

# NXR-710

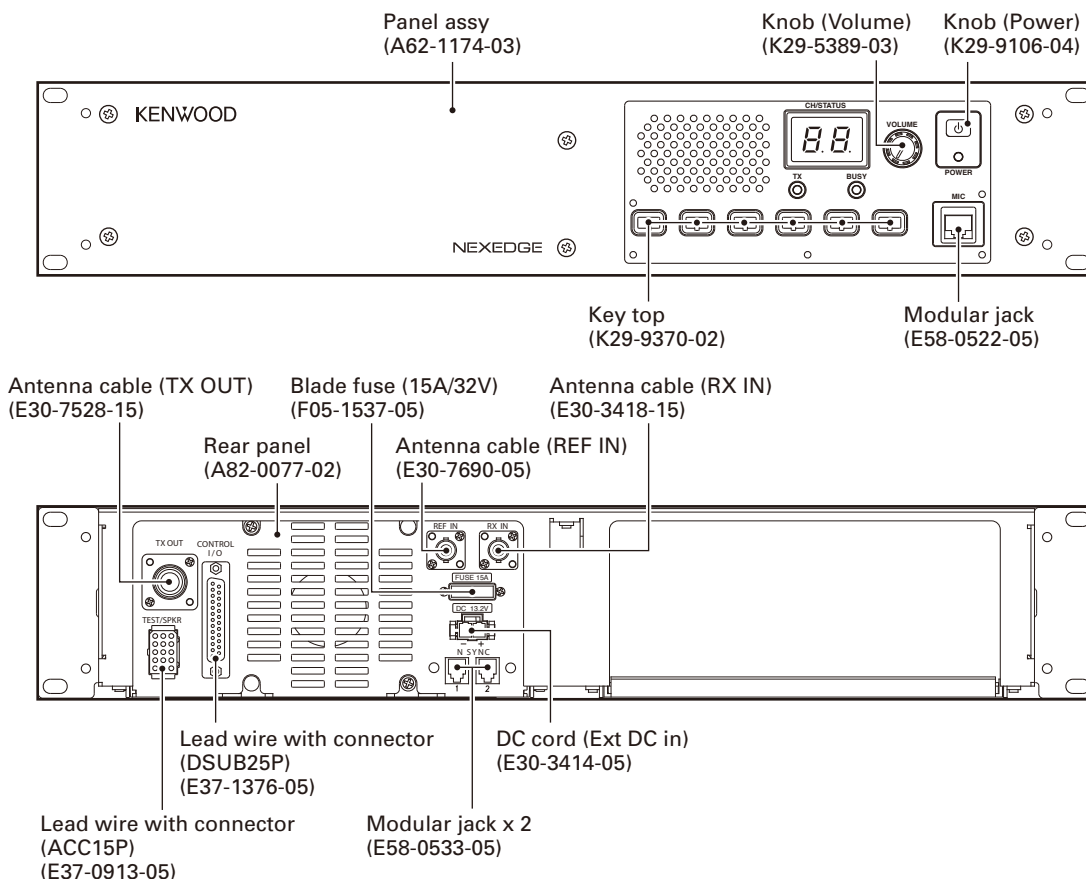
## SERVICE MANUAL

E version

# KENWOOD

Kenwood Corporation

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# NXR-710

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The AMBE+2™ 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

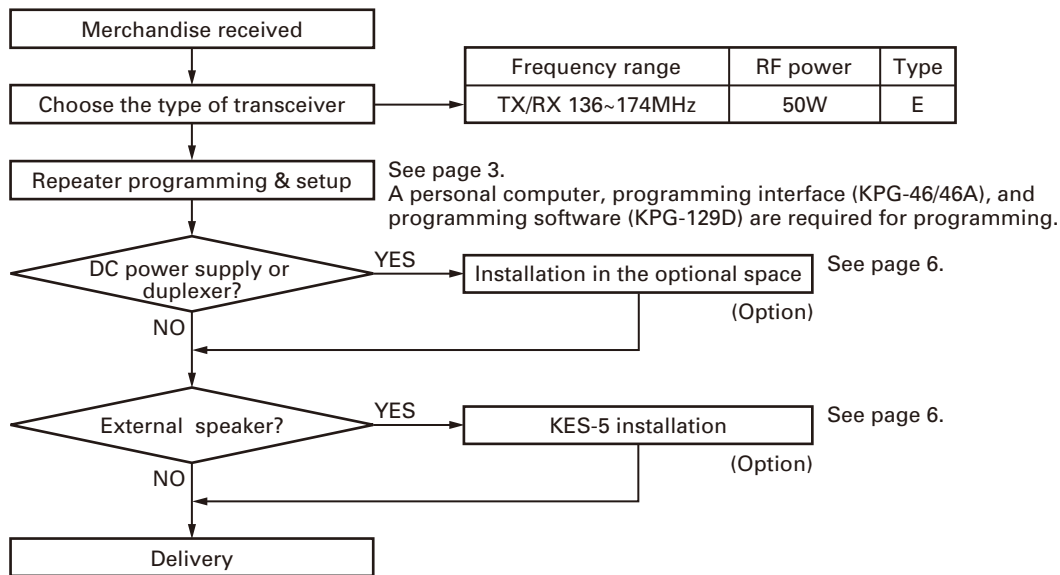
The following precautions are recommended for personal safety:

- DO NOT transmit if someone is within two feet (0.6 meter) of the antenna.
- DO NOT transmit until all RF connectors are secure and any open connectors are properly terminated.
- SHUT OFF this equipment when near electrical blasting caps or while in an explosive atmosphere.
- All equipment should be properly grounded before powerup for safe operation.
- This equipment should be serviced by only qualified technicians.

## SERVICE

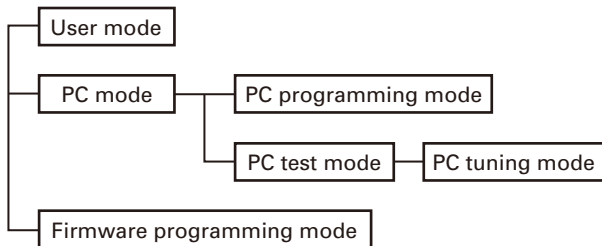
This transceiver is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained within.

## SYSTEM SET-UP



## REALIGNMENT

### 1. Modes



Mode	Function
User mode	Use this mode for normal operation.
PC mode	Use this mode to make various settings by means of the FPU through the RS-232C port.
PC programming mode	Use to read and write frequency data and other features to and from the repeater.
PC test mode	Use to check the repeater using the PC. This feature is included in the FPU.
Firmware programming mode	Use when changing the firmware program of the flash memory.

### 2. How to Enter Each Mode

Mode	Operation
User mode	Power on.
PC mode	Received commands from PC.
Firmware programming mode	[PF1] + Power on (one second)

### 3. PC Mode

#### 3-1. Preface

The NXR-710 is programmed by using a personal computer, programming interface (KPG-46/46A) and programming software (KPG-129D).

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

#### 3-2. Connection Procedure

1. Connect the NXR-710 to the computer using the interface cable and USB adapter (When the interface cable is KPG-46A, 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 power is applied, the user mode is entered immediately. When the PC sends a command, the repeater enters the PC mode and displays "PC" on the 7-segment LED. When data is being transmitted to the PC from the repeater, the TX LED flashes. The BUSY LED flashes when data from the PC is being received by the repeater.

#### Note:

- The data stored in the personal computer must match the model type, when it is written into the flash memory.
- Change the NXR-710 to PC mode, then attach the interface cable.

# NXR-710

## REALIGNMENT

### 3-3. KPG-46/KPG-46A Description

#### (PC programming interface cable: Option)

The KPG-46/46A is required to interface the NXR-710 to the computer. It has a circuit in its D-sub connector (KPG-46: 25-pin, KPG-46A: 9-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-46/46A connects the 8-pin microphone connector of the NXR-710 to the RS-232C serial port of the computer.

### 3-4. KCT-53U Description (USB adapter: Option)

The KCT-53U is a cable which connects the KPG-46A 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).

### 3-5. Programming Software KPG-129D Description

The KPG-129D is the programming software for the transceiver supplied on a CD-ROM. This software runs under Windows XP, Vista or 7 on a PC.

The data can be input to or read from the NXR-710 and edited on the screen. The programmed or edited data can be printed out. It is also possible to tune the NXR-710.

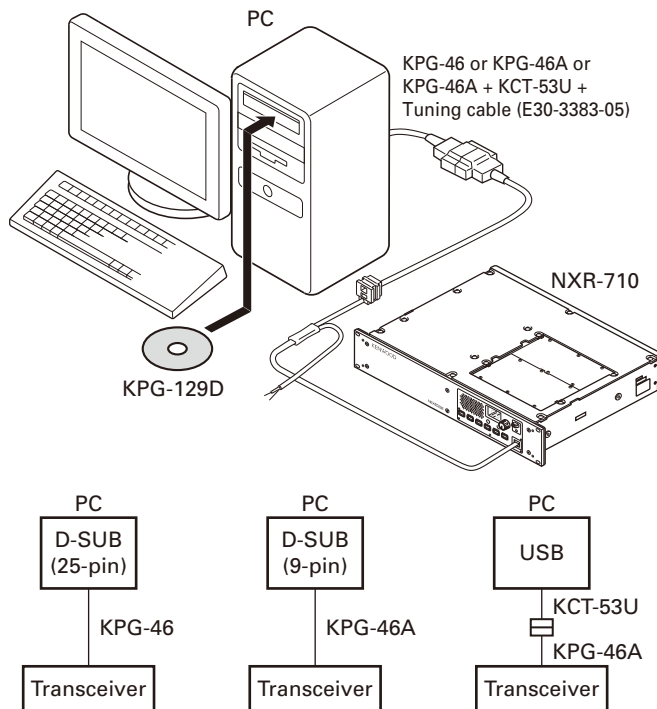


Fig. 1

## 4. Firmware Programming Mode

### 4-1. Preface

The NXR-710 uses flash memory to allow it to be easily upgraded when new features are released in the future.

### 4-2. Connection Procedure

Connect the NXR-710 to the personal computer using the interface cable (KPG-46/46A) and USB adapter (KCT-53U: when the interface cable is KPG-46A, the KCT-53U can be used.). (Connection is the same as in the PC Mode.)

#### Note:

You can only program firmware from the 8-pin microphone connector on the front panel. Using the 25-pin logic interface on the rear panel will not work.

### 4-3. Programming

1. Start up the firmware programming software (Fpro.exe (ver. 4.1 or later)). The Fpro.exe exists in the KPG-129D installed folder.
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. Turn the NXR-710 power ON with the [PF1] key held down. Then, "P.G." is displayed.
5. Check the connection between the NXR-710 and the personal computer, and make sure that the NXR-710 is in the Program mode.
6. Press write button in the window. When the NXR-710 starts to receive data.
7. If writing ends successfully, the TX LED on the NXR-710 lights.
8. If you want to continue programming other NXR-710s, repeat steps 4 to 7.

#### Note:

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

### 4-4. Function

If you press the [PF6] key while "P.G." is displayed, the display changes to "PG" to indicate that the write speed is low speed (38400 bps). If you press the [PF6] key again while "PG" is displayed, the display changes to "P.G." to indicate that the write speed is mid speed (57600 bps). If you press the [PF6] key again while "P.G." is displayed, the display changes to "P.G." to indicate that the write speed is high speed (115200 bps).

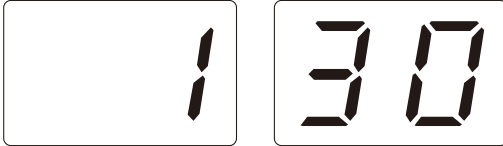
#### Note:

Normally, write in the high-speed mode.

## OPERATING FEATURES

### 1. Two 7-segment LED Displays

- Channel display (1~30): While operating normally in user mode.



- When the displayed channel is contained in scan sequence, the right side decimal point is displayed.



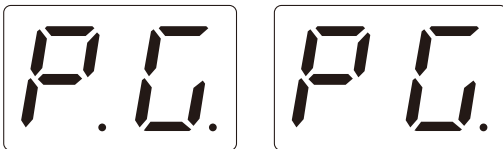
- When the displayed channel is the priority channel, the left side decimal point is displayed.



- "PC" is displayed while in PC mode.



- "PG" is displayed while in firmware programming mode.  
2 decimal points displayed = 115,200 bps  
1 decimal point displayed = 57,600 bps  
No decimal = 38,400 bps



- "E1" is displayed when FPU data is not written.



- "E2" is displayed when the channel data is not written.



- "E3" is displayed when PLL is unlocked.  
Receiver PLL unlocked = BUSY LED blinks.  
Transmitter PLL unlocked = TX LED blinks.



- "E4" is displayed when PTT is attempted on a channel number that has no TX frequency data programmed.



- "SC" is displayed while in scan mode.



- "E5" is ESN blank error.



- "E.6." is MCU internal RAM error.



- "E6." is DSP RAM error.



- "E6" is MCU External RAM error.



## INSTALLATION

### 1. External Speaker (KES-5)

The NXR-710 has a built-in speaker (5W/8Ω), and the external speaker output from the TEST/SPKR connector (15-pin) on the rear of the radio is 4W/4Ω. Use external speaker KES-5.

#### 1-1. Connection for the KES-5 with the NXR-710

##### ■ When taking the AF output from the TEST/SPKR connector (15-pin) on the rear of the radio

The following tools are required for changing the connector.

##### • Extracting tool

The following extracting tool is recommended:  
Molex Inc. Order No.: 11-03-0002 (W05-0878-00)

1. Remove the connector with jumper from the external speaker connector on the rear panel of the radio. (Fig. 1-1)  
**Note:** Save the jumper, which is required when the radio is used without the external speaker.
2. Remove the terminals with the jumper from the connector housing holes number 9 and 12 using the extracting tool.

##### Removing the jumper lead (Fig. 1-2)

- 1) Insert the extracting tool (11-03-0002) into the connector while pushing the jumper lead in the direction of (a).
- 2) Push the extracting tool in to collapse the barbs of the crimp terminal.
- 3) Pull out the lead while continuing to push the extracting tool in the direction (b).
3. Reinsert the terminal with the black and white stripe lead into hole number 12, and the terminal with the black lead into hole number 6. (Fig. 1-3)
4. Attach the connector to the external speaker connector on the radio.

##### Note:

Relationship between the TEST/SPKR connector (15-pin) connection and speaker output:

- When pins 9 and 12 are shorted: The built-in speaker is used.
- When pins 9 and 12 are open and output is from pins 6 and 12: KES-5 is used.

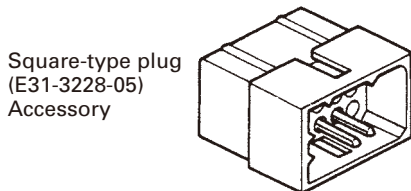


Fig. 1-1

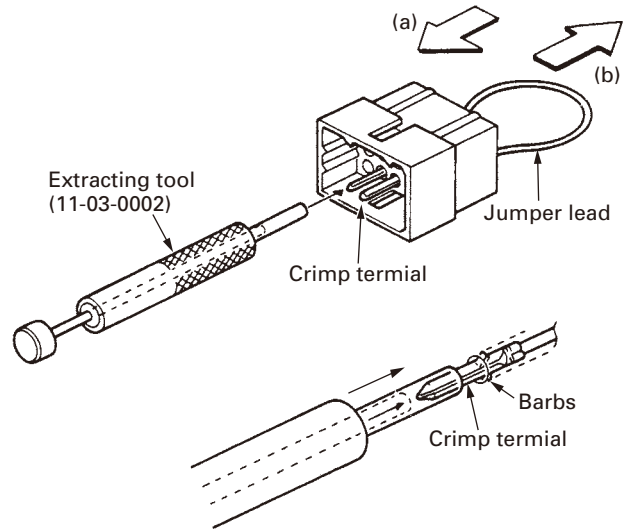


Fig. 1-2

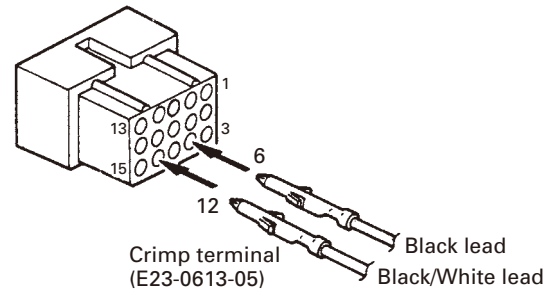


Fig. 1-3

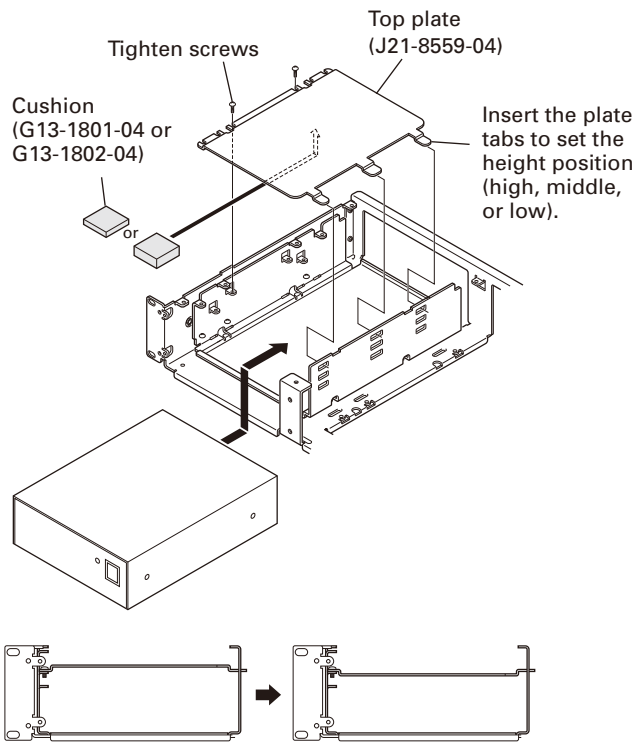
### 2. Accessory Cabinet

You can install optional accessories, such as a DC power supply or duplexers, in the accessory cabinet.

1. Place the optional accessory in the cabinet as shown below.
2. If necessary, attach cushions (G13-1801-04 and/or G13-1802-04) to the top plate (J21-8559-04) in order to adjust the space between the cabinet and the top plate. Then, insert the 3 tabs of the plate into the slots in the side of the cabinet. High, middle, or low positions are available. To affix the plate, inset and tighten the 2 screws on the other side of the plate.

You can also flip the top plate upside-down to adjust the height of the cabinet space.

## INSTALLATION



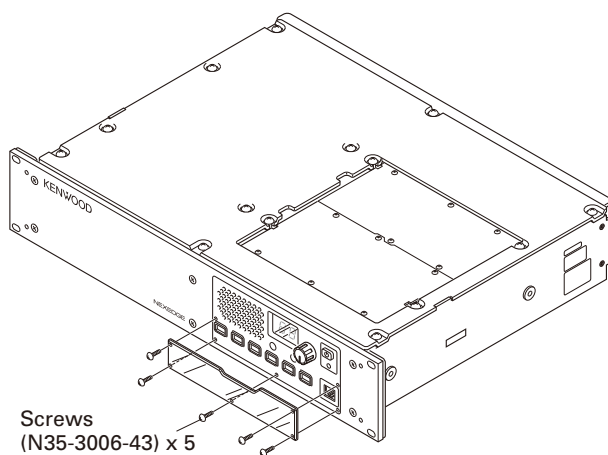
The top plate can be inverted to adjust the height of the cabinet space.

**Fig. 2**

### 3. Key Cover

To avoid accidentally pressing the keys, you can install the key cover.

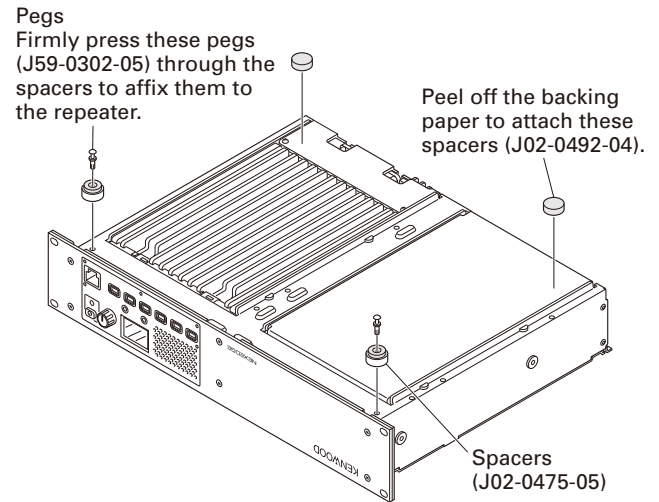
1. Install and fix the key protector using the 5 supplied screws (N35-3006-43).



**Fig. 3**

### 4. Desktop Repeater

When you use the repeater on a desktop, attach the 4 spacers to the base of the repeater as shown in the figure. With these spacers attached, the front panel will not touch the desk surface.

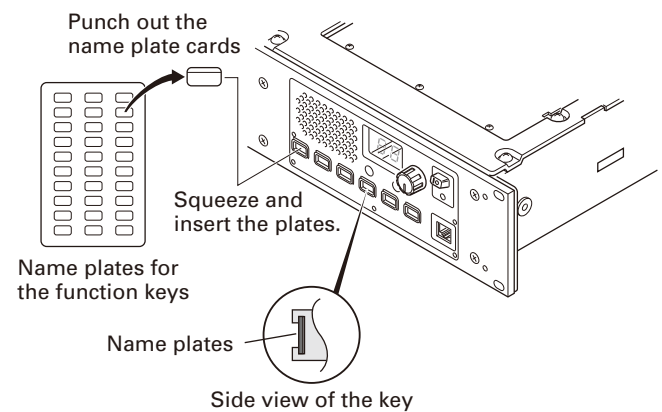


**Fig. 4**

### 5. Installing Name Plates

Punch out the name plate card. Then insert the plates onto the relative function keys.

You can reconfigure the name plates at any time.



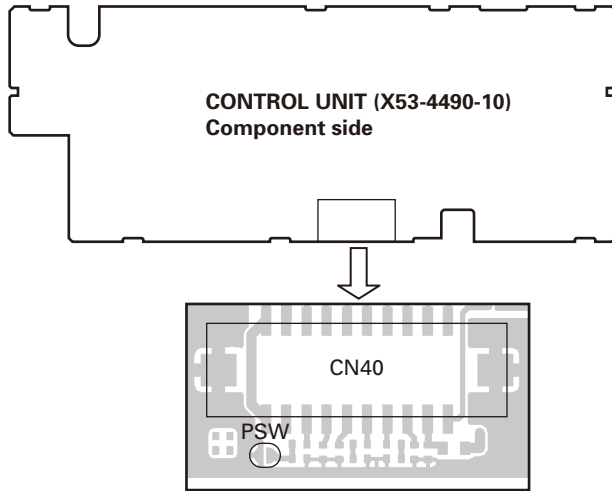
**Fig. 5**

## MODIFICATION

### 1. DC Source Switch

To prevent the power supply from turning off due to misoperation of the DC source switch on the front panel or accidents (tampering) after installation, the main unit can be kept on regardless of the on/off setting of the DC source switch on the front panel.

Using solder, short the PSW land near the CN40 connector.

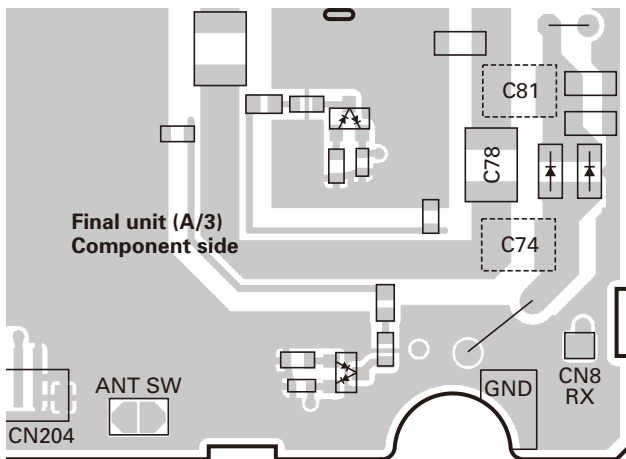


### 2. Single Antenna

The NXR-710 can be used as a base station by sharing an external antenna connector for both transmitting and receiving data.

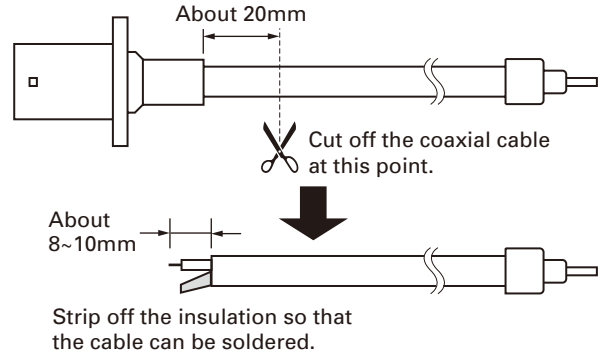
#### 2-1. Modification

- Using a soldering iron, delete C78 and add C74 and C81 (470pF; CM73F2H471J) on the Final unit (A/3).



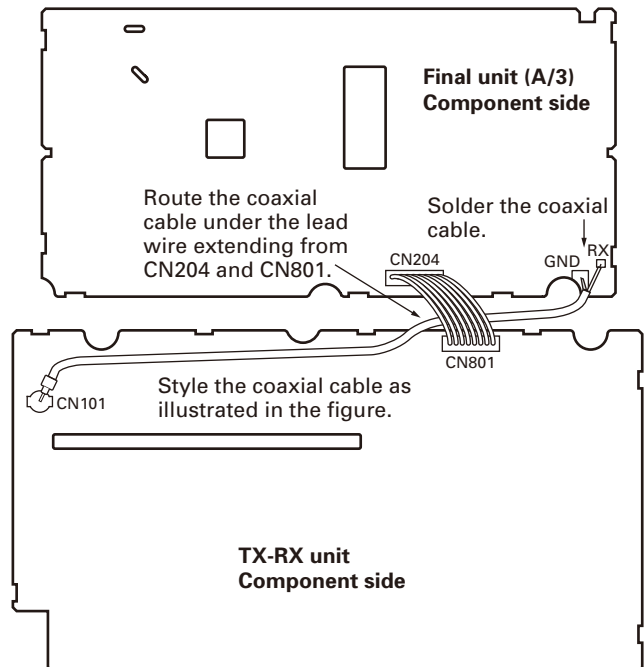
- Short-circuit the printed pattern of ANT SW near the CN204 connector by soldering.
- Disconnect the pin connector from CN101 of the TX-RX unit.  
Remove the two screws used for securing the BNC connector on the back panel of the unit. Detach the antenna cable assy. (E30-3418-05)

- Cut off the coaxial cable of the removed antenna cable assy on the BNC connector side.  
Strip off the insulation of the cut-off coaxial cable to prepare it to be soldered.



#### 2-2. Connection

- Solder the prepared coaxial cable to the Final unit (A/3).
- Connect the pin connector of the coaxial cable to CN101 of the TX-RX unit.



#### 2-3. Setting the FPU

Set the channel to be used as "Simplex" using the FPU. Check and readjust the transmit power if needed.

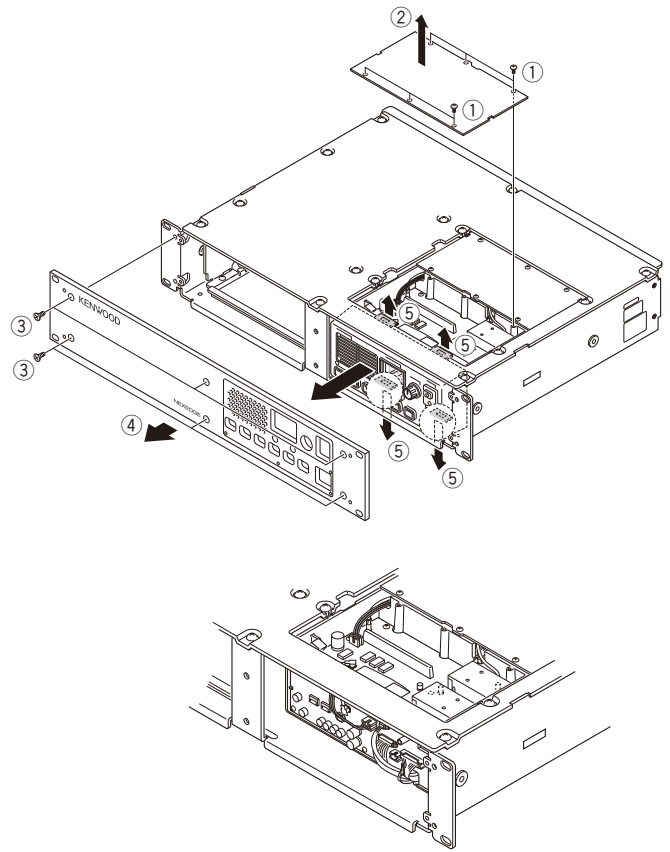


## DISASSEMBLY FOR REPAIR

### 1. How to Remove the Panel Assy (ABS)

**Note:** You can remove the panel assembly (ABS) without removing the top panel (A62-1148-03).

1. To remove the panel (TX-RX, ②), loosen the 6 screws (①).
2. To remove the panel assembly (Front, ④), loosen the 6 screws (③).
3. The panel assembly (ABS) is securely fastened by 4 tabs (⑤) on the top and bottom. You can remove the panel assembly by pulling to the front while you are pulling up the tabs.



## CIRCUIT DESCRIPTION

### 1. Outline

The NXR-710 is a VHF repeater operating in the 136~174MHz frequency range.

### 2. TX-RX unit

TX-RX unit (X57-794) consists of the following circuit.

- (1) Internal/external reference circuit
- (2) Transmitter reference 16.8MHz PLL circuit
- (3) Transmitter main PLL circuit
- (4) Modulation level adjustment circuit
- (5) Front-end circuit
- (6) 1st-Mixer circuit
- (7) IF circuit
- (8) Receiver PLL circuits
- (9) AVR circuits
- (10) Other circuits

#### 2-1. Internal/External reference circuit

The internal reference circuit consists of X500, Q502, Q504 and D505. The output of 19.2MHz VCTCXO (X500) is fed to buffer amplifier Q502. The higher harmonic wave is attenuated by the LPF. This reference signal is fed to IF IC (IC304) as the 2nd Local signal through the Tripler.

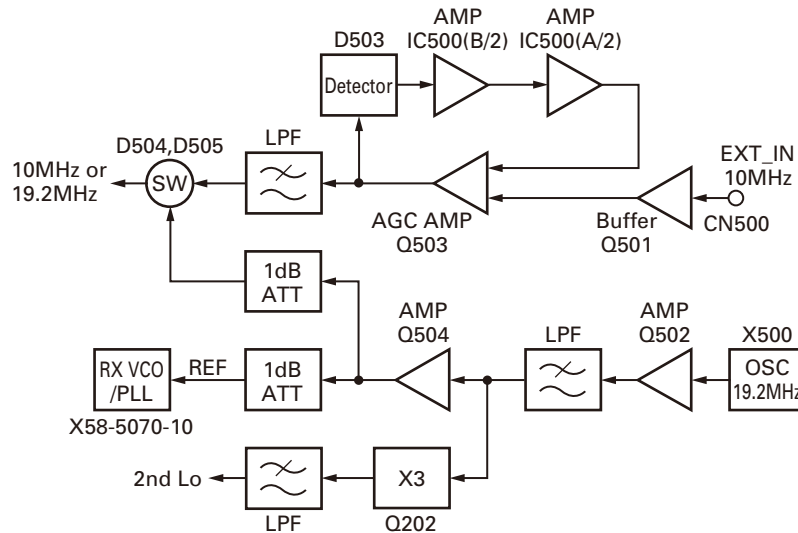
The internal reference signal is amplified by Q504 to achieve the needed level for PLL ICs. That signal is divided

by a Wilkinson divider. The divided signal is fed to the PLL IC for the receiver. Another signal is fed to the transmitter reference 16.8MHz PLL IC through PIN diode switch (D505) which switches the Internal or external reference.

The external reference circuit consists of CN500, Q501, Q503, IC500, IC501, D503 and D504. The external reference signal (10MHz/0dBm) input from CN500 is fed to buffer amplifier Q501 and is amplified by Q503. Q503 is a dual gate MOS-FET. The output of amplifier (Q503) is detected by D503 and that DC voltage is amplified by IC500 (B/2). The amplified DC voltage is compared to the reference voltage by IC500 (A/2). The difference of voltages is amplified by IC500 (A/2) and is fed to the gate-2 terminal of Q503. The voltage of the Q503 gate-2 terminal is controlled automatically to constantly maintain the power output of amplifier (Q503). The output of amplifier (Q503) is fed to the transmitter reference 16.8MHz PLL IC through the PIN diode switch (D504) which switches the Internal or External reference.

The PIN diode switches (D504, D505) are controlled by the I/O expander IC (IC805 Pin15). The I/O expander IC is controlled by the MCU which is in the Control unit (X53-449). If internal reference is selected by FPU, the I/O expander IC outputs an "H" status. This signal sets power switch Q506 to ON. Then D505 is activated.

If external reference is selected, the I/O expander IC outputs an "L" status. This signal sets power switch Q500 to ON. Then D504 is activated.



**Fig. 1 Internal/external reference circuit**

#### 2-2. Transmitter reference 16.8MHz PLL circuit

The transmitter reference 16.8MHz PLL circuit produces the reference frequency signal for the Transmitter Main PLL circuit and modulates the low-frequency components.

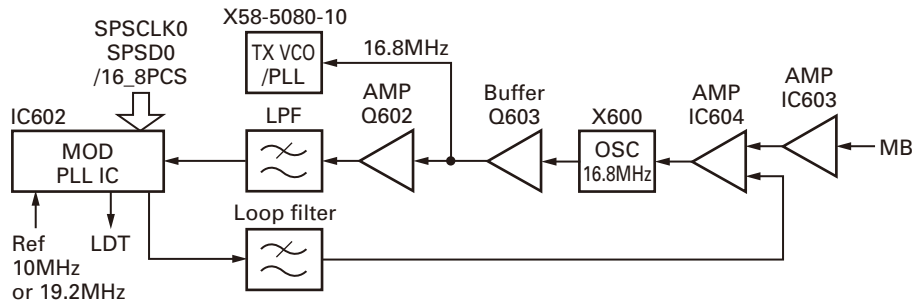
The circuit consists of IC600, IC601, IC602, IC603, IC604, Q601, Q602, Q603, and X600.

The VCXO (X600) signal enters the buffer amplifier Q603 and is amplified by Q602. The higher harmonic wave is attenuated by the LPF and returns to IC602. Its phase is compared with that of the reference frequency 5kHz.

The phase difference signal produced by the comparing phase is converted to a DC voltage by a lag-lead type loop filter. This DC voltage is input to the IC604 invert amplifier and is synthesized with the modulating signal. This DC voltage is input to the X600 control voltage terminal for controlling the VCXO oscillating frequency 16.8MHz.

The 16.8MHz oscillating signal is fed to the Q603 buffer amplifier. The output signal of the buffer amplifier is used as the reference frequency signal of the transmitter main PLL circuit.

## CIRCUIT DESCRIPTION



**Fig. 2 Transmitter reference 16.8MHz PLL circuit**

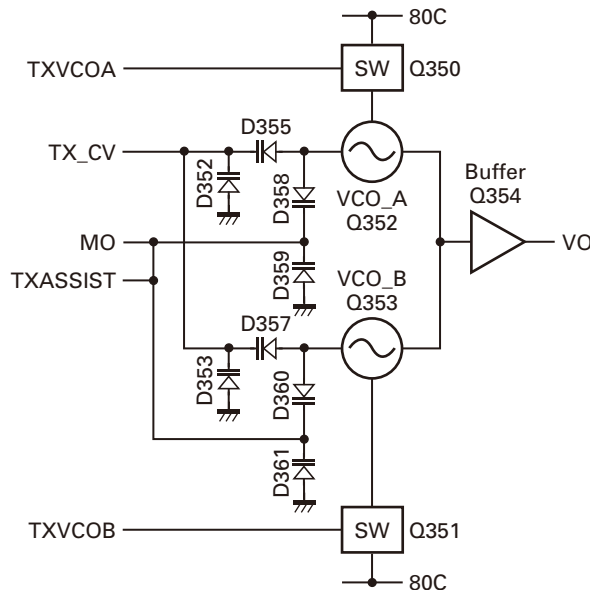
### 2-3. Transmitter Main PLL circuit (SUB unit)

#### ■ VCO

The TX VCO circuit consists of two VCOs (VCO A X58-508: Q352, VCO B X58-508: Q353). Those VCOs generate a transmit carrier. VCO A Q352 produces a transmitter frequency from 136.000MHz to 154.995MHz. VCO B Q353 produces a transmitter frequency from 155.000MHz to 174.000MHz.

Those VCO oscillation frequencies are determined by two systems of voltage control terminals: "CV" and "TXASSIST".

The voltage control terminals, "CV" and "TXASSIST", are controlled by the PLL IC (X58-508: IC300) and MCU (X53-449: IC20) and the output frequency changes continuously according to the applied voltage. For the modulation input terminal, "MO", the output frequency changes according to the applied voltage.



**Fig. 3 Transmitter VCO circuit**

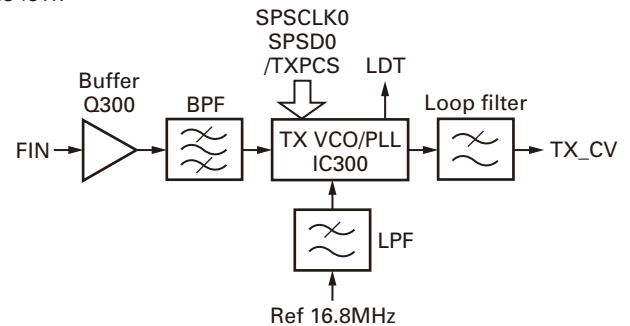
#### ■ PLL IC (X58-508: IC300)

The PLL IC compares the differences in phases of the VCO oscillation frequency and the transmitter PLL reference signal (16.8MHz), returns the difference to the VCO CV ter-

minal 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 MCU 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 approx. 3.0V.

The desired frequency is set for the PLL IC by the MCU (X53-449: IC20) through the 3-line "SPSPD0", "SPSCLK0", "/TXPCS" serial bus. Whether the PLL IC is locked or not is monitored by the MCU through the "LDT" signal line. If the VCO is not the desired frequency (unlock), the "LDT" logic is low.



**Fig. 4 Transmitter Main PLL IC circuit**

### 2-4. Modulation level adjustment circuit

The Modulation level adjustment circuit adjusts the modulation waveform balance. This circuit consists of IC804, IC603, IC604, IC605 and IC606.

The modulating signal comes from the Control unit (X53-449) through the interface connector (CN800 Pin14). The modulating signal is produced by the modulation low-pitched tone to the transmitter modulation 16.8MHz PLL circuit and adds the high-pitched modulation to the transmitter main PLL.

IC804 is an electronic volume control IC. It has 8 electronic volume control circuits. The modulation level adjustment circuit uses 2 electronic volume control circuits in IC804. The 1st electronic volume control circuit adjusts the modulating signal and is fed to IC603 and the 2nd electronic

## CIRCUIT DESCRIPTION

volume control circuit. The 2nd electronic volume control circuit adjusts the modulating signal and is fed to IC606.

IC603 is an inverting amplifier for inverting the amplification of the modulating signal. The output of IC603 and the charge pump output of IC602 (Transmitter modulation 16.8MHz PLL IC) are synthesized by IC604 and is fed to VCXO (X600).

IC606 is a non-inverting amplifier. The output of the 2nd electronic volume control circuit is amplified by IC606 and is fed to the transmitter main PLL circuit.

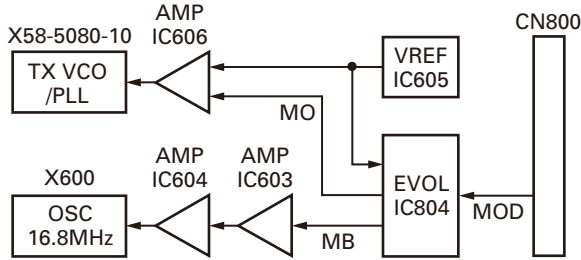


Fig. 5 Modulation level adjustment circuit

### 2-5. Front-end circuit

The front-end circuit consists of LPF, L111, L112, L114, and L115 coils, former BPF tuning Variable Capacitance Diodes (D105, D106, D107 and D108), RF amplifier Q101 (LNA), L100, L101, L103, and L104 coils, and latter BPF tuning Variable Capacitance Diodes (D100, D101, D103 and D104). The BPF covers frequency ranges 136 to 174MHz.

The LPF, former and latter BPF attenuate the unwanted signals receiving from RX antenna (CN101) and only the desired signals transmit to the 1st-mixer.

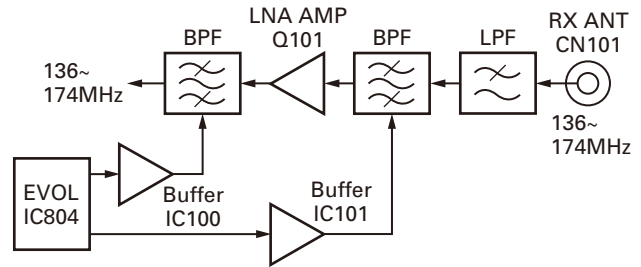


Fig. 6 Front-end circuit

### 2-6. 1st-Mixer circuit

The signal passing the front-end circuit is heterodyned with the first local oscillator signal from the PLL frequency synthesizer circuit at the first mixer (IC300) to become a 58.05 MHz first intermediate frequency (IF) signal.

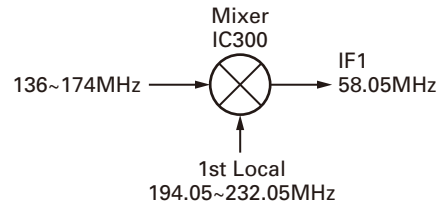


Fig. 7 1st-Mixer circuit

### 2-7. IF circuit

The first IF signal is amplified by the IF Post Amp (Q301) and passed through a four-pole monolithic crystal filter (XF300) to reject adjacent channel signals. The filtered first IF signal is amplified by the IF AGC amplifier (Q300) and then applied to the IF system IC (IC403). The IF system IC

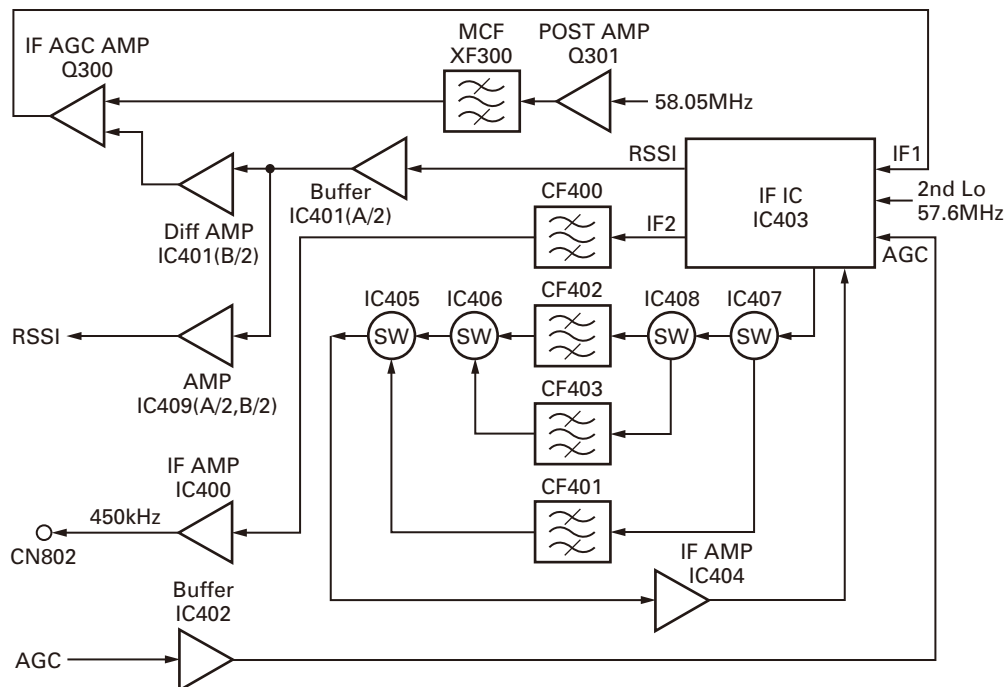


Fig. 8 IF circuit

## CIRCUIT DESCRIPTION

provides a second mixer, AGC amplifier, and RSSI (Received Signal Strength Indicator).

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

The second IF signal is passed through the ceramic filter (CF401, CF402 and CF403) to reject the adjacent channel signal. The filtered second IF signal is amplified by the second IF amplifier (IC404) and AGC amplifier (IC403).

The signal from the AGC amplifier is input to the AD converter (X53-449: IC20) through the ceramic filter (CF400) and operational amplifier (IC400 and X53-449: IC20).

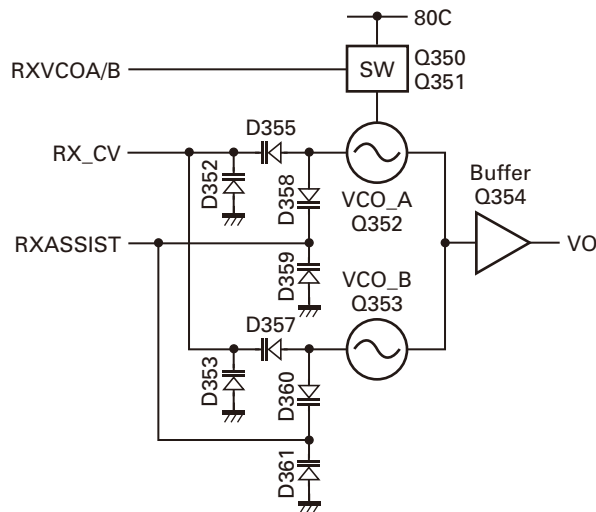
### 2-8. Receiver PLL circuit (SUB unit)

#### ■ VCO

RX VCO circuit consists of two VCOs (VCO A X58-507: Q352, VCO B X58-507: Q353). Those VCOs generate a 1st local signal. For the VCO oscillation frequency, the 1st local signal is 194.05 to 232.05MHz. (VCO A: 194.05~213.05MHz, VCO B: 213.05~232.05MHz)

Those VCO oscillation frequencies are determined by two systems of voltage control terminals: "CV" and "RXASSIST".

The voltage control terminals, "CV" and "RXASSIST", are controlled by the PLL IC (X58-507: IC300) and the MCU (X53-449: IC20) and the output frequency changes continuously according to the applied voltage.



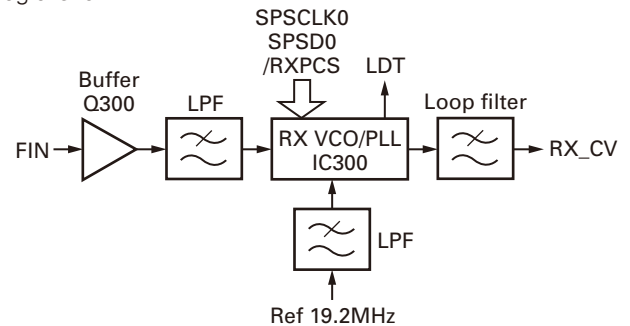
**Fig. 9 Receiver VCO circuit**

#### ■ PLL IC (X58-507: IC300)

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 MCU 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 approx. 3.0V.

The desired frequency is set for the PLL IC by the MCU (X53-449: IC20) through the 3-line "SPSD0", "SPSCLK0", "/RXPCS\_TR" serial bus. Whether the PLL IC is locked or not is monitored by the MCU through the "LDR" signal line. If the VCO is not the desired frequency (unlock), the "LDR" logic is low.



**Fig. 10 Receiver PLL circuit**

### 2-9. AVR circuit

The 13.2V Power Source (+B) is provided through the Connector (CN701) from the Final unit (X45-392). +B is connected to a FET switch (Q702, Q703) and CN700. Q702 and Q703 are controlled by the "SBC" signal from the MCU which is in the Control unit (X53-449). If "SBC" logic is high, Q702 and Q703 turn on. The 13.2V power source (SB) which is turned on by Q702 and Q703 is provided to the 8V AVR IC (IC702) and CN700. CN700 is connected to the Control unit (X53-449) to provide the +B power source and the SB power source.

IC702 supplies 8V to the VCO, 15V DC/DC converter IC (IC701), AVR IC (IC700) and FET switches (Q700, Q701). IC701 is a step-up switching regulator. IC701 regulates 8V to 15V and supplies the 15V power source to the "assist circuit" and "front-end BPF tuning circuit". The FET switches (Q700, Q701) are controlled by the I/O expander IC (IC805). When Q700 and Q701 turn on, the 8V power source is provided to receiver section.

IC700 regulates 5V to 8V. The output of IC700 is provided to the FET switches (Q705, Q706) and AVR IC (IC703). The FET switches (Q705, Q706) are controlled by the I/O expander IC (IC805). When Q705 and Q706 turn on, the 5V power source is provided to the receiver section, IF section and IC704. IC704 regulates 5V to 3V. The 3V power source is provided to the Mixer IC (IC300). IC703 regulates 5V to 3.3V. The output of IC703 is provided to the IF section.

## CIRCUIT DESCRIPTION

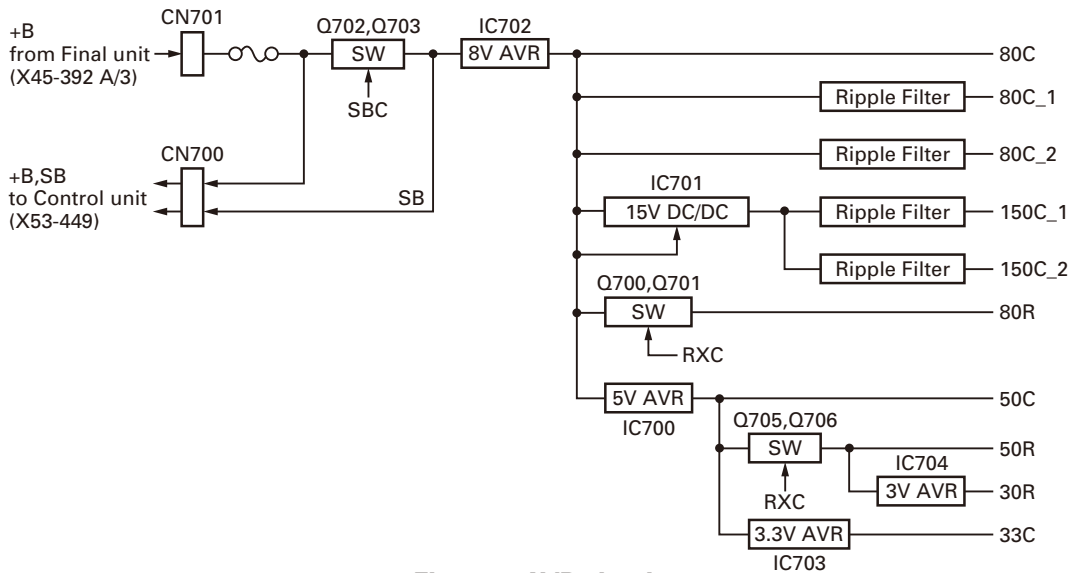


Fig. 11 AVR circuit

### 2-10. Other circuit

#### ■ EEPROM

The EEPROM (IC802) has a data capacity of 2Kbit. It stores the tuning data in frequency adjustment.

#### ■ Temperature sensor

The temperature sensor (IC800) monitors temperature around the VCTCXO (X500).

#### ■ I/O expander

The I/O expander IC (IC805) controls power sources, fan, analogue switches, and the transmit power control circuit. IC805 is controlled by the MCU which is in the Control unit (X53-449).

#### ■ Electronic volume control IC

The Electronic volume control IC (IC804) adjusts the modulating signal, center frequency of the front-end BPF, and the power of the RF final amplifier. IC804 is controlled by the MCU which is in the Control unit.

### 3. Final unit

The RF final amplifier unit (X45-392) amplifies the transmitter power to a specified level.

This unit consists of the following circuits:

- (1) Driver and Final power amplifier circuit
- (2) CM coupler circuit
- (3) Filter circuit
- (4) APC circuit
- (5) High temperature detector circuit
- (6) FAN action control circuit
- (7) AVR circuit

#### 3-1. Driver and Final power amplifier circuit

The transmit signal from the TX IN terminal CN1 of the Final unit (X45-392) is amplified by Q1, Q2 and Q3, and is passed to the final stage Q4. The signal amplified by the final stage Q4 passes through the CM coupler circuit and filter circuit, and is then fed to the antenna.

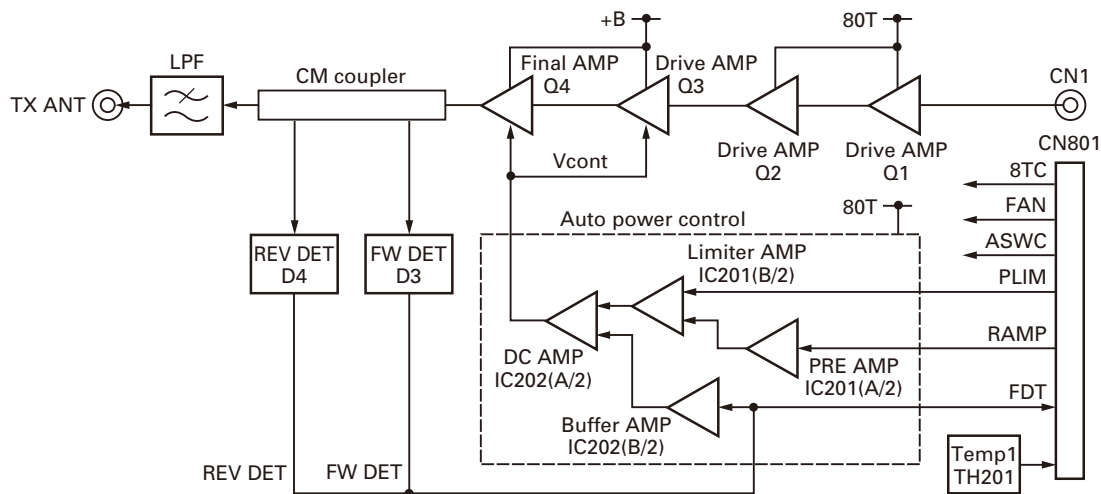


Fig. 12 Driver and Final power amplifier circuit

## CIRCUIT DESCRIPTION

### 3-2. CM coupler circuit

The CM coupler circuit is a line for detecting forward wave and reflected wave. Forward wave is detected by D3, and is converted into DC voltage. If an abnormal antenna load is connected, reflected wave is detected by D4 and converted into DC voltage.

### 3-3. Filter circuit

This circuit removes harmonics from the transmitter output and sends filtered signals to the antenna.

### 3-4. APC circuit

The automatic transmission power control (APC) circuit stabilizes the transmitter output power at a pre-determined level. DC voltage from the CM coupler circuit is amplified by the DC amplifier IC202 (1/2). IC202 (2/2) compares the APC control voltage (RAMP) generated by the MCU (X53-449) and the DC amplifier IC201 (1/2, 2/2) with the output voltage from IC202 (1/2) to control the gate voltage for amplifier Q3 and final amplifier Q4.

### 3-5. High temperature detector circuit

To prevent thermal destruction of amplifier Q3 and final amplifier Q4, this circuit reduces the APC control voltage (RAMP) when the temperature of amplifier Q3 and final amplifier Q4 rises. The MCU detects the temperature with the thermistor (TH201) and controls the APC voltage (RAMP).

### 3-6. FAN action control circuit

The FAN action control circuit consists of the FAN and switching transistor Q207. It is controlled by the MCU (X53-449). If the FAN action is set to "Temperature", the cooling fan is turned ON or OFF according to temperature. If the FAN action is set to "Continuous", the cooling fan operates continuously, but Q207 stays ON.

### 3-7. AVR circuit

The 13.2V power source (+B) is provided through connector CN201 to the Final unit (X45-392 A/3). +B is connected to CN203 to supply the 13.2V power source for the TX-RX unit (X57-794). +B is a power source for the "final amplifier", "drive amplifier" and fan. IC203 regulates the +B voltage to 8V. This 8V power source is connected to the FET switches Q203, Q204, Q205, and Q206. Q204 and Q206 are controlled by the "8TC" signal from the I/O expander IC which is in the TX-RX unit (X57-794). If "8TC" logic is high, Q204 and Q206 turn on and supply the 8V power source to the APC circuit and pre drive amplifiers. Q203 and Q205 are controlled by the "ASWC" signal from the I/O expander IC which is in the TX-RX unit (X57-794). If "ASWC" logic is high, Q203 and Q205 turn on and supply the 8V power source to the antenna switch circuit.

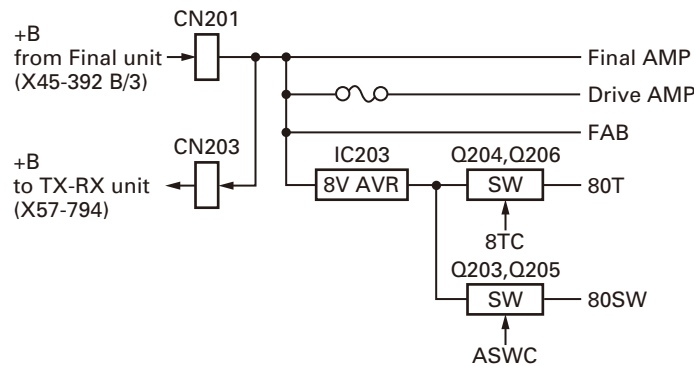


Fig. 13 AVR circuit

## 4. Control unit

The Control unit (X53-449) consists of the following circuits:

- (1) MCU circuit
- (2) Memory circuit
- (3) DSP circuit
- (4) Squelch circuit
- (5) Power supply circuit
- (6) Power Supply Voltage Monitoring Circuit
- (7) 18.432MHz clock circuit
- (8) Audio circuit
- (9) Other circuit

### 4-1. MCU circuit

The MCU (IC20) is a 32bit RISC processor, equipped with a peripheral function and ADC/DAC.

This MCU operates at a 18.432MHz clock and 3.3V/1.5V DC.

It controls the flash memory, SRAM, DSP, receive circuit, transmitter circuit, and control circuit.

## CIRCUIT DESCRIPTION

### 4-2. Memory circuit

The Memory circuit consists of the MCU (IC20), the SRAM (IC9), and the flash memory (IC3).

The flash memory has a capacity of 32Mbit that contains the transceiver control program for the MCU and stores the data. It also stores the data for transceiver channels and operating parameters that are written by the FPU. This program can be easily written from external devices.

The SRAM has a capacity of 1Mbit that contains work area and data area.

#### ■ Flash memory

**Note:** The flash memory stores the data that is written by the FPU, tuning data (Deviation, Squelch, etc.), and firmware program.

#### ■ SRAM (static memory)

**Note:** The SRAM has a 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.

### 4-3. DSP circuit

The DSP circuit consists of a DSP (IC6) and processes the base band signal. The DSP operates on an external clock of 18.432MHz (the same as IC20). The I/O section operates at 3.3V and the core section operates at 1.6V. The DSP carries out the following processes:

#### ■ Digital processing

- 4Level FSK and Baseband filter processing
- Vocoder processing between audio codec and modulation/demodulation
- CAI processing, such as error correction encoding/decoding and interleaving
- AFC loop control
- Frame synchronization and Time tracking
- Data scrambling

#### ■ Analog FM processing

- Pre-emphasis/De-emphasis
- QT/DQT encoding/decoding
- DTMF encoding/decoding
- Compressor/Expander processing
- Voice scrambler processing

#### ■ Audio or Modulation function

- Transmit/Receive audio filtering processing
- Microphone amplifier AGC processing
- Audio soft mute processing
- Modulation level processing
- Squelch Filtering

#### ■ Other function

- Voting tone
- CWID
- Courtesy tone
- Repeater operating
- Analog/Digital Mixed mode

### 4-4. Squelch circuit

The Squelch circuit amplifies the demodulated noise signal from IC6 after filtering through the BPF circuit. The processed digital noise signal is applied to CODEC IC14, and is converted from digital to analog. The amplified signal is then converted to a DC signal by the detection circuit. The converted signal is fed back to IC20.

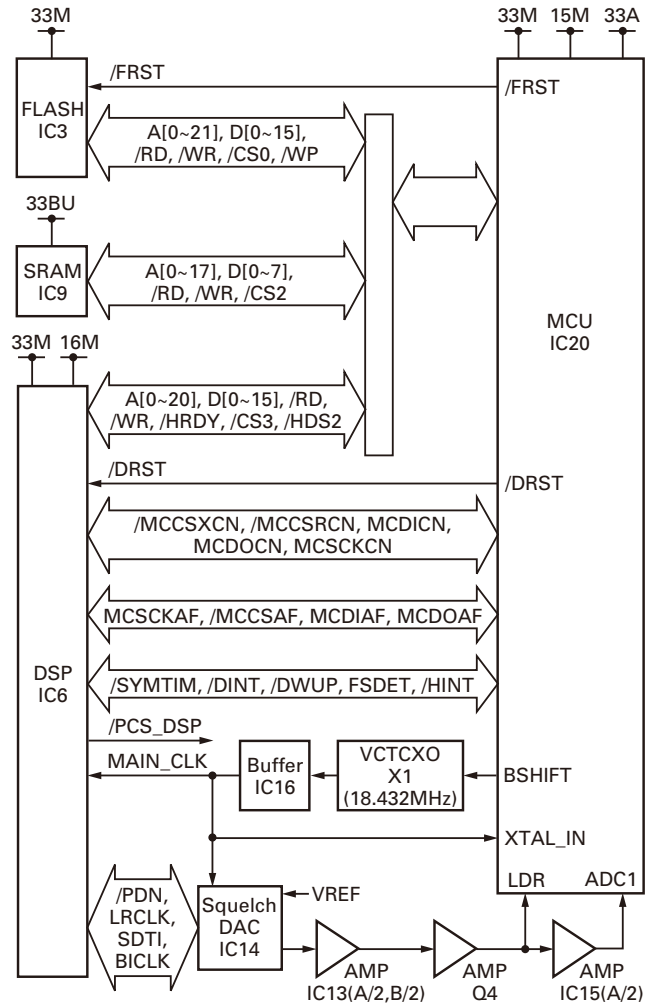


Fig. 14 Control circuit

### 4-5. Power supply circuit

The X53-449 circuit consists of IC301, IC302, IC303, IC304, IC305 and IC306.

IC301 is a DC/DC converter that converts 13.2V to 6.0V. This 13.2V voltage is supplied from TX-RX unit (X57-794).

IC302 is connected to IC301 and regulates the voltage to 5.0V. IC303, IC304, IC305 and IC306 are connected to IC301. IC303 and IC306 are 3.3V voltage regulators. IC304 is a 1.5V regulator IC, and IC305 is a 1.6V regulator IC.

CN302 is the connector for the lithium battery. The lithium battery is used to back up the SRAM and RTC data when no external DC power source is available.



## CIRCUIT DESCRIPTION

### 4-6. Power supply voltage monitoring circuit

The X53-449 circuit consists of IC307, IC308, D303 and Q301.

IC308 is a voltage detect IC and is used to generate the "/RST" signal for the MCU (IC20).

This "/RST" signal is connected to the hardware reset pin of MCU (IC20).

IC307 is a voltage detect IC and is used to generate the "/BINT" signal for the MCU (IC20).

This "/BINT" signal is connected to the hardware interrupt pin of MCU (IC20). The software of the MCU (IC20) runs to the sleep-mode to use the "/BINT" signal.

D303 and Q301 are used to generate the "OVRB" signal for the MCU (IC20). The software of the MCU (IC20) runs to the sleep-mode to use the "OVRB" signal.

