location Identification" procedure on page 15.

Note:

If the valve is not closed, the pump piston is drawn by the negative pressure of the transceiver and the meter needle will move unexpectedly. Be sure to close the valve, before beginning the observation.



- If water resistance retention is confirmed, press the black part of the hose adapter and remove the hose. Then turn the hose adapter and remove it from the chassis.



- Perform the "Attaching the water-resistant sheet and black sheet" on page 16.

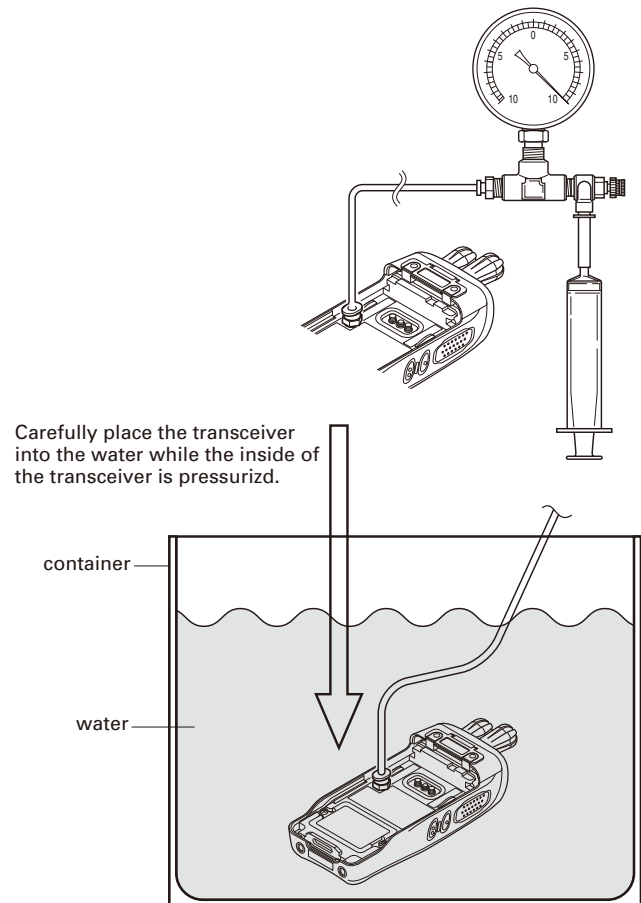
Leakage Location Identification

If step 6 of "Water Resistance Confirmation" on page 15 fails, perform this procedure.

- Prepare for a container that can contain the transceiver sufficiently and put water to a height of approximately 20

cm (7.87 inch) from the bottom of the container. The water temperature must be between 10°C (50°F) and 30°C (86°F).

- Open the valve on the side of the pump, push the pump piston and increase the inside pressure of the transceiver to approximately 10kPa (right side of meter). If the meter needle does not reach 10kPa when the piston is pushed in to the end, perform the following steps.
 - Close the valve on the side of the pump.
 - Remove the pump from the hose.
 - Pull the piston of the removed pump to the end.
 - Insert the pump into the hose.
 - Open the valve and push the pump piston. Repeat steps a) to e) until the meter needle indicates approximately 10kPa (right side of meter). Disassemble and reassembly the transceiver when you do not reach approximately 10kPa even if the step from a) to e) is repeated three times.
- Wait for one minute after the meter needle reaches approximately 10kPa. Go to the next step if the meter needle indicates 5kPa or more. Disassemble and reassemble the transceiver if the meter needle indicates 5kPa or less.
- Carefully place the transceiver into the water while the inside of the transceiver is pressurized.



DISASSEMBLY FOR REPAIR

The meter needle will move down gradually due to air leakage. Place the transceiver into the water before it reaches 5kPa.

Air leakage can be confirmed by air bubbles. When the meter needle indicates 3 to 4kPa (right side of meter), perform steps a) to e) in 3) above to increase the pressure to approximately 10kPa.

Note:

If the transceiver is left under water when the meter needle is 0kPa, water may be leaked inside the transceiver. Take the transceiver out of the water before the meter needle reaches 3kPa. Because the meter needle indicates 3kPa or more, pressurized air in the transceiver is released in water as bubbles, so water cannot be leaked inside the transceiver.

- 5) Observe the transceiver while it is under water, while paying attention to the meter needle value. With the transceiver under water, air leaks if air bubbles are produced continuously. If air bubbles are not produced continuously, it is not a leakage location.

Note:

If air bubbles come out of the speaker grill and are not continuous, they are air that is collected in the front of the speaker and do not indicate a leakage location.

- 6) Identify the component from which continuous air bubbles are released.
- 7) Remove the transceiver from the water, wipe off the water and dry it completely. Shake the transceiver to remove excess water from the microphone and speaker grill. Sound may be muffled or distorted if water remains in the microphone and speaker grill. Wipe off the battery terminal on the rear of the chassis.

Note:

Take special care because water collected between the transceiver case and chassis may be leaked inside the transceiver during disassembly and damage the transceiver components.

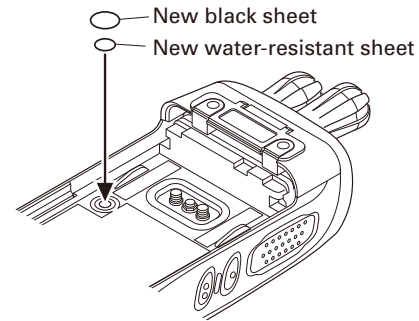
- 8) After the transceiver is dried completely, replace the components with the leakage location identified while paying attention to foreign matters. Refer to page 17 for parts concerning the waterproof of each leakage location.
- 9) Perform the "Water Resistance Confirmation" on page 14 after reassembly.

■ Attaching the water-resistant sheet and black sheet

Attach a new water-resistant sheet to the screw hole on the rear of the chassis, then attach a new black sheet onto the water-resistant sheet.

Note:

- Remove any adhesive trace from the location where the water-resistant sheet and black sheet of the chassis is attached before attaching a new water-resistant sheet and black sheet to the screw hole.
- Attach the water-resistant sheet and black sheet to the chassis firmly; failure to do so may allow water to pass into the transceiver.

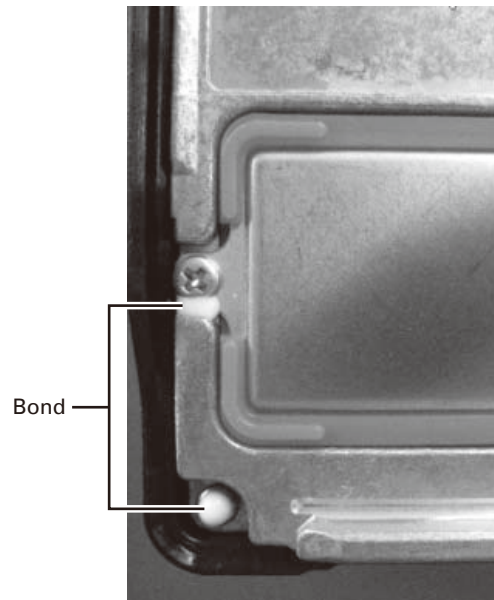


■ After repairing and reassembling

After repairing and reassembling, apply bond to the top of the left side screw for the chassis and between the chassis and the left side screw for the option board cover.

Note:

- Take care that the bond does not protrude above the chassis surface. (Take care that the bond does not come into contact with the battery.)
- Use a silicon based bond.



DISASSEMBLY FOR REPAIR

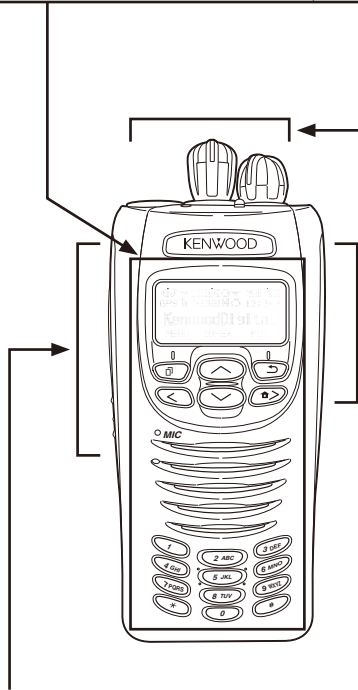
■ Parts list concerning the waterproof of each leakage location

**LCD Display, Front Key, Speaker,
The space of the Front panel and the chassis**

Part Name	Part Number
PLASTIC CABINET (6-key)	A02-4002-23
PLASTIC CABINET (18-key)	A02-4003-23
PACKING (6-key)	G53-1765-11
PACKING (18-key)	G53-1766-11
HOLDER (FG-SP)	J19-5505-11
SHEET (SP)	G11-4458-14

**ANT, Volume Knob, Selector Knob,
The space of the TOP panel and the chassis**

Part Name	Part Number
PACKING (TOP)	G53-1762-02
ILLUMINATION GUIDE (TX/BUSY)	B11-1855-04
PANEL (TOP)	A62-1156-02
Double-sided adhesive tape (AUX)	J99-0728-04
Double-sided adhesive tape (VOL/CH)	J99-0727-04
PACKING (VOL,CH O-RING)	G53-1768-04
PACKING (SMA O-RING)	G53-1792-04
TERMINAL ASSY (SMA)	X60-3860-10
VARIABLE RESISTOR (VOL)	R31-0666-05
ROTARY SWITCH (CH)	S60-0437-05
CIRCULAR NUT (VOL,CH)	N14-0844-04

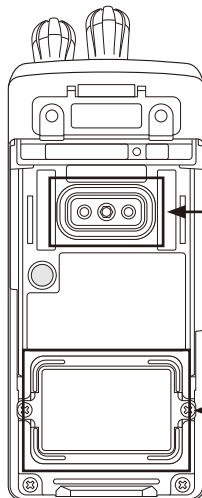


Universal Connector

Part Name	Part Number
RECTANGULAR RECEPTACLE (SP/MIC)	E58-0532-05
FPC (LEAD FREE/UNIVERSAL)	J87-0007-05

PTT Switch, Side/ 2 Key

Part Name	Part Number
SHEET (PTT)	G11-4428-04



Battery Terminal

Part Name	Part Number
PACKING (TERMINAL BLOCK)	G53-1763-03
TERMINAL BLOCK	E72-0425-03
ADHESIVE SHEET (TERMINAL BLOCK)	J99-0725-04
CUSHION (BATT-)	G13-2265-04

Option Board Cover

Part Name	Part Number
PACKING (OP BOARD COVER)	G53-1764-03
ADHESIVE SHEET (OP BOARD COVER)	J99-0732-04

CIRCUIT DESCRIPTION

1. Overview

The NX-300 is a UHF portable transceiver designed to operate in the frequency range of 400 to 470MHz. The unit consists of receiver, transmitter, phase-locked loop (PLL) frequency synthesizer, base band parts, power supply, and control circuits.

2. Frequency Configuration

The receiver is a double-conversion superheterodyne using the first intermediate frequency (IF) of 58.05MHz and the second IF of 450kHz. Incoming signals from the antenna are mixed with the local signal from the PLL circuit to produce the first IF of 58.05MHz. This is then mixed with the 57.6MHz second local oscillator output to produce the 450kHz second IF. The transmit signal frequency is generated by the PLL VCO, and modulated by the signal from the DSP. It is then amplified and fed to the antenna.

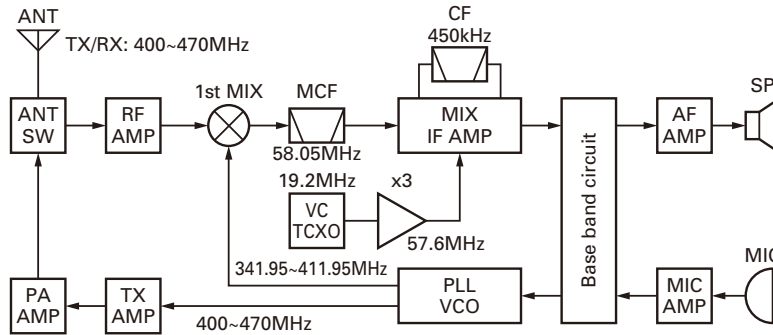


Fig. 1 Frequency configuration

3. Receiver System

3-1. RF Circuit

An incoming RF signal from the antenna terminal is passed through the antenna switch (D606, D607, D709, D711) and then the bandpass filter (L721, L722). The bandpass filter is adjusted by a variable capacitor. The input voltage to the variable capacitor is regulated by the voltage output from the D/A converter (IC703). The signal is amplified by an RF amplifier (Q705), and passed through the bandpass filter (L713, L714, L715). The resulting signal is applied to the first mixer (Q703), where it is mixed with the first local oscillator signal output from the frequency synthesizer to produce the first IF (58.05MHz).

3-2. IF Circuit

The first IF signal is passed through a four-pole monolithic crystal filter (XF700) to reject adjacent channel signals. The filtered first IF signal is amplified by the first IF amplifier (Q701) and then applied to the IF system IC (IC701). The IF system IC provides a second mixer, AGC amplifier, and RSSI (Received Signal Strength Indicator).

The second mixer mixes the first IF signal with the 57.6MHz of second local oscillator output and produces the second IF signal of 450kHz.

The second IF signal is passed through the ceramic filter (CF700) to reject the adjacent channel signal. The filtered second IF signal is amplified by the AGC amplifier.

The signal from the AGC amplifier is input to the ASIC (IC108) through the ceramic filter (CF701) and operational amplifier (IC700).

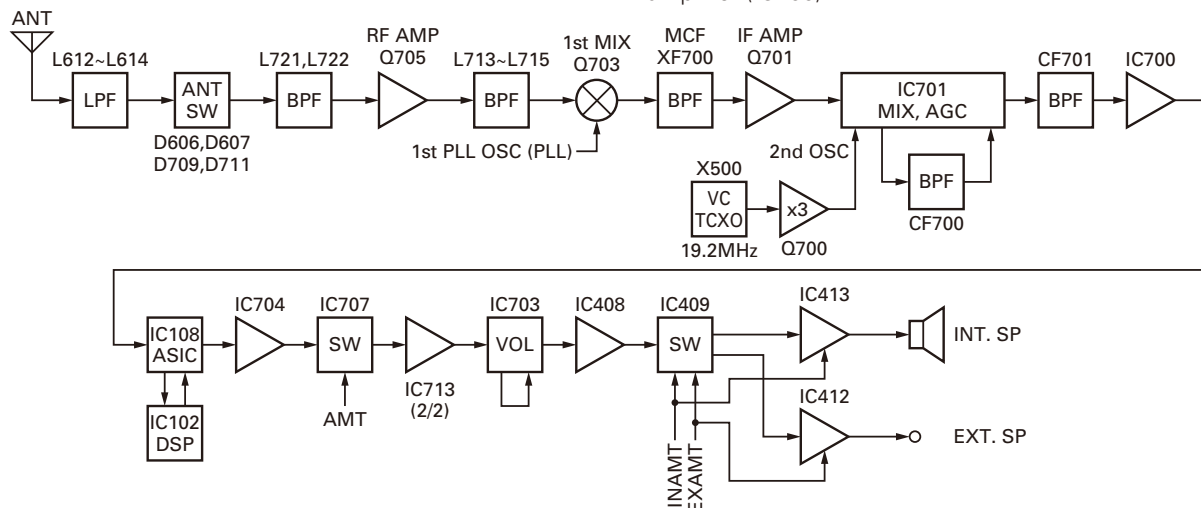


Fig. 2 RF and IF circuit

CIRCUIT DESCRIPTION

3-3. Audio Amplifier Circuit

Audio processing (high-pass filter, low-pass filter, de-emphasized and so on) at FM mode and decoding at NXDN mode are processed by DSP. The audio signal from IC108 and IC102 goes through the amplifier (IC704). The signal then goes through a mute switch (IC707), amplifier (IC713), electronic volume control (IC703), and AF amplifier (IC408).

While busy, AMT becomes Low to turn IC707 on, and the signal is fed to the AF switch. While INAMT is High, the AF switch (IC409) selects the internal speaker, and the audio signal is fed to the internal audio power amplifier (IC413), and output to the internal speaker. While EXAMT is High, the AF switch (IC409) selects the external speaker, and the audio signal is fed to the external audio power amplifier (IC412), and output to the external speaker. The power supply for IC413 and IC412 is turned on while INAMT or EX-AMT is High.

The speaker is switched by the logic of the speaker switching terminal SSW on the universal connector. When the SP-MIC is not attached, SSW becomes High. IC108 detects the logic of SSW and activates either INAMT or EX-AMT.

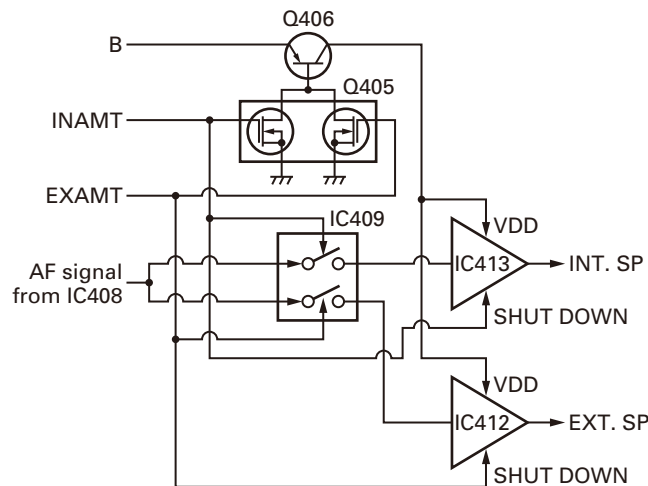


Fig. 3 Audio amplifier circuit

3-4. Squelch Circuit

It amplifies the demodulated noise signal from IC108 after filtering through the BPF circuit. Then, the amplified signal is converted to a DC signal by the detection circuit. The converted signal is fed back to IC108.

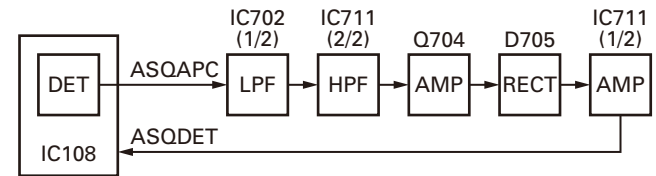


Fig. 4 Squelch circuit

4. Transmitter System

4-1. Audio Band Circuit

The signal from the internal microphone goes through the mute switch (Q5). When the SP-MIC is not attached, the microphone switching terminal (MSW) on the universal connector becomes High, and the mute switch (Q5) is turned on. When the SP-MIC is attached, MSW is connected to GND inside the SP-MIC. For this reason, Q5 is turned off, the internal microphone is muted, and only the input of the external microphone is supplied to the microphone amplifier. The signal from the microphone goes through the mute switch (Q707), and is amplified by IC716 (1/2) and limited by the AGC circuit which is composed of D703, D704, Q705 and Q706.

4-2. Base Band Circuit

The audio signal output from the base band circuit is converted to digital data with a sampling frequency of 48kHz. This digital data is sent to the DSP (IC102), and voice signals of 300Hz or lower and frequencies of 3kHz or higher are cut off and an audio range of 300Hz to 3kHz is extracted. The audio signal is then pre-emphasized in FM mode and synthesized with the signals, such as QT and DQT, as required, and is then output from IC108. In Digital mode, the audio signal is converted to the 4-Level FSK base band signal and output from IC108. The DTMF and MSK base band signals are also generated by the DSP and output by IC108.

LPF (IC705) works as a smoothing filter. The DAC (IC703) assigns the base band signal to the VCO and VCTCXO (X500). At this time, the level output according to the transmit carrier is fine-adjusted according to each modulation method.

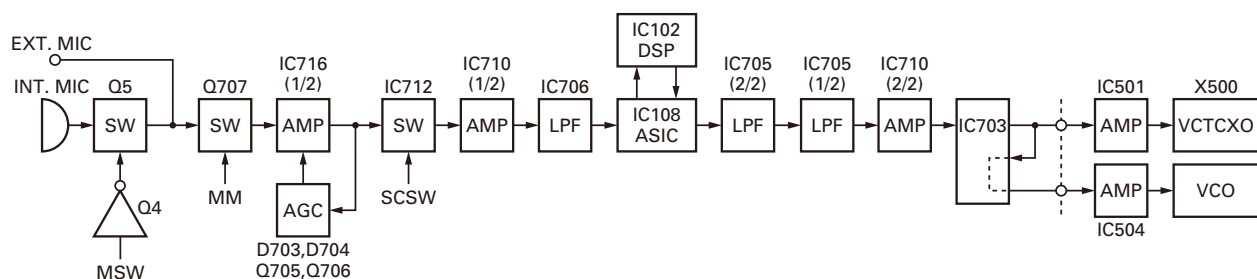


Fig. 5 Audio band and Base band circuit

CIRCUIT DESCRIPTION

4-3. VOX

IC716 (2/2) amplifies the audio signal captured in the microphone. The signal is then converted into the DC voltage, rectified by D706. The DC voltage activates the ASIC (IC108), and the VOX starts.

4-4. Drive and Final Amplifier

The signal from the T/R switch (D601 is on) is amplified by the drive amplifier (Q601, Q602 and Q603) to 25~27dBm. The output of the drive amplifier is amplified by the RF power amplifier (Q606) to 5.0W (1W when the power is low). The RF power amplifier is MOS FET. The output of the RF power amplifier is then passed through the harmonic filter (LPF) and antenna switch (D606, D607 are on) and applied to the antenna terminal.

4-5. APC Circuit

The APC circuit always monitors the current flowing through the RF power amplifier (Q606) and keeps a constant current. The voltage drop at R642, R645 and R647 is caused by the current flowing through the RF power amplifier and this voltage is applied to the differential amplifier (IC600 1/2). IC600 (2/2) compares the output voltage of IC600 (1/2) with the reference voltage from IC108, and the output of IC600 (2/2) controls the VGG of Q602, Q603 and Q606 to make the both voltages the same. The change of power high/low is carried out by the change of the reference voltage. Q607, Q608 and Q610 are turned on and Q604 and Q605 are turned off in transmit and the APC circuit is active.

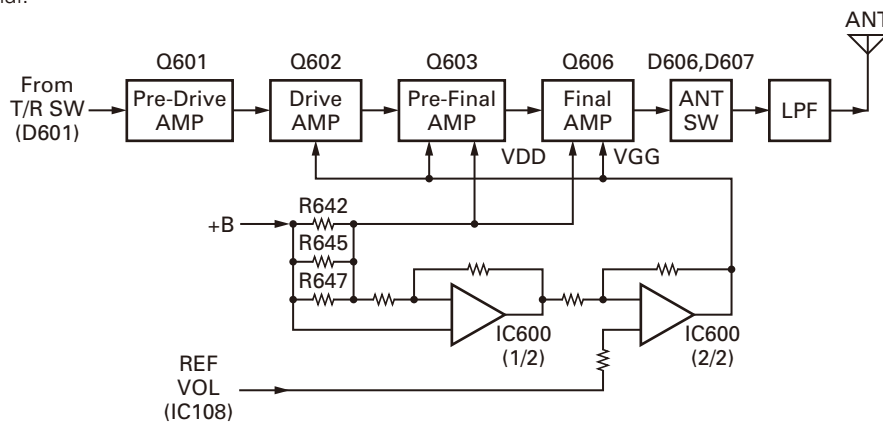


Fig. 6 Drive and final amplifier and APC circuit

5. PLL Frequency Synthesizer

5-1. VCTCXO (X500)

VCTCXO (X500) generates a reference frequency of 19.2MHz for the PLL frequency synthesizer. This reference frequency is applied to pin 9 of the PLL IC (IC502) and connected to the IF circuit as a 2nd local signal through the Tripler (Q700). The VCTCXO oscillation frequency is determined by the DC voltage of the VC terminal. The VC voltage is fixed to 1.65V by R500 and R501, and supplied to the VC terminal through IC501. The modulation signal is also fed to the VC terminal through IC501.

The frequency adjustment is achieved by switching the ratio of the dividing frequency that is not adjusted by the DC voltage impressed to the VC. The resolution of the adjusting frequency is approximately 4Hz.

5-2. VCO

There is a RX VCO and a TX VCO.

The TX VCO (Q509) generates a transmit carrier and the RX VCO (Q508) generates a 1st local signal. For the VCO oscillation frequency, the transmit carrier is 400 to 470MHz and the 1st local signal is 341.95 to 411.95MHz.

The VCO oscillation frequency is determined by one system of operation switching terminal "T/R" and two systems of voltage control terminals "CV" and "ASSIST".

The operation switching terminal, "T/R", is controlled by the control line (/T_R) output from the ASIC (IC108). When the /T_R logic is low, the VCO outputs the transmit carrier and when it is high, it outputs a 1st local receive signal.

The voltage control terminals, "CV" and "ASSIST", are controlled by the PLL IC (IC502) and ASIC (IC108) and the output frequency changes continuously according to the applied voltage. For the modulation input terminal, "VCO_MOD", the output frequency changes according to the applied voltage. This is used to modulate the VCO output. "VCO_MOD" works only when "/T_R" is low.

CIRCUIT DESCRIPTION

5-3. PLL IC (IC502)

The PLL IC compares the differences in phases of the VCO oscillation frequency and the VCTCXO reference frequency, returns the difference to the VCO CV terminal and realizes the "Phase Locked Loop" for the return control. This allows the VCO oscillation frequency to accurately match (lock) the desired frequency.

When the frequency is controlled by the PLL, the frequency convergence time increases as the frequency difference increases when the set frequency is changed. To supplement this, the ASIC is used before control by the PLL IC to bring the VCO oscillation frequency close to the desired frequency. As a result, the VCO CV voltage does not change and is always stable at approximately 2.5V.

The desired frequency is set for the PLL IC by the ASIC (IC108) through the 3-line "SDO1", "SCK1", "/PCS_RF" serial bus. Whether the PLL IC is locked or not is monitored by the ASIC through the "PLD" signal line. If the VCO is not the desired frequency (unlock), the "PLD" logic is low.

5-4. Local Switch (D600, D601)

The connection destination of the signal output from the buffer amplifier (Q600) is changed with the diode switch (D601) that is controlled by the transmission power supply, 50T, and the diode switch (D600) that is controlled by the receive power supply, 50R. If the 50T logic is high, it is connected to a send-side pre-drive (Q601). If the 50T logic is low, it is connected to a receive-side mixer (Q703).

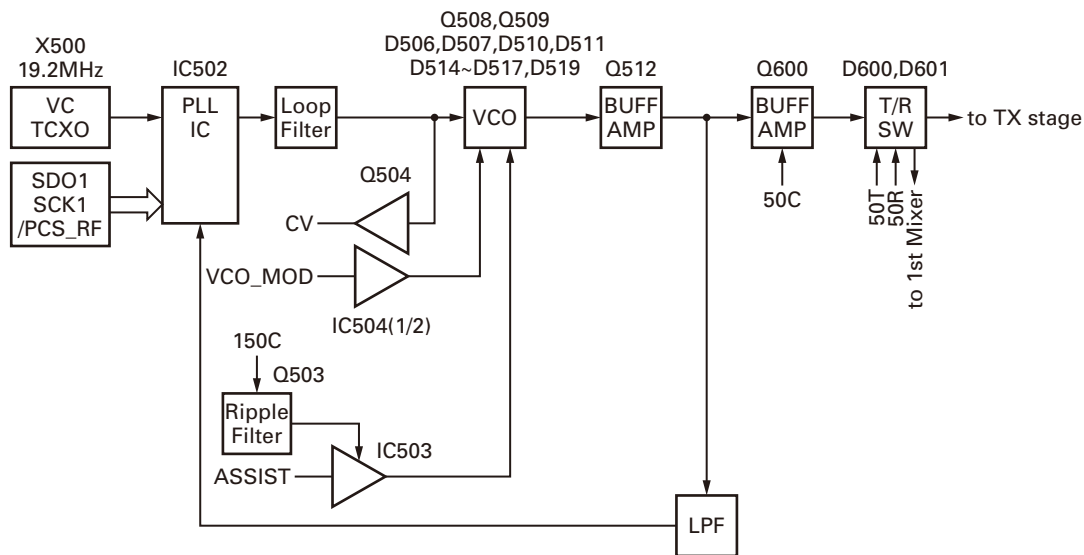


Fig. 7 PLL block diagram

6. Control Circuit

The control circuit consists of the ASIC (IC108) and its peripheral circuits. IC108 mainly performs the following;

- 1) Switching between transmission and reception by PTT signal input.
- 2) Reading system, zone, frequency, and program data from the memory circuit.
- 3) Sending frequency program data to the PLL.
- 4) Controlling squelch on/off by the DC voltage from the squelch circuit.
- 5) Controlling the audio mute circuit by decode data input.

6-1. ASIC

The ASIC (IC108) is a 32-bit RISC processor, equipped with peripheral function and ADC/DAC.

This ASIC operates at 18.432MHz clock and 3.3V /1.5V DC. It controls the flash memory, SRAM, DSP, the receive circuit, the transmitter circuit, the control circuit, and the display circuit and transfers data to or from an external device.

CIRCUIT DESCRIPTION

6-2. Memory Circuit

The memory circuit consists of the ASIC (IC108) and the SRAM (IC103) and flash memory (IC101). The flash memory has capacity of 32M-bit that contains the transceiver control program for the ASIC and stores the data. It also stores the data for transceiver channels and operating parameter that are written by the FPU. This program can be easily written from external devices. The SRAM has capacity of 1M-bit that contains work area and data area.

■ Flash memory

Note: The flash memory stores the data that is written by the FPU (KPG-111D), tuning data (Deviation, Squelch, etc.) ,and firmware program (User mode, Test mode, Tuning mode, etc.). This data must be rewritten when replacing the flash memory.

■ SRAM (Static memory)

Note: The SRAM has temporary data area and work area. When the power supply is off, it is backed up by an internal secondary lithium battery. Therefore, the saved data is not lost.

■ Real-time clock

The clock function is based on real-time clock IC (IC106). When the power supply is off, it is backed up by an internal secondary lithium battery.

6-3. LCD

The LCD is controlled using the bus lines on the connector (CN1) of the Control unit (X53-426). It corrects the LCD contrast voltage using IC1.

6-4. Key Detection Circuit

Keys are detected using the key scan circuit in IC108. The /KEY1* signals that are normally pulled down go high when any key is pressed.

6-5. Low Battery Warning

The battery voltage is divided using R444 and R445 and is detected by the ASIC (IC108). When the battery voltage falls below the voltage set by the Low battery warning adjustment, the red LED blinks to notify the operator that it is time to replace the battery. If the battery voltage falls even more (approx. 5.8V), a beep sounds and transmission stops.

Low battery warning	Battery condition
The red LED blinks during transmission.	The battery voltage is low but the transceiver is still usable.
The red LED blinks and the warning tone beeps while the PTT switch is pressed.	The battery voltage is low and the transceiver is not usable to make calls.

6-6. DSP

The DSP circuit consists of a DSP (IC102) and processes the base band signal. The DSP operates on an external clock of 18.432MHz (the same as the IC108), the I/O section operates at 3.3V and the core section operates at 1.5V. The DSP carries out the following processes:

- 4 Level FSK processing
- Analog FM pre-emphasis/de-emphasis
- Vocoder processing between audio codec and modulation/demodulation
- CAI processing, such as error correction encoding
- QT/DQT encoding/decoding
- LTR encoding/decoding
- DTMF encoding/decoding
- MSK encoding/decoding
- 2-tone encoding/decoding
- Compressor/expander processing
- Voice scrambler processing
- Transmit/receive audio filtering processing
- Microphone amplifier AGC processing
- Audio mute processing
- Modulation level processing

7. Power Supply Circuit

The battery voltage (+B) is provided from the battery terminal on the TX/RX unit (X57). The battery voltage passes through the 2.5A fuse (F900), and goes to the RF final amplifier, AVR ICs (IC902, IC903), and Control unit (X53-426).

In the control unit, +B is connected to the DC/DC (IC407), AVR ICs (IC411, IC708, IC416), and voltage detector IC (IC414). The voltage detector watches the battery voltage. If the battery voltage is 5.6V or higher, the detector outputs High. While the output of IC414 is High, IC416 and Q409 provide 3.1V (31BU) to the backup-section.

When the VOL SW is turned on, SB1 becomes high (battery voltage). The DC/DC (IC407) operates if both SB1 and the output of the detector are high. IC407 outputs 3.8V and it activates IC404 (33M), IC717 (15M), and IC406 (33A). As a result, the ASIC and DSP operate.

The SBC signal becomes High after the ASIC operates, IC708 (5A), Q403 on the Control unit (SB2) and Q901 on the TX-RX unit (SB3) are turned on. IC901 and IC903 operate by turning on these AVR ICs and FET switches.

The 5UC signal becomes High when an option is installed on the universal connector. Then IC411 (50U) operates.

When the /SAVE signal becomes High, IC902 (50C) operates. The output of IC902 is connected to three FET switches (Q902, Q903, Q905). When the SBC signal becomes High, IC903 (33C) operates. The FET switches are controlled by the CPU. Q905 (50T) is turned on in transmit mode. Q902 (50R) and Q903 (50IF) are turned on in receive mode.

When the VOL SW is turned off the /PSW signal becomes Low. After detecting the /PSW signal, the ASIC changes SBC signal to Low. Then the power supplies except IC416 (31BU) stop.

CIRCUIT DESCRIPTION

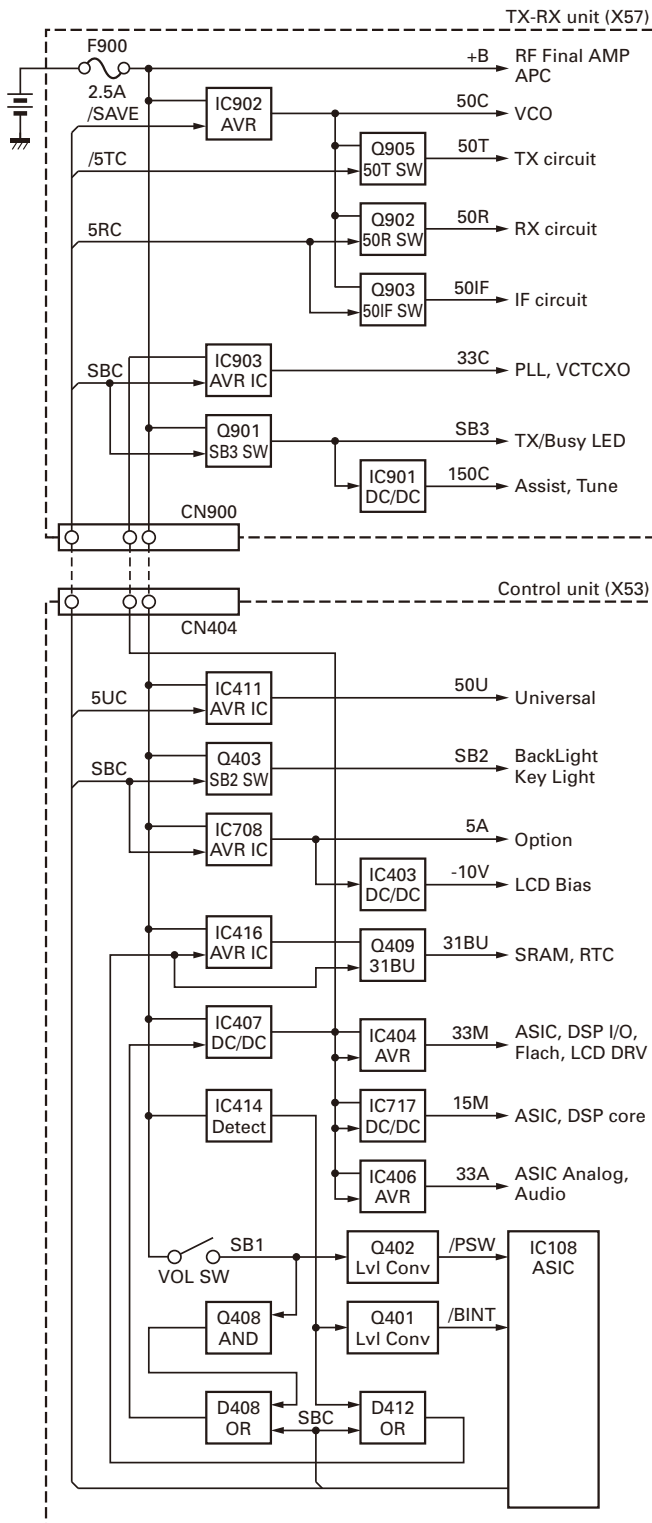


Fig. 8 Power supply circuit

8. Signaling Circuit

8-1. Encode (QT/DQT/LTR/DTMF/2-tone/MSK)

Each signaling data signal of QT, DQT, LTR, DTMF, 2-tone and MSK is generated by the DSP circuit, superposed on a modulation signal and output from IC108. The modulation balance of the QT/DQT/LTR signal is adjusted by the D/A converter (IC703) and the resulting signal is routed to the modulation input of the VCO and VCXO (X500). Each deviation of the TX QT, DQT, LTR, DTMF, 2-tone and MSK tone is adjusted by changing the output level of IC108 and the resulting signal is routed to the VCO and VCXO. The RX DTMF tone is routed to the receive audio signal system, and is output from the speaker.

8-2. Decode (QT/DQT/LTR/DTMF/2-tone/MSK)

The audio signal is removed from the FM detection signal sent to the DSP circuit and the resulting signal is decoded.

9. Componder Circuit

The term "componder" means compressor and expander. The compander reduces noise by utilizing a compressor and an expander. The transceiver contains a DSP (IC102) to perform this operation. The transceiver compander can be turned on or off using the FPU.

COMPONENTS DESCRIPTION

Control unit (X53-4262-XX)

Ref. No.	Part Name	Description
IC1	IC	LCD contrast
IC101	IC	FLASH ROM
IC102	IC	DSP
IC103	IC	SRAM
IC104	IC	2 input AND gate
IC105	IC	Reset
IC106	IC	RTC
IC107	IC	Buffer
IC108	IC	ASIC
IC109	IC	2 input AND gate
IC401,402	IC	Bus switch
IC403	IC	Voltage doubling inverter
IC404	IC	Voltage regulator (33M)
IC406	IC	Voltage regulator (33A)
IC407	IC	DC/DC converter
IC408	IC	AF AMP
IC409	IC	AF switch
IC411	IC	Voltage regulator (50U)
IC412,413	IC	Audio AMP
IC414	IC	Reset
IC415	IC	2 input AND gate
IC416	IC	Voltage regulator
IC417,418	IC	Dual bus buffer
IC701	IC	I/O control
IC702	IC	APC LPF
IC703	IC	D/A converter
IC704	IC	RX AF LPF
IC705	IC	Modulation LPF
IC706	IC	MIC AMP
IC707	IC	RX AF switch
IC708	IC	Voltage regulator (5A)
IC709	IC	Sidetone mute
IC710	IC	MOD/MIC summing AMP
IC711	IC	SQL BPF/SQL DC AMP
IC712	IC	MIC switch
IC713	IC	1.65V REF/RX summing AMP
IC714	IC	OPT switch
IC715,716	IC	VOX AMP
IC717	IC	DC/DC converter (15M)
Q1,2	Transistor	LCD backlight switch
Q3	FET	LCD backlight switch
Q4	FET	MIC mute control
Q5	FET	MIC mute switch
Q101,102	Transistor	12key backlight switch

Ref. No.	Part Name	Description
Q103	FET	12key backlight switch
Q401,402	FET	Level converter
Q403	Transistor	SB2 switch
Q404	FET	SB2 switch control
Q405	FET	AF AMP switch
Q406,407	Transistor	Voltage regulator (AF AMP)
Q408,409	Transistor	DC switch
Q410	FET	DC switch
Q411	FET	Level converter
Q412	FET	DC switch control
Q413~415	Transistor	DC switch
Q701	Transistor	OPT switch
Q702	FET	Tone switch
Q703	FET	W/N noise switch
Q704	Transistor	SQL noise AMP
Q705,706	Transistor	MIC AGC
Q707	FET	MIC mute
D1,2	LED	12key backlight
D3,4	LED	LCD backlight
D5,6	LED	12key backlight
D7,8	LED	LCD backlight
D9,10	LED	12key backlight
D11	Diode	LCD backlight switch
D12~16	Diode	Reverse current prevention
D17~21	Zener diode	Surge absorption
D22,23	Diode	Surge absorption
D101	Diode	12key backlight switch
D102	Diode	Reverse current prevention
D401~404	Diode	12key control
D405,406	Diode	DC/DC converter
D407	Diode	Over voltage prevention
D408	Diode	DC/DC converter control
D409,410	Diode	SP control
D411	Diode	RTC BATT control
D412	Diode	DC switch control
D413	Diode	RTC BATT control
D414,415	Diode	Reverse current prevention
D416	Diode	33M control
D417	Diode	33A control
D701	Diode	5A switch
D702	Diode	PLD control
D703,704	Diode	Detector
D705	Diode	Noise detector
D706	Diode	VOX detector
D707	Diode	VOX

COMPONENTS DESCRIPTION

TX-RX unit (X57-7370-11)

Ref. No.	Part Name	Description
IC404	IC	OP AMP (RSSI/VAGC)
IC500	IC	Temperature sensor
IC501	IC	AF AMP for TCXO MOD
IC502	IC	PLL IC
IC503	IC	DC AMP for VCO tune
IC504	IC	OP AMP (VCO MOD/APC)
IC600	IC	Auto power control
IC700	IC	Buffer
IC701	IC	FM IC
IC702,703	IC	DC AMP for BPF
IC900	IC	50T control
IC901	IC	DC/DC converter
IC902	IC	Voltage regulator (50C)
IC903	IC	Voltage regulator (33C)
Q503	Transistor	Ripple filter
Q504	FET	Buffer AMP
Q507	Transistor	Ripple filter
Q508,509	FET	VCO oscillation
Q510,511	FET	T/R switch
Q512,600	Transistor	Buffer AMP
Q601	Transistor	Pre-drive AMP
Q602	FET	Drive AMP
Q603	FET	Pre-final AMP
Q604	Transistor	APC switch
Q605	FET	APC switch
Q606	FET	RF final AMP
Q607	Transistor	APC switch
Q608	FET	APC switch
Q610	Transistor	APC switch
Q700	Transistor	2nd Local tripler
Q701	Transistor	IF AMP
Q703	FET	Mixer

Ref. No.	Part Name	Description
Q704	Transistor	Ripple filter
Q705	FET	RF AMP
Q706	FET	RF AGC
Q900	Transistor	TX/RX LED switch
Q901	FET	SB3 switch
Q902	FET	50R switch
Q903	FET	50IF switch
Q904	FET	DC/DC converter switch
Q905	Transistor	50T switch
D501	Diode	Ripple filter
D505	Diode	Bypass diode
D506,507, D510,511	Variable capaci- tance diode	Frequency control
D514~517	Variable capaci- tance diode	Frequency control
D518	Diode	Ripple filter
D519	Variable capaci- tance diode	TX modulation
D600,601	Diode	Local switch
D604	Zener diode	APC switch
D605	Zener diode	APC protect
D606,607	Diode	Antenna switch
D700	Diode	Ripple filter
D702~704	Variable capaci- tance diode	Vari-cap tune
D705	Diode	RF AGC
D706,708	Variable capaci- tance diode	Vari-cap tune
D709	Diode	Antenna switch
D710	Variable capaci- tance diode	Vari-cap tune
D711	Diode	Antenna switch
D900	LED	TX/RX LED
D901	Diode	Reverse protection
D902	Diode	50T control

NX-300

PARTS LIST

* New Parts. Δ indicates safety critical components.

Parts without **Parts No.** are not supplied.

Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.

Teile ohne **Parts No.** werden nicht geliefert.

L : Scandinavia

Y : PX (Far East, Hawaii)

Y : AAFES (Europe)

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

NX-300 (Y50-6122-XX)

CONTROL UNIT (X53-4262-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
NX-300					
1	1B		A02-4002-23	PLASTIC CABINET (6KEY)	E4
2	1A		A02-4003-23	PLASTIC CABINET (18KEY)	E
3	3A	*	A10-4127-01	CHASSIS	
4	2B		A62-1156-02	PANEL (TOP)	
6	1B,1D		B09-0712-03	CAP ACCESSORY	
7	1A		B11-1853-24	FILTER (LCD)	
8	1A		B11-1854-02	ILLUMINATION GUIDE (LCD)	
9	3B		B11-1855-04	ILLUMINATION GUIDE (TX/BUSY)	
10	1A		B38-0923-05	LCD ASSY	
12	1A		B42-7296-04	STICKER	
13	1B		B43-1606-04	BADGE	
14	2D	*	B62-2117-00	INSTRUCTION MANUAL	
15	2C	*	B62-2153-00	INSTRUCTION MANUAL	
17	2B		D32-0446-14	STOPPER (16CH)	
19	2A		E29-1220-04	RELAY HARDWARE (VCO-PCB)	
20	3A		E29-1221-14	RELAY HARDWARE (VCO-CHASSIS)	
21	3B		E58-0532-05	RECTANGULAR RECEPTACLE (SP/MIC)	
22	3B		E72-0425-03	TERMINAL BLOCK	
24	3A		F07-1931-04	COVER (OP BOARD)	
25	2A		F10-3106-03	SHIELDING CASEASSY	
27	2A		G02-1836-13	EARTH SPRING (SP)	
28	1A		G10-1373-04	FIBROUS SHEET (SP)	
29	2B		G10-1384-14	FIBROUS SHEET (TOP PANEL)	
30	2A		G11-4272-14	RUBBER CUSHION (SP)	
31	3A		G11-4331-04	SHEET (AIR)	
33	2A		G11-4428-04	SHEET (PTT)	
34	3A		G11-4429-04	RUBBER SHEET (FET)	
35	3A		G11-4440-04	SHEET (AIR)	
36	2A		G11-4458-14	SHEET (SP)	
37	2A		G11-4459-04	SHEET (TX-RX PCB)	
39	2A		G11-4476-04	SHEET (MIC ELEMENT)	E
40	2A		G13-2129-14	CUSHION (TX-RX PCB)	
41	2A,3B		G13-2220-04	CUSHION (ANT/OP BOARD)	
42	2A		G13-2249-04	CUSHION (TX-RX PCB)	
43	2A		G13-2258-04	CUSHION (50PIN FPC)	
45	2A		G13-2265-04	CUSHION (BATT-)	
46	2B		G53-1762-02	PACKING (TOP)	
47	3B		G53-1763-03	PACKING (TERMINAL BLOCK)	
48	3A		G53-1764-03	PACKING (OP BOARD COVER)	
49	1B		G53-1765-11	PACKING (6KEY)	E4
51	1A		G53-1766-11	PACKING (18KEY)	E
52	2B		G53-1768-04	PACKING (VOL,CH O-RING)	
53	1B,1D		G53-1769-04	PACKING (CAP)	
54	2B		G53-1792-04	PACKING (SMA O-RING)	
56	2A		J19-5505-11	HOLDER (FG-SP)	
57	2B		J19-5506-03	HOLDER (VOL,CH)	
58	2A		J19-5507-02	HOLDER (OP BOARD)	
59	2B		J21-8579-04	MOUNTING HARDWARE (FG-SP HOLDER)	
60	1C		J29-0730-05	BELT CLIP ACCESSORY	
62	2B		J30-1296-04	SPACER (VOL)	
63	2B		J87-0006-05	FPC (LEAD FREE/VOL,CH)	
64	3B		J87-0007-05	FPC (LEAD FREE/UNIVERSAL)	

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
66	2B		J99-0390-04	ADHESIVE SHEET (6KEY FPC)	
67	3A		J99-0711-04	ADHESIVE SHEET (PTT FPC)	
68	2B		J99-0712-14	ADHESIVE SHEET (6KEY FPC)	
69	1A,2A		J99-0714-04	ADHESIVE SHEET (LCD)	
70	3B		J99-0715-08	ADHESIVE SHEET (UNIVERSAL)	
72	3B		J99-0725-04	ADHESIVE SHEET (TERMINAL BLOCK)	
73	3B		J99-0727-04	ADHESIVE SHEET (TOP)	
74	3B		J99-0728-04	ADHESIVE SHEET (EMG)	
75	3A		J99-0732-04	ADHESIVE SHEET (OP BOARD COVER)	
77	3A		K25-2001-03	PUSH KNOB (PTT)	
78	1A		K29-9405-03	KNOB (PTT)	
79	1A		K29-9406-03	BUTTON KNOB (SIDE KEY)	
80	1B		K29-9407-03	KNOB (VOL)	
81	1B		K29-9408-13	KNOB (CH)	
A	1B,1D		N08-0564-04	DRESSED SCREW ACCESSORY	
B	3B		N09-2426-14	HEXAGON HEAD SCREW (BATT-)	
C	3A		N09-2440-15	SPECIAL SCREW (CASE)	
D	2A,2B		N09-6549-04	STEPPED SCREW (FG-SP HOLDER)	
E	2B,3A		N09-6554-05	PAN HEAD SCREW (ANT/OP BOARD)	
F	2B		N14-0844-04	CIRCULAR NUT (VOL,CH)	
G	1C		N30-3008-60	PAN HEAD MACHINE SCREW (BELT CLIP)	
H	1A,2A,2B		N83-2005-48	PAN HEAD TAPTITE SCREW (PCB)	
83	1A		S79-0472-05	KEYBOARD ASSY (12KEY)	E
85	2A		T07-0755-15	SPEAKER	
86	2A		T91-0575-05	MIC ELEMENT	
88	2A		W09-0971-05	LITHIUM CELL	
90	3A		X41-3710-10	SWITCH UNIT (PTT FPC)	
91	2B		X41-3720-10	SWITCH UNIT (6KEY FPC)	
92	2A		X42-3340-10	CORD ASSY (50PIN FPC)	
93	2B		X60-3860-10	TERMINAL ASSY (SMA)	
CONTROL UNIT (X53-4262-XX) -71: E4 -72: E					
D1-10			B30-2215-05	LED	E
D3,4			B30-2215-05	LED	E4
D7,8			B30-2215-05	LED	E4
C1			CK73HB1A104K	CHIP C 0.10UF K	
C2-6			CK73GB1E105K	CHIP C 1.0UF K	
C7,8			CK73HB1A104K	CHIP C 0.10UF K	
C10			CK73HB1A104K	CHIP C 0.10UF K	
C11			CK73HBOJ105K	CHIP C 1.0UF K	
C12-15			CK73HB1H471K	CHIP C 470PF K	
C16,17			CC73HCH1H101J	CHIP C 100PF J	
C23			CK73HB1H102K	CHIP C 1000PF K	
C24			CC73HCH1H470J	CHIP C 47PF J	
C25-27			CK73HB1H102K	CHIP C 1000PF K	
C28			CC73HCH1H101J	CHIP C 100PF J	
C30-32			CC73HCH1H101J	CHIP C 100PF J	
C35			CK73HB1H102K	CHIP C 1000PF K	
C36			CK73HB1E682K	CHIP C 6800PF K	
C37			CK73HB1H102K	CHIP C 1000PF K	

PARTS LIST

CONTROL UNIT (X53-4262-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C38			CC73HCH1H101J	CHIP C 100PF J		C442			CK73HB1H471K	CHIP C 470PF K	
C40			CC73HCH1H221J	CHIP C 220PF J		C443			CK73HB1E103K	CHIP C 0.010UF K	
C41			CC73HCH1H101J	CHIP C 100PF J		C445			CK73HB1H102K	CHIP C 1000PF K	
C101-104			CK73HB1A104K	CHIP C 0.10UF K		C446			CK73GB1E105K	CHIP C 1.0UF K	
C105			CK73HB0J105K	CHIP C 1.0UF K		C447			CK73HB1H102K	CHIP C 1000PF K	
C106			CK73HB1E103K	CHIP C 0.010UF K		C448-450			CK73HB0J105K	CHIP C 1.0UF K	
C107			CK73HB1A104K	CHIP C 0.10UF K	E4	C452,453			CK73HB1E103K	CHIP C 0.010UF K	
C107,108			CK73HB1A104K	CHIP C 0.10UF K	E	C454			CK73GB1E105K	CHIP C 1.0UF K	
C109,110			CK73HB1H102K	CHIP C 1000PF K		C455-457			CK73HB1H471K	CHIP C 470PF K	
C111-113			CK73HB1A104K	CHIP C 0.10UF K		C459			CK73HB1H471K	CHIP C 470PF K	
C114			CK73HB0J105K	CHIP C 1.0UF K	E	C460			CK73HB1E682K	CHIP C 6800PF K	
C115			CK73HB1H471K	CHIP C 470PF K	E	C461-463			CK73HB1H471K	CHIP C 470PF K	
C116,117			CK73HB1A104K	CHIP C 0.10UF K		C464			CK73HB1E103K	CHIP C 0.010UF K	
C118,119			CK73HB0J105K	CHIP C 1.0UF K		C465			CK73HB1H102K	CHIP C 1000PF K	
C120,121			CK73HB1A104K	CHIP C 0.10UF K		C466			CK73HB1E682K	CHIP C 6800PF K	
C122-124			CK73HB1E103K	CHIP C 0.010UF K		C467,468			CK73HB1A104K	CHIP C 0.10UF K	
C130			CK73HB1E103K	CHIP C 0.010UF K		C469,470			CK73HB1H102K	CHIP C 1000PF K	
C131			CK73HB1A104K	CHIP C 0.10UF K		C480			CK73HB1E103K	CHIP C 0.010UF K	
C133			CS77CP0J100M	CHIP TNTL 10UF 6.3WV		C701			CK73HB1A104K	CHIP C 0.10UF K	
C134			CK73HB1E103K	CHIP C 0.010UF K		C703			CK73GB0J475K	CHIP C 4.7UF K	
C135			CK73HB1H102K	CHIP C 1000PF K		C704,705			CK73HB1A104K	CHIP C 0.10UF K	
C136			CK73HB1E103K	CHIP C 0.010UF K		C706			CC73HCH1H680J	CHIP C 68PF J	
C137			CK73GB1E105K	CHIP C 1.0UF K		C707			CC73HCH1H270J	CHIP C 27PF J	
C138-140			CK73HB1A104K	CHIP C 0.10UF K		C708			CK73HB1A104K	CHIP C 0.10UF K	
C141			CC73HCH1H101J	CHIP C 100PF J		C709			CK73HB0J105K	CHIP C 1.0UF K	
C142			CS77CP0J100M	CHIP TNTL 10UF 6.3WV		C710			CK73HB1E103K	CHIP C 0.010UF K	
C143			CK73HB1E103K	CHIP C 0.010UF K		C711			CK73HB1A104K	CHIP C 0.10UF K	
C144			CK73GB1E105K	CHIP C 1.0UF K		C712			CK73HB1E103K	CHIP C 0.010UF K	
C145-148			CK73HB1A104K	CHIP C 0.10UF K		C713			CK73HB1H332K	CHIP C 3300PF K	
C149			CK73HB1E103K	CHIP C 0.010UF K		C714			CK73HB1H122K	CHIP C 1200PF K	
C150			CK73GB1E105K	CHIP C 1.0UF K		C715			CK73HB1A104K	CHIP C 0.10UF K	
C151-155			CK73HB1A104K	CHIP C 0.10UF K		C716			CK73HB1H681K	CHIP C 680PF K	
C156,157			CK73HB1H102K	CHIP C 1000PF K		C717			CK73HB1E103K	CHIP C 0.010UF K	
C158			CK73HB1E103K	CHIP C 0.010UF K		C718			CK73HB1H152K	CHIP C 1500PF K	
C159			CK73HB1A104K	CHIP C 0.10UF K		C719			CK73HB1A104K	CHIP C 0.10UF K	
C160,161			CK73HB1E682K	CHIP C 6800PF K		C720			CK73HB1E103K	CHIP C 0.010UF K	
C401,402			CK73HB1A104K	CHIP C 0.10UF K		C721			CK73HB1A104K	CHIP C 0.10UF K	
C403-405			CS77AP1C2R2M	CHIP TNTL 2.2UF 16WV		C722			CK73HB1E103K	CHIP C 0.010UF K	
C406			CK73HB0J105K	CHIP C 1.0UF K		C723			CK73HB1A104K	CHIP C 0.10UF K	
C407,408			CK73HB1H102K	CHIP C 1000PF K		C724			CK73HB1E103K	CHIP C 0.010UF K	
C409			CK73HB0J105K	CHIP C 1.0UF K		C725			CC73HCH1E181J	CHIP C 180PF J	
C411,412			CK73HB0J105K	CHIP C 1.0UF K		C726,727			CK73HB1A104K	CHIP C 0.10UF K	
C414			CK73HB0J105K	CHIP C 1.0UF K		C728			CK73HB1H331K	CHIP C 330PF K	
C415			CS77AP1A100M	CHIP TNTL 10UF 10WV		C730			CK73HB1H331K	CHIP C 330PF K	
C416			CK73FB1A106K	CHIP C 10UF K		C731,732			CK73HB1E103K	CHIP C 0.010UF K	
C417			CC73HCH1H221J	CHIP C 220PF J		C734			CK73HB1H102K	CHIP C 1000PF K	
C418			CK73HB1E103K	CHIP C 0.010UF K		C735			CK73HB1H122K	CHIP C 1200PF K	
C419			CK73FB1E475K	CHIP C 4.7UF K		C736,737			CK73HB1A104K	CHIP C 0.10UF K	
C420			CK73HB1E103K	CHIP C 0.010UF K		C738			CK73HB1H102K	CHIP C 1000PF K	
C421			CK73HB1E682K	CHIP C 6800PF K		C739			CK73HB1E682K	CHIP C 6800PF K	
C422			CC73HCH1H100C	CHIP C 10PF C		C740			CK73HB1H102K	CHIP C 1000PF K	
C424,425			CK73HB1A104K	CHIP C 0.10UF K		C742			CK73GB1E105K	CHIP C 1.0UF K	
C427			CK73HB1E103K	CHIP C 0.010UF K		C743			CK73HB0J105K	CHIP C 1.0UF K	
C428			CC73HCH1H030C	CHIP C 3.0PF C		C744-746			CK73HB1E103K	CHIP C 0.010UF K	
C429,430			CK73HB1A104K	CHIP C 0.10UF K		C747,748			CK73HB1A104K	CHIP C 0.10UF K	
C431			CK73FB1A106K	CHIP C 10UF K		C749,750			CC73HCH1H470J	CHIP C 47PF J	
C433			CK73FB1A106K	CHIP C 10UF K		C751			CK73GB1E105K	CHIP C 1.0UF K	
C435-438			CK73HB1A563K	CHIP C 0.056UF K		C752,753			CC73HCH1H101J	CHIP C 100PF J	
C439,440			CK73HB1A104K	CHIP C 0.10UF K		C755			CC73HCH1H470J	CHIP C 47PF J	
C441			CK73GB1E105K	CHIP C 1.0UF K		C756			CK73HB1A104K	CHIP C 0.10UF K	

PARTS LIST

CONTROL UNIT (X53-4262-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C757,758			CK73GB0J475K	CHIP C 4.7UF K		L409-411			L92-0467-05	CHIP FERRITE	
C759,760			CK73HB1E103K	CHIP C 0.010UF K		L701			L92-0140-05	CHIP FERRITE	
C761			CC73HCH1H100D	CHIP C 10PF D		L702			L92-0162-05	BEADS CORE	
C762			CK73HB1A104K	CHIP C 0.10UF K		L704-709			L92-0162-05	BEADS CORE	
C763			CK73HB1E103K	CHIP C 0.010UF K		L710-712			L92-0444-05	CHIP FERRITE	
C764			CK73HB1H102K	CHIP C 1000PF K		L713			L92-0163-05	BEADS CORE	
C765-767			CK73HB1A104K	CHIP C 0.10UF K		L714-717			L92-0444-05	CHIP FERRITE	
C768			CK73HB1H102K	CHIP C 1000PF K		L718			L92-0408-05	CHIP FERRITE	
C771			CK73HB1A224K	CHIP C 0.22UF K		L719			L33-1494-05	SMALL FIXED INDUCTOR	
C772			CK73HB1E103K	CHIP C 0.010UF K		X101			L77-1802-05	CRYSTAL RESONATOR (32768HZ)	
C775			CC73HCH1H470J	CHIP C 47PF J		X102			L77-3015-05	TCXO (18.432MHZ)	
C777			CK73HB1H102K	CHIP C 1000PF K		R1			RK73HB1J105J	CHIP R 1.0M J 1/16W	
C778			CK73HB0J105K	CHIP C 1.0UF K		R2			RK73HB1J104J	CHIP R 100K J 1/16W	
C779			CK73HB1E103K	CHIP C 0.010UF K		R3			RK73HB1J123J	CHIP R 12K J 1/16W	
C780			CK73HB1A224K	CHIP C 0.22UF K		R4-10			RK73HB1J103J	CHIP R 10K J 1/16W	
C781,782			CK73HB0J105K	CHIP C 1.0UF K		R11			RK73HB1J104J	CHIP R 100K J 1/16W	
C785			CK73HB1A224K	CHIP C 0.22UF K		R12			RK73HB1J103J	CHIP R 10K J 1/16W	
C786			CK73HB1E103K	CHIP C 0.010UF K		R14			RK73HB1J472J	CHIP R 4.7K J 1/16W	
C787			CK73HB0J105K	CHIP C 1.0UF K		R15			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C788			CC73HCH1H150J	CHIP C 15PF J		R16			RK73HB1J331J	CHIP R 330 J 1/16W	
C789			CC73HCH1H680J	CHIP C 68PF J		R17			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C790			CK73HB1A104K	CHIP C 0.10UF K		R18			RK73HB1J822J	CHIP R 8.2K J 1/16W	
C791			CK73HB1A393K	CHIP C 0.039UF K		R19			RK73HB1J471J	CHIP R 470 J 1/16W	
C792			CK73HB0J105K	CHIP C 1.0UF K		R20			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C793,794			CK73HB1A104K	CHIP C 0.10UF K		R21			RK73HB1J122J	CHIP R 1.2K J 1/16W	
C795			CK73HB1E103K	CHIP C 0.010UF K		R22-24			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C796			CK73HB1A104K	CHIP C 0.10UF K		R25			RK73HB1J122J	CHIP R 1.2K J 1/16W	
C797			CK73HB0J105K	CHIP C 1.0UF K		R26			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C798			CS77AP1A100M	CHIP TNL 10UF 10WV		R27			RK73HB1J104J	CHIP R 100K J 1/16W	
C799			CK73HB1A104K	CHIP C 0.10UF K		R28,29			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C800			CK73HB1H152K	CHIP C 1500PF K		R30			RK73HB1J101J	CHIP R 100 J 1/16W	
C801			CK73HB1C223K	CHIP C 0.022UF K		R31			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C802			CK73HB1E103K	CHIP C 0.010UF K		R32-35			RK73HB1J101J	CHIP R 100 J 1/16W	
C803			CK73HB1H102K	CHIP C 1000PF K		R40			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C804			CC73HCH1H470J	CHIP C 47PF J		R101,102			RK73HB1J474J	CHIP R 470K J 1/16W	
C805,806			CK73HB1H471K	CHIP C 470PF K		R103			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C808			CK73GB0J475K	CHIP C 4.7UF K		R105			RK73HB1J104J	CHIP R 100K J 1/16W	
C809			CK73FB1A106K	CHIP C 10UF K		R106			RK73HB1J472J	CHIP R 4.7K J 1/16W	E
C812			CK73HB0J105K	CHIP C 1.0UF K		R107			RK73HB1J104J	CHIP R 100K J 1/16W	E
CN1			E40-6755-05	FLAT CABLE CONNECTOR		R108			RK73HB1J474J	CHIP R 470K J 1/16W	E
CN22			E23-1325-05	TERMINAL		R110,111			RK73HB1J104J	CHIP R 100K J 1/16W	
CN23			E40-6758-05	PIN ASSY		R112			RK73HB1J000J	CHIP R 0.0 J 1/16W	E
CN24			E23-1325-05	TERMINAL		R113			RK73HB1J104J	CHIP R 100K J 1/16W	
CN403			E40-6813-05	PIN ASSY		R114			RK73HB1J331J	CHIP R 330 J 1/16W	E
CN404			E40-6421-15	PIN ASSY		R115			RK73HB1J104J	CHIP R 100K J 1/16W	
CN405			E40-6754-05	FLAT CABLE CONNECTOR		R116			RK73HB1J473J	CHIP R 47K J 1/16W	
CN701			E40-6586-05	SOCKET FOR PIN ASSY		R117			RK73HB1J000J	CHIP R 0.0 J 1/16W	E
CN710			E40-6757-05	PIN ASSY		R118			RK73HB1J473J	CHIP R 47K J 1/16W	
F701			F53-0360-05	FUSE (0.25A)		R119			RK73HB1J104J	CHIP R 100K J 1/16W	
CN401			J19-5386-05	HOLDER (LITHIUM CELL)		R120			RK73HB1J474J	CHIP R 470K J 1/16W	
L1,2			L92-0408-05	CHIP FERRITE		R121-123			RK73HB1J104J	CHIP R 100K J 1/16W	
L3			L92-0140-05	CHIP FERRITE		R126			RK73HB1J101J	CHIP R 100 J 1/16W	
L4-7			L92-0408-05	CHIP FERRITE		R127,128			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L8			L92-0140-05	CHIP FERRITE		R129-131			RK73HB1J101J	CHIP R 100 J 1/16W	
L101,102			L92-0408-05	CHIP FERRITE		R132,133			RK73HB1J104J	CHIP R 100K J 1/16W	
L401			L33-1496-05	SMALL FIXED INDUCTOR		R135-137			RK73HB1J104J	CHIP R 100K J 1/16W	
L402			L92-0467-05	CHIP FERRITE		R138			RK73HB1J473J	CHIP R 47K J 1/16W	
L403			L92-0466-05	CHIP FERRITE		R139			RK73HB1J104J	CHIP R 100K J 1/16W	
						R140			RK73HB1J000J	CHIP R 0.0 J 1/16W	

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Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R141-143			RK73HB1J104J	CHIP R 100K J 1/16W		R446			RK73HB1J274J	CHIP R 270K J 1/16W	
R144			RK73HB1J471J	CHIP R 470 J 1/16W		R447			RK73HB1J104J	CHIP R 100K J 1/16W	
R145-147			RK73HB1J104J	CHIP R 100K J 1/16W		R448			RK73HB1J103J	CHIP R 10K J 1/16W	
R148			RK73HB1J151J	CHIP R 150 J 1/16W		R449-452			RK73HB1J474J	CHIP R 470K J 1/16W	
R149			RK73HB1J000J	CHIP R 0.0 J 1/16W		R453			RK73HB1J104J	CHIP R 100K J 1/16W	
R150			RK73HB1J102J	CHIP R 1.0K J 1/16W		R454			RK73HB1J474J	CHIP R 470K J 1/16W	
R153,154			RK73HB1J104J	CHIP R 100K J 1/16W		R455			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R155			RK73HB1J473J	CHIP R 47K J 1/16W		R456			RK73HB1J474J	CHIP R 470K J 1/16W	
R156,157			RK73HB1J472J	CHIP R 4.7K J 1/16W		R457,458			RK73HB1J104J	CHIP R 100K J 1/16W	
R158,159			RK73HB1J220J	CHIP R 22 J 1/16W		R459,460			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R160,161			RK73HB1J000J	CHIP R 0.0 J 1/16W		R461			RK73HB1J103J	CHIP R 10K J 1/16W	
R162			RK73HB1J474J	CHIP R 470K J 1/16W		R462			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R163			RK73HH1J104D	CHIP R 100K D 1/16W		R463			RK73HB1J104J	CHIP R 100K J 1/16W	
R165			RK73HB1J102J	CHIP R 1.0K J 1/16W		R464			RK73HB1J474J	CHIP R 470K J 1/16W	
R166			RK73HB1J104J	CHIP R 100K J 1/16W		R465,466			RK73HB1J103J	CHIP R 10K J 1/16W	
R167			RK73HB1J102J	CHIP R 1.0K J 1/16W		R467			RK73HB1J104J	CHIP R 100K J 1/16W	
R168			RK73HB1J000J	CHIP R 0.0 J 1/16W		R468			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R170			RK73HH1J103D	CHIP R 10K D 1/16W		R469			RK73HB1J474J	CHIP R 470K J 1/16W	
R171-173			RK73HB1J000J	CHIP R 0.0 J 1/16W		R470			RK73HB1J183J	CHIP R 18K J 1/16W	
R174-178			RK73HB1J104J	CHIP R 100K J 1/16W		R471			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R180,181			RK73HB1J104J	CHIP R 100K J 1/16W		R472			RK73HB1J223J	CHIP R 22K J 1/16W	
R182			RK73HB1J474J	CHIP R 470K J 1/16W		R473			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R183			RK73HB1J104J	CHIP R 100K J 1/16W		R474,475			RK73HB1J333J	CHIP R 33K J 1/16W	
R184			RK73HB1J473J	CHIP R 47K J 1/16W		R477,478			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R185			RK73HB1J105J	CHIP R 1.0M J 1/16W		R479			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R186			RK73HB1J473J	CHIP R 47K J 1/16W		R481			RK73HB1J474J	CHIP R 470K J 1/16W	
R187			RK73HB1J102J	CHIP R 1.0K J 1/16W		R483			RK73HB1J473J	CHIP R 47K J 1/16W	
R188			RK73HB1J473J	CHIP R 47K J 1/16W		R484			RK73HB1J223J	CHIP R 22K J 1/16W	
R189			RK73HB1J104J	CHIP R 100K J 1/16W		R485			RK73HB1J103J	CHIP R 10K J 1/16W	
R190			RK73HB1J102J	CHIP R 1.0K J 1/16W		R487-490			RK73HH1J223D	CHIP R 22K D 1/16W	
R191			RK73HB1J474J	CHIP R 470K J 1/16W		R491			RK73HB1J104J	CHIP R 100K J 1/16W	
R192			RK73HB1J102J	CHIP R 1.0K J 1/16W		R492			RK73HB1J474J	CHIP R 470K J 1/16W	
R193,194			RK73HB1J104J	CHIP R 100K J 1/16W		R493			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R401			RK73HB1J152J	CHIP R 1.5K J 1/16W	E	R494-497			RK73HH1J104D	CHIP R 100K D 1/16W	
R402			RK73HB1J151J	CHIP R 150 J 1/16W		R500			RK73HB1J473J	CHIP R 47K J 1/16W	
R403			RK73HB1J152J	CHIP R 1.5K J 1/16W	E	R501			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R404			RK73HB1J151J	CHIP R 150 J 1/16W		R502,503			RK73HB1J103J	CHIP R 10K J 1/16W	
R405			RK73HB1J152J	CHIP R 1.5K J 1/16W	E	R504			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R406			RK73HB1J000J	CHIP R 0.0 J 1/16W		R506			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R407,408			RK73HB1J103J	CHIP R 10K J 1/16W		R507-511			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R409			RK73HB1J470J	CHIP R 47 J 1/16W		R512			RK73HB1J101J	CHIP R 100 J 1/16W	
R410-416			RK73HB1J471J	CHIP R 470 J 1/16W		R513-515			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R417			RK73HB1J000J	CHIP R 0.0 J 1/16W		R516			RK73HB1J101J	CHIP R 100 J 1/16W	
R418			RK73HB1J471J	CHIP R 470 J 1/16W		R517			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R419,420			RK73HB1J000J	CHIP R 0.0 J 1/16W		R518			RK73HB1J101J	CHIP R 100 J 1/16W	
R424			RK73HH1J683D	CHIP R 68K D 1/16W		R519-528			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R425			RK73HH1J333D	CHIP R 33K D 1/16W		R529-531			RK73HB1J101J	CHIP R 100 J 1/16W	
R426-429			RK73HB1J000J	CHIP R 0.0 J 1/16W		R532			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R431			RK73HB1J474J	CHIP R 470K J 1/16W		R533-535			RK73HB1J101J	CHIP R 100 J 1/16W	
R432,433			RK73HB1J000J	CHIP R 0.0 J 1/16W		R536-540			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R434			RK73HB1J393J	CHIP R 39K J 1/16W		R541			RK73HB1J101J	CHIP R 100 J 1/16W	
R435,436			RK73HB1J104J	CHIP R 100K J 1/16W		R543			RK73HB1J101J	CHIP R 100 J 1/16W	
R437			RK73HB1J471J	CHIP R 470 J 1/16W		R544			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R438,439			RK73HB1J104J	CHIP R 100K J 1/16W		R545			RK73HB1J101J	CHIP R 100 J 1/16W	
R440			RK73HB1J000J	CHIP R 0.0 J 1/16W		R546,547			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R441			RK73HB1J153J	CHIP R 15K J 1/16W		R548,549			RK73HB1J473J	CHIP R 47K J 1/16W	
R442			RK73HB1J102J	CHIP R 1.0K J 1/16W		R550			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R443			RK73HB1J474J	CHIP R 470K J 1/16W		R701-707			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R444			RK73HB1J564J	CHIP R 560K J 1/16W		R709-715			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R445			RK73HB1J154J	CHIP R 150K J 1/16W		R716			RK73GB2A000J	CHIP R 0.0 J 1/10W	

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R717-722			RK73HB1J104J	CHIP R 100K J 1/16W		R799			RK73HB1J334J	CHIP R 330K J 1/16W	
R723			RK73HB1J105J	CHIP R 1.0M J 1/16W		R800			RK73HB1J474J	CHIP R 470K J 1/16W	
R724			RK73HB1J104J	CHIP R 100K J 1/16W		R801			RK73HB1J473J	CHIP R 47K J 1/16W	
R725			RK73HB1J100J	CHIP R 10 J 1/16W		R802			RK73HB1J474J	CHIP R 470K J 1/16W	
R726			RK73HB1J104J	CHIP R 100K J 1/16W		R803			RK73HB1J103J	CHIP R 10K J 1/16W	
R727-729			RK73HB1J105J	CHIP R 1.0M J 1/16W		R804			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R730			RK73HB1J471J	CHIP R 470 J 1/16W		R805,806			RK73HB1J473J	CHIP R 47K J 1/16W	
R731,732			RK73HB1J105J	CHIP R 1.0M J 1/16W		R807			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R733			RK73HB1J473J	CHIP R 47K J 1/16W		R808			RK73HB1J471J	CHIP R 470 J 1/16W	
R735			RK73HB1J473J	CHIP R 47K J 1/16W		R809			RK73HB1J334J	CHIP R 330K J 1/16W	
R736			RK73HB1J823J	CHIP R 82K J 1/16W		R810			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R737			RK73HB1J153J	CHIP R 15K J 1/16W		R811			RK73HB1J823J	CHIP R 82K J 1/16W	
R738			RK73HB1J563J	CHIP R 56K J 1/16W		R812			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R739			RK73HB1J823J	CHIP R 82K J 1/16W		R813			RK73HB1J273J	CHIP R 27K J 1/16W	
R740			RK73HB1J000J	CHIP R 0.0 J 1/16W		R814			RK73HB1J564J	CHIP R 560K J 1/16W	
R741			RK73HB1J474J	CHIP R 470K J 1/16W		R815			RK73HB1J104J	CHIP R 100K J 1/16W	
R742,743			RK73HB1J103J	CHIP R 10K J 1/16W		R816			RK73HB1J683J	CHIP R 68K J 1/16W	
R744			RK73HB1J223J	CHIP R 22K J 1/16W		R818			RK73HB1J104J	CHIP R 100K J 1/16W	
R745			RK73HB1J682J	CHIP R 6.8K J 1/16W		R819,820			RK73HB1J103J	CHIP R 10K J 1/16W	
R746			RK73HB1J563J	CHIP R 56K J 1/16W		R821			RK73HB1J104J	CHIP R 100K J 1/16W	
R747			RK73HB1J333J	CHIP R 33K J 1/16W		R822,823			RK73HB1J103J	CHIP R 10K J 1/16W	
R748			RK73HB1J103J	CHIP R 10K J 1/16W		R824			RK73HB1J393J	CHIP R 39K J 1/16W	
R749			RK73HB1J472J	CHIP R 4.7K J 1/16W		R825			RK73HB1J104J	CHIP R 100K J 1/16W	
R750			RK73HB1J103J	CHIP R 10K J 1/16W		R826			RK73HB1J334J	CHIP R 330K J 1/16W	
R752			RK73HB1J101J	CHIP R 100 J 1/16W		R827			RK73HB1J184J	CHIP R 180K J 1/16W	
R753			RK73HB1J683J	CHIP R 68K J 1/16W		R828,829			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R754			RK73HB1J564J	CHIP R 560K J 1/16W		R830			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R755			RK73HB1J104J	CHIP R 100K J 1/16W		R831			RK73HB1J474J	CHIP R 470K J 1/16W	
R756			RK73HB1J101J	CHIP R 100 J 1/16W		R832			RK73HB1J473J	CHIP R 47K J 1/16W	
R757			RK73HB1J223J	CHIP R 22K J 1/16W		R833			RK73HB1J684J	CHIP R 680K J 1/16W	
R758			RK73HB1J103J	CHIP R 10K J 1/16W		R834			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R759			RK73HB1J101J	CHIP R 100 J 1/16W		R835			RK73HB1J153J	CHIP R 15K J 1/16W	
R761-764			RK73HB1J223J	CHIP R 22K J 1/16W		R836			RK73HB1J473J	CHIP R 47K J 1/16W	
R765			RK73HB1J334J	CHIP R 330K J 1/16W		R837			RK73HB1J683J	CHIP R 68K J 1/16W	
R766			RK73HB1J000J	CHIP R 0.0 J 1/16W		R838			RK73HB1J564J	CHIP R 560K J 1/16W	
R767			RK73HB1J103J	CHIP R 10K J 1/16W		R839			RK73HB1J333J	CHIP R 33K J 1/16W	
R768			RK73HB1J224J	CHIP R 220K J 1/16W		R840			RK73HB1J123J	CHIP R 12K J 1/16W	
R769,770			RK73HB1J334J	CHIP R 330K J 1/16W		R841			RK73HB1J564J	CHIP R 560K J 1/16W	
R771			RK73HB1J153J	CHIP R 15K J 1/16W		R842			RK73HB1J104J	CHIP R 100K J 1/16W	
R775			RK73HB1J183J	CHIP R 18K J 1/16W		R843			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R777			RK73HB1J473J	CHIP R 47K J 1/16W		R844			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R778			RK73HB1J333J	CHIP R 33K J 1/16W		R845			RK73HB1J104J	CHIP R 100K J 1/16W	
R779			RK73HB1J473J	CHIP R 47K J 1/16W		R846			RK73HB1J471J	CHIP R 470 J 1/16W	
R780			RK73HB1J104J	CHIP R 100K J 1/16W		R847			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R782			RK73HB1J104J	CHIP R 100K J 1/16W		R848			RK73HB1J000J	CHIP R 0.0 J 1/16W	E4
R783			RK73HB1J183J	CHIP R 18K J 1/16W		R849,850			RK73HB1J000J	CHIP R 0.0 J 1/16W	E
R784			RK73HB1J104J	CHIP R 100K J 1/16W		R850			RK73HB1J000J	CHIP R 0.0 J 1/16W	E4
R785			RK73HB1J682J	CHIP R 6.8K J 1/16W		R851,852			RK73HB1J683J	CHIP R 68K J 1/16W	
R786			RK73HB1J000J	CHIP R 0.0 J 1/16W		R856			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R787			RK73HB1J124J	CHIP R 120K J 1/16W							
R788			RK73HB1J473J	CHIP R 47K J 1/16W		VR1	2B		R31-0666-05	VARIABLE RESISTOR (VOL)	
R789			RK73HB1J154J	CHIP R 150K J 1/16W		S1	2B		S60-0437-05	ROTARY SWITCH (CH)	
R790			RK73HB1J102J	CHIP R 1.0K J 1/16W		D11			MA2S111-F	DIODE	
R791			RK73HB1J474J	CHIP R 470K J 1/16W		D12-16			1SS416	DIODE	
R793			RK73HB1J102J	CHIP R 1.0K J 1/16W		D17			EMZ6.8N	ZENER DIODE	
R794			RK73HB1J104J	CHIP R 100K J 1/16W		D18,19			HZC6.8-E	ZENER DIODE	
R795			RK73HB1J000J	CHIP R 0.0 J 1/16W		D20,21			NNCD6.8G-A	ZENER DIODE	
R796			RK73HB1J333J	CHIP R 33K J 1/16W		D22,23			DA221	DIODE	
R797			RK73HB1J102J	CHIP R 1.0K J 1/16W							
R798			RK73HB1J104J	CHIP R 100K J 1/16W							

PARTS LIST

CONTROL UNIT (X53-4262-XX)
TX-RX UNIT (X57-7370-11)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
D101			MA2S111-F	DIODE	E	Q3,4			SSM3K15TE (F)	FET	
D102			1SS416	DIODE		Q5			2SJ347F	FET	
D401-405			1SS388F	DIODE		Q101			2SA1832 (GR)F	TRANSISTOR	E
D406			HRB0502A	DIODE		Q102			2SC4617 (S)	TRANSISTOR	E
D407			MA2S111-F	DIODE		Q103			SSM3K15TE (F)	FET	E
D408			1SS301F	DIODE		Q401,402			SSM6N16FE-F	FET	
D409,410			MA2S111-F	DIODE		Q403			2SJ648-A	FET	
D411			1SS416	DIODE		Q404			SSM3K15TE (F)	FET	
D412			1SS301F	DIODE		Q405			SSM6N16FE-F	FET	
D413			1SS388F	DIODE		Q406			2SB1132 (Q,R)	TRANSISTOR	
D414,415			1SS416	DIODE		Q407			UMG3N	TRANSISTOR	
D416,417			1SS388F	DIODE		Q408			EMD12	TRANSISTOR	
D701			1SS301F	DIODE		Q409			2SA1955A-F	TRANSISTOR	
D702			MA2S111-F	DIODE		Q410			SSM3K15TE (F)	FET	
D703-706			RB706F-40	DIODE		Q411			SSM6N16FE-F	FET	
D707			DA221	DIODE		Q412			SSM3K15TE (F)	FET	
IC1			NJM2130F3-ZB	BI-POLAR IC		Q413			2SA1955A-F	TRANSISTOR	
IC101			Note 1	ROM IC		Q414,415			EMD12	TRANSISTOR	
IC102			Note 1	MICROPROCESSOR IC		Q701			2SA1832 (GR)F	TRANSISTOR	
IC103			Note 1	SRAM IC		Q702,703			SSM3K15TE (F)	FET	
IC104			TC7SH08FU-F	MOS-IC		Q704			2SC4617 (S)	TRANSISTOR	
IC105			XC6109C29ANN	ANALOGUE IC		Q705			2SC4738 (GR)F	TRANSISTOR	
IC106			RV5C386A	MOS-IC		Q706			2SA1832 (GR)F	TRANSISTOR	
IC107			SM5023CNDH-G	MOS-IC		Q707			2SJ243-A	FET	
IC108			Note 1	MOS-IC		TH1			ERTJ0EV104H	THERMISTOR	
IC109			TC7SH08FU-F	MOS-IC		TH701			ERTJ0EV104H	THERMISTOR	
IC401			TC74LCX245FK	MOS-IC		-		*	X53-4262-73	SERVICE CONTROL UNIT (6KEY)	
IC402			TC7WZ245FK-F	MOS-IC		-		*	X53-4262-74	SERVICE CONTROL UNIT (18KEY)	
IC403			LM2682MMX	MOS-IC							
IC404			XC6204B332D	MOS-IC							
IC406			XC6204B332M	MOS-IC							
IC407			LT1616ES6-PBF	ANALOGUE IC							
IC408			TC75S51FE (F)	MOS-IC							
IC409			TC7W66FK-F	MOS-IC							
IC411			NJM2880U105ZB	ANALOGUE IC							
IC412,413			TPA6201A1DRBR	ANALOGUE IC							
IC414			XC61CC5602NR	MOS-IC							
IC415			TC7SET08FU-F	MOS-IC							
IC416			S-812C31BPI-G	ANALOGUE IC							
IC417			TC7WH126FK	MOS-IC							
IC418			TC7WT125FUF	MOS-IC							
IC701			Note 1	MOS-IC							
IC702			TC75W51FK (F)	MOS-IC							
IC703			M62364FP-F	MOS-IC							
IC704			TC75S51FE (F)	MOS-IC							
IC705			TC75W51FK (F)	MOS-IC							
IC706			TC75S51FE (F)	MOS-IC							
IC707			TC7W53FK (F)	MOS-IC							
IC708			XC6204B502PR	MOS-IC							
IC709			TC7W53FK (F)	MOS-IC							
IC710,711			TC75W51FK (F)	MOS-IC							
IC712			TC7S66FUF	MOS-IC							
IC713			TC75W51FK (F)	MOS-IC							
IC714			TC7W53FK (F)	MOS-IC							
IC715			TC75S51FE (F)	MOS-IC							
IC716			TC75W51FK (F)	MOS-IC							
IC717		*	XC9235A15CM1	MOS-IC							
Q1			2SA1362-F (GR)	TRANSISTOR							
Q2			2SC4617 (S)	TRANSISTOR							

TX-RX UNIT (X57-7370-11)											
D900			B30-2278-05	LED (RED/YELLOW)							
C500			CK73HB1A104K	CHIP C					0.10UF	K	
C501			CC73HCH1H101J	CHIP C					100PF	J	
C502			CK73HB1H471K	CHIP C					470PF	K	
C503			CK73HB1A104K	CHIP C					0.10UF	K	
C504			CK73HB1C103K	CHIP C					0.010UF	K	
C505			CC73HCH1H101J	CHIP C					100PF	J	
C506			CC73HCH1H100C	CHIP C					10PF	C	
C508			CK73HB1C103K	CHIP C					0.010UF	K	
C509			CC73HCH1H100C	CHIP C					10PF	C	
C511			CK73FB0J106K	CHIP C					10UF	K	
C512			CK73HB1C103K	CHIP C					0.010UF	K	
C513			CC73HCH1H101J	CHIP C					100PF	J	
C514,515			CK73HB1C103K	CHIP C					0.010UF	K	
C517-519			CC73HCH1H101J	CHIP C					100PF	J	
C520			CK73GB1E105K	CHIP C					1.0UF	K	
C521			CC73HCH1H101J	CHIP C					100PF	J	
C522			CK73HB1A104K	CHIP C					0.10UF	K	
C523,524			CC73HCH1H101J	CHIP C					100PF	J	
C525			CC73HCH1H470J	CHIP C					47PF	J	
C526			CK73HB1A104K	CHIP C					0.10UF	K	
C527,528			CC73HCH1H101J	CHIP C					100PF	J	
C533			CK73HB1H471K	CHIP C					470PF	K	
C534			CC73HCH1H101J	CHIP C					100PF	J	
C535			CS77AA1VR15M	CHIP TNTL					0.15UF	35WV	
C536			CC73HCH1H470J	CHIP C					47PF	J	

Note 1: This part cannot be replaced. Therefore, this part is not supplied as a service part.

PARTS LIST

TX-RX UNIT (X57-7370-11)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C539			CS77BA1D100M	CHIP TNTL 10UF 20WV		C632			CK73HB1H471K	CHIP C 470PF K	
C541			C92-0863-05	CHIP TNTL 0.047UF 35WV		C634-637			CK73HB1H471K	CHIP C 470PF K	
C542			C93-0787-05	CERAMIC 0.1UF 50WV		C639			CC73HCH1H330J	CHIP C 33PF J	
C543			CC73HCH1H040B	CHIP C 4.0PF B		C640			CC73HCH1H470J	CHIP C 47PF J	
C545			CK73HB1H471K	CHIP C 470PF K		C641			CC73HCH1H100C	CHIP C 10PF C	
C546			CK73HB1H472K	CHIP C 4700PF K		C642,643			CC73HCH1H151J	CHIP C 150PF J	
C547			CK73HB1H471K	CHIP C 470PF K		C645			CK73GB1C104K	CHIP C 0.10UF K	
C548			CC73HCH1H101J	CHIP C 100PF J		C646			CK73GB1E105K	CHIP C 1.0UF K	
C550			CC73HCH1H050B	CHIP C 5.0PF B		C648,649			CK73HB1C103K	CHIP C 0.010UF K	
C553			CC73HCH1H100B	CHIP C 10PF B		C651			CK73HB1H471K	CHIP C 470PF K	
C554			CC73HCH1H470J	CHIP C 47PF J		C653			CK73HB1H471K	CHIP C 470PF K	
C555			CK73HB0J105K	CHIP C 1.0UF K		C660			CC73GCH1H101J	CHIP C 100PF J	
C556,557			CK73HB1H471K	CHIP C 470PF K		C661			CK73HB1H471K	CHIP C 470PF K	
C561			CK73HB1C103K	CHIP C 0.010UF K		C662			CC73GCH1H040B	CHIP C 4.0PF B	
C562			CK73HB0J105K	CHIP C 1.0UF K		C663			CC73GCH1H101J	CHIP C 100PF J	
C563			CC73HCH1H101J	CHIP C 100PF J		C664			CC73GCH1H2R5B	CHIP C 2.5PF B	
C565			CC73HCH1H330J	CHIP C 33PF J		C665			CC73GCH1H030B	CHIP C 3.0PF B	
C566			CC73HCH1H820J	CHIP C 82PF J		C666			CC73GCH1H080B	CHIP C 8.0PF B	
C567			CC73HCH1H0R5B	CHIP C 0.5PF B		C667			CC73GCH1H2R5B	CHIP C 2.5PF B	
C568			CC73HCH1H1R5B	CHIP C 1.5PF B		C668			CC73GCH1H100C	CHIP C 10PF C	
C570			CC73HCH1HR75B	CHIP C 0.75PF B		C669			CC73GCH1H1R5B	CHIP C 1.5PF B	
C571			CC73HCH1H030B	CHIP C 3.0PF B		C670			CK73HB1H471K	CHIP C 470PF K	
C572			CK73FB0J106K	CHIP C 10UF K		C671			CC73HCH1H100B	CHIP C 10PF B	
C573			CC73HCH1H060B	CHIP C 6.0PF B		C689-691			CK73HB1A104K	CHIP C 0.10UF K	
C574			CC73HCH1H020B	CHIP C 2.0PF B		C692			C93-0951-05	CERAMIC 47PF 50WV	
C575			CC73HCH1H060B	CHIP C 6.0PF B		C700			CC73HCH1H070B	CHIP C 7.0PF B	
C576			CC73HCH1H050B	CHIP C 5.0PF B		C701			CK73HB1C103K	CHIP C 0.010UF K	
C577			CK73HB1H471K	CHIP C 470PF K		C702			CC73HCH1H820J	CHIP C 82PF J	
C578			CK73GB0J475K	CHIP C 4.7UF K		C703			CK73HB1A104K	CHIP C 0.10UF K	
C579			CC73HCH1H050B	CHIP C 5.0PF B		C704			CC73HCH1H100B	CHIP C 10PF B	
C580			CK73HB1H471K	CHIP C 470PF K		C705			CK73FB1E475K	CHIP C 4.7UF K	
C581			CC73HCH1H0R5B	CHIP C 0.5PF B		C706			CC73HCH1H100B	CHIP C 10PF B	
C582			CK73HB1H471K	CHIP C 470PF K		C707			CC73HCH1H680J	CHIP C 68PF J	
C583			CC73HCH1H0R5B	CHIP C 0.5PF B		C708			CC73HCH1H101J	CHIP C 100PF J	
C584,585			CK73HB1H471K	CHIP C 470PF K		C709-711			CK73HB1A104K	CHIP C 0.10UF K	
C586			CC73HCH1H100B	CHIP C 10PF B		C712			CC73HCH1H680J	CHIP C 68PF J	
C587			CK73HB1H471K	CHIP C 470PF K		C713			CK73FB1A106K	CHIP C 10UF K	
C588			CC73HCH1H100B	CHIP C 10PF B		C714			CK73GB1H102K	CHIP C 1000PF K	
C600			CK73HB1A104K	CHIP C 0.10UF K		C715			CC73HCH1H470J	CHIP C 47PF J	
C601			CC73HCH1H101J	CHIP C 100PF J		C717			CK73HB1C103K	CHIP C 0.010UF K	
C602			CK73HB1A104K	CHIP C 0.10UF K		C718			CK73HB1A104K	CHIP C 0.10UF K	
C603			CC73HCH1H100B	CHIP C 10PF B		C719			CK73FB1A106K	CHIP C 10UF K	
C604,605			CK73HB1H471K	CHIP C 470PF K		C720			CC73HCH1H100B	CHIP C 10PF B	
C607			CC73HCH1H070B	CHIP C 7.0PF B		C721			CK73HB1A104K	CHIP C 0.10UF K	
C609			CC73GCH1H010B	CHIP C 1.0PF B		C722			CC73HCH1H470G	CHIP C 47PF G	
C610-612			CK73HB1H471K	CHIP C 470PF K		C723,724			CK73HB1A104K	CHIP C 0.10UF K	
C613			CC73HCH1H040B	CHIP C 4.0PF B		C725			CK73HB1C103K	CHIP C 0.010UF K	
C614,615			CK73HB1H471K	CHIP C 470PF K		C727,728			CK73HB1A104K	CHIP C 0.10UF K	
C617,618			CK73HB1H471K	CHIP C 470PF K		C729			CK73FB1E474K	CHIP C 0.47UF K	
C619			CK73HB1A104K	CHIP C 0.10UF K		C730			CK73HB1C103K	CHIP C 0.010UF K	
C621			CC73HCH1H040B	CHIP C 4.0PF B		C732			CK73HB1H471K	CHIP C 470PF K	
C622			CK73HB1H471K	CHIP C 470PF K		C733,734			CK73HB1C103K	CHIP C 0.010UF K	
C623			CC73HCH1H120J	CHIP C 12PF J		C735			CC73HCH1H470G	CHIP C 47PF G	
C625			CK73HB1H471K	CHIP C 470PF K		C736			CK73HB1C103K	CHIP C 0.010UF K	
C626			CK73HB1A104K	CHIP C 0.10UF K		C737			CC73HCH1H020B	CHIP C 2.0PF B	
C627			CC73HCH1H080B	CHIP C 8.0PF B		C738			CC73HCH1H220G	CHIP C 22PF G	
C628			CC73HCH1H100C	CHIP C 10PF C		C739			CC73HCH1H060B	CHIP C 6.0PF B	
C629			CK73HB1H471K	CHIP C 470PF K		C740,741			CK73HB1C103K	CHIP C 0.010UF K	
C630			CK73GB1E105K	CHIP C 1.0UF K		C742			CK73FB1A475K	CHIP C 4.7UF K	
C631			CS77AA1A6R8M	CHIP TNTL 6.8UF 10WV		C743			CK73HB1C103K	CHIP C 0.010UF K	