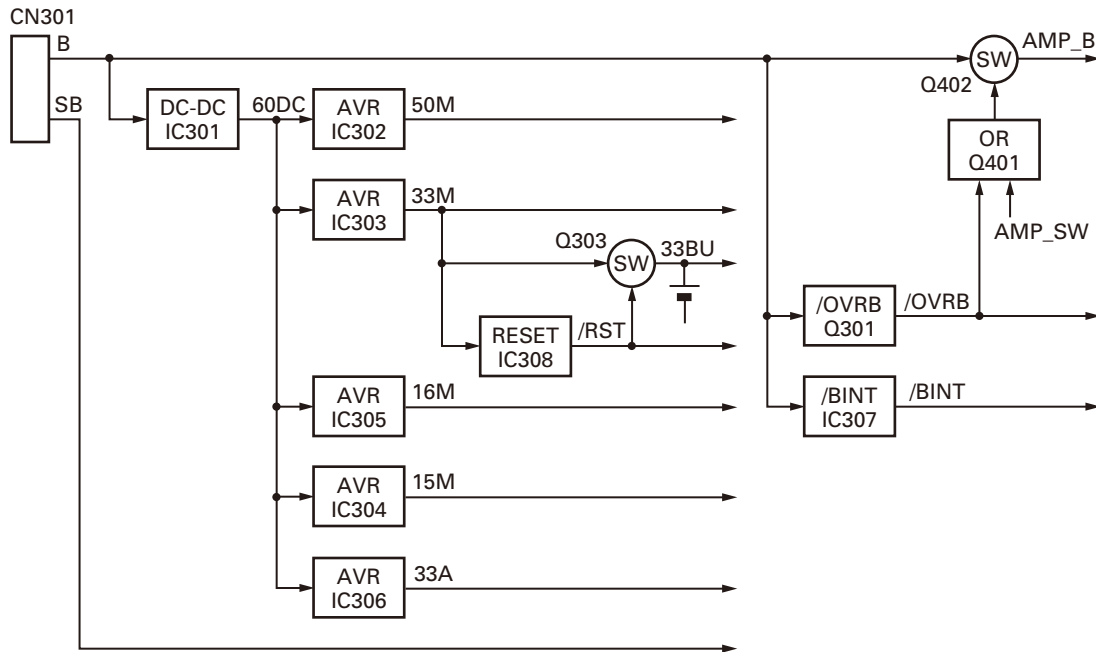


Fig. 15 Power supply circuit

### 4-7. 18.432MHz clock circuit

The 18.432MHz clock is provided to the MCU (IC20), DSP(IC6), and DAC (IC14) of the Squelch circuit.

### 4-8. Audio circuit

#### ■ Audio amplifier circuit

The audio amplifier circuit is located in the control section of the Control unit (X53-449). The 4W output audio power is available from the pin 15 TEST/SPKR connector "SPO", "SPG" on the rear panel to the external speaker in the case of a power supply voltage of 13.2V and a 4Ω load.

#### ■ Microphone circuit

The signal from the microphone is passed through the AGC circuit located in the Display unit (X54-373 A/2) so that it may not saturate. This circuit consists of IC501, D501, D502, Q501, and Q502. The AGC controls the amplifier gains using the detected audio signal depending on the positive and negative peaks of the signal amplitude. The audio signal goes to the control section of the Control unit (X53-449) from the Display unit (X54-373 A/2).

#### ■ Modulation circuit (Analog/Digital signal processing)

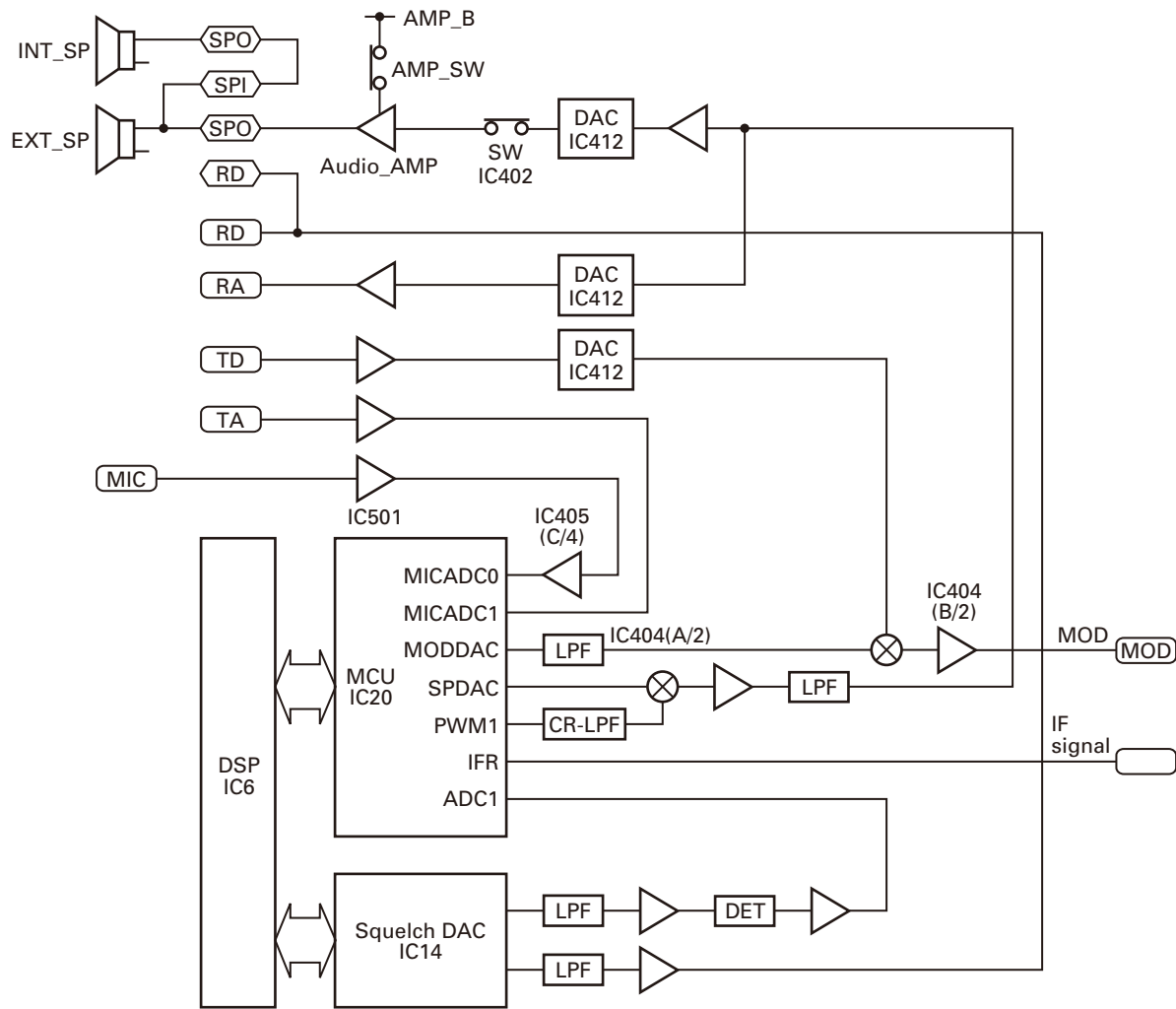
In the case of the Analog Signal Processing mode, the transmitting audio signal is amplified by IC405 (C/4), input to the MICADCO terminal of the MCU (IC20), and audio processed by DSP (IC6). The processed audio signal from the MODDAC terminal of IC20 is passed through an anti-aliasing filter at IC404 (A/2), and is then amplified to a sufficient level by IC404 (B/2), and amplified by the summing (TD) amplifier. The Digital Signal Processing mode is the same as the Analog Signal Processing mode.

### 4-9. Other circuit

#### ■ Real-time clock

The clock function is based on a real-time clock IC (IC17). When the power supply is off, it is backed up by an internal secondary lithium battery.

## CIRCUIT DESCRIPTION



**Fig. 16 Modulation circuit (Analog/Digital signal processing)**

### 5. Display unit

The Display unit (X54-3730-20) is different from X54-3580-20 which is used in the TKR-750/850/751/851.

The Display unit (X54-3730-20) consists of the following circuits:

- (1) LED circuit
- (2) Key switch circuit
- (3) Power supply voltage detector

#### 5-1. LED circuit

The display circuit consists of various types of LEDs: 7-segment type D506 and D507 (red), D503 (red: transmission), D504 (green: busy), D505 (green: power on).

IC502 to IC505 are shift registers that convert MCU serial data to parallel data and turn on the LEDs.

#### 5-2. Key switch circuit

There are PF key 1 to PF key 6 on the Display unit. Using these key switches, mode settings are available.

The logic signals pushing these key switches are entered directly into the MCU (IC20).

#### 5-3. Power supply voltage detector

The Display unit has a power supply voltage detector circuit.

The power supply voltage (SB) is divided through two resistors (R545 and R546).

The divided voltage is input to the MCU via the IC508.

## COMPONENTS DESCRIPTION

### FINAL UNIT (X45-3922-71)

Ref. No.	Part Name	Description
IC201,202	IC	DC amplifier
IC203	IC	Voltage regulator
Q1,2	Transistor	RF amplifier
Q3	FET	TX drive amplifier
Q4	FET	Final amplifier
Q203~206	FET	DC switch
Q207	Transistor	DC switch
D1	Diode	RF switch
D3,4	Diode	RF detector
D5~8	Diode	RF switch
D9	Surge absorber	Surge protection
D10	Diode	RF detector
D201	Zener diode	Voltage reference
D202	Surge absorber	Surge protector
D203	Diode	Surge protector
D301	Diode	Protect of reverse connection

### CONTROL UNIT (X53-4490-10)

Ref. No.	Part Name	Description
IC3	IC	Flash memory
IC4,5	IC	RS-485 transceiver
IC6	IC	DSP
IC7,8	IC	Buffer
IC9	IC	SRAM
IC10,11	IC	Buffer
IC12	IC	AND gate
IC13	IC	AF amplifier
IC14	IC	CODEC
IC15	IC	AF amplifier
IC16	IC	Buffer amplifier
IC17	IC	RTC IC
IC18,19	IC	Buffer
IC20	IC	MCU
IC21	IC	RS-232C driver/receiver
IC22	IC	I/O expander
IC23	IC	NAND gate
IC24	IC	AND gate
IC25	IC	OR gate
IC26	IC	AND gate
IC27,28	IC	AF amplifier
IC301	IC	DC/DC converter
IC302	IC	Voltage regulator
IC303~306	IC	Voltage regulator
IC307	IC	Voltage regulator
IC308	IC	Voltage regulator

Ref. No.	Part Name	Description
IC401	IC	NAND gate
IC402	IC	Analog switch
IC403	IC	AF power amplifier
IC404~406	IC	OP AMP
IC407	IC	Analog switch
IC411	IC	OP AMP
IC412	IC	DC/AC converter
Q4	Transistor	DC switch
Q5	FET	DC switch
Q6~10	Transistor	Buffer amplifier
Q301	Transistor	DC switch
Q302	FET	DC switch
Q303	Transistor	Power switch
Q401	Transistor	Power switch
Q402	FET	Power switch
Q403	Transistor	Power switch
Q404,405	Transistor	AF mute switch
D1,2	Diode	Detector
D3~12	Diode	Surge protector
D13	Zener diode	Surge protector
D14~16	Diode	Surge protector
D18	Diode	Surge protector
D20	Diode	Surge protector
D22,23	Diode	Surge protector
D24	Zener diode	Surge protector
D26	Diode	Surge protector
D28,29	Diode	Surge protector
D30	Zener diode	Surge protector
D31	Diode	Surge protector
D32	Zener diode	Surge protector
D35	Diode	Surge protector
D36	Zener diode	Surge protector
D37	Varistor	Current protector
D301,302	Diode	Surge protector
D303	Zener diode	Voltage reference
D304,305	Diode	Surge protector
D401	Diode	Diode switch

### DISPLAY UNIT (X54-3730-20)

Ref. No.	Part Name	Description
IC501	IC	MIC amplifier
IC502~505	IC	Shift register
IC506,507	IC	Voltage regulator
IC508	IC	Analog switch
Q501,502	Transistor	Level controller
Q503,504	FET	DC switch

## COMPONENTS DESCRIPTION

Ref. No.	Part Name	Description
Q506	Transistor	DC switch
Q507	FET	DC switch
Q508~511	Transistor	DC switch
Q512~514	FET	DC switch
Q516~519	FET	DC switch
Q521~525	FET	DC switch
D501,502	Diode	AF detector
D503~507	LED	LED
D508~514	Diode	Surge absorption
D601,602	Diode	Surge absorption
D603	Varistor	Current protector

### TX-RX UNIT (X57-7942-71)

Ref. No.	Part Name	Description
IC100,101	IC	OP AMP
IC200,201	IC	OP AMP
IC203	IC	Buffer
IC300	IC	Mixer
IC400	IC	IF amplifier
IC401	IC	Buffer amplifier
IC402	IC	OP AMP
IC403	IC	IF system
IC404	IC	IF amplifier
IC405~408	IC	Analog switch
IC409	IC	Buffer amplifier
IC500	IC	Buffer amplifier
IC501	IC	OP AMP
IC600,601	IC	Buffer
IC602	IC	16.8MHz PLL
IC603~607	IC	OP AMP
IC608	IC	AF amplifier
IC700~702	IC	Voltage regulator
IC703,704	IC	Voltage regulator
IC800	IC	Temperature sensor
IC801	IC	OP AMP
IC802	IC	EEPROM
IC803	IC	Buffer amplifier
IC804	IC	Digital potentiometer
IC805	IC	I/O expander
IC806	IC	Analog switch
Q100	Transistor	DC switch
Q101	Transistor	RF amplifier
Q200,201	Transistor	DC switch
Q202,203	Transistor	RF amplifier
Q300	FET	RF amplifier
Q301	Transistor	RF amplifier

Ref. No.	Part Name	Description
Q500	FET	DC switch
Q501	Transistor	RF amplifier
Q502,503	FET	RF amplifier
Q504	Transistor	RF amplifier
Q505~507	FET	DC switch
Q600	FET	DC switch
Q601	Transistor	DC switch
Q602,603	Transistor	RF amplifier
Q604,605	Transistor	DC switch
Q606	Transistor	RF amplifier
Q607	FET	DC switch
Q700~702	FET	DC switch
Q703	Transistor	DC switch
Q704~706	FET	DC switch
Q800	FET	DC switch
D100,101	Varicap	Frequency control
D103~108	Varicap	Frequency control
D200	Diode	DC switch
D500,501	Zener diode	Limiter
D503	Diode	Detector
D504,505	Diode	RF switch
D600	Diode	DC switch
D601	Diode	RF switch
D801	Diode	DC switch

### RX VCO/PLL UNIT (X58-5070-10)

Ref. No.	Part Name	Description
IC300	IC	PLL
Q300	Transistor	Buffer amplifier
Q350,351	FET	DC switch
Q352,353	FET	VCO OSC
Q354	Transistor	Buffer amplifier
D352,353	Varicap	Frequency control
D355	Varicap	Frequency control
D357~361	Varicap	Frequency control

### TX VCO/PLL UNIT (X58-5080-10)

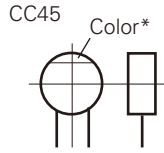
Ref. No.	Part Name	Description
IC300	IC	PLL
Q300	Transistor	Buffer amplifier
Q350,351	FET	DC switch
Q352,353	FET	VCO OSC
Q354	Transistor	Buffer amplifier
D352,353	Varicap	Frequency control
D355	Varicap	Frequency control
D357~361	Varicap	Frequency control

## PARTS LIST

### CAPACITORS

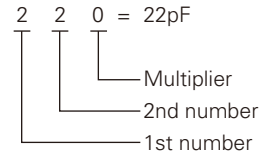
$\frac{C}{1} \frac{C}{2} \frac{45}{3} \frac{TH}{4} \frac{1H}{5} \frac{220}{6} \frac{J}{6}$

- 1 = Type ... ceramic, electrolytic, etc.
- 2 = Shape ... round, square, etc.
- 3 = Temp. coefficient
- 4 = Voltage rating
- 5 = Value
- 6 = Tolerance



#### • Capacitor value

- 010 = 1pF
- 100 = 10pF
- 101 = 100pF
- 102 = 1000pF = 0.001μF
- 103 = 0.01μF



#### • Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470±60ppm/°C

#### • Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10μF : -10~+50 Less than 4.7μF : -10~+75

#### (Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

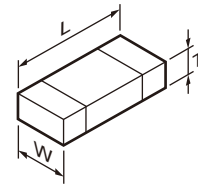
#### • Voltage rating

2nd word	A	B	C	D	E	F	G	H	J	K	V	
1st word	0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35	-
2	100	125	160	200	250	315	400	500	630	800	-	-
3	1000	1250	1600	2000	2500	2150	4000	5000	6300	8000	-	-

#### • Chip capacitors

- (EX)  $\frac{C}{1} \frac{C}{2} \frac{73}{3} \frac{F}{4} \frac{SL}{5} \frac{1H}{6} \frac{000}{7} \frac{J}{7}$  → Refer to the table above.
- 1 = Type
  - 2 = Shape
  - 3 = Dimension
  - 4 = Temp. coefficient
  - 5 = Voltage rating
  - 6 = Value
  - 7 = Tolerance
- (Chip) (CH, RH, UJ, SL)
- (EX)  $\frac{C}{1} \frac{K}{2} \frac{73}{3} \frac{F}{4} \frac{F}{5} \frac{1H}{6} \frac{000}{7} \frac{Z}{7}$
- (Chip) (B, F)

#### • Dimension



#### Chip capacitor

Code	L	W	T
Empty	5.6±0.5	5.0±0.5	Less than 2.0
A	4.5±0.5	3.2±0.4	Less than 2.0
B	4.5±0.5	2.0±0.3	Less than 2.0
C	4.5±0.5	1.25±0.2	Less than 1.25
D	3.2±0.4	2.5±0.3	Less than 1.5
E	3.2±0.2	1.6±0.2	Less than 1.25
F	2.0±0.3	1.25±0.2	Less than 1.25
G	1.6±0.2	0.8±0.2	Less than 1.0
H	1.0±0.05	0.5±0.05	0.5±0.05

#### Chip resistor

Code	L	W	T
E	3.2±0.2	1.6±0.2	1.0
F	2.0±0.3	1.25±0.2	1.0
G	1.6±0.2	0.8±0.2	0.5±0.1
H	1.0±0.05	0.5±0.05	0.35±0.05

### RESISTORS

#### • Chip resistor (Carbon)

- (EX)  $\frac{R}{1} \frac{D}{2} \frac{73}{3} \frac{E}{4} \frac{B}{5} \frac{2B}{6} \frac{000}{7} \frac{J}{7}$
- (Chip) (B, F)

#### • Carbon resistor (Normal type)

- (EX)  $\frac{R}{1} \frac{D}{2} \frac{14}{3} \frac{B}{4} \frac{B}{5} \frac{2C}{6} \frac{000}{7} \frac{J}{7}$

- 1 = Type
- 2 = Shape
- 3 = Dimension
- 4 = Temp. coefficient
- 5 = Rating wattage
- 6 = Value
- 7 = Tolerance

#### • Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

# NXR-710

## 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

K : USA

P : Canada

Y : PX (Far East, Hawaii)

T : England

E : Europe

C : China

X : Australia

M : Other Areas

### NXR-710

#### FINAL UNIT (X45-3922-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination
<b>NXR-710</b>					
1	3A		A62-0933-23	PANEL ASSY (INNER)	
2	1A		A62-1146-04	PANEL (TX-RX)	
3	1B		A62-1147-04	PANEL (FINAL)	
4	1D		A62-1148-03	PANEL (OUTER)	
5	3C		A62-1174-03	PANEL ASSY	
6	2C		A82-0077-02	REAR PANEL	
8	1F		B10-2635-04	FRONT GLASS ACCESSORY	
9	1F		B11-1259-04	FILTER ACCESSORY	
10	1F	*	B62-2200-00	INSTRUCTION MANUAL	
11	2C,3D	*	B72-2597-04	MODEL NAME-PLATE	
13	1B		E30-3414-05	DC CORD (EXT DC IN)	
14	1C		E30-3418-15	ANTENNA CABLE (RX IN)	
15	1E		E30-3427-35	DC CORD ACCESSORY	
16	1D		E30-7528-15	ANTENNA CABLE (TX OUT)	
17	1A		E30-7689-05	TRUNK CABLE (X57-X53)	
18	1C		E30-7690-05	ANTENNA CABLE (REF IN)	
19	1E		E31-3228-05	15P PLUG ACCESSORY	
20	1B		E37-0902-15	LEAD WIRE WITH TERMINAL (DC+)	
21	1B		E37-0903-15	LEAD WIRE WITH TERMINAL (DC-)	
22	3A		E37-0905-15	LEAD WIRE WITH CONNECTOR (SP)	
23	3A		E37-0906-05	LEAD WIRE WITH CONNECTOR (X53-X54)	
24	3A,2B		E37-0908-05	LEAD WIRE WITH CONNECTOR (11P)	
25	3A,1B		E37-0911-05	LEAD WIRE WITH CONNECTOR (3P)	
26	2B		E37-0912-15	LEAD WIRE WITH MINIPIN PLUG	
27	2C		E37-0913-05	LEAD WIRE WITH CONNECTOR (ACC15P)	
28	2A	*	E37-1340-25	FLAT CABLE	
29	2C		E37-1376-05	LEAD WIRE WITH CONNECTOR (DSUB25P)	
32	1C,1E		F05-1537-05	BLADE FUSE (15A/32V) ACCESSORY	
33	2C		F09-0445-05	CAP (DSUB)	
34	1C		F09-0471-15	FANMOTOR	
36	1B		F10-3129-03	SHIELDING CASE (X45 FINAL PCB)	
38	2A,2B		G02-0576-14	FLAT SPRING	
39	2B		G02-0829-14	FLAT SPRING (RX VCO)	
40	3A		G02-0885-13	EARTH SPRING (X54 DISPLAY PCB)	
41	1B		G02-0894-04	EARTH SPRING (X45:FINAL FET)	
42	2B		G02-1831-04	EARTH SPRING (REAR BOTTOM)	
43	1C		G02-1832-04	EARTH SPRING (REAR TOP)	
44	1B		G02-1855-04	FLAT SPRING (X45:AVR)	
46	2B,3B		G10-1263-04	FIBROUS SHEET (CHASSIS)	
47	3C,2D		G10-1264-04	FIBROUS SHEET (PANEL ASSY)	
48	3B		G10-1344-04	FIBROUS SHEET (EARTH SPRING,SHORT)	
49	3B		G10-1345-04	FIBROUS SHEET (EARTH SPRING,LONG)	
50	3A		G10-1377-04	FIBROUS SHEET (VOLUME)	
51	3A		G10-1821-04	FIBROUS SHEET (KNOB)	
52	1F		G13-1801-04	CUSHION (40X40X5) ACCESSORY	
53	1F		G13-1802-04	CUSHION (40X40X10) ACCESSORY	
54	2B		G13-1886-04	CUSHION(BNC)	
55	1E		H25-0029-04	PROTECTION BAG (60/110/0.07)	
56	1F		H25-0747-04	PROTECTION BAG (250X350)	
57	1E		H25-0762-04	PROTECTION BAG (120X300)	
58	1F		H25-2328-04	PROTECTION BAG (80/250/0.07)	
59	3F	*	H52-2388-02	ITEM CARTON CASE	

Ref. No.	Address	New parts	Parts No.	Description	Destination
60	1E		J02-0475-05	FOOT ACCESSORY	
61	1E		J02-0492-04	FOOT (RUBBER) ACCESSORY	
62	2B		J19-5540-03	HOLDER (TRUNK CABLE)	
63	1B		J21-8467-04	MOUNTING HARDWARE (X45:DRIVE FET)	
64	1F		J21-8559-04	MOUNTING HARDWARE ACCESSORY	
66	1E		J59-0302-05	GROMMET ACCESSORY	
67	1B,1E		J61-0307-05	BAND	
69	1E		K01-0418-15	HANDLE ACCESSORY	
70	3A		K29-5389-03	KNOB (VOLUME)	
71	3A		K29-9106-04	KNOB (POWER)	
72	3A		K29-9370-02	KEY TOP	
74	1E		L79-1419-05	LINE FILTER (ACCESSORY DC CORD)	
75	1B		L79-1854-05	LINE FILTER (DC CORD,DC+,DC-)	
76	1B		L79-1855-05	LINE FILTER (DC+,DC-)	
A	2C		N09-2292-05	HEXAGON HEAD SCREW (DSUB)	
B	1C,2C,2D		N30-2606-48	PAN HEAD MACHINE SCREW (ANT)	
C	2A,1E		N30-4006-48	PAN HEAD MACHINE SCREW (CHAS,ACC)	
D	2B,2C		N30-4014-48	PAN HEAD MACHINE SCREW (CHASSIS)	
E	1C		N30-4020-43	PAN HEAD MACHINE SCREW (FAN)	
F	1C,2C		N32-3006-48	FLAT HEAD MACHINE SCREW (R PANEL)	
G	3B		N32-4008-43	FLAT HEAD MACHINE SCREW (F PANEL)	
H	1A,1B,1E		N35-3006-43	BINDING HEAD MACHINE SCREW (TOP,ACC)	
J	1C		N35-4006-43	BINDING HEAD MACHINE SCREW (TOP)	
K	1B,3B		N67-3008-48	PAN HEAD SEMS SCREW (X53:AUDIO IC)	
L	1C,2C		N80-2608-43	PAN HEAD TAPTITE SCREW (FUSE)	
M	3A		N87-3005-43	BRAZIER HEAD TAPTITE SCREW (SP)	
N	3A,1B,2B		N87-3006-48	BRAZIER HEAD TAPTITE SCREW (PCB)	
78	3A	*	T07-0770-45	SPEAKER	
80	3A		W09-0971-05	LITHIUM CELL	
-		*	X53-4490-11	SERVICE CONTROL UNIT	
-			490-0174-05	ADHESIVE TAPE	
<b>FINAL UNIT (X45-3922-71)</b>					
C4			CK73GB1H104K	CHIP C 0.10UF	K
C5-7			CK73GB1H102K	CHIP C 1000PF	K
C10			CK73GB1H102K	CHIP C 1000PF	K
C12			CC73GCH1H270J	CHIP C 27PF	J
C14			CK73GB1H102K	CHIP C 1000PF	K
C16-18			CK73GB1H102K	CHIP C 1000PF	K
C19			CC73FCH1H180J	CHIP C 18PF	J
C21			CK73GB1H102K	CHIP C 1000PF	K
C23			CK73GB1H102K	CHIP C 1000PF	K
C24			CK73FB1H102K	CHIP C 1000PF	K
C25			CC73FCH1H270J	CHIP C 27PF	J
C26			CC73FCH1H470J	CHIP C 47PF	J
C27			CC73FCH1H560J	CHIP C 56PF	J
C28			CK73FB1H102K	CHIP C 1000PF	K
C33			C93-0572-05	CHIP C 100PF	J

## PARTS LIST

FINAL UNIT (X45-3922-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C34		*	C93-1747-05	CHIP C 130PF J		CN203			E41-2672-05	PIN ASSY	
C37			CK73GB1E105K	CHIP C 1.0UF K		CN204			E41-2743-05	PIN ASSY	
C43			CC73GCH1H220J	CHIP C 22PF J		CN205			E41-1682-05	PIN ASSY	
C44			CC73GCH1H101J	CHIP C 100PF J		J401,402			E58-0533-05	MODULAR JACK	
C45			C93-0595-05	CHIP C 220PF K							
C51			C93-0603-05	CHIP C 1000PF K		F1			F53-0392-05	FUSE (3A)	
C52			C93-0868-15	MICA 240PF J		102	1B		G02-1856-04	EARTH SPRING	
C53			CK73GB1E105K	CHIP C 1.0UF K		103	2C		J21-8616-04	MOUNTING HARDWARE (MODULAR)	
C54			C93-1747-05	CHIP C 130PF J		CN301			J13-0071-05	FUSE HOLDER	
C57			C93-1800-05	CHIP C 82PF J							
C60			CK73GB1H102K	CHIP C 1000PF K		L3,4			L41-6878-14	SMALL FIXED INDUCTOR (68NH)	
C61			CC73GCH1H220J	CHIP C 22PF J		L5			L41-2778-14	SMALL FIXED INDUCTOR (27NH)	
C63			C93-1790-05	CHIP C 33PF J		L6			L41-1278-14	SMALL FIXED INDUCTOR (12NH)	
C65			CC73GCH1H101J	CHIP C 100PF J		L7			L41-1878-14	SMALL FIXED INDUCTOR (18NH)	
C66			CK73GB1H102K	CHIP C 1000PF K		L8			L92-0179-05	CHIP FERRITE	
C68			CM73F2H221J	CHIP C 220PF J		L9			L34-4520-05	AIR-CORE COIL	
C69			CK73GB1H102K	CHIP C 1000PF K		L10			L34-4560-05	AIR-CORE COIL	
C71			CK73GB1H102K	CHIP C 1000PF K		L11			L34-4557-05	AIR-CORE COIL	
C75			C93-0603-05	CHIP C 1000PF K		L12,13			L41-2785-14	SMALL FIXED INDUCTOR (270NH)	
C78			CM73F2H221J	CHIP C 220PF J		L14			L34-4667-05	AIR-CORE COIL	
C80			CC73FCH1H270J	CHIP C 27PF J		L15			L34-4744-05	AIR-CORE COIL	
C82			C93-0563-05	CHIP C 18PF J		L16-18			L34-4520-05	AIR-CORE COIL	
C83			C93-0551-05	CHIP C 1.5PF C		L19			L40-1085-92	SMALL FIXED INDUCTOR (100NH)	
C84			C93-0562-05	CHIP C 15PF J							
C88			C93-1788-05	CHIP C 27PF J		R2			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C89			C93-1784-05	CHIP C 18PF J		R6			RK73GB2A472J	CHIP R 4.7K J 1/10W	
C91			C93-1788-05	CHIP C 27PF J		R7			RK73GB2A102J	CHIP R 1.0K J 1/10W	
C92			C93-1786-05	CHIP C 22PF J		R8			RK73FB2B330J	CHIP R 33 J 1/8W	
C94			C93-0564-05	CHIP C 22PF J		R9			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C97			CK73GB1H102K	CHIP C 1000PF K		R10			RK73FB2B102J	CHIP R 1.0K J 1/8W	
C98			C93-0564-05	CHIP C 22PF J		R11			RK73FB2B270J	CHIP R 27 J 1/8W	
C99			CC73FCH1H050C	CHIP C 5.0PF C		R12			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C201			CK73GB1H102K	CHIP C 1000PF K		R14			RK73GB2A220J	CHIP R 22 J 1/10W	
C205			CK73GB1H102K	CHIP C 1000PF K		R15			RK73GB2A472J	CHIP R 4.7K J 1/10W	
C206			CK73GB1H472K	CHIP C 4700PF K		R16			RK73GB2A102J	CHIP R 1.0K J 1/10W	
C207			CK73GB1H102K	CHIP C 1000PF K		R17			RK73FB2B100J	CHIP R 10 J 1/8W	
C210			CK73GB1H102K	CHIP C 1000PF K		R18			RK73GB2A471J	CHIP R 470 J 1/10W	
C216			CK73GB1H102K	CHIP C 1000PF K		R19			RK73FB2B271J	CHIP R 270 J 1/8W	
C218			CK73GB1H104K	CHIP C 0.10UF K		R20			RK73FB2B220J	CHIP R 22 J 1/8W	
C219			CK73GB1H102K	CHIP C 1000PF K		R21			RK73FB2B271J	CHIP R 270 J 1/8W	
C220			CD04A21V100M	ELECTRO 10UF 35WV		R23			RK73FB2B180J	CHIP R 18 J 1/8W	
C221,222			CK73GB1H102K	CHIP C 1000PF K		R24			RK73FB2B271J	CHIP R 270 J 1/8W	
C223			CD04A21V102M	ELECTRO 1000UF 35WV		R25			RK73EB2E470J	CHIP R 47 J 1/4W	
C224			CK73GB1H102K	CHIP C 1000PF K		R26			RK73FB2B154J	CHIP R 150K J 1/8W	
C225			CK73GB1H104K	CHIP C 0.10UF K		R27			RK73FB2B104J	CHIP R 100K J 1/8W	
C229-238			CK73GB1H102K	CHIP C 1000PF K		R28			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C239			CD04BD1H101M	ELECTRO 100UF 50WV		R29			RK73GB2A822J	CHIP R 8.2K J 1/10W	
C240			CC73GCH1H220J	CHIP C 22PF J		R30			RK73RB2H5R6J	CHIP R 5.6 J 1/2W	
C241-244			CK73GB1H102K	CHIP C 1000PF K		R31			RK73FB2B823J	CHIP R 82K J 1/8W	
C245			CC73GCH1H220J	CHIP C 22PF J		R32			RK73FB2B104J	CHIP R 100K J 1/8W	
C246			CK73GB1H104K	CHIP C 0.10UF K		R33			RK73GB2A823J	CHIP R 82K J 1/10W	
C247-253			CK73GB1H102K	CHIP C 1000PF K		R34,35			RK73FB2B000J	CHIP R 0.0 J 1/8W	
C301,302			CK73GB1H471K	CHIP C 470PF K		R36			RK73FB2B820J	CHIP R 82 J 1/8W	
C303			CC73GCH1H220J	CHIP C 22PF J		R38			RK73FB2B000J	CHIP R 0.0 J 1/8W	
C304			CC73GCH1H470J	CHIP C 47PF J		R39			RK73GB2A101J	CHIP R 100 J 1/10W	
101	2C		E37-1473-05	LEAD WIRE WITH CONNECTOR (X45-X53)		R40			RK73FB2B000J	CHIP R 0.0 J 1/8W	
CN1			E04-0154-05	PIN SOCKET		R41			RK73FB2B820J	CHIP R 82 J 1/8W	
CN2,3			E23-1262-05	TERMINAL		R42			RK73PB2H121J	CHIP R 120 J 1/2W	
CN4,5			E23-1330-05	TERMINAL		R43			RK73FB2B224J	CHIP R 220K J 1/8W	
CN201,202			E23-0462-05	TERMINAL		R44			RK73GB2A000J	CHIP R 0.0 J 1/10W	

## PARTS LIST

FINAL UNIT (X45-3922-71)

CONTROL UNIT (X53-4490-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R201			RK73GB2A333J	CHIP R 33K J 1/10W		C41-45			CK73HB1A104K	CHIP C 0.10UF K	
R202			RK73GB2A104J	CHIP R 100K J 1/10W		C46			CK73HB1A105K	CHIP C 1.0UF K	
R203			RK73GB2A473J	CHIP R 47K J 1/10W		C47			CK73HB1H102K	CHIP C 1000PF K	
R204			RK73GB2A273J	CHIP R 27K J 1/10W		C49			CK73HB1A105K	CHIP C 1.0UF K	
R205,206			RK73GB2A104J	CHIP R 100K J 1/10W		C50			CK73HB1A104K	CHIP C 0.10UF K	
R207			RK73GB2A154J	CHIP R 150K J 1/10W		C51			CK73HB1A105K	CHIP C 1.0UF K	
R208			RK73GB2A101J	CHIP R 100 J 1/10W		C52			CC73HCH1H270J	CHIP C 27PF J	
R210			RK73GB2A104J	CHIP R 100K J 1/10W		C56,57			CK73HB1A104K	CHIP C 0.10UF K	
R213			RK73GB2A564J	CHIP R 560K J 1/10W		C58			CK73HB1H681K	CHIP C 680PF K	
R215			RK73GB2A563J	CHIP R 56K J 1/10W		C60,61			CK73HB1H102K	CHIP C 1000PF K	
R217			RK73GB2A154J	CHIP R 150K J 1/10W		C62,63			CK73FB0J106K	CHIP C 10UF K	
R218,219			RK73GB2A104J	CHIP R 100K J 1/10W		C64			CK73HB1A105K	CHIP C 1.0UF K	
R220			RK73GB2A224J	CHIP R 220K J 1/10W		C65			CK73HB1H102K	CHIP C 1000PF K	
R221			RK73GB2A183J	CHIP R 18K J 1/10W		C66			CK73HB1E103K	CHIP C 0.010UF K	
R225			RK73GB2A000J	CHIP R 0.0 J 1/10W		C67			CK73HB1A104K	CHIP C 0.10UF K	
R226			RK73GB2A332J	CHIP R 3.3K J 1/10W		C68			CK73HB1E103K	CHIP C 0.010UF K	
R228,229			RK73GB2A473J	CHIP R 47K J 1/10W		C69			CK73HB1H102K	CHIP C 1000PF K	
R230,231			RK73GB2A472J	CHIP R 4.7K J 1/10W		C70			CK73HB1A224K	CHIP C 0.22UF K	
R232,233			RK73GB2A474J	CHIP R 470K J 1/10W		C72			CK73HB1A224K	CHIP C 0.22UF K	
R235,236			RK73PB2H100J	CHIP R 10 J 1/2W		C73			CC73HCH1H470J	CHIP C 47PF J	
R237			RK73GB2A123J	CHIP R 12K J 1/10W		C74			CC73HCH1H101J	CHIP C 100PF J	
R352			RK73GB2A000J	CHIP R 0.0 J 1/10W		C75			CK73GB1C104K	CHIP C 0.10UF K	
R354			RK73GB2A000J	CHIP R 0.0 J 1/10W		C76			CC73HCH1H470J	CHIP C 47PF J	
D1			1SS226-F	DIODE		C77			CK73HB1A104K	CHIP C 0.10UF K	
D3,4			HSM88AS-E	DIODE		C79,80			CK73HB1E103K	CHIP C 0.010UF K	
D5-8			L7091CER	DIODE		C81			CK73HB1H102K	CHIP C 1000PF K	
D9			CSA70-401L	SURGE ABSORBER		C82,83			CC73HCH1H101J	CHIP C 100PF J	
D10			MA2S111-F	DIODE		C84-86			CK73HB1H682K	CHIP C 6800PF K	
D201			02DZ6.2F-Y	ZENER DIODE		C87			CK73HB1H102K	CHIP C 1000PF K	
D202			22ZR-10D	SURGE ABSORBER		C88			CK73GB1C104K	CHIP C 0.10UF K	
D203			1SS355	DIODE		C89			CK73HB1H102K	CHIP C 1000PF K	
D301			DSA3A1	DIODE		C90			CK73GB1C104K	CHIP C 0.10UF K	
IC201,202			TA75W01FUF	MOS-IC		C91			CK73HB1A104K	CHIP C 0.10UF K	
IC203			NJM78M08FA-ZB	ANALOGUE IC		C92			CK73HB1E103K	CHIP C 0.010UF K	
Q1,2			2SC3357-A	TRANSISTOR		C93			CS77CPOJ100M	CHIP TNL 10UF 6.3WV	
Q3	2B		PD55003S-E	FET		C94			CK73HB1A104K	CHIP C 0.10UF K	
Q4	2B		RD70HV1F-101	FET		C95,96			CC73HCH1H020C	CHIP C 2.0PF C	
Q203,204			2SJ484	FET		C97			CK73HB1H102K	CHIP C 1000PF K	
Q205,206			SSM3K15TE(F)	FET		C98-100			CK73HB1A104K	CHIP C 0.10UF K	
Q207			DTD123EK	DIGITAL TRANSISTOR		C101			CK73HB1E103K	CHIP C 0.010UF K	
TH201			S1R103J440H	THERMISTOR		C102			CK73HB1A105K	CHIP C 1.0UF K	
<b>CONTROL UNIT (X53-4490-10)</b>						C103			CK73HB1H102K	CHIP C 1000PF K	
C7-10			CC73HCH1H101J	CHIP C 100PF J		C104-107			CK73GB1C104K	CHIP C 0.10UF K	
C11			CK73HB1A105K	CHIP C 1.0UF K		C108			CC73HCH1H020C	CHIP C 2.0PF C	
C12-15			CC73HCH1H101J	CHIP C 100PF J		C109			CS77CPOJ100M	CHIP TNL 10UF 6.3WV	
C18,19			CK73GB1C104K	CHIP C 0.10UF K		C110,111			CC73HCH1H101J	CHIP C 100PF J	
C20			CK73HB1A105K	CHIP C 1.0UF K		C112			CK73HB1A104K	CHIP C 0.10UF K	
C21,22			CK73GB1C104K	CHIP C 0.10UF K		C114			CC73HCH1H101J	CHIP C 100PF J	
C23-30			CK73HB1A104K	CHIP C 0.10UF K		C115-119			CK73HB1A104K	CHIP C 0.10UF K	
C31			CK73HB1H102K	CHIP C 1000PF K		C120			CK73HB1A105K	CHIP C 1.0UF K	
C32,33			CK73HB1A104K	CHIP C 0.10UF K		C121			CK73HB1H102K	CHIP C 1000PF K	
C34			CK73HB1A105K	CHIP C 1.0UF K		C122-126			CK73HB1A104K	CHIP C 0.10UF K	
C35,36			CK73GB1C104K	CHIP C 0.10UF K		C127			CK73HB1E103K	CHIP C 0.010UF K	
C38			CK73HB1H102K	CHIP C 1000PF K		C128			CK73HB1A105K	CHIP C 1.0UF K	
C39			CK73HB1A104K	CHIP C 0.10UF K		C129			CK73HB1H102K	CHIP C 1000PF K	
C40			CK73HB1A105K	CHIP C 1.0UF K		C130,131			CK73HB1A104K	CHIP C 0.10UF K	
						C132			CK73HB1E103K	CHIP C 0.010UF K	
						C133			CK73HB1H102K	CHIP C 1000PF K	
						C134			CK73HB1E103K	CHIP C 0.010UF K	
						C135,136			CK73HB1H102K	CHIP C 1000PF K	



## PARTS LIST

### CONTROL UNIT (X53-4490-10)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C137			CK73HB1E103K	CHIP C 0.010UF K		C240-242			CK73HB1H102K	CHIP C 1000PF K	
C138			CC73HCH1H101J	CHIP C 100PF J		C243			CC73HCH1H101J	CHIP C 100PF J	
C139			CK73HB1E103K	CHIP C 0.010UF K		C244			CK73HB1H102K	CHIP C 1000PF K	
C140			CK73GB1C104K	CHIP C 0.10UF K		C245,246			CC73HCH1H101J	CHIP C 100PF J	
C141,142			CK73HB1H102K	CHIP C 1000PF K		C247			CK73HB1H102K	CHIP C 1000PF K	
C143			CK73HB1E103K	CHIP C 0.010UF K		C249			CK73HB1H102K	CHIP C 1000PF K	
C144-146			CK73HB1H102K	CHIP C 1000PF K		C250			CC73HCH1H101J	CHIP C 100PF J	
C147			CK73HB1E103K	CHIP C 0.010UF K		C252			CK73HB1H102K	CHIP C 1000PF K	
C148			CK73HB1H122K	CHIP C 1200PF K		C254			CC73HCH1H101J	CHIP C 100PF J	
C149			CK73HB1H102K	CHIP C 1000PF K		C256			CC73HCH1H101J	CHIP C 100PF J	
C150			CK73HB1E103K	CHIP C 0.010UF K		C257			CK73HB1H102K	CHIP C 1000PF K	
C151-155			CK73HB1H102K	CHIP C 1000PF K		C258			CC73HCH1H101J	CHIP C 100PF J	
C156			CC73HCH1H221J	CHIP C 220PF J		C259,260			CK73HB1A104K	CHIP C 0.10UF K	
C157			CK73HB1H102K	CHIP C 1000PF K		C301,302			C92-0905-05	OS-CON 47UF 35WV	
C158			CK73HB1A104K	CHIP C 0.10UF K		C303,304			C93-1810-05	CHIP C 4.7UF K	
C159			CK73HB1E103K	CHIP C 0.010UF K		C306			CK73HB1H471K	CHIP C 470PF K	
C160			CC73HCH1H101J	CHIP C 100PF J		C308			CK73EB1H474K	CHIP C 0.47UF K	
C161			CK73HB1H102K	CHIP C 1000PF K		C310,311			CE32AU1C330M	CHIP EL 33UF 16WV	
C162			CC73HCH1H101J	CHIP C 100PF J		C312			CE32BM1E470M	CHIP EL 47UF 25WV	
C164			CK73HB1H102K	CHIP C 1000PF K		C313			CK73HB1E223K	CHIP C 0.022UF K	
C166			CK73HB1E103K	CHIP C 0.010UF K		C314			CK73HB1H102K	CHIP C 1000PF K	
C167			CC73HCH1H101J	CHIP C 100PF J		C315-317			CE32BM1E470M	CHIP EL 47UF 25WV	
C170,171			CK73HB1H102K	CHIP C 1000PF K		C318-321			CK73HB1H102K	CHIP C 1000PF K	
C175,176			CK73HB1H102K	CHIP C 1000PF K		C322			CE32BM1E470M	CHIP EL 47UF 25WV	
C179,180			CK73HB1H102K	CHIP C 1000PF K		C323			CK73HB1H102K	CHIP C 1000PF K	
C182			CK73HB1H102K	CHIP C 1000PF K		C324			CE32BM1E470M	CHIP EL 47UF 25WV	
C184,185			CK73HB1H102K	CHIP C 1000PF K		C325,326			CK73HB1H102K	CHIP C 1000PF K	
C186			CC73HCH1H101J	CHIP C 100PF J		C327-329			CE32BM1E470M	CHIP EL 47UF 25WV	
C187			CK73HB1H102K	CHIP C 1000PF K		C330,331			CK73HB1H102K	CHIP C 1000PF K	
C188			CC73HCH1H101J	CHIP C 100PF J		C332			CE32BM1E470M	CHIP EL 47UF 25WV	
C189			CK73HB1H102K	CHIP C 1000PF K		C333			CK73HB1A104K	CHIP C 0.10UF K	
C190			CC73HCH1H101J	CHIP C 100PF J		C334			CK73HB1E103K	CHIP C 0.010UF K	
C191			CK73HB1H102K	CHIP C 1000PF K		C335			CK73HB1H471K	CHIP C 470PF K	
C192			CK73HB1E103K	CHIP C 0.010UF K		C336			CK73HB1E103K	CHIP C 0.010UF K	
C193			CC73HCH1H101J	CHIP C 100PF J		C337			CK73HB1H102K	CHIP C 1000PF K	
C194-197			CK73HB1H102K	CHIP C 1000PF K		C401			CK73HB1E103K	CHIP C 0.010UF K	
C198			CC73HCH1H101J	CHIP C 100PF J		C402			CC73HCH1H101J	CHIP C 100PF J	
C199			CK73HB1E103K	CHIP C 0.010UF K		C403			CK73HB1A105K	CHIP C 1.0UF K	
C200			CC73HCH1H101J	CHIP C 100PF J		C404			C90-4120-05	ELECTRO 470UF 35WV	
C201			CK73HB1H102K	CHIP C 1000PF K		C405			CK73HB1A104K	CHIP C 0.10UF K	
C202			CC73HCH1H101J	CHIP C 100PF J		C406,407			CK73HB1A105K	CHIP C 1.0UF K	
C203			CK73HB1H102K	CHIP C 1000PF K		C408,409			C93-0912-05	CHIP C 100UF M	
C205			CK73HB1H102K	CHIP C 1000PF K		C410			CK73HB1A105K	CHIP C 1.0UF K	
C206			CC73HCH1H101J	CHIP C 100PF J		C412			CK73FB0J106K	CHIP C 10UF K	
C207			CK73HB1E103K	CHIP C 0.010UF K		C413			CK73HB1H102K	CHIP C 1000PF K	
C209-212			CK73HB1H102K	CHIP C 1000PF K		C414			CK73HB1A105K	CHIP C 1.0UF K	
C213			CK73HB1E103K	CHIP C 0.010UF K		C415			CD04AY1E470M	ELECTRO 47UF 25WV	
C215,216			CK73HB1H102K	CHIP C 1000PF K		C416			CK73HB1H102K	CHIP C 1000PF K	
C218			CC73HCH1H101J	CHIP C 100PF J		C417			CK73HB1H222K	CHIP C 2200PF K	
C219-223			CK73HB1H102K	CHIP C 1000PF K		C418			CC73HCH1H391J	CHIP C 390PF J	
C224			CC73HCH1H101J	CHIP C 100PF J		C419			CK73HB1H152K	CHIP C 1500PF K	
C225,226			CK73HB1H102K	CHIP C 1000PF K		C420			CC73HCH1H221J	CHIP C 220PF J	
C227			CC73HCH1H101J	CHIP C 100PF J		C421			CK73FB0J106K	CHIP C 10UF K	
C228,229			CK73HB1H102K	CHIP C 1000PF K		C422			CD04AY1E470M	ELECTRO 47UF 25WV	
C230			CC73HCH1H101J	CHIP C 100PF J		C423			CK73HB1H471K	CHIP C 470PF K	
C232			CK73HB1H102K	CHIP C 1000PF K		C424			CC73HCH1H331J	CHIP C 330PF J	
C233			CC73HCH1H101J	CHIP C 100PF J		C425			CD04AY1E470M	ELECTRO 47UF 25WV	
C235			CK73HB1E103K	CHIP C 0.010UF K		C426			CK73HB1A104K	CHIP C 0.10UF K	
C237			CC73HCH1H101J	CHIP C 100PF J		C427			CK73HB1H471K	CHIP C 470PF K	
C239			CC73HCH1H101J	CHIP C 100PF J		C428			CK73HB1A105K	CHIP C 1.0UF K	

## PARTS LIST

### CONTROL UNIT (X53-4490-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C429			CK73HB1A104K	CHIP C 0.10UF K		R15			RK73HB1J104J	CHIP R 100K J 1/16W	
C430			C92-0777-05	ELECTRO 1000UF 25WV		R18			RK73HB1J104J	CHIP R 100K J 1/16W	
C432			CK73HB1A104K	CHIP C 0.10UF K		R22,23			RK73HB1J104J	CHIP R 100K J 1/16W	
C433			CC73HCH1H181J	CHIP C 180PF J		R24			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C434,435			CC73HCH1H101J	CHIP C 100PF J		R25,26			RK73HB1J103J	CHIP R 10K J 1/16W	
C436			CC73HCH1H221J	CHIP C 220PF J		R27,28			RK73HB1J473J	CHIP R 47K J 1/16W	
C438			C93-0912-05	CHIP C 100UF M		R29			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C441			C93-0912-05	CHIP C 100UF M		R30			RK73HB1J474J	CHIP R 470K J 1/16W	
C442			CK73HB1A105K	CHIP C 1.0UF K		R32,33			RK73HB1J472J	CHIP R 4.7K J 1/16W	
C443			CK73HB1A104K	CHIP C 0.10UF K		R34-36			RK73HB1J104J	CHIP R 100K J 1/16W	
C445			CK73HB1A105K	CHIP C 1.0UF K		R37			RK73HB1J103J	CHIP R 10K J 1/16W	
C446			CK73HB1A104K	CHIP C 0.10UF K		R38			RK73HB1J104J	CHIP R 100K J 1/16W	
C450,451			CK73HB1A105K	CHIP C 1.0UF K		R40-42			RK73HB1J104J	CHIP R 100K J 1/16W	
C455			CC73HCH1H101J	CHIP C 100PF J		R43-50			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C456			CC73HCH1H221J	CHIP C 220PF J		R51			RK73HB1J104J	CHIP R 100K J 1/16W	
C457			CK73HB1A105K	CHIP C 1.0UF K		R52			RK73HB1J220J	CHIP R 22 J 1/16W	
C459			CC73HCH1H221J	CHIP C 220PF J		R53-57			RK73HB1J104J	CHIP R 100K J 1/16W	
C460-462			CK73HB1A104K	CHIP C 0.10UF K		R58			RK73HB1J101J	CHIP R 100 J 1/16W	
C463			CC73HCH1H331J	CHIP C 330PF J		R59-61			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C464			CC73HCH1H101J	CHIP C 100PF J		R62			RK73HB1J101J	CHIP R 100 J 1/16W	
C465			CK73HB1H152K	CHIP C 1500PF K		R63			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C466			CK73HB1A105K	CHIP C 1.0UF K		R64,65			RK73HB1J101J	CHIP R 100 J 1/16W	
C469			CK73HB1A105K	CHIP C 1.0UF K		R66-73			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C470,471			CK73HB1H102K	CHIP C 1000PF K		R74,75			RK73HB1J104J	CHIP R 100K J 1/16W	
C472,473			CK73HB1E103K	CHIP C 0.010UF K		R77			RK73HB1J151J	CHIP R 150 J 1/16W	
CN5			E41-1481-05	PIN ASSY		R78			RK73HB1J102J	CHIP R 1.0K J 1/16W	
CN38			E40-6656-05	PIN ASSY		R79			RK73HB1J000J	CHIP R 0.0 J 1/16W	
CN39			E04-0193-05	PIN SOCKET		R80			RK73HB1J823J	CHIP R 82K J 1/16W	
CN40			E40-6102-05	PIN ASSY		R81-83			RK73HB1J104J	CHIP R 100K J 1/16W	
CN41			E41-3086-05	PIN ASSY		R85			RK73HB1J103J	CHIP R 10K J 1/16W	
CN42			E41-3090-05	PIN ASSY		R87			RK73HB1J334J	CHIP R 330K J 1/16W	
CN43			E41-2671-05	PIN ASSY		R88			RK73HB1J100J	CHIP R 10 J 1/16W	
CN44			E40-5960-05	PIN ASSY		R89			RK73HB1J332J	CHIP R 3.3K J 1/16W	
CN301			E41-2672-05	PIN ASSY		R90			RK73HB1J471J	CHIP R 470 J 1/16W	
CN302			J19-5386-05	HOLDER (LITHIUM CELL)		R92-94			RK73HB1J104J	CHIP R 100K J 1/16W	
L1			L92-0467-05	CHIP FERRITE		R95			RK73HB1J220J	CHIP R 22 J 1/16W	
L2,3			L33-1500-05	CHOKE COIL		R99,100			RK73HB1J104J	CHIP R 100K J 1/16W	
L4			L92-0467-05	CHIP FERRITE		R101			RK73HB1J103J	CHIP R 10K J 1/16W	
L5-7			L92-0162-05	BEADS CORE		R102,103			RK73HB1J104J	CHIP R 100K J 1/16W	
L8			L92-0639-05	CHIP FERRITE		R104			RK73HB1J393J	CHIP R 39K J 1/16W	
L9-11			L92-0467-05	CHIP FERRITE		R105			RK73HB1J334J	CHIP R 330K J 1/16W	
L14-16			L92-0467-05	CHIP FERRITE		R106			RK73HB1J100J	CHIP R 10 J 1/16W	
L17			L92-0639-05	CHIP FERRITE		R107			RK73HB1J103J	CHIP R 10K J 1/16W	
L18			L92-0162-05	BEADS CORE		R108			RK73HB1J184J	CHIP R 180K J 1/16W	
L20			L92-0162-05	BEADS CORE		R109			RK73HB1J104J	CHIP R 100K J 1/16W	
L22,23			L92-0171-05	BEADS CORE		R110			RK73HB1J682J	CHIP R 6.8K J 1/16W	
L301-304			L92-0639-05	CHIP FERRITE		R111,112			RK73HB1J104J	CHIP R 100K J 1/16W	
L305			L33-1541-05	SMALL FIXED INDUCTOR (10UH)		R113			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L306-309			L92-0467-05	CHIP FERRITE		R114,115			RK73HB1J220J	CHIP R 22 J 1/16W	
L311			L92-0162-05	BEADS CORE		R116,117			RK73HB1J472J	CHIP R 4.7K J 1/16W	
L312			L92-0467-05	CHIP FERRITE		R118			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L313,314			L92-0639-05	CHIP FERRITE		R119			RK73HB1J474J	CHIP R 470K J 1/16W	
L315-317			L92-0467-05	CHIP FERRITE		R121			RK73HB1J104J	CHIP R 100K J 1/16W	
X1			L77-3015-05	TCXO (18.432MHZ)		R122			RK73HB1J103J	CHIP R 10K J 1/16W	
X2			L77-1802-05	CRYSTAL RESONATOR (32768HZ)		R123			RK73HB1J473J	CHIP R 47K J 1/16W	
CP1-8			RK74HB1J334J	CHIP-COM 330K J 1/16W		R124			RK73HB1J103J	CHIP R 10K J 1/16W	
R3-9			RK73HB1J104J	CHIP R 100K J 1/16W		R126			RK73HB1J104J	CHIP R 100K J 1/16W	
R10-13			RK73EB2E101J	CHIP R 100 J 1/4W		R127			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R14			RK73HB1J000J	CHIP R 0.0 J 1/16W		R128			RK73HB1J104J	CHIP R 100K J 1/16W	
						R129,130			RK73HB1J101J	CHIP R 100 J 1/16W	

## PARTS LIST

CONTROL UNIT (X53-4490-10)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R131			RK73HB1J472J	CHIP R 4.7K J 1/16W		R267			RK73HB1J103J	CHIP R 10K J 1/16W	
R132			RK73HB1J102J	CHIP R 1.0K J 1/16W		R268			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R133			RK73HB1J472J	CHIP R 4.7K J 1/16W		R269			RK73HB1J103J	CHIP R 10K J 1/16W	
R135			RK73HB1J104J	CHIP R 100K J 1/16W		R270-275			RK73HB1J101J	CHIP R 100 J 1/16W	
R137,138			RK73HB1J104J	CHIP R 100K J 1/16W		R276			RK73HB1J471J	CHIP R 470 J 1/16W	
R141,142			RK73HB1J104J	CHIP R 100K J 1/16W		R277			RK73HB1J101J	CHIP R 100 J 1/16W	
R143,144			RK73HB1J000J	CHIP R 0.0 J 1/16W		R278,279			RK73HB1J471J	CHIP R 470 J 1/16W	
R145			RK73HB1J104J	CHIP R 100K J 1/16W		R280			RK73HB1J101J	CHIP R 100 J 1/16W	
R146,147			RK73HB1J101J	CHIP R 100 J 1/16W		R281			RS14KB3D5R6J	FL-PROOF RS 5.6 J 2W	
R148			RK73HB1J563J	CHIP R 56K J 1/16W		R282			RK73HB1J104J	CHIP R 100K J 1/16W	
R149-151			RK73HB1J104J	CHIP R 100K J 1/16W		R301,302			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R152			RK73HB1J102J	CHIP R 1.0K J 1/16W		R303			RK73HB1J104J	CHIP R 100K J 1/16W	
R153			RK73HB1J473J	CHIP R 47K J 1/16W		R304			RK73HB1J223J	CHIP R 22K J 1/16W	
R154,155			RK73HB1J104J	CHIP R 100K J 1/16W		R305			RK73HB1J183J	CHIP R 18K J 1/16W	
R156,157			RK73HB1J474J	CHIP R 470K J 1/16W		R306			RK73HB1J184D	CHIP R 180K D 1/16W	
R159			RK73HB1J103J	CHIP R 10K J 1/16W		R307			RK73HH1J273D	CHIP R 27K D 1/16W	
R160			RK73HB1J101J	CHIP R 100 J 1/16W		R308			RK73HB1J473J	CHIP R 47K J 1/16W	
R161			RK73HB1J103J	CHIP R 10K J 1/16W		R309			RK73PB2H220J	CHIP R 22 J 1/2W	
R162			RK73HB1J104J	CHIP R 100K J 1/16W		R310			RK73GB2A220J	CHIP R 22 J 1/10W	
R163			RK73HH1J334D	CHIP R 330K D 1/16W		R312			RK73HB1J104J	CHIP R 100K J 1/16W	
R164			RK73HH1J104D	CHIP R 100K D 1/16W		R313			RK73HH1J822D	CHIP R 8.2K D 1/16W	
R165,166			RK73HB1J104J	CHIP R 100K J 1/16W		R314			RK73HH1J332D	CHIP R 3.3K D 1/16W	
R167-169			RK73HB1J473J	CHIP R 47K J 1/16W		R315			RK73HB1J471J	CHIP R 470 J 1/16W	
R170			RK73HH1J124D	CHIP R 120K D 1/16W		R316			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R171			RK73HB1J473J	CHIP R 47K J 1/16W		R317,318			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R172			RK73HB1J103J	CHIP R 10K J 1/16W		R319			RK73HB1J103J	CHIP R 10K J 1/16W	
R173,174			RK73HB1J473J	CHIP R 47K J 1/16W		R320			RK73HB1J101J	CHIP R 100 J 1/16W	
R175			RK73HB1J683J	CHIP R 68K J 1/16W		R321			RK73HH1J272D	CHIP R 2.7K D 1/16W	
R176-178			RK73HB1J473J	CHIP R 47K J 1/16W		R322			RK73HH1J473D	CHIP R 47K D 1/16W	
R179			RK73HB1J000J	CHIP R 0.0 J 1/16W		R323			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R180-183			RK73HB1J473J	CHIP R 47K J 1/16W		R324			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R184			RK73HB1J000J	CHIP R 0.0 J 1/16W		R401			RK73HB1J473J	CHIP R 47K J 1/16W	
R185			RK73HB1J473J	CHIP R 47K J 1/16W		R402			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R186			RK73HB1J103J	CHIP R 10K J 1/16W		R403			RK73HB1J473J	CHIP R 47K J 1/16W	
R187			RK73HB1J473J	CHIP R 47K J 1/16W		R404			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R190			RK73HB1J000J	CHIP R 0.0 J 1/16W		R405			RK73HB1J473J	CHIP R 47K J 1/16W	
R191			RK73HB1J474J	CHIP R 470K J 1/16W		R406,407			RK73HB1J104J	CHIP R 100K J 1/16W	
R194			RK73HB1J103J	CHIP R 10K J 1/16W		R408,409			RK73HB1J103J	CHIP R 10K J 1/16W	
R196,197			RK73HB1J103J	CHIP R 10K J 1/16W		R410			RK73HB1J104J	CHIP R 100K J 1/16W	
R199			RK73HB1J103J	CHIP R 10K J 1/16W		R411			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R204			RK73HB1J103J	CHIP R 10K J 1/16W		R412			RK73HB1J123J	CHIP R 12K J 1/16W	
R205-208			RK73HB1J102J	CHIP R 1.0K J 1/16W		R413			RK73HB1J223J	CHIP R 22K J 1/16W	
R209			RK73HB1J121J	CHIP R 120 J 1/16W		R414			RK73HB1J153J	CHIP R 15K J 1/16W	
R210			RK73HB1J102J	CHIP R 1.0K J 1/16W		R415			RK73HB1J123J	CHIP R 12K J 1/16W	
R211,212			RK73HB1J101J	CHIP R 100 J 1/16W		R416			RK73HB1J224J	CHIP R 220K J 1/16W	
R213-219			RK73HB1J102J	CHIP R 1.0K J 1/16W		R417,418			RK73HB1J104J	CHIP R 100K J 1/16W	
R220			RK73HB1J471J	CHIP R 470 J 1/16W		R419			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R221			RK73HB1J102J	CHIP R 1.0K J 1/16W		R420			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R222			RK73HB1J101J	CHIP R 100 J 1/16W		R421			RK73HB1J393J	CHIP R 39K J 1/16W	
R223			RK73HB1J102J	CHIP R 1.0K J 1/16W		R422			RK73HB1J223J	CHIP R 22K J 1/16W	
R224			RK73HB1J121J	CHIP R 120 J 1/16W		R423			RK73HB1J471J	CHIP R 470 J 1/16W	
R225			RK73HB1J102J	CHIP R 1.0K J 1/16W		R424			RK73HB1J153J	CHIP R 15K J 1/16W	
R226			RK73HB1J103J	CHIP R 10K J 1/16W		R425			RK73HB1J223J	CHIP R 22K J 1/16W	
R227-230			RK73HB1J122J	CHIP R 1.2K J 1/16W		R426			RK73HB1J103J	CHIP R 10K J 1/16W	
R231-238			RK73HB1J000J	CHIP R 0.0 J 1/16W		R430			RK73HB1J2R7J	CHIP R 2.7 J 1/16W	
R241-253			RK73HB1J000J	CHIP R 0.0 J 1/16W		R431			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R254			RK73HB1J103J	CHIP R 10K J 1/16W		R432			RK73HB1J333J	CHIP R 33K J 1/16W	
R255-262			RK73HB1J000J	CHIP R 0.0 J 1/16W		R433			RK73HB1J104J	CHIP R 100K J 1/16W	
R263			RK73HB1J103J	CHIP R 10K J 1/16W		R435			RK73HB1J473J	CHIP R 47K J 1/16W	
R265,266			RK73HB1J471J	CHIP R 470 J 1/16W		R436			RK73HB1J124J	CHIP R 120K J 1/16W	