PARTS LIST

TX-RX UNIT (X57-7370-11)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C744,745			CK73HB1H471K	CHIP C 470PF K		C925-943			CC73HCH1H470J	CHIP C 47PF J	
C746			CC73HCH1H090B	CHIP C 9.0PF B		C944			CK73HB1H471K	CHIP C 470PF K	
C747			CC73HCH1H100B	CHIP C 10PF B		C945,946			CC73HCH1H470J	CHIP C 47PF J	
C748			CK73HB1H471K	CHIP C 470PF K		C947			CK73HB1H471K	CHIP C 470PF K	
C749			CC73HCH1H040B	CHIP C 4.0PF B		C948,949			CK73GB1E105K	CHIP C 1.0UF K	
C750			CK73HB1C103K	CHIP C 0.010UF K		C950			C92-0765-05	CHIP TNTL 4.7UF 16WV	
C751			CC73HCH1H090B	CHIP C 9.0PF B		C951			CK73GB1C224K	CHIP C 0.22UF K	
C752			CK73HB1H471K	CHIP C 470PF K		C952			CK73HB1H102K	CHIP C 1000PF K	
C753			CC73HCH1H040B	CHIP C 4.0PF B		C953			CK73HB1A104K	CHIP C 0.10UF K	
C754			CC73HCH1H090B	CHIP C 9.0PF B		C954			CK73GB1C224K	CHIP C 0.22UF K	
C755			CC73HCH1H050B	CHIP C 5.0PF B		C955,956			CK73HB1H102K	CHIP C 1000PF K	
C756			CK73HB1H471K	CHIP C 470PF K		C957,958			CK73GB1E105K	CHIP C 1.0UF K	
C758			CK73HB1H471K	CHIP C 470PF K		C961			CK73HB1H471K	CHIP C 470PF K	
C759,760			CK73HB1A104K	CHIP C 0.10UF K		C962			CC73HCH1E181J	CHIP C 180PF J	
C761			CK73GB1E105K	CHIP C 1.0UF K		C963			CK73GB1E105K	CHIP C 1.0UF K	
C764			CC73HCH1H1R5B	CHIP C 1.5PF B		C964,965			CK73GB1C224K	CHIP C 0.22UF K	
C765			CK73HB1H471K	CHIP C 470PF K		C966			CC73HCH1H220J	CHIP C 22PF J	
C766			CK73GB1H104K	CHIP C 0.10UF K		C967			CK73HB1H471K	CHIP C 470PF K	
C767			CC73HCH1H120G	CHIP C 12PF G		C968			CK73GB1C224K	CHIP C 0.22UF K	
C768			CC73HCH1H010B	CHIP C 1.0PF B		C969			CK73GB1E105K	CHIP C 1.0UF K	
C769			CK73HB1H471K	CHIP C 470PF K		C970,971			CK73HB1H102K	CHIP C 1000PF K	
C770			CC73HCH1H030B	CHIP C 3.0PF B		C972-974			CK73GB1E105K	CHIP C 1.0UF K	
C771			CK73HB1H471K	CHIP C 470PF K		C975			C93-0899-05	CERAMIC 9.0PF 50WV	
C772			CC73HCH1H120G	CHIP C 12PF G		C976			CC73HCH1H470J	CHIP C 47PF J	
C773			CC73HCH1H1R5B	CHIP C 1.5PF B		C977			CK73GB1E105K	CHIP C 1.0UF K	
C774			CC73HCH1H020B	CHIP C 2.0PF B		C980			CK73GB1E105K	CHIP C 1.0UF K	
C775			CK73HB1H471K	CHIP C 470PF K		C981			CK73HB1A474K	CHIP C 0.47UF K	
C776			CC73HCH1H120G	CHIP C 12PF G		C987			CC73HCH1H050B	CHIP C 5.0PF B	
C777,778			CK73HB1H471K	CHIP C 470PF K		C988			C93-0945-05	CERAMIC CAP	
C779			CK73HB1C103K	CHIP C 0.010UF K		C989			C93-0939-05	CERAMIC CAP	
C780			CK73GB1H104K	CHIP C 0.10UF K		CN600			E23-1326-05	TERMINAL	
C782			CC73HCH1H0R5B	CHIP C 0.5PF B		CN601			E23-1167-05	TERMINAL	
C783			CK73GB1E105K	CHIP C 1.0UF K		CN737			E40-6358-05	SOCKET FOR PIN ASSY	
C784-786			CK73HB1H471K	CHIP C 470PF K		CN900			E40-6422-15	SOCKET FOR PIN ASSY	
C788			CK73GB1H104K	CHIP C 0.10UF K		CN901			E40-6752-05	FLAT CABLE CONNECTOR	
C789			CK73HB1H471K	CHIP C 470PF K		CN902			E23-1326-05	TERMINAL	
C790			CK73HB1A104K	CHIP C 0.10UF K		F900			F53-0324-05	FUSE (2.5A)	
C791			CK73HB1H471K	CHIP C 470PF K		CF700			L72-1017-05	CERAMIC FILTER	
C792			CK73HB1A104K	CHIP C 0.10UF K		CF701			L72-1020-05	CERAMIC FILTER	
C794,795			CK73HB1H471K	CHIP C 470PF K		L500			L41-4795-39	SMALL FIXED INDUCTOR (4.7UH)	
C796			CC73HCH1H110G	CHIP C 11PF G		L503			L92-0163-05	BEADS CORE	
C798			CC73HCH1H030B	CHIP C 3.0PF B		L504			L40-1275-92	SMALL FIXED INDUCTOR (12NH)	
C799			CK73HB1H471K	CHIP C 470PF K		L508,509			L40-2285-92	SMALL FIXED INDUCTOR (220NH)	
C800			CC73HCH1H1R5B	CHIP C 1.5PF B		L514-519			L40-2285-92	SMALL FIXED INDUCTOR (220NH)	
C801			CK73HB1H471K	CHIP C 470PF K		L520			L40-2278-67	SMALL FIXED INDUCTOR (22NH)	
C802,803			CC73HCH1H040B	CHIP C 4.0PF B		L521			L40-2778-67	SMALL FIXED INDUCTOR (27NH)	
C804			CC73HCH1H110G	CHIP C 11PF G		L522			L40-2285-92	SMALL FIXED INDUCTOR (220NH)	
C807			CC73HCH1H030B	CHIP C 3.0PF B		L523			L92-0446-05	BEADS CORE	
C810			CC73HCH1H040B	CHIP C 4.0PF B		L524-526			L40-2285-92	SMALL FIXED INDUCTOR (220NH)	
C811			CC73HCH1H070B	CHIP C 7.0PF B		L527			L92-0446-05	BEADS CORE	
C813,814			CC73HCH1H270J	CHIP C 27PF J		L528			L40-3375-71	SMALL FIXED INDUCTOR (33NH)	
C849			CK73HB1H471K	CHIP C 470PF K		L530			L40-5675-57	SMALL FIXED INDUCTOR (56.0NH)	
C850			CC73HCH1H101J	CHIP C 100PF J		L598,599			L92-0163-05	BEADS CORE	
C900			CK73GB1H102K	CHIP C 1000PF K		L600			L40-2275-92	SMALL FIXED INDUCTOR (22NH)	
C901,902			CK73HB1H471K	CHIP C 470PF K		L602			L40-2775-92	SMALL FIXED INDUCTOR (27NH)	
C903			CK73GB1H471K	CHIP C 470PF K		L603			L40-1875-92	SMALL FIXED INDUCTOR (18NH)	
C904-908			CC73HCH1H470J	CHIP C 47PF J		L604			L92-0138-05	CHIP FERRITE	
C910			CC73HCH1H470J	CHIP C 47PF J		L605			L40-1275-92	SMALL FIXED INDUCTOR (12NH)	
C912-920			CC73HCH1H470J	CHIP C 47PF J							
C922,923			CC73HCH1H470J	CHIP C 47PF J							

PARTS LIST

TX-RX UNIT (X57-7370-11)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L606			L41-1875-43	SMALL FIXED INDUCTOR (18NH)		R552			RK73HB1J104J	CHIP R 100K J 1/16W	
L607			L92-0149-05	CHIP FERRITE		R554,555			RK73HB1J473J	CHIP R 47K J 1/16W	
L609			L34-4575-05	AIR-CORE COIL		R557			RK73HB1J152J	CHIP R 1.5K J 1/16W	
L610			L92-0149-05	CHIP FERRITE		R558			RK73HB1J474J	CHIP R 470K J 1/16W	
L611			L41-2285-43	SMALL FIXED INDUCTOR (220NH)		R559			RK73HH1J221D	CHIP R 220 D 1/16W	
L612-614			L34-4564-05	AIR-CORE COIL		R560			RK73HB1J220J	CHIP R 22 J 1/16W	
L615			L40-2275-57	SMALL FIXED INDUCTOR (22.0NH)		R561			RK73HH1J221D	CHIP R 220 D 1/16W	
L701			L40-5681-86	SMALL FIXED INDUCTOR (0.56UH)		R562			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L703			L41-4778-45	SMALL FIXED INDUCTOR (47NH)		R563			RK73HB1J473J	CHIP R 47K J 1/16W	
L704			L40-1891-86	SMALL FIXED INDUCTOR (1.8UH)		R564			RK73HB1J154J	CHIP R 150K J 1/16W	
L705,706			L92-0138-05	CHIP FERRITE		R565			RK73HB1J101J	CHIP R 100 J 1/16W	
L707			L41-2785-39	SMALL FIXED INDUCTOR (0.27UH)		R566			RK73HH1J474D	CHIP R 470K D 1/16W	
L708			L41-5685-39	SMALL FIXED INDUCTOR (0.56UH)		R567			RK73HB1J472J	CHIP R 4.7K J 1/16W	
L709,710			L40-1575-92	SMALL FIXED INDUCTOR (15NH)		R568			RK73HB1J474J	CHIP R 470K J 1/16W	
L711			L40-3375-92	SMALL FIXED INDUCTOR (33NH)		R570,571			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L713-715			L41-1078-14	SMALL FIXED INDUCTOR (10NH)		R572			RK73HB1J100J	CHIP R 10 J 1/16W	
L716			L92-0138-05	CHIP FERRITE		R573			RK73HB1J124J	CHIP R 120K J 1/16W	
L717			L41-2285-14	SMALL FIXED INDUCTOR (220NH)		R574-576			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L721,722			L41-1078-14	SMALL FIXED INDUCTOR (10NH)		R577			RK73GB2A000J	CHIP R 0.0 J 1/10W	
L723			L34-4564-05	AIR-CORE COIL		R580,581			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L725			L40-6865-92	SMALL FIXED INDUCTOR (6.8NH)		R583			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L726			L41-3978-03	SMALL FIXED INDUCTOR (39NH)		R586			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L780			L40-1085-57	SMALL FIXED INDUCTOR (100NH)		R589,590			RK73HB1J103J	CHIP R 10K J 1/16W	
L900			L92-0149-05	CHIP FERRITE		R599			RK73HB1J104J	CHIP R 100K J 1/16W	
L901			L33-1462-05	SMALL FIXED INDUCTOR		R600			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L902			L40-2702-86	SMALL FIXED INDUCTOR (27UH)		R601			RK73HB1J183J	CHIP R 18K J 1/16W	
L903			L41-6869-16	SMALL FIXED INDUCTOR (6.8NH)		R602			RK73HB1J124J	CHIP R 120K J 1/16W	
X500			L77-3016-05	TCXO (19.2MHZ)		R603			RK73HB1J222J	CHIP R 2.2K J 1/16W	
XF700			L71-0640-05	MCF (58.05MHZ)		R604			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R430			RK73GB2A000J	CHIP R 0.0 J 1/10W		R605			RK73HB1J103J	CHIP R 10K J 1/16W	
R431,432			RK73HB1J000J	CHIP R 0.0 J 1/16W		R606			RK73HB1J331J	CHIP R 330 J 1/16W	
R500,501			RN73HH1J104D	CHIP R 100K D 1/16W		R607			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R503			RK73HB1J100J	CHIP R 10 J 1/16W		R608			RK73HB1J470J	CHIP R 47 J 1/16W	
R504			RK73HB1J104J	CHIP R 100K J 1/16W		R610			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R505			RK73HB1J000J	CHIP R 0.0 J 1/16W		R612			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R506			RK73HB1J473J	CHIP R 47K J 1/16W		R613			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R511-514			RK73HB1J100J	CHIP R 10 J 1/16W		R616			RK73HB1J181J	CHIP R 180 J 1/16W	
R515			RK73HB1J472J	CHIP R 4.7K J 1/16W		R617			RK73HB1J331J	CHIP R 330 J 1/16W	
R519			RK73HB1J100J	CHIP R 10 J 1/16W		R618			RK73HB1J220J	CHIP R 22 J 1/16W	
R520			RK73HB1J102J	CHIP R 1.0K J 1/16W		R619			RK73HB1J821J	CHIP R 820 J 1/16W	
R522			RK73HB1J100J	CHIP R 10 J 1/16W		R620			RK73HB1J5R6J	CHIP R 5.6 J 1/16W	
R523			RK73HB1J102J	CHIP R 1.0K J 1/16W		R621			RK73HB1J821J	CHIP R 820 J 1/16W	
R527			RK73HB1J000J	CHIP R 0.0 J 1/16W		R622			RK73HB1J101J	CHIP R 100 J 1/16W	
R529			RK73HB1J102J	CHIP R 1.0K J 1/16W		R623			RK73HB1J123J	CHIP R 12K J 1/16W	
R530			RK73HB1J473J	CHIP R 47K J 1/16W		R624			RK73HB1J333J	CHIP R 33K J 1/16W	
R531			RK73HB1J683J	CHIP R 68K J 1/16W		R626			RK73HB1J221J	CHIP R 220 J 1/16W	
R532			RK73HB1J000J	CHIP R 0.0 J 1/16W		R627,628			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R533			RK73HH1J224D	CHIP R 220K D 1/16W		R629			RK73HB1J273J	CHIP R 27K J 1/16W	
R534			RK73HH1J473D	CHIP R 47K D 1/16W		R630			RK73HB1J103J	CHIP R 10K J 1/16W	
R535			RK73HB1J151J	CHIP R 150 J 1/16W		R631			RK73HB1J470J	CHIP R 47 J 1/16W	
R536			RK73HB1J000J	CHIP R 0.0 J 1/16W		R632			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R537			RK73HB1J102J	CHIP R 1.0K J 1/16W		R633			RK73HB1J101J	CHIP R 100 J 1/16W	
R538			RK73HH1J391D	CHIP R 390 D 1/16W		R634			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R539			RK73HB1J106J	CHIP R 10M J 1/16W		R635			RK73HB1J561J	CHIP R 560 J 1/16W	
R541			RK73HB1J103J	CHIP R 10K J 1/16W		R636			RK73HB1J221J	CHIP R 220 J 1/16W	
R546			RK73HB1J104J	CHIP R 100K J 1/16W		R639			RK73HB1J103J	CHIP R 10K J 1/16W	
R547			RK73HB1J000J	CHIP R 0.0 J 1/16W		R641			RK73HB1J103J	CHIP R 10K J 1/16W	
R548			RK73HB1J104J	CHIP R 100K J 1/16W		R642			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R550			RK73HB1J000J	CHIP R 0.0 J 1/16W		R644			RK73HB1J220J	CHIP R 22 J 1/16W	
						R645			RK73EB2ER39K	CHIP R 0.39 K 1/4W	

PARTS LIST

TX-RX UNIT (X57-7370-11)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R646			RK73HB1J333J	CHIP R 33K J 1/16W		R762			RK73HB1J103J	CHIP R 10K J 1/16W	
R647			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R763			RK73HB1J824J	CHIP R 820K J 1/16W	
R648,649			RK73HH1J154D	CHIP R 150K D 1/16W		R764			RK73HB1J104J	CHIP R 100K J 1/16W	
R650			RK73GB2A000J	CHIP R 0.0 J 1/10W		R765			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R651-654			RK73HH1J274D	CHIP R 270K D 1/16W		R768			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R655			RK73HB1J103J	CHIP R 10K J 1/16W		R769			RK73HB1J103J	CHIP R 10K J 1/16W	
R656			RK73HB1J563J	CHIP R 56K J 1/16W		R770			RK73HB1J680J	CHIP R 68 J 1/16W	
R657			RK73HB1J000J	CHIP R 0.0 J 1/16W		R771			RK73HB1J151J	CHIP R 150 J 1/16W	
R658			RK73HB1J821J	CHIP R 820 J 1/16W		R772			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R659			RK73HB1J474J	CHIP R 470K J 1/16W		R773			RK73HB1J824J	CHIP R 820K J 1/16W	
R660			RK73HB1J473J	CHIP R 47K J 1/16W		R774,775			RK73HB1J104J	CHIP R 100K J 1/16W	
R661			RK73HB1J104J	CHIP R 100K J 1/16W		R777			RK73HB1J103J	CHIP R 10K J 1/16W	
R664			RK73HB1J000J	CHIP R 0.0 J 1/16W		R778			RK73HB1J104J	CHIP R 100K J 1/16W	
R665,666			RK73HB1J271J	CHIP R 270 J 1/16W		R779			RK73HB1J683J	CHIP R 68K J 1/16W	
R667			RK73EB2E823J	CHIP R 82K J 1/4W		R780			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R670			RK73HB1J224J	CHIP R 220K J 1/16W		R781			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R671			RK73GB2A000J	CHIP R 0.0 J 1/10W		R783			RK73HB1J224J	CHIP R 220K J 1/16W	
R701			RK73HB1J561J	CHIP R 560 J 1/16W		R784			RK73HB1J474J	CHIP R 470K J 1/16W	
R702			RK73HB1J334J	CHIP R 330K J 1/16W		R785			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R703			RK73HB1J100J	CHIP R 10 J 1/16W		R786			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R704			RK73HB1J102J	CHIP R 1.0K J 1/16W		R788			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R705			RK73HB1J000J	CHIP R 0.0 J 1/16W		R790			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R709			RK73HB1J103J	CHIP R 10K J 1/16W		R791			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R712			RK73HB1J103J	CHIP R 10K J 1/16W		R792			RK73HB1J104J	CHIP R 100K J 1/16W	
R714			RK73HB1J100J	CHIP R 10 J 1/16W		R794,795			RK73HB1J103J	CHIP R 10K J 1/16W	
R717			RK73HB1J473J	CHIP R 47K J 1/16W		R796			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R718			RK73HB1J183J	CHIP R 18K J 1/16W		R797			RK73HB1J473J	CHIP R 47K J 1/16W	
R719			RK73HB1J274J	CHIP R 270K J 1/16W		R798			RK73HB1J470J	CHIP R 47 J 1/16W	
R720			RK73HB1J222J	CHIP R 2.2K J 1/16W		R799			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R721			RK73HB1J103J	CHIP R 10K J 1/16W		R800			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R722			RK73HB1J472J	CHIP R 4.7K J 1/16W		R900			RK73HB1J391J	CHIP R 390 J 1/16W	
R724			RK73HB1J104J	CHIP R 100K J 1/16W		R901			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R725			RK73HB1J223J	CHIP R 22K J 1/16W		R902			RK73HB1J100J	CHIP R 10 J 1/16W	
R726			RK73HB1J183J	CHIP R 18K J 1/16W		R903			RK73HB1J821J	CHIP R 820 J 1/16W	
R727			RK73HB1J222J	CHIP R 2.2K J 1/16W		R904			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R728			RK73HB1J221J	CHIP R 220 J 1/16W		R905			RK73HB1J330J	CHIP R 33 J 1/16W	
R730			RK73HB1J000J	CHIP R 0.0 J 1/16W		R906			RK73HB1J474J	CHIP R 470K J 1/16W	
R731			RK73HB1J103J	CHIP R 10K J 1/16W		R907			RK73GB2A100J	CHIP R 10 J 1/10W	
R733			RK73HB1J564J	CHIP R 560K J 1/16W		R908			RK73HB1J473J	CHIP R 47K J 1/16W	
R735			RK73HB1J101J	CHIP R 100 J 1/16W		R909			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R736			RK73HB1J104J	CHIP R 100K J 1/16W		R910-912			RK73HB1J474J	CHIP R 470K J 1/16W	
R737			RK73HB1J221J	CHIP R 220 J 1/16W		R913			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R738			RK73HB1J272J	CHIP R 2.7K J 1/16W		R914			RK73HB1J154J	CHIP R 150K J 1/16W	
R739			RK73HB1J221J	CHIP R 220 J 1/16W		R915-917			RK73HB1J474J	CHIP R 470K J 1/16W	
R740			RK73HB1J470J	CHIP R 47 J 1/16W		R918			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R742			RK73HB1J472J	CHIP R 4.7K J 1/16W		R920,921			RK73HB1J473J	CHIP R 47K J 1/16W	
R743			RK73HB1J681J	CHIP R 680 J 1/16W		R922			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R744			RK73HB1J221J	CHIP R 220 J 1/16W		R923			RK73HB1J123J	CHIP R 12K J 1/16W	
R745			RK73HB1J102J	CHIP R 1.0K J 1/16W		R925			RK73HH1J334D	CHIP R 330K D 1/16W	
R746			RK73HB1J104J	CHIP R 100K J 1/16W		R926			RK73HH1J223D	CHIP R 22K D 1/16W	
R747			RK73HB1J154J	CHIP R 150K J 1/16W		R927			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R748			RK73HB1J104J	CHIP R 100K J 1/16W		R928			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R749			RK73HB1J224J	CHIP R 220K J 1/16W		R929			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R750			RK73GB2A000J	CHIP R 0.0 J 1/10W		R931			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R752,753			RK73HB1J000J	CHIP R 0.0 J 1/16W		R932			RK73HB1J104J	CHIP R 100K J 1/16W	
R755			RK73HB1J472J	CHIP R 4.7K J 1/16W		R933			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R757			RK73HB1J105J	CHIP R 1.0M J 1/16W		R934			RK73HB1J273J	CHIP R 27K J 1/16W	
R758			RK73HB1J103J	CHIP R 10K J 1/16W		R935			RK73HB1J153J	CHIP R 15K J 1/16W	
R759,760			RK73HB1J105J	CHIP R 1.0M J 1/16W		R951			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R761			RK73HB1J101J	CHIP R 100 J 1/16W		R954			RK73GB2A000J	CHIP R 0.0 J 1/10W	

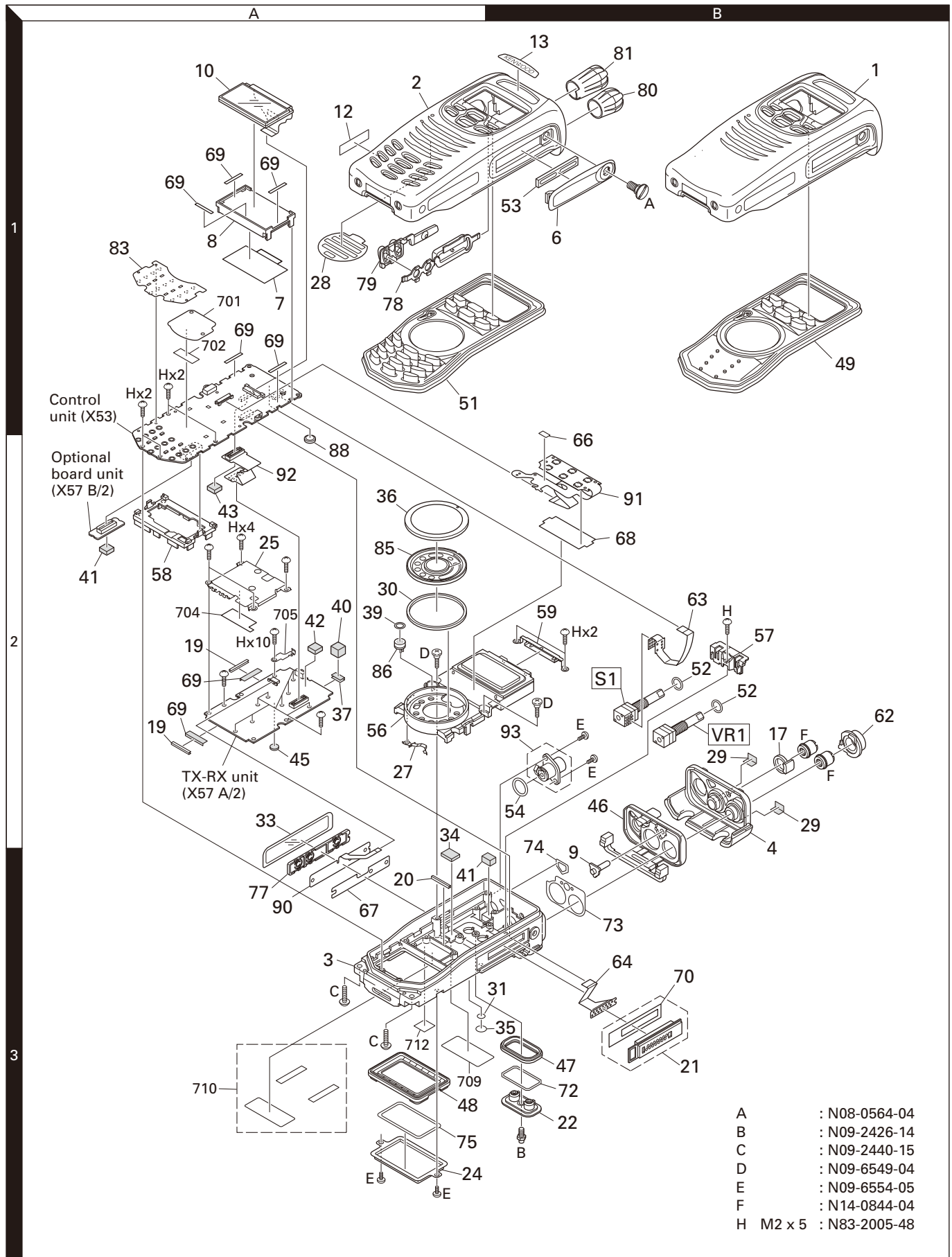
NX-300

PARTS LIST

TX-RX UNIT (X57-7370-11)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R955-958			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q704			2SC5383-T111	TRANSISTOR	
S1			S70-0483-05	TACT SWITCH		Q705			3SK318	FET	
D501			HSC119	DIODE		Q706			2SK1830F	FET	
D505			DA221	DIODE		Q900			UMG9N	TRANSISTOR	
D506,507			1SV325F	VARIABLE CAPACITANCE DIODE		Q901-903			SSM6L05FU-F	FET	
D510			1SV290B-F	VARIABLE CAPACITANCE DIODE		Q904			SSM5H01TU-F	FET	
D511			1SV282-F	VARIABLE CAPACITANCE DIODE		Q905			2SA1955A-F	TRANSISTOR	
D514,515			1SV290B-F	VARIABLE CAPACITANCE DIODE		TH600			ERTJ0EV104H	THERMISTOR	
D516,517			1SV282-F	VARIABLE CAPACITANCE DIODE							
D518			HSC119	DIODE							
D519			1SV278F	VARIABLE CAPACITANCE DIODE							
D600,601			HSC277	DIODE							
D604			HZU2ALL	ZENER DIODE							
D605			HZU5CLL	ZENER DIODE							
D606,607			HVC131	DIODE							
D700			HSC119	DIODE							
D702-704			1SV286F	VARIABLE CAPACITANCE DIODE							
D705			HSC119	DIODE							
D706			1SV286F	VARIABLE CAPACITANCE DIODE							
D708			1SV286F	VARIABLE CAPACITANCE DIODE							
D709			HVC131	DIODE							
D710			1SV286F	VARIABLE CAPACITANCE DIODE							
D711			HVC131	DIODE							
D901			1SR154-400	DIODE							
D902			HSC119	DIODE							
IC404			TC75W51FUF	MOS-IC							
IC500			LM73CIMKX-0	MOS-IC							
IC501			TLV2381IDBV	MOS-IC							
IC502			SKY72300-362	MOS-IC							
IC503			TLV2381IDBV	MOS-IC							
IC504			TC75W51FUF	MOS-IC							
IC600			TA75W01FUF	MOS-IC							
IC700			MCP6021-E/OT	MOS-IC							
IC701			TK10931VTL-G	ANALOGUE IC							
IC702,703			TLV2381IDBV	MOS-IC							
IC900			TC75S51FE (F)	MOS-IC							
IC901			XC9101D09AKR	ANALOGUE IC							
IC902			TK11250CUCB	MOS-IC							
IC903			TK71733S	BI-POLAR IC							
Q503			2SC5383-T111	TRANSISTOR							
Q504			2SK879-F (Y)	FET							
Q507			2SC5383-T111	TRANSISTOR							
Q508,509			2SK508NV (K52)	FET							
Q510			SSM6L05FU-F	FET							
Q511			2SJ347F	FET							
Q512			2SC5636	TRANSISTOR							
Q600,601			2SC5636	TRANSISTOR							
Q602			2SK3077F	FET							
Q603			RD01MUS1-T113	FET							
Q604			2SC5383-T111	TRANSISTOR							
Q605			SSM3K15TE (F)	FET							
Q606			RD07MVS1BT122	FET							
Q607			DTC144EE	DIGITAL TRANSISTOR							
Q608			2SK1824-A	FET							
Q610			EMD5	TRANSISTOR							
Q700			2SC5108 (Y)F	TRANSISTOR							
Q701			2SC4215-F (Y)	TRANSISTOR							
Q703			3SK318	FET							

EXPLODED VIEW

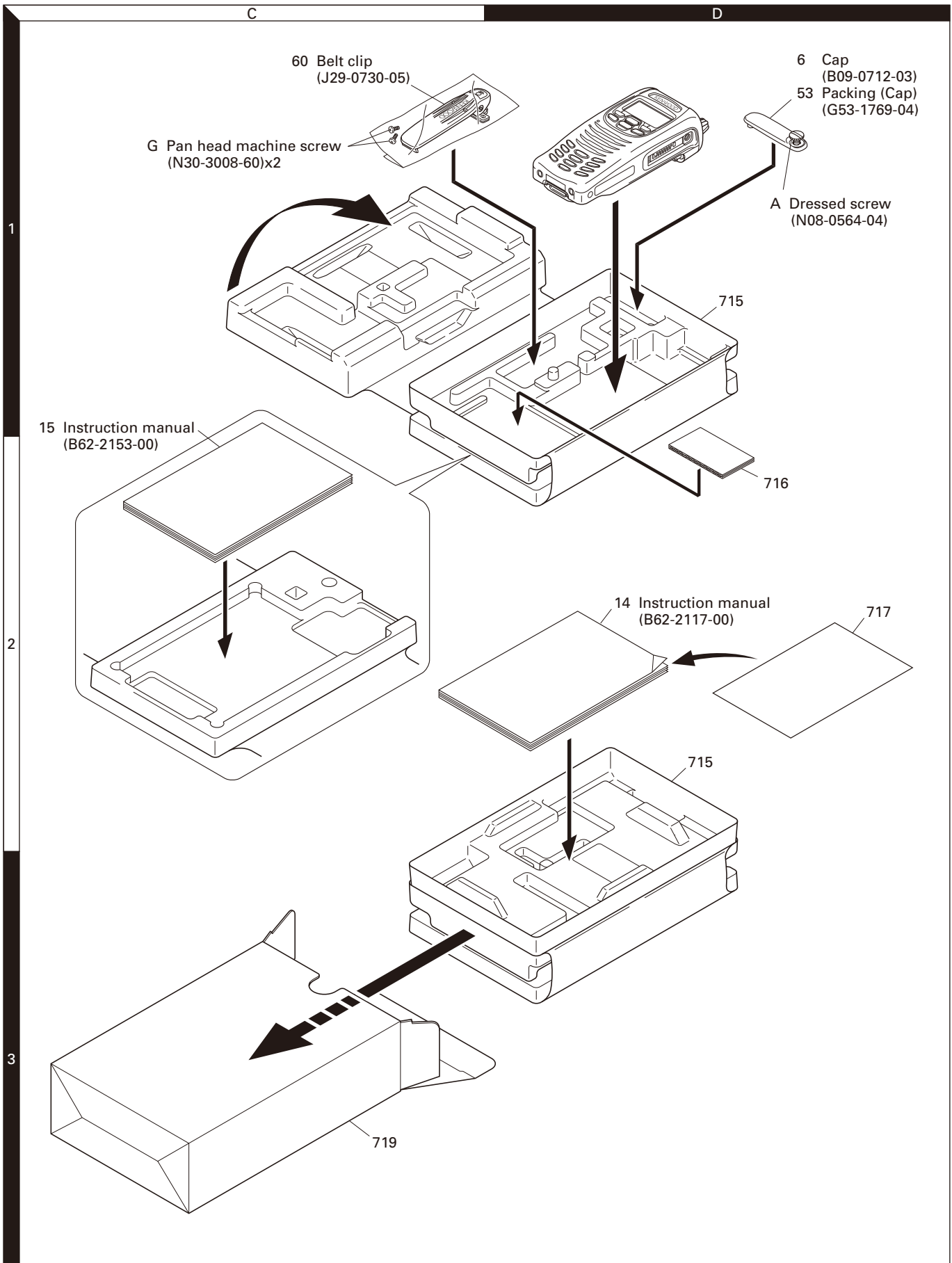


Parts with the exploded numbers larger than 700 are not supplied.

If a part reference number is listed in a box on the exploded view of the PCB, that part does not come with the PCB.

These parts must be ordered separately.

PACKING



TROUBLE SHOOTING

Fault Diagnosis of the BGA (Ball Grid Array) IC

■ Overview

A flowchart for determining whether or not the transceiver can be powered on (the LCD does not function even if the power switch is turned on) due to broken BGA parts.

■ BGA parts

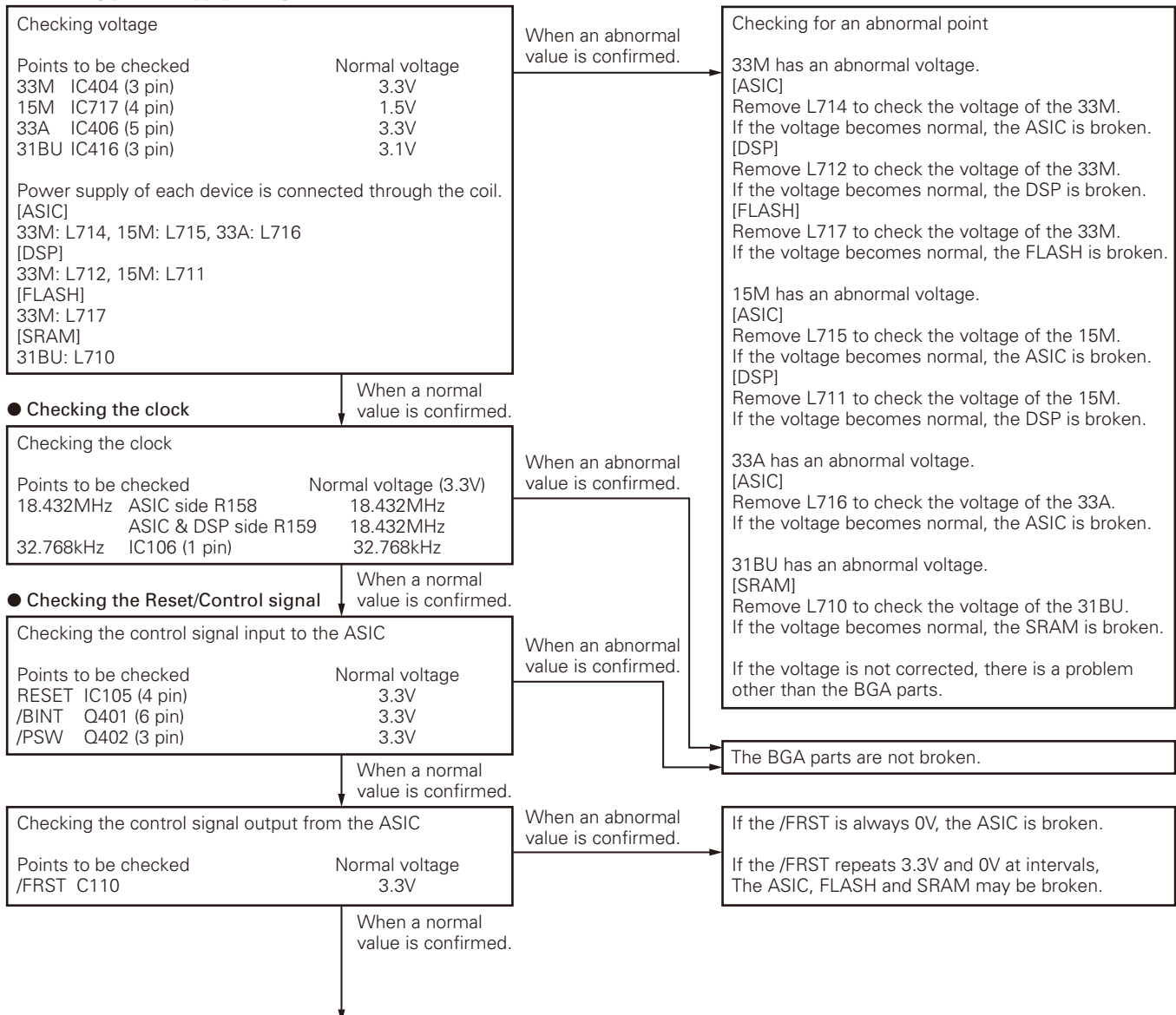
ASIC (IC108), DSP (IC102), FLASH (IC101), SRAM (IC103)

When the BGA IC is problematic, please bring the printed circuit board (X53-4262-73 for 6-key, X53-4262-74 for 18-key) in for service. Various ESN/default adjustment values are written on the printed circuit board for service.

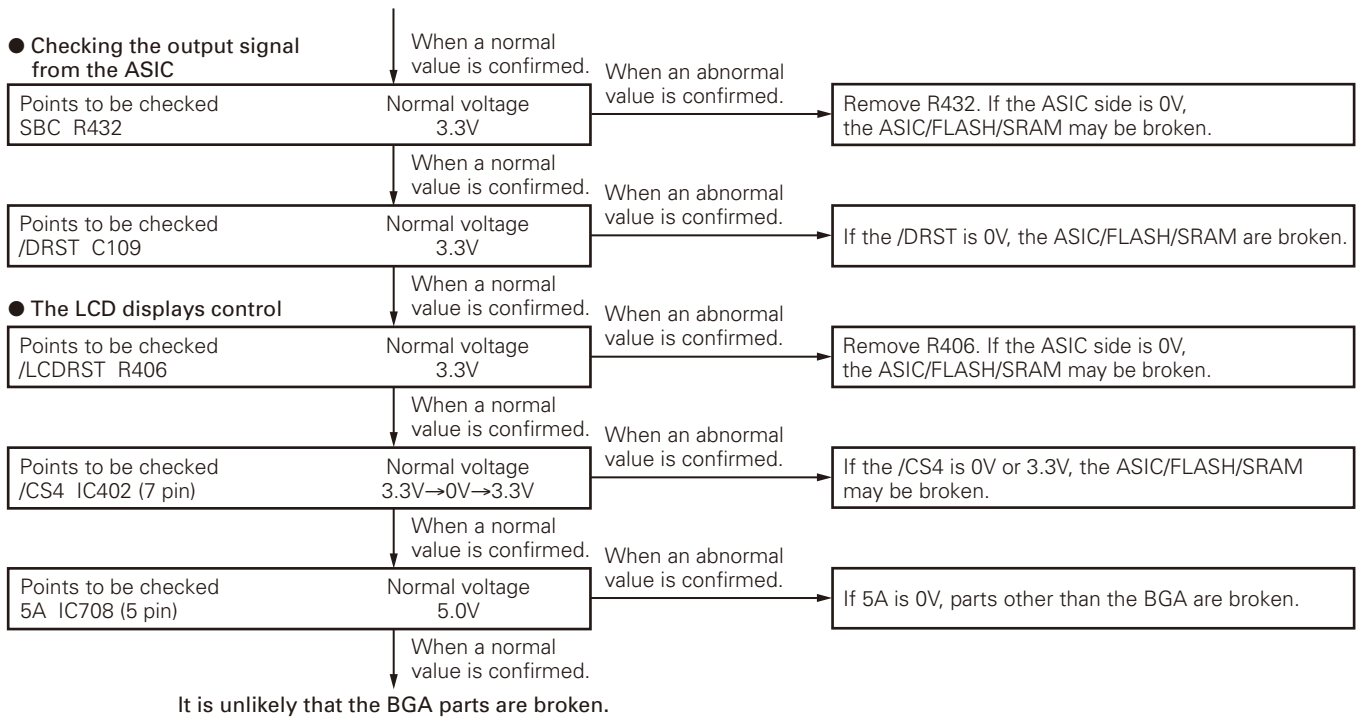
Additionally various ESN stickers are included. (Please refer to pages 41 and 42.)

Button type lithium battery (W09-0971-05) does not belong to the printed circuit board for service. Please use the part which has been attached to the printed circuit board. After the printed circuit board has been readjusted, please attach any ESN stickers to the chassis. When "ESN Validation" is used with NXDN Trunking, you must modify the ESN register.

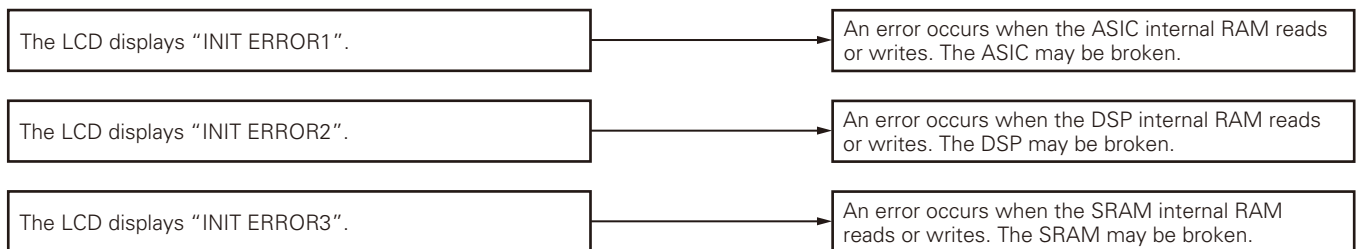
● Checking power supply voltage



TROUBLE SHOOTING



● **When an error display appears on the LCD.**



■ **Descriptions of signal names**

- | | | |
|---------------|---|---------------------|
| 1) RST(RESET) | : ASIC reset signal | LOW → Reset |
| 2) /BINT | : Battery final voltage monitoring | LOW → Final voltage |
| 3) /PSW | : Power switch signal | LOW → ON |
| 4) /FRST | : FLASH reset signal | LOW → Reset |
| 5) SBC | : Switch B control | HIGH → ON |
| 6) /DRST | : DSP reset signal | LOW → Reset |
| 7) /LCDRST | : LCD reset signal | LOW → Reset |
| 8) /CS4 | : LCD controller chip select signal | LOW → Active |
| 9) 5A | : Analog peripheral control 5.0V power supply | |

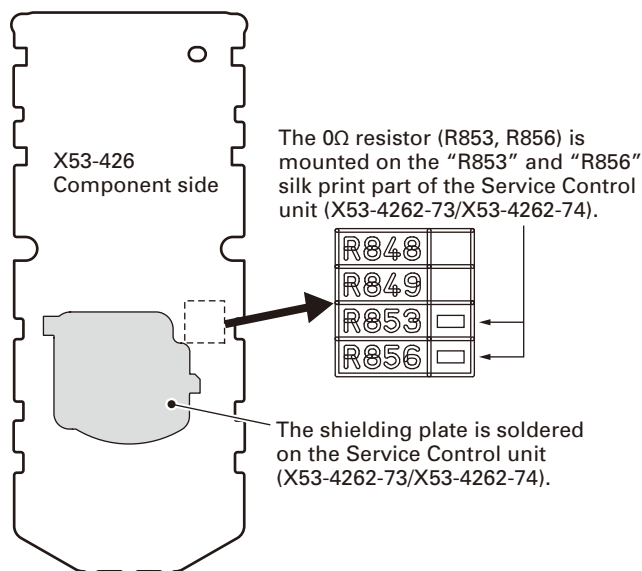
TROUBLE SHOOTING

Replacing Control Unit

Control unit Information

Model Name	Original Control unit Number	For Service Control unit Number
NX-300 (E: 18-key)	X53-4262-72	X53-4262-74
NX-300 (E4: 6-key)	X53-4262-71	X53-4262-73

Method of confirming "Original Control unit" and "Service Control unit"



X53-426	R848	R849	R853	R856
2-71	0Ω	(None)	(None)	0Ω
2-72	(None)	0Ω	(None)	0Ω
2-73	0Ω	(None)	0Ω	0Ω
2-74	(None)	0Ω	0Ω	0Ω

Note:

- The 0Ω resistor (R848, R849, R853 and R856) is used to differentiate the destination with a visual check. These are not connected with any PCB pattern; they are specifically for production control. There is no need to change the mount of these resistors.
- There is no difference between the schematic diagram of the Service Control unit (X53-4262-73/X53-4262-74) and the schematic diagram of the original Control unit (X53-4262-71/X53-4262-72). (R848, R849, R853 and R856 are connected with GND (ground) only.)

Supplied Accessories of "Service Control unit"

Item (Including Part Number)	Quantity
	Ex
Control Unit (X53-426)	1
Kenwood ESN Label	1
NXDN ESN Label	1
MPT ESN Label	1
Addendum (B59-2576-XX)	1

Note:

- "Ex" refers to an E-type series (E4 for example).

"Service Control unit" Data

The following data is written on the service control unit:

Data Type	Description
Firmware	NX-200/300 Firmware.
FPU Data (PC programming mode)	X53-426 (NX-300) Ex type data.
Various Adjustment Data (PC Test mode)	General adjustment values for the X53-426 (NX-300).
Kenwood ESN	Model Name: [X53-426] NX-xxxS Type: Ex The same number as the Kenwood ESN label is written.
NXDN ESN/ MPT ESN	The same number as the NXDN ESN/ MPT ESN label is written.