## PARTS LIST

CONTROL UNIT (X53-4490-10)  
 DISPLAY UNIT (X54-3730-20)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R437			RK73HB1J333J	CHIP R 33K J 1/16W		IC18			TC74VHCT244AFK	MOS-IC	
R438			RK73HB1J104J	CHIP R 100K J 1/16W		IC19			TC7MBD3245AFK	MOS-IC	
R439			RK73HB1J473J	CHIP R 47K J 1/16W		IC20			<b>Note 1 (BGA)</b>	MOS-IC	
R441			RK73HB1J104J	CHIP R 100K J 1/16W		IC21			ADM101EARMZ	MOS-IC	
R442			RK73HB1J683J	CHIP R 68K J 1/16W		IC22			MCP23017TE/ML	MOS-IC	
R443			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC23			TC7WT125FUF	MOS-IC	
R444,445			RK73HB1J333J	CHIP R 33K J 1/16W		IC24			TC7SH08FU-F	MOS-IC	
R446			RK73HB1J224J	CHIP R 220K J 1/16W		IC25			TC7SH32FU-F	MOS-IC	
R450			RK73HB1J473J	CHIP R 47K J 1/16W		IC26			TC7SET08FU-F	MOS-IC	
R451			RK73HB1J104J	CHIP R 100K J 1/16W		IC27			TC75W51FK(F)	MOS-IC	
R452			RK73HB1J473J	CHIP R 47K J 1/16W		IC28			TC75S51FE(F)	MOS-IC	
R457			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC301			LT3685EMSE	ANALOGUE IC	
R458-460			RK73HB1J101J	CHIP R 100 J 1/16W		IC302			XC6201P502PR	MOS-IC	
R461-463			RK73HB1J223J	CHIP R 22K J 1/16W		IC303			XC6204B332P1	ANALOGUE IC	
R464,465			RK73HB1J104J	CHIP R 100K J 1/16W		IC304			XC6205B152PRN	ANALOGUE IC	
R466,467			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC305			XC6205B162PR	ANALOGUE IC	
R502			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC306			XC6204B332P1	ANALOGUE IC	
R508			RK73HB1J103J	CHIP R 10K J 1/16W		IC307			XC61CN2702N	MOS-IC	
R509			RK73HB1J223J	CHIP R 22K J 1/16W		IC308			XC6109C29ANN	ANALOGUE IC	
R510			RK73HB1J103J	CHIP R 10K J 1/16W		IC401			TC7SH00FU-F	MOS-IC	
R511			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC402			TC7S66FUF	MOS-IC	
D1			RB706F-40	DIODE		IC403	3B		LA4422-E	BI-POLAR IC	
D2			MA2S111-F	DIODE		IC404			NJM2732V	BI-POLAR IC	
D3			1SS388F	DIODE		IC405			NJM2734V	BI-POLAR IC	
D4-11			DA204U	DIODE		IC406			NJM2732V	BI-POLAR IC	
D12			1SS355	DIODE		IC407			TC7W53FK(F)	MOS-IC	
D13			02D218F-X	ZENER DIODE		IC411			NJM2734V	BI-POLAR IC	
D14-16			DA204U	DIODE		IC412			M62364FP-F	MOS-IC	
D18			DA204U	DIODE		Q4			2SC4617(S)	TRANSISTOR	
D20			DA204U	DIODE		Q5			SSM3K15TE(F)	FET	
D22			DA204U	DIODE		Q6-10			2SD2114K(W)	TRANSISTOR	
D23			1SS355	DIODE		Q301			RT1N441U-T111	TRANSISTOR	
D24			02D218F-X	ZENER DIODE		Q302			SSM3K15TE(F)	FET	
D26			DA204U	DIODE		Q303			2SA1955A-F	TRANSISTOR	
D28			DA204U	DIODE		Q401			RT1N141M-T111	TRANSISTOR	
D29			1SS355	DIODE		Q402			2SJ506-E(S)	FET	
D30			02D218F-X	ZENER DIODE		Q403			RT1N441M-T111	TRANSISTOR	
D31			1SS355	DIODE		Q404			RT1N141M-T111	TRANSISTOR	
D32			02D218F-X	ZENER DIODE		Q405			DTC363EU	DIGITAL TRANSISTOR	
D35			1SS355	DIODE		TH1			ERTJ0EV104H	THERMISTOR	
D36			02D218F-X	ZENER DIODE		<b>DISPLAY UNIT (X54-3730-20)</b>					
D37			SMD185F-2	VARISTOR		D503-505			B30-2151-05	LED (RED/GREEN)	
D301			RSX301L-30	DIODE		C501			CS77BA1A100M	CHIP TNTL 10UF 10WV	
D302			1SS388F	DIODE		C502,503			CS77AA1A1R5M	CHIP TNTL 1.5UF 10WV	
D303			02D218F-X	ZENER DIODE		C504,505			CK73GB1C104K	CHIP C 0.10UF K	
D304,305			1SS388F	DIODE		C506			CC73GCH1H470J	CHIP C 47PF J	
D401		*	1SS388F	DIODE		C507,508			CK73GB1C104K	CHIP C 0.10UF K	
IC3			E29PL03270TID	ROM IC		C509			CK73GB1H103K	CHIP C 0.010UF K	
IC4,5			ISL8485EIBZ	MOS-IC		C510			CS77BA1A100M	CHIP TNTL 10UF 10WV	
IC6			<b>Note 1 (BGA)</b>	MICROPROCESSOR IC		C511,512			CK73GB1E103K	CHIP C 0.010UF K	
IC7,8			TC7WT125FUF	MOS-IC		C513-518			CC73GCH1H101J	CHIP C 100PF J	
IC9			<b>Note 1 (BGA)</b>	SRAM IC		C519,520			CK73GB1E103K	CHIP C 0.010UF K	
IC10,11			TC7SH125FU-F	MOS-IC		C521			CS77BA1A100M	CHIP TNTL 10UF 10WV	
IC12			TC7SH08FU-F	MOS-IC		C522			CK73GB1C104K	CHIP C 0.10UF K	
IC13			TC75W51FK(F)	MOS-IC		C523			CK73FB1E334K	CHIP C 0.33UF K	
IC14			AK4386VTP	MOS-IC		C524			CS77BA1A100M	CHIP TNTL 10UF 10WV	
IC15			TC75W51FK(F)	MOS-IC							
IC16			SM5023CNDH-G	MOS-IC							
IC17			R2023T	MOS-IC							

## PARTS LIST

DISPLAY UNIT (X54-3730-20)  
TX-RX UNIT (X57-7942-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C525			CK73GB1C104K	CHIP C 0.10UF K		Q506			RT1P141M-T111	TRANSISTOR	
C526			CK73FB1E334K	CHIP C 0.33UF K		Q507			UPA672T-A	FET	
C527			CK73GB1H102K	CHIP C 1000PF K		Q508-511			RT1P141M-T111	TRANSISTOR	
C528			CK73GB1H103K	CHIP C 0.010UF K		Q512-514			UPA672T-A	FET	
C532			CK73GB1H102K	CHIP C 1000PF K		Q516-519			UPA672T-A	FET	
C533			CC73GCH1H101J	CHIP C 100PF J		Q521-524			UPA672T-A	FET	
C534			CK73GB1H102K	CHIP C 1000PF K		Q525			2SK1824-A	FET	
C601			CC73GCH1H101J	CHIP C 100PF J		<b>TX-RX UNIT (X57-7942-71)</b>					
C602			CK73GB1H102K	CHIP C 1000PF K		C101,102			CK73HB1H102K	CHIP C 1000PF K	
C603			CC73GCH1H101J	CHIP C 100PF J		C103			CC73HCH1H100B	CHIP C 10PF B	
C606			CC73GCH1H101J	CHIP C 100PF J		C104			CK73HB1H102K	CHIP C 1000PF K	
C607			CK73GB1C104K	CHIP C 0.10UF K		C105			CC73HCH1H100B	CHIP C 10PF B	
CN501			E41-2743-05	PIN ASSY		C106,107			CK73HB1H102K	CHIP C 1000PF K	
CN502			E40-6102-05	PIN ASSY		C108			CC73HCH1H100B	CHIP C 10PF B	
CN601			E41-2751-05	PIN ASSY		C109			CK73HB1H102K	CHIP C 1000PF K	
J601			E58-0522-05	MODULAR JACK		C110			CS77CA1V2R2M	CHIP TNTL 2.2UF 35WV	
-			J31-0543-05	COLLAR (LH-5-1.5)		C112			CK73HB1H102K	CHIP C 1000PF K	
CP51-54			RK75GB1J471J	CHIP-COM 470 J 1/16W		C113			CC73HCH1H120G	CHIP C 12PF G	
R502,503			RK73GB2A000J	CHIP R 0.0 J 1/10W		C114			CK73HB1H102K	CHIP C 1000PF K	
R505			RK73GB2A683J	CHIP R 68K J 1/10W		C115			CC73HCH1H100B	CHIP C 10PF B	
R506			RK73GB2A103J	CHIP R 10K J 1/10W		C116,117			CK73HB1H102K	CHIP C 1000PF K	
R507			RK73GB2A682J	CHIP R 6.8K J 1/10W		C118			CC73HCH1H220G	CHIP C 22PF G	
R508			RK73GB2A102J	CHIP R 1.0K J 1/10W		C119			CK73HB1E104K	CHIP C 0.10UF K	
R509			RK73GB2A103J	CHIP R 10K J 1/10W		C120			CK73HB1H102K	CHIP C 1000PF K	
R510			RK73GB2A224J	CHIP R 220K J 1/10W		C121			CC73HCH1H070B	CHIP C 7.0PF B	
R511,512			RK73GB2A103J	CHIP R 10K J 1/10W		C122			CK73HB1H102K	CHIP C 1000PF K	
R513			RK73GB2A104J	CHIP R 100K J 1/10W		C123			CK73HB1E104K	CHIP C 0.10UF K	
R514			RK73GB2A154J	CHIP R 150K J 1/10W		C124			CC73HCH1H270J	CHIP C 27PF J	
R516			RK73PB2H102J	CHIP R 1.0K J 1/2W		C125			CK73HB1H102K	CHIP C 1000PF K	
R517			RK73PB2H821J	CHIP R 820 J 1/2W		C127			CK73HB1H102K	CHIP C 1000PF K	
R518,519			RK73PB2H102J	CHIP R 1.0K J 1/2W		C129			CC73HCH1H080D	CHIP C 8.0PF D	
R520-526			RK73PB2H821J	CHIP R 820 J 1/2W		C130			CK73HB1H102K	CHIP C 1000PF K	
R529-540			RK73GB2A102J	CHIP R 1.0K J 1/10W		C131			CK73HB1E104K	CHIP C 0.10UF K	
R541-544			RK73GB2A103J	CHIP R 10K J 1/10W		C134,135			CK73HB1H102K	CHIP C 1000PF K	
R545			RK73GH2A472D	CHIP R 4.7K D 1/10W		C136			CC73HCH1H080B	CHIP C 8.0PF B	
R546			RK73GH2A153D	CHIP R 15K D 1/10W		C137			CK73HB1H102K	CHIP C 1000PF K	
R547			RK73GB2A103J	CHIP R 10K J 1/10W		C138			CC73HCH1H100B	CHIP C 10PF B	
R550			RK73GB2A472J	CHIP R 4.7K J 1/10W		C139,140			CK73HB1H102K	CHIP C 1000PF K	
R601			RK73GB2A681J	CHIP R 680 J 1/10W		C141			CC73HCH1H080B	CHIP C 8.0PF B	
R604,605			RK73GB2A102J	CHIP R 1.0K J 1/10W		C142			CK73HB1H102K	CHIP C 1000PF K	
R606			RK73GB2A473J	CHIP R 47K J 1/10W		C144			CK73HB1H102K	CHIP C 1000PF K	
VR501			R32-0689-05	SEMI FIXED VARIABLE RESISTOR (10K)		C145			CC73HCH1H100B	CHIP C 10PF B	
VR601			R31-0630-05	VARIABLE RESISTOR (10K)		C146			CK73HB1H102K	CHIP C 1000PF K	
S501-506			S70-0502-05	TACT SWITCH		C147			CC73HCH1H100B	CHIP C 10PF B	
S507			S68-0410-05	PUSH SWITCH		C148,149			CK73HB1H102K	CHIP C 1000PF K	
D501,502			HSM88AS-E	DIODE		C150			CC73HCH1H100B	CHIP C 10PF B	
D506,507			LA-501DD	LED		C151			CK73HB1H102K	CHIP C 1000PF K	
D508-514			DA204U	DIODE		C152			CC73HCH1H220G	CHIP C 22PF G	
D601,602			DA204U	DIODE		C154			CC73HCH1H330G	CHIP C 33PF G	
D603			MINISMDC020F	VARIATOR		C156			CC73HCH1H330G	CHIP C 33PF G	
IC501			NJM4558E-ZB	ANALOGUE IC		C158			CC73HCH1H220G	CHIP C 22PF G	
IC502-505			BU4094BCFV	MOS-IC		C160,161			CK73HB1H102K	CHIP C 1000PF K	
IC506,507			TA78L05FF	MOS-IC		C176			CK73GB1H102K	CHIP C 1000PF K	
IC508			TC7W53FU-F	HYBRID IC		C200,201			CS77CA1V2R2M	CHIP TNTL 2.2UF 35WV	
Q501			2SC4116(Y)F	TRANSISTOR		C202			CC73HCH1H100D	CHIP C 10PF D	
Q502			2SA1586(Y,GR)F	TRANSISTOR		C203			CK73HB1H102K	CHIP C 1000PF K	
Q503,504			UPA672T-A	FET							

## PARTS LIST

### TX-RX UNIT (X57-7942-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C204			CC73HCH1H101J	CHIP C 100PF J		C412			CK73HB1H102K	CHIP C 1000PF K	
C205			CK73HB1E104K	CHIP C 0.10UF K		C413			CK73GB1E105K	CHIP C 1.0UF K	
C206			CC73HCH1H330J	CHIP C 33PF J		C414			CK73HB1H102K	CHIP C 1000PF K	
C207,208			CS77BA1D100M	CHIP TNTL 10UF 20WV		C415			CK73HB1E104K	CHIP C 0.10UF K	
C209			CK73HB1H102K	CHIP C 1000PF K		C416			CK73HB1H103K	CHIP C 0.010UF K	
C210			CE32CL1V100M	CHIP EL 10UF 35WV		C417			CK73HB1E104K	CHIP C 0.10UF K	
C211			CK73HB1H102K	CHIP C 1000PF K		C418,419			CK73HB1H102K	CHIP C 1000PF K	
C212			CK73HB1H103K	CHIP C 0.010UF K		C421			CK73HB1H102K	CHIP C 1000PF K	
C219			CC73HCH1H100D	CHIP C 10PF D		C422			CK73HB1E104K	CHIP C 0.10UF K	
C220-223			CK73HB1H103K	CHIP C 0.010UF K		C423			CK73HB1H103K	CHIP C 0.010UF K	
C224			CK73HB1H102K	CHIP C 1000PF K		C424-430			CK73HB1E104K	CHIP C 0.10UF K	
C225			CC73HCH1H120G	CHIP C 12PF G		C437-440			CK73HB1E104K	CHIP C 0.10UF K	
C226			CC73HCH1H680J	CHIP C 68PF J		C500-503			CK73HB1E104K	CHIP C 0.10UF K	
C227			CK73HB1E104K	CHIP C 0.10UF K		C504			CK73HB1H102K	CHIP C 1000PF K	
C228			CC73HCH1H101J	CHIP C 100PF J		C505-507			CK73HB1E104K	CHIP C 0.10UF K	
C229			CK73HB1H102K	CHIP C 1000PF K		C508			CK73HB1H103K	CHIP C 0.010UF K	
C230			CC73HCH1H680J	CHIP C 68PF J		C509-512			CK73HB1E104K	CHIP C 0.10UF K	
C231			CK73HB1H102K	CHIP C 1000PF K		C514			CK73HB1H103K	CHIP C 0.010UF K	
C233,234			CC73HCH1H470J	CHIP C 47PF J		C515			CK73HB1E104K	CHIP C 0.10UF K	
C235,236			CK73HB1H102K	CHIP C 1000PF K		C517			CK73HB1H103K	CHIP C 0.010UF K	
C237			CC73HCH1H080B	CHIP C 8.0PF B		C518			CK73HB1E104K	CHIP C 0.10UF K	
C239			CC73HCH1H180J	CHIP C 18PF J		C519			CK73HB1H103K	CHIP C 0.010UF K	
C241			CC73HCH1H270J	CHIP C 27PF J		C520			CK73HB1E104K	CHIP C 0.10UF K	
C243			CC73HCH1H270J	CHIP C 27PF J		C521			CC73HCH1H180J	CHIP C 18PF J	
C245			CC73HCH1H150J	CHIP C 15PF J		C522			CC73HCH1H101J	CHIP C 100PF J	
C246			CK73HB1H103K	CHIP C 0.010UF K		C523			CC73HCH1H331J	CHIP C 330PF J	
C247			CK73HB1H102K	CHIP C 1000PF K		C524			CC73HCH1H180J	CHIP C 18PF J	
C300			CC73HCH1H270J	CHIP C 27PF J		C525			CC73HCH1H470J	CHIP C 47PF J	
C301			CK73HB1H102K	CHIP C 1000PF K		C526			CC73HCH1H471J	CHIP C 470PF J	
C302-305			CK73HB1H103K	CHIP C 0.010UF K		C528			CC73HCH1H121J	CHIP C 120PF J	
C306			CC73HCH1H020B	CHIP C 2.0PF B		C529			CC73HCH1H221J	CHIP C 220PF J	
C318			CC73HCH1H270G	CHIP C 27PF G		C530-533			CK73HB1E104K	CHIP C 0.10UF K	
C322			CK73HB1H102K	CHIP C 1000PF K		C534			CC73HCH1H050C	CHIP C 5.0PF C	
C323			CE32CL1E4R7M	CHIP EL 4.7UF 25WV		C535			CK73HB1H103K	CHIP C 0.010UF K	
C325			CK73HB1E104K	CHIP C 0.10UF K		C536,537			CK73HB1E104K	CHIP C 0.10UF K	
C326			CC73HCH1H220J	CHIP C 22PF J		C538			CK73HB1H103K	CHIP C 0.010UF K	
C329			CK73HB1H103K	CHIP C 0.010UF K		C539			CC73HCH1H820J	CHIP C 82PF J	
C331			CK73HB1H102K	CHIP C 1000PF K		C540			CK73HB1H103K	CHIP C 0.010UF K	
C332,333			CC73HCH1H270J	CHIP C 27PF J		C541			CK73HB1E104K	CHIP C 0.10UF K	
C334			CK73HB1H103K	CHIP C 0.010UF K		C542			CK73FB1A106K	CHIP C 10UF K	
C335			CC73HCH1H820J	CHIP C 82PF J		C543-545			CK73HB1E104K	CHIP C 0.10UF K	
C336			CC73HCH1H270J	CHIP C 27PF J		C546			CC73HCH1H390J	CHIP C 39PF J	
C337,338			CK73HB1H103K	CHIP C 0.010UF K		C547,548			CC73HCH1H100D	CHIP C 10PF D	
C339			CK73HB1H102K	CHIP C 1000PF K		C549			CK73HB1E104K	CHIP C 0.10UF K	
C341			CK73HB1H103K	CHIP C 0.010UF K		C550			CK73HB1H103K	CHIP C 0.010UF K	
C342			CC73HCH1H180J	CHIP C 18PF J		C551			CC73HCH1H100D	CHIP C 10PF D	
C343,344			CK73HB1H103K	CHIP C 0.010UF K		C600,601			CK73FB1A106K	CHIP C 10UF K	
C345			CK73HB1H102K	CHIP C 1000PF K		C602-604			CK73HB1E104K	CHIP C 0.10UF K	
C346			CC73HCH1H180J	CHIP C 18PF J		C605			CK73HB1H103K	CHIP C 0.010UF K	
C347			CC73HCH1H150G	CHIP C 15PF G		C606,607			CK73FB1A106K	CHIP C 10UF K	
C349			CK73HB1H103K	CHIP C 0.010UF K		C608			CK73HB1H103K	CHIP C 0.010UF K	
C350			CK73HB1A104K	CHIP C 0.10UF K		C610-613			CK73HB1H103K	CHIP C 0.010UF K	
C356			CC73HCH1H100D	CHIP C 10PF D		C614			CS77BA1D100M	CHIP TNTL 10UF 20WV	
C400-403			CK73HB1E104K	CHIP C 0.10UF K		C615			CC73HCH1H181J	CHIP C 180PF J	
C404			CC73HCH1H100D	CHIP C 10PF D		C616			CC73HCH1H470J	CHIP C 47PF J	
C405,406			CK73HB1E104K	CHIP C 0.10UF K		C618			CS77CB21A470M	CHIP TNTL 47UF 10WV	
C407			CK73HB1H102K	CHIP C 1000PF K		C619			CC73HCH1H331J	CHIP C 330PF J	
C408			CK73HB1E104K	CHIP C 0.10UF K		C620			CC73HCH1H180J	CHIP C 18PF J	
C410			CK73HB1H102K	CHIP C 1000PF K		C621			CS77CB21A470M	CHIP TNTL 47UF 10WV	
C411			CK73GB1E105K	CHIP C 1.0UF K		C622			CC73HCH1H221J	CHIP C 220PF J	

## PARTS LIST

TX-RX UNIT (X57-7942-71)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C623			CK73HB1H103K	CHIP C 0.010UF K		C721			CK73GB1E105K	CHIP C 1.0UF K	
C624			CK73HB1E104K	CHIP C 0.10UF K		C722,723			CK73HB1E104K	CHIP C 0.10UF K	
C625			CK73HB1H103K	CHIP C 0.010UF K		C724,725			CK73GB1E105K	CHIP C 1.0UF K	
C626			CS77BA1D100M	CHIP TNTL 10UF 20WV		C726			CK73HB1H103K	CHIP C 0.010UF K	
C627			CK73HB1H103K	CHIP C 0.010UF K		C727			CK73GB1E105K	CHIP C 1.0UF K	
C628			CC73HCH1H100D	CHIP C 10PF D		C728,729			CK73HB1H102K	CHIP C 1000PF K	
C629,630			CK73HB1H103K	CHIP C 0.010UF K		C814			CC73HCH1H101J	CHIP C 100PF J	
C631			CC73HCH1H100D	CHIP C 10PF D		C815			CK73HB1H103K	CHIP C 0.010UF K	
C632			CK73HB1E104K	CHIP C 0.10UF K		C817,818			CK73HB1E104K	CHIP C 0.10UF K	
C633,634			CK73HB1H103K	CHIP C 0.010UF K		C819			CK73HB1H103K	CHIP C 0.010UF K	
C635			CC73HCH1H100D	CHIP C 10PF D		C820			CK73HB1H102K	CHIP C 1000PF K	
C636,637			CK73HB1H103K	CHIP C 0.010UF K		C821			CK73HB1E104K	CHIP C 0.10UF K	
C638			CK73GB1E105K	CHIP C 1.0UF K		C822			CC73HCH1H100D	CHIP C 10PF D	
C639			CK73HB1H103K	CHIP C 0.010UF K		C823			CK73HB1E104K	CHIP C 0.10UF K	
C641			CK73HB1H103K	CHIP C 0.010UF K		C825			C93-0912-05	CHIP C 100UF M	
C642			CK73HB1E104K	CHIP C 0.10UF K		C826			CK73GB1E105K	CHIP C 1.0UF K	
C643			CS77BA1D100M	CHIP TNTL 10UF 20WV		C827			CK73HB1H102K	CHIP C 1000PF K	
C644			CC73HCH1H100D	CHIP C 10PF D		C828			CK73HB1E104K	CHIP C 0.10UF K	
C645			CK73GB1E105K	CHIP C 1.0UF K		C831			CK73HB1E104K	CHIP C 0.10UF K	
C647,648			CS77CA1V2R2M	CHIP TNTL 2.2UF 35WV		C832			CC73HCH1H050B	CHIP C 5.0PF B	
C649			CK73HB1E104K	CHIP C 0.10UF K		CN101			E04-0154-05	PIN SOCKET	
C650			CK73HB1H102K	CHIP C 1000PF K		CN102			E23-1330-05	TERMINAL	
C651			CC73HCH1H101J	CHIP C 100PF J		CN106			E23-1330-05	TERMINAL	
C652			CC73HCH1H100D	CHIP C 10PF D		CN500			E04-0154-05	PIN SOCKET	
C653,654			CS77BA1D100M	CHIP TNTL 10UF 20WV		CN610			E04-0154-05	PIN SOCKET	
C655			CK73HB1H102K	CHIP C 1000PF K		CN700,701			E41-2672-05	PIN ASSY	
C656			CE32CL1V100M	CHIP EL 10UF 35WV		CN800			E40-6656-05	PIN ASSY	
C657			CC73HCH1H330J	CHIP C 33PF J		CN801			E41-2743-05	PIN ASSY	
C658			CK73HB1H102K	CHIP C 1000PF K		CN802			E04-0193-05	PIN SOCKET	
C660			CC73HCH1H100D	CHIP C 10PF D		CN807-809			E23-1278-05	TERMINAL	
C661			CK73HB1E104K	CHIP C 0.10UF K		CN811-813			E23-1278-05	TERMINAL	
C662			CC73HCH1H390G	CHIP C 39PF G		-			F10-2409-04	SHIELDING CASE	
C663			CK73HB1H103K	CHIP C 0.010UF K		F700			F53-0328-15	FUSE(5A)	
C664			CC73HCH1H390G	CHIP C 39PF G		CF400,401			L72-1028-05	CERAMIC FILTER	
C667			CC73HCH1H030B	CHIP C 3.0PF B		CF402			L72-1027-05	CERAMIC FILTER	
C671			CC73HCH1H100D	CHIP C 10PF D		CF403			L72-1041-05	CERAMIC FILTER	
C672,673			CK73HB1H102K	CHIP C 1000PF K		L100,101			L34-4567-05	AIR-CORE COIL	
C674			CC73HCH1H220J	CHIP C 22PF J		L102			L41-2785-14	SMALL FIXED INDUCTOR (270NH)	
C679,680			CK73HB1H102K	CHIP C 1000PF K		L103,104			L34-4567-05	AIR-CORE COIL	
C683-688			CK73HB1H102K	CHIP C 1000PF K		L105			L41-2775-33	SMALL FIXED INDUCTOR (0.027UH)	
C700			CK73HB1H103K	CHIP C 0.010UF K		L106			L92-0467-05	CHIP FERRITE	
C701			C92-0905-05	OS-CON 47UF 35WV		L107			L41-6878-14	SMALL FIXED INDUCTOR (68NH)	
C702			CK73GB1E105K	CHIP C 1.0UF K		L108			L41-2775-33	SMALL FIXED INDUCTOR (0.027UH)	
C703			CK73HB1H102K	CHIP C 1000PF K		L109			L41-2278-14	SMALL FIXED INDUCTOR (22NH)	
C704			CK73GB1E105K	CHIP C 1.0UF K		L111,112			L34-4567-05	AIR-CORE COIL	
C705			CK73HB1H102K	CHIP C 1000PF K		L113			L41-2785-14	SMALL FIXED INDUCTOR (270NH)	
C706			C92-0765-05	CHIP TNTL 4.7UF 16WV		L114,115			L34-4567-05	AIR-CORE COIL	
C707			CE32CL1V100M	CHIP EL 10UF 35WV		L116-118			L34-4932-05	AIR-CORE COIL	
C708			CK73HB1E104K	CHIP C 0.10UF K		L119			L34-4615-05	AIR-CORE COIL	
C709			CK73HB1H103K	CHIP C 0.010UF K		L203			L41-5685-47	SMALL FIXED INDUCTOR (560NH)	
C710,711			CK73HB1H102K	CHIP C 1000PF K		L205			L41-4778-14	SMALL FIXED INDUCTOR (47NH)	
C712			CK73GB1E105K	CHIP C 1.0UF K		L206			L40-1085-92	SMALL FIXED INDUCTOR (100NH)	
C713			CK73HB1H102K	CHIP C 1000PF K		L207			L41-5678-14	SMALL FIXED INDUCTOR (56NH)	
C714			CC73HCH1H181J	CHIP C 180PF J		L208-210			L41-3375-33	SMALL FIXED INDUCTOR (0.033UH)	
C715			CK73HB1H102K	CHIP C 1000PF K		L211			L41-1578-14	SMALL FIXED INDUCTOR (15NH)	
C716			CE32CL1V100M	CHIP EL 10UF 35WV		L212,213			L92-0467-05	CHIP FERRITE	
C717			CC73HCH1H220J	CHIP C 22PF J		L215			L92-0163-05	BEADS CORE	
C718			CK73HB1H102K	CHIP C 1000PF K		L300			L92-0467-05	CHIP FERRITE	
C719			CK73GB1E105K	CHIP C 1.0UF K							
C720			CK73HB1E104K	CHIP C 0.10UF K							

## PARTS LIST

### TX-RX UNIT (X57-7942-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L301			L40-3381-86	SMALL FIXED INDUCTOR (0.33UH)		R131			RK73HB1J393J	CHIP R 39K J 1/16W	
L302			L41-5685-47	SMALL FIXED INDUCTOR (560NH)		R132-136			RK73HB1J104J	CHIP R 100K J 1/16W	
L303		*	L41-3985-47	SMALL FIXED INDUCTOR (390NH)		R137			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L308			L41-2263-14	SMALL FIXED INDUCTOR (2.2NH)		R200			RK73HB1J223J	CHIP R 22K J 1/16W	
L309			L41-1085-14	SMALL FIXED INDUCTOR (100NH)		R201,202			RK73HB1J103J	CHIP R 10K J 1/16W	
L310		*	L41-2785-47	SMALL FIXED INDUCTOR (270NH)		R203			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L312			L41-3978-14	SMALL FIXED INDUCTOR (39NH)		R204			RK73HB1J224J	CHIP R 220K J 1/16W	
L313			L40-8275-92	SMALL FIXED INDUCTOR (82NH)		R205			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L315			L41-3978-14	SMALL FIXED INDUCTOR (39NH)		R206			RK73HB1J334J	CHIP R 330K J 1/16W	
L316			L40-2785-92	SMALL FIXED INDUCTOR (270NH)		R207			RK73HB1J393J	CHIP R 39K J 1/16W	
L317			L41-1095-33	SMALL FIXED INDUCTOR (1.0UH)		R208			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L320			L40-1885-92	SMALL FIXED INDUCTOR (180NH)		R209			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L500			L41-3395-33	SMALL FIXED INDUCTOR (3.3UH)		R210			RK73HB1J124J	CHIP R 120K J 1/16W	
L501			L41-4795-33	SMALL FIXED INDUCTOR (4.7UH)		R211			RK73HB1J333J	CHIP R 33K J 1/16W	
L502			L41-6885-33	SMALL FIXED INDUCTOR (0.68UH)		R212			RK73HB1J394J	CHIP R 390K J 1/16W	
L503			L41-5685-33	SMALL FIXED INDUCTOR (0.56UH)		R213			RK73HB1J106J	CHIP R 10M J 1/16W	
L504			L41-2295-33	SMALL FIXED INDUCTOR (2.2UH)		R214			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L505,506			L41-1295-33	SMALL FIXED INDUCTOR (1.2UH)		R215,216			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L507,508			L41-3305-33	SMALL FIXED INDUCTOR (33UH)		R220			RK73HB1J101J	CHIP R 100 J 1/16W	
L600,601			L41-1005-33	SMALL FIXED INDUCTOR (10UH)		R223			RK73HB1J181J	CHIP R 180 J 1/16W	
L602			L92-0467-05	CHIP FERRITE		R224			RK73HB1J220J	CHIP R 22 J 1/16W	
L603			L41-1005-33	SMALL FIXED INDUCTOR (10UH)		R225			RK73HB1J334J	CHIP R 330K J 1/16W	
L604			L41-3385-39	SMALL FIXED INDUCTOR (0.33UH)		R227			RK73HB1J220J	CHIP R 22 J 1/16W	
L605		*	L41-3985-39	SMALL FIXED INDUCTOR (0.39UH)		R228,229			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L606			L41-1095-39	SMALL FIXED INDUCTOR (1.0UH)		R230			RK73HB1J271J	CHIP R 270 J 1/16W	
L607,608			L41-4778-14	SMALL FIXED INDUCTOR (47NH)		R231			RK73HB1J180J	CHIP R 18 J 1/16W	
L609			L41-1578-14	SMALL FIXED INDUCTOR (15NH)		R232			RK73HB1J271J	CHIP R 270 J 1/16W	
L610			L41-8278-14	SMALL FIXED INDUCTOR (82NH)		R233			RK73HB1J472J	CHIP R 4.7K J 1/16W	
L613,614			L92-0639-05	CHIP FERRITE		R234			RK73HB1J182J	CHIP R 1.8K J 1/16W	
L615-617			L92-0467-05	CHIP FERRITE		R235			RK73HB1J220J	CHIP R 22 J 1/16W	
L618			L41-1095-14	SMALL FIXED INDUCTOR (1.0UH)		R236			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L700			L33-1462-05	SMALL FIXED INDUCTOR		R237			RK73HB1J680J	CHIP R 68 J 1/16W	
L701,702			L41-1005-33	SMALL FIXED INDUCTOR (10UH)		R238			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L800,801			L92-0467-05	CHIP FERRITE		R243			RK73HB1J271J	CHIP R 270 J 1/16W	
L803			L92-0162-05	BEADS CORE		R244			RK73HB1J180J	CHIP R 18 J 1/16W	
L804			L41-1285-14	SMALL FIXED INDUCTOR (120NH)		R245			RK73HB1J271J	CHIP R 270 J 1/16W	
L805,806			L92-0467-05	CHIP FERRITE		R247-249			RK73GB2A180J	CHIP R 18 J 1/10W	
X500			L77-3034-05	TCXO (19.2MHZ)		R250			RK73HB1J000J	CHIP R 0.0 J 1/16W	
X600			L77-1960-15	VCXO (16.8MHZ)		R251			RK73HB1J103J	CHIP R 10K J 1/16W	
XF300			L71-0649-05	MCF (58.05MHZ)		R300			RK73HB1J331J	CHIP R 330 J 1/16W	
R100			RK73GB2A102J	CHIP R 1.0K J 1/10W		R301			RK73HB1J101J	CHIP R 100 J 1/16W	
R101			RK73HB1J000J	CHIP R 0.0 J 1/16W		R302			RK73HB1J473J	CHIP R 47K J 1/16W	
R105,106			RK73HB1J104J	CHIP R 100K J 1/16W		R303			RK73HB1J220J	CHIP R 22 J 1/16W	
R107			RK73HB1J103J	CHIP R 10K J 1/16W		R304			RK73HB1J104J	CHIP R 100K J 1/16W	
R109,110			RK73HB1J104J	CHIP R 100K J 1/16W		R305			RK73HB1J123J	CHIP R 12K J 1/16W	
R111			RK73HB1J101J	CHIP R 100 J 1/16W		R306			RK73HB1J103J	CHIP R 10K J 1/16W	
R112			RK73HB1J104J	CHIP R 100K J 1/16W		R310			RK73HB1J122J	CHIP R 1.2K J 1/16W	
R113			RK73HB1J103J	CHIP R 10K J 1/16W		R311			RK73GB2A220J	CHIP R 22 J 1/10W	
R114			RK73HB1J101J	CHIP R 100 J 1/16W		R312			RK73HB1J220J	CHIP R 22 J 1/16W	
R115			RK73FB2B121J	CHIP R 120 J 1/8W		R313			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R117			RK73HB1J220J	CHIP R 22 J 1/16W		R314			RK73HB1J103J	CHIP R 10K J 1/16W	
R118			RK73HB1J274J	CHIP R 270K J 1/16W		R315			RK73GB2A101J	CHIP R 100 J 1/10W	
R119			RK73HB1J393J	CHIP R 39K J 1/16W		R316			RK73GB2A100J	CHIP R 10 J 1/10W	
R120			RK73HB1J102J	CHIP R 1.0K J 1/16W		R318			RK73HB1J220J	CHIP R 22 J 1/16W	
R121			RK73HB1J821J	CHIP R 820 J 1/16W		R320			RK73HB1J220J	CHIP R 22 J 1/16W	
R122			RK73HB1J221J	CHIP R 220 J 1/16W		R323			RK73HB1J181J	CHIP R 180 J 1/16W	
R125			RK73HB1J000J	CHIP R 0.0 J 1/16W		R332			RK73HB1J470J	CHIP R 47 J 1/16W	
R126			RK73HB1J103J	CHIP R 10K J 1/16W		R400			RK73HB1J224J	CHIP R 220K J 1/16W	
R128,129			RK73HB1J000J	CHIP R 0.0 J 1/16W		R401			RK73HB1J220J	CHIP R 22 J 1/16W	
R130			RK73HB1J274J	CHIP R 270K J 1/16W		R402			RK73HB1J101J	CHIP R 100 J 1/16W	



## PARTS LIST

TX-RX UNIT (X57-7942-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R403			RK73HB1J682J	CHIP R 6.8K J 1/16W		R535			RK73HB1J104J	CHIP R 100K J 1/16W	
R404			RK73HB1J000J	CHIP R 0.0 J 1/16W		R536			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R405			RK73HB1J103J	CHIP R 10K J 1/16W		R537			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R406			RK73HB1J220J	CHIP R 22 J 1/16W		R538			RK73HB1J221J	CHIP R 220 J 1/16W	
R407			RK73HB1J474J	CHIP R 470K J 1/16W		R539,540			RK73HB1J104J	CHIP R 100K J 1/16W	
R408			RK73HB1J103J	CHIP R 10K J 1/16W		R541			RK73HB1J101J	CHIP R 100 J 1/16W	
R409-411			RK73HB1J473J	CHIP R 47K J 1/16W		R542			RK73HB1J104J	CHIP R 100K J 1/16W	
R412			RK73HB1J101J	CHIP R 100 J 1/16W		R543			RK73HB1J221J	CHIP R 220 J 1/16W	
R413			RK73HB1J000J	CHIP R 0.0 J 1/16W		R544			RK73HB1J104J	CHIP R 100K J 1/16W	
R415			RK73HB1J000J	CHIP R 0.0 J 1/16W		R545,546			RK73HB1J120J	CHIP R 12 J 1/16W	
R416			RK73HB1J222J	CHIP R 2.2K J 1/16W		R547-550			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R417,418			RK73HB1J220J	CHIP R 22 J 1/16W		R551			RK73HB1J101J	CHIP R 100 J 1/16W	
R420			RK73HB1J470J	CHIP R 47 J 1/16W		R552			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R421			RK73HB1J182J	CHIP R 1.8K J 1/16W		R602			RK73HB1J101J	CHIP R 100 J 1/16W	
R422			RK73HB1J101J	CHIP R 100 J 1/16W		R604			RK73HB1J104J	CHIP R 100K J 1/16W	
R425			RK73HB1J183J	CHIP R 18K J 1/16W		R605			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R426			RK73HB1J822J	CHIP R 8.2K J 1/16W		R606-608			RK73HB1J104J	CHIP R 100K J 1/16W	
R427,428			RK73HB1J473J	CHIP R 47K J 1/16W		R609			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R429			RK73HB1J220J	CHIP R 22 J 1/16W		R610			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R431			RK73HB1J000J	CHIP R 0.0 J 1/16W		R611			RK73HB1J101J	CHIP R 100 J 1/16W	
R433-435			RK73HB1J000J	CHIP R 0.0 J 1/16W		R612			RK73HB1J470J	CHIP R 47 J 1/16W	
R436-438			RK73HB1J152J	CHIP R 1.5K J 1/16W		R613			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R442,443			RK73HB1J821J	CHIP R 820 J 1/16W		R614			RK73HB1J223J	CHIP R 22K J 1/16W	
R444			RK73HB1J122J	CHIP R 1.2K J 1/16W		R615			RK73HB1J273J	CHIP R 27K J 1/16W	
R447			RK73HB1J000J	CHIP R 0.0 J 1/16W		R616			RK73HB1J103J	CHIP R 10K J 1/16W	
R448,449			RK73HB1J334J	CHIP R 330K J 1/16W		R617			RK73HB1J104J	CHIP R 100K J 1/16W	
R450			RK73HB1J563J	CHIP R 56K J 1/16W		R618			RK73HB1J101J	CHIP R 100 J 1/16W	
R451			RK73HB1J104J	CHIP R 100K J 1/16W		R619			RK73HB1J221J	CHIP R 220 J 1/16W	
R452			RK73HB1J224J	CHIP R 220K J 1/16W		R620			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R453			RK73HB1J220J	CHIP R 22 J 1/16W		R621			RK73HB1J220J	CHIP R 22 J 1/16W	
R500			RK73HB1J104J	CHIP R 100K J 1/16W		R622			RK73HB1J103J	CHIP R 10K J 1/16W	
R501,502			RK73HB1J104D	CHIP R 100K D 1/16W		R623			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R503			RK73HB1J101J	CHIP R 100 J 1/16W		R624			RK73HB1J224J	CHIP R 220K J 1/16W	
R504			RK73HB1J220J	CHIP R 22 J 1/16W		R625			RK73HB1J221J	CHIP R 220 J 1/16W	
R505			RK73HB1J124J	CHIP R 120K J 1/16W		R626			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R506			RK73HB1J471J	CHIP R 470 J 1/16W		R627			RK73HB1J220J	CHIP R 22 J 1/16W	
R507			RK73HB1J220J	CHIP R 22 J 1/16W		R628			RK73HB1J471J	CHIP R 470 J 1/16W	
R509			RK73HB1J183J	CHIP R 18K J 1/16W		R629,630			RK73HB1J104J	CHIP R 100K J 1/16W	
R510			RK73HB1J223J	CHIP R 22K J 1/16W		R631			RK73HB1J822J	CHIP R 8.2K J 1/16W	
R511			RK73HB1J220J	CHIP R 22 J 1/16W		R632			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R512			RK73HB1J223J	CHIP R 22K J 1/16W		R633			RK73HB1J220J	CHIP R 22 J 1/16W	
R513			RK73HB1J471J	CHIP R 470 J 1/16W		R634			RK73HB1J473J	CHIP R 47K J 1/16W	
R514			RK73HB1J220J	CHIP R 22 J 1/16W		R635			RK73GB2A2R2J	CHIP R 2.2 J 1/10W	
R515			RK73HB1J272J	CHIP R 2.7K J 1/16W		R636			RK73HB1J104J	CHIP R 100K J 1/16W	
R516			RK73HB1J000J	CHIP R 0.0 J 1/16W		R637			RK73HB1J473J	CHIP R 47K J 1/16W	
R518			RK73HB1J102J	CHIP R 1.0K J 1/16W		R638			RK73HB1J220J	CHIP R 22 J 1/16W	
R519			RK73HB1J181J	CHIP R 180 J 1/16W		R639			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R520			RK73HB1J394J	CHIP R 390K J 1/16W		R640			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R521			RK73HB1J154J	CHIP R 150K J 1/16W		R641			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R522			RK73HB1J333J	CHIP R 33K J 1/16W		R642,643			RK73HB1J104J	CHIP R 100K J 1/16W	
R523			RK73HB1J151J	CHIP R 150 J 1/16W		R644			RK73HB1J103J	CHIP R 10K J 1/16W	
R524			RK73HB1J104J	CHIP R 100K J 1/16W		R645			RK73HB1J220J	CHIP R 22 J 1/16W	
R525			RK73HB1J000J	CHIP R 0.0 J 1/16W		R646			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R527			RK73HB1J104J	CHIP R 100K J 1/16W		R647			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R528			RK73HB1J224J	CHIP R 220K J 1/16W		R648			RK73HB1J274J	CHIP R 270K J 1/16W	
R529			RK73HB1J104J	CHIP R 100K J 1/16W		R649			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R530			RK73HB1J471J	CHIP R 470 J 1/16W		R650-652			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R531,532			RK73HB1J103J	CHIP R 10K J 1/16W		R653			RK73HB1J124J	CHIP R 120K J 1/16W	
R533			RK73HB1J220J	CHIP R 22 J 1/16W		R654			RK73HB1J333J	CHIP R 33K J 1/16W	
R534			RK73HB1J682J	CHIP R 6.8K J 1/16W		R655			RK73HB1J394J	CHIP R 390K J 1/16W	

## PARTS LIST

### TX-RX UNIT (X57-7942-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R656			RK73HB1J106J	CHIP R 10M J 1/16W		R857			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R657			RK73HB1J223J	CHIP R 22K J 1/16W		R860			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R658			RK73HB1J103J	CHIP R 10K J 1/16W		D100,101			1SV283F	VARIABLE CAPACITANCE DIODE	
R659			RK73HB1J224J	CHIP R 220K J 1/16W		D103-108			1SV283F	VARIABLE CAPACITANCE DIODE	
R660			RK73HB1J334J	CHIP R 330K J 1/16W		D200			DA221	DIODE	
R661			RK73HB1J393J	CHIP R 39K J 1/16W		D500,501			UD2S3.0B	ZENER DIODE	
R663			RK73HB1J000J	CHIP R 0.0 J 1/16W		D503			HSM88AS-E	DIODE	
R665			RK73HB1J000J	CHIP R 0.0 J 1/16W		D504,505			JDP4P02AT	DIODE	
R666			RK73HB1J101J	CHIP R 100 J 1/16W		D600			DA221	DIODE	
R668			RK73HB1J472J	CHIP R 4.7K J 1/16W		D601			HVC131	DIODE	
R669			RK73HB1J182J	CHIP R 1.8K J 1/16W		D801			1SS388F	DIODE	
R670			RK73HB1J271J	CHIP R 270 J 1/16W		IC100,101			LMC7101BIM5	MOS-IC	
R671			RK73HB1J220J	CHIP R 22 J 1/16W		IC200			TC75W51FK(F)	MOS-IC	
R672			RK73HB1J180J	CHIP R 18 J 1/16W		IC201			LMC7101BIM5	MOS-IC	
R680			RK73HB1J821J	CHIP R 820 J 1/16W		IC203			TC7SH126FU-F	MOS-IC	
R681			RK73HB1J5R6J	CHIP R 5.6 J 1/16W		IC300			ADL5350ACPZ	MOS-IC	
R682			RK73HB1J821J	CHIP R 820 J 1/16W		IC400			AD8051ART	ANALOGUE IC	
R683-685			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC401			TC75W51FK(F)	MOS-IC	
R686,687			RK73HB1J472J	CHIP R 4.7K J 1/16W		IC402			LMC7101BIM5	MOS-IC	
R689,690			RK73HB1J271J	CHIP R 270 J 1/16W		IC403			NJM2287V	MOS-IC	
R700			RK73HB1J330J	CHIP R 33 J 1/16W		IC404			MCP6021-E/OT	MOS-IC	
R701			RK73HB1J100J	CHIP R 10 J 1/16W		IC405-408			TC7W53FK(F)	MOS-IC	
R702			RK73HB1J473J	CHIP R 47K J 1/16W		IC409			TC75W51FK(F)	MOS-IC	
R703			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC500			TC75W51FK(F)	MOS-IC	
R704			RK73HB1J472J	CHIP R 4.7K J 1/16W		IC501			TC75S59F-F	MOS-IC	
R705			RK73HB1J104J	CHIP R 100K J 1/16W		IC600,601			TC7WH126FU-F	MOS-IC	
R706			RK73HB1J102J	CHIP R 1.0K J 1/16W		IC602			ADF4001BRUZ	MOS-IC	
R707			RK73HB1J154J	CHIP R 150K J 1/16W		IC603			TC75S51FE(F)	MOS-IC	
R708,709			RK73HB1J473J	CHIP R 47K J 1/16W		IC604			LMC7101BIM5	MOS-IC	
R710			RK73HB1J472J	CHIP R 4.7K J 1/16W		IC605			TC75S51FE(F)	MOS-IC	
R711			RK73HB1J123J	CHIP R 12K J 1/16W		IC606,607			LMC7101BIM5	MOS-IC	
R712			RK73HB1J474J	CHIP R 470K J 1/16W		IC608			TC75W51FK(F)	MOS-IC	
R713			RK73HB1J334D	CHIP R 330K D 1/16W		IC700			NJM78M05DL1AZB	ANALOGUE IC	
R714			RK73HB1J223D	CHIP R 22K D 1/16W		IC701			XC9101D09AKR	ANALOGUE IC	
R715-717			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC702			NJM78M08FA-ZB	ANALOGUE IC	
R800-803			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC703			TK71733S	BI-POLAR IC	
R806-815			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC704			TK11230CMCL-G	BI-POLAR IC	
R816,817			RK73HB1J101J	CHIP R 100 J 1/16W		IC800			LM73CIMKX-0	MOS-IC	
R818			RK73HB1J102J	CHIP R 1.0K J 1/16W		IC801			TC75S51FE(F)	MOS-IC	
R819			RK73HB1J683J	CHIP R 68K J 1/16W		IC802			M24C02-RMN6TP	ROM IC	
R820			RK73HB1J473J	CHIP R 47K J 1/16W		IC803			TC75W51FK(F)	MOS-IC	
R821			RK73HB1J394J	CHIP R 390K J 1/16W		IC804			M62364FP-F	MOS-IC	
R822			RK73HB1J104J	CHIP R 100K J 1/16W		IC805			MCP23S08TE/ML	MOS-IC	
R824,825			RK73HB1J101J	CHIP R 100 J 1/16W		IC806			TC7W53FK(F)	MOS-IC	
R826			RK73HB1J562J	CHIP R 5.6K J 1/16W		Q100			2SC5383-T111	TRANSISTOR	
R827			RK73HB1J103J	CHIP R 10K J 1/16W		Q101			2SC5337	TRANSISTOR	
R828			RK73HB1J224J	CHIP R 220K J 1/16W		Q200,201			2SC5383-T111	TRANSISTOR	
R829			RK73HB1J220J	CHIP R 22 J 1/16W		Q202,203			2SC5636	TRANSISTOR	
R830			RK73HB1J334J	CHIP R 330K J 1/16W		Q300			3SK294-FP	FET	
R831			RK73HB1J563J	CHIP R 56K J 1/16W		Q301			2SC5337	TRANSISTOR	
R832			RK73HB1J683J	CHIP R 68K J 1/16W		Q500			SSM6L05FU-F	FET	
R833-835			RK73HB1J101J	CHIP R 100 J 1/16W		Q501			2SC4617(R)	TRANSISTOR	
R837			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q502			2SK3737-5	FET	
R838			RK73HB1J101J	CHIP R 100 J 1/16W		Q503			3SK294-FP	FET	
R840,841			RK73HB1J101J	CHIP R 100 J 1/16W		Q504			2SC4617(R)	TRANSISTOR	
R842-849			RK73HB1J104J	CHIP R 100K J 1/16W		Q505			SSM3K15TE(F)	FET	
R850,851			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q506			SSM6L05FU-F	FET	
R853			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q507			UPA672T-A	FET	
R855			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q600			SSM3K15TE(F)	FET	
R856			RK73GB2A220J	CHIP R 22 J 1/10W							

## PARTS LIST

TX-RX UNIT (X57-7942-71)  
RX VCO/PLL UNIT (X58-5070-10)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
Q601			2SA1832(GR)F	TRANSISTOR		CN303			E40-5816-05	PIN ASSY	
Q602,603			2SC4617(R)	TRANSISTOR		CN350			E40-6860-05	PIN ASSY	
Q604,605			2SC5383-T111	TRANSISTOR		CN351			E40-6098-05	PIN ASSY	
Q606			2SC5636	TRANSISTOR		-			F10-2377-04	SHIELDING CASE	
Q607			SSM3K15TE(F)	FET		L300			L92-0163-05	BEADS CORE	
Q700			CPH3317	FET		L303			L41-1295-33	SMALL FIXED INDUCTOR (1.2UH)	
Q701			SSM3K15TE(F)	FET		L305,306			L92-0163-05	BEADS CORE	
Q702			2S.J506-E(S)	FET		L307			L41-6868-14	SMALL FIXED INDUCTOR (6.8NH)	
Q703			RT1N141M-T111	TRANSISTOR		L309			L41-3978-14	SMALL FIXED INDUCTOR (39NH)	
Q704			SSM5H01TU-F	FET		L310			L92-0163-05	BEADS CORE	
Q705			CPH3317	FET		L312,313			L92-0163-05	BEADS CORE	
Q706			SSM3K15TE(F)	FET		L314			L41-6868-14	SMALL FIXED INDUCTOR (6.8NH)	
Q800			SSM3K15TE(F)	FET		L315			L41-2778-14	SMALL FIXED INDUCTOR (27NH)	
						L350-357			L41-1005-33	SMALL FIXED INDUCTOR (10UH)	
<b>RX VCO/PLL UNIT (X58-5070-10)</b>						L358,359			L34-4612-05	AIR-CORE COIL	
C300			C92-0863-05	CHIP TNL 0.047UF 35WV		L360-363			L41-1005-33	SMALL FIXED INDUCTOR (10UH)	
C303			CS77BA1D100M	CHIP TNL 10UF 20WV		L364			L41-8275-33	SMALL FIXED INDUCTOR (0.082UH)	
C304			CC73GCH1H100C	CHIP C 10PF C		L365,366			L92-0163-05	BEADS CORE	
C306			CC73GCH1H100C	CHIP C 10PF C		R301			RK73GB2A391J	CHIP R 390 J 1/10W	
C307			CS77CA1V0R1M	CHIP TNL 0.1UF 35WV		R302			RK73GB2A151J	CHIP R 150 J 1/10W	
C308-310			CK73HB1E103K	CHIP C 0.010UF K		R303			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C311			CK73HB1H102K	CHIP C 1000PF K		R304			RK73HB1J472J	CHIP R 4.7K J 1/16W	
C312			CC73GCH1H180J	CHIP C 18PF J		R305			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C313			CC73HCH1H101J	CHIP C 100PF J		R306			RK73HB1J100J	CHIP R 10 J 1/16W	
C314			CS77BA1E010M	CHIP TNL 1.0UF 25WV		R307			RK73HB1J470J	CHIP R 47 J 1/16W	
C315,316			CC73HCH1H101J	CHIP C 100PF J		R308			RK73HB1J100J	CHIP R 10 J 1/16W	
C317			CK73HB1E103K	CHIP C 0.010UF K		R310			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C318			CC73HCH1H101J	CHIP C 100PF J		R311			RK73HB1J100J	CHIP R 10 J 1/16W	
C320-322			CC73HCH1H101J	CHIP C 100PF J		R312			RK73HB1J330J	CHIP R 33 J 1/16W	
C323			CC73GCH1H030B	CHIP C 3.0PF B		R313			RK73HB1J103J	CHIP R 10K J 1/16W	
C324			CC73HCH1H101J	CHIP C 100PF J		R314			RK73HB1J472J	CHIP R 4.7K J 1/16W	
C326			CC73HCH1H101J	CHIP C 100PF J		R315			RK73HB1J101J	CHIP R 100 J 1/16W	
C328			CC73GCH1H180J	CHIP C 18PF J		R316			RK73HB1J100J	CHIP R 10 J 1/16W	
C329			CK73HB1H102K	CHIP C 1000PF K		R317			RK73HB1J101J	CHIP R 100 J 1/16W	
C330			CC73HCH1H040B	CHIP C 4.0PF B		R319			RK73HB1J331J	CHIP R 330 J 1/16W	
C331			CK73HB1H102K	CHIP C 1000PF K		R320			RK73HB1J223J	CHIP R 22K J 1/16W	
C332			CC73HCH1H100C	CHIP C 10PF C		R321			RK73HB1J103J	CHIP R 10K J 1/16W	
C333			CK73HB1E103K	CHIP C 0.010UF K		R322			RK73HB1J8R2J	CHIP R 8.2 J 1/16W	
C335			CC73HCH1H101J	CHIP C 100PF J		R323			RK73HB1J151J	CHIP R 150 J 1/16W	
C352,353			CC73HCH1H101J	CHIP C 100PF J		R324			RK73HB1J8R2J	CHIP R 8.2 J 1/16W	
C354,355			CK73GB1H102K	CHIP C 1000PF K		R325			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C356,357			CK73HB1H102K	CHIP C 1000PF K		R327			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C358,359			CK73HB1E103K	CHIP C 0.010UF K		R331			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C360,361			CK73HB1H102K	CHIP C 1000PF K		R333			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C362			CC73GCH1H330G	CHIP C 33PF G		R350,351			RK73HB1J474J	CHIP R 470K J 1/16W	
C363			CC73GCH1H220G	CHIP C 22PF G		R352			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C364			CC73GCH1H070B	CHIP C 7.0PF B		R354			RK73HB1J474J	CHIP R 470K J 1/16W	
C365			CC73GCH1H050B	CHIP C 5.0PF B		R357,358			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C366,367			CK73HB1H102K	CHIP C 1000PF K		R361,362			RN73GH1J330D	CHIP R 33 D 1/16W	
C368			CC73GCH1H150G	CHIP C 15PF G		R363,364			RN73GH1J271D	CHIP R 270 D 1/16W	
C369			CC73GCH1H120G	CHIP C 12PF G		R365,366			RN73GH1J470D	CHIP R 47 D 1/16W	
C370-373			CC73GCH1H080B	CHIP C 8.0PF B		R367			RK73HB1J330J	CHIP R 33 J 1/16W	
C374,375			CC73GCH1H010B	CHIP C 1.0PF B		R368			RN73GH1J473D	CHIP R 47K D 1/16W	
C376,377			CK73HB1H102K	CHIP C 1000PF K		R369			RN73GH1J103D	CHIP R 10K D 1/16W	
C378			CC73HCH1H100C	CHIP C 10PF C		R370			RK73HB1J221J	CHIP R 220 J 1/16W	
C379			C93-0787-05	CHIP C 0.1UF J		R372			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C380,381			CC73GCH1H030B	CHIP C 3.0PF B		R374			RK73GB2A000J	CHIP R 0.0 J 1/10W	
						R377			RK73GB2A000J	CHIP R 0.0 J 1/10W	

## PARTS LIST

### RX VCO/PLL UNIT (X58-5070-10)

### TX VCO/PLL UNIT (X58-5080-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R379			RK73HB1J000J	CHIP R 0.0 J 1/16W		L303			L41-1295-33	SMALL FIXED INDUCTOR (1.2UH)	
D352,353			1SV325F	VARIABLE CAPACITANCE DIODE		L305,306			L92-0163-05	BEADS CORE	
D355			1SV282-F	VARIABLE CAPACITANCE DIODE		L307			L41-6868-14	SMALL FIXED INDUCTOR (6.8NH)	
D357-361			1SV282-F	VARIABLE CAPACITANCE DIODE		L309			L41-6878-14	SMALL FIXED INDUCTOR (68NH)	
IC300			SKY72300-362	MOS-IC		L310			L92-0163-05	BEADS CORE	
Q300			2SC5636	TRANSISTOR		L312,313			L92-0163-05	BEADS CORE	
Q350,351			SSM6L05FU-F	FET		L314			L41-6868-14	SMALL FIXED INDUCTOR (6.8NH)	
Q352,353			MCH3914(8)-H	FET		L315			L41-4778-14	SMALL FIXED INDUCTOR (47NH)	
Q354			2SC5636	TRANSISTOR		L350-353			L41-1005-33	SMALL FIXED INDUCTOR (10UH)	
						L354,355			L41-2295-33	SMALL FIXED INDUCTOR (2.2UH)	
						L356,357			L41-1005-33	SMALL FIXED INDUCTOR (10UH)	
						L358			L34-4613-05	AIR-CORE COIL	
						L359			L34-4612-05	AIR-CORE COIL	
						L362,363			L41-1005-33	SMALL FIXED INDUCTOR (10UH)	
						L364			L41-6875-33	SMALL FIXED INDUCTOR (0.068UH)	
						L365,366			L92-0163-05	BEADS CORE	
<b>TX VCO/PLL UNIT (X58-5080-10)</b>											
C300			C92-0863-05	CHIP TNTL 0.047UF 35WV		R301			RK73GB2A391J	CHIP R 390 J 1/10W	
C303			CS77BA1D100M	CHIP TNTL 10UF 20WV		R302			RK73GB2A151J	CHIP R 150 J 1/10W	
C304			CC73GCH1H100C	CHIP C 10PF C		R303			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C306			CC73GCH1H100C	CHIP C 10PF C		R305			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C307			CS77CA1VR15M	CHIP TNTL 0.15UF 35WV		R306			RK73HB1J100J	CHIP R 10 J 1/16W	
C308-310			CK73HB1E103K	CHIP C 0.010UF K		R307			RK73HB1J560J	CHIP R 56 J 1/16W	
C311			CK73HB1H102K	CHIP C 1000PF K		R308			RK73HB1J100J	CHIP R 10 J 1/16W	
C312			CC73GCH1H330G	CHIP C 33PF G		R310			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C313			CC73HCH1H101J	CHIP C 100PF J		R311			RK73HB1J100J	CHIP R 10 J 1/16W	
C314			CS77BA1E010M	CHIP TNTL 1.0UF 25WV		R312			RK73HB1J470J	CHIP R 47 J 1/16W	
C315,316			CC73HCH1H101J	CHIP C 100PF J		R313			RK73HB1J473J	CHIP R 47K J 1/16W	
C317			CK73HB1E103K	CHIP C 0.010UF K		R315			RK73HB1J101J	CHIP R 100 J 1/16W	
C318			CC73HCH1H101J	CHIP C 100PF J		R316			RK73HB1J100J	CHIP R 10 J 1/16W	
C320-322			CC73HCH1H101J	CHIP C 100PF J		R317			RK73HB1J101J	CHIP R 100 J 1/16W	
C323			CC73GCH1H030B	CHIP C 3.0PF B		R318			RK73HB1J222J	CHIP R 2.2K J 1/16W	
C324			CC73HCH1H101J	CHIP C 100PF J		R319			RK73HB1J331J	CHIP R 330 J 1/16W	
C326			CC73HCH1H101J	CHIP C 100PF J		R320			RK73HB1J103J	CHIP R 10K J 1/16W	
C328			CC73GCH1H330G	CHIP C 33PF G		R321			RK73HB1J562J	CHIP R 5.6K J 1/16W	
C329			CK73HB1H102K	CHIP C 1000PF K		R322			RK73HB1J8R2J	CHIP R 8.2 J 1/16W	
C330			CC73HCH1H050C	CHIP C 5.0PF C		R323			RK73HB1J151J	CHIP R 150 J 1/16W	
C331,332			CK73HB1H102K	CHIP C 1000PF K		R324			RK73HB1J8R2J	CHIP R 8.2 J 1/16W	
C333			CK73HB1E103K	CHIP C 0.010UF K		R325			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C335			CC73HCH1H101J	CHIP C 100PF J		R327			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C350			C93-0787-05	CHIP C 0.1UF J		R331			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C354,355			CK73GB1H102K	CHIP C 1000PF K		R333			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C356,357			CK73HB1H102K	CHIP C 1000PF K		R350,351			RK73HB1J474J	CHIP R 470K J 1/16W	
C358,359			CK73HB1E103K	CHIP C 0.010UF K		R353			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C360,361			CK73HB1H102K	CHIP C 1000PF K		R354			RK73HB1J474J	CHIP R 470K J 1/16W	
C362,363			CC73GCH1H220G	CHIP C 22PF G		R355			RK73HB1J103J	CHIP R 10K J 1/16W	
C366,367			CK73HB1H102K	CHIP C 1000PF K		R356			RK73HB1J330J	CHIP R 33 J 1/16W	
C368			CC73GCH1H020B	CHIP C 2.0PF B		R357,358			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C369			CC73GCH1H030B	CHIP C 3.0PF B		R361,362			RN73GH1J330D	CHIP R 33 D 1/16W	
C372,373			CC73GCH1H150G	CHIP C 15PF G		R363,364			RN73GH1J331D	CHIP R 330 D 1/16W	
C374,375			CC73GCH1H010B	CHIP C 1.0PF B		R365,366			RN73GH1J470D	CHIP R 47 D 1/16W	
C376,377			CK73HB1H102K	CHIP C 1000PF K		R367			RK73HB1J330J	CHIP R 33 J 1/16W	
C378			CC73HCH1H120J	CHIP C 12PF J		R368			RN73GH1J473D	CHIP R 47K D 1/16W	
C379			C93-0787-05	CHIP C 0.1UF J		R369			RN73GH1J103D	CHIP R 10K D 1/16W	
C382			CC73GCH1H050B	CHIP C 5.0PF B		R370			RK73HB1J221J	CHIP R 220 J 1/16W	
C384			CC73GCH1H050B	CHIP C 5.0PF B		R371			RK73HB1J681J	CHIP R 680 J 1/16W	
CN303			E40-5816-05	PIN ASSY		R372			RK73HB1J000J	CHIP R 0.0 J 1/16W	
CN350			E40-6860-05	PIN ASSY		R373			RK73HB1J474J	CHIP R 470K J 1/16W	
CN351			E40-6098-05	PIN ASSY		R374			RK73GB2A000J	CHIP R 0.0 J 1/10W	
-			F10-2377-04	SHIELDING CASE		R377			RK73GB2A000J	CHIP R 0.0 J 1/10W	
L300			L92-0163-05	BEADS CORE							

## PARTS LIST

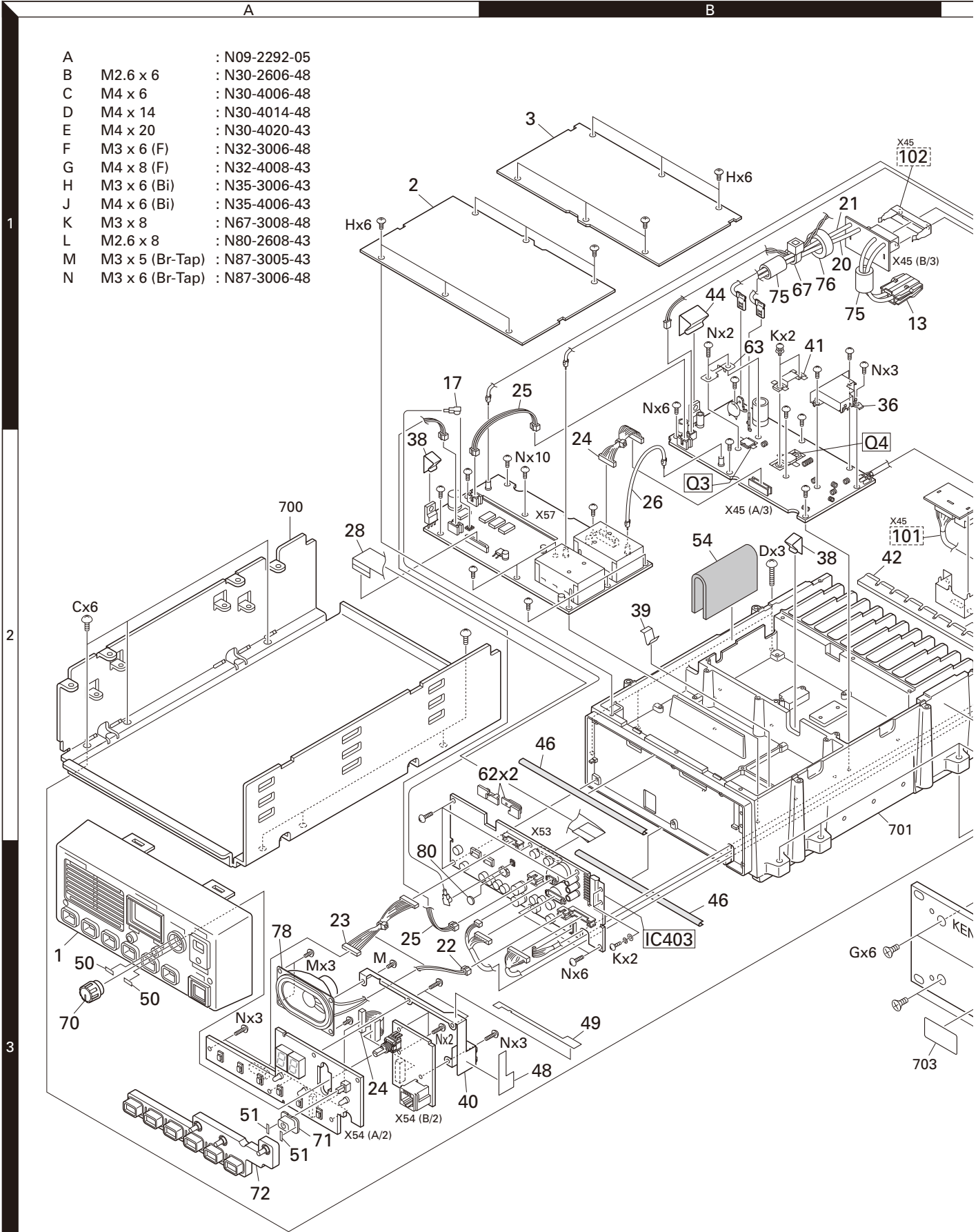
TX VCO/PLL UNIT (X58-5080-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R379			RK73HB1J000J	CHIP R 0.0 J 1/16W							
D352,353			1SV282-F	VARIABLE CAPACITANCE DIODE							
D355			1SV282-F	VARIABLE CAPACITANCE DIODE							
D357-361			1SV282-F	VARIABLE CAPACITANCE DIODE							
IC300			SKY72300-362	MOS-IC							
Q300			2SC5636	TRANSISTOR							
Q350,351			SSM6L05FU-F	FET							
Q352,353			MCH3914(8)-H	FET							
Q354			2SC5636	TRANSISTOR							

# NXR-710

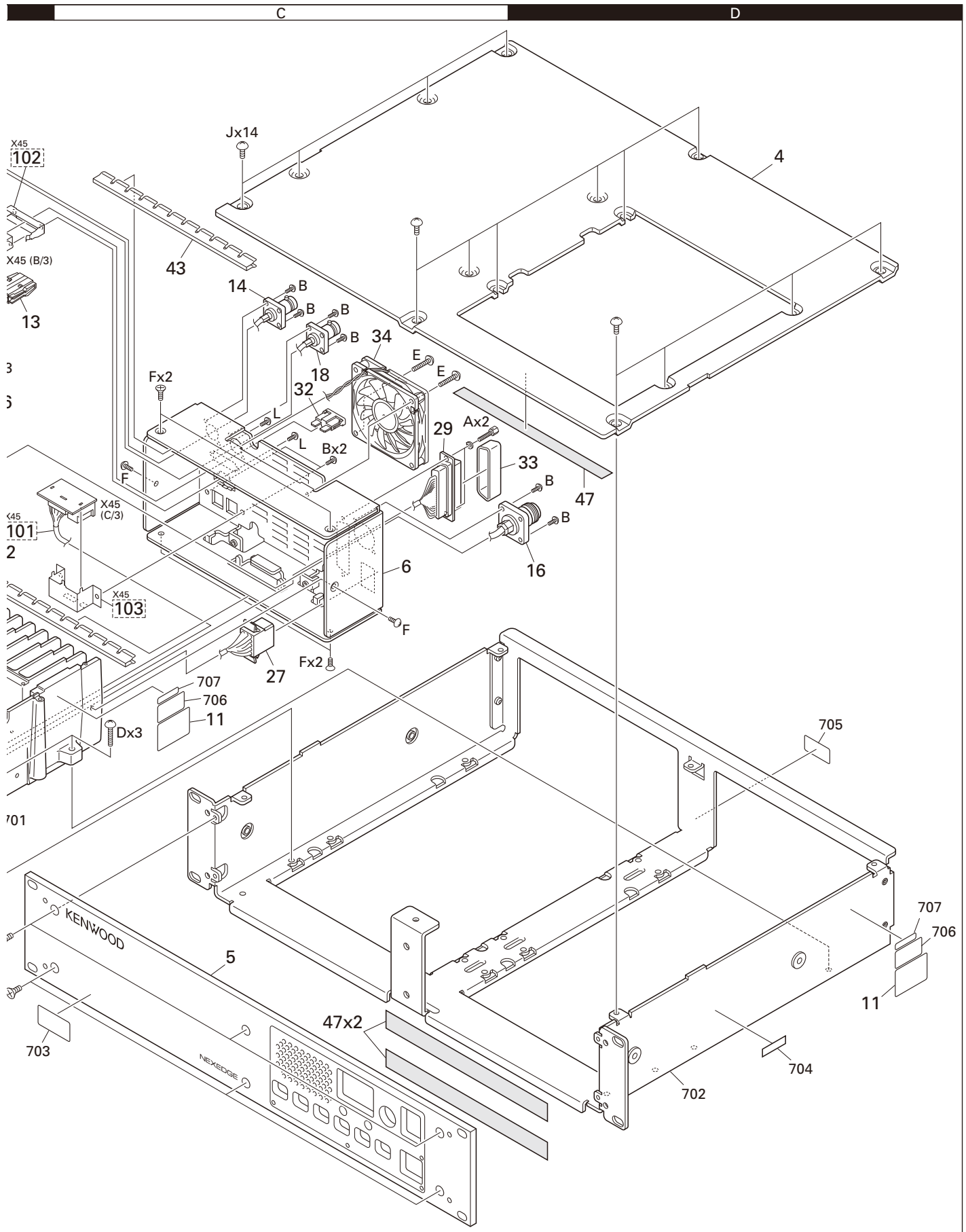
## EXPLODED VIEW

A	:	N09-2292-05
B	M2.6 x 6	: N30-2606-48
C	M4 x 6	: N30-4006-48
D	M4 x 14	: N30-4014-48
E	M4 x 20	: N30-4020-43
F	M3 x 6 (F)	: N32-3006-48
G	M4 x 8 (F)	: N32-4008-43
H	M3 x 6 (Bi)	: N35-3006-43
J	M4 x 6 (Bi)	: N35-4006-43
K	M3 x 8	: N67-3008-48
L	M2.6 x 8	: N80-2608-43
M	M3 x 5 (Br-Tap)	: N87-3005-43
N	M3 x 6 (Br-Tap)	: N87-3006-48



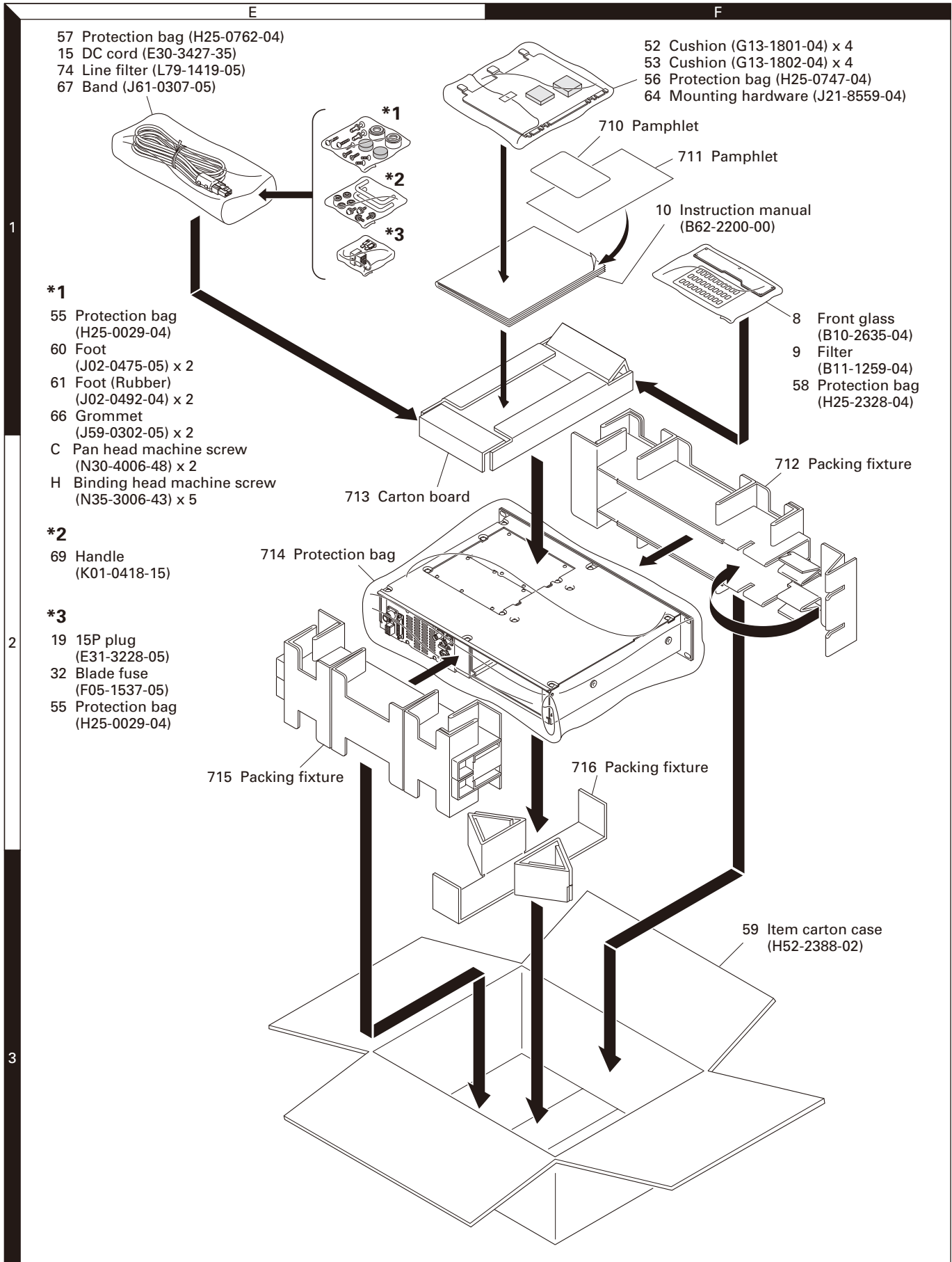
**38** Parts with the exploded numbers larger than 700 are not supplied.  
 If a part reference number is listed in a box on the exploded view of the PCB, that part does not come with the PCB.  
 These parts must be ordered separately.

## 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



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



## TROUBLE SHOOTING

### 1. Fault Diagnosis of the BGA (Ball Grid Array) IC

#### ■ Overview

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

#### ■ BGA parts

ASIC (IC20), DSP (IC6), SRAM (IC9)

#### ● Checking power supply voltage

Checking voltage	
Points to be checked	Normal voltage
33M IC303 (5 pin)	3.3V
16M IC305 (5 pin)	1.6V
15M IC304 (5 pin)	1.5V
33A IC306 (5 pin)	3.3V
33BU Q303 (Collector Side)	3.3V

Power supply of each device is connected through the coil.  
[ASIC]  
33M: L20 and L308, 15M: L309  
[DSP]  
33M: L4 and L308, 16M: R324  
[SRAM]  
33BU: L5

When an abnormal value is confirmed.

Checking for an abnormal point

33M has an abnormal voltage.  
[ASIC]  
Remove L20 to check the voltage of the 33M.  
If the voltage becomes normal, the ASIC is broken.  
[DSP]  
Remove L4 to check the voltage of the 33M.  
If the voltage becomes normal, the DSP is broken.

16M has an abnormal voltage.  
[DSP]  
Remove R324 to check the voltage of the 16M.  
If the voltage becomes normal, the DSP is broken.

15M has an abnormal voltage.  
[ASIC]  
Remove L309 to check the voltage of the 15M.  
If the voltage becomes normal, the ASIC is broken.

33A has an abnormal voltage.  
[ASIC]  
Remove L316 to check the voltage of the 33A.  
If the voltage becomes normal, the ASIC is broken.

33BU has an abnormal voltage.  
[SRAM]  
Remove L5 to check the voltage of the 33BU.  
If the voltage becomes normal, the SRAM is broken.

If the voltage is not corrected, there is a problem other than the BGA parts.

#### ● Checking the clock

Checking the frequency and the magnitude voltage.	
Points to be checked	Normal Freq. and Magnitude
18.432MHz R115 (ASIC side)	18.432MHz 3.3V
R52 (DSP side)	18.432MHz 3.3V
32.768 kHz IC17 (1 pin)	32.768kHz 3.3V

When an abnormal value is confirmed.

[18.432MHz]  
Remove the R115 and R52. If it oscillates normally, the DSP and ASIC may be broken.  
[32.768kHz]  
Exchange IC17(RTC). If it oscillates normally, the ASIC may be broken.

#### ● Checking the Reset/Control signal

Checking the reset and control signal input to the ASIC	
Points to be checked	Normal voltage
RESET R511	3.3V
/BINT IC307 (1 pin)	3.3V
/OVRB Q301 (Collector side)	3.3V

When an abnormal value is confirmed.

The BGA parts are not broken.

Checking the ASIC input switch signal	
*Each signal is not masked by the setting of the FPU. The POWER key is pressed and held.	
Points to be checked	Confirmed voltage
/PSW R271 (ASIC Side)	0V

When an abnormal value is confirmed.

#### ● Checking the output signal from the ASIC

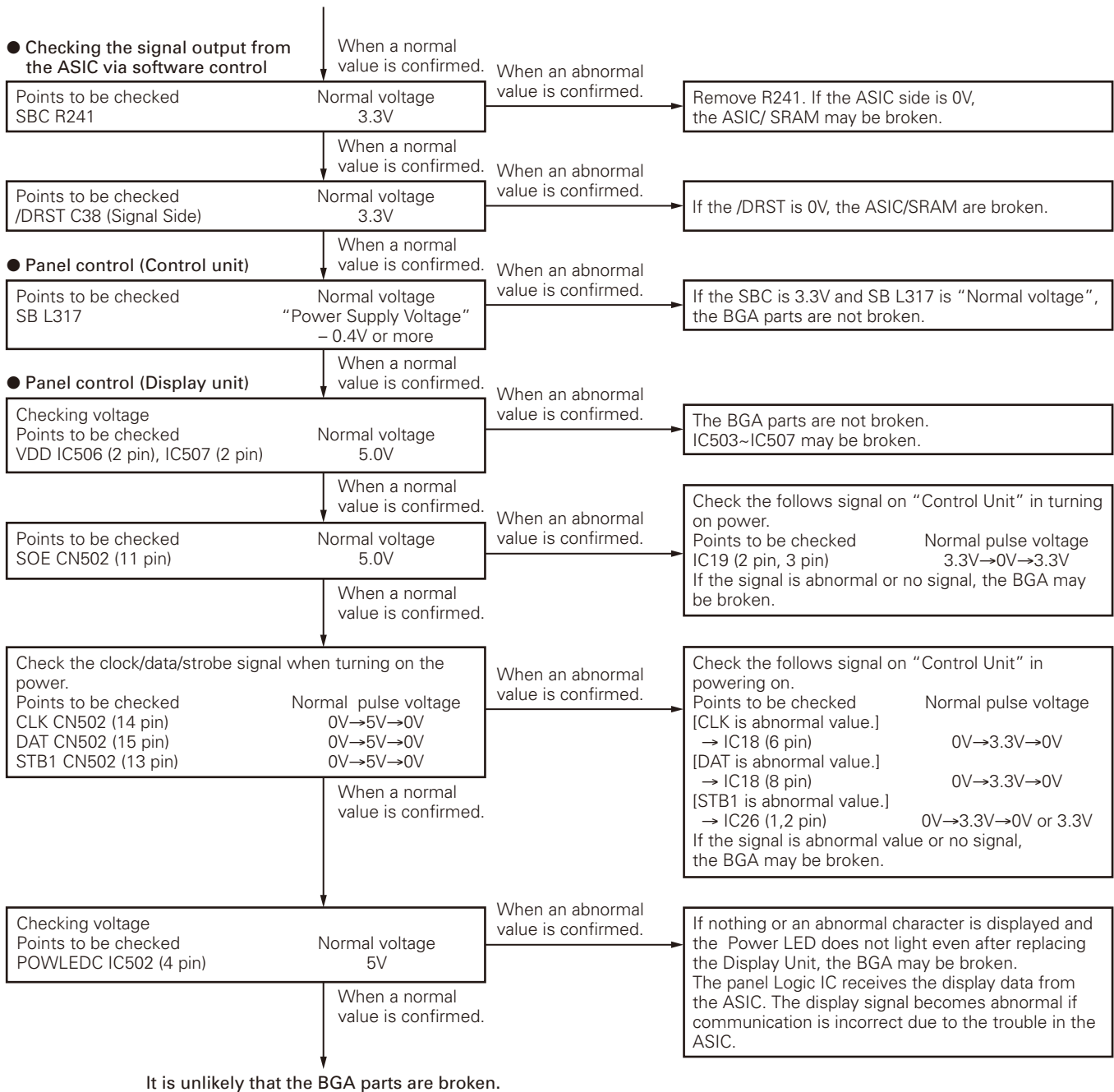
Points to be checked	Normal voltage
/FRST IC3 (12 pin)	3.3V

When an abnormal value is confirmed.

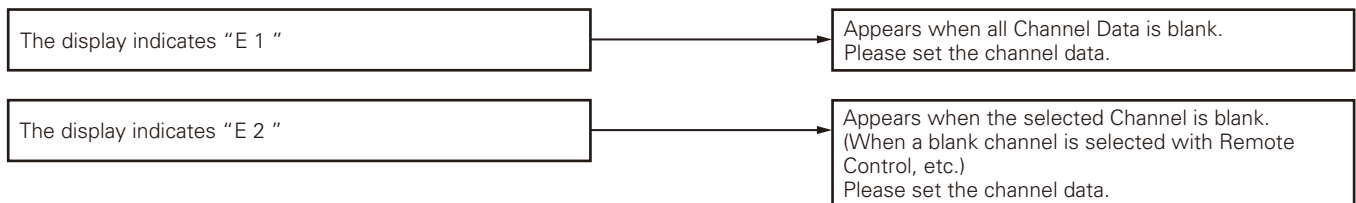
If the /FRST is always 0V, the ASIC is broken.

When a normal value is confirmed.

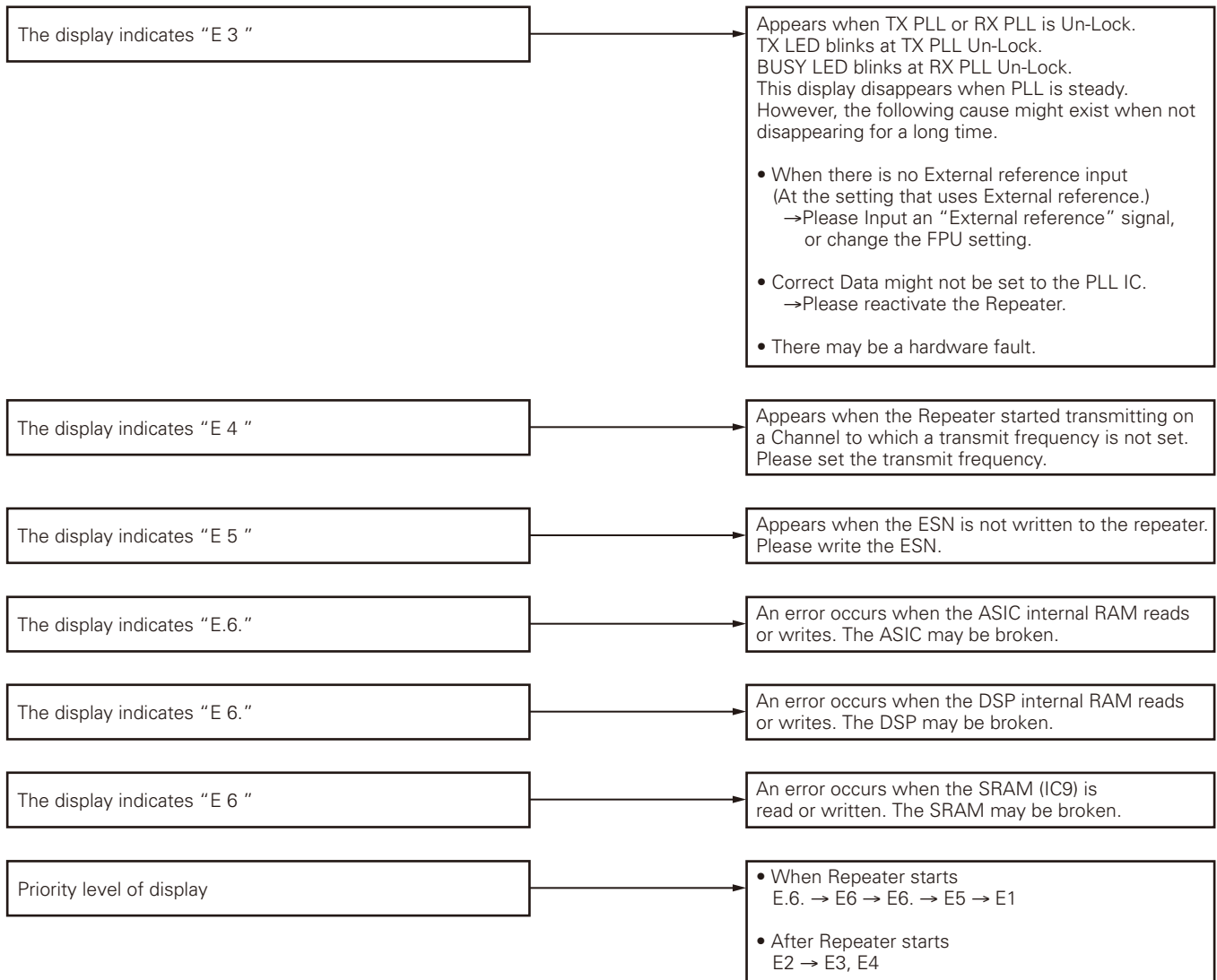
## TROUBLE SHOOTING



● **When an error display appears on the LED segment indicator.**



## TROUBLE SHOOTING



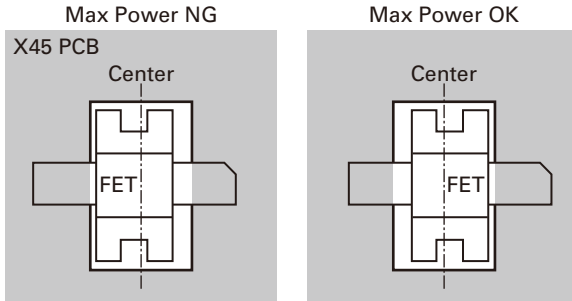
### 2. If normal power is not obtained, please follow the steps below

- Switch off the repeater.  
The impedance of the Final FET (Q4) and Drive FET (Q3) can be measured easily using a DVM (Digital Volt Meter) ohm mode.  
Normal condition – Gate: > 50kohm  
The above impedance values are rough estimations.
- Switch on the repeater. Check the voltage at F1 output point.  
The voltage is around 13.2V during reception.  
The voltage will be 13.0V~ during transmission.  
If this point measures 0V, then F1 is damaged.
- Remove C24.
- Connect a 50ohm load to the ANT terminal.  
Transmit and check the current drain in High power mode.  
If the current drain is less than 1.0A, then the Final FET is damaged.  
If the current drain is less than 5.0A, short the Drive FET gate to ground, and check the current drain.  
If the current drain is not 0.1A less than the original value, then the Drive FET is damaged.
- Check the input power level at the Drive FET gate location.  
Connect the wire to [RF] location. (A join of R23 and R24)  
Confirm that it is about 0.1W.  
If power found is considerably lower than 0.1W, check the circuit before the Drive FET.

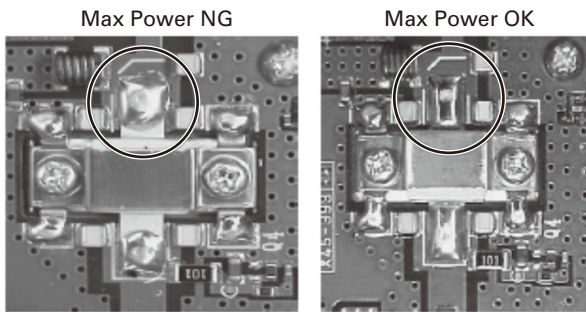
## TROUBLE SHOOTING

### ■ Replacing the Final FET (Q4)

- 1) The X45 (final) PCB must be shifted to the left after placing it into the chassis.  
Insert a board of just 1mm between the PCB and the case.
- 2) The FET (RD70HVF1-101) must be shifted to the right during mounting.

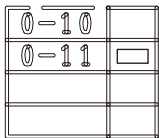


- 3) Apply solder to cover the entire FET terminal. (Both input and output terminals of the FET (Q3,Q4)).



## 3. Replacing Control Unit

### 3-1. Control Unit Information

Original Control Unit	Control Unit (Service Unit)	Difference between Original Unit and Service Unit
X53-4490-10	X53-4490-11	Mounted chip at 0-11 location for Service Unit. 

### 3-2. Supplied Accessories

Item (Including Part Number)	Quantity
Control Unit (X53-449)	1
Kenwood ESN Label	3
NXDN ESN Label	2
Addendum (B59-2621-XX)	1

### 3-3. Printed Circuit Board Data

The following data is written on the printed circuit board:

Data Type	Description
Firmware	NXR-710/810 Firmware
FPU Data (PC programming mode)	NXR-710 K type data.
Various Adjustment Data (PC test mode)	General adjustment values for the NXR-710.
Kenwood ESN	Model Name: NXR-710/810S Type: K The same number as the Kenwood ESN label is written.
NXDN ESN	The same number as the NXDN ESN label is written.

### 3-4. After Changing the PCB

1. After changing the printed circuit board, write the up-to-date Firmware following the instructions in the "REALIGNMENT 4. Firmware Programming Mode".
2. Using the KPG-129D, select your desired item (Model Name and Frequency) from the Model > Product Information menu, then use Program > Write Data to the repeater to write the FPU data (PC Programming mode). When writing to the repeater, a Warning Message, corresponding to the item selected, appears. Click [OK] to continue writing the data.
3. Enter Program > Test mode, then adjust the various adjustment data (PC Test mode) as described in the "ADJUSTMENT".
4. For the X53-449, attach the new labels corresponding to the new printed circuit board. (Refer to the images on page 45 for label placement.)
5. If necessary, write the FPU data used by the customer with the KPG-129D.

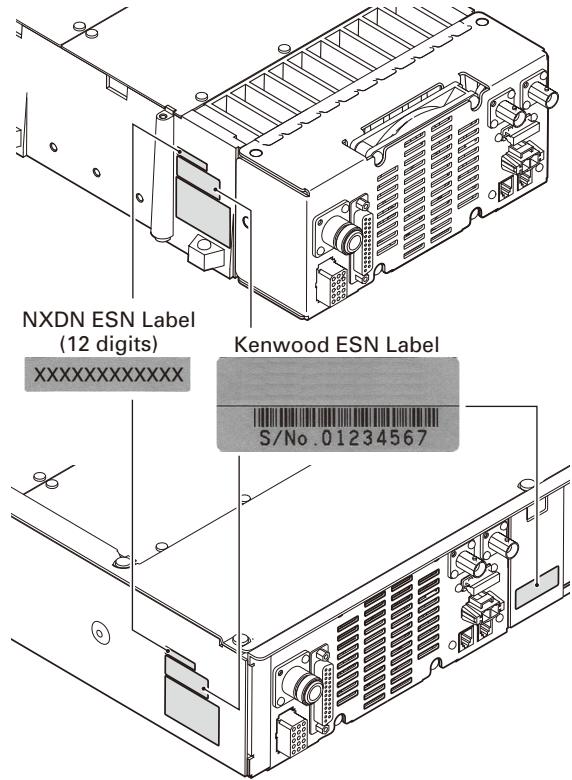
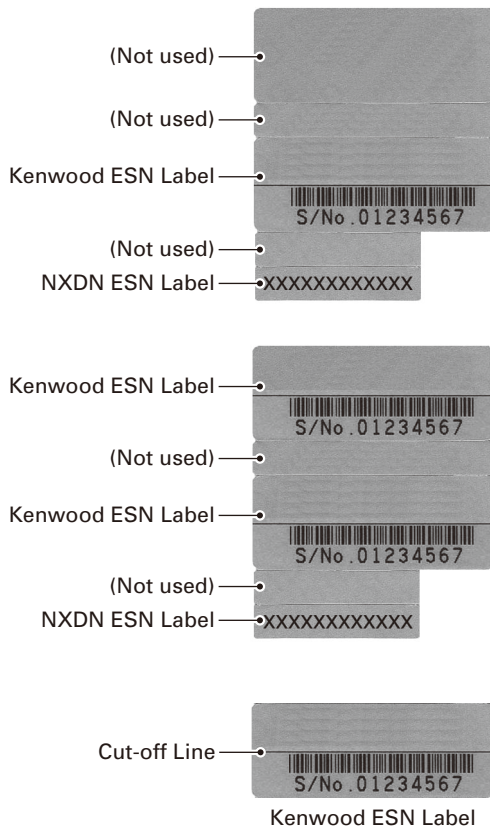
#### Note:

- When a new printed circuit board is used, the Kenwood ESN changes, as does the Repeater Information display of the KPG-129D, 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.
- Re-installing other parts from original unit to Service unit is not required after changing to Service unit.

## TROUBLE SHOOTING

### 3-5. ESN Label Layout

The following labels are provided in the service unit package.



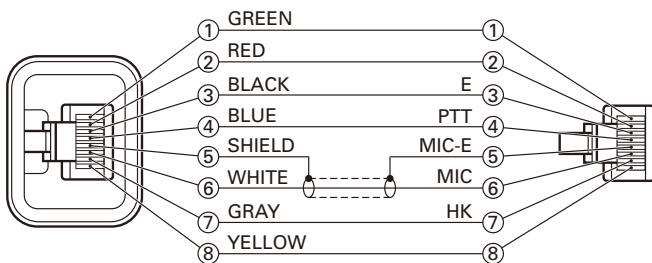
**Note:** For the X53-449, a UPC code and UPC barcode is not printed on the Kenwood ESN Label. If necessary, cut the label at the cut-off line and attach only the serial number.

## ADJUSTMENT

### Test Equipment Required for Alignment

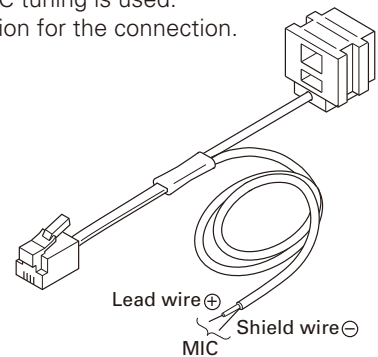
Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output When performing the Frequency adjustment, the following accuracy is necessary. • 0.003ppm Use a standard oscillator for adjustments, if necessary.	136 to 174MHz Frequency modulation and external modulation -127dBm/0.1μV to greater than -20dBm/22.4mV
2. Power Meter	Input Impedance Operation Frequency Measurement Capability	50Ω 136 to 174MHz or more Vicinity of 100W
3. Deviation Meter	Frequency Range	136 to 174MHz
4. Digital Volt Meter (DVM)	Measuring Range Input Impedance	1V to 20V DC High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 600MHz 0.2ppm or less
7. Ammeter		15A or more
8. AF Volt Meter (AF V.M)	Frequency Range Voltage Range	50Hz to 10kHz 3mV to 3V
9. Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz 0 to 1V
10. Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11. Voltmeter	Measuring Range Input Impedance	10V to 1.5V DC or less 50kΩ/V or greater
12. 4Ω Dummy Load		Approx. 4Ω, 5W

### Test cable for microphone input (E30-3360-28)

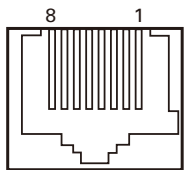


### Tuning cable (E30-3383-05)

Adapter cable (E30-3383-05) is required for injecting an audio if PC tuning is used. See "PC Mode" section for the connection.



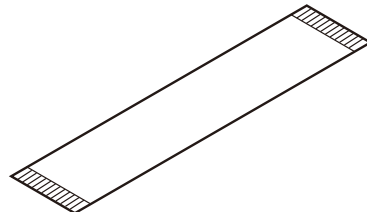
### MIC connector (Front panel view)



- 1: NC
- 2: SB
- 3: GND
- 4: PTT/TXD  
(PC serial data from transceiver)
- 5: MIC GND
- 6: MIC
- 7: HOOK/RXD  
(PC serial data to transceiver)
- 8: NC

### Flat cable (36-pin) about 256mm

To connect the Control unit (CN38) to the TX-RX unit (CN800) while in servicing, you can use the 36-pin flat cable, E37-0979-05, which is available from the KENWOOD parts center.



## ADJUSTMENT

### Test Channel

No.	RX	TX
1	155.050000MHz	155.100000MHz
2	136.050000MHz	136.100000MHz
3	173.950000MHz	173.900000MHz
4	155.000000MHz	155.000000MHz
5	155.200000MHz	155.200000MHz
6	155.400000MHz	155.400000MHz
7~16	-	-

### Test Signaling (Analog)

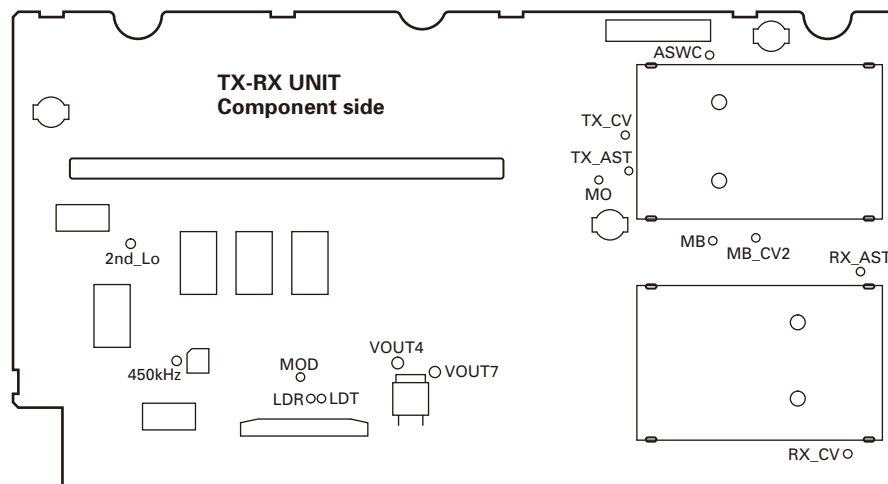
No.	RX (Decode Signaling)	TX (Encode Signaling)
1	None	None
2	None	100Hz Square Wave
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 254.1Hz	QT 254.1Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	DTMF Decode (CODE: 159D)	DTMF Encode (CODE: 159D)
10	None	DTMF Encode (CODE: 9)
11	None	Test Tone Encode
12	None	CW ID Encode (ID: VVV)
13	None	Courtesy Tone

### Test Signaling (NXDN)

No.	RX (Decode Signaling)	TX (Encode Signaling)
1	RAN 1	RAN 1
2	RAN 1	PN 9
3	RAN 1	Maximum Deviation Pattern

- Signaling number 1 is used for link test.
- Signaling number 2 is used for TX modulation signal quality test. i.e, TX adjacent channel power, FSK error, Occupied bandwidth, Emission mask, etc.
- Signaling number 3 is used for TX deviation test. If the modulation mode is very narrow, the modulation frequency is 600Hz. If the modulation mode is narrow, the modulation frequency is 1200Hz.

### Adjustment Points



## ADJUSTMENT

### Common Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) Connect the unit to a suitable power supply (13.2V). 2) Turn the power switch on after connecting a PC and FPU cable to the radio. 3) Start up the program for the adjustment.							
2. Receive Assist Adjust	FPU Test mode 1) Adjust Item: [Receive Assist] 2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High]					PC ADJ	3.0V	±0.1V  [V] indicator on the PC window shows "VCO lock voltage". Change the adjustment value to get "VCO lock voltage" within the limit of the specified voltage.  Press [Apply All] button to store the adjustment value.  Confirm the VCO lock voltage approximately 3 seconds after the adjustment value is changed.
	3) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High]	DVM	TX-RX	RX_CV			Check	3.0V±0.1V
3. Transmit Assist Adjust	FPU Test mode 1) Adjust Item: [Transmit Assist] 2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High] Press [Transmit] button.					PC ADJ	3.0V	±0.1V  [V] indicator on the PC window shows "VCO lock voltage". Change the adjustment value to get "VCO lock voltage" within the limit of the specified voltage.  Press [Apply All] button to store the adjustment value.  Confirm the VCO lock voltage approximately 3 seconds after the adjustment value is changed.
	3) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High] Press [Transmit] button.	DVM	TX-RX	TX_CV			Check	3.0V±0.1V
4. Sensitivity 1 Adjust	FPU Test mode 1) Adjust Item: [Sensitivity 1] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]					PC ADJ	Write the value as followings (typical value) [Low] = 55 [Low'] = 70 [Center] = 85 [High'] = 110 [High] = 135	Press [Apply All] button to store the adjustment value.  Variable-Capacitor Tune voltage is adjusted. (Output voltage is adjustment of BPF)



## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Sensitivity 2 Adjust	FPU Test mode 1) Adjust Item: [Sensitivity 2] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]					PC ADJ	Write the value as followings (typical value) [Low] = 65 [Low'] = 75 [Center] = 90 [High'] = 115 [High] = 145	Press [Apply All] button to store the adjustment value.  Variable-Capacitor Tune voltage is adjusted. (Output voltage is adjustment of BPF)
6. AGC Target Level Adjustment	FPU Test mode 1) Adjust Item: [AGC Target Level Adjustment]						Write the value as followings (typical value) [AGC Target Level Adjustment] = -18	Press [Apply] button to store the adjustment value.
7. AGC Adjustment [Analog Narrow]	FPU Test mode 1) Adjust Item: [AGC Adjustment (Analog Narrow)] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]						Write the value as followings (typical value) [Low] = 256 [Low'] = 256 [Center] = 256 [High'] = 256 [High] = 256	Press [Apply All] button to store the adjustment value.
8. AGC Adjustment [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [AGC Adjustment (Analog Wide 5k)] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]							
9. AGC Adjustment [NXDN Very Narrow]	FPU Test mode 1) Adjust Item: [AGC Adjustment (NXDN Very Narrow)] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]							
10. Frequency Adjust	FPU Test mode 1) Adjust Item: [Frequency] Connect the SSG to the RX ANT. CH: 1 (Analog Narrow) SSG Output: -47dBm (1mV) (CW (without modulation)) <b>Caution:</b> Perform the frequency adjustment under the following condition. <ul style="list-style-type: none"> <li>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-129D.)</li> <li>Use an accuracy of 0.003ppm for the SSG. (Use a standard oscillator if necessary.)</li> </ul>	SSG	Rear	RX ANT		PC ADJ		Press [Start] button of [Auto Tuning]. Press [Apply] button to store the adjustment value after the automatic adjustment was finished.

## ADJUSTMENT

### Receiver Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. RD Level Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [RD Level (Analog Wide 5k)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501µV) MOD: 1.0kHz DEV: ±3.0kHz	SSG AF VTVM	Rear	RX ANT  Control I/O Jack RD (Pin No.10)		PC ADJ	80mV	±5mV  Press [Apply] button to store the adjustment value.
2. RD Level Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [RD Level (Analog Wide 4k)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501µV) MOD: 1.0kHz DEV: ±2.4kHz							
3. RD Level Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [RD Level (Analog Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501µV) MOD: 1.0kHz DEV: ±1.5kHz							
4. RA Level Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [RA Level (Analog Wide 5k)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501µV) MOD: 1.0kHz DEV: ±3.0kHz	SSG AF VTVM	Rear	RX ANT  Control I/O Jack RA (Pin No.11)		PC ADJ	400mV	±20mV  Press [Apply] button to store the adjustment value.
5. RA Level Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [RA Level (Analog Wide 4k)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501µV) MOD: 1.0kHz DEV: ±2.4kHz							
6. RA Level Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [RA Level (Analog Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501µV) MOD: 1.0kHz DEV: ±1.5kHz							

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. Open Squelch Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [Open Squelch (Analog Wide 5k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'], [Center], [High'], [High] Output : 12dB SINAD level -1dB MOD: 1.0kHz DEV: ±3.0kHz	SSG Audio analyzer Oscilloscope	Rear	RX ANT		PC ADJ		Press [Apply] button to store the adjustment value.  <b>Note:</b> Write the fixed value of "33" when the adjustment value is 27 or less.
	2) SSG output: OFF						Check	The squelch shall be closed.
8. Open Squelch Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [Open Squelch (Analog Wide 4k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'], [Center], [High'], [High] Output : 12dB SINAD level -1dB MOD: 1.0kHz DEV: ±2.4kHz							Press [Apply] button to store the adjustment value.  <b>Note:</b> Write the fixed value of "33" when the adjustment value is 27 or less.
	2) SSG output: OFF						Check	The squelch shall be closed.
9. Open Squelch Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [Open Squelch (Analog Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'], [Center], [High'], [High] Output : 12dB SINAD level -1dB MOD: 1.0kHz DEV: ±1.5kHz					PC ADJ		Press [Apply] button to store the adjustment value.  <b>Note:</b> Write the fixed value of "30" when the adjustment value is 24 or less.
	2) SSG output: OFF						Check	The squelch shall be closed.
10. Open Squelch Adjust [NXDN Very Narrow]	FPU Test mode 1) Adjust Item: [Open Squelch (NXDN Very Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'], [Center], [High'], [High] Output: 12dB SINAD level of Analog Narrow -4dB MOD: OFF					PC ADJ		Press [Apply] button to store the adjustment value.

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
11. Tight Squelch Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [Tight Squelch (Analog Wide 5k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'], [Center], [High'], [High] Output : 12dB SINAD level +8dB MOD: 1.0kHz DEV: ±3.0kHz	SSG Audio analyzer Oscilloscope	Rear	RX ANT		PC ADJ		Press [Apply] button to store the adjustment value.
	2) SSG output: OFF							Check
12. Tight Squelch Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [Tight Squelch (Analog Wide 4k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'], [Center], [High'], [High] Output : 12dB SINAD level +8dB MOD: 1.0kHz DEV: ±2.4kHz					PC ADJ		Press [Apply] button to store the adjustment value.
	2) SSG output: OFF							Check
13. Tight Squelch Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [Tight Squelch (Analog Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'], [Center], [High'], [High] Output : 12dB SINAD level +8dB MOD: 1.0kHz DEV: ±1.5kHz					PC ADJ		Press [Apply] button to store the adjustment value.
	2) SSG output: OFF							Check
14. RSSI Reference Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [RSSI Reference (Analog Wide 5k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output : 12dB SINAD level -1dB MOD: 1.0kHz DEV: ±3.0kHz	SSG Audio analyzer	Rear	RX ANT		PC ADJ		Press [Apply] button to store the adjustment value.

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
15. RSSI Reference Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [RSSI Reference (Analog Wide 4k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output : 12dB SINAD level -1dB MOD: 1.0kHz DEV: ±2.4kHz	SSG Audio analyzer	Rear	RX ANT		PC ADJ		Press [Apply] button to store the adjustment value.
16. RSSI Reference Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [RSSI Reference (Analog Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output : 12dB SINAD level -1dB MOD: 1.0kHz DEV: ±1.5kHz							
17. RSSI Reference Adjust [NXDN Very Narrow]	FPU Test mode 1) Adjust Item: [RSSI Reference (NXDN Very Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output : 12dB SINAD level -1dB MOD: OFF							
18. Low RSSI Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [Low RSSI (Analog Wide 5k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output: -118dBm (0.28µV) MOD: 1.0kHz DEV: ±3.0kHz	SSG	Rear	RX ANT		PC ADJ		Press [Apply] button to store the adjustment value.
19. Low RSSI Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [Low RSSI (Analog Wide 4k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output: -118dBm (0.28µV) MOD: 1.0kHz DEV: ±2.4kHz							

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
20. Low RSSI Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [Low RSSI (Analog Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output: -118dBm (0.28μV) MOD: 1.0kHz DEV: ±1.5kHz	SSG	Rear	RX ANT		PC ADJ		Press [Apply] button to store the adjustment value.
21 .Low RSSI Adjust [NXDN Very Narrow]	FPU Test mode 1) Adjust Item: [Low RSSI (NXDN Very Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output: -118dBm (0.28μV) MOD: OFF							
22. High RSSI Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [High RSSI (Analog Wide 5k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output: -70dBm (70.7μV) MOD: 1.0kHz DEV: ±3.0kHz	SSG	Rear	RX ANT		PC ADJ		Press [Apply] button to store the adjustment value.
23. High RSSI Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [High RSSI (Analog Wide 4k)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output: -70dBm (70.7μV) MOD: 1.0kHz DEV: ±2.4kHz							
24. High RSSI Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [High RSSI (Analog Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output: -70dBm (70.7μV) MOD: 1.0kHz DEV: ±1.5kHz							

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
25. High RSSI Adjust [NXDN Very Narrow]	FPU Test mode 1) Adjust Item: [High RSSI (NXDN Very Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'] [Center], [High'], [High] Output: -70dBm (70.7μV) MOD: OFF	SSG	Rear	RX ANT		PC ADJ		Press [Apply] button to store the adjustment value.
26. Receiver Sensitivity Check [Analog Wide 5k]	1) Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501μV) MOD = 1.0kHz DEV: ±3.0kHz AF: 0.45V/4Ω	SSG Audio analyzer	Rear	RX ANT			Check	-115dBm (0.4μV) or Less
[Analog Narrow]	2) SSG setting DEV: ±1.5kHz	Oscilloscope		TEST/ SPKR Jack pin 12 4Ω load				

### Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. High Transmit Power Limit Adjust	FPU Test mode 1) Adjust Item: [High Transmit Power Limit] Frequency: [Low], [Low'], [Center], [High'], [High] Press [Transmit] button.	Power meter	Rear	TX ANT		PC ADJ	53W±1.5W	Press [Apply] button to store the adjustment value.
2. High Transmit Power Adjust	FPU Test mode 1) Adjust Item: [High Transmit Power] Frequency: [Low], [Low'], [Center], [High'], [High] Press [Transmit] button.						50W±0.5W	
3. Low Transmit Power Limit Adjust	FPU Test mode 1) Adjust Item: [Low Transmit Power Limit] Frequency: [Low], [Low'], [Center], [High'], [High] Press [Transmit] button.						28W±1.5W	
4. Low Transmit Power Adjust	FPU Test mode 1) Adjust Item: [High Transmit Power] Frequency: [Low], [Low'], [Center], [High'], [High] Press [Transmit] button.						5W±0.5W	

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Maximum Deviation Adjust [NXDN Narrow]	FPU Test mode 1) Adjust Item: [Maximum Deviation (NXDN Narrow)]					PC ADJ	Write the value as followings (typical value) [Maximum Deviation (NXDN Narrow)] = 530	Press [Apply] button to store the adjustment value.
6. Maximum Deviation Adjust [NXDN Very Narrow]	FPU Test mode 1) Adjust Item: [Maximum Deviation (NXDN Very Narrow)]						Write the value as followings (typical value) [Maximum Deviation (NXDN Very Narrow)] = 530	
7. Maximum Deviation Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [Maximum Deviation (Analog Wide 5k)]						Write the value as followings (typical value) [Maximum Deviation (Analog Wide 5k)] = 530	
8. Maximum Deviation Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [Maximum Deviation (Analog Wide 4k)]						Write the value as followings (typical value) [Maximum Deviation (Analog Wide 4k)] = 530	
9. Maximum Deviation Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [Maximum Deviation (Analog Narrow)]						Write the value as followings (typical value) [Maximum Deviation (Analog Narrow)] = 530	
10. Balance Adjust [20Hz Adjustment]	FPU Test mode 1) Adjust Item: [Balance] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz HPF: OFF De-emphasis: OFF 2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High] Press [Transmit] button. 20Hz is transmitted.	Deviation meter Oscilloscope	Rear	TX ANT		PC ADJ	The Deviation of 20Hz frequency is fixed to 2.05kHz Deviation. Change the 2kHz adjustment value to become the same deviation to 20Hz within the specified range.	2kHz Tone deviation is within $\pm 1.0\%$ of 20Hz tone deviation.  Press [Apply All] button to store the adjustment value after all adjustment point was adjusted.
[2.0kHz Adjustment]	FPU Test mode 1) Adjust Item: [Balance] [2kHz Sine Wave] check box is checked. 2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High] Press [Transmit] button. Check while transmitting change to 2kHz.							



## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
11. Standard Modulation Check [Analog Wide 5k]	1) Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Detector: (p-p)/2 2) Connect the AG to the MIC Terminal of MIC connector. AG Frequency : 1kHz (Sine Wave) AG Output level: Adjust to become the 3kHz Deviation.	Deviation meter Oscilloscope AG DVM	Rear  Front	TX ANT  MIC			Check	5.0mV±1.5mV
[Analog Wide 4k]	1) Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Detector: (p-p)/2 2) Connect the AG to the MIC Terminal of MIC connector. AG Frequency : 1kHz (Sine Wave) AG Output level: Adjust to become the 2.4kHz Deviation.							
[Analog Narrow]	1) Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Detector: (p-p)/2 2) Connect the AG to the MIC Terminal of MIC connector. AG Frequency : 1kHz (Sine Wave) AG Output level: Adjust to become the 1.5kHz Deviation.							
12. TD Deviation Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [TD Deviation (Analog Wide 5k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz, HPF: OFF De-emphasis: OFF 2) Connect the AG to the TD Terminal of Control I/O Jack. AG Frequency : 100Hz (Sine Wave) AG Output level : 0.5Vpp (177mVrms) Press [Transmit] button.	Deviation meter Oscilloscope AG AF VTVM	Rear	TX ANT  Control I/O Jack TD (Pin No.8)		PC ADJ	0.75kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
13. TD Deviation Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [TD Deviation (Analog Wide 4k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz, HPF: OFF De-emphasis: OFF 2) Connect the AG to the TD Terminal of Control I/O Jack. AG Frequency : 100Hz (Sine Wave) AG Output level : 0.5Vpp (177mVrms) Press [Transmit] button.	Deviation meter Oscilloscope AG AF VTVM	Rear	TX ANT  Control I/O Jack TD (Pin No.8)		PC ADJ	0.75kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.
14. TD Deviation Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [TD Deviation (Analog Narrow)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz, HPF: OFF De-emphasis: OFF 2) Connect the AG to the TD Terminal of Control I/O Jack. AG Frequency : 100Hz (Sine Wave) AG Output level : 0.5Vpp (177mVrms) Press [Transmit] button.							
15. Transmit Audio Input (TA) Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [Transmit Audio Input (TA) (Analog Wide 5k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz, HPF: OFF De-emphasis: OFF 2) Connect the AG to the TA Terminal of Control I/O Jack. AG Frequency : 1kHz (Sine Wave) AG Output level: 280mVrms Press [Transmit] button.	Deviation meter Oscilloscope AG AF VTVM	Rear	TX ANT  Control I/O Jack TA (Pin No.9)		PC ADJ	3.0kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.
16. Transmit Audio Input (TA) Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [Transmit Audio Input (TA) (Analog Wide 4k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz, HPF: OFF De-emphasis: OFF 2) Connect the AG to the TA Terminal of Control I/O Jack. AG Frequency : 1kHz (Sine Wave) AG Output level: 280mVrms Press [Transmit] button.						2.4kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
17. Transmit Audio Input (TA) Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [Transmit Audio Input (TA) (Analog Narrow)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz, HPF: OFF De-emphasis: OFF 2) Connect the AG to the TA Terminal of Control I/O Jack. AG Frequency : 1kHz (Sine Wave) AG Output level: 280mVrms Press [Transmit] button.	Deviation meter Oscilloscope AG AF VTVM	Rear	TX ANT  Control I/O Jack TA (Pin No.9)		PC ADJ	1.5kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
18. QT Deviation Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [QT Deviation (Analog Wide 5k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz, HPF: OFF De-emphasis: OFF Detector: p-p/2 Press [Transmit] button.	Deviation meter Oscilloscope	Rear	TX ANT		PC ADJ	0.75kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
19. QT Deviation Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [QT Deviation (Analog Wide 4k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz, HPF: OFF De-emphasis: OFF Detector: p-p/2 Press [Transmit] button.						0.60kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
20. QT Deviation Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [QT Deviation (Analog Narrow)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz, HPF: OFF De-emphasis: OFF Detector: p-p/2 Press [Transmit] button.						0.35kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
21. DQT Deviation Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [DQT Deviation (Analog Wide 5k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz, HPF: OFF De-emphasis: OFF Detector: Peak hold Press [Transmit] button.						0.75kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
22. DQT Deviation Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [DQT Deviation (Analog Wide 4k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz, HPF: OFF De-emphasis: OFF Detector: Peak hold Press [Transmit] button.	Deviation meter Oscilloscope	Rear	TX ANT		PC ADJ	0.60kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
23. DQT Deviation Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [DQT Deviation (Analog Narrow)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 3kHz, HPF: OFF De-emphasis: OFF Detector: Peak hold Press [Transmit] button.						0.35kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
24. DTMF Deviation Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [DTMF Deviation (Analog Wide 5k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz, HPF: OFF De-emphasis: OFF Press [Transmit] button.	Deviation meter Oscilloscope	Rear	TX ANT		PC ADJ	3.0kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.
25. DTMF Deviation Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [DTMF Deviation (Analog Wide 4k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz, HPF: OFF De-emphasis: OFF Press [Transmit] button.						2.4kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.
26. DTMF Deviation Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [DTMF Deviation (Analog Narrow)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz, HPF: OFF De-emphasis: OFF Press [Transmit] button.						1.5kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
27. Test Tone Deviation Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [Test Tone Deviation (Analog Wide 5k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Press [Transmit] button.						3.0kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
28. Test Tone Deviation Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [Test Tone Deviation (Analog Wide 4k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Press [Transmit] button.	Deviation meter Oscilloscope	Rear	TX ANT		PC ADJ	2.4kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.
29. Test Tone Deviation Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [Test Tone Deviation (Analog Narrow)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Press [Transmit] button.						1.5kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
30. CW ID Deviation Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [CW ID Deviation (Analog Wide 5k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Press [Transmit] button.						2.0kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.
31. CW ID Deviation Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [CW ID Deviation (Analog Wide 4k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Press [Transmit] button.						1.6kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.
32. CW ID Deviation Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [CW ID Deviation (Analog Narrow)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Press [Transmit] button.						1.0kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
33. Courtesy Tone Deviation Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [Courtesy Tone Deviation (Analog Wide 5k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Press [Transmit] button.	Deviation meter Oscilloscope	Rear	TX ANT		PC ADJ	1.0kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
34. Courtesy Tone Deviation Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [Courtesy Tone Deviation (Analog Wide 4k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Press [Transmit] button.						0.8kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
35. Courtesy Tone Deviation Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [Courtesy Tone Deviation (Analog Narrow)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF Press [Transmit] button.						0.5kHz Deviation	±0.05kHz  Press [Apply] button to store the adjustment value.
36. Repeat Gain Adjust [Analog Wide 5k]	FPU Test mode 1) Adjust Item: [Repeat Gain (Analog Wide 5k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF 2) Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501μV) MOD: 1.0kHz DEV: ±1.0kHz	Deviation meter Oscilloscope  SSG	Rear	TX ANT  RX ANT		PC ADJ	1.0kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.

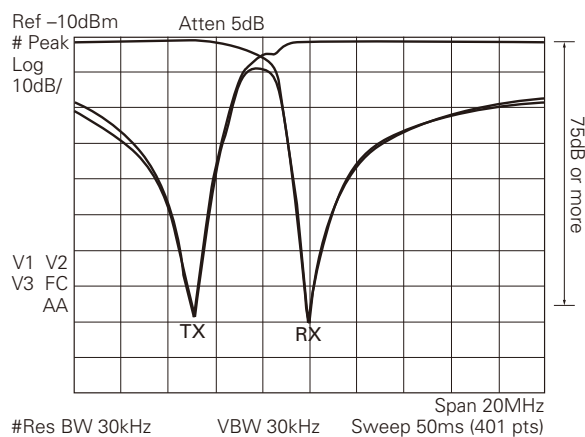
## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
37. Repeat Gain Adjust [Analog Wide 4k]	FPU Test mode 1) Adjust Item: [Repeat Gain (Analog Wide 4k)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF 2) Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501μV) MOD: 1.0kHz DEV: ±1.0kHz	Deviation meter Oscilloscope SSG	Rear	TX ANT  RX ANT		PC ADJ	1.0kHz Deviation	±0.1kHz  Press [Apply] button to store the adjustment value.
38. Repeat Gain Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [Repeat Gain (Analog Narrow)] Connect the Deviation Meter to the TX ANT end via the ATT. Deviation Meter setting LPF: 15kHz HPF: OFF De-emphasis: OFF 2) Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501μV) MOD: 1.0kHz DEV: ±1.0kHz							

### Confirmation and Alignment of Set-up to Prevent Receiver Desensitization

#### 1. Confirmation of Duplexer alignment

The duplexer allows the Repeater to simultaneously transmit and receive. To accomplish this, in the programmed receive frequency, the transmit frequency must be notched or suppressed by 75dB or more. Additionally, on the programmed transmit frequency, the receive frequency must be notched or suppressed by 75dB or more. The following figures are examples of Duplexer alignment using a spectrum analyzer.

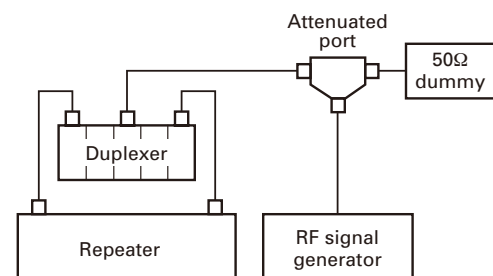


#### 2. Confirmation of Repeater Desensitization

The following figure is a Test set-up for Repeater Desensitization.

After this Test set-up is completed, confirm the Repeater Desensitization as mentioned below.

- 1) Disable the repeater mode.
- 2) Adjust the level of the RF generator until 12dB SINAD is reached.
- 3) Increase the output of the RF generator by 1dB. (This increases the SINAD.)
- 4) Enable the repeater mode.
- 5) Read the SINAD level. It should not drop below 12dB SINAD. If the SINAD is less than 12dB SINAD, check the tightness of the connectors and the tuning of duplexer.