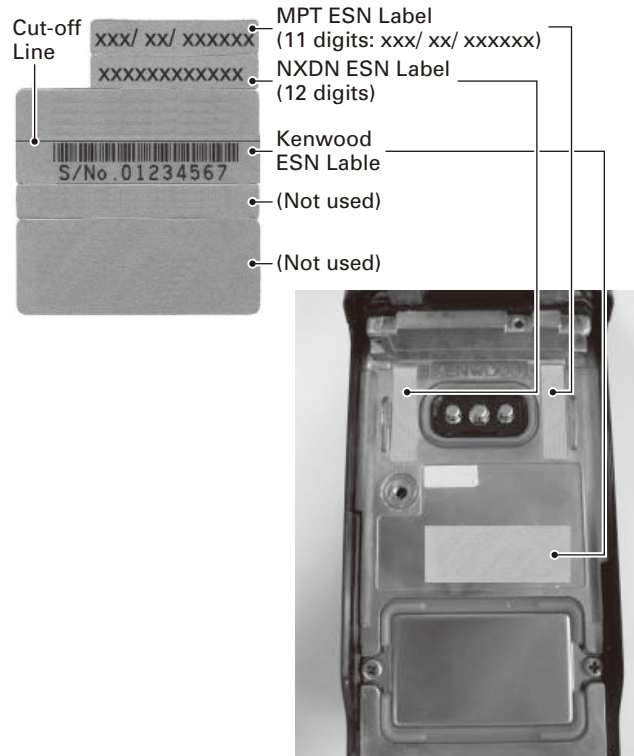
After Changing the PCB

- After changing the printed circuit board, write the up-to-date Firmware following the instructions in the "REALIGNMENT - 6.Firmware Programming Mode".
- Using the KPG-111D, select your desired item (Model Name and Frequency) from the Model> Product Information menu, then use Program> Write Data to the Transceiver to write the FPU data (PC Programming mode). When writing to the transceiver, a Warning Message, corresponding to the item selected, appears. Click [OK] to continue writing the data.
- Enter Program> Test Mode, then adjust the various adjustment data (PC Test Mode) as described in the "ADJUSTMENT".
- Attach the new labels corresponding to the new printed circuit board. (Refer to the images on page 42 for label placement.)
- If necessary, write the FPU data used by the customer with the KPG-111D.

TROUBLE SHOOTING

Note:

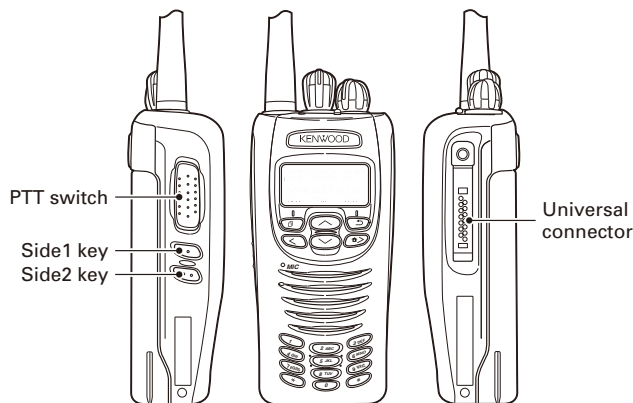
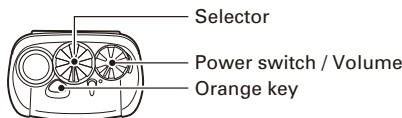
- When using the ESN Validation function of NXDN Trunking, the NXDN ESN number changes when the circuit board is changed (the number is written on the circuit board); the NXDN Trunking System cannot be accessed. Use the KPG-110SM on the NXDN Trunking System side to reprogram the NXDN ESN number.
- When a new printed circuit board is used, the Kenwood ESN changes, as does the Transceiver Information display of the KPG-111D, but this does not have any effect on the operation of the transceiver.
- If changing to the original Kenwood ESN and NXDN ESN, please contact our service center.



Note: A UPC code and UPC barcode is not printed on the Kenwood ESN Label. If necessary, cut the label at the cut-off line and attach only the serial number.

ADJUSTMENT

Controls



Panel Test Mode

■ Test mode operation features

This transceiver has a test mode. **To enter test mode, press and hold the [↵] key while turning the transceiver power ON. Before the transceiver enters test mode, the frequency version information appears on the LCD momentarily.** Test mode can be inhibited by programming. To exit test mode, turn the transceiver power OFF. The following functions are available in test mode.

ADJUSTMENT

■ Key operation

Key	"FNC" not appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[^]	Push: Test channel up Hold: Test channel up continuously	Channel No.
[v]	Push: Test channel down Hold: Test channel down continuously	Channel No.
[Side1]	Push: Squelch level up Hold: Squelch off	Squelch level Squelch off: [Squelch off icon] appears
[Side2]	Wide 5k/Wide 4k/ Narrow/Very narrow	Wide 5k: "w" Wide 4k: "s" Narrow: "n" Very narrow: "v"
[M]	Shift to panel tuning mode	-
[>]	Function on	"FNC" appears on the sub LCD display
[<]	MSK 1200bps and 2400bps	2400bps: [2400bps icon] appears
[*>]	Push: Test signaling up Hold: Test signaling up continuously	Signaling No.
[Orange]	-	-
[PTT]	Transmit	-
[0] to [9] and [#], [*]	Use as the DTMF keypad. If a key is pressed during transmission, the DTMF corresponding to the key that was pressed is sent.	-

Key	"FNC" appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[^]	Function off	-
[v]	Analog/NXDN	Analog: "A" NXDN: "N"
[Side1]	Function off	-
[Side2]	LCD all lights	LCD all point appears
[M]	High power/Low power	High: "H" Low: "L"
[>]	Function off	-
[<]	Compander on/off	On: [Compander icon] appears
[*>]	Beat shift on/off	On: [Beat shift icon] appears
[Orange]	Function off	-
[PTT]	Transmit	-
[0] to [9] and [#], [*]	Function off	-

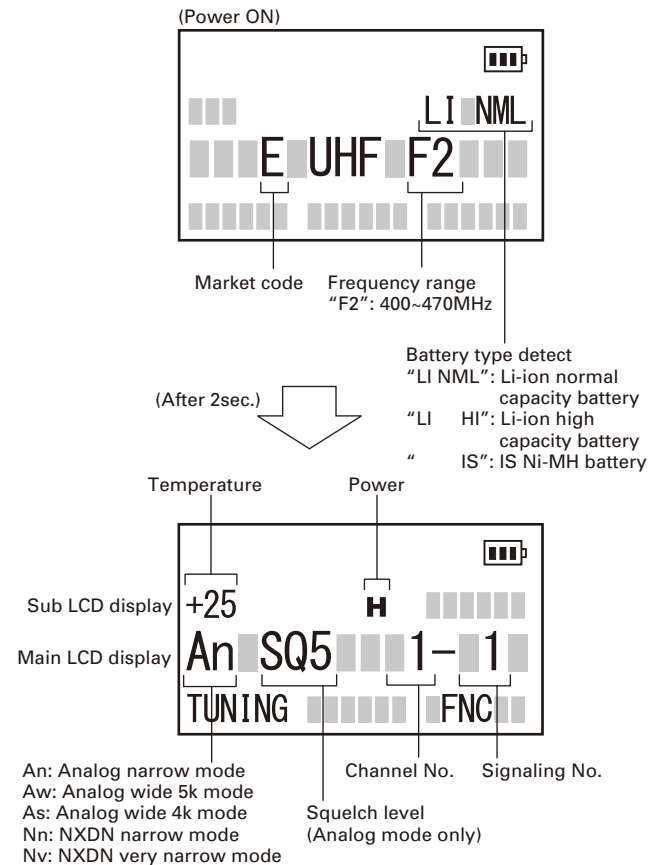
• LED indicator

Red LED Lights during transmission.
Green LED Lights when there is carrier.

• Sub LCD indicator

"FNC" Appears at function on.

• LCD display in panel test mode



■ Frequency and Signaling

The transceiver has been adjusted for the frequencies shown in the following table. When required, readjust them following the adjustment procedure to obtain the frequencies you want in actual operation.

• Test frequency

CH	RX (MHz)	TX (MHz)
1	435.05000	435.10000
2	400.05000	400.10000
3	469.95000	469.90000
4	435.00000	435.00000
5	435.20000	435.20000
6	435.40000	435.40000
7~16	-	-

ADJUSTMENT

• Analog mode signaling

No.	RX	TX
1	None	None
2	None	100Hz Square Wave
3	LTR Data: AREA=0, GOTO=12 HOME=12 ID=47, FREE=25	LTR Data: AREA=0, GOTO=12 HOME=12 ID=47, FREE=25
4	QT: 67.0Hz	QT: 67.0Hz
5	QT: 151.4Hz	QT: 151.4Hz
6	QT: 210.7Hz	QT: 210.7Hz
7	QT: 254.1Hz	QT: 254.1Hz
8	DQT: D023N	DQT: D023N
9	DQT: D754I	DQT: D754I
10	DTMF: 159D	DTMF: 159D
11	None	DTMF Code 9
12	2-tone: A: 304.7Hz B: 3106.0Hz	2-tone: A: 304.7Hz B: 3106.0Hz
13	Single Tone: 979.9Hz	Single Tone: 979.9Hz
14	None	Single Tone: 1000Hz
15	None	MSK
16	MSK	MSK

• NXDN mode signaling

No.	RX	TX
1	RAN1	RAN1
2	None	PN9
3	RAN1	Maximum deviation pattern

RAN: Radio Access Number

PN9: Pseudo-Random Pattern (for production only)

Panel Tuning Mode

■ Preparations for tuning the transceiver

Before attempting to tune the transceiver, connect the unit to a suitable power supply.

Whenever the transmitter is turned, the unit must be connected to a suitable dummy load (i.e. power meter).

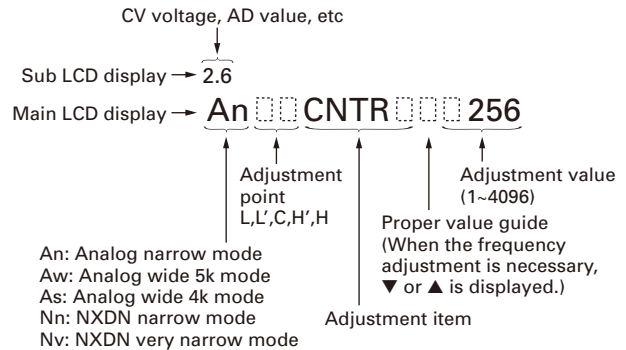
The speaker output connector must be terminated with a 8Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

■ Transceiver tuning (To enter tuning mode)

To enter tuning mode, press the [a] key while the transceiver is in test mode. Use the [<] key to write tuning data through tuning modes, and the [^]/[v] key to adjust tuning requirements (1 to 4096 appears on the LCD).

Use the [a>] key to select the adjustment item through tuning modes. Use the [⇒] key to adjust 5 reference level adjustments, and use the [Side2] key to switch between Wide 5k/Wide 4k/Narrow/Very narrow.

• LCD display in panel tuning mode



■ Key operation


Key	Function	
	Push	Hold (1 second)
[Selector]	-	
[^]	Adjustment value up	Continuation up
[v]	Adjustment value down	Continuation down
[Side1]	Auto adjustment start	-
[Side2]	Wide 5k/Wide 4k/ Narrow/Very narrow	-
[a]	Shift to panel test mode	-
[⇒]	To enter 5 reference level adjustments	-
[<]	Writes the adjustment value	-
[a>]	Go to next adjustment item	Back to last adjustment item
[Orange]	-	
[PTT]	Transmit	
[0] to [9] and [#], [*]	-	

■ 5 reference level adjustments frequency

Tuning point	RX (MHz)	TX (MHz)
Low	400.05000	400.10000
Low'	417.55000	417.60000
Center	435.05000	435.10000
High'	452.55000	452.60000
High	469.95000	469.90000

ADJUSTMENT

■ Adjustment item supplement

Adjustment Item	Description
LCD contrast	The contrast of LCD display can be changed.
Counterclockwise Volume	“Counterclockwise Volume” is adjusted at the minimum volume position. “Clockwise Volume” is adjusted at the maximum volume position. These adjustments can correct the volume variation.
Clockwise Volume	Both “Counterclockwise Volume” and “Clockwise Volume” must be adjusted. (The curve data of volume is applied.)
Receive Assist	The lock voltage of VCO (Receive) is adjusted. This item must be adjusted before all adjustment items for receiver section are adjusted.
Transmit Assist	The lock voltage of VCO (Transmit) is adjusted. This item must be adjusted before all adjustment items for transmitter section are adjusted.
Frequency	Frequency stability is adjusted under receiving condition with SSG. The SSG needs 0.001ppm accuracy so please use a standard oscillator if necessary. This item can be adjusted only in PC Test Mode so that the adjustment value is not changed easily.
RTC	Real-Time Clock (RTC) is adjusted. This item uses the internal clock. (Any measurement equipment is not required.)
High Transmit Power	High Transmit Power is adjusted.
Low Transmit Power	Low Transmit Power is adjusted.
Balance	The transmit audio frequency response is adjusted. This item is adjusted so that the deviation of 2kHz becomes the same deviation of 20Hz. This item must be adjusted before all adjustment items for deviations are adjusted.
Maximum Deviation (NXDN Narrow/Very Narrow)	Maximum Deviation of NXDN (Narrow/Very Narrow) is adjusted.
Maximum Deviation (Analog Wide 5k/Wide 4k/Narrow)	Maximum Deviation of Analog (Wide 5k/Wide 4k/Narrow) is adjusted. This item must be adjusted before all adjustment items for tone deviations are adjusted. Note: “Maximum Deviation (Analog Narrow)” must be adjusted before “CWID Deviation (NXDN Very Narrow)” is adjusted.
QT Deviation	QT tone deviation is adjusted.
DQT Deviation	DQT tone deviation is adjusted.
LTR Deviation	LTR tone deviation is adjusted.
DTMF Deviation	DTMF tone deviation is adjusted.
Single Tone Deviation	The deviation of Single Tone used in “2-tone” is adjusted.
MSK Deviation	MSK tone deviation is adjusted.
CWID Deviation	CWID tone deviation is adjusted. CWID is used to inform the others who is transmitting on a 6.25-kHz spacing channel. (In FCC rule, Analog mode or CWID is required for each channel-spacing.)
VOX 1	VOX sensitivity at “VOX 1” is adjusted.
VOX 10	VOX sensitivity at “VOX 10” is adjusted.
Sensitivity 1	Notch filter is adjusted. The performance of Receive Spurious Response is improved.
Sensitivity 2	Band-Pass Filter is adjusted. The performance of Receive Sensitivity is improved.
RSSI Reference	The minimum RSSI level for scan stop is adjusted.
Open Squelch	The squelch level at level “5” is adjusted.
Low RSSI	RSSI display level “  ” is adjusted.
High RSSI	Both “Low RSSI” and “High RSSI” must be adjusted. (The curve data of RSSI level is applied.)
Tight Squelch	The squelch level at level “9” is adjusted.
Battery Warning Level	Battery Warning Level (LED blinking level) is adjusted. Battery Warning Level minus 0.4V is the transmission inhibited level.

ADJUSTMENT

■ Adjustment item and Display

Order	Adjustment item	Main LCD display	Sub LCD display	Aw (Analog Wide 5k)	As (Analog Wide 4k)	An (Analog Narrow)	Nn (NXDN Narrow)	Nv (NXDN Very Narrow)	Adjust item Number
				Adjustment range					
1	LCD contrast	CNTR	-	1 point ADJ					Common Section 2
				1~256					
2	Counterclockwise Volume	VOL1	VOL measurement value	1 point ADJ					Common Section 3
				1~256					
3	Clockwise Volume	VOL2	VOL measurement value	1 point ADJ					Common Section 4
				1~256					
4	Receive Assist	RAST	(CV voltage)	5 point ADJ					Common Section 5
				1~4096					
5	Transmit Assist	TAST	(CV voltage)	5 point ADJ					Common Section 5
				1~4096					
6	RTC (Real-time clock)	RTC	-	1 point ADJ					Common Section 6
				-62~-1/0/+1~+62					
7	High Transmit Power	HIPWR	-	-	-	5	-	-	Transmitter Section 1
				1~1024					
8	Low Transmit Power	LOPWR	-	-	-	5	-	-	Transmitter Section 2
				1~1024					
9	Balance	BAL	(Encode frequency)	-	-	5	-	-	Transmitter Section 3
				1~256					
10	Maximum Deviation (NXDN)	NDEV	-	-	-	-	5	5	Transmitter Section 4
				1~1024					
11	Maximum Deviation (Analog)	ADEV	-	5	5	5	-	-	Transmitter Section 5
				1~1024					
12	QT Deviation	QT	-	1	1	1	-	-	Transmitter Section 6
				1~1024					
13	DQT Deviation	DQT	-	1	1	1	-	-	Transmitter Section 7
				1~1024					
14	LTR Deviation	LTR	-	1	-	1	-	-	Transmitter Section 8
				1~1024					
15	DTMF Deviation	DTMF	-	1	1	1	-	-	Transmitter Section 9
				1~1024					
16	Single Tone Deviation	TONE	-	1	1	1	-	-	Transmitter Section 10
				1~1024					
17	MSK Deviation	MSK	-	1	1	1	-	-	Transmitter Section 11
				1~1024					
18	CWID Deviation	CWID	-	-	-	-	-	1	Transmitter Section 12
				1~1024					
19	VOX1	VOX1	VOX measurement value	1 point ADJ					Transmitter Section 13
				1~256					
20	VOX10	VOX10	VOX measurement value	1 point ADJ					Transmitter Section 14
				1~256					
21	Sensitivity 1	SENS1	(RSSI measurement value)	-	-	5	-	-	Receive Section 2
				1~256					

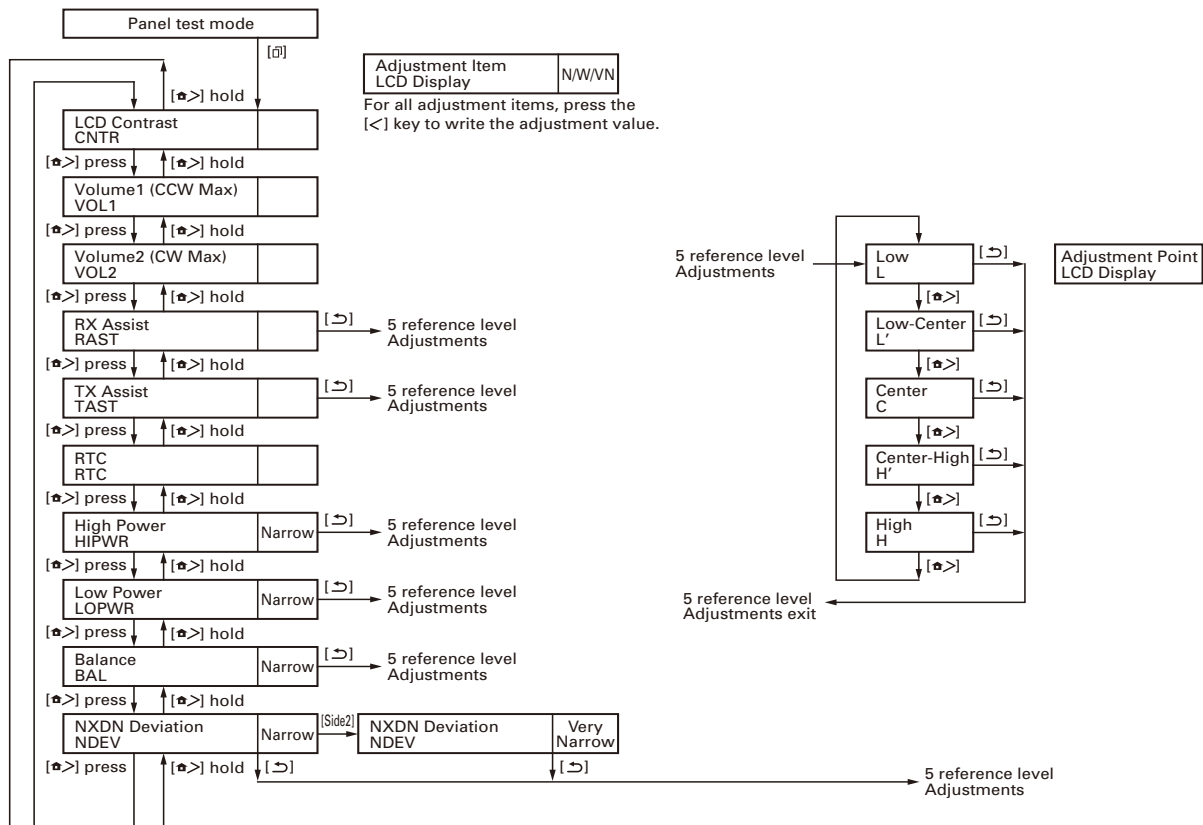
ADJUSTMENT

Order	Adjustment item	Main LCD display	Sub LCD display	Aw (Analog Wide 5k)	As (Analog Wide 4k)	An (Analog Narrow)	Nn (NXDN Narrow)	Nv (NXDN Very Narrow)	Adjust item Number
				Adjustment range					
22	Sensitivity 2	SENS2	(RSSI measurement value)	-	-	5	- *1	-	Receive Section 3
				1~256					
23	RSSI Reference	RRSSI	(RSSI measurement value)	5	5	5	- *1	5	Receive Section 4
				1~256					
24	Open Squelch	SQL	(ASQDET measurement value)	5	5	5	- *1	5	Receive Section 5
				1~256					
25	Low RSSI	LRSSI	(RSSI measurement value)	5	5	5	- *1	5	Receive Section 6
				1~256					
26	High RSSI	HRSSI	(RSSI measurement value)	5	5	5	- *1	5	Receive Section 7
				1~256					
27	Tight Squelch	SQLT	(ASQDET measurement value)	5	5	5	-	-	Receive Section 8
				1~256					
28	Battery Warning Level	BATT	(BATT measurement value)	1 point ADJ					Transmitter Section 15
				1~256					

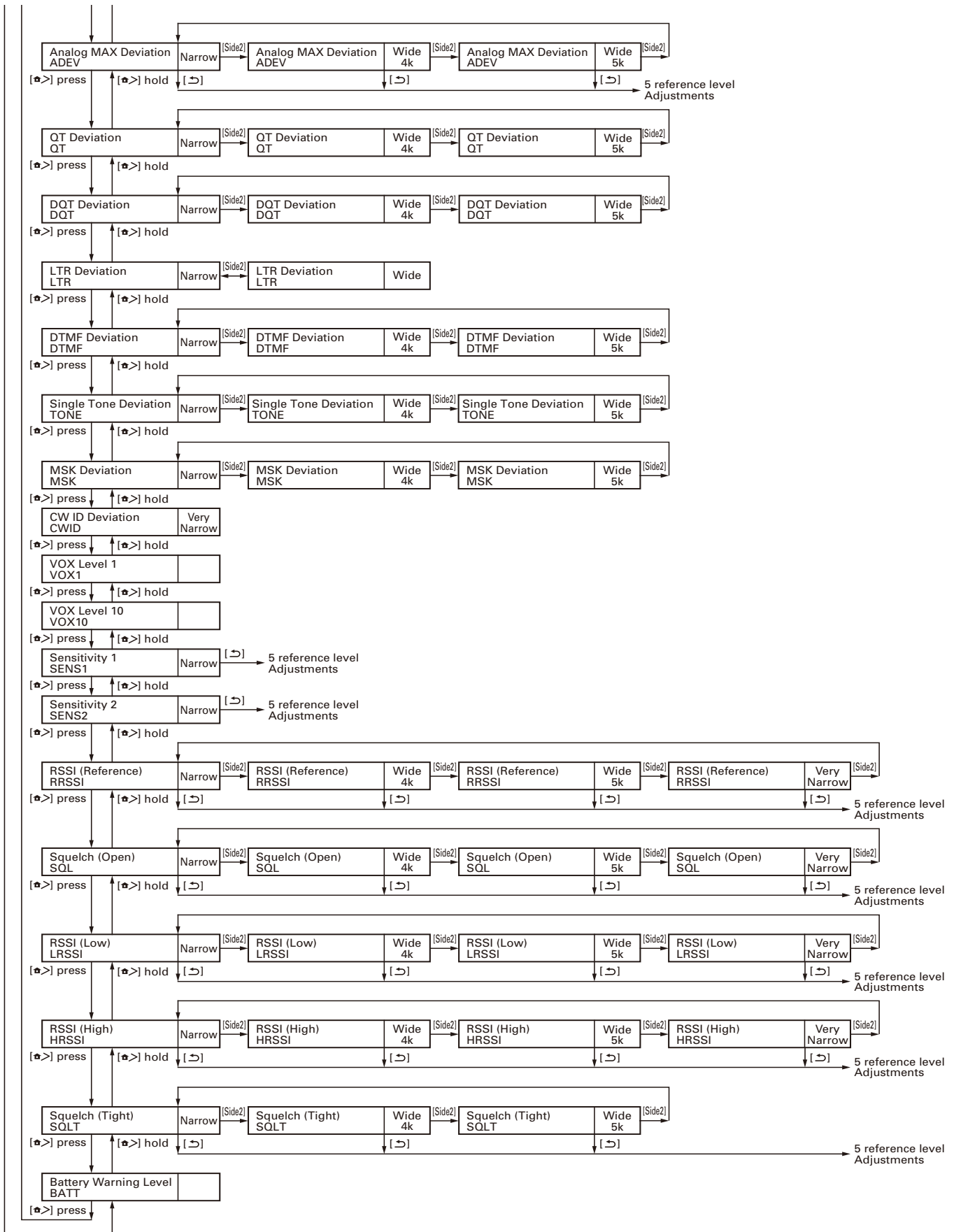
*1: Because NXDN Narrow is adjusted by adjusting Analog Narrow, it is not necessary to adjust NXDN Narrow.

■ Panel tuning mode flow chart

Note: In this Panel tuning mode flow chart, the Adjustment item name is modified.



ADJUSTMENT



ADJUSTMENT

Test Equipment Required for Alignment

Test Equipment	Major Specifications
1. Standard Signal Generator (SSG)	Frequency Range 400 to 520MHz Modulation Frequency modulation and external modulation Output $-127\text{dBm}/0.1\mu\text{V}$ to greater than $-20\text{dBm}/22.4\text{mV}$ When performing the Frequency adjustment, the following accuracy is necessary. • 0.001ppm Use a standard oscillator for adjustments, if necessary.
2. Power Meter	Input Impedance 50Ω Operation Frequency 400 to 520MHz Measurement Capability Vicinity of 10W
3. Deviation Meter	Frequency Range 400 to 520MHz
4. Digital Volt Meter (DVM)	Measuring Range 10mV to 10V DC Input Impedance High input impedance for minimum circuit loading
5. Oscilloscope	DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range 10Hz to 1000MHz Frequency Stability 0.2ppm or less
7. Ammeter	5A
8. AF Volt Meter (AF VTVM)	Frequency Range 50Hz to 10kHz Voltage Range 1mV to 10V
9. Audio Generator (AG)	Frequency Range 50Hz to 5kHz or more Output 0 to 1V
10. Distortion Meter	Capability 3% or less at 1kHz Input Level 50mV to 10Vrms
11. 8Ω Dummy Load	Approx. 8Ω , 3W
12. Regulated Power Supply	5V to 10V, approx. 3A Useful if ammeter equipped

■ Antenna connector adapter

The antenna connector of this transceiver uses an SMA terminal.

Use an antenna connector adapter [SMA(f) – BNC(f) or SMA(f) – N(f)] for adjustment. (The adapter is not provided as an option, so buy a commercially-available one.)

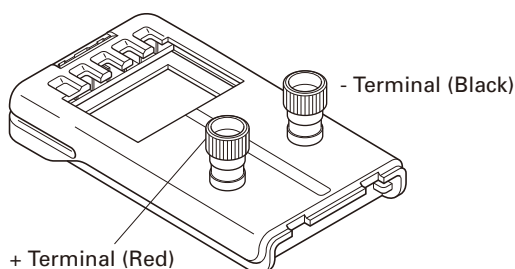
■ Nut wrench

In order to turn the volume nut and the channel selector nut, use a recommendation tool.

KENWOOD part No.: W05-1123-00

■ Battery jig (W05-1370-00)

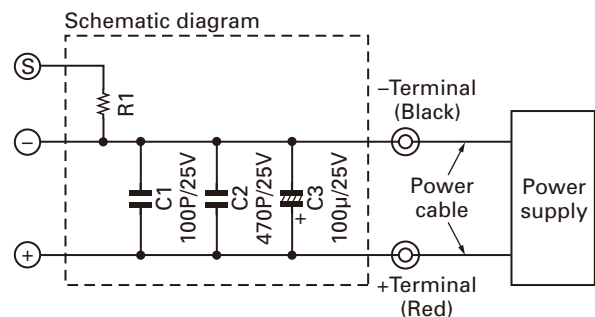
Connect the power cable properly between the battery jig installed in the transceiver and the power supply, and be sure output voltage and the power supply polarity prior to switching the power supply ON, otherwise over voltage and reverse connection may damage the transceiver, or the power supply or both.



Note:

- When using the battery jig, you must measure the voltage at the terminals of the battery jig. Otherwise, a slight voltage drop may occur within the power cable, between the power supply and the battery jig, especially while the transceiver transmits.
- The battery jig is detected as "Li-ion High Capacity Battery".

Li-ion High Capacity Battery: R1=Open
 Li-ion Normal Capacity Battery: R1=560k Ω



ADJUSTMENT

■ Universal connector

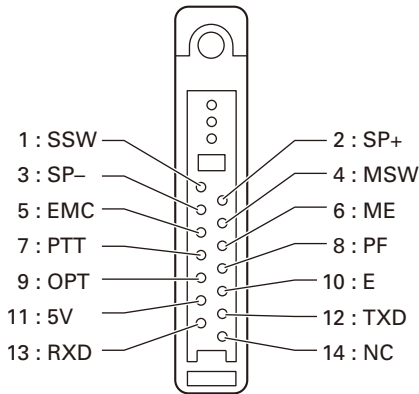
Use the interface cable (KPG-36/36A) for PC tuning or the lead wire with plug (E30-3287-28) and screw (N08-0535-08) for panel tuning. Connect the plug to the universal connector of the transceiver and tighten the screw.

The lead wire with plug (E30-3287-28) and screw (N08-0535-08) terminals are as follows. Numbers are universal connector terminal numbers.

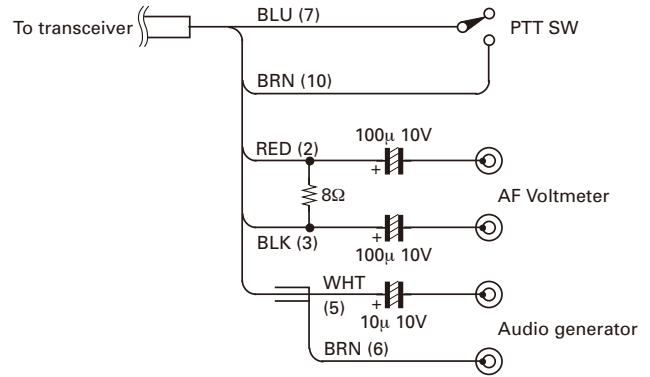
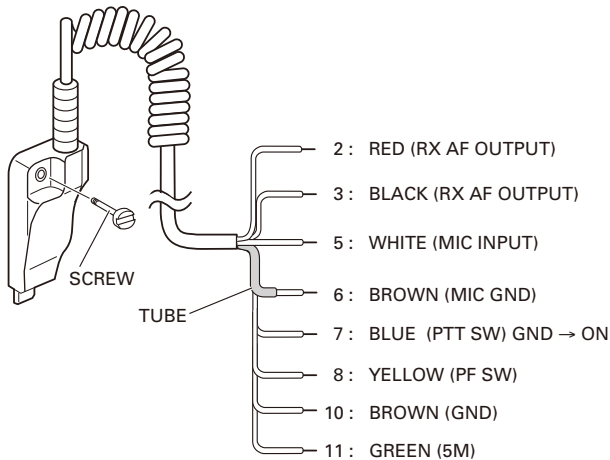
Caution

1. When connecting the plug to the universal connector of the transceiver, a short circuit may occur. To prevent this, be sure to turn the transceiver POWER switch off.
2. Since the RX AF output is a BTL output, there is a DC component. Isolate this with a capacitor or transformer as shown in the figure.
3. Do not connect an instrument between red or black and GND.

• Universal connector



• Panel tuning

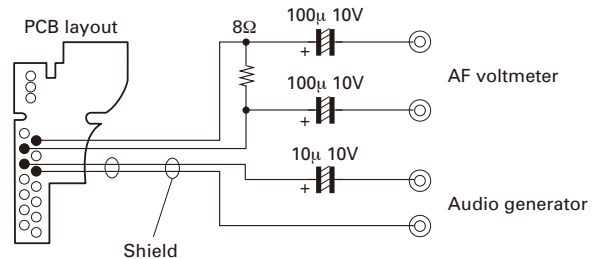
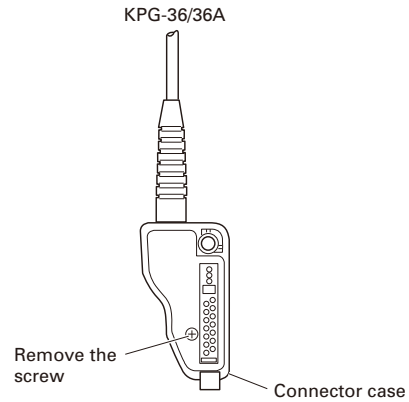


Note: Pin 1 (SSW) and Pin 4 (MSW) are connected to Pin 10 (GND) to active External SP and External MIC.

• PC tuning

Connect the wires to the PCB in the connector case of interface cable.

For output the wires out of the connector case, need to process the connector case.



ADJUSTMENT

Radio Check Section

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency check	1) CH-Sig: 1-1 PTT: ON	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	f. counter	Panel	ANT			Check an internal temperature of radio within 25°C ± 2°C.	+0.05/+0.55ppm +21.76Hz~+239.31Hz @435.1MHz
2. High power check (Batt: 7.5V)	1) CH-Sig: 1-1 PTT: ON	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter					Check	4.5W~5.5W 2.3A or less
	2) CH-Sig: 2-1 PTT: ON	2) Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3) CH-Sig: 3-1 PTT: ON	3) Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.							
3. Low power check (Batt: 7.5V)	1) CH-Sig: 1-1 PTT: ON	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.							0.7W~1.2W 1.2A or less
	2) CH-Sig: 2-1 PTT: ON	2) Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3) CH-Sig: 3-1 PTT: ON	3) Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.							
4. MIC sensitivity check	1) CH-Sig: 1-1 AG: 1kHz PTT: ON	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 AG: 1kHz PTT: Press [Transmit] button.	Deviation meter Oscilloscope AG AF VTVM		ANT Universal connector			Adjust AG input to get a standard MOD.	12.5mV±5.8mV

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Sensitivity check	1) CH-Sig: 1-1 SSG output Wide 5k: -116dBm (0.35μV) (MOD: 1kHz/±3kHz) Wide 4k: -116dBm (0.35μV) (MOD: 1kHz/±2.4kHz) Narrow: -115dBm (0.40μV) (MOD: 1kHz/±1.5kHz)	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 SSG output Wide 5k: -116dBm (0.35μV) (MOD: 1kHz/±3kHz) Wide 4k: -116dBm (0.35μV) (MOD: 1kHz/±2.4kHz) Narrow: -115dBm (0.40μV) (MOD: 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscope Distortion meter 8Ω Dummy load		ANT Universal connector			Check	12dB SINAD or more

Common Section

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) DC voltage: 7.5V 2) SSG standard modulation [Wide 5k] MOD: 1kHz, DEV: 3kHz [Wide 4k] MOD: 1kHz, DEV: 2.4kHz [Narrow] MOD: 1kHz, DEV: 1.5kHz								
2. LCD contrast	1) Adj item: [CNTR] Adjust: [***] Press [◀] key to store the adjustment value.	1) Adj item: [LCD Contrast] Press [Apply] button to store the adjustment value.				Panel	[Panel tuning mode] [↖], [↘] [PC test mode] [◀],[▶]	Adjust the LCD contrast by looking.	This item is needed when the LCD ASSY (B38-0923-05) is replaced.
3. Counterclockwise Volume	1) Adj item: [VOL1] Adjust: [***]	1) Adj item: [Counterclockwise Volume]						[Panel tuning mode] Turn the volume knob counterclockwise fully. Press [◀] key to store the adjustment value. [PC test mode] Turn the volume knob counterclockwise fully. Press [Apply] button to store the adjustment value.	This item is needed when the variable resistor (R31-0666-05) is replaced.

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Clockwise Volume	1) Adj item: [VOL2] Adjust: [***]	1) Adj item: [Clockwise Volume]				Panel		<p>[Panel tuning mode] Turn the volume knob clockwise fully. Press [◀] key to store the adjustment value.</p> <p>[PC test mode] Turn the volume knob clockwise fully. Press [Apply] button to store the adjustment value.</p>	This item is needed when the variable resistor (R31-0666-05) is replaced.
5. Receive Assist	1) Adj item: [RAST] Adjust: [*****] 2) Adj item: [L RAST]→ [L' RAST]→ [C RAST]→ [H' RAST]→ [H RAST] Adjust: [*****] Press [◀] key to store the adjustment value.	1) Adj item: [Receive Assist] 2) Adj item: [Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value.					<p>[Panel tuning mode] [∧], [∨]</p> <p>[PC test mode] [◀], [▶]</p> <p>Note: Confirm the VCO lock voltage approximately 3 seconds after the adjustment value is changed.</p>	2.5V±0.1V [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.	
Transmit Assist	1) Adj item: [TAST] Adjust: [*****] 2) Adj item: [L TAST]→ [L' TAST]→ [C TAST]→ [H' TAST]→ [H TAST] Adjust: [*****] PTT : ON (RF power is not output.) Press [◀] key to store the adjustment value.	1) Adj item: [Transmit Assist] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.							
6. RTC oscillation frequency adjust	1) Adj item: [RTC] Adjust: [***]	1) Adj item: [RTC (Real-time clock)]					[Side1]	<p>[Panel tuning mode] Press [Side1] key. After automatic adjustment adjusted value is displayed on the LCD. Press [◀] key to store the adjustment value.</p> <p>[PC test mode] Press [Start] button of "Auto Tuning". Press [Apply] button to store the adjustment value after the automatic adjustment was finished.</p>	

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. Frequency adjust	* The Frequency adjustment can be performed only in PC test mode.	1) Adj item: [Frequency] SSG output : -20dBm (22.4mV) (CW (without modulation)) Caution: Perform the frequency adjustment under the following conditions. <ul style="list-style-type: none"> Temperature range of +23°C to +27°C (+73.4°F to +80.6°F). (The temperature is displayed on the Frequency adjustment screen of the KPG-111D and the LCD of the transceiver.) Use an accuracy of 0.001ppm for the SSG. (Use a standard oscillator if necessary.) 	SSG	Panel	ANT	Panel	[Side1]	[PC test mode] Press [Start] button of "Auto Tuning". Press [Apply] button to store the adjustment value after the automatic adjustment was finished.	[PC test mode] The value of "IF20" will become around "0" after the adjustment was finished. Remark: "Frequency" is adjusted under receiving condition with SSG.

Transmitter Section

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. High Transmit Power adjust (Batt: 7.5V)	1) Adj item: [HIPWR] Adjust: [*****] 2) Adj item: [L HIPWR]→ [L' HIPWR]→ [C HIPWR]→ [H' HIPWR]→ [H HIPWR] Adjust: [*****] PTT: ON Press [<] key to store the adjustment value.	1) Adj item: [High Transmit Power] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [∧], [∨] [PC test mode] [◀], [▶]	5.0W	±0.2W 2.3A or less [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.
2. Low Transmit Power adjust (Batt: 7.5V)	1) Adj item: [LOPWR] Adjust: [*****] 2) Adj item: [L LOPWR]→ [L' LOPWR]→ [C LOPWR]→ [H' LOPWR]→ [H LOPWR] Adjust: [*****] PTT: ON Press [<] key to store the adjustment value.	1) Adj item: [Low Transmit Power] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.					0.8W	±0.1W 1.2A or less [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.	

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Balance adjust *2	<p>1) Adj item: [BAL] Adjust: [***] Deviation meter LPF: 3kHz HPF: OFF</p> <p>2) Adj item: [L BAL]→ [L' BAL]→ [C BAL]→ [H' BAL]→ [H BAL] Adjust: [***] PTT: ON Press [◀] key to store the adjustment value. Sub LCD: Tone frequency [Side1] key: Press while transmitting to change 20Hz and 2kHz.</p>	<p>1) Adj item: [Balance] Deviation meter LPF : 3kHz HPF : OFF</p> <p>2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value. [2kHz Sine Wave Check box]: Check while transmitting change to 2kHz.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	<p>[Panel tuning mode] [∧], [∨]</p> <p>[PC test mode] [◀], [▶]</p>	<p>The Deviation of 20Hz frequency is fixed. Change the 2kHz adjustment value to become the same deviation of 20Hz within the specified range.</p>	<p>2kHz Tone deviation is within ±1.0% of 20Hz tone deviation.</p> <p>[PC test mode] Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.</p>
<p>*2: Refer to the "Necessary Deviation adjustment item for each signaling and mode" table on page 61. Balance adjustment is common with the adjustment of all signaling deviations.</p>									
4. Maximum Deviation (NXDN) adjust *3 [Narrow]	<p>1) Adj item: [Nn NDEV] Adjust: [****] Deviation meter LPF: 3kHz HPF: OFF</p> <p>2) Adj item: [NnL NDEV]→ [NnL' NDEV]→ [NnC NDEV]→ [NnH' NDEV]→ [NnH NDEV] Adjust: [****] PTT: ON Press [◀] key to store the adjustment value.</p>	<p>1) Adj item: [Maximum Deviation (NXDN Narrow)] Deviation meter LPF: 3kHz HPF: OFF</p> <p>2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	<p>[Panel tuning mode] [∧], [∨]</p> <p>[PC test mode] [◀], [▶]</p>	3056Hz	<p>2995~3117Hz</p> <p>[PC test mode] Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.</p>
[Very Narrow]	<p>1) Adj item: [Nv NDEV] Adjust: [****]</p> <p>2) Adj item: [NvL NDEV]→ [NvL' NDEV]→ [NvC NDEV]→ [NvH' NDEV]→ [NvH NDEV] Adjust: [****] PTT: ON Press [◀] key to store the adjustment value.</p>	<p>1) Adj item: [Maximum Deviation (NXDN Very Narrow)]</p> <p>2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.</p>					1337Hz	<p>1311~1363Hz</p> <p>[PC test mode] Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.</p>	

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Maximum Deviation (Analog) adjust *3 [Narrow]	1) Adj item: [An ADEV] Adjust: [****] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [AnL ADEV]→ [AnL' ADEV]→ [AnC ADEV]→ [AnH' ADEV]→ [AnH ADEV] Adjust: [****] Press [<] key to store the adjustment value.	1) Adj item: [Maximum Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [∧], [∨] [PC test mode] [◀], [▶]	Write the same adjustment value of "NXDN Deviation [Narrow]" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 2050Hz and 2150Hz. Deviation meter LPF: 15kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	2050~2150Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.
[Wide 4k]	1) Adj item: [As ADEV] Adjust: [****] 2) Adj item: [AsL ADEV]→ [AsL' ADEV]→ [AsC ADEV]→ [AsH' ADEV]→ [AsH ADEV] Adjust: [****] Press [<] key to store the adjustment value.	1) Adj item: [Maximum Deviation (Analog Wide 4k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value.						Write the same adjustment value of "NXDN Deviation [Narrow]" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 3310Hz and 3410Hz. Deviation meter LPF: 15kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	3310~3410Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.
[Wide 5k]	1) Adj item: [Aw ADEV] Adjust: [****] 2) Adj item: [AwL ADEV]→ [AwL' ADEV]→ [AwC ADEV]→ [AwH' ADEV]→ [AwH ADEV] Adjust: [****] Press [<] key to store the adjustment value.	1) Adj item: [Maximum Deviation (Analog Wide 5k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value.						Write the same adjustment value of "NXDN Deviation [Narrow]" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 4150Hz and 4250Hz. Deviation meter LPF: 15kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	4150~4250Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.

*3: Refer to the "Necessary Deviation adjustment item for each signaling and mode" table on page 61.
Regarding Maximum Deviation (Analog), it is common with the adjustment of all analog signalings.