## TERMINAL FUNCTION

### Final Unit (X45-3922-71) (A/3)

Pin No.	Name	I/O	Function
<b>CN1 (To X57-794 CN610)</b>			
1	TX IN	I	TX driver input signal (Coaxial)
<b>CN201 (To X45-392 B/3 +B)</b>			
1	+B	I	Power supply input
<b>CN202 (To X45-392 B/3 GND)</b>			
1	GND	-	Ground
<b>CN203 (To X57-794 CN701)</b>			
1	GND	-	Ground
2	+B	O	Power supply output
3	+B	O	Power supply output
<b>CN204 (To X57-794 CN801)</b>			
1	GND	-	Ground
2	8TC	I	8V power supply control
3	RAMP	I	RF power control voltage
4	ASWC	I	ANT switch control
5	FAN	I	FAN control
6	FDT	O	Coupler input voltage
7	TMP2	O	Temperature of X45 Final unit
8	TMP1	O	Temperature of X45 Final unit
9	PLIM	I	Power limit control
10	H/L	I	Power control
11	HWV2	O	Hardware version detect
<b>CN205 (To FAN)</b>			
1	FAB	O	FAN power supply
2	FAG	-	FAN ground

### Final Unit (X45-3922-71) (B/3)

Pin No.	Name	I/O	Function
<b>+B (To X45-392 A/3 CN201)</b>			
1	+B	O	Power supply output
<b>GND (To X45-392 A/3 CN202)</b>			
1	GND	-	Ground
<b>+B1 (To DC 13.2V)</b>			
1	+B	I	Power supply input
<b>GND (To DC 13.2V)</b>			
1	GND	-	Ground

### Final Unit (X45-3922-71) (C/3)

Pin No.	Name	I/O	Function
<b>N_SYNC1, 2 (To X53-449 CN5)</b>			
1	N_SYNC1_B	I/O	RS-485 differential signal 1-B
2	N_SYNC1_A	I/O	RS-485 differential signal 1-A
3	N_SYNC2_B	I/O	RS-485 differential signal 2-B
4	N_SYNC2_A	I/O	RS-485 differential signal 2-A
5	N_SYNC1_B	I/O	RS-485 differential signal 1-B
6	N_SYNC1_A	I/O	RS-485 differential signal 1-A
7	N_SYNC2_B	I/O	RS-485 differential signal 2-B
8	N_SYNC2_A	I/O	RS-485 differential signal 2-A
<b>J401, 402 (N_SYNC1, 2 jack)</b>			
1	N_SYNC2_A	I/O	RS-485 differential signal 2-A
2	N_SYNC2_B	I/O	RS-485 differential signal 2-B
3	N_SYNC1_A	I/O	RS-485 differential signal 1-A
4	N_SYNC1_B	I/O	RS-485 differential signal 1-B

### Control Unit (X53-4490-10)

Pin No.	Name	I/O	Function
<b>CN5 (To X45-392 C/3)</b>			
1	N_SYNC1_B	I/O	RS-485 differential signal 1-B
2	N_SYNC1_A	I/O	RS-485 differential signal 1-A
3	N_SYNC2_B	I/O	RS-485 differential signal 2-B
4	N_SYNC2_A	I/O	RS-485 differential signal 2-A
5	N_SYNC1_B	I/O	RS-485 differential signal 1-B
6	N_SYNC1_A	I/O	RS-485 differential signal 1-A
7	N_SYNC2_B	I/O	RS-485 differential signal 2-B
8	N_SYNC2_A	I/O	RS-485 differential signal 2-A
<b>CN38 (To X57-794 CN800)</b>			
1	TMP1	I	Temperature of X45 Final unit
2	TMP2	I	Temperature of X45 Final unit
3	RAMP	O	RF power control voltage
4	FWD	I	RF power monitor voltage
5	TXASSIST	O	TX PLL assist voltage
6	RXASSIST	O	RX PLL assist voltage
7	TX_CV	I	TX VCO lock voltage
8	RX_CV	I	RX VCO lock voltage
9	GND	-	Ground
10	GND	-	Ground
11	TXVCOB	O	TX VCO B control signal
12	RXVCOA/B	O	RX VCO control signal to A or B
13	TXVCOA	O	TX VCO A control signal



## TERMINAL FUNCTION

Pin No.	Name	I/O	Function
14	/RXPCS_TR	O	RX PLL chip select signal
15	LDT	I	TX PLL lock detect signal
16	/16_8PCS	O	Reference clock PLL chip select signal
17	LDR	I	RX PLL lock detect signal
18	/TXPCS	O	TX PLL chip select signal
19	SPSCLK0	O	Serial clock
20	SPSD0	O	Serial data
21	SBC	O	Switched +B control signal
22	GND	-	Ground
23	MOD	O	Audio signal for TX modulation
24	GND	-	Ground
25	RSSI	I	RSSI voltage
26	AGC	O	Auto gain control voltage
27	33A	O	3.3V voltage
28	/EWP	O	EEPROM write control signal
29	HVV1	I	Hardware version signal
30	I2CCK	O	Serial clock
31	SPSCLK1	O	Serial clock
32	I2CDA	I/O	Serial data
33	SPSD1	O	Serial data
34	/IOCS	I	IO expander chip select signal
35	/EVCS	O	DA converter chip select signal
36	NC	-	No connection
<b>CN39</b>			
IN	IF_SIG	I	450kHz IF signal
OUT	GND	-	Ground
<b>CN40 (To X54-373 CN502)</b>			
1	SB	O	Power supply input
2	SB	O	Power supply input
3	GND	-	Ground
4	NC	-	No connection
5	DAT	O	Serial data
6	PSW	I	Power switch signal
7	STB1	O	Data latch signal
8	CLK	O	Serial clock
9	SOE	O	Output enable signal
10	TXD1	I/O	MIC PTT, UART TX data
11	K1	I	Key scan input
12	RXD1	I	Hook detect signal, UART TX data
13	K2	I	Key scan input
14	K3	I	Key scan input

Pin No.	Name	I/O	Function
15	K4	O	Key scan output
16	K5	O	Key scan output
17	VLI	I	Speaker audio level control voltage
18	5C	O	5V voltage
19	MIG	-	MIC ground
20	MIC	I	MIC signal
<b>CN41 (To TEST/SPKR 15pin Connector)</b>			
1	SB	O	Power supply output
2	SB	O	Power supply input
3	GND	-	Ground
4	GND	-	Ground
<b>CN42 (To TEST/SPKR 15pin Connector)</b>			
1	AO5	O	Auxiliary output 5
2	AO4	O	Auxiliary output 4
3	AO3	O	Auxiliary output 3
4	SPO	O	Speaker AF output
5	SPO	O	Speaker AF output
6	AO2	O	Auxiliary output 2
7	AO1	O	Auxiliary output 1
8	SPI	I	Internal speaker AF input
9	RSI	O	RSSI voltage
10	RD	O	RX data output
11	SPG	-	Speaker ground
12	SPG	-	Speaker ground
<b>CN43 (To INT SPKR )</b>			
1	SPO	O	Internal speaker AF output
2	SPG	-	Speaker ground
<b>CN44 (To Control I/O 25pin D-sub Connector)</b>			
1	NC	-	No connection
2	NC	-	No connection
3	SPM_D25	I	Speaker mute signal input
4	IO6_D25	I/O	Programmable function input/output 6
5	RXG	-	RX signal ground for RA,RD
6	IO5_D25	I/O	Programmable function input/output 5
7	RA_D25	O	RX-Audio output (voice)
8	IO4_D25	I/O	Programmable function input/output 4
9	RD_D25	O	RX-DATA output (data or signaling)
10	IO3_D25	I/O	Programmable function input/output 3
11	TA_D25	I	TX audio input (voice)
12	IO2_D25	I/O	Programmable function input/output 2
13	TD_D25	I	TX-DATA input (data or signaling)

## TERMINAL FUNCTION

Pin No.	Name	I/O	Function
14	IO1_D25	I/O	Programmable function input/output 1
15	DG	-	Control line ground
16	TXG	-	TX signal ground for TA,TD
17	AI3_D25	I	Programmable function input 3
18	BER_DATA_D25	O	Bit error rate data
19	AI2_D25	I	Programmable function input 2
20	SC_D25	O	Squelch control output
21	AI1_D25	I	Programmable function input 1
22	/EPTT_D25	I	External PTT
23	TXD0_D25	O	UART TX data
24	EXT_MON_D25	I	External monitor signal
25	RXD0_D25	I	UART RX data
26	BER_CLK_D25	O	Bit error rate clock
27	NC (RSSI)		No connection (RSSI)
28	NC	-	No connection
29	NC	-	No connection
30	NC	-	No connection
<b>CN301 (To X57-794 CN700)</b>			
1	GND	-	Ground
2	+B	I	Power supply input
3	SB	I	Power supply input

### Display Unit (X54-3730-20) (A/2)

Pin No.	Name	I/O	Function
<b>CN501 (To X54-373 B/2 CN601)</b>			
1	HK	I	Hook detection input/ RXD input
2	MIC	I	MIC signal input
3	MIG	-	MIC ground
4	PTT	I/O	PTT input/ TDX output
5	GND	-	Ground
6	NC	-	No connection
7	SB	O	Power supply output after power switch
8	NC	-	No connection
9	GND	-	Ground
10	5M	O	Common 5V output
11	VLI	I	Volume control input for AF signal
<b>CN502 (To X53-449 CN40)</b>			
1	MIG	-	MIC ground
2	MIC	O	MIC signal output
3	VLI	O	Volume control output for AF signal
4	5C	I	Common 5V output

Pin No.	Name	I/O	Function
5	K4	I	KEY input 4
6	K5	I	KEY input 5
7	K2	O	KEY input 2
8	K3	O	KEY input 3
9	K1	O	KEY input 1
10	HK/RXD	O	Hook detection output/ RXD input
11	SOE	I	Output enable for shift register
12	PTT/TXD	I/O	PTT output/ TDX input
13	STB1	I	Strobe data for shift register
14	CLK	I	Clock data input
15	DAT	I	Serial data input
16	PSW	O	Power switch output
17	GND	-	Ground
18	NC	-	No connection
19	SB	I	Power supply output after power switch
20	SB	I	Power supply output after power switch

### Display Unit (X54-3730-20) (B/2)

Pin No.	Name	I/O	Function
<b>CN601 (To X54-373 A/2 CN501)</b>			
1	VLI	O	Volume control output for AF signal
2	5M	I	Common 5V input
3	GND	-	Ground
4	NC	-	No connection
5	SB	I	Power supply output after power switch
6	NC	-	No connection
7	GND	-	Ground
8	PTT	I/O	PTT output/ TDX input
9	MIG	-	MIC ground
10	MIC	O	MIC signal output
11	HK	O	Hook detection output/ RXD output
<b>J601 (MIC jack)</b>			
1	NC	-	No connection
2	SB	O	Power supply output after power switch
3	GND	-	Ground
4	PTT/TXD	I/O	PTT input/ TDX output
5	MIG	-	MIC ground
6	MIC	I	MIC signal input
7	HOOK/RXD	I	Hook detection input/ RXD input
8	NC	-	No connection

## TERMINAL FUNCTION

### TX-RX Unit (X57-7942-71)

Pin No.	Name	I/O	Function
<b>CN101 (To RX ANT)</b>			
1	RX_SIGNAL	I	Receive signal input (Coaxial)
<b>CN202 (To X58-507 CN350)</b>			
1	GND	-	Ground
2	NC	-	No connection
3	80C_2	O	8V power supply
4	RXVCOA/B	O	VCO select
5	RX_CV	I	Control voltage input
6	NC	-	No connection
7	RXASSIST	O	Assist voltage output
<b>CN203 (To X58-507 CN351)</b>			
1	VO	I	VCO input
2	GND	-	Ground
<b>CN204 (To X58-507 CN303)</b>			
1	FIN	O	VCO output
2	SPSCLK0	O	PLL clock output
3	/RXPCS_TR	O	PLL chip select output
4	SPSD0	O	PLL data output
5	33C	O	3.3V power supply
6	50C	O	5V power supply
7	LDR	I	PLL lock detect input
8	REF	O	19.2MHz reference clock output
<b>CN500 (To Ext IN)</b>			
1	REF IN	I	External reference input (Coaxial)
<b>CN605 (To X58-508 CN350)</b>			
1	GND	-	Ground
2	TXVCOB	O	VCOB select
3	80C_1	O	8V power supply
4	TXVCOA	O	VCOA select
5	TX_CV	I	Control voltage input
6	MO	O	Modulation output
7	TXASSIST	O	Assist voltage output
<b>CN608 (To X58-508 CN351)</b>			
1	VO	I	VCO input
2	GND	-	Ground
<b>CN609 (To X58-508 CN303)</b>			
1	FIN	O	VCO output
2	SPSCLK0	O	PLL clock output
3	/TXPCS	O	PLL chip select output
4	SPSD0	O	PLL data output

Pin No.	Name	I/O	Function
5	33C	O	3.3V power supply
6	50C	O	5V power supply
7	LDT	I	PLL lock detect input
8	REF	O	16.8MHz reference clock output
<b>CN610 (To X45-392 A/3 CN1)</b>			
1	TX OUT	O	TX driver output signal (Coaxial)
<b>CN700 (To X53-449 CN301)</b>			
1	GND	-	Ground
2	+B	O	Power supply output
3	SB	O	Power supply output
<b>CN701 (To X45-392 A/3 CN203)</b>			
1	GND	-	Ground
2	+B	I	Power supply input
3	+B	I	Power supply input
<b>CN800 (To X53-449 CN38)</b>			
1	NC	-	No connection
2	/EVCS	I	DA converter chip select signal
3	/IOCS	O	IO expander chip select signal
4	SPSD1	I	Serial data
5	I2CDA	I/O	Serial data
6	SPSCLK1	I	Serial clock
7	I2CCK	I	Serial clock
8	HWW1	O	Hardware version signal
9	/EWP	I	EEPROM write control signal
10	33A	I	3.3V voltage
11	AGC	I	Auto gain control voltage
12	RSSI	O	RSSI voltage
13	GND	-	Ground
14	MOD	I	Audio signal for TX modulation
15	GND	-	Ground
16	SBC	I	Switched +B control signal
17	SPSD0	I	Serial data
18	SPSCLK0	I	Serial clock
19	/TXPCS	I	TX PLL chip select signal
20	LDR	O	RX PLL lock detect signal
21	/16_8PCS	I	Reference clock PLL chip select signal
22	LDT	O	TX PLL lock detect signal
23	/RXPCS_TR	I	RX PLL chip select signal
24	TXVCOA	I	TX VCO A control signal
25	RXVCOA/B	I	RX VCO control signal to A or B
26	TXVCOB	I	TX VCO B control signal

## TERMINAL FUNCTION

Pin No.	Name	I/O	Function
27	GND	-	Ground
28	GND	-	Ground
29	RX_CV	O	RX VCO lock voltage
30	TX_CV	O	TX VCO lock voltage
31	RXASSIST	I	RX PLL assist voltage
32	TXASSIST	I	TX PLL assist voltage
33	FWD	O	RF power monitor voltage
34	RAMP	I	RF power control voltage
35	TMP2	O	Temperature of X45 Final unit
36	TMP1	O	Temperature of X45 Final unit
<b>CN801 (To X45-392 A/3 CN204)</b>			
1	HVV2	I	Hardware version detect
2	H/L	O	Power control
3	PLIM	O	Power limit control
4	TMP1	I	Temperature of X45 Final unit
5	TMP2	I	Temperature of X45 Final unit
6	FDT	I	Coupler input voltage
7	FAN	O	FAN control
8	ASWC	O	ANT switch control
9	RAMP	O	RF power control voltage
10	8TC	O	8V power supply control
11	GND	-	Ground
<b>CN802 (To X53-449 CN39)</b>			
1	IF_SIG	O	450kHz IF signal (Coaxial)

### RX VCO/PLL Unit (X58-5070-10)

Pin No.	Name	I/O	Function
<b>CN303 (To X57-794 CN204)</b>			
1	FIN	I	VCO input
2	SPSCLK0	I	PLL clock input
3	/RXPCS_TR	I	PLL chip select input
4	SPSD0	I	PLL data input
5	33C	I	3.3V power supply
6	50C	I	5V power supply
7	LDR	O	PLL Lock detect output
8	REF	I	19.2MHz reference clock input

Pin No.	Name	I/O	Function
<b>CN350 (To X57-794 CN202)</b>			
1	GND	-	Ground
2	NC	-	No connection
3	80C_2	I	8V power supply
4	RXVCOA/B	I	VCO select
5	RX_CV	O	Control voltage output
6	NC	-	No connection
7	RXASSIST	I	Assist voltage input
<b>CN351 (To X57-794 CN203)</b>			
1	VO	O	VCO output
2	GND	-	Ground

### TX VCO/PLL Unit (X58-5080-10)

Pin No.	Name	I/O	Function
<b>CN303 (To X57-794 CN609)</b>			
1	FIN	I	VCO input
2	SPSCLK0	I	PLL clock input
3	/TXPCS	I	PLL chip select input
4	SPSD0	I	PLL data input
5	33C	I	3.3V power supply
6	50C	I	5V power supply
7	LDT	O	PLL lock detect output
8	REF	I	16.8MHz reference clock input
<b>CN350 (To X57-794 CN605)</b>			
1	GND	-	Ground
2	TXVCOB	I	VCOB select
3	80C_1	I	8V power supply
4	TXVCOA	I	VCOA select
5	TX_CV	O	Control voltage output
6	MO	I	Modulation input
7	TXASSIST	I	Assist voltage input
<b>CN351 (To X57-794 CN608)</b>			
1	VO	O	VCO output
2	GND	-	Ground

## TERMINAL FUNCTION

### CONTROL I/O 25 pin D-sub Connector

Pin No	Pin Name	I/O	Signal Type	Signal Summary	Specification	Min	Typ	Max	Unit	Remarks
1	NC (RSSI)	-	-	-	-	-	-	-	-	
2	RXD 2	I	Digital	Serial Data input 2 RS-232C level	-	-15	-	+15	V	
3	TXD 2	O	Digital	Serial Data output 2 RS-232C level	-	±3.5	±4.2		V	
4	AI1	I	Digital	Programmable Function Input 1 /CMOS	VIH	0.8Vcc		Vcc	V	Vcc=5V±2%
					VIL	0		0.2Vcc	V	
					Input impedance		47k		Ohm	47k ohm PU to Vcc
5	AI2	I	Digital	Programmable Function Input 2 /CMOS	VIH	0.8Vcc		Vcc	V	Vcc=5V±2%
					VIL	0		0.2Vcc	V	
					Input impedance		47k		Ohm	47k ohm PU to Vcc
6	AI3	I	Digital	Programmable Function Input 3 /CMOS	VIH	0.8Vcc		Vcc	V	Vcc=5V±2%
					VIL	0		0.2Vcc	V	
					Input impedance		47k		Ohm	47k ohm PU to Vcc
7	DG	-	GND	Digital GND	-	-	-	-	-	
8	TD	I	Analog	TX Data Input (signaling)	INPUT: 0.1kHz/0.5Vp-p	0.7	0.75	0.8	kHzDEV	NFM/WFM
					Input Impedance		600		Ohm	600 ohm PDis applied to GND.
9	TA	I	Analog	TX Audio Input (voice)	1kHz/60% Dev	270	280	290	mV	
					Input impedance		600		Ohm	600 ohm PDis applied to GND.
10	RD	O	Analog	RX Data Output (signaling) Not squelched	INPUT: 60% Dev.	75	80	85	mV	
11	RA	O	Analog	RX Audio Output (voice) Squelched	INPUT: 60% Dev.	380	400	420	mV	
12	RXG	-	GND	RX Signal GND	-	-	-	-	-	
13	SPM	I	Digital	Speaker Mute /CMOS	VIH	0.7Vcc	-	5.5	V	Vcc=3.3V±2%
					VIL	-	-	0.3Vcc	V	
					Input impedance		47k		Ohm	
14	BER_CLK	O	Digital	for Bit Error Rate Clock	VOH (IO=-20µA)	4.4	4.5		V	47k ohm PU to Vcc
					VOL (IO=20µA)		0	0.1	V	
15	EMON	I	Digital	External Monitor Switch	VIH	0.8Vcc		Vcc	V	Vcc=5V±2%
					VIL	0		0.2Vcc	V	
					Input impedance		47k		Ohm	
16	EPTT	I	Digital	External PTT Switch	VIH	2.0			V	Vcc=5V ±2%
					VIL			0.8	V	
					Input impedance		47k		Ohm	
17	SC	O	Digital	Squelch Control	VOH (Vcc=5V, IO=-3mA)	Vcc-0.7			V	47k ohm PU to Vcc
					VOL (Vcc=5V, IO=8mA)			0.6	V	
18	BER_DAT	O	Digital	for Bit Error Rate Data	VOH (IO=-20µA)	4.4	4.5		V	47k ohm PU to Vcc
					VOL (IO=20µA)		0	0.1	V	

## TERMINAL FUNCTION

Pin No	Pin Name	I/O	Signal Type	Signal Summary	Specification	Min	Typ	Max	Unit	Remarks
19	TXG	-	GND	TX Signal GND	-	-	-	-	-	
20	IO1	I	Digital	Programmable Function I/O 1	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
		O			Input impedance		47k		Ohm	47k ohm PU to V <sub>cc</sub>
					VOH (V <sub>cc</sub> =5V, IO=-3mA)	V <sub>cc</sub> -0.7			V	
					VOL (V <sub>cc</sub> =5V, IO=8mA)			0.6	V	
21	IO2	I	Digital	Programmable Function I/O 2	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
		O			Input impedance		47k		Ohm	47k ohm PU to V <sub>cc</sub>
					VOH (V <sub>cc</sub> =5V, IO=-3mA)	V <sub>cc</sub> -0.7			V	
					VOL (V <sub>cc</sub> =5V, IO=8mA)			0.6	V	
22	IO3	I	Digital	Programmable Function I/O 3	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
		O			Input impedance		47k		Ohm	47k ohm PU to V <sub>cc</sub>
					VOH (V <sub>cc</sub> =5V, IO=-3mA)	V <sub>cc</sub> -0.7			V	
					VOL (V <sub>cc</sub> =5V, IO=8mA)			0.6	V	
23	IO4	I	Digital	Programmable Function I/O 4	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
		O			Input impedance		47k		Ohm	47k ohm PU to V <sub>cc</sub>
					VOH (V <sub>cc</sub> =5V, IO=-3mA)	V <sub>cc</sub> -0.7			V	
					VOL (V <sub>cc</sub> =5V, IO=8mA)			0.6	V	
24	IO5	I	Digital	Programmable Function I/O 5	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
		O			Input impedance		47kΩ		V	47k ohm PU to V <sub>cc</sub>
					VOH (V <sub>cc</sub> =5V, IO=-3mA)	V <sub>cc</sub> -0.7			V	
					VOL (V <sub>cc</sub> =5V, IO=8mA)			0.6	V	
25	IO6	I	Digital	Programmable Function I/O 6	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
		O			Input impedance		47kΩ		V	47k ohm PU to V <sub>cc</sub>
					VOH (V <sub>cc</sub> =5V, IO=-3mA)	V <sub>cc</sub> -0.7			V	
					VOL (V <sub>cc</sub> =5V, IO=8mA)			0.6	V	

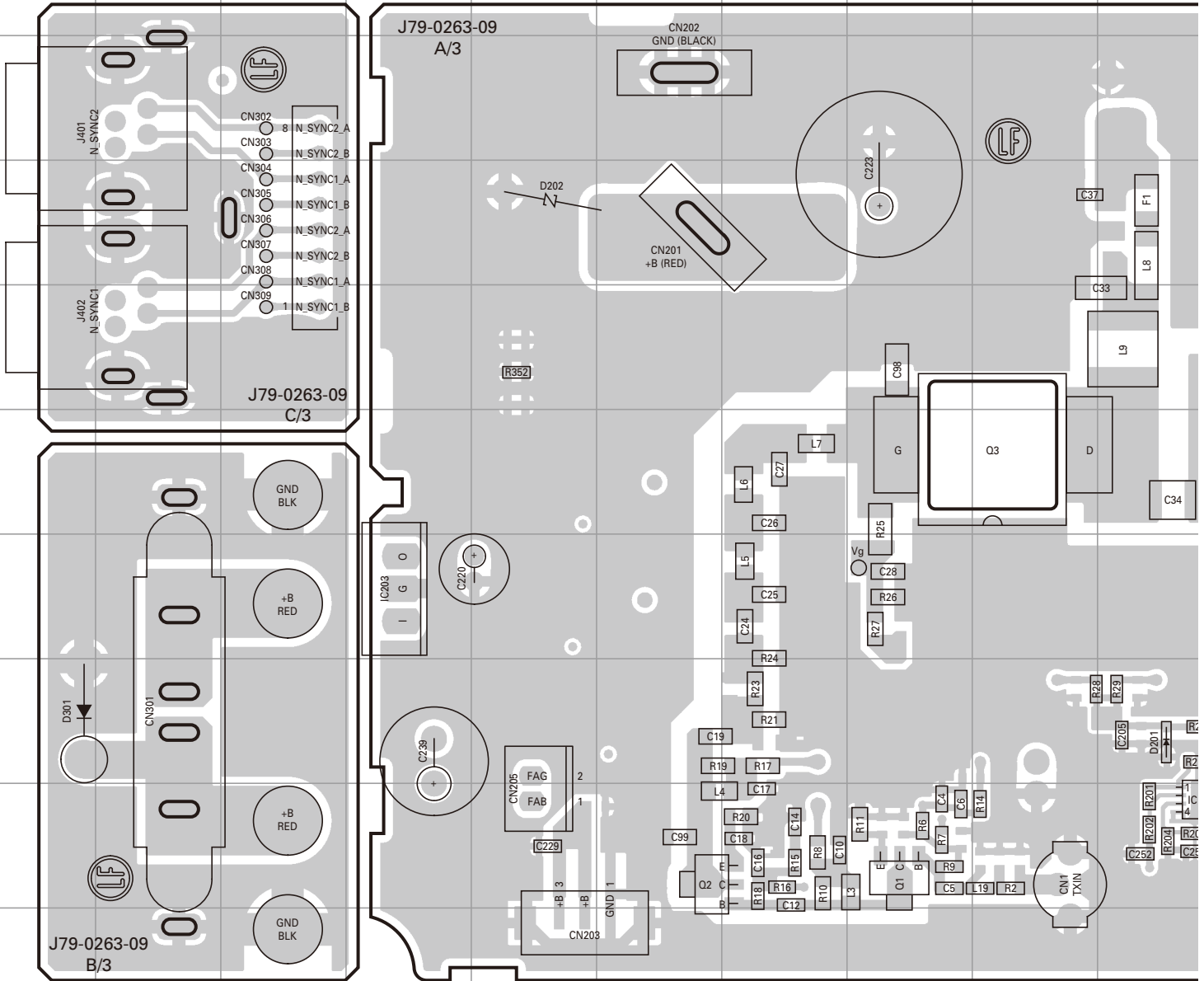
## TERMINAL FUNCTION

### TEST/SPKR 15 pin Connector

Pin No.	Pin Name	I/O	Signal Type	Configuration Change	Signal Summary	Specification	Min	Typ	Max	Unit	Remarks
1	SB	-	-	No	Power Supply	Voltage value	10.8	13.2	15.6	V	
						Supply current			1	A	
2	SB	-	-	No	Power Supply	Voltage value	10.8	13.2	15.6	V	
						Supply current			1	A	
3	NC	-	-	-	-	-					
4	GND	-	GND	No	Digital GND						
5	GND	-	GND	No	Digital GND						
6	SPG	-	GND	No	Speaker GND		-	-			
7	RD	O	Analog	No	RX Data Output (signaling) Not squelched	INPUT: 60% Dev.	75	80	85	mV	
8	RSSI	O	Analog	No	RSSI Output	Amplitude value	0		3.3	V	
						Allowable Load value	10k			Ohm	
9	SPI	I	Analog	No	Internal Speaker Input		-	-	-		
10	AO1	O	Digital	default	Auxiliary Output 1 Open collector	External voltage value			16	V	
						Supply current			200	mA	
				R203	Auxiliary Output 1 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	
11	AO2	O	Digital	default	Auxiliary Output 2 Open collector	External Voltage value			16	V	
						Supply current			200	mA	
				R202	Auxiliary Output 2 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	
12	SPO	O	Analog	No	External Speaker Output	Output level			4	W	
13	AO3	O	Digital	default	Auxiliary Output 3 Open collector	External voltage value			16	V	
						Supply current			200	mA	
				R201	Auxiliary Output 3 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	
14	AO4	O	Digital	default	Auxiliary Output 4 Open collector	External voltage value			16	V	
						Supply current			200	mA	
				R200	Auxiliary Output 4 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	
15	AO5	O	Digital	default	Auxiliary Output 5 Open collector	External voltage value			16	V	
						Supply current			200	mA	
				R198	Auxiliary Output 5 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	

# NXR-710 PC BOARD

## FINAL UNIT (X45-3922-71) Component side view (J79-0263-09)

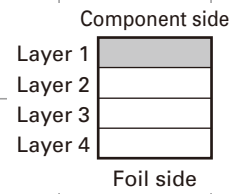
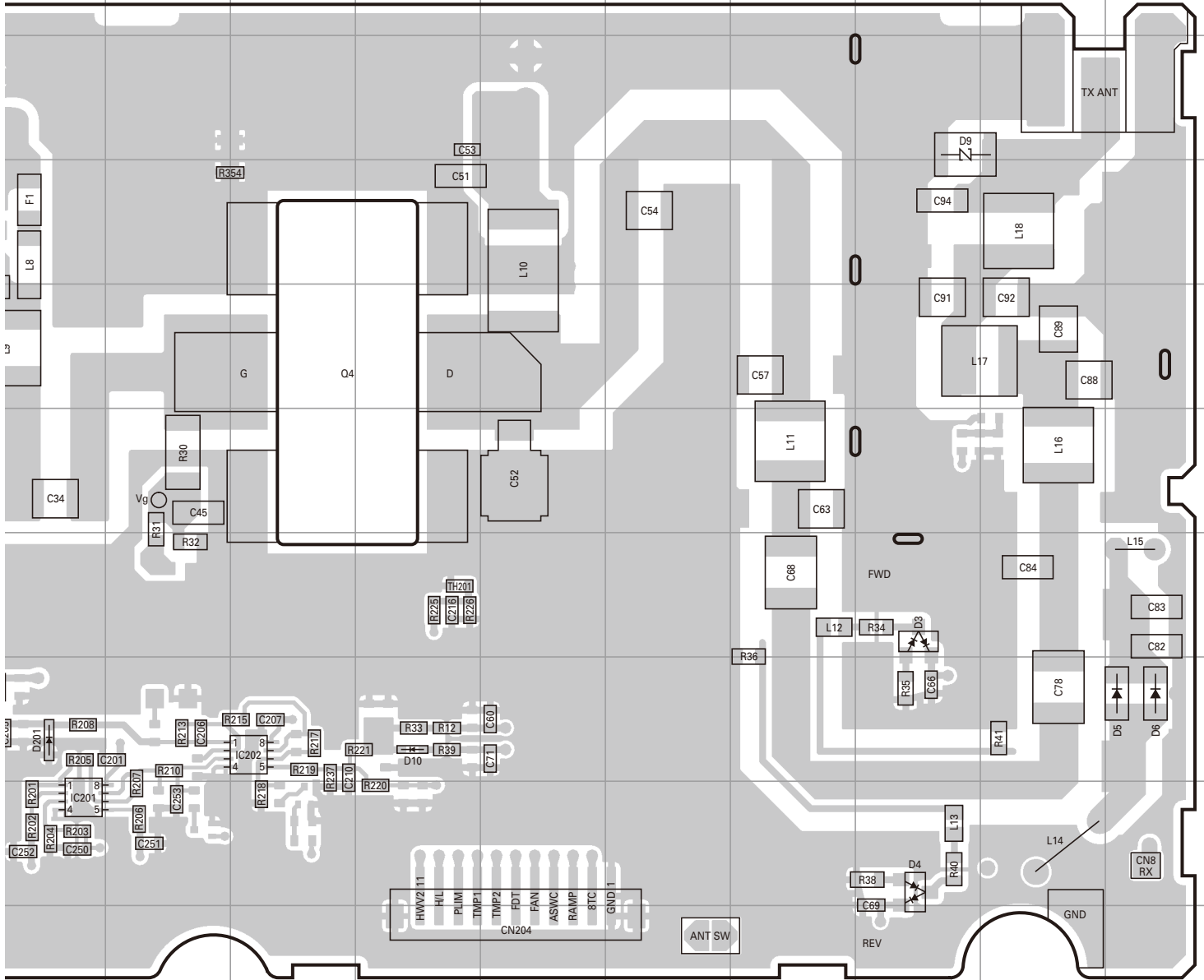


Ref. No.	Address	Ref. No.	Address
IC201	9J	D4	9Q
IC202	8L	D5	8S
IC203	7D	D6	8S
Q1	9H	D9	3Q
Q2	9F	D10	8M
Q3	6I	D201	8J
Q4	5L	D202	4E
D3	7Q	D301	8A



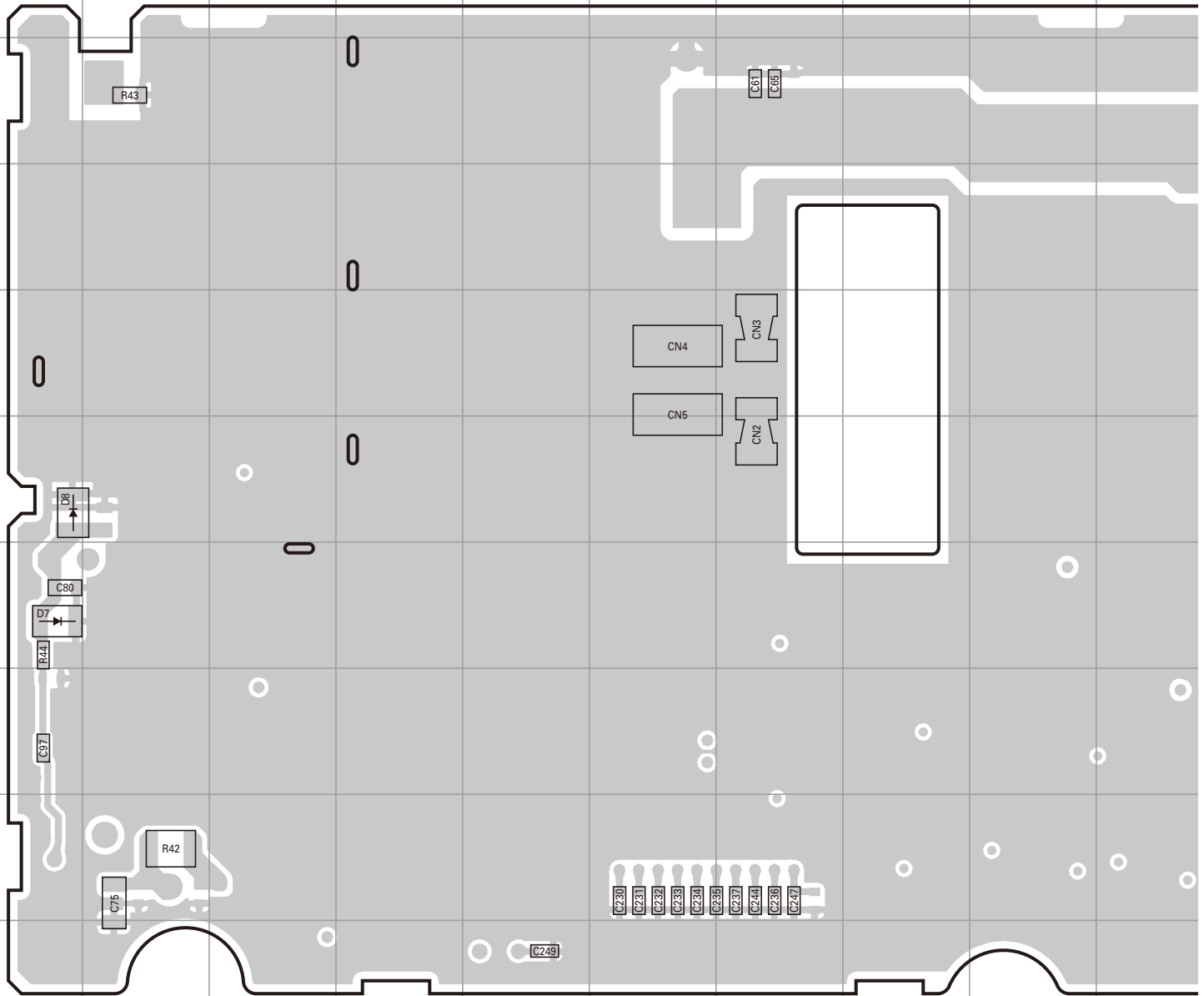
# PC BOARD NXR-710

FINAL UNIT (X45-3922-71)  
Component side view (J79-0263-09)



# NXR-710 PC BOARD

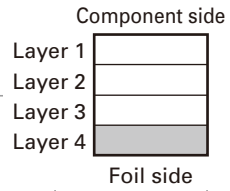
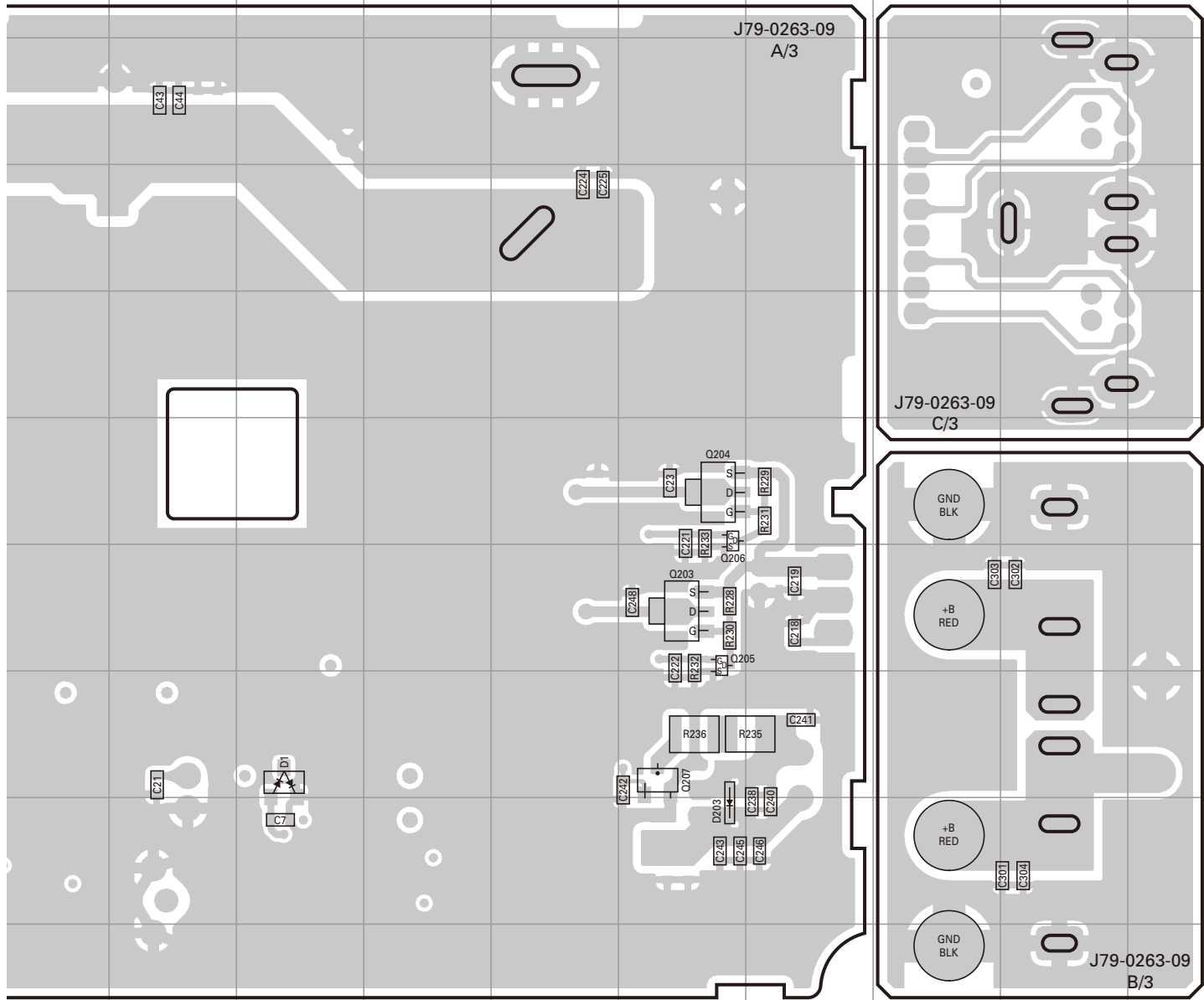
FINAL UNIT (X45-3922-71)  
Foil side view (J79-0263-09)



Ref. No.	Address
Q203	70
Q204	60
Q205	70
Q206	60
Q207	80
D1	8L
D7	7A
D8	6A
D203	90

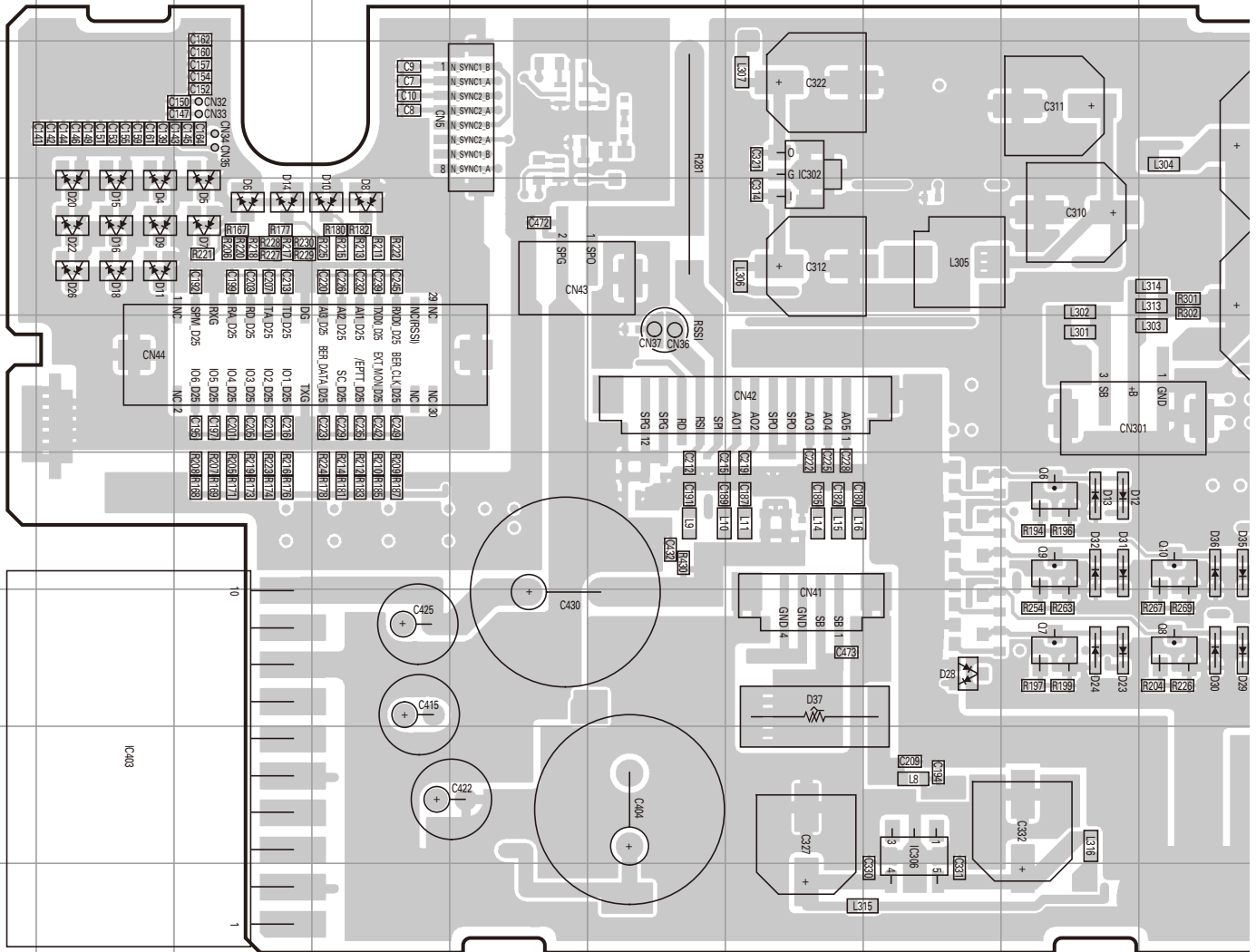
# PC BOARD NXR-710

FINAL UNIT (X45-3922-71)  
Foil side view (J79-0263-09)



# NXR-710 PC BOARD

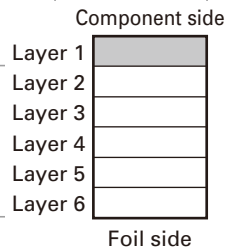
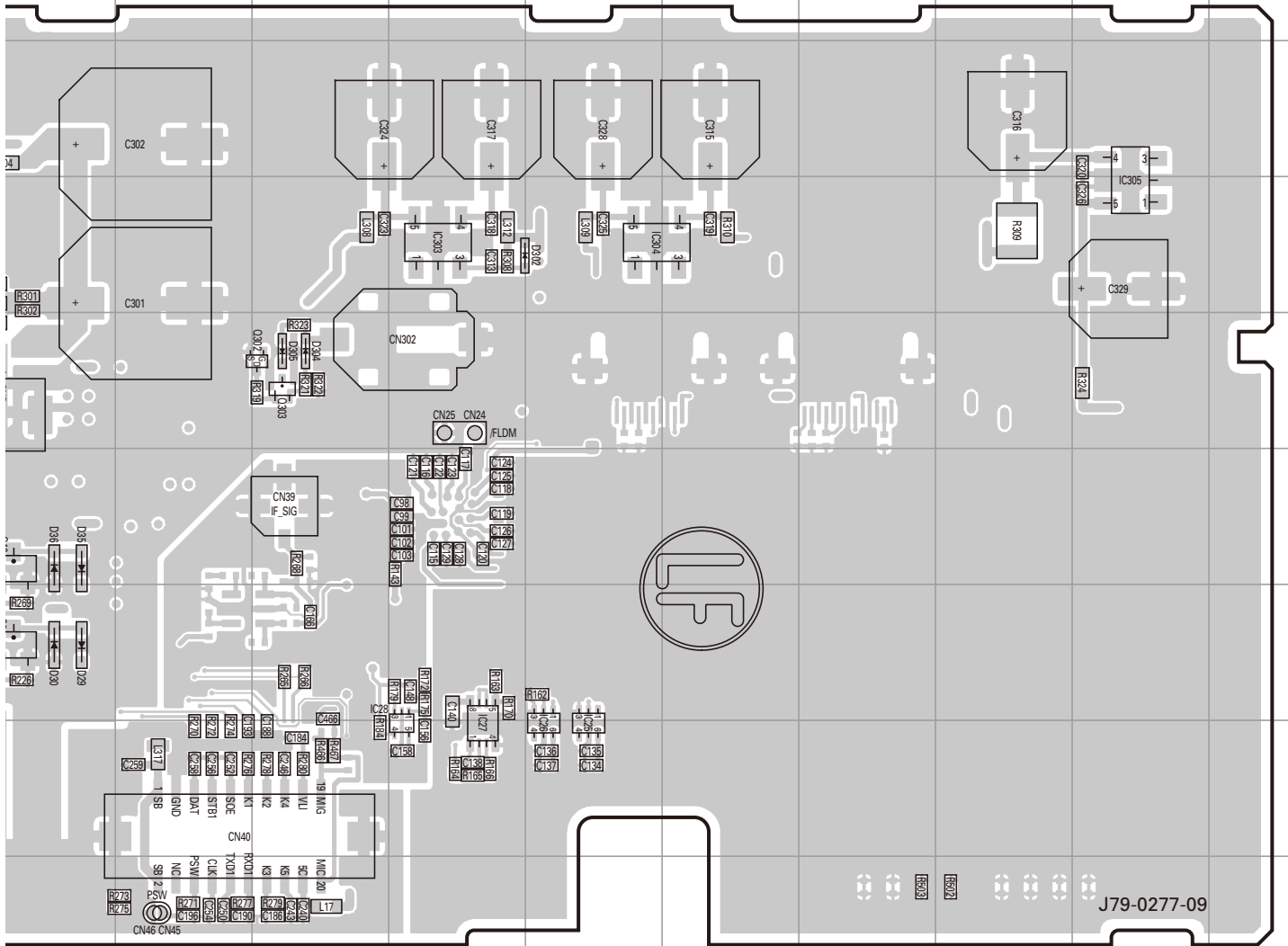
## CONTROL UNIT (X53-4490-10) Component side view (J79-0277-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC25	8N	Q6	6I	D7	4C	D18	4B	D32	6I
IC26	8N	Q7	7I	D8	4D	D20	4B	D35	6J
IC27	8M	Q8	7J	D9	4B	D22	4B	D36	6J
IC28	8M	Q9	6I	D10	4D	D23	7I	D37	7G
IC302	3G	Q10	6J	D11	4B	D24	7I	D302	4N
IC303	4M	Q302	5L	D12	6I	D26	4B	D304	5L
IC304	4N	Q303	5L	D13	6I	D28	7H	D305	5L
IC305	4R	D4	4B	D14	4C	D29	7J		
IC306	8H	D5	4C	D15	4B	D30	7J		
IC403	8B	D6	4C	D16	4B	D31	6I		

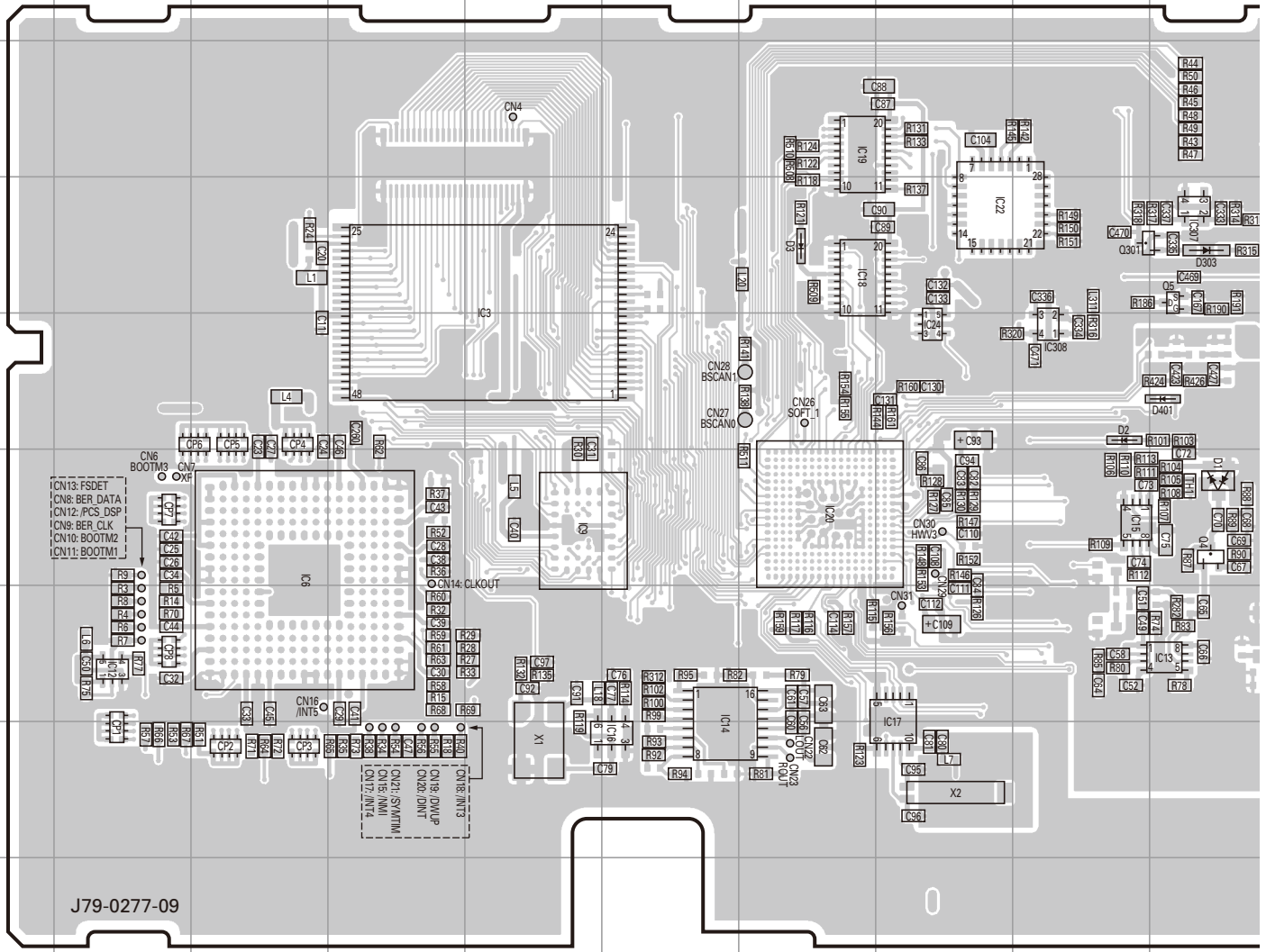
# PC BOARD NXR-710

## CONTROL UNIT (X53-4490-10) Component side view (J79-0277-09)



# NXR-710 PC BOARD

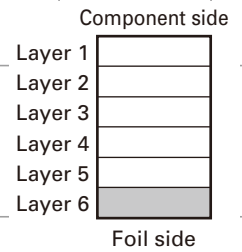
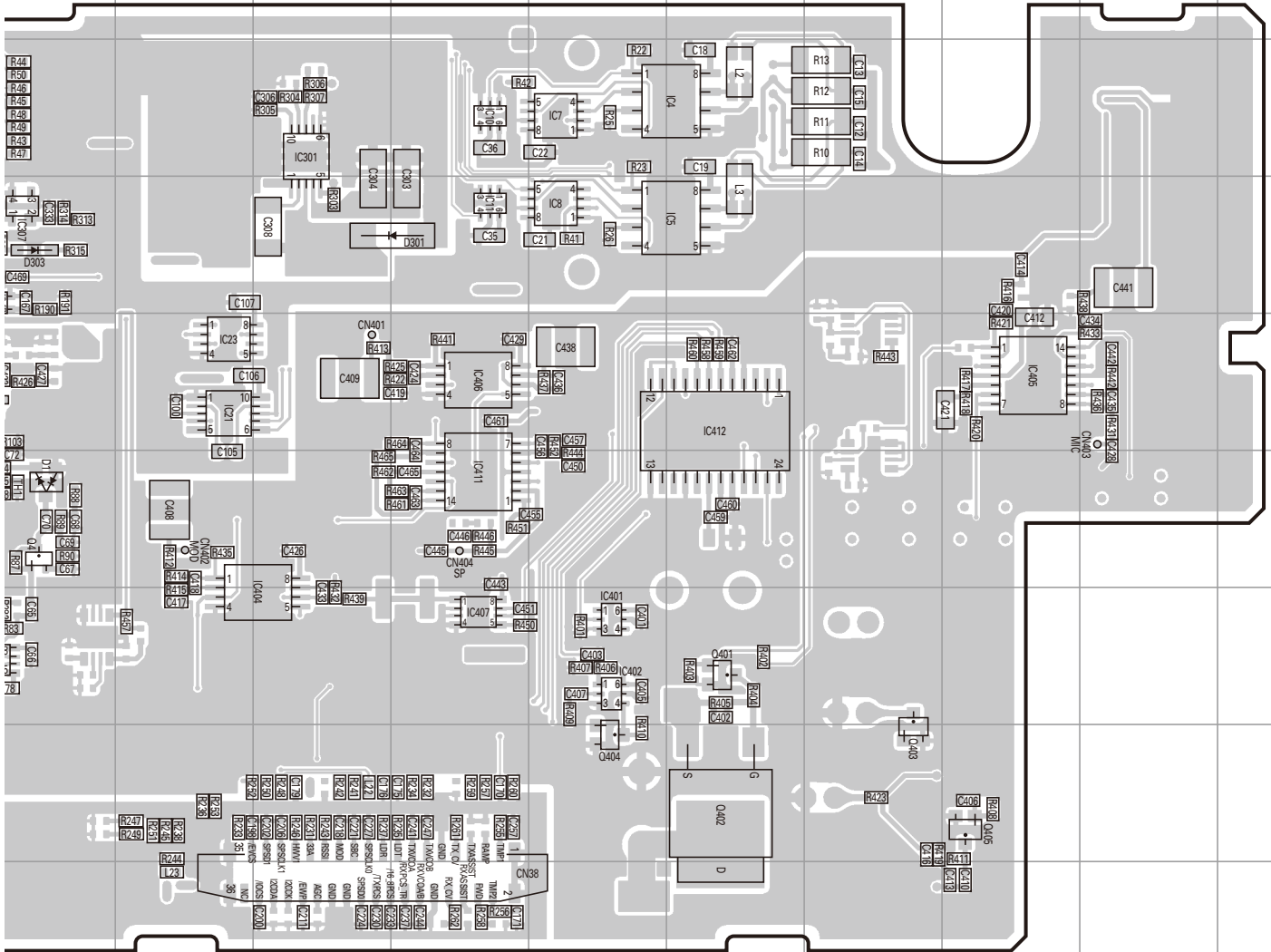
**CONTROL UNIT (X53-4490-10)**  
**Foil side view (J79-0277-09)**



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC3	4E	IC13	7J	IC23	5K	IC407	7M	Q405	8Q
IC4	3O	IC14	8F	IC24	5H	IC411	6M	D1	6J
IC5	4O	IC15	6I	IC301	3L	IC412	5O	D2	5I
IC6	6C	IC16	8F	IC307	4J	Q4	6J	D3	4G
IC7	3N	IC17	8H	IC308	5I	Q5	4J	D301	4M
IC8	4N	IC18	4G	IC401	7N	Q301	4I	D303	4J
IC9	6E	IC19	3G	IC402	7N	Q401	7O	D401	5J
IC10	3M	IC20	6G	IC404	7L	Q402	8O		
IC11	4M	IC21	5K	IC405	5Q	Q403	8P		
IC12	7B	IC22	4H	IC406	5M	Q404	8N		

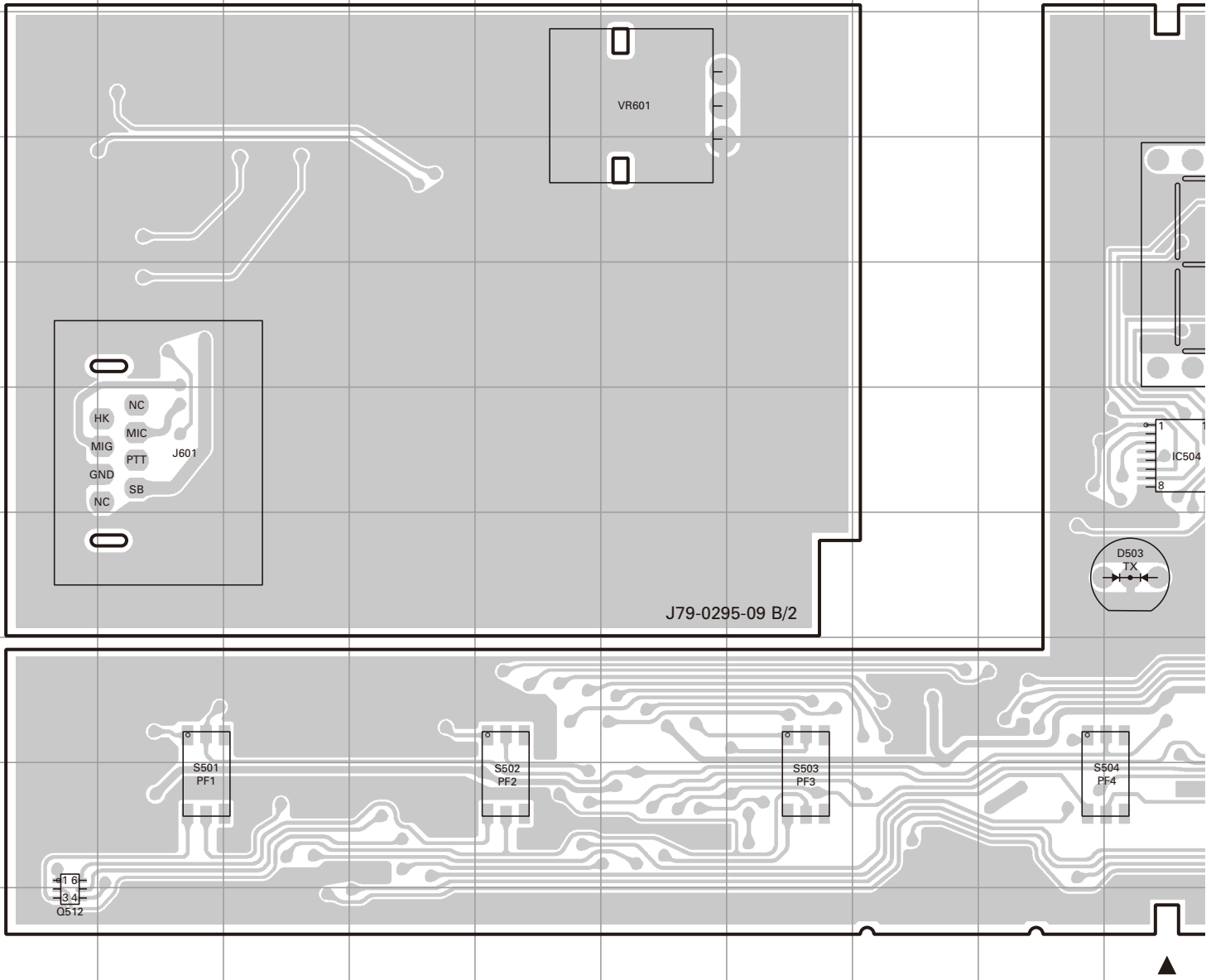
# PC BOARD NXR-710

CONTROL UNIT (X53-4490-10)  
Foil side view (J79-0277-09)



# NXR-710 PC BOARD

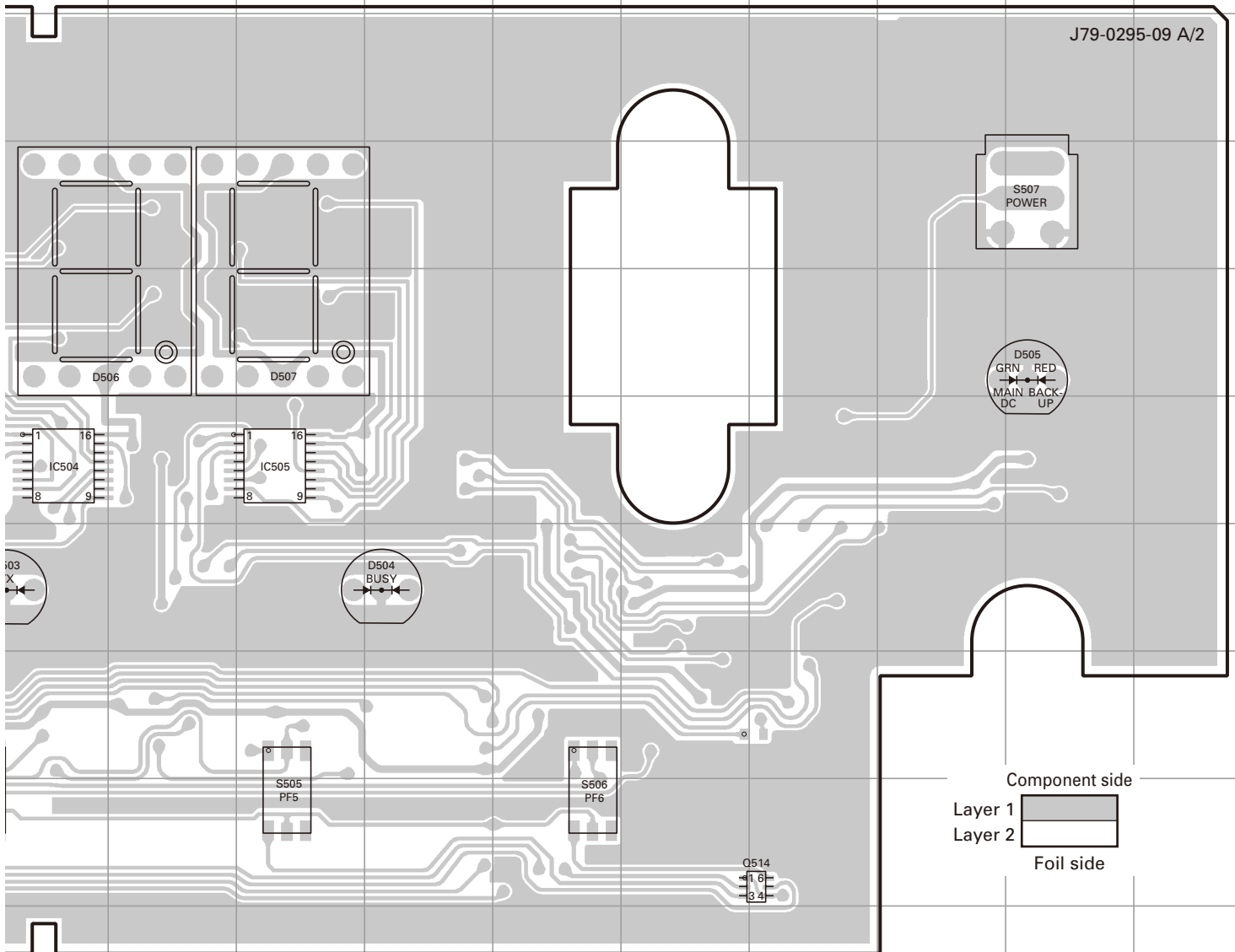
## DISPLAY UNIT (X54-3730-20) Component side view (J79-0295-09)





# PC BOARD NXR-710

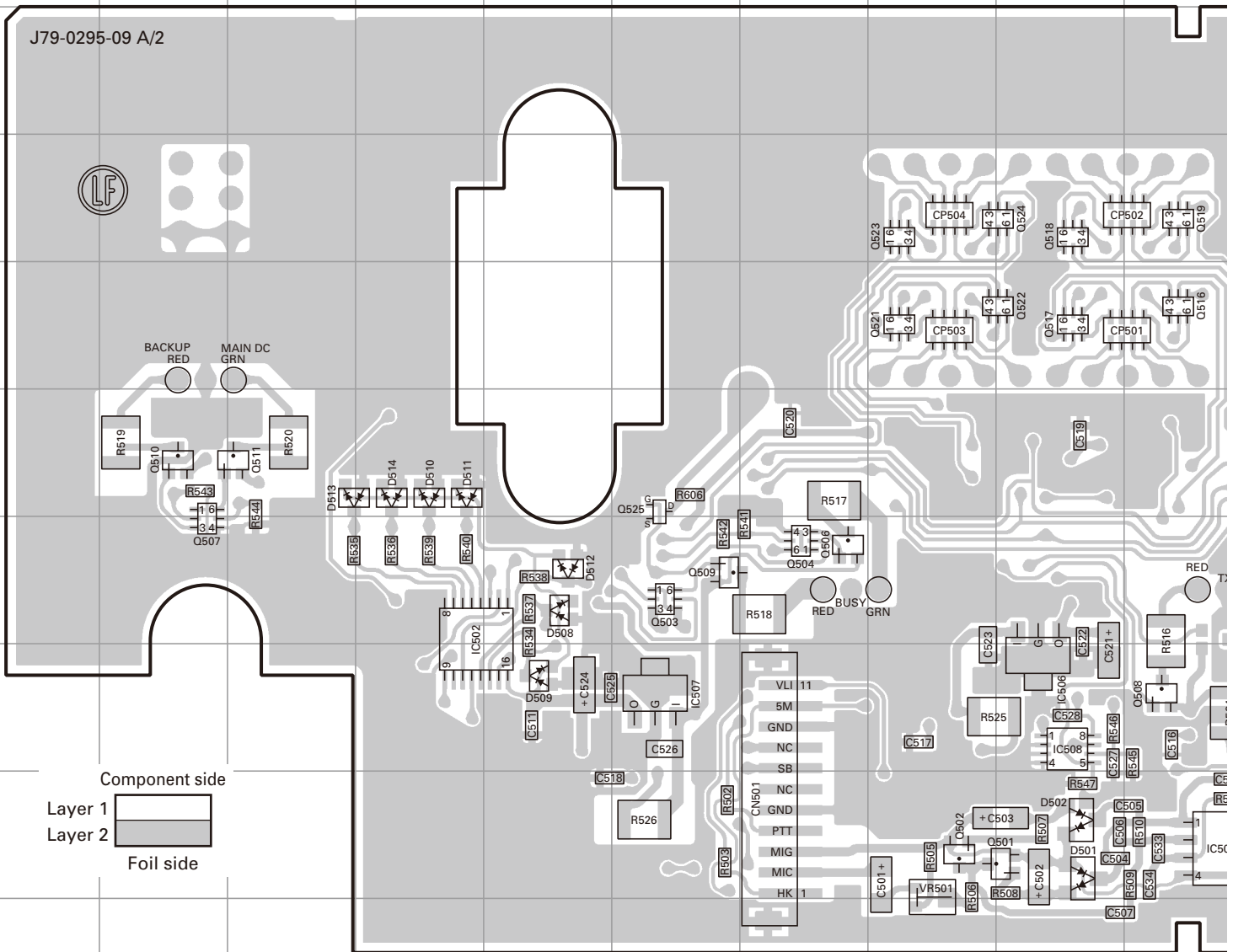
## DISPLAY UNIT (X54-3730-20) Component side view (J79-0295-09)



Ref. No.	Address
IC504	6J
IC505	6L
Q512	10A
Q514	9P
D503	7J
D504	7M
D505	5R
D506	5J
D507	5L

# NXR-710 PC BOARD

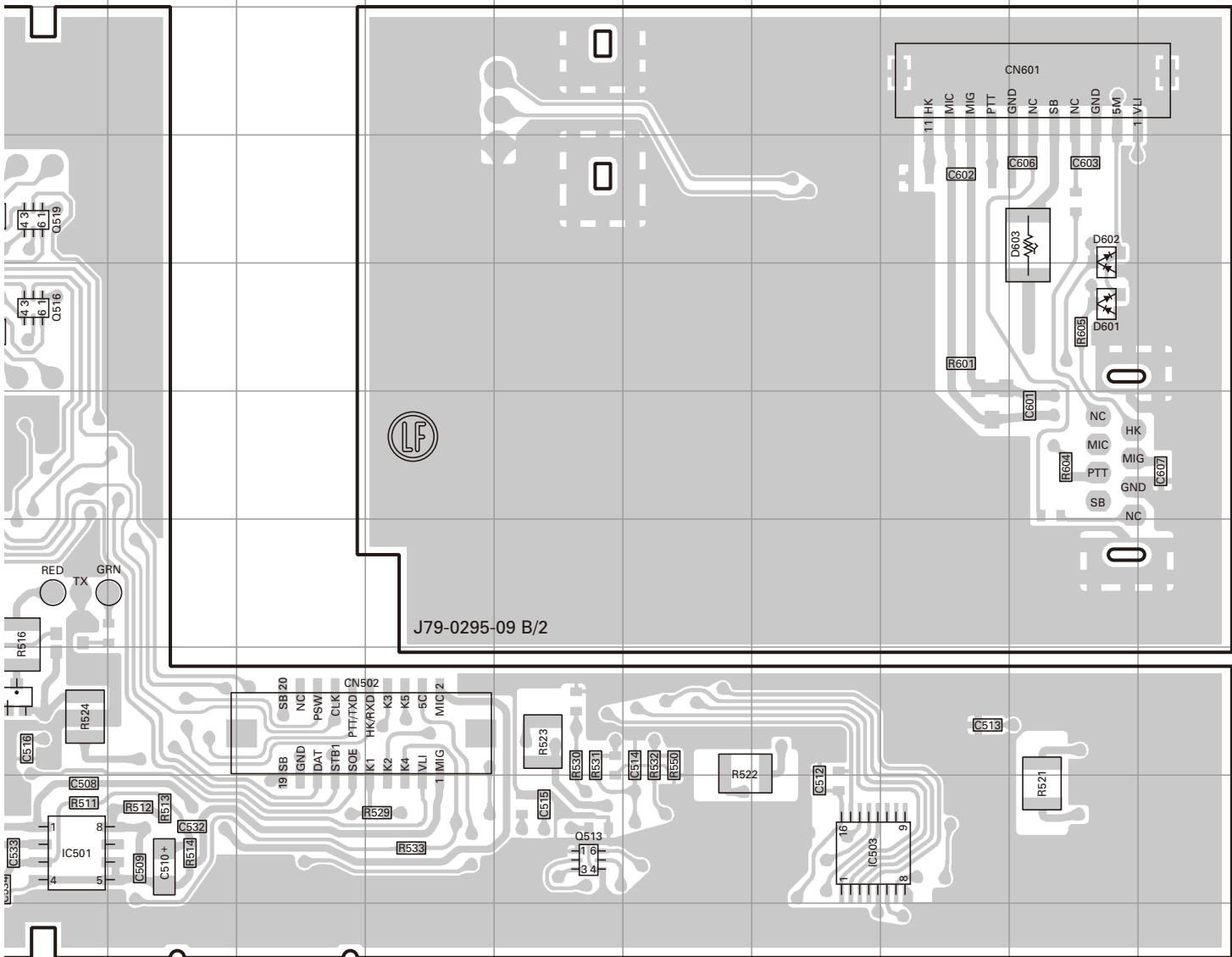
## DISPLAY UNIT (X54-3730-20) Foil side view (J79-0295-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC501	9J	Q506	7G	Q519	4J	D510	6D
IC502	7D	Q507	7B	Q521	5H	D511	6D
IC503	9P	Q508	8J	Q522	5I	D512	7E
IC506	8I	Q509	7F	Q523	4H	D513	6C
IC507	8F	Q510	6B	Q524	4I	D514	6D
IC508	8I	Q511	6C	Q525	6F	D601	5R
Q501	9I	Q513	9N	D501	9I	D602	4R
Q502	9H	Q516	5J	D502	9I	D603	4R
Q503	7F	Q517	5I	D508	7E		
Q504	7G	Q518	4I	D509	8E		

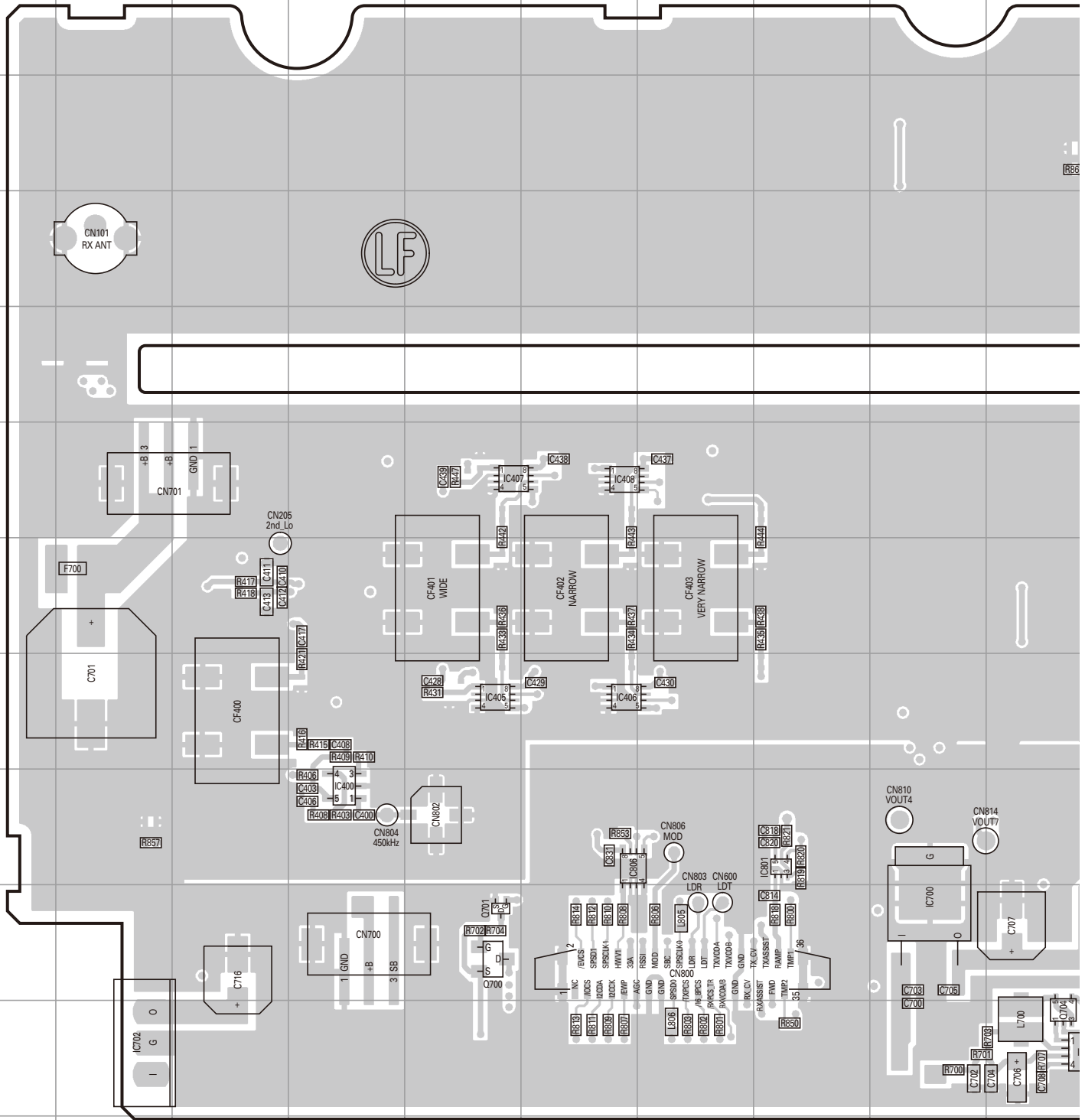
# PC BOARD NXR-710

## DISPLAY UNIT (X54-3730-20) Foil side view (J79-0295-09)



# NXR-710 PC BOARD

## TX-RX UNIT (X57-7942-71) Component side view (J79-0265-09)

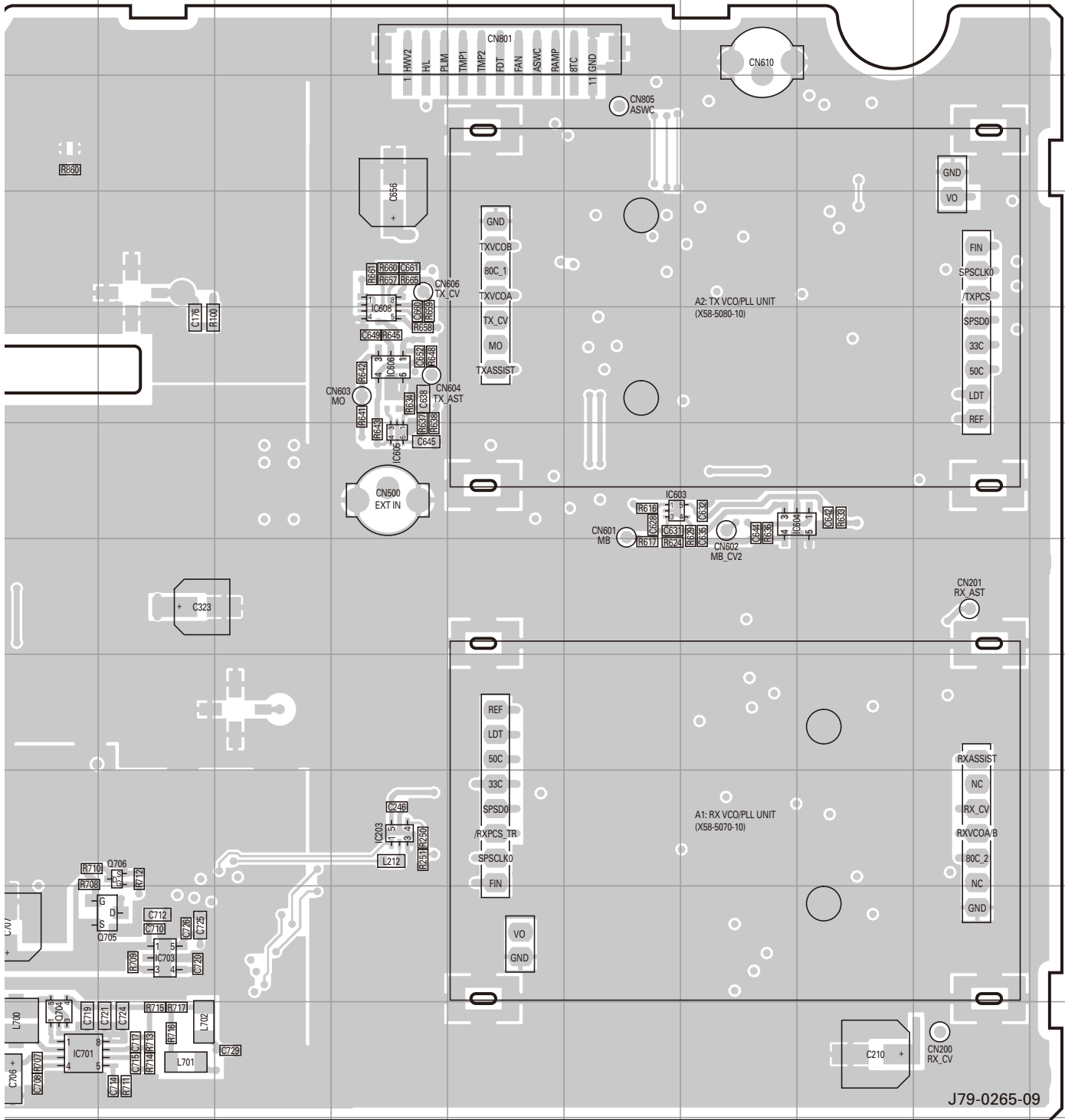


Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC203	9M	IC603	6O	IC701	11J	Q701	10E
IC400	9D	IC604	6P	IC702	11B	Q704	11J
IC405	8E	IC605	6M	IC703	10K	Q705	10K
IC406	8F	IC606	5M	IC801	9H	Q706	9K
IC407	6E	IC608	5M	IC806	9F		
IC408	6F	IC700	10I	Q700	10E		

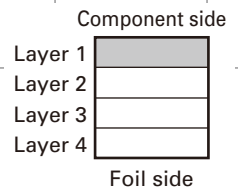
# PC BOARD NXR-710

## TX-RX UNIT (X57-7942-71)

### Component side view (J79-0265-09)

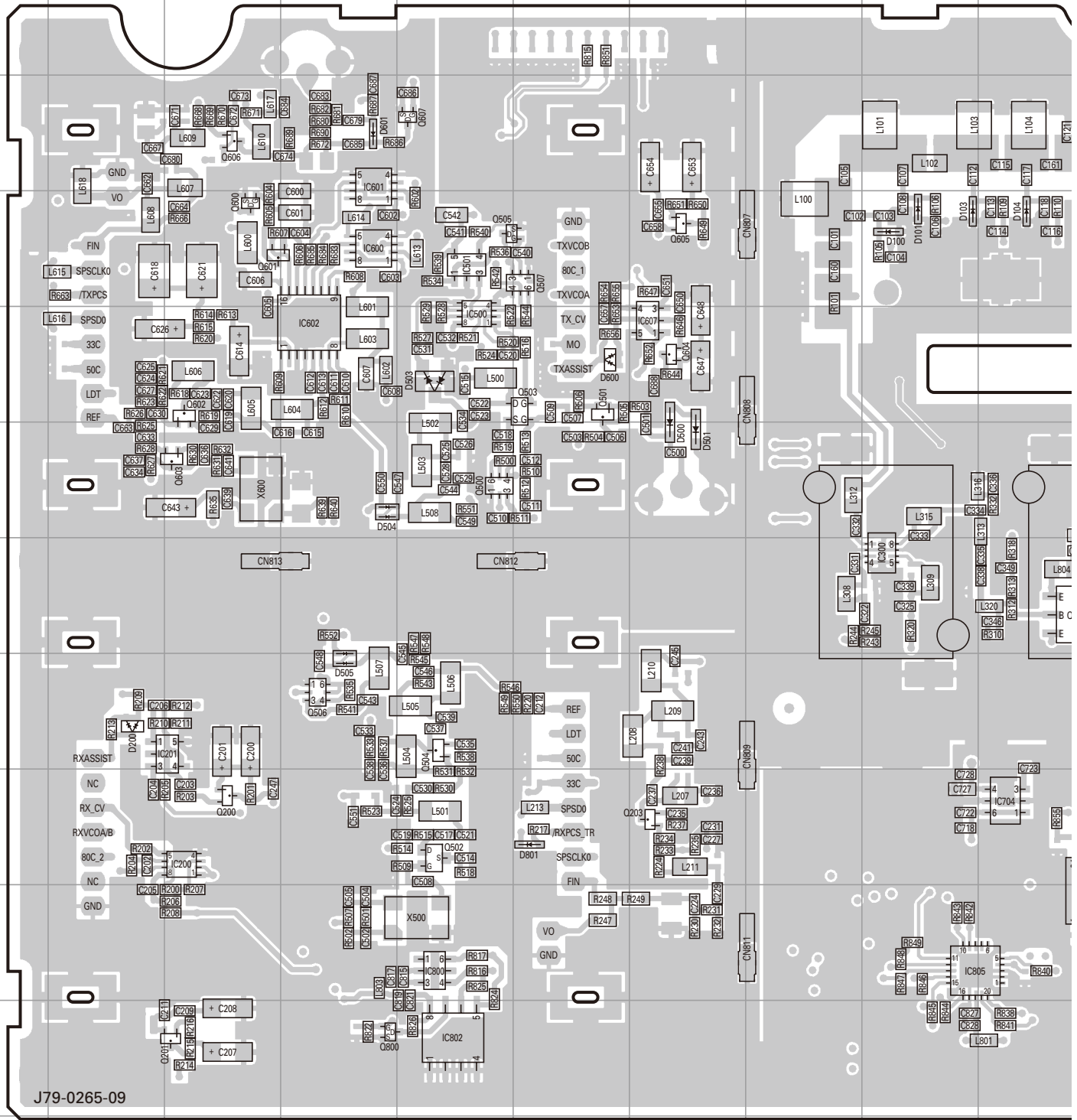


J79-0265-09



# NXR-710 PC BOARD

## TX-RX UNIT (X57-7942-71) Foil side view (J79-0265-09)



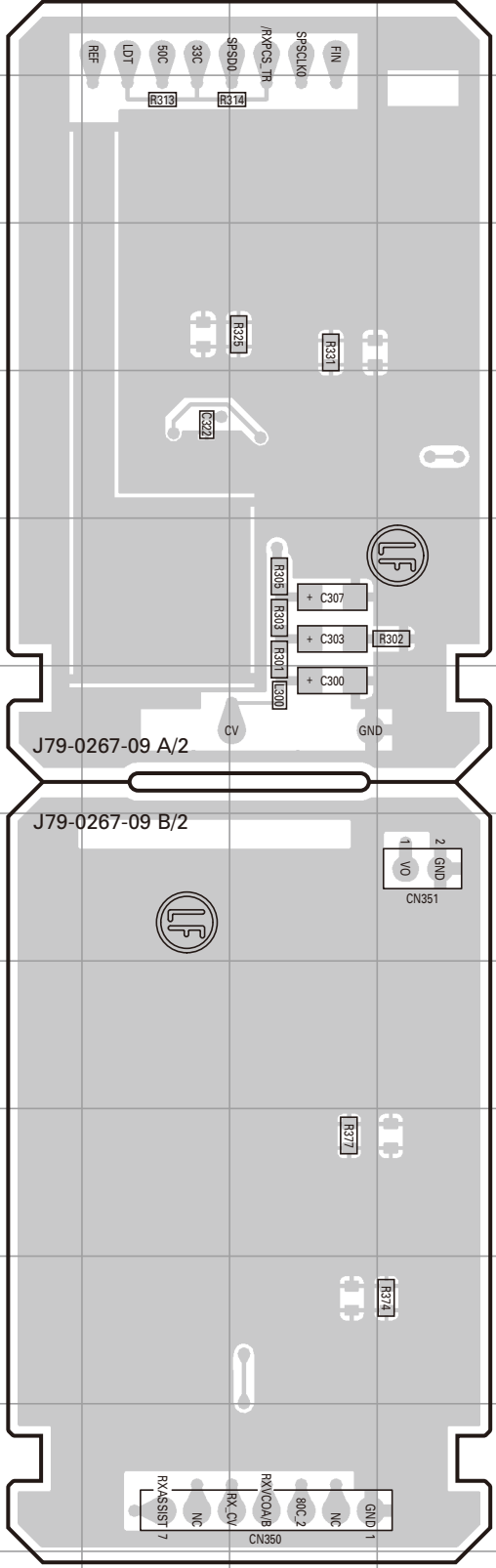
J79-0265-09

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC100	4P	IC402	8P	IC600	4D	IC802	11E	Q200	9C	Q500	6E	Q506	8D	Q604	
IC101	4O	IC403	7P	IC601	3D	IC803	10L	Q201	11C	Q501	5F	Q507	4F	Q605	
IC200	9C	IC404	8O	IC602	5D	IC804	10K	Q202	6P	Q502	9E	Q600	4C	Q606	
IC201	8C	IC409	7Q	IC607	5G	IC805	10I	Q203	9G	Q503	5F	Q601	4C	Q607	
IC300	7I	IC500	5E	IC704	9J	Q100	4Q	Q300	7O	Q504	8E	Q602	5C	Q702	
IC401	7Q	IC501	4E	IC800	10E	Q101	3K	Q301	7J	Q505	4E	Q603	6C	Q703	

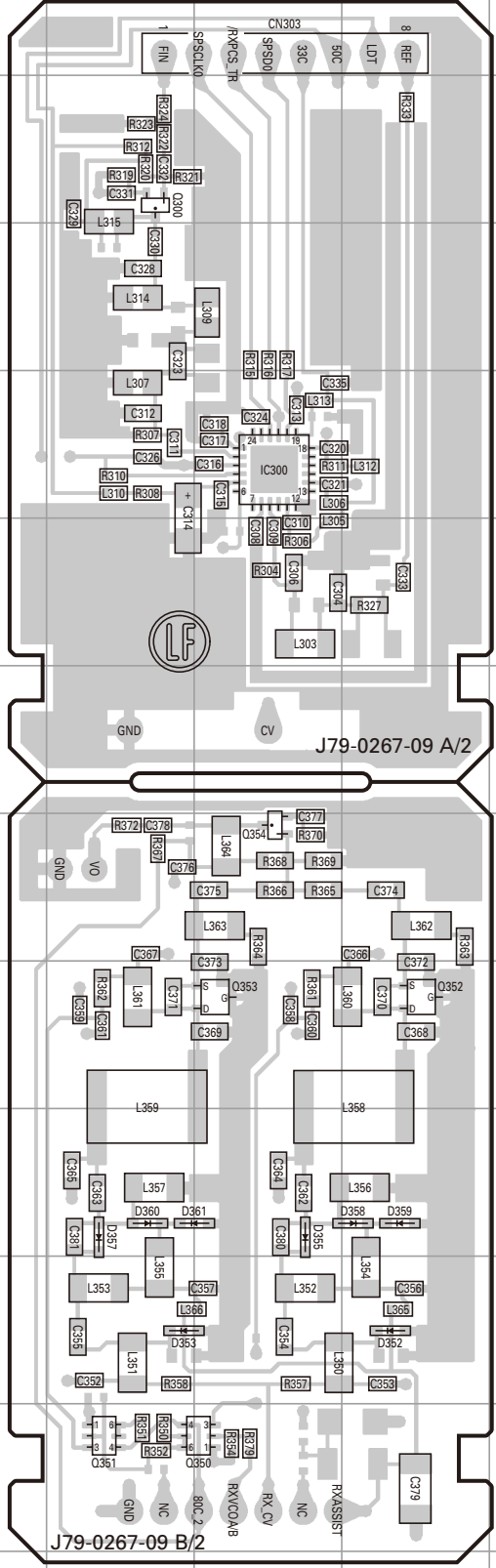


# NXR-710 PC BOARD

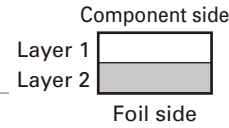
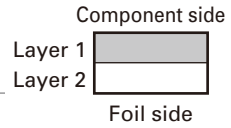
**RX VCO/PLL UNIT (X58-5070-10)  
Component side view (J79-0267-09)**



**RX VCO/PLL UNIT (X58-5070-10)  
Foil side view (J79-0267-09)**



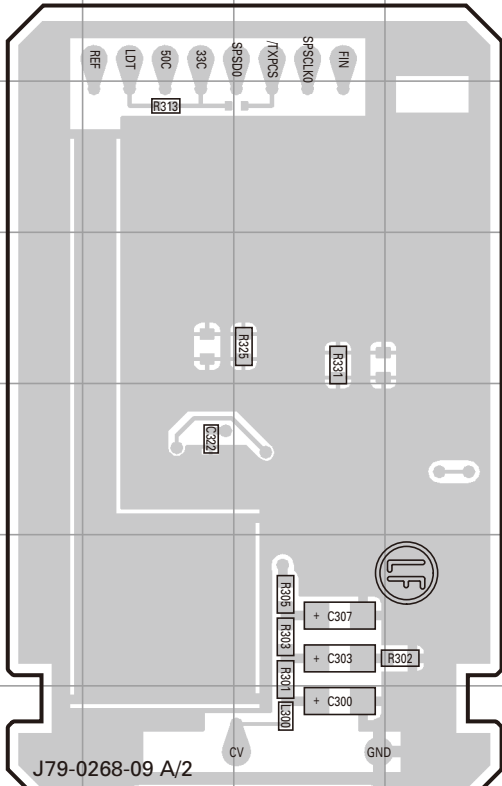
Ref. No.	Address
IC300	5G
Q300	3F
Q350	12G
Q351	12F
Q352	9H
Q353	9G
Q354	8G
D352	11H
D353	11F
D355	10G
D357	10F
D358	10H
D359	10H
D360	10F
D361	10G



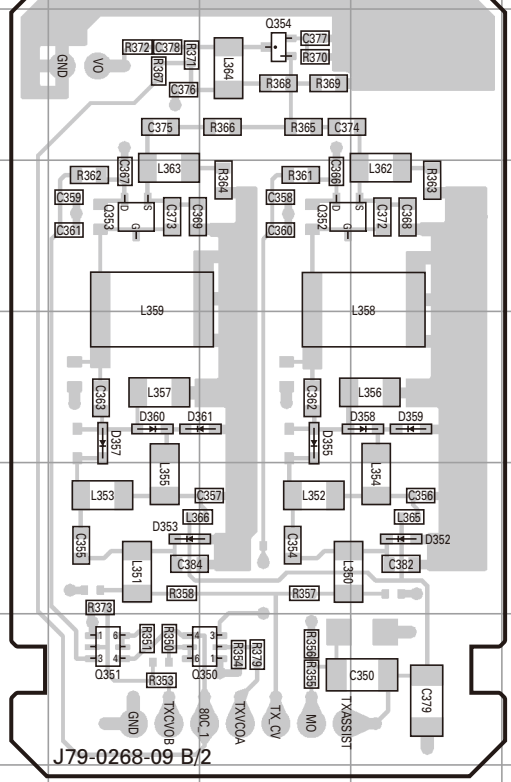
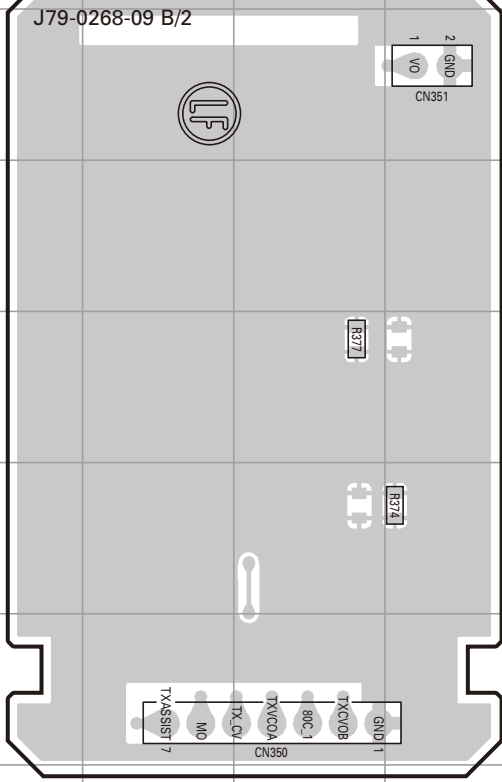
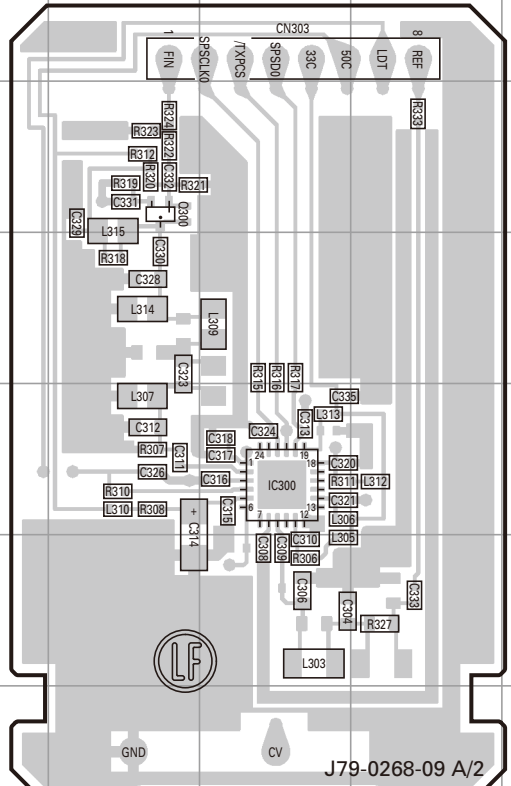


# PC BOARD NXR-710

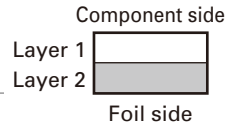
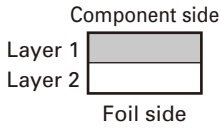
**TX VCO/PLL UNIT (X58-5080-10)**  
**Component side view (J79-0268-09)**



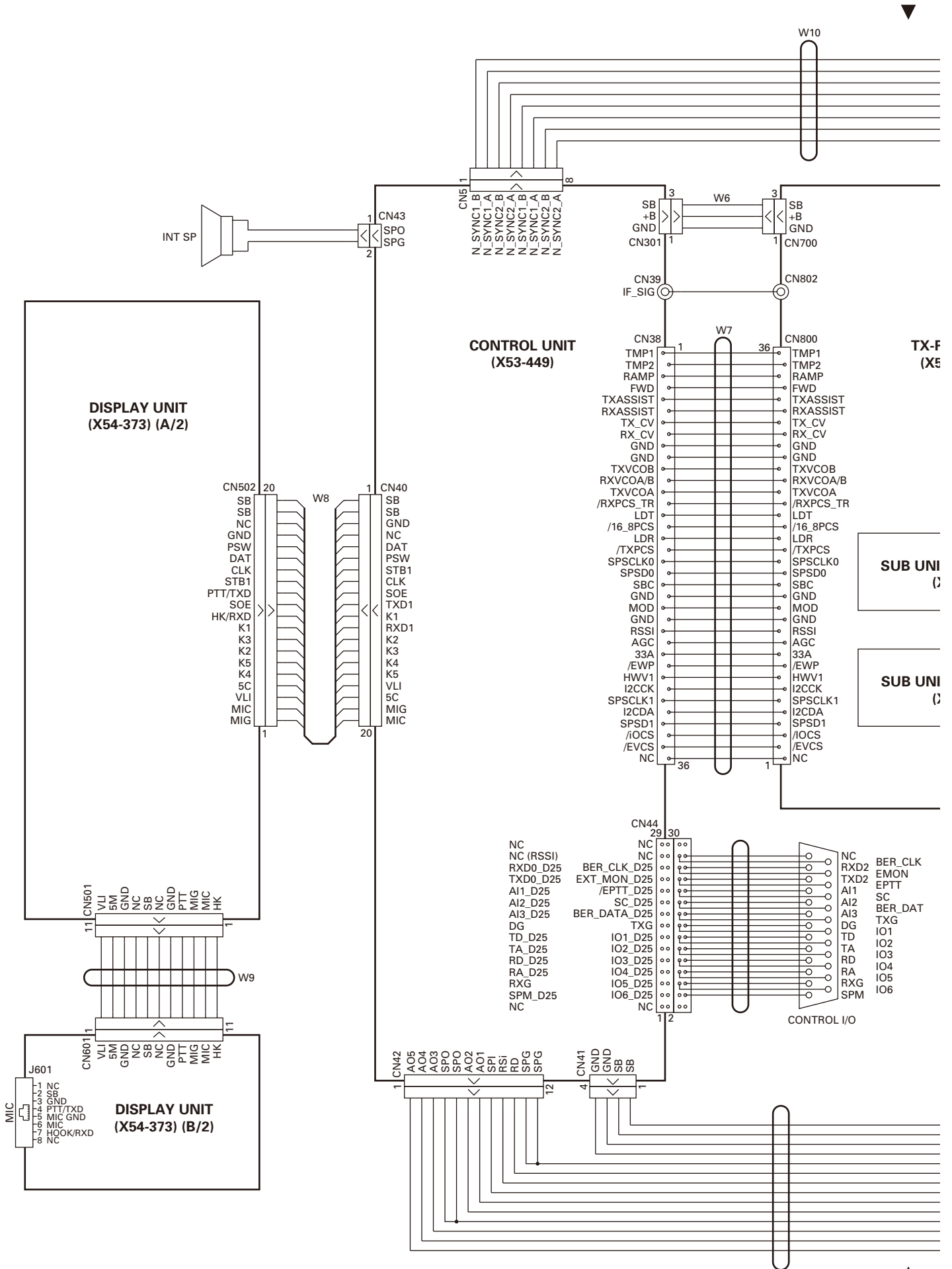
**TX VCO/PLL UNIT (X58-5080-10)**  
**Foil side view (J79-0268-09)**



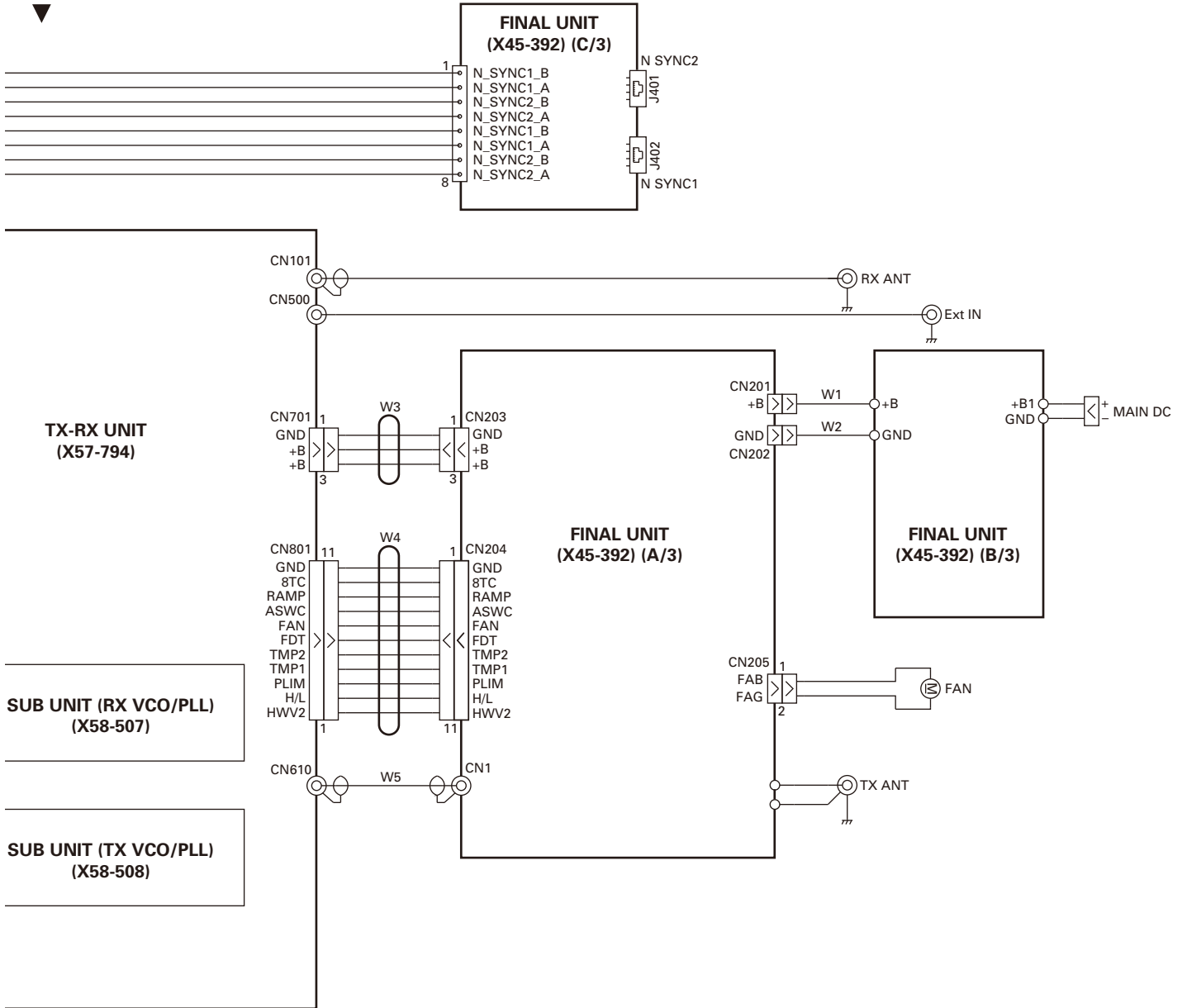
Ref. No.	Address
IC300	5G
Q300	3F
Q350	12G
Q351	12F
Q352	9G
Q353	9F
Q354	8G
D352	11H
D353	11F
D355	10G
D357	10F
D358	10H
D359	10H
D360	10F
D361	10G



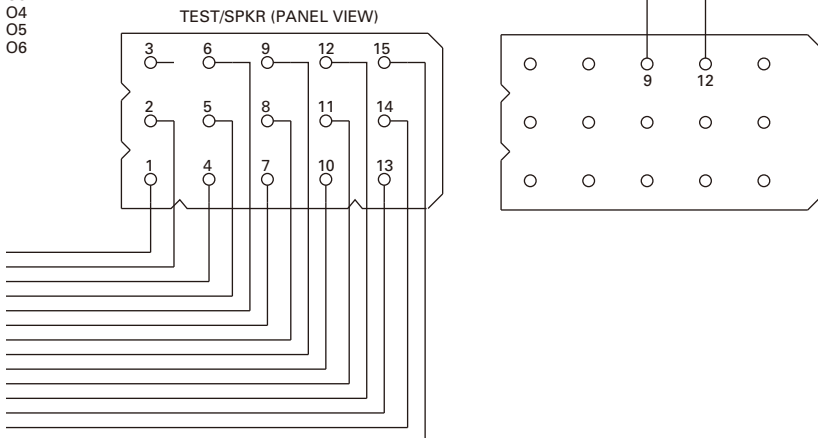
# NXR-710 INTERCONNECTION DIAGRAM



# INTERCONNECTION DIAGRAM NXR-710

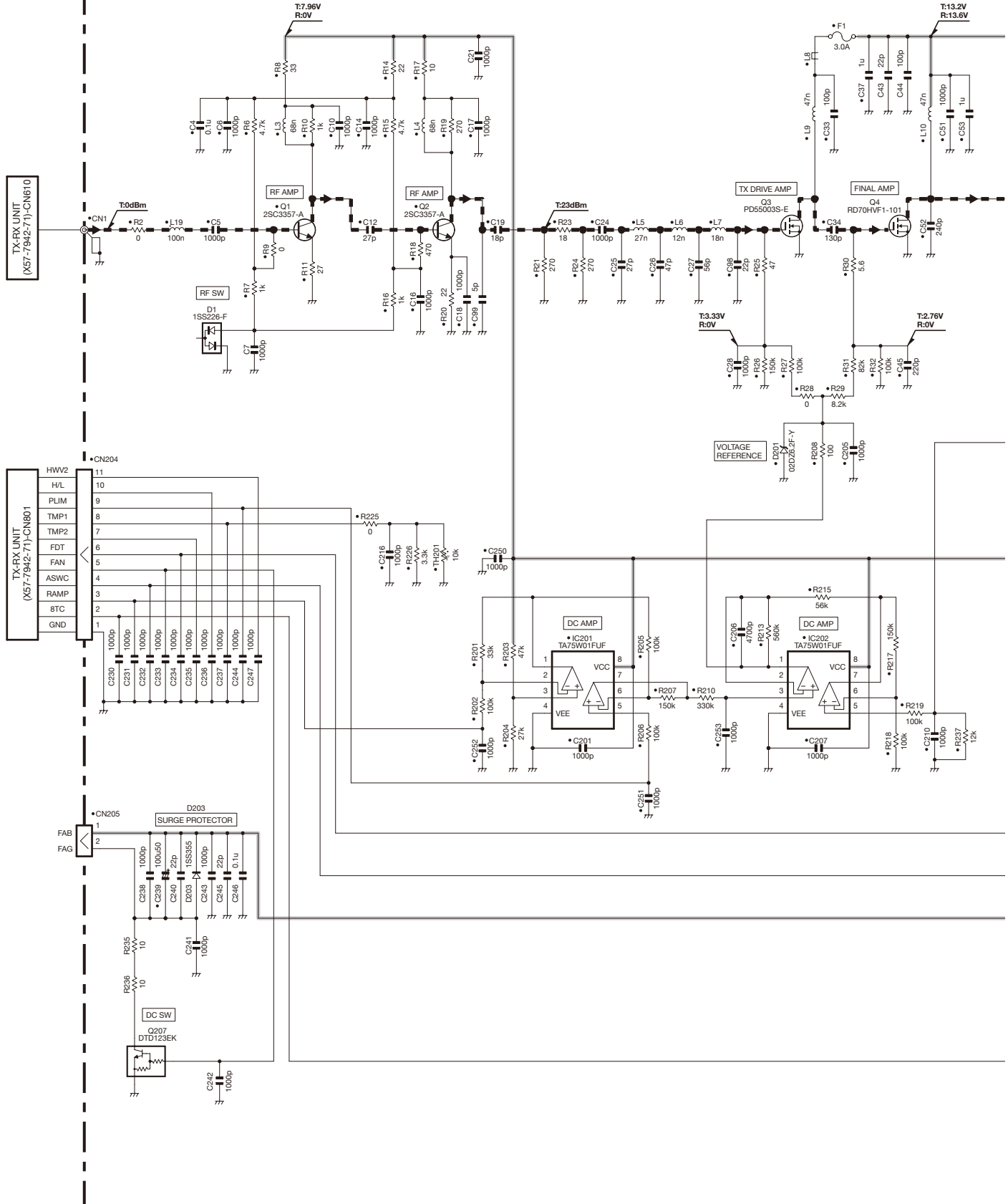


- 3ER\_CLK
- MON
- PTT
- 3C
- 3ER\_DAT
- TXG
- O1
- O2
- O3
- O4
- O5
- O6



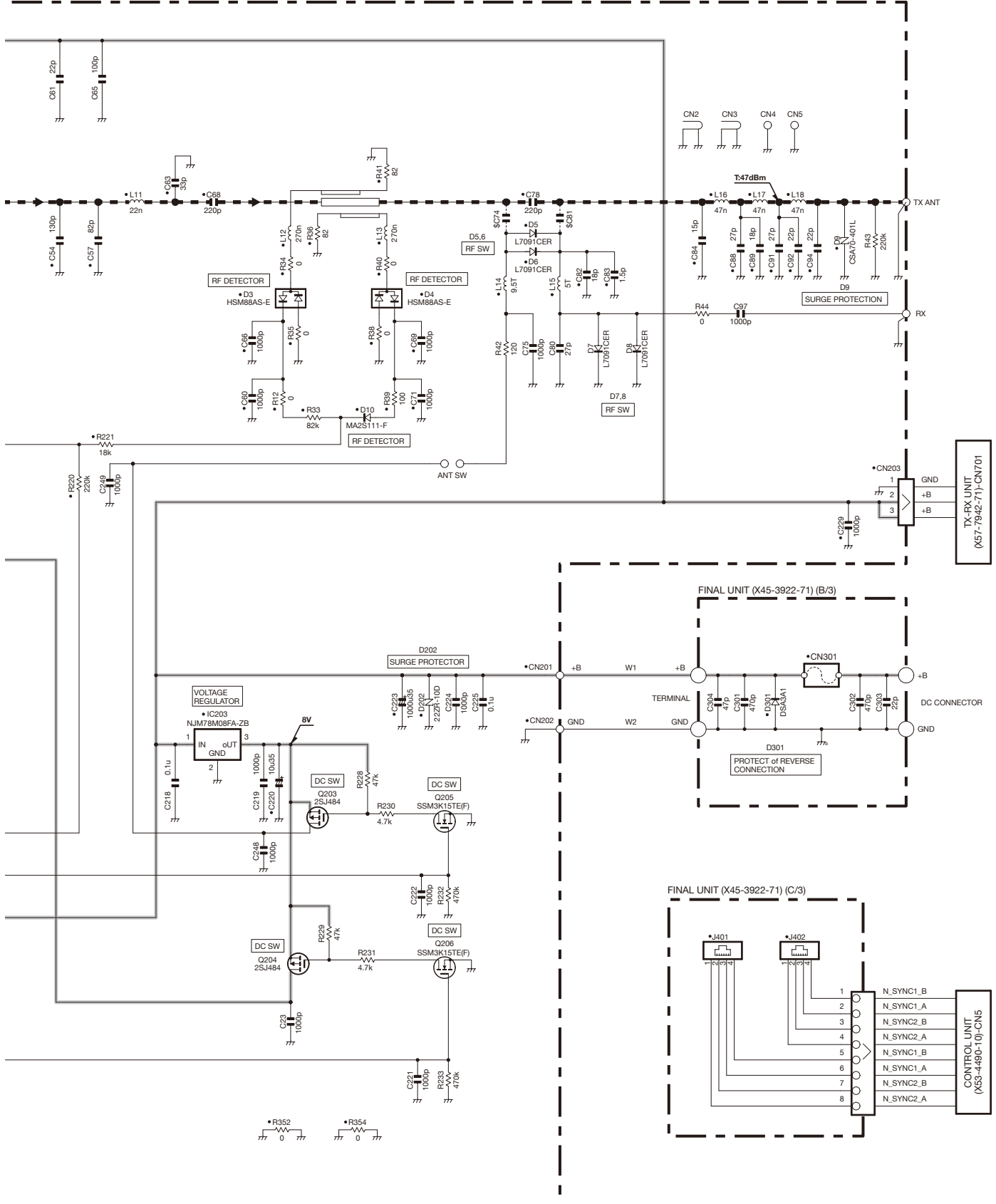
# NXR-710 SCHEMATIC DIAGRAM

FINAL UNIT (X45-3922-71) (A/3)



# SCHEMATIC DIAGRAM NXR-710

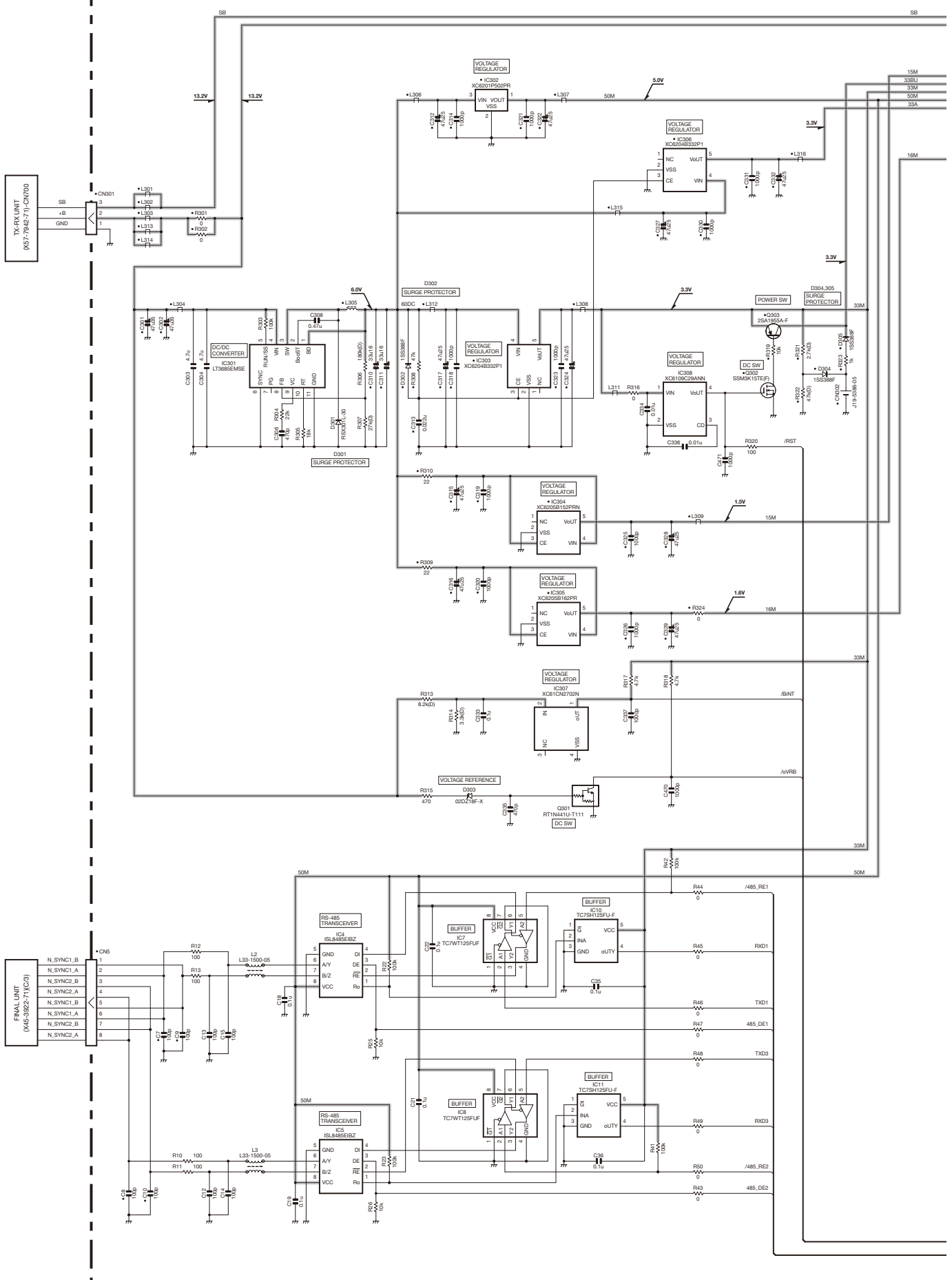
FINAL UNIT (X45-3922-71) (A/3)



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

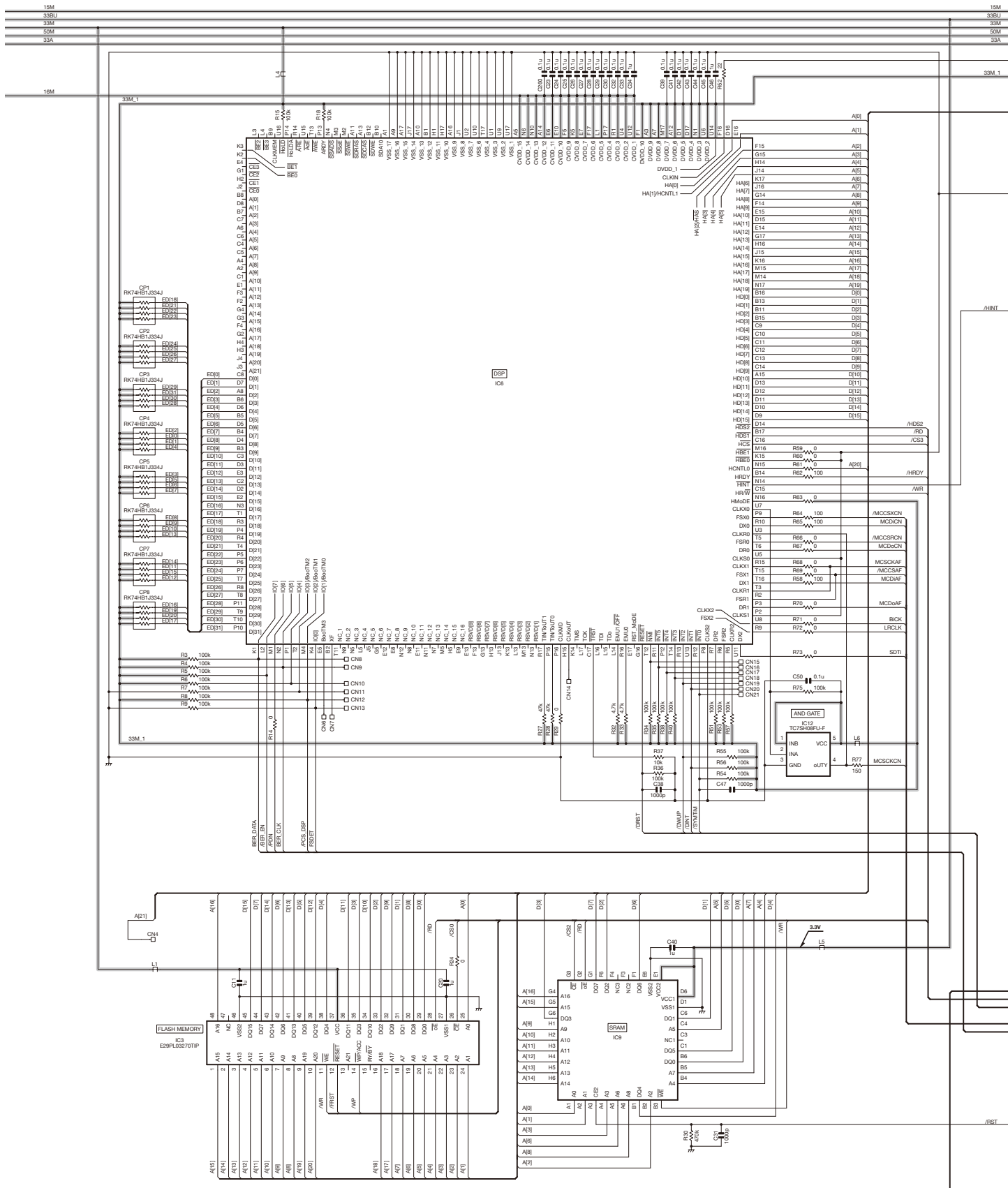
# NXR-710 SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4490-10)



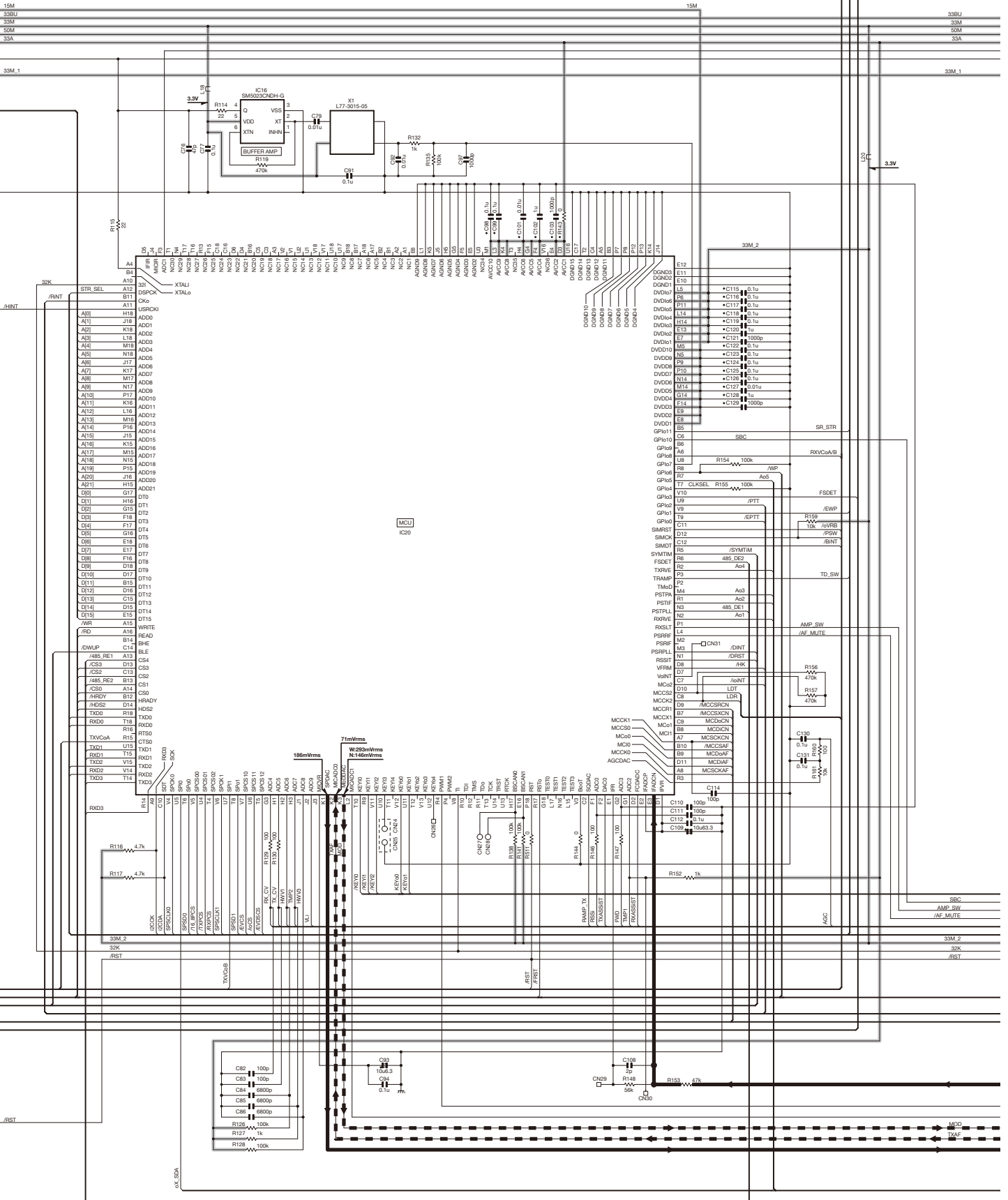
# SCHEMATIC DIAGRAM NXR-710

CONTROL UNIT (X53-4490-10)



# NXR-710 SCHEMATIC DIAGRAM

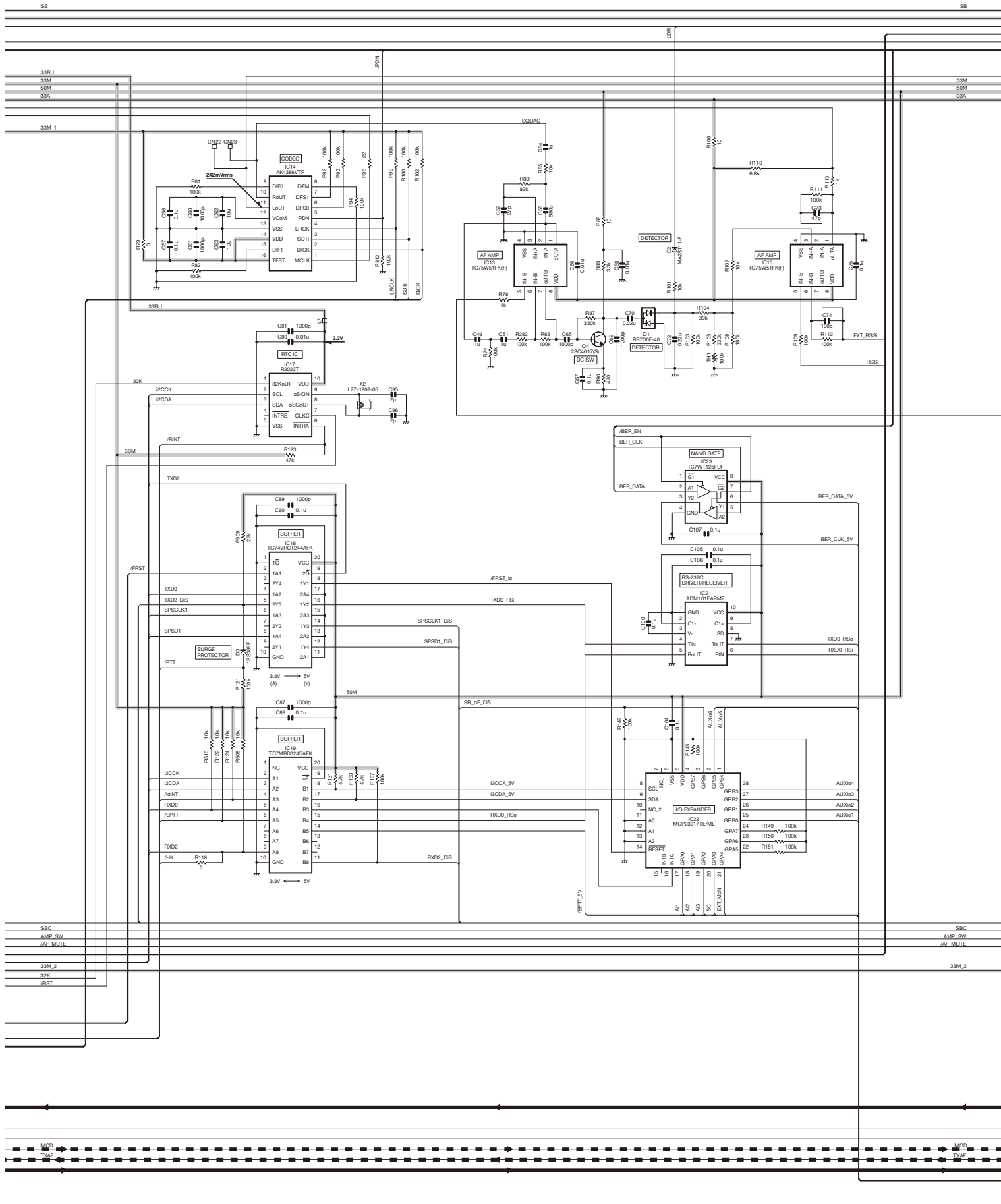
CONTROL UNIT (X53-4490-10)