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks	
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method		
6. QT Deviation adjust *4 [Narrow]	1) Adj item: [An QT] Adjust: [*****] Deviation meter LPF: 3kHz HPF: OFF PTT: ON Press [◀] key to store the adjustment value.	1) Adj item: [QT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [∧], [∨] [PC test mode] [◀],[▶]	Write the value as followings. 513 (Reference value)	0.35kHz±0.05kHz	
	[Wide 4k]	1) Adj item: [As QT] Adjust: [*****] PTT: ON Press [◀] key to store the adjustment value.							1) Adj item: [QT Deviation (Analog Wide 4k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	0.60kHz±0.05kHz
	[Wide 5k]	1) Adj item: [Aw QT] Adjust: [*****] PTT: ON Press [◀] key to store the adjustment value.							1) Adj item: [QT Deviation (Analog Wide 5k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	0.75kHz±0.05kHz
7. DQT Deviation adjust *4 [Narrow]	1) Adj item: [An DQT] Adjust: [*****] Deviation meter LPF: 3kHz HPF: OFF PTT: ON Press [◀] key to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.						Write the value as followings. 415 (Reference value)	0.35kHz±0.05kHz	
	[Wide 4k]	1) Adj item: [As DQT] Adjust: [*****] PTT: ON Press [◀] key to store the adjustment value.							1) Adj item: [DQT Deviation (Analog Wide 4k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	0.60kHz±0.05kHz
	[Wide 5k]	1) Adj item: [Aw DQT] Adjust: [*****] PTT: ON Press [◀] key to store the adjustment value.							1) Adj item: [DQT Deviation (Analog Wide 5k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	0.75kHz±0.05kHz

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks	
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method		
8. LTR Deviation adjust *4 [Narrow]	1) Adj item: [An LTR] Adjust: [****] Deviation meter LPF: 3kHz HPF: OFF PTT: ON Press [<] key to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [<], [>] [PC test mode] [Left], [Right]	Write the value as followings. 465 (Reference value)	0.75kHz±0.05kHz	
	[Wide]	1) Adj item: [Aw LTR] Adjust: [****] PTT: ON Press [<] key to store the adjustment value.							1) Adj item: [LTR Deviation (Analog Wide)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	1.00kHz±0.05kHz
	9. DTMF Deviation adjust *4 [Narrow]	1) Adj item: [An DTMF] Adjust: [****] Deviation meter LPF: 15kHz HPF: OFF PTT: ON Press [<] key to store the adjustment value.							1) Adj item: [DTMF Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Write the value as followings. 540 (Reference value)
[Wide 4k]	1) Adj item: [As DTMF] Adjust: [****] PTT: ON Press [<] key to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide 4k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	2.00kHz±0.05kHz							
[Wide 5k]	1) Adj item: [Aw DTMF] Adjust: [****] PTT: ON Press [<] key to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide 5k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	2.50kHz±0.05kHz							

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks	
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method		
10. Single Tone Deviation adjust *4 [Narrow]	1) Adj item: [An TONE] Adjust: [*****] Deviation meter LPF: 15kHz HPF: OFF PTT: ON Press [◀] key to store the adjustment value.	1) Adj item: [Single Tone Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [∧], [∨] [PC test mode] [◀],[▶]	Write the value as followings. 513 (Reference value)	1.50kHz±0.05kHz	
	[Wide 4k]	1) Adj item: [As TONE] Adjust: [*****] PTT: ON Press [◀] key to store the adjustment value.							1) Adj item: [Single Tone Deviation (Analog Wide 4k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	2.40kHz±0.05kHz
	[Wide 5k]	1) Adj item: [Aw TONE] Adjust: [*****] PTT: ON Press [◀] key to store the adjustment value.							1) Adj item: [Single Tone Deviation (Analog Wide 5k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	3.00kHz±0.05kHz
11. MSK Deviation adjust *4 [Narrow]	1) Adj item: [An MSK] Adjust: [*****] Deviation meter LPF: 15kHz HPF: OFF PTT: ON Press [◀] key to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.					Write the value as followings. 513 (Reference value)	1.50kHz±0.05kHz		
	[Wide 4k]	1) Adj item: [As MSK] Adjust: [*****] PTT: ON Press [◀] key to store the adjustment value.						1) Adj item: [MSK Deviation (Analog Wide 4k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	2.40kHz±0.05kHz	
	[Wide 5k]	1) Adj item: [Aw MSK] Adjust: [*****] PTT: ON Press [◀] key to store the adjustment value.						1) Adj item: [MSK Deviation (Analog Wide 5k)] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	3.00kHz±0.05kHz	

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
12. CWID Deviation adjust *4 [Very Narrow]	1) Adj item: [Nv CWID] Adjust: [****] Deviation meter LPF: 15kHz HPF: OFF PTT: ON Press [<] key to store the adjustment value.	1) Adj item: [CW ID Deviation (NXDN Very Narrow)] Deviation meter LPF: 15kHz HPF: OFF PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [∧], [∨] [PC test mode] [◀],[▶]	Write the value as followings. 376 (Reference value)	1.10kHz±0.10kHz
*4: Refer to the "Necessary Deviation adjustment item for each signaling and mode" table on page 61.									
13. VOX1 adjust	1) Adj item: [VOX1] Adjust: [***] AG: 1kHz/45mV at MIC terminal	1) Adj item: [VOX1] AG: 1kHz/45mV at MIC terminal	AG	Panel	Universal connector			[Panel tuning mode] After apply signal from AG, press [<] key to store the adjustment value. [PC test mode] After apply signal from AG, press [Apply] button to store the adjustment value.	
14. VOX10 adjust	1) Adj item: [VOX10] Adjust: [***] AG: 1kHz/3mV at MIC terminal	1) Adj item: [VOX10] AG: 1kHz/3mV at MIC terminal							
15. BATT detection writing	1) Adj item: [BATT] Adjust: [***] PTT: ON	1) Adj item:[Battery Warning Level] PTT: Press [Transmit] button.	Power meter DVM	Panel	ANT BATT terminal			Press the PTT switch or [Transmit] button on the PC window. Apply 6.20V to battery terminal. Confirm that one pre-determined numeric in the range 1 to 256 appears. [Panel tuning mode] Press [<] key to store the adjustment value. [PC test mode] Press [Apply] button to store the adjustment value.	
16. BATT detection check	[Panel test mode] 1) CH-Sig: 1-1 BATT terminal voltage: 6.0V while transmitting	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 BATT terminal voltage: 6.0V while transmitting						Check	The transceiver can transmit with causing the LED to blink.

ADJUSTMENT

■ Necessary Deviation adjustment item for each signaling and mode

The following shows the necessary adjustment items for each signaling deviation. Please read the following table like the following example. In the case of the signaling "QT (Wide 5k)", this signaling is composed of three elements [Balance, Maximum Deviation (Analog Wide 5k) and QT Deviation (Wide 5k)]. Please adjust Balance and Maximum Deviation (Analog Wide 5k) before adjusting QT Deviation (Wide 5k).

Mode	Signaling	Necessary adjustment and order			
		Wide 5k	Wide 4k	Narrow	Very Narrow
Analog	Audio	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 5k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 4k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Narrow)	-
	QT	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 5k) Step3. QT Deviation (Wide 5k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 4k) Step3. QT Deviation (Wide 4k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Narrow) Step3. QT Deviation (Narrow)	-
	DQT	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 5k) Step3. DQT Deviation (Wide 5k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 4k) Step3. DQT Deviation (Wide 4k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Narrow) Step3. DQT Deviation (Narrow)	-
	LTR	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide) Step3. LTR Deviation (Wide)	-	Step1. Balance adjust Step2. Maximum Deviation (Analog Narrow) Step3. LTR Deviation (Narrow)	-
	DTMF	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 5k) Step3. DTMF Deviation (Wide 5k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 4k) Step3. DTMF Deviation (Wide 4k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Narrow) Step3. DTMF Deviation (Narrow)	-
	2TONE	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 5k) Step3. Single Tone Deviation (Analog Wide 5k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 4k) Step3. Single Tone Deviation (Analog Wide 4k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Narrow) Step3. Single Tone Deviation (Analog Narrow)	-
	MSK (FleetSync)	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 5k) Step3. MSK Deviation (Analog Wide 5k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Wide 4k) Step3. MSK Deviation (Analog Wide 4k)	Step1. Balance adjust Step2. Maximum Deviation (Analog Narrow) Step3. MSK Deviation (Analog Narrow)	-
NXDN	Audio	-	-	Step1. Balance adjust Step2. Maximum Deviation (NXDN Narrow)	Step1. Balance adjust Step2. Maximum Deviation (NXDN Very Narrow)
	CWID	-	-	-	Step1. Balance adjust Step2. Maximum Deviation (Analog Narrow) Step3. CWID Deviation (NXDN Very Narrow)

- Balance is common with all the above deviation adjustments. If Balance (Transmitter Section 3) has already adjusted, please skip Step1 and adjust from Step2.
- Maximum Deviation (Analog Wide 5k/Wide 4k/Narrow) is common with all the analog signaling deviations and CWID Deviation (NXDN Very Narrow). If Balance and Maximum Deviation (Analog Wide 5k/Wide 4k/Narrow) (Transmitter Section 5) have already adjusted, please skip Step2 and adjust from Step3.

ADJUSTMENT

Receiver Section

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. AF level setting	[Panel test mode] 1) CH-Sig: 1-1 SSG output: -47dBm (1mV) (MOD: 1kHz/±1.5kHz) Wide 5k/Wide 4k/ Narrow: Narrow Beat Shift: Uncheck Compander: Uncheck	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 Wide 5k/Wide 4k/ Narrow: Narrow Beat Shift: Uncheck Compander: Uncheck SSG output: -47dBm (1mV) (MOD: 1kHz/±1.5kHz)	SSG DVM AF VTVM Dummy load	Panel	ANT Universal connector	Panel	Volume knob	Turn the Volume knob to obtain 0.63V AF output.	0.63V±0.1V
2. Sensitivity 1 adjust	1) Adj item: [SENS1] Adjust: [***] 2) Adj item: [L SENS1]→ [L' SENS1]→ [C SENS1]→ [H' SENS1] Adjust: [***] Press [←] key to store the adjustment value.	1) Adj item: [Sensitivity 1] 2) Adj item: [Low], [Center], [High] Press [Apply All] button to store the adjustment value.	SSG AF VTVM Oscilloscope	Panel	ANT Universal connector	Panel	[Panel tuning mode] [∧], [∨] [PC test mode] [←], [→]	Write the value as followings [L SENS1] / [Low] : 100 [L' SENS1] / [Low'] : 115 [C SENS1] / [Center] : 128 [H' SENS1] / [High'] : 142	
	3) Adj item: [H SENS1] Adjust: [***]	3) Adj item: [High]						Increase the adjustment value from 1 to get 12dB SINAD.	
	Caution: Perform the step 3 adjustments of "3. Sensitivity 2 adjust" before performing the [H SENS1] adjustment.								
	SSG output: -118dBm (0.28μV) (MOD: 1kHz/±1.5kHz) Press [←] key to store the adjustment value.	SSG output: -118dBm (0.28μV) (MOD: 1kHz/±1.5kHz) Press [Apply All] button to store the adjustment value.						Note: If the SINAD value is less than 12dB SINAD, conduct the following. At first, apply "104" as the temporary value for "Sensitivity 1 [High]". Next, decrease "Sensitivity 2 [High]" from "256" until the SINAD value becomes 13dB SINAD, then apply the adjustment value. (Keep this "Sensitivity 2 [High]" adjustment value and no need to restore the adjustment value to "256".) Finally, increase "Sensitivity 1 [High]" adjustment value from 1 to get 12dB SINAD.	

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks	
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method		
3. Sensitivity 2 adjust	1) Adj item: [SENS2] Adjust: [***] 2) Adj item: [L SENS2]→ [L' SENS2]→ [C SENS2]→ [H' SENS2] Adjust: [***] SSG output: -118dBm (0.28μV) (MOD: 1kHz±1.5kHz) Press [◀] key to store the adjustment value.	1) Adj item: [Sensitivity 2] 2) Adj item: [Low], [Low'], [Center], [High'] SSG output: -118dBm (0.28μV) (MOD: 1kHz±1.5kHz) Press [Apply All] button to store the adjustment value.	SSG AF VTVM Oscilloscope	Panel	ANT Universal connector	Panel	[Panel tuning mode] [<], [>]	Decrease the adjustment value from 256 to get 12dB SINAD.		
	3) Adj item: [H SENS2] Adjust: [***] Press [◀] key to store the adjustment value.	3) Adj item: [High] Press [Apply All] button to store the adjustment value.					[PC test mode] [◀],[▶]	Write the value as followings. [H SENS2]/[High] : 256		
4. RSSI reference adjust *5 [Analog Narrow]	1) Adj item: [An RRSSI] Adjust: [***] 2) Adj item: [AnL RRSSI]→ [AnL' RRSSI]→ [AnC RRSSI]→ [AnH' RRSSI]→ [AnH RRSSI] Adjust: [***] SSG output: 12dB SINAD level -3dB (MOD: 1kHz±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level -3dB (MOD: 1kHz±1.5kHz)	SSG Distortion meter Oscilloscope				[Panel tuning mode] After input signal from SSG, press [◀] key to store the adjustment value.			
	[Analog Wide 4k]	1) Adj item: [As RRSSI] Adjust: [***] 2) Adj item: [AsL RRSSI]→ [AsL' RRSSI]→ [AsC RRSSI]→ [AsH' RRSSI]→ [AsH RRSSI] Adjust: [***] SSG output: 12dB SINAD level -3dB (MOD: 1kHz±2.4kHz)					1) Adj item: [RSSI Reference (Analog Wide 4k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level -3dB (MOD: 1kHz±2.4kHz)			[PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.
	[Analog Wide 5k]	1) Adj item: [Aw RRSSI] Adjust: [***] 2) Adj item: [AwL RRSSI]→ [AwL' RRSSI]→ [AwC RRSSI]→ [AwH' RRSSI]→ [AwH RRSSI] Adjust: [***] SSG output: 12dB SINAD level -3dB (MOD: 1kHz±3kHz)					1) Adj item: [RSSI Reference (Analog Wide 5k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level -3dB (MOD: 1kHz±3kHz)			

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
RSSI reference adjust *5 [NXDN Very Narrow]	1) Adj item: [Nv RRSSI] Adjust: [***] 2) Adj item: [NvL RRSSI]→ [NvL' RRSSI]→ [NvC RRSSI]→ [NvH' RRSSI]→ [NvH RRSSI] Adjust: [***] SSG output: 12dB SINAD level for Analog Narrow -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (NXDN Very Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level for Analog Narrow -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT Universal connector			[Panel tuning mode] After input signal from SSG, press [<] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	Adjust with the analog signal.
*5: Because RSSI reference (NXDN Narrow) is adjusted by adjusting RSSI reference (Analog Narrow), it is not necessary to adjust RSSI reference (NXDN Narrow).									
5. Open Squelch adjust *6 (Squelch level 5 adjust) [Analog Narrow]	1) Adj item: [An SQL] Adjust: [***] 2) Adj item: [AnL SQL]→ [AnL' SQL]→ [AnC SQL]→ [AnH' SQL]→ [AnH SQL] Adjust: [***] SSG output: 12dB SINAD level (MOD: 1kHz/±1.5kHz)	1) Adj item: [Open Squelch (Analog Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT Universal connector			[Panel tuning mode] After input signal from SSG, press [<] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	“Open Squelch” will not be adjusted correctly if MOD and Deviation are wrong.
[Analog Wide 4k]	1) Adj item: [As SQL] Adjust: [***] 2) Adj item: [AsL SQL]→ [AsL' SQL]→ [AsC SQL]→ [AsH' SQL]→ [AsH SQL] Adjust: [***] SSG output: 12dB SINAD level (MOD: 1kHz/±2.4kHz)	1) Adj item: [Open Squelch (Analog Wide 4k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level (MOD: 1kHz/±2.4kHz)							
[Analog Wide 5k]	1) Adj item: [Aw SQL] Adjust: [***] 2) Adj item: [AwL SQL]→ [AwL' SQL]→ [AwC SQL]→ [AwH' SQL]→ [AwH SQL] Adjust: [***] SSG output: 12dB SINAD level (MOD: 1kHz/±3kHz)	1) Adj item: [Open Squelch (Analog Wide 5k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level (MOD: 1kHz/±3kHz)							

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
Open Squelch adjust *6 (Squelch level 5 adjust) [NXDN Very Narrow]	1) Adj item: [Nv SQL] Adjust: [***] 2) Adj item: [NvL SQL]→ [NvL' SQL]→ [NvC SQL]→ [NvH' SQL]→ [NvH SQL] Adjust: [***] SSG output: 12dB SINAD level for Analog Narrow -4dB (MOD: 400Hz/±1.1kHz)	1) Adj item: [Open Squelch (NXDN Very Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level for Analog Narrow -4dB (MOD: 400Hz/±1.1kHz)	SSG Distortion meter Oscilloscope	Panel	ANT Universal connector			[Panel tuning mode] After input signal from SSG, press [<] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	Adjust with the analog signal. This item is adjusted under the condition that MOD is "400Hz" and Deviation is "±1.1kHz" due to the circuit configuration.
*6: Because Open Squelch (NXDN Narrow) is adjusted by adjusting Open Squelch (Analog Narrow), it is not necessary to adjust Open Squelch (NXDN Narrow).									
6. Low RSSI at -118dBm adjust *7 [Analog Narrow]	1) Adj item: [An LRSSI] Adjust: [***] 2) Adj item: [AnL LRSSI]→ [AnL' LRSSI]→ [AnC LRSSI]→ [AnH' LRSSI]→ [AnH LRSSI] Adjust: [***] SSG output: -118dBm (0.28μV) (MOD: 1kHz/±1.5kHz)	1) Adj item: [Low RSSI (Analog Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: -118dBm (0.28μV) (MOD: 1kHz/±1.5kHz)	SSG	Panel	ANT Universal connector			[Panel tuning mode] After input signal from SSG, press [<] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[Analog Wide 4k]	1) Adj item: [As LRSSI] Adjust: [***] 2) Adj item: [AsL LRSSI]→ [AsL' LRSSI]→ [AsC LRSSI]→ [AsH' LRSSI]→ [AsH LRSSI] Adjust: [***] SSG output: -118dBm (0.28μV) (MOD: 1kHz/±2.4kHz)	1) Adj item: [Low RSSI (Analog Wide 4k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: -118dBm (0.28μV) (MOD: 1kHz/±2.4kHz)							
[Analog Wide 5k]	1) Adj item: [Aw LRSSI] Adjust: [***] 2) Adj item: [AwL LRSSI]→ [AwL' LRSSI]→ [AwC LRSSI]→ [AwH' LRSSI]→ [AwH LRSSI] Adjust: [***] SSG output: -118dBm (0.28μV) (MOD: 1kHz/±3kHz)	1) Adj item: [Low RSSI (Analog Wide 5k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: -118dBm (0.28μV) (MOD: 1kHz/±3kHz)							

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
Low RSSI at -118dBm adjust *7 [NXDN Very Narrow]	1) Adj item: [Nv LRSSI] Adjust: [***] 2) Adj item: [NvL LRSSI]→ [NvL' LRSSI]→ [NvC LRSSI]→ [NvH' LRSSI]→ [NvH LRSSI] Adjust: [***] SSG output: -118dBm (0.28μV) (MOD: 1kHz±1.5kHz)	1) Adj item: [Low RSSI (NXDN Very Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: -118dBm (0.28μV) (MOD: 1kHz±1.5kHz)	SSG	Panel	ANT Universal connector			[Panel tuning mode] After input signal from SSG, press [<] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	Adjust with the analog signal.
*7: Because Low RSSI at -118dBm (NXDN Narrow) is adjusted by adjusting Low RSSI at -118dBm (Analog Narrow), it is not necessary to adjust Low RSSI at -118dBm (NXDN Narrow).									
7. High RSSI at -80dBm adjust *8 [Analog Narrow]	1) Adj item: [An HRSSI] Adjust: [***] 2) Adj item: [AnL HRSSI]→ [AnL' HRSSI]→ [AnC HRSSI]→ [AnH' HRSSI]→ [AnH HRSSI] Adjust: [***] SSG output: -80dBm (22.4μV) (MOD: 1kHz±1.5kHz)	1) Adj item: [High RSSI (Analog Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: -80dBm (22.4μV) (MOD: 1kHz±1.5kHz)	SSG	Panel	ANT Universal connector			[Panel tuning mode] After input signal from SSG, press [<] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[Analog Wide 4k]	1) Adj item: [As HRSSI] Adjust: [***] 2) Adj item: [AsL HRSSI]→ [AsL' HRSSI]→ [AsC HRSSI]→ [AsH' HRSSI]→ [AsH HRSSI] Adjust: [***] SSG output: -80dBm (22.4μV) (MOD: 1kHz±2.4kHz)	1) Adj item: [High RSSI (Analog Wide 4k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: -80dBm (22.4μV) (MOD: 1kHz±2.4kHz)							
[Analog Wide 5k]	1) Adj item: [Aw HRSSI] Adjust: [***] 2) Adj item: [AwL HRSSI]→ [AwL' HRSSI]→ [AwC HRSSI]→ [AwH' HRSSI]→ [AwH HRSSI] Adjust: [***] SSG output: -80dBm (22.4μV) (MOD: 1kHz±3kHz)	1) Adj item: [High RSSI (Analog Wide 5k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: -80dBm (22.4μV) (MOD: 1kHz±3kHz)							

ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
High RSSI at -80dBm adjust *8 [NXDN Very Narrow]	1) Adj item: [Nv HRSSI] Adjust: [***] 2) Adj item: [NvL HRSSI]→ [NvL' HRSSI]→ [NvC HRSSI]→ [NvH' HRSSI]→ [NvH HRSSI] Adjust: [***] SSG output: -80dBm (22.4μV) (MOD: 1kHz/±1.5kHz)	1) Adj item: [High RSSI (NXDN Very Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: -80dBm (22.4μV) (MOD: 1kHz/±1.5kHz)	SSG	Panel	ANT Universal connector			[Panel tuning mode] After input signal from SSG, press [<] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	Adjust with the analog signal.
*8: Because High RSSI at -80dBm (NXDN Narrow) is adjusted by adjusting High RSSI at -80dBm (Analog Narrow), it is not necessary to adjust High RSSI at -80dBm (NXDN Narrow).									
8. Tight Squelch adjust (Squelch level 9 adjust) [Analog Narrow]	1) Adj item: [An SQLT] Adjust: [***] 2) Adj item: [AnL SQLT]→ [AnL' SQLT]→ [AnC SQLT]→ [AnH' SQLT]→ [AnH SQLT] Adjust: [***] SSG output: 12dB SINAD level +5dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [Tight Squelch (Analog Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level +5dB (MOD: 1kHz/±1.5kHz)	SSG	Panel	ANT Universal connector			[Panel tuning mode] After input signal from SSG, press [<] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[Analog Wide 4k]	1) Adj item: [As SQLT] Adjust: [***] 2) Adj item: [AsL SQLT]→ [AsL' SQLT]→ [AsC SQLT]→ [AsH' SQLT]→ [AsH SQLT] Adjust: [***] SSG output: 12dB SINAD level +5dB (MOD: 1kHz/±2.4kHz)	1) Adj item: [Tight Squelch (Analog Wide 4k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level +5dB (MOD: 1kHz/±2.4kHz)							
[Analog Wide 5k]	1) Adj item: [Aw SQLT] Adjust: [***] 2) Adj item: [AwL SQLT]→ [AwL' SQLT]→ [AwC SQLT]→ [AwH' SQLT]→ [AwH SQLT] Adjust: [***] SSG output: 12dB SINAD level +5dB (MOD: 1kHz/±3kHz)	1) Adj item: [Tight Squelch (Analog Wide 5k)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level +5dB (MOD: 1kHz/±3kHz)							

TERMINAL FUNCTION

Control unit (X53-4262-XX)

Pin No.	Name	I/O	Function
CN1			
1	/CS	O	Chip select output
2	/RES	O	LCD reset output
3	A0	O	Address bus 0 output
4	/WR	O	WR bus output
5	D0	I/O	Data bus 0
6	D1	I/O	Data bus 1
7	D2	I/O	Data bus 2
8	D3	I/O	Data bus 3
9	D4	I/O	Data bus 4
10	D5	I/O	Data bus 5
11	D6	I/O	Data bus 6
12	D7	I/O	Data bus 7
13	VDD	O	3.3V LCD power supply output
14	VSS	-	GND
15	VDD	O	3.3V LCD power supply output
16	V1	-	LCD drive power supply
17	V2	-	LCD drive power supply
18	V3	-	LCD drive power supply
19	V4	-	LCD drive power supply
20	V5	O	LCD drive power supply
CN23			
1	ME	-	Internal MIC GND
2	EMC	I	Internal MIC input
3	SP+	O	BTL output + for internal speaker
4	SP+	O	BTL output + for internal speaker
5	SP-	O	BTL output – for internal speaker
6	SP-	O	BTL output – for internal speaker
7	6_/KEYI1	I	Key matrix input (KEYI1 for 6-key)
8	6_/KEYO2	O	Key matrix output (KEYO2 for 6-key)
9	BL_SB	O	LCD backlight voltage output
10	6_/KEYO0	O	Key matrix output (KEYO0 for 6-key)
11	6_/KEYO1	O	Key matrix output (KEYO1 for 6-key)
12	BL_SB	O	LCD backlight voltage output
13	6_/KEYI0	I	Key matrix input (KEYI0 for 6-key)
14	AGND	-	GND
CN403			
1	33A	O	3.3V for volume level
2	VOL_GND	-	GND for volume level
3	VOL	I	Volume level input for audio control
4	EN3	I	Rotary switch input
5	AGND	-	GND
6	EN4	I	Rotary switch input
7	EN1	I	Rotary switch input
8	EN2	I	Rotary switch input

Pin No.	Name	I/O	Function
9	+B	O	Power output after passing through the fuse
10	SB1	I	Power input after power switch
CN404			
1	LED_G	O	Green LED control output
2	/EMG	I	Emergency (Orange) key input
3	LED_R	O	Red LED control output
4	IFC	I	TX-RX PCB version recognition input
5	/SAVE	O	50C Reg. control output
6	I2CCK	O	TCXO thermometer clock output
7	/5TC	O	50T Reg. switch control output
8	I2CSDA	I/O	TCXO thermometer data input/output
9	SBC	O	SB3 switch control output
10	/T_R	O	TX/RX control output
11	TV2	O	RX tuning voltage 2 output
12	ASSIST	O	VCO tuning voltage output
13	TV1	O	RX tuning voltage 1 output
14	VAGC	I	AGC voltage input
15	5RC	O	50R switch control output
16	TCXO_MOD	O	TCXO modulation output
17	PGND	-	GND
18	RSSI	I	RSSI voltage input
19	PGND	-	GND
20	CV	I	CV voltage input
21	AGND	-	GND
22	NC	-	No connection
23	NC	-	No connection
24	+B	I	Power input after passing through the fuse
25	+B	I	Power input after passing through the fuse
26	+B	I	Power input after passing through the fuse
27	+B	I	Power input after passing through the fuse
28	NC	-	No connection
29	NC	-	No connection
30	AGND	-	GND
31	/PTT	I	PTT input
32	Side_G	O	Key matrix output (SIDE1,2 key)
33	Side_1	I	Key matrix input (SIDE1 key)
34	W_/N	O	W/N control output
35	SDO1	O	PLL serial data output
36	Side_2	I	Key matrix input (SIDE2 key)
37	/PCS_RF	O	PLL enable output
38	/DSW	O	APC voltage discharge switch control output
39	APC	O	APC control voltage output
40	/APCSW	O	APC switch control output
41	VCO_MOD	O	VCO modulation output

TERMINAL FUNCTION

Pin No.	Name	I/O	Function
42	THP	I	Thermistor voltage input
43	PLD	I	PLL lock detect input
44	38M	O	38M output
45	SCK1	O	PLL clock output
46	GND	-	GND
47	S_DET	I	Battery select input
48	GND	-	GND
49	NC	-	No connection
50	IF_DET	I	IF input
CN405			
1	SSW	I	EXT/INT speaker switch input
2	SP+	O	BTL output + for external speaker
3	SP-	O	BTL output - for external speaker
4	MSW	I	EXT/INT MIC switch input
5	EMC	I	External MIC input
6	ME	-	External MIC GND
7	PTT	I	External PTT input
8	PF	I	Programmable function key input
9	OPT	I/O	Option interface I/O
10	E	-	GND
11	5V	O	5V output
12	TXD	O	Serial data output
13	RXD	I	Serial data input
14	NC	-	No connection
CN701 (for production)			
1~20			
CN710			
1	OPT1	I/O	Refer to "CN710 26-pin connector specification" described on pages 72 to 74.
2	OPT3	I/O	
3	26P_RD	I	
4	26P_TD	O	
5	NC	-	
6	OPT4	O	
7	OPT10	O	
8	OPT5	O	
9	DGND	-	
10	AGND	-	
11	AI	I	
12	AO	O	
13	AGND	-	
14	5V	O	
15	OPT9	I	
16	DTI	I	
17	OPT8	I/O	
18	OPT11	O	
19	OPT7	I/O	

Pin No.	Name	I/O	Function
20	OPT2	I/O	Refer to "CN710 26-pin connector specification" described on pages 72 to 74.
21	TXO	O	
22	RXEO	O	
23	RXEI	I	
24	TXI	I	
25	OPT6	O	
26	POW	O	

TX-RX unit (X57-7370-11 A/2)

Pin No.	Name	I/O	Function
CN900			
1	LED_G	I	Green LED control input
2	/EMG	O	Emergency (Orange) key output
3	LED_R	I	Red LED control input
4	IFC	O	TX-RX PCB version recognition output
5	/SAVE	I	50C Reg. control input
6	I2CCK	I	TCXO thermometer clock input
7	/5TC	I	50T Reg. switch control input
8	I2CSDA	I/O	TCXO thermometer data input/output
9	SBC	I	SB3 switch control input
10	/T_R	I	TX/RX control input
11	TV2	I	RX tuning voltage 2 input
12	ASSIST	I	VCO tuning voltage input
13	TV1	I	RX tuning voltage 1 input
14	VAGC	O	AGC voltage output
15	5RC	I	50R switch control input
16	TCXO_MOD	I	TCXO modulation input
17	GND	-	GND
18	RSSI	O	RSSI voltage output
19	GND	-	GND
20	CV	O	CV voltage output
21	GND	-	GND
22	NC	-	No connection
23	NC	-	No connection
24	+B	O	Power output after passing through the fuse
25	+B	O	Power output after passing through the fuse
26	+B	O	Power output after passing through the fuse
27	+B	O	Power output after passing through the fuse
28	NC	-	No connection
29	NC	-	No connection
30	GND	-	GND
31	/PTT	O	PTT output

TERMINAL FUNCTION

Pin No.	Name	I/O	Function
32	Side_G	I	Key matrix input (SIDE1,2 key)
33	Side_1	O	Key matrix output (SIDE1 key)
34	W_N	I	No connection
35	SDO1	I	PLL serial data input
36	Side_2	O	Key matrix output (SIDE2 key)
37	/PCS_RF	I	PLL enable input
38	/DSW	I	APC voltage discharge switch control input
39	APC	I	APC control voltage input
40	/APCSW	I	APC switch control input
41	VCO_MOD	I	VCO modulation input
42	THP	O	Thermistor voltage output
43	PLD	O	PLL lock detect output
44	38M	I	38M input
45	SCK1	I	PLL clock input
46	GND	-	GND
47	S_DET	O	Battery select output
48	GND	-	GND
49	NC	-	No connection
50	IF_DET	O	IF output
CN901			
1	PTT	I	Internal PTT input
2	GND	-	GND
3	Side_G	O	Key matrix output (SIDE1,2 key)
4	Side_1	I	Key matrix input (SIDE1 key)
5	Side_2	I	Key matrix input (SIDE2 key)

Option board unit (X57-7370-11 B/2)

Pin No.	Name	I/O	Function
CN737			
1	OPT1	I/O	
2	OPT3	I/O	
3	26P_RD	O	
4	26P_TD	I	
5	NC	-	
6	OPT4	I	
7	OPT10	I	
8	OPT5	I	
9	DGND	-	
10	AGND	-	
11	NC	-	
12	NC	-	
13	AGND	-	
14	5V	I	
15	OPT9	O	
16	DTI	O	
17	OPT8	I/O	
18	OPT11	I	
19	OPT7	I/O	
20	OPT2	I/O	
21	TXO	I	
22	RXEO	I	
23	RXEI	O	
24	TXI	O	
25	OPT6	I	
26	POW	I	

Refer to "CN737 Option board connector specification" described on page 75.

Solder Pad

Name	I/O	Signal Type	Function	Rating and Condition				
				Parameter	Min	Typ	Max	Unit
PTT2	O	Digital	PTT output	[Output] Output Impedance			10k	Ω
PTT1	I	Digital	PTT input	[Input] VIH	2.8		3.3	V
				[Input] VIL	0		0.5	V
MDSW	I	Digital	Man-down switch input	[Input] VIH	2.8		3.3	V
				[Input] VIL	0		0.5	V
GND	-	GND	GND	Allowable current value				mA
TXD	O	Digital	Serial data output	VOH (I _o =-5mA)	4.0	-	5.3	V
				VOL (I _o =5mA)	0	-	0.8	V
				Baud Rate			19200	bps
RXD	I	Digital	Serial data input	VIH	2.8	-	5.3	V
				VIL	0	-	0.8	V
				Baud Rate			19200	bps
RSSI	O	Analog	RSSI output	Output Impedance			10k	Ω

TERMINAL FUNCTION

Universal connector

Pin No.	Name	I/O	Signal Type	Function	Rating and Condition				
					Parameter	Min	Typ	Max	Unit
1	SSW	I	Digital	EXT/INT speaker switch input L: External speaker ON H: Internal speaker ON	VIH	2.8	-	5.3	V
					VIL	0	-	0.7	V
2	SP+	O	Analog	BTL output + for external speaker	[8Ω load] Max output power (1kHz, Batt=7.5V)		1.3	1.8	W
					[8Ω load] DC Bias		2.5		V
					[8Ω load] Allowable Frequency	300		3000	Hz
3	SP-	O	Analog	BTL output - for external speaker	[16Ω load] Max output power (1kHz, Batt=7.5V)		0.9	1.4	W
					[16Ω load] DC Bias		2.5		V
					[16Ω load] Allowable Frequency	300		3000	Hz
4	MSW	I	Digital	EXT/INT MIC switch input L: External MIC ON H: Internal MIC ON	VIH	2.8	-	5.3	V
					VIL	0	-	0.5	V
5	EMC	I	Analog	External MIC input	Audio Level (STD deviation)	7.7	12.5	17.3	mV
					DC Bias		3.3		V
					Allowable Frequency	300		3000	Hz
					Input Impedance	-	1.8	-	kΩ
6	ME	-	-	External MIC GND					
7	PTT	I	Digital	External PTT input L: PTT ON	VIH	2.8	-	5.3	V
					VIL	0	-	0.7	V
8	PF	I	Analog	Programmable function key input	V (PF2 key ON)	2.2	-	2.8	V
					V (PF1 key ON)	1.7	-	2.2	V
					V (PF1, PF2 key ON)	1.3	-	1.7	V
9	OPT	I	Digital	Man-down input Programmable active H/L	VIH	2.8	-	5.3	V
					VIL	0	-	0.7	V
10	E	-	-	GND					
11	5V	-	Power	5V power supply output (Output control is FPU programmable)	Output Voltage (Iout=100mA)	4.9	5.0	5.1	V
					Maximum Current	-	-	0.2	A
12	TXD	O	Digital	Serial data output	VOH (Io=-5mA)	4.0	-	5.3	V
					VOL (Io=5mA)	0	-	0.8	V
					Baud Rate			19200	bps
13	RXD	I	Digital	Serial data input	VIH	2.8	-	5.3	V
					VIL	0	-	0.8	V
					Baud Rate			115200	bps
14	NC	-	-	Not used (reserved for future option)					

TERMINAL FUNCTION

CN710 26-pin connector specification

Pin No.	Name	I/O	Signal Type	Rating and Condition				
				Parameter	Min	Typ	Max	Unit
1	OPT1	I/O	Digital	[Input] VIH	2.8		3.3	V
6	OPT4			[Input] VIL	0		0.5	V
8	OPT5			[Output] VOH	2.8		3.5	V
17	OPT8			[Output] VOL	0		0.5	V
18	OPT11							
2	OPT3	I/O	Digital	[Input] VIH	2.8		3.3	V
19	OPT7			[Input] VIL	0		0.5	V
20	OPT2			[Output] VOH	2.8		3.5	V
25	OPT6			[Output] VOL	0		0.5	V
3	26P_RD	I	Digital	[Input] VIH	2.8		3.3	V
				[Input] VIL	0		0.5	V
				Baud Rate			19200	bps
4	26P_TD	O	Digital	[Output] VOH	2.8		3.5	V
				[Output] VOL	0		0.5	V
				Baud Rate			19200	bps
15	OPT9	I	Analog	Input Amplitude (Square wave)	-	3.3	-	V _{p-p}
				Coupling Capacitor	-	0.01	-	μF
				Input Impedance	22k	-	-	Ω
				Allowable Frequency	300	-	3000	Hz
7	OPT10	O	Analog/Digital	Output Amplitude (1kHz, 60% deviation)	0.9	1.3	1.7	V _{p-p}
				Coupling Capacitor		0.1		μF
				Output Impedance			22k	Ω
				Allowable Frequency	300		3000	Hz
11	AI	I	Analog	Input Amplitude (1kHz, 60% deviation)	0.3	0.5	0.7	V _{p-p}
				Coupling Capacitor	-	0.1	-	μF
				Input Impedance	-	12k	-	Ω
				Allowable Frequency	300	-	3000	Hz
12	AO	O	Analog	Output Amplitude (1kHz, 60% deviation)	30	50	70	mV _{p-p}
				Coupling Capacitor	-	0.1	-	μF
				Output Impedance	-	35k	-	Ω
				Allowable Frequency	300		3000	Hz
16	DTI	I	Analog	Input Amplitude (1kHz, 60% deviation)	0.8	1.1	1.4	V _{p-p}
				Coupling Capacitor	-	0.1	-	μF
				Input Impedance	22k	-	-	Ω
				Allowable Frequency	300	-	3000	Hz
21	TXO	O	Analog	Output Amplitude (1kHz, 60% deviation) while external MIC	160	260	360	mV _{p-p}
				Output Amplitude (1kHz, 60% deviation) while internal MIC	-	130	-	mV _{p-p}
				Coupling Capacitor	-	0.1	-	μF
				Output Impedance	-	-	2.2k	Ω
				Allowable Frequency	300		3000	Hz

TERMINAL FUNCTION

Pin No.	Name	I/O	Signal Type	Rating and Condition				
				Parameter	Min	Typ	Max	Unit
22	RXEO	O	Analog	Output Amplitude (1kHz, 60% deviation)	450	640	830	mVp-p
				Coupling Capacitor	-	0.1	-	μF
				Output Impedance	-	-	2.2k	Ω
				Allowable Frequency	300	-	3000	Hz
23	RXEI	I	Analog	Input Amplitude (1kHz, 60% deviation)	450	640	830	mVp-p
				Coupling Capacitor		0.1		μF
				Input Impedance	22k			Ω
				Allowable Frequency	300		3000	Hz
24	TXI	I	Analog	Input Amplitude (1kHz, 60% deviation) while external MIC	160	260	360	mVp-p
				Input Amplitude (1kHz, 60% deviation) while internal MIC	-	130	-	mVp-p
				Coupling Capacitor	-	0.1	-	μF
				Input Impedance	22k	-	-	Ω
				Allowable Frequency	300	-	3000	Hz
14	5V	O	Power	Output Voltage		5		V
				Output Current			78	mA
26	POW	O	Power	Output Voltage		7.5		V
				Output Current			100	mA
9	DGND	-	GND	Allowable current value (Total current of 3 pins)			100	mA
10	AGND							
13								
5	NC	-	-	-				

CN710 26-pin connector specification

Pin No.	Name	Device	I/O	Connection	Function
1	OPT1	ANI board	O	Aux Input	[COR] Conv/LTR L: Activity receiving H: Not activity receiving [TOR] Conv/LTR L: Activity receiving (Sub Tone or LTR ID is OK) H: Not activity receiving [LOK] Conv L: TX Complete H: Not TX Complete LTR L: TX Link Complete (until TX finishes) H: Not TX Link Complete
		VGS-1	I	BUSY	BUSY indication
2	OPT3	ANI board	I	KEY	TX requirement input
		VGS-1	I	PLAY	PLAY indication
3	26P_RD	ANI board	-	-	-
		VGS-1	I	SO	Serial data input

TERMINAL FUNCTION

Pin No.	Name	Device	I/O	Connection	Function
4	26P_TD	ANI board	-	-	-
		VGS-1	O	SI	Serial data output
5	NC	-	-	-	-
6	OPT4	ANI board	O	PTT	PTT signal output
		VGS-1	O	EN	Enable
7	OPT10	ANI board	-	-	-
		VGS-1	O	USEL	UART speed select output
8	OPT5	ANI board	O	Emergency	Emergency signal output
		VGS-1	O	RST	Reset output
9	DGND	ANI board	-	A-	GND
		VGS-1	-	DGND	DGND
10	AGND	ANI board	-	A-	GND
		VGS-1	-	AGND	AGND
11	AI	ANI board	-	-	-
		VGS-1	I	AO	VGS Audio input
12	AO	ANI board	-	-	-
		VGS-1	O	AI	VGS Audio output
13	AGND	ANI board	-	A-	GND
		VGS-1	-	AGND	AGND
14	5V	ANI board	-	-	Note: POW and 5V can not be used simultaneously.
		VGS-1	O	5C	5V power supply
15	OPT9	ANI board	I	Sidetone	Sidetone input
		VGS-1	-	-	-
16	DTI	ANI board	I	Data Out	Data signal input
		VGS-1	-	-	-
17	OPT8	ANI board	I	Tone Control	Speaker mute signal input
		VGS-1	-	-	-
18	OPT11	ANI board	O	Man-Down	Man-Down output
		VGS-1	-	-	-
19	OPT7	ANI board	I	MIC Mute	MIC mute signal input
		VGS-1	-	-	-
20	OPT2	ANI board	I	Aux Output	Emergency signal input
		VGS-1	-	-	-
21	TXO	ANI board	-	-	-
		VGS-1	-	-	-
22	RXEO	ANI board	-	-	-
		VGS-1	-	-	-
23	RXEI	ANI board	-	-	-
		VGS-1	-	-	-
24	TXI	ANI board	-	-	-
		VGS-1	-	-	-
25	OPT6	ANI board	-	-	-
		VGS-1	-	-	-
26	POW	ANI board	O	A+	Switched B output
		VGS-1	-	-	Note: POW and 5V can not be used simultaneously.

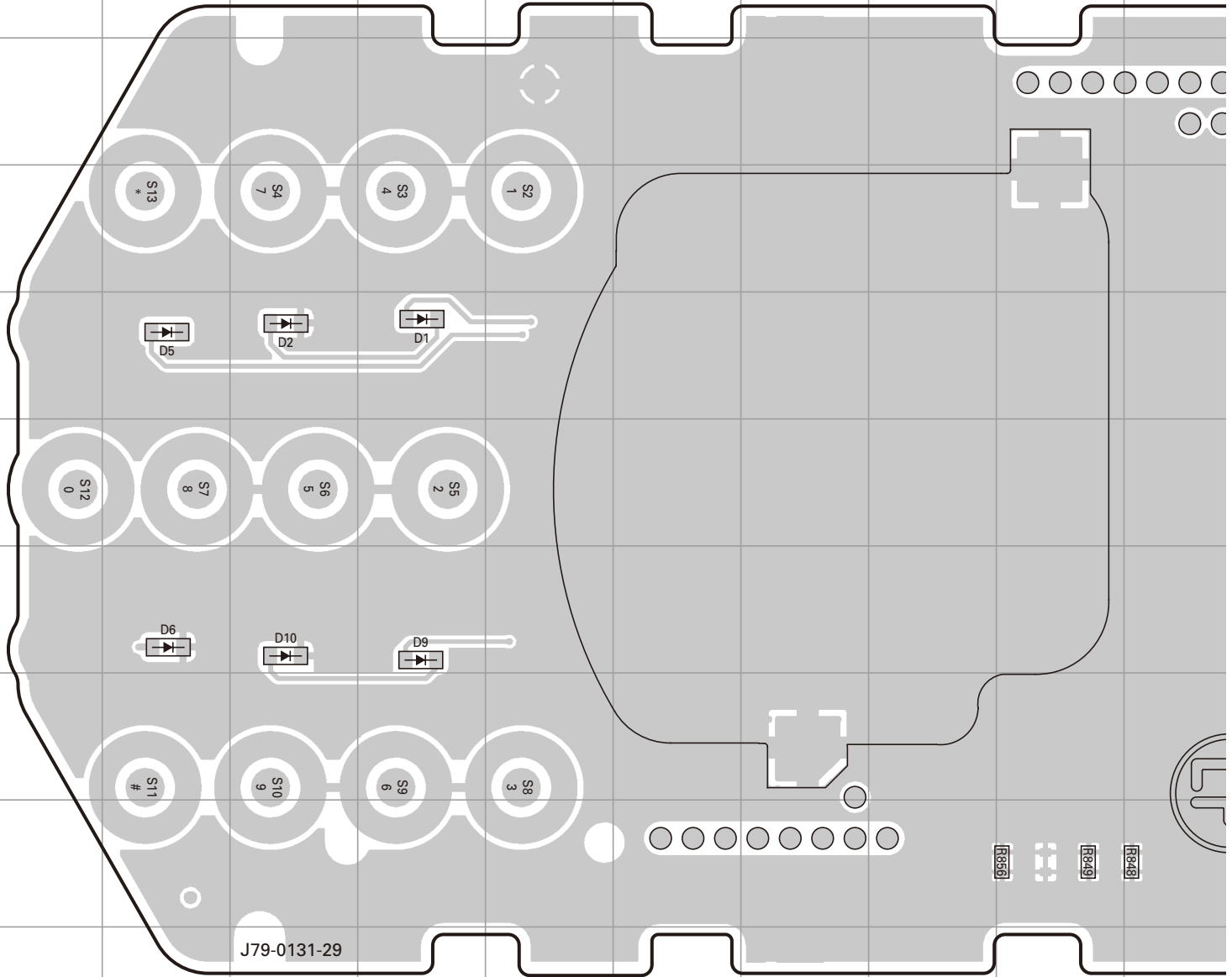
TERMINAL FUNCTION

CN737 Option board connector specification

Pin No.	Name	Device	I/O	Connection	Function
1	OPT1	ANI board	I	Aux Output	[COR] Conv/LTR L: Activity receiving H: Not activity receiving [TOR] Conv/LTR L: Activity receiving (Sub Tone or LTR ID is OK) H: Not activity receiving [LOK] Conv L: TX Complete H: Not TX Complete LTR L: TX Link Complete (until TX finishes) H: Not TX Link Complete
2	OPT3	ANI board	O	KEY	TX requirement output
3	26P_RD	ANI board	-	-	-
4	26P_TD	ANI board	-	-	-
5	NC	-	-	-	-
6	OPT4	ANI board	I	PTT	PTT signal input
7	OPT10	ANI board	-	-	-
8	OPT5	ANI board	I	Emergency	Emergency signal input
9	DGND	ANI board	-	A-	GND
10	AGND	ANI board	-	A-	GND
11	NC	-	-	-	-
12	NC	-	-	-	-
13	AGND	ANI board	-	A-	GND
14	5V	ANI board	-	-	Note: POW and 5V can not be used simultaneously.
15	OPT9	ANI board	O	Sidetone	Sidetone output
16	DTI	ANI board	O	Data Out	Data signal output
17	OPT8	ANI board	O	Tone Control	Speaker mute signal output
18	OPT11	ANI board	I	Man-Down	Man-Down input
19	OPT7	ANI board	O	MIC Mute	MIC mute signal output
20	OPT2	ANI board	O	Aux Output	Emergency signal output
21	TXO	ANI board	-	-	-
22	RXEO	ANI board	-	-	-
23	RXEI	ANI board	-	-	-
24	TXI	ANI board	-	-	-
25	OPT6	ANI board	-	-	-
26	POW	ANI board	I	A+	Switched B input