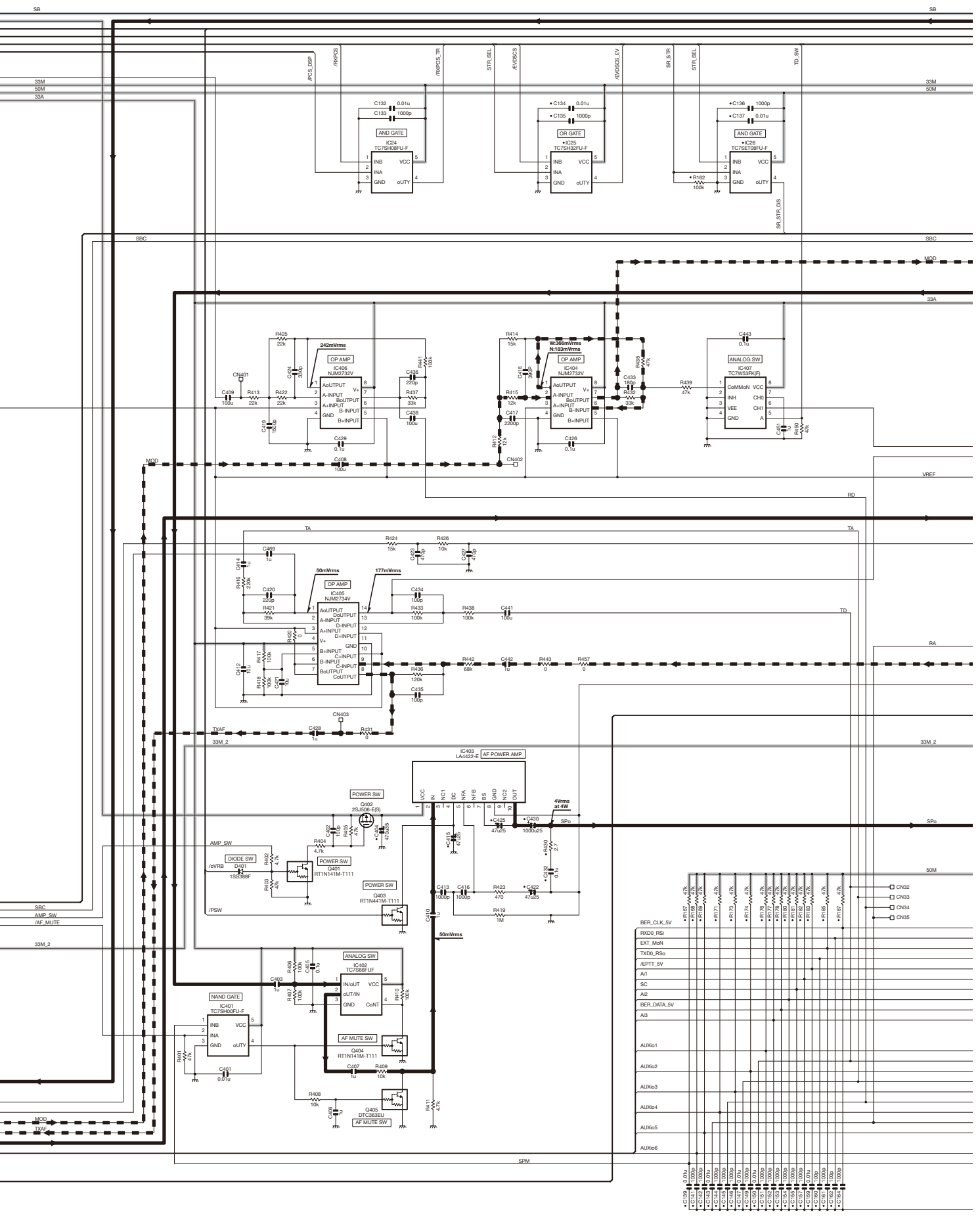
# SCHEMATIC DIAGRAM NXR-710

CONTROL UNIT (X53-4490-10)



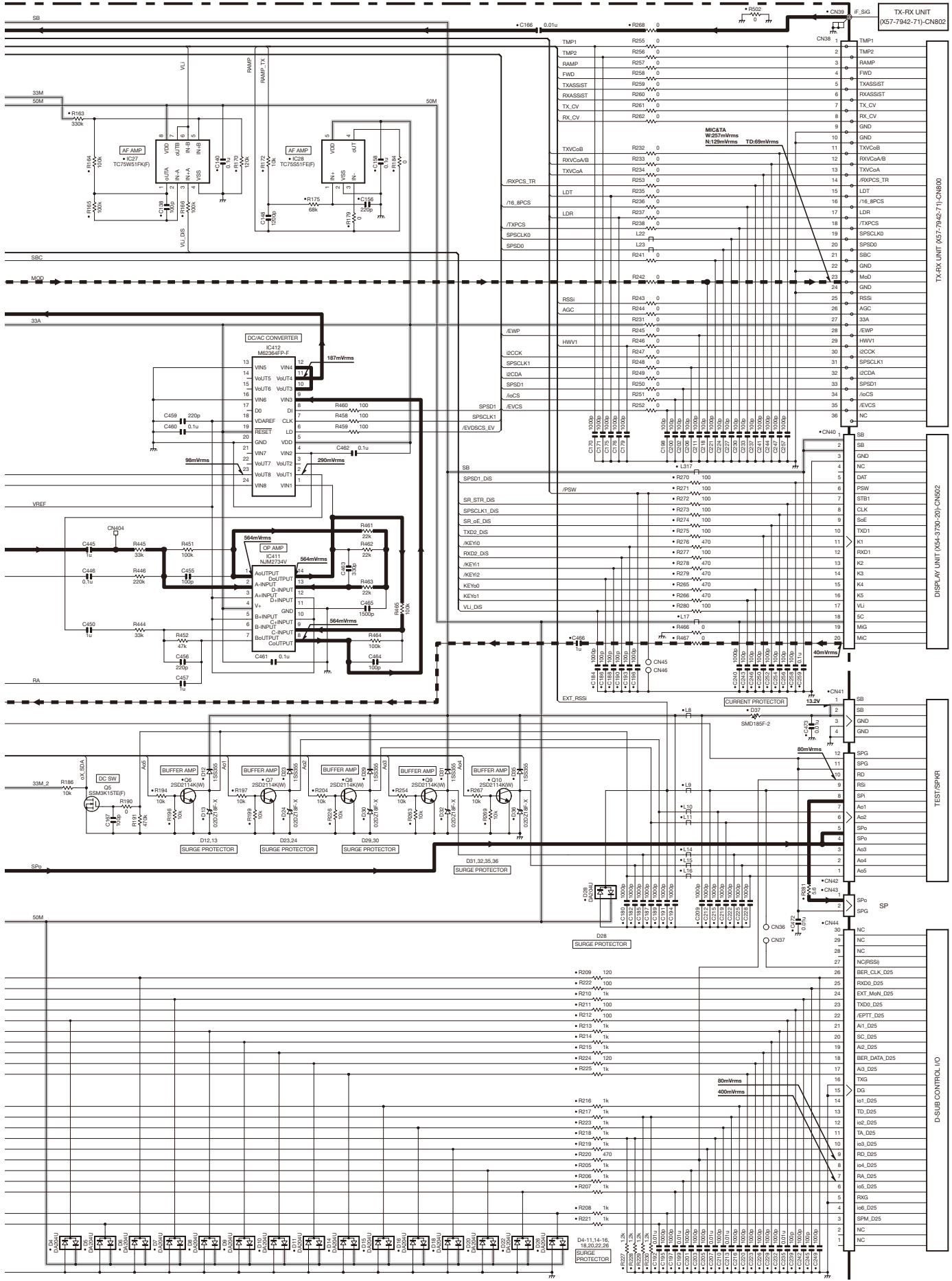
# NXR-710 SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4490-10)



# SCHEMATIC DIAGRAM NXR-710

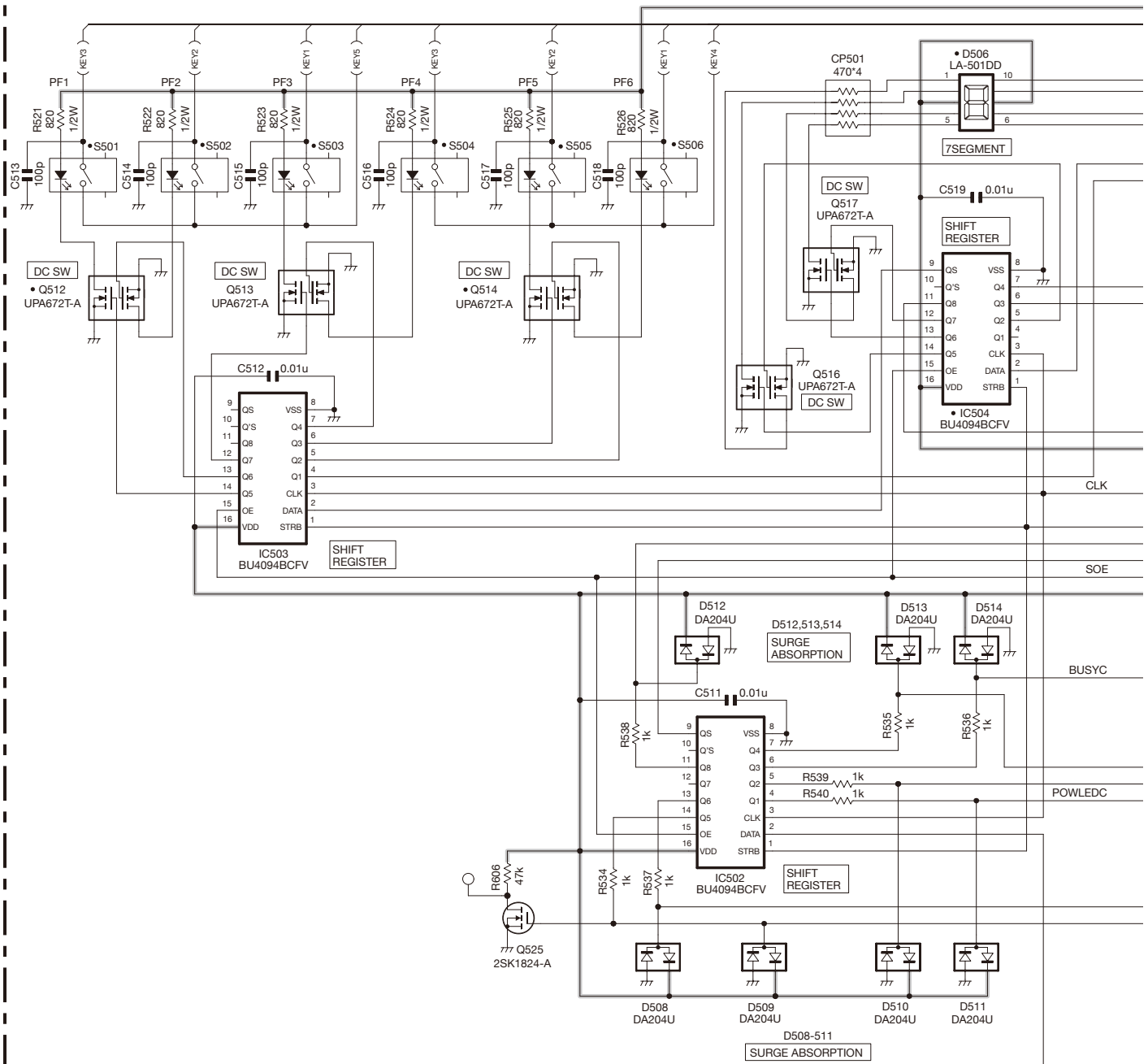
CONTROL UNIT (X53-4490-10)



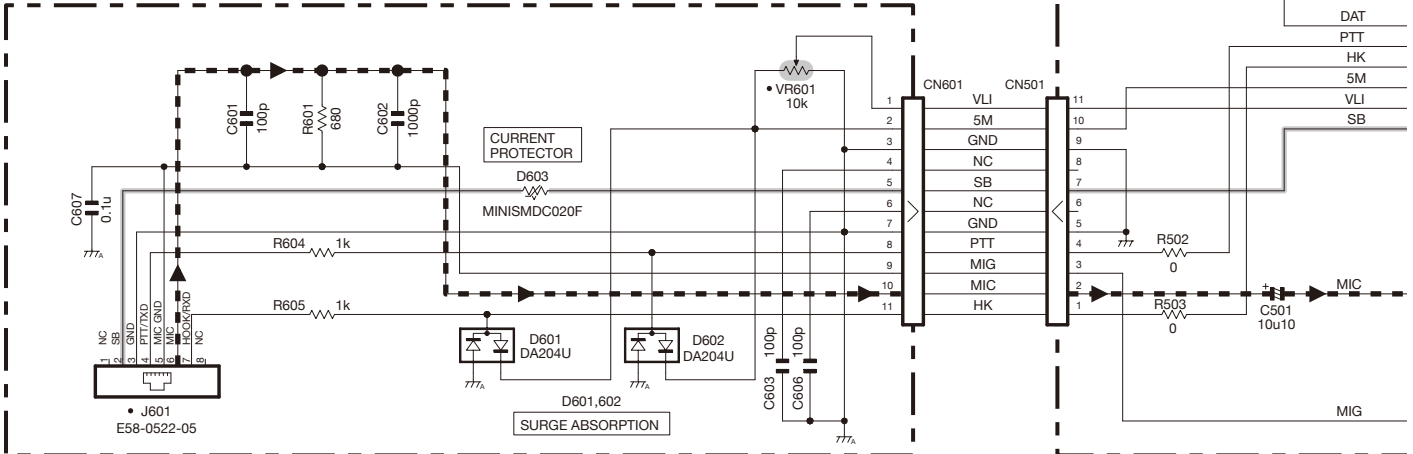
Note : The components marked with a dot (•) are parts of layer 1.

# NXR-710 SCHEMATIC DIAGRAM

DISPLAY UNIT (X54-3730-20) (A/2)

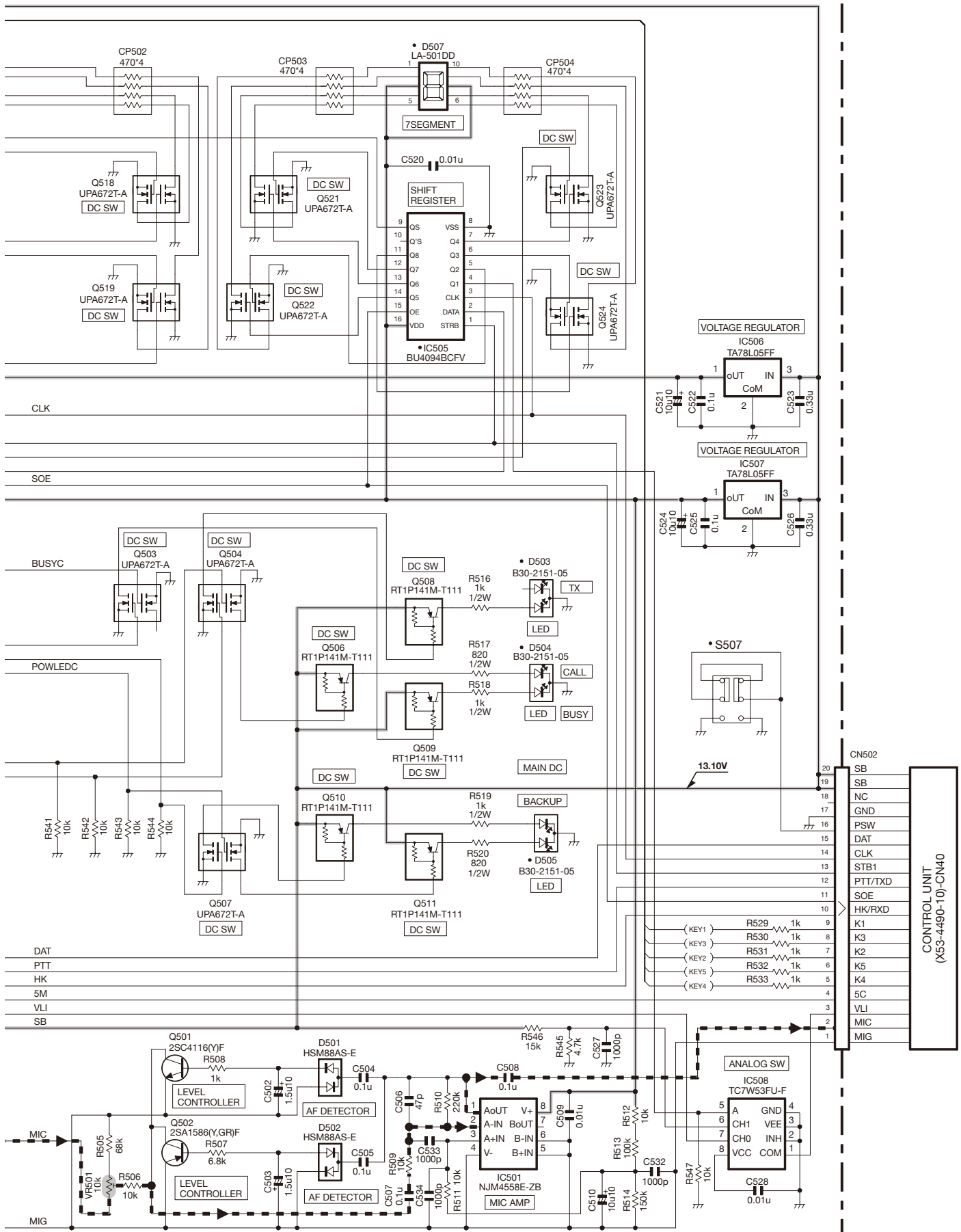


DISPLAY UNIT (X54-3730-20) (B/2)



# SCHEMATIC DIAGRAM NXR-710

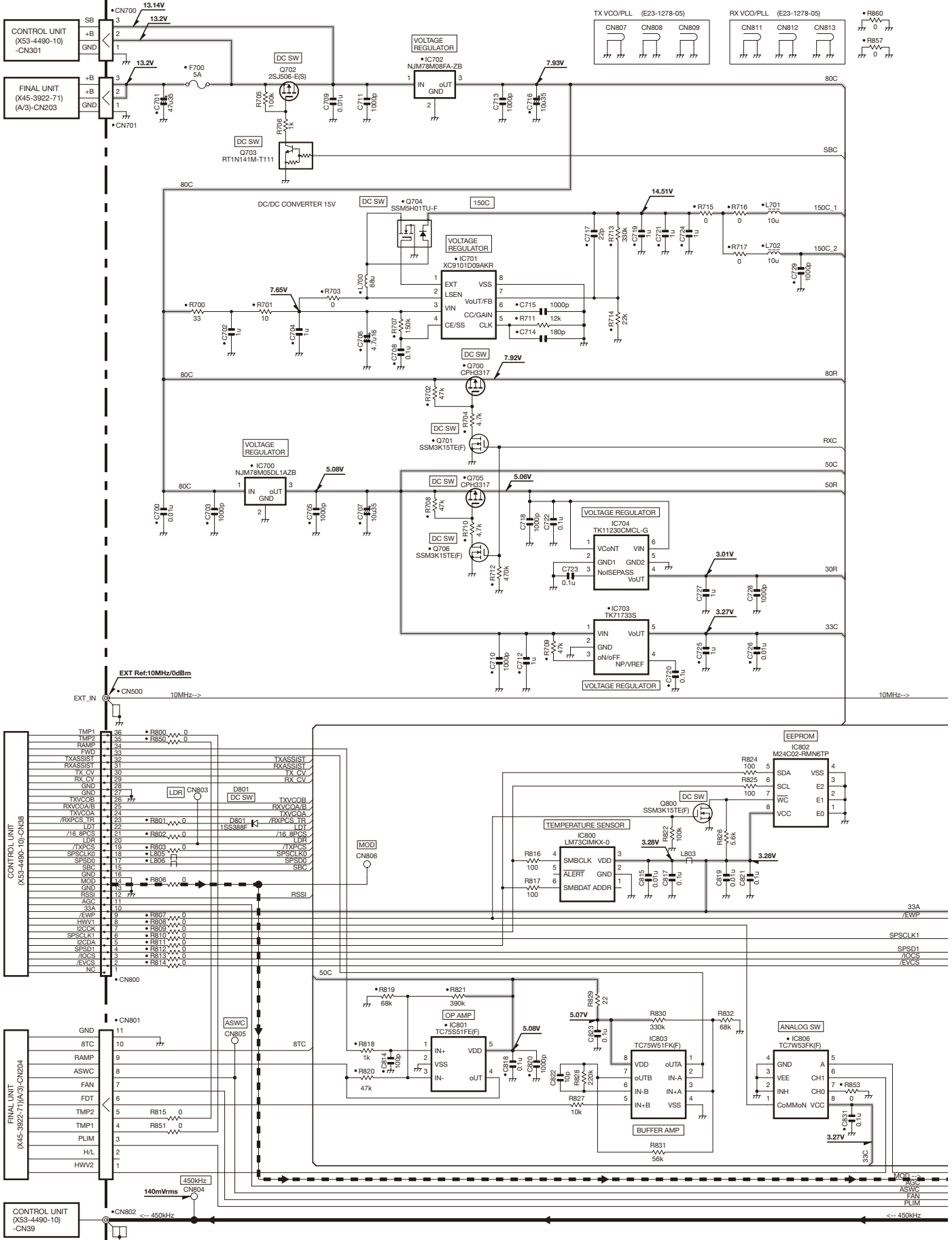
DISPLAY UNIT (X54-3730-20) (A/2)



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

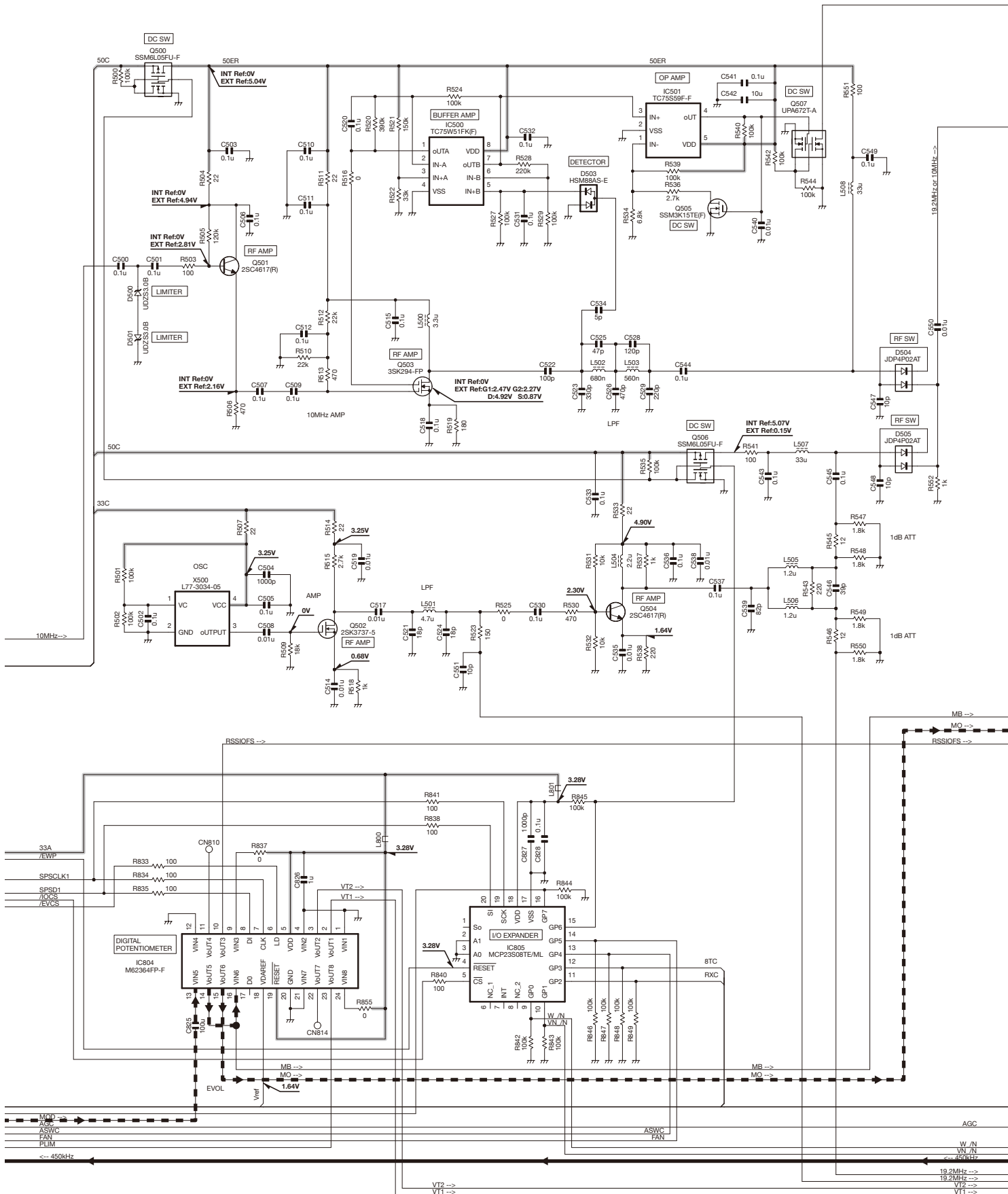
# NXR-710 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7942-71)



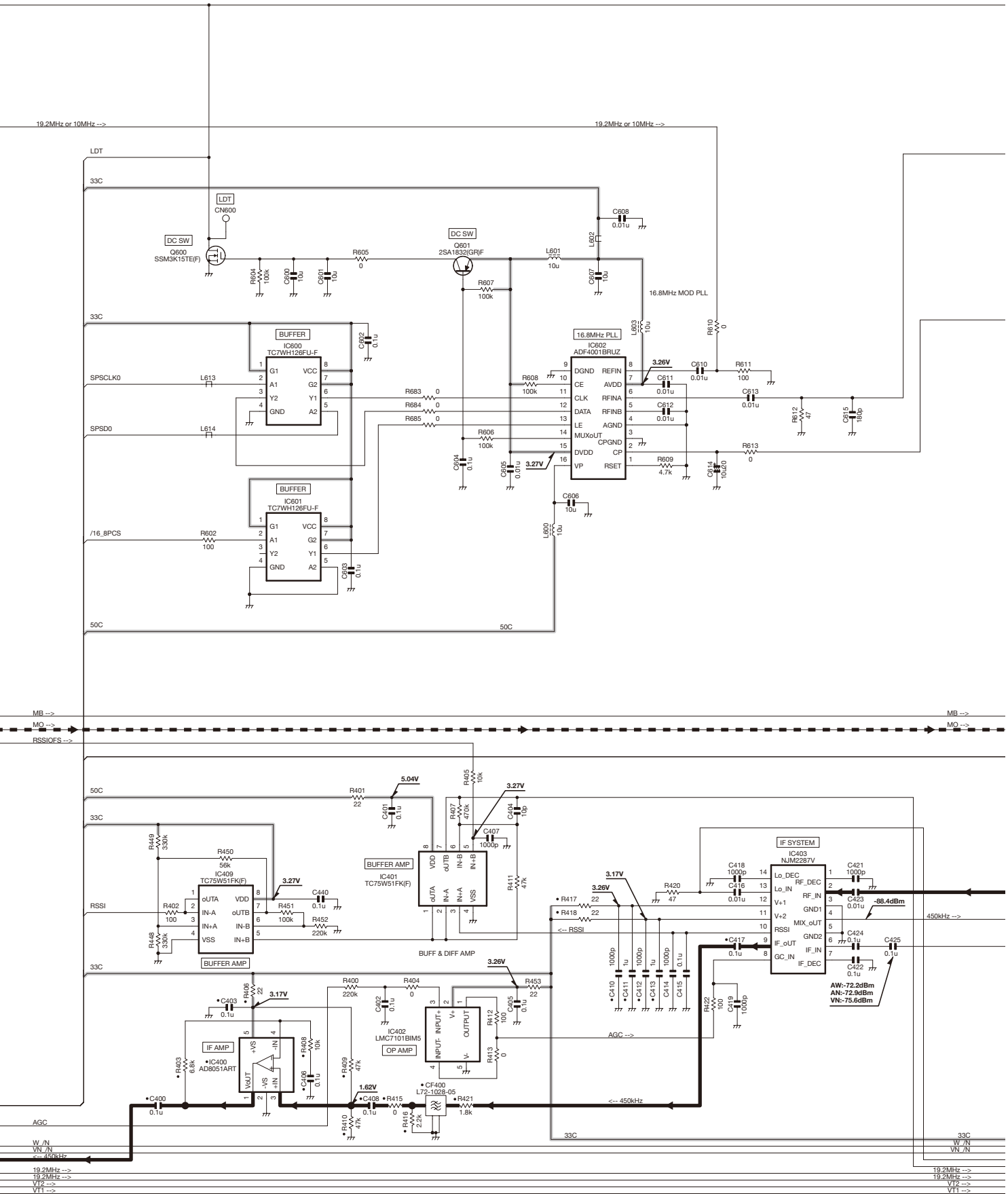
# SCHEMATIC DIAGRAM NXR-710

TX-RX UNIT (X57-7942-71)



# NXR-710 SCHEMATIC DIAGRAM

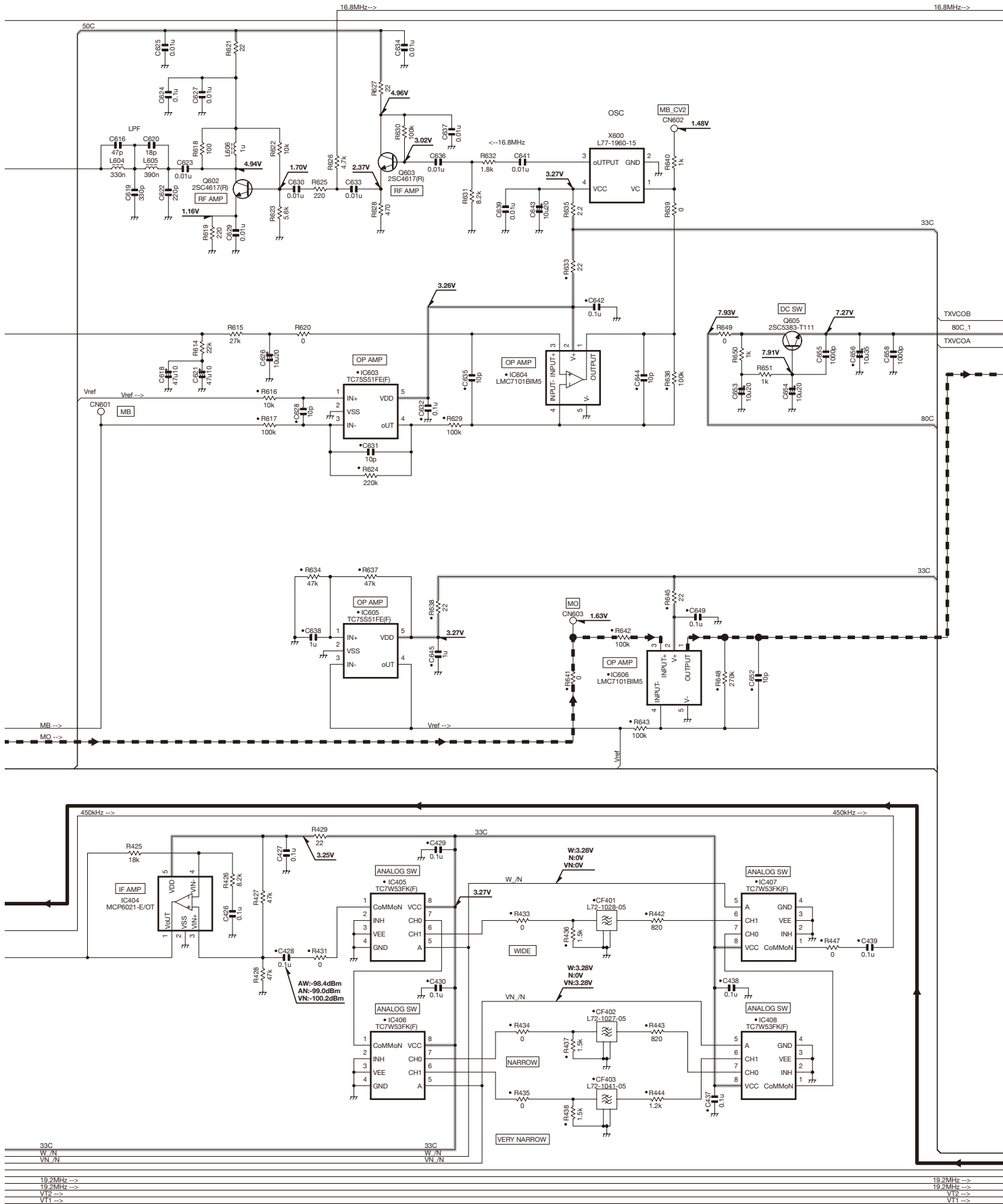
TX-RX UNIT (X57-7942-71)





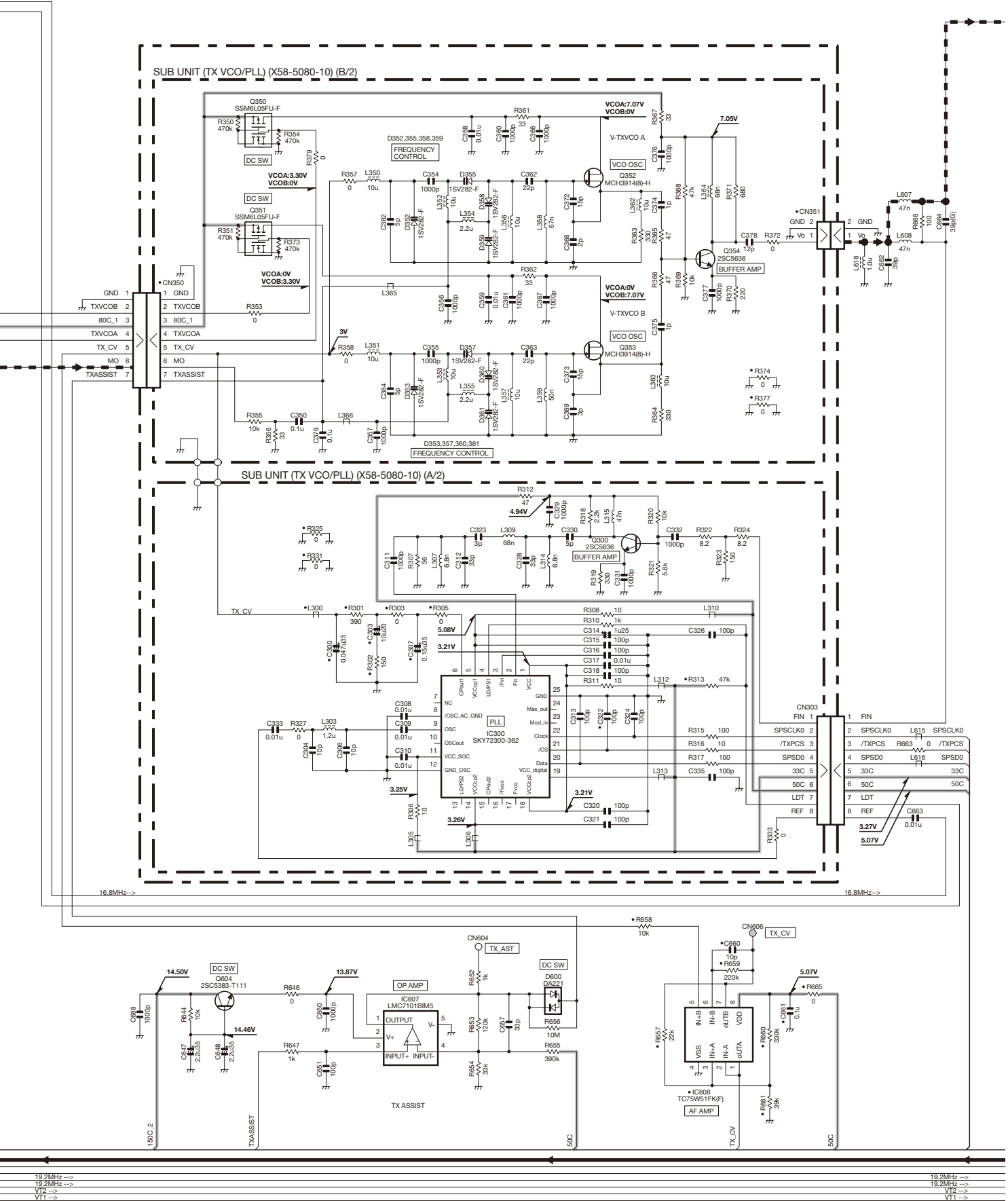
# SCHEMATIC DIAGRAM NXR-710

TX-RX UNIT (X57-7942-71)



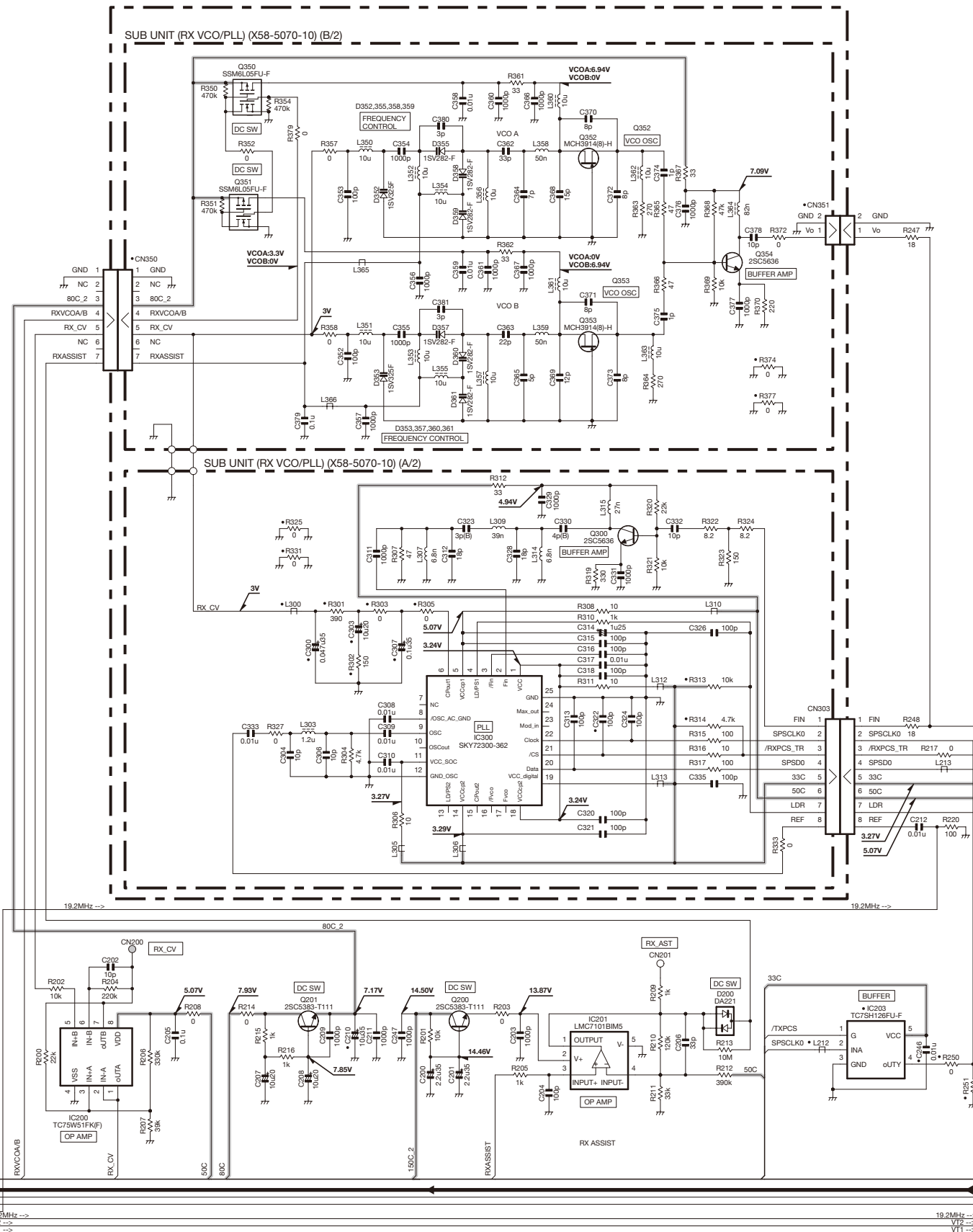
# NXR-710 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7942-71)



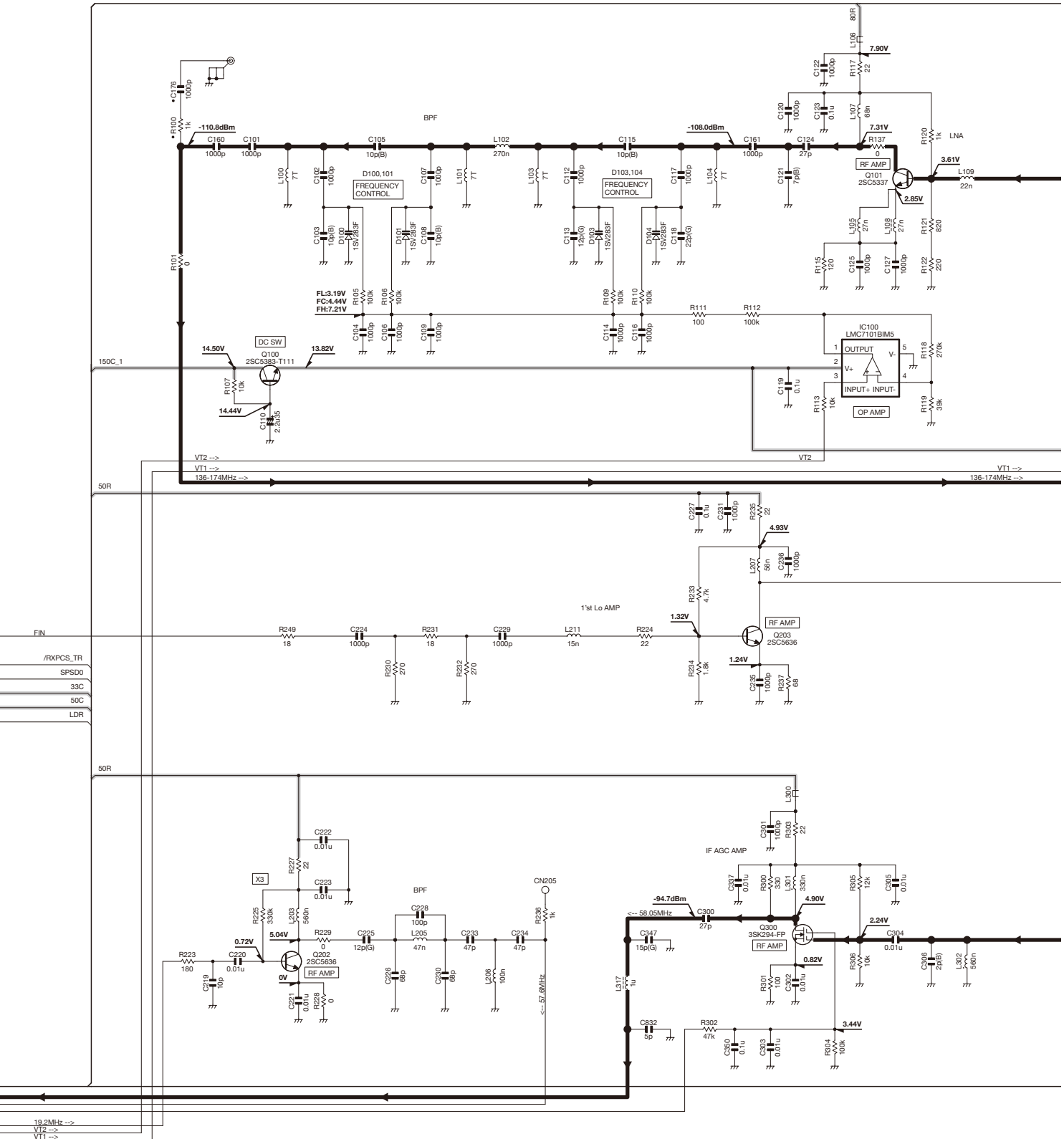
# SCHEMATIC DIAGRAM NXR-710

TX-RX UNIT (X57-7942-71)



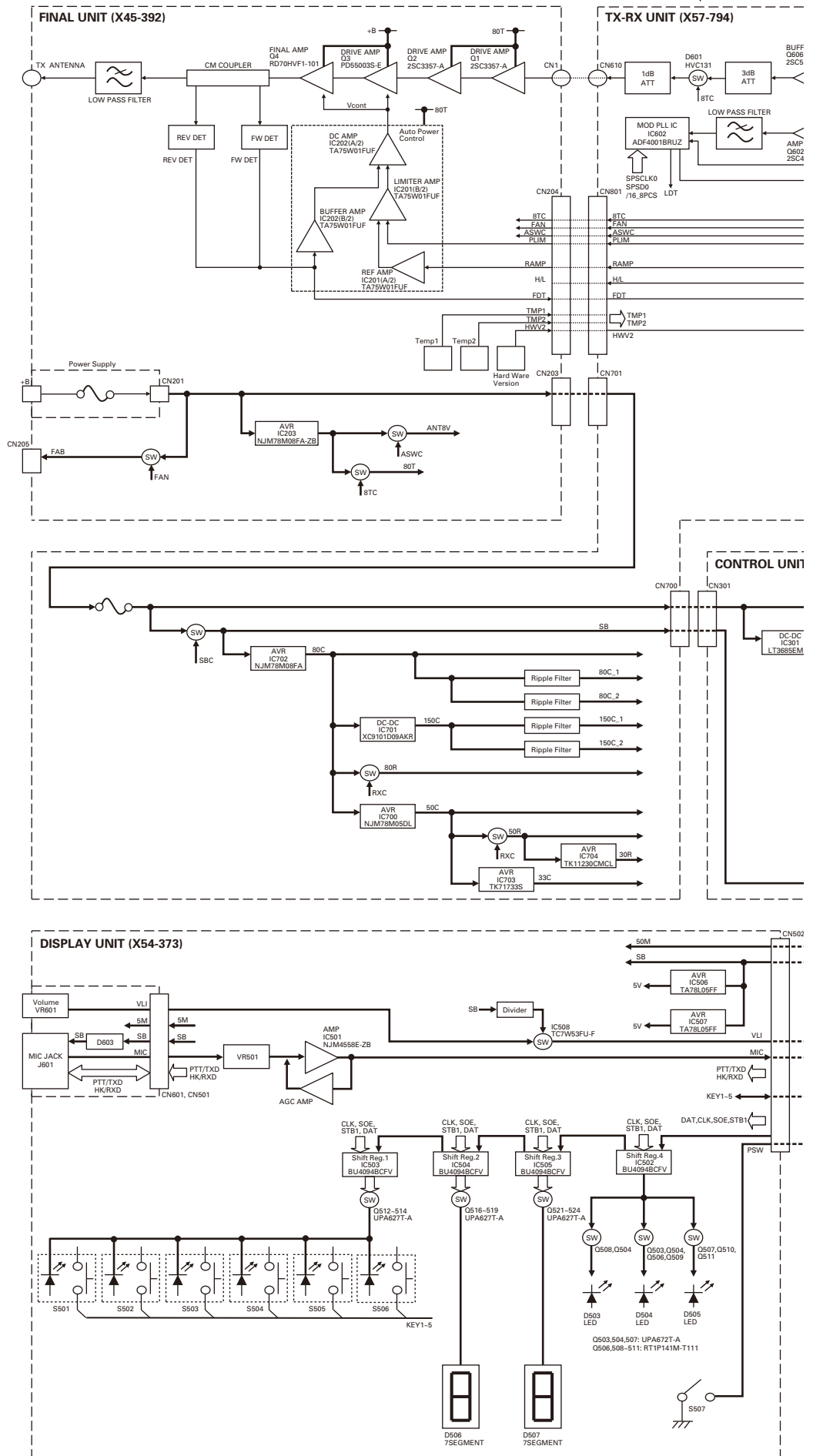
# NXR-710 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7942-71)

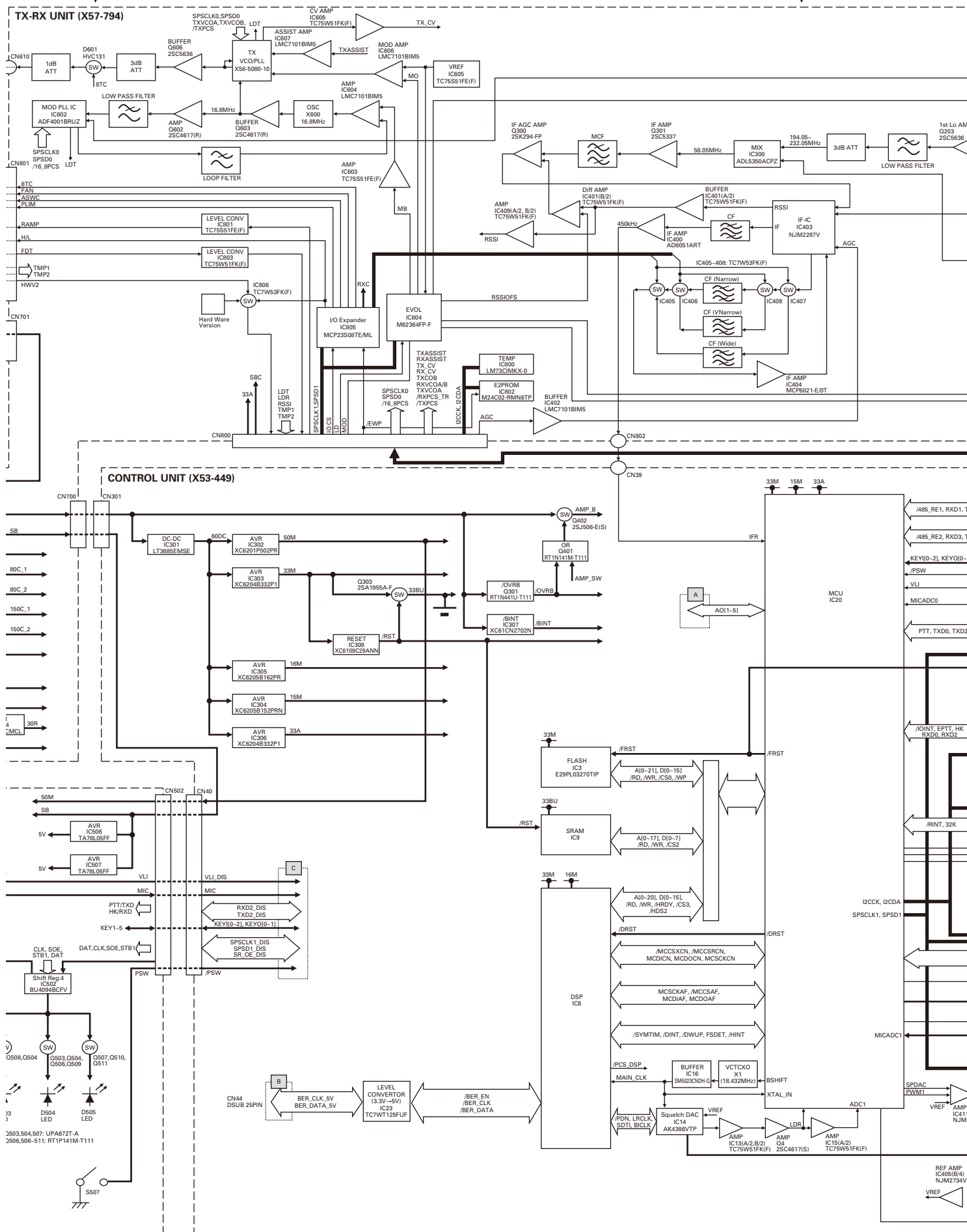




# NXR-710 BLOCK DIAGRAM



# BLOCK DIAGRAM NXR-710







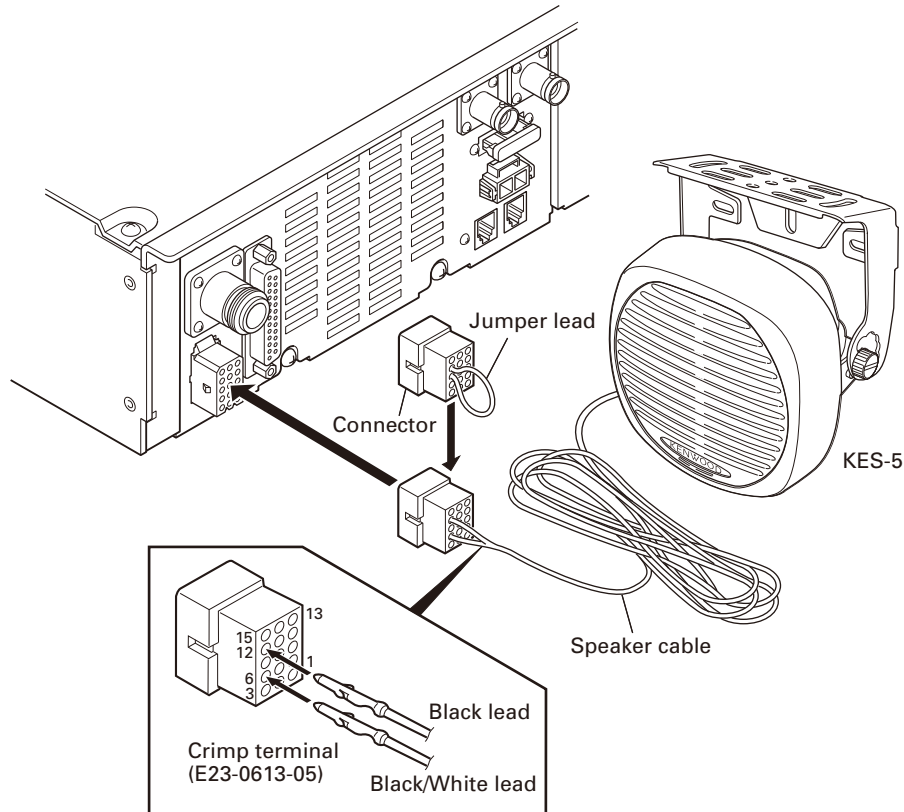
## OPTIONAL ACCESSORIES: KES-5 (EXTERNAL SPEAKER)

### When Using an External Speaker

1. Make sure the unit's power is tuned off.
2. When using the external speaker, remove the jumper lead from the connector, and attach the speaker cable.
3. When not using the external speaker, replace the jumper lead and insert the connector into the speaker jack (pin 9 and 12).

### Specifications

Maximum input power .....	40W
Impedance .....	4Ω
Dimensions (W x H x D) projection not included .....	129 x 129 x 77 mm
Weight .....	820g



## SPECIFICATIONS

### General

Frequency Ranges.....	136~174MHz
Number of Channels.....	30
Channel Spacing	
Analogue.....	12.5/ 20/ 25kHz
Digital.....	6.25/ 12.5kHz
PLL Channel Step.....	2.5/ 3.125kHz
Antenna Impedance .....	50Ω
Operating Voltage.....	13.2V DC (10.8~15.6V DC)
Current Drain	
Standby.....	0.5A
Receive.....	1.0A
Transmit.....	11.0A
Duty Cycle (TX, RX).....	100% at 25W, 50% at maximum power
Operating Temperature Range .....	-30°C~+60°C
Frequency Stability.....	±1.0ppm
Dimension (W x H x D) (Projections not included).....	482.6 x 88 x 340 mm
Weight (net).....	9.7kg

### Receiver

Sensitivity (Analogue)	
EIA 12dB SINAD.....	0.28μV
EN 20dB SINAD.....	-3dBμVemf (0.35μV)
Sensitivity (Digital)	
3% BER.....	12.5kHz: 0.28μV, 6.25kHz: 0.22μV
1% BER.....	12.5kHz: -4dBμVemf (0.32μV), 6.25kHz: -6dBμVemf (0.25μV)
Adjacent Channel Selectivity (Analogue).....	25kHz: 83dB, 20kHz: 81dB, 12.5kHz: 77dB
Intermodulation (Analogue).....	72dB
Spurious Respons Rejection (Analogue).....	85dB
Audio Distortion.....	Less than 2.5% at 1000Hz
Audio Output.....	4W (at 4Ω, less than 5% distortion)

### Transmitter

RF Power Output.....	5~50W
Modulation Limiting (Analogue).....	±5.0kHz at 25kHz, ±4.0kHz at 20kHz, ±2.5kHz at 12.5kHz
Spurious Emission.....	-36dBm≤1GHz, -30dBm>1GHz
FM Noise (EIA) (Analogue).....	25kHz: 55dB, 20kHz: 53dB, 12.5kHz: 50dB
Modulation Distortion.....	Less than 1% at 1000Hz
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.

**MEMO**

# NXR-710

## **Kenwood Corporation**

2967-3, Ishikawa-machi, Hachioji-shi, Tokyo, 192-8525 Japan

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CA 90801-5745, U.S.A.