NX-300 PC BOARD

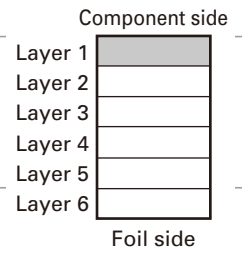
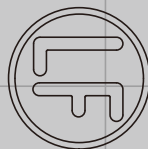
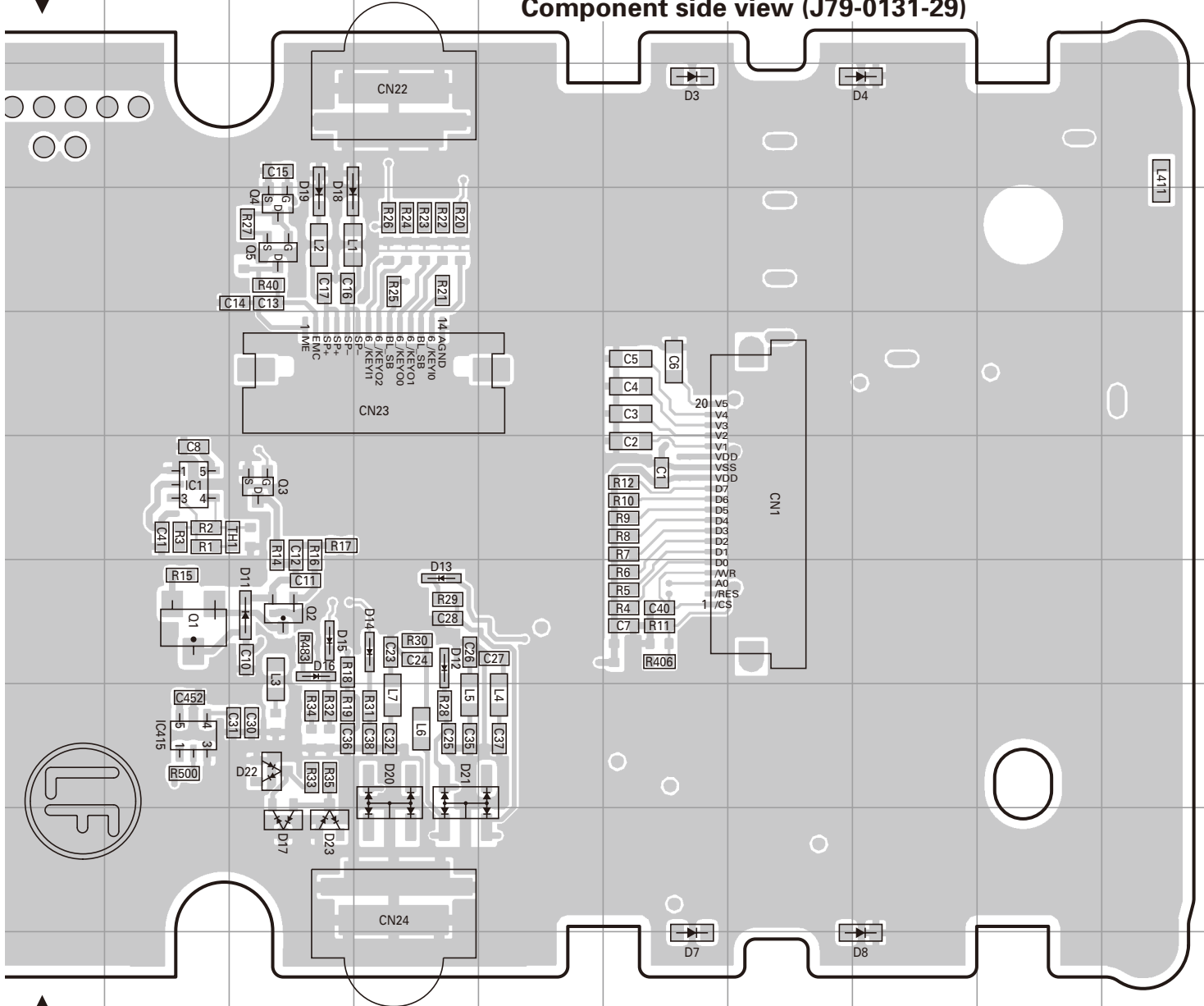
CONTROL UNIT (X53-4262-XX) -71: E4 -72: E
Component side view (J79-0131-29)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	6K	D4	3Q	D14	7M
IC415	8K	D5	5B	D15	7L
Q1	7K	D6	7B	D16	7L
Q2	7L	D7	10O	D17	9L
Q3	6L	D8	10Q	D18	4L
Q4	4L	D9	7D	D19	4L
Q5	4L	D10	7C	D20	8M
D1	5D	D11	7L	D21	8M
D2	5C	D12	7M	D22	8L
D3	3O	D13	7M	D23	9L

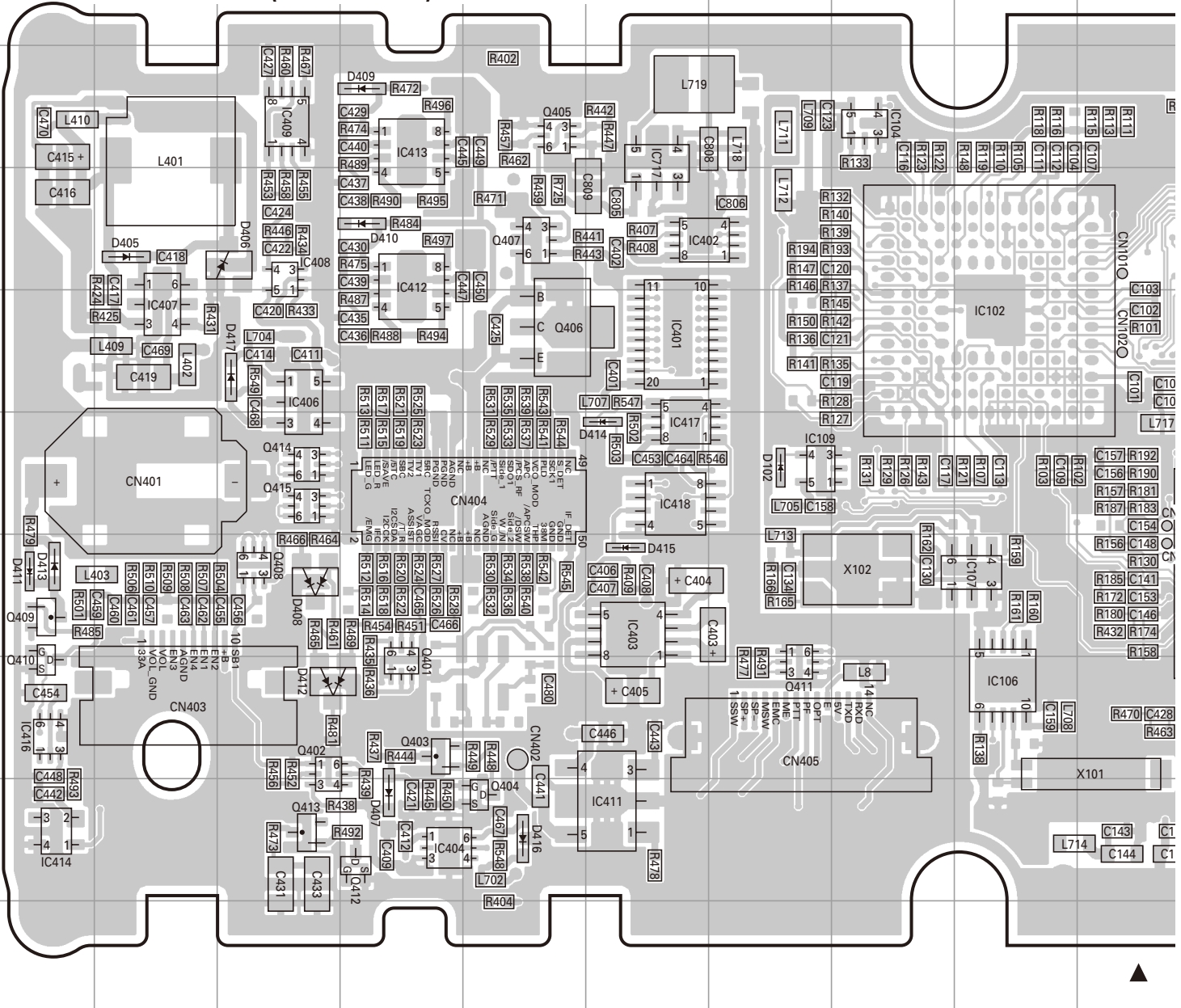
PC BOARD NX-300

CONTROL UNIT (X53-4262-XX) -71: E4 -72: E
Component side view (J79-0131-29)



NX-300 PC BOARD

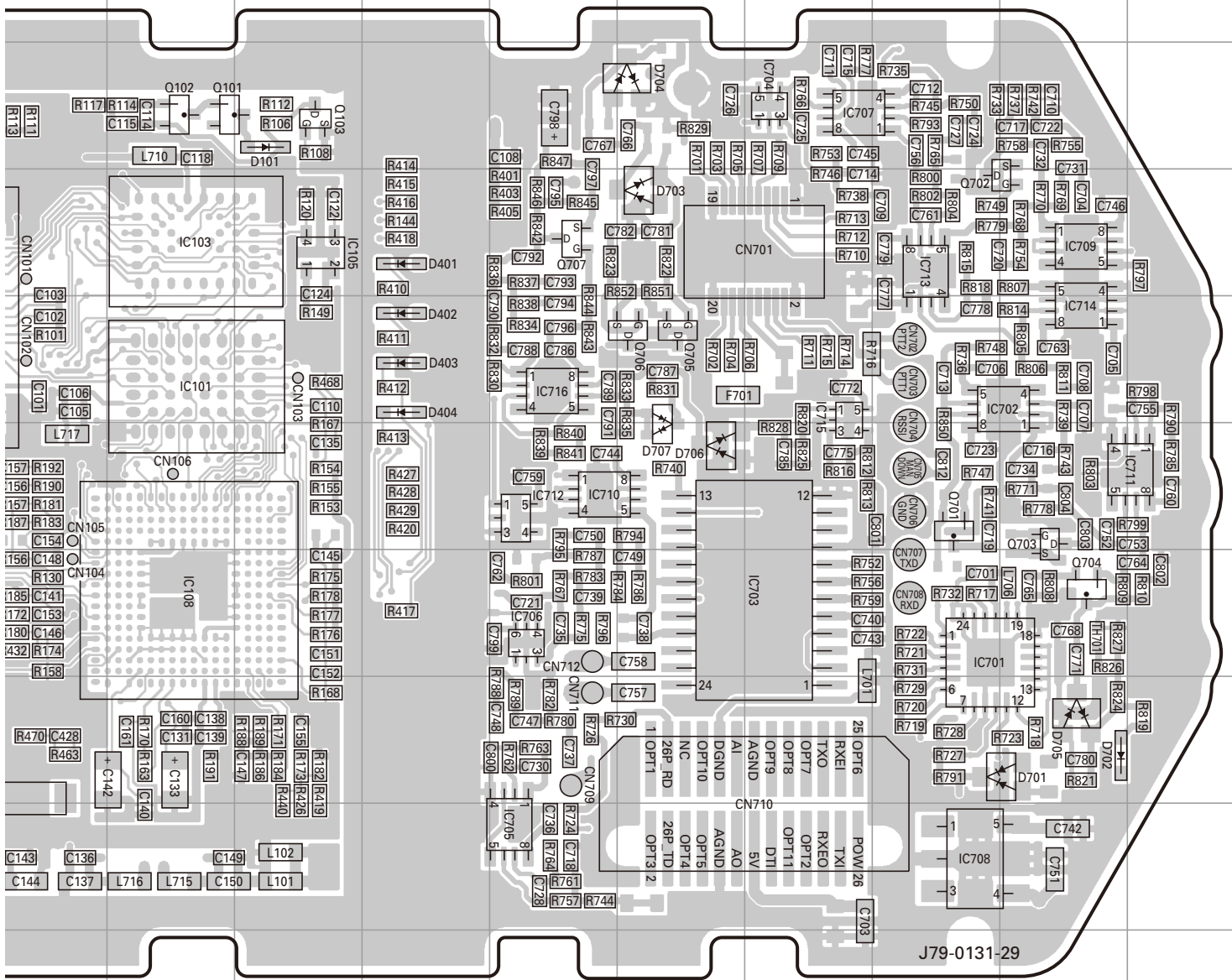
CONTROL UNIT (X53-4262-XX) -71: E4 -72: E
Foil side view (J79-0131-29)



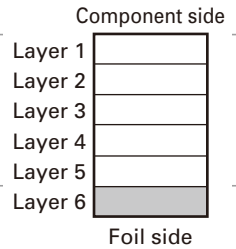
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IC101	5K	IC404	9D	IC701	7Q	IC713	4Q	Q405	3E	Q702	4R	D405	4B	D417	
IC102	5I	IC406	5C	IC702	5R	IC714	5R	Q406	5E	Q703	6R	D406	4C	D701	
IC103	4K	IC407	5B	IC703	7P	IC715	5P	Q407	4E	Q704	7R	D407	9D	D702	
IC104	3H	IC408	4C	IC704	3P	IC716	5N	Q408	7C	Q705	5O	D408	7C	D703	
IC105	4L	IC409	3C	IC705	9N	IC717	3F	Q409	7A	Q706	5O	D409	3D	D704	
IC106	8I	IC411	9F	IC706	7N	Q101	3K	Q410	8A	Q707	4N	D410	4D	D705	
IC107	7I	IC412	4D	IC707	3P	Q102	3K	Q411	8G	D101	3L	D411	7A	D706	
IC108	7K	IC413	3D	IC708	9Q	Q103	3L	Q412	9D	D102	6G	D412	8C	D707	
IC109	6G	IC414	9A	IC709	4R	Q401	8D	Q413	9C	D401	4M	D413	7A		
IC401	5F	IC416	8A	IC710	6N	Q402	8C	Q414	6C	D402	5M	D414	6F		
IC402	4F	IC417	6F	IC711	6S	Q403	8D	Q415	6C	D403	5M	D415	7F		
IC403	7F	IC418	6F	IC712	6N	Q404	9E	Q701	6Q	D404	5M	D416	9E		

PC BOARD NX-300

CONTROL UNIT (X53-4262-XX) -71: E4 -72: E
Foil side view (J79-0131-29)



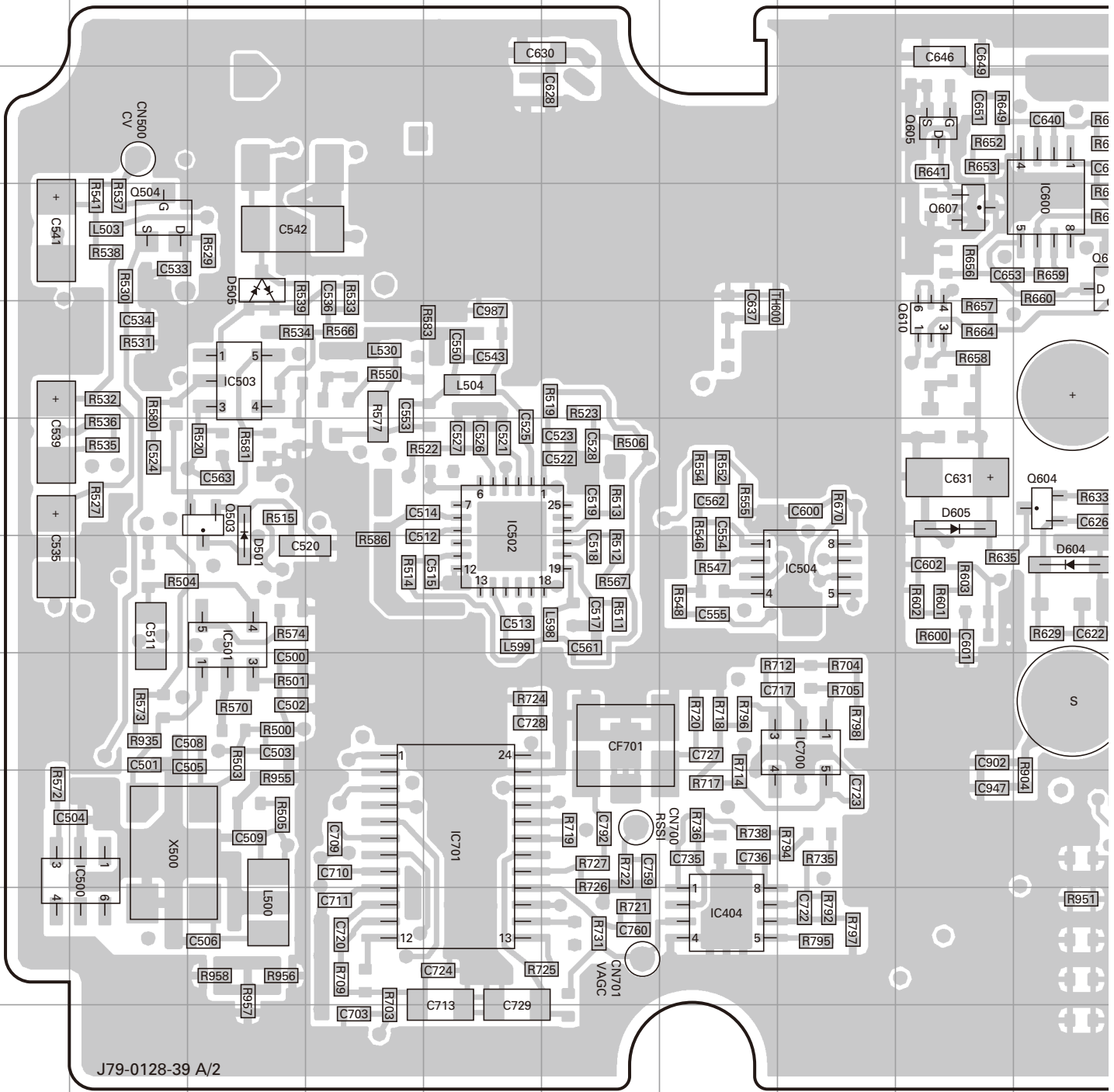
ss	Ref. No.	Address
	D417	5C
	D701	8R
	D702	8R
	D703	4O
	D704	3O
	D705	8R
	D706	6O
	D707	6O



NX-300 PC BOARD

TX-RX UNIT (X57-7370-11) (A/2)

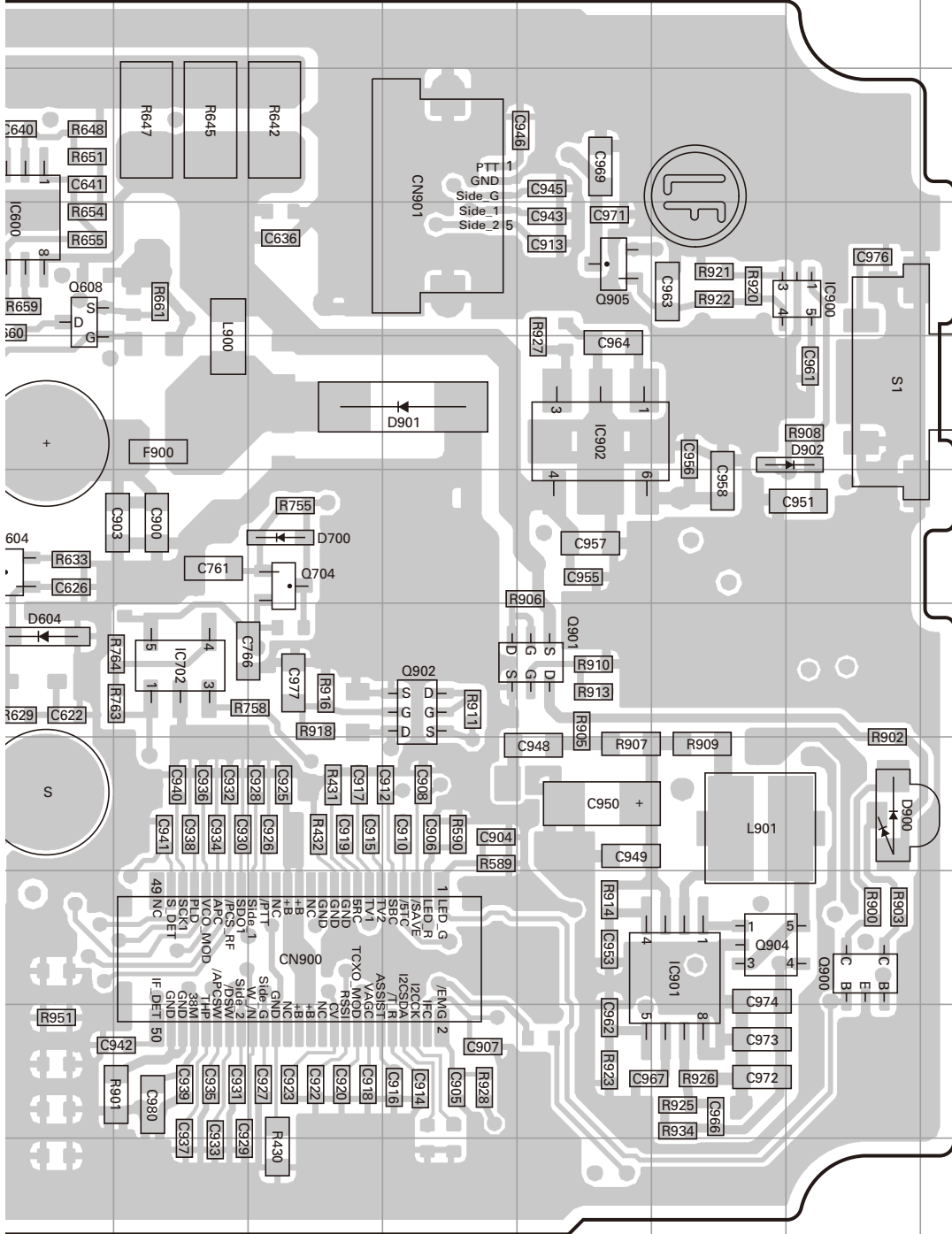
Component side view (J79-0128-39 A/2)



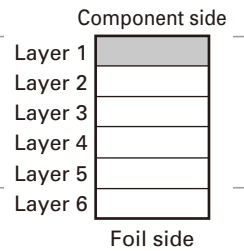
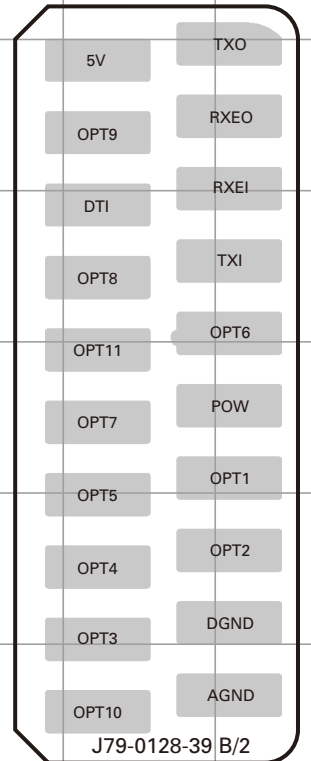
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC404	10G	IC700	8H	Q504	4B	Q900	9P	D604	7J
IC500	9B	IC701	9E	Q604	6J	Q901	7N	D605	6I
IC501	7C	IC702	7K	Q605	3I	Q902	7M	D700	6L
IC502	7E	IC900	4P	Q607	4I	Q904	9O	D900	8P
IC503	5C	IC901	9O	Q608	4J	Q905	4N	D901	5M
IC504	7H	IC902	5N	Q610	5I	D501	7C	D902	5P
IC600	4J	Q503	6C	Q704	6L	D505	4C		

PC BOARD NX-300

TX-RX UNIT (X57-7370-11) (A/2) Component side view (J79-0128-39 A/2)



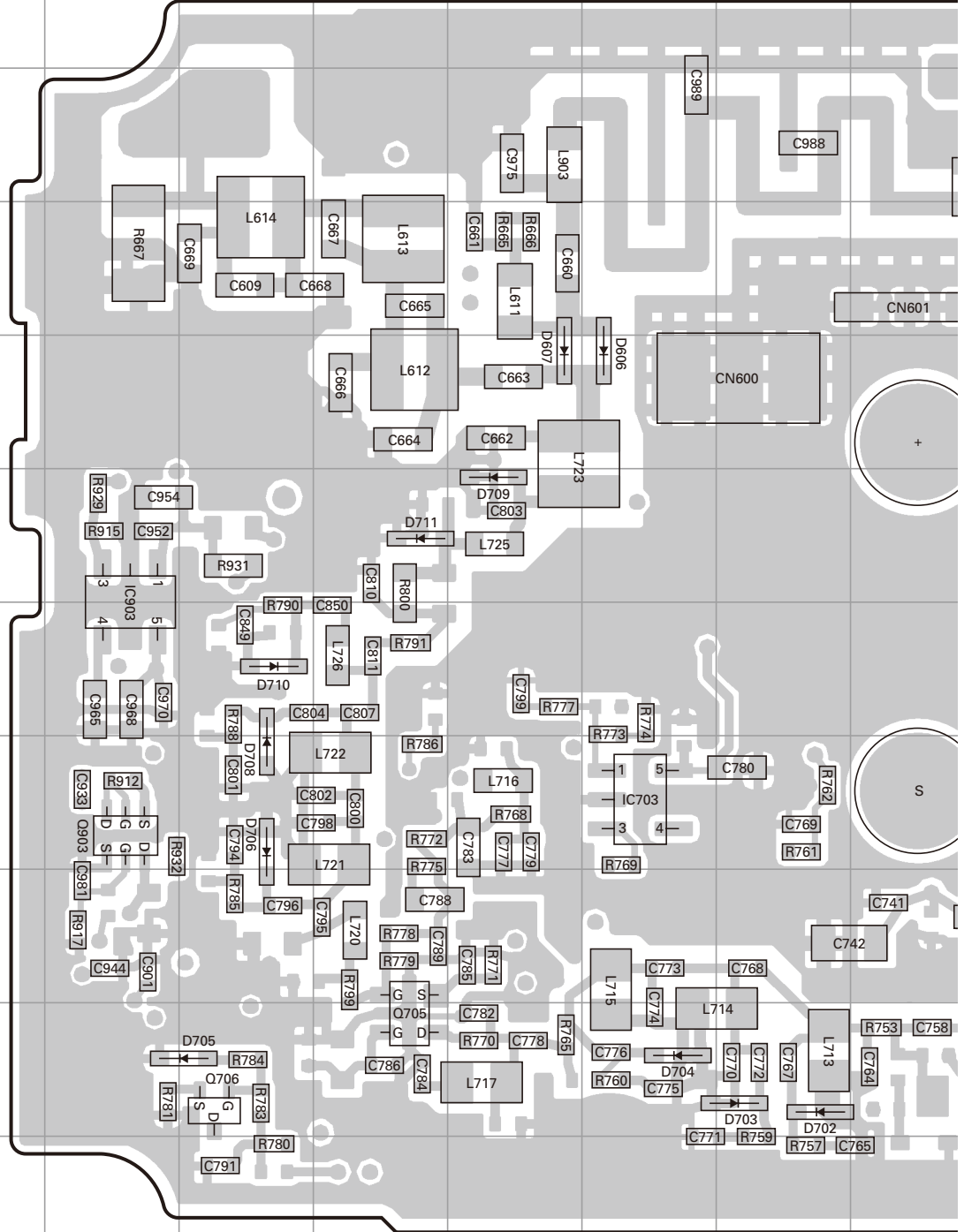
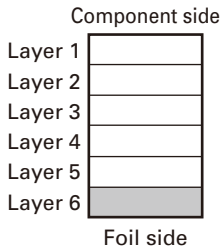
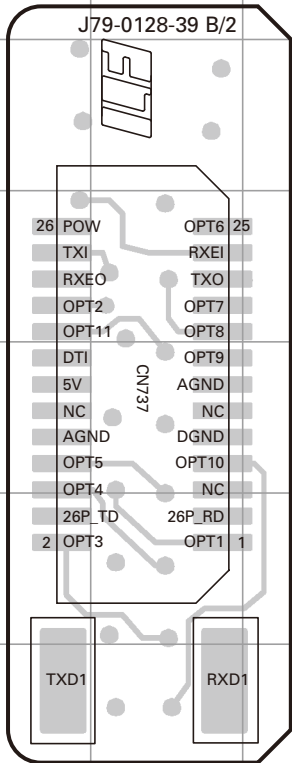
TX-RX UNIT (X57-7370-11) (B/2)



NX-300 PC BOARD

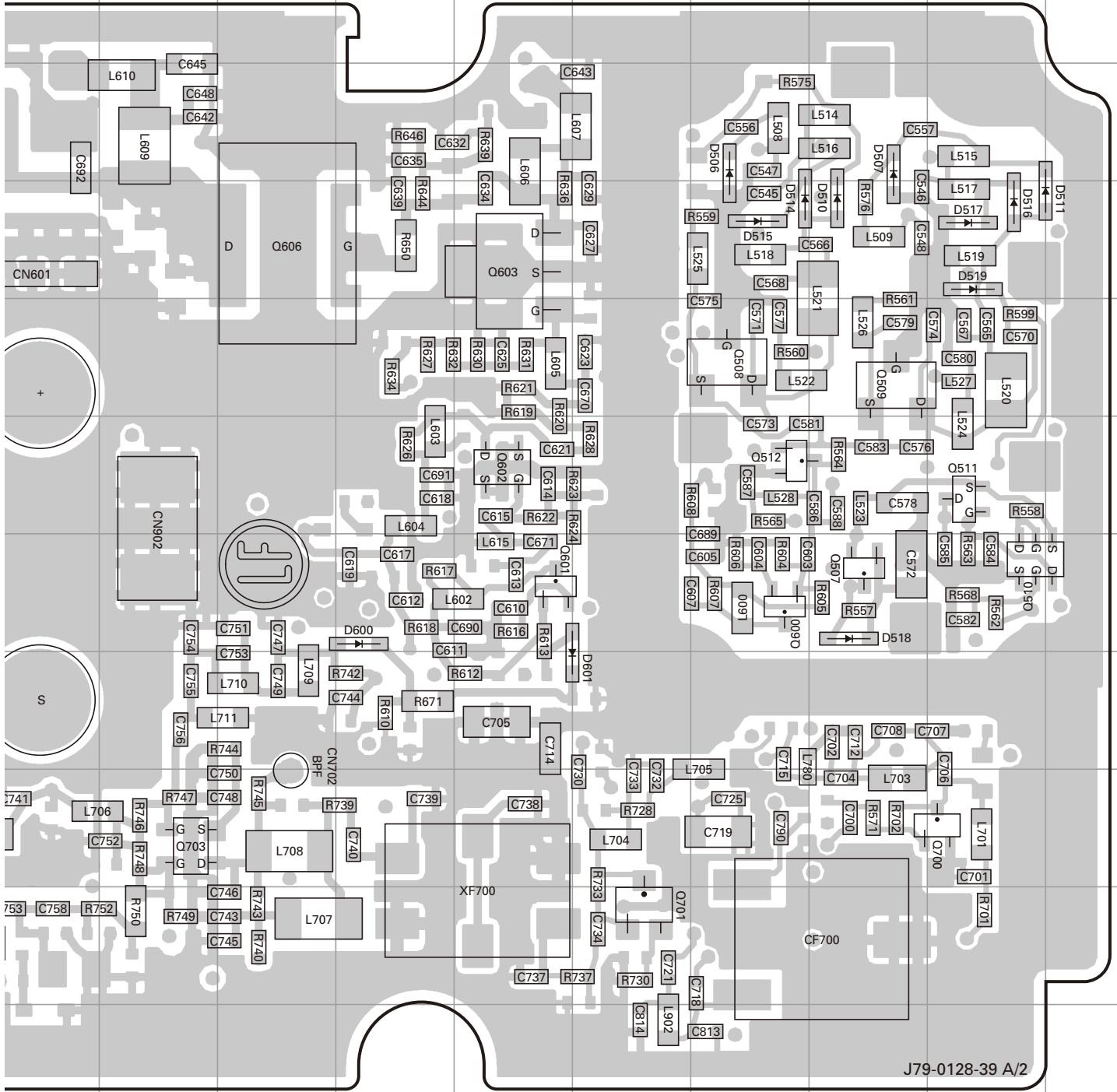
TX-RX UNIT (X57-7370-11) (A/2)
Foil side view (J79-0128-39 A/2)

TX-RX UNIT (X57-7370-11) (B/2)



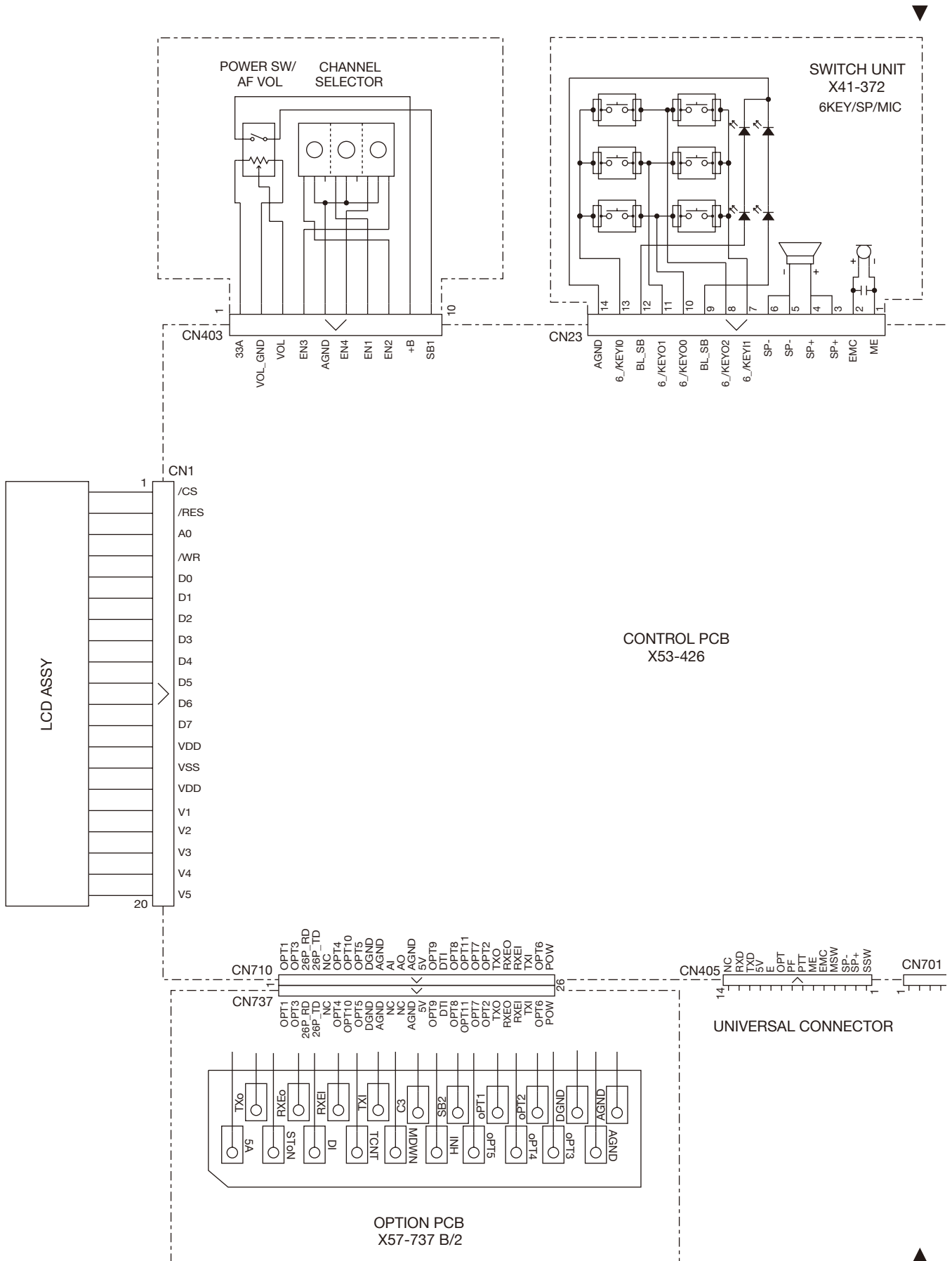
PC BOARD NX-300

TX-RX UNIT (X57-7370-11) (A/2)
Foil side view (J79-0128-39 A/2)

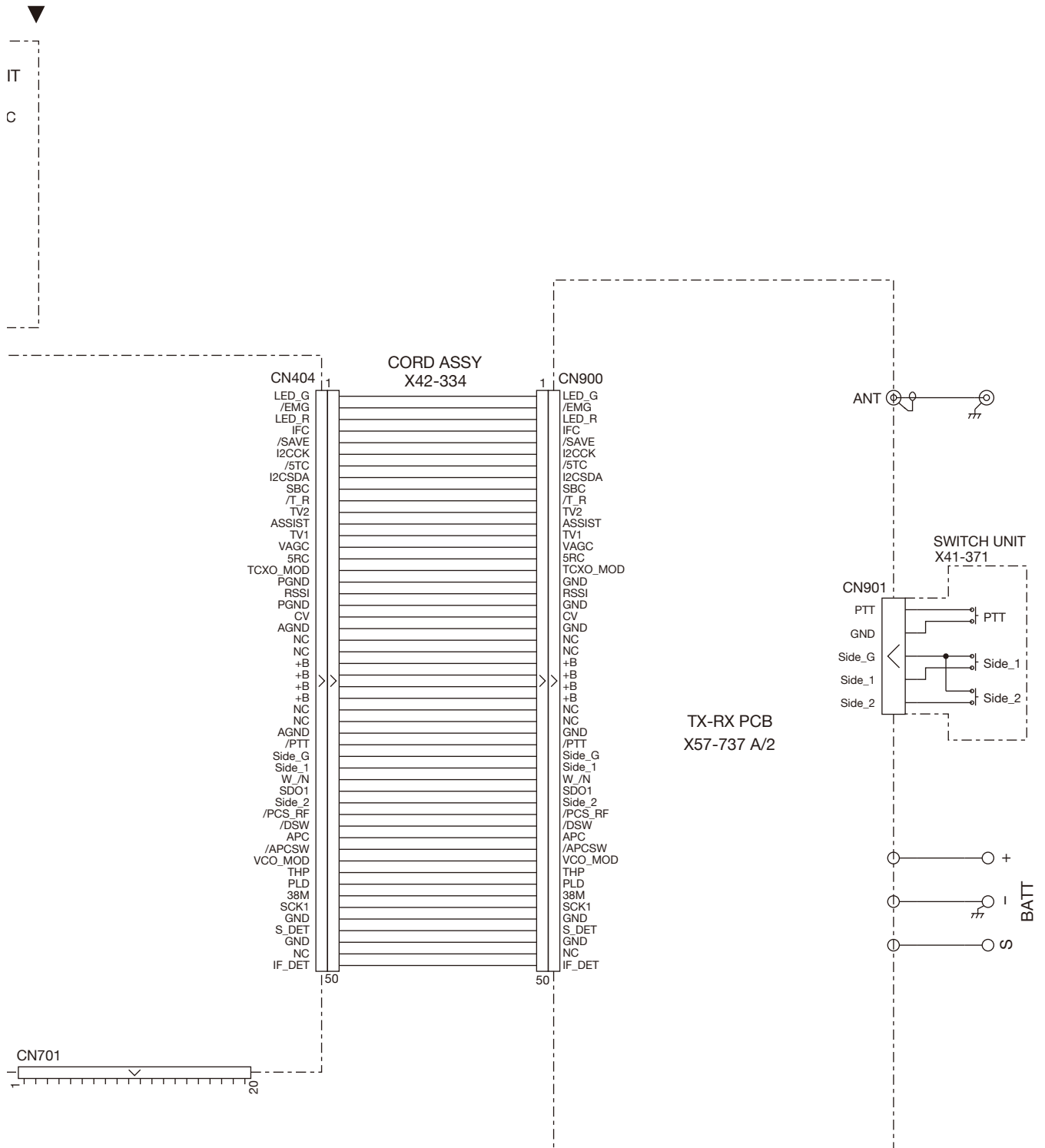


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IC703	8H	Q512	6P	Q701	10O	D510	4Q	D519	4R	D704	10H
IC903	7D	Q600	7P	Q703	9K	D511	4S	D600	7M	D705	10E
Q507	7Q	Q601	7N	Q705	10F	D514	4P	D601	8O	D706	8E
Q508	5P	Q602	6N	Q706	10E	D515	4P	D606	5H	D708	8E
Q509	5Q	Q603	4N	Q903	8D	D516	4R	D607	5G	D709	6G
Q510	7R	Q606	4L	D506	3P	D517	4R	D702	10I	D710	7E
Q511	6R	Q700	9R	D507	3Q	D518	7Q	D703	10I	D711	6F

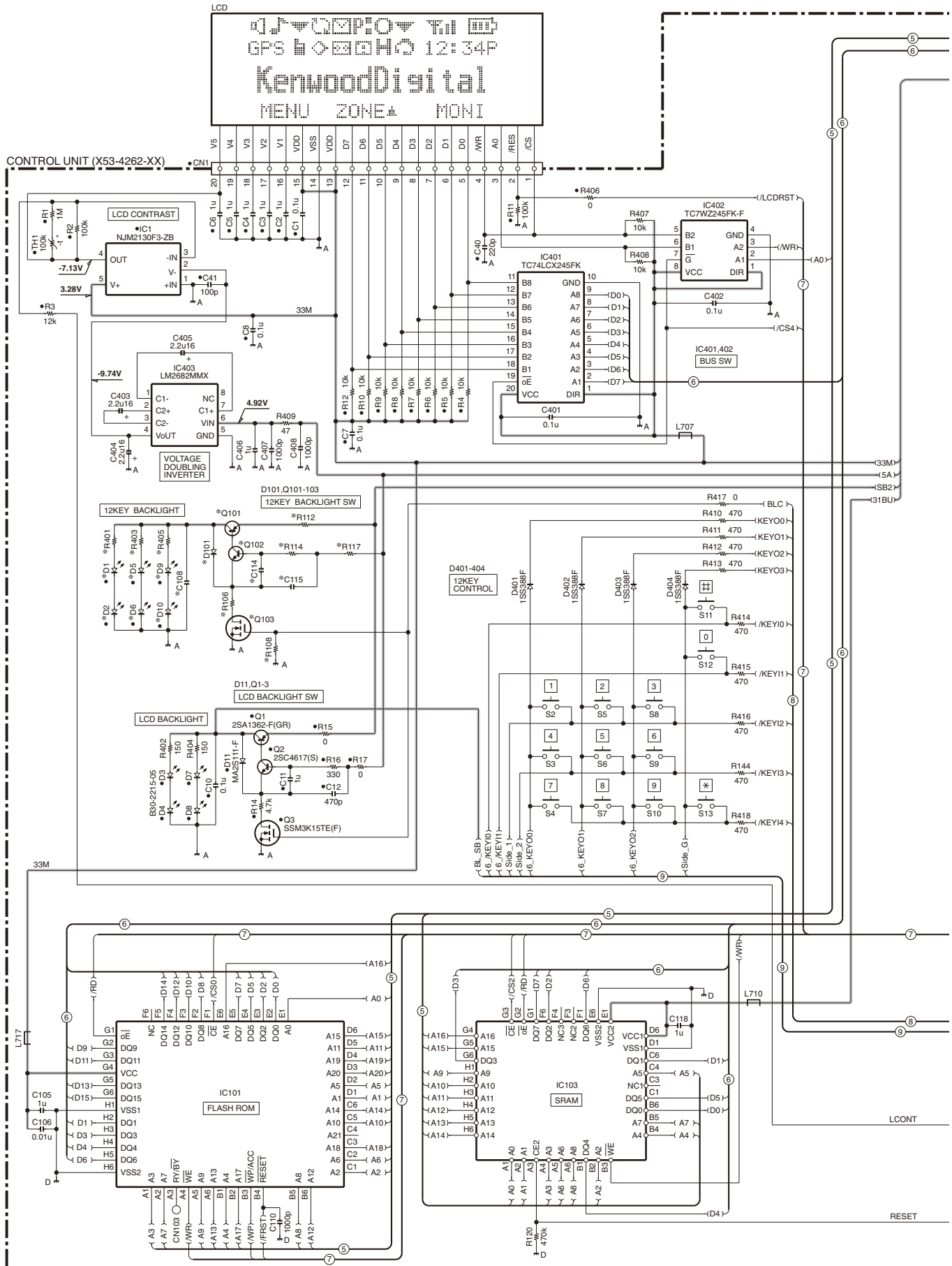
INTERCONNECTION DIAGRAM



INTERCONNECTION DIAGRAM



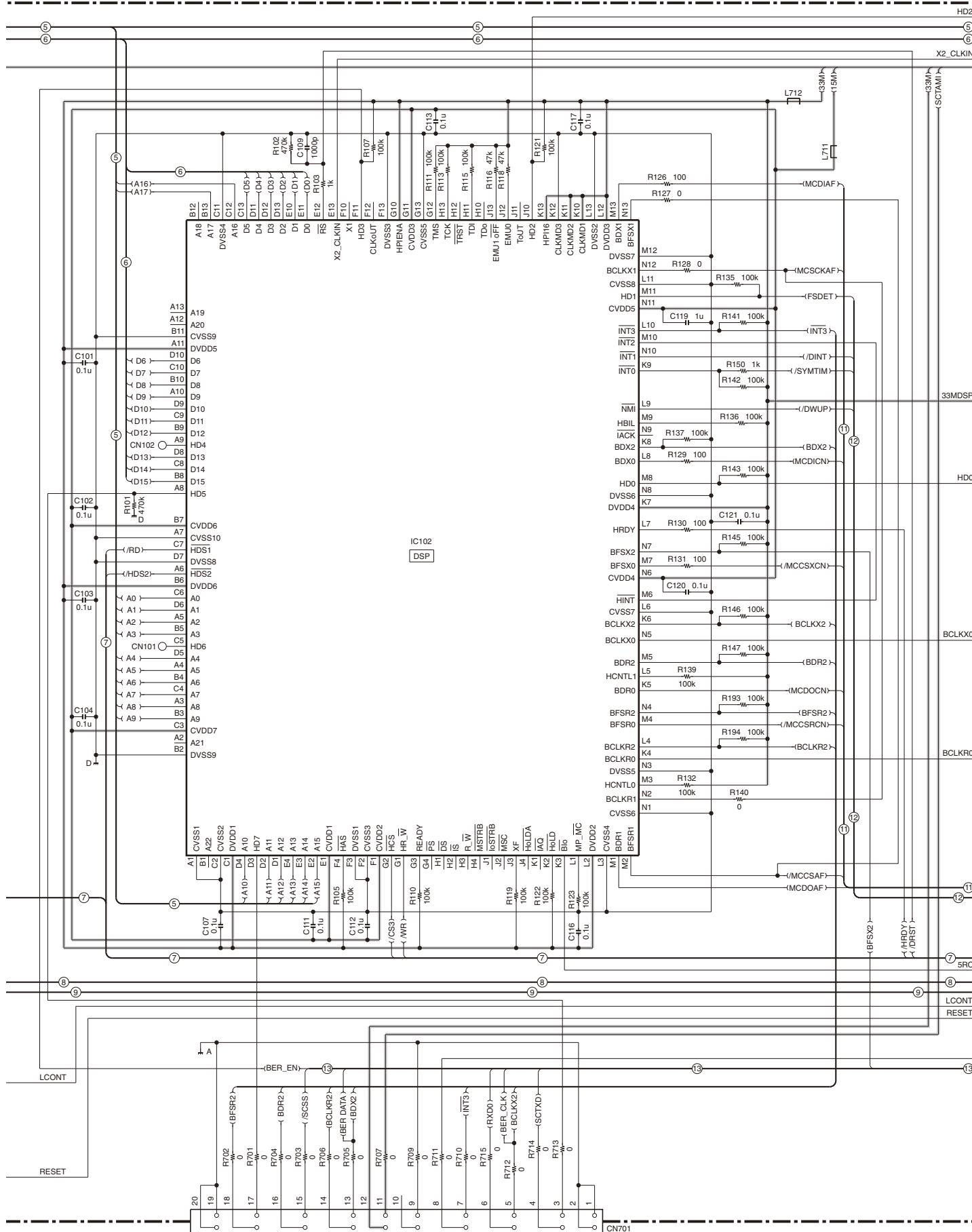
NX-300 SCHEMATIC DIAGRAM



X53-4262-XX	D1	D2	D5	D6	D9	D10	D101	Q101	Q102	Q103	R106	R108	R112	R114	R117	R401	R403	R405	C108	C114	C115	
-71	E4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
-72	E	B30-2215-05	B30-2215-05	B30-2215-05	B30-2215-05	B30-2215-05	B30-2215-05	MA2S111-F	2SA1832-(GR)F	2SC4617(S)	4.7k	470k	0	330	0	1.5k	1.5k	1.5k	0.1u	1u	470p	

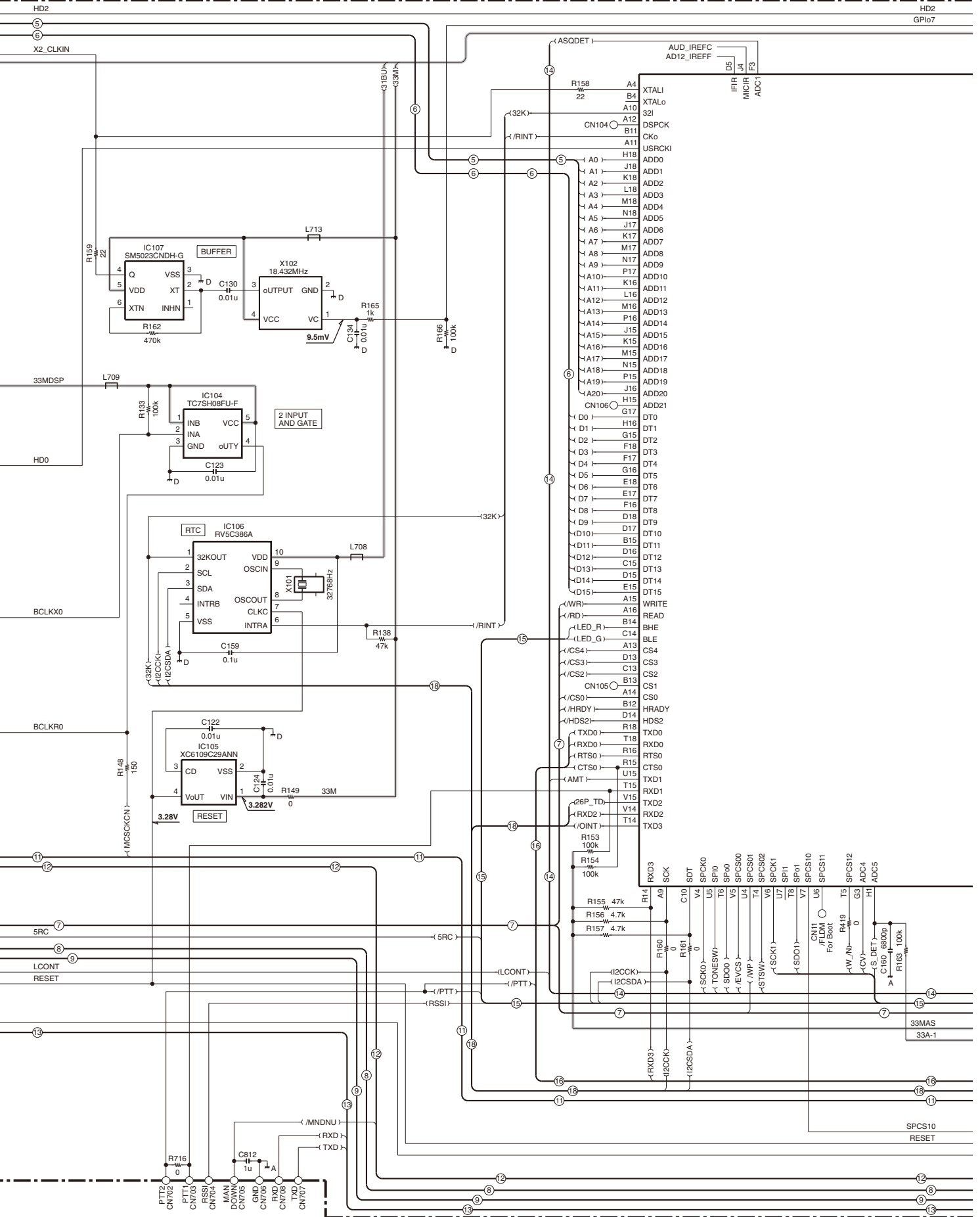
SCHEMATIC DIAGRAM NX-300

CONTROL UNIT (X53-426-XX)



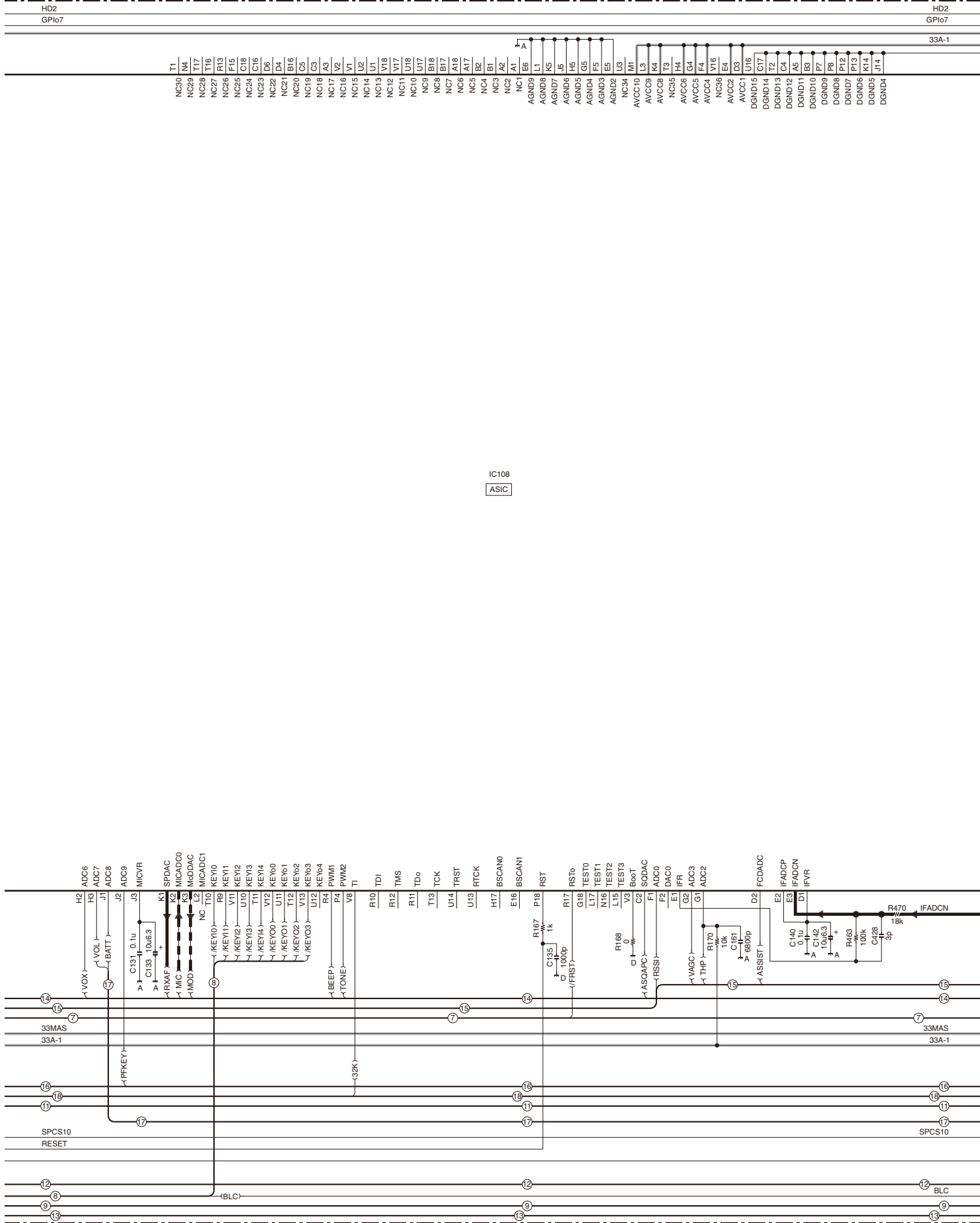
NX-300 SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4262-XX)



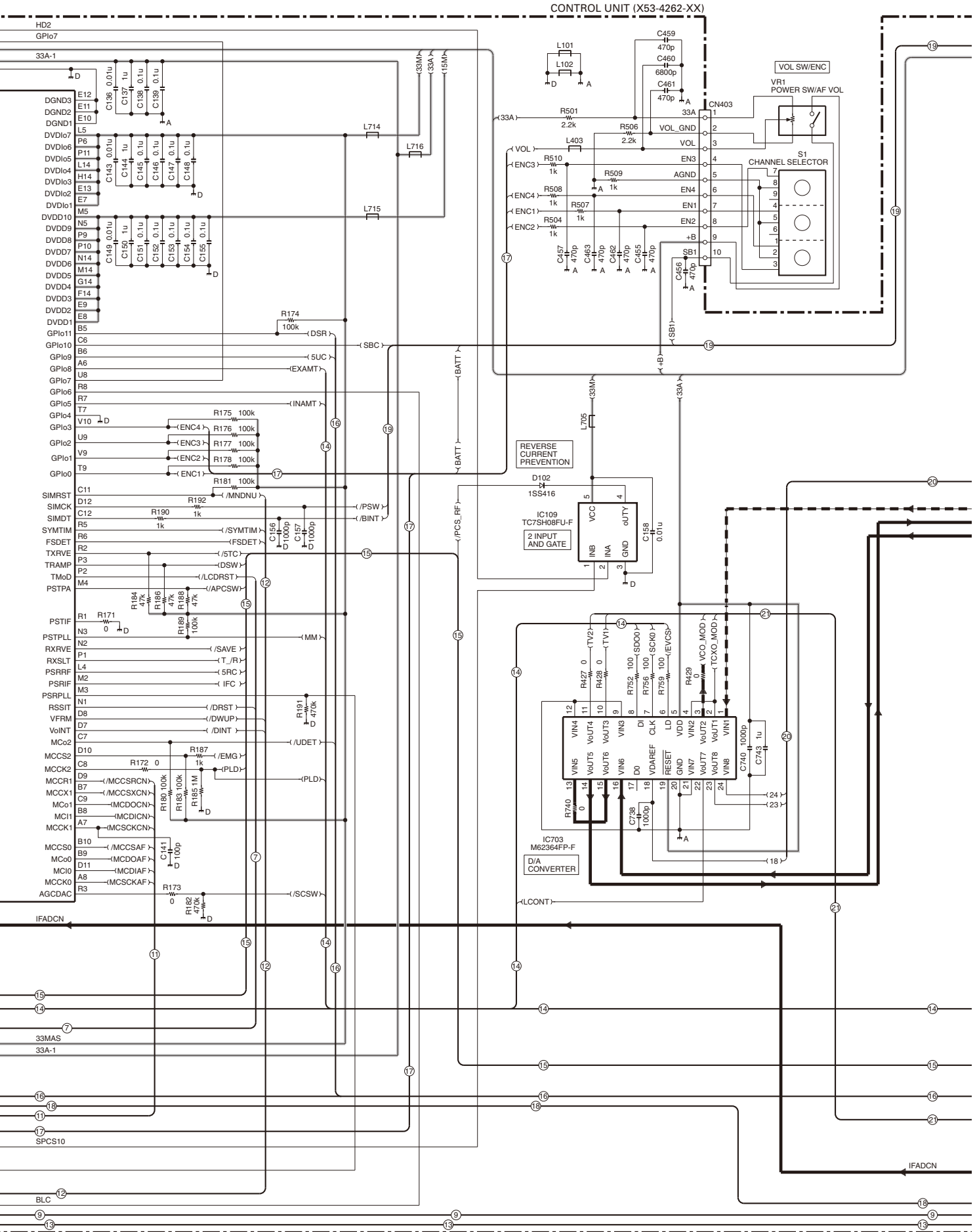
SCHEMATIC DIAGRAM NX-300

CONTROL UNIT (X53-4262-XX)



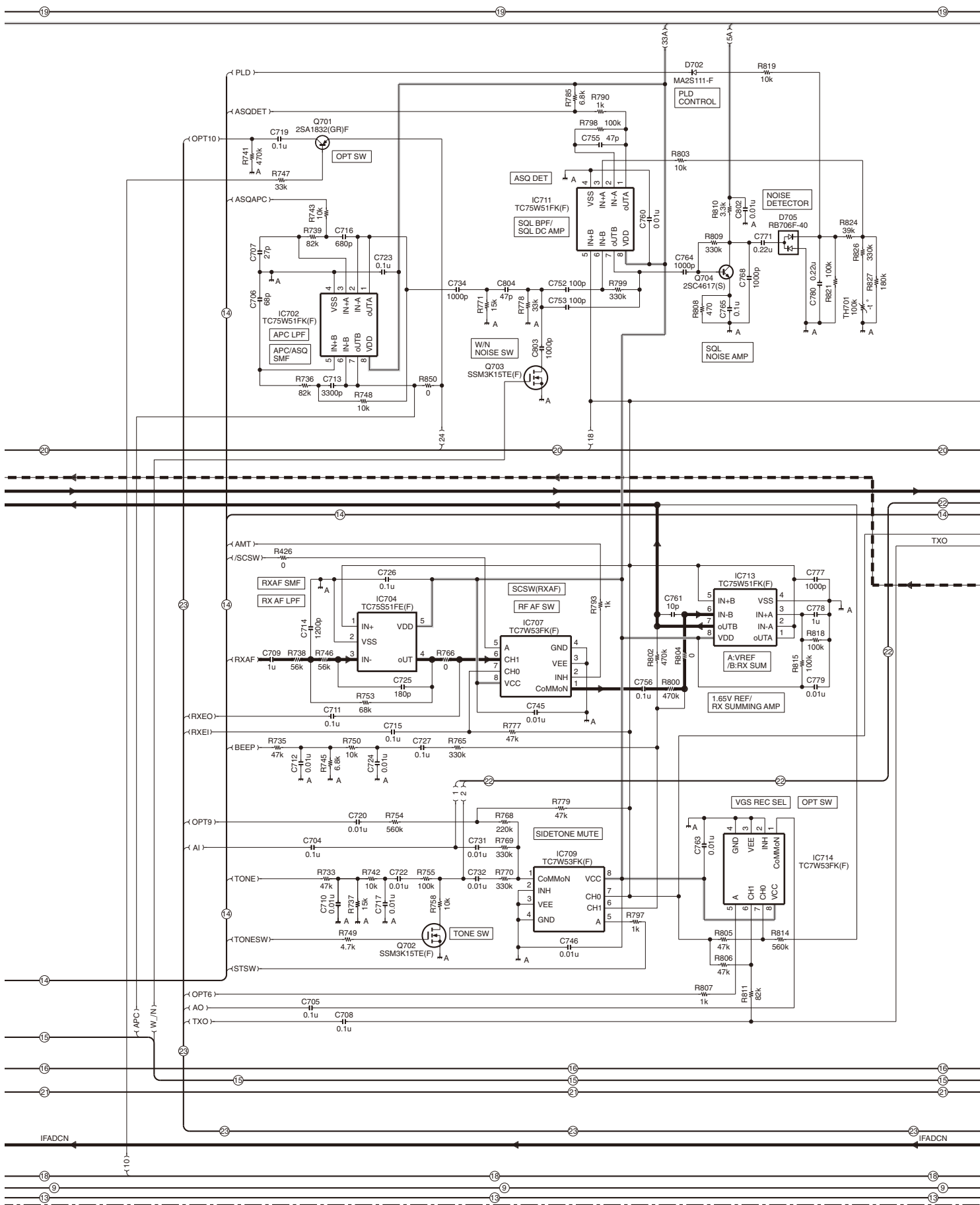
IC108
 ASIC

NX-300 SCHEMATIC DIAGRAM



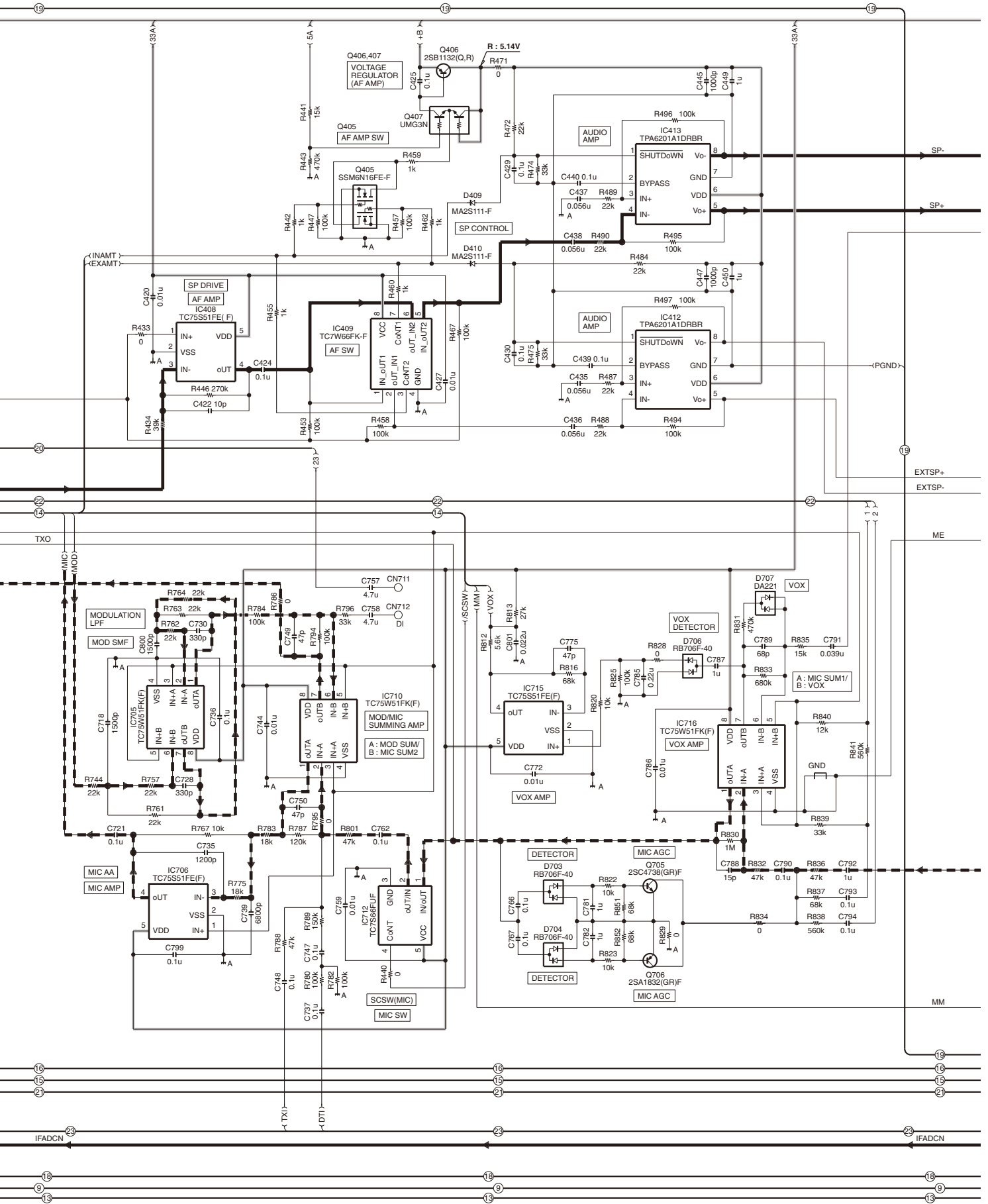
SCHEMATIC DIAGRAM NX-300

CONTROL UNIT (X53-4262-XX)



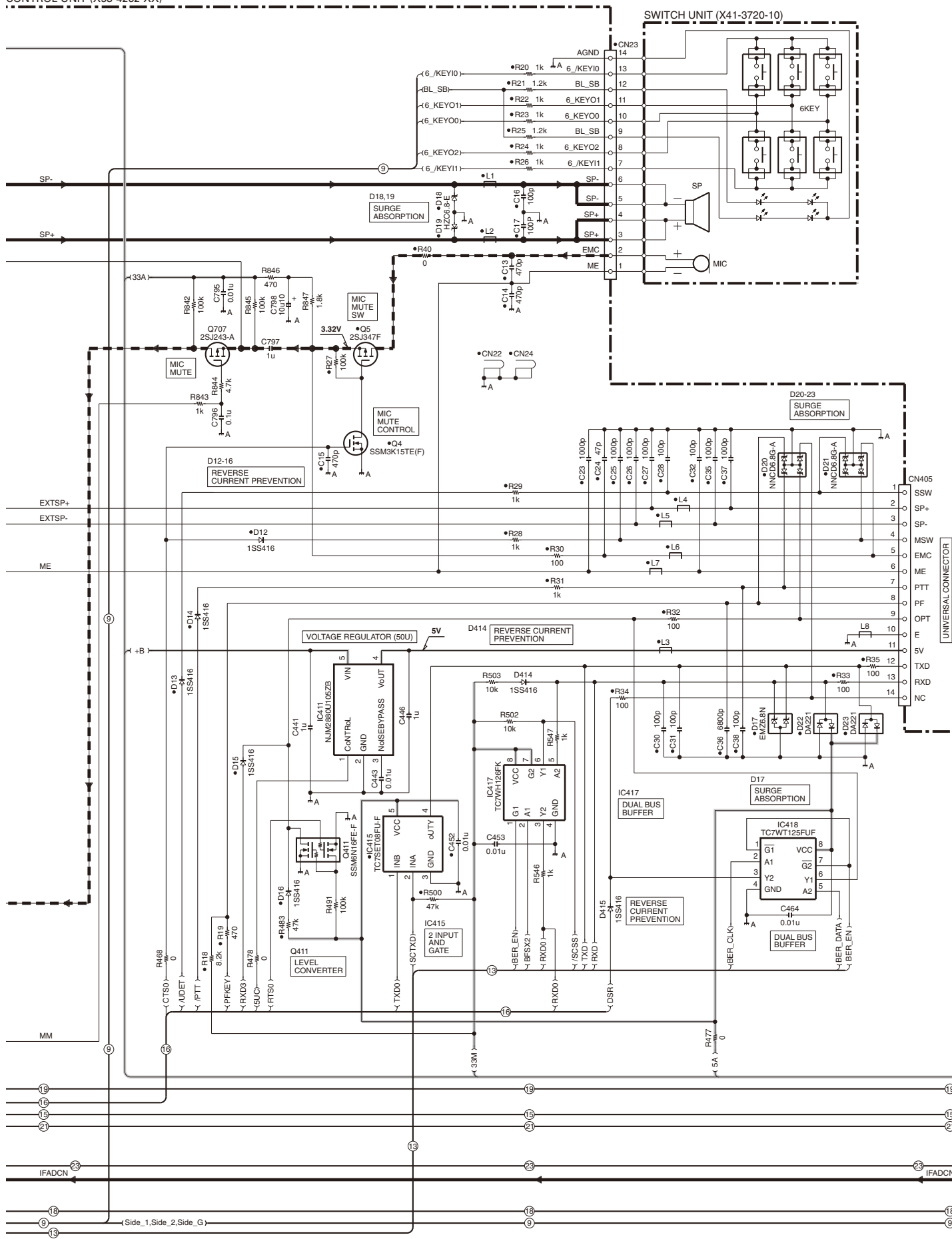
NX-300 SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4262-XX)



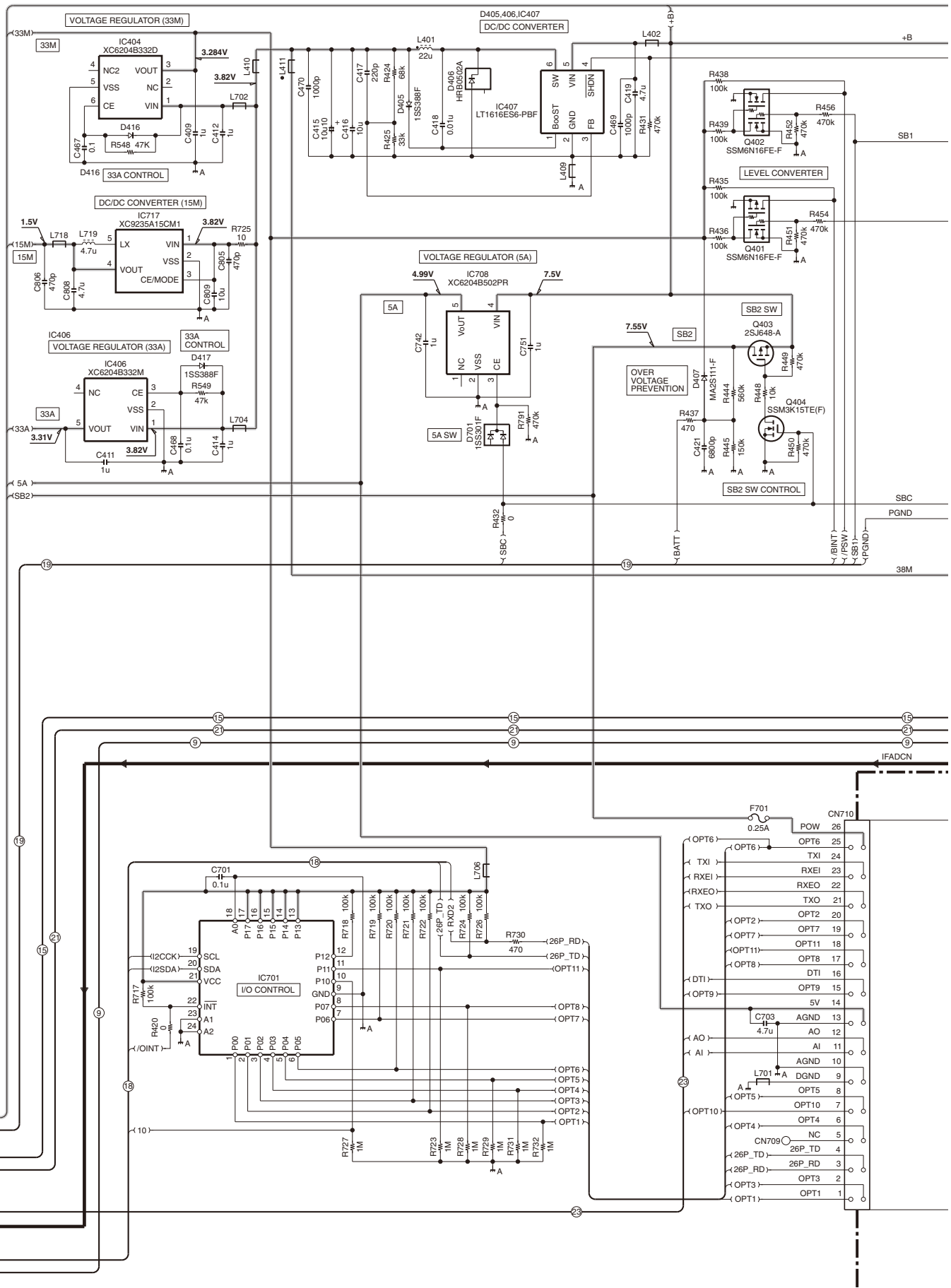
SCHEMATIC DIAGRAM NX-300

CONTROL UNIT (X53-4262-XX)



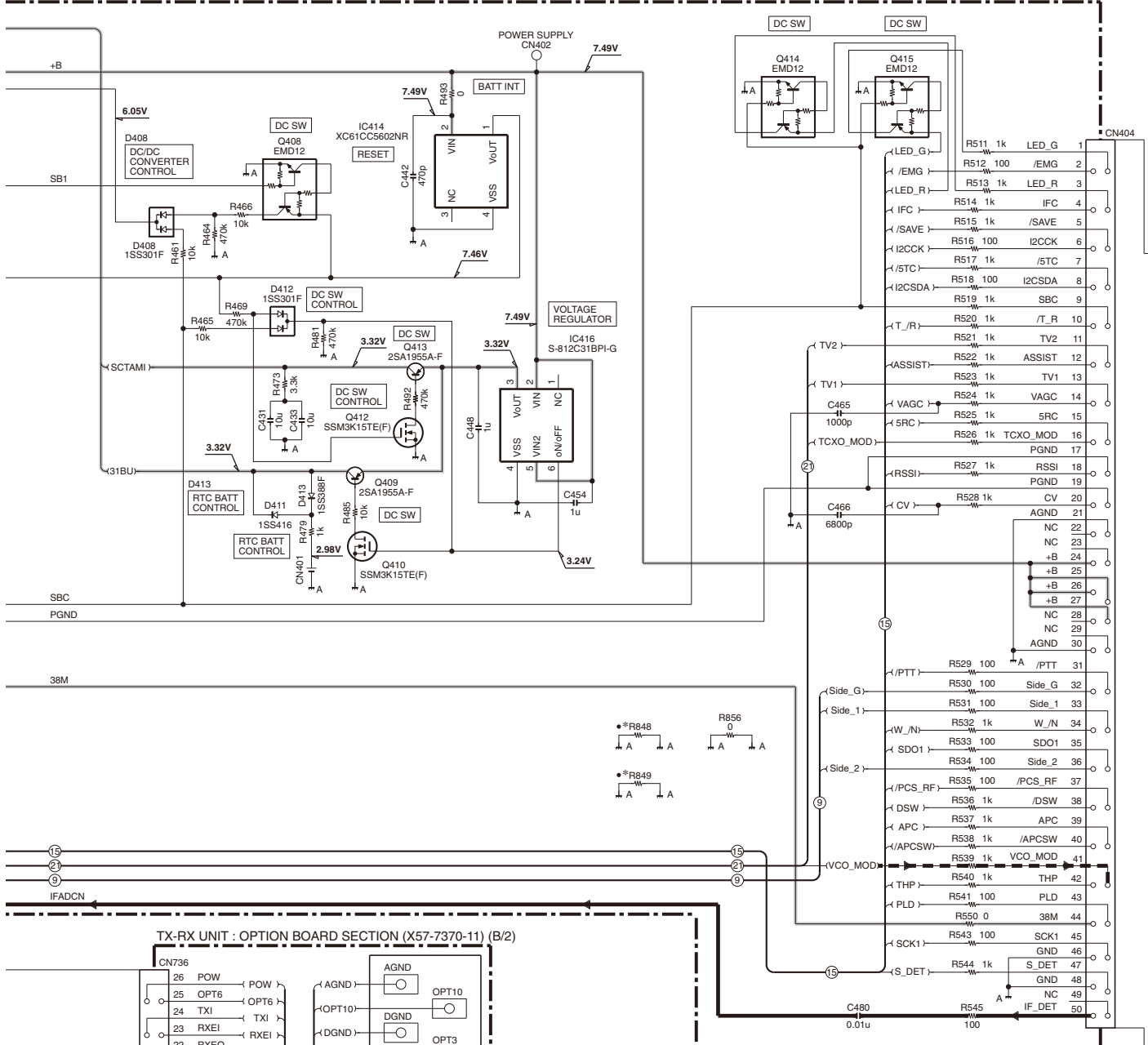
NX-300 SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4262-XX)



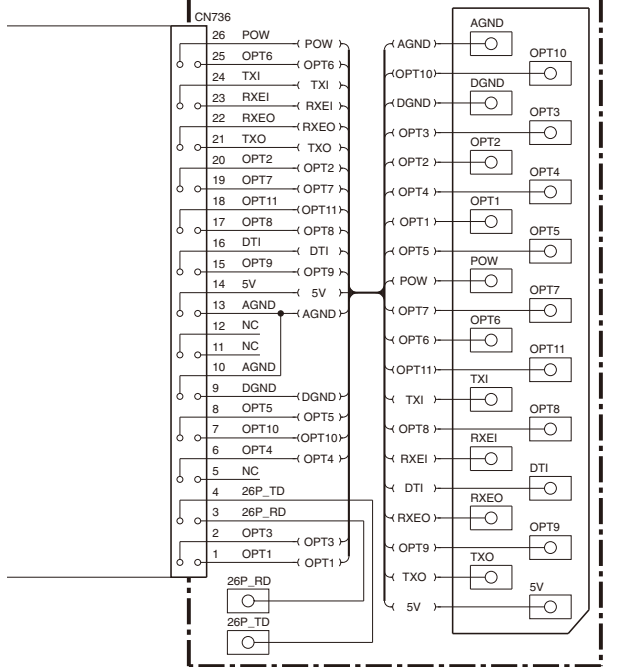
SCHEMATIC DIAGRAM NX-300

CONTROL UNIT (X53-4262-XX)



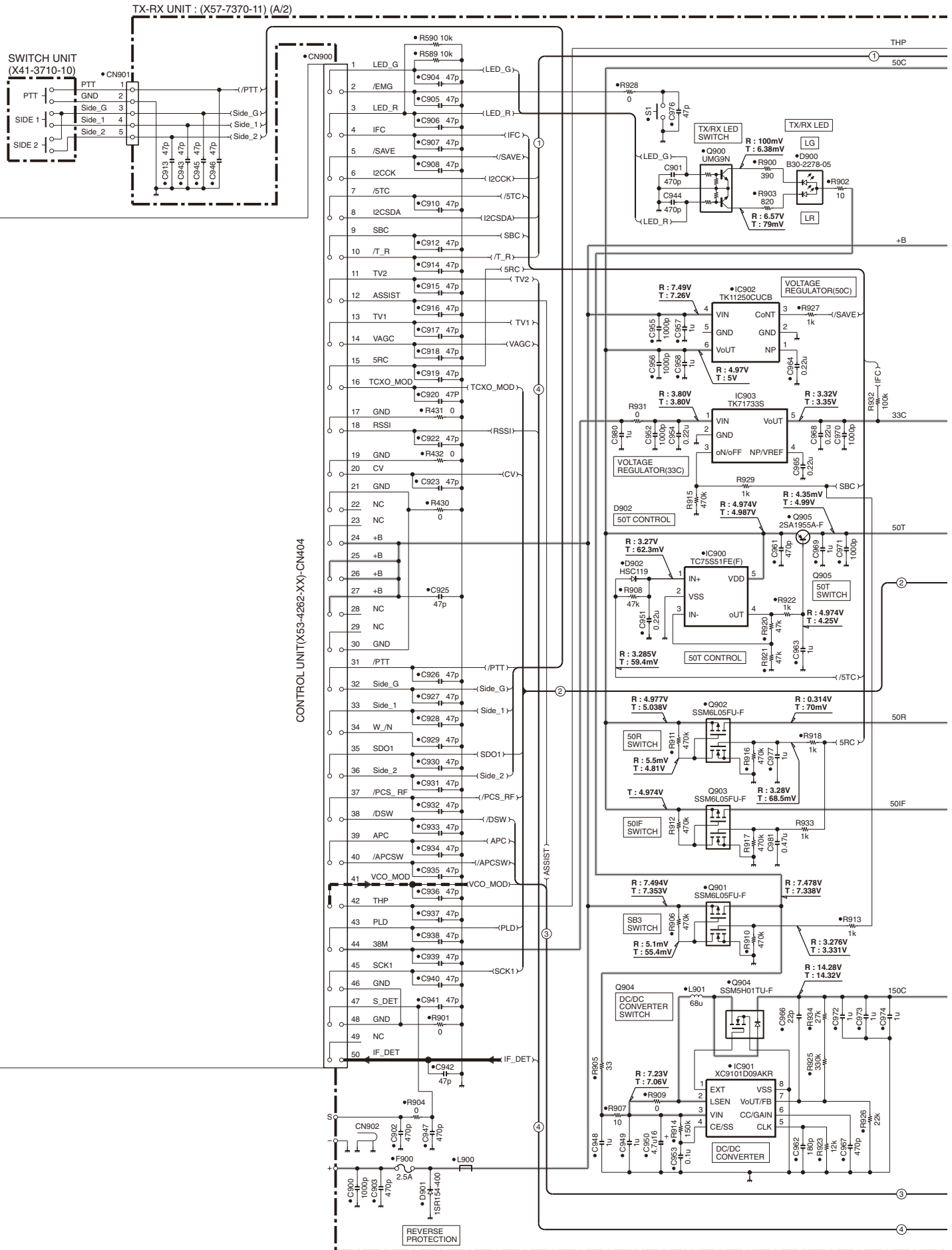
TX-RX UNIT (X57-7370-11) (A/2)-CN900

TX-RX UNIT : OPTION BOARD SECTION (X57-7370-11) (B/2)



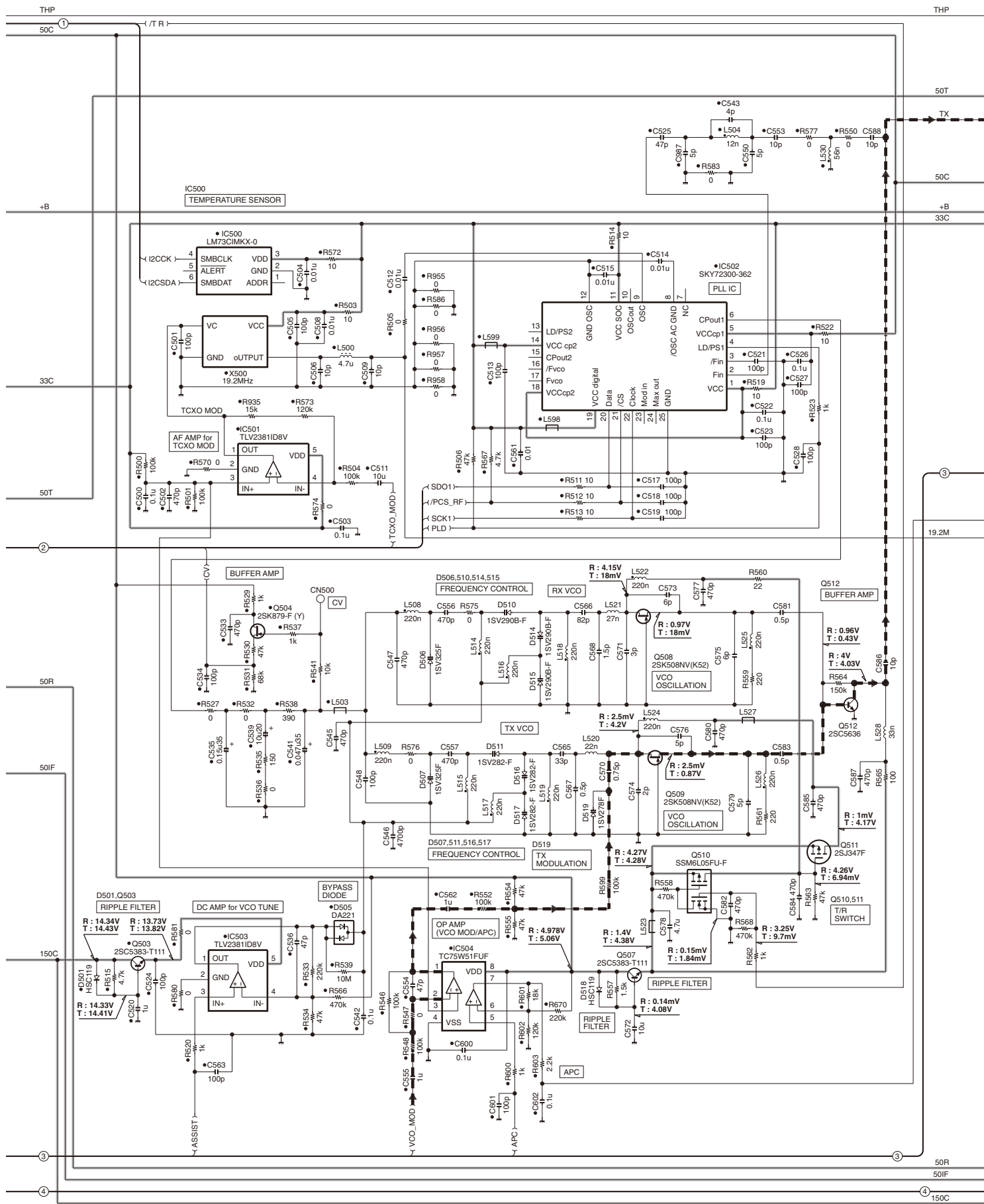
X53-4262-XX	R848	R849
-71	E4	0 NO
-72	E	NO 0

NX-300 SCHEMATIC DIAGRAM



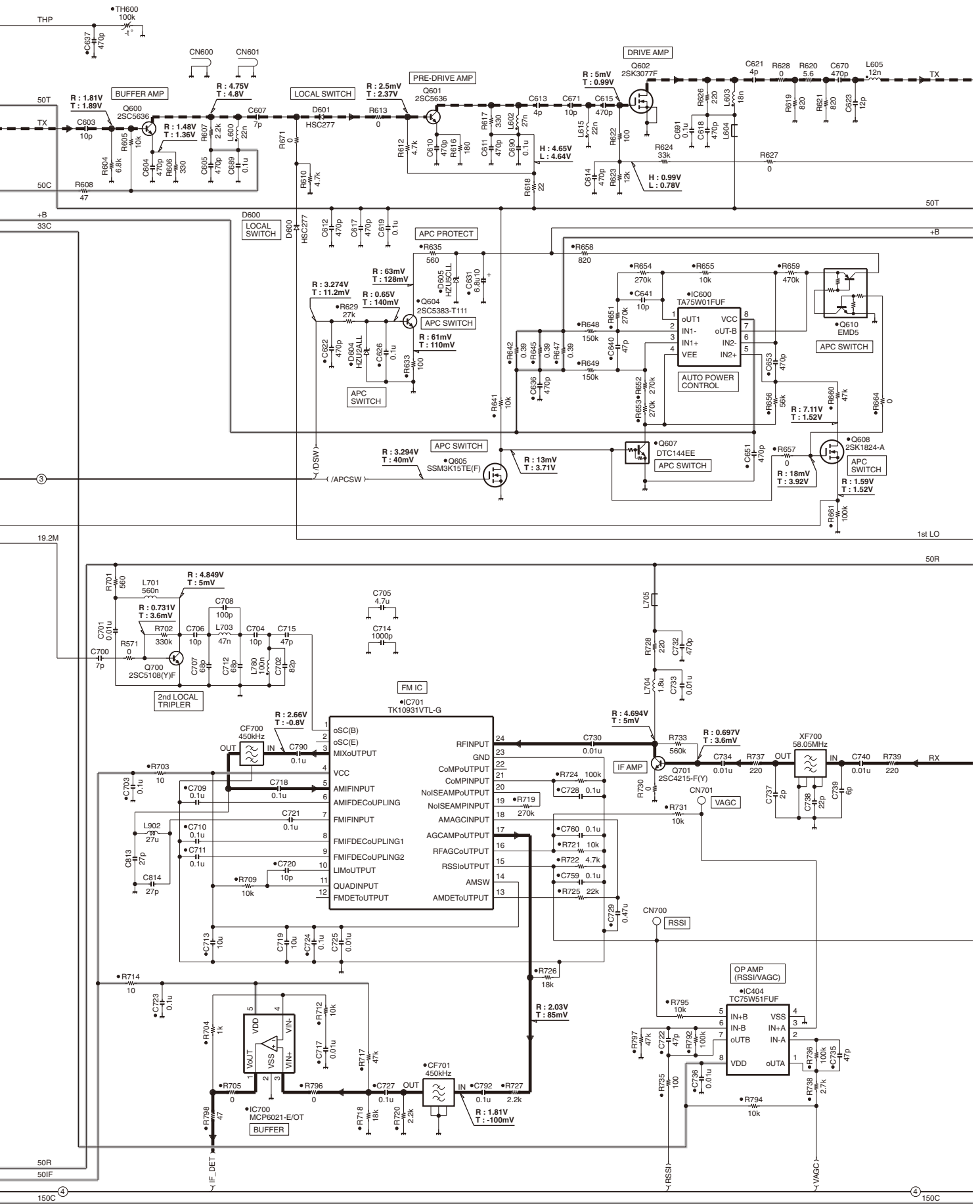
SCHEMATIC DIAGRAM NX-300

TX-RX UNIT (X57-7370-11) (A/2)



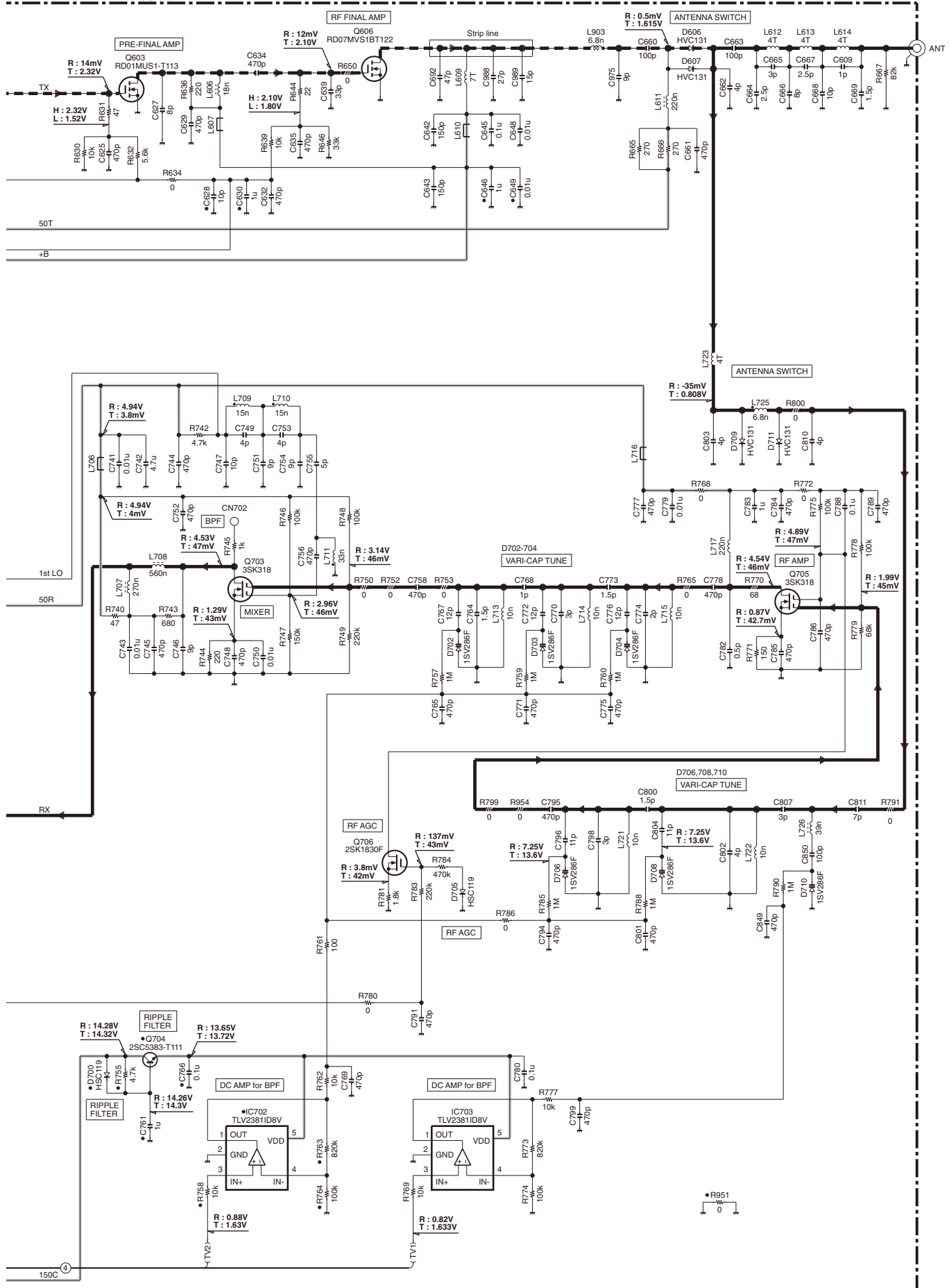
NX-300 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7370-11) (A/2)