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6070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8

### **Kenwood Electronics Deutschland GmbH**

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### **Kenwood Electronics UK Limited**

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WD18 9EB United Kingdom

### **Kenwood Electronics Europe B.V.**

Amsterdamseseweg 37, 1422 AC Uithoorn, The Netherlands

### **Kenwood Electronics Italia S.p.A.**

Via G. Sirtori, 7/9 20129 Milano, Italy

### **Kenwood Ibérica, S.A.**

Bolivia, 239-08020 Barcelona, Spain

### **Kenwood Electronics Australia Pty. Ltd.**

Talavera Business Park Building A, 4 Talavera Road,  
North Ryde NSW 2113 Australia

### **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**

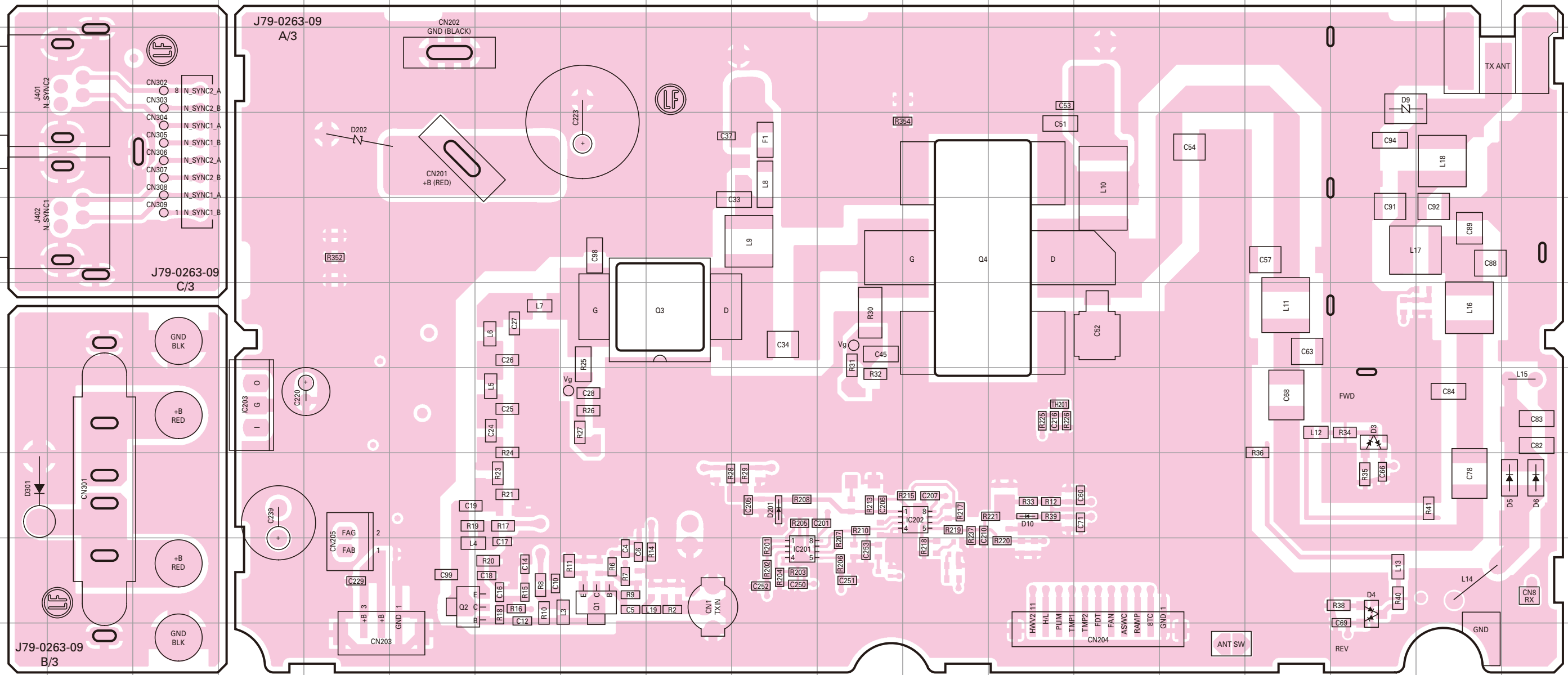
1 Ang Mo Kio Street 63, Singapore 569110

# NXR-710 PC BOARD

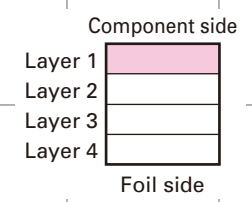
# PC BOARD NXR-710

**FINAL UNIT (X45-3922-71)**  
**Component side view (J79-0263-09)**

**FINAL UNIT (X45-3922-71)**  
**Component side view (J79-0263-09)**



Ref. No.	Address	Ref. No.	Address
IC201	9J	D4	9Q
IC202	8L	D5	8S
IC203	7D	D6	8S
Q1	9H	D9	3Q
Q2	9F	D10	8M
Q3	6I	D201	8J
Q4	5L	D202	4E
D3	7Q	D301	8A



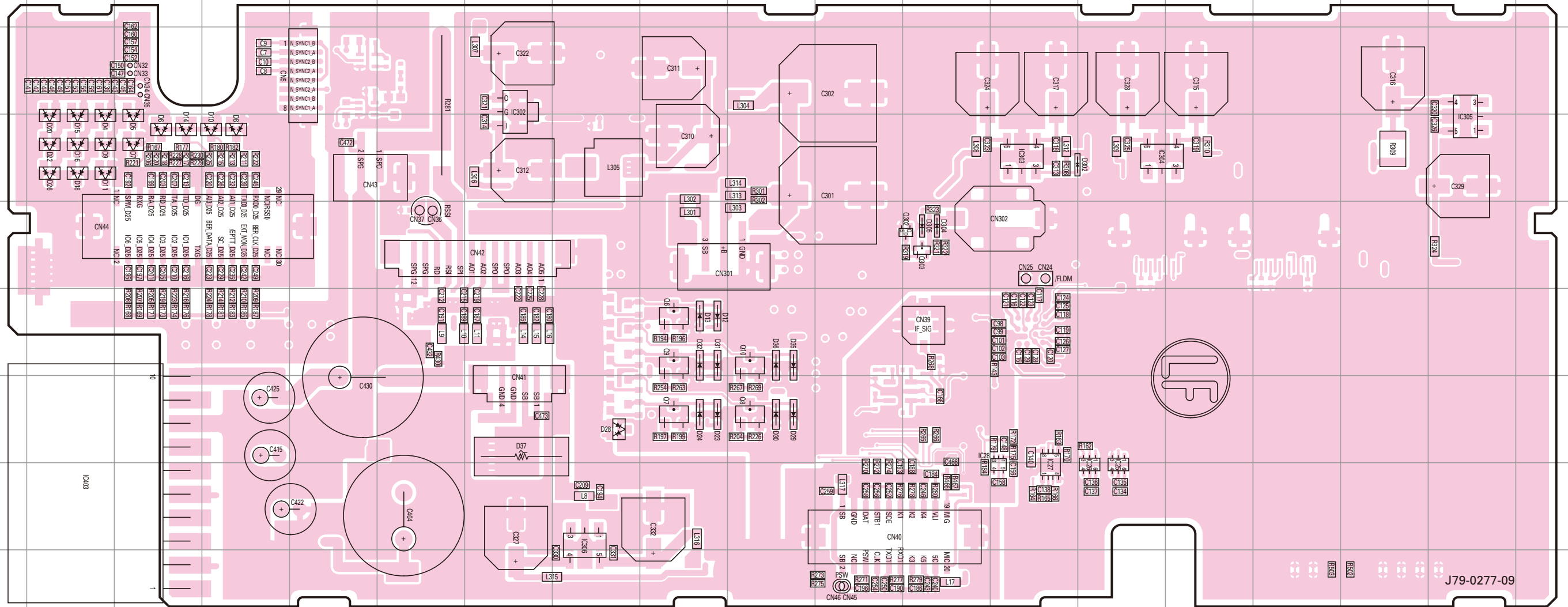


# NXR-710 PC BOARD

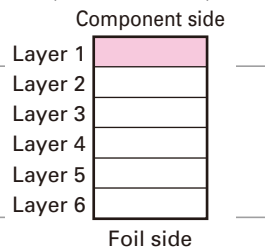
# PC BOARD NXR-710

**CONTROL UNIT (X53-4490-10)**  
**Component side view (J79-0277-09)**

**CONTROL UNIT (X53-4490-10)**  
**Component side view (J79-0277-09)**



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC25	8N	Q6	6I	D7	4C	D18	4B	D32	6I
IC26	8N	Q7	7I	D8	4D	D20	4B	D35	6J
IC27	8M	Q8	7J	D9	4B	D22	4B	D36	6J
IC28	8M	Q9	6I	D10	4D	D23	7I	D37	7G
IC302	3G	Q10	6J	D11	4B	D24	7I	D302	4N
IC303	4M	Q302	5L	D12	6I	D26	4B	D304	5L
IC304	4N	Q303	5L	D13	6I	D28	7H	D305	5L
IC305	4R	D4	4B	D14	4C	D29	7J		
IC306	8H	D5	4C	D15	4B	D30	7J		
IC403	8B	D6	4C	D16	4B	D31	6I		

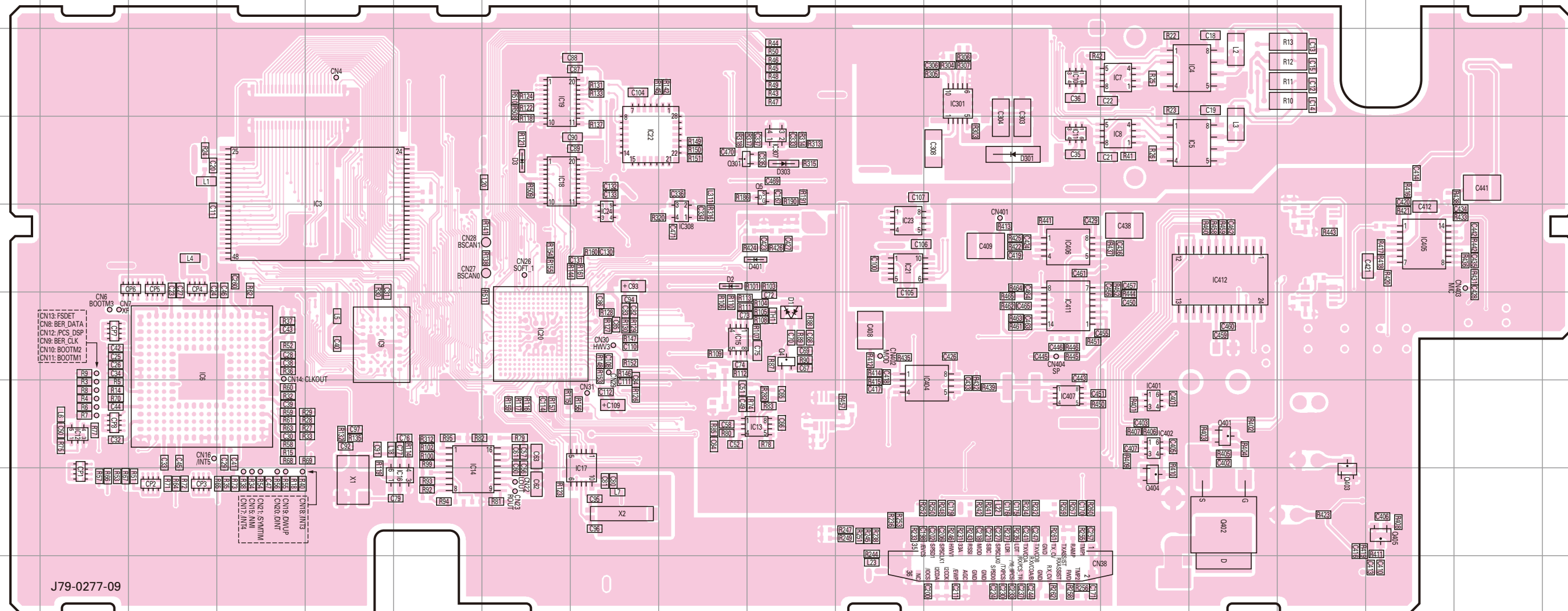


# NXR-710 PC BOARD

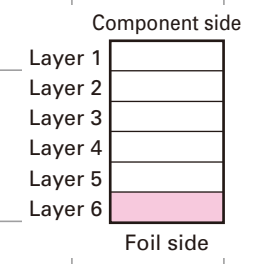
# PC BOARD NXR-710

**CONTROL UNIT (X53-4490-10)**  
Foil side view (J79-0277-09)

**CONTROL UNIT (X53-4490-10)**  
Foil side view (J79-0277-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC3	4E	IC13	7J	IC23	5K	IC407	7M	Q405	8Q
IC4	3O	IC14	8F	IC24	5H	IC411	6M	D1	6J
IC5	4O	IC15	6I	IC301	3L	IC412	5O	D2	5I
IC6	6C	IC16	8F	IC307	4J	Q4	6J	D3	4G
IC7	3N	IC17	8H	IC308	5I	Q5	4J	D301	4M
IC8	4N	IC18	4G	IC401	7N	Q301	4I	D303	4J
IC9	6E	IC19	3G	IC402	7N	Q401	7O	D401	5J
IC10	3M	IC20	6G	IC404	7L	Q402	8O		
IC11	4M	IC21	5K	IC405	5Q	Q403	8P		
IC12	7B	IC22	4H	IC406	5M	Q404	8N		



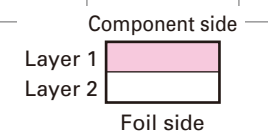
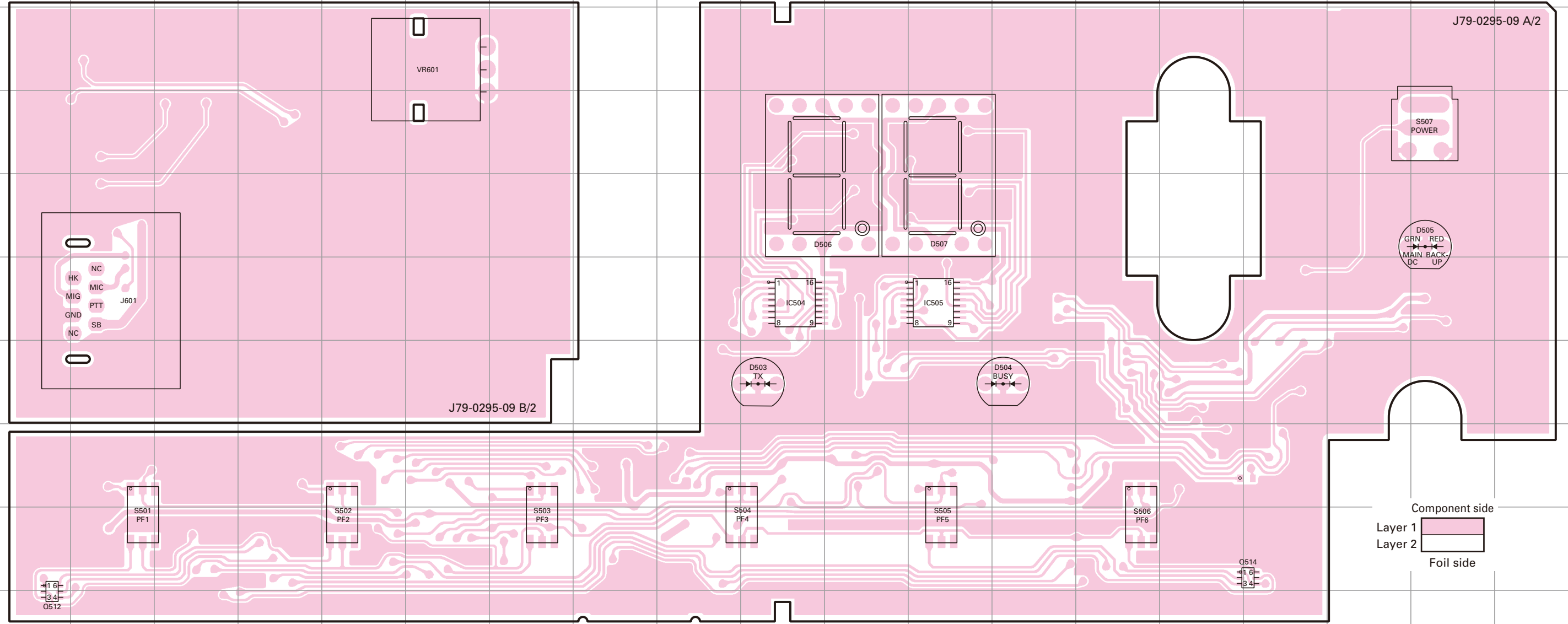


# NXR-710 PC BOARD

# PC BOARD NXR-710

DISPLAY UNIT (X54-3730-20) Component side view (J79-0295-09)

DISPLAY UNIT (X54-3730-20) Component side view (J79-0295-09)



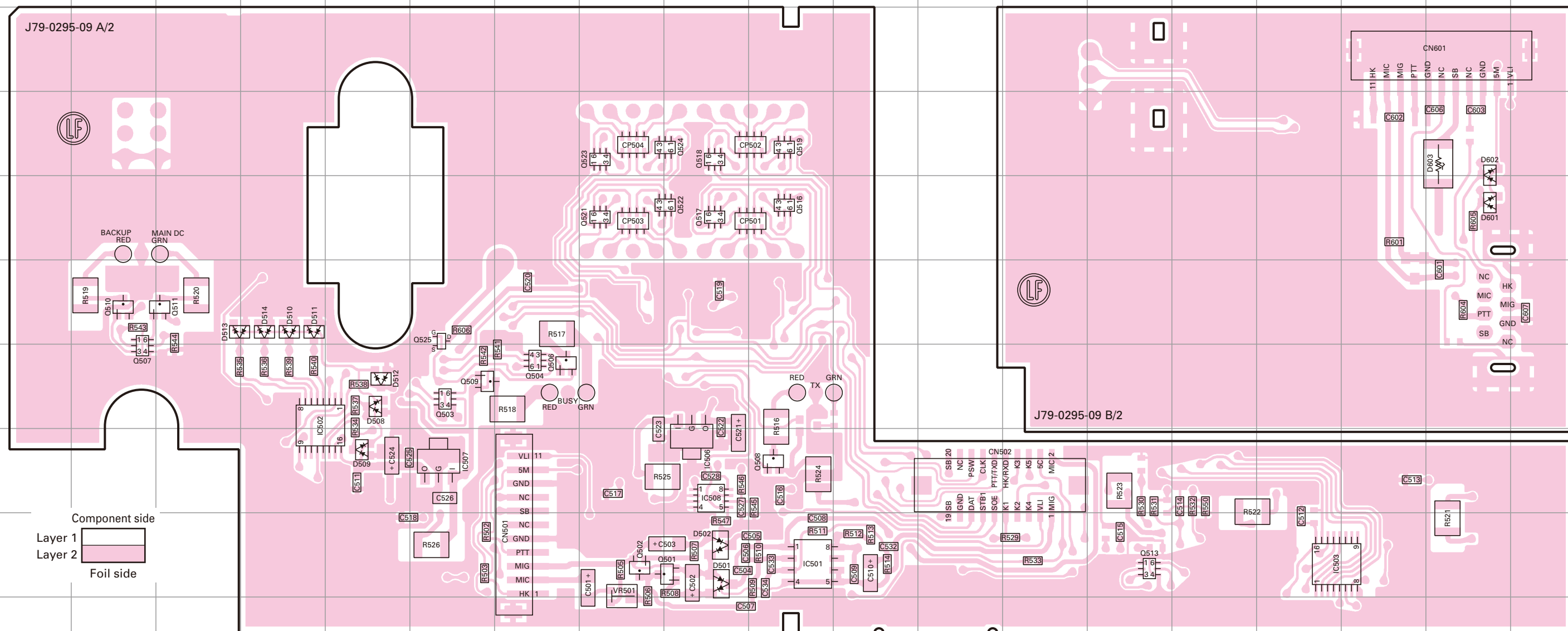
Ref. No.	Address
IC504	6J
IC505	6L
Q512	10A
Q514	9P
D503	7J
D504	7M
D505	5R
D506	5J
D507	5L

# NXR-710 PC BOARD

# PC BOARD NXR-710

DISPLAY UNIT (X54-3730-20) Foil side view (J79-0295-09)

DISPLAY UNIT (X54-3730-20) Foil side view (J79-0295-09)



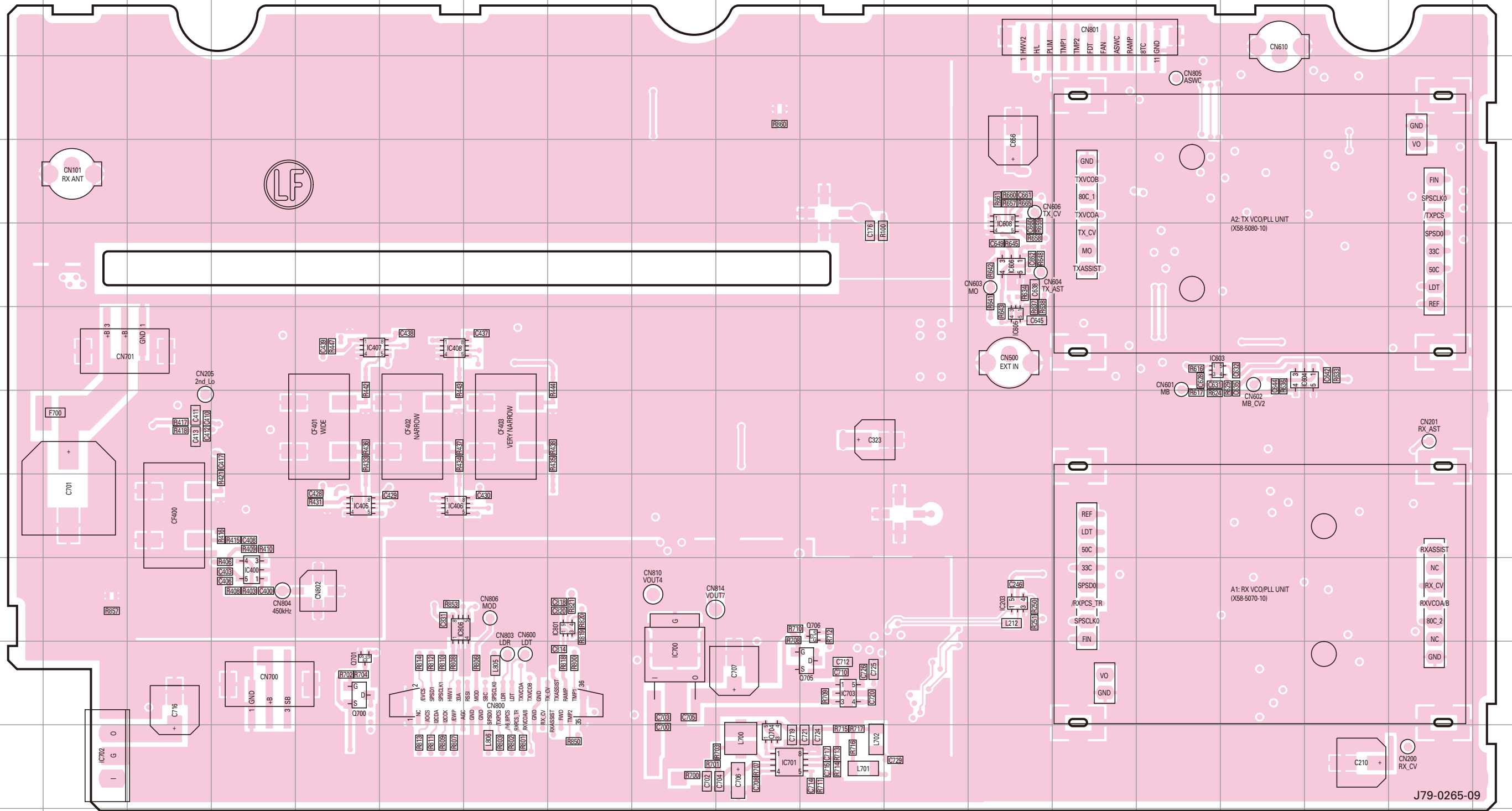
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC501	9J	Q506	7G	Q519	4J	D510	6D
IC502	7D	Q507	7B	Q521	5H	D511	6D
IC503	9P	Q508	8J	Q522	5I	D512	7E
IC506	8I	Q509	7F	Q523	4H	D513	6C
IC507	8F	Q510	6B	Q524	4I	D514	6D
IC508	8I	Q511	6C	Q525	6F	D601	5R
Q501	9I	Q513	9N	D501	9I	D602	4R
Q502	9H	Q516	5J	D502	9I	D603	4R
Q503	7F	Q517	5I	D508	7E		
Q504	7G	Q518	4I	D509	8E		

# NXR-710 PC BOARD

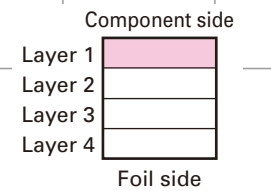
# PC BOARD NXR-710

**TX-RX UNIT (X57-7942-71)**  
**Component side view (J79-0265-09)**

**TX-RX UNIT (X57-7942-71)**  
**Component side view (J79-0265-09)**



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC203	9M	IC603	6O	IC701	11J	Q701	10E
IC400	9D	IC604	6P	IC702	11B	Q704	11J
IC405	8E	IC605	6M	IC703	10K	Q705	10K
IC406	8F	IC606	5M	IC801	9H	Q706	9K
IC407	6E	IC608	5M	IC806	9F		
IC408	6F	IC700	10I	Q700	10E		



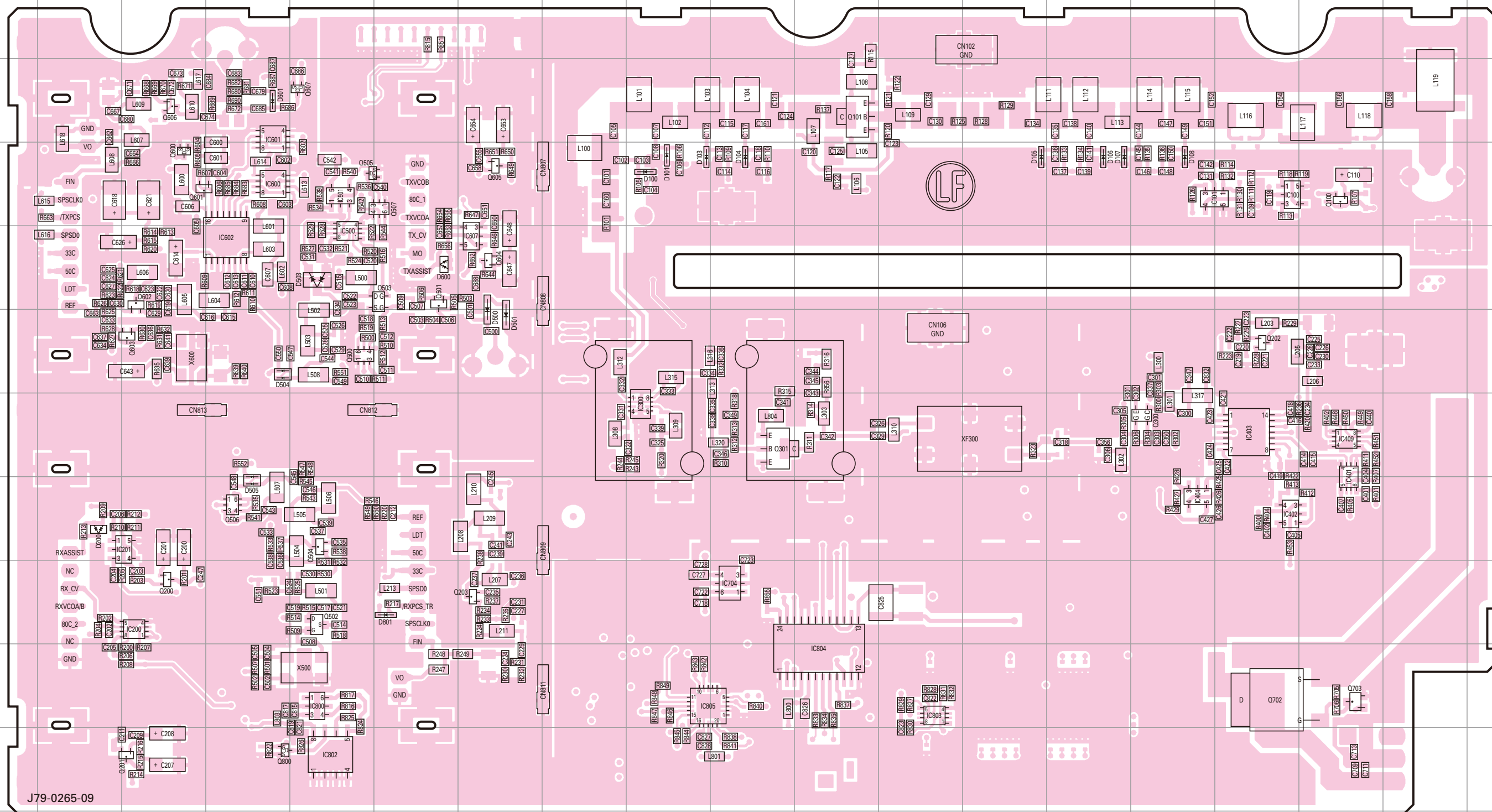
J79-0265-09

# NXR-710 PC BOARD

# PC BOARD NXR-710

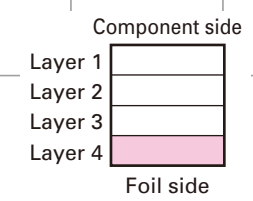
**TX-RX UNIT (X57-7942-71)**  
**Foil side view (J79-0265-09)**

**TX-RX UNIT (X57-7942-71)**  
**Foil side view (J79-0265-09)**



J79-0265-09

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address		
IC100	4P	IC402	8P	IC600	4D	IC802	11E	Q200	9C	Q500	6E	Q506	8D	Q604	5G	Q800	11D	D106	4N	D503	5E
IC101	4O	IC403	7P	IC601	3D	IC803	10L	Q201	11C	Q501	5F	Q507	4F	Q605	4G	D100	4I	D107	4N	D504	6D
IC200	9C	IC404	8O	IC602	5D	IC804	10K	Q202	6P	Q502	9E	Q600	4C	Q606	3C	D101	4I	D108	4O	D505	8D
IC201	8C	IC409	7Q	IC607	5G	IC805	10I	Q203	9G	Q503	5F	Q601	4C	Q607	3E	D103	4I	D200	8B	D600	5F
IC300	7I	IC500	5E	IC704	9J	Q100	4Q	Q300	7O	Q504	8E	Q602	5C	Q702	10P	D104	4J	D500	6G	D601	3D
IC401	7Q	IC501	4E	IC800	10E	Q101	3K	Q301	7J	Q505	4E	Q603	6C	Q703	10Q	D105	4M	D501	6G	D801	9F

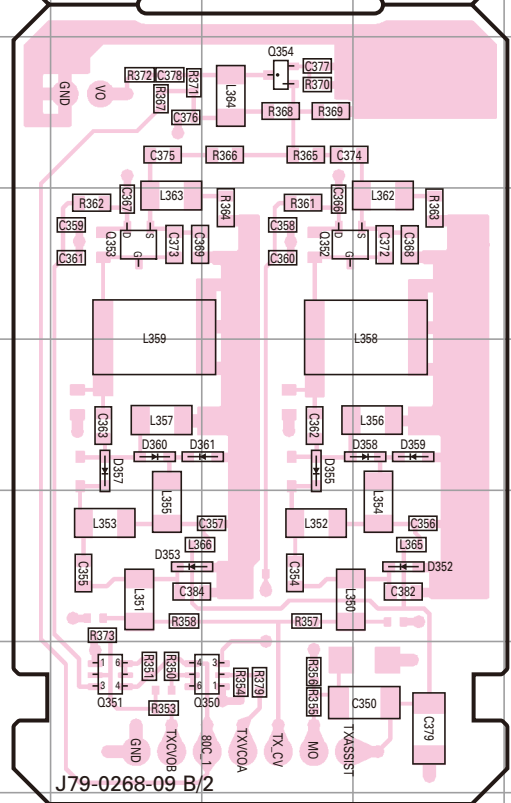
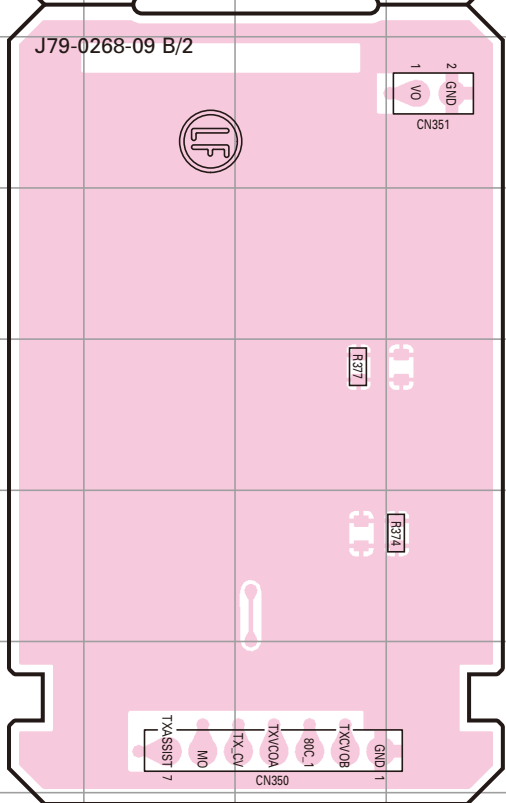
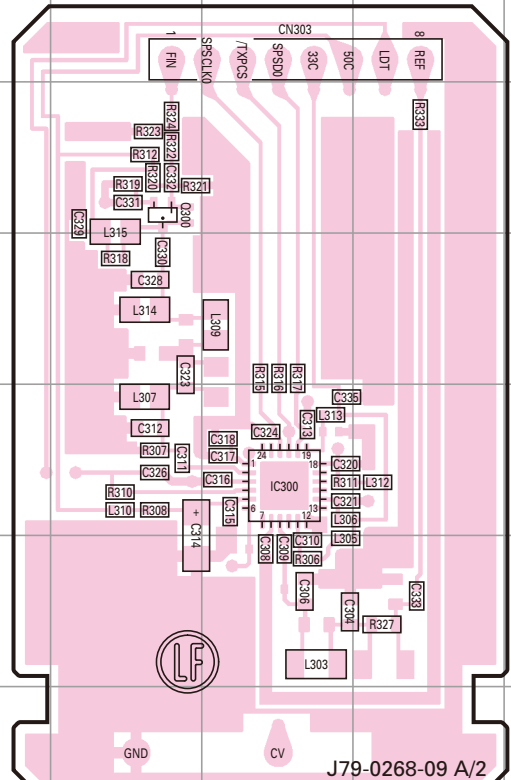
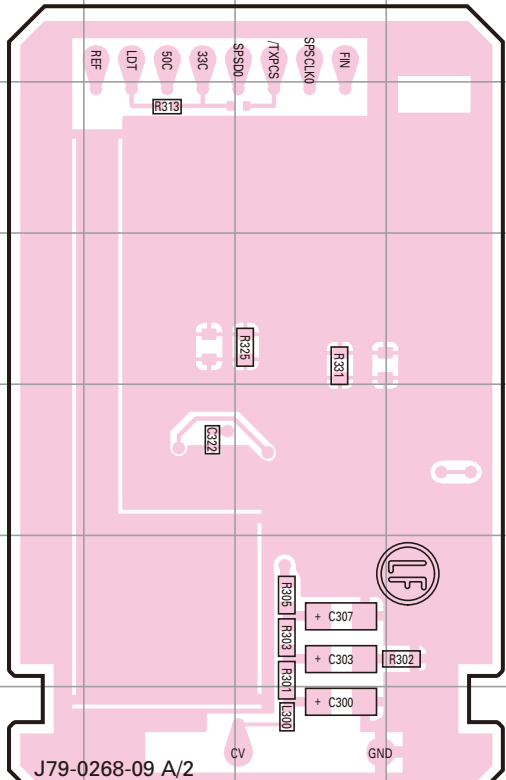




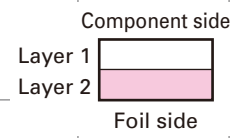
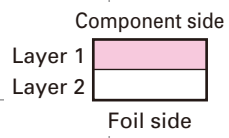
# PC BOARD NXR-710

**TX VCO/PLL UNIT (X58-5080-10)**  
**Component side view (J79-0268-09)**

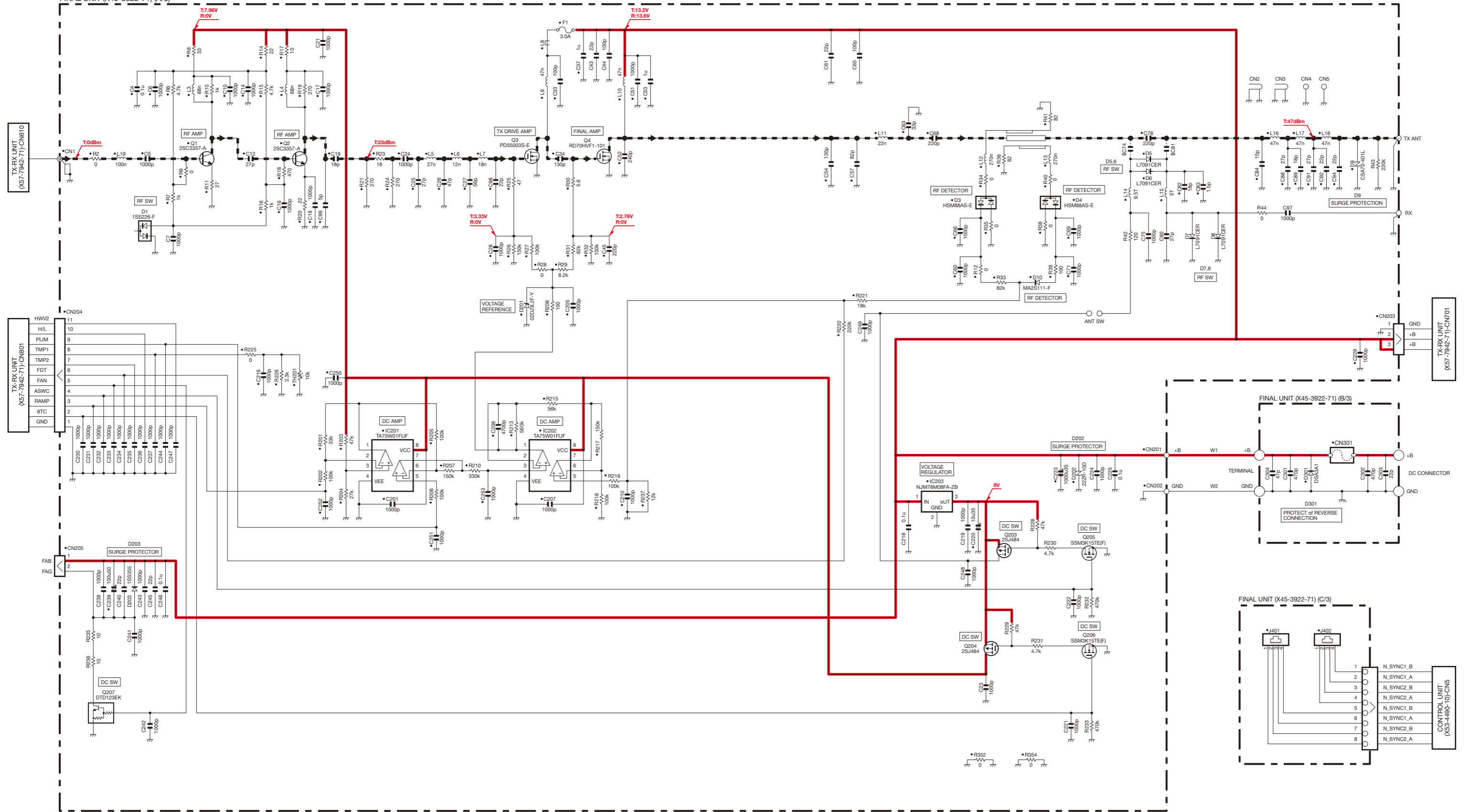
**TX VCO/PLL UNIT (X58-5080-10)**  
**Foil side view (J79-0268-09)**



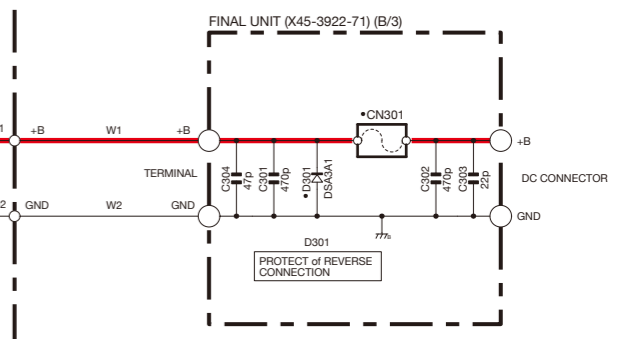
Ref. No.	Address
IC300	5G
Q300	3F
Q350	12G
Q351	12F
Q352	9G
Q353	9F
Q354	8G
D352	11H
D353	11F
D355	10G
D357	10F
D358	10H
D359	10H
D360	10F
D361	10G



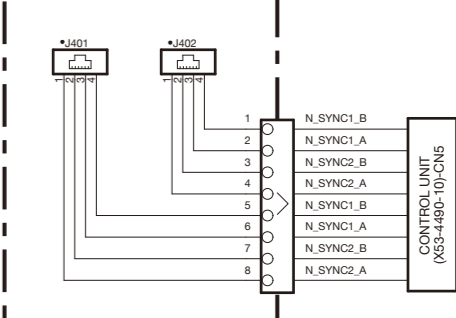
FINAL UNIT (X45-3922-71) (A/3)

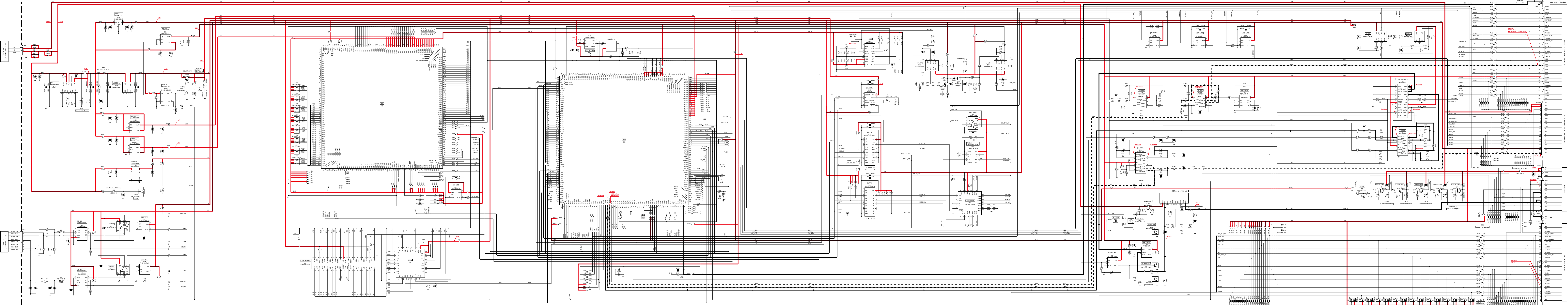


FINAL UNIT (X45-3922-71) (B/3)



FINAL UNIT (X45-3922-71) (C/3)

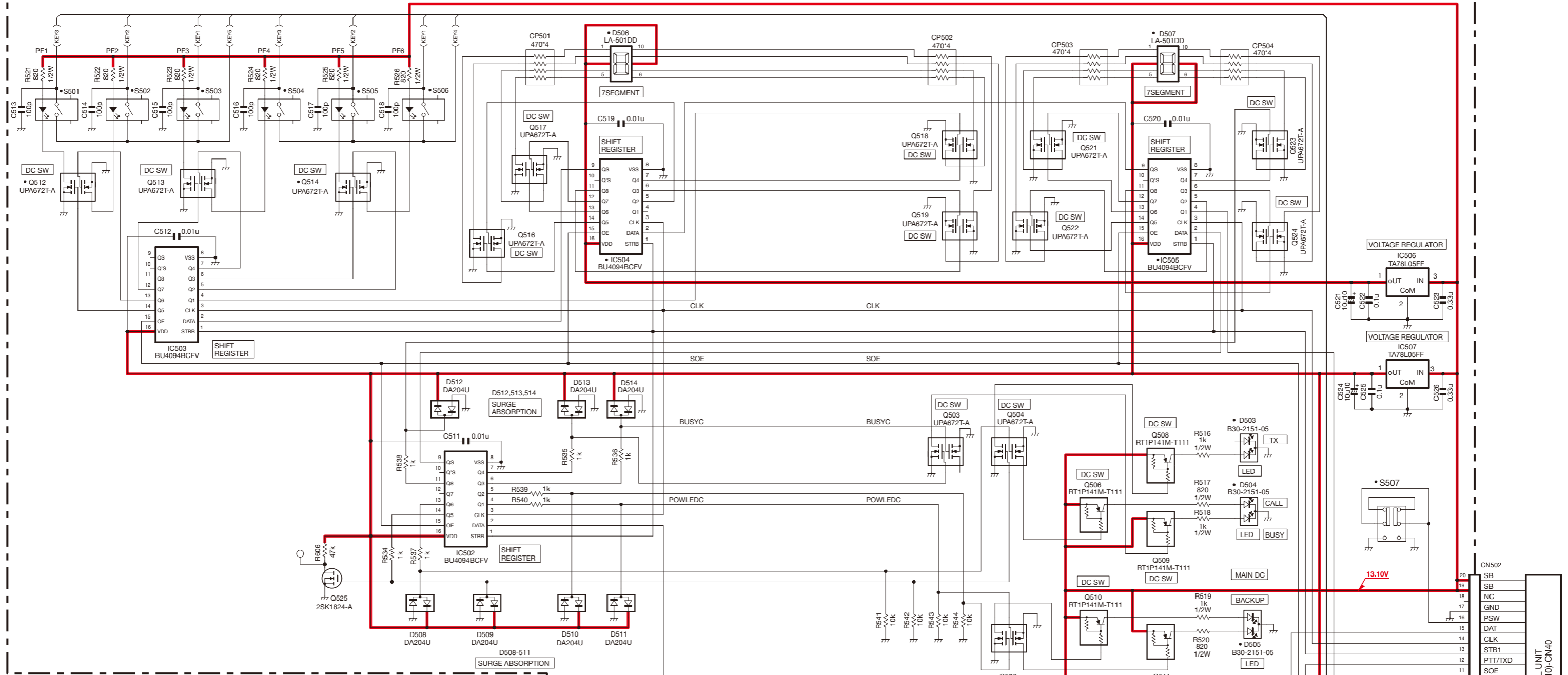




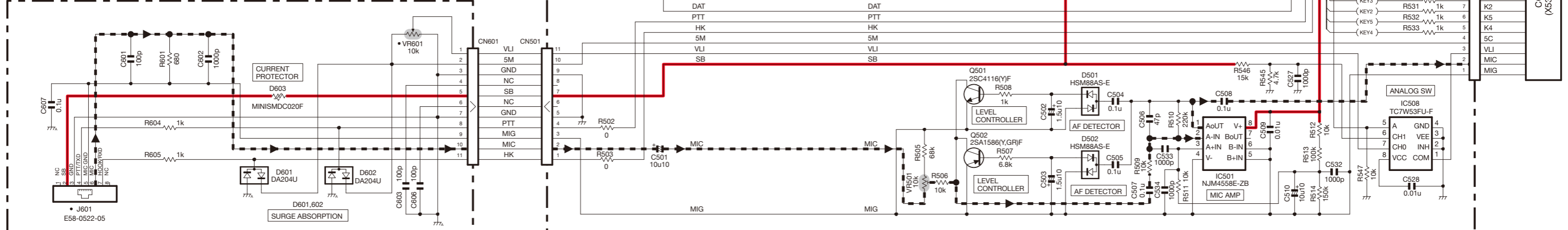
Terminal	Signal	Terminal	Signal
1	+	1	+
2	-	2	-
3	+	3	+
4	-	4	-
5	+	5	+
6	-	6	-
7	+	7	+
8	-	8	-
9	+	9	+
10	-	10	-
11	+	11	+
12	-	12	-
13	+	13	+
14	-	14	-
15	+	15	+
16	-	16	-
17	+	17	+
18	-	18	-
19	+	19	+
20	-	20	-
21	+	21	+
22	-	22	-
23	+	23	+
24	-	24	-
25	+	25	+
26	-	26	-
27	+	27	+
28	-	28	-
29	+	29	+
30	-	30	-
31	+	31	+
32	-	32	-
33	+	33	+
34	-	34	-
35	+	35	+
36	-	36	-
37	+	37	+
38	-	38	-
39	+	39	+
40	-	40	-
41	+	41	+
42	-	42	-
43	+	43	+
44	-	44	-
45	+	45	+
46	-	46	-
47	+	47	+
48	-	48	-
49	+	49	+
50	-	50	-

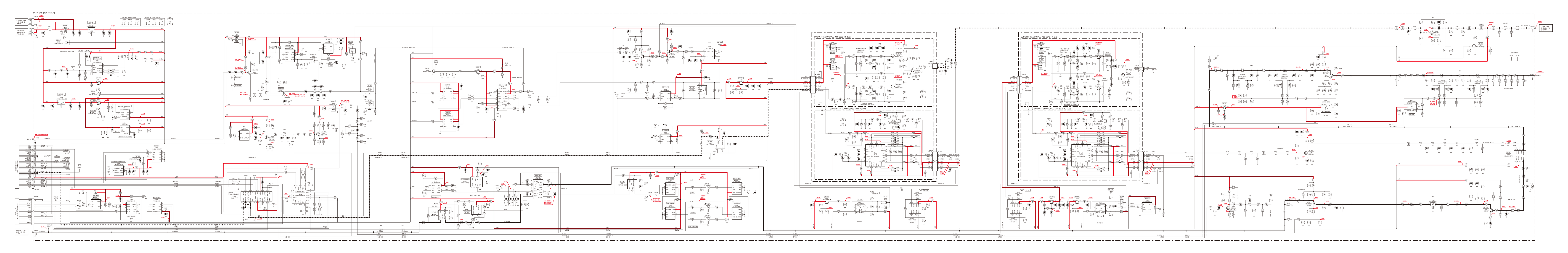


DISPLAY UNIT (X54-3730-20) (A/2)

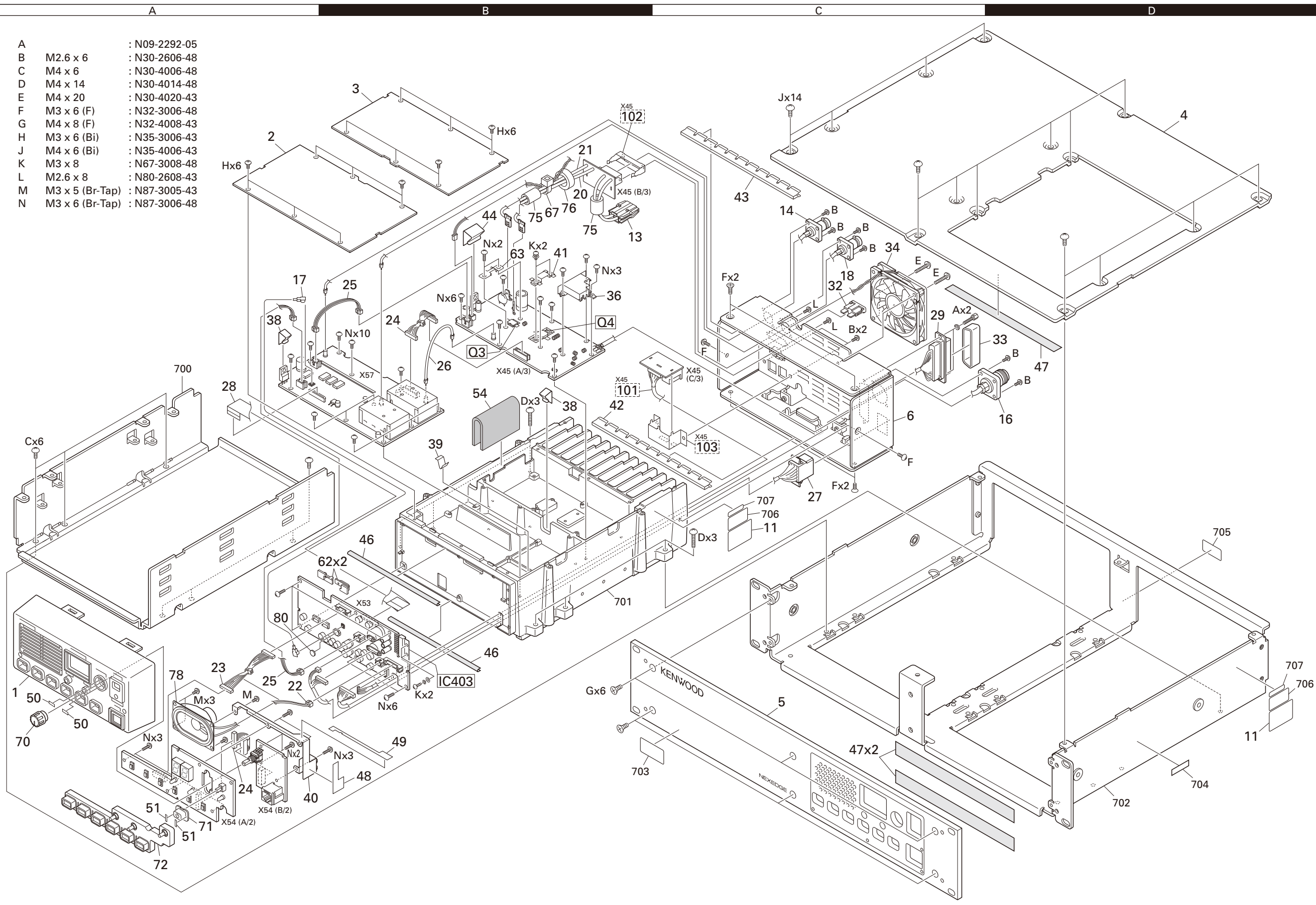


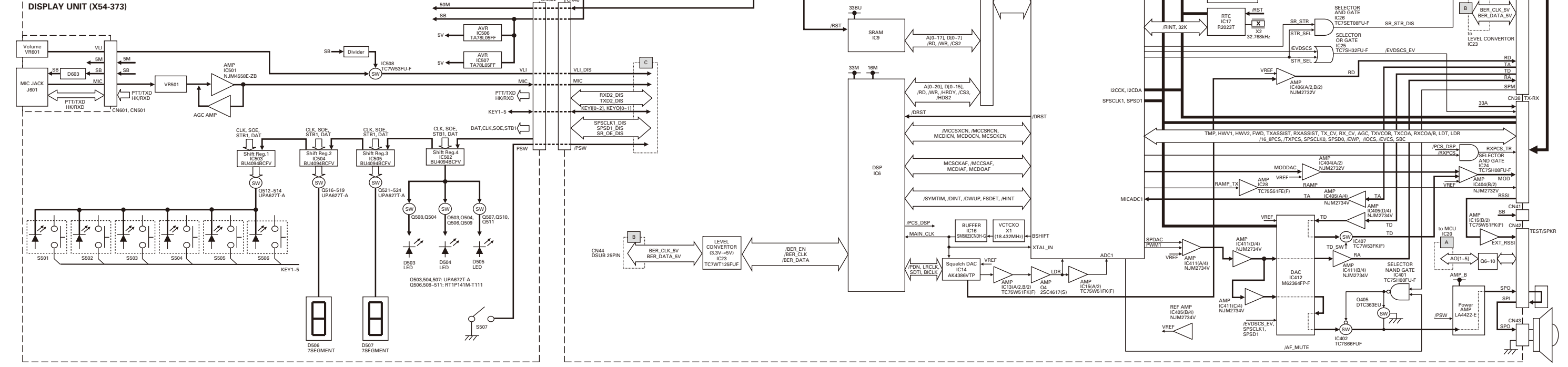
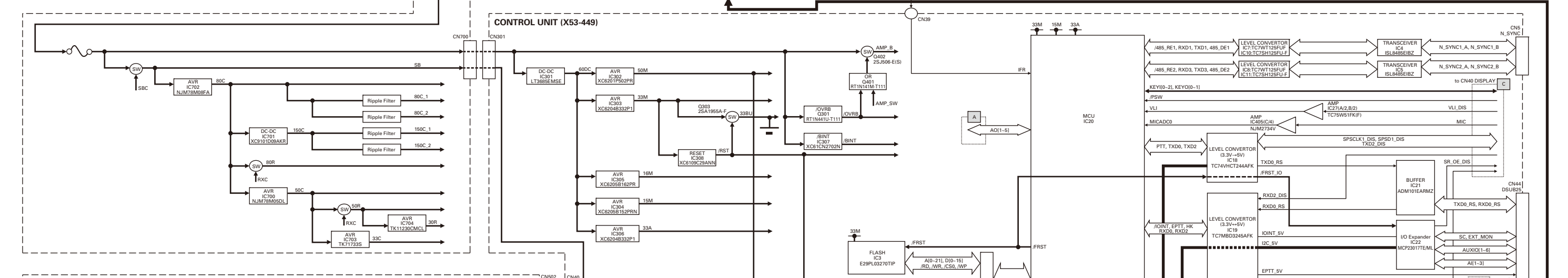
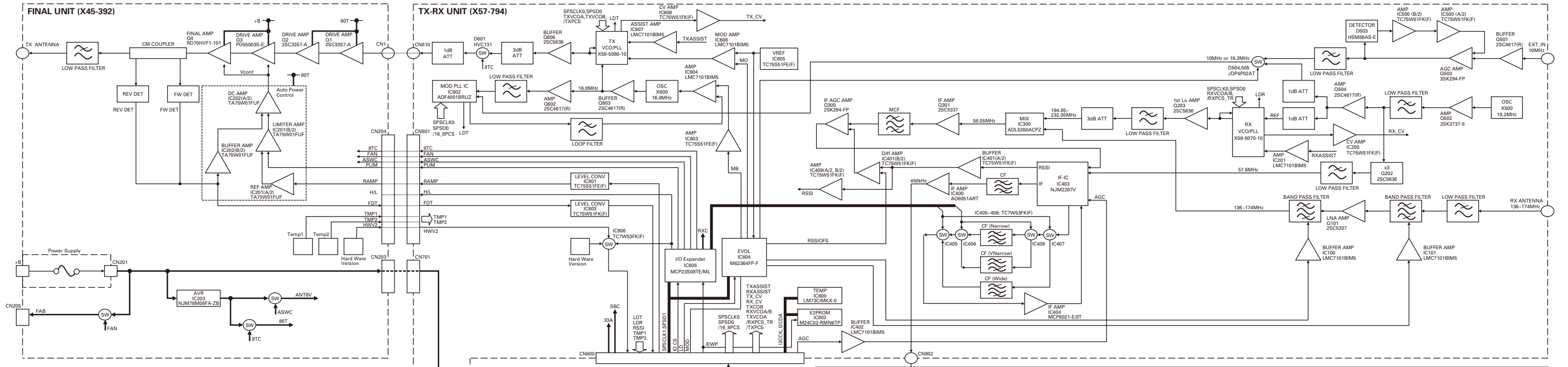
DISPLAY UNIT (X54-3730-20) (B/2)

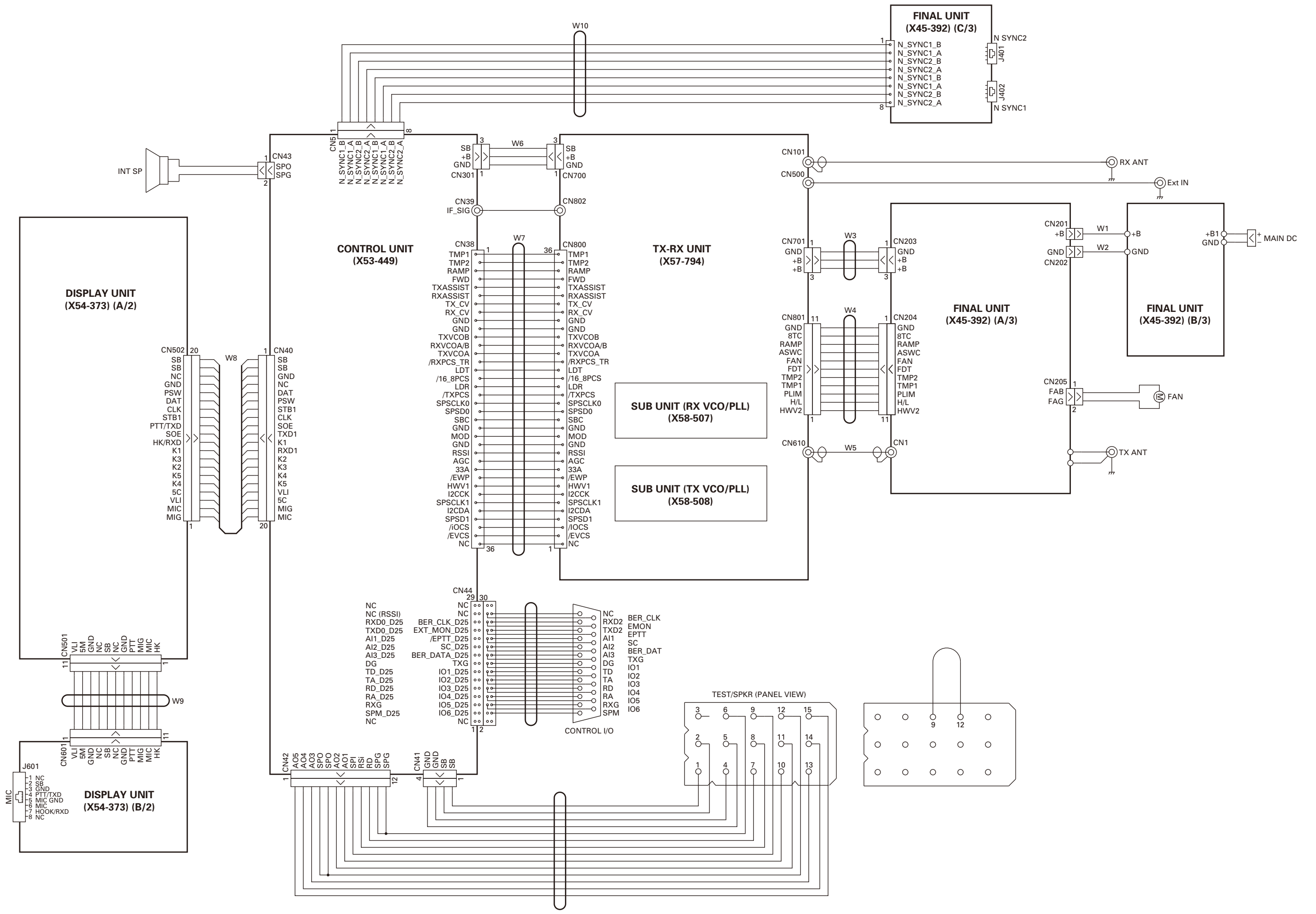




- |   |                 |               |
|---|-----------------|---------------|
| A | :               | N09-2292-05   |
| B | M2.6 x 6        | : N30-2606-48 |
| C | M4 x 6          | : N30-4006-48 |
| D | M4 x 14         | : N30-4014-48 |
| E | M4 x 20         | : N30-4020-43 |
| F | M3 x 6 (F)      | : N32-3006-48 |
| G | M4 x 8 (F)      | : N32-4008-43 |
| H | M3 x 6 (Bi)     | : N35-3006-43 |
| J | M4 x 6 (Bi)     | : N35-4006-43 |
| K | M3 x 8          | : N67-3008-48 |
| L | M2.6 x 8        | : N80-2608-43 |
| M | M3 x 5 (Br-Tap) | : N87-3005-43 |
| N | M3 x 6 (Br-Tap) | : N87-3006-48 |







**DISPLAY UNIT  
(X54-373) (A/2)**

**CONTROL UNIT  
(X53-449)**

**TX-RX UNIT  
(X57-794)**

**SUB UNIT (RX VCO/PLL)  
(X58-507)**

**SUB UNIT (TX VCO/PLL)  
(X58-508)**

**FINAL UNIT  
(X45-392) (A/3)**

**FINAL UNIT  
(X45-392) (B/3)**

**FINAL UNIT  
(X45-392) (C/3)**

**DISPLAY UNIT  
(X54-373) (B/2)**

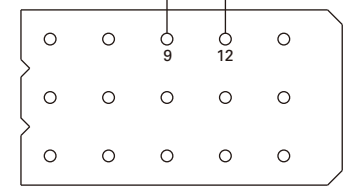
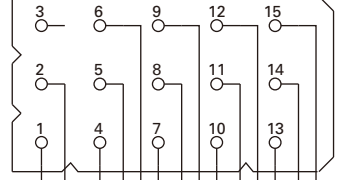
NC  
 NC (RSSI)  
 RXD0\_D25  
 TXD0\_D25  
 AI1\_D25  
 AI2\_D25  
 AI3\_D25  
 DG  
 TD\_D25  
 TA\_D25  
 RD\_D25  
 RA\_D25  
 RXG  
 SPM\_D25  
 NC

CN44  
 29  
 30  
 NC  
 NC  
 BER\_CLK\_D25  
 EXT\_MON\_D25  
 /EPTT\_D25  
 SC\_D25  
 BER\_DATA\_D25  
 TXG  
 IO1\_D25  
 IO2\_D25  
 IO3\_D25  
 IO4\_D25  
 IO5\_D25  
 IO6\_D25  
 NC

NC  
 BER\_CLK  
 EMON  
 EPTT  
 SC  
 BER\_DAT  
 TXG  
 IO1  
 IO2  
 IO3  
 IO4  
 IO5  
 IO6

CONTROL I/O

TEST/SPKR (PANEL VIEW)



CN502 20  
 SB  
 SB  
 NC  
 GND  
 PSW  
 DAT  
 CLK  
 STB1  
 PTT/TXD  
 SOE  
 HK/RXD  
 K1  
 K3  
 K2  
 K5  
 K4  
 5C  
 VLI  
 MIC  
 MIG

W8

CN40 1  
 SB  
 SB  
 GND  
 NC  
 DAT  
 PSW  
 STB1  
 SOE  
 TXD1  
 K1  
 RXD1  
 K2  
 K3  
 K4  
 K5  
 VLI  
 5C  
 MIG  
 MIC

CN501 11  
 VLI  
 5M  
 GND  
 NC  
 NC  
 GND  
 PTT  
 MIG  
 MIC  
 HK

CN601 11  
 VLI  
 5M  
 GND  
 NC  
 NC  
 GND  
 PTT  
 MIG  
 MIC  
 HK

J601  
 1 NC  
 2 SB  
 3 GND  
 4 PTT/TXD  
 5 MIC GND  
 6 MIC  
 7 HOOK/RXD  
 8 NC

CN51 8  
 N\_SYNC1\_B  
 N\_SYNC1\_A  
 N\_SYNC2\_B  
 N\_SYNC2\_A  
 N\_SYNC1\_B  
 N\_SYNC1\_A  
 N\_SYNC2\_B  
 N\_SYNC2\_A

CN301 1  
 SB  
 +B  
 GND

CN700 1  
 SB  
 +B  
 GND

CN38 1  
 TMP1  
 TMP2  
 RAMP  
 FWD  
 TXASSIST  
 RXASSIST  
 TX\_CV  
 RX\_CV  
 GND  
 TXVCOB  
 RXVCOA/B  
 TXVCOA  
 /RXPCS\_TR  
 LDT  
 /16\_8PCS  
 LDR  
 /TXPCS  
 SPSCLK0  
 SPSD0  
 SBC  
 GND  
 MOD  
 GND  
 RSSI  
 AGC  
 33A  
 /EWP  
 HWV1  
 I2CCK  
 SPSCLK1  
 I2CDA  
 SPSD1  
 /IOCS  
 /EVCS  
 NC

CN800 1  
 TMP1  
 TMP2  
 RAMP  
 FWD  
 TXASSIST  
 RXASSIST  
 TX\_CV  
 RX\_CV  
 GND  
 TXVCOB  
 RXVCOA/B  
 TXVCOA  
 /RXPCS\_TR  
 LDT  
 /16\_8PCS  
 LDR  
 /TXPCS  
 SPSCLK0  
 SPSD0  
 SBC  
 GND  
 MOD  
 GND  
 RSSI  
 AGC  
 33A  
 /EWP  
 HWV1  
 I2CCK  
 SPSCLK1  
 I2CDA  
 SPSD1  
 /IOCS  
 /EVCS  
 NC

CN101  
 CN500  
 CN701 1  
 GND  
 +B  
 +B

CN801 11  
 GND  
 8TC  
 RAMP  
 ASWC  
 FAN  
 FDT  
 TMP2  
 TMP1  
 PLIM  
 H/L  
 HWV2

CN610  
 CN1

CN203 1  
 GND  
 +B  
 +B

CN204 1  
 GND  
 8TC  
 RAMP  
 ASWC  
 FAN  
 FDT  
 TMP2  
 TMP1  
 PLIM  
 H/L  
 HWV2

CN201  
 +B  
 GND  
 CN202

CN205 1  
 FAB  
 FAG

+B1  
 GND

N\_SYNC2  
 J401  
 N\_SYNC1  
 J402

RX ANT  
 Ext IN

FAN

TX ANT

MAIN DC

INT SP

W10

W6

W7

W3

W4

W5

W8

W9