SCHEMATIC DIAGRAM NX-300

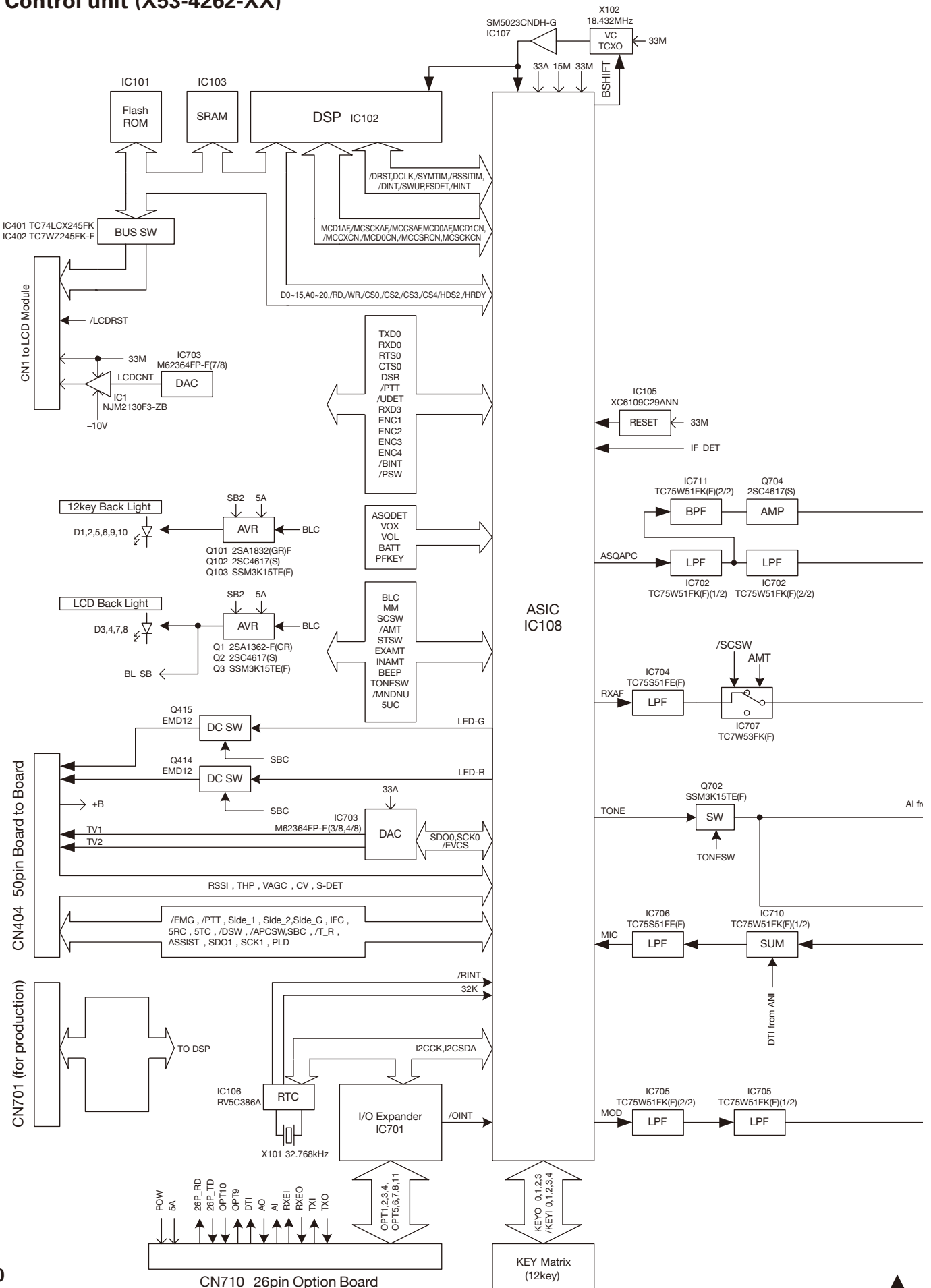
TX-RX UNIT (X57-7370-11) (A/2)



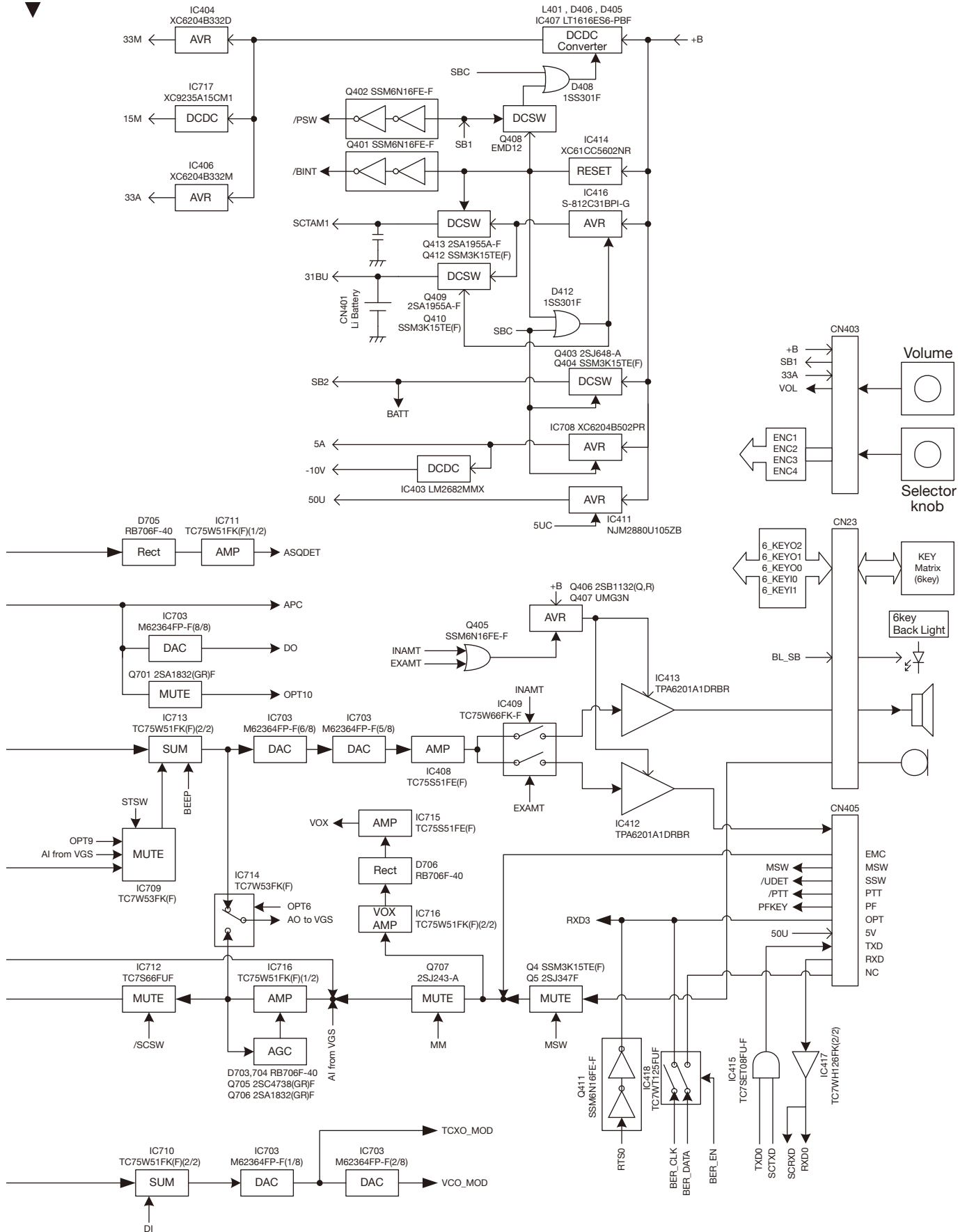
Note : The components marked with a dot (•) are parts of layer 1.

NX-300 BLOCK DIAGRAM

Control unit (X53-4262-XX)

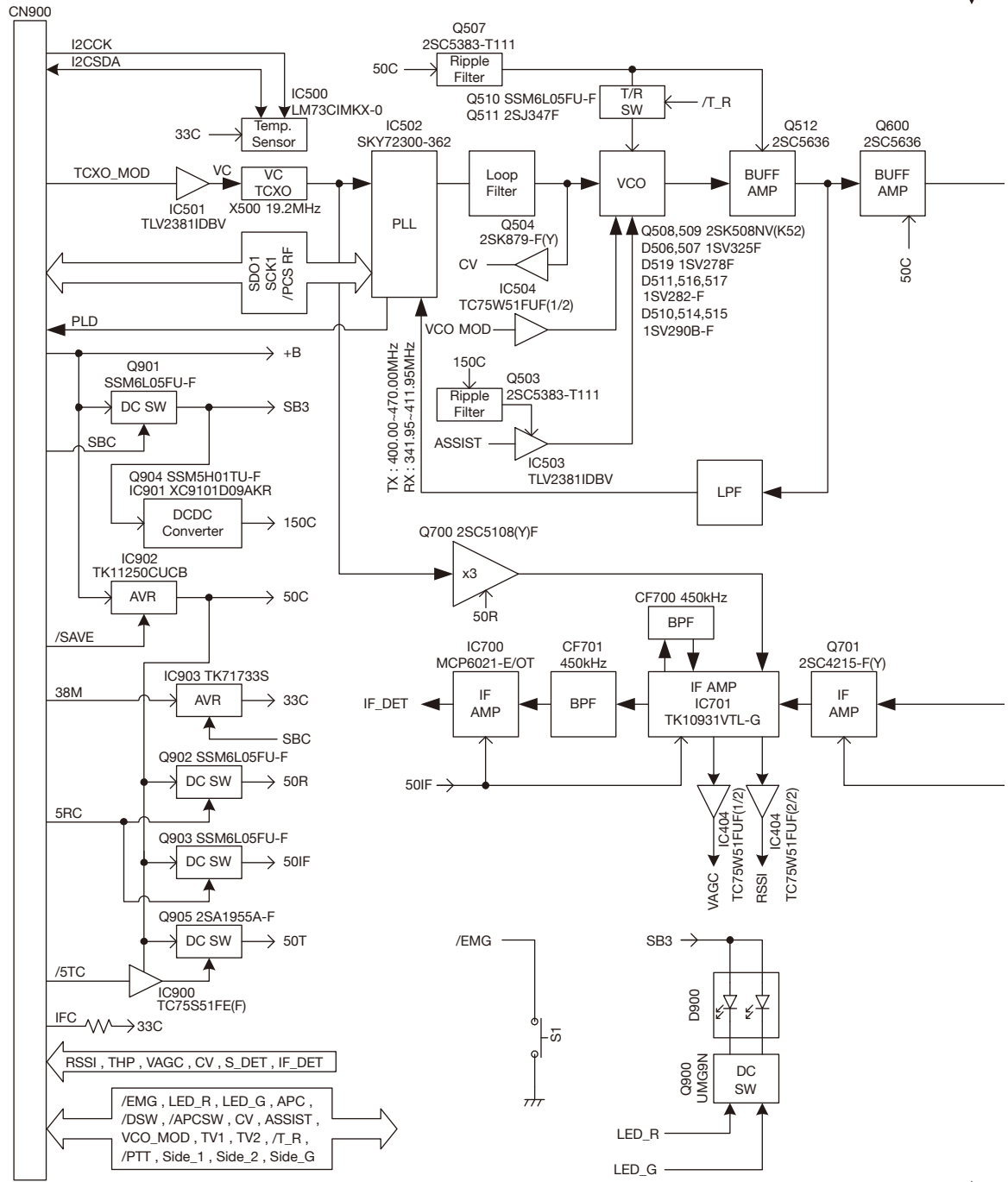


BLOCK DIAGRAM NX-300

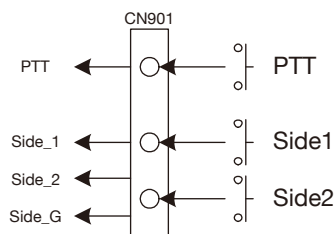
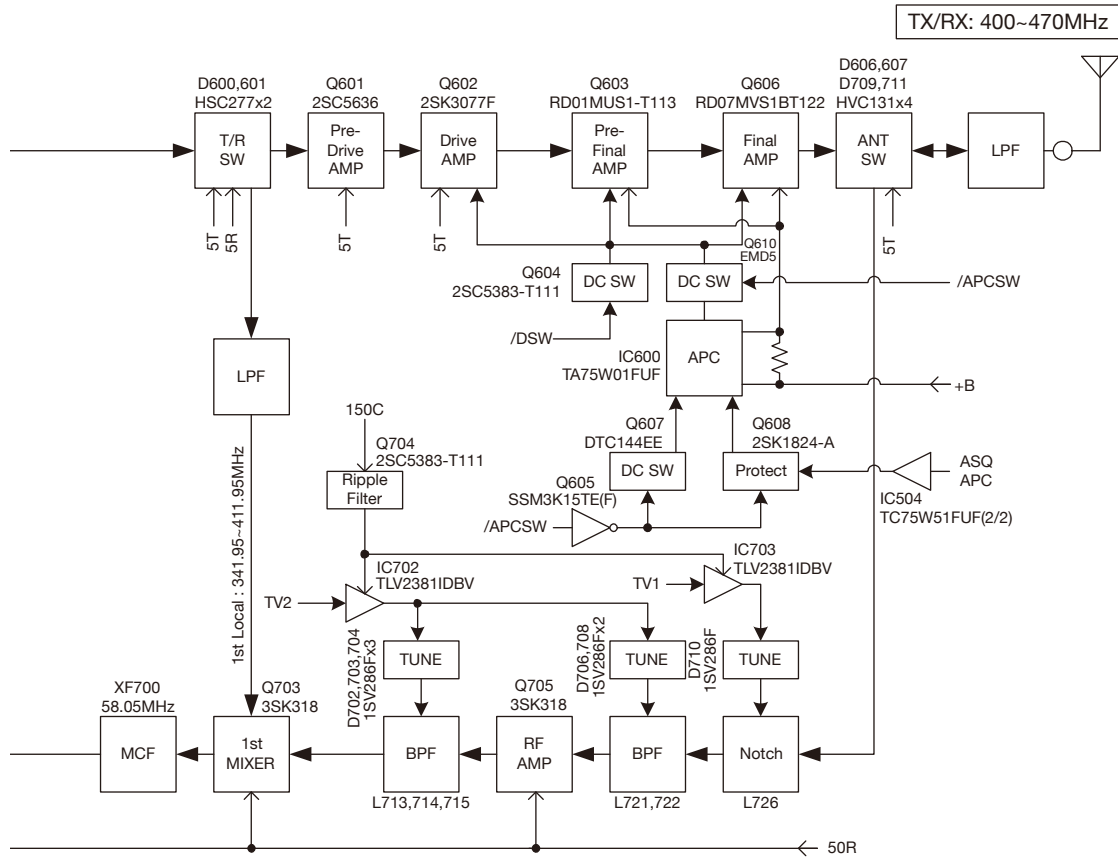


BLOCK DIAGRAM

TX-RX unit (X57-7370-11)

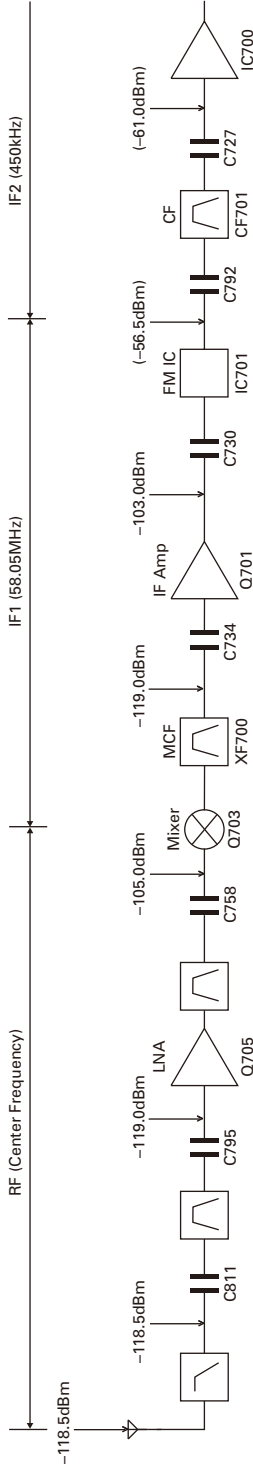


BLOCK DIAGRAM

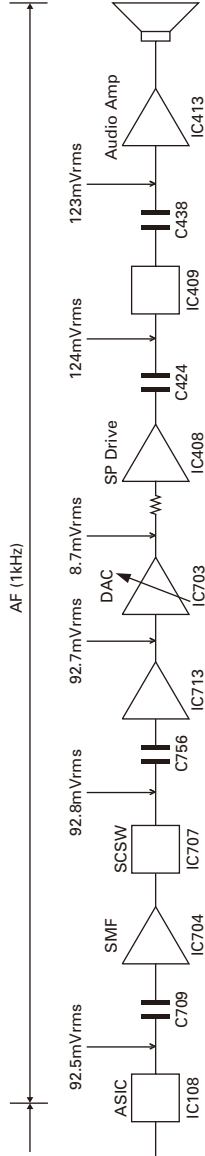


LEVEL DIAGRAM

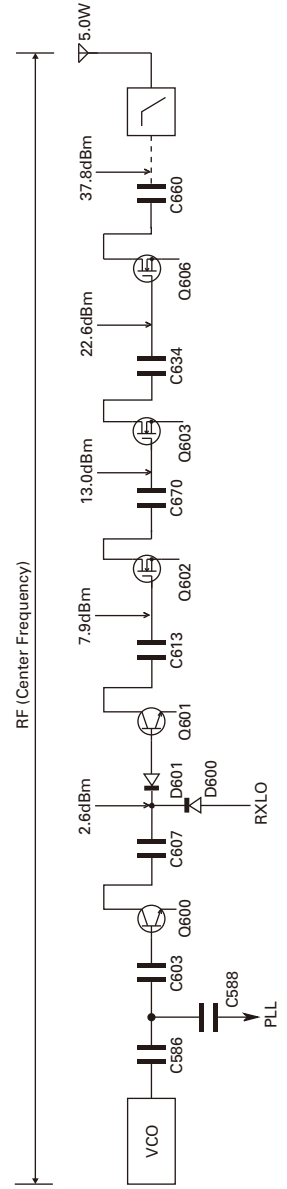
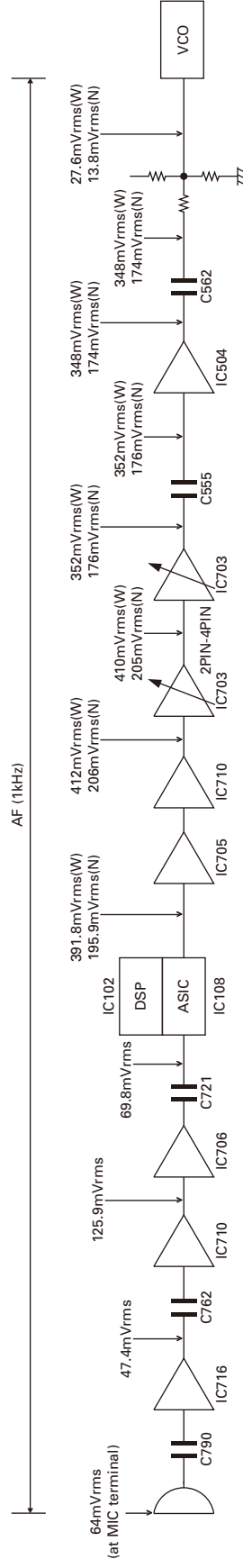
Receiver Section



To make measurements in the AF section, connect the AC level meter. (ANT input: -53dB, 1kHz FM, 3kHz DEV (Wide))
 In the RF section, use a 1000pF coupling capacitor.
 (The display shows the SSG input value required to obtain 12dB SINAD without local level.)



Transmitter Section



AG is set to the MIC input becomes (3kHz/1.5kHz) at 1kHz MOD (Wide/Narrow).
 To make measurements in the AF section, connect the AC level meter.
 In the RF section, use a 1000pF coupling capacitor.

OPTIONAL ACCESSORIES

KNB-47L (Li-ion Battery Pack)

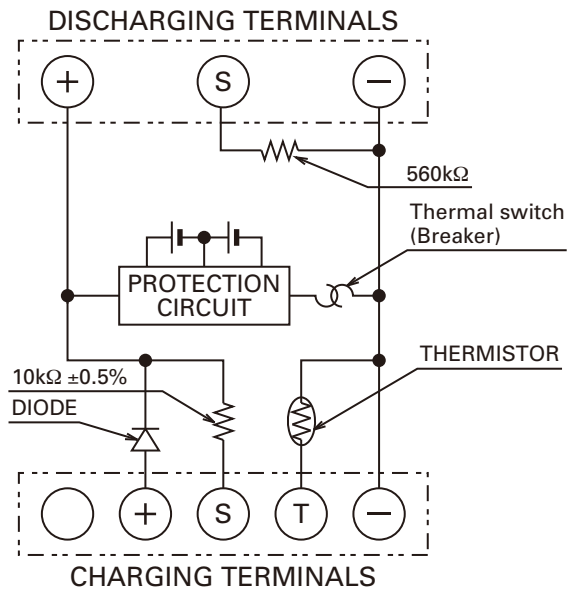
■ External View



■ Specifications

Voltage.....7.4V
 Battery capacity..... 1950mAh

■ Schematic Diagram



KNB-48L (Li-ion Battery Pack)

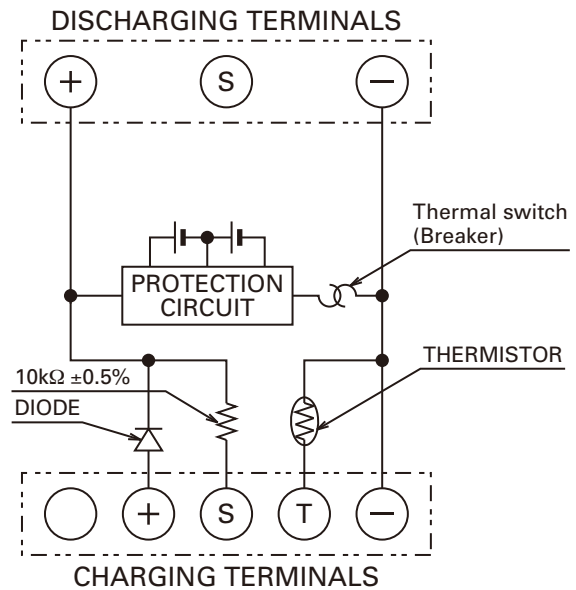
■ External View



■ Specifications

Voltage.....7.4V
 Battery capacity..... 2550mAh

■ Schematic Diagram



SPECIFICATIONS

GENERAL

Models.....	E4: Basic Model	E: w/12-key Model
Frequency Range.....	400~470 MHz	
Number of Channels.....	512	
Zones.....	128	
Max. Channels per Zone.....	250	
Channel Spacing.....	Analogue: 12.5/20/25 kHz	Digital: 6.25/12.5 kHz
Operating Voltage.....	7.5V DC \pm 20%	
Battery Life (with KNB-48L).....	5-5-90 duty cycle: More than 12.5 hours 10-10-80 duty cycle: More than 8.5 hours	
Operating Temperature Range.....	-30°C to +60°C	
Frequency Stability.....	\pm 1.0ppm	
Antenna Impedance.....	50 Ω	
Dimensions (W x H x D) (Projections not included)		
Radio only.....	58 x 127.5 x 41.3 mm	
with KNB-47L.....	58 x 127.5 x 41.3 mm	
with KNB-48L.....	58 x 127.5 x 48.5 mm	
Weight (net)		
Radio only.....	250 g	
with KNB-47L.....	375 g	
with KNB-48L.....	405 g	

RECEIVER

Sensitivity (Analogue)			
EIA 12dB SINAD.....	25kHz: 0.28 μ V	20kHz: 0.28 μ V	12.5kHz: 0.32 μ V
EN 20dB SINAD.....	25kHz: -3dB μ V	20kHz: -3dB μ V	12.5kHz: -1dB μ V
Sensitivity (Digital)			
3% BER.....	12.5kHz: 0.32 μ V	6.25kHz: 0.25 μ V	
1% BER.....	12.5kHz: -1dB μ V	6.25kHz: -4dB μ V	
Adjacent Channel Selectivity (Analogue).....	25kHz: 76dB	20kHz: 74dB	12.5kHz: 68dB
Intermodulation (Analogue).....	65dB		
Spurious Response Rejection (Analogue).....	75dB		
Audio Distortion.....	Less than 3%		
Audio Output.....	500mW/8 Ω		

TRANSMITTER

RF Power Output High/Low.....	5W/1W		
Modulation Limiting (Analogue).....	\pm 5.0kHz at 25kHz	\pm 4.0kHz at 20kHz	\pm 2.5kHz at 12.5kHz
Spurious Emission.....	-36dBm \leq 1GHz, -30dBm $>$ 1GHz		
FM Noise (EIA) (Analogue).....	25kHz: 45dB	20kHz: 45dB	12.5kHz: 40dB
Modulation Distortion.....	Less than 3%		
Microphone Impedance.....	1.8k Ω		
Modulation.....	16K0F3E, 14K0F3E, 14K0F2D, 12K0F2D, 8K50F3E, 7K50F2D, 8K30F1E, 8K30F1D, 8K30F7W, 4K00F1E, 4K00F1D, 4K00F7W, 4K00F2D		

Analogue measurements made per EN standards or TIA/EIA 603 and specifications shown are typical
KENWOOD reserves the right to change specifications without prior notice or obligation.

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Kenwood Ibérica, S.A.

Bolivia, 239-08020 Barcelona, Spain

Kenwood Electronics Australia Pty. Ltd.

(A.C.N. 001 499 074)

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Kenwood Electronics (Hong Kong) Ltd.

Unit 3712-3724, Level 37, Tower one Metroplaza, 223 Hing Fong Road,
Kwai Fong, N.T., Hong Kong

Kenwood Electronics Singapore Pte Ltd

1 Ang Mo Kio Street 63, Singapore 569110

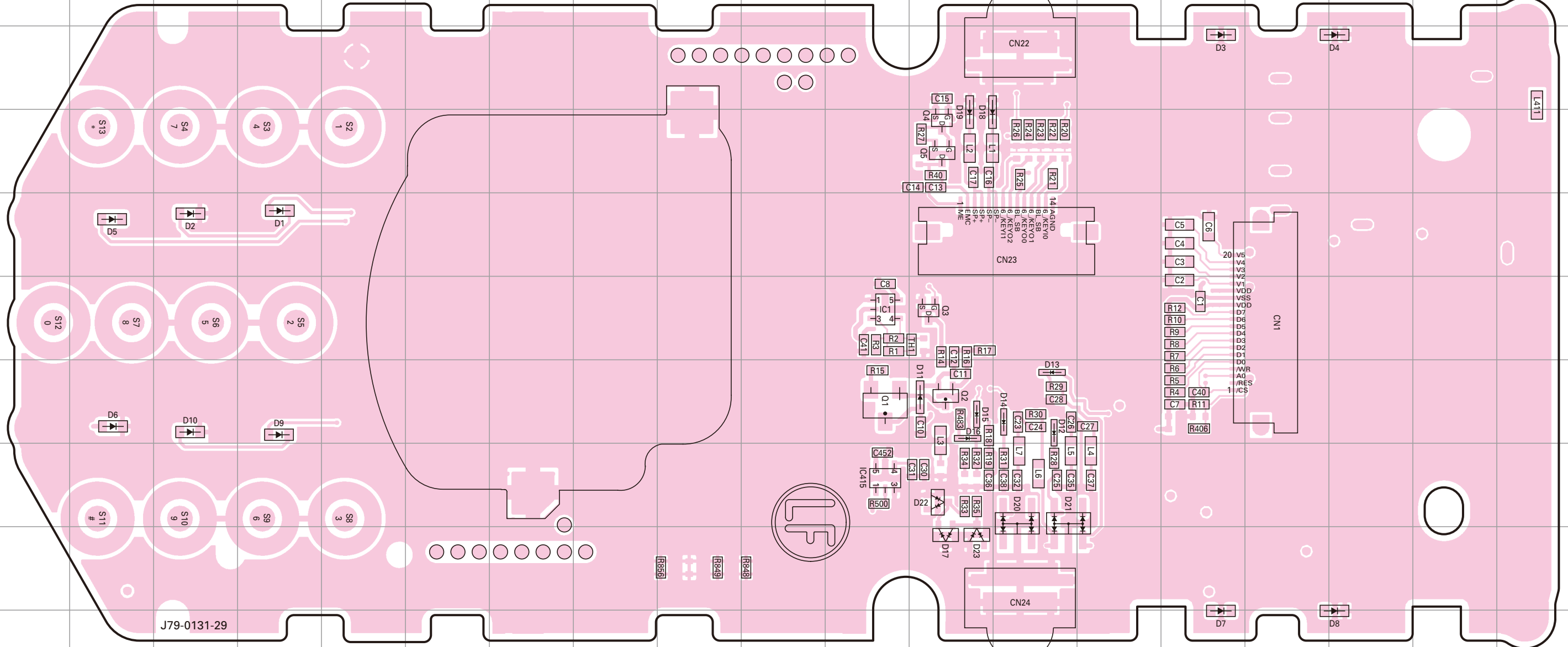


NX-300 PC BOARD

PC BOARD NX-300

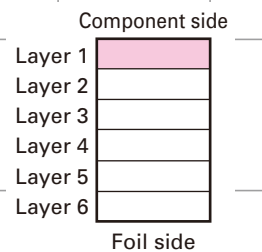
CONTROL UNIT (X53-4262-XX) -71: E4 -72: E
Component side view (J79-0131-29)

CONTROL UNIT (X53-4262-XX) -71: E4 -72: E
Component side view (J79-0131-29)



J79-0131-29

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	6K	D4	3Q	D14	7M
IC415	8K	D5	5B	D15	7L
Q1	7K	D6	7B	D16	7L
Q2	7L	D7	10O	D17	9L
Q3	6L	D8	10Q	D18	4L
Q4	4L	D9	7D	D19	4L
Q5	4L	D10	7C	D20	8M
D1	5D	D11	7L	D21	8M
D2	5C	D12	7M	D22	8L
D3	3O	D13	7M	D23	9L

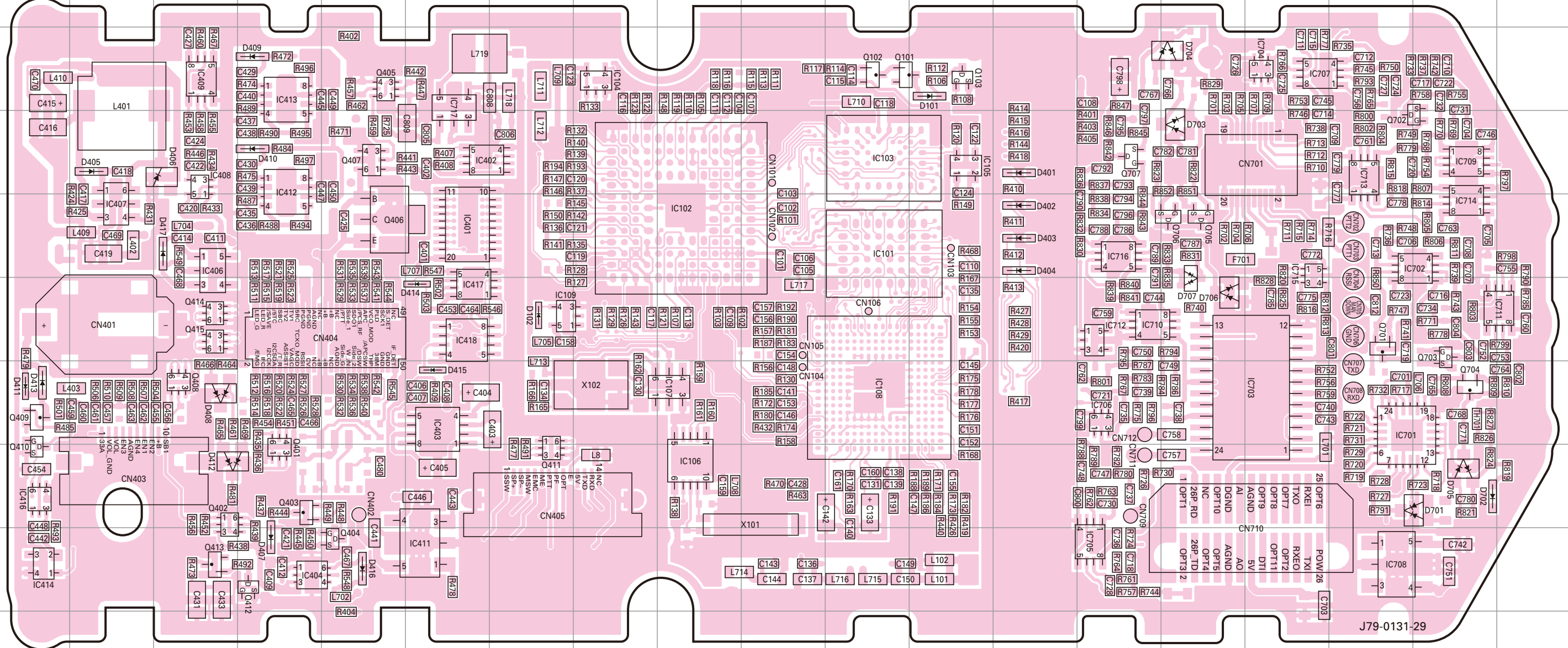


NX-300 PC BOARD

PC BOARD NX-300

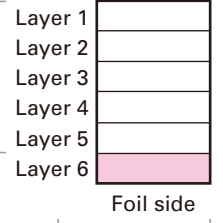
CONTROL UNIT (X53-4262-XX) -71: E4 -72: E
Foil side view (J79-0131-29)

CONTROL UNIT (X53-4262-XX) -71: E4 -72: E
Foil side view (J79-0131-29)



J79-0131-29

Component side



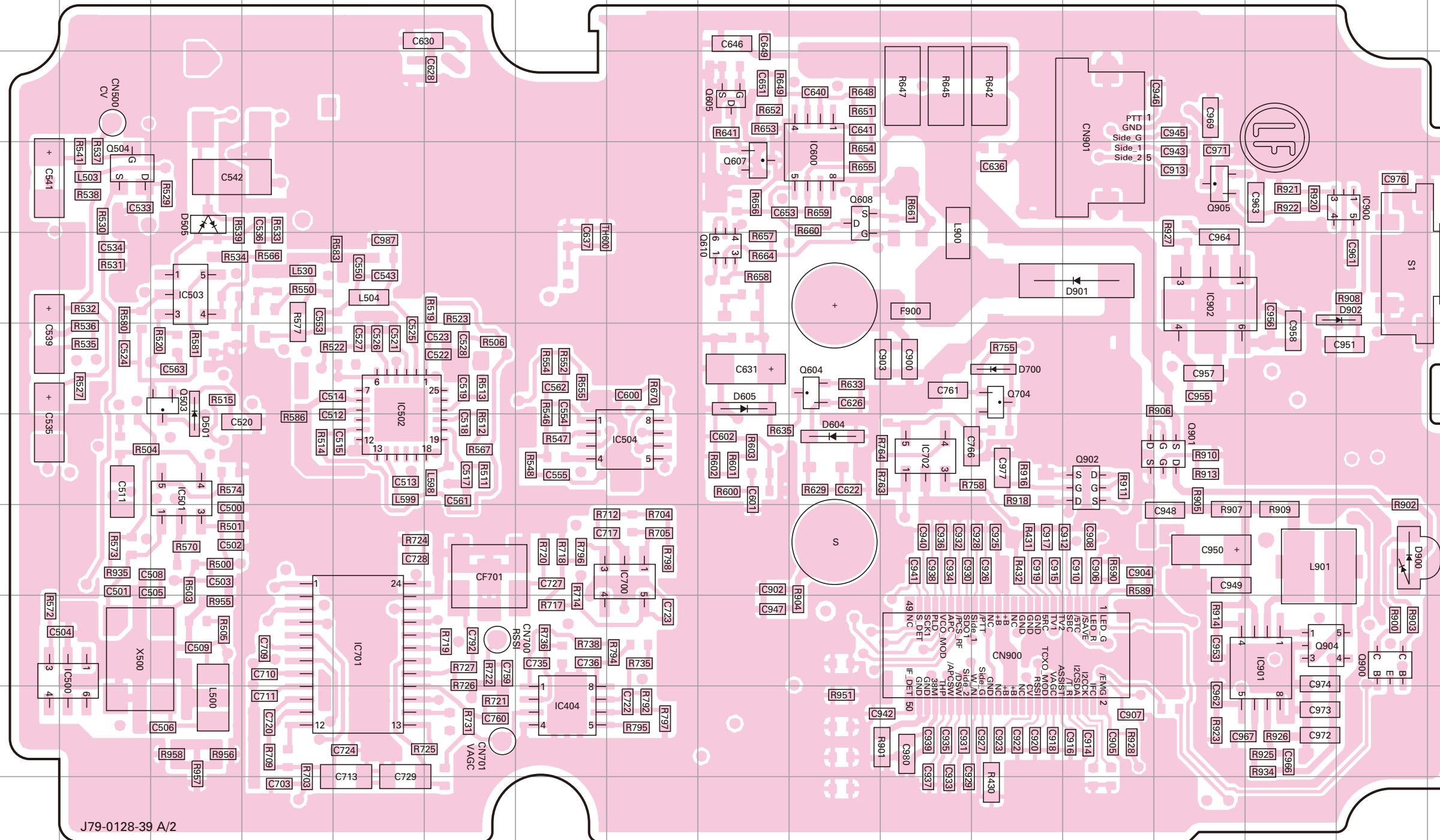
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IC102	5I	IC406	5C	IC702	5R	IC714	5R	Q406	5E	Q703	6R	D406	4C	D701	8R
IC103	4K	IC407	5B	IC703	7P	IC715	5P	Q407	4E	Q704	7R	D407	9D	D702	8R
IC104	3H	IC408	4C	IC704	3P	IC716	5N	Q408	7C	Q705	5O	D408	7C	D703	4O
IC105	4L	IC409	3C	IC705	9N	IC717	3F	Q409	7A	Q706	5O	D409	3D	D704	3O
IC106	8I	IC411	9F	IC706	7N	Q101	3K	Q410	8A	Q707	4N	D410	4D	D705	8R
IC107	7I	IC412	4D	IC707	3P	Q102	3K	Q411	8G	D101	3L	D411	7A	D706	6O
IC108	7K	IC413	3D	IC708	9Q	Q103	3L	Q412	9D	D102	6G	D412	8C	D707	6O
IC109	6G	IC414	9A	IC709	4R	Q401	8D	Q413	9C	D401	4M	D413	7A		
IC401	5F	IC416	8A	IC710	6N	Q402	8C	Q414	6C	D402	5M	D414	6F		
IC402	4F	IC417	6F	IC711	6S	Q403	8D	Q415	6C	D403	5M	D415	7F		
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NX-300 PC BOARD

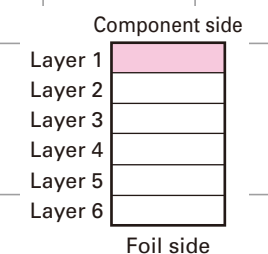
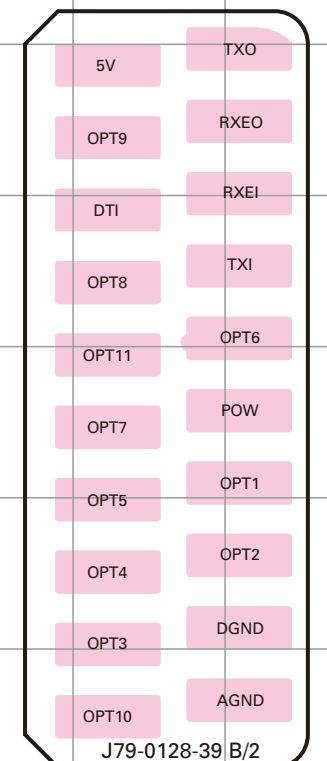
PC BOARD NX-300

TX-RX UNIT (X57-7370-11) (A/2)
Component side view (J79-0128-39 A/2)

TX-RX UNIT (X57-7370-11) (A/2)
Component side view (J79-0128-39 A/2)



TX-RX UNIT (X57-7370-11) (B/2)

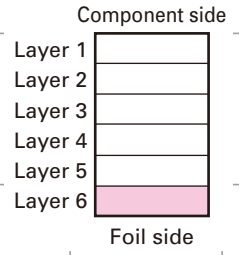
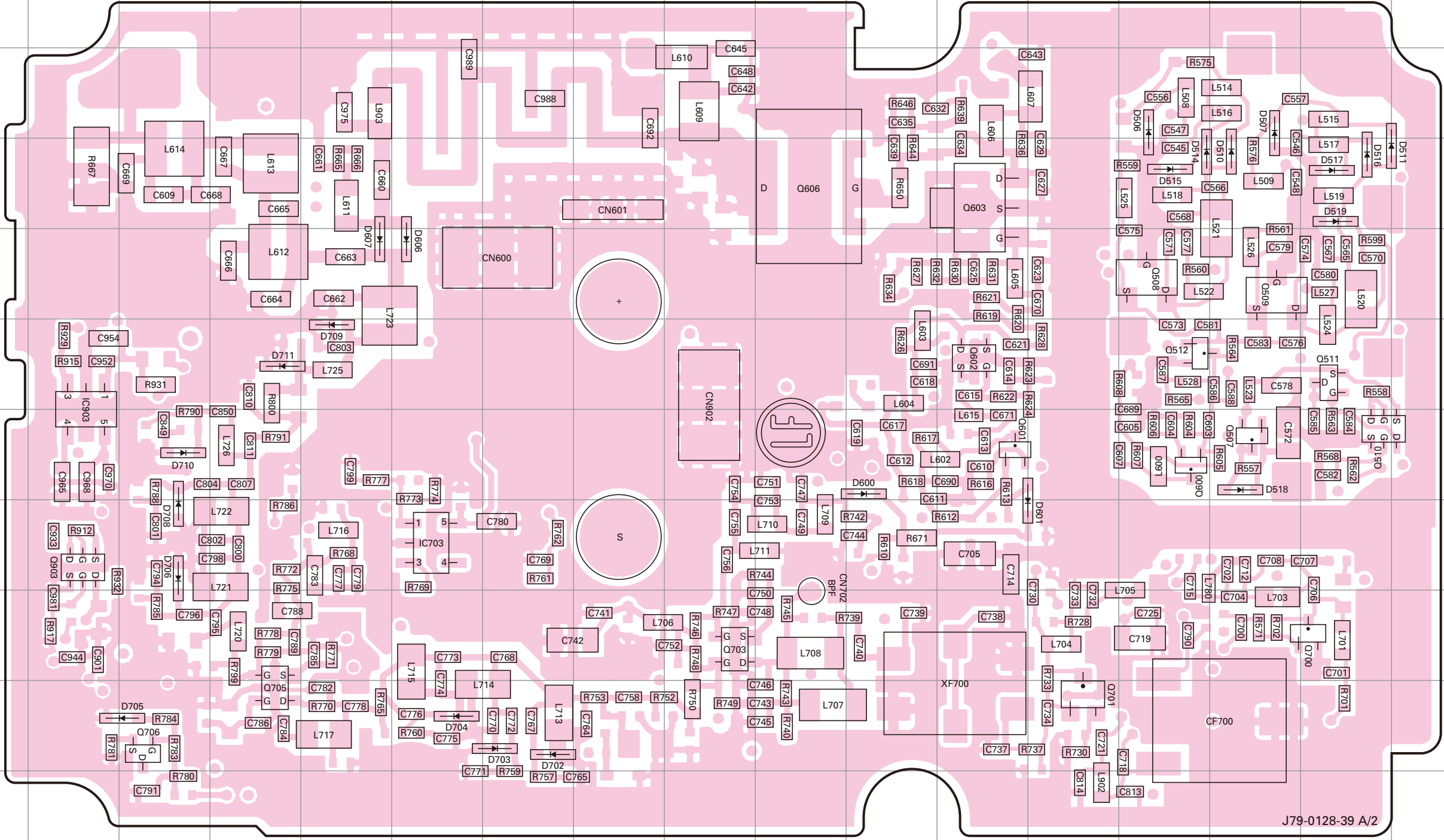
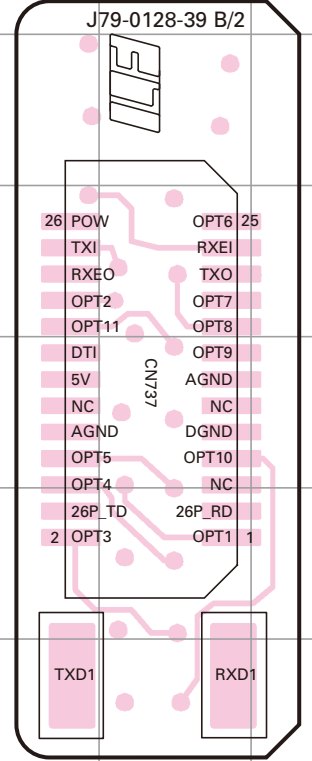


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IC501	7C	IC702	7K	Q605	3I	Q902	7M	D700	6L
IC502	7E	IC900	4P	Q607	4I	Q904	9O	D900	8P
IC503	5C	IC901	9O	Q608	4J	Q905	4N	D901	5M
IC504	7H	IC902	5N	Q610	5I	D501	7C	D902	5P
IC600	4J	Q503	6C	Q704	6L	D505	4C		

TX-RX UNIT (X57-7370-11) (A/2)
Foil side view (J79-0128-39 A/2)

TX-RX UNIT (X57-7370-11) (A/2)
Foil side view (J79-0128-39 A/2)

TX-RX UNIT
(X57-7370-11) (B/2)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC703	8H	Q512	6P	Q701	10O	D510	4Q	D519	4R	D704	10H
IC903	7D	Q600	7P	Q703	9K	D511	4S	D600	7M	D705	10E
Q507	7Q	Q601	7N	Q705	10F	D514	4P	D601	8O	D706	8E
Q508	5P	Q602	6N	Q706	10E	D515	4P	D606	5H	D708	8E
Q509	5Q	Q603	4N	Q903	8D	D516	4R	D607	5G	D709	6G
Q510	7R	Q606	4L	D506	3P	D517	4R	D702	10I	D710	7E
Q511	6R	Q700	9R	D507	3Q	D518	7Q	D703	10I	D711	6F